



City of Palmer

PALMER, ALASKA

Wastewater Treatment Facility Improvements Project - Phase II

Bid Documents

Volume 4 of 4

Standard Details

May 25, 2021

HDR Project No. 10022766



City of Palmer
WASTEWATER TREATMENT FACILITY IMPROVEMENTS PROJECT
STANDARD DESIGN DETAILS

DRAWING TITLE	DETAIL NUMBER
Division 01 - General Requirements	
Alternate Machinery Anchor Bolt	01 61 03-07
Typical Equipment Support Pad	01 61 03-11
Division 03 - Concrete	
Extra Reinforcement Around Openings	03 21 00-01
Reinforcing Hook Schedule	03 21 00-04
Wall Reinforcing at Corner	03 21 00-19
TYP Approach Slab	03 21 00-22
Circular Tank Horizontal Reinforcing	03 21 00-26
Wall Vertical Reinforcing At Construction Joint	03 21 00-29
Reinforcing Splice Not At Construction Joint	03 21 00-29
Plastic Waterstop	03 31 31-12
Provision For Future Construction Joint	03 31 31-18
Division 04 - Masonry	
Division 05 - Metals	
Bollard	05 50 00-13
Floor Mounted Hose Rack	05 50 00-17
Type "V" Notch Weir And Baffle Assembly	05 50 00-20
Straight Edge Weir & Plate	05 50 00-21
Fiberglass Straight Edge Weir	05 50 00-22
Weir Closure	05 50 00-23
Anchor Bolt For Weir And Baffel Plates	05 50 00-24
Lifting Eye	05 50 00-25
Lifting Handle	05 50 00-26
Stair Bottom Connection	05 50 00-27
Stair Top Connection	05 50 00-28
Stair Detail	05 50 00-29
Stair Landing With Supports	05 50 00-30
Stair Landing With Supports	05 50 00-31
Stair Treads	05 50 00-32
Valve Cover in Concrete	05 50 00-35
Division 07 - Thermal and Moisture Protection	
Division 08 - Openings	
Access Door	08 31 00-01
Coating Termination Detail	09 96 00-01
Division 10 - Specialties	
Signage	10 14 23-08

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DRAWING TITLE	DETAIL NUMBER
Division 22 - Plumbing	
Emergency Shower & Eyewash	22 20 00-05
Non-Freeze Hydrant Installation	22 20 00-09
Spray Nozzle	22 20 00-10
Thrust Block Detail	22 20 00-27
Division 23 - Heating, Ventilating, and Air-Conditioning (HVAC)	
Gooseneck Detail	23 31 00-20
Division 26 - Electrical	
Modular Equipment Rack	26 05 00-02
Column Ground Connection	26 05 26-02
4 Wire Service, Grounded System, Ground Bar, Remote Building	26 05 26-06
Direct Buried Conduit(s) Section	26 05 43-01
Conduit Transition To Above Grade (Exterior)	26 05 43-08
Light Pole Foundation	26 50 00-01
Flourescent Luminaire Mounting Detail	26 50 00-03
Division 31 - Earthwork	
Cement Stabilized Backfill Pipe Embedment	31 23 33-06
Water/Sewer Crossing Detail	31 23 33-10
Typical Trench Section	31 23 33-12
Division 32 - Exterior Improvements	
Asphalt/Concrete Paving Section	32 12 16-01
Typ Gravel Access /Parking Area Section	32 12 16-05
Concrete Header Detail	32 13 13-12
Concrete Walk Joint Detail	32 16 13-11
Stabilized Construction Entrance	32 16 13-20
Typical Walkway Structure Interface	32 16 13-25
Concrete Walkway / Sidewalk	32 16 23-02
Division 33 - Utilities	
Manhole Cover And Frame	33 05 16-03
Precast Sanitary Sewer Manhole	33 05 16-04
Sewer Cleanout Detail	33 46 13-05

City of Palmer
WASTEWATER TREATMENT FACILITY IMPROVEMENTS PROJECT
STANDARD DESIGN DETAILS

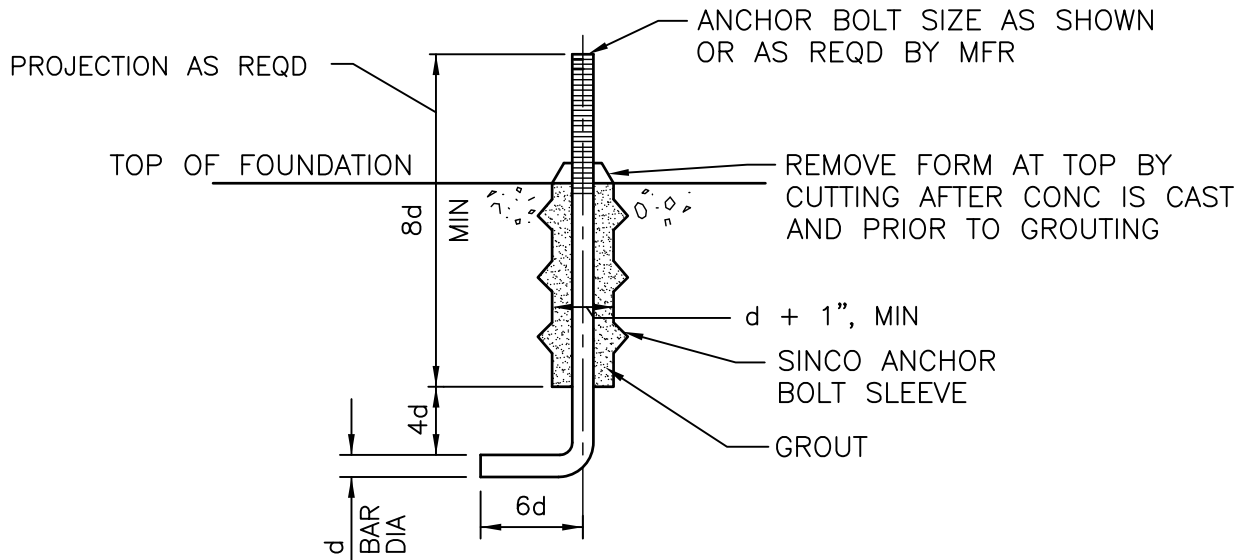
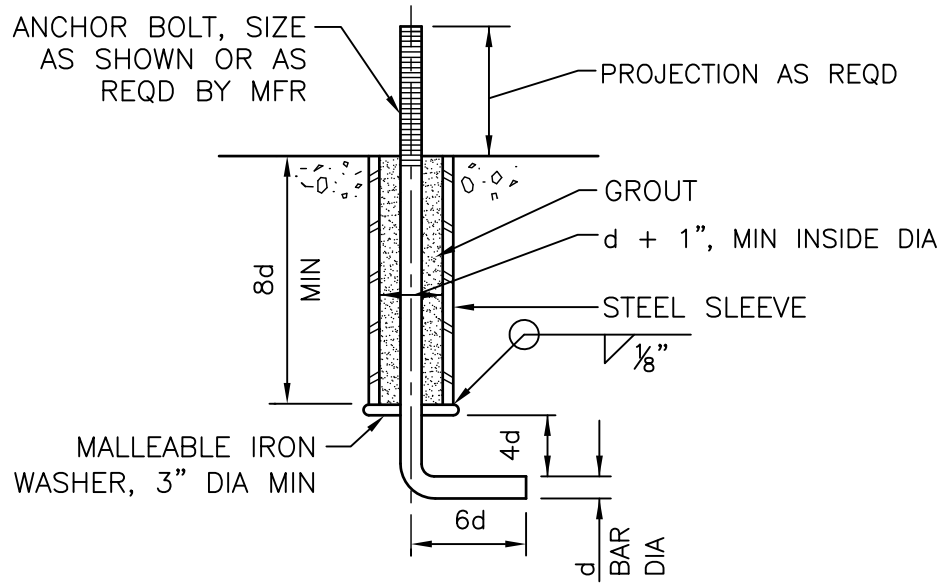
DRAWING TITLE	DETAIL NUMBER
Division 40 - Process Interconnections	
Underslab Pipe Encasement Type 1	40 05 00-01
Underslab Pipe Encasement Type 2	40 05 00-02
Thrust Block Detail	40 05 00-06
Thrust Tie Detail	40 05 00-14
Line Drain Valve Installation	40 05 00-15
Ductile Iron Wall Pipe	40 05 00-17
Wall Pipe	40 05 00-18
Ductile Iron Wall Pipe In Concrete Ceiling	40 05 00-20
Steel Wall Pipe	40 05 00-21
Ductile Iron Pipe Seep Ring	40 05 00-25
Modular Mechanical Seal	40 05 00-26
Modular Mechanical Seal	40 05 00-27
Floor Sleeve	40 05 00-28
Wall Pipe - Large Diameter Ductile Iron or Steel Pipe	40 05 00-34
Thrust Tie	40 05 00-43
Buried DIP Wall Connection	40 05 00-52
Restrained Mechanical Joint to Flanged Joint	40 05 00-53
Pipe Wall Penetration	40 05 00-55
HDPE Wall Pipe Connection	40 05 00-57
Concrete Pedestal Support	40 05 07-01
Fabricated Steel Base Elbow	40 05 07-02A
Steel Elbow Support	40 05 07-02B
Submerged LPA Piping Support	40 05 07-03
Medium Pipe Support	40 05 07-05
Heavy Pipe Support	40 05 07-06
Heavy Duty Pipe Support	40 05 07-07
Surface Mount Modular Strut	40 05 07-08
One Hole Clamp	40 05 07-10
Flanged Pipe Support	40 05 07-11
Riser Pipe Support	40 05 07-12
Pipe Support Detail	40 05 07-13
Pipe Support Detail	40 05 07-14
Offset Pipe Support	40 05 07-15
Floor Pipe Support	40 05 07-18
Pipe Hanger Detail	40 05 07-20
Pipe Hanger Detail	40 05 07-21
Pipe Hanger Detail	40 05 07-22
Pipe Hanger Detail	40 05 07-23
Beam Clamp	40 05 07-24
Pipe Sway Brace	40 05 07-26
Overhead Pipe Hanger Sway Brace Assembly	40 05 07-37
Pipe Hanger Detail	40 05 07-39
Pipe Support Beam Mounted ALP	40 05 07-40
Arctic Pipe Typical Concrete Wall Penetration	40 05 35-01
Arctic Pipe Section	40 05 35-02
Arctic Pipe Coupling Band Detail	40 05 35-03
Arctic Pipe - Typical HDPE Arctic Pipe Bends and Tees	40 05 35-05

City of Palmer
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STANDARD DESIGN DETAILS

DRAWING TITLE	DETAIL NUMBER
Division 40 - Process Interconnections (continued)	
Arctic Chase	40 05 35-07
Arctic Pipe Typical Wall Penetration	40 05 35-08
Sample Valve	40 05 51-07
Stop Slide Gate	40 05 58-01
Fabricated Slide Gate	40 05 58-02
Fabricated Weir Gates	40 05 58-03
Floor Stand Installation	40 05 58-07
Stem Guide Installation	40 05 58-08
Mud Valve	40 05 67-01
Mud Valve	40 05 67-01-A
Wall Mounted Instrument Installation	40 91 10-01
Floor Mounted Pipe Stand For One Instrument	40 91 10-02
Ultrasonic Sensor Installation	40 91 10-08
Typical Float Type Level Switch Installation	40 91 10-12
Inline Primary Element Installation	40 91 10-17
Analytical Probe Junction Box	40 91 10-20
Typical Static Pressure Transmitter Installation	40 91 10-29
High Level Alarm Support Bracket	40 91 10-30
Magnetic Flow Meter Grounding Ring Bonding	40 91 10-33
Shielded Control Cable Termination Dressing	40 91 10-34
Single Phase Control Disconnect	40 91 10-35
Suspended Float Switch	40 91 10-37
In-Line Isolation Sleeve Pressure Switch/Transmitter Annular Seal	40 91 10-38
Pressure Gauge PG-1	40 91 10-39
Pressure Gauge PG-2	40 91 10-40
In-Line Isolation Sleeve Pressure Gauge PG-4	40 91 10-41
Pressure Transmitter- Air or Gas Applications	40 91 10-45
Differential Pressure Switch Fan Ducts Tubing	40 91 10-48
Flood Alarm Switch	40 91 10-49
Diaphragm Seal	40 91 10-54
DO or NH4 Sensor	40 91 10-56
Submersible Level Transmitter	40 91 10-57
Surface Mounted Door Position Switch	40 91 10-58
Hatch Intrusion Switch Installation Detail	40 91 10-59
Ammonia Probe Bracket	40 91 10-60
Division 40 - Process Interconnections (contuied)	
Suspended Float Switch	40 91 10-62
Division 43 - Process Gas and Liquid Handling, Purification, and Storage Equipment	
Single Sump Pump	43 25 13-02

City of Palmer
WASTEWATER TREATMENT FACILITY IMPROVEMENTS PROJECT
STANDARD DESIGN DETAILS

DRAWING TITLE	DETAIL NUMBER
Division 46 - Water and Wastewater Equipment	
Mechanical Details	
Diffuser Connection Detail	15000C040
Duct Hanging Detail	15000C100
Low Velocity Round Duct Take-Off Fitting Detail	15000C003
Gas Service Entrance Detail	15000C089
Low Pressure Duct Connection Detail	15000C283



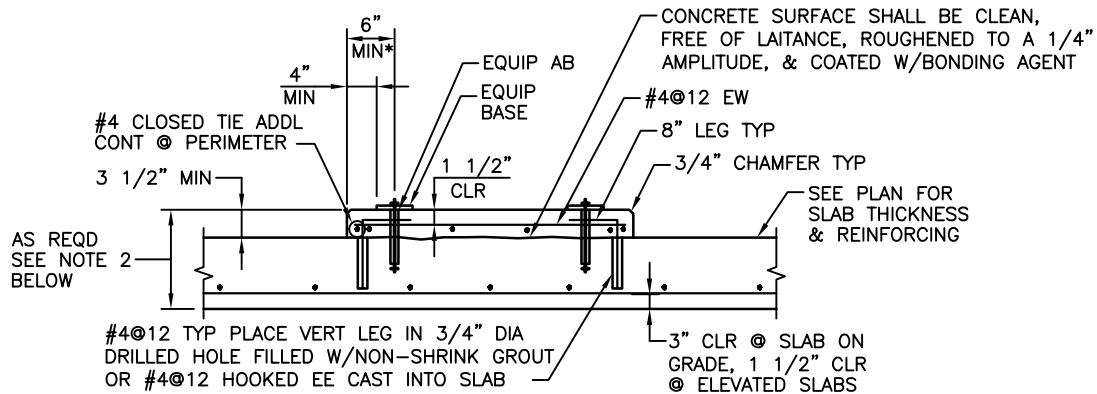
NOTE:
 SINCO PRODUCTS INC EAST
 HAMPTON, CT 1-800-243-6753

ALTERNATE MACHINERY ANCHOR BOLT

NTS

01 61 03-07





MINIMUM PAD THICKNESS TABLE	
AB DIA	MIN PAD THK
1/4" DIA	5"
3/8" DIA	6 1/2"
1/2" DIA	8"
5/8" DIA	9 1/2"
3/4" DIA	11"
7/8" DIA	12 1/2"
1" DIA	14"

PAD NOTES:

1. ABOVE PAD DETAILS APPLY FOR SUPPORT OF ALL EQUIPMENT UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
2. BEFORE EQUIPMENT SUPPORT PADS ARE CAST, THE PAD SIZES AND REINFORCING SHALL BE APPROVED BY THE ENGINEER AS BEING CAPABLE OF SUPPORTING EQUIPMENT TO BE PLACED THEREON. EQUIPMENT BASE DIMENSIONS SHALL BE THE LARGER OF AS DETERMINED BY THE EQUIPMENT MANUFACTURER OR AS INDICATED ON THE DRAWINGS. SUBMIT ALL EQUIPMENT DIMENSIONS AND LOADS TO ENGINEER. THE SIZE, NUMBER, TYPE, LOCATION AND THREAD PROJECTION OF THE ANCHOR BOLTS (AB) SHALL BE AS DETERMINED BY THE EQUIPMENT MANUFACTURER AND SHALL BE AS APPROVED BY THE ENGINEER. AB SHALL BE HELD IN POSITION WITH A TEMPLATE WHILE EQUIPMENT PAD IS CAST.
- *3. 6" MINIMUM PAD EDGE DIMENSION TO EQUIPMENT AB APPLIES FOR ALL EQUIPMENT SUPPORT PADS.

NOTES:

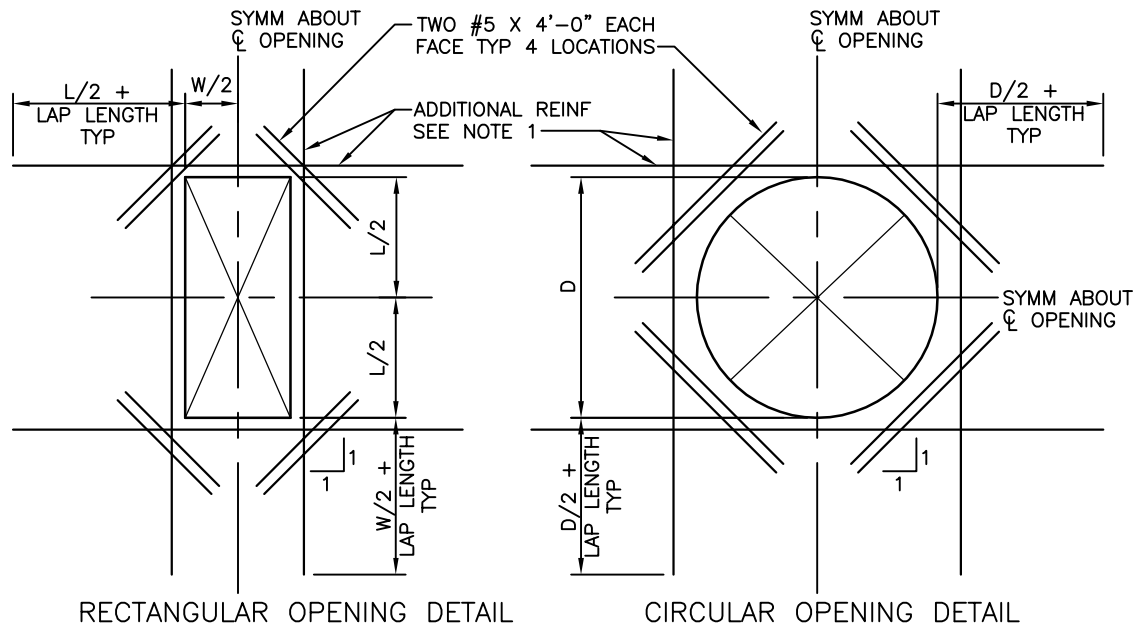
1. PROVIDE ABOVE PAD UNDER ALL ELECTRICAL AND MECHANICAL EQUIPMENT SUPPORTED ON STRUCTURAL SLABS. ALSO PROVIDE FOR EQUIPMENT WEIGHING LESS THAN 5000 POUNDS WHICH ARE SUPPORTED ON GRADE OR WHERE SPECIFICALLY NOTED ON PLANS.
2. PAD THICKNESS SHALL BE THE LARGER OF SLAB THICKNESS PLUS 3 1/2" OR MINIMUM PAD THICKNESS FROM TABLE. PROVIDE AN ADDITIONAL LAYER OF #4@12 EACH WAY WITH 1 1/2" CLEAR TOP AND BOTTOM FOR EACH 8" ADDITIONAL PAD THICKNESS EXCEEDING THE 3 1/2" MINIMUM THICKNESS. ALTERNATIVELY, THICKEN SLAB ON GRADE BELOW EQUIPMENT PAD AS REQD TO MAINTAIN MIN 3" COVER ON ANCHOR BOLTS.

TYPICAL EQUIPMENT SUPPORT PAD

NOT TO SCALE

01 61 03-11





NOTES:

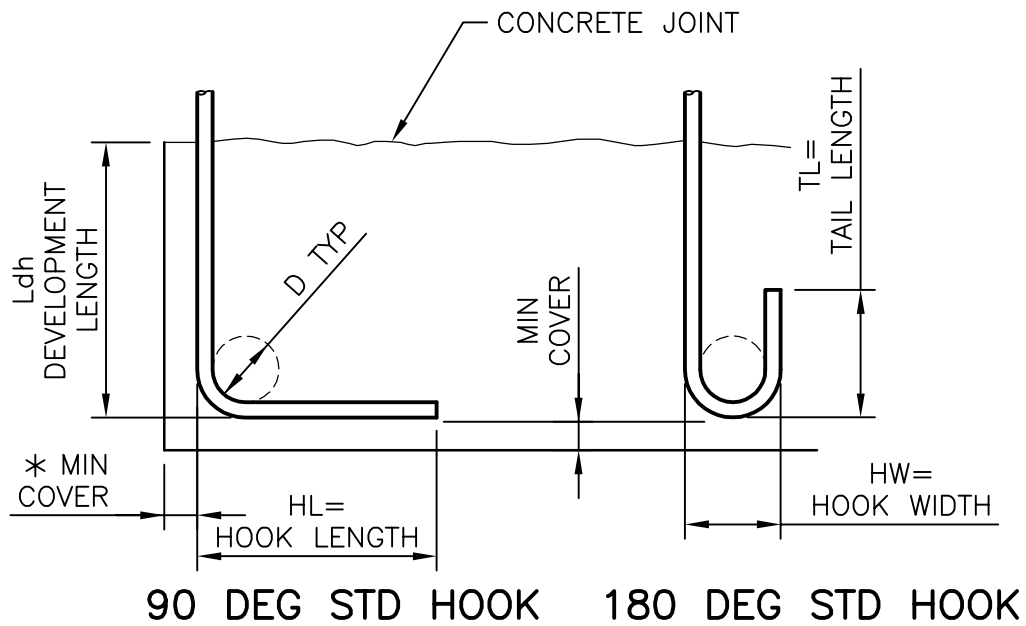
1. PROVIDE ADDITIONAL REINFORCING THE SAME SIZE AS DISCONTINUOUS REINFORCEMENT AT OPENING. QUANTITY OF REINFORCING IN EACH DIRECTION SHALL BE EQUAL TO OR ONE GREATER THAN THE NUMBER OF DISCONTINUOUS BARS. PLACE 1/2 OF ADDITIONAL REINFORCING BARS EACH SIDE OF OPENING, PLACE ADDITIONAL REINFORCEMENT AT 3" OC (TYPICAL BOTH DIRECTIONS AND ALL LAYERS OF REINFORCEMENT). START FIRST BAR 2" CLEAR TO OPENING.
2. EXTEND ADDITIONAL REINFORCING BEYOND EDGE OF OPENING AS SHOWN ABOVE. ADDITIONAL BARS MAY TERMINATE AT THE END OF THE WALL WITH A STANDARD HOOK WHERE THE LENGTH OF THE WALL WILL NOT PERMIT BARS TO EXTEND AS SHOWN ABOVE.
3. TYPICAL WALL OR SLAB REINFORCING NOT SHOWN FOR CLARITY. TERMINATE TYPICAL REINFORCING 2" CLEAR TO OPENING.
4. OPENINGS 12" OR LESS IN SLABS AND WALLS, NO EXTRA REBARS ARE REQUIRED UNLESS SHOWN OTHERWISE. TYPICAL REINFORCING SHALL BE RESPACED (NOT CUT) TO ALLOW FOR OPENINGS TO BE MADE.
5. UNLESS SHOWN OTHERWISE ON DRAWINGS, PROVIDE EXTRA REINFORCING AROUND OPENINGS AS SHOWN AND INDICATED ABOVE.
6. PROVIDE ADDITIONAL DOWELS PER NOTE 1 ABOVE FOR ALL OPENINGS NEAR THE FLOOR SLAB, BASE SLAB, OR CORNERS.

EXTRA REINFORCEMENT AROUND OPENINGS

NOT TO SCALE

03 21 00-01





BAR SIZE GRADE 60	HL	HW	TL	D	f'c=4.0 OR 4.5 KSI	
					Ldh *	
#3	6"	3"	3"	2 1/4"	6"	
#4	8"	4"	4 1/2"	3"	7"	
#5	10"	5"	5"	3 3/4"	9"	
#6	1'-0"	6"	6"	4 1/2"	10"	
#7	1'-2"	7"	7"	5 1/4"	12"	
#8	1'-4"	8"	8"	6"	14"	
#9	1'-7"	11 3/4"	10 1/2"	9 1/2"	15"	
#10	1'-10"	1'-1 1/4"	11 1/2"	10 3/4"	17"	
#11	2'-0"	1'-2 3/4"	1'-1"	12"	19"	

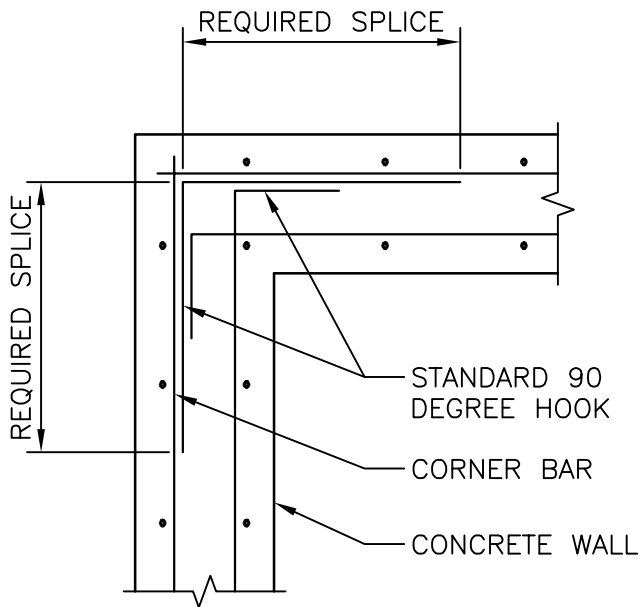
* COMPLYING WITH MINIMUM COVER REQUIREMENTS OF
ACI 318, 12.5.3. OTHERWISE Ldh MUST BE RE-CALCULATED.

REINFORCING HOOK SCHEDULE

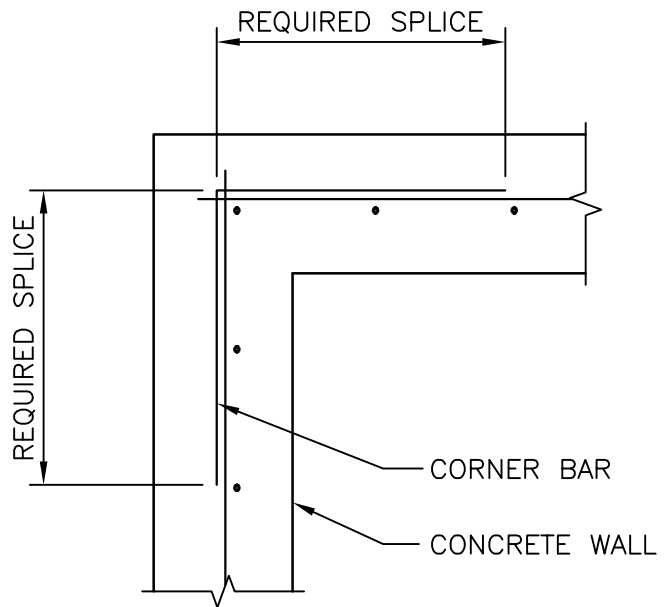
NOT TO SCALE

03 21 00-04

HR



DOUBLE LAYER



SINGLE LAYER

NOTE:

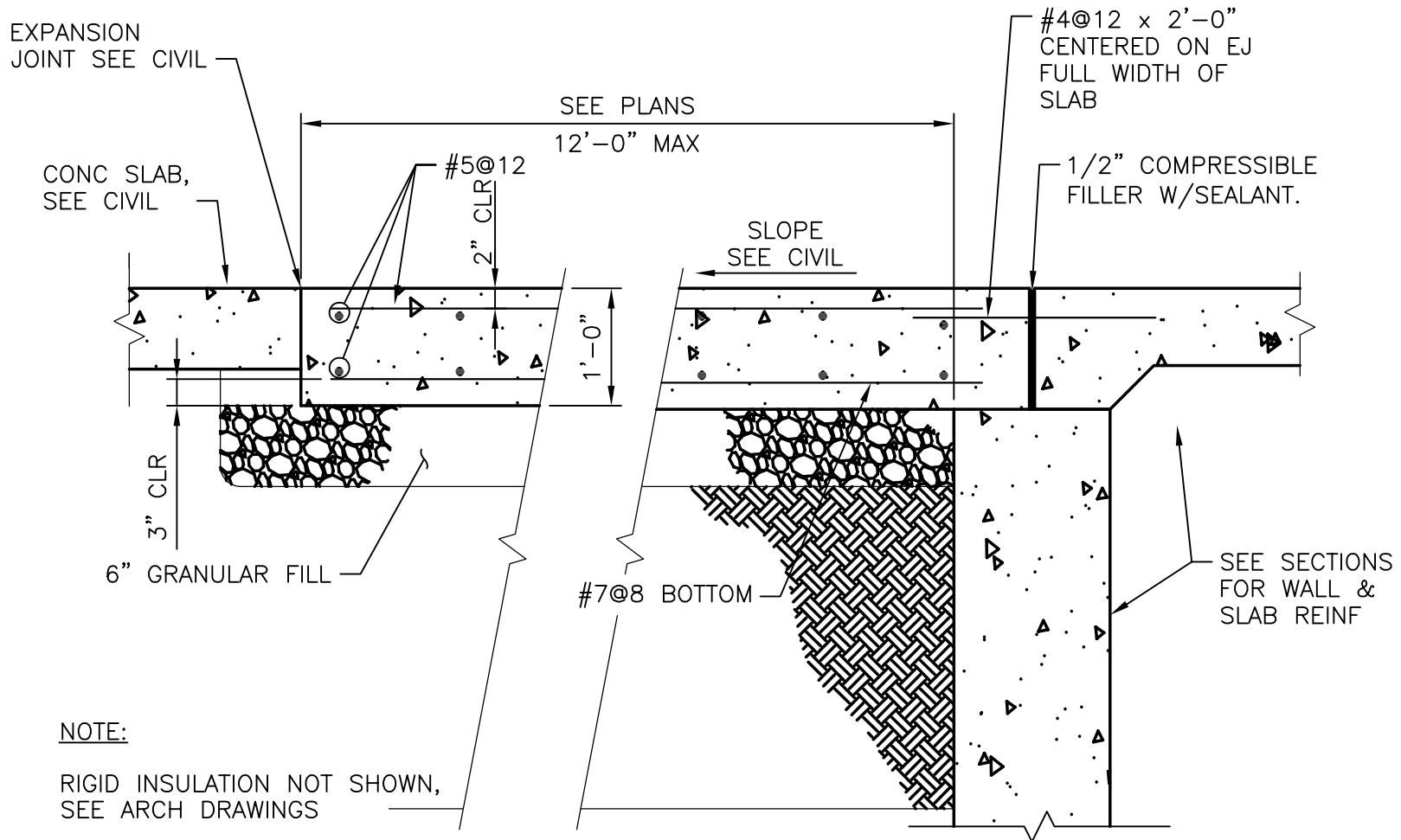
1. CORNER BARS TO BE SAME SIZE AND SPACING AS HORIZONTAL BARS.

WALL REINFORCING AT CORNER

NOT TO SCALE

03 21 00-19





TYP APPROACH SLAB

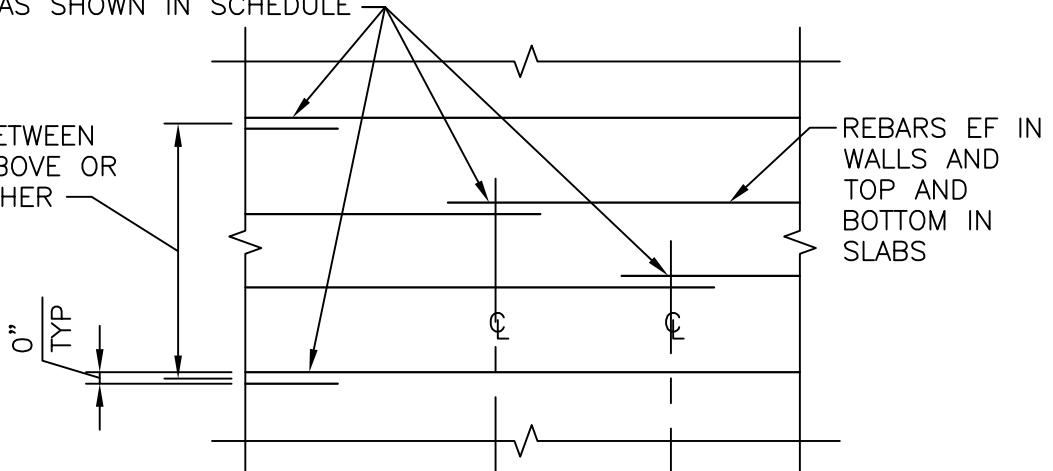
NTS

03 21 00-22



PROVIDE REQUIRED LAP SPACE
LENGTH AS SHOWN IN SCHEDULE

MIN 3 SPACES BETWEEN
LAPS DIRECTLY ABOVE OR
BELOW ONE ANOTHER



STAGGER 2X LAP SPLICE LENGTH AS SHOWN
IN SCHEDULE BUT NOT LESS THAN 3'-0" MIN
BETWEEN ϕ LAPS OF ADJACENT REBARS

NOTES:

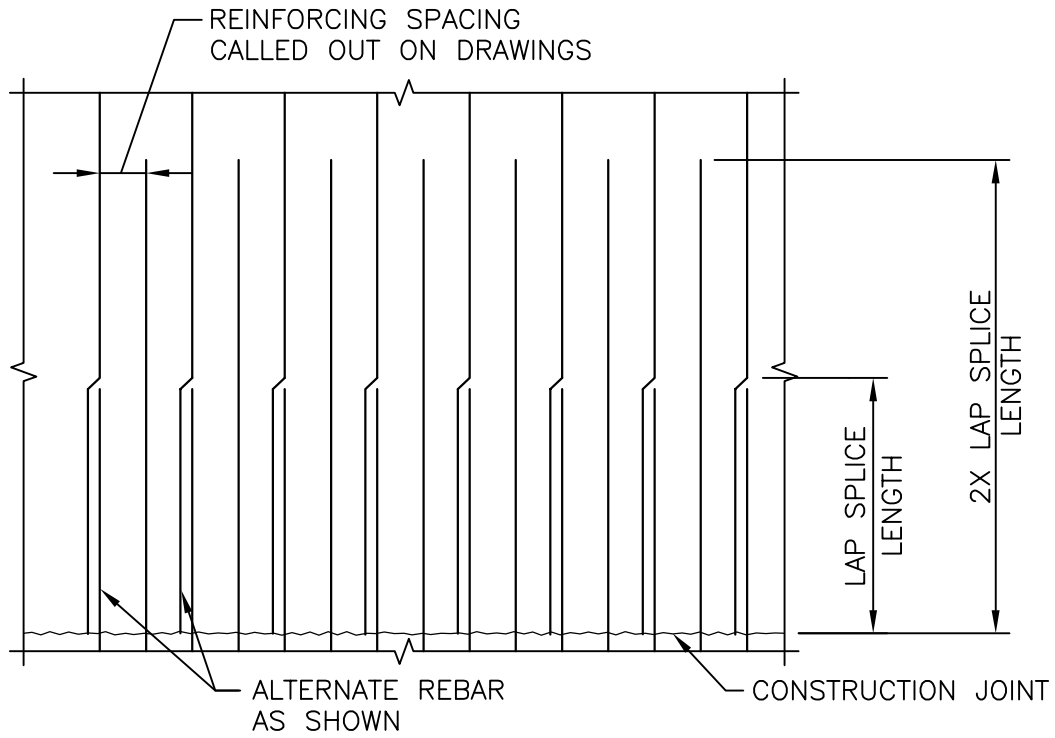
1. LAP AND STAGGER ALL HORIZONTAL CIRCULAR WALL REINFORCING PER THIS DETAIL, INCLUDING ONE LAP STAGGER BETWEEN INSIDE FACE LAPS AND OUTSIDE FACE LAPS.
2. LAP ALL CIRCUMFERENTIAL BARS IN THE BASE SLAB WITHIN 6 WALL THICKNESSES OF EACH FACE OF TANK WALL PER THIS DETAIL.

CIRCULAR TANK HORIZONTAL REINFORCING

NOT TO SCALE

03 21 00-26

HDR

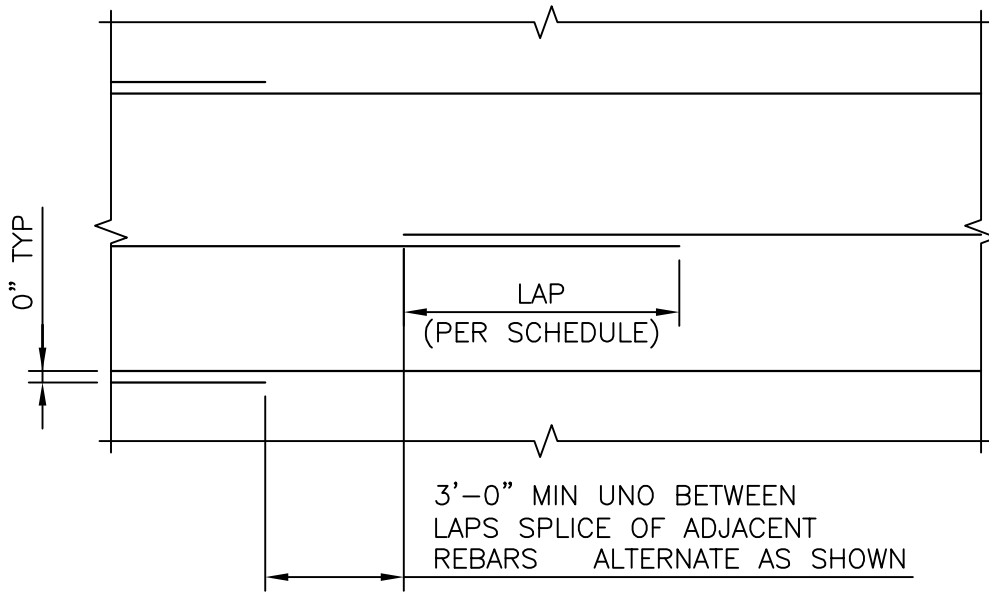


WALL VERTICAL REINFORCING AT CONSTRUCTION JOINT

NOT TO SCALE

03 21 00-28





NOTE:

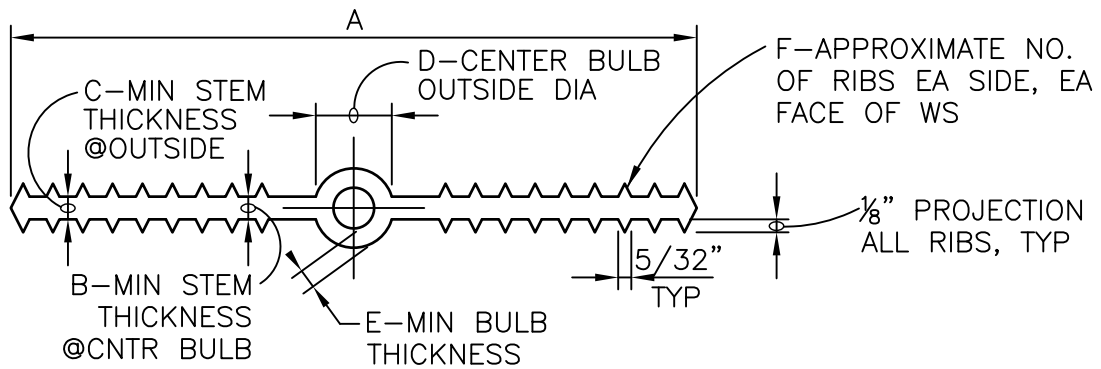
1. APPLIES TO SLABS AND WALLS (BOTH HORIZONTAL AND VERTICAL).

REINFORCING SPLICE
NOT AT CONSTRUCTION JOINT

NOT TO SCALE

03 21 00-29





SIZE	A	B	C	D	E	F
6" x 3/8"	6"	3/8"	3/8"	7/8"	1/4"	6
9" x 3/8"	9"	3/8"	3/8"	1"	1/4"	8

NOTES:

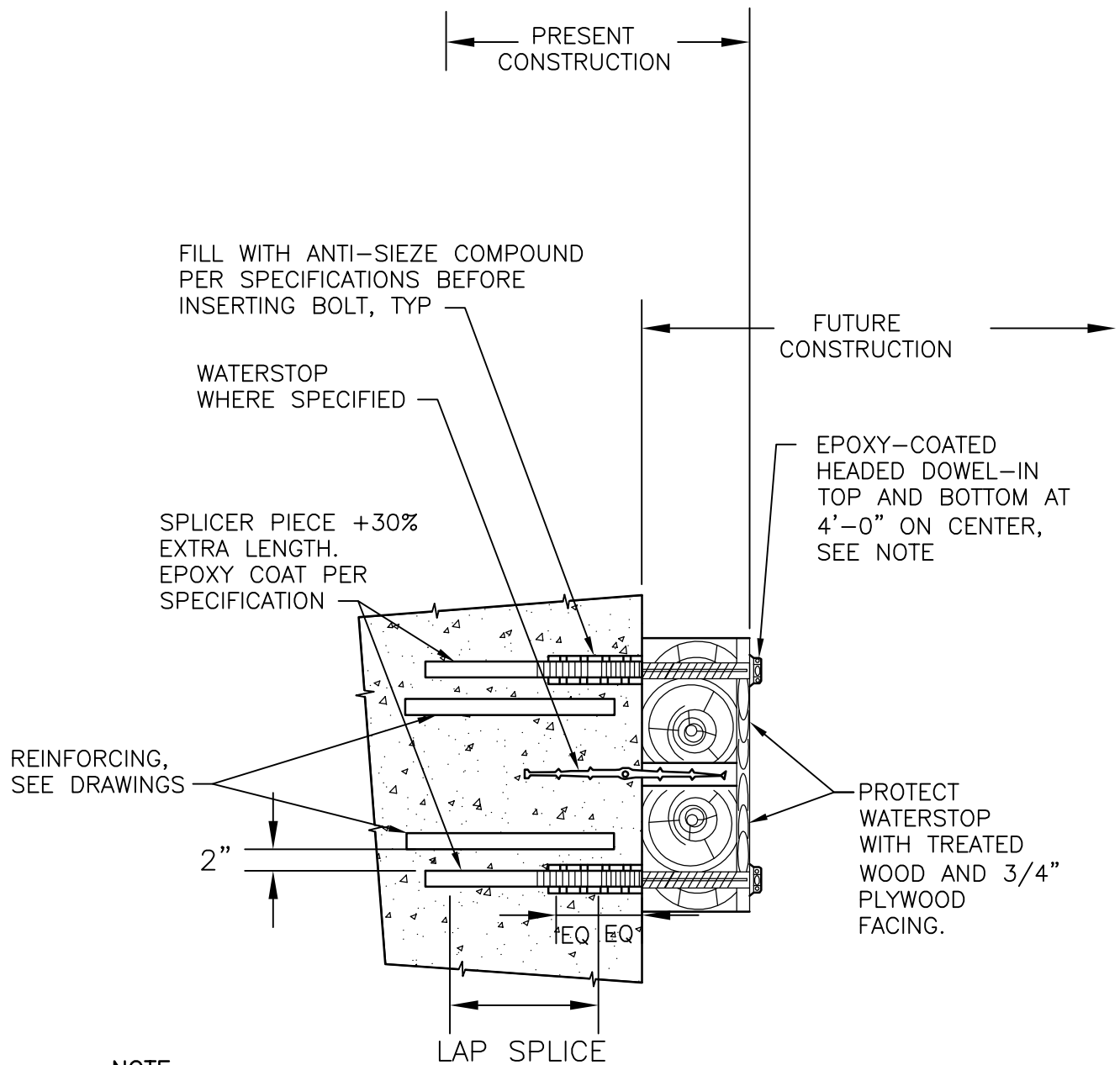
1. MATERIAL QUALITY PER SPECIFICATIONS.
2. DIM REQUIREMENTS INDICATED SHOULD BE GIVEN TO SUPPLIERS PRIOR TO PLACING ORDERS.
3. NON-ROUND CENTER BULBS SHALL HAVE A MIN OUTSIDE DIM OF "D"

PLASTIC WATERSTOP

NTS

03 31 31-12





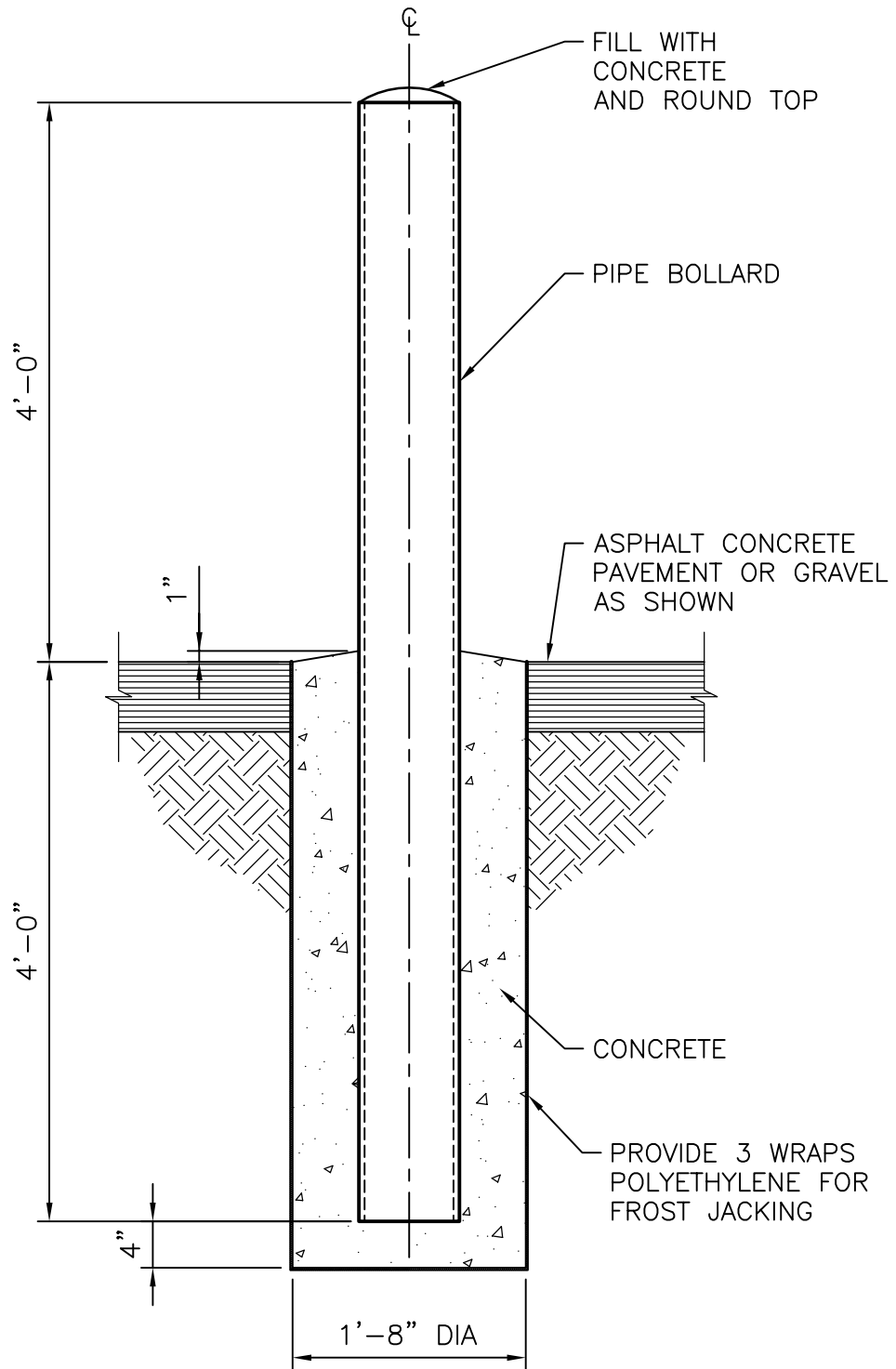
NOTE:

SPLICER PIECES WITHOUT DOWEL-IN SHALL BE FILLED WITH ANTI-SIEZE COMPOUND AND PLASTIC CAPPED. PRESSURE TREATED WOOD SHALL SECURELY HOLD CAPS IN PLACE, TIGHT AGAINST SPLICER PIECE.

PROVISION FOR FUTURE CONSTRUCTION JOINT

NTS

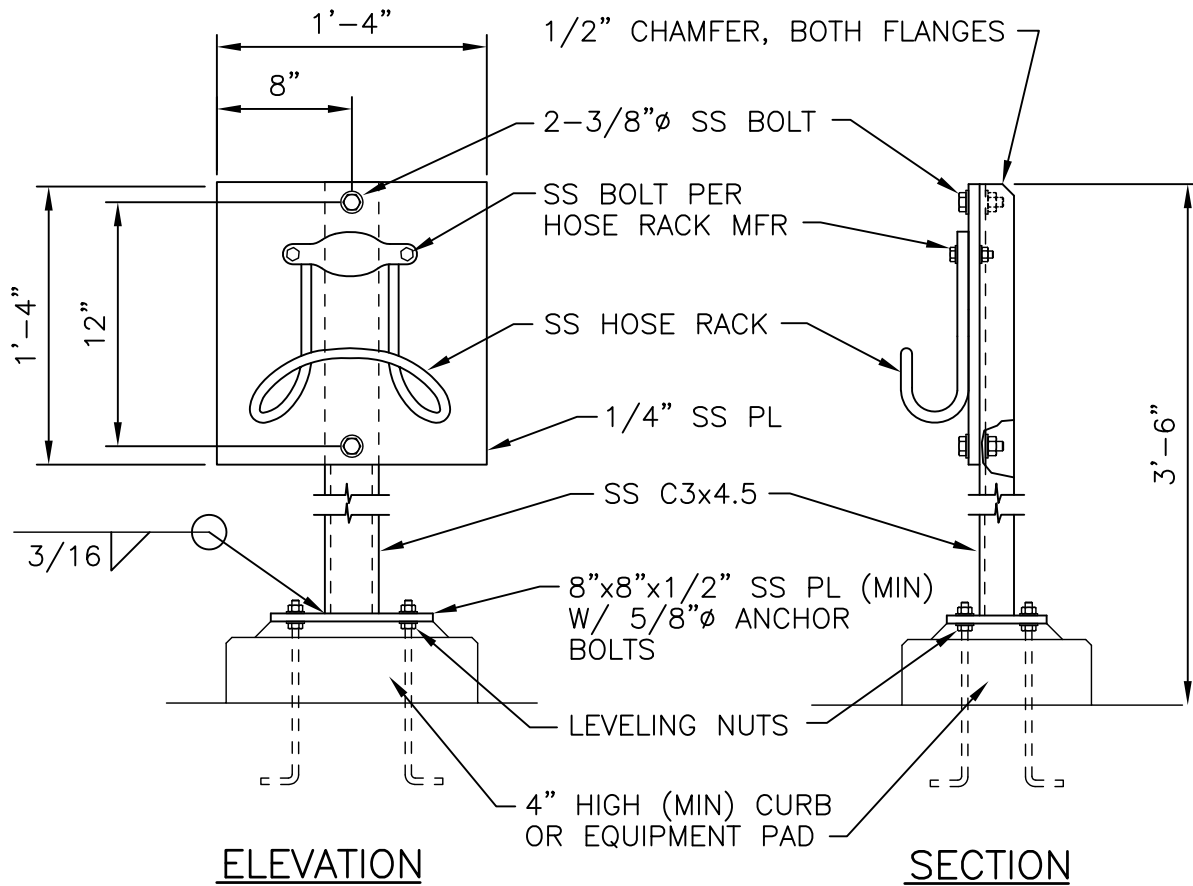
03 31 31-18



BOLLARD
 NOT TO SCALE

05 50 00-13





NOTE:

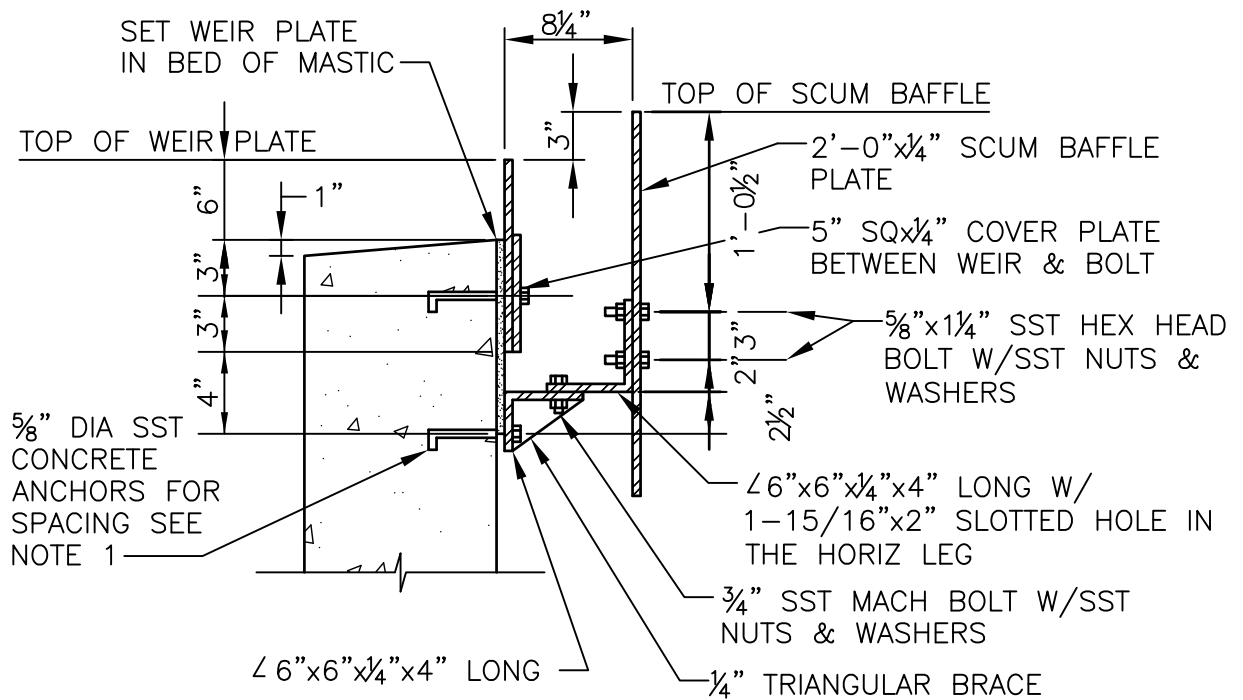
REMOVE ALL BURRS AND SHARP EDGES.

FLOOR MOUNTED HOSE RACK

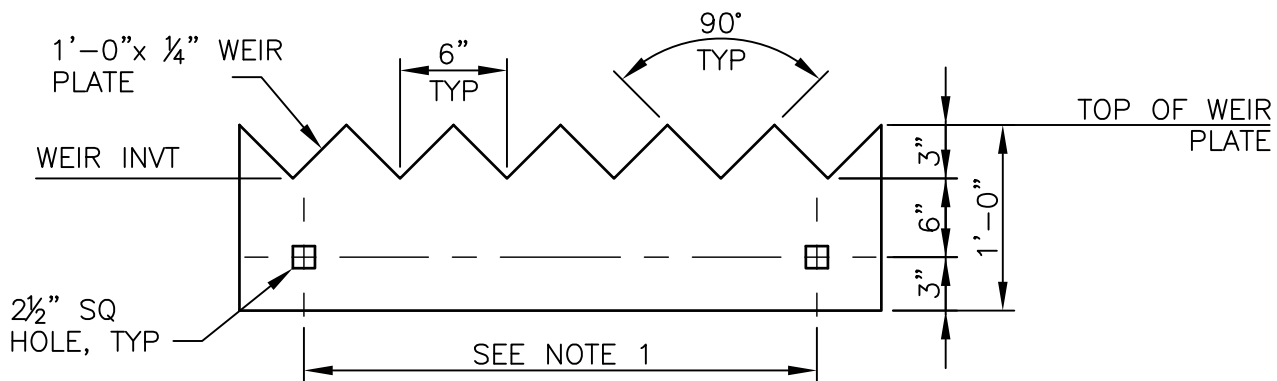
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05 50 00-17





WEIR AND BAFFLE SECTION



WEIR PLATE DETAIL

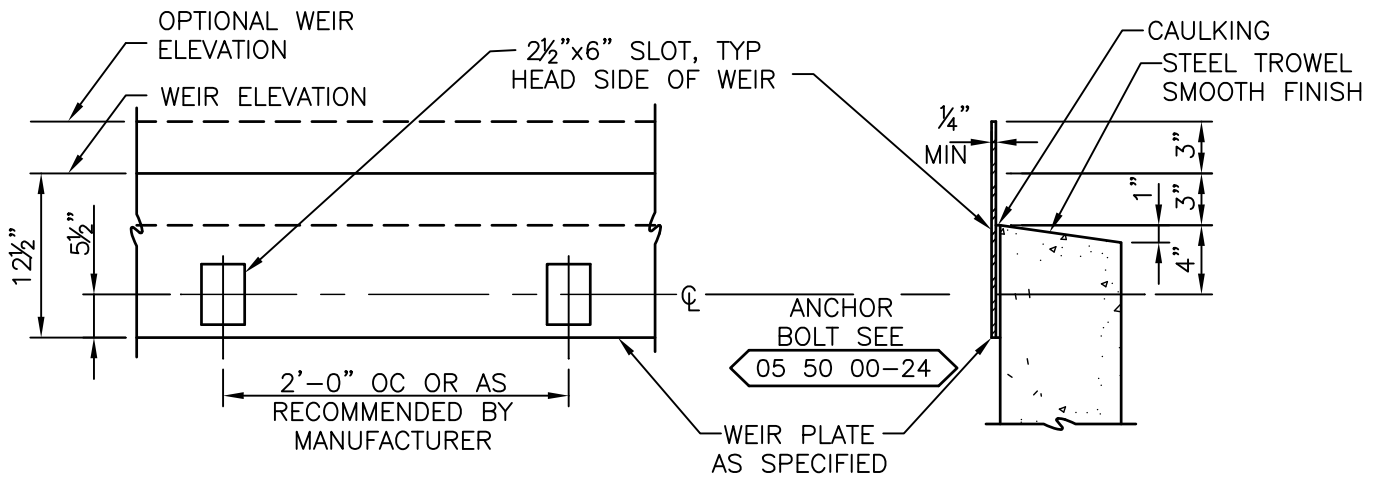
NOTES:

1. SCUM BAFFLE ANCHORS SHALL BE EQUALLY SPACED AT 4'-0" OC MAX PLACE WEIR ANCHORS AT 2'-0" OC MAX OR AS RECOMMENDED BY MFR SEE 05 50 00-24.
2. ALL PARTS EXCEPT FASTENERS SHALL BE FIBERGLASS.
3. PROVIDE WEIR CLOSURE DETAIL SIMILAR TO 05 50 00-22 AT EITHER SIDE OF SCUM TROUGH.

TYPE 'V' NOTCH WEIR AND BAFFLE ASSEMBLY

NTS

05 50 00-20

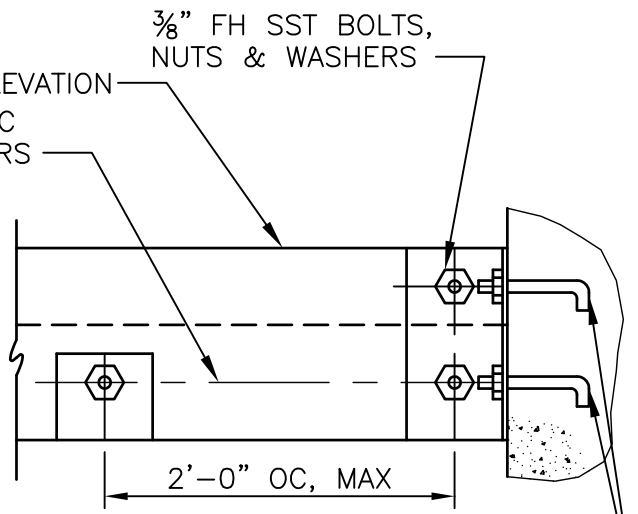
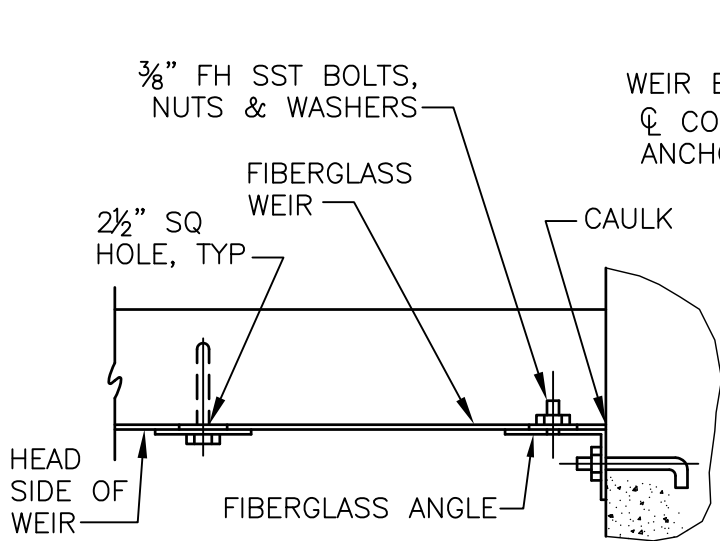


NOTE:
 FOR WEIR CLOSURE, SEE DETAIL 05 50 00-23

STRAIGHT EDGE WEIR & PLATE

NTS

05 50 00-21

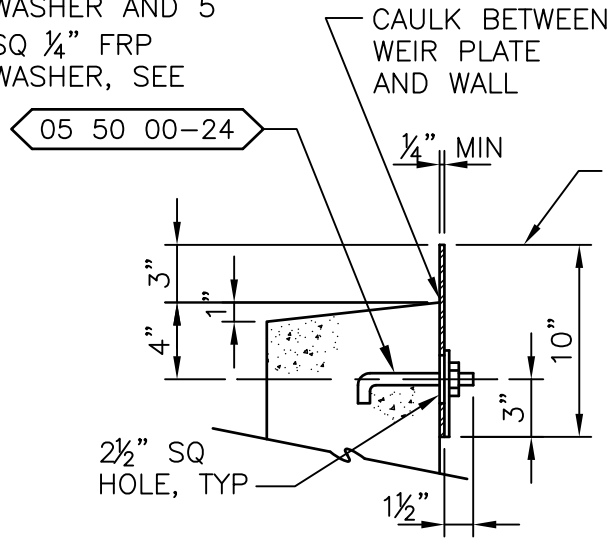


1/2"x6" SST CONC ANCHORS W/ SST NUT, LOCK WASHER AND 5" SQ 1/4" FRP WASHER, SEE

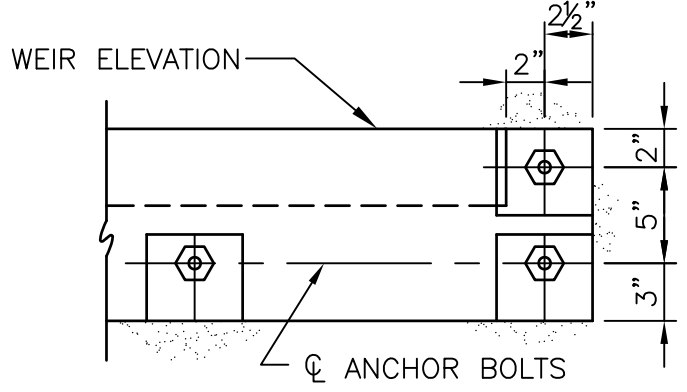
PLAN

SST CONC ANCHORS SEE 05505-24

ELEVATION



SECTION



ALTERNATE ELEVATION

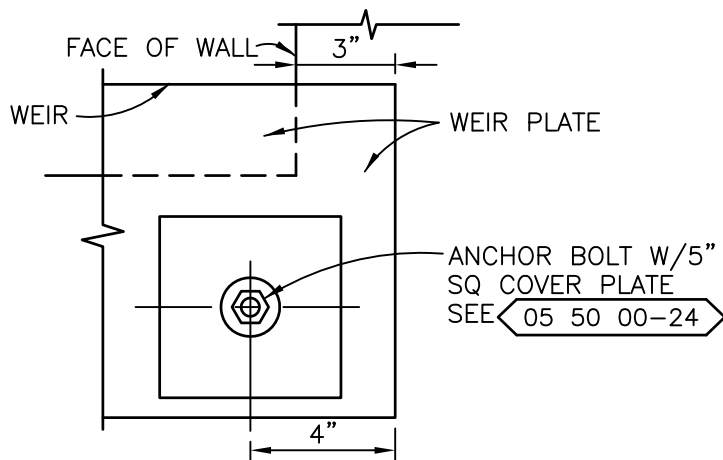
NOTE:
STEEL TROWEL TOP OF CONCRETE TO OBTAIN SMOOTH DENSE FINISH

FIBERGLASS STRAIGHT EDGE WEIR

NTS

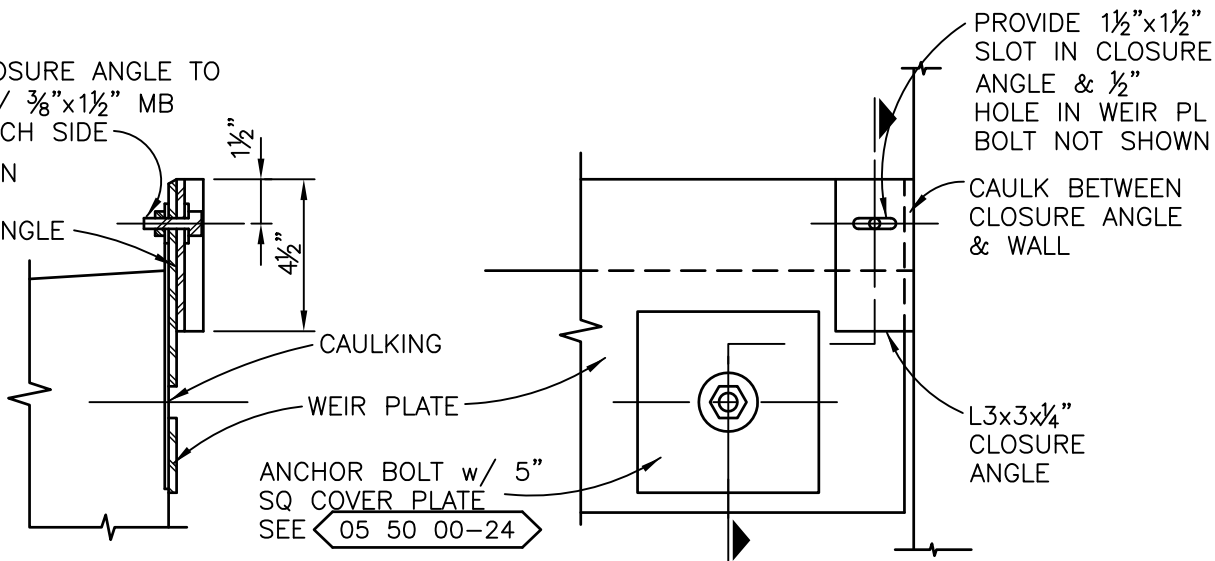
05 50 00-22





ELEVATION
TYPE-1 ENCLOSURE

FASTEN CLOSURE ANGLE TO WEIR PL w/ $\frac{3}{8}$ "x $1\frac{1}{2}$ " MB WASHER EACH SIDE
CAULK BTWN WEIR PL & CLOSURE ANGLE



SECTION

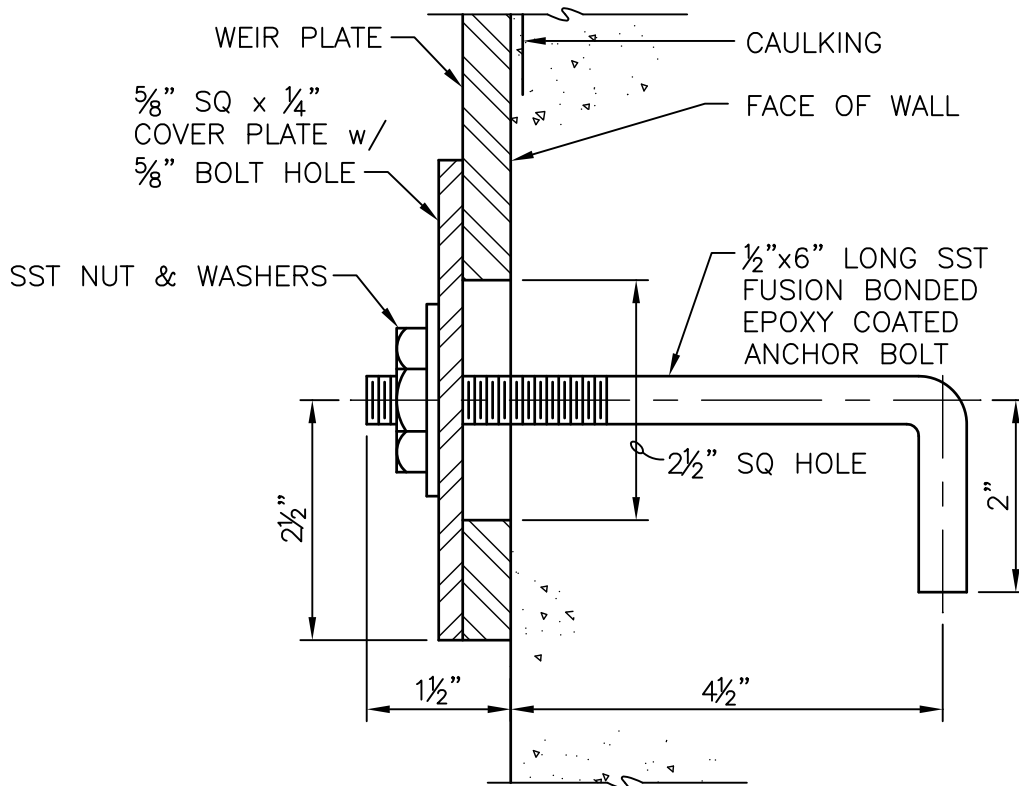
ELEVATION

TYPE-2 CLOSURE

WEIR CLOSURE

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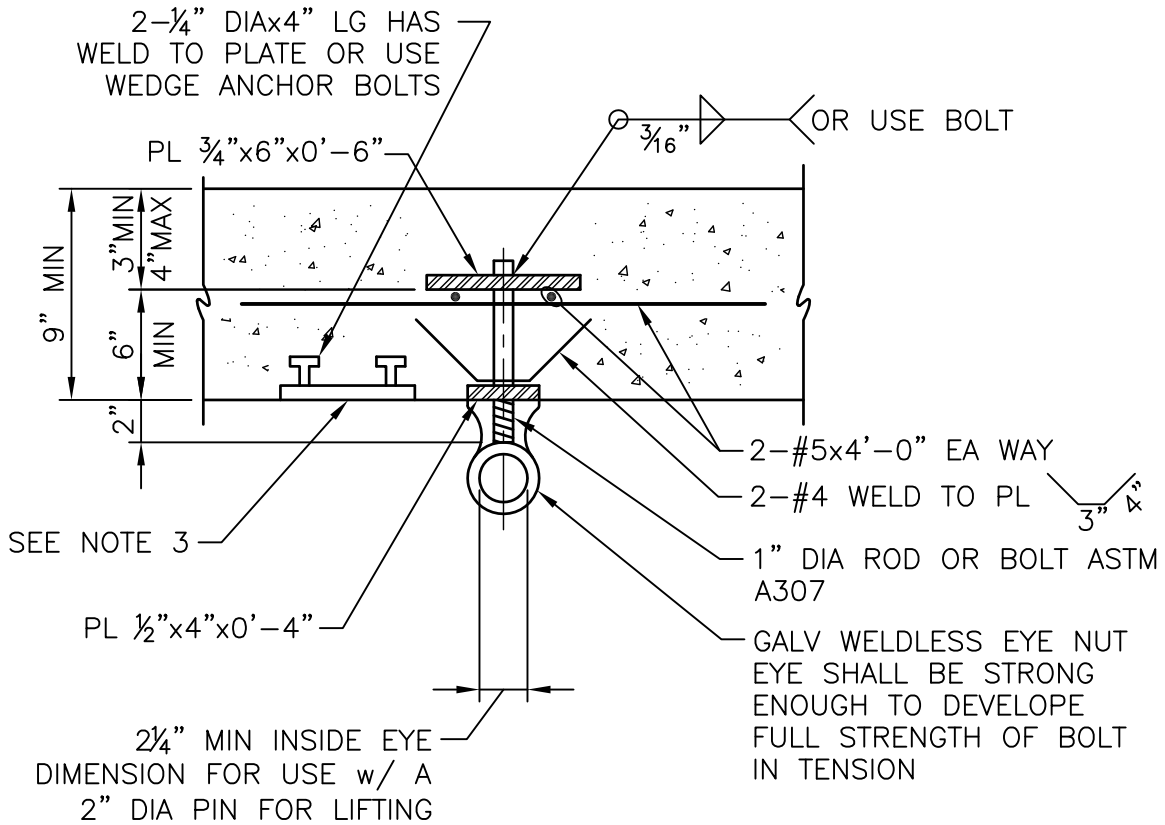
05 50 00-23



ANCHOR BOLT FOR WEIR AND BAFFLE PLATES

NTS

05 50 00-24



NOTES:

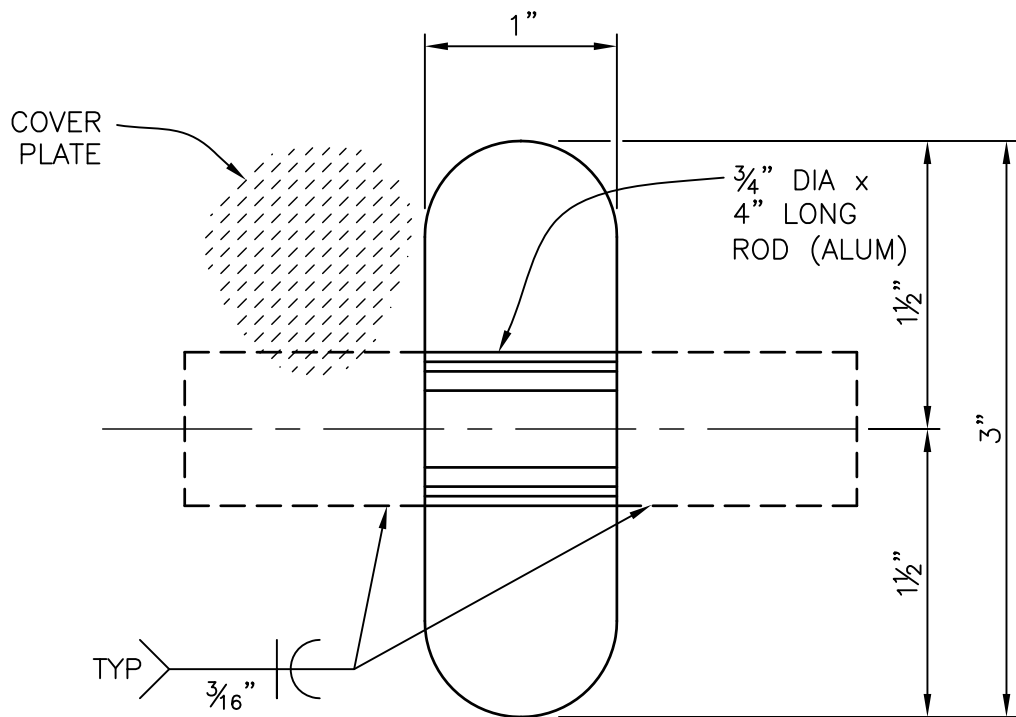
1. MAX. LOAD RATING FOR LIFTING EYE AS SHOWN ON DWGS. (4000 LBS MAX)
2. SUBMIT DATA ON EYE BOLT WITH SHOP DWGS.
3. PROVIDE $\frac{1}{8}$ " THICK GALVANIZED STEEL SIGN STATING MAX ALLOWABLE LOAD CAPACITY OF LIFTING EYE. SIGN LETTER HEIGHT SHALL BE 6" MIN.

LIFTING EYE

NTS

05 50 00-25





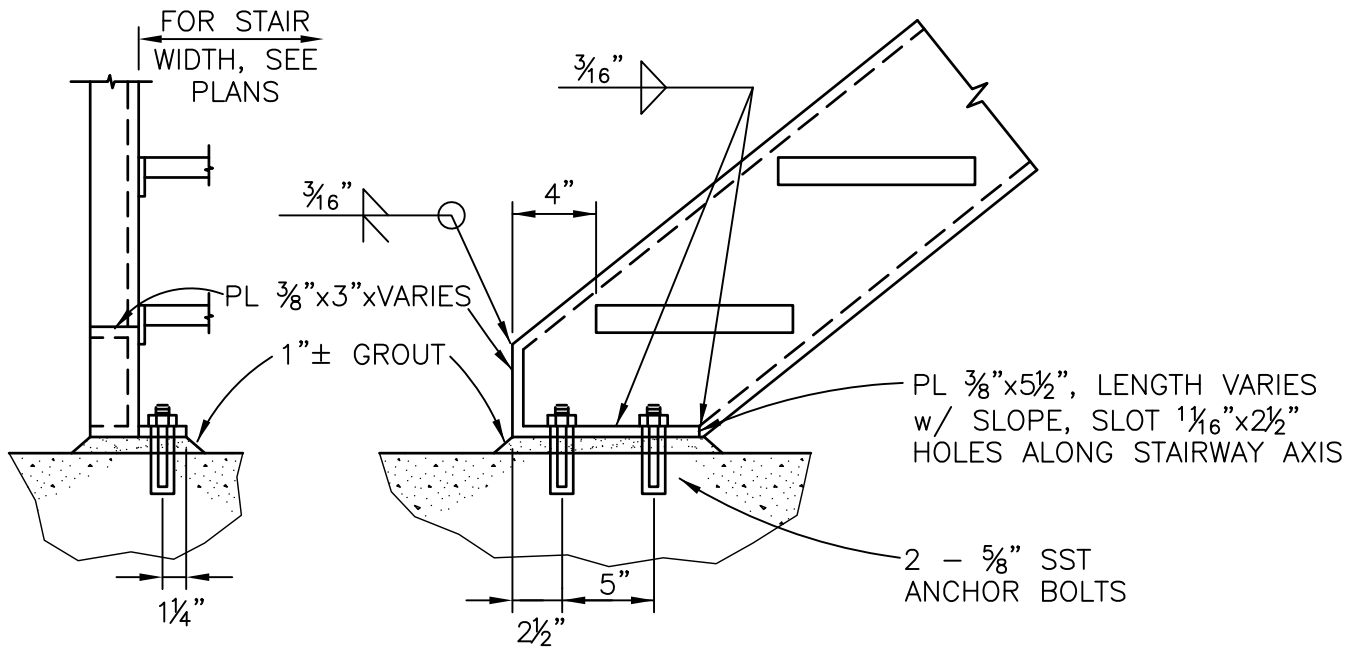
NOTES:

1. THIS DETAIL APPLIES TO TYPES "A" AND "B" COVERS.
SEE $\langle 05\ 50\ 00-10 \rangle$ AND $\langle 05\ 50\ 00-11 \rangle$.

LIFTING HANDLE

NTS

$\langle 05\ 50\ 00-26 \rangle$



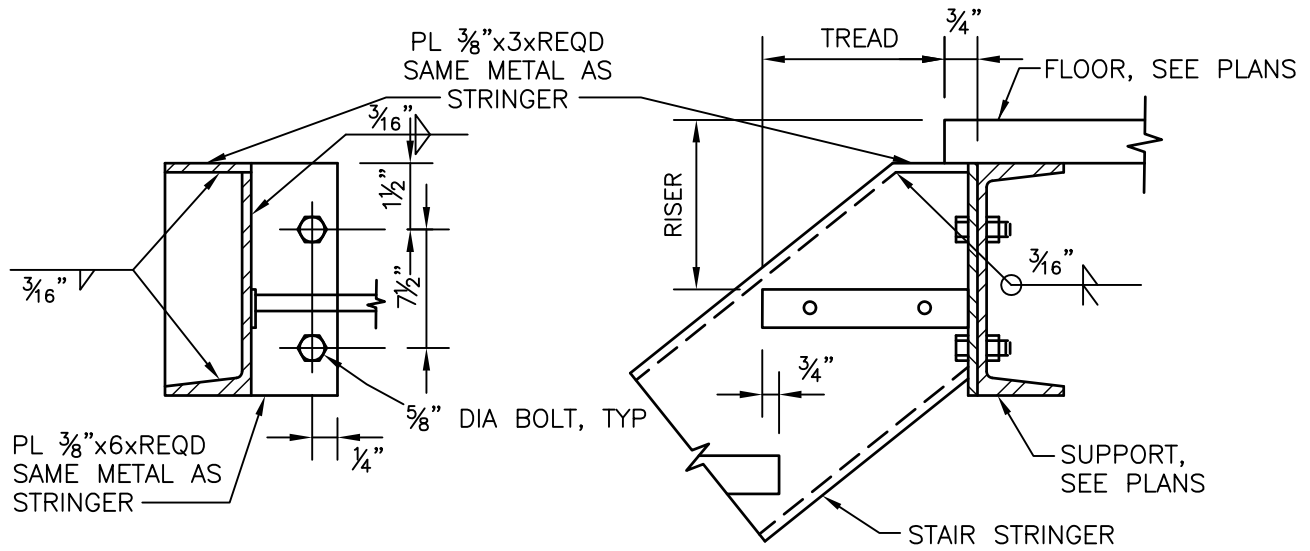
NOTES:

1. USE BASE PL OF SAME METAL AS STRINGER.
2. PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE AS SPECIFIED.
3. STAIR HANDRAIL NOT SHOWN.

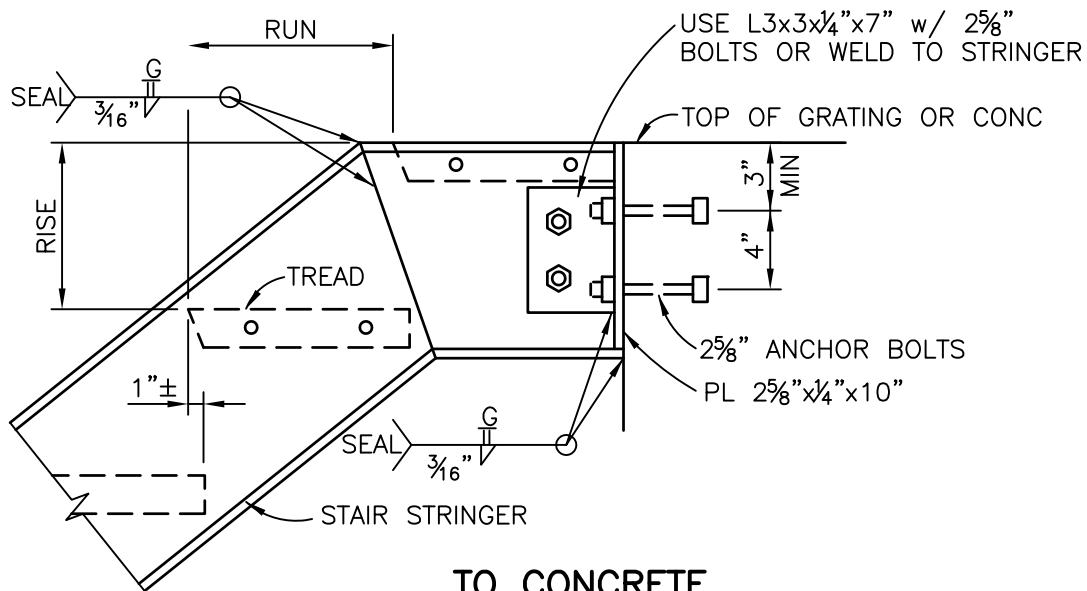
STAIR BOTTOM CONNECTION

NTS

05 50 00-27



TO METAL FRAMING



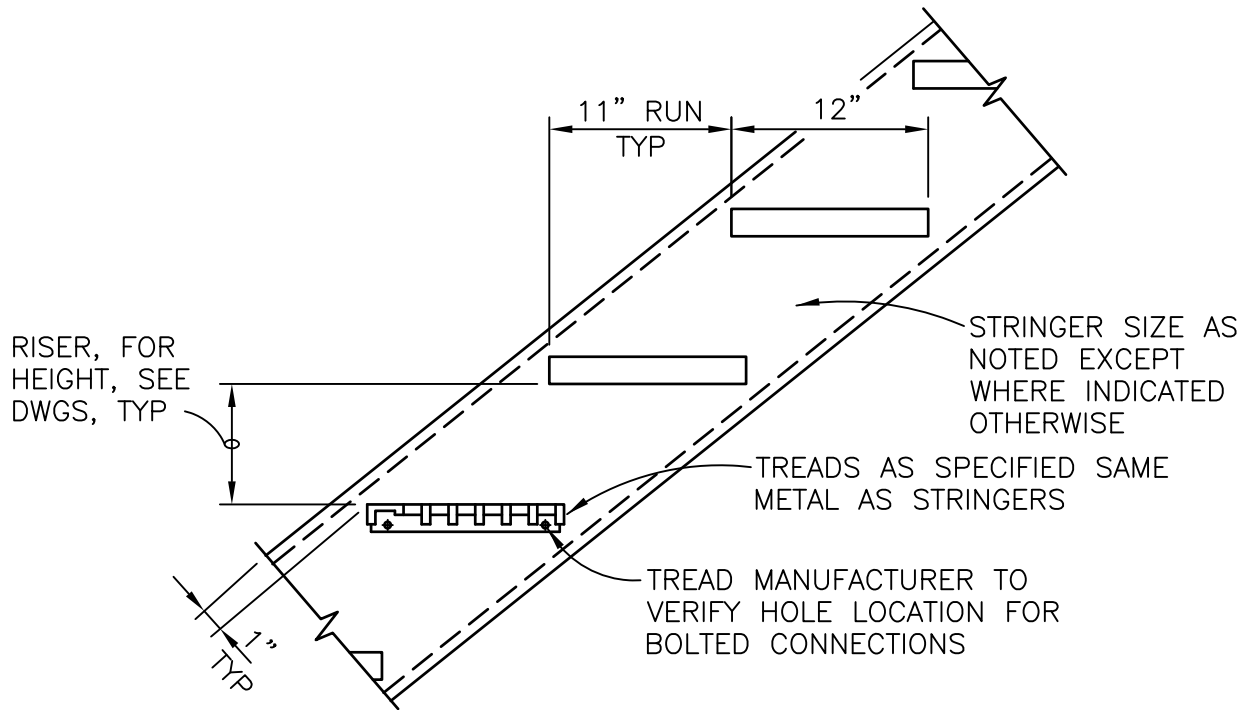
TO CONCRETE

NOTE:
HANDRAIL NOT SHOWN

STAIR TOP CONNECTION

NTS

05 50 00-28



NOTES:

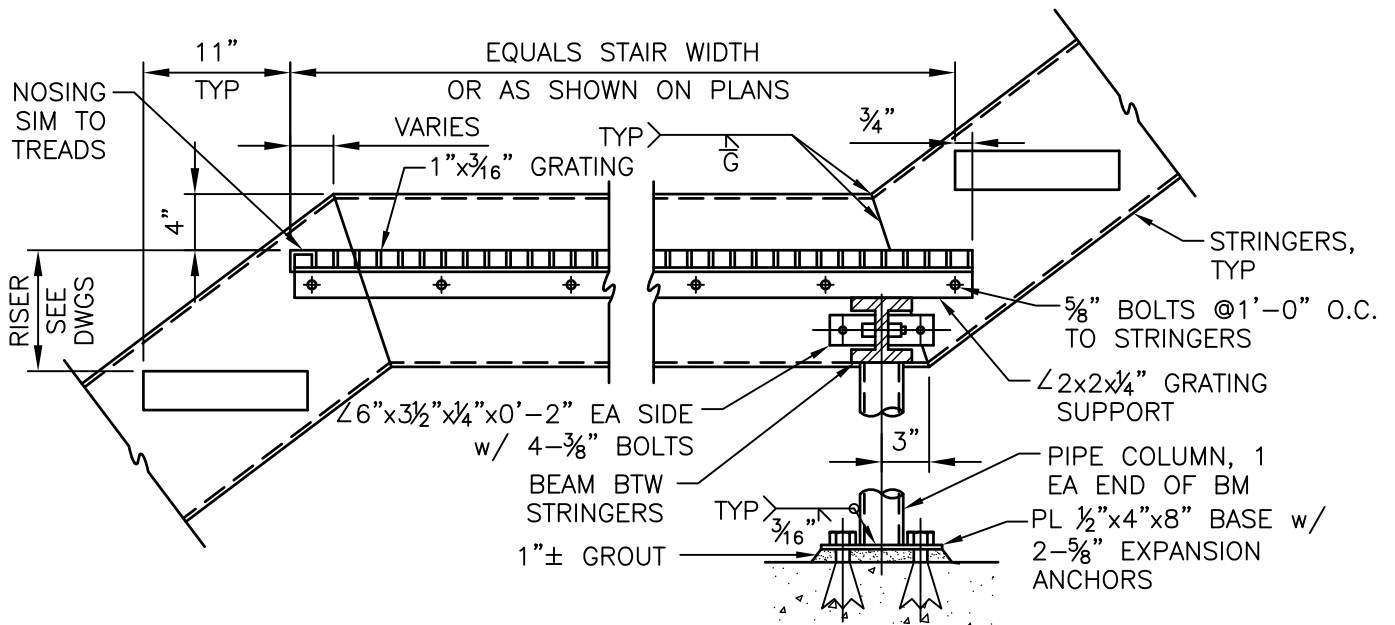
1. FOR MATERIALS USED FOR STAIRWAY, SEE PLANS AND OR SPECS. USE C12x20.7 FOR STEEL STRINGERS AND C12x7.41 FOR ALUMINUM STRINGERS.
2. STAIR HANDRAIL NOT SHOWN.

STAIR DETAIL

NTS

05 50 00-29



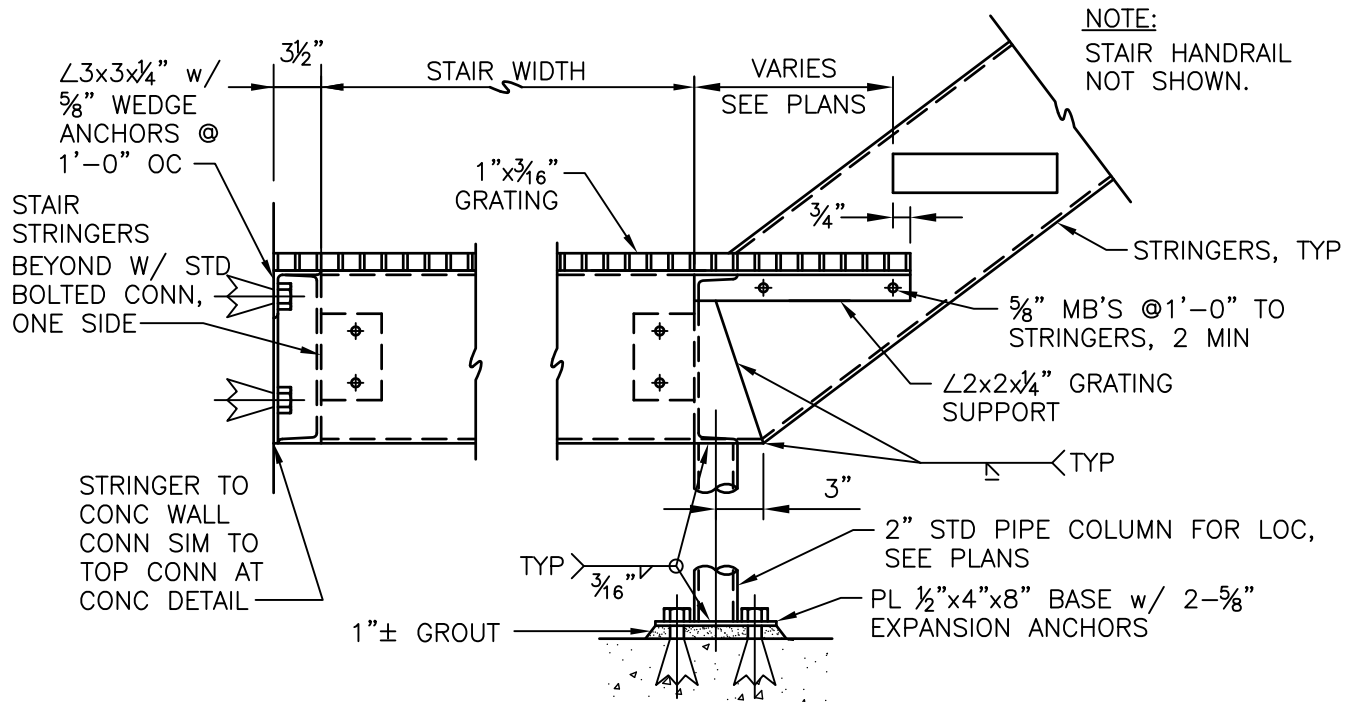


NOTE:
STAIR HANDRAIL NOT SHOWN.

STAIR LANDING WITH SUPPORTS

NTS

05 50 00-30



NOTES:

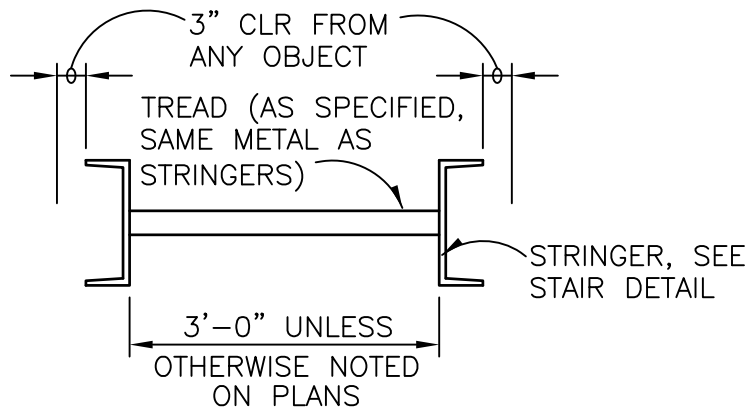
1. USE ANGLES, POST & PLATES OF SAME METAL AS STRINGERS
2. FOR ALUMINUM STAIRS, USE ALUMINUM GRATING. SEE 05 50 00-09.
3. FOR ALUMINUM STAIRS, USE SST BOLTS & SST ANCHOR BOLTS.

STAIR LANDING WITH SUPPORTS

NTS

05 50 00-31

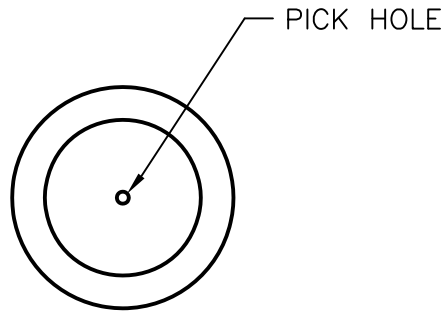
STAIRWAY WIDTH	BEARING BARS	
	ALUMINUM THREAD	STEEL THREAD
2'-3" OR LESS	1" x $\frac{3}{16}$ "	$\frac{3}{4}$ " x $\frac{3}{16}$ "
2'-9" OR LESS	$1\frac{1}{4}$ " x $\frac{3}{16}$ "	1" x $\frac{3}{16}$ "
3'-3" OR LESS	$1\frac{1}{2}$ " x $\frac{3}{16}$ "	$1\frac{1}{4}$ " x $\frac{3}{16}$ "
4'-7" OR LESS	$1\frac{3}{4}$ " x $\frac{3}{16}$ "	$1\frac{1}{2}$ " x $\frac{3}{16}$ "



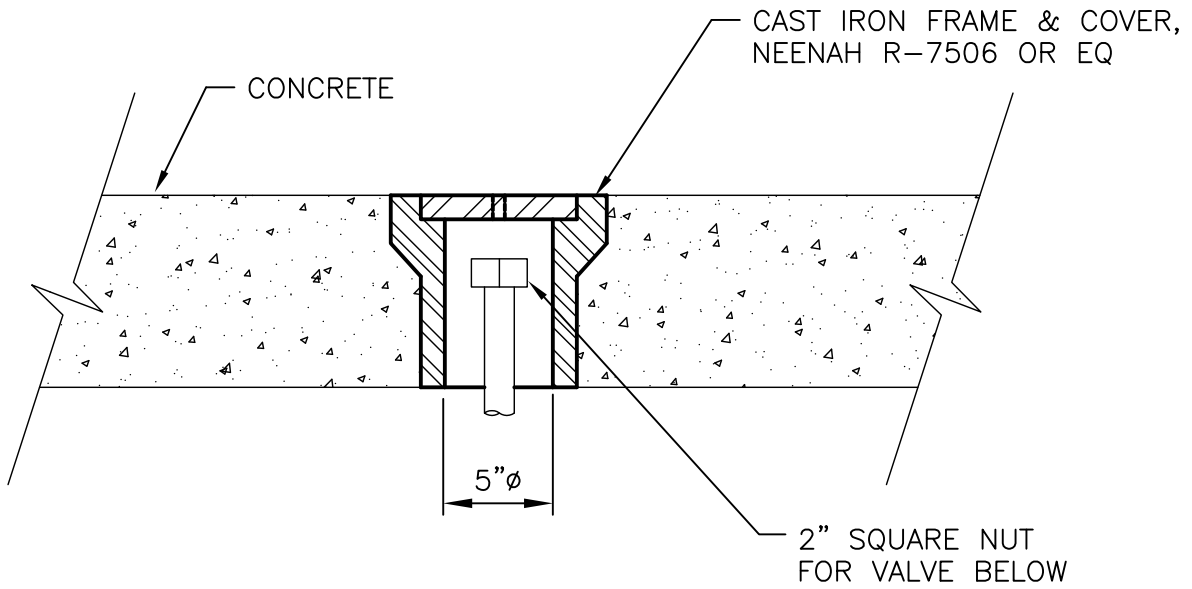
STAIR TREADS

NTS

05 50 00-32



PLAN

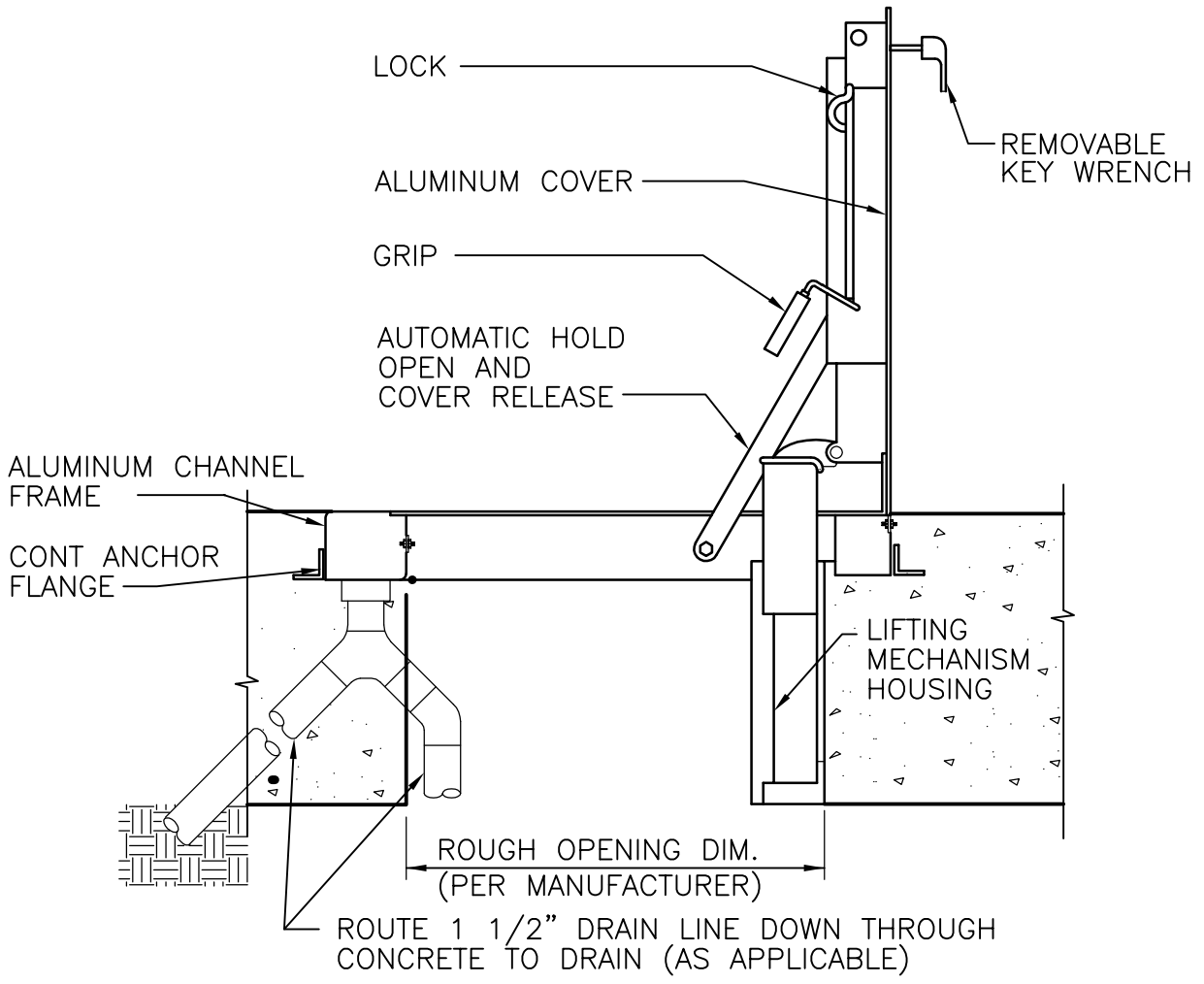


SECTION

VALVE COVER IN CONCRETE

NTS

05 50 00-35

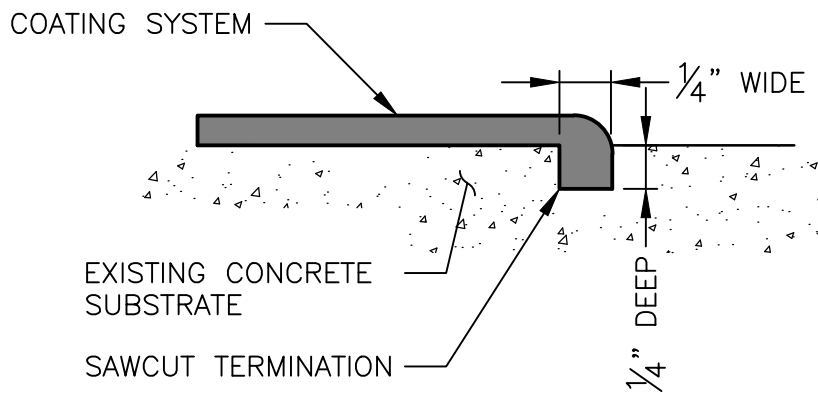


ACCESS DOOR

NTS

08 31 00-01

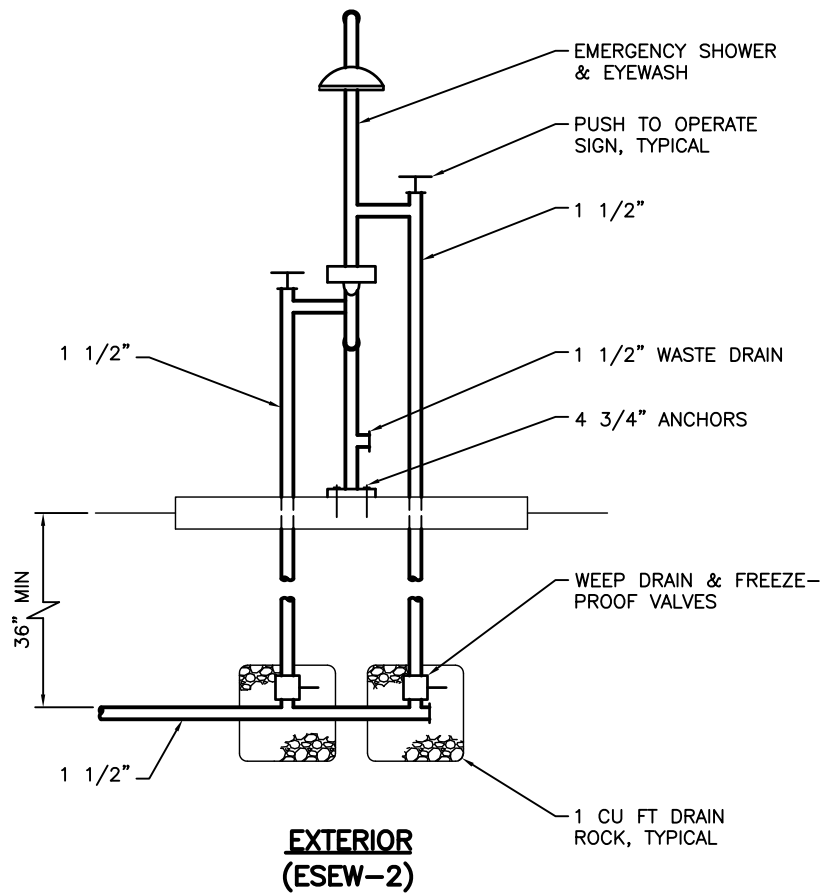




COATING TERMINATION DETAIL

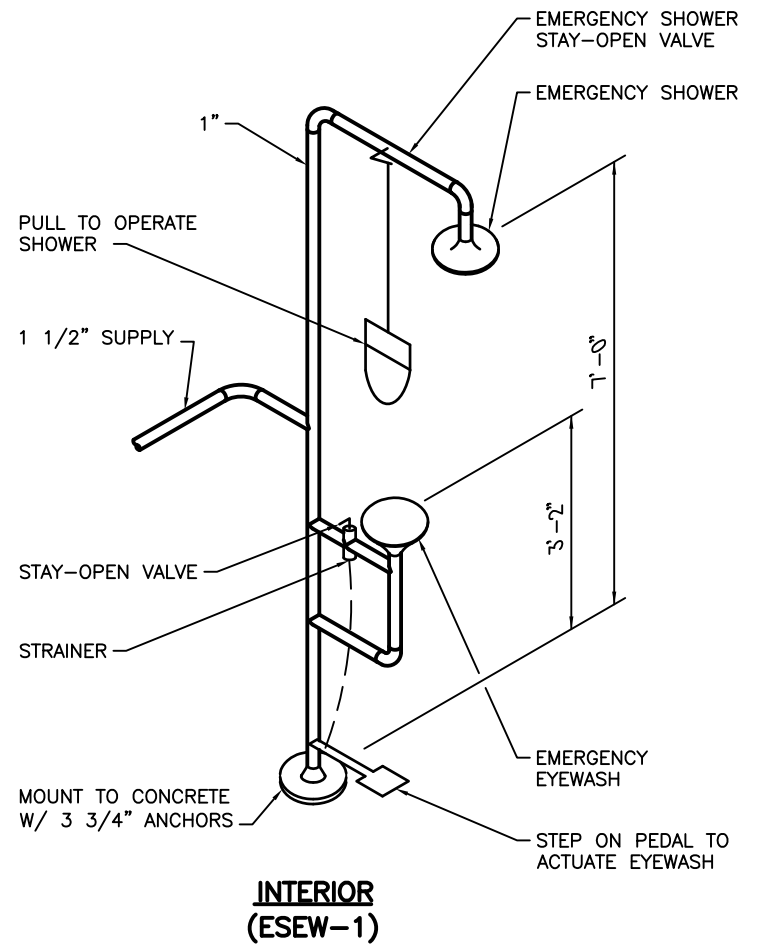
NTS

09 96 00-01



NOTE:

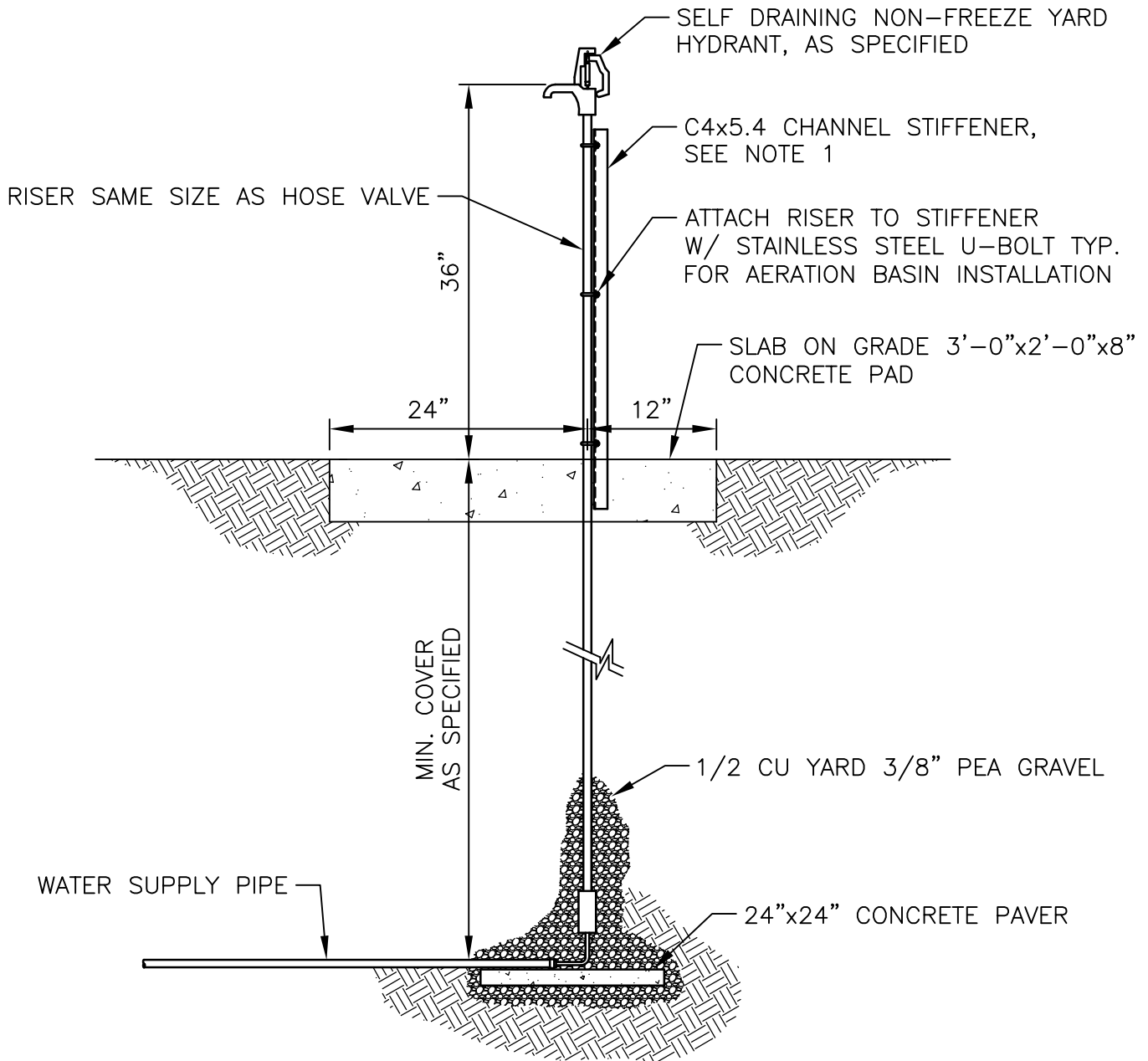
1. EXTERIOR SYSTEM TO BE EQUIPPED WITH FREEZE-PROOF VALVES.



EMERGENCY SHOWER & EYEWASH

NTS

22 20 00-05



NOTES:

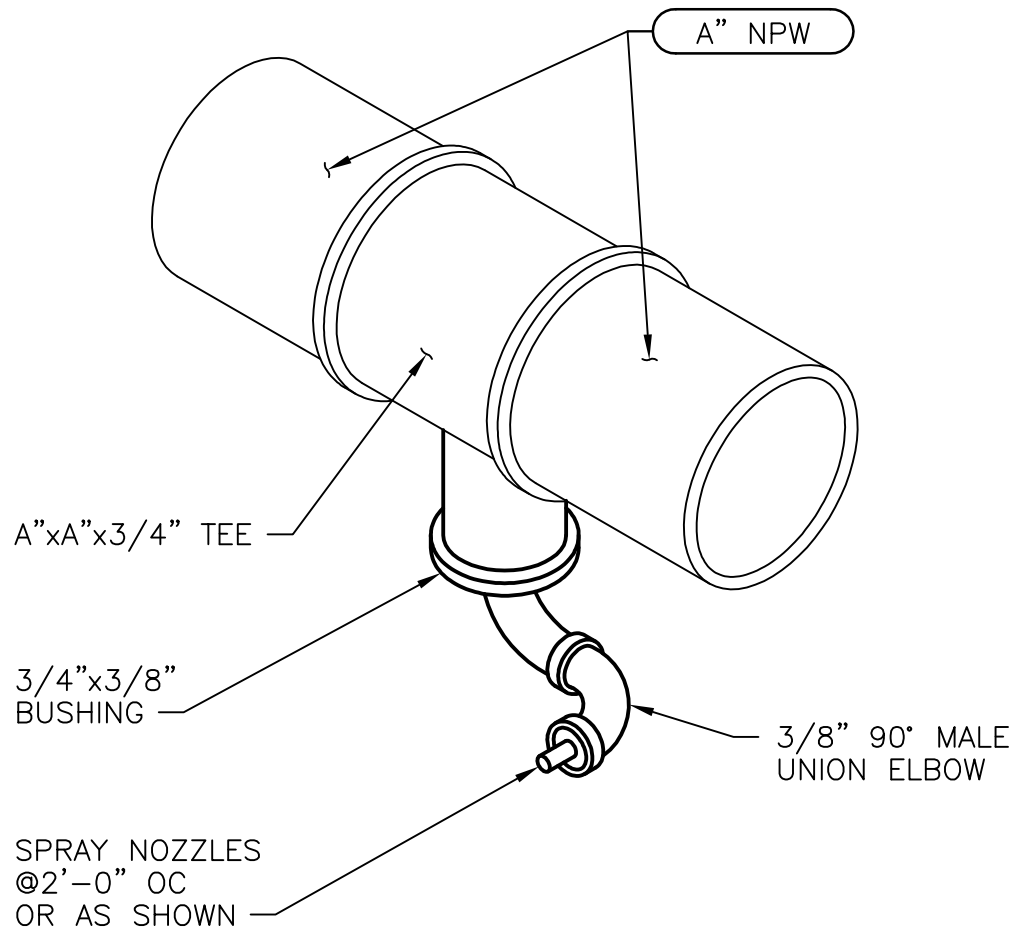
1. CHANNEL STIFFENER AND RISER ATTACHMENT HARDWARE SHALL BE SPECIFIED IN THE AREA CLASSIFICATION TABLE.
2. REFER TO AREA CLASSIFICATION TABLE LOCATED ON DRAWINGS FOR MATERIAL REQUIREMENTS. MATERIAL SHALL BE STAINLESS STEEL UNLESS OTHERWISE SPECIFIED.

NON-FREEZE HYDRANT INSTALLATION

NTS

22 20 00-09





NOTES:

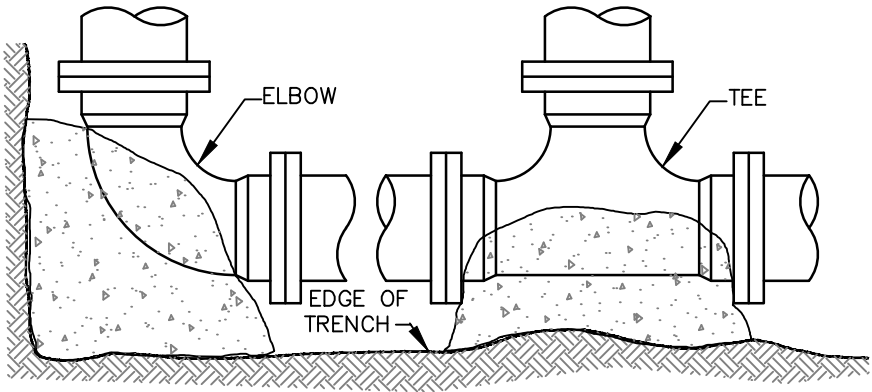
1. DIRECTION OF SPRAY NOZZLE AS SHOWN ON DRAWINGS.
2. SIZE OF NPW PIPE, A", AS SHOWN ON DRAWINGS.

SPRAY NOZZLE

NTS

22 20 00-10

PIPE SIZE	MIN. BASE AREA SQ. FT.	
	90° BEND	45° BEND
8"	2.5	1.5

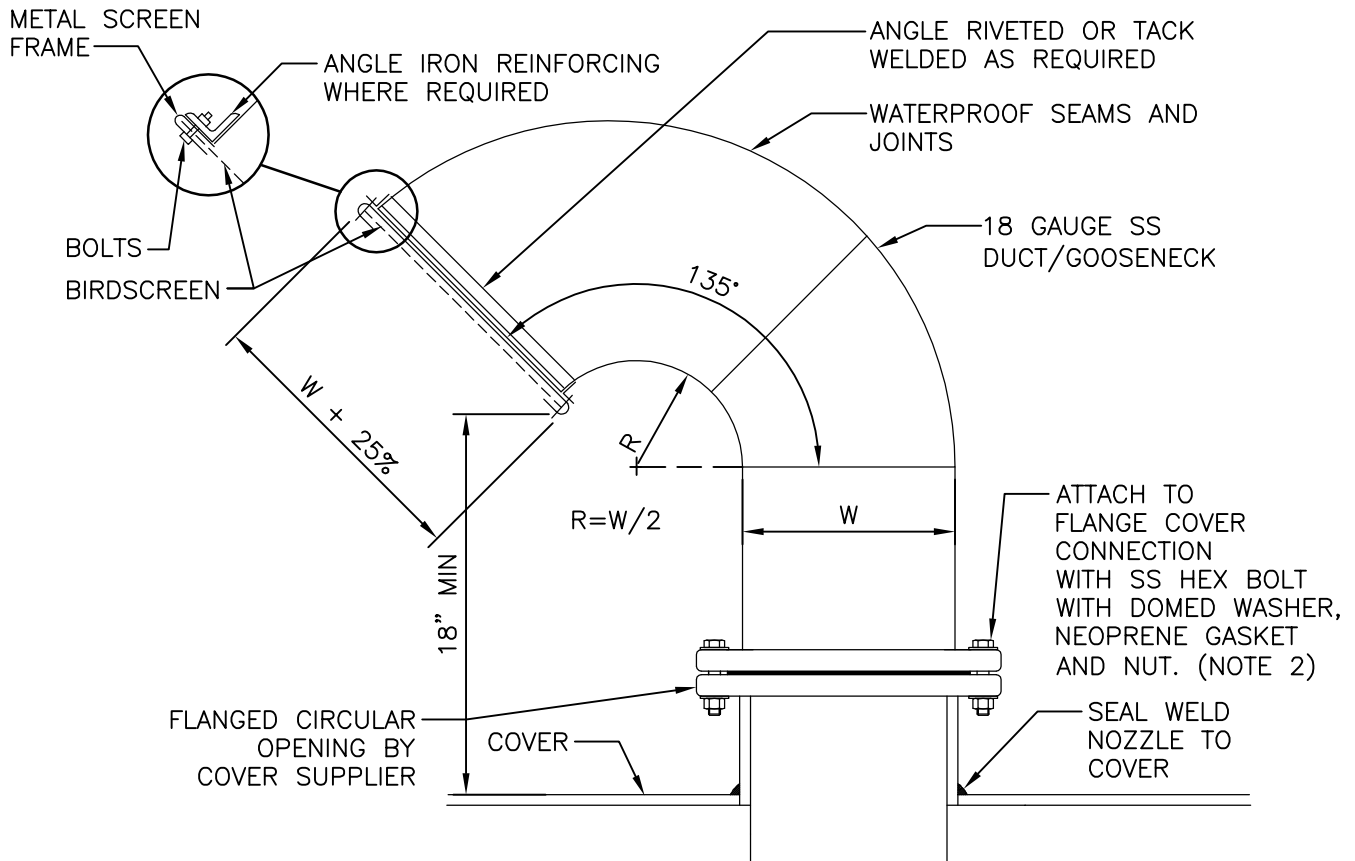


THRUST BLOCK DETAIL

NOT TO SCALE

22 20 00-27





NOTES:

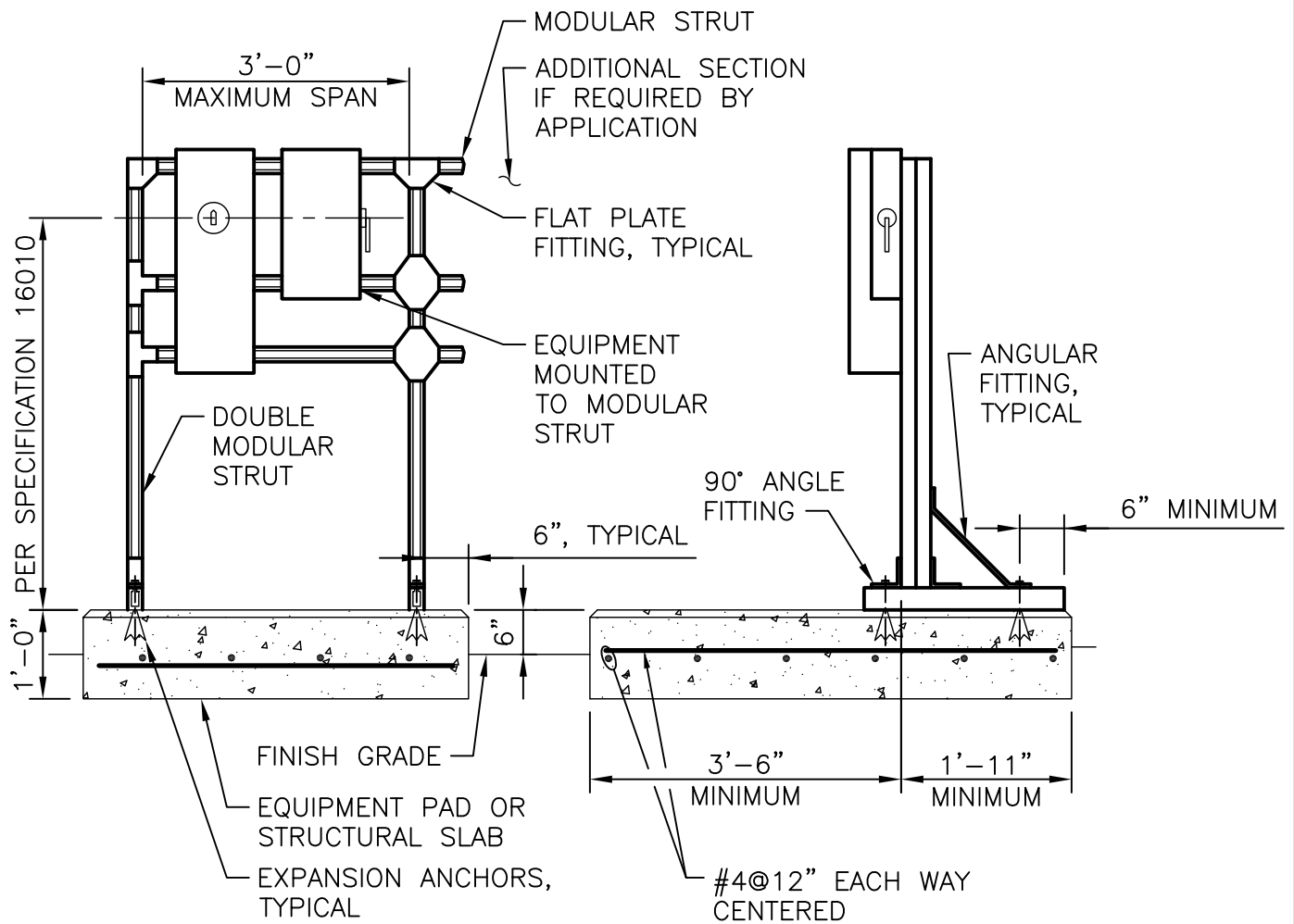
1. (W) TO MATCH COVER OPENING DIAMETER.
(SEE COVER DETAIL DRAWINGS).
2. PROVIDE INSULATED WASHERS TO
PREVENT SS AND ALUMINUM CONTACT.

GOOSENECK DETAIL

NOT TO SCALE

23 31 00-20





FRONT VIEW

SIDE VIEW

NOTES:

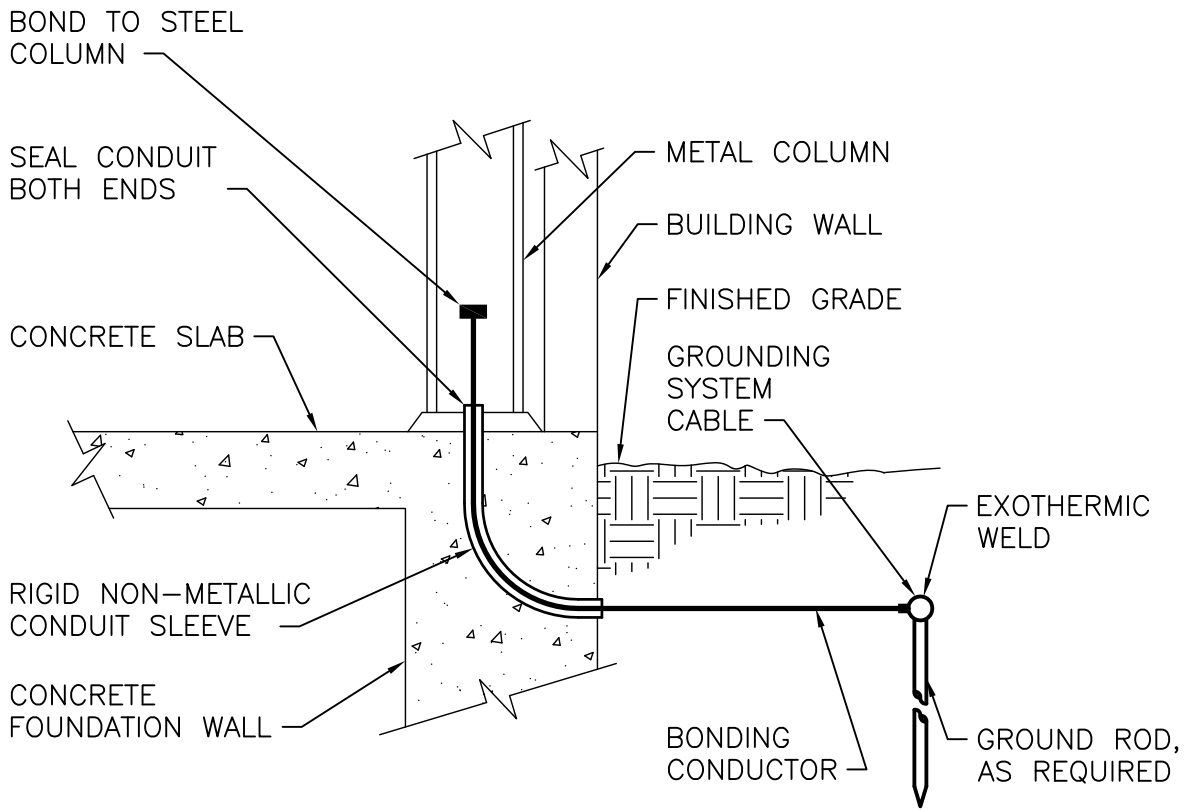
1. COMBINED EQUIPMENT LOADS PER 36" SPAN SHALL NOT EXCEED 500 LBS.
2. PROVIDE GROUNDING FOR OUTDOOR INSTALLATIONS, PER SPECIFICATION 16060.
3. MODULAR STRUT WIDTH: 1 5/8".
4. RACK ASSEMBLY MATERIAL: GALVANIZED PER SPECIFICATION 16010.
5. ANCHORS: STAINLESS STEEL, 1/2" DIAMETER, 3 1/2" EMBEDMENT, PER SPECIFICATION 05505.
6. PROTECT SURFACES WITH DISSIMILAR MATERIALS IN ACCORDANCE WITH SPECIFICATION 09905.
7. REPAIR CUT ENDS AND DAMAGED SURFACES IN ACCORDANCE WITH SPECIFICATION 05505.

MODULAR EQUIPMENT RACK

NTS

26 05 00-02



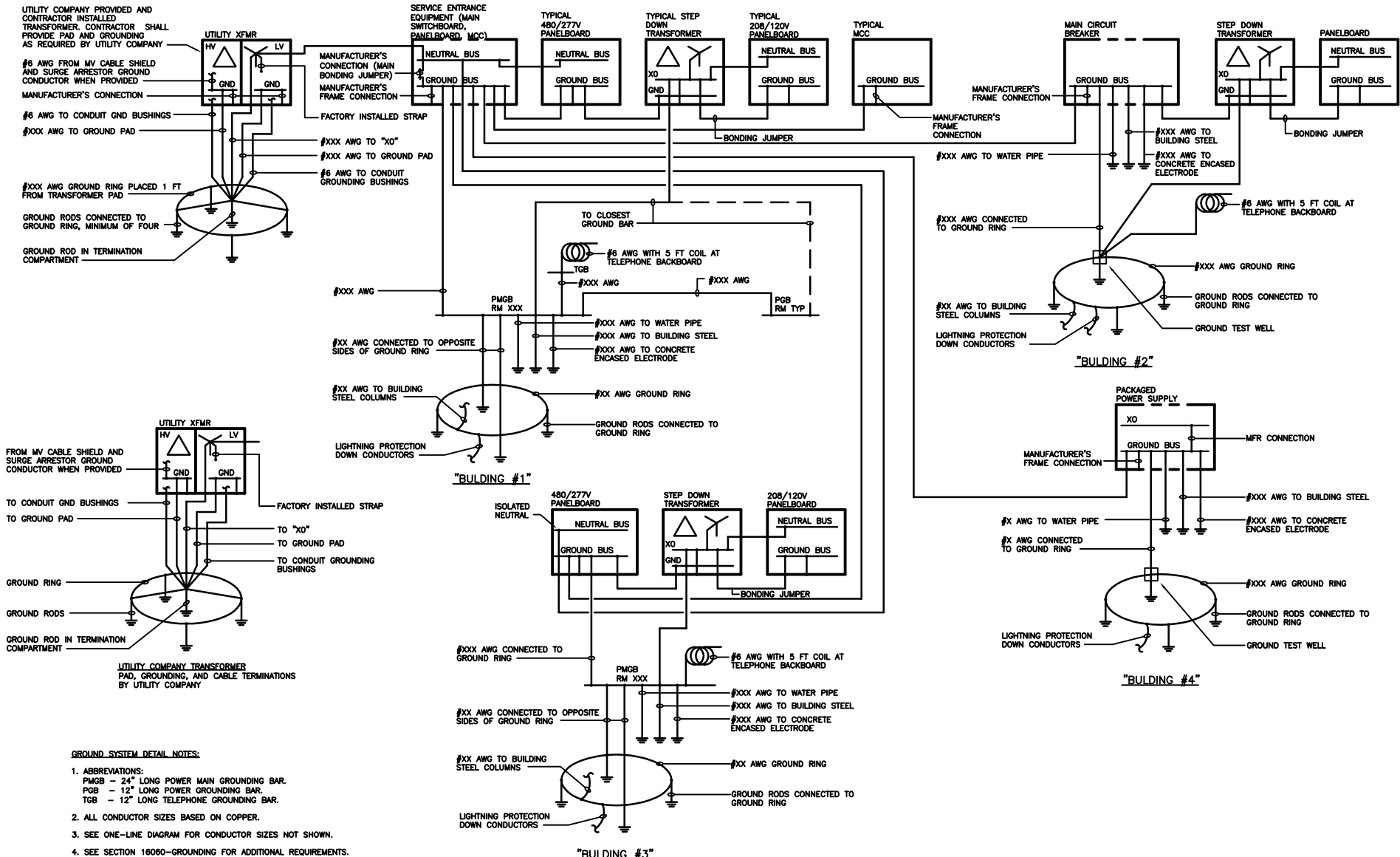


COLUMN GROUND CONNECTION

NTS

26 05 26-02



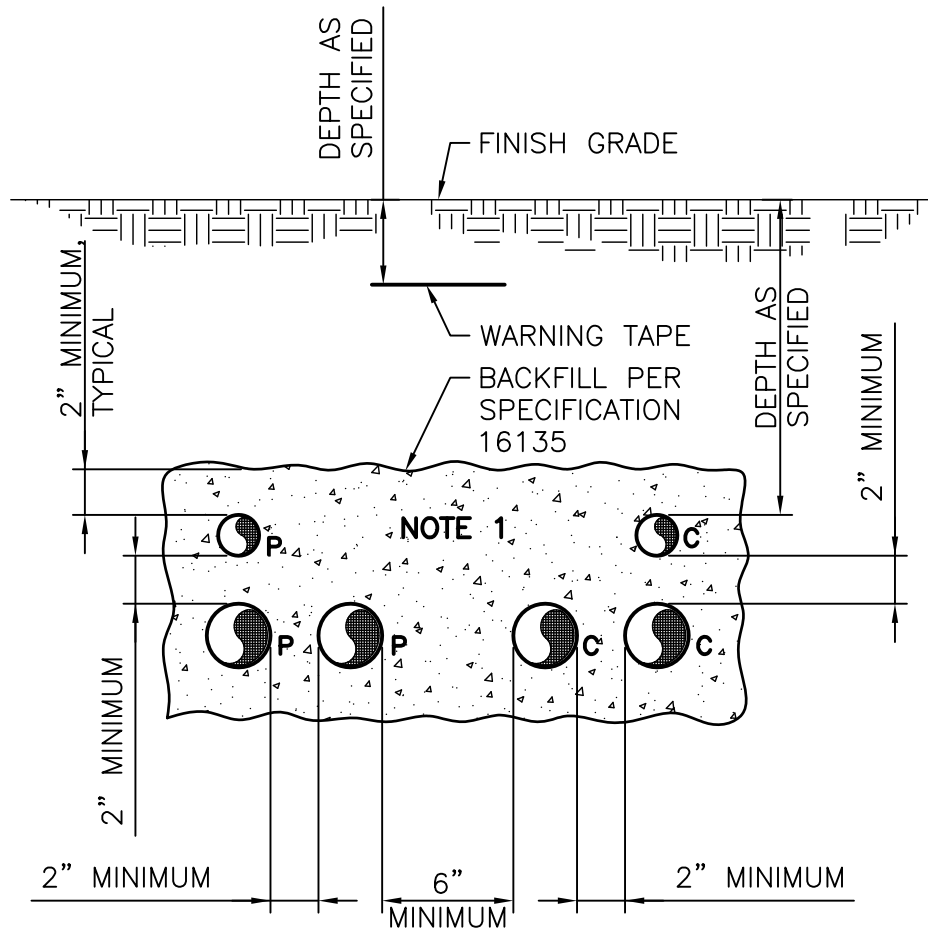


- GROUND SYSTEM DETAIL NOTES:**
- ABBREVIATIONS:
 PMGB - 24" LONG POWER MAIN GROUNDING BAR.
 PGB - 12" LONG POWER GROUNDING BAR.
 TGB - 12" LONG TELEPHONE GROUNDING BAR.
 - ALL CONDUCTOR SIZES BASED ON COPPER.
 - SEE ONE-LINE DIAGRAM FOR CONDUCTOR SIZES NOT SHOWN.
 - SEE SECTION 16060-GROUNDING FOR ADDITIONAL REQUIREMENTS.

4 WIRE SERVICE, GROUNDING SYSTEM, GROUND BAR, REMOTE BUILDING

NOT TO SCALE





NOTES:

1. NUMBER OF CONDUITS AS REQUIRED FOR THE APPLICATION.
2. P SUBSCRIPT ELECTRICAL POWER OR CONTROL CONDUIT.
3. C SUBSCRIPT COMMUNICATION (TELEPHONE, DATA, INSTRUMENTATION) CONDUIT.

DIRECT BURIED CONDUIT(S) SECTION

NTS

26 05 43-01

EQUIPMENT
OUTLINE
OR SUPPORT
STRUCTURE

CONDUIT
CONTINUATION,
AS REQUIRED

BUSHING, END BELL
OR COUPLING,
AS REQUIRED

TOP OF PAD

CONDUITS INTEGRALLY
CAST IN PAD OR
CONDUIT WINDOW IN
PAD, AS REQUIRED

MANUFACTURED ELBOWS

6" MAXIMUM

DUCTBANK

NOTES:

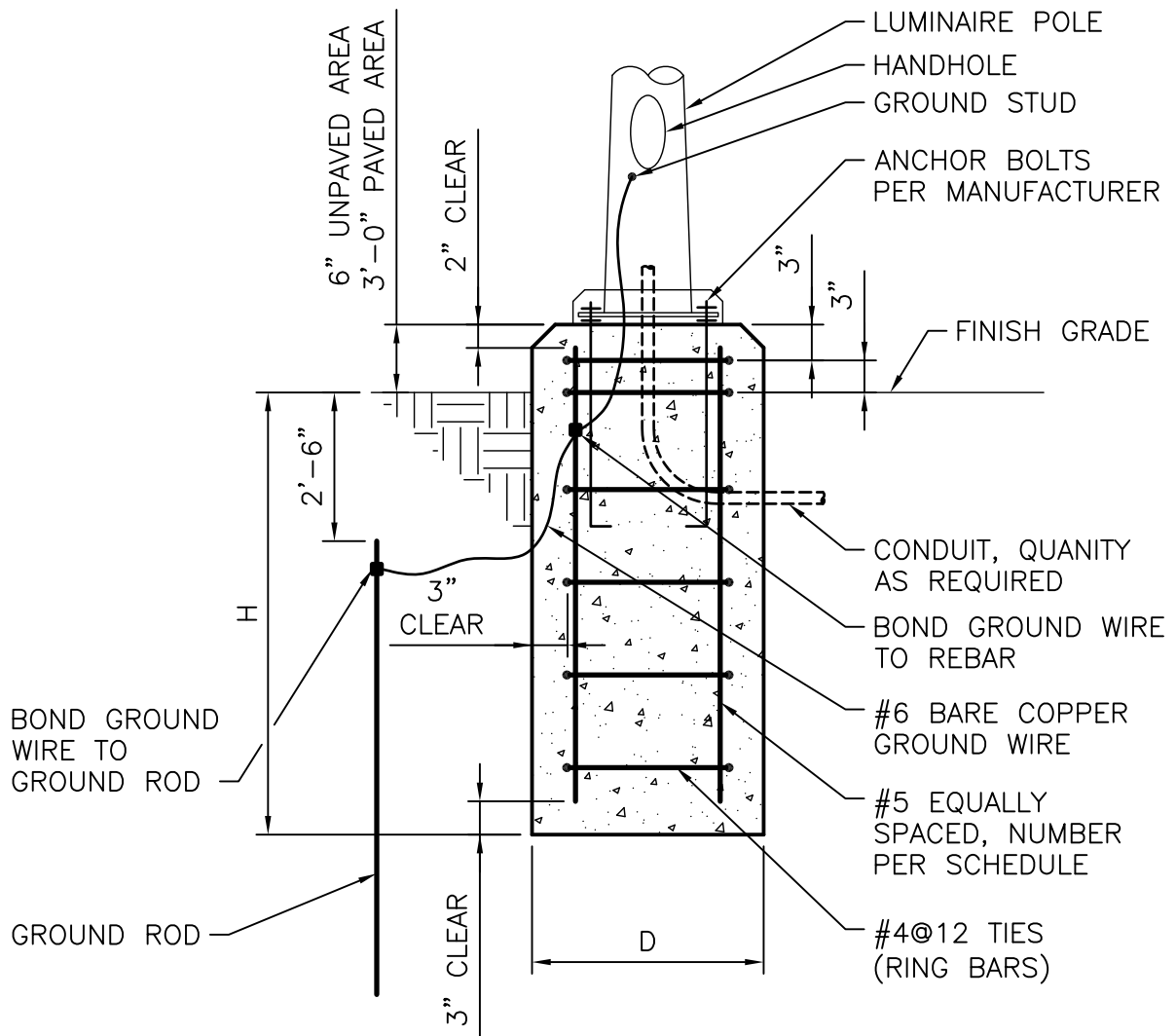
1. SEE DUCTBANK SECTION FOR ADDITIONAL REQUIREMENTS.
2. SEE OTHER CONTRACT DRAWING FOR PAD REQUIREMENTS.

CONDUIT TRANSITION TO ABOVE GRADE (EXTERIOR)

NOT TO SCALE

26 05 43-08





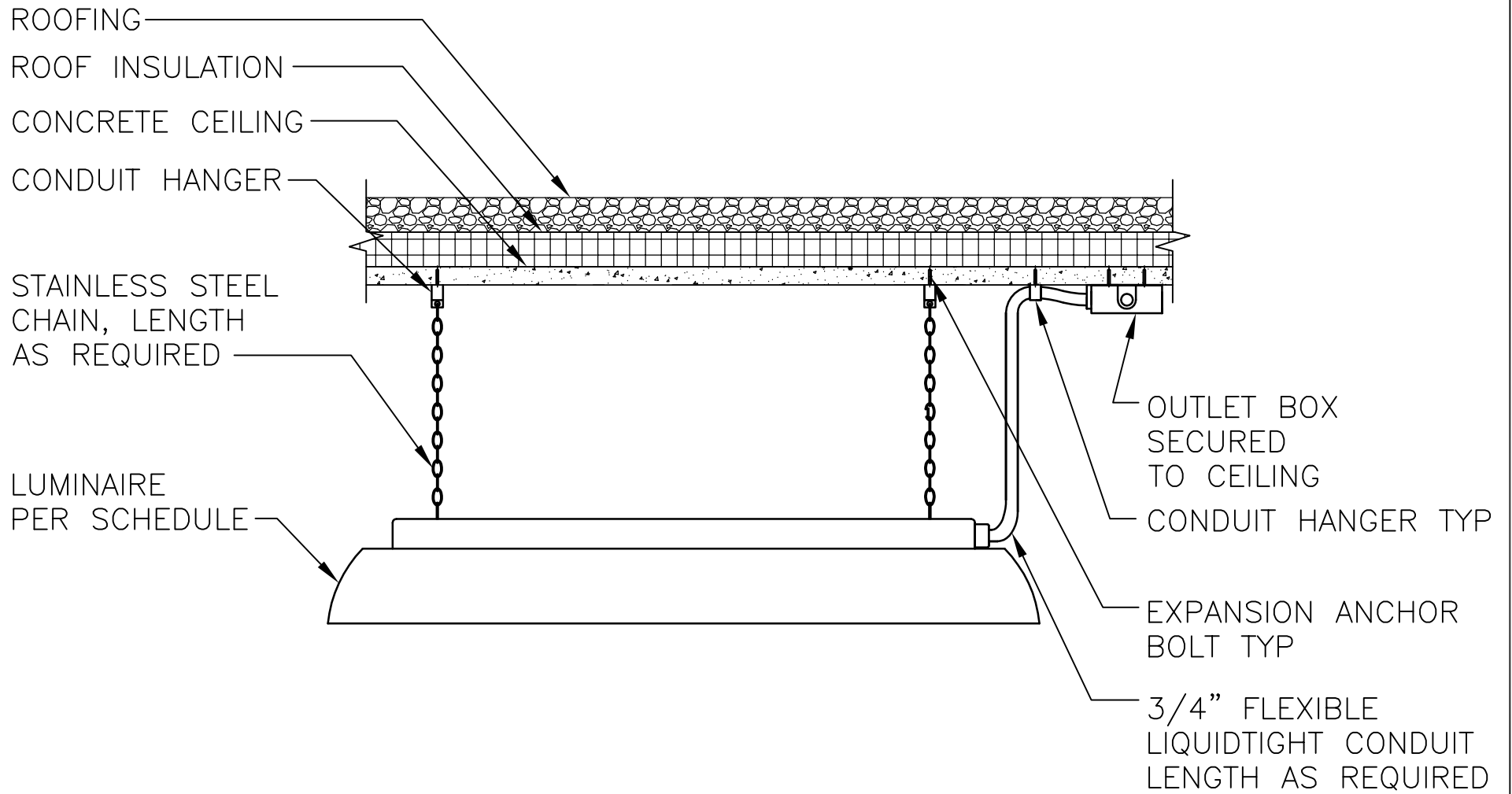
DIMENSION SCHEDULE			
POLE HEIGHT	MINIMUM D	MINIMUM H	VERTICAL REBAR EACH
UP TO 10'	2'-0"	4'-6"	6
11' TO 20'	2'-0"	6'-6"	6
21' TO 30'	2'-0"	8'-6"	6
31' TO 40'	2'-0"	9'-6"	8
41' TO 50'	2'-6"	10'-6"	10

LIGHT POLE FOUNDATION

NTS

26 50 00-01



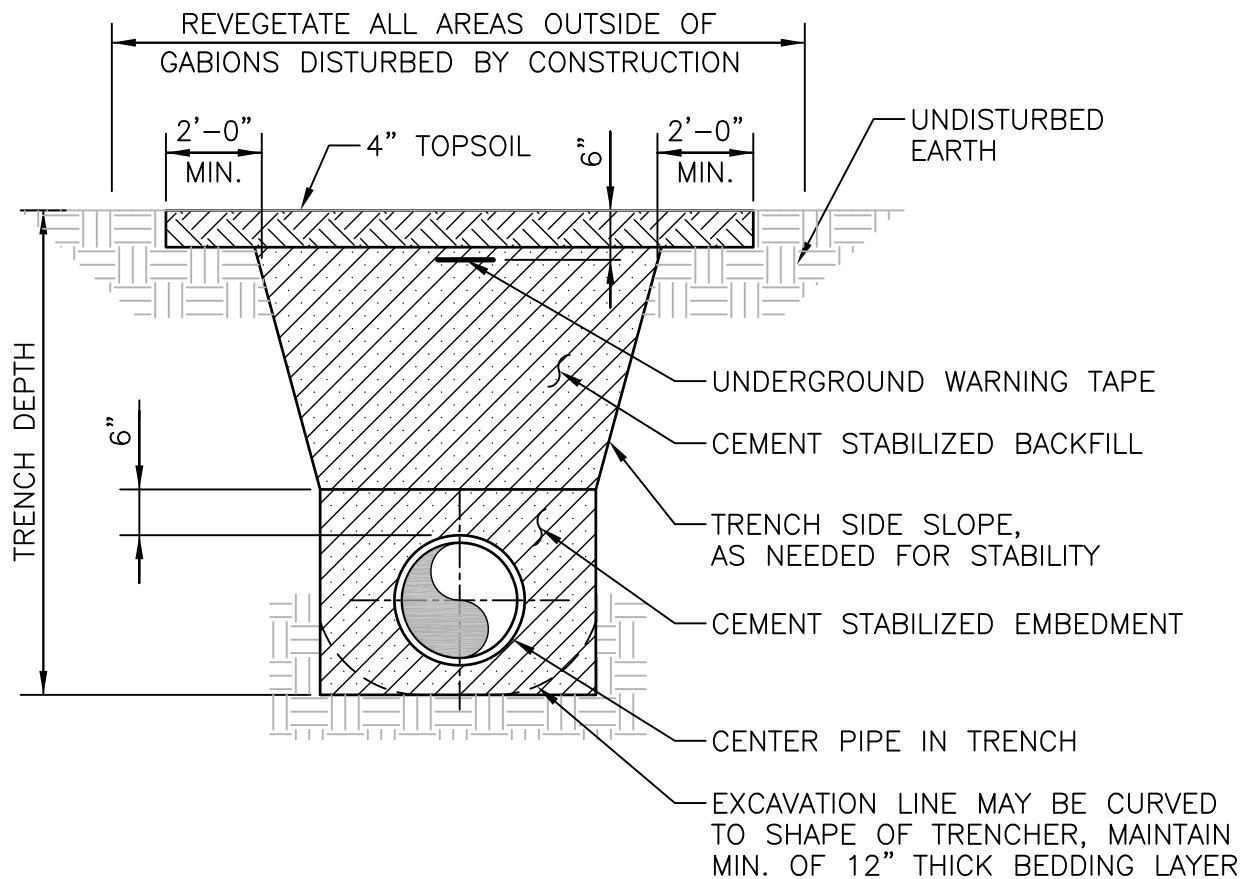


FLUORESCENT LUMINAIRE MOUNTING DETAIL

NOT TO SCALE

26 50 00-03





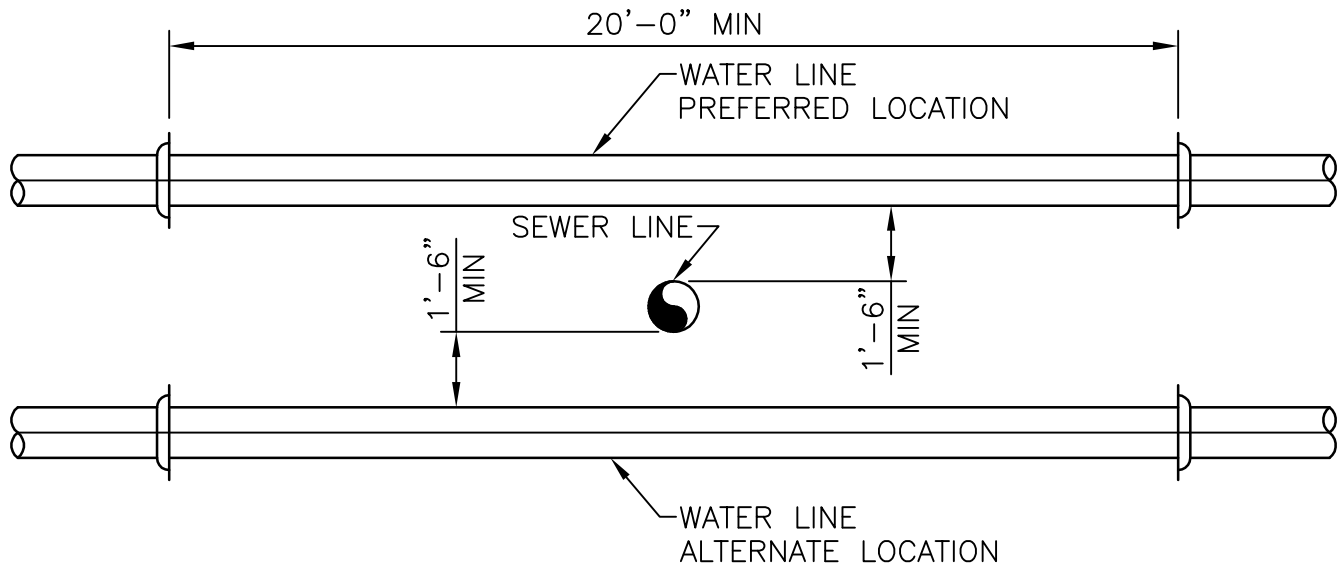
NOTES:

FOR ADDITIONAL TRENCH DIMENSION REQUIREMENTS SEE TYPICAL PIPE EMBEDMENT DIMENSIONS DETAIL.

CEMENT STABILIZED BACKFILL PIPE EMBEDMENT

NTS

31 23 33-06



NOTES:

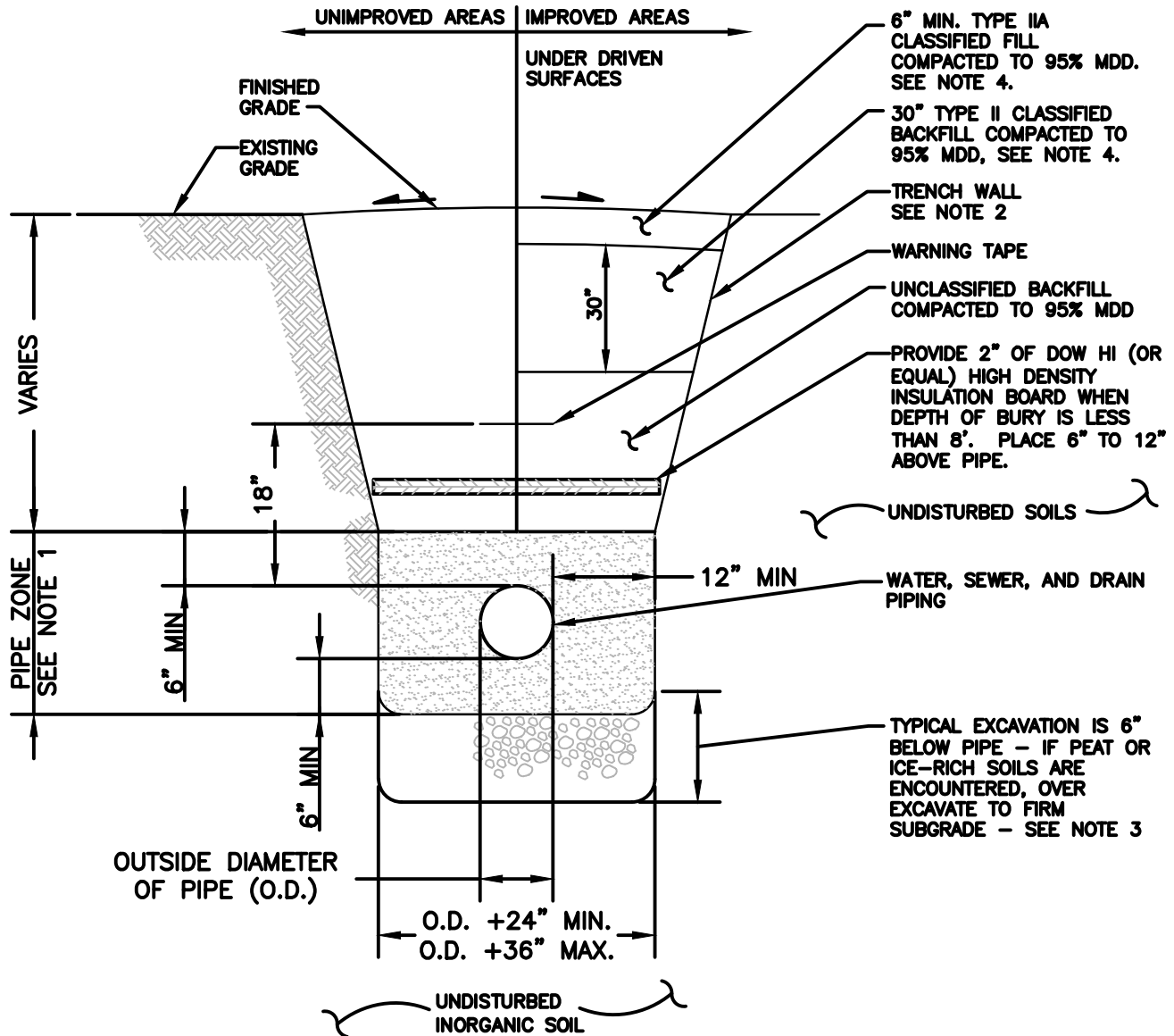
1. MEET ALL STATE REGULATORY CROSSING REQUIREMENTS.
2. INSTALL AIR RELIEF VALVE IF THE CROSSING CREATES A HIGH POINT IN THE PIPE PROFILE.
3. CONSTRUCT THRUST BLOCKS OR INSTALL RESTRAINED JOINT FITTINGS FOR VERTICAL OR HORIZONTAL CHANGES IN ALIGNMENT REQUIRED TO AVOID UTILITY CONFLICTS.
4. CENTER WATER PIPE OVER SEWER PIPE CROSSING TO MAXIMIZE SPACING OF JOINTS FROM THE PIPE CROSSING.

WATER/SEWER CROSSING DETAIL

NOT TO SCALE

31 23 33-10



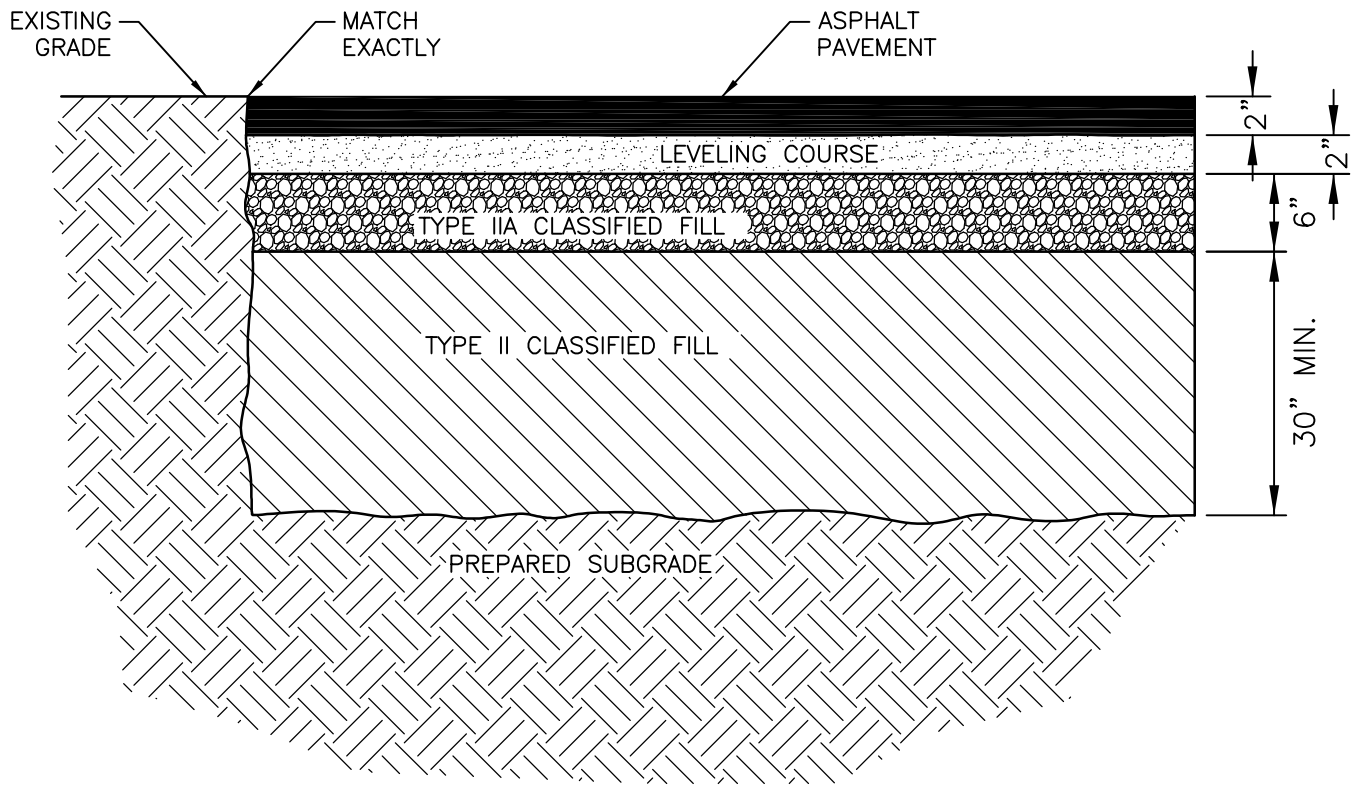


NOTES:

1. PIPE ZONE MATERIAL SHALL BE BEDDING MATERIAL COMPACTED TO 95% MAX. DRY DENSITY.
2. TRENCH WALL SHALL BE SLOPED OR SHORED IN CONFORMANCE WITH ALL APPLICABLE SAFETY STANDARDS.
3. OVER EXCAVATE AND FILL W/ SELECT BACKFILL IN AREAS OF HIGH ICE CONTENT OR PEAT.
4. NATIVE SOILS MAY BE USED IN LIEU OF CLASSIFIED FILL AS APPROVED BY ENGINEER.

TYPICAL TRENCH SECTION

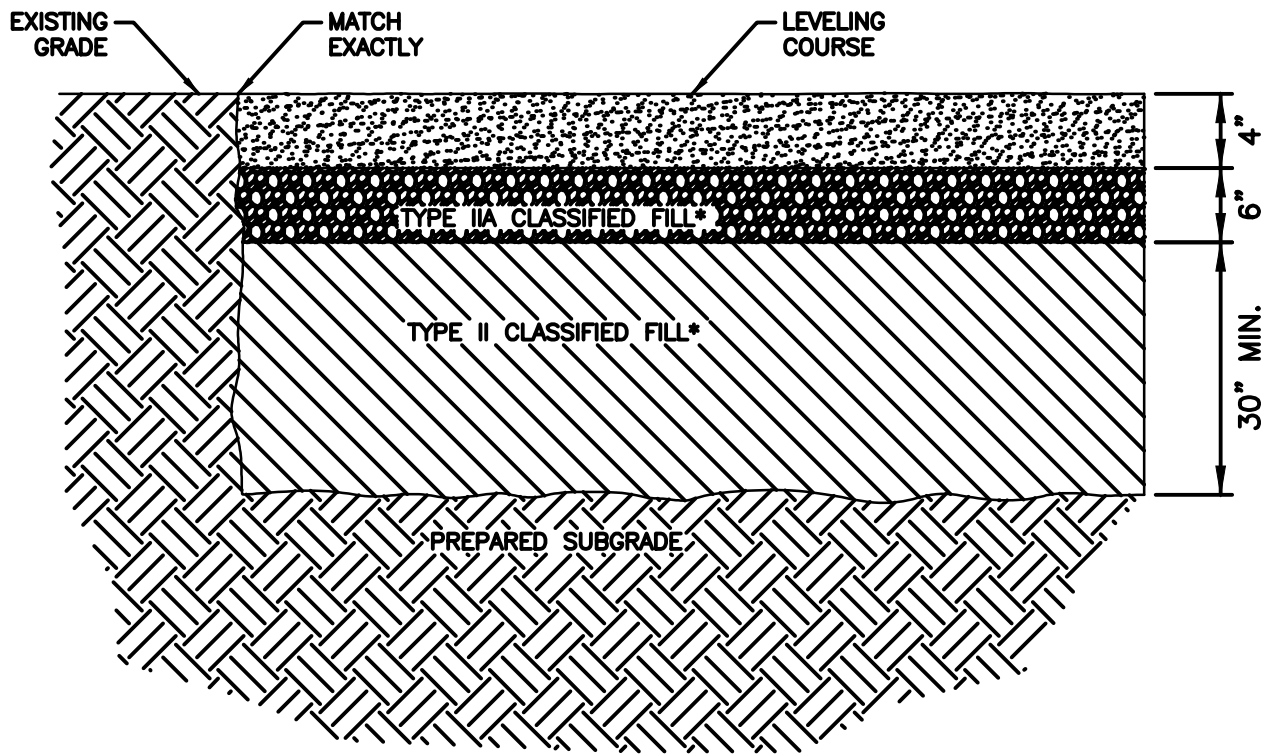
NOT TO SCALE



ASPHALT/CONCRETE PAVING SECTION

NTS

32 12 16-01



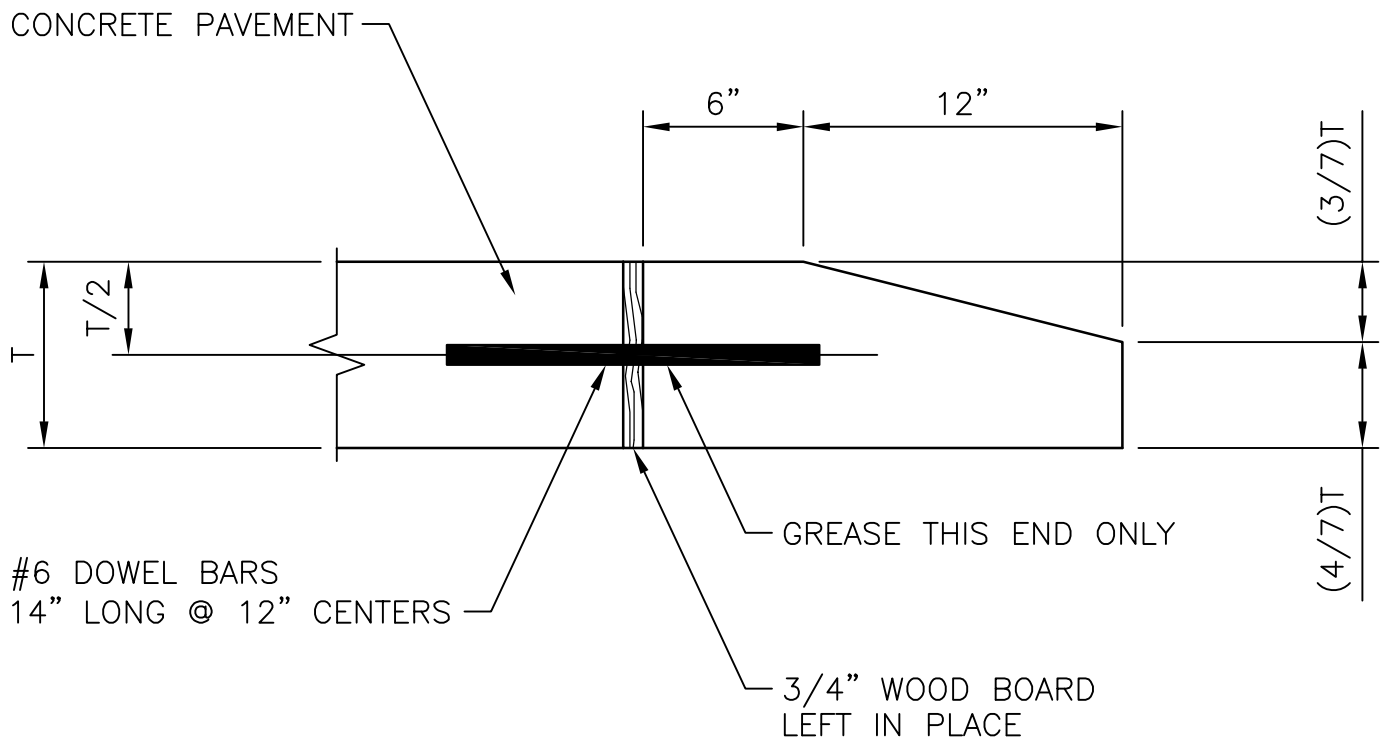
* - NATIVE SOIL MAY BE USED IN LIEU OF CLASSIFIED FILL AS APPROVED BY ENGINEER.

TYP GRAVEL ACCESS/PARKING AREA SECTION

NTS

32 12 16-05



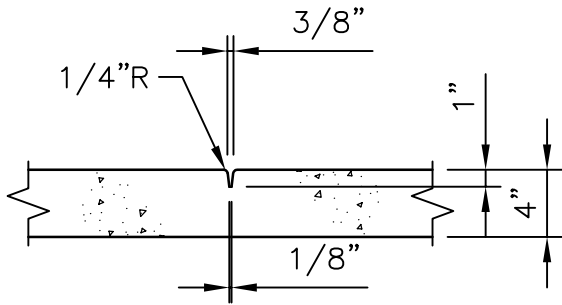


CONCRETE HEADER DETAIL

NOT TO SCALE

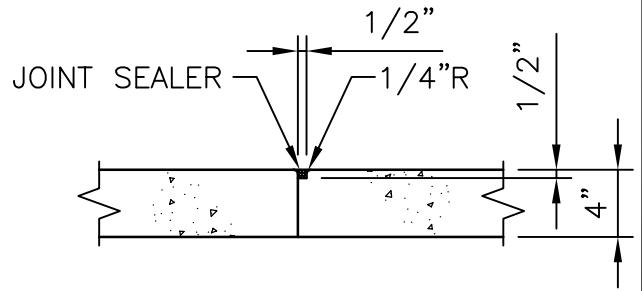
32 13 13-12





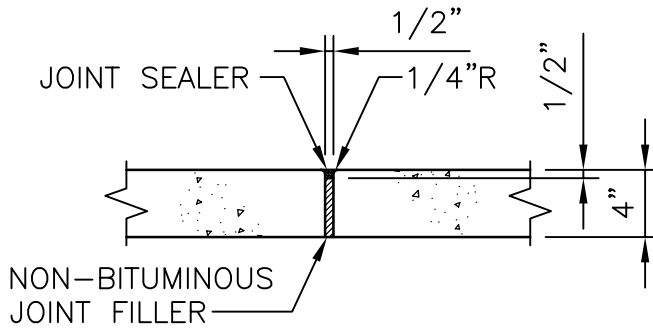
SPACING: 4'-0" WALK = 4'-0" C TO C
 5'-0" WALK = 5'-0" C TO C
 6'-0" WALK = 6'-0" C TO C

CONTRACTION JOINT



USE ONLY WHERE CONTRACTION JOINTS WOULD OCCUR

CONSTRUCTION JOINT

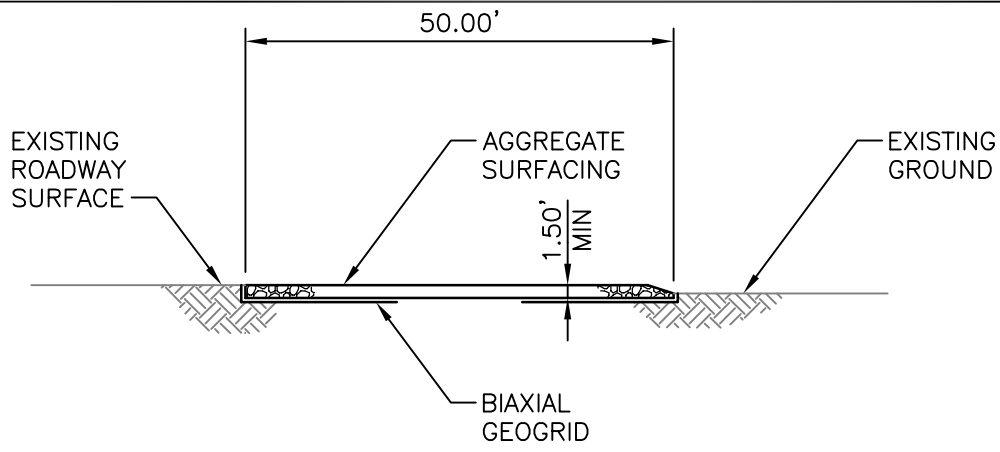


MAXIMUM SPACING 45'-0". USE AT ABUTTING BUILDINGS, CURBS, WALLS AND OTHER STRUCTURES; AND AS SHOWN.

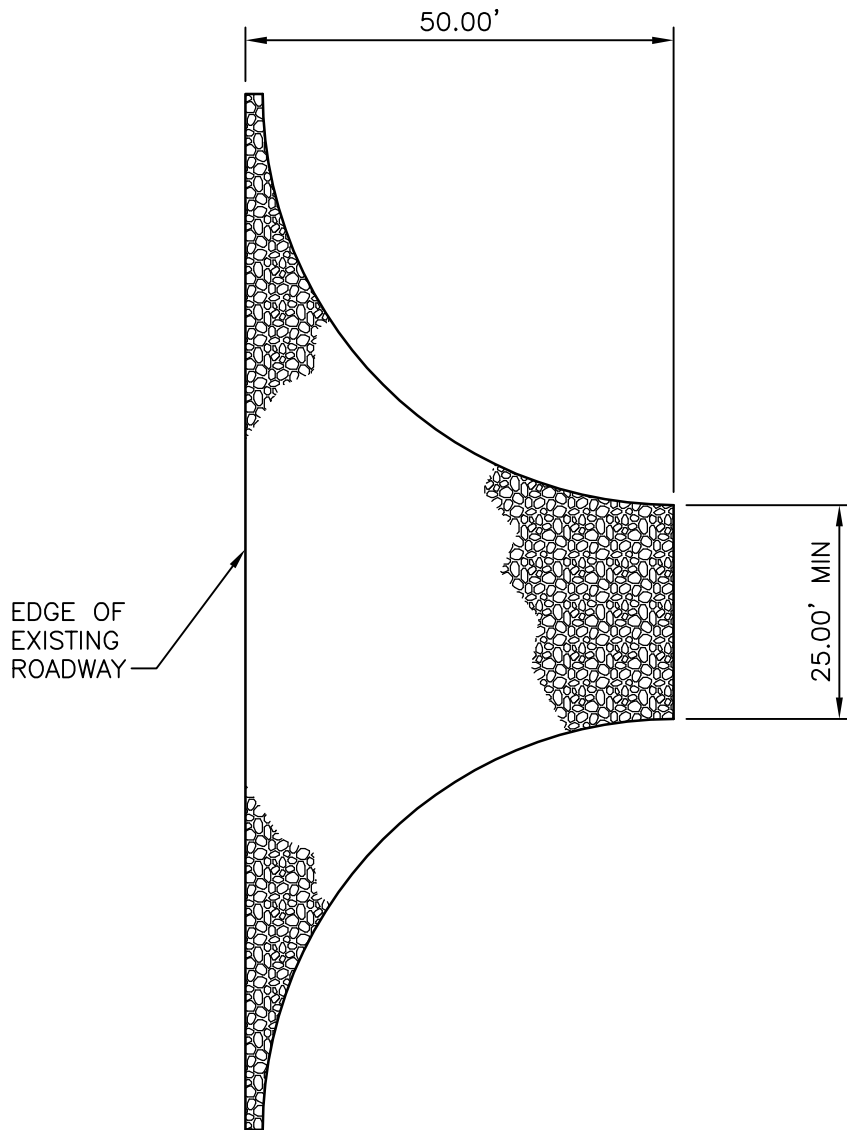
EXPANSION JOINT

CONCRETE WALK JOINT DETAIL

NOT TO SCALE



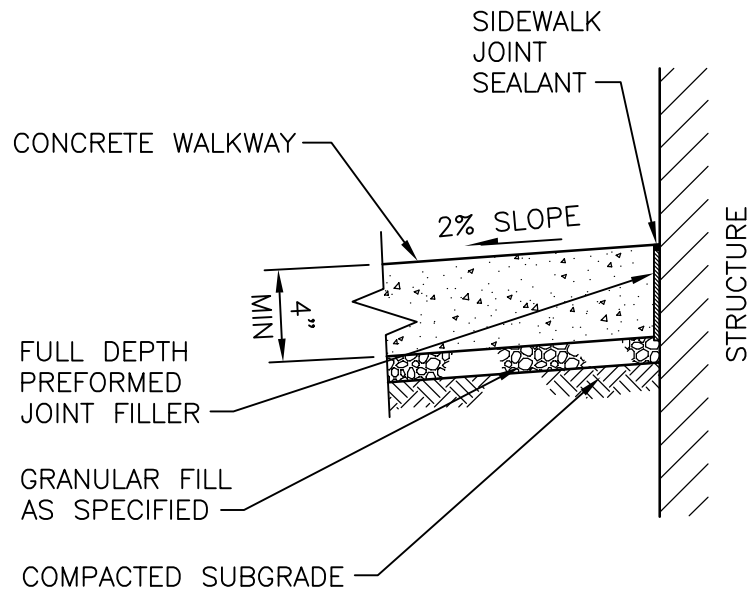
SECTION



PLAN

STABILIZED CONSTRUCTION
ENTRANCE

NOT TO SCALE

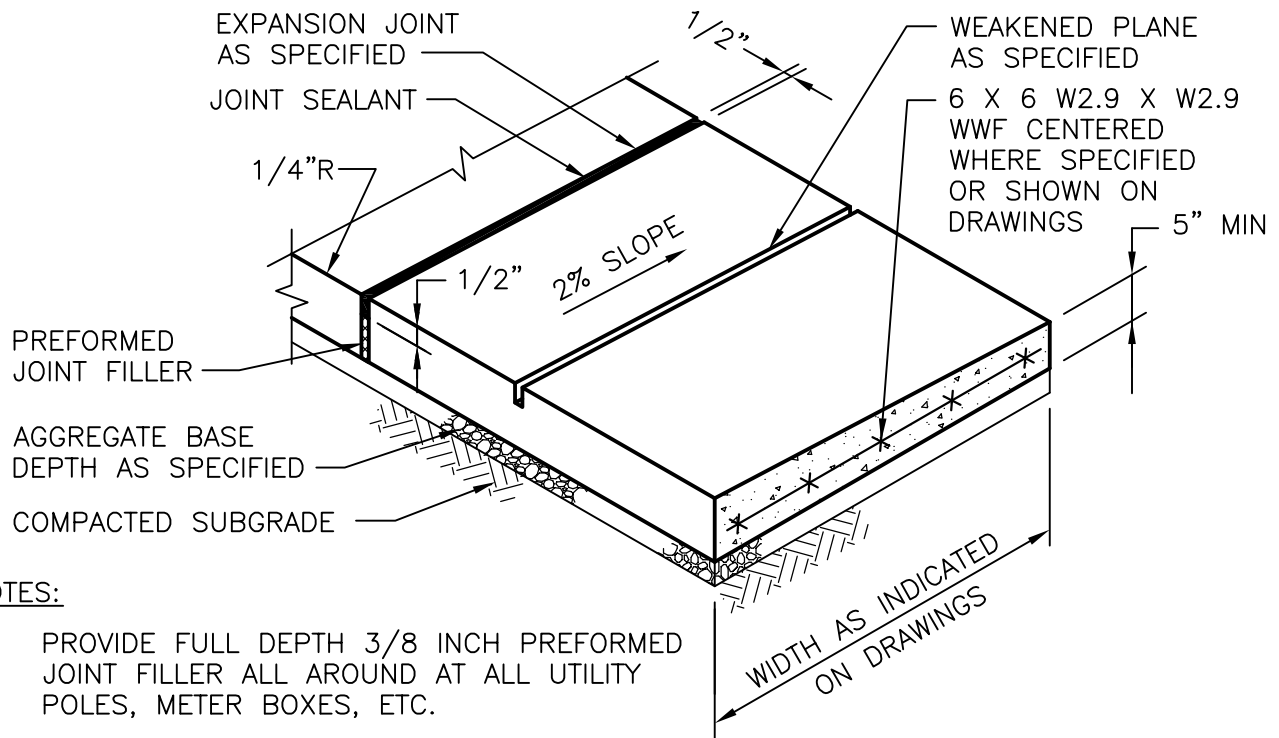


TYPICAL WALKWAY STRUCTURE INTERFACE

NOT TO SCALE

32 16 13-25





NOTES:

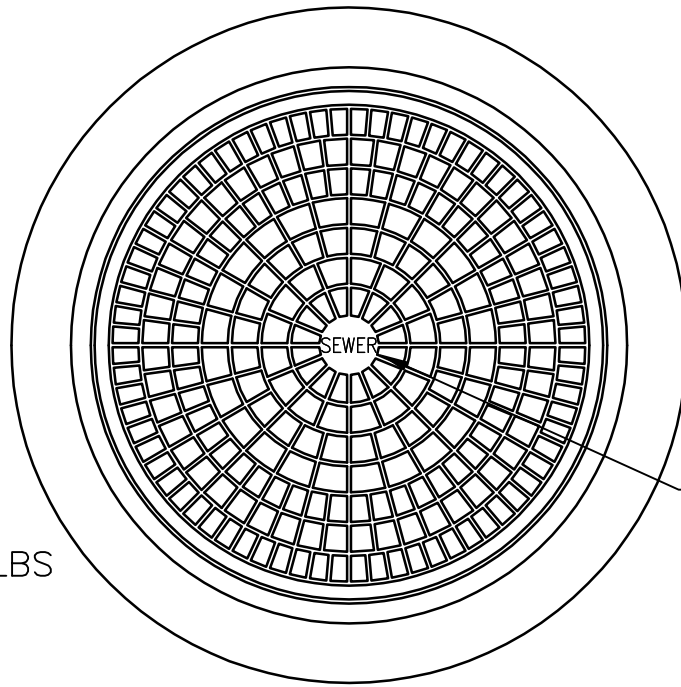
1. PROVIDE FULL DEPTH 3/8 INCH PREFORMED JOINT FILLER ALL AROUND AT ALL UTILITY POLES, METER BOXES, ETC.
2. PLACE PREFORMED JOINT FILLER FULL DEPTH THRU JOINTS AT POINT OF TANGENCY AND AT MINIMUM 25 FOOT INTERVALS.

CONCRETE WALKWAY/SIDEWALK

NOT TO SCALE

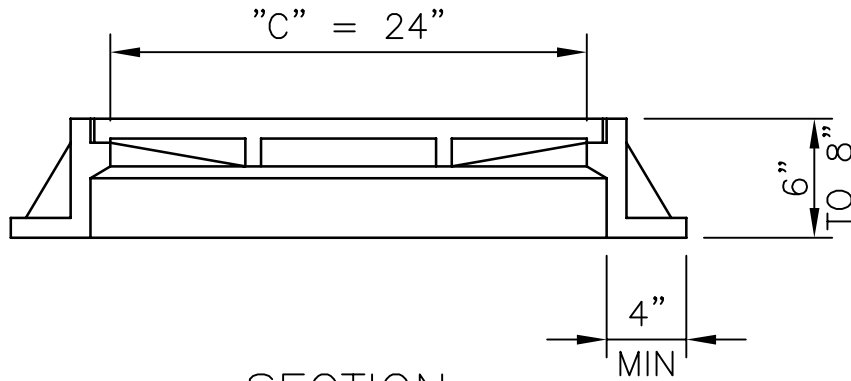
32 16 23-02





APRX WT - 400 LBS

"SEWER" CAST INTO CENTER OF ALL COVERS



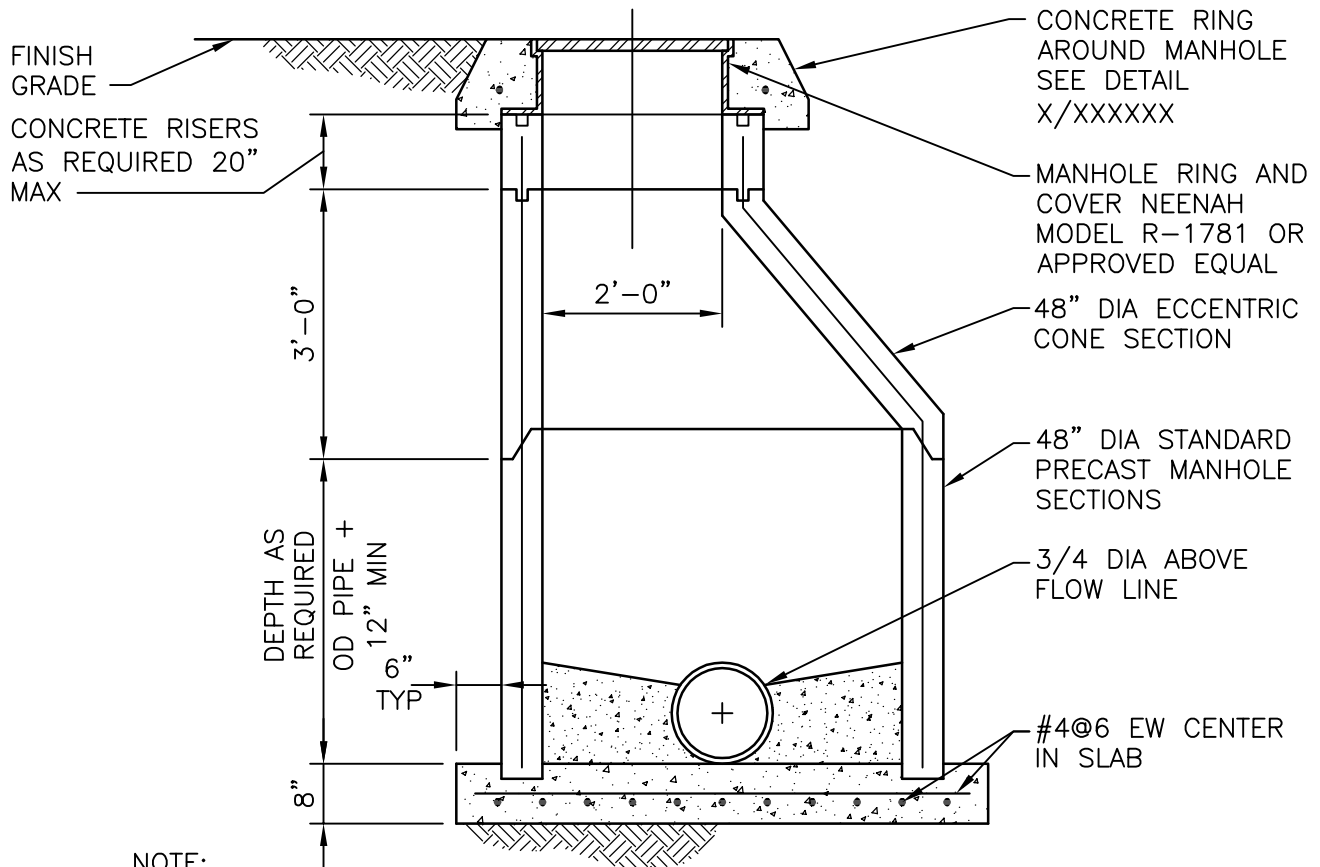
SECTION

MANHOLE COVER AND FRAME

NOT TO SCALE

33 05 16-03





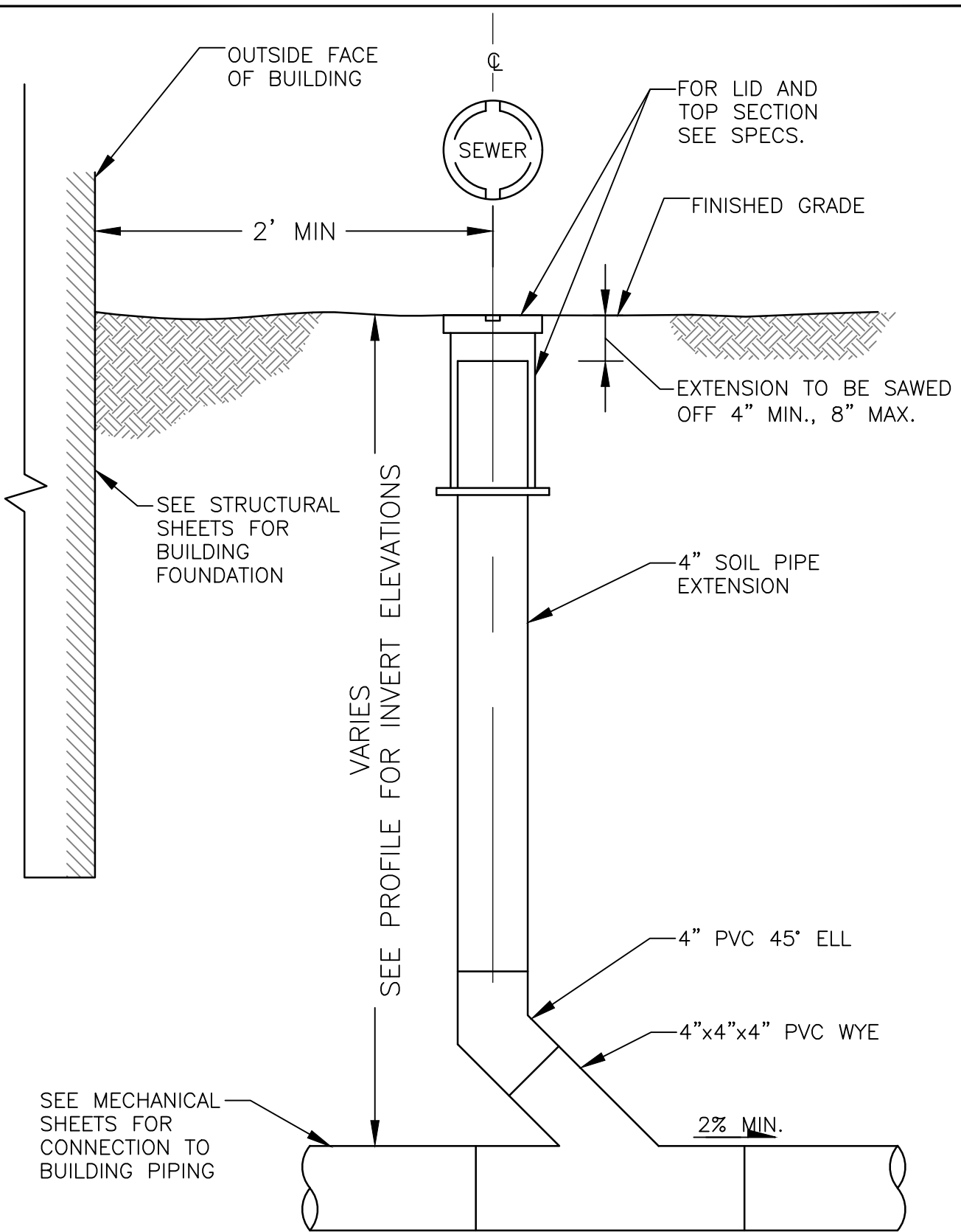
NOTE: MANUFACTURE MANHOLES IN ACCORDANCE WITH ASTM C-478.

PRECAST SANITARY SEWER MANHOLE

NOT TO SCALE

33 05 16-04





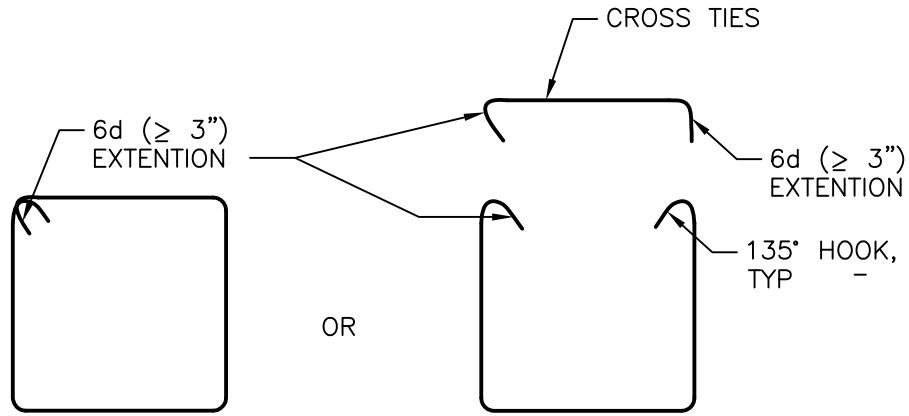
SEWER CLEANOUT DETAIL

NOT TO SCALE

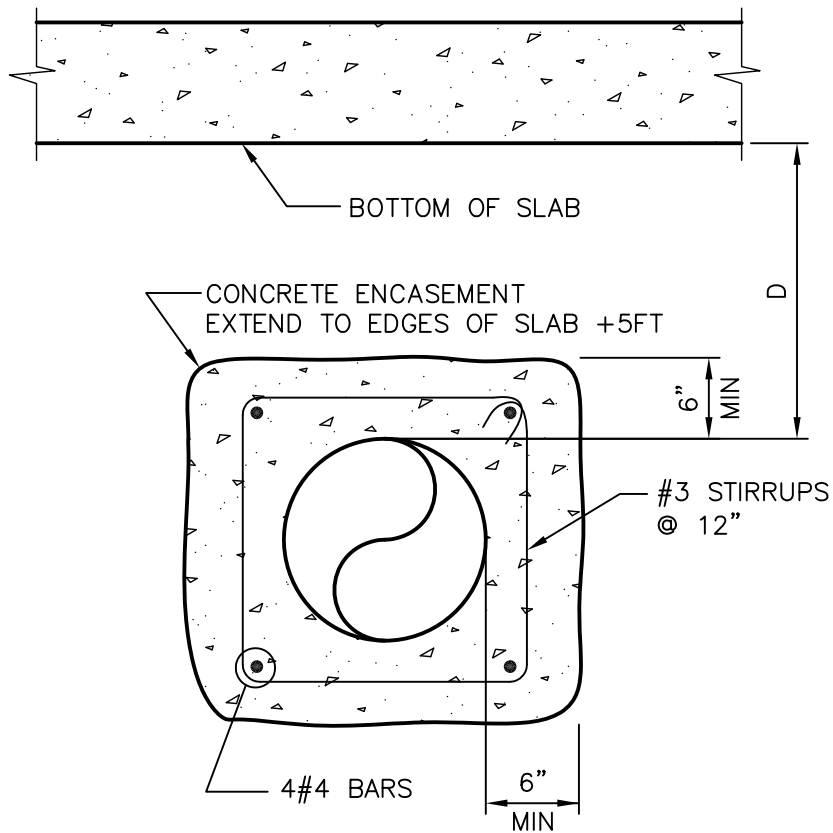
33 46 13-05



ALTERNATE CROSS
TIES ALONG MEMBER



STIRRUP OPTIONS



NOTE:

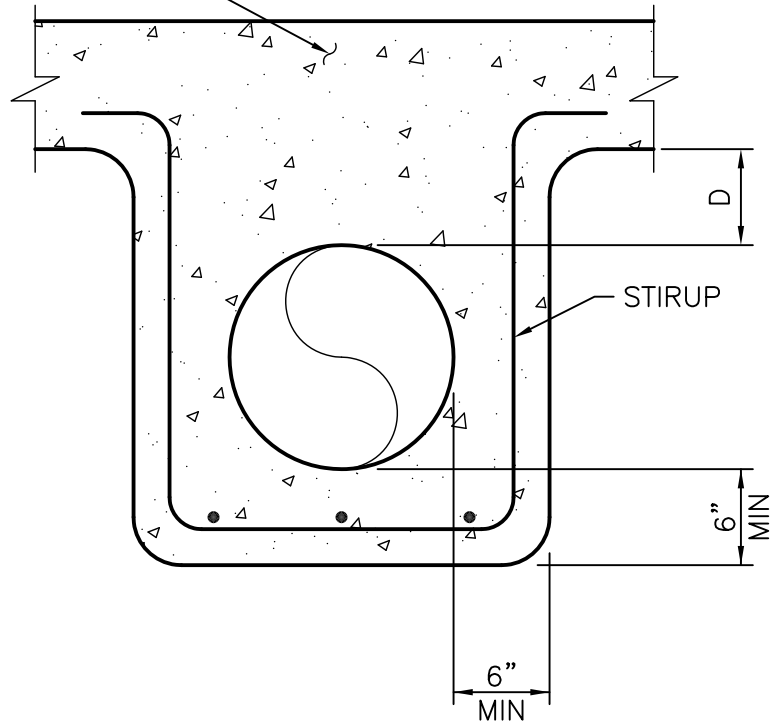
PROVIDE ENCASEMENT FOR ALL UNDERSLAB PIPING
AS SHOWN ABOVE.

UNDERSLAB PIPE ENCASEMENT TYPE 1

NTS

40 05 00-01

SLAB THICKNESS
& REINFORCING
VARIES



PIPE ENCASEMENT REINFORCING TABLE		
PIPE SIZE	STIRUPS	BOTTOM BARS
4"–14"	#3@12	3#4
16"–20"	#3@12	4#4
24"–30"	#4@12	4#4
36"–48"	#4@8	5#4

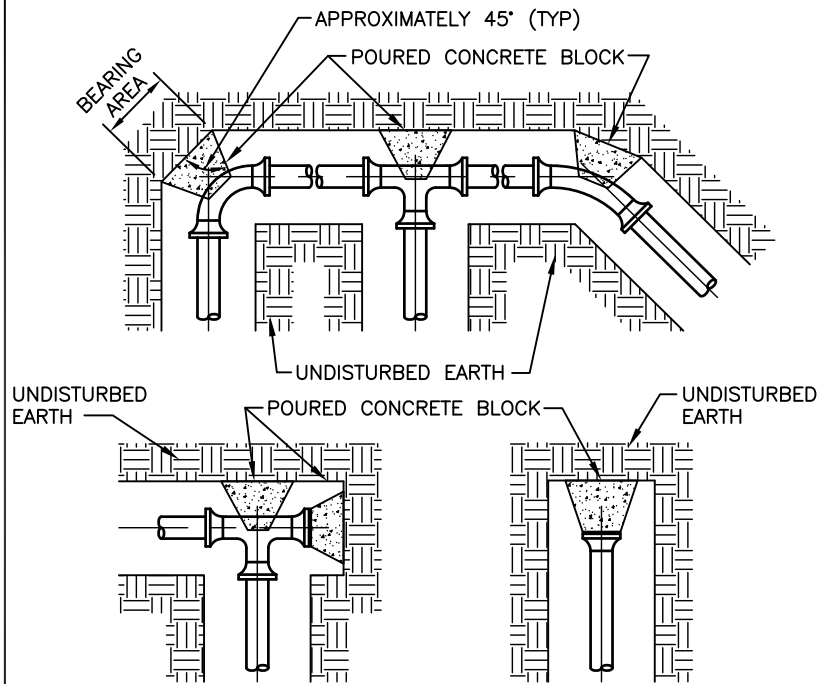
NOTE:

1. FOR ALL UNDERSLAB PIPE ENCASEMENT WHEN $D < 4'-0"$.

UNDERSLAB PIPE ENCASEMENT TYPE 2

NTS

40 05 00-02



FITTING SIZES	BEARING AREA OF BLOCK IN SQ. FT.				
	TEE & END	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND
4"	1.0	1.4	1.0	—	—
6"	2.1	3.0	1.6	1.0	—
8"	3.8	5.3	2.9	1.5	1.0
10"	5.9	8.4	4.6	2.4	1.2
12"	8.5	12.0	6.6	3.4	1.7
14"	11.5	16.3	8.8	4.5	2.3
16"	15.0	21.3	11.6	6.0	3.0
18"*	19.0	27.0	14.6	7.6	3.8
20"*	23.5	33.3	18.1	9.4	4.7
24"*	34.0	48.0	26.2	13.6	6.8
30"*	53.0	75.0	40.6	20.7	10.4
36"*	76.3	107.9	58.3	29.8	15.0

NOTES:

1. PLACE 4 MIL POLYETHYLENE BETWEEN CONCRETE AND FITTING. CONSTRUCT BLOCK SUCH THAT CONCRETE DOES NOT INTERFERE WITH THE ADJACENT PIPE JOINT.
2. THE HEIGHT (h) OF THE BLOCK SHALL BE EQUAL TO OR LESS THAN 1/2 THE TOTAL DEPTH FROM FINISHED GRADE TO THE BOTTOM THE BLOCK BUT NOT LESS THAN THE PIPE DIAMETER.
3. THE HORIZONTAL DIMENSION OF THE BEARING AREA SHALL BE BETWEEN 1 AND 2 TIMES THE VERTICAL DIMENSION.
4. THRUST BLOCK ORIENTATION SHALL BE SUCH THAT THE CENTER OF THE FITTING CORRESPONDS WITH THE CENTER OF THE THRUST BLOCK.
5. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI @ 28 DAYS.
6. LISTED AREAS ARE BASED ON TEST PRESSURE OF 100 P.S.I. AND AN ALLOWABLE SOIL BEARING STRESS OF 2,000 LBS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURE, USE THE FOLLOWING EQUATION: BEARING AREA = (TEST PRESSURE/100) x (TABLE VALUE).

THRUST BLOCK DETAIL

NTS

EDITOR NOTE:

1. * RESTRAINED JOINTS RECOMMENDED FOR PIPE 18 IN AND LARGER.
2. BEARING AREA CALCULATED IN ACCORDANCE WITH DIPRA "THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE".

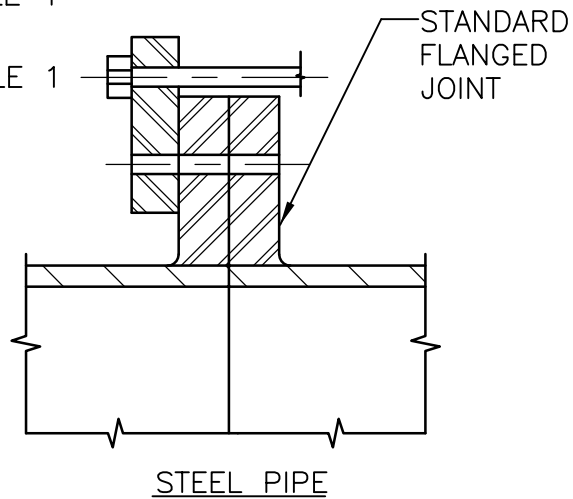
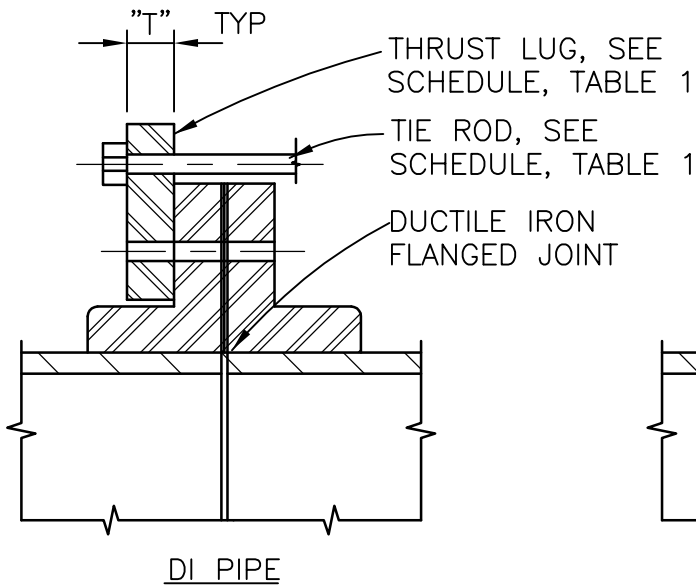
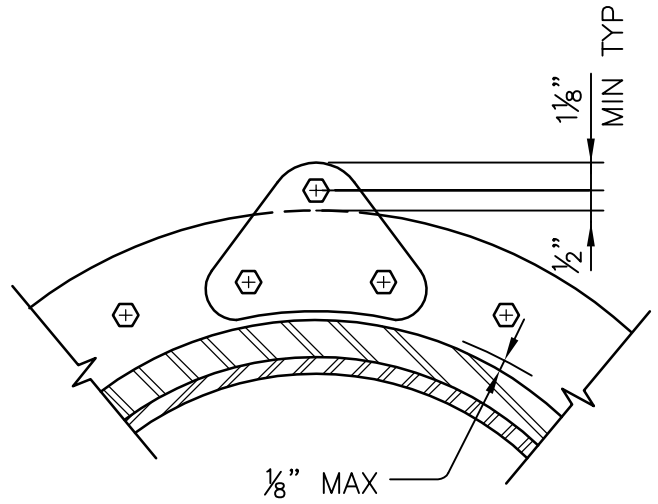
40 05 00-06



TABLE 1 TIE ROD AND LUG SCHEDULE		
PIPE DIA (IN)	TIE ROD DIA (IN)	"T" MINIMUM LUG THICKNESS DIA (IN)
4 - 6	5/8	1/2
8 - 12	5/8	1/2
14 - 18	5/8	7/8
20 - 24	5/8	1 1/4

NOTE:

1. MAXIMUM PIPE PRESSURE = 50 PSI
2. GRIND ALL EDGES SMOOTH



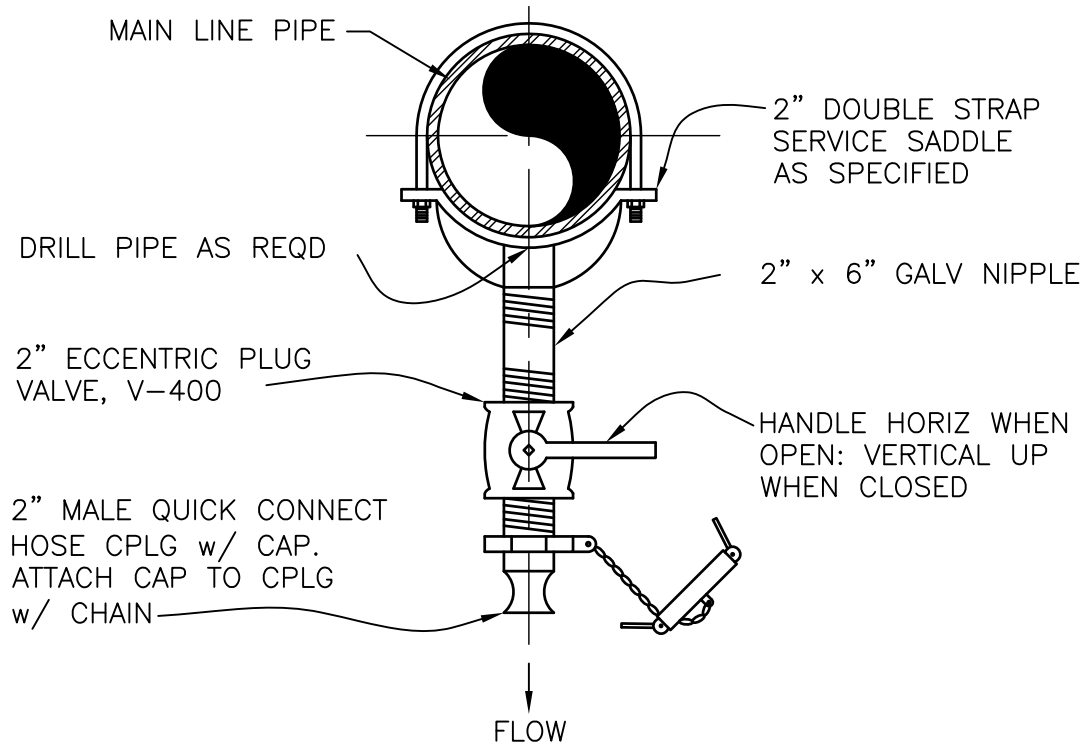
SECTIONS

THRUST TIE DETAIL

NTS

40 05 00-14



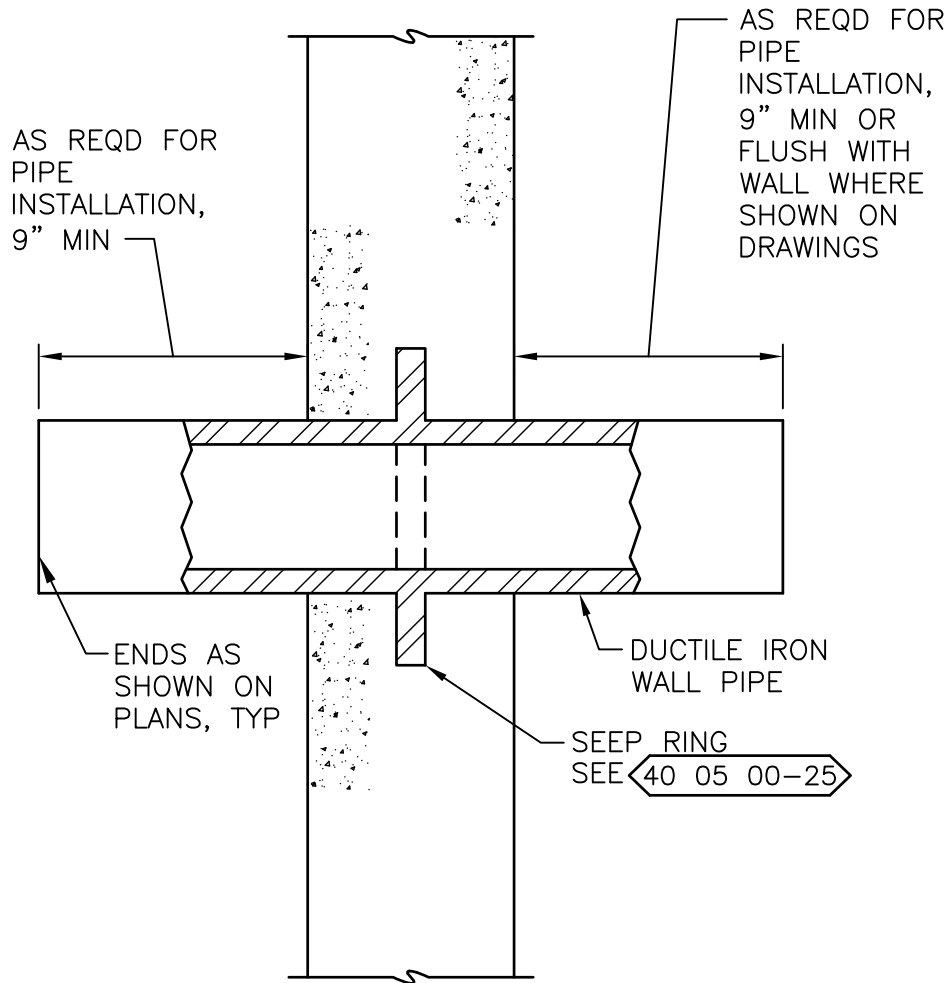


NOTE:
 FOR LINE SIZE 2" AND SMALLER, FITTINGS
 AND VALVE SHALL BE SAME SIZE AS LINE

LINE DRAIN VALVE INSTALLATION

NTS

40 05 00-15



NOTE:

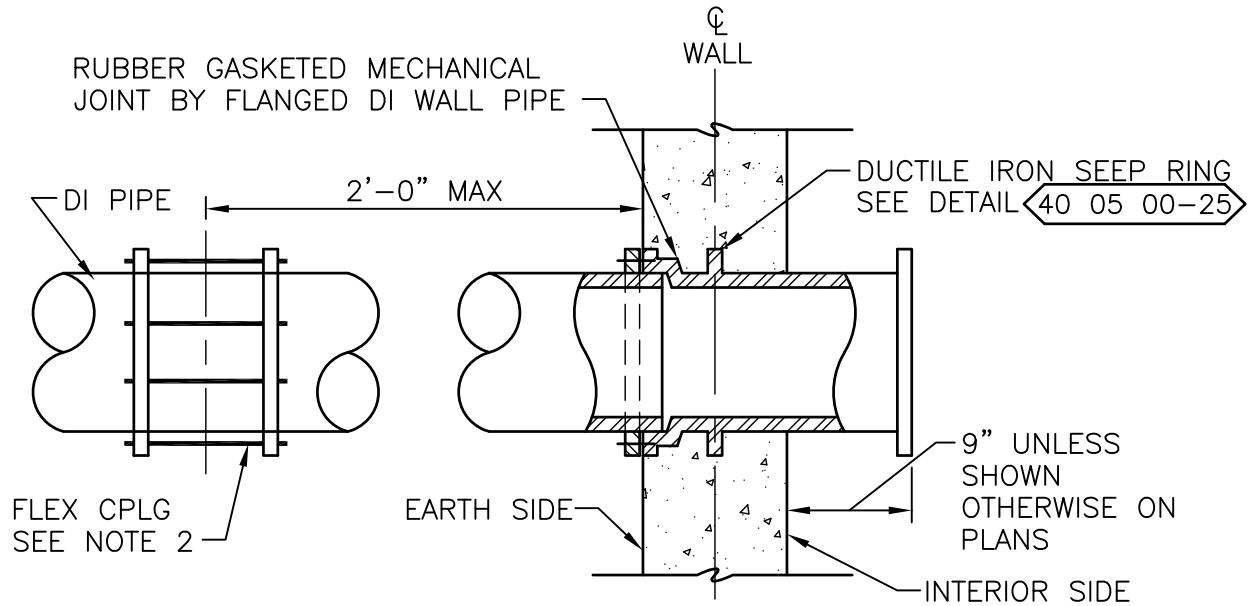
COAT & LINE PIPE w/ SPECIFIED PAINT AND/OR CEMENT SYSTEMS PRIOR TO CONC PLACEMENT. DO NOT ALLOW PIPE OR SEEP RING TO CONTACT WALL REINFORCING STEEL.

DUCTILE IRON WALL PIPE

NTS

40 05 00-17





NOTES:

1. COAT & LINE WALL PIPE w/ SPECIFIED PAINT AND/OR CEMENT SYSTEMS PRIOR TO CONC PLACEMENT.
2. PROVIDE TWO FLEX CPLGS WHERE SHOWN, SECOND CPLG TO BE 2'-0" FROM FIRST CPLG.

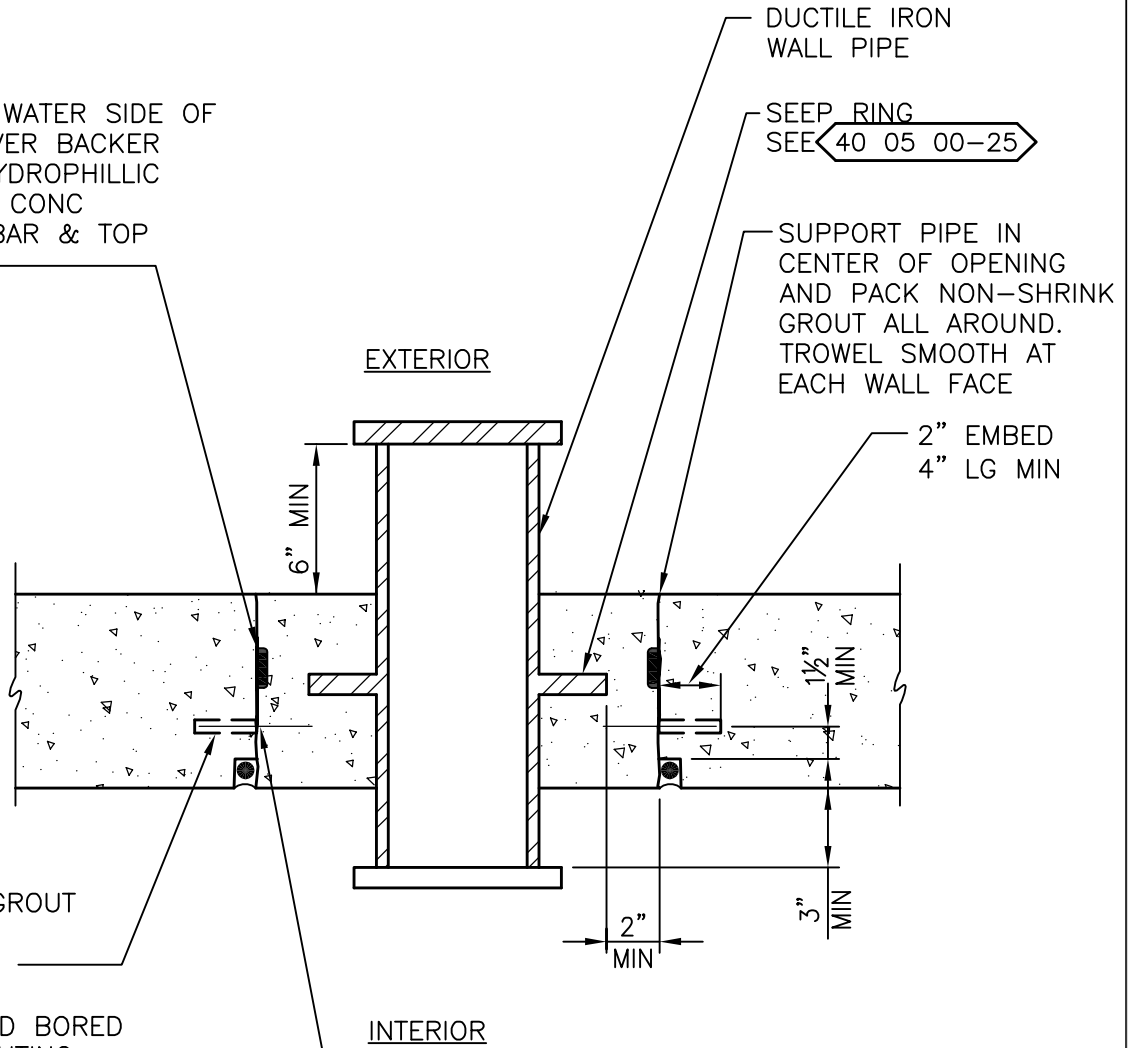
WALL PIPE

NTS

40 05 00-18



PROVIDE KERF AROUND WATER SIDE OF
OPENING AND CAULK OVER BACKER
ROPE. ALSO PROVIDE HYDROPHILIC
WATERSTOP BONDED TO CONC
CENTERED BETWEEN REBAR & TOP
EDGE



DRILL RADIALLY INTO
CONCRETE CEILING TO GROUT
6 - #4 BARS AROUND
PERIMETER OF OPENING

ROUGHEN EDGES AROUND BORED
OPENING PRIOR TO GROUTING

NOTE:

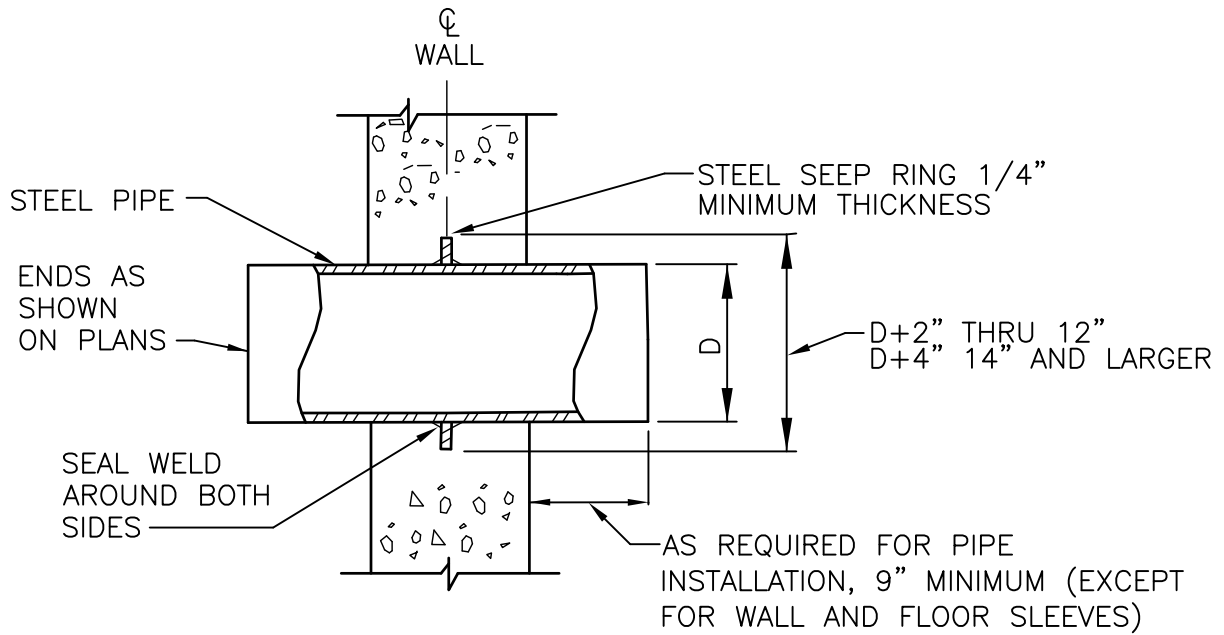
COAT & LINE PIPE W/ SPECIFIED PAINT AND/OR CEMENT SYSTEMS
PRIOR TO GROUT PLACEMENT. DO NOT ALLOW PIPE OR SEEP RING TO
CONTACT EXIST. WALL OPENING OR REINF STEEL. ALSO, APPLY EPOXY
BONDING AGENT TO OPENING SURFACE PRIOR TO GROUTING.

DUCTILE IRON WALL PIPE IN CONCRETE CEILING

NTS

40 05 00-20





NOTE:

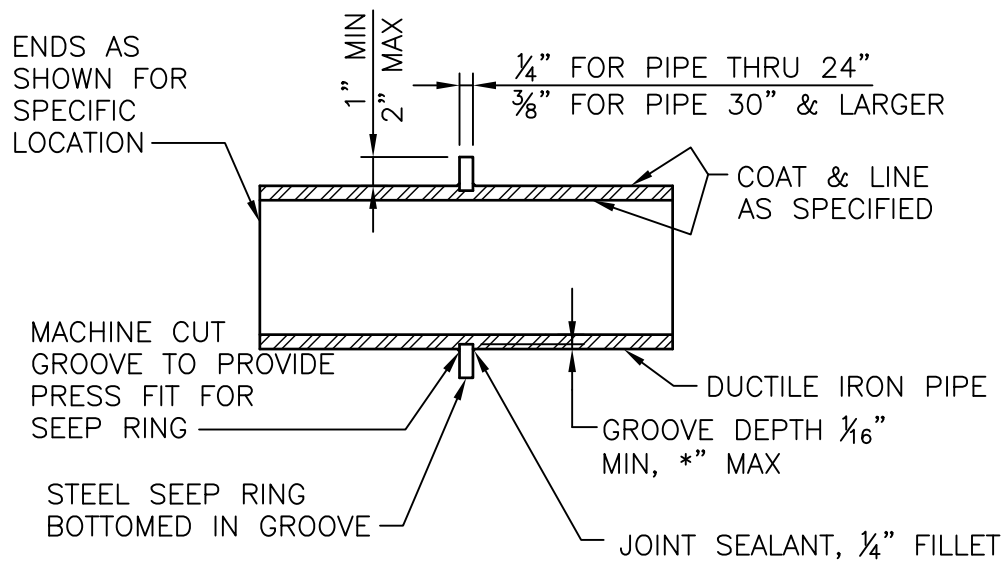
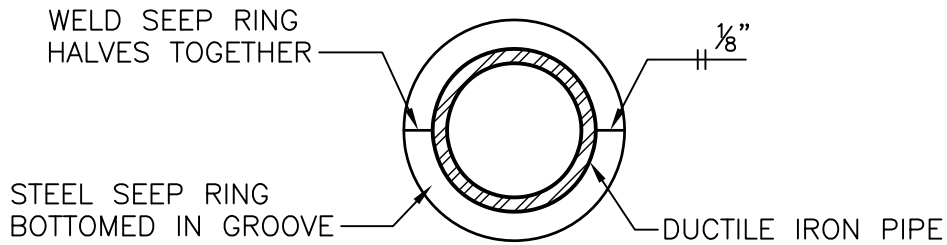
HOT DIP GALV AFTER FABRICATION WHERE NOTED. LINE AND COAT WALL PIPE w/ SPECIFIED PAINT SYSTEM PRIOR TO CONCRETE PLACEMENT.

STEEL WALL PIPE

NTS

40 05 00-21





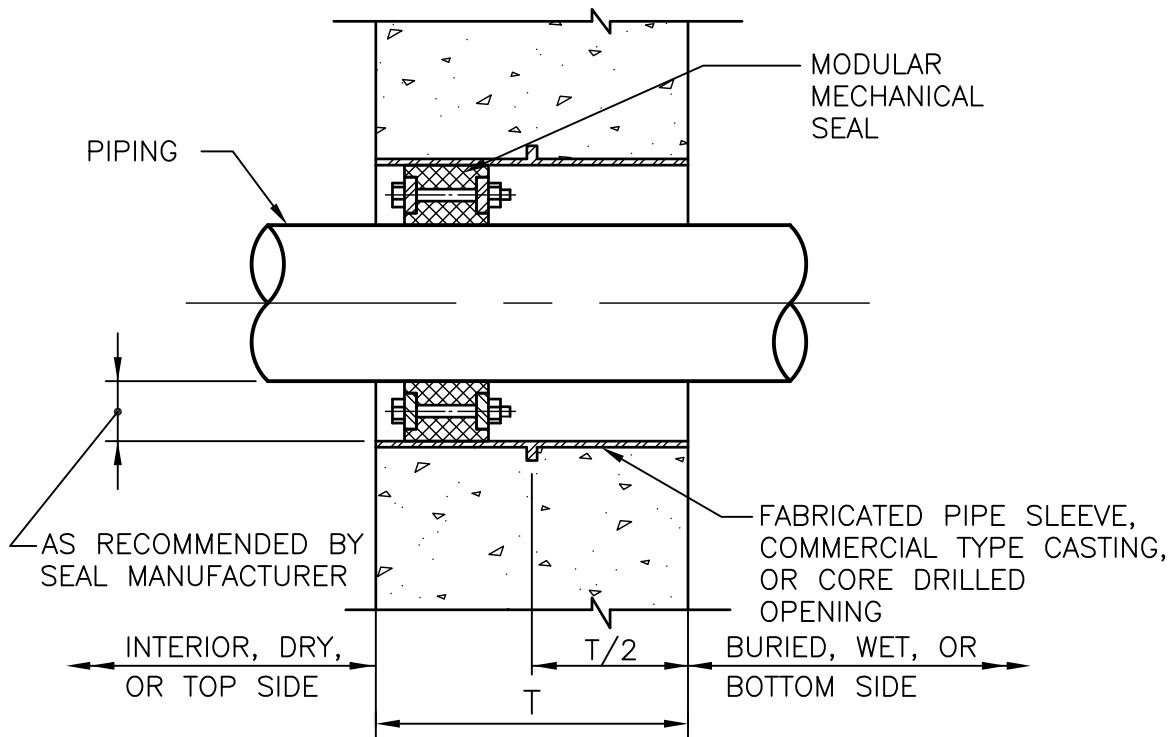
NOTES:

1. DO NOT WELD SEEP RING TO PIPE
2. *AS RECOMMENDED BY PIPE MFR.

DUCTILE IRON PIPE SEEP RING

NTS

40 05 00-25



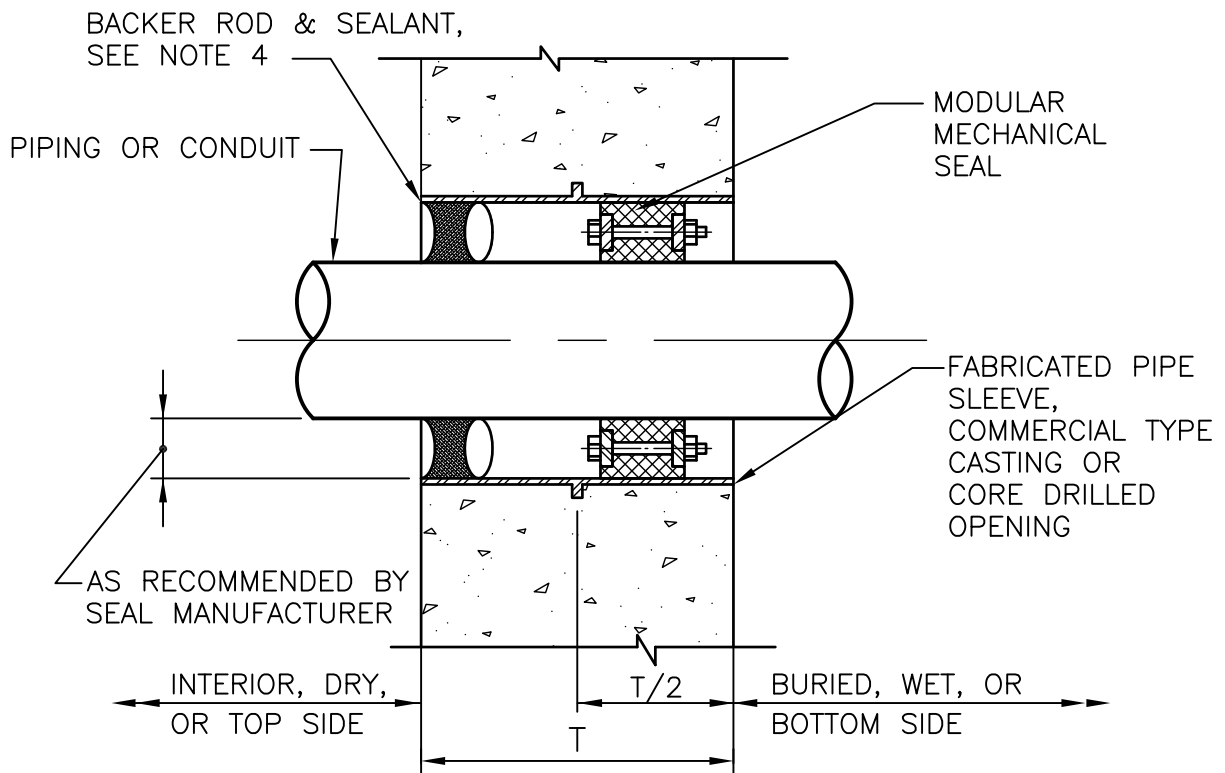
NOTES:

1. BOLT HEADS ON ACCESSIBLE SIDE OF PENETRATION
2. PROVIDE DOUBLE ROW OF SEALS FOR PIPES 16" DIAMETER AND LARGER IF CONCRETE THICKNESS PERMITS
3. ONE SEAL FOR WALLS LESS THAN 8" THICK, TWO FOR WALLS 8" THICK AND LARGER

MODULAR MECHANICAL SEAL

NTS

40 05 00-26



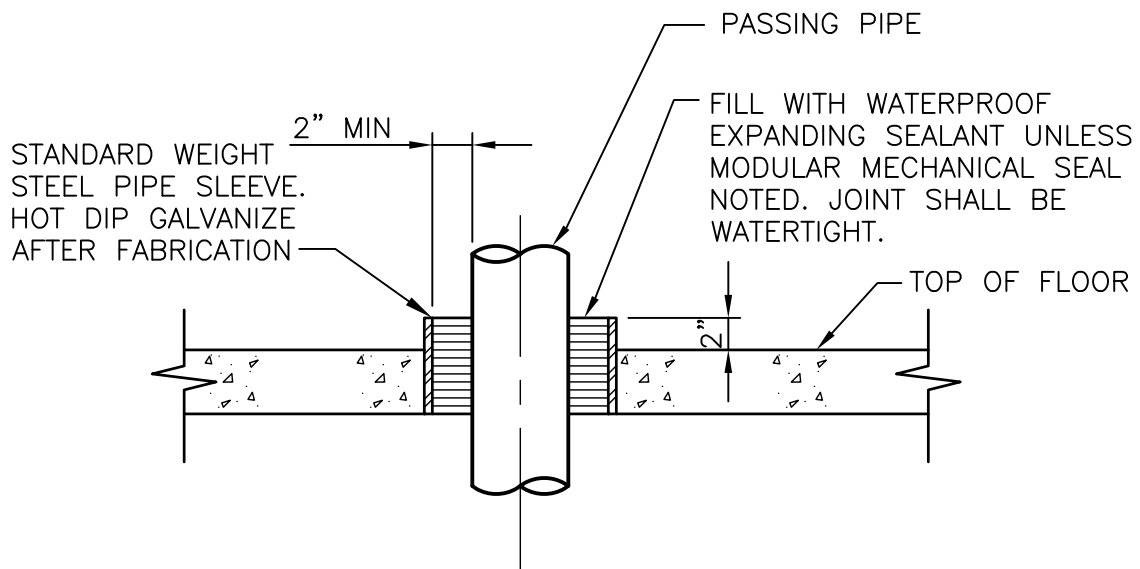
NOTES:

1. BOLT HEADS ON ACCESSIBLE SIDE OF PENETRATION
2. PROVIDE DOUBLE ROW OF SEALS FOR PIPES 16" DIAMETER AND LARGER IF CONCRETE THICKNESS PERMITS
3. ONE SEAL FOR WALLS LESS THAN 8" THICK, TWO FOR WALLS 8" THICK AND LARGER
4. INSTALL BACKER ROD AND SEALANT ONLY ON TOP SIDE OF SLABS OR AT FINISHED WALLS.

MODULAR MECHANICAL SEAL

NTS

40 05 00-27

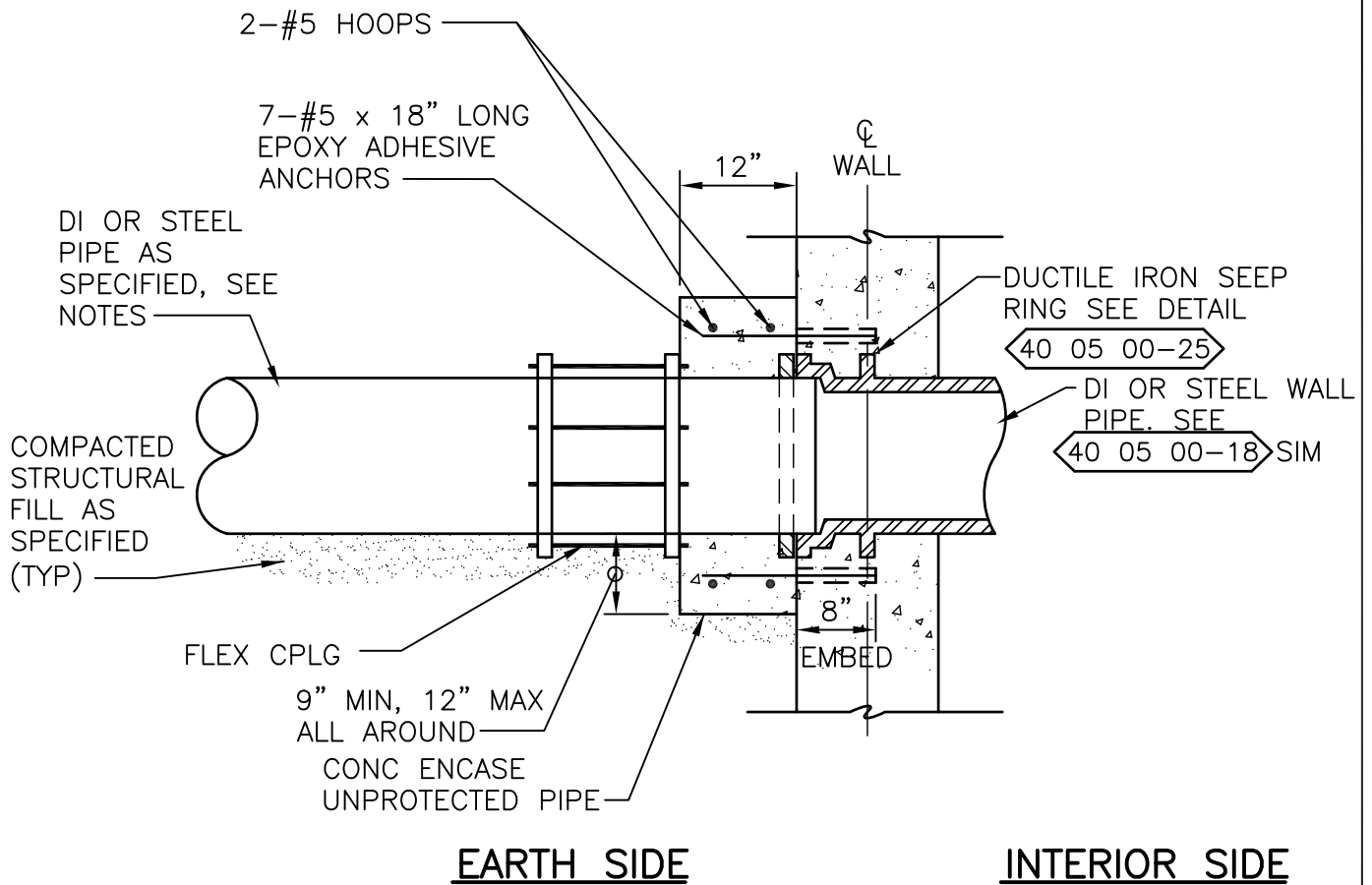


FLOOR SLEEVE

NTS

40 05 00-28





NOTES:

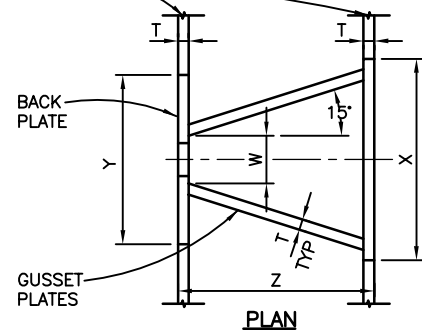
1. AT A MINIMUM, ALL BURIED DUCTILE IRON OR STEEL PIPE SHALL BE JOINT BONDED AS SPECIFIED.
2. PROVIDE TEST STATIONS AT EACH END OF PROTECTED PIPE. SEE PLANS.
3. POLYWRAP ALL BURIED DUCTILE IRON PIPE AND TAPE WRAP ALL BURIED STEEL PIPE AS SPECIFIED.

**WALL PIPE – LARGE DIAMETER
DUCTILE IRON OR STEEL PIPE**

NTS

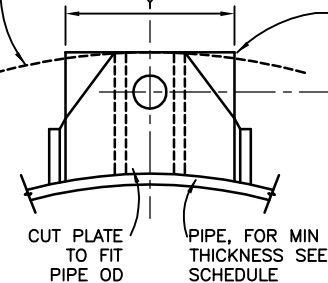
40 05 00-34

CUT CONTINUOUS PLATES TO UNIFORM HT CONT AROUND PIPE, SEE SCHEDULE

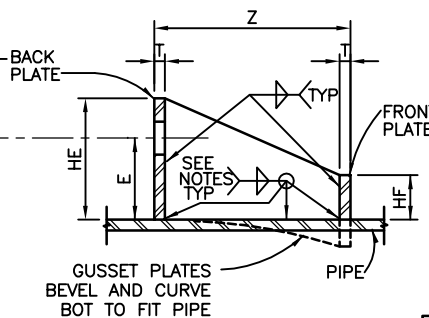


PLAN

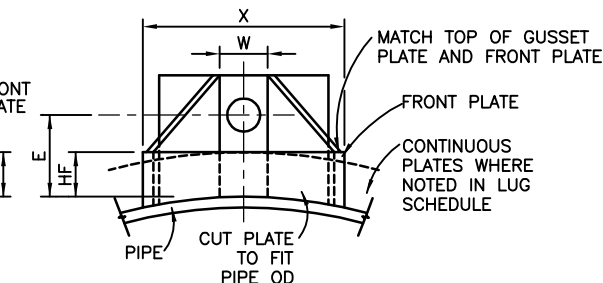
CUT CONTINUOUS PLATES TO UNIFORM HT CONT AROUND PIPE, SEE SCHEDULE



BACK ELEVATION

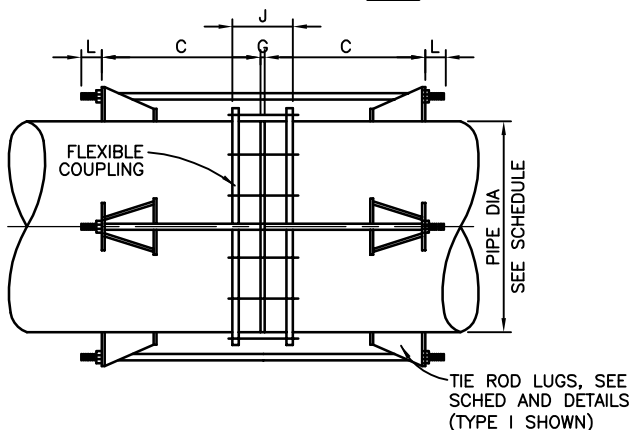


SECTION

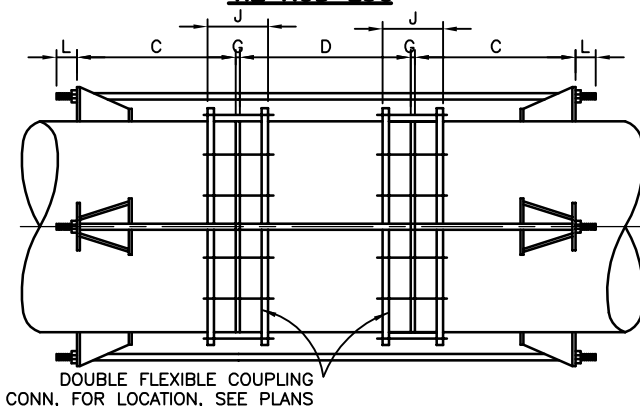


FRONT ELEVATION

TIE ROD LUG



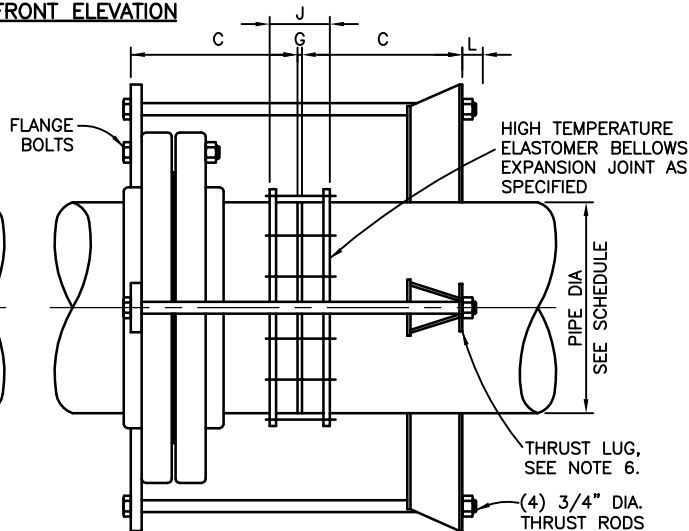
TIE ROD LUGS, SEE SCHED AND DETAILS (TYPE I SHOWN)



DOUBLE FLEXIBLE COUPLING CONN, FOR LOCATION, SEE PLANS

NOTES:

1. THE MIDDLE RING LENGTH OF THE FLEXIBLE COUPLING SHALL BE AS SPECIFIED.
2. THE CONTRACTOR SHALL DETERMINE THE LENGTH "J" (COUPLING BOLT LENGTH) FROM MANUFACTURER'S CATALOGS USING THE SPECIFIED MIDDLE RING LENGTH.
3. "G" = MANUFACTURER'S RECOMMENDED SPACE BETWEEN ENDS OF PIPE.
4. "C" = J+Z+1 INCH, (ROUND THIS VALUE UP TO NEXT EVEN INCH), MINIMUM. (FOR Z DIMENSIONS, SEE LUG SCHEDULE)
5. "D" = 2C+6 INCHES.
6. TIE ROD LENGTH = 2L+2C+2G+D.
7. SIMILAR TO TYPICAL THRUST TIE DETAIL EXCEPT AS NOTED.



NOTES:

1. THE MIDDLE RING LENGTH OF THE FLEXIBLE COUPLING SHALL BE AS SPECIFIED.
2. THE CONTRACTOR SHALL DETERMINE THE LENGTH "J" (COUPLING BOLT LENGTH) FROM MANUFACTURER'S CATALOGS USING THE SPECIFIED MIDDLE RING LENGTH.
3. "G" = MANUFACTURER'S RECOMMENDED SPACE BETWEEN ENDS OF PIPE.
4. "C" = J+Z+1 INCH, (ROUND THIS VALUE UP TO NEXT EVEN INCH), MINIMUM. (FOR Z DIMENSIONS, SEE LUG SCHEDULE)
5. TIE ROD LENGTH = 2L+2C+G.
6. CATHODIC PROTECTION FOR BELLOWS REQUIRED WHERE NOTED ON DWGS OR IN THE SPECIFICATIONS.

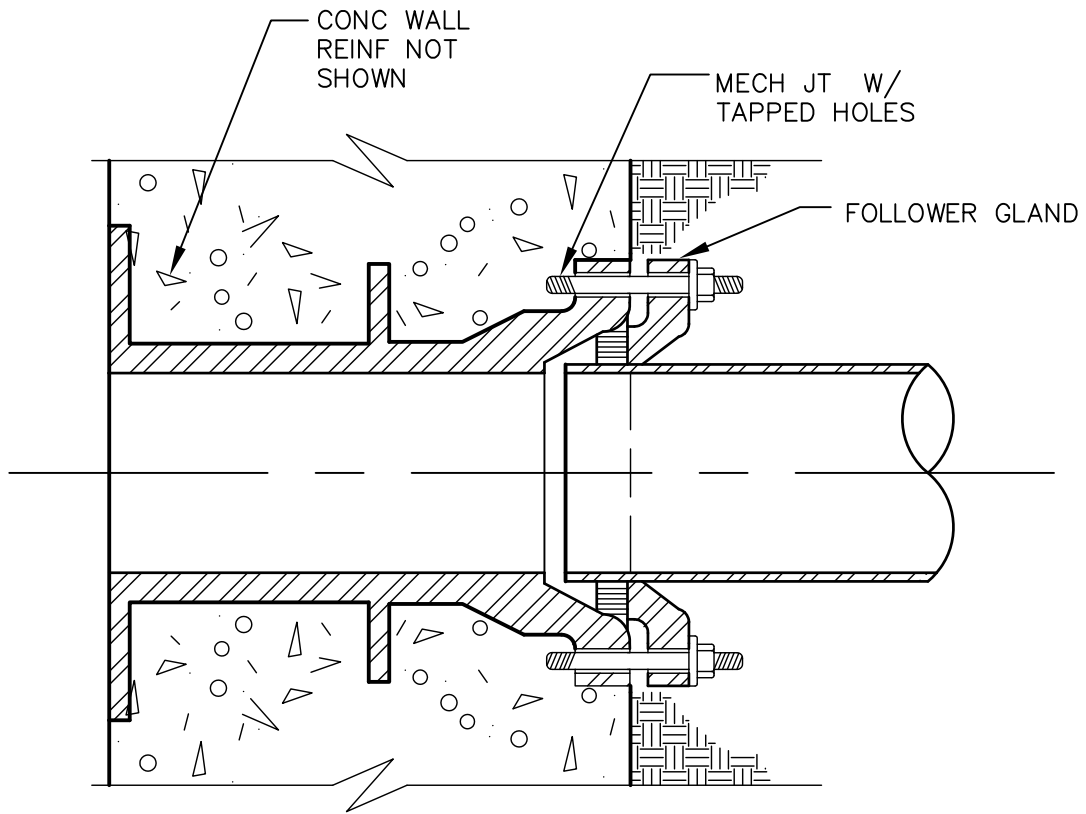
TYPICAL THRUST TIE DETAIL FOR STEEL PIPE-SINGLE COUPLING

THRUST TIE

NTS

TYPICAL THRUST TIE DETAIL FOR STEEL PIPE-DUAL COUPLINGS

TYPICAL THRUST TIE DETAIL FOR STEEL PIPE-FLANGED COUPLING



BURIED DIP WALL CONNECTION

NTS

40 05 00-52

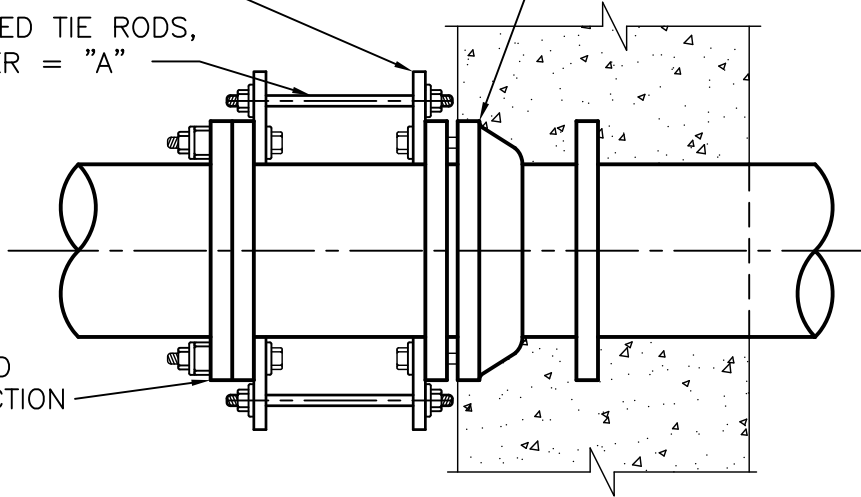


FABRICATED GUSSET PLATE
FOR ALIGNING MJ & FLG
BOLT HOLES, TWO BOLTS PER PLATE
THICKNESS = "D"

THREADED TIE RODS,
DIAMETER = "A"

MECHANICAL JOINT WALL
PIPE WITH TAPPED HOLES

FLANGED
CONNECTION



PIPE SIZE	"D"	"A"	MAX PRESSURE	
			2-RODS	3-RODS
2	3/8	5/8	200	—
2 1/2	3/8	5/8	200	—
3	3/8	5/8	200	—
4	3/8	5/8	200	—
5	3/8	5/8	200	—
6	1/2	5/8	140	200
8	1/2	3/4	140	190
10	3/4	7/8	140	190
12	3/4	1	140	190
14	3/4	1	85	130
16	3/4	1 1/8	65	110
18	3/4	1 1/8	65	110
20	3/4	1 1/8	65	110
24	1	1 1/4	65	100

NOTE:

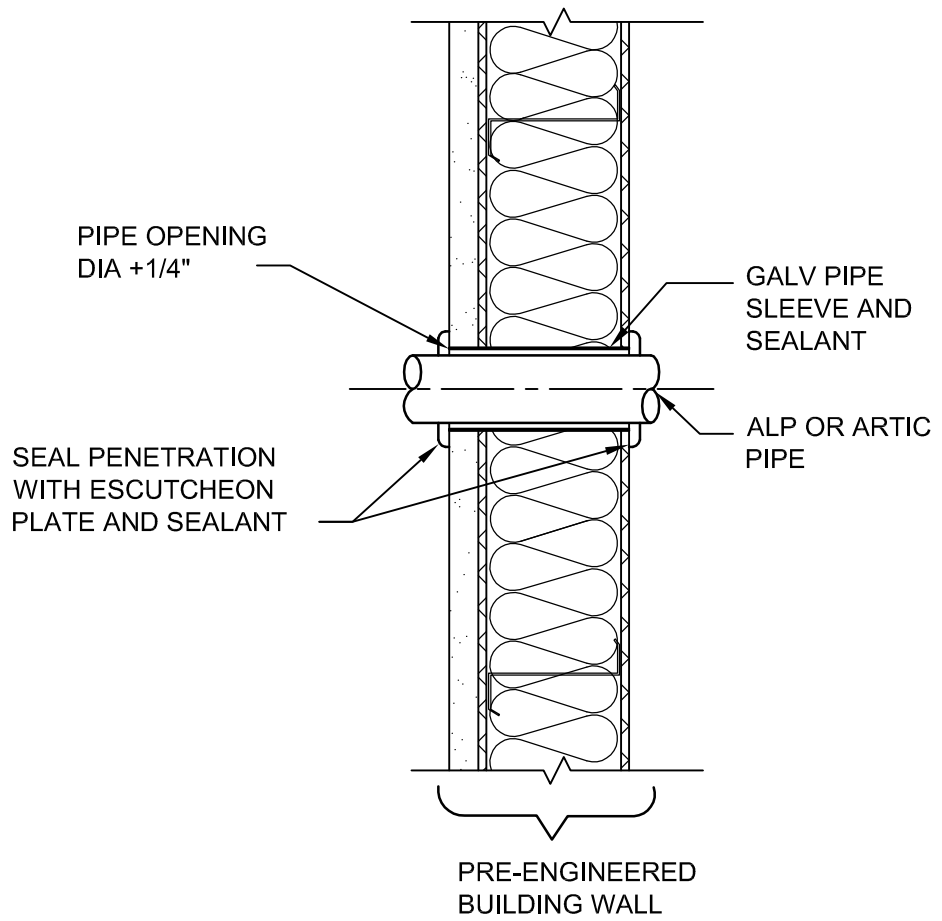
1. USE WHEN SPACE IS LIMITED AND YOU CANNOT INSTALL A DOUBLE MECHANICAL JOINT.

RESTRAINED MECHANICAL JOINT TO FLANGED JOINT

NTS

40 05 00-53



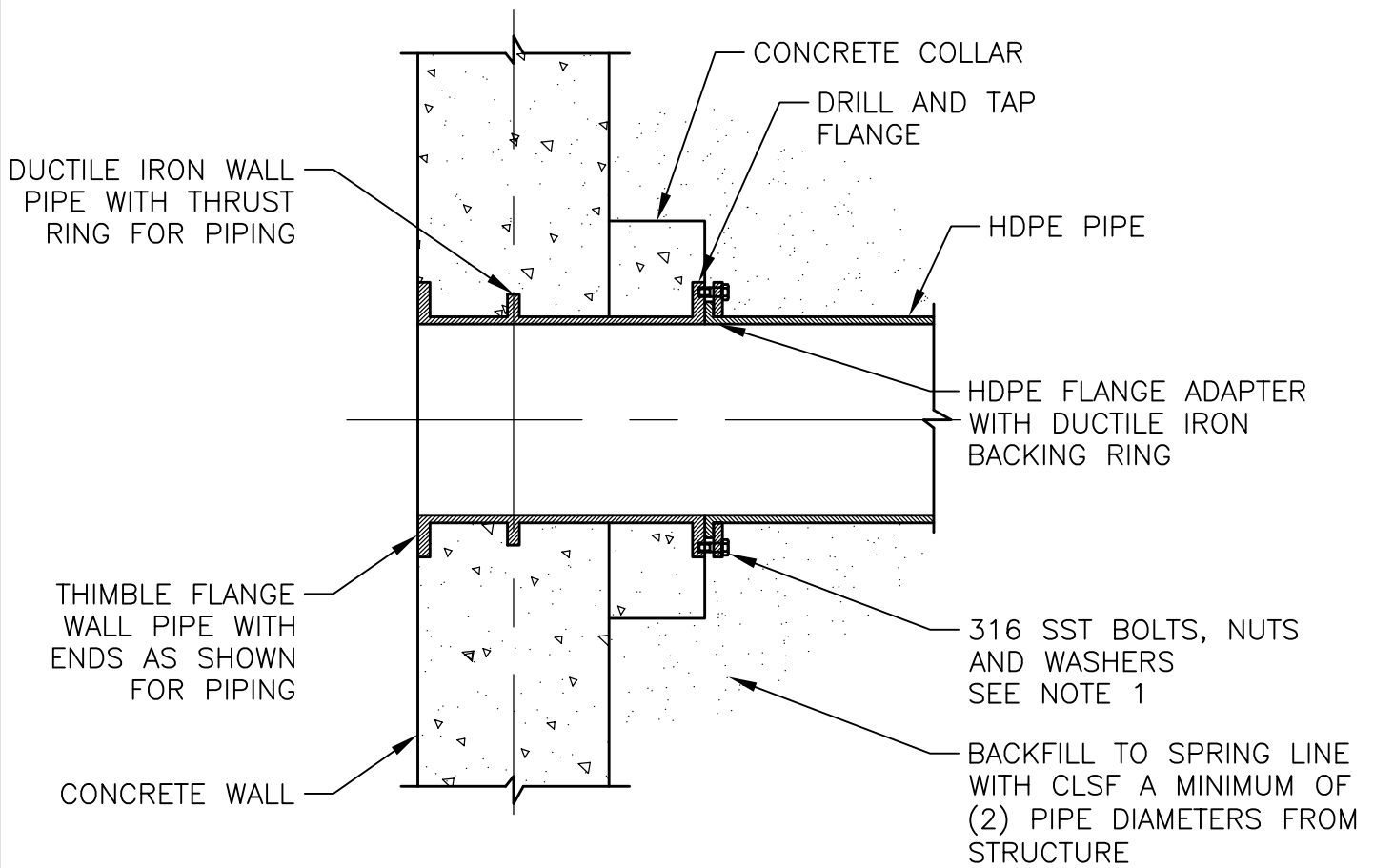


PIPE WALL PENETRATION

NTS

40 05 00-55





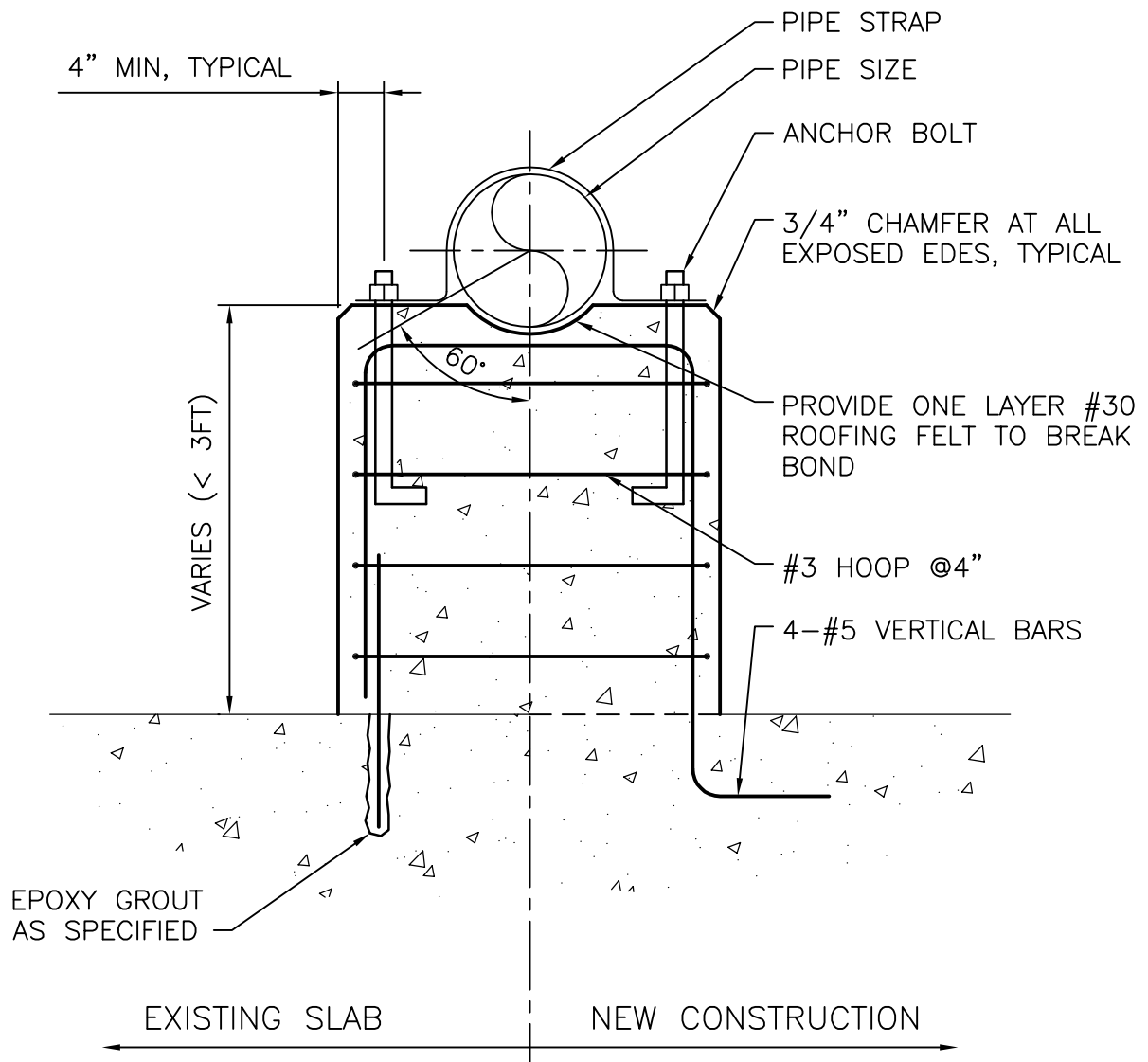
NOTE:

1. WAX TAPE BURIED BOLTS AND NUTS PER AWWA C217. POLY WRAP FLANGE CONNECTION PRIOR TO CLFS BACKFILL.
2. COAT WALL THIMBLE AS SPECIFIED.

HDPE WALL PIPE CONNECTION

NTS

40 05 00-57



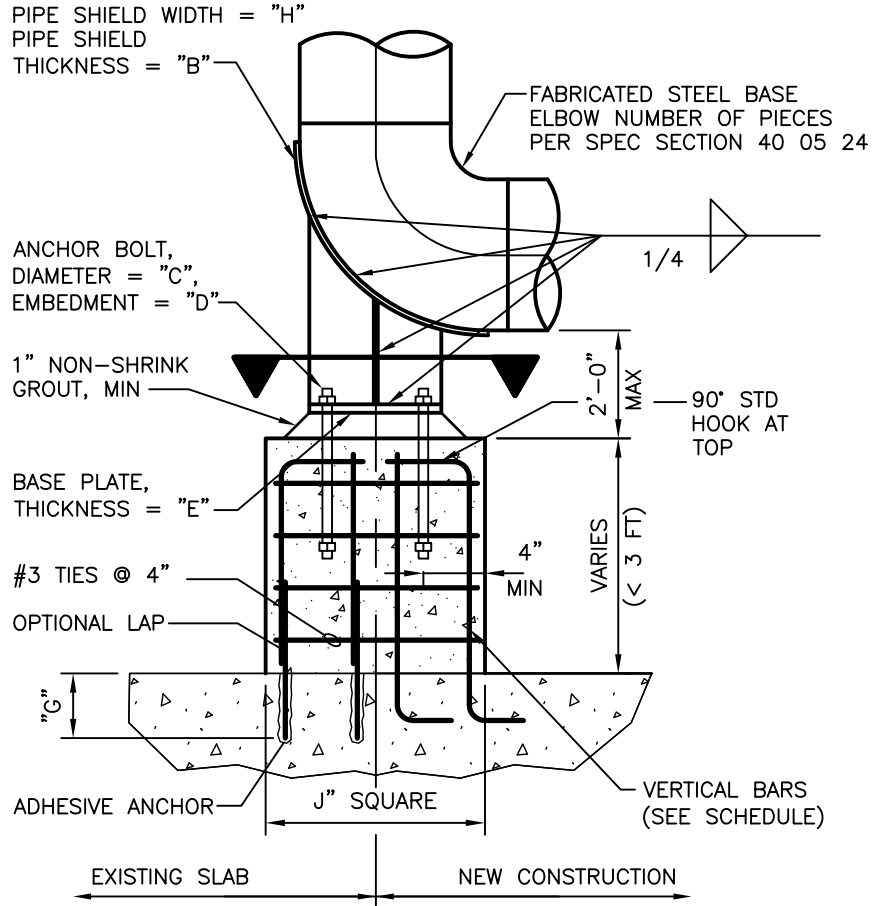
PIPE SIZE, DIA	PIPE STRAP	ANCHOR BOLTS, DIA	PEDESTAL THICKNESS
6"–12"	1/4"x2"	1/2"	12"
14"–24"	3/8"x2 1/2"	5/8"	16"
30"–48"	1/2"x3"	3/4"	24"

CONCRETE PEDESTAL SUPPORT

NTS

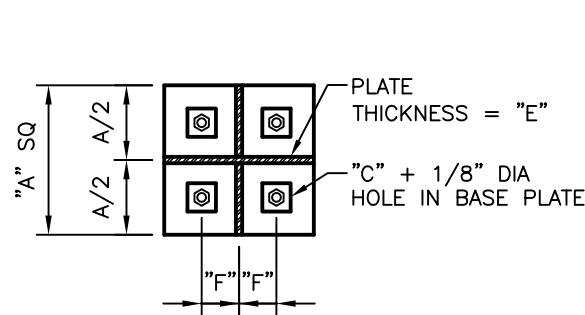
40 05 07-01



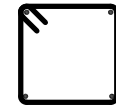


PIPE SIZE	A	B	C	D	E	F	G	H	J	VERT REINF	
										QTY	SIZE
8"	6"	5/16"	1/2"	8"	1/2"	2"	5"	2"	12"	4	#6
10"	6"			8"		2"		2 1/2"	12"	4	#6
12"	8"		5/8"	10"	5/8"	3"		3"	14"	4	#6
14"	10"					4"		3 1/2"	16"	8	#6
16"	10"	3/8"				4"	7 1/2"	4"	16"	8	#6
18"	12"			12"		5"		4 1/2"	18"	8	#6
20"	14"					6"		5"	20"	8	#7
24"	16"	1/2"	3/4"		3/4"	6 3/4"		6"	22"	8	#7
30"	20"	1/2"		14"		8 3/4"	10"	7 1/2"	26"	12	#7
36"	24"	5/8"				10 3/4"		9"	30"	12	#8
42"	28"	3/4"		16"		12 3/4"		10 1/2"	34"	16	#8
48"	30"	7/8"	1"		1"	13"		12"	34"	16	#8
54"	30"	7/8"		18"		13"		13 1/2"	34"	16	#8
60"	36"	1"				16"		15"	40"	20	#8

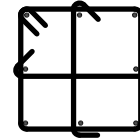
NOTE:
1. FOR TIE CONFIGURATION SEE TIE CONFIGURATION DETAIL BELOW.



SECTION



4-BAR



8-BAR

TIE CONFIGURATION

NOTE:

1. ALL STEEL BASE ELBOWS, BOLTS, NUTS, ETC. INSIDE PRE-TREATMENT TANK TO BE STAINLESS.
2. ALL OTHER - TO BE GALVANIZED STEEL.

FABRICATED STEEL BASE ELBOW

NTS

40 05 07-02A



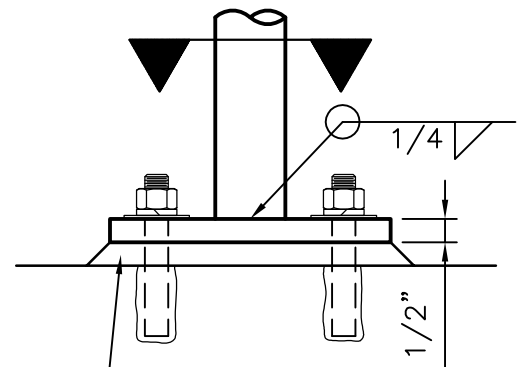
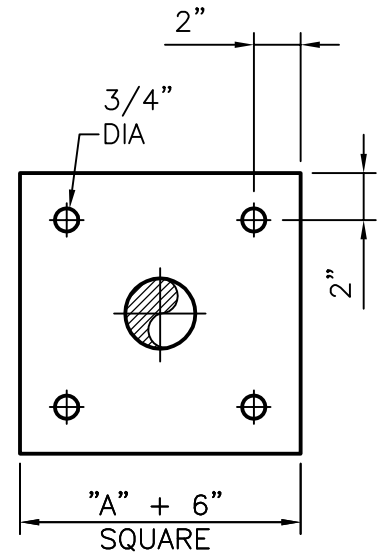
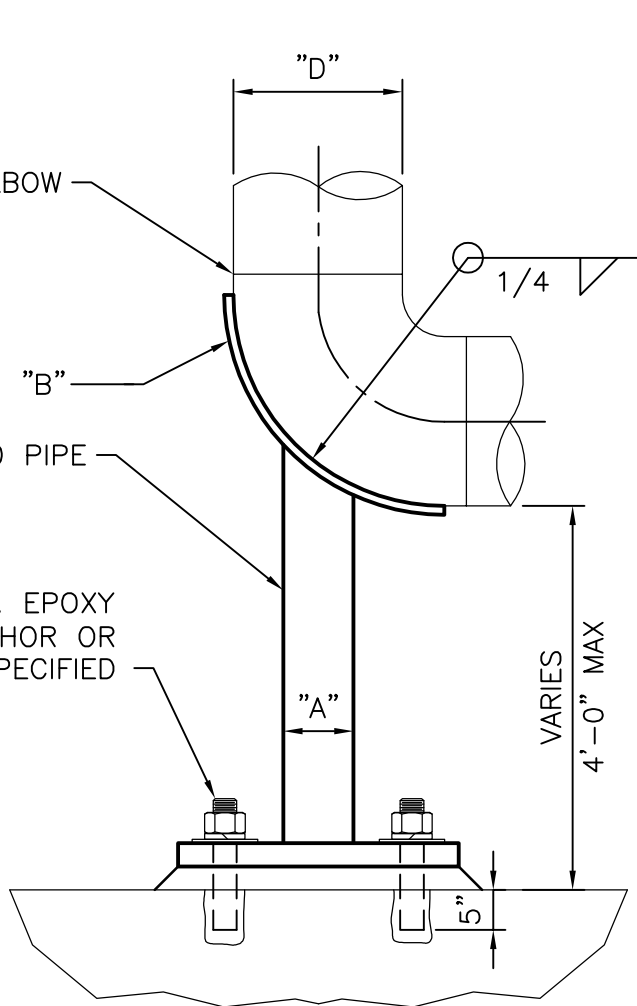
90° STEEL ELBOW

PIPE SHIELD
WIDTH = "H"

PIPE SHIELD
THICKNESS = "B"

SCHEDULE 40 PIPE

MIN. 5/8" DIA. EPOXY
ADHESIVE ANCHOR OR
AS SPECIFIED



1" MIN.
NON-SHRINK
GROUT

BASE PLATE DETAIL

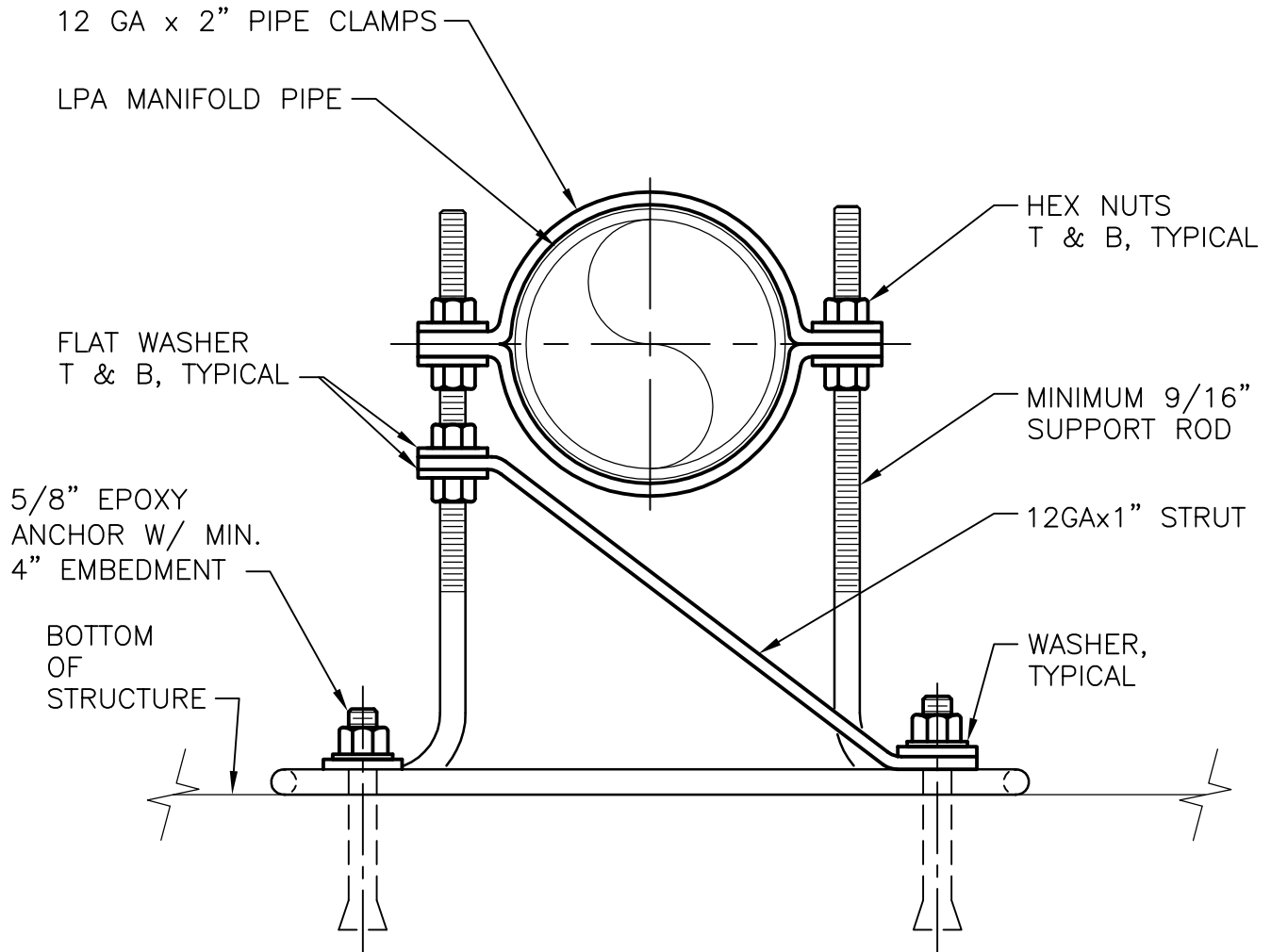
PIPE SIZE			
"A"	"B"	"D"	"H"
2"	-	4"	-
3"	-	6"	-
4"	5/16"	8"	2"
4"	5/16"	10"	2 1/2"
6"	5/16"	12"	3"

STEEL ELBOW SUPPORT

NTS

40 05 07-02B





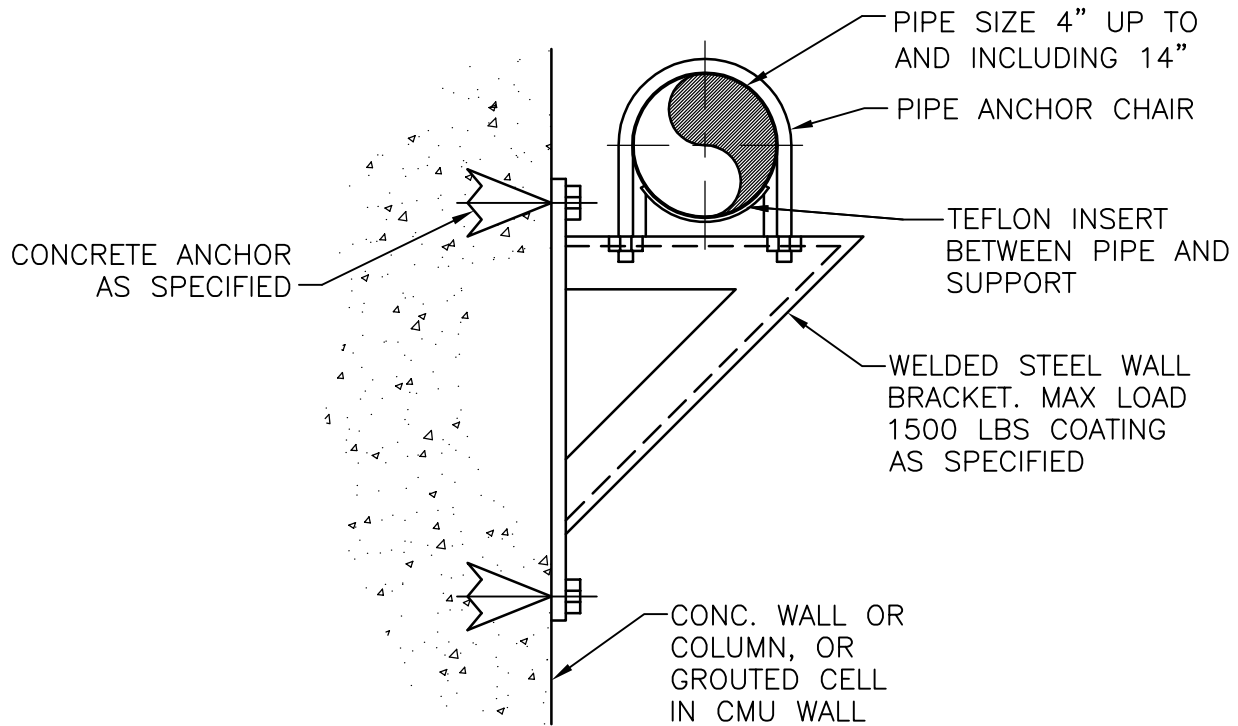
NOTE:

1. MATERIAL FOR ALL COMPONENTS SHALL BE STAINLESS STEEL

SUBMERGED ALP PIPING SUPPORT

NTS

40 05 07-03

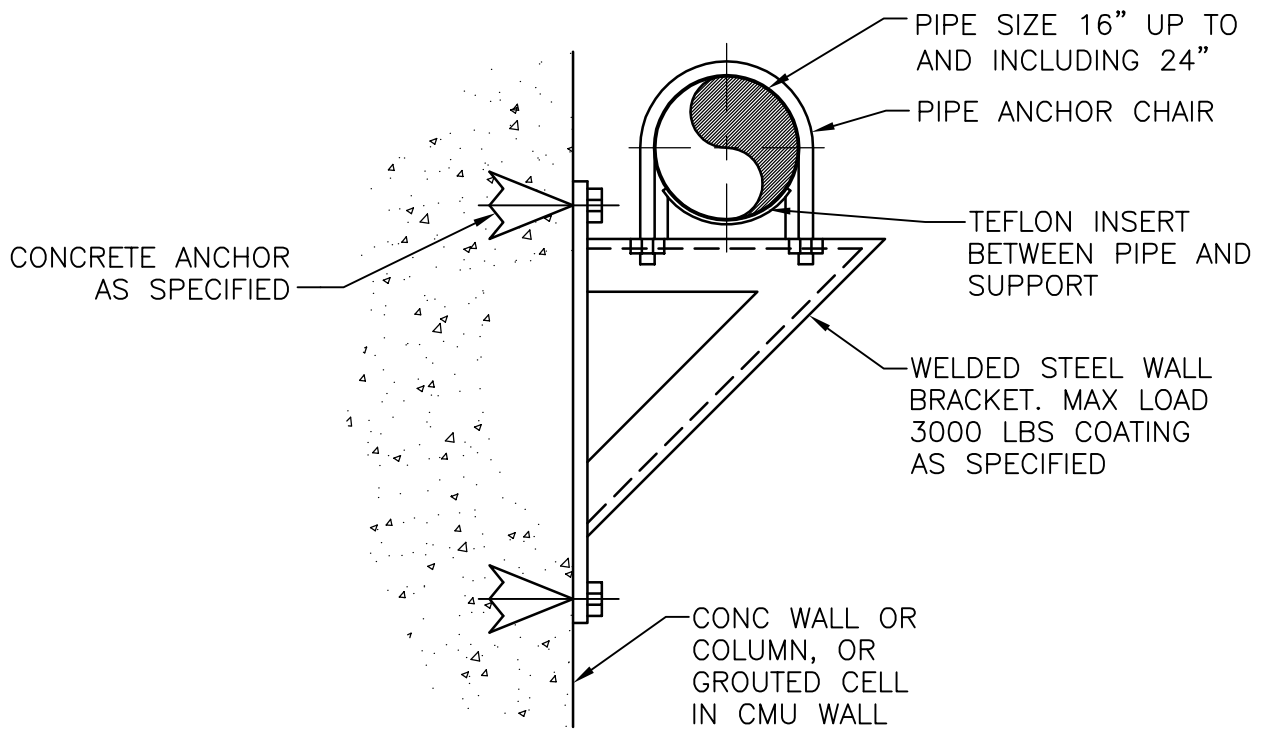


MEDIUM PIPE SUPPORT

NTS

40 05 07-05



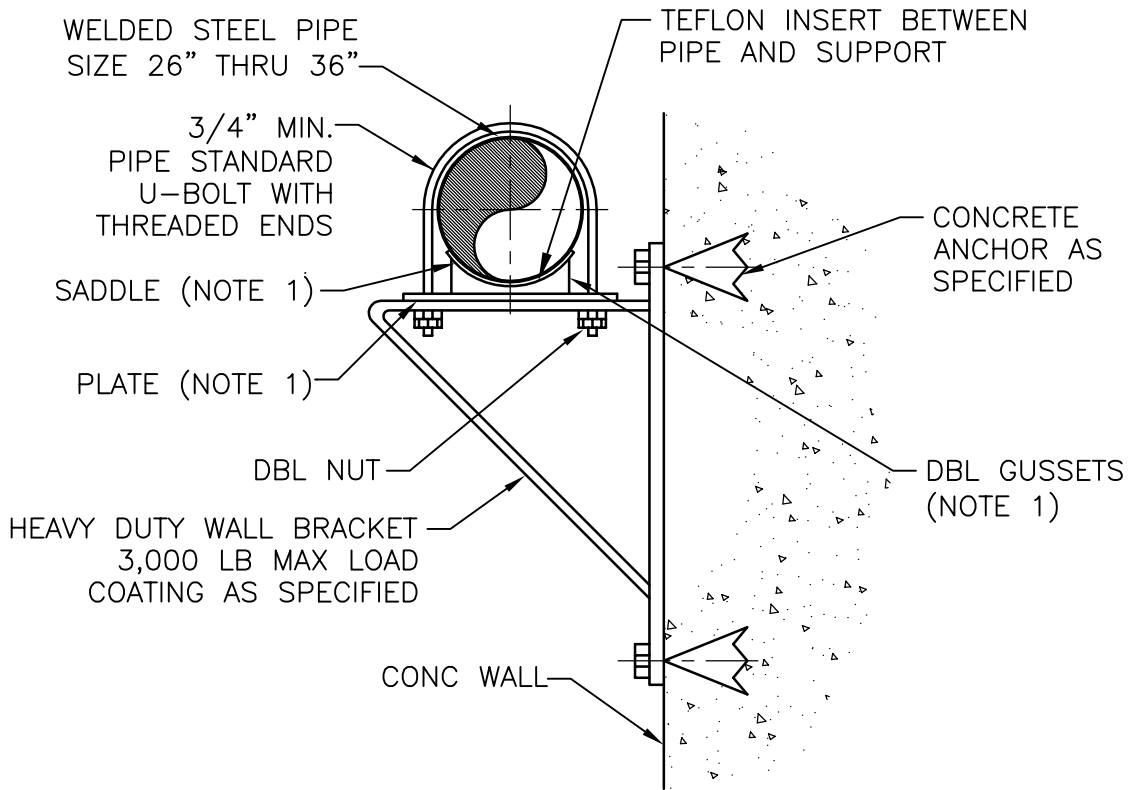


HEAVY PIPE SUPPORT

NTS

40 05 07-06





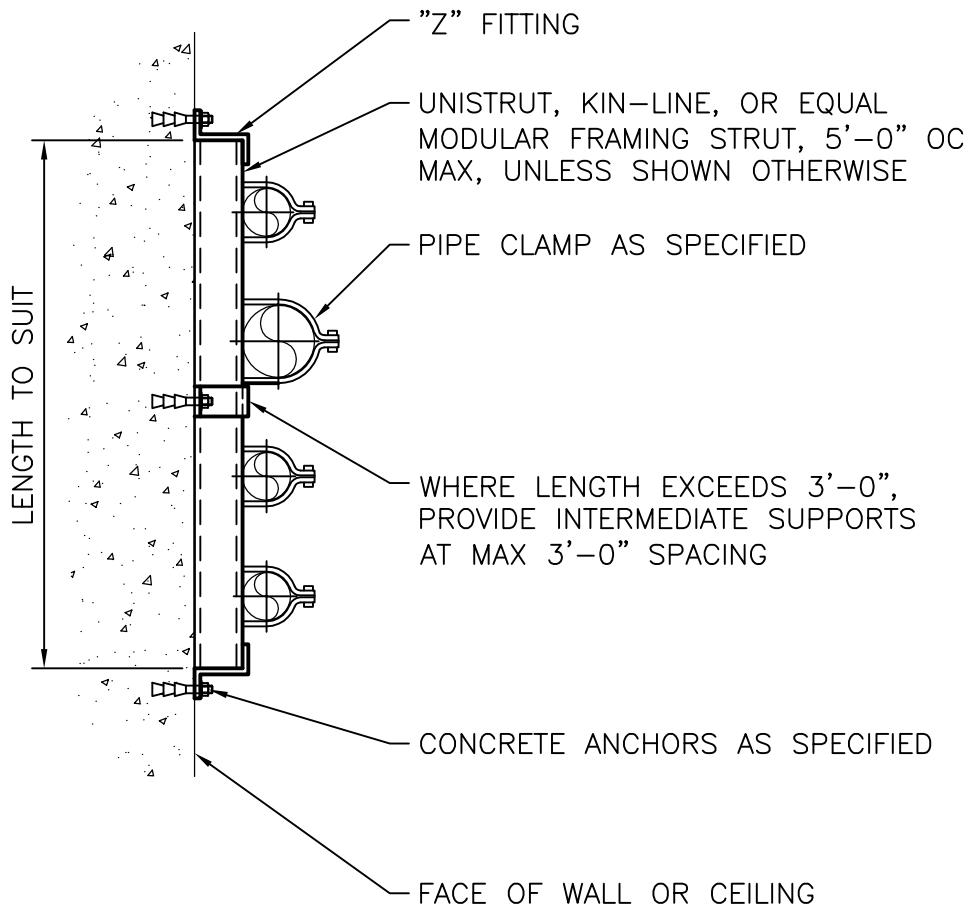
NOTE:

1. FABRICATE FROM STL, 3/8" MIN THICKNESS.

HEAVY DUTY PIPE SUPPORT

NTS

40 05 07-07



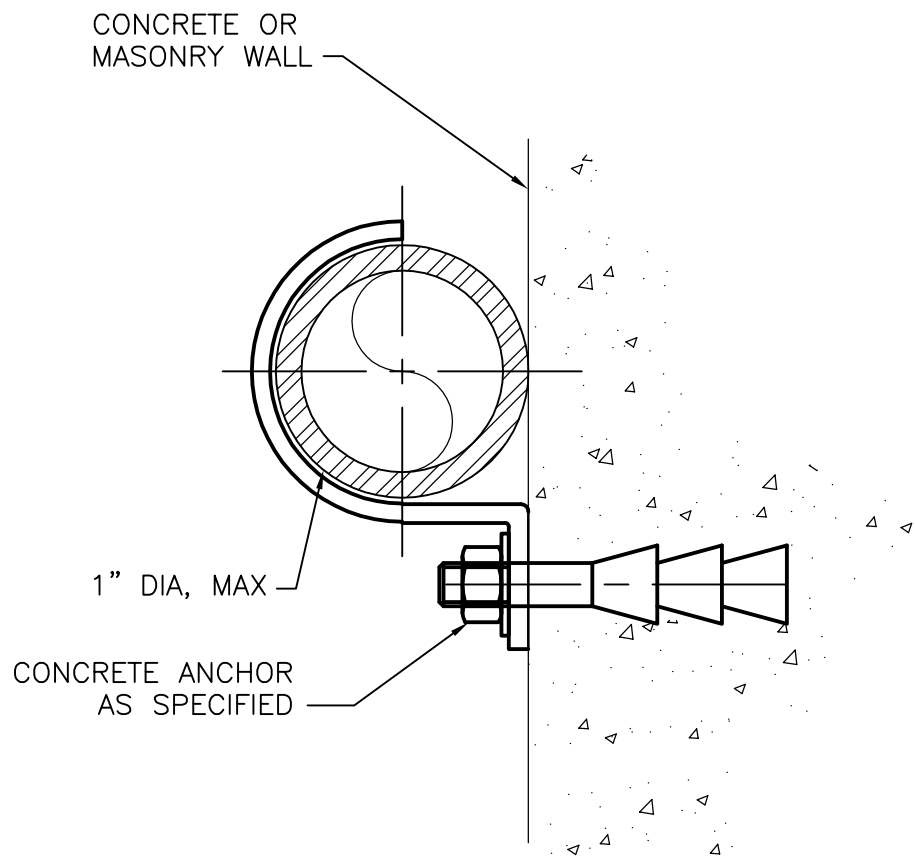
NOTES:

1. UP TO 8" DIAMETER PIPES ONLY.
2. MAXIMUM OF 3-6" PIPES.

SURFACE MOUNT MODULAR STRUT

NTS

40 05 07-08

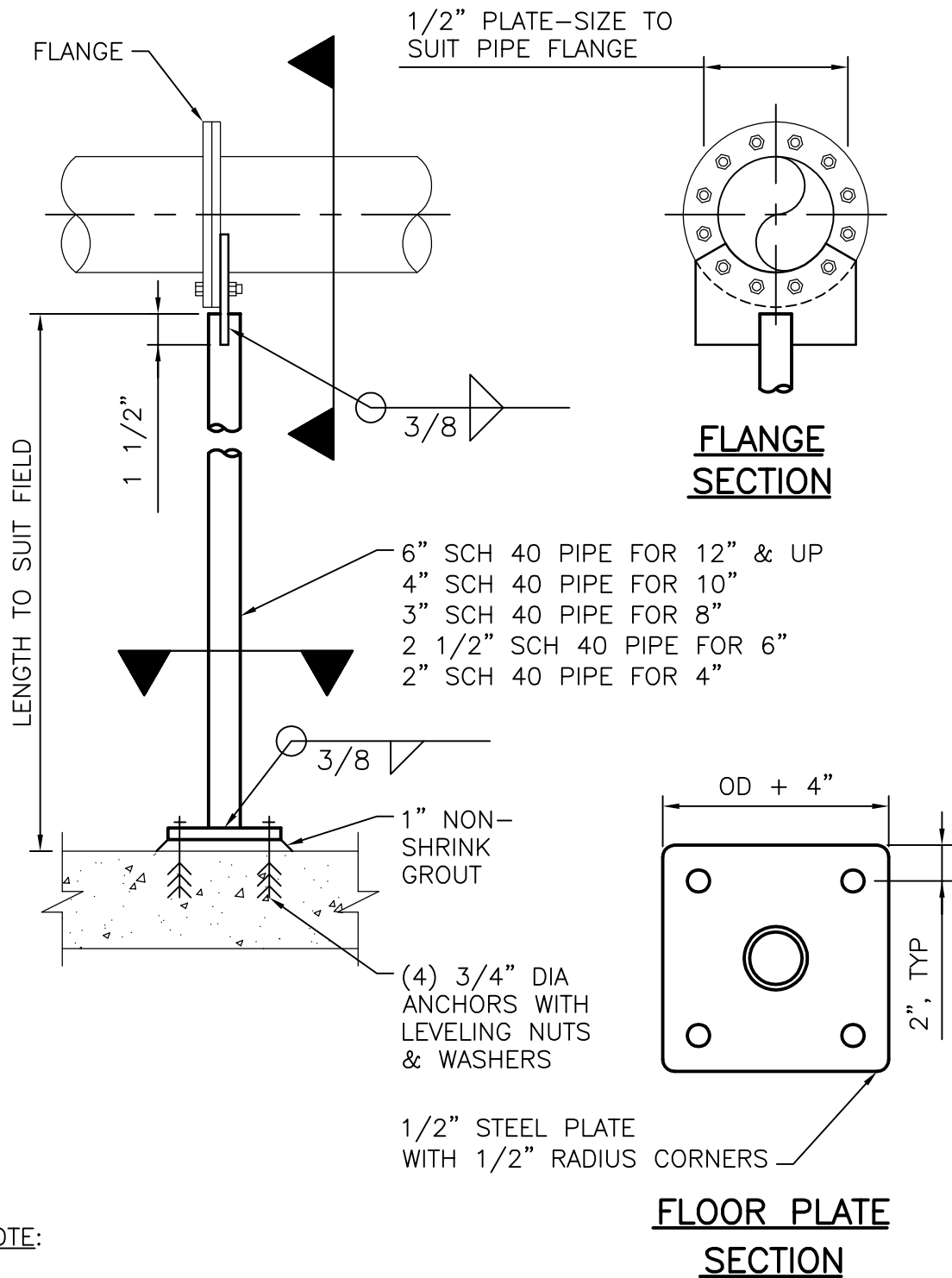


ONE HOLE CLAMP

NTS

40 05 07-10





NOTE:

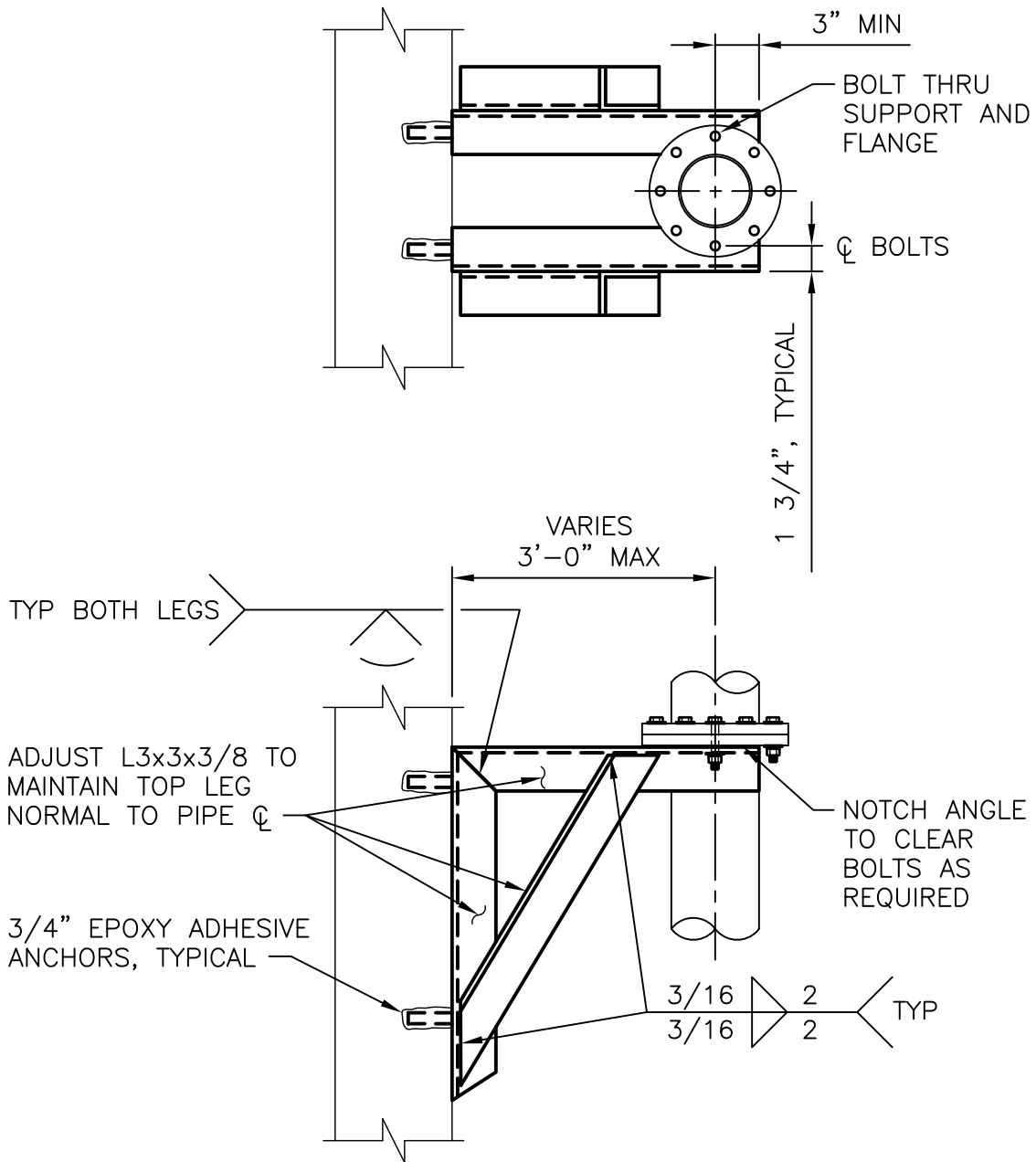
1. NOT INTENDED FOR THRUST RESTRAINT.

FLANGED PIPE SUPPORT

NTS

40 05 07-11

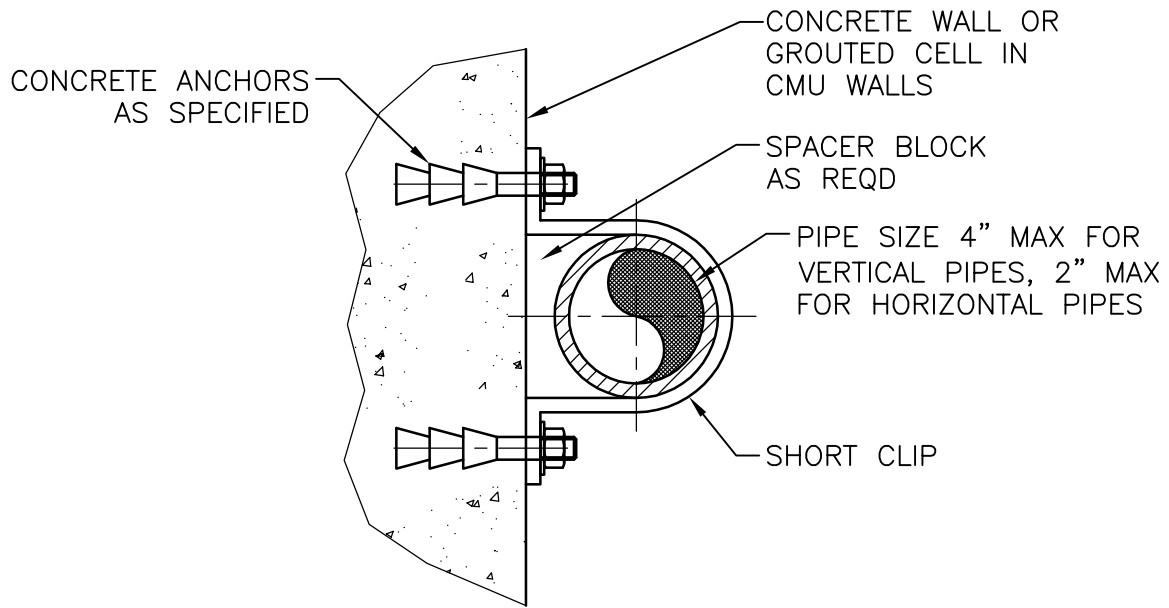




RISER PIPE SUPPORT

NTS

40 05 07-12



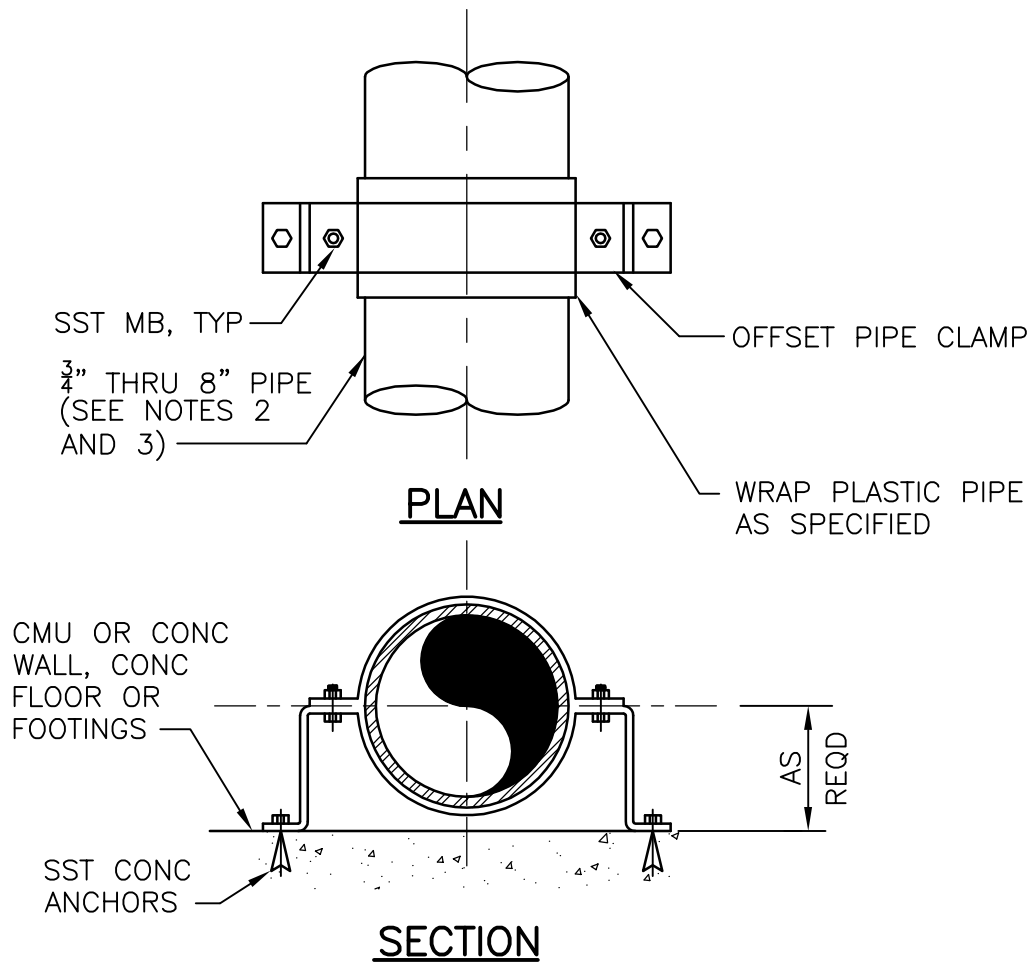
NOTE:

USE SST HARDWARE UNLESS OTHERWISE SPECIFIED.

PIPE SUPPORT DETAIL

NTS

40 05 07-13



NOTES:

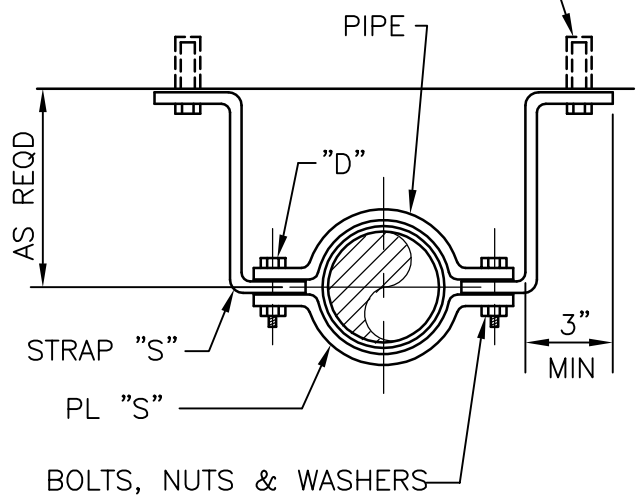
1. USE SST MATERIALS UNLESS OTHERWISE SPECIFIED.
2. NOT SUITABLE FOR PIPING OVER 3" DIAMETER THAT IS HORIZONTALLY MOUNTED ON VERTICAL WALLS OR CEILINGS.
3. FOR PIPES LARGER THAN 3" DIAMETER, USE ONLY FOR HORIZ PIPING MOUNTED TO FLOORS.

PIPE SUPPORT DETAIL

NTS

40 05 07-14

"D" SST ADHESIVE ANCHOR, TYP 2



PIPE SIZE	"D"	"S"
≤ 2-1/2"	3/8"	1/4"x1"
3"-4"	5/8"	1/4"x1-1/2"
6"-8"	3/4"	3/8"x2"
10"-14"	7/8"	5/8"x2"

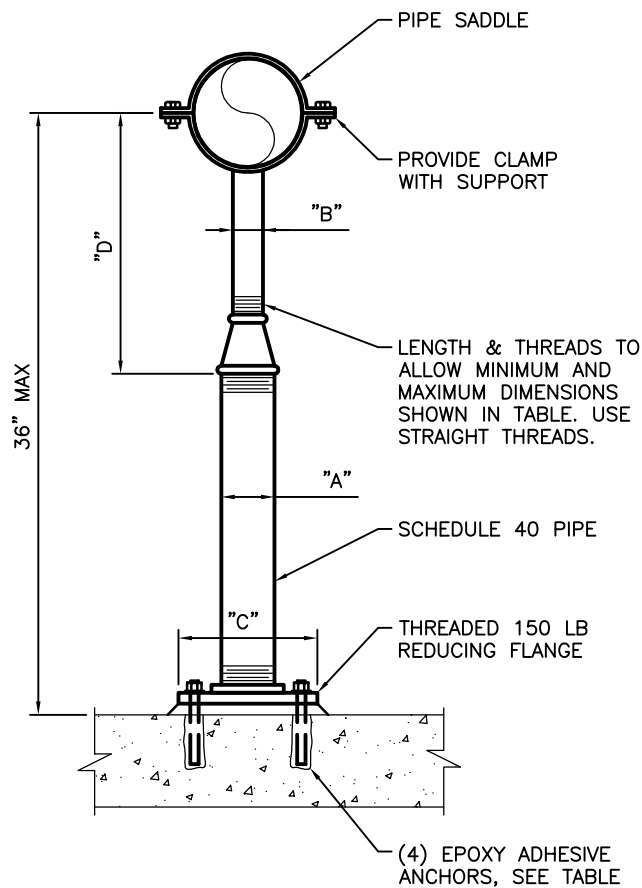
NOTES:
 1. HARDWARE AND MATERIALS AS SPECIFIED.

OFFSET PIPE SUPPORT

NTS

40 05 07-15





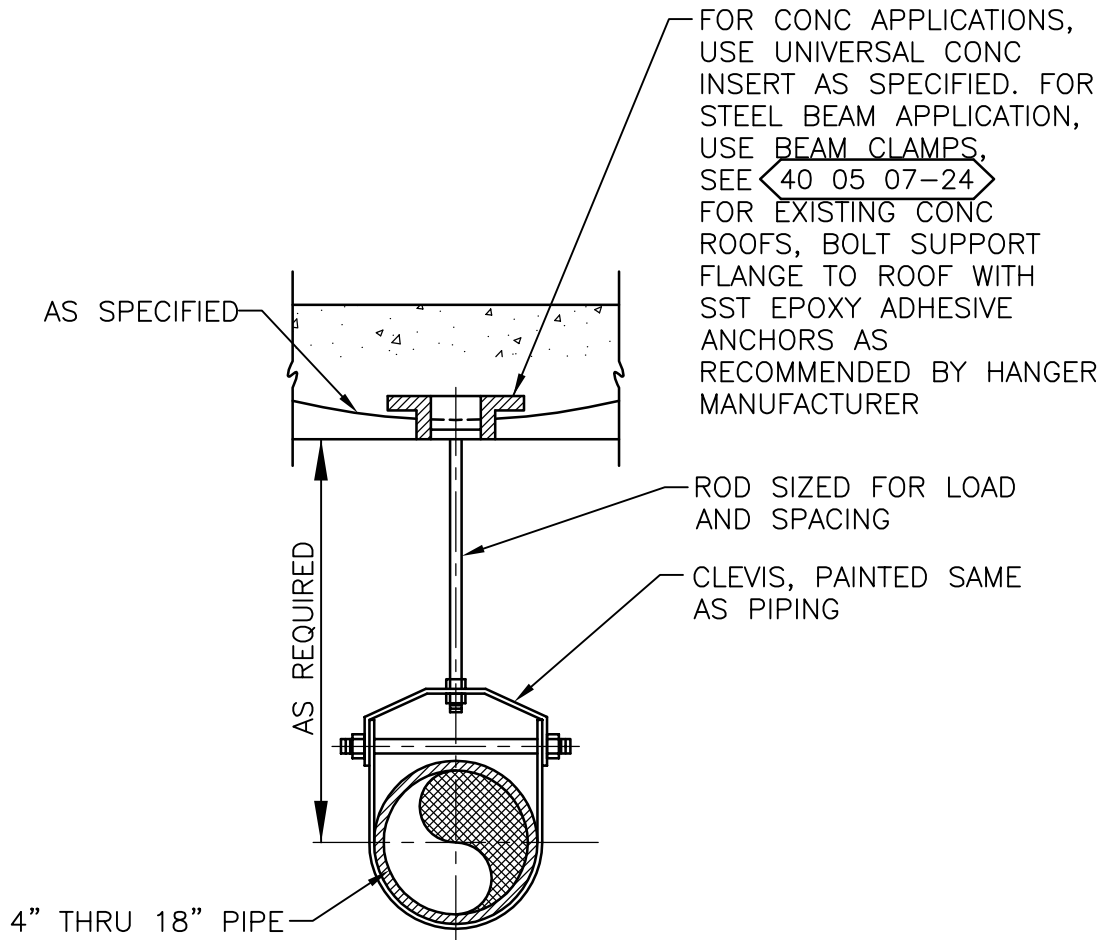
FLOOR PIPE SUPPORT SCHEDULE DIMENSIONS IN INCHES							
PIPE SIZE	"A"	"B"	"C"	"D"		ANCHORS	
				MINIMUM	MAXIMUM	DIA	EMBED
≤ 2 1/2	2 1/2	1 1/2	9	8	13	5/8	5
3	2 1/2	1 1/2	9	8 1/2	13 1/2	5/8	5
3 1/2	2 1/2	1 1/2	9	8 1/2	13 1/2	5/8	5
4	3	2 1/2	9	9 1/2	14	5/8	5
6	3	2 1/2	9	10 1/2	15 1/2	5/8	5
8	3	2 1/2	9	11 1/2	16 1/2	5/8	5
10	3	2 1/2	9	13 1/2	18 1/2	5/8	5
12	3	2 1/2	9	15	19 1/2	5/8	5
14	4	3	11	16 1/2	20 1/2	3/4	6 5/8
16	4	3	11	17 1/2	22 1/2	3/4	6 5/8
18	6	3 1/2	13 1/2	19 1/2	24	3/4	6 5/8
20	6	3 1/2	13 1/2	21	25 1/2	3/4	6 5/8
24	6	4	13 1/2	23 1/2	28 1/2	3/4	6 5/8
30	6	4	13 1/2	27	31 1/2	3/4	6 5/8
32	6	4	13 1/2	28 1/2	32 1/2	3/4	6 5/8
36	6	4	13 1/2	30 1/2	34 1/2	3/4	6 5/8

FLOOR PIPE SUPPORT

NTS

40 05 07-18





NOTE:

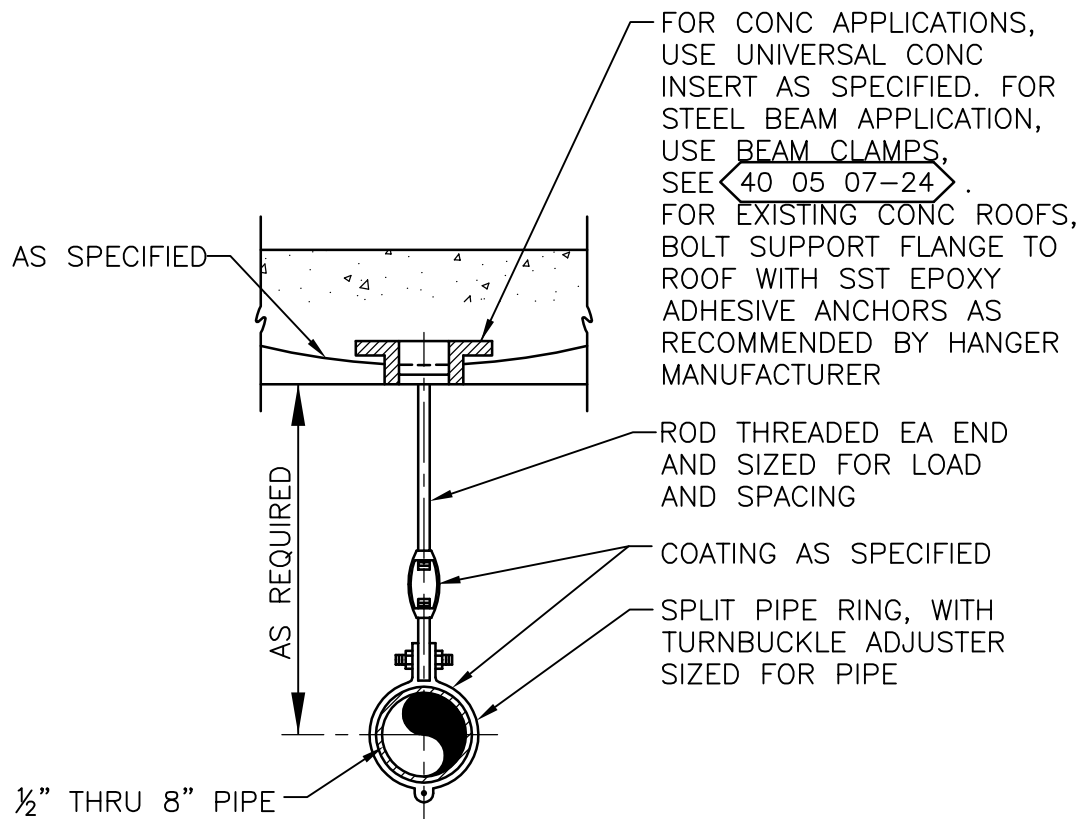
1. FOR INSULATED PIPES, SEE SPECIFICATIONS FOR INSULATION PROTECTION SHIELD AS SPECIFIED.
2. TOTAL LOADING ON EACH CONC. INSERT OR OTHER TYPE HANGER ROD ANCHOR SHALL NOT EXCEED MFR'S RECOMMENDED LOADINGS.

PIPE HANGER DETAIL

NTS

40 05 07-20





NOTES:

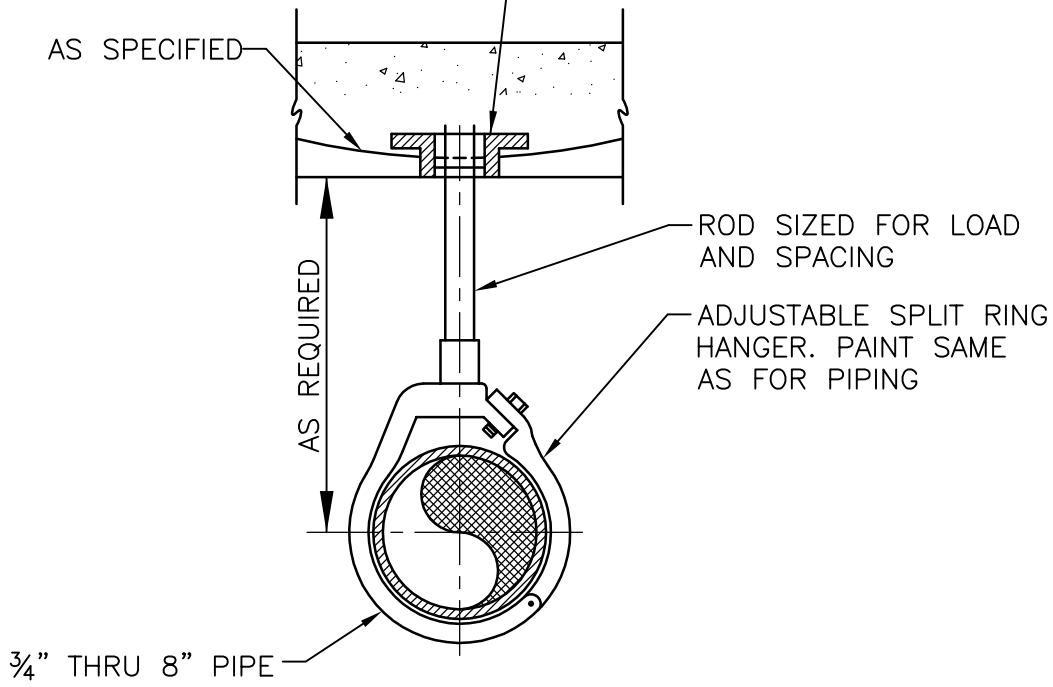
1. TOTAL LOADING ON EACH CONC. INSERT OR OTHER TYPE HANGER ROD ANCHOR SHALL NOT EXCEED MFR.'S RECOMMENDED LOADINGS.
2. COMPONENTS SHALL BE AS AS SPECIFIED.

PIPE HANGER DETAIL

NTS

40 05 07-21

FOR CONC APPLICATIONS, USE UNIVERSAL CONC INSERT AS SPECIFIED. FOR STEEL BEAM APPLICATION, USE BEAM CLAMPS, SEE 40 05 07-24
 FOR EXISTING CONC ROOFS, BOLT SUPPORT FLANGE TO ROOF WITH SST EPOXY ADHESIVE ANCHORS AS RECOMMENDED BY HANGER MANUFACTURER



NOTE:
 TOTAL LOADING ON EACH CONC INSERT OR OTHER TYPE HANGER ROD ANCHOR SHALL NOT EXCEED MFR'S RECOMMENDED LOADINGS.

PIPE HANGER DETAIL

NTS

40 05 07-22



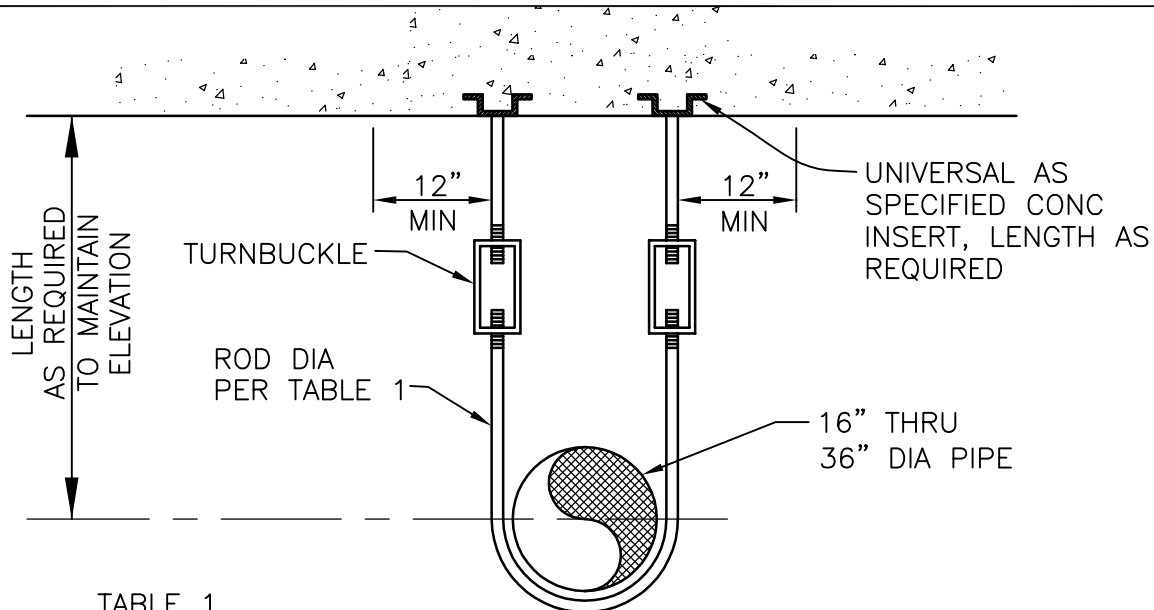
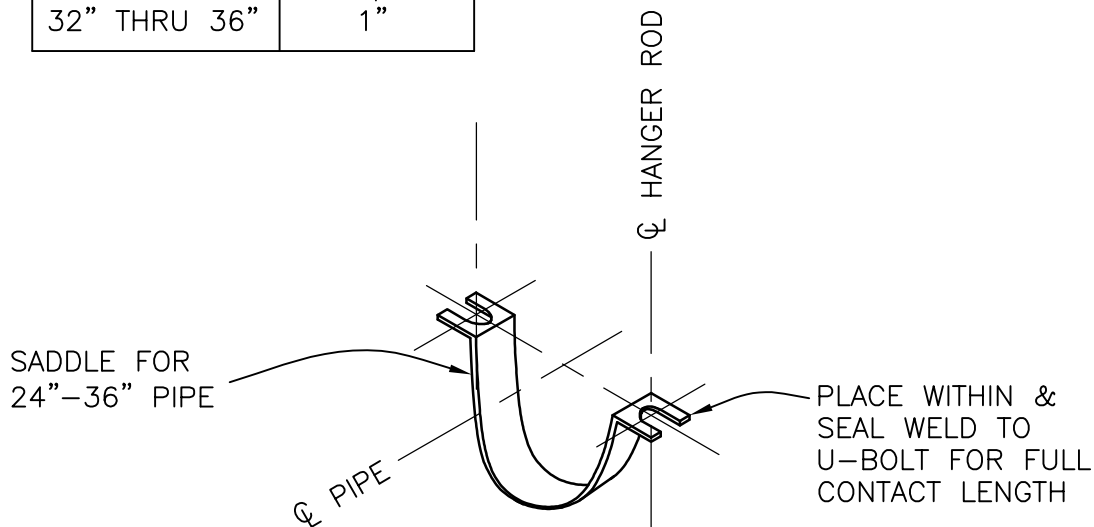


TABLE 1

PIPE DIA	ROD DIA
16" AND 18"	1/2"
20" THRU 24"	5/8"
26" THRU 30"	3/4"
32" THRU 36"	1"



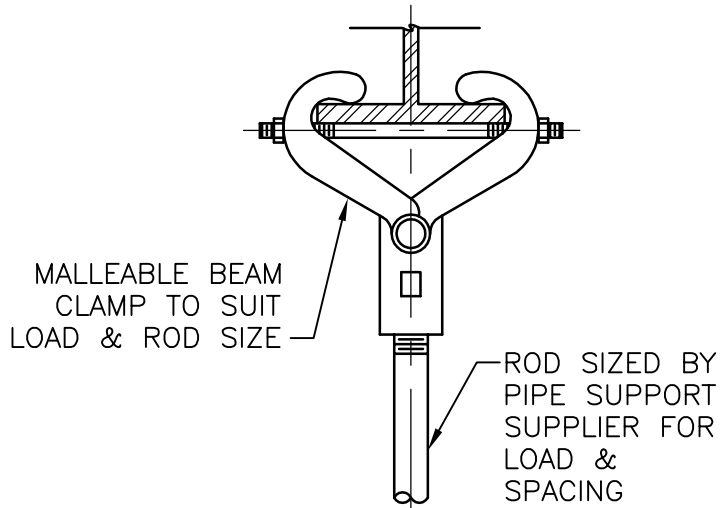
NOTES:

1. HANGERS FOR PIPES 24" & LARGER SHALL BE EQUIPPED WITH 1/4"x4" STEEL PLATE SADDLE (SEE DETAIL).
2. HOT DIP GALV AFTER FABRICATION.
3. SPACE HANGERS 12'-0" OC MAXIMUM.

PIPE HANGER DETAIL

NTS

40 05 07-23

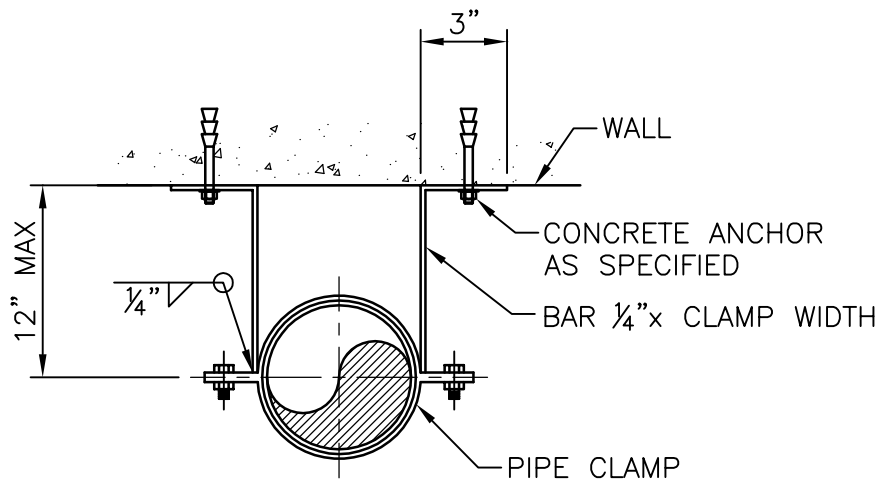


NOTE:
TOTAL LOADING OF EACH BEAM CLAMP SHALL NOT EXCEED MFR RECOMMENDED LOADINGS.

BEAM CLAMP
NTS

40 05 07-24





NOTE:

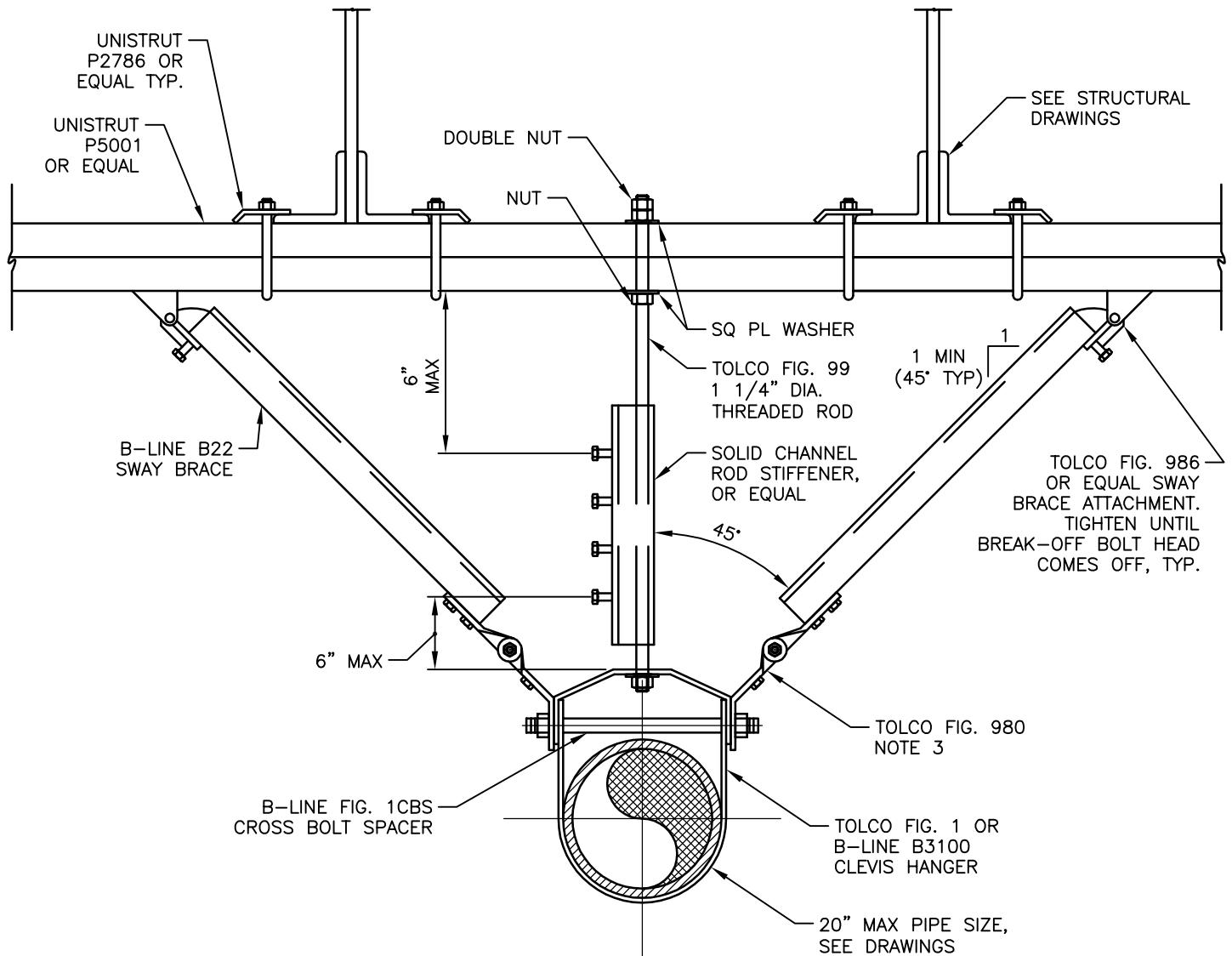
1. COATING OF SWAY BRACE AS SPECIFIED.

PIPE SWAY BRACE

NTS

40 05 07-26





NOTE:

1. REFER TO AREA CLASSIFICATION TABLE LOCATED ON DRAWINGS FOR MATERIAL REQUIREMENTS. DEFAULT MATERIAL SHALL BE STAINLESS STEEL UNLESS SHOWN OTHERWISE.
2. FOR CONNECTION DIRECTLY TO JOIST, USE B-LINE FIG. B3055.
3. SWAY BRACE ASSEMBLY, TIGHTEN UNTIL BREAK-OFF.

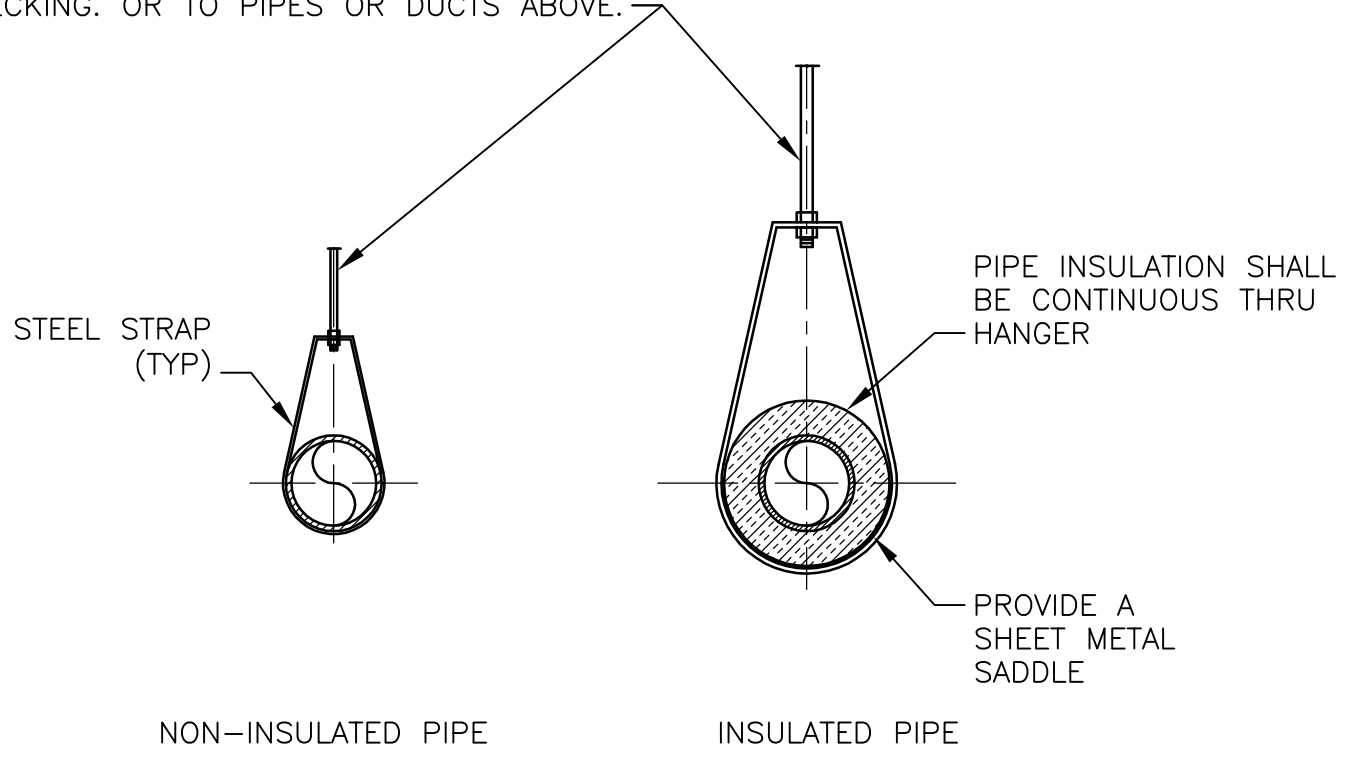
OVERHEAD PIPE HANGER SWAY BRACE ASSEMBLY

NOT TO SCALE

40 05 07-37



TREADED STEEL ROD BOLTED TO TOP AND BOTTOM OF STEEL STRAP. ATTACH HANGER RODS TO PRIMARY STRUCTURAL ELEMENTS ONLY, OR PROVIDE SUPPLEMENTAL FRAMING AS REQUIRED. PROVIDE CLAMPS, ECT. AS REQUIRED FOR ATTACHMENT. HANGERS SHALL NOT BE ATTACHED TO STEEL ROOF/FLOOR DECKING. OR TO PIPES OR DUCTS ABOVE.

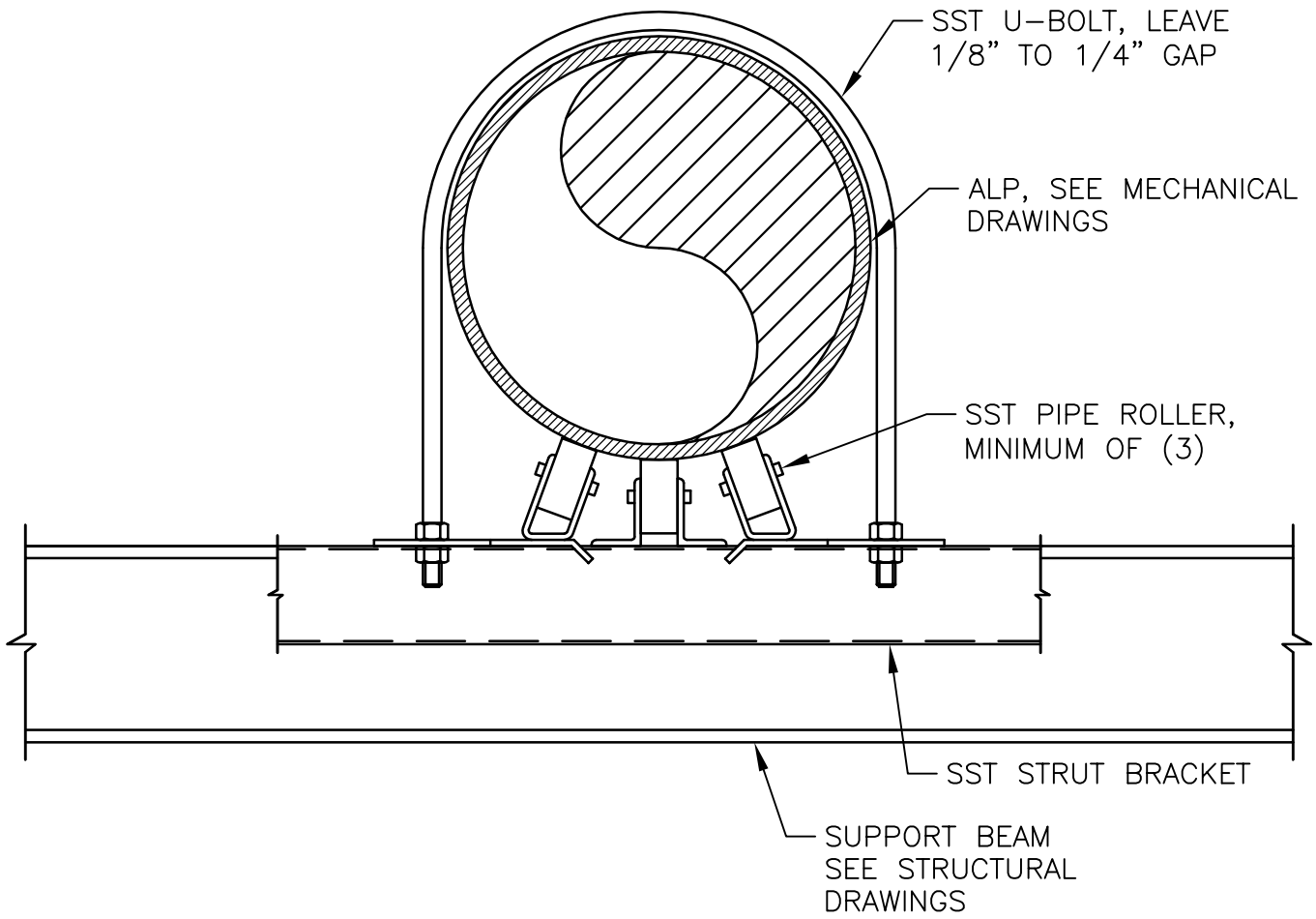


PIPE HANGER DETAIL

NTS

40 05 07-39

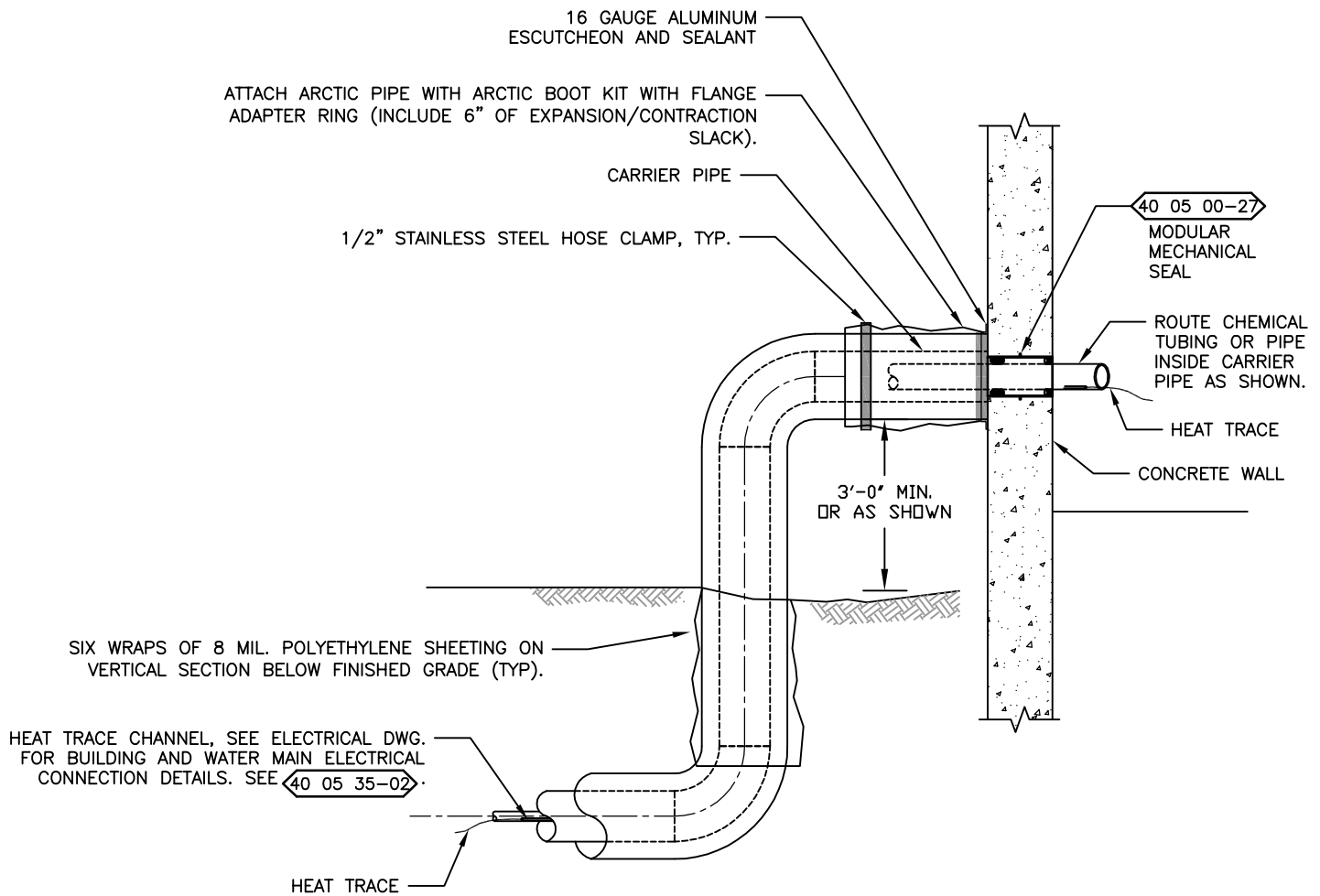




PIPE SUPPORT BEAM
MOUNTED ALP

NTS

40 05 07-40



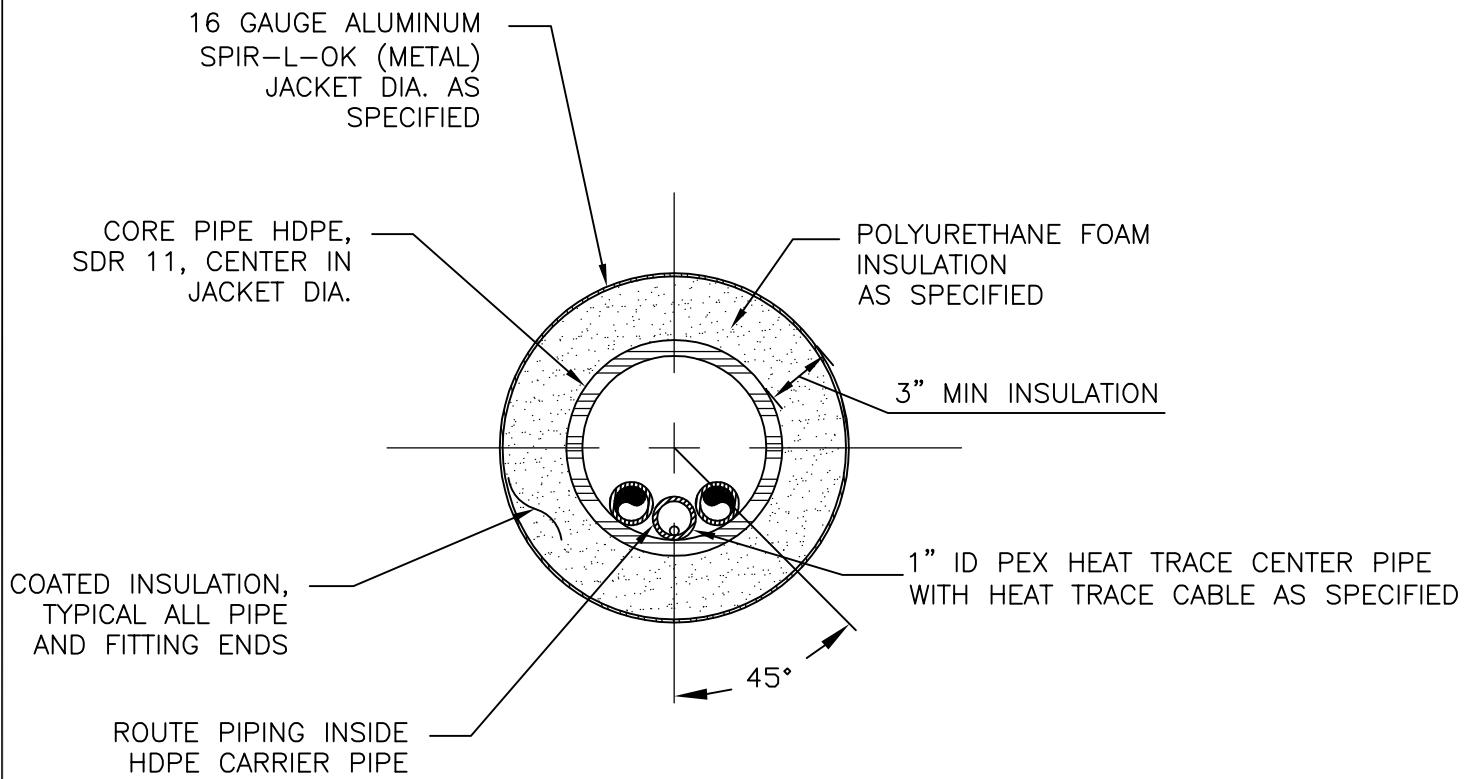
NOTE:
1. SEAL WALL PENETRATIONS WATER TIGHT IN ACCORDANCE WITH METAL BUILDING MANUFACTURE REQUIREMENTS.

ARCTIC PIPE TYPICAL CONCRETE WALL PENETRATION

NOT TO SCALE

40 05 35-01



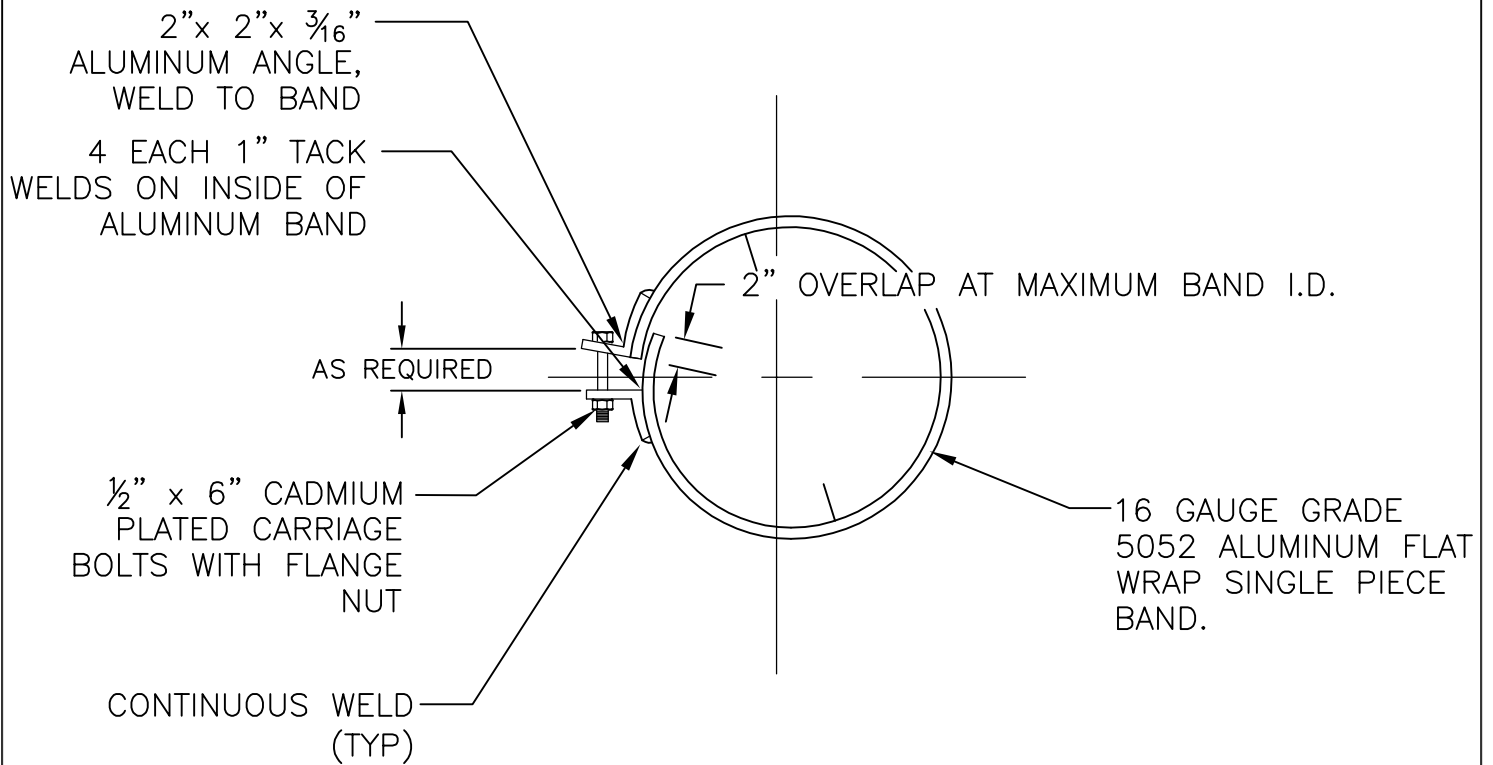
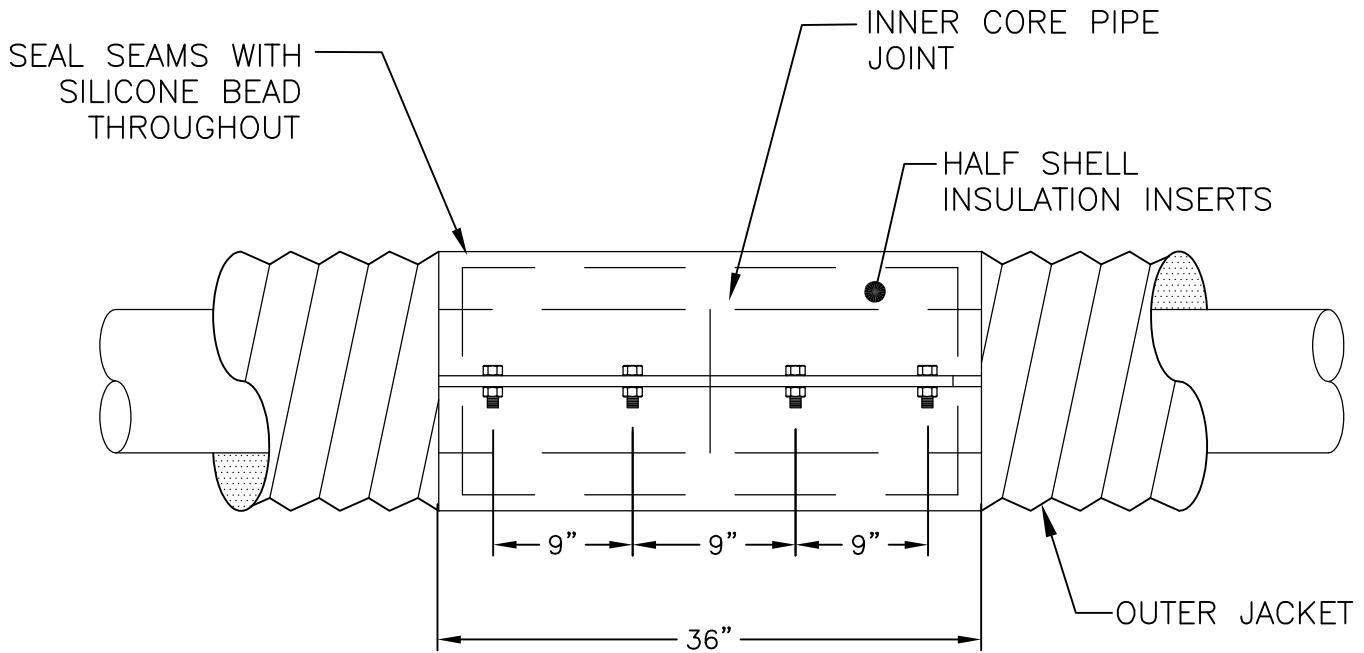


ARCTIC PIPE SECTION

NOT TO SCALE

40 05 35-02



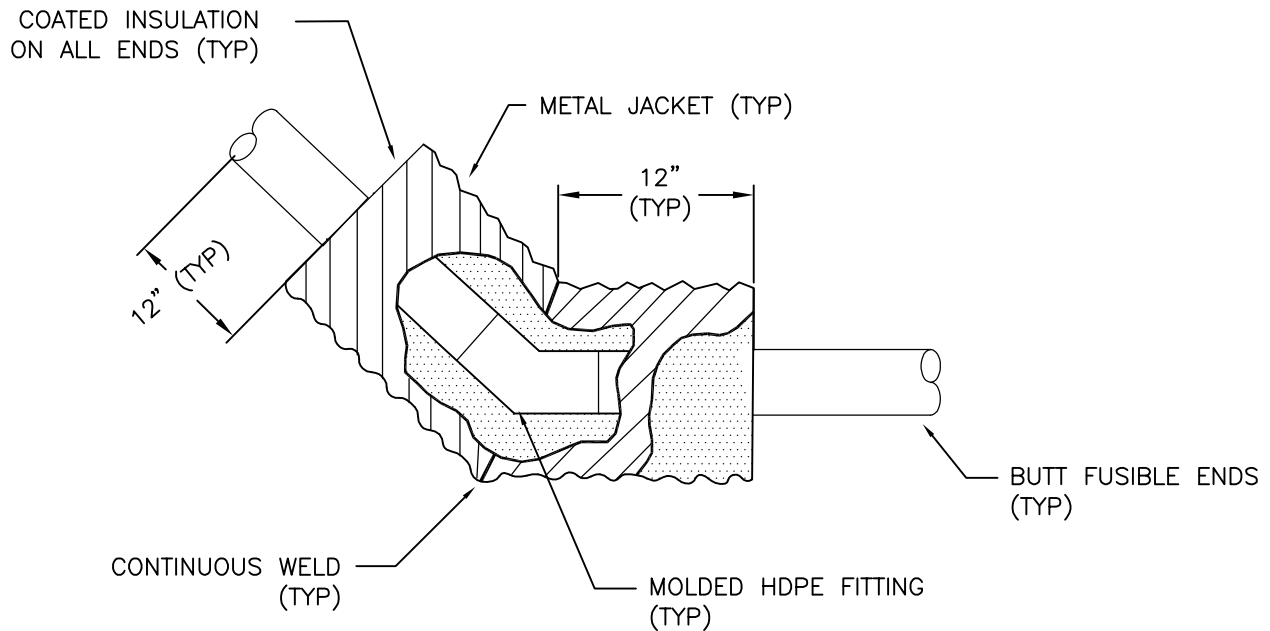
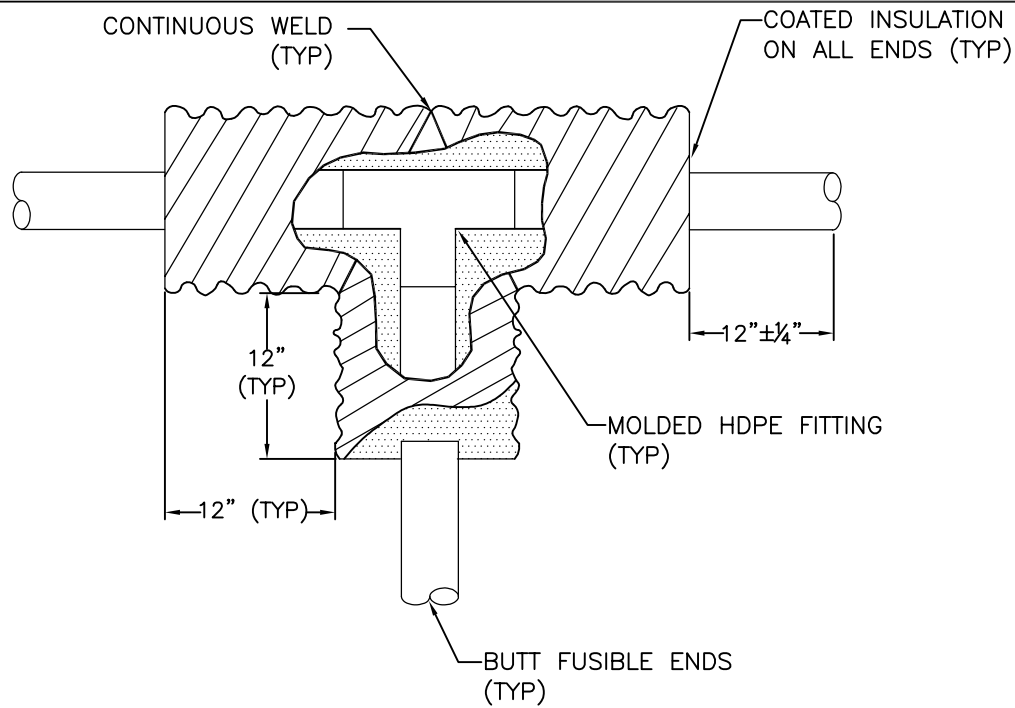


ARCTIC PIPE COUPLING BAND DETAIL

NOT TO SCALE

40 05 35-03





NOTES:

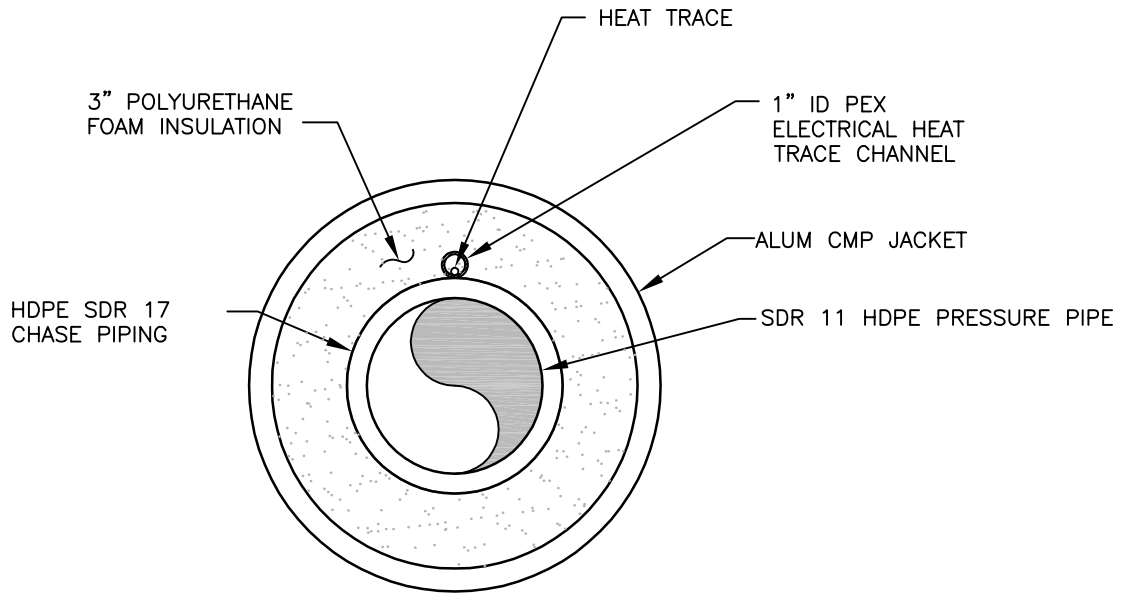
1. ALL BENDS SHALL BE LONG RADIUS SWEEP CORE PIPE FITTINGS.

ARCTIC PIPE – TYPICAL HDPE ARCTIC PIPE BENDS AND TEES

NOT TO SCALE

40 05 35-05



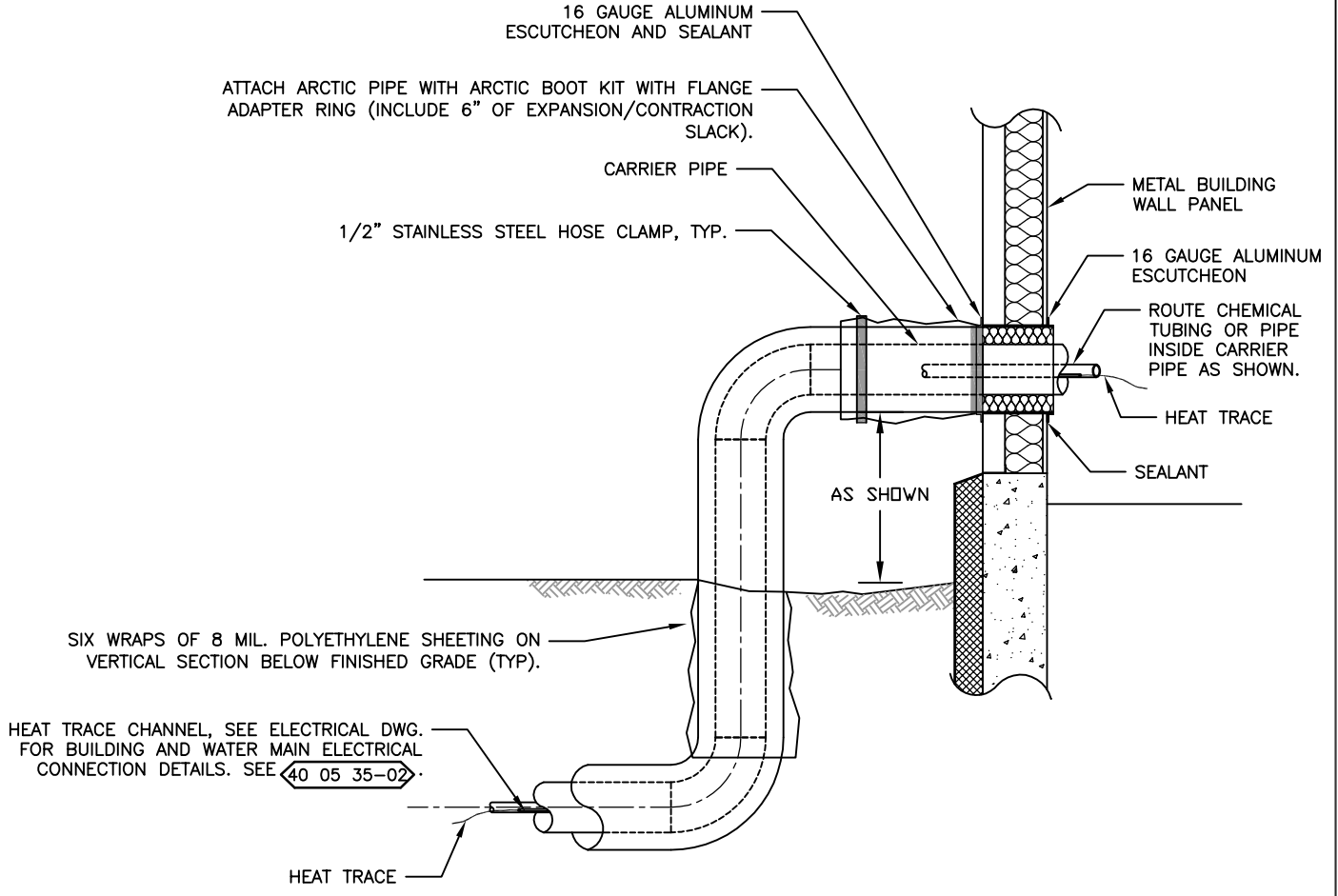


ARCTIC CHASE

NOT TO SCALE

40 05 35-07





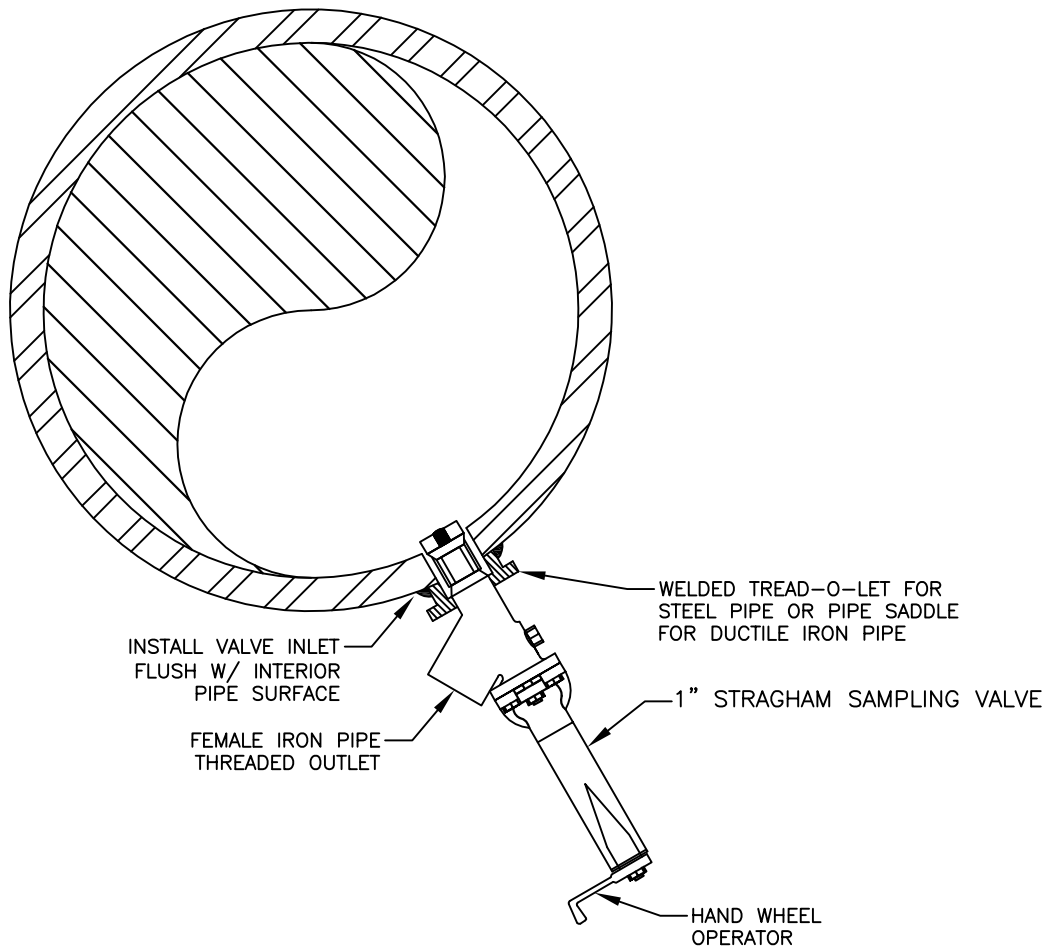
NOTE:
 1. SEAL WALL PENETRATIONS WATER TIGHT IN ACCORDANCE WITH METAL BUILDING MANUFACTURE REQUIREMENTS.

ARCTIC PIPE TYPICAL WALL PENETRATION

NOT TO SCALE

40 05 35-08





NOTES:

1. APPLY ANTI-GALLING COMPOUND TO SST PIPE THREADS.
2. LOCATE VALVE FOR CONVENIENT OPERATION WITH OWNER'S REPRESENTATIVE APPROVAL ONLY.

SAMPLE VALVE

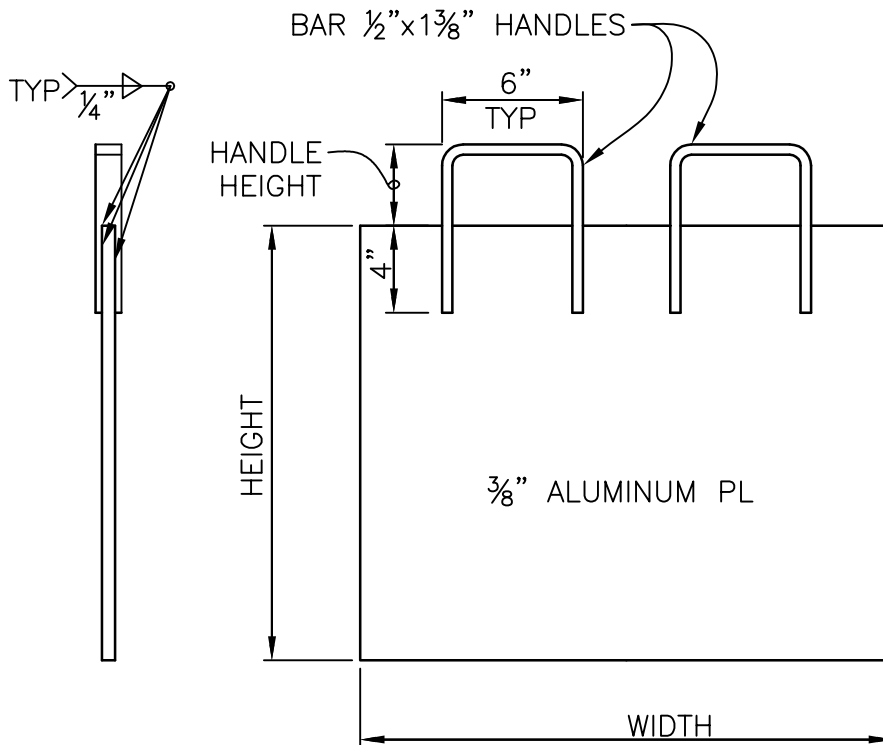
NTS

40 05 51-07



NOTE:

1. LOCATE HANDLES @ THIRD POINTS
2. ON GATES LESS THAN 3'-0" WIDE, LOCATE ONLY ONE HANDLE @ CENTER OF GATE.



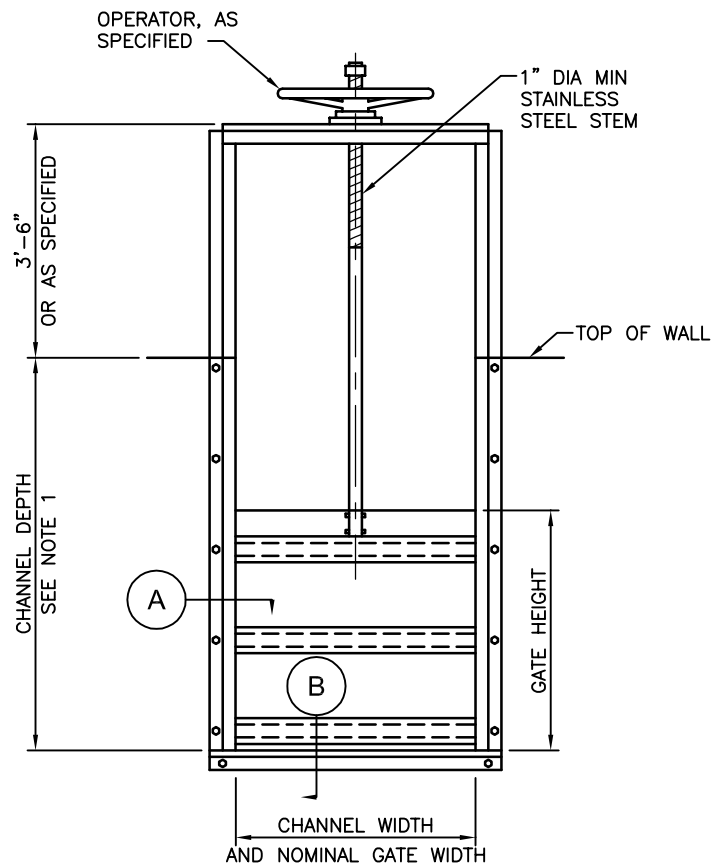
GATE AND GATE GUIDE NOTES

1. ALL GATES TO BE AS SPECIFIED.
2. ALL GUIDES, ANCHORS AND GATE RESTS TO BE TYPE 316 STAINLESS STEEL AS SPECIFIED.
3. GUIDES TO BE ASSEMBLED AS A COMPLETE UNIT. AFTER FABRICATION AND PRIOR TO SHIPMENT THEY SHALL BE CROSS-BRACED TO ASSURE TRUE ALIGNMENT.
4. GUIDES TO BE CONTINUOUS WELDED TO GATE RESTS.
5. ANCHORS FOR GATE RESTS TO BE SIMILAR TO THOSE FOR GUIDES.
6. GATE GUIDES TO BE FLUSH WITH BOTTOM OF GRATING SUPPORTS WHERE UNDER GRATING.
7. GRATING, WHERE OVER GATES, IS TO BE EXTENDED CONTINUOUSLY OVER GUIDES AND GATES.
8. GRATING SUPPORTS TO BE NOTCHED AS REQUIRED AT GATES.

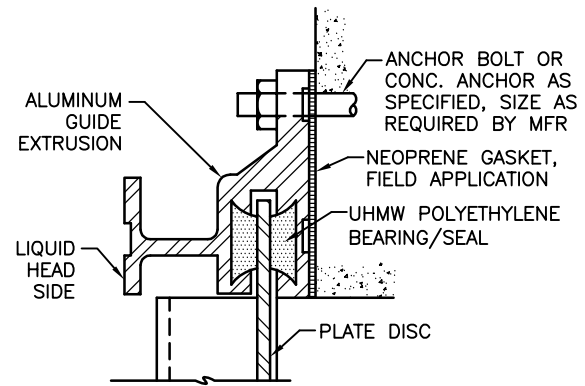
STOP SLIDE GATE

NTS

40 05 58-01

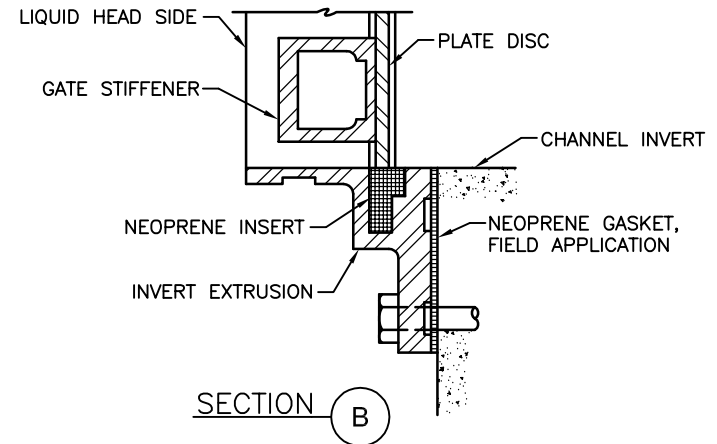


STYLE A



SECTION A

GUIDE DETAIL
NTS



SECTION B

FLUSH INVERT DETAIL
NTS

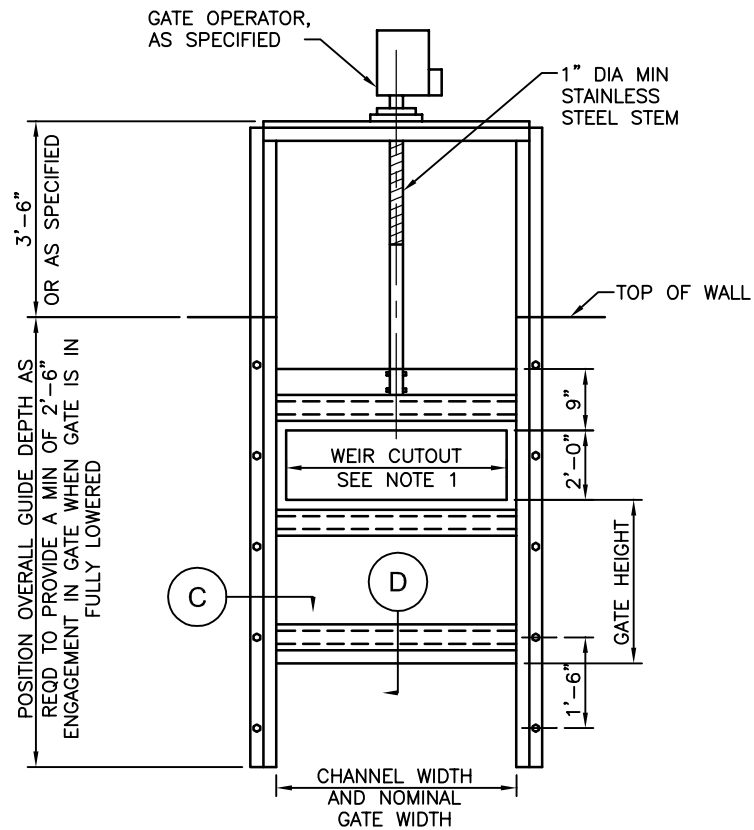
NOTES:
1. OVERALL GUIDE DEPTH REQUIRED TO PROVIDE A MINIMUM OF 2'-6" ENGAGEMENT IN GATE WHEN GATE IS IN FULLY LOWERED POSITION.

FABRICATED SLIDE GATES

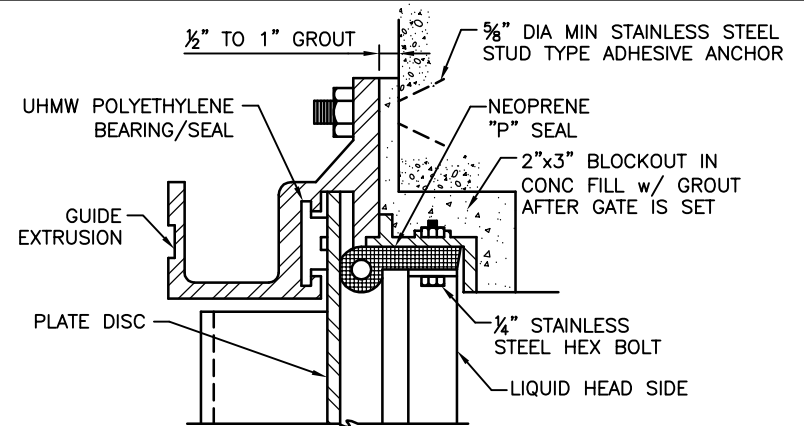
NTS

40 05 58-02



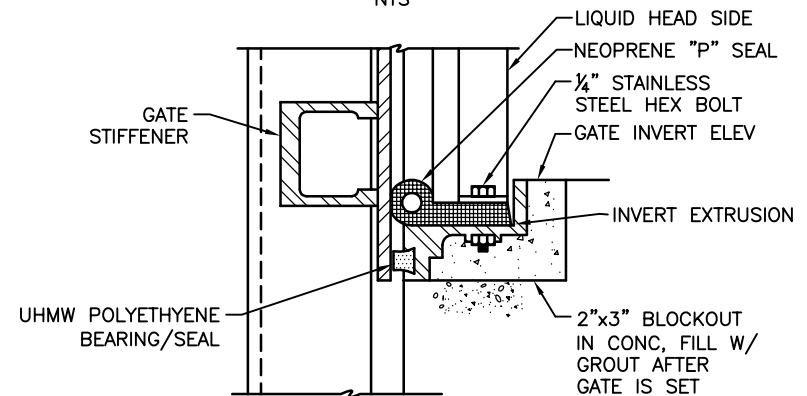


STYLE B



SECTION C

WEIR DETAIL
NTS



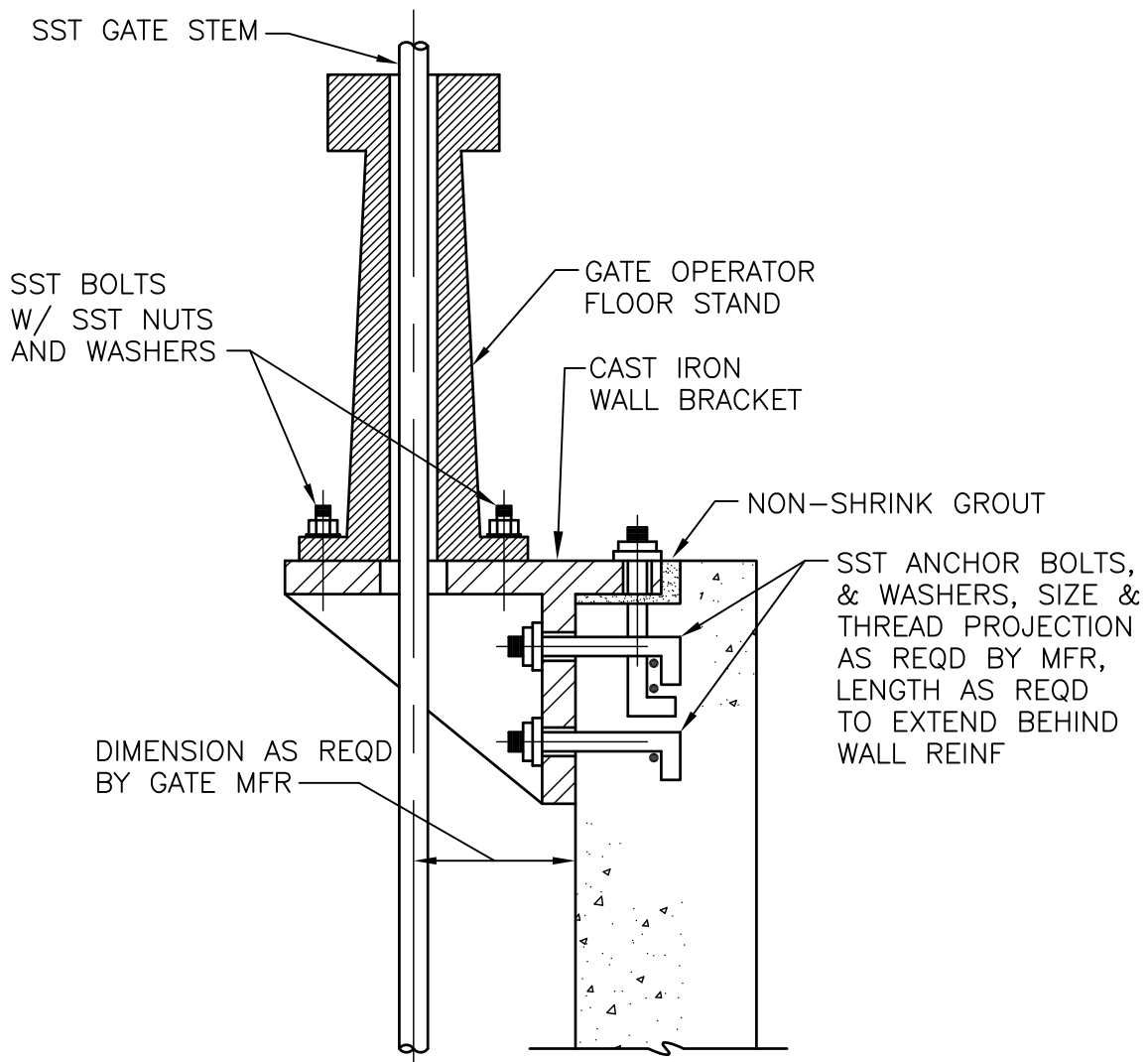
SECTION D

WEIR INVERT DETAIL
NTS

- NOTES:
1. FOR WEIR CUTOUT DIMENSIONS,
SEE SPECIFICATIONS - GATE
SCHEDULE

FABRICATED WEIR GATES

NTS



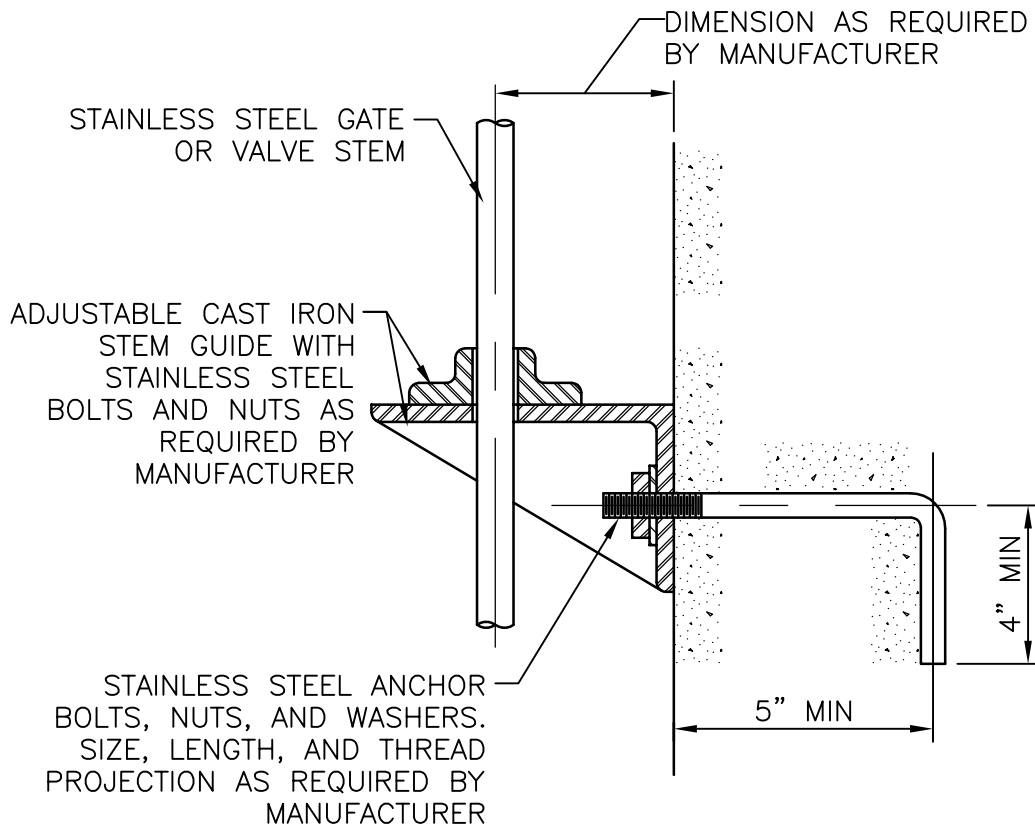
NOTE:
 FLOOR STAND IS REPRESENTATIVE ONLY.

FLOOR STAND INSTALLATION

NTS

40 05 58-07



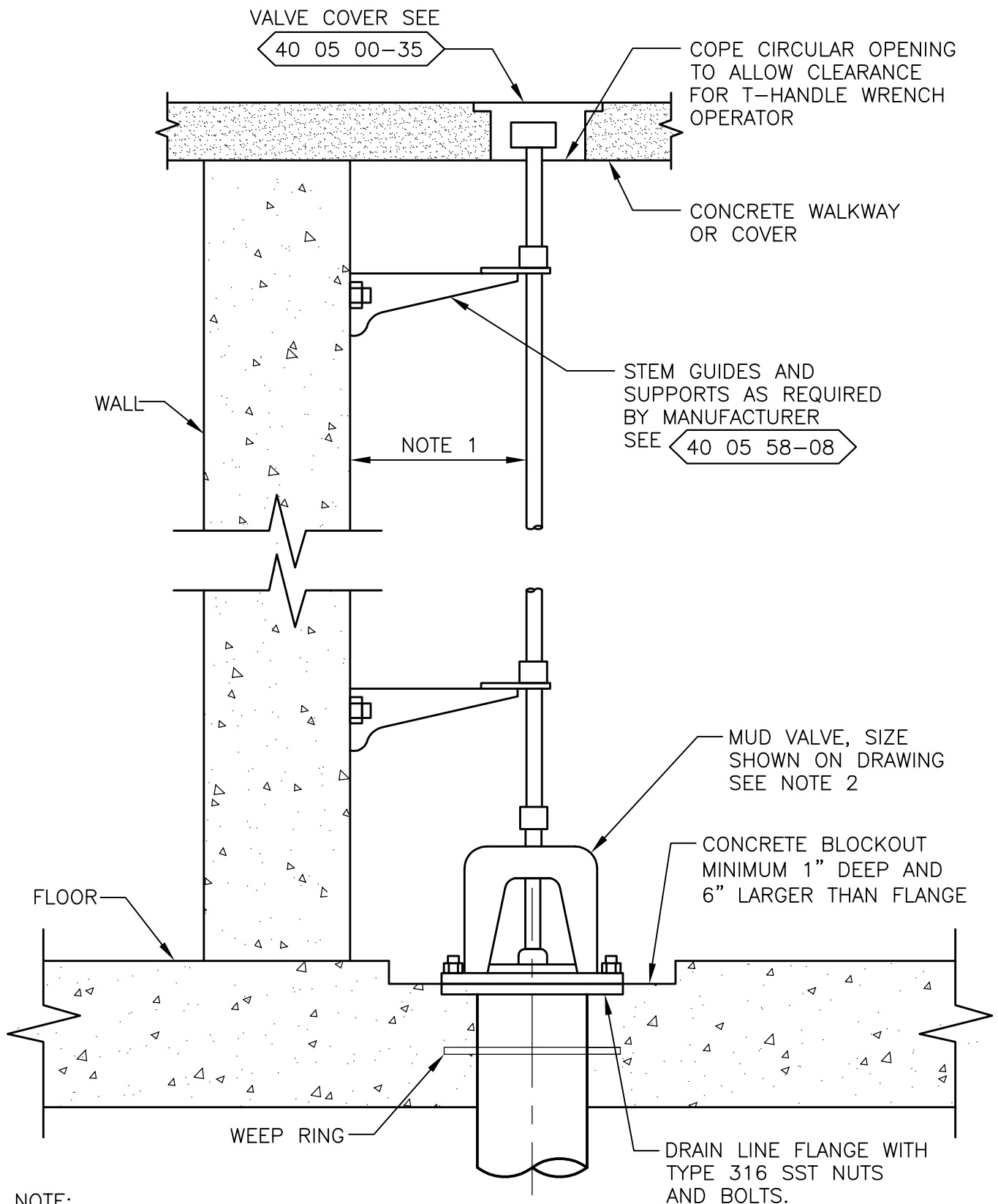


STEM GUIDE INSTALLATION

NTS

40 05 58-08





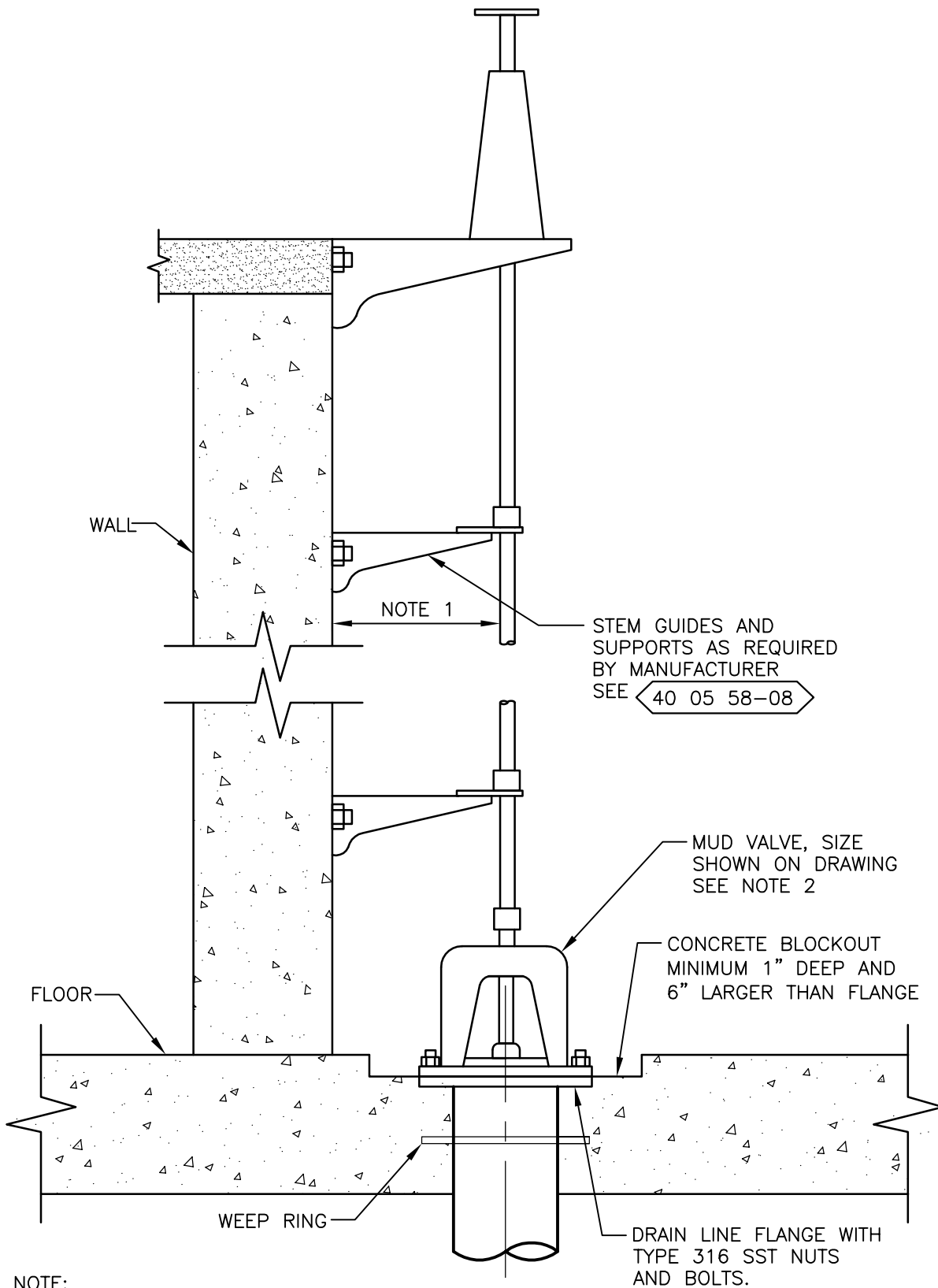
- NOTE:
1. VERIFY AND COORDINATE STEM LOCATION WITH LOCATION OF CIRCULAR OPENING IN WALKWAY.
 2. COORDINATE SCREEN OVER MUD VALVE WITH MBBR SUPPLIER.

MUD VALVE

NOT TO SCALE

40 05 67-01





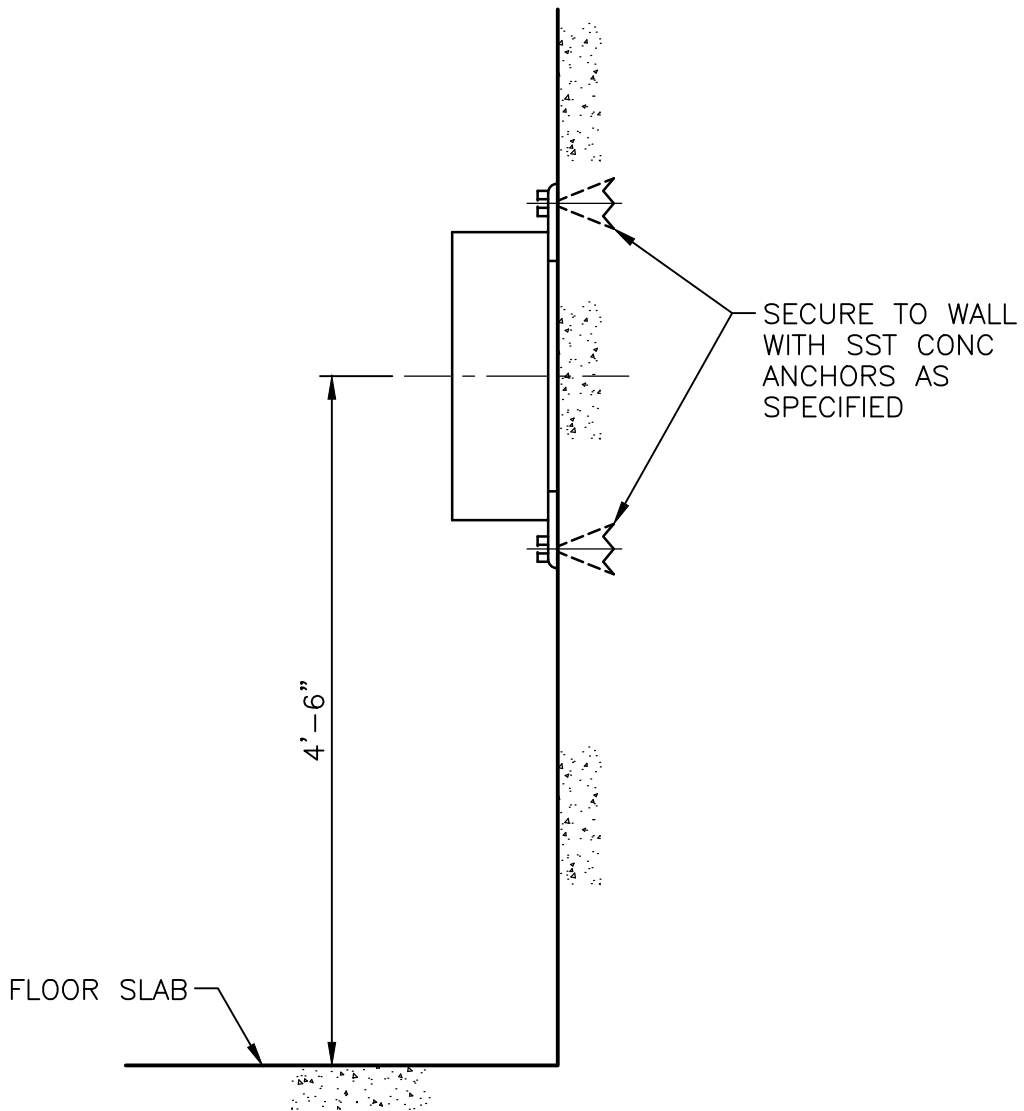
- NOTE:
1. VERIFY AND COORDINATE STEM LOCATION WITH LOCATION OF MUD VALVE IN SLAB PRIOR TO POURING SLAB.
 2. COORDINATE SCREEN OVER MUD VALVE WITH MBBR SUPPLIER SUBMITTAL.

MUD VALVE

NOT TO SCALE

40 05 67-01-A



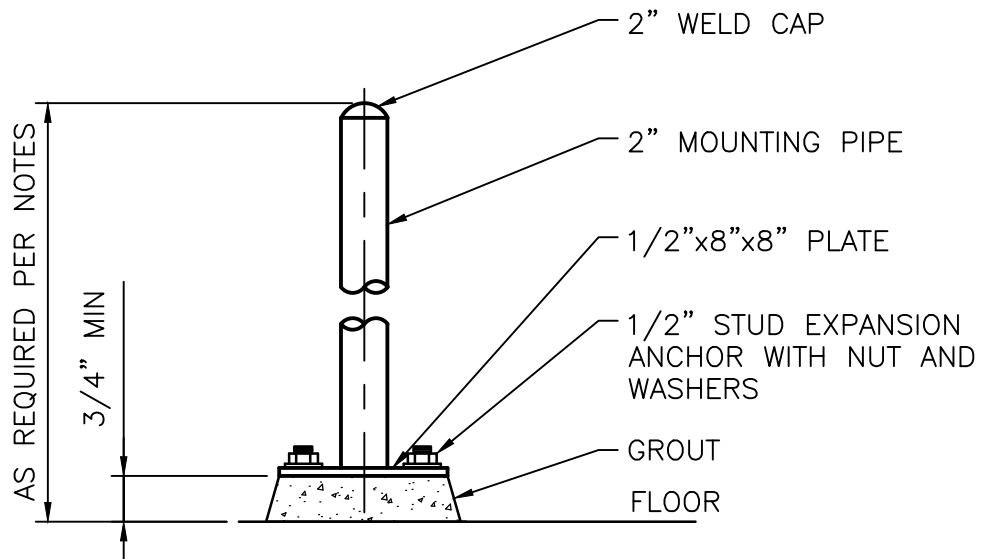


WALL MOUNTED INSTRUMENT INSTALLATION

NTS

40 91 10-01





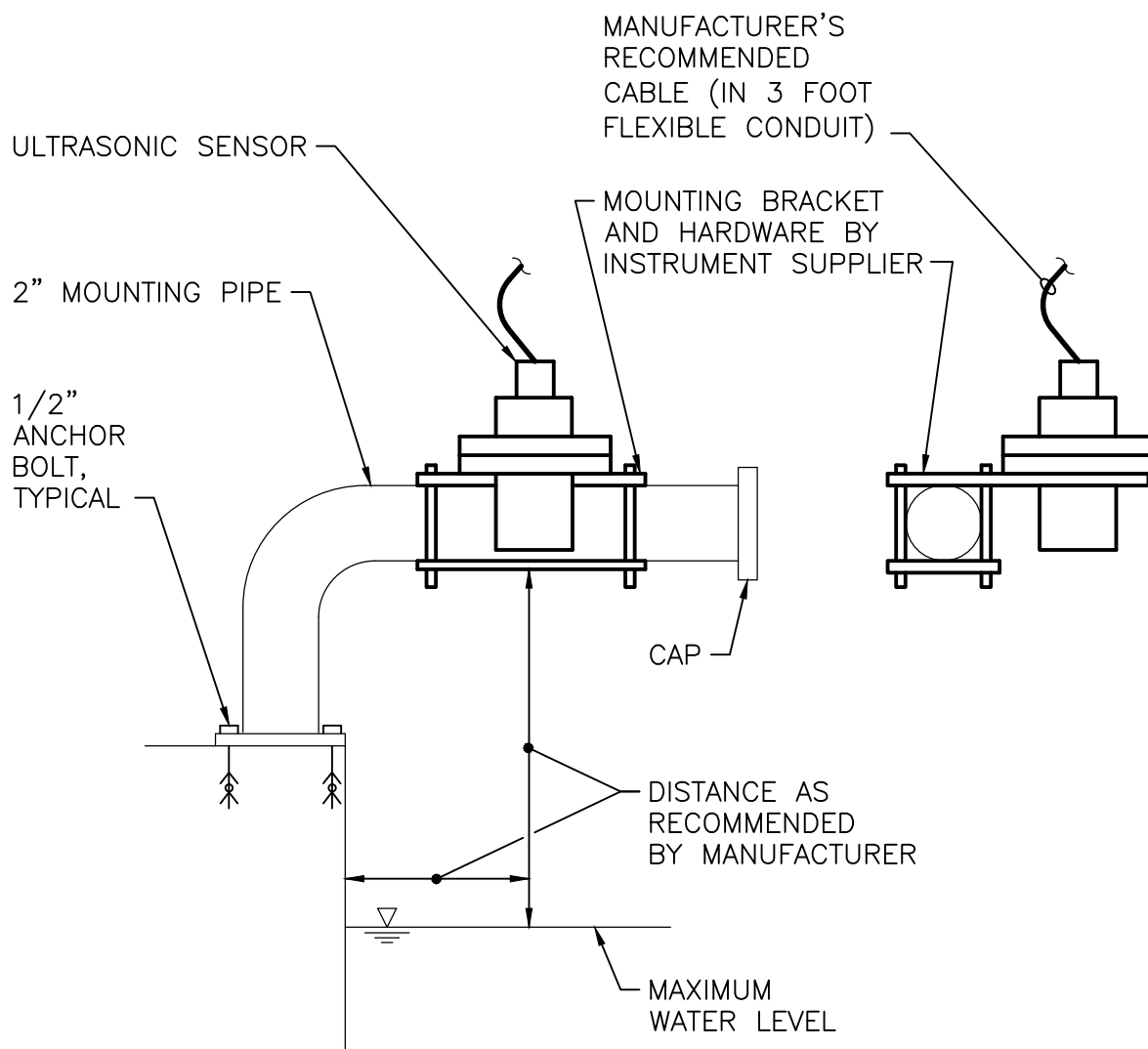
NOTES:

1. MOUNT BLIND INSTRUMENTS 52" ABOVE FLOOR.
2. MOUNT INDICATING INSTRUMENTS SO THAT CENTER LINE OF INDICATOR IS 60" ABOVE FLOOR.

FLOOR MOUNTED PIPE STAND FOR ONE INSTRUMENT

NTS

40 91 10-02

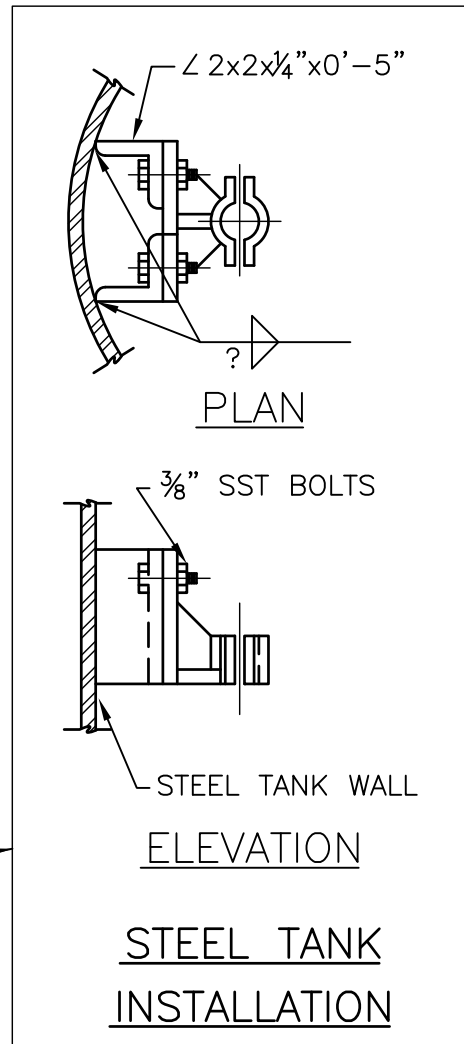
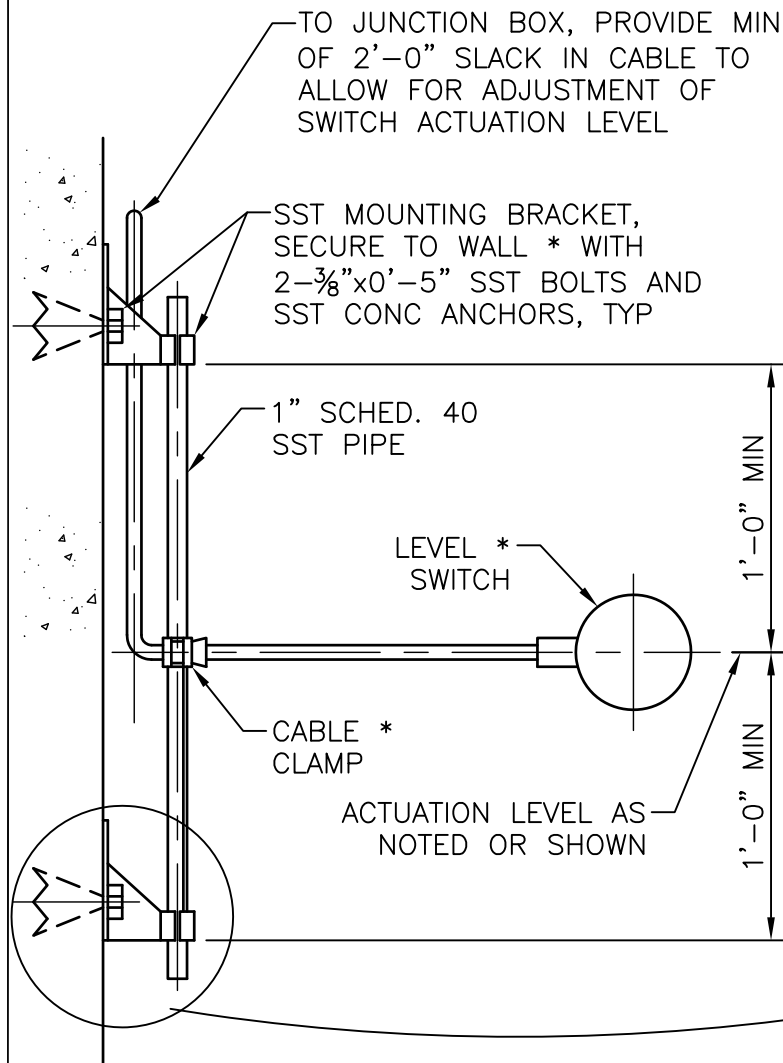


ULTRASONIC SENSOR INSTALLATION

NTS

40 91 10-08





NOTES:

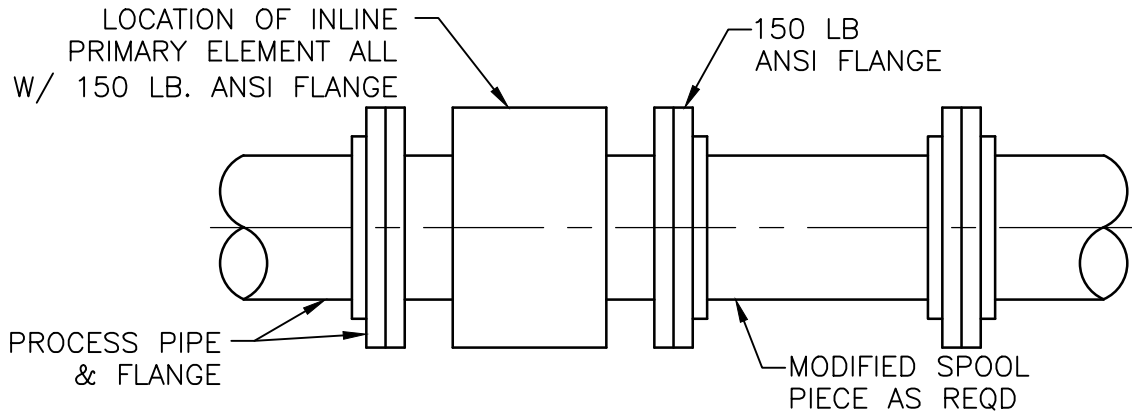
1. * DENOTES ITEMS FURNISHED BY SWITCH MFR.
2. THIS IS A STANDARD DETAIL, THEREFORE BOTH INSTALLATIONS MAY NOT BE USED.

TYPICAL FLOAT TYPE LEVEL SWITCH INSTALLATION

NTS

40 91 10-12

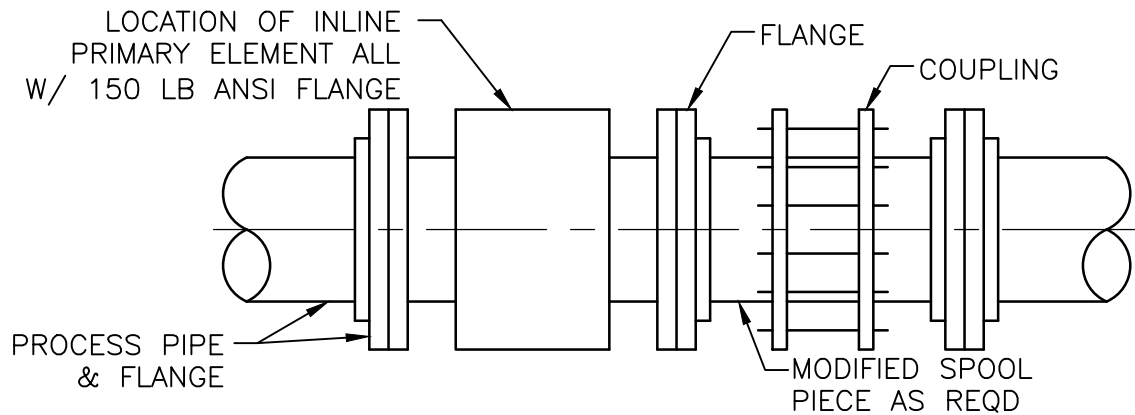
HR



NOTE:

FOR EXISTING PIPING, REMOVE & CUT EXISTING SPOOL PIECE TO PROPER LENGTH & INSTALL PRIMARY ELEMENT AS SHOWN. CEMENT WELD NEW 150 LB ANSI FLANGE & REINSTALL MODIFIED SPOOL PIECE.

PVC & CPVC PIPE



NOTE:

FOR EXISTING PIPING, REMOVE EXISTING SPOOL PIECE & COUPLING, INSTALL PRIMARY ELEMENT AS SHOWN. CUT EXISTING SPOOL PIECE TO PROPER LENGTH & REINSTALL MODIFIED SPOOL PIECE.

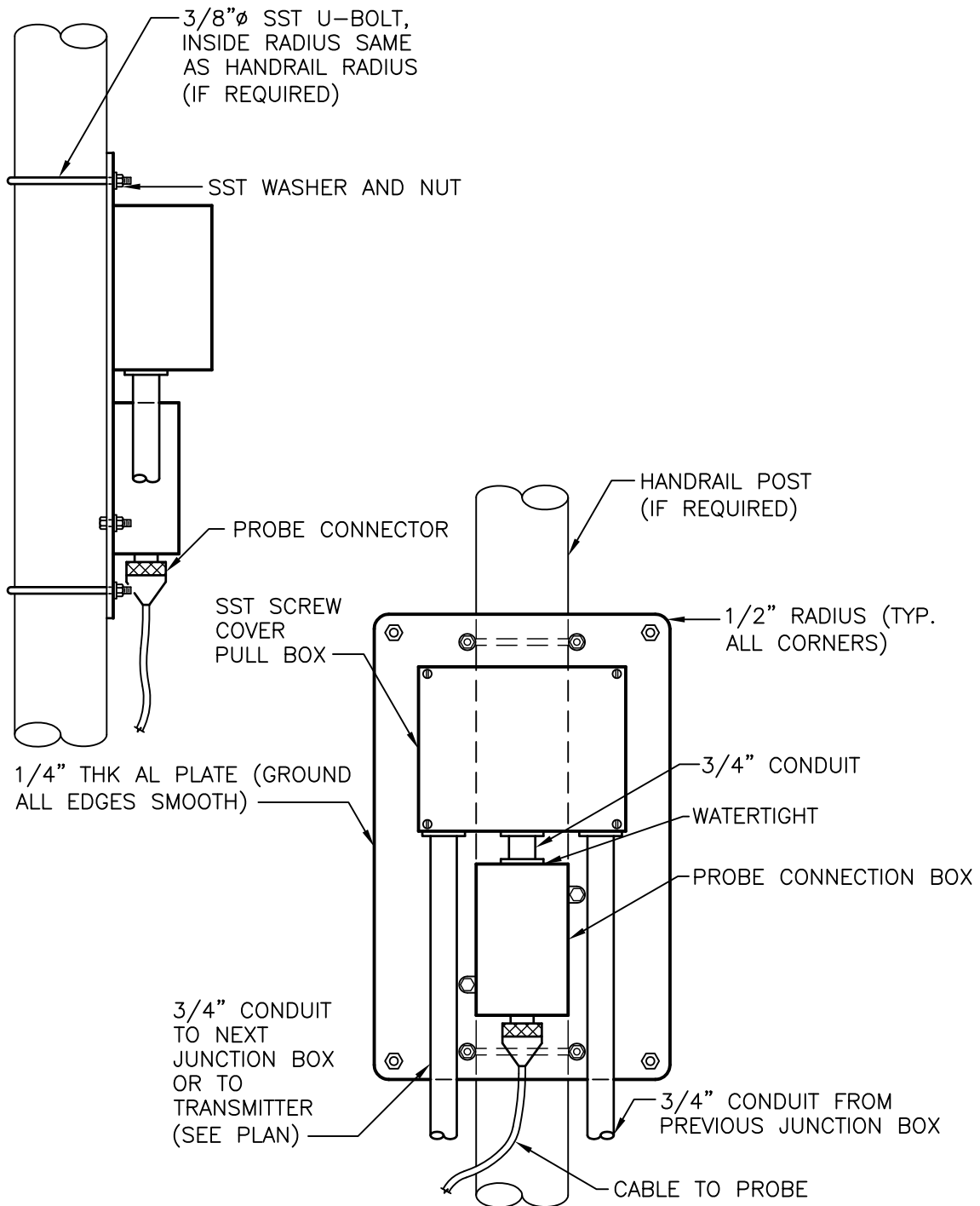
DI, STEEL & SST PIPE

**INLINE PRIMARY ELEMENT
INSTALLATION**

NTS

40 91 10-17





NOTES:

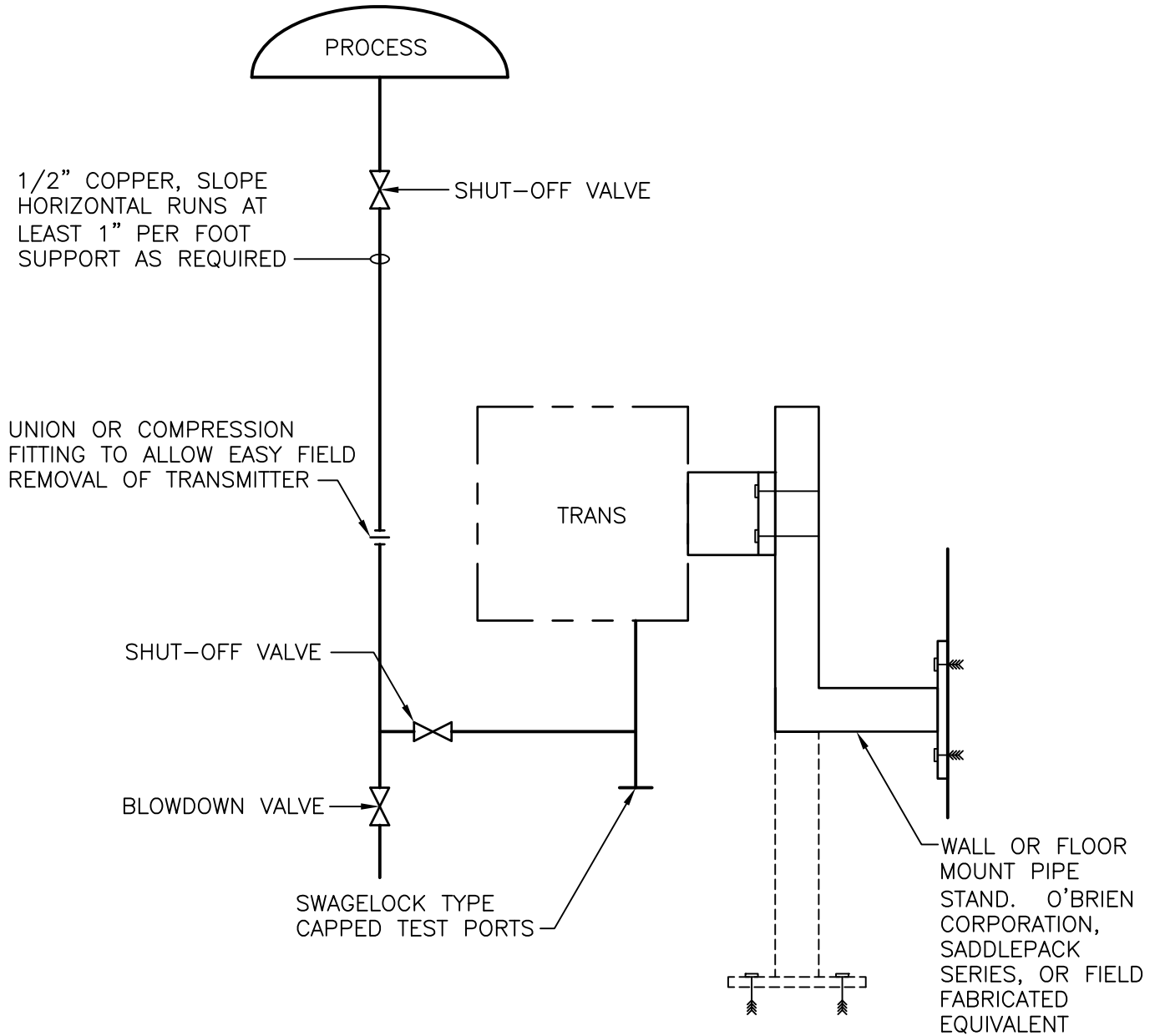
1. INSTALL ASSEMBLY ON HANDRAIL VERTICAL MEMBER CLOSEST TO THE PROBE OR ON WALL.

ANALYTICAL PROBE JUNCTION BOX

NTS

40 91 10-20



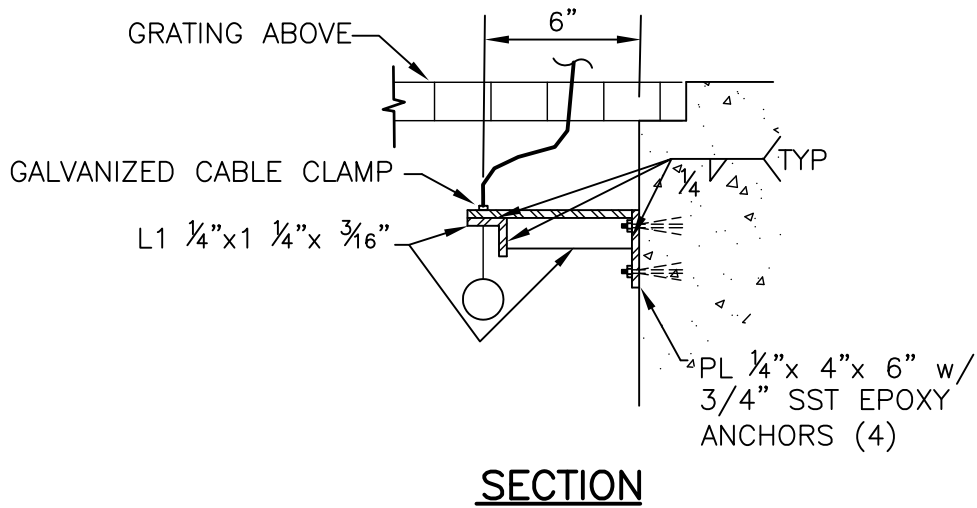


TYPICAL STATIC PRESSURE TRANSMITTER INSTALLATION

NTS

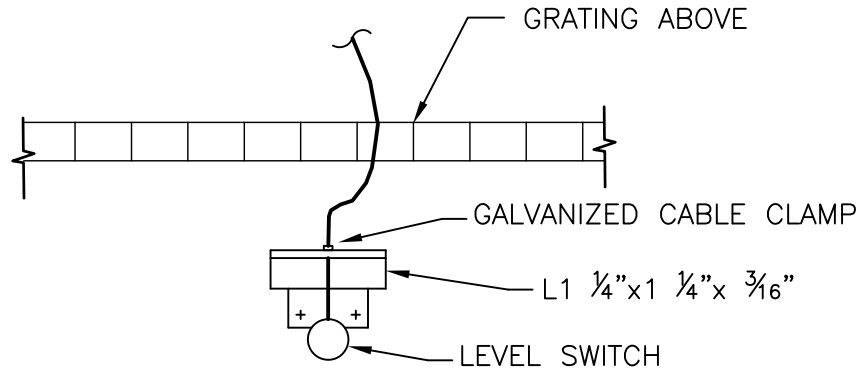
40 91 10-29





NOTE:

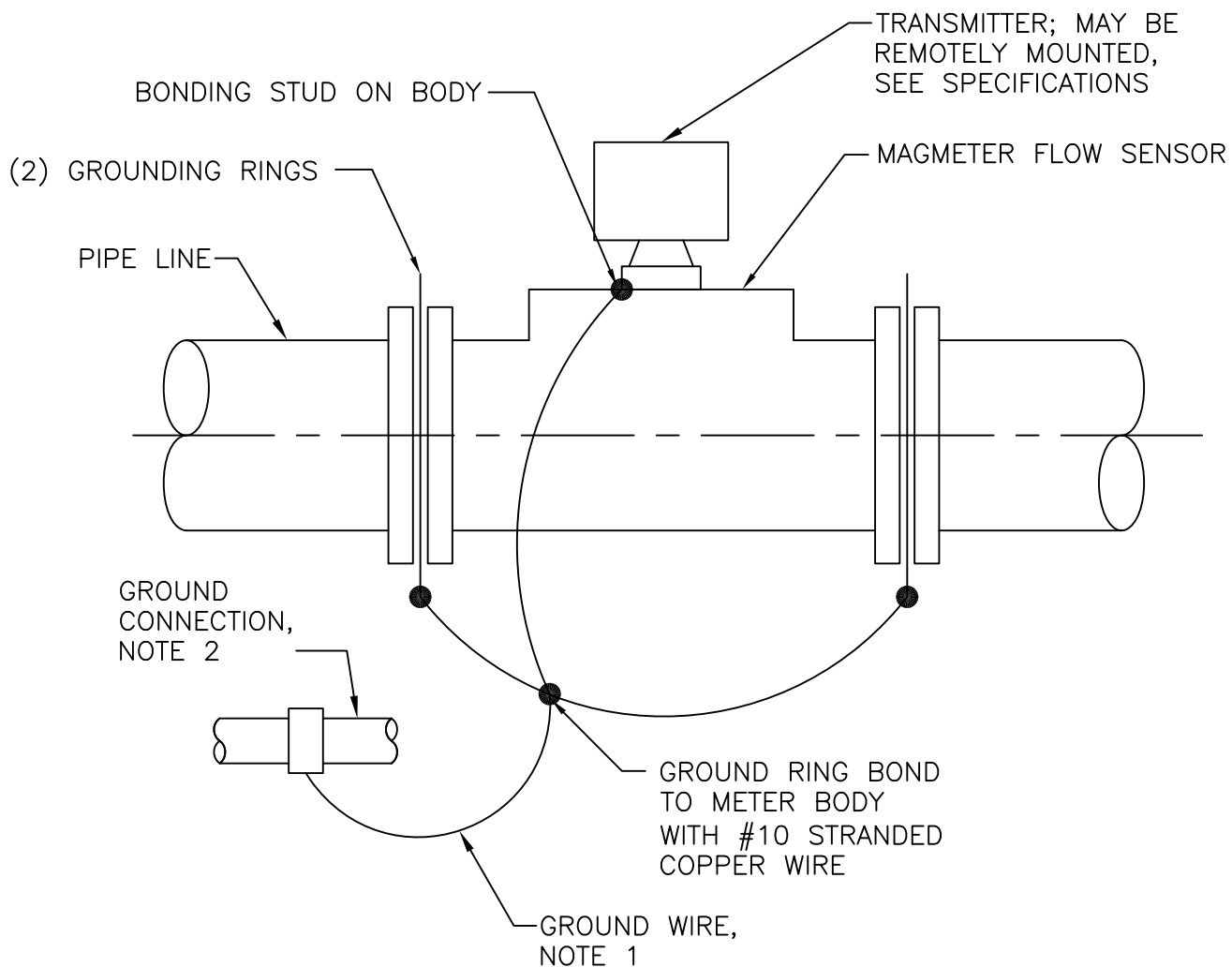
LOCATE BRACKET AS CLOSE TO BOTTOM OF GRATING AS POSSIBLE, GALVANIZE AFTER FABRICATION.



HIGH LEVEL ALARM SUPPORT BRACKET

NTS

40 91 10-30



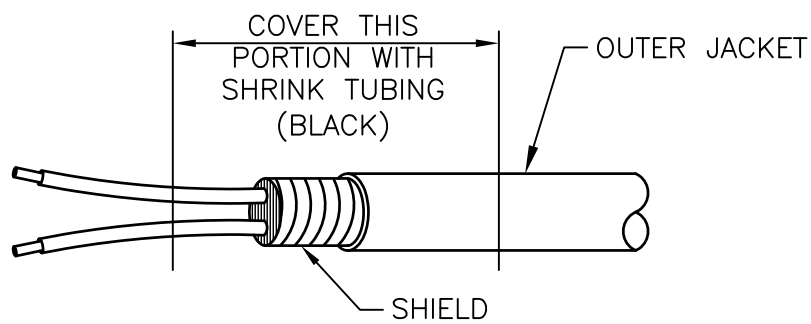
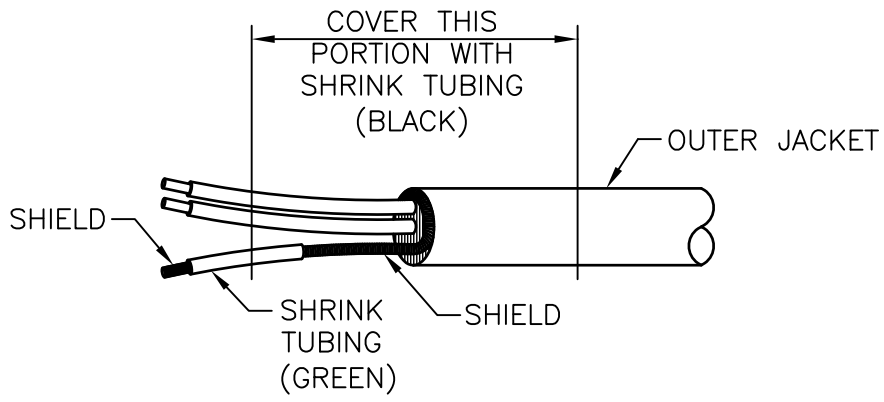
NOTES:

1. NO. 10 AWG INSULTATED IF LENGTH IS LESS THAN 6'. IF MORE THAN 6', INSTALL CONDUCTOR IN $\frac{3}{4}$ " CONDUIT.
2. BOND MAGMETER TO ONE OF THE FOLLOWING ACCEPTABLE GROUNDS:
 - A. POWER CIRCUIT GROUND CONDUCTOR AT TRANSMITTER.
 - B. NEAREST AVAILABLE EQUIPMENT GROUND CONNECTION POINT.
 - C. SEPARATE TAIL FROM EMBEDDED GROUND MAT.

MAGNETIC FLOW METER GROUNDING RING BONDING

NTS

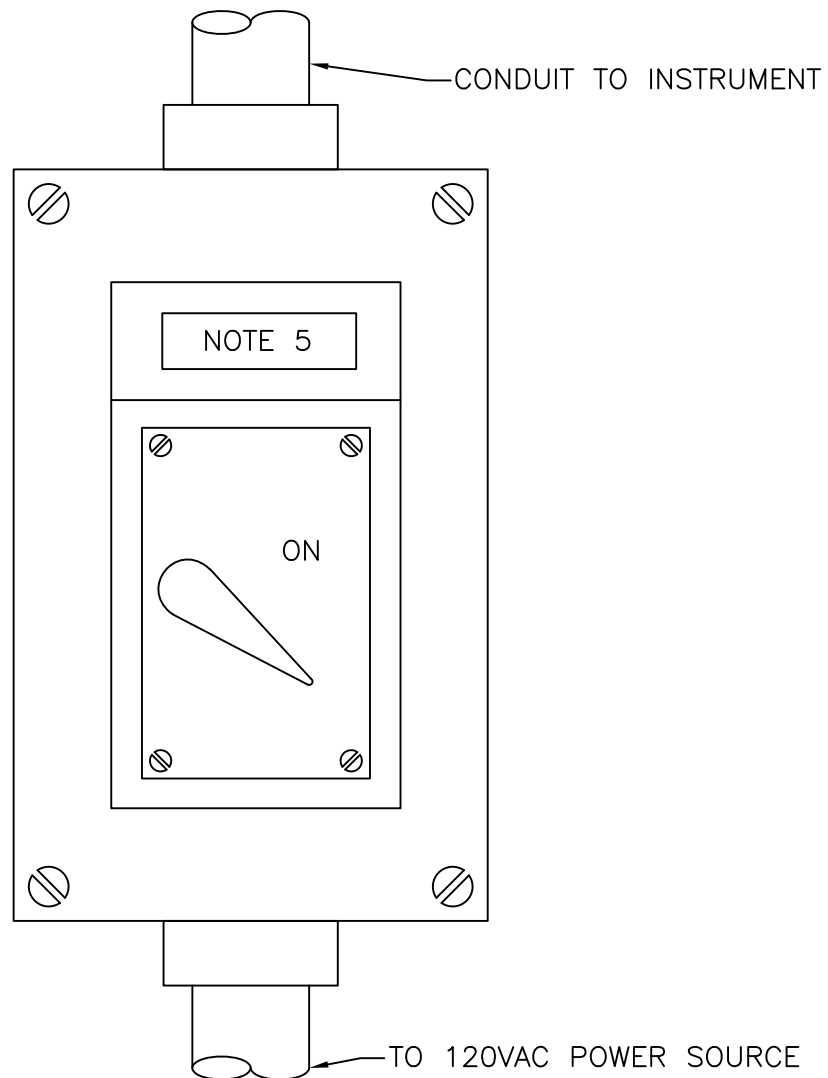
40 91 10-33



SHIELDED CONTROL CABLE TERMINATION DRESSING

NTS

40 91 10-34



NOTES:

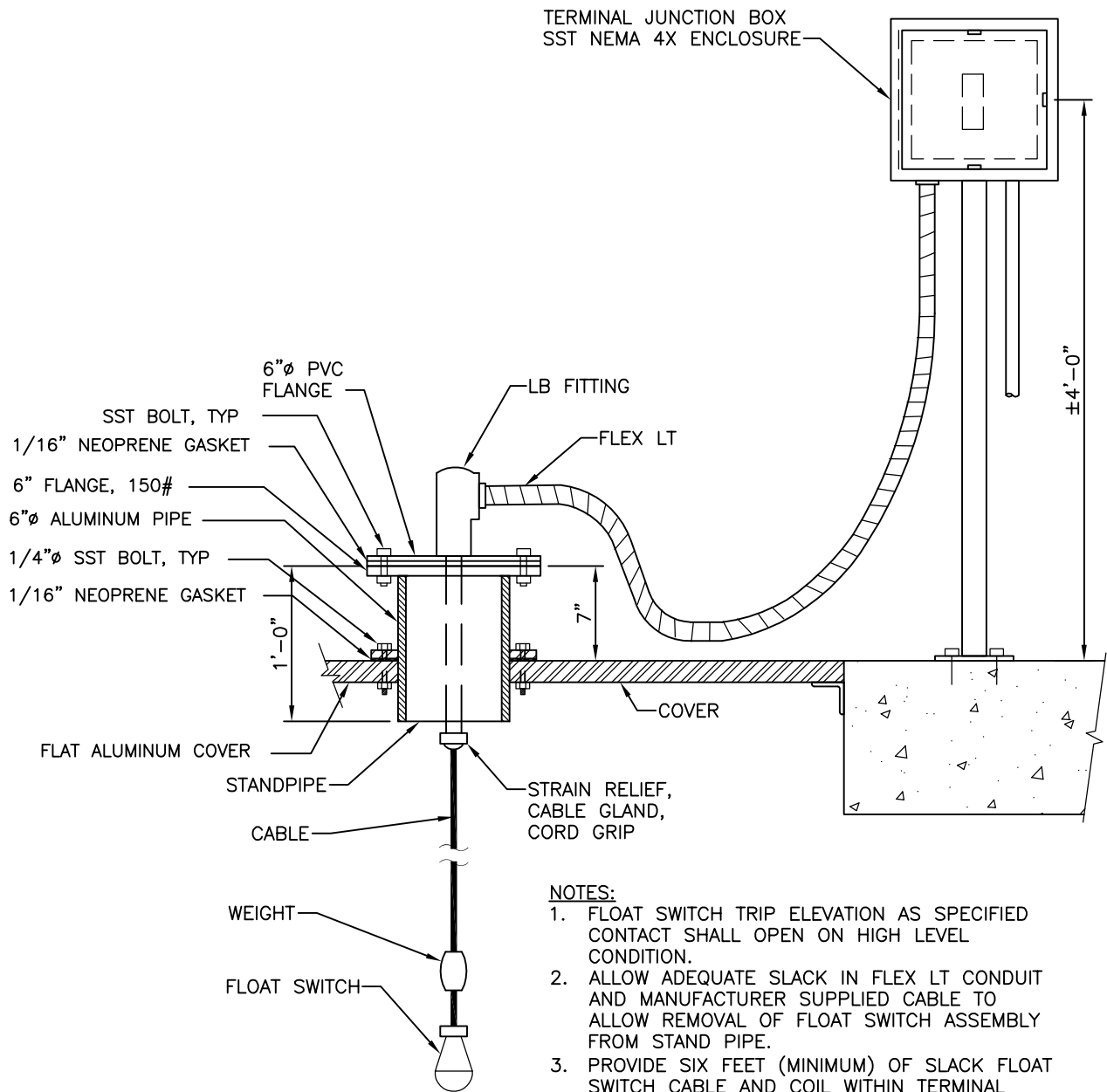
1. SINGLE-PHASE, MANUAL SWITCH REQUIRED FOR EACH AC POWERED FIELD INSTRUMENT
2. OPERATING HANDLE PAD-LOCKABLE IN OFF POSITION
3. CAST ALUMINUM NEMA 4, WATERPROOF ENCLOSURE
4. CUTLER-HAMMER TYPE MS, OR EQUAL
5. NAME PLATE ATTACHED SECURELY. ENGRAVED WITH INSTRUMENT TAG NUMBER AND DESCRIPTION
6. ENCLOSURES AND COMPONENTS TO BE NEMA 7, NEMA 9 RATED WHERE INSTALLED IN HAZARDOUS RATED LOCATIONS. REFERENCE ELECTRICAL PLAN SHEETS FOR AREA RATINGS.

SINGLE PHASE CONTROL DISCONNECT

NTS

40 91 10-35

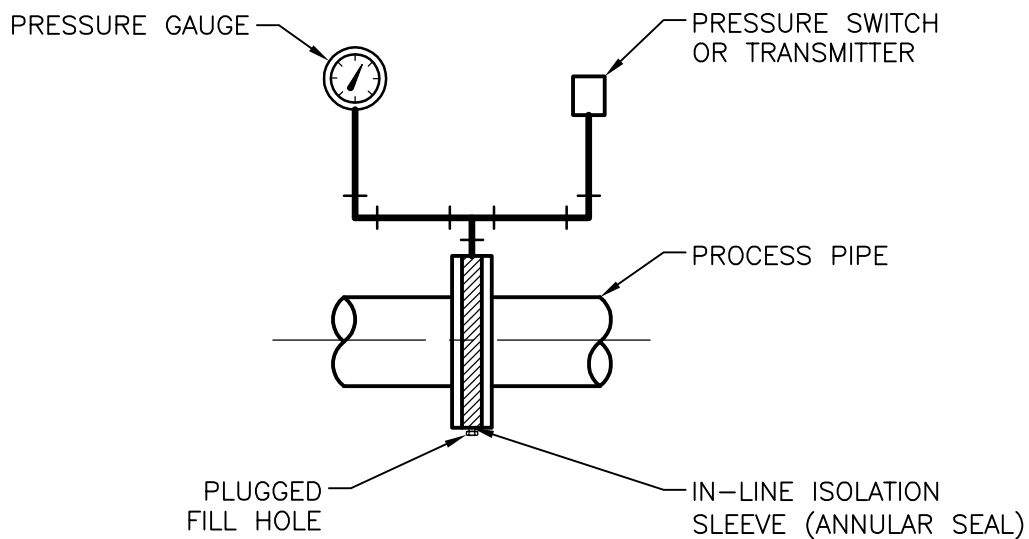
HR



SUSPENDED FLOAT SWITCH

NTS

40 91 10-37



NOTE:

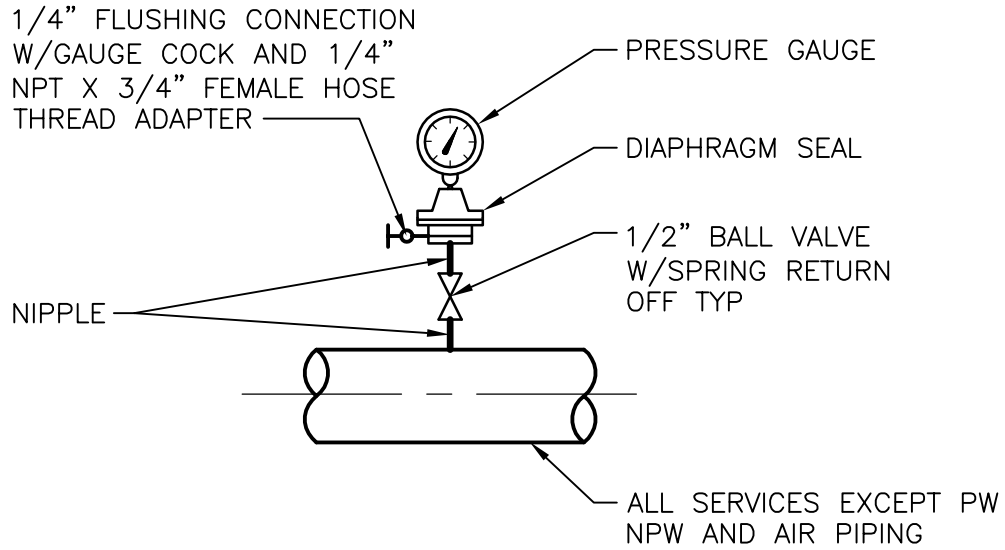
1. MOUNT PRESSURE GAUGE IN VERTICAL FOR VIEWING.
2. INDICATOR AND PRESSURE SWITCH INSTALLATION AS SPECIFIED, FOR SINGLE INSTRUMENT INSTALLATIONS, MOUNT DEVICE DIRECTLY TO ANNULAR SEAL

IN-LINE ISOLATION SLEEVE PRESSURE SWITCH/TRANSMITTER ANNULAR SEAL

NOT TO SCALE

40 91 10-38



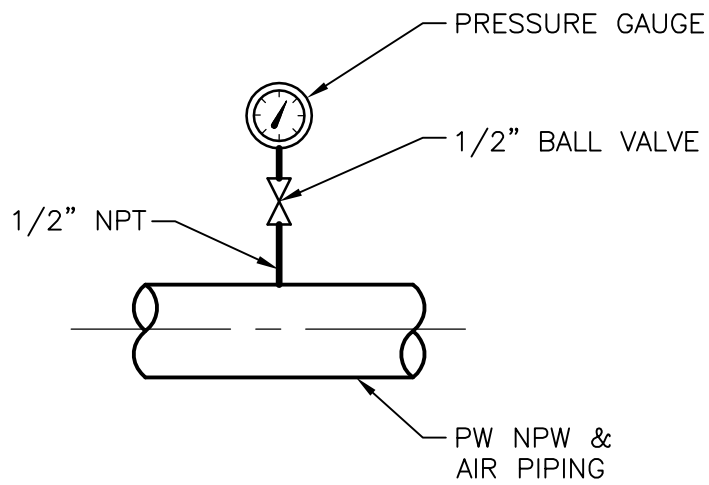


PRESSURE GAUGE PG-1

NOT TO SCALE

40 91 10-39



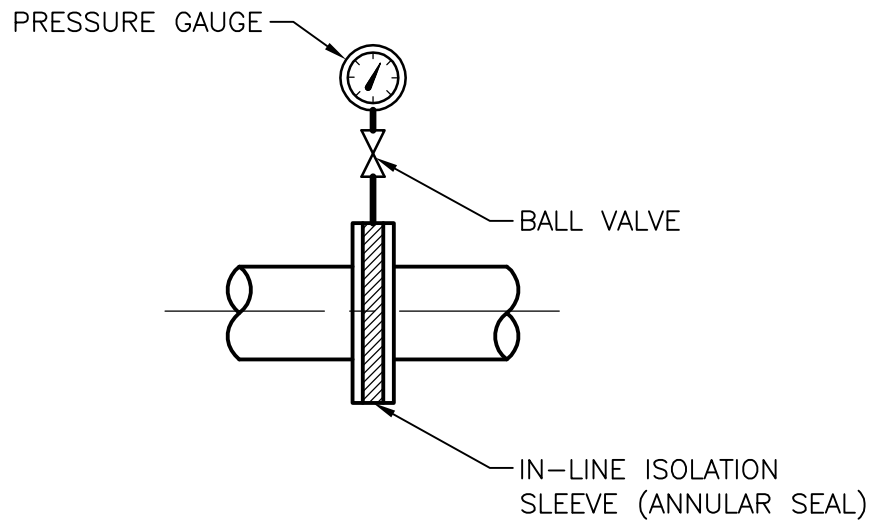


PRESSURE GAUGE PG-2

NOT TO SCALE

40 91 10-40



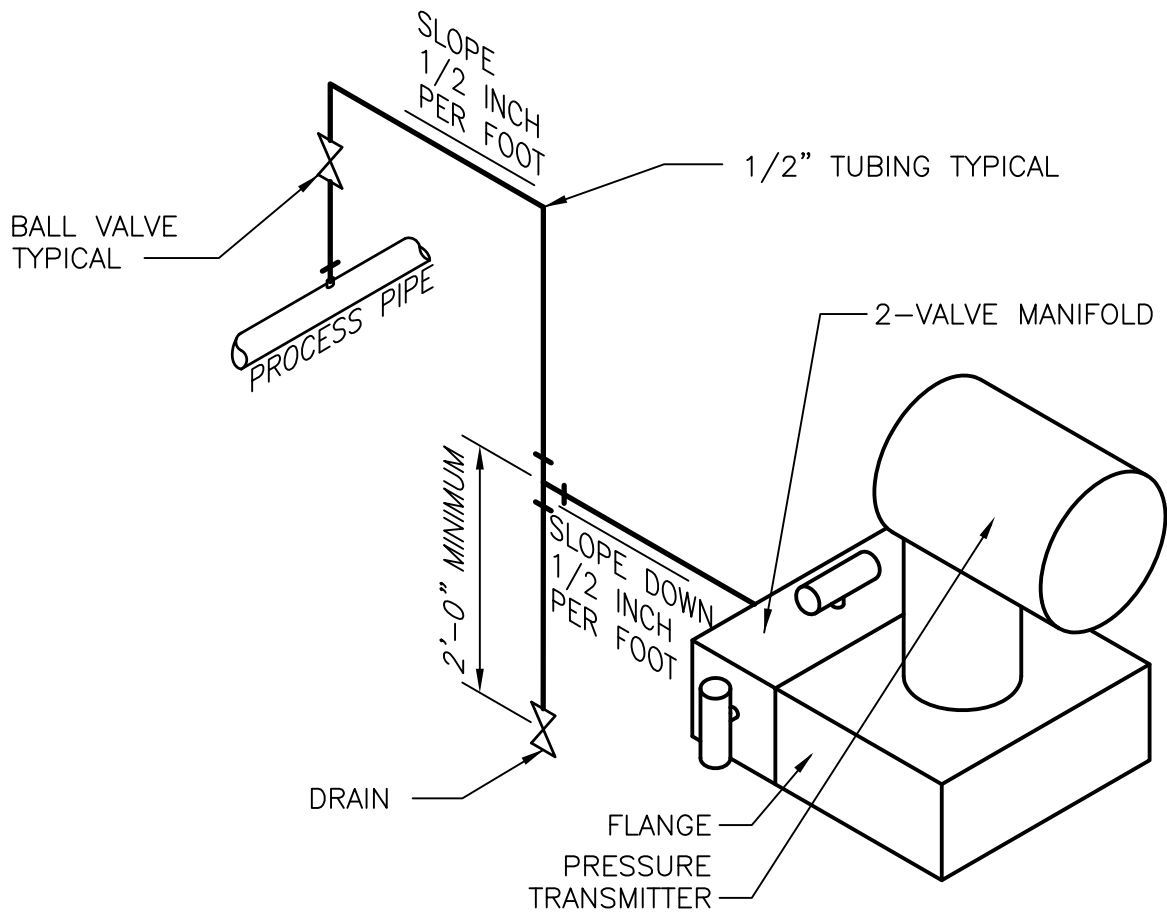


IN-LINE ISOLATION SLEEVE PRESSURE GAUGE PG-4

NOT TO SCALE

40 91 10-41

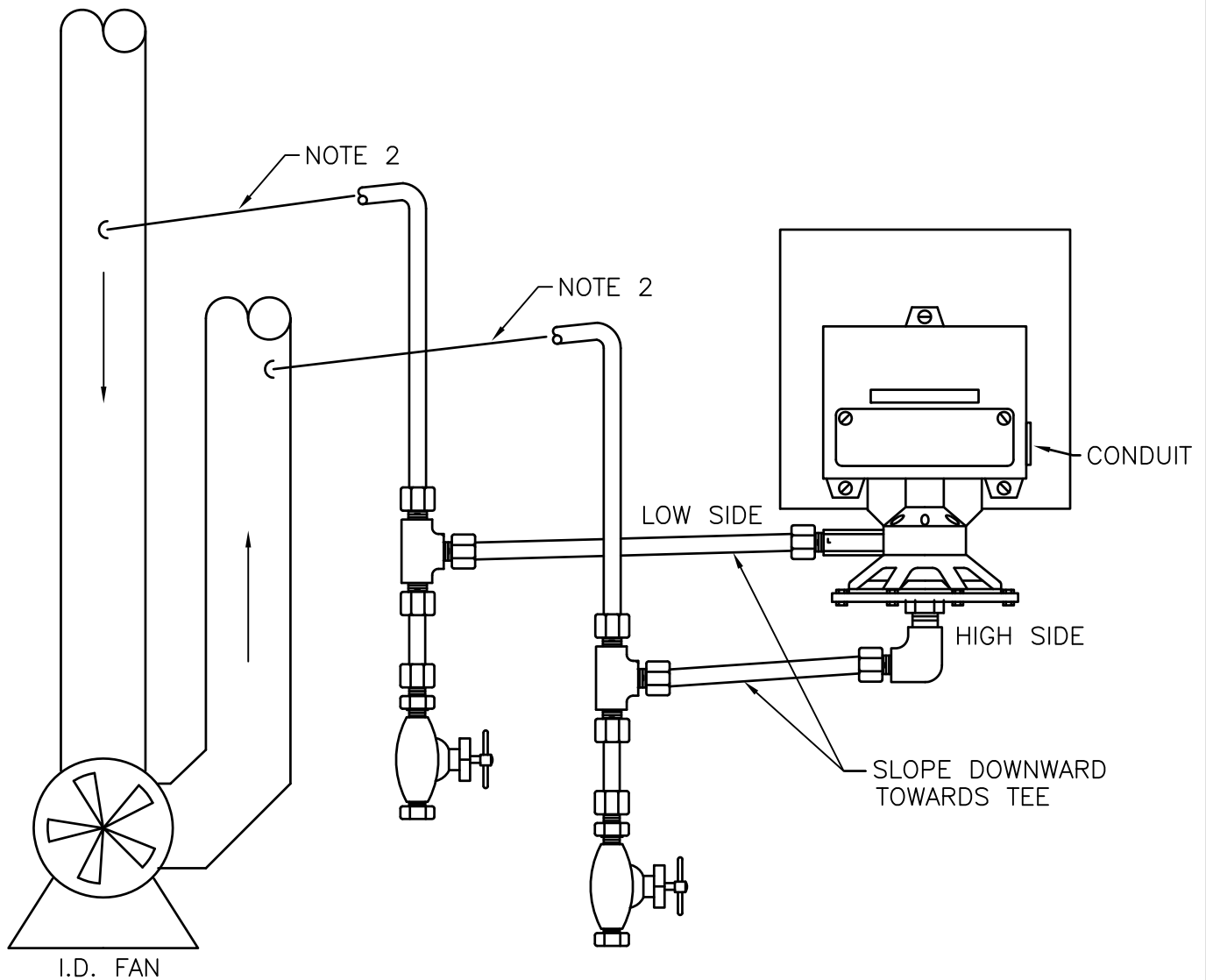




PRESSURE TRANSMITTER— AIR OR GAS APPLICATIONS

NTS

40 91 10-45

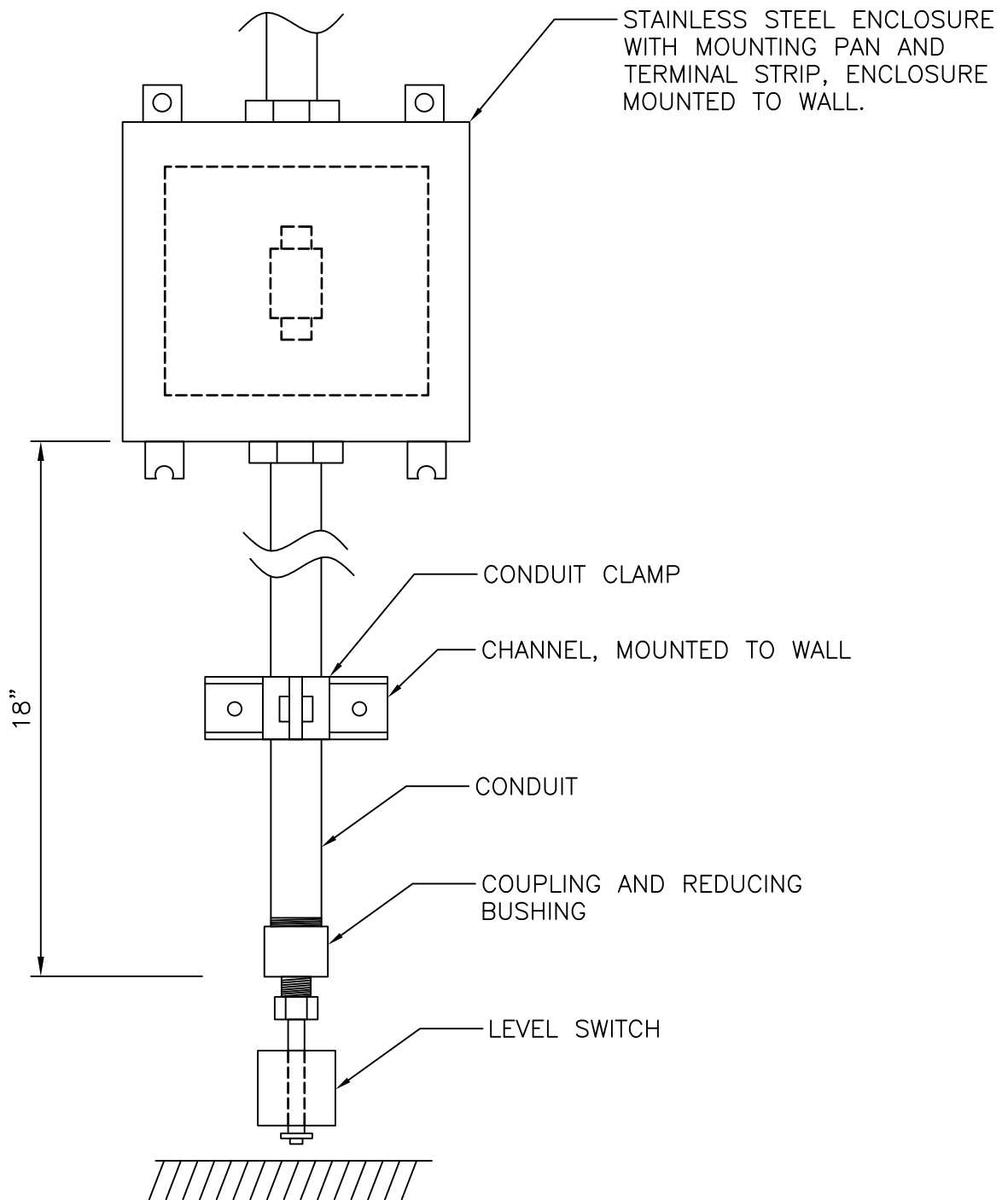


1. ALL MATERIALS AND TYPE FITTINGS FOR EACH INSTALLATION ARE PER PIPING SPECIFICATION UNLESS OTHERWISE NOTED.
2. TUBING RUN TO HAVE CONTINUOUS SLOPE OF 1" PER FOOT MIN. DOWN TO PROCESS CONNECTION.
3. ALL TUBING RUNS OVER 4 FEET ARE TO BE INSTALLED IN TRAY. TRAY AND CONDUIT MUST BE SUPPORTED AT LEAST EVERY TEN FEET AND WITHIN TWO FEET OF EACH END.
4. ALL CONDUIT AND TRAY BRACKETS ARE TO BE ANCHORED SECURELY TO AN I-BEAM, WALL , OR STAND.

DIFFERENTIAL PRESSURE SWITCH FAN DUCTS TUBING

NTS

40 91 10-48



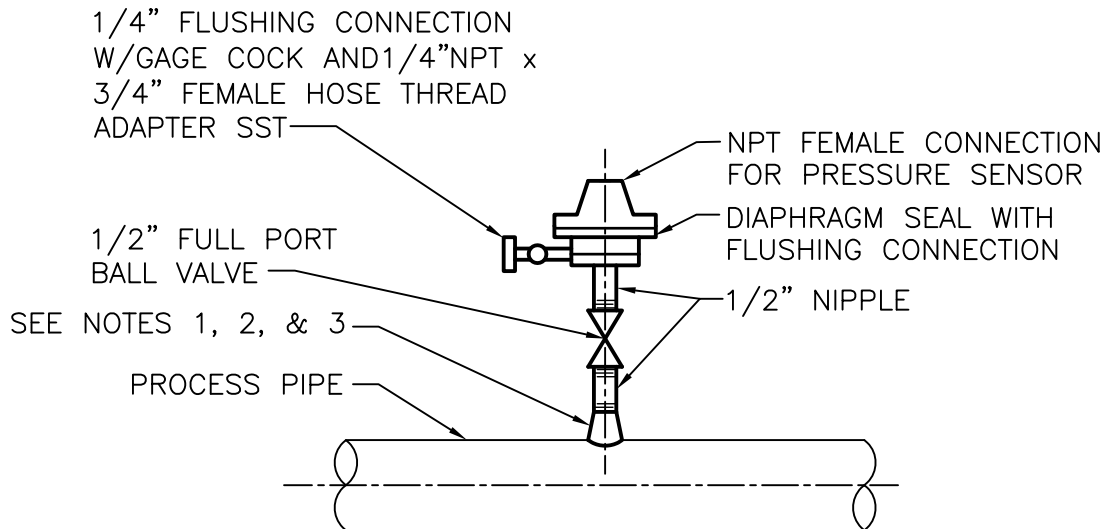
NOTES:

1. LEVEL SWITCH TRIP ELEVATION AS SPECIFIED. CONTACT SHALL OPEN ON HIGH LEVEL CONDITION.

FLOOD ALARM SWITCH

NTS

40 91 10-49



NOTES:

1. FOR STL, GSP, AND PVC 2 1/2" AND SMALLER, USE A BUSHING IN A TEE.
2. FOR DI AND FRP ALL SIZES, USE PIPE SADDLE W/ BUSHING.
3. FOR STL, AND SST PIPES 3" AND LARGER, AND PRESSURE VESSELS, USE THREAD-O-LET, OR EQUAL AS SHOWN.
4. DIAPHRAGM SEAL AND PRESSURE INSTRUMENT SHALL BE FACTORY ASSEMBLED.

DIAPHRAGM SEAL

NTS

40 91 10-54

TO HIGH OUTPUT
AIR BLAST SYSTEM
IN CONTROL PANEL

SST EYEBOLT AND NUT

SST BOLT, TYP

1/16" NEOPRENE GASKET

6" FLANGE, 150#

6"Ø ALUMINUM PIPE

1/4"Ø SST BOLT, TYP

1/16" NEOPRENE GASKET

FLAT ALUMINUM COVER

1/4" DIA, SST CABLE
AND CABLE CLAMPS

DRILL HOLE AND INSERT AIR
TIGHT GLAND FOR SENSOR CABLE

TO ANALYTICAL
PROBE JUNCTION
BOX, SEE

40 91 10-20

ALUMINUM FLANGE
AROUND OPENING. BOLT
THROUGH FLANGE AND
DIGESTER COVER.

NYLON CABLE TIES.

SENSOR CABLE. ATTACH WITH
NYLON CABLE TIES AT 2'-0"
INTERVALS

AIR DELIVERY TUBE

SENSOR ATTACHED WITH
NYLON CABLE TIES

AIR BLAST SENSOR
ADAPTER

SST EYEBOLT AND NUT

4" DIA SOLID CONCRETE
WEIGHT

12"

NOTES:

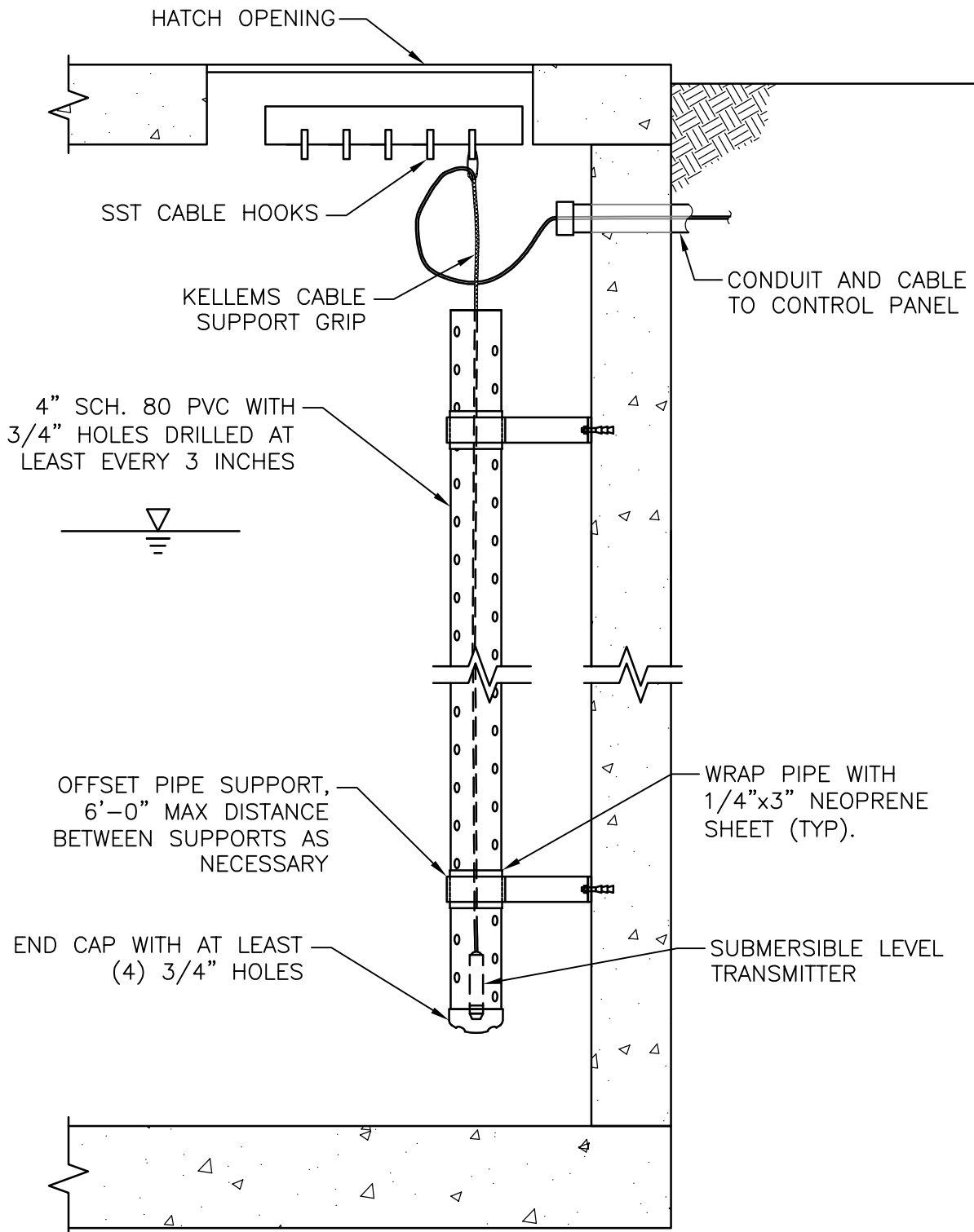
1. L AS REQUIRED TO ALLOW
CONCRETE WEIGHT TO REST
AT THE BOTTOM OF THE
BASIN.

DO OR NH4 SENSOR

NTS

40 91 10-56

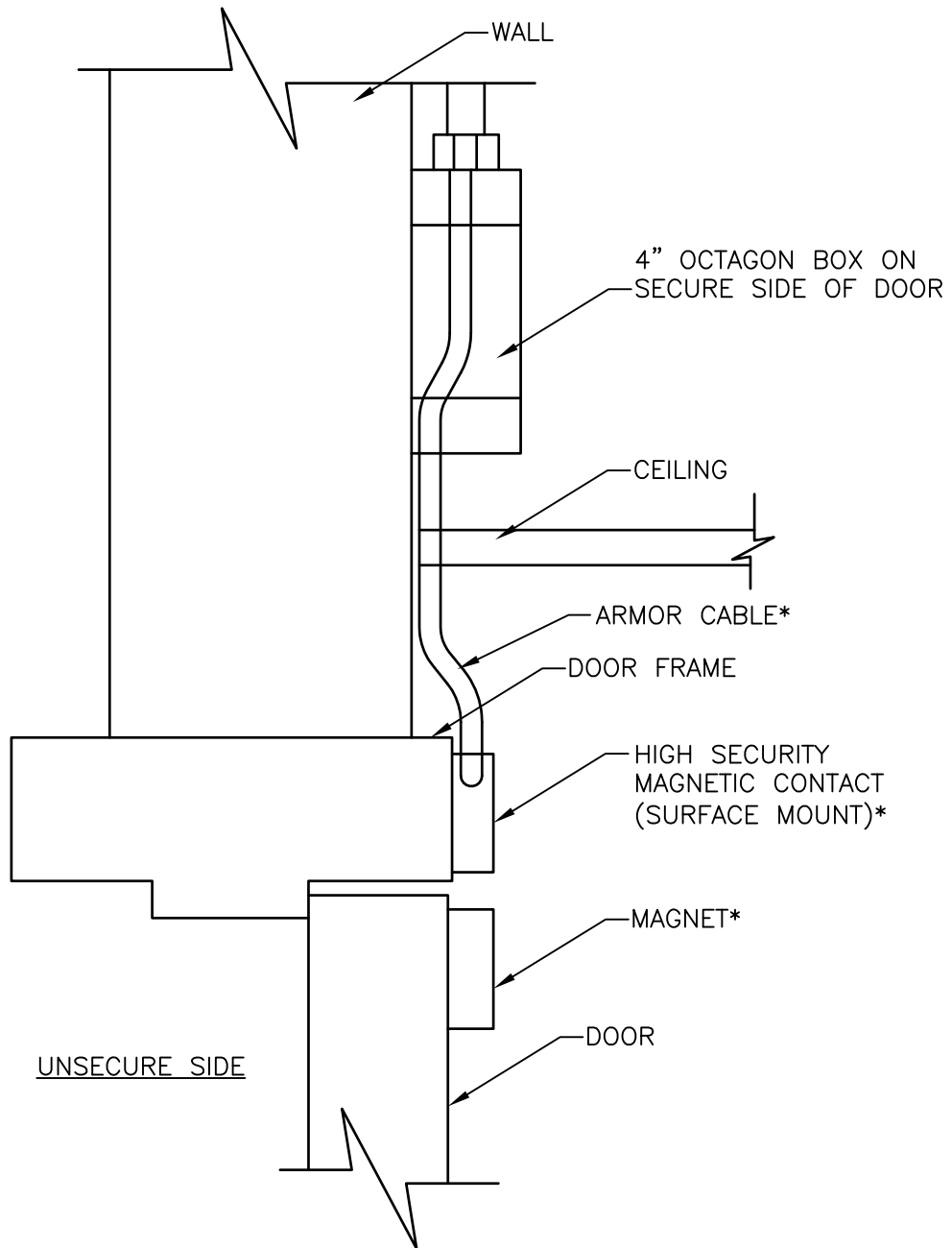




SUBMERSIBLE LEVEL TRANSMITTER

NTS

40 91 10-57



NOTES

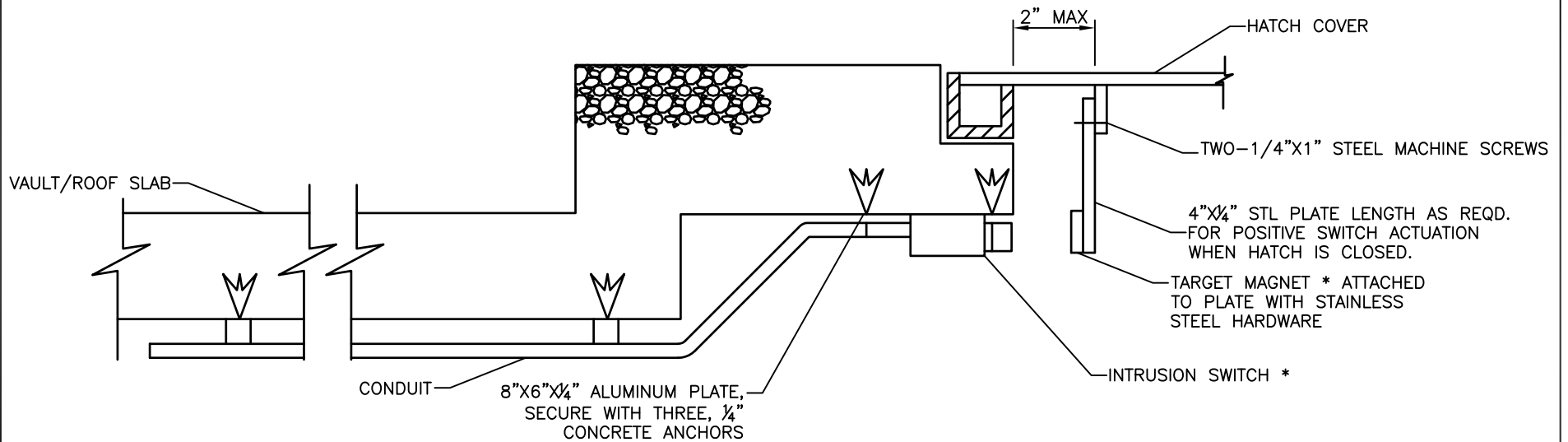
1. * DENOTES SUPPLIED UNDER SECTION 40 91 10.
2. THE INSTALLATION DETAIL SHOWN IS GENERIC. ACTUAL INSTALLATIONS MAY VARY.

SURFACE MOUNTED DOOR POSITION SWITCH

NTS

40 91 10-58





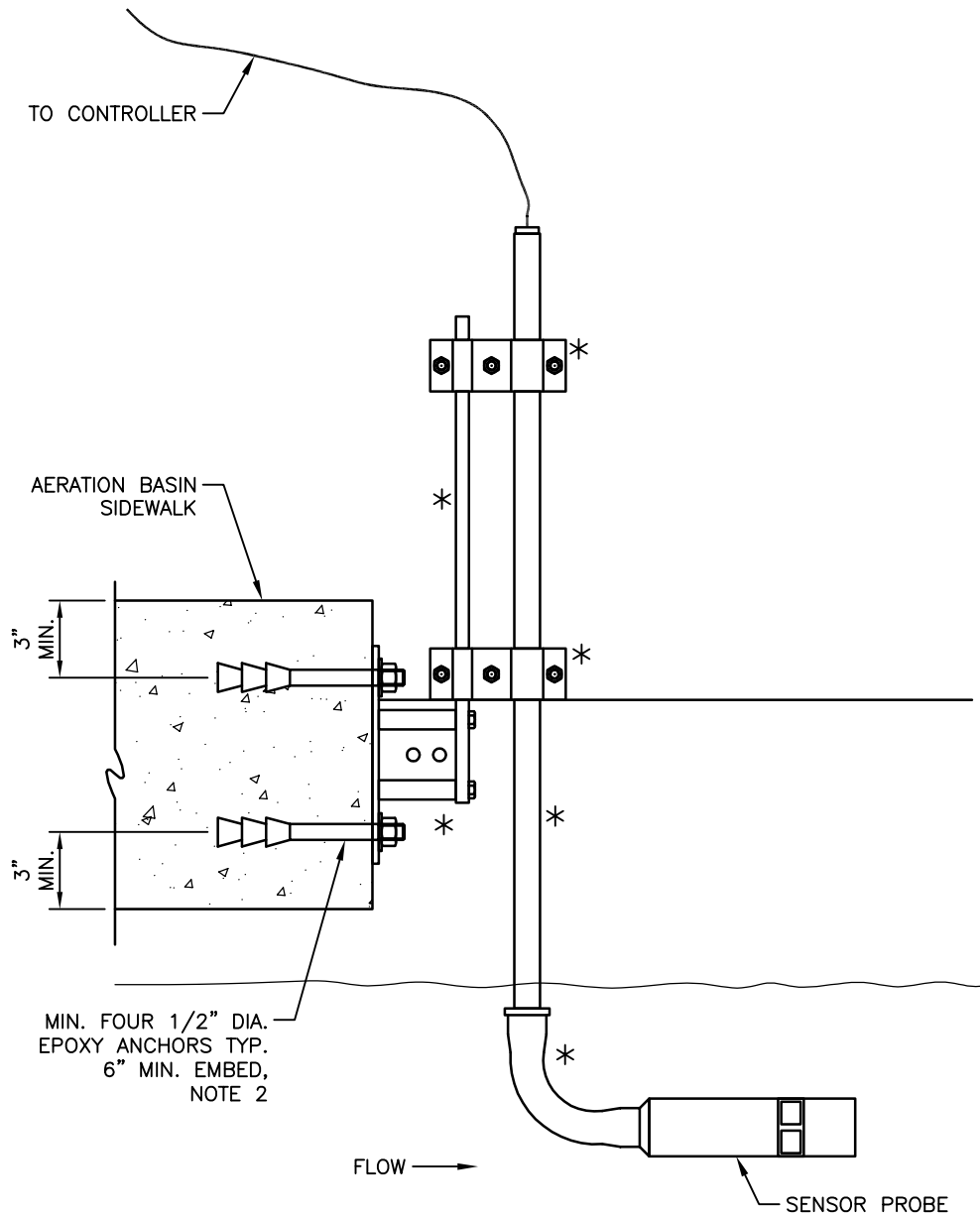
NOTES

1. * DENOTES SUPPLIED UNDER SECTION 40 91 10
2. THE INSTALLATION DETAIL SHOWN IS GENERIC. ACTUAL INSTALLATIONS MAY VARY.

HATCH INTRUSION SWITCH INSTALLATION DETAIL

NTS

40 91 10-59



MIN. FOUR 1/2" DIA.
EPOXY ANCHORS TYP.
6" MIN. EMBED,
NOTE 2

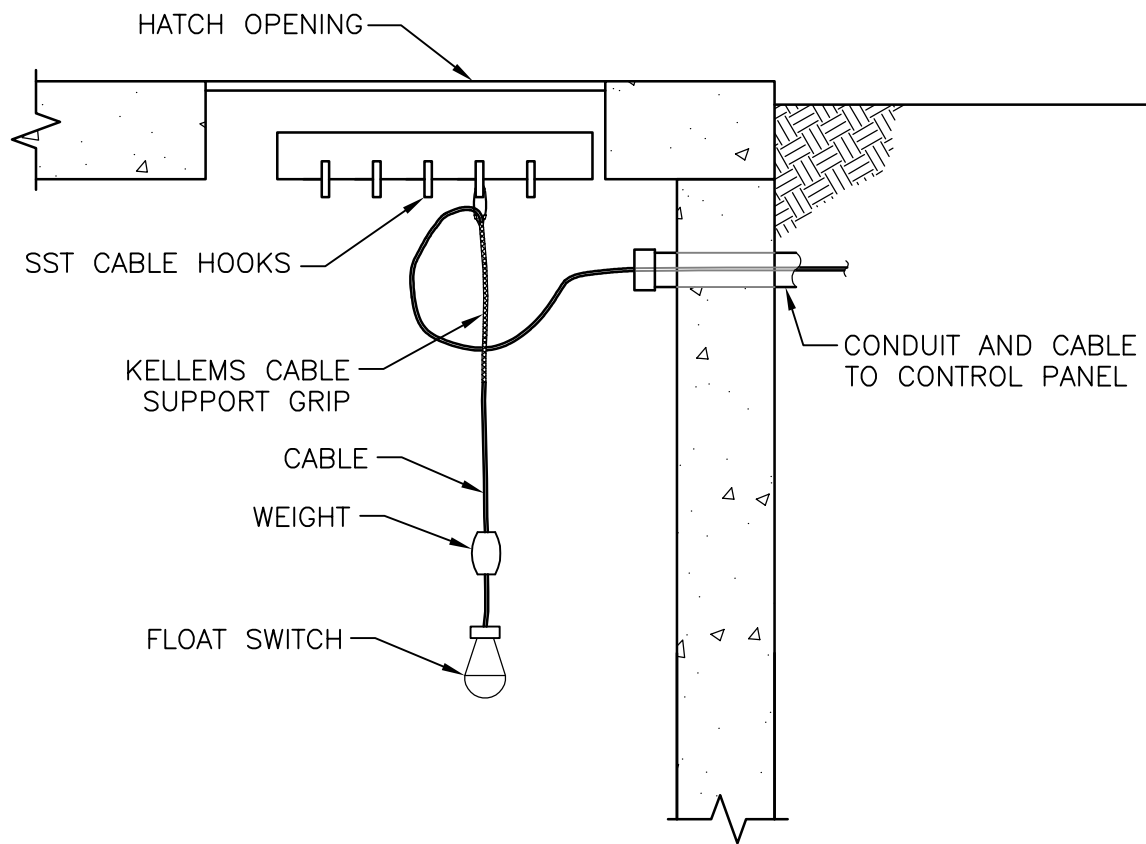
- NOTES
1. * SENSOR PROBE MANUFACTURES ACCESSORY SENSOR BRACKET.
 2. REFER TO AREA CLASSIFICATION TABLE FOR MATERIAL SELECTION.
 3. SUBMIT FINAL DESIGN AND CALCULATIONS FOR SUPPORT AND ANCHORAGE AS SPECIFIED.

AMMONIA PROBE BRACKET

NOT TO SCALE

40 91 10-60





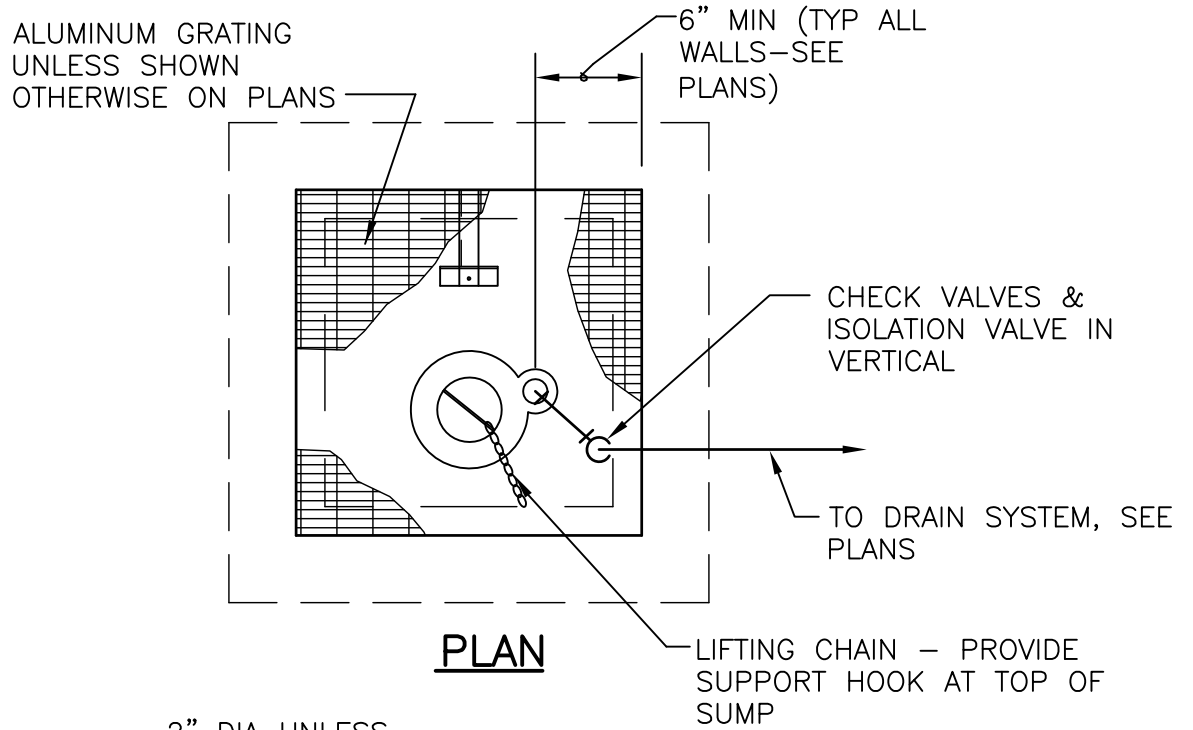
NOTES:

1. FLOAT SWITCH TRIP ELEVATION AS SPECIFIED CONTACT SHALL OPEN ON HIGH LEVEL CONDITION.
2. PROVIDE SIX FEET (MINIMUM) OF SLACK FLOAT SWITCH CABLE AND COIL WITHIN WETWELL ISOLATION PEDESTAL.

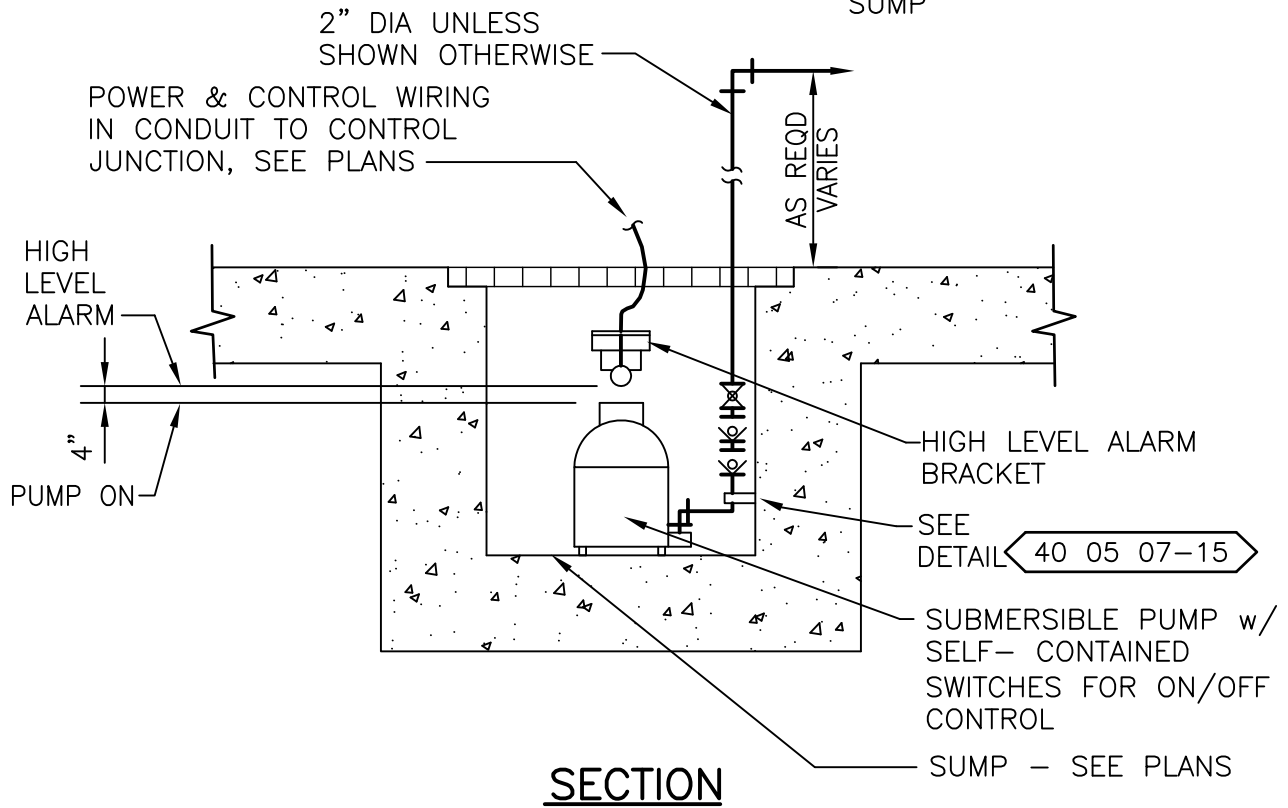
SUSPENDED FLOAT SWITCH

NTS

40 91 10-62



PLAN



SECTION

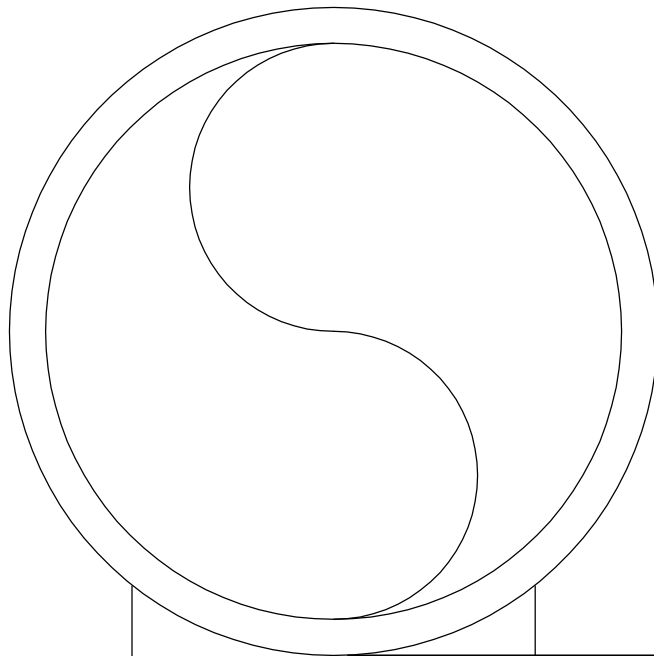
NOTE:
 STANDARD DETAIL IS GENERAL w/ RESPECT TO PIPING ARRANGEMENT. SEE PLANS FOR SPECIFIC ORIENTATION OF PIPES AND VALVES.

SINGLE SUMP PUMP

NTS

43 25 13-02





EQUALIZING GRID

OPPOSED BLADE
VOLUME DAMPER

SHEET METAL
SCREW (TYP)

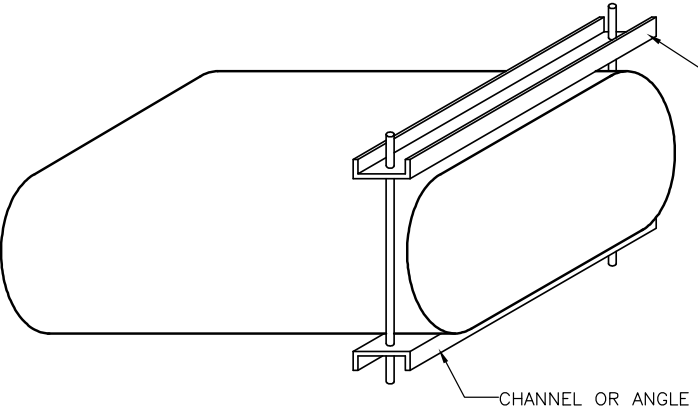
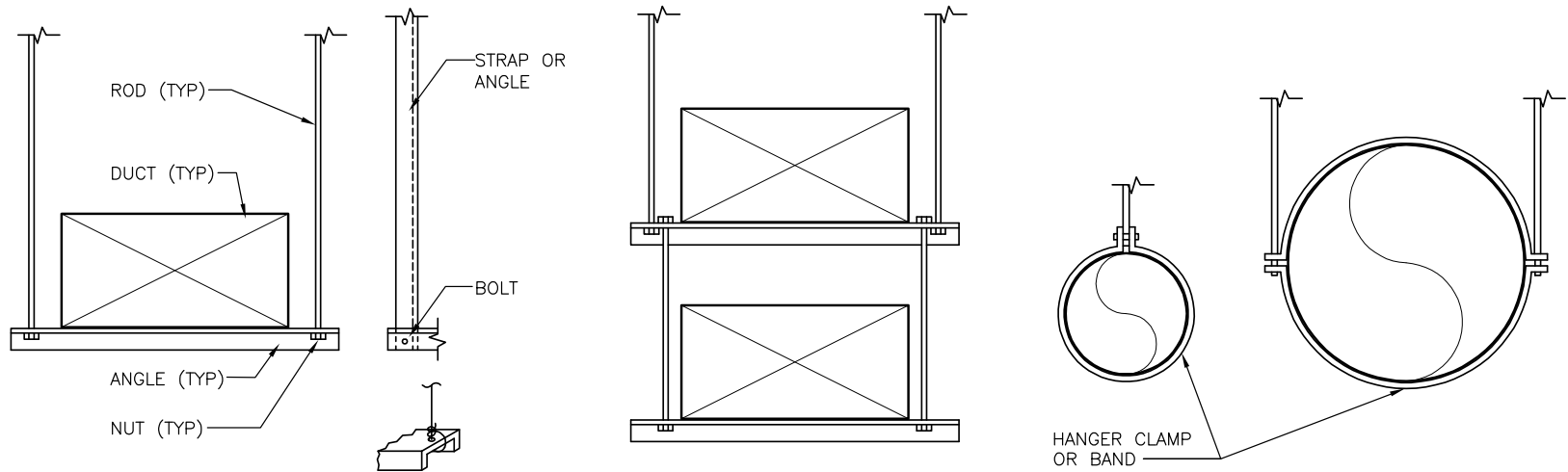
SUPPLY DIFFUSER OR REGISTER

6"

DIFFUSER CONNECTION DETAIL

NTS

15000C040

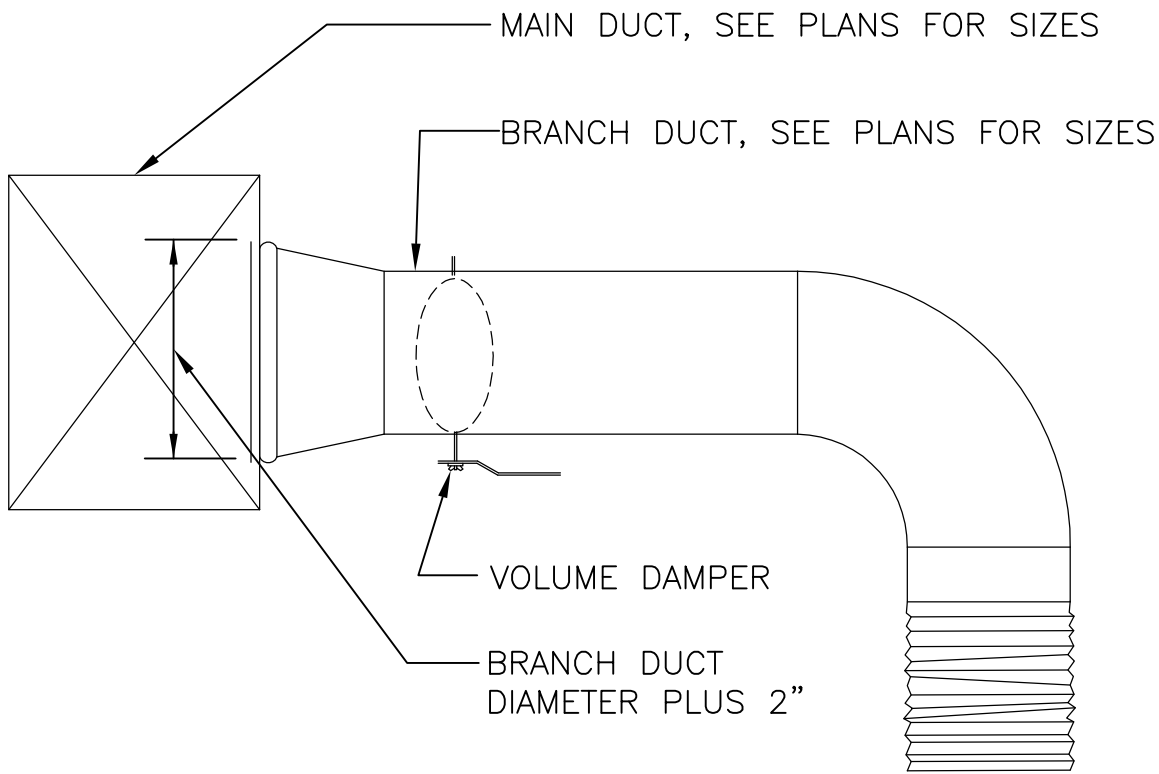


LONG FLAT SPANS ON OVAL DUCT HAVE A TENDENCY TO SAG. OVAL DUCT WITH A MAJOR AXIS OF 42 INCHES OR MORE SHALL BE REINFORCED PER SMACNA HVAC DUCT CONSTRUCTION STANDARDS TYPE 2.

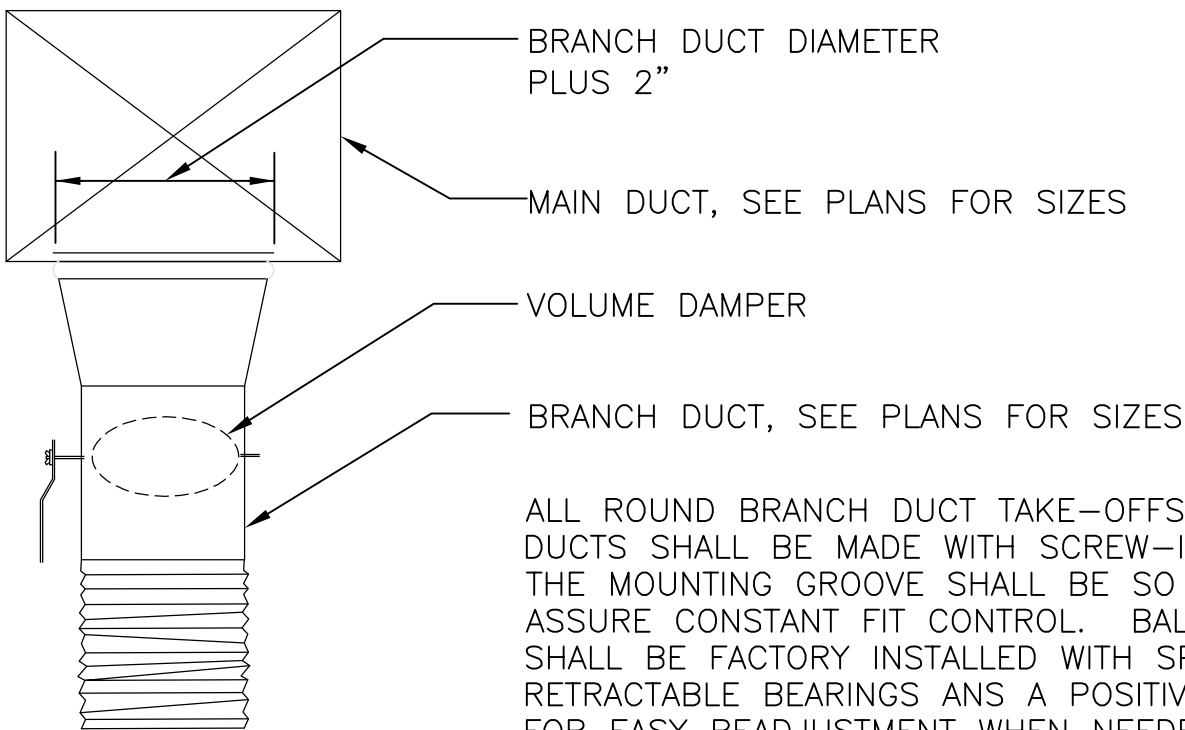
- NOTES:**
1. DO NOT EXCEED ALLOWABLE LOAD LIMITS OF ANY OR ALL OF THE INDIVIDUAL TRAPEZE PARTS.
 2. DO NOT PENETRATE DUCT OR DUCT INSULATION VAPOR BARRIER WHEN SECURING HANGERS TO DUCTWORK. EVENTUALLY THE PENETRATIONS WILL LEAK.
 3. USE HANGER CLAMPS OR BANDS FOR ROUND DUCT AS ROUND DUCT TENDS TO DEFORM ON TRAPEZE HANGERS.
 4. TEARS, PUNCTURES, ETC. SHALL BE REPAIRED WITH TAPE OR MASTIC TO MAINTAIN THE INTEGRITY OF THE VAPOR BARRIER.
 5. DO NOT USE ANY STRAP HANGERS WITH SCREWS ON ANY DUCTWORK THAT IS EXTERNALLY WRAPPED.

DUCT HANGING DETAIL

NTS



SIDE TAKE OFF

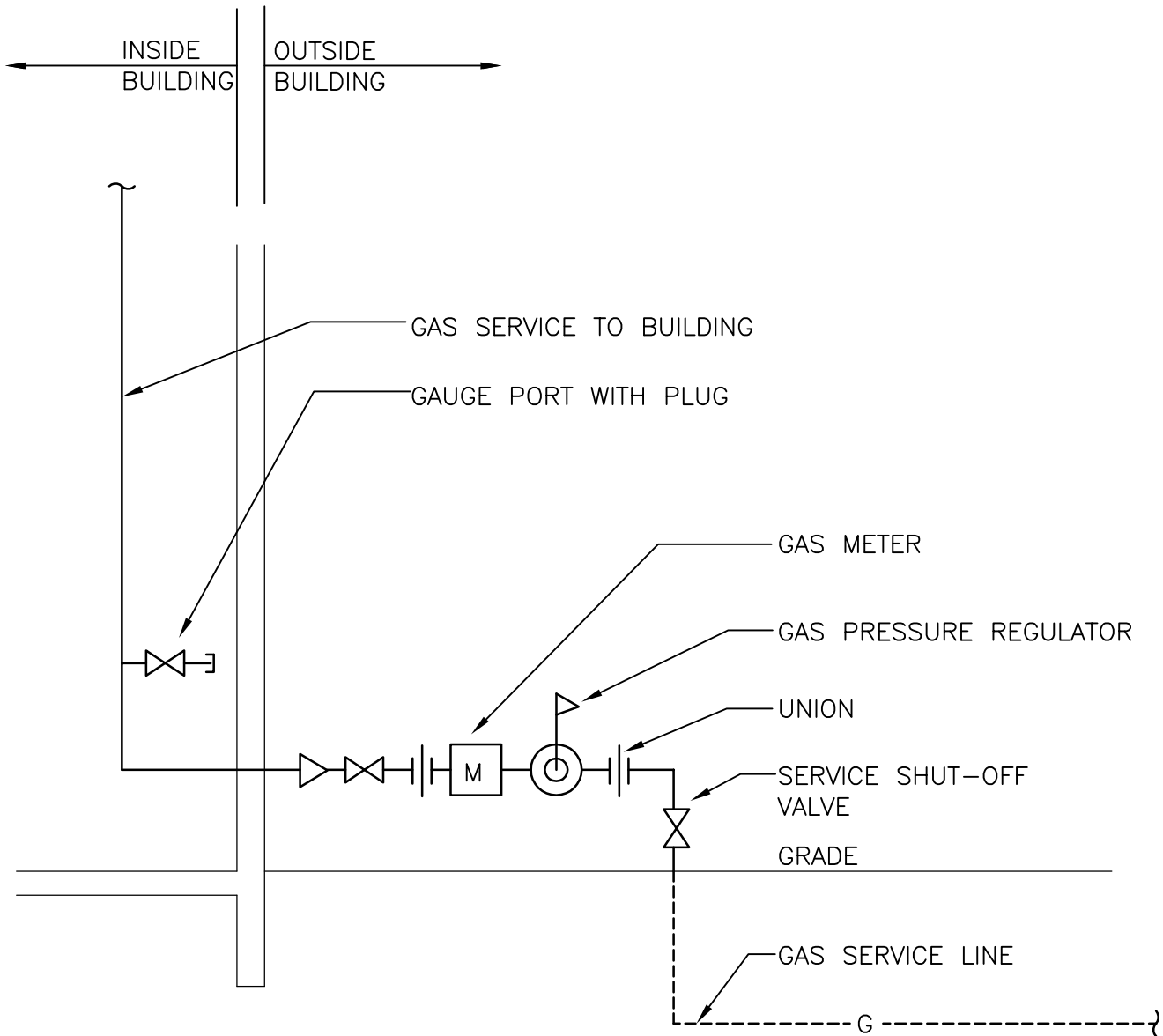


ALL ROUND BRANCH DUCT TAKE-OFFS FROM RECTANGULAR DUCTS SHALL BE MADE WITH SCREW-IN TYPE FITTINGS. THE MOUNTING GROOVE SHALL BE SO CONSTRUCTED AS TO ASSURE CONSTANT FIT CONTROL. BALANCING DAMPERS SHALL BE FACTORY INSTALLED WITH SPRING LOADED RETRACTABLE BEARINGS AND A POSITIVE LOCKING WING NUT FOR EASY READJUSTMENT WHEN NEEDED. FITTING SHALL BE MASTIC SEALED AND TAPERED

BOTTOM TAKE OFF

LOW VELOCITY ROUND DUCT TAKE-OFF FITTING DETAIL

C:\Users\TCARSON\Desktop\DETAILS\Details 1-208 Converted to HDR Standard Format\Plumbing\Gas\15000C089.DWG, PRINT, 12/5/2016 4:22:40 PM, TCARSON



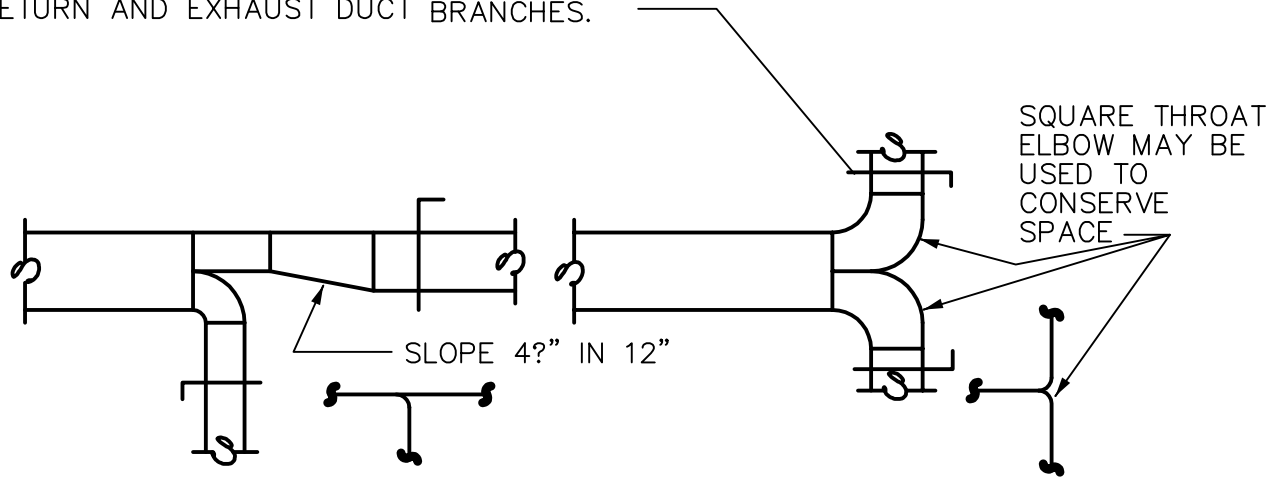
GAS SERVICE ENTRANCE DETAIL

NTS

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NOTE:

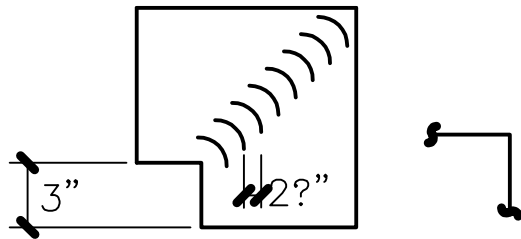
INSTALL MANUAL VOLUME DAMPERS
IN ALL LOW PRESSURE SUPPLY,
RETURN AND EXHAUST DUCT BRANCHES.



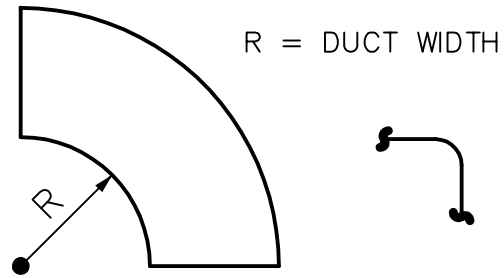
SQUARE THROAT
ELBOW MAY BE
USED TO CONSERVE
SPACE

RECTANGULAR BRANCH TAKE-OFF

RECTANGULAR TEE



SQUARE THROAT ELBOW



FULL RADIUS ELBOW

NOTE: SEE "BRANCH TAKEOFF & DAMPER" DETAIL, ALSO

LOW PRESSURE DUCT CONN. DETAIL

NTS

15000C283