

CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

SWWRF NITROGEN REMOVAL



PREPARED FOR:

MANATEE COUNTY UTILITIES
MANATEE COUNTY, FL

VOLUME 2 OF 3
STANDARD DETAILS

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CH2MHILL

CH2M HILL
Project No. 457133

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CONSTRUCTION DOCUMENTS
ISSUED FOR BID

Standard Details Index

SWWRF NITROGEN REMOVAL

Manatee County, Fl

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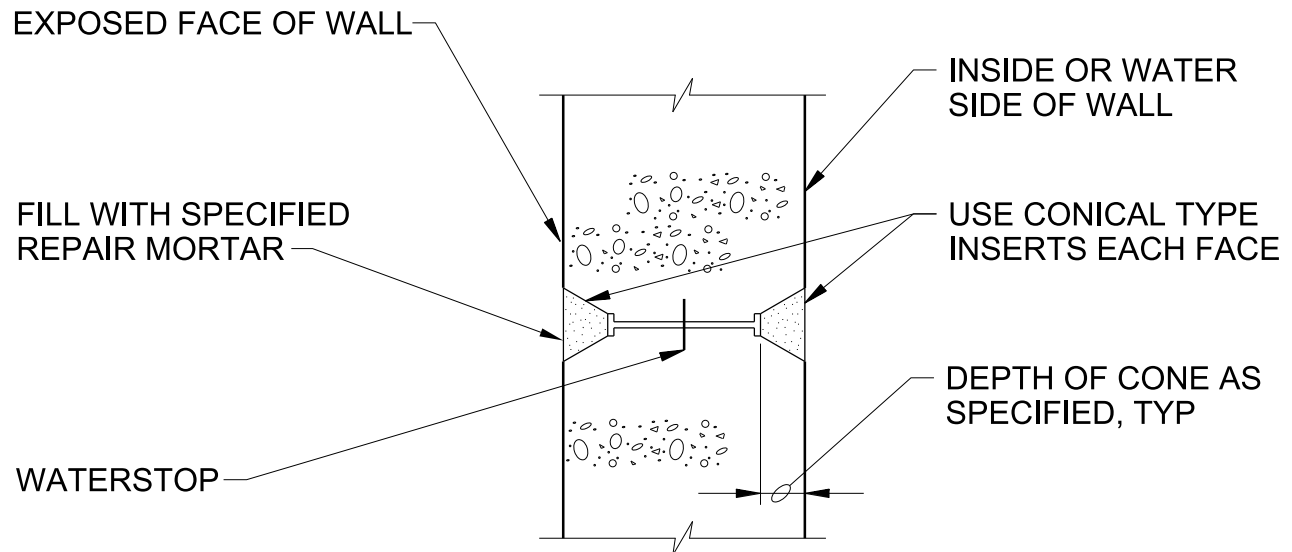
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Detail	Description
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NOTES:

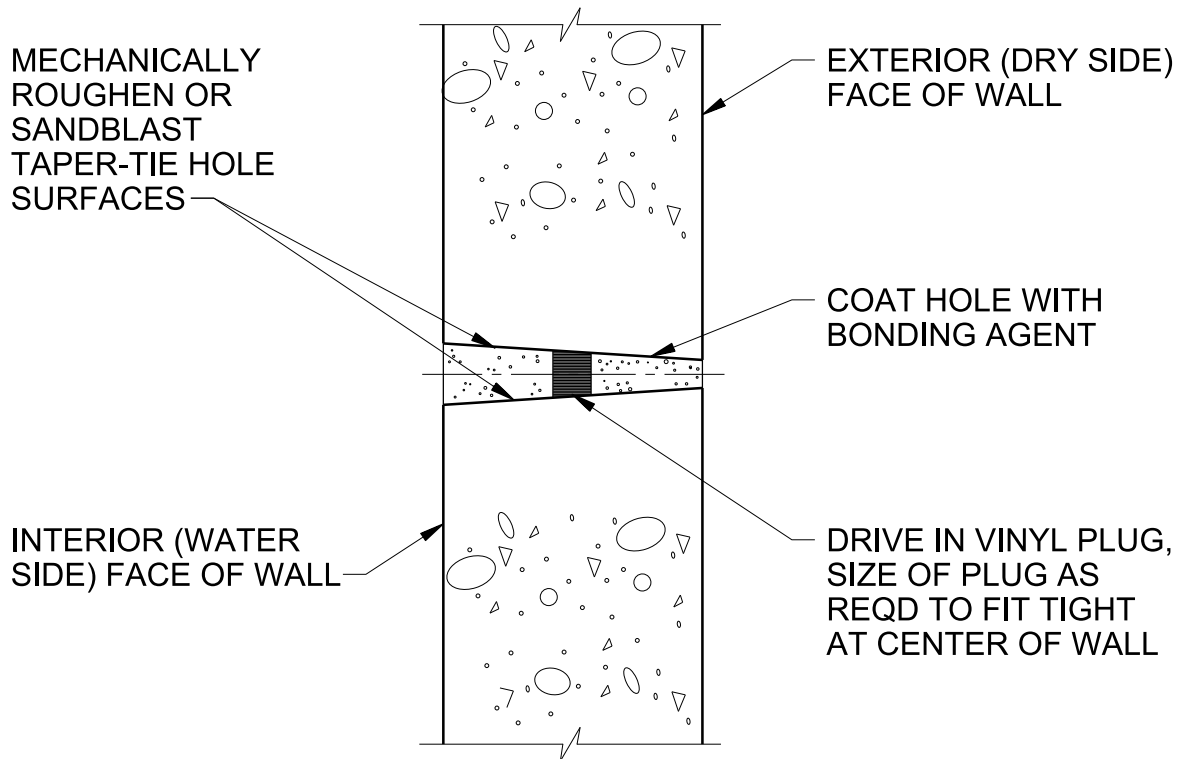
1. THE SPACING OF FORM TIES ON EXPOSED PORTIONS OF WALLS SHALL BE APPROXIMATELY EQUAL HORIZONTALLY AND VERTICALLY AND SHALL BE UNIFORM IN EACH DIRECTION.

FORM SNAP-TIE HOLE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0310-051

**NOTE:**

MINIMUM HOLE DIAMETER AT EXTERIOR FACE = 1". TAPER HOLE SO THAT MINIMUM HOLE DIAMETER AT INTERIOR FACE = 1 1/4"

CONSTRUCTION STEPS:

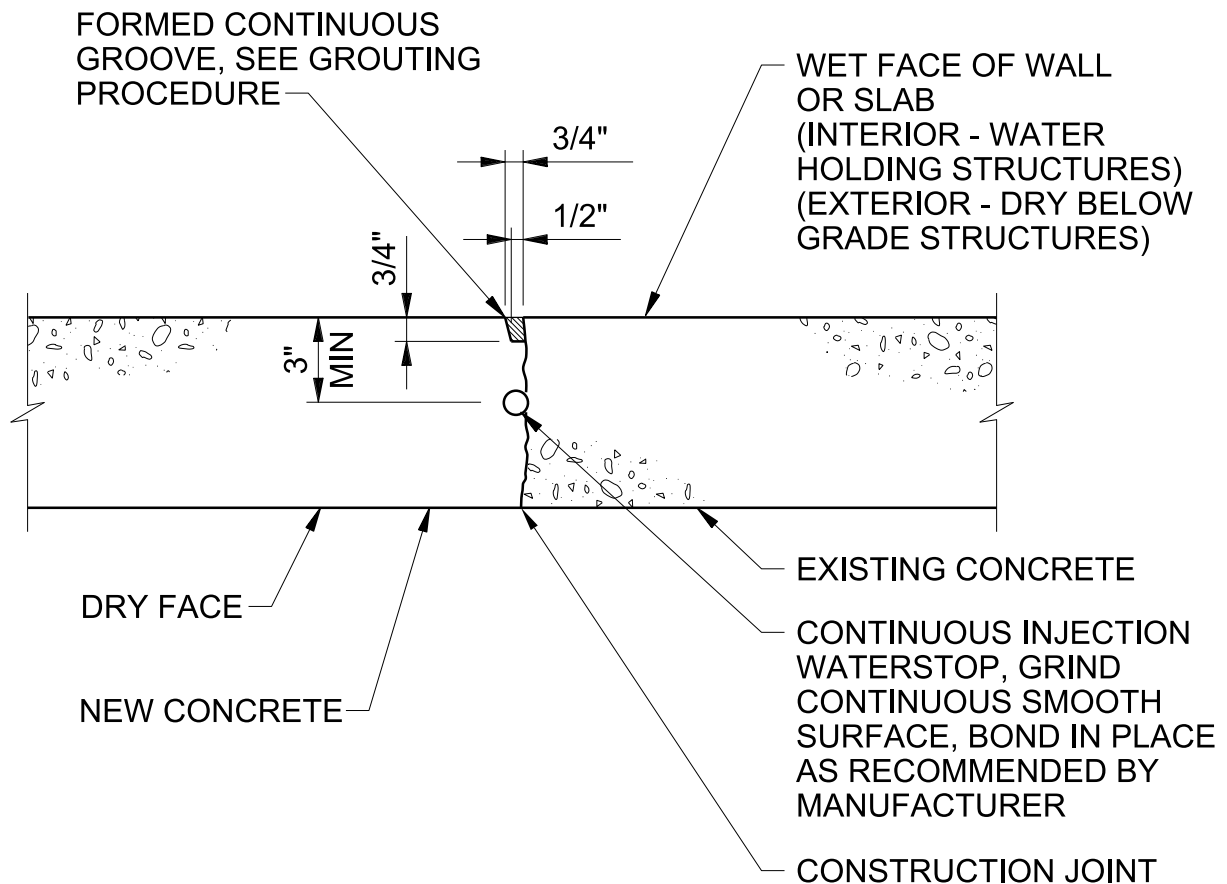
1. SANDBLAST OR MECHANICALLY ROUGHEN WITH ELECTRIC EQUIPMENT.
2. DRIVE IN VINYL PLUG.
3. COAT HOLE WHILE BONDING AGENT IS TACKY.
4. USE CONCRETE REPAIR MORTAR.

ALTERNATE FORM TIE-THROUGH BOLT

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0310-052

**NOTE:**

FOR USE IN NON-MOVING CONSTRUCTION JOINTS AND ONLY WHERE SPECIFICALLY INDICATED ON PLANS.

GROUTING PROCEDURE:

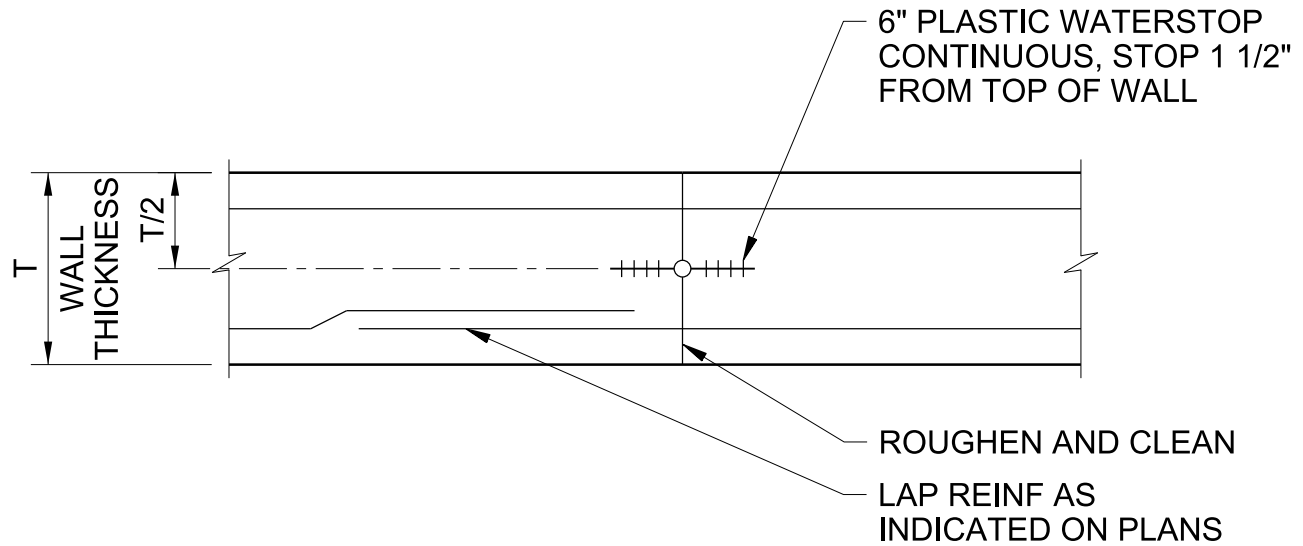
1. WAIT UNTIL NEW CONCRETE MINIMUM 28 DAYS OLD PRIOR TO GROUTING GROOVE.
2. ROUGHEN AND CLEAN SURFACES OF GROOVE WITH POWER WIRE BRUSH OR SANDBLASTING.
3. SATURATE AREA FOR 24 HOURS PRIOR TO GROUTING.
4. DRY PACK WITH TYPE II NON-SHRINK GROUT.
5. USE STEEL HAMMER AND STEEL TOOL TO DENSELY PACK GROUT INTO GROOVE.
6. WATER CURE GROUT FOR 4 DAYS MINIMUM.

INJECTION WATERSTOP

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0315-003

PLANNOTES:

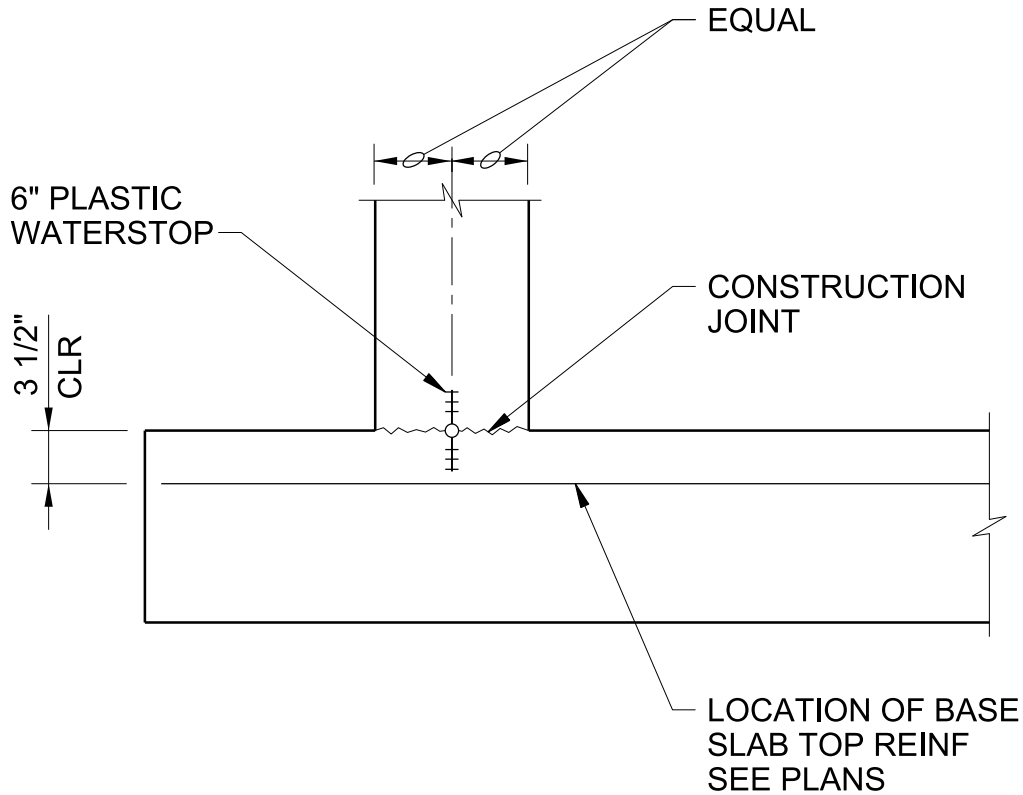
1. ALL REINFORCING CONTINUOUS ACROSS JOINT.

WALL VERTICAL CONSTRUCTION JOINT

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0315-151

**NOTES:**

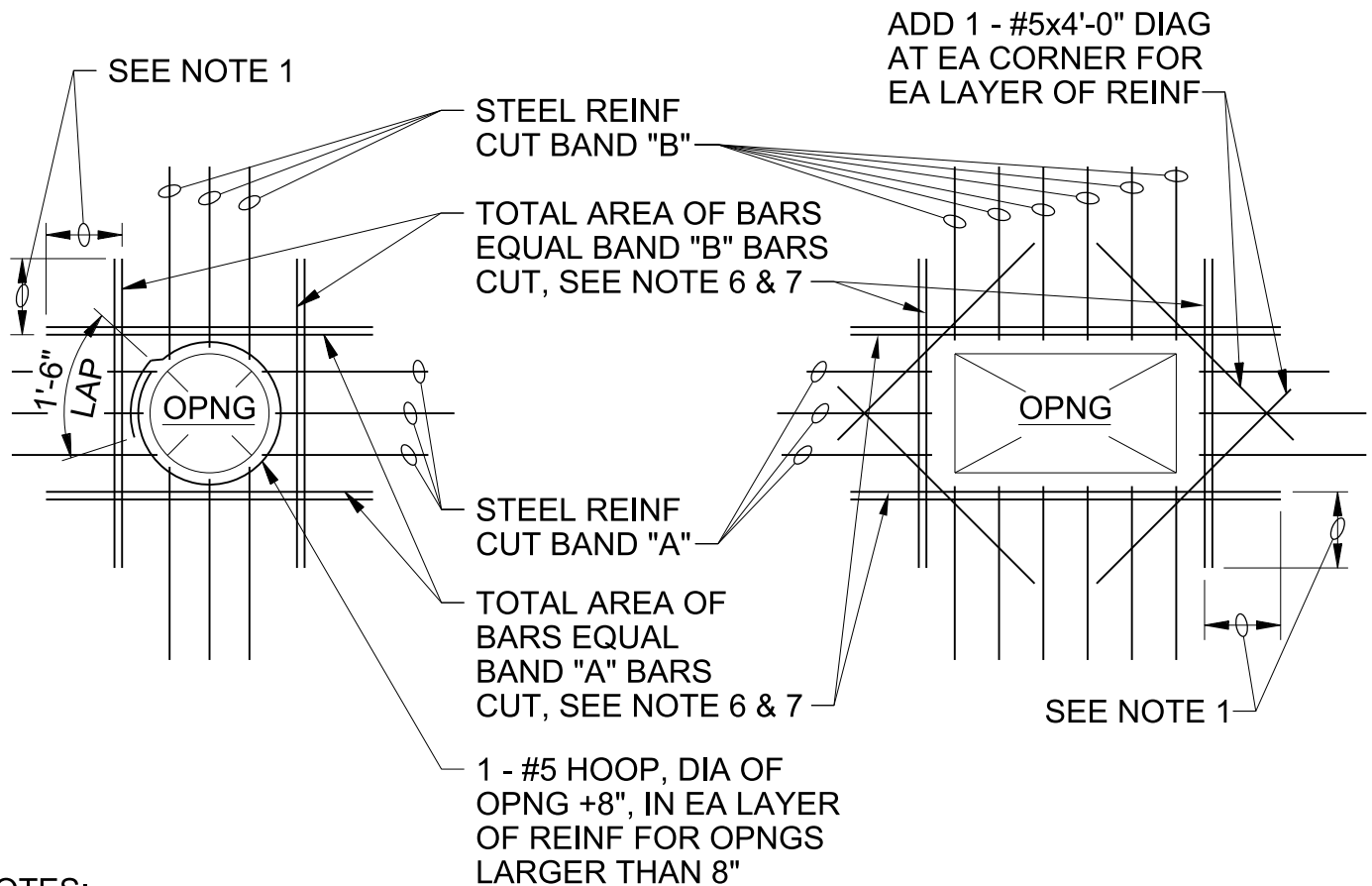
1. FOR WALLS WITH SINGLE MAT OF REINFORCING LOCATE WATERSTOP ON LIQUID FACE, 1" CLEAR OF REINFORCEMENT.
2. SECURE WATERSTOP IN-PLACE AS SPECIFIED.

WALL BASE CONSTRUCTION JOINT

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0315-154



NOTES:

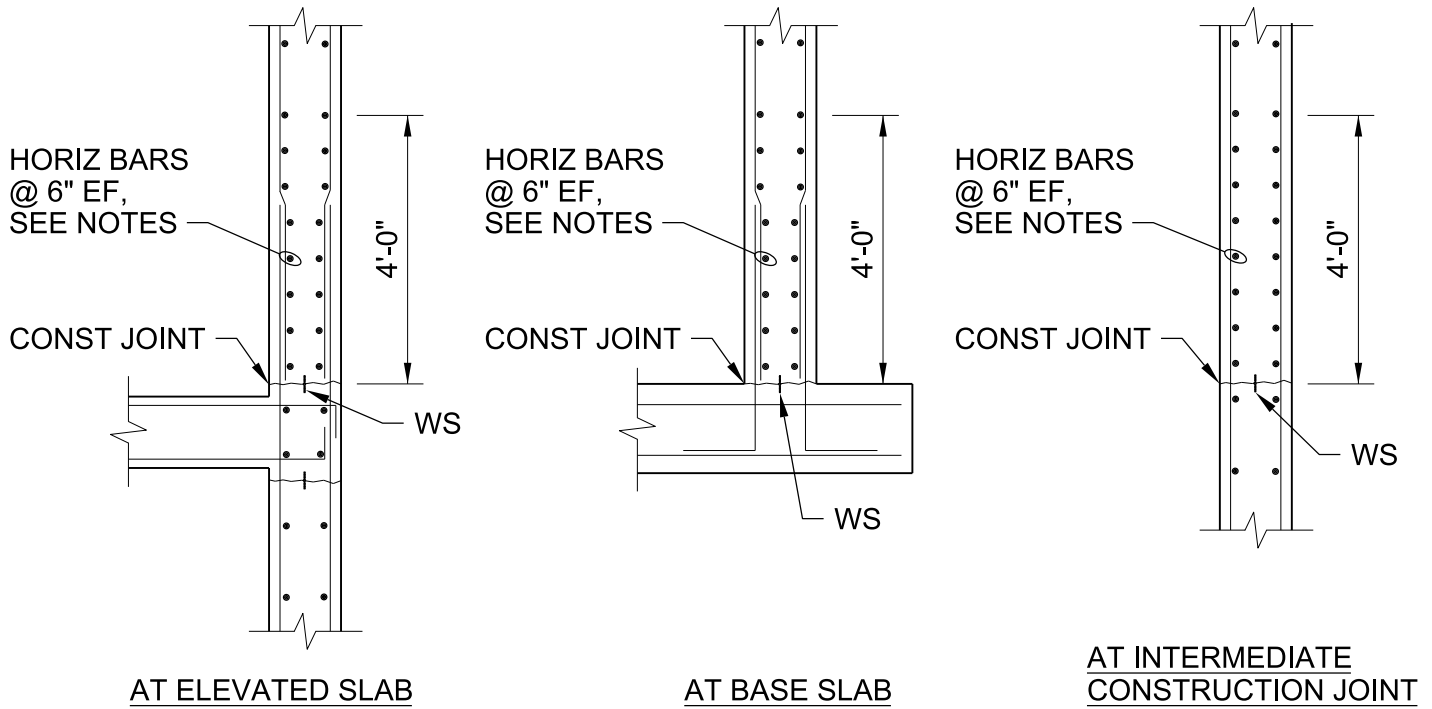
1. PROVIDE MINIMUM LAP, SEE GENERAL STRUCTURAL NOTES.
2. TYPICAL FOR ALL OPENINGS IN CONCRETE WALLS OF BELOW GRADE AND HYDRAULIC STRUCTURES AND ALL STRUCTURAL CONCRETE SLABS UNLESS INDICATED OTHERWISE ON PLANS.
3. DO NOT WELD REINFORCEMENT TO PIPE SLEEVES AND INSERTS.
4. PROVIDE A MINIMUM OF 2 "A" BARS AND 2 "B" BARS EACH SIDE OF OPENING (1 EACH FACE), INCLUDING DOWELS AND CORNER BARS, TYPICAL.
5. FOR OPENINGS LARGER THAN 8'-0", REINFORCE SAME AS FOR 8'-0" OPENINGS.
6. SPACE AT 3 BAR DIAMETERS (OR 3" MINIMUM) ON CENTER. LOCATE HALF OF TOTAL AREA ON EACH SIDE OF OPENING.
7. AT OPENINGS WITHIN 12" OF AN INTERSECTING WALL OR SLAB, PROVIDE ONLY THE EXTRA REINFORCEMENT WHICH WILL FIT, AT THE BAR SPACING IN NOTE 6.

OPENING REINFORCING

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0330-001



NOTES:

1. PROVIDE HORIZONTAL BARS AT 6" SPACING EACH FACE IN THE FIRST 4'-0" ABOVE ALL HORIZONTAL WALL CONSTRUCTION JOINTS IN LIQUID CONTAINING AND BELOW-GRADE STRUCTURES. WHERE TYPICAL WALL HORIZONTAL BARS ARE AT 12" SPACING, PROVIDE ADDITIONAL BARS FOR 6" SPACING.
2. HORIZONTAL BAR SIZE FOR THE 4'-0" ZONE SHALL BE THE TYPICAL WALL HORIZONTAL BAR SIZE SHOWN ON THE DRAWINGS OR THE MINIMUM BAR SIZE IN THE TABLE BELOW, WHICHEVER IS GREATER.

WALL THICKNESS (INCHES)	MINIMUM BAR SIZE
10	#5
12, 14	#6
16, 18, 20	#7
≥22	#8

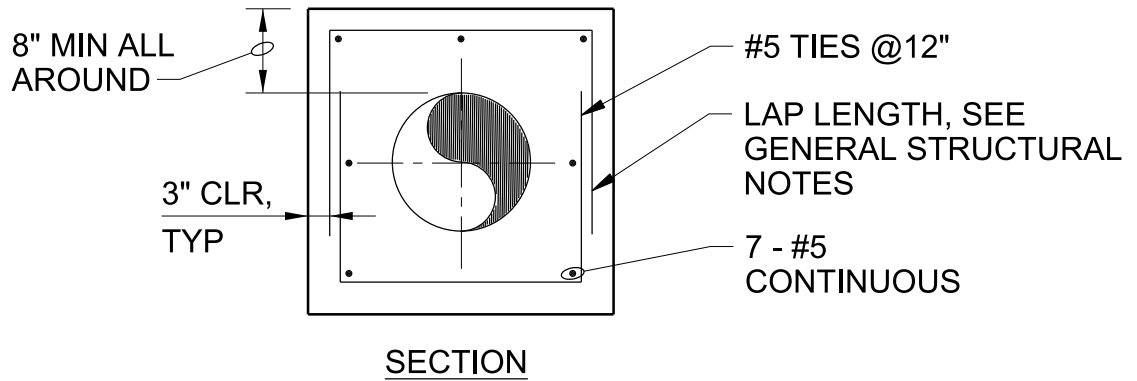
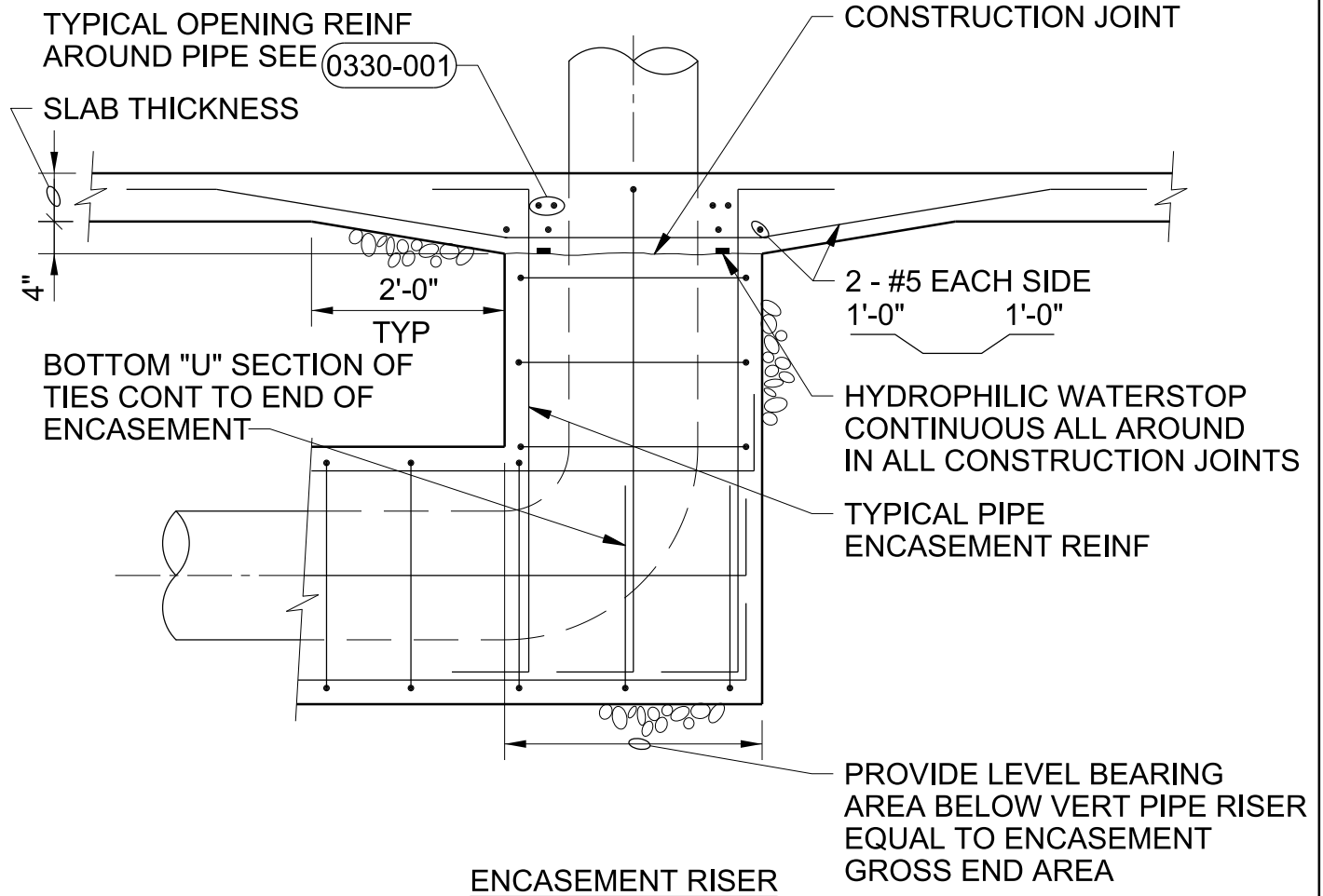
3. PROVIDE CORNER BARS AT 6" SPACING EACH FACE TO LAP WITH THE BARS SHOWN ABOVE, SEE PLANS.

REINFORCING AT HORIZONTAL CONSTRUCTION JOINT

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0330-004



NOTES:

- SECTION APPLIES TO PIPES W/ DIAMETERS 18" AND SMALLER. FOR 20" DIAMETER PIPES AND LARGER, SEE (0330-017)

PIPE ENCASEMENT

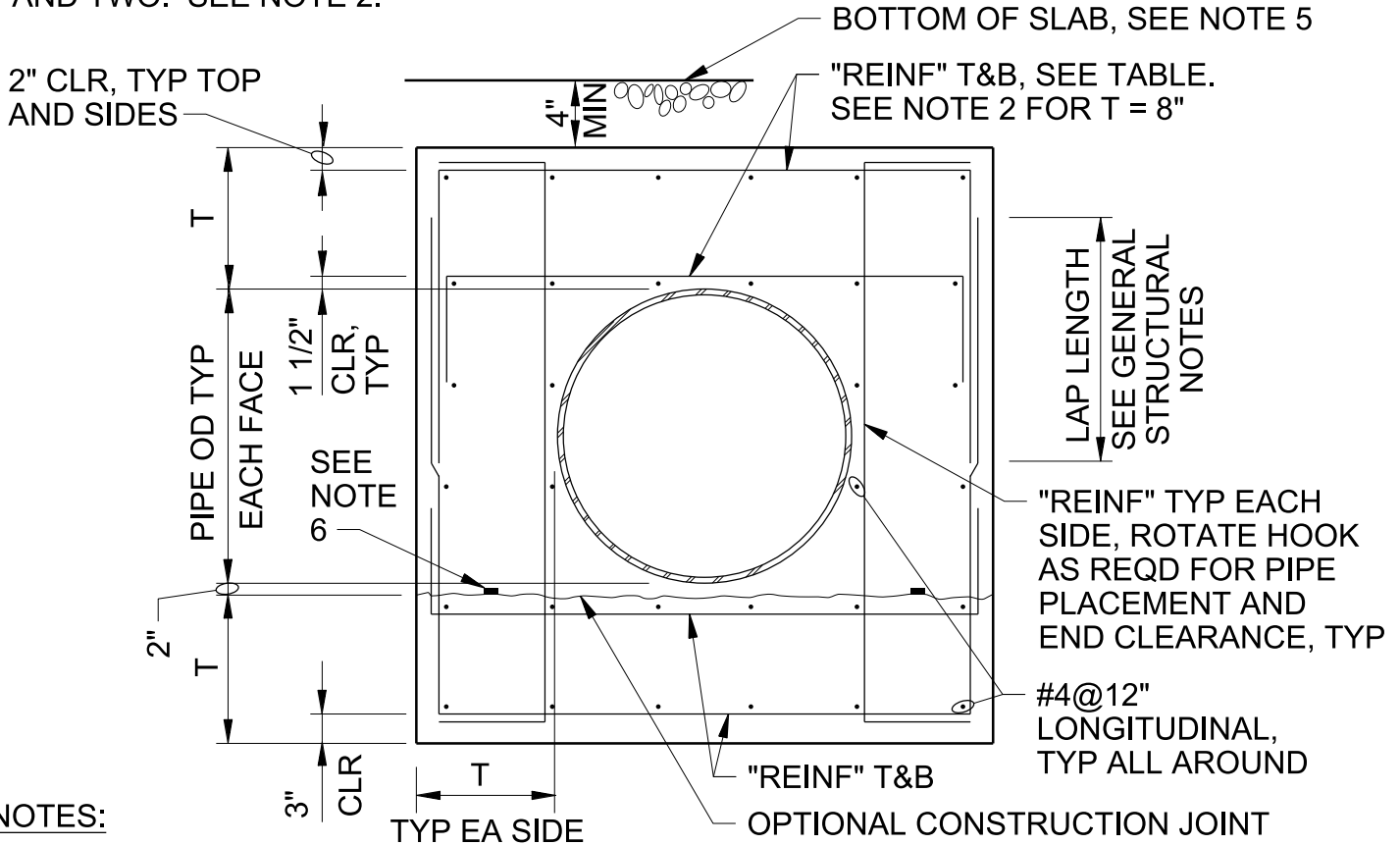
NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0330-016

PIPE ENCASEMENT TABLE								
PIPE DIA (IN.)	H=10 FEET		H=20 FEET		H=30 FEET		H=40 FEET	
	T (in)	REINF	T (in)	REINF	T (in)	REINF	T (in)	REINF
20 THRU 30	8	#5@12"	10	#5@12"	10	#5@12"	10	#6@12"
36 THRU 42	10	#5@12"	10	#6@12"	10	#7@12"	10	#6@6"
48 THRU 54	10	#6@12"	10	#7@12"	10	#7@6"	12	#7@6"
UP TO 66	10	#6@12"	10	#6@6"	14	#7@6"	14	#7@6"

HEAVY DARK LINE INDICATES BREAK BETWEEN ONE LAYER OF REINFORCING AND TWO. SEE NOTE 2.



NOTES:

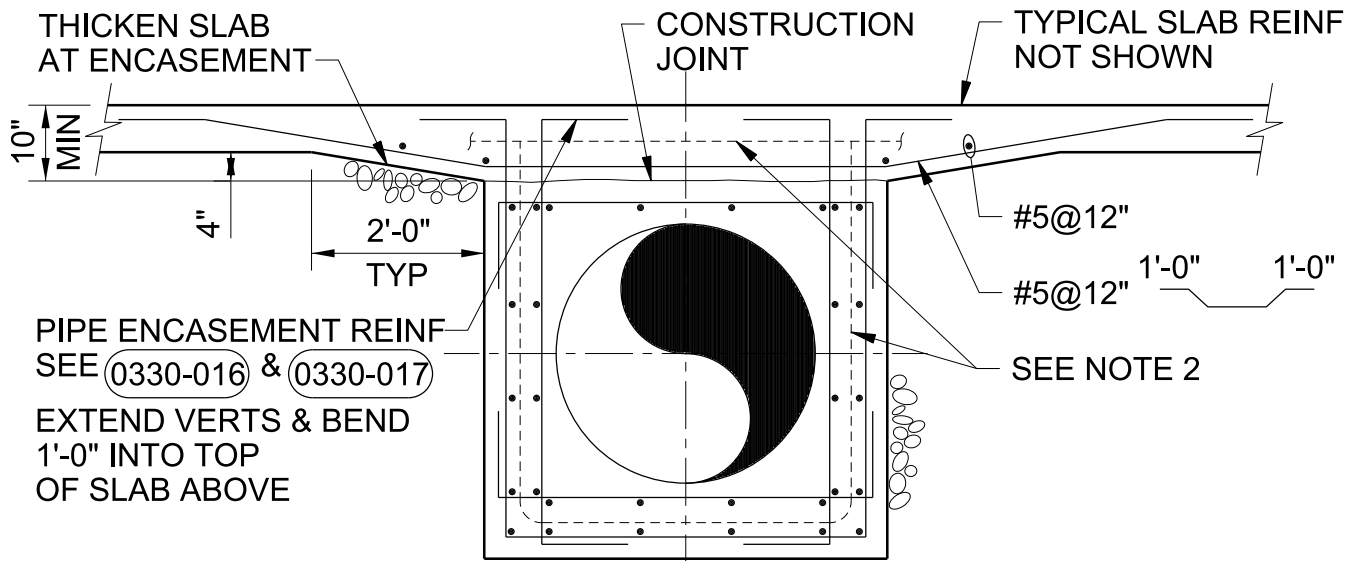
1. THIS DETAIL APPLIES TO PIPE DIAMETER OF 20" AND LARGER. FOR SMALLER THAN 20", SEE DETAIL (0330-016) .
2. FOR T=8" REINFORCING SHALL BE ONE LAYER AND CENTERED IN SLABS OR WALLS. SIM (0330-016) .
3. FOR ENCASEMENT AT PIPE RISER, SEE (0330-016) .
4. "H" IS FILL HEIGHT OR WATER DEPTH OR COMBINATION ABOVE PIPE.
5. WHEN PIPE ENCASEMENT CLOSER THAN 4" TO SLAB ABOVE, FILL SPACE WITH CONCRETE.
6. HYDROPHILIC WATERSTOP CONTINUOUS ALL AROUND IN ALL CONSTRUCTION JOINTS.

PIPE ENCASEMENT

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0330-017



THICKEN SLAB AT ENCASEMENT
 10" MIN
 4"
 2'-0" TYP
 PIPE ENCASEMENT REINF
 SEE (0330-016) & (0330-017)
 EXTEND VERTS & BEND
 1'-0" INTO TOP
 OF SLAB ABOVE

CONSTRUCTION JOINT

TYPICAL SLAB REINF NOT SHOWN

#5@12"

#5@12" 1'-0" 1'-0"

SEE NOTE 2

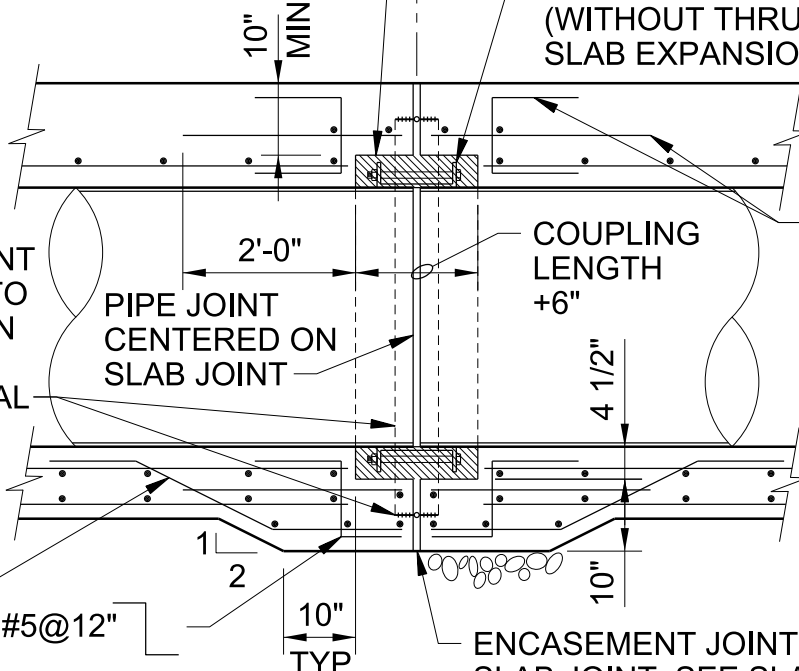
CLOSED CELLULAR SPONGE RUBBER ALL AROUND COUPLING TO ALLOW JOINT MOVEMENT (1" MIN)

SECTION

CL SLAB EXP, CONTRACTION OR CONTROL JOINT, SEE PLANS FOR LOCATION & JOINT TYPE

LOCATE PIPE FLEX COUPLING (WITHOUT THRUST TIES) AT ALL SLAB EXPANSION & CONTROL JOINTS

6" PLASTIC WATERSTOP IN ENCASEMENT JOINT. WELD TO WATERSTOP IN SLAB JOINT FOR CONT SEAL



#5@12" TYPICAL ENCASEMENT REINF DISCONTINUOUS AT JOINT

#5@12", TYP

#5@12"

10" TYP

ENCASEMENT JOINT TYPE SAME AS SLAB JOINT, SEE SLAB JOINT DETAILS

NOTES:

JOINT DETAIL

1. TIE PIPE ENCASEMENT TO SLAB AS SHOWN WHEN DISTANCE BETWEEN PIPE ENCASEMENT AND BOTTOM OF SLAB IS LESS THAN 4".
2. 6" PLASTIC WS IN ENCASEMENT JOINTS. WELD TO WS IN SLAB JOINTS.

PIPE ENCASEMENT AT SLAB

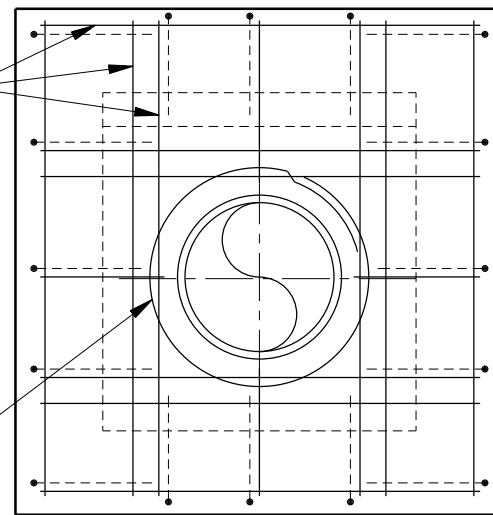
NTS

SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS
 MANATEE COUNTY, FL

0330-018

#5@12" EW
W/ 2 - #5@3"
T&B & EA
SIDE OF PIPE

#5 HOOP x
PIPE OD + 4"



ELEVATION

1/4"x1" HYDROPHILIC
WATERSTOP BONDED
TO SMOOTH SAWCUT
SURFACE OF EXST
WALL CONT ALL
AROUND

EXST WALL
REINFORCING,
SEE PIPE
PENETRATION
W/O CLOSURE
COLLAR

FORM 1/2"x3/4"x1"
DEEP RECESS FOR
DRYPACK GROUT
ALL AROUND

ROUGHEN
SURFACE

WATERSIDE
OF WALL

#5 12" DOWELS @
12" MAX SPG ALL
AROUND PERIMETER
OF CLOSURE COLLAR,
DRILL & EPOXY
GROUT 5 1/2" MIN
INTO EXST WALL

CONC
CLOSURE
COLLAR

6"+/-, TYP
7", TYP
2", TYP

SECTION

1'-0"
BACKFILLED
SIDE OF
WALL

NOTES:

1. SAW-CUT 1-INCH DEEP x PIPE OD + 12" SQUARE SCORE LINE ON EACH FACE OF WALL. (VERIFY DEPTH OF CUT TO CLEAR REINFORCING.) (INCREASE HEIGHT AS NOTED AT TOP ON WATERSIDE FACE FOR POURING.)
2. CHIP TO REMOVE THE CONCRETE WITHIN THE SCORE LINE, WHILE PRESERVING THE EXISTING WALL REINFORCING.
3. CUT EXISTING REINFORCING AT CENTER OF OPENING AND BEND TO CLEAR PIPE.
4. GRIND 1 1/2" WIDE x CONT SMOOTH SURFACE ALL AROUND THE OPENING AT CENTER OF WALL. CLEAN SURFACES AND BOND CONTINUOUS HYDROPHILIC WATERSTOP IN PLACE.
5. INSTALL WALL PIPE. (COAT CONCRETE ENCASED PORTION OF PIPE WITH SPECIFIED COATING SYSTEM.)
6. INSTALL ADDITIONAL REINFORCING EACH FACE, EACH SIDE, ABOVE AND BELOW PIPE. HORIZONTAL REINFORCING TO HAVE COMBINED AREA EQUAL TO AREA OF HORIZONTAL REINFORCING CUT. VERTICAL REINFORCING TO HAVE COMBINED AREA EQUAL TO AREA OF VERTICAL REINFORCING CUT.
7. SOAK CONCRETE SURFACES AND WITHIN 15-MINUTES CAST CONCRETE CLOSURE. (CONCRETE CLOSURE MUST BE CAST BEFORE HYDROPHILIC WATERSTOP EXPANDS.) FORM GROOVE ON ALL SIDES OF OPENING EXCEPT AT TOP ON THE POUR SIDE.
8. CLEAN SURFACES OF FORMED GROOVE WITH POWER WIRE BRUSH OR SANDBLASTING AND DRY-PACK WITH NON-SHRINK GROUT AFTER NEW CONCRETE MIN 28-DAYS OLD.

PIPE PENETRATION - EXISTING WALL

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0330-022

2" MIN ALL AROUND
OR AS REQUIRED BY
ANCHORAGE
CALCULATIONS

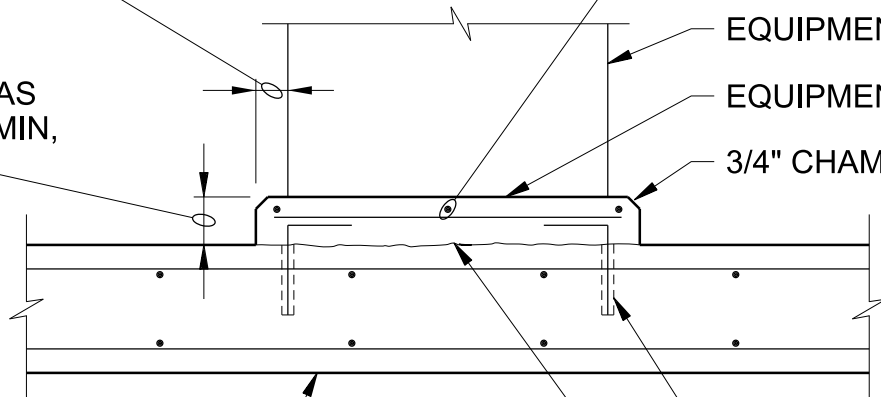
#3@12" EW, 1" CLR
FOR PAD HT < 4",
#4@12" EW, 1 1/2" CLR
FOR PAD HT > 4"

PAD HEIGHT AS
REQD, 3 1/2" MIN,
10" MAX

EQUIPMENT

EQUIPMENT PAD

3/4" CHAMFER, TYP



EXST OR NEW SUSPENDED
SLAB OR SLAB ON GRADE,
FOR THICKNESS SEE PLANS

#4 ADHESIVE DOWEL
@ 12" OC @ PERIMETER
(0330-105)

CONSTRUCTION JOINT,
ROUGHEN & CLEAN PRIOR
TO PLACING PAD

NOTES:

1. WHEN ANCHORAGE OF EQUIPMENT TO PAD IS REQUIRED, USE CONCRETE ANCHORS SPECIFIED.
2. CONCRETE PADS FOR ELECTRICAL EQUIPMENT SHALL BE 3 1/2" HIGH, UNLESS NOTED OTHERWISE.

TYPE E

GENERAL NOTE:

FOR GENERAL NOTES SEE DETAIL 4 OF 4.

CONCRETE EQUIPMENT PAD - TYPE E

NTS

DETAIL 1 OF 4

(0330-056)

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

CH2MHILL®

6" MIN, TYP UNLESS NOTED OTHERWISE ON PLANS

3/4" CHAMFER, TYP

THICKENED EDGE OF SLAB ALL AROUND

#5@12" EW AT 2" CLR FROM TOP SURFACE

EQUIPMENT

CONCRETE ANCHORS, SEE NOTE

FINISH GRADE

4" MIN
6" MIN

#5 CONT

6" MIN

NOTE:

WHEN ANCHORAGE OF EQUIPMENT TO PAD IS REQUIRED, USE CONCRETE ANCHORS SPECIFIED.

TYPE G

GENERAL NOTE:

FOR GENERAL NOTES SEE DETAIL 4 OF 4.

CONCRETE EQUIPMENT PAD - TYPE G

NTS

DETAIL 2 OF 4

0330-056

SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

CH2MHILL

6" MIN, TYP UNLESS NOTED OTHERWISE ON PLANS

3/4" CHAMFER, TYP

THICKENED EDGE OF SLAB ALL AROUND

#5@12" EW T&B

EQUIPMENT

CONCRETE ANCHORS, SEE NOTE

FINISH GRADE

10" MIN

4"

1'-0" MIN

1
1.5

6" MIN

2 - #5 CONT

NOTE:

WHEN ANCHORAGE OF EQUIPMENT TO PAD IS REQUIRED, USE CONCRETE ANCHORS SPECIFIED.

TYPE H

GENERAL NOTE:

FOR GENERAL NOTES SEE DETAIL 4 OF 4.

CONCRETE EQUIPMENT PAD - TYPE H

NTS

DETAIL 3 OF 4

SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0330-056

NOTES:

1. PAD SIZE SHALL BE MINIMUM INDICATED OR AS SHOWN ON THE PLANS OR AS INDICATED BY THE MANUFACTURER AND APPROVED BY THE ENGINEER.
2. THE SIZE, NUMBER, TYPE, LOCATION, AND THREAD PROJECTION OF THE ANCHOR BOLTS SHALL BE DETERMINED BY THE EQUIPMENT MANUFACTURER AND AS APPROVED BY THE ENGINEER. ANCHOR BOLTS SHALL BE HELD IN POSITION WITH A TEMPLATE OR OTHER ACCEPTABLE MEANS, MATCHING THE BASE PLATE, WHILE PAD IS BEING PLACED.
3. EQUIPMENT BASES SHALL BE INSTALLED LEVEL UNLESS INDICATED OTHERWISE.
4. WEDGES, SHIMS, OR LEVELING NUTS SHALL BE USED TO SUPPORT THE BASE WHILE THE NON-SHRINK GROUT IS PLACED. WEDGES OR SHIMS THAT ARE LEFT IN PLACE SHALL NOT BE EXPOSED TO VIEW.
5. HEIGHT OF PADS SHALL BE MINIMUM REQUIRED FOR ANCHOR BOLT CLEARANCE TO KEEP ANCHOR BOLT ABOVE SUPPORTING SLAB (SEE TABLE BELOW). WHERE EQUIPMENT OR PIPING ELEVATION REQUIRE A PAD HEIGHT LESS THAN THE MINIMUM SHOWN, USE TYPE "B" EQUIPMENT PAD WITH BLOCKOUT.
6. AT CONTRACTOR'S OPTION, CONCRETE ANCHORS MAY BE USED IN LIEU OF CAST-IN-PLACE ANCHOR BOLTS FOR EQUIPMENT ANCHOR BOLTS LESS THAN 3/4" DIAMETER WHEN APPROVED BY THE EQUIPMENT MANUFACTURER AND APPROVED BY THE ENGINEER. ANCHORS SHALL BE INSTALLED WITH 4" MINIMUM EDGE DISTANCE IN EACH DIRECTION.

AB DIA (IN.)	1/2	5/8	3/4	7/8	1	1 1/4	1 3/8	1 1/2	1 3/4	2
MIN PAD HT (IN.)	7	8 1/2	10	11	12 1/2	15	16 1/2	18	21	24

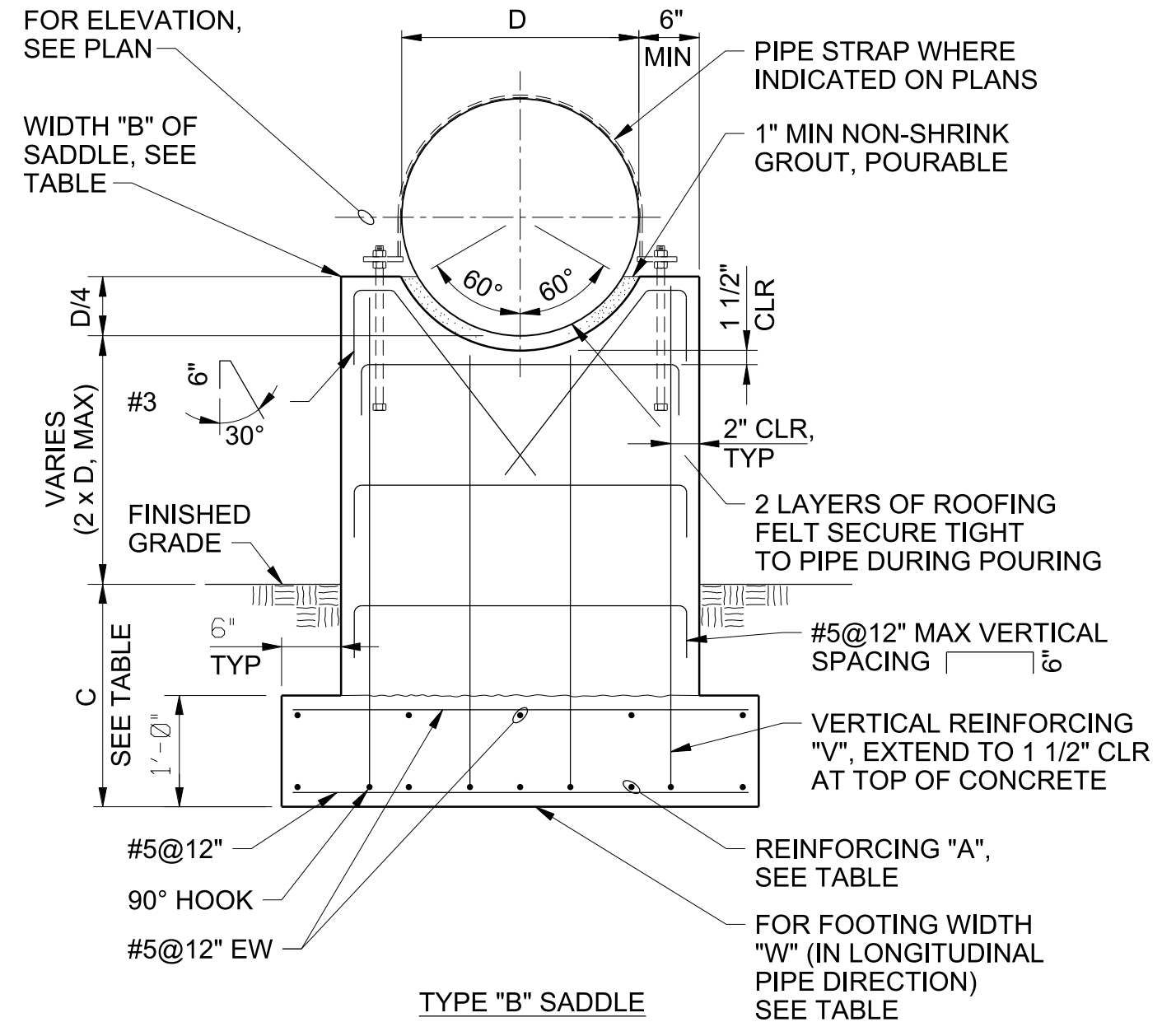
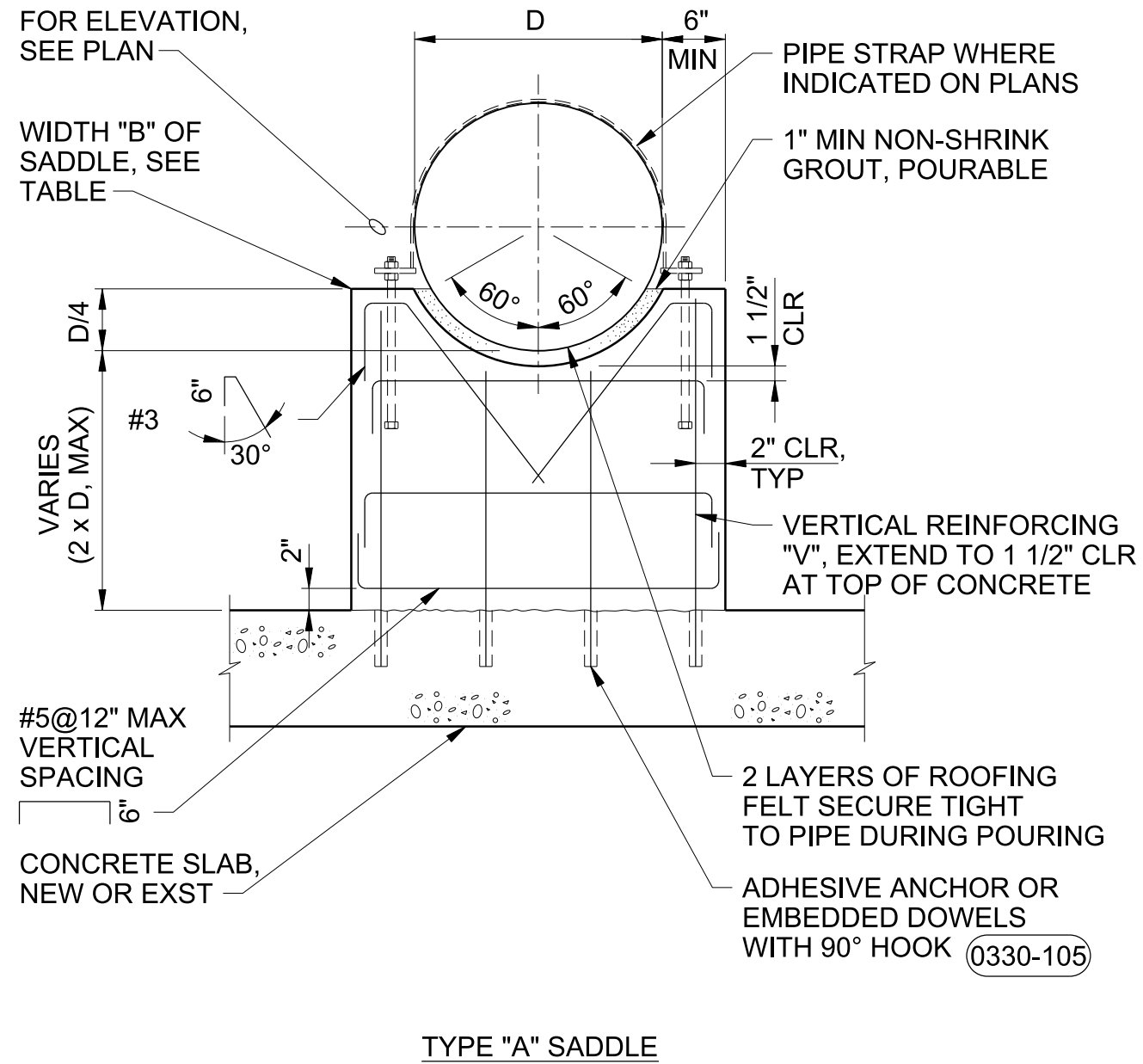
CONCRETE EQUIPMENT PAD - NOTES

NTS

DETAIL 4 OF 4

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0330-056



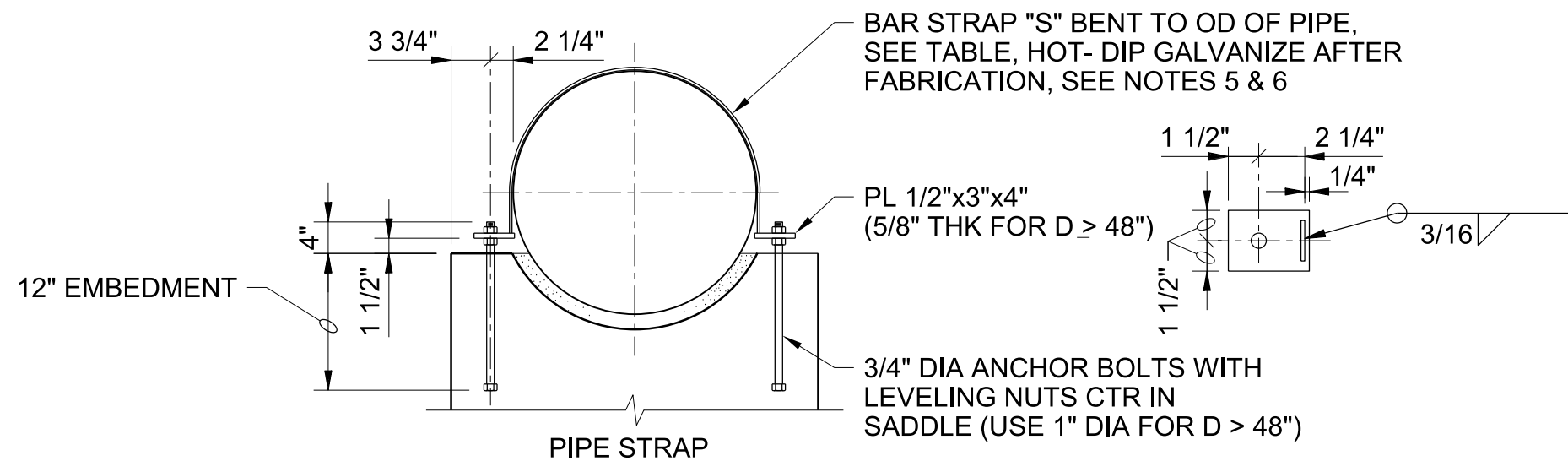
PIPE SUPPORT - CONCRETE SADDLE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL


DETAIL 1 OF 2

0330-061



PIPE SADDLE TABLE								
PIPE DIAMETER D	SADDLE WIDTH B	LAYERS OF REINFORCING	VERTICAL REINFORCING V	PIPE STRAP SIZE S	NO. OF STRAPS	FOOTING WIDTH W	REINFORCING A	FOOTING DEPTH C
D<12"	6"	1 (CTRD)	#5@12"	3/16"x2"	1	1'-6"	#5@12"	2'-0"
12"<D<24"	8"	1 (CTRD)	#5@12"	3/16"x2 1/2"	1	2'-0"	#5@12"	2'-0"
24"<D<36"	10"	2 (EF)	#5@12"	1/4"x2"	1	3'-0"	#5@12"	2'-0"
36"<D<48"	12"	2 (EF)	#5@12"	1/4"x3"	1	4'-0"	#5@12"	2'-0"
48"<D<60"	16"	2 (EF)	#6@12"	3/8"x3"	2	6'-0"	#5@6"	2'-0"
60"<D<72"	18"	2 (EF)	#6@12"	3/8"x3"	2	8'-0"	#5@6"	2'-0"

NOTES:

- FOR "B"=10" OR THICKER, USE 2 LAYERS OF REINFORCING, TURN HORIZONTAL BARS 90° TO HOOK AROUND VERTICALS  , 1 1/2" CLEAR OF CONCRETE
- FORM 3/4" BEVEL ON ALL EXPOSED CORNERS OF SUPPORT.
- USE TYPE 'A' SADDLE IN ALL LOCATIONS WHERE A SLAB (NEW OR EXISTING) OCCURS. USE TYPE 'B' IN OTHER LOCATIONS.
- FOR LOCATIONS WHERE PIPE STRAP IS REQUIRED, SEE DRAWINGS. UNLESS INDICATED OTHERWISE A STRAP IS NOT REQUIRED.
- AT SUBMERGED CONDITIONS, STRAP SHALL BE STAINLESS STEEL.
- PROVIDE 3/4" BY STRAP WIDTH PLUS 1" WIDE NEOPRENE PAD BELOW STRAP.

PIPE SUPPORT - CONCRETE SADDLE

NTS

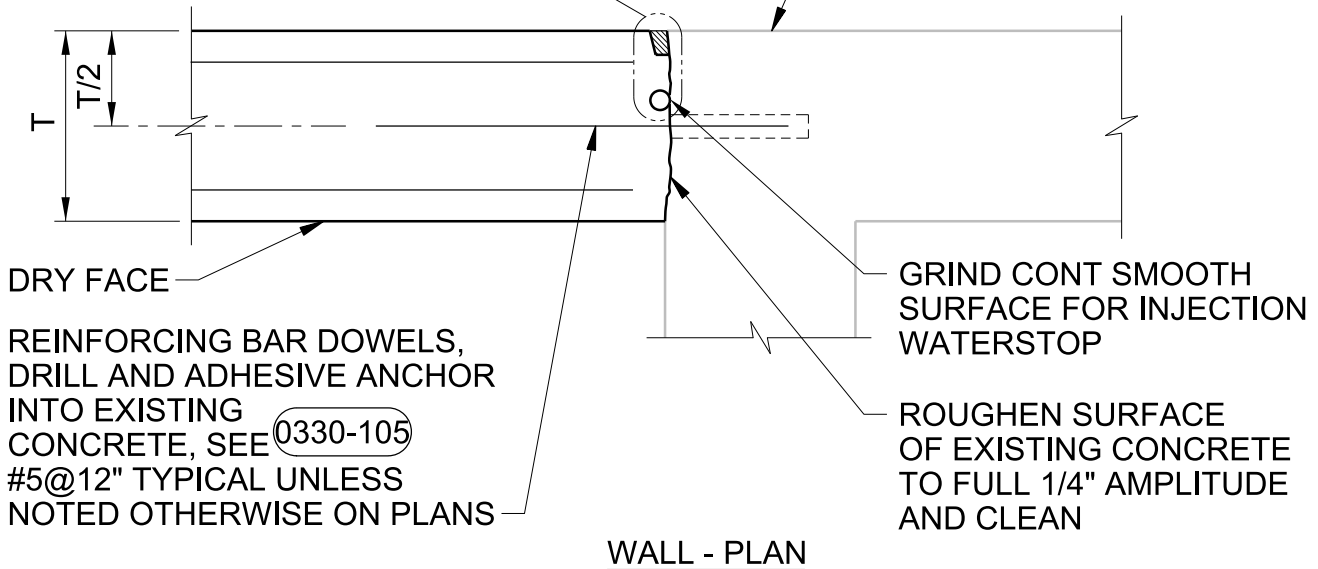
SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

DETAIL 2 OF 2

0330-061

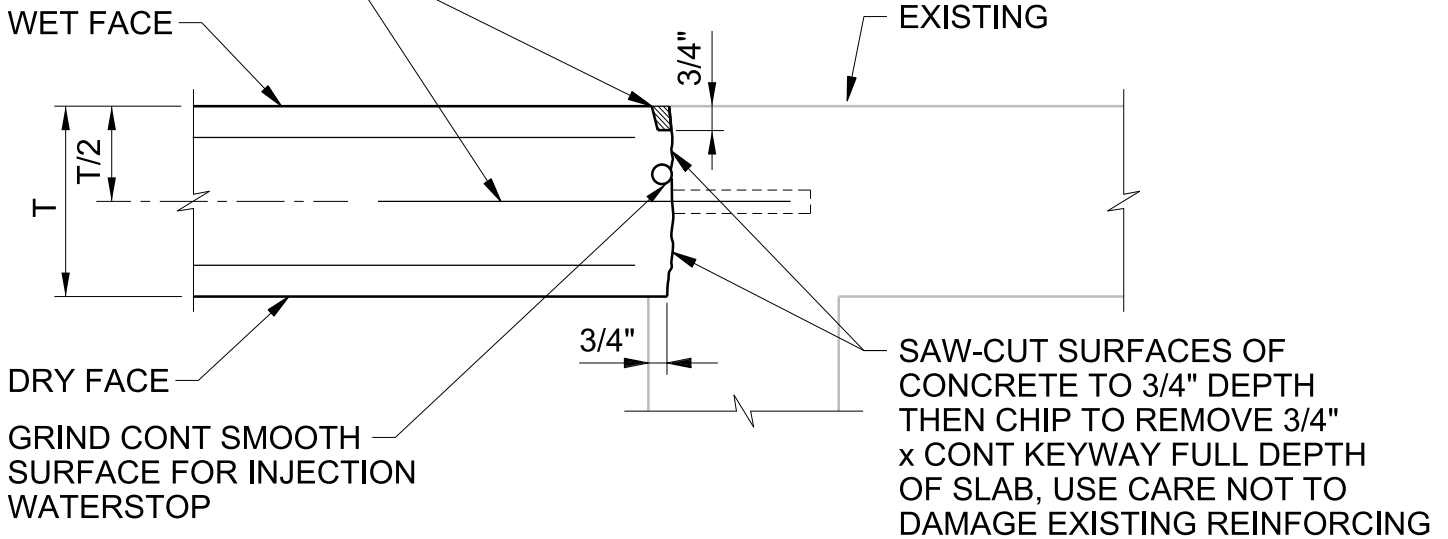
FOR ALL WATER HOLDING AND DRY BELOW GRADE STRUCTURES, SEE 0315-003

WET FACE OF WALL OR SLAB (INTERIOR - WATER HOLDING STRUCTURES) (EXTERIOR - DRY BELOW GRADE STRUCTURES)



WALL - PLAN

SEE NOTES ABOVE



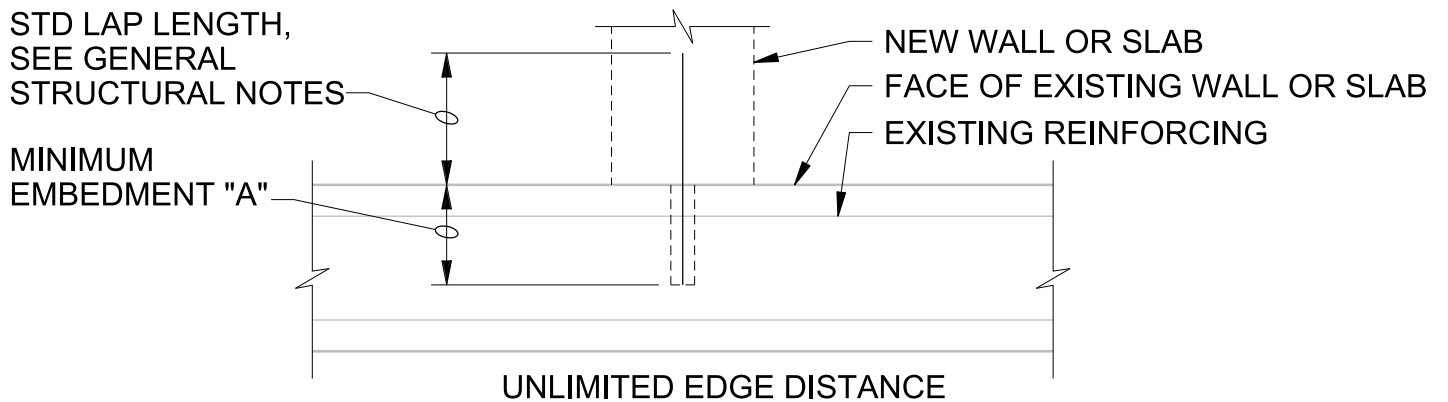
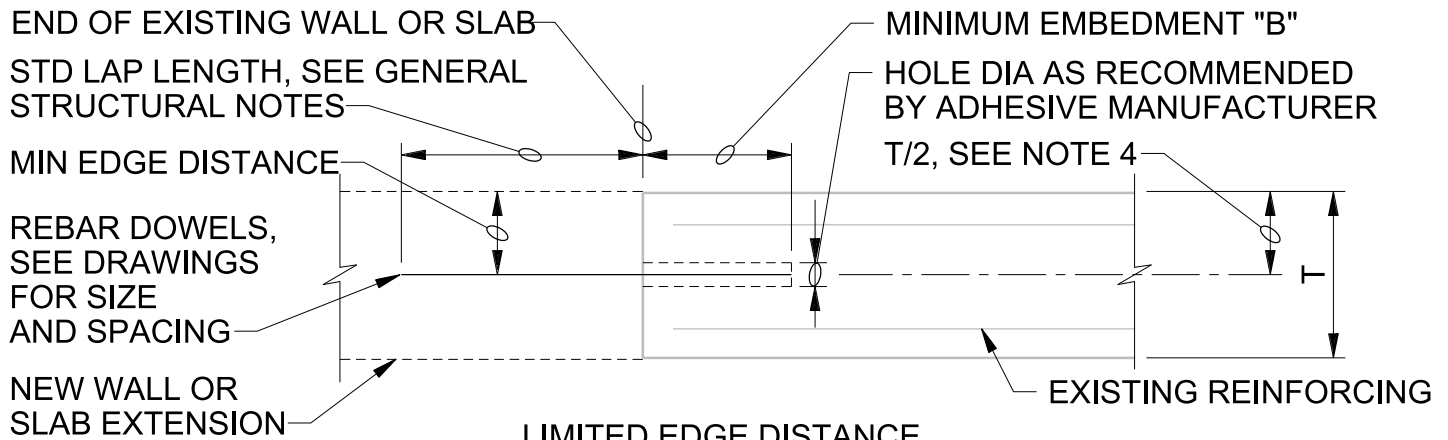
SLAB - SECTION

CONNECTION OF NEW CONCRETE TO EXISTING

NTS

SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0330-101



DOWEL SIZE	MINIMUM EDGE DIST	MINIMUM EMBEDMENT A	MINIMUM EMBEDMENT B
#3	2 1/2"	5"	8"
#4	3 1/2"	7"	11"
#5	4"	8"	13"
#6	5"	10 1/2"	16"
#7	6"	12 1/2"	20"
#8	7"	14"	22"
#9	7 1/2"	15"	24"

NOTES:

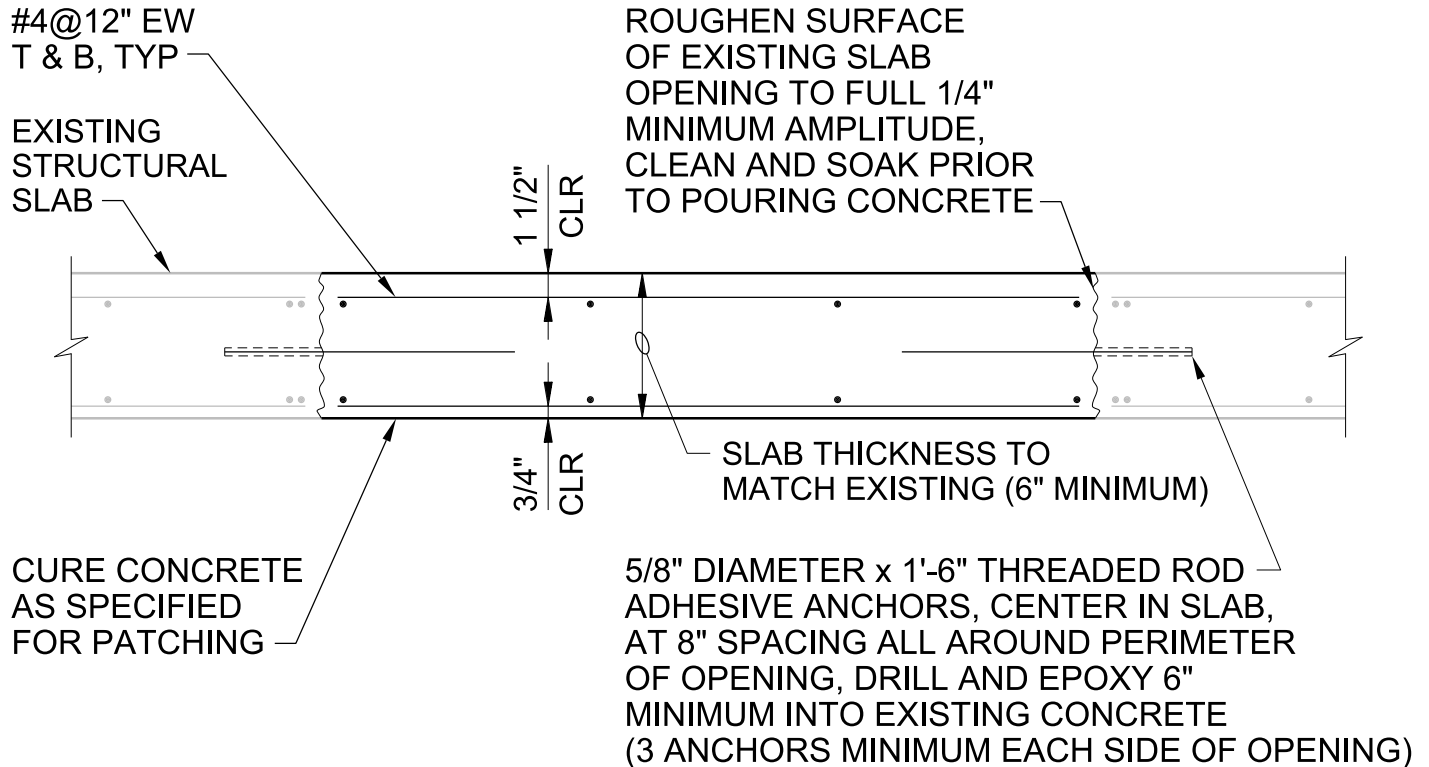
1. CONFORM TO THE REQUIREMENTS OF SPECIFICATION SECTION 03 63 00, CONCRETE DOWELING.
2. FOLLOW ADHESIVE MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION.
3. USE MINIMUM EMBEDMENTS SHOWN, EXCEPT USE MANUFACTURER'S MINIMUM RECOMMENDED EMBEDMENT IF GREATER.
4. LOCATE DOWELS CENTERED IN WALL OR SLAB UNLESS OTHERWISE NOTED ON DRAWINGS. WHERE 2 ROWS OF DOWELS INDICATED, STAGGER SPACING & LOCATE ALTERNATING DOWELS AT MINIMUM EDGE DISTANCE FROM OPPOSITE FACES.

ADHESIVE DOWEL

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0330-105

**NOTES:**

1. FOR 6" SLAB REPAIR, REINFORCE WITH #4@12" EW, 3" CLEAR FROM BOTTOM.

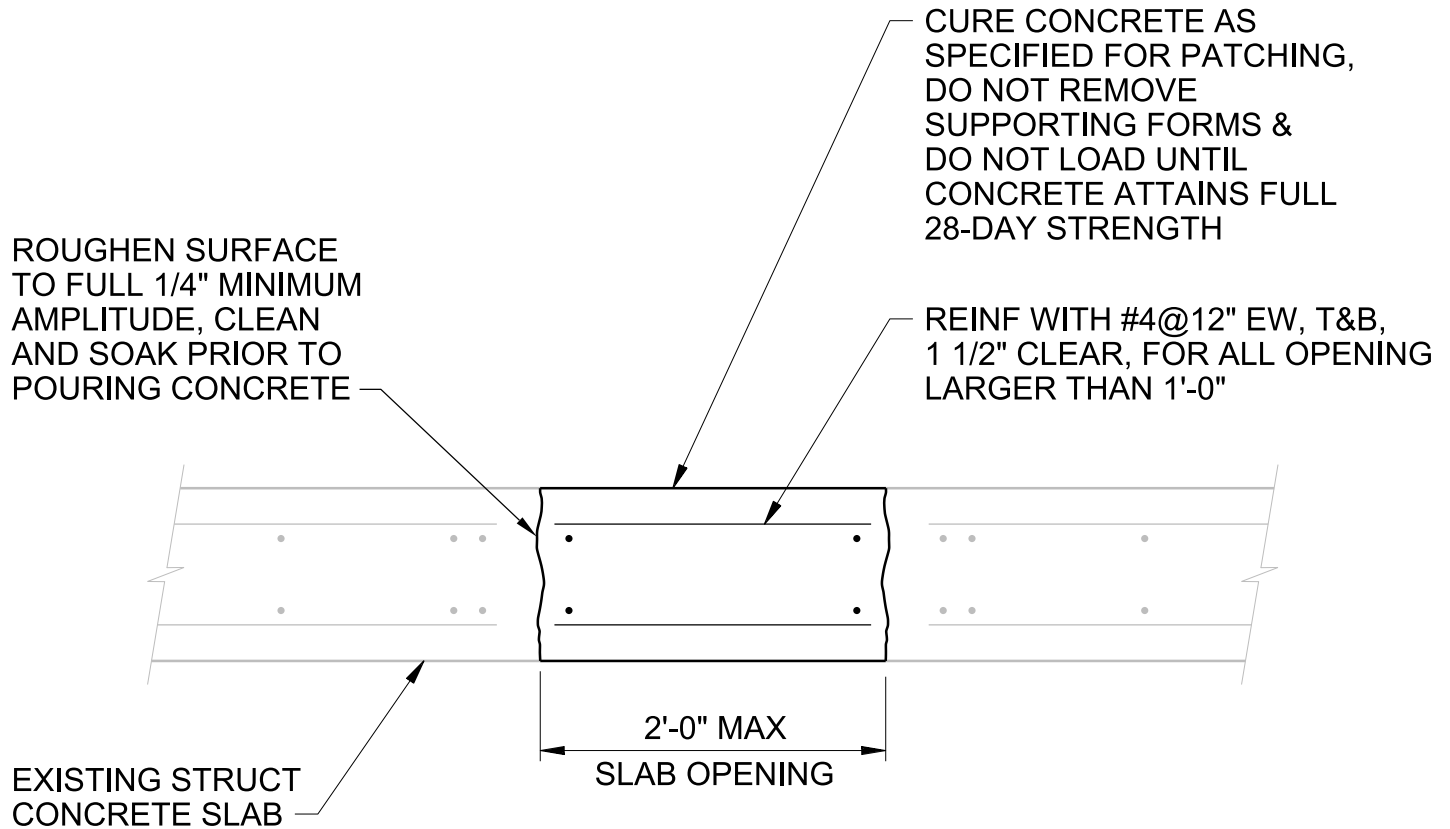
EXISTING SLAB OPENING REPAIR

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0330-141

CH2MHILL®

**NOTE:**

FOR REPAIR OF LARGER SLAB OPENINGS SEE (0330-141)

EXISTING SLAB OPENING REPAIR

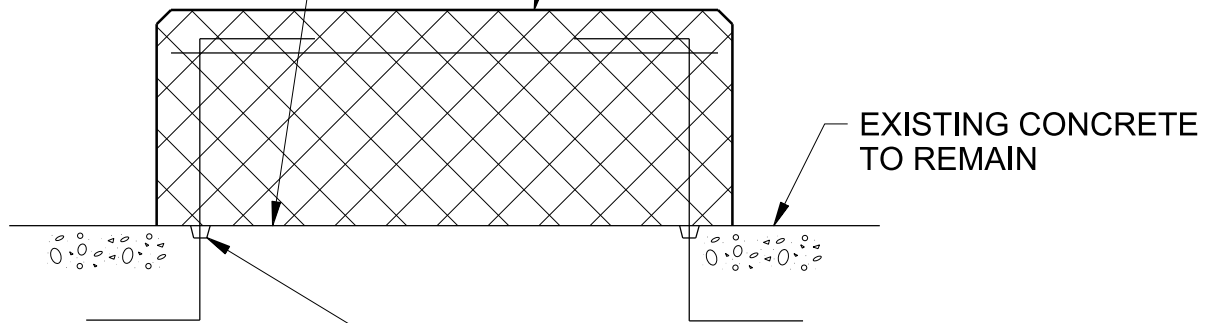
NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0330-142

FINISH SLAB OR WALL UNDER REMOVED CONCRETE TO MATCH EXISTING ADJACENT CONCRETE FINISH, REPAIR ROUGH OR DAMAGED SURFACES AS NOTED

SAW-CUT AND CHIP TO REMOVE EXISTING CONCRETE TO BE REMOVED, USE CARE NOT TO DAMAGE EXISTING ADJACENT CONCRETE SURFACES TO REMAIN



CORE DRILL 2" DIAMETER HOLE, 1 1/2" DEEP, AND CHIP AND GRIND TO REMOVE EXISTING REINFORCING AND EQUIPMENT ANCHORS TO 1 1/2" MIN BELOW TOP OF EXISTING CONCRETE TO REMAIN, CLEAN AND SOAK, AND DRY-PACK WITH REPAIR MORTAR

NOTES:

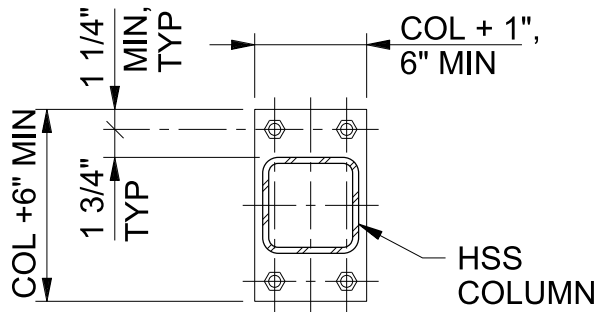
1. REMOVE CONCRETE OUT TO SOUND CONCRETE.
2. IF CHIPPING INTO THE SURFACE OF THE EXISTING SLAB OR WALL TO REMAIN IS REQUIRED, MAKE EDGES PERPENDICULAR TO THE SURFACE. DO NOT FEATHER EDGES.
3. FILL DEFECTIVE AREA WITH REPAIR MORTAR TO MATCH APPEARANCE OF ADJACENT CONCRETE SURFACES.
4. USE BONDING AGENT ON SURFACES TO BE PATCHED PRIOR TO PLACING REPAIR MORTAR.
5. DEMONSTRATE METHODS FOR REPAIR USING ACTUAL MATERIALS, METHODS, AND CURING PROCEDURES REQUIRED BY MATERIAL MANUFACTURERS. CONSULT WITH BONDING AGENT MANUFACTURER AND ON TECHNIQUES.

CONCRETE DEMOLITION

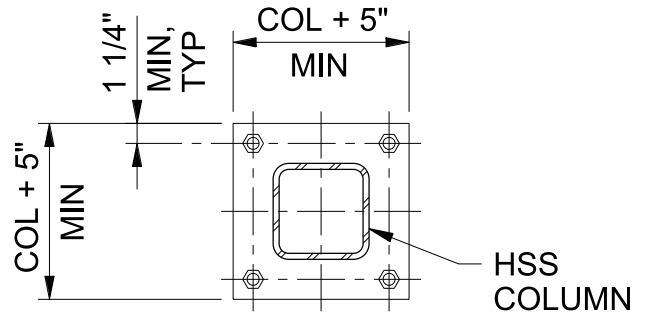
NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

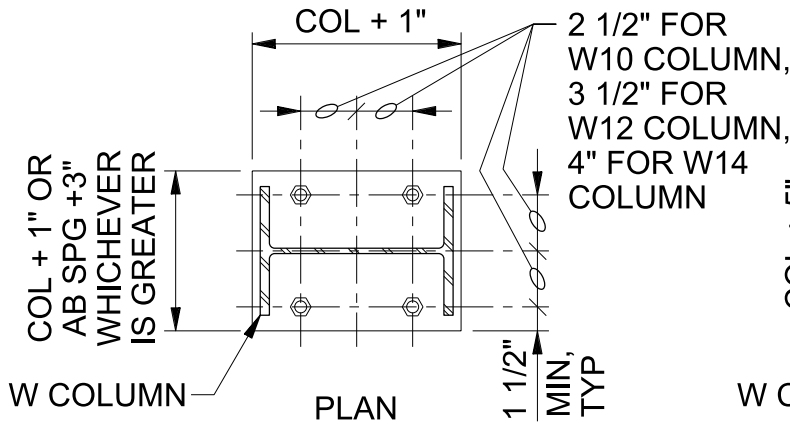
0330-143



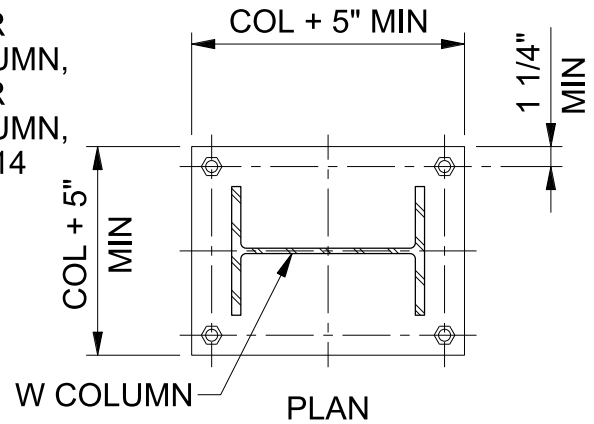
PLAN



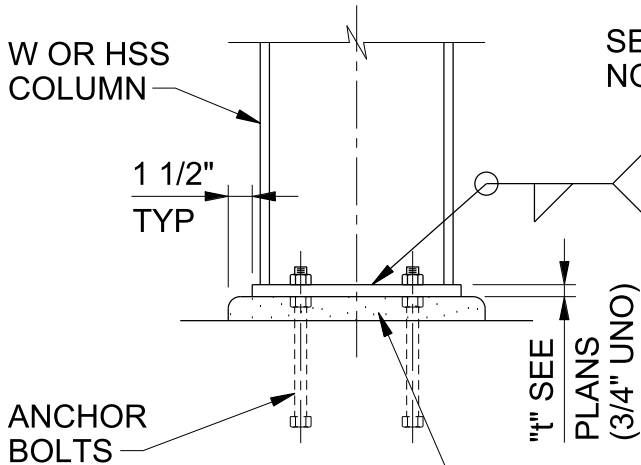
PLAN



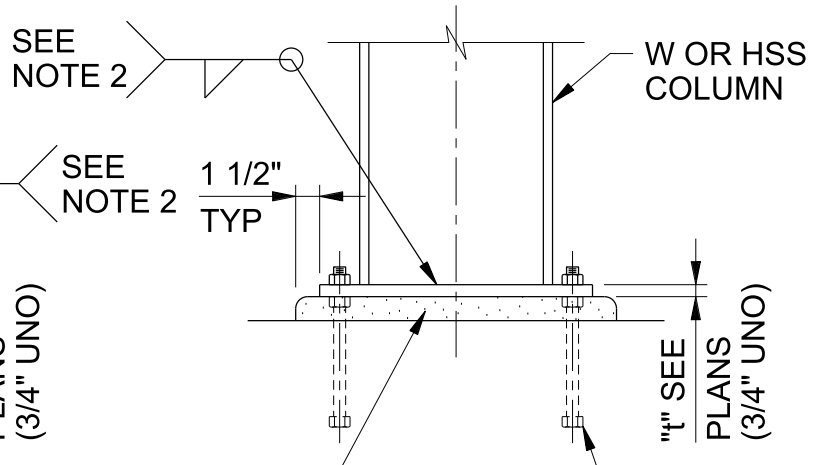
PLAN



PLAN



ELEVATION
TYPE A



ELEVATION
TYPE B

NOTES:

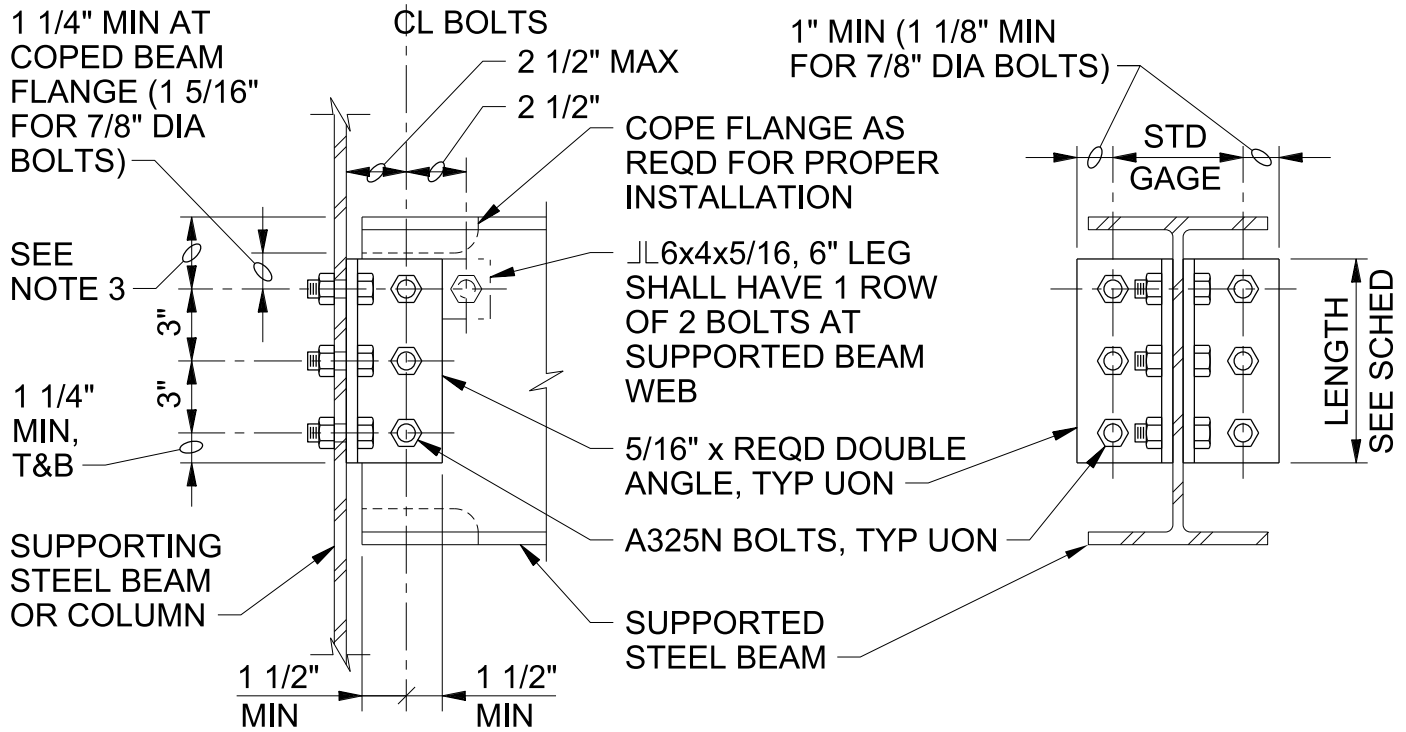
- UNLESS OTHERWISE NOTED, ANCHOR BOLTS SHALL BE 3/4" DIA x REQUIRED WITH LEVELING NUTS AND 1'-0" MINIMUM EMBED AND BASEPLATES SHALL BE CENTERED ON COLUMN.
- WELD SIZE SHALL BE DETERMINED BY THE THICKEST MEMBER JOINED; MINIMUM WELD SIZE SHALL BE 3/16" FILLET FOR MATERIAL THICKNESSES UP TO AND INCLUDING 1/2", 1/4" FILLET FOR THICKNESSES OVER 1/2" TO 3/4", AND 5/16" FILLET FOR MATERIAL THICKNESSES OVER 3/4". ALL WELDS SHALL BE SINGLE-PASS WELDS.

COLUMN BASE - STEEL

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0512-001



NOMINAL BEAM DEPTH, INCHES	ROWS OF BOLTS	BOLT DIA, INCHES	DOUBLE ANGLE, LENGTH, INCHES	COMMENTS
36	10	7/8"	2'-6"	ANGLE THK = 3/8"
33	9	7/8"	2'-3"	ANGLE THK = 3/8"
30	8	7/8"	2'-0"	ANGLE THK = 3/8"
27	7	3/4"	1'-8 1/2"	-
24	6	3/4"	1'-5 1/2"	-
21	5	3/4"	1'-2 1/2"	-
16-18	4	3/4"	0'-11 1/2"	-
12-15	3	3/4"	0'-8 1/2"	-
8-10	2	3/4"	0'-5 1/2"	-
6	1	3/4"	0'-3"	JL 6"x4"x5/16"
4	1	3/4"	0'-2 1/2"	JL 6"x4"x5/16"

NOTES:

1. ALL BEAM FRAMING CONNECTIONS SHALL CONFORM TO THIS DETAIL UNLESS SPECIFICALLY NOTED OTHERWISE OR APPROVED IN WRITING BY THE ENGINEER.
2. PROVIDE ADDITIONAL 1 1/2" LENGTH TO DOUBLE ANGLE FOR STAGGERED BOLT CONNECTIONS WHEN REQUIRED OR USED.
3. DIMENSION SHALL BE 3" UNLESS OTHERWISE REQUIRED FOR PROPER FABRICATION.

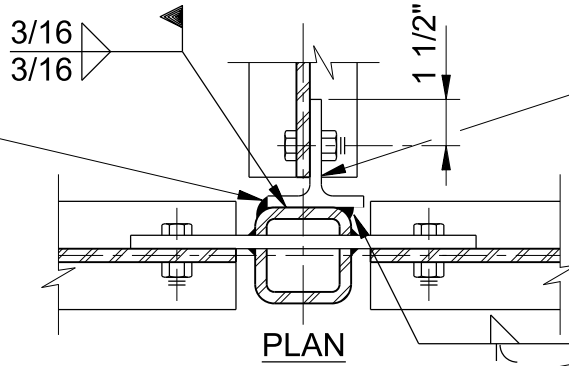
TYPICAL BEAM CONNECTION - STEEL

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

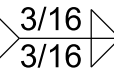
0512-020

CONNECTION SHOWN FOR 4" OR NARROWER TUBE COLUMN

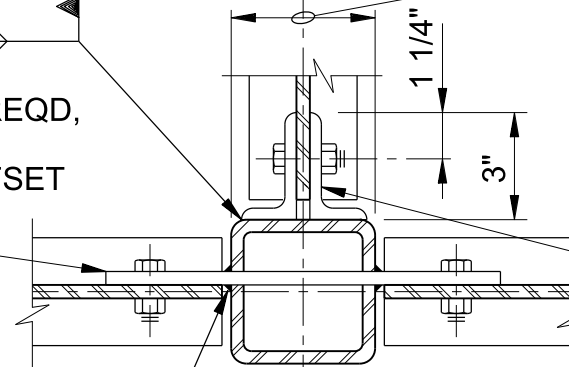


WT 4x7.5 (MIN) x REQD, CONNECTION SIMILAR TO BEAM CONNECTION DETAIL

1/2" RETURN T & B, TYP

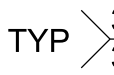


GUSSET PL 3/8x AS REQD, NOTCH COLUMN TO RECEIVE PLATE, OFFSET SO BEAM CENTERED ON COLUMN CL



6" MIN TUBE WIDTH REQD FOR CLIP CONNECTION SHOWN

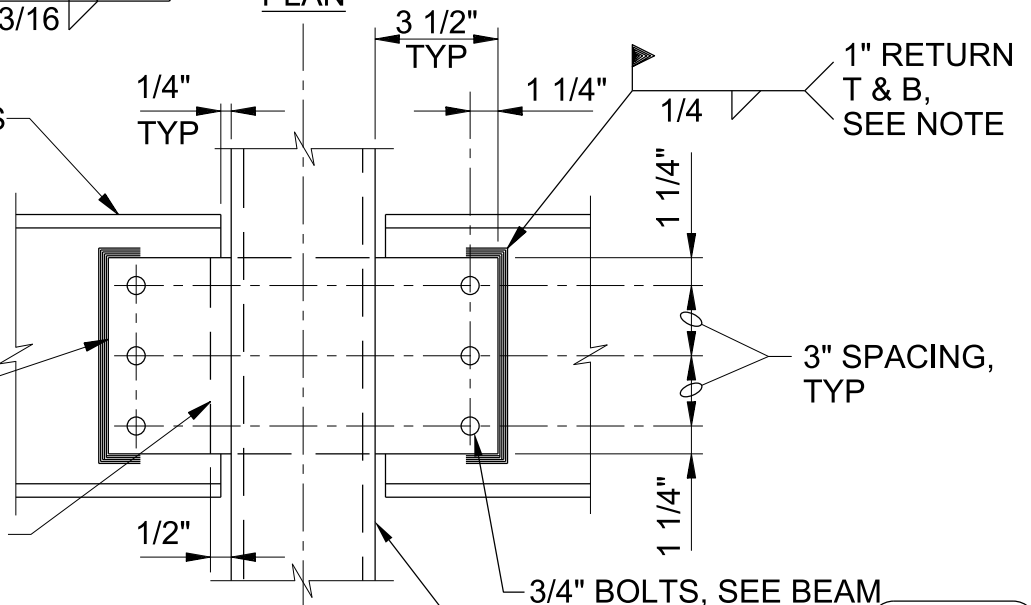
JL 3x2x1/4 x REQD, SIMILAR TO BEAM CONNECTION DETAIL



STEEL BEAM, SEE FRAMING PLANS

GUSSET PL 3/8x AS REQD, NOTCH COLUMN TO RECEIVE PLATE, OFFSET SO BEAM CENTERED ON COLUMN CL

END OF GUSSET PL FOR ONE SIDED CONNECTION



3/4" BOLTS, SEE BEAM CONNECTION DETAIL 0512-020

STEEL TUBE COLUMN x CONTINUOUS

NOTE:

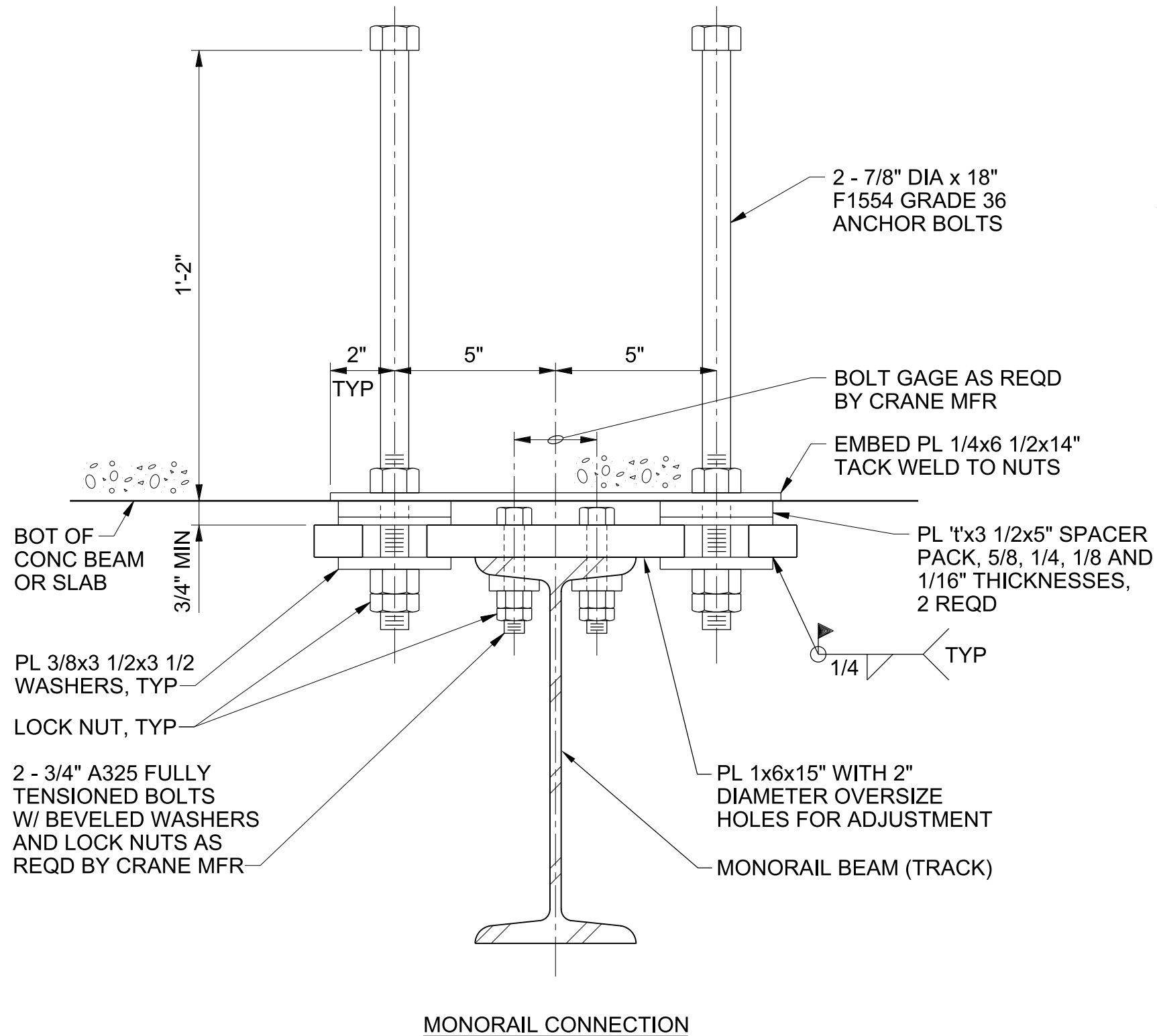
BOLTED CONNECTION INDICATED TYPICAL, WELD CONNECTION ONLY AT COLUMNS INDICATED ON PLANS.

CONTINUOUS TUBE COLUMN - BEAM CONNECTION - STEEL

NTS

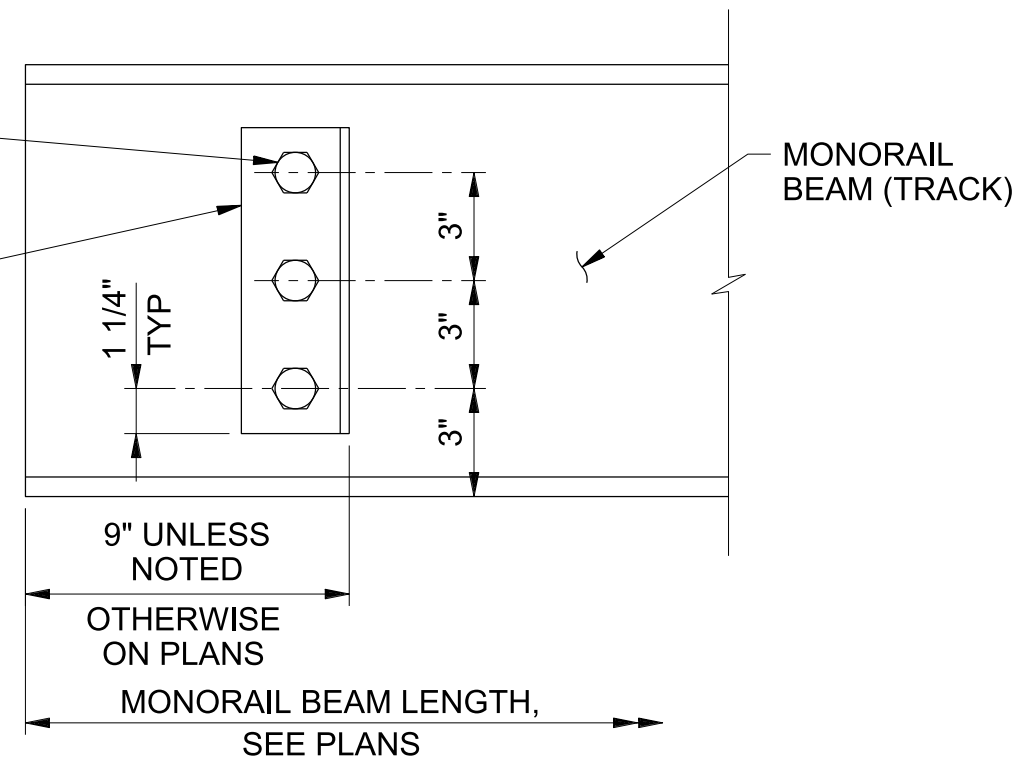
SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0512-041

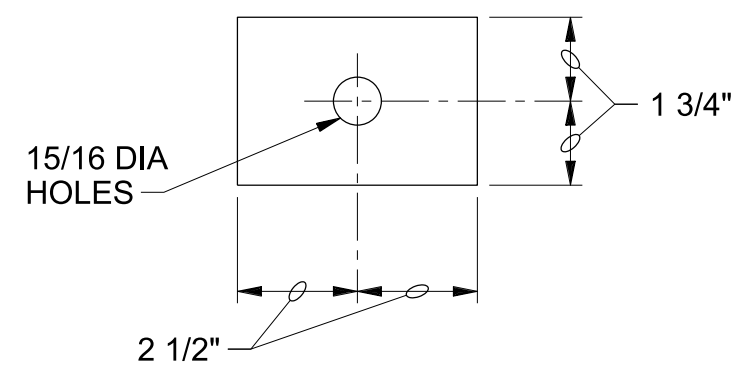


3 - 3/4" DIA A325N BOLTS

L 3x3x1/4 END STOP EA SIDE OF BEAM



MONORAIL STOP



MONORAIL DETAILS

NTS

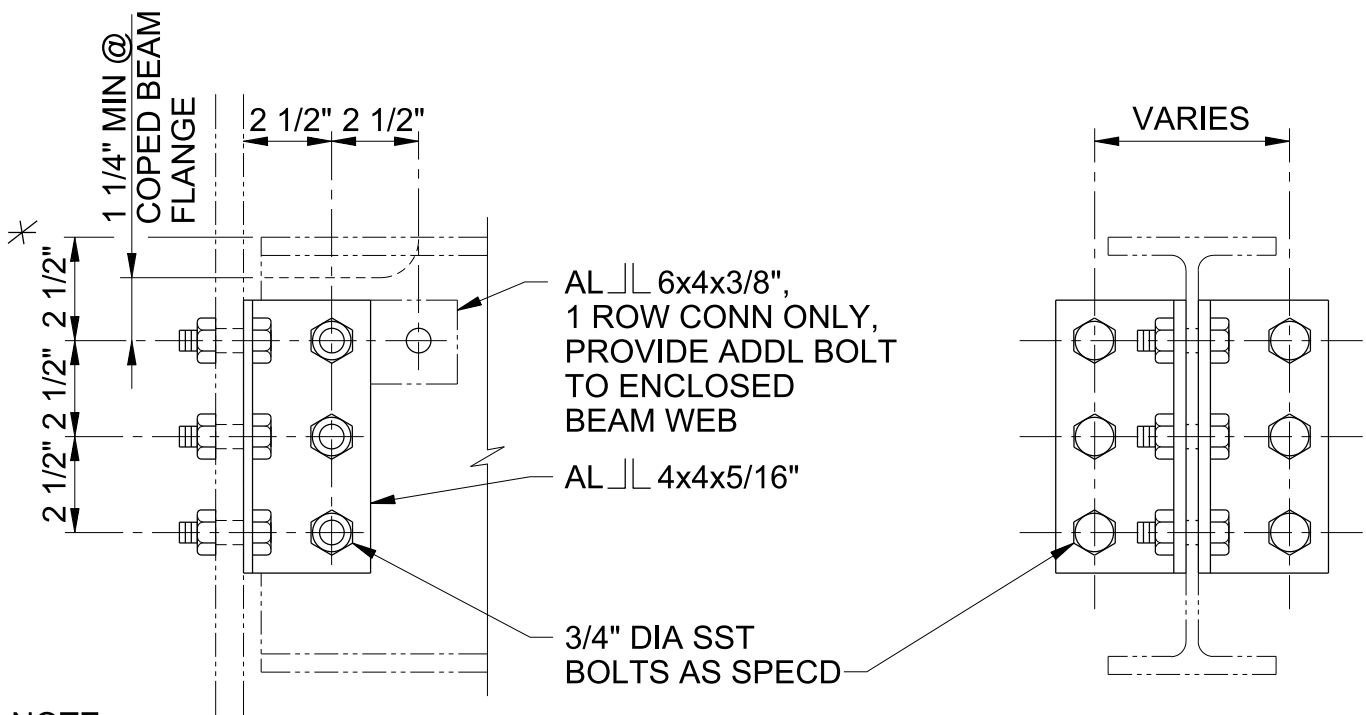
SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0512-101

ALUMINUM		
NOMINAL BEAM DEPTH, INCHES	ROWS OF BOLTS	LENGTH OF ANGLE
10	3	7 1/2"
7-8-9	2	5"
5-6	1	3"
4	1	2 3/4"

NOTES:

1. NUMBER OF ROWS IS EQUAL TO NUMBER OF BOLTS TO ENCLOSED WEB.
2. ALL FRAMING CONNECTIONS SHALL CONFORM TO SCHEDULE UNLESS DETAILED OTHERWISE ON FRAMING PLANS.



NOTE:

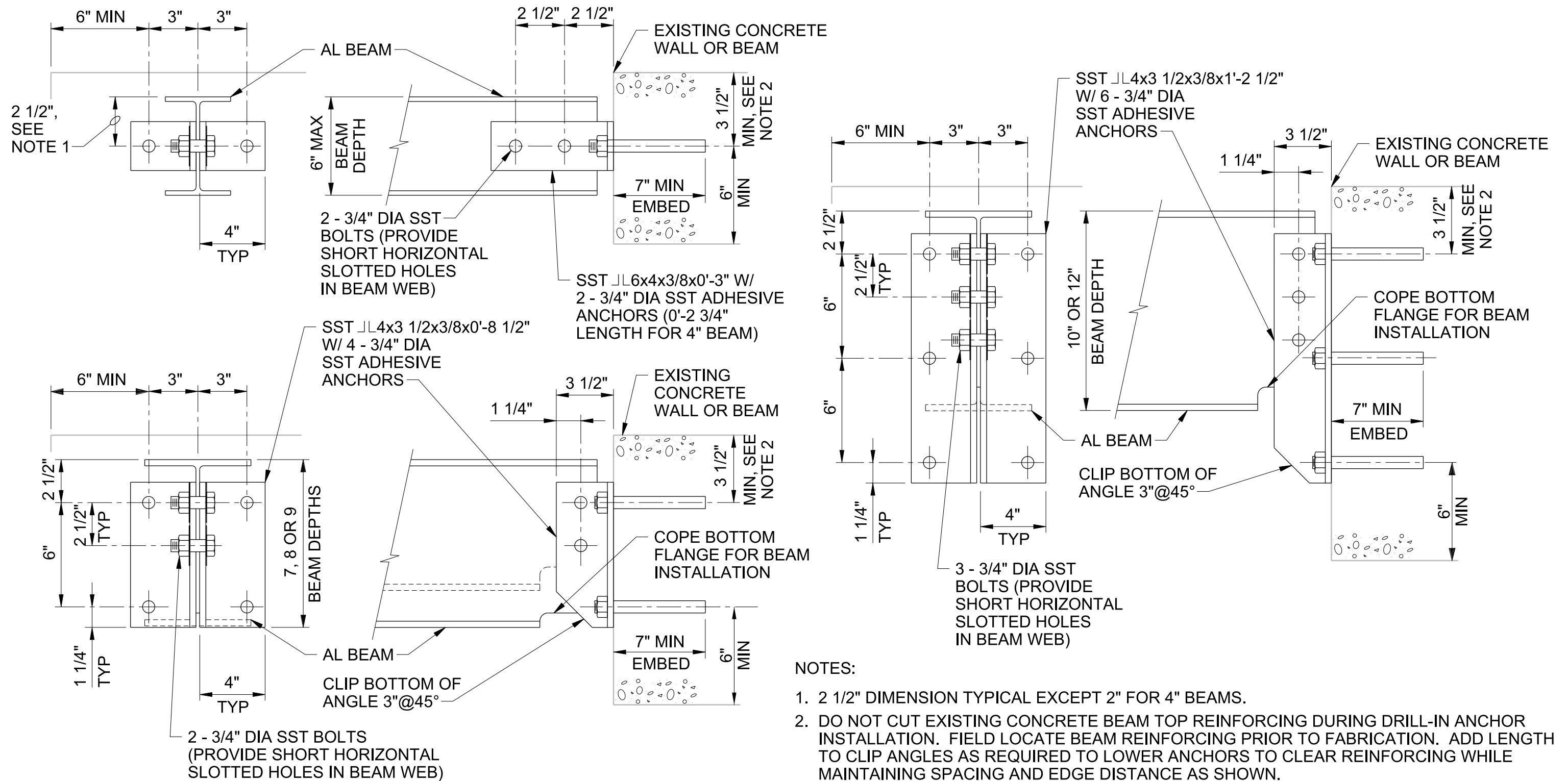
* 2 1/2" DIMENSION TYPICAL EXCEPT 2" FOR 4" BEAM.

TYPICAL BEAM CONNECTION - ALUMINUM

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0514-020



NOTES:

1. 2 1/2" DIMENSION TYPICAL EXCEPT 2" FOR 4" BEAMS.
2. DO NOT CUT EXISTING CONCRETE BEAM TOP REINFORCING DURING DRILL-IN ANCHOR INSTALLATION. FIELD LOCATE BEAM REINFORCING PRIOR TO FABRICATION. ADD LENGTH TO CLIP ANGLES AS REQUIRED TO LOWER ANCHORS TO CLEAR REINFORCING WHILE MAINTAINING SPACING AND EDGE DISTANCE AS SHOWN.
3. WHERE BOTH ENDS OF BEAM ARE ATTACHED TO A WALL, PROVIDE LONG HORIZONTALLY SLOTTED HOLES IN BEAM WEB AT ONE END. TIGHTEN NUTS SNUG TIGHT, BACK OFF 1/2 TURN, AND LOCK WITH DOUBLE NUT.

BEAM/WALL CONNECTION - ALUMINUM

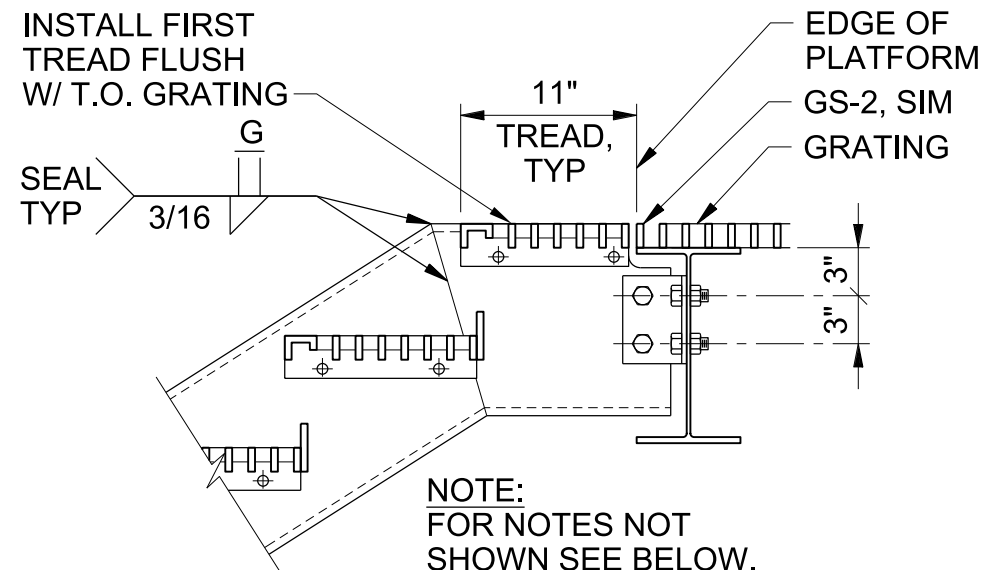
NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

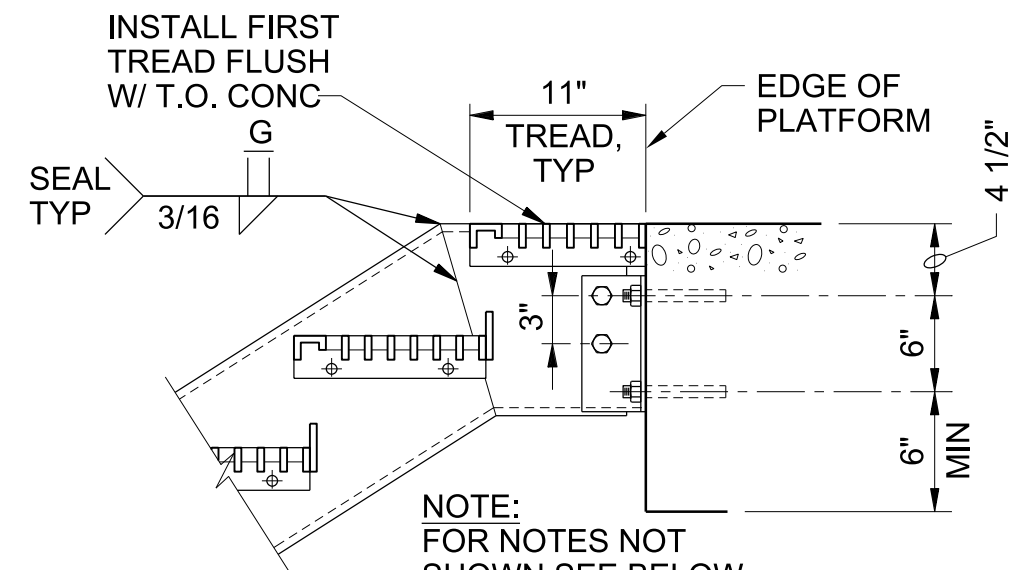
0514-056

NOTES:

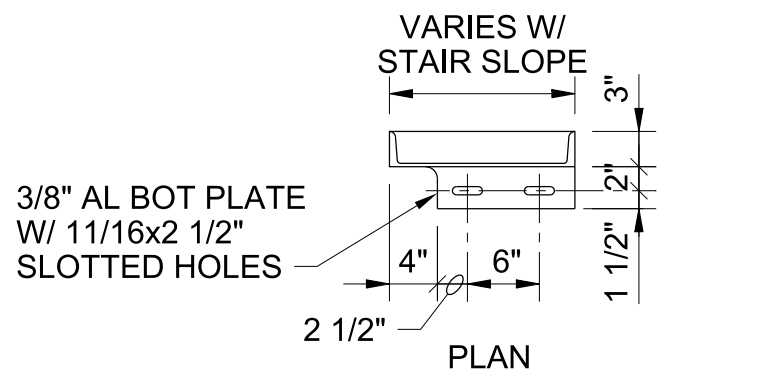
1. PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE AS SPECIFIED.
2. AMERICAN STANDARD C12x7.41 ALUMINUM STRINGERS TYPICAL EXCEPT WHERE OTHERWISE NOTED ON PLANS.
3. STAIR HANDRAIL NOT SHOWN.
4. STAIR MANUFACTURER TO COORDINATE BOLTED TREADS AND HANDRAIL CONNECTIONS.
5. ALL FASTENERS SHALL BE STAINLESS STEEL.
6. FIELD VERIFY DIMENSIONS AND ELEVATIONS PRIOR TO FABRICATION.
7. FOR RISER PLATE SEE PARTIAL RISER PLATE DETAIL UNLESS NOTED OTHERWISE. CLEARANCE BETWEEN TOP OF RISER PLATE AND BOTTOM OF TREAD TO BE 3 3/4" MAX. FOR STAIRS WITH PICKET HANDRAIL EXTEND RISER PLATE PER FULL RISER PLATE DETAIL.



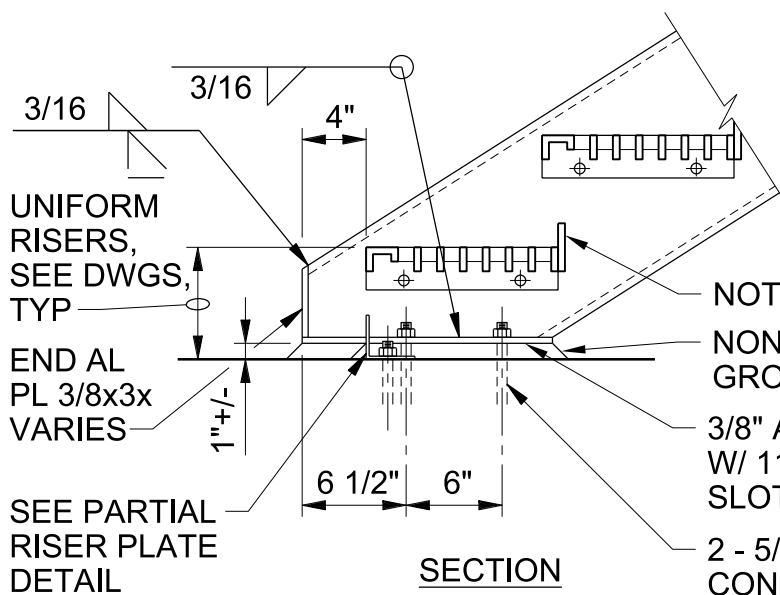
TOP CONNECTION - ALUMINUM



TOP CONNECTION - CONCRETE

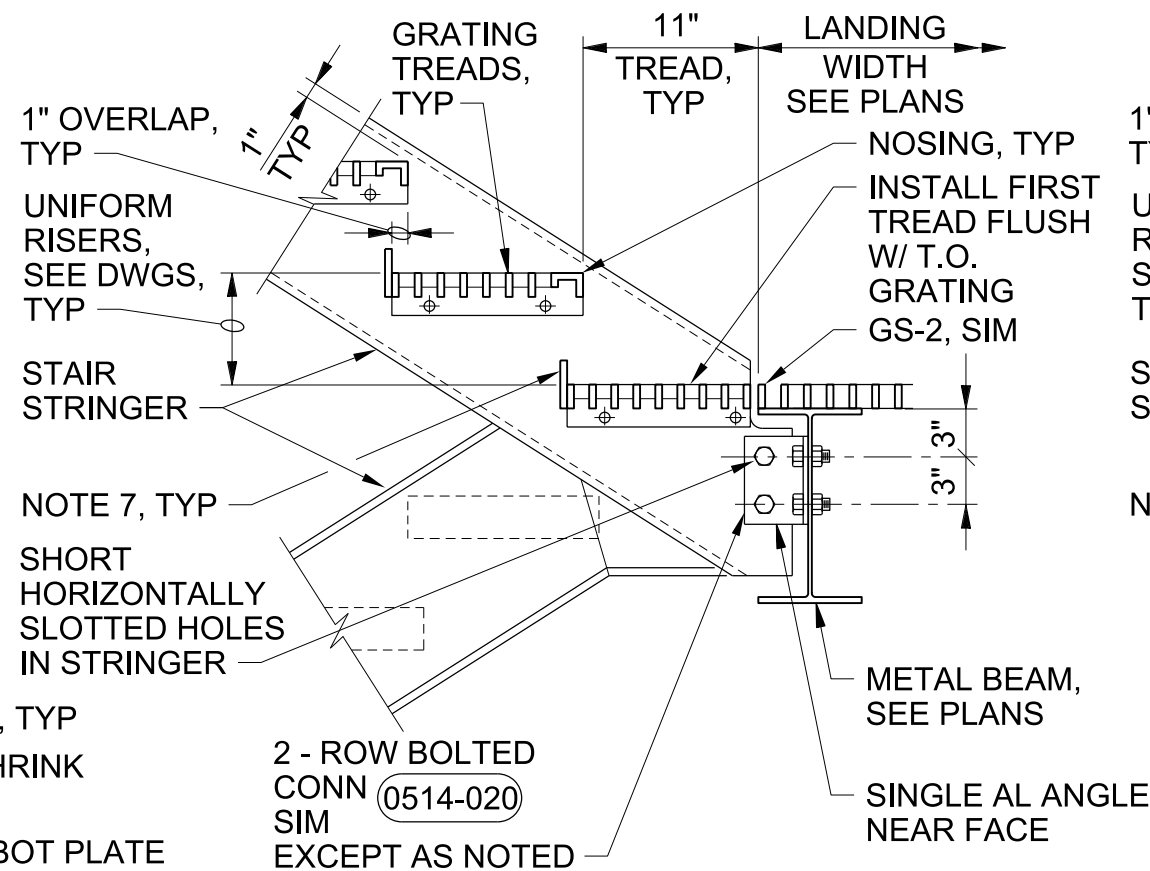


PLAN

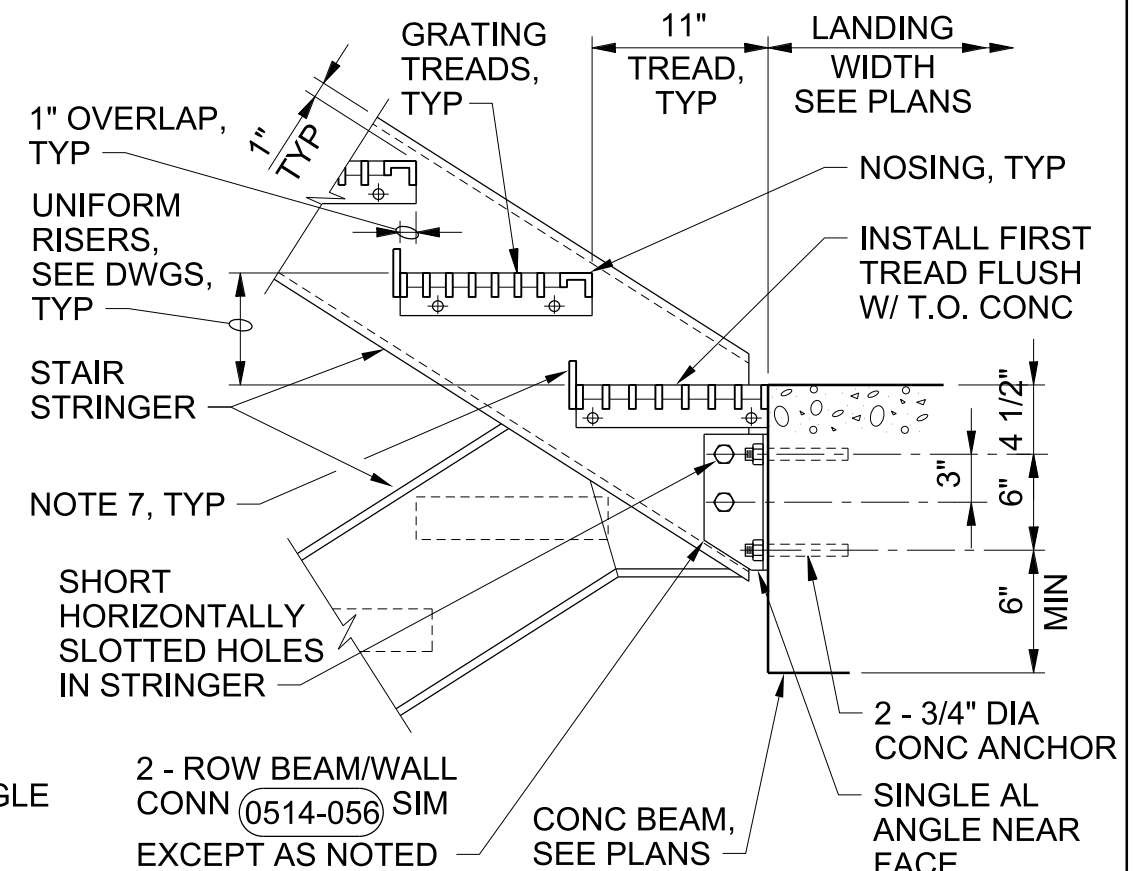


SECTION

BOTTOM CONNECTION



LANDING CONNECTION - ALUMINUM



LANDING CONNECTION - CONCRETE

STAIR DETAILS - ALUMINUM

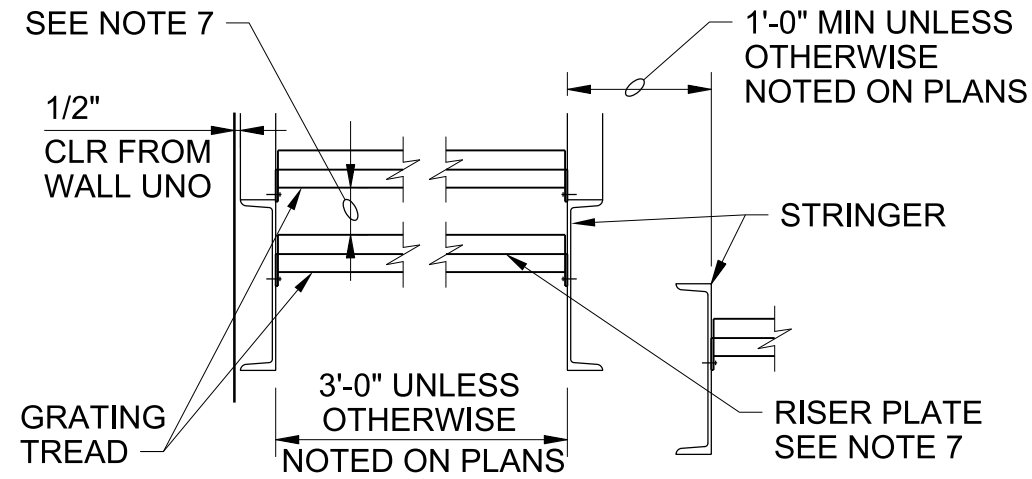
NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

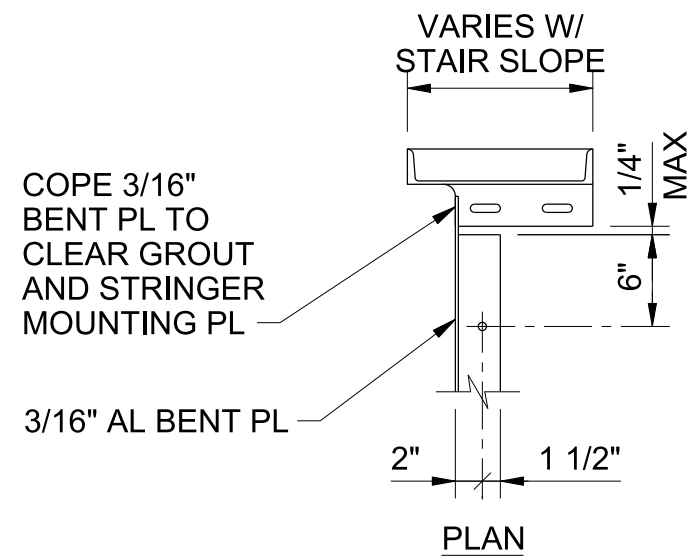
DETAIL 1 OF 2

0551-001

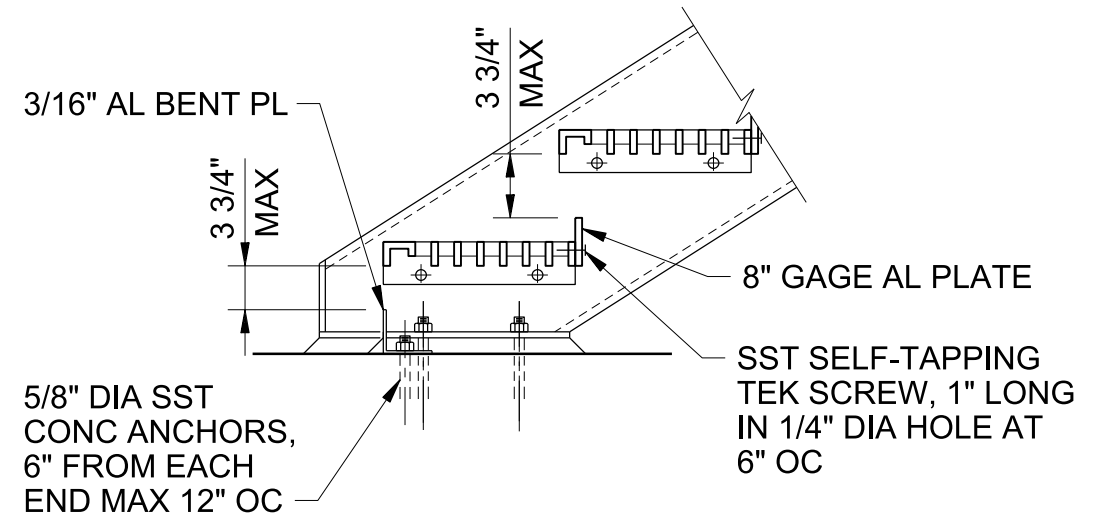
STAIRWAY WIDTH	TREAD BEARING BARS
	ALUMINUM TREAD
2'-3" OR LESS	1" x 3/16"
2'-9" OR LESS	1 1/4" x 3/16"
3'-3" OR LESS	1 1/2" x 3/16"
4'-7" OR LESS	1 3/4" x 3/16"



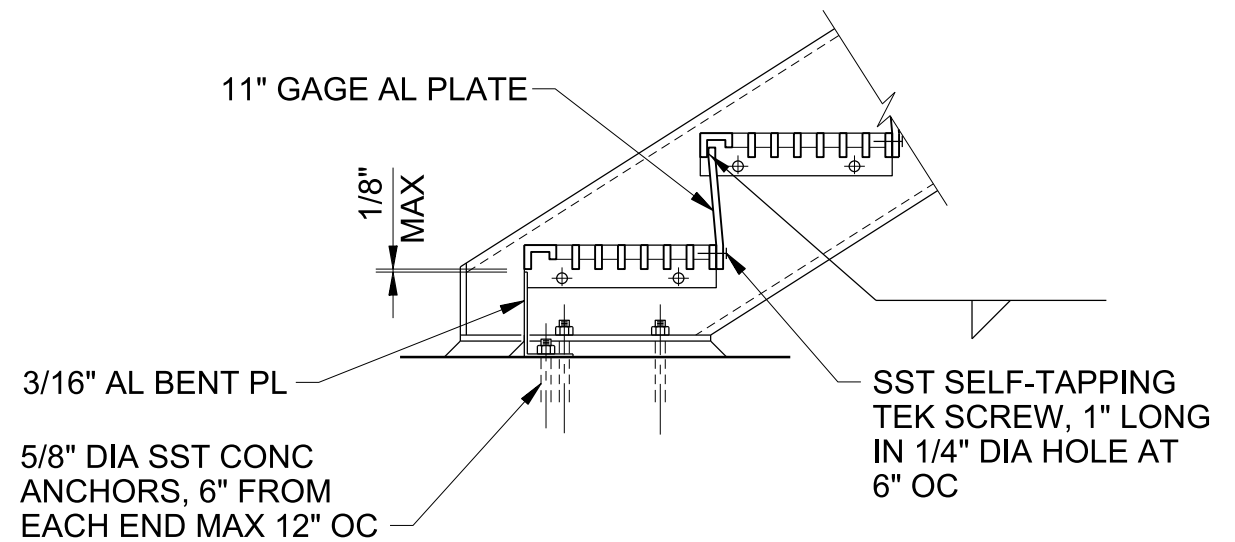
STAIR TREADS



BOTTOM CLOSURE PLATE



PARTIAL RISER PLATE



FULL RISER PLATE

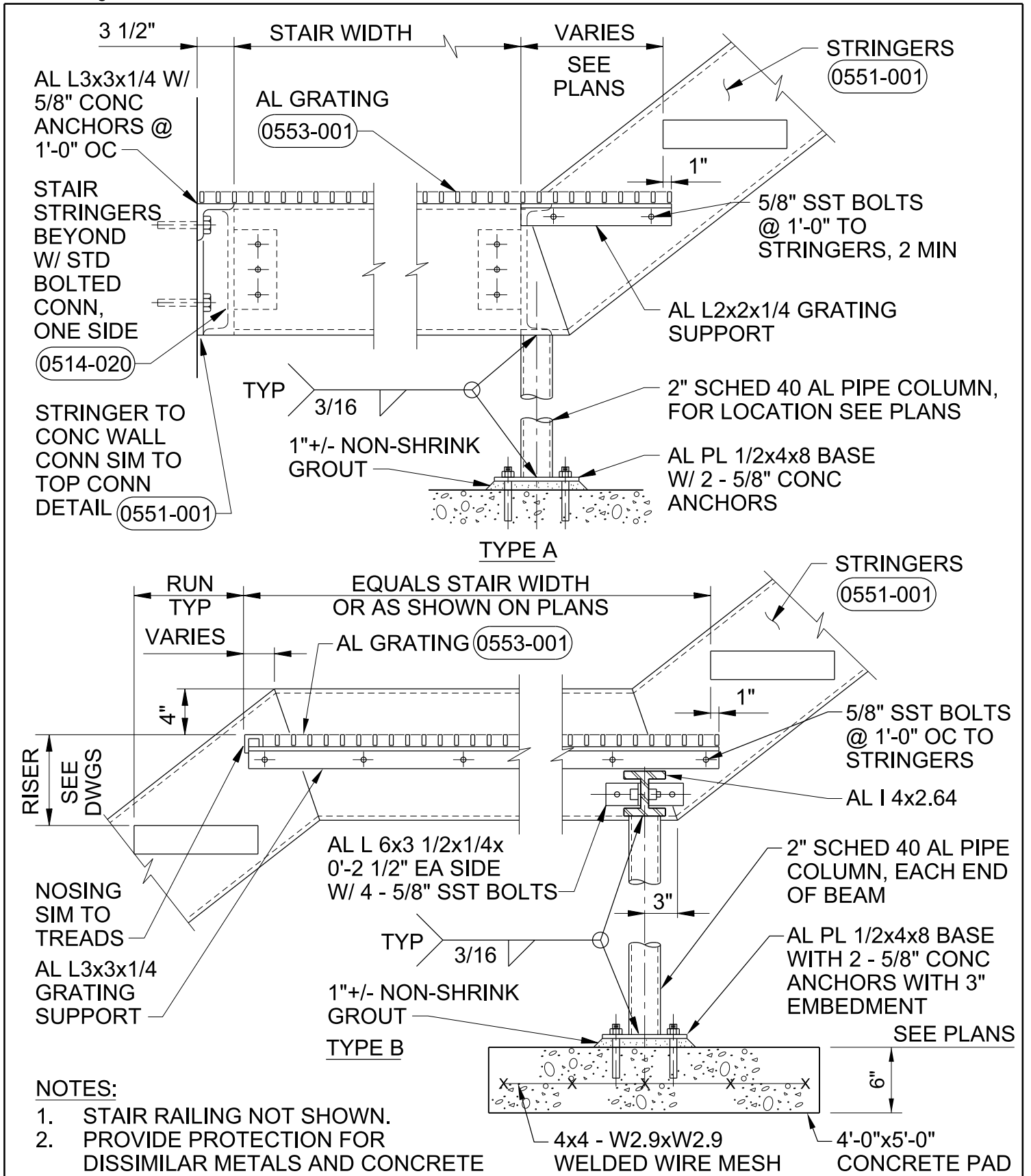
STAIR DETAILS - ALUMINUM

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

DETAIL 2 OF 2

0551-001

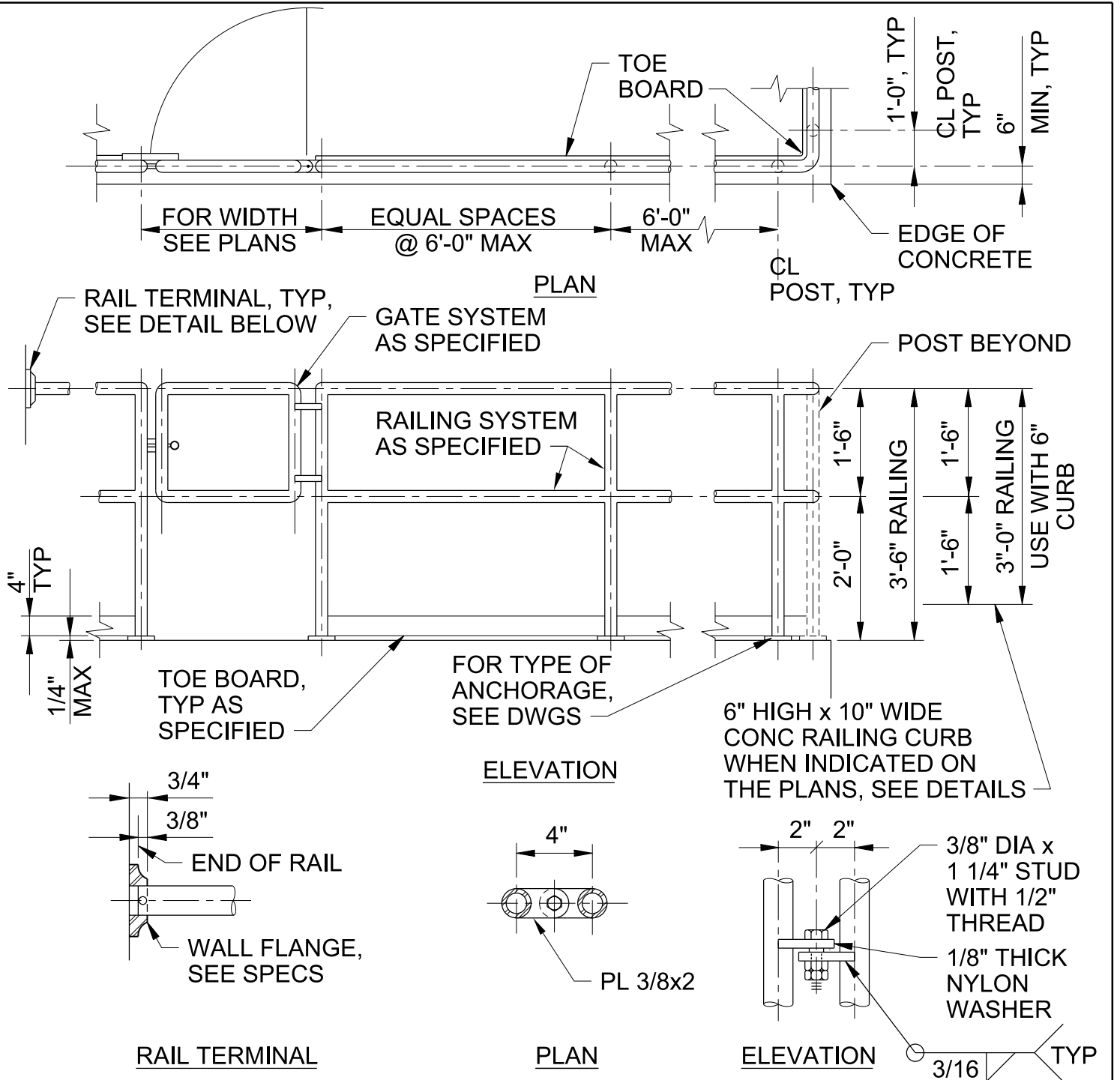


STAIR LANDING WITH SUPPORTS - ALUMINUM

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

0551-002



NOTES:

1. FASTEN RAIL TO WALL FLANGE PER MANUFACTURER'S RECOMMENDATIONS.
2. WALL FLANGE TO BE MOUNTED TO WALL WITH (2) 3/8" DIA SST WEDGE ANCHORS.
3. AT CONTRACTOR'S OPTION FABRICATE HINGES OR PROVIDE OTHER HINGES AS SPECIFIED. ANODIZE FINISH AFTER ALL WELDING AS SPECIFIED.

RAILING - 2 RAIL - ALUMINUM

NTS

DETAIL 1 OF 4

0552-001

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

LOCATE POST AT EACH END OF INTERMEDIATE LANDING, WHERE NO LANDING REQD SEE DETAIL BELOW

RAILING SYSTEM AS SPECIFIED

HANDRAIL

EQUAL SPACING
5'-0" MAX

1'-0" MIN

1'-9"

3'-0"

3'-6" MIN

3'-6" MIN

3'-0"

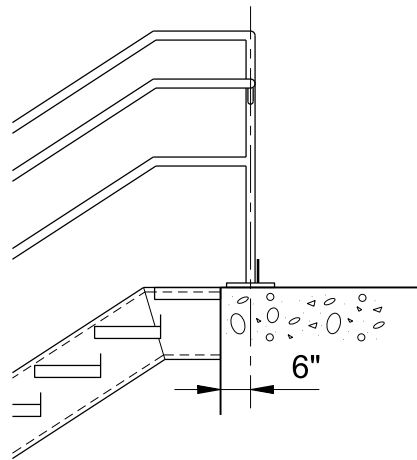
SEE RAILING POST ANCHORAGE DETAIL

METAL STRINGER SHOWN, CONC STAIRS SIM

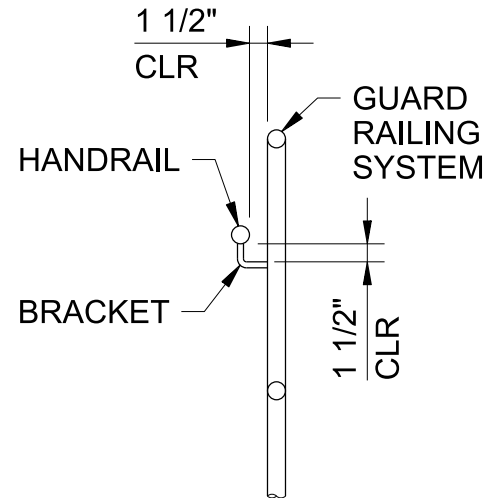
FOR RETURN AT HANDRAIL SEE NOTE 2

11" MIN

4"



RAILING DETAIL WITHOUT LANDING



RAILING SECTION

NOTES:

1. PROVIDE TOE BOARD AT LANDING WHERE REQUIRED.
2. RETURN ENDS OF HANDRAIL TO GUARD AT BOTH ENDS.

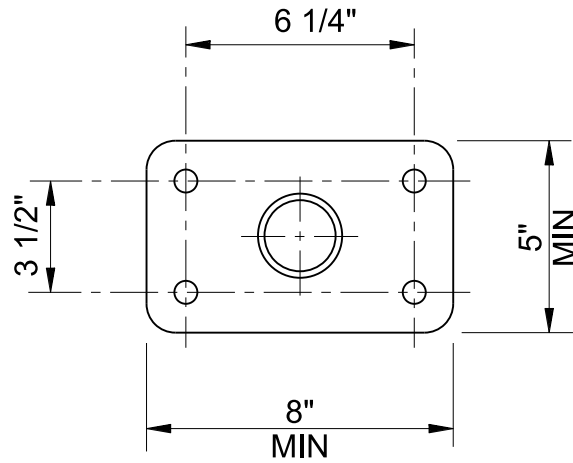
RAILING - 2 RAIL STAIR - ALUMINUM (IBC)

NTS

DETAIL 2 OF 4

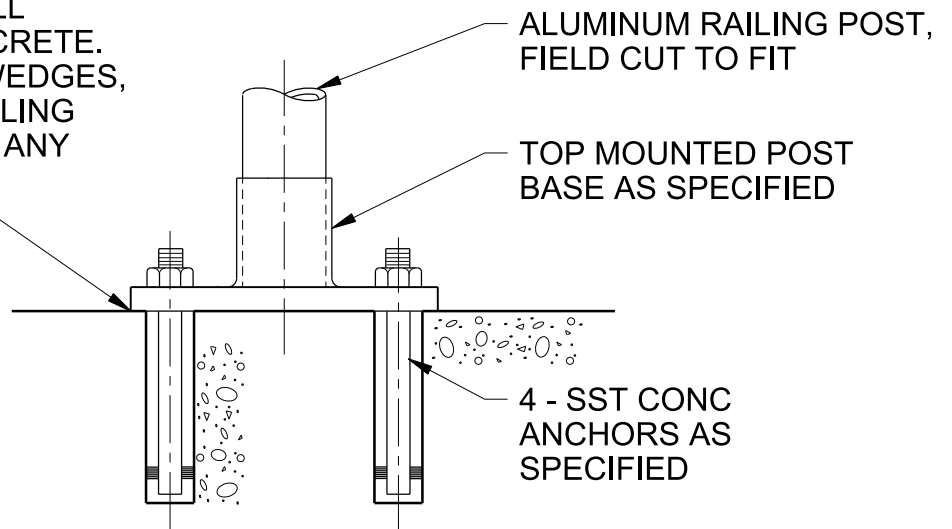
0552-001

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL



PLAN

THE BASEPLATE SHALL SIT SOLIDLY ON CONCRETE. THE USE OF SHIMS, WEDGES, GROUT, ETC FOR RAILING POST ALIGNMENT OR ANY OTHER REASON WILL NOT BE PERMITTED



ELEVATION

TYPE "A"

NOTE:

PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE PER SPECIFICATIONS.

RAILING POST ANCHORAGE TYPE A - ALUMINUM

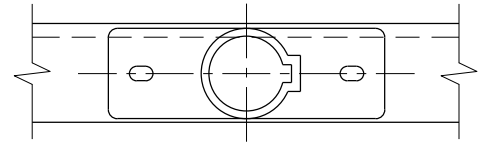
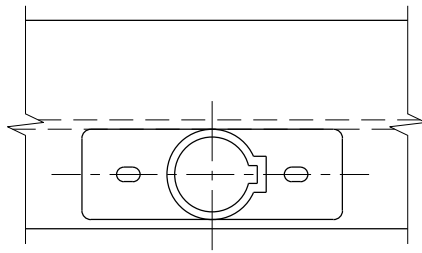
NTS

DETAIL 3 OF 4

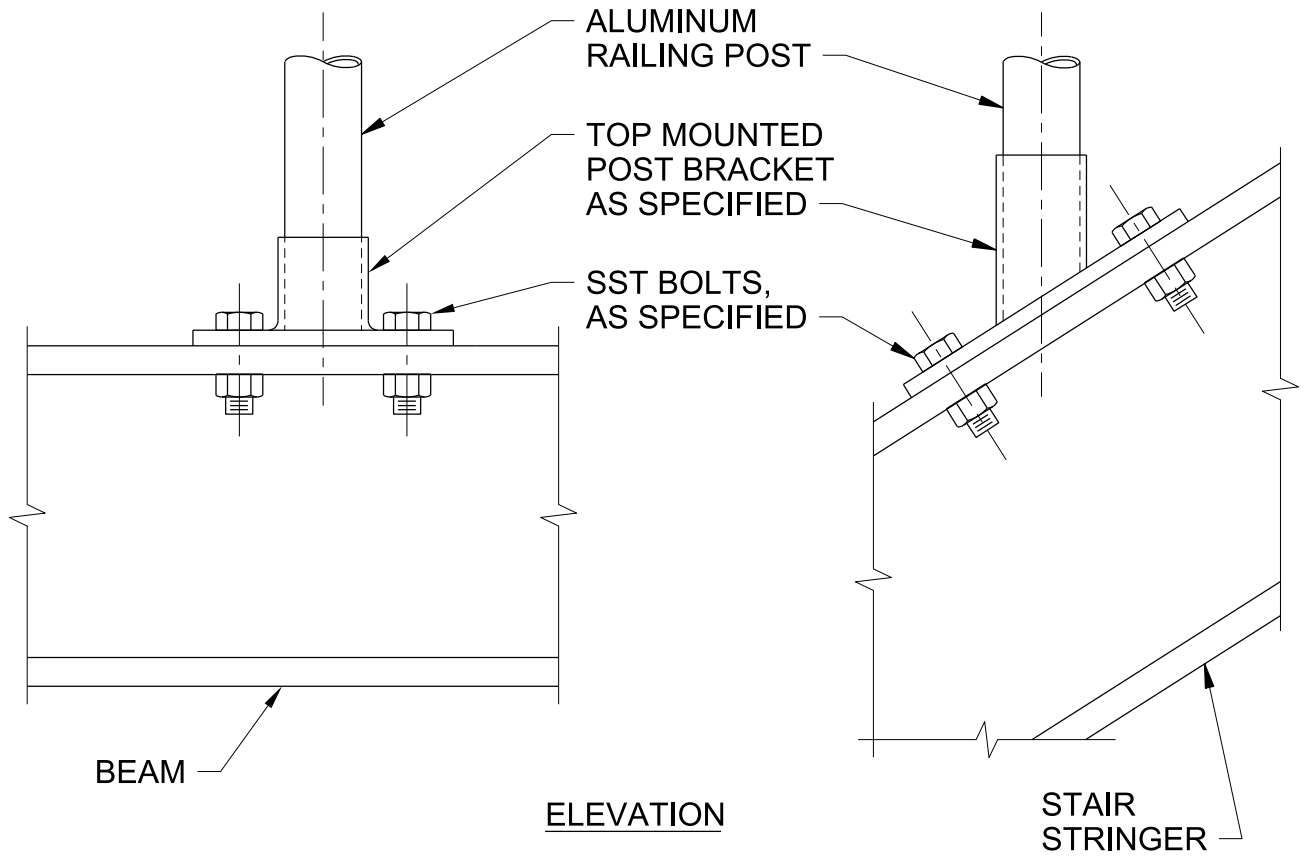
0552-001

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

CH2MHILL®



PLAN



ELEVATION

TYPE "C"

NOTE:

PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE PER SPECIFICATIONS.

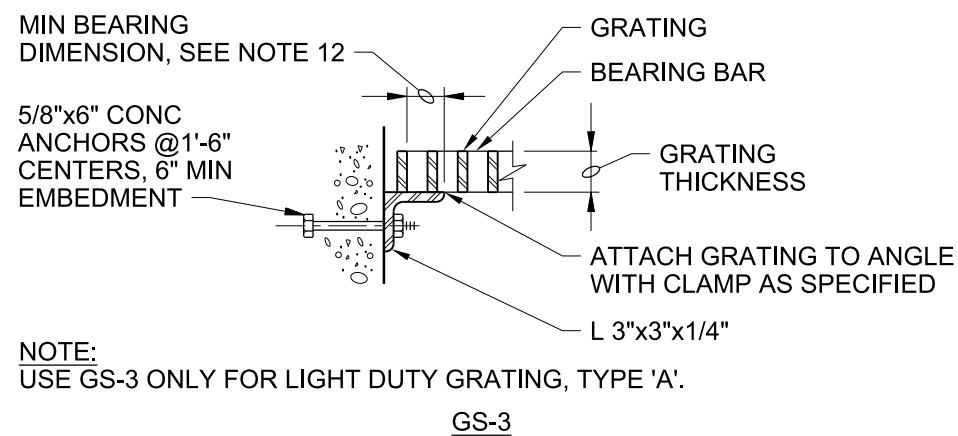
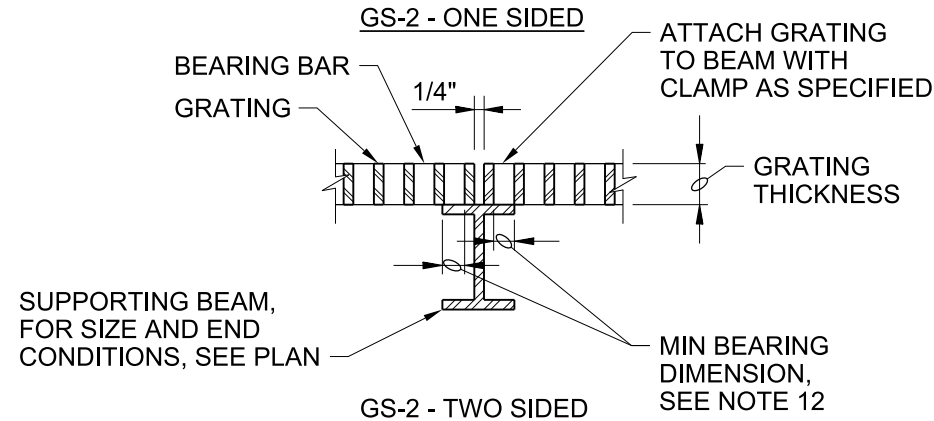
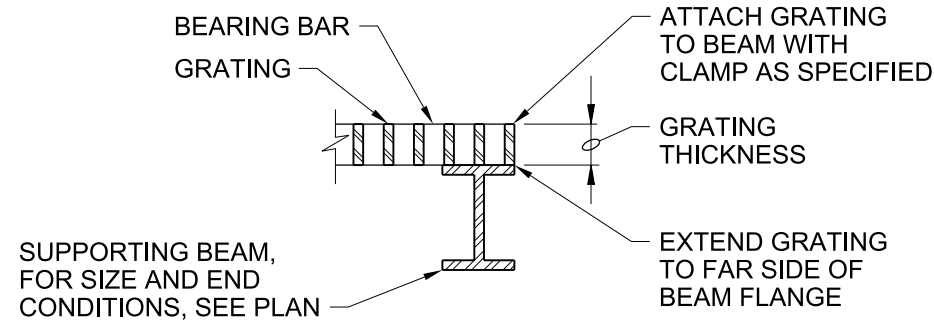
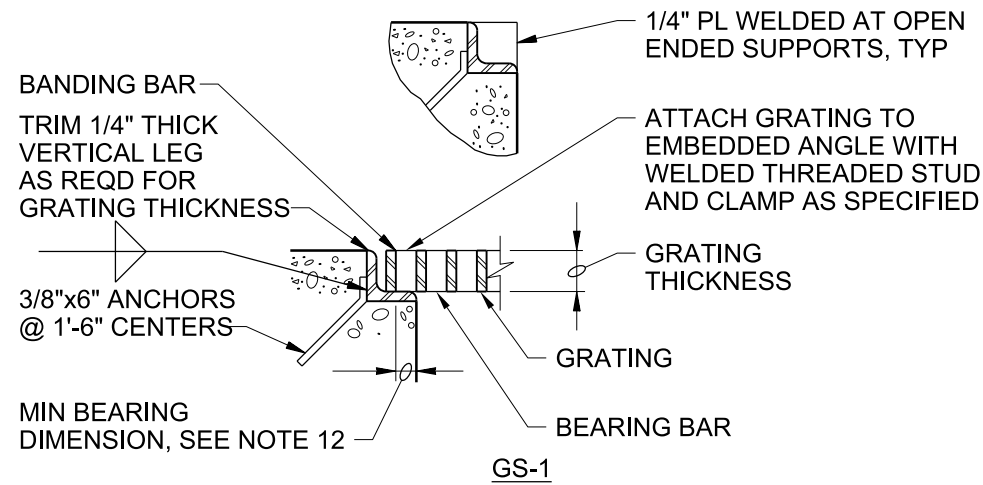
RAILING POST ANCHORAGE TYPE C - ALUMINUM

NTS

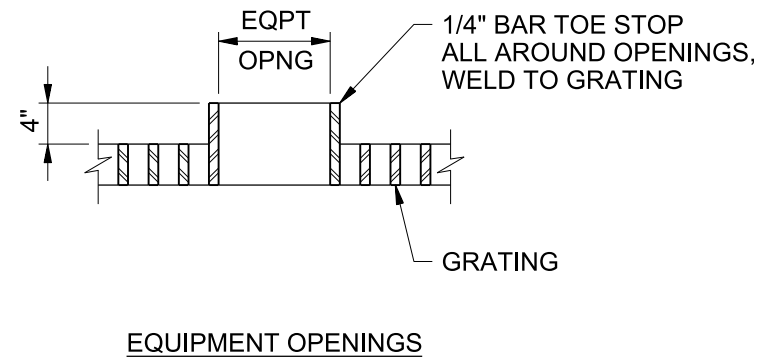
DETAIL 4 OF 4

0552-001

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL



NOTE:
USE GS-3 ONLY FOR LIGHT DUTY GRATING, TYPE 'A'.



GENERAL NOTES:

1. GRATING SHALL BE LIGHT DUTY GRATING UNLESS OTHERWISE NOTED ON DRAWINGS.
2. GRATING SPAN ← SEE PLAN.
3. INDIVIDUAL GRATING SECTIONS SHALL NOT EXCEED 3'-0" IN WIDTH OR WEIGH MORE THAN 150 POUNDS, UNLESS INDICATED OTHERWISE, FOR TYPES 'A' & 'B' GRATING. TYPE 'C' GRATING SHALL HAVE A MINIMUM WIDTH OF 2'-0" REGARDLESS OF WEIGHT.
4. SHOP DRAWINGS BASED ON FIELD DIMENSIONS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO FABRICATION.
5. MATERIAL FOR SUPPORTS OF STEEL AND ALUMINUM GRATING TO BE SAME AS GRATING, EXCEPT METAL SUPPORTS THAT ARE TO BE EMBEDDED IN CONCRETE SHALL BE TYPE 316 STAINLESS STEEL.
6. UNLESS NOTED OTHERWISE ON PLANS, GRATING THICKNESS SHALL BE AS TABULATED IN "GRATING THICKNESS TABLE" FOR APPLICABLE GRATING TYPE.
7. FOR SERRATED BEARING BARS, INCREASE GRATING THICKNESSES SHOWN IN TABLES BY 1/4".
8. BEARING BAR THICKNESS FOR GRATING TO BE 3/16" MINIMUM. SEE SPECIFICATIONS FOR SPACING OF BEARING AND CROSS BARS.
9. BAND ALL EDGES. MATCH DEPTH OF BEARING BAR.
10. TYPE OF MATERIAL USED SHALL BE AS SHOWN ON PLANS OR AS SPECIFIED. THIS STANDARD DETAIL INCLUDES 2 TYPES, ALTHOUGH BOTH MAY NOT BE INCLUDED IN PROJECT.
11. THE HORIZONTAL CLEARANCE BETWEEN THE GRATING AND GRATING SUPPORTS SHALL NOT BE LESS THAN 1/4" NOR GREATER THAN 1/2" AND AS SPECIFIED.
12. FOR TYPE A & B MIN BEARING HORIZONTAL DIMENSION = 1" FOR GRATING DEPTH 2 1/4" OR LESS, MIN BEARING HORIZONTAL = 2" FOR GRATING DEPTH GREATER THAN 2 1/4"

STANDARD GRATING

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

LIGHT DUTY GRATING

TYPE 'A'
(100 PSF)

GRATING THICKNESS TABLE

MAXIMUM SPAN	STEEL	ALUMINUM
3'-6"	1"	1 1/4"
4'-0"	1"	1 1/2"
4'-6"	1"	1 3/4"
5'-0"	1 1/4"	1 3/4"
5'-6"	1 1/4"	2"
6'-0"	1 1/2"	2 1/4"
6'-6"	1 1/2"	2 1/4"
7'-0"	1 3/4"	2 1/2"

MEDIUM DUTY GRATING

TYPE 'B'
(500 PSF)

GRATING THICKNESS TABLE

MAXIMUM SPAN	STEEL	ALUMINUM
< 2'-0"	1"	1"
2'-6"	1"	1 1/4"
3'-0"	1 1/4"	1 1/2"
3'-6"	1 1/4"	1 3/4"
4'-0"	1 1/2"	2"
4'-6"	1 3/4"	2 1/4"
5'-0"	1 3/4"	2 1/2"
5'-6"	2"	DO NOT USE ALUMINUM GRATING
6'-0"	2 1/4"	
6'-6"	2 1/2"	

HEAVY DUTY GRATING

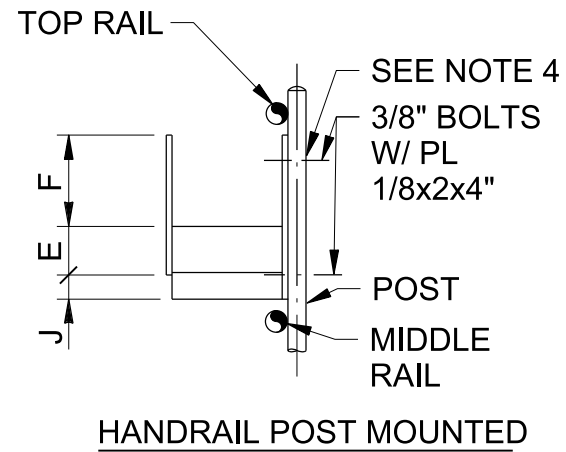
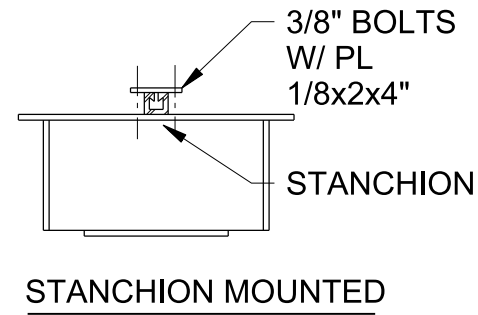
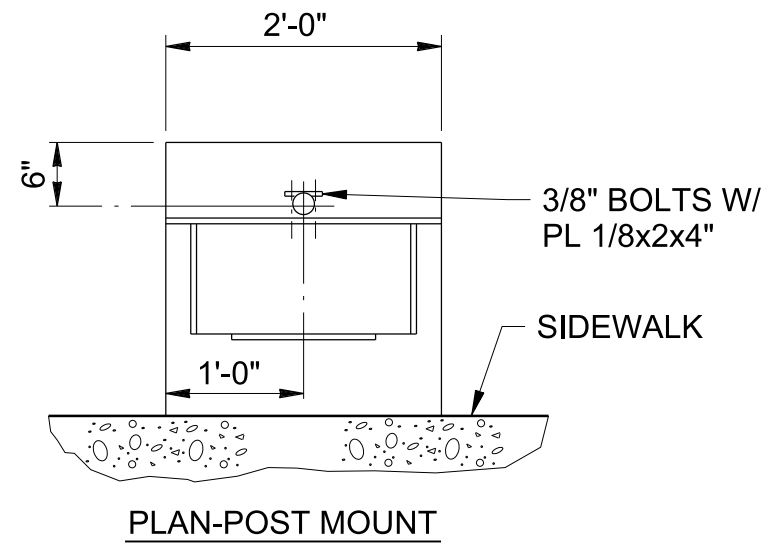
TYPE 'C'
(H 20 WHEEL LOAD)

GRATING THICKNESS TABLE

MAXIMUM SPAN	STEEL	ALUMINUM
1'-0"	2"x3/16"	DO NOT USE ALUMINUM GRATING
1'-8"	2 1/2"x1/4"	
2'-0"	2 1/2"x3/8" OR 3"x1/4"	
2'-6"	3"x3/8" OR 4"x1/4"	
3'-3"	3 1/2"x3/8"	
4'-0"	4"x3/8"	
5'-0"	4 1/2"x3/8"	

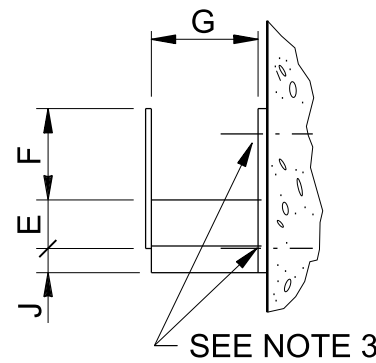
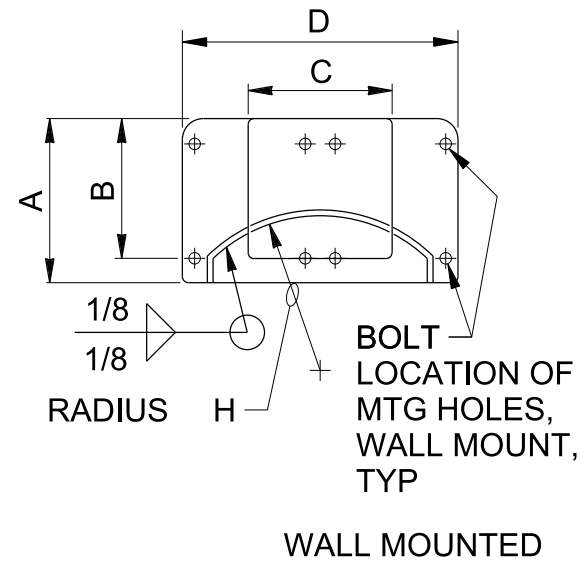
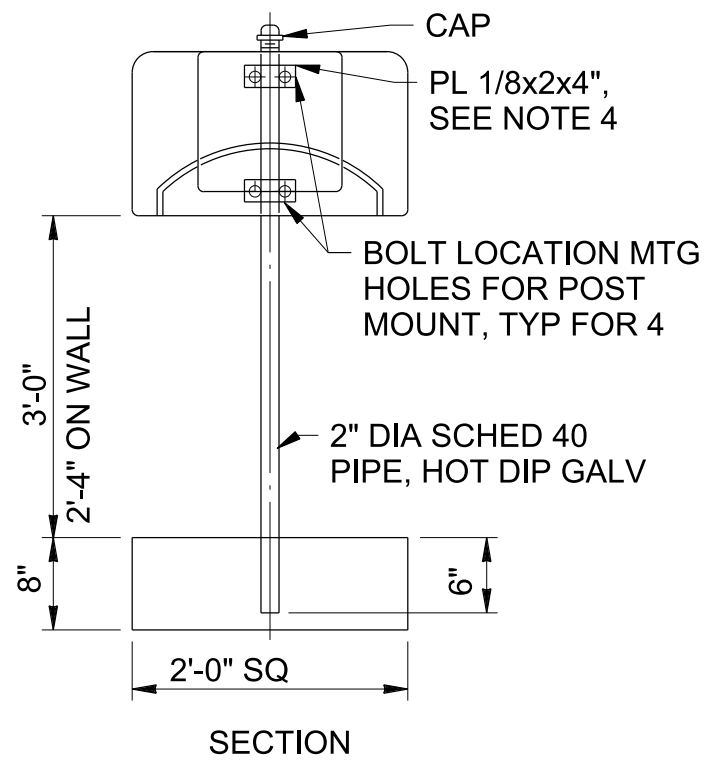
DIMENSION IN INCHES

RACK TYPE	DIMENSION IN INCHES								
	A	B	C	D	E	F	G	H	J
TYPE A-3/4" & 1" HOSE	10-1/2	9	9	18	3	6	7-1/2	9-3/4	1-1/2
TYPE B-1 1/2" HOSE	14	12	12	24	4	8	10	13	2



NOTES:

1. INTERIOR UNITS SHALL BE FABRICATED FROM 1/8" A-36 STEEL PLATE AND ENTIRE UNIT SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
2. EXTERIOR UNITS SHALL BE FABRICATED FROM 3/16" 6061-T6 ALUMINUM ALLOY PLATE.
3. ATTACH TO CONCRETE WALL WITH (4) - 3/8" STAINLESS STEEL STUD TYPE WEDGE ANCHORS.
4. ATTACH TO VERTICAL HANDRAIL OR INDIVIDUAL POST WITH PLATES AND (4)- 3/8" STAINLESS STEEL BOLTS.
5. ATTACH TO STEEL COLUMN WITH (4)- 3/8" ROUND HEAD BOLTS, ONE IN EACH CORNER. INSERT DOUBLE SPACER NUTS BETWEEN COLUMN AND HOSE RACK.

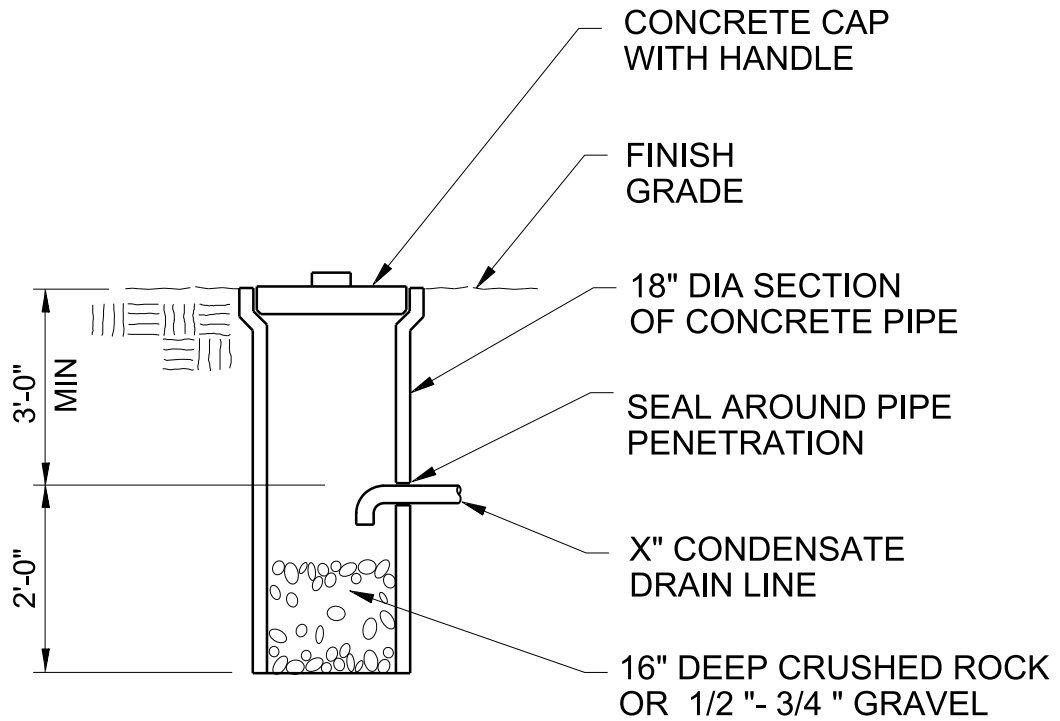


HOSE RACKS

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2210-720

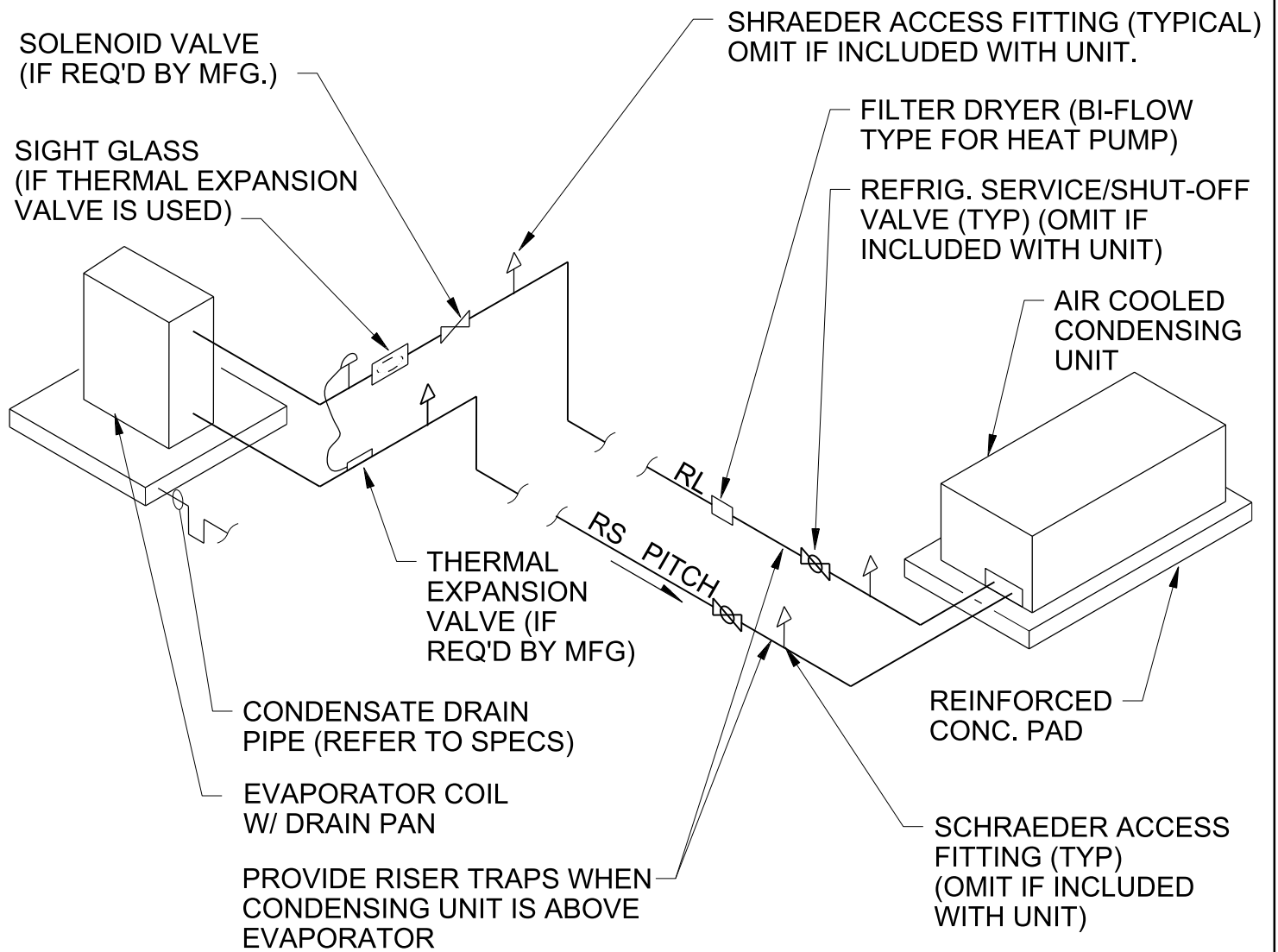


DRAINAGE DRYWELL

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2214-100



NOTES:

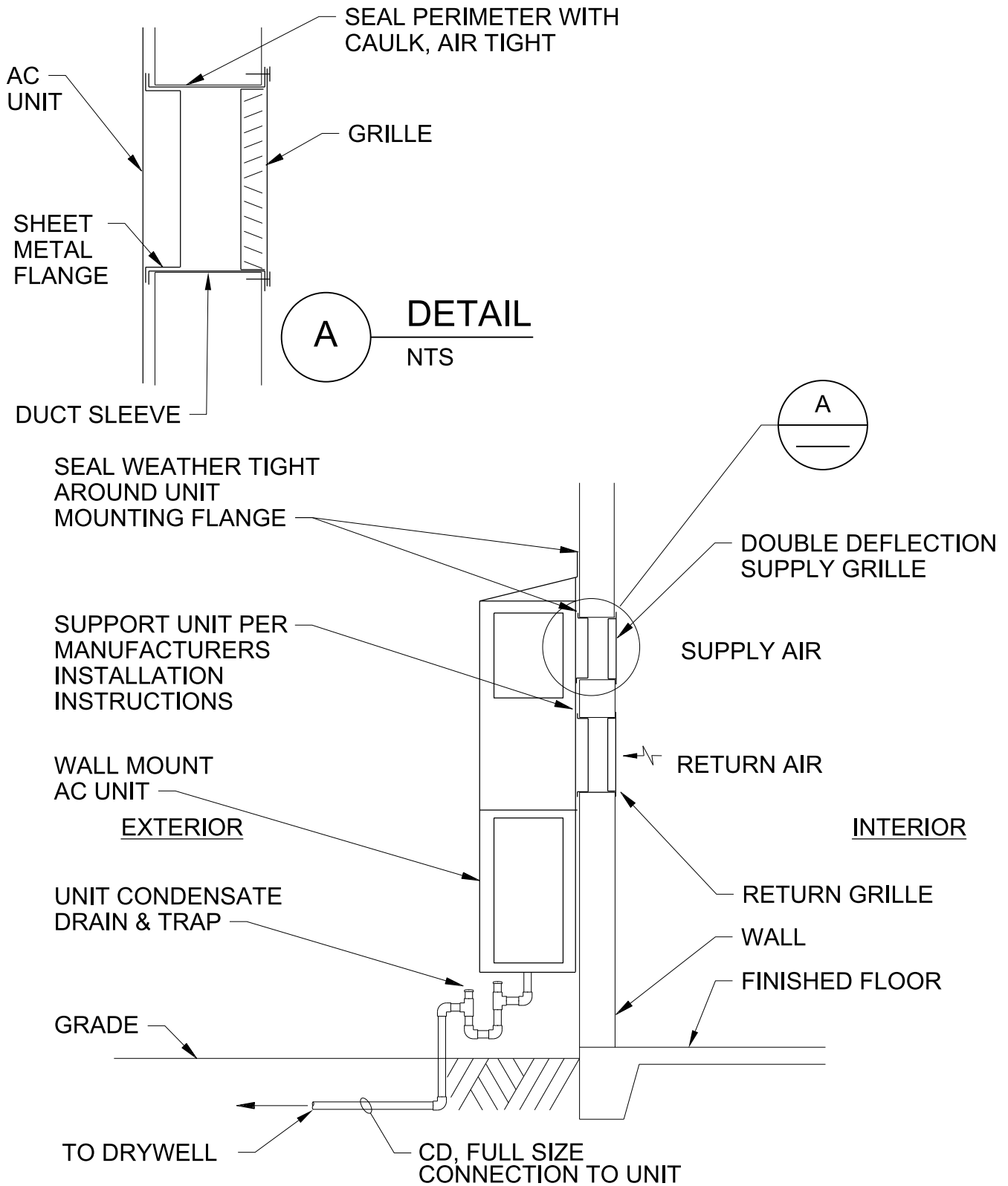
1. CONTRACTOR SHALL SUBMIT A REFRIGERANT PIPING DIAGRAM APPROVED BY THE CONDENSING UNIT MANUFACTURER BEFORE PROCEEDING WITH WORK. (REFER TO SPECIFICATIONS FOR REFRIGERANT PIPING INSTALLATION REQUIREMENTS)
2. DELETE ANY VALVES OR MATERIALS THAT ARE FURNISHED WITH UNIT.
3. REFRIGERANT PIPING SHALL BE SIZED PER MANUFACTURER OPTIMUM PERFORMANCE RATING.

REFRIGERANT PIPING

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2323-184



A DETAIL
NTS

A

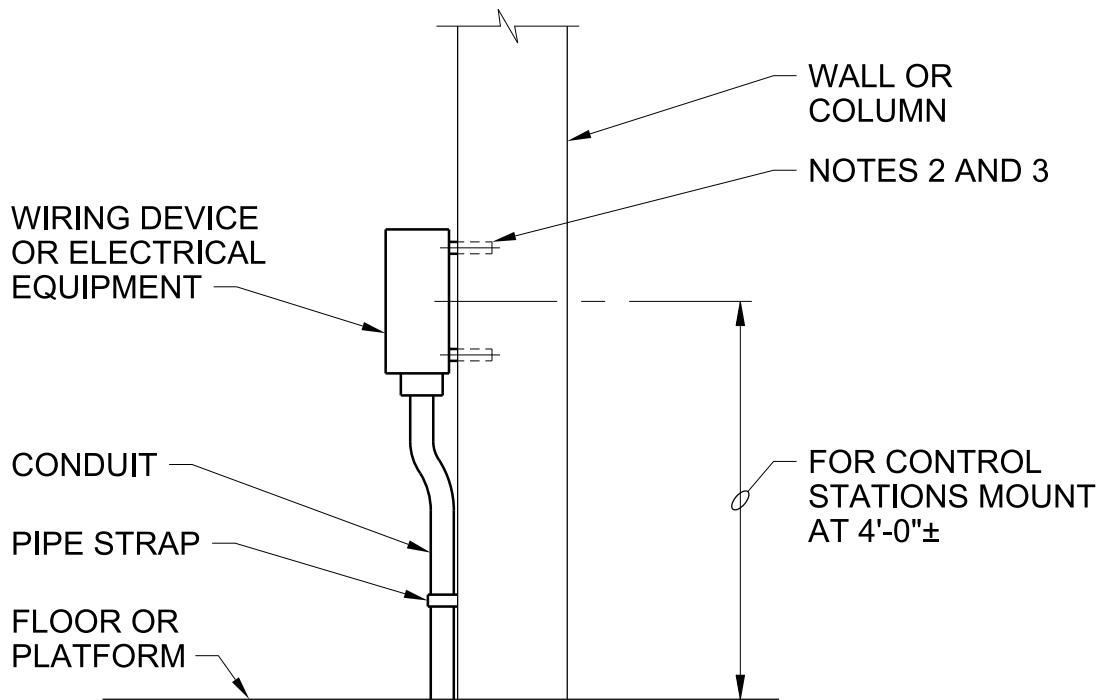
WALL MTD AC UNIT

NTS

NOTE: SUPPLY AND RETURN GRILLE BY AC UNIT MANUFACTURER, UNLESS SHOWN OTHERWISE ON PLANS.

SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2381-140



NOTES:

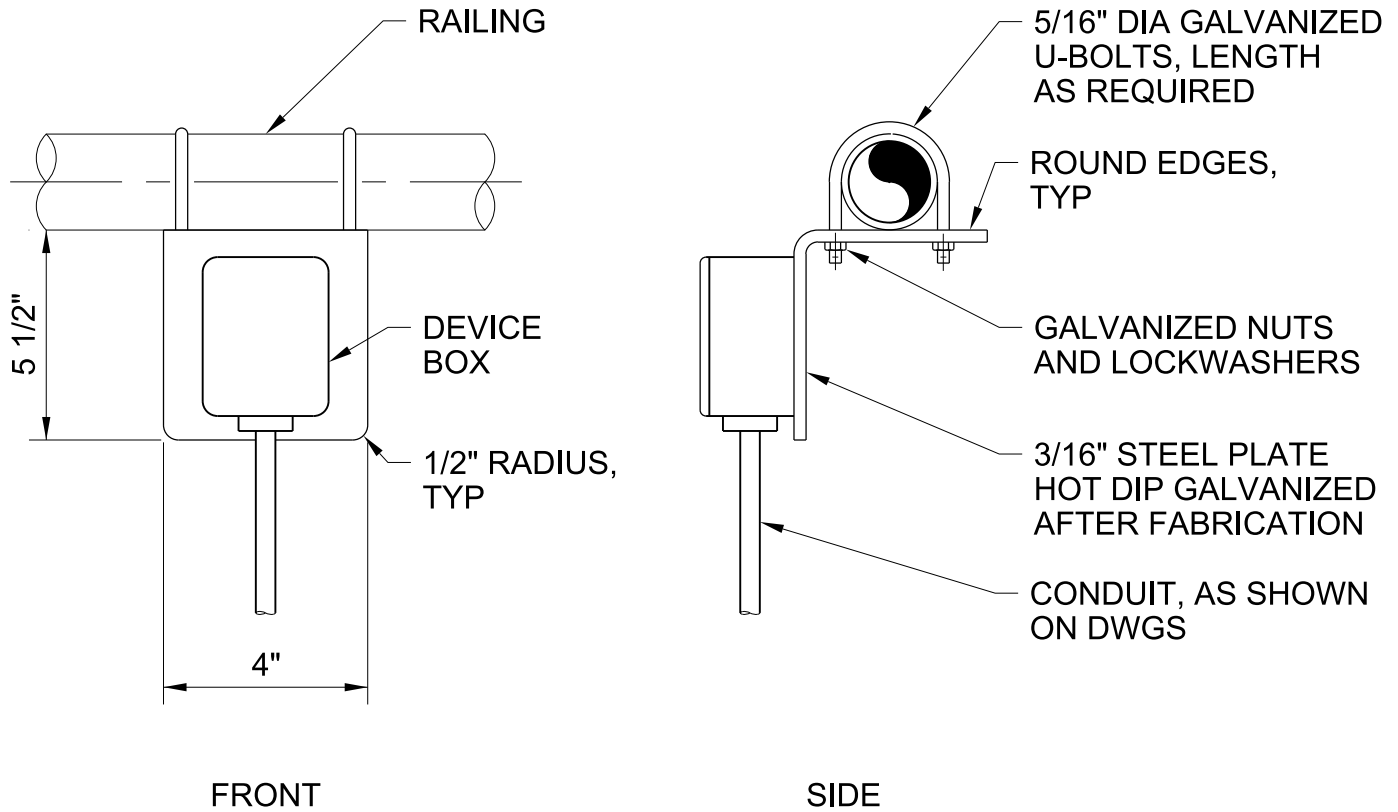
1. ALL MOUNTING HARDWARE SHALL BE STAINLESS STEEL. USE WASHER AND SPLIT-LOCK WASHERS UNDER ALL NUTS.
2. ON CONCRETE WALLS USE STAINLESS STEEL CONCRETE ANCHORS. MOUNT ENCLOSURE ON 1/2" SPACERS OF 1/2" SCHEDULE 80 PVC CONDUIT.
3. BOXES 6 INCHES SQUARE AND LESS SHALL BE SUPPORTED BY TWO ANCHORS. LARGER BOXES SHALL BE SUPPORTED BY AT LEAST FOUR.

DEVICE MOUNTING, WALL OR COLUMN

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-002



NOTE:

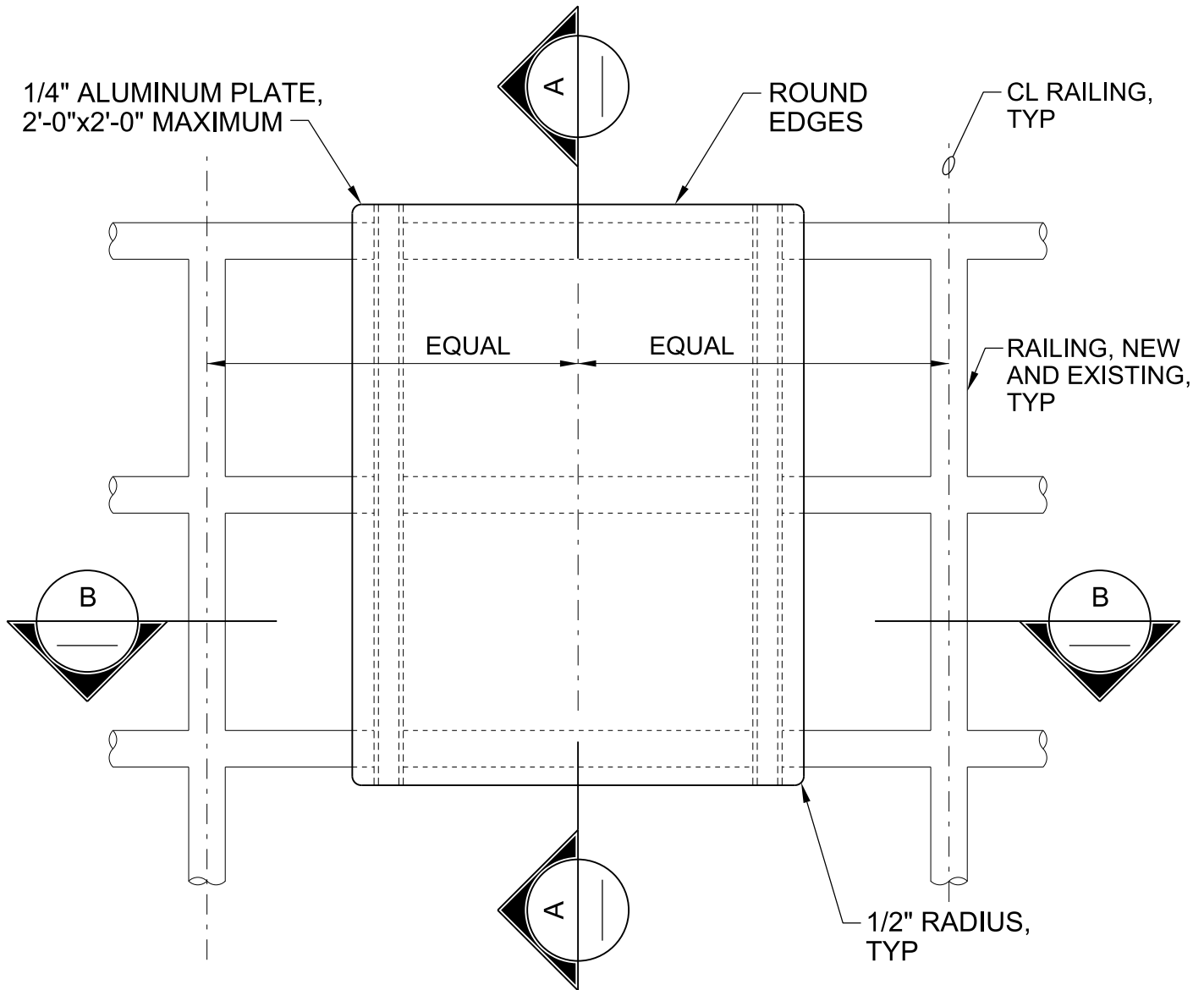
AT ALUMINUM RAILING, PROVIDE PROTECTION FOR ALUMINUM IN CONTACT WITH STEEL MEMBERS AND CONNECTIONS PER SPECIFICATIONS.

DEVICE MOUNTING AT RAILING

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-004



ELEVATION

NOTES:

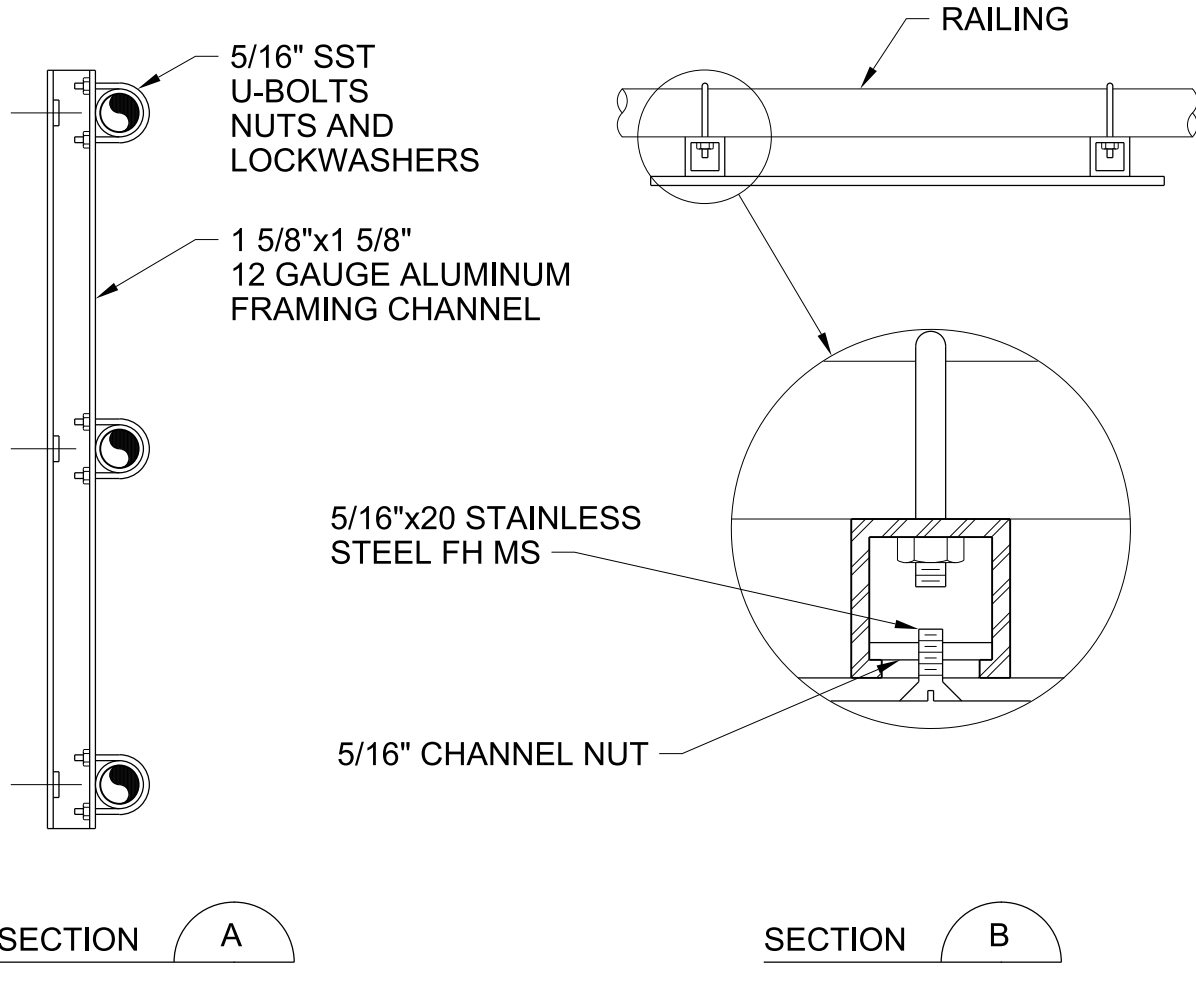
1. ALL HARDWARE SHALL BE STAINLESS STEEL. USE WASHERS AND SPLIT-LOCK WASHERS ON ALL NUTS AND BOLTS.
2. DIMENSIONS SHALL BE AS REQUIRED FOR EQUIPMENT TO BE MOUNTED. EDGE OF MOUNTING PLATE SHALL EXTEND A MINIMUM OF 2 INCHES EACH SIDE OF THE MOUNTED EQUIPMENT.
3. THIS DETAIL SHALL BE USED FOR MOUNTING EQUIPMENT AND JUNCTION BOXES WEIGHING LESS THAN 50 LBS ON RAILINGS WHETHER DETAIL IS CALLED OUT OR NOT. EQUIPMENT MOUNTING SHALL NOT REDUCE THE WIDTH OF A WALKWAY TO LESS THAN 3'-0".

**DEVICE MOUNTING, RAILING
MOUNTED EQUIPMENT SUPPORT**

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-007b

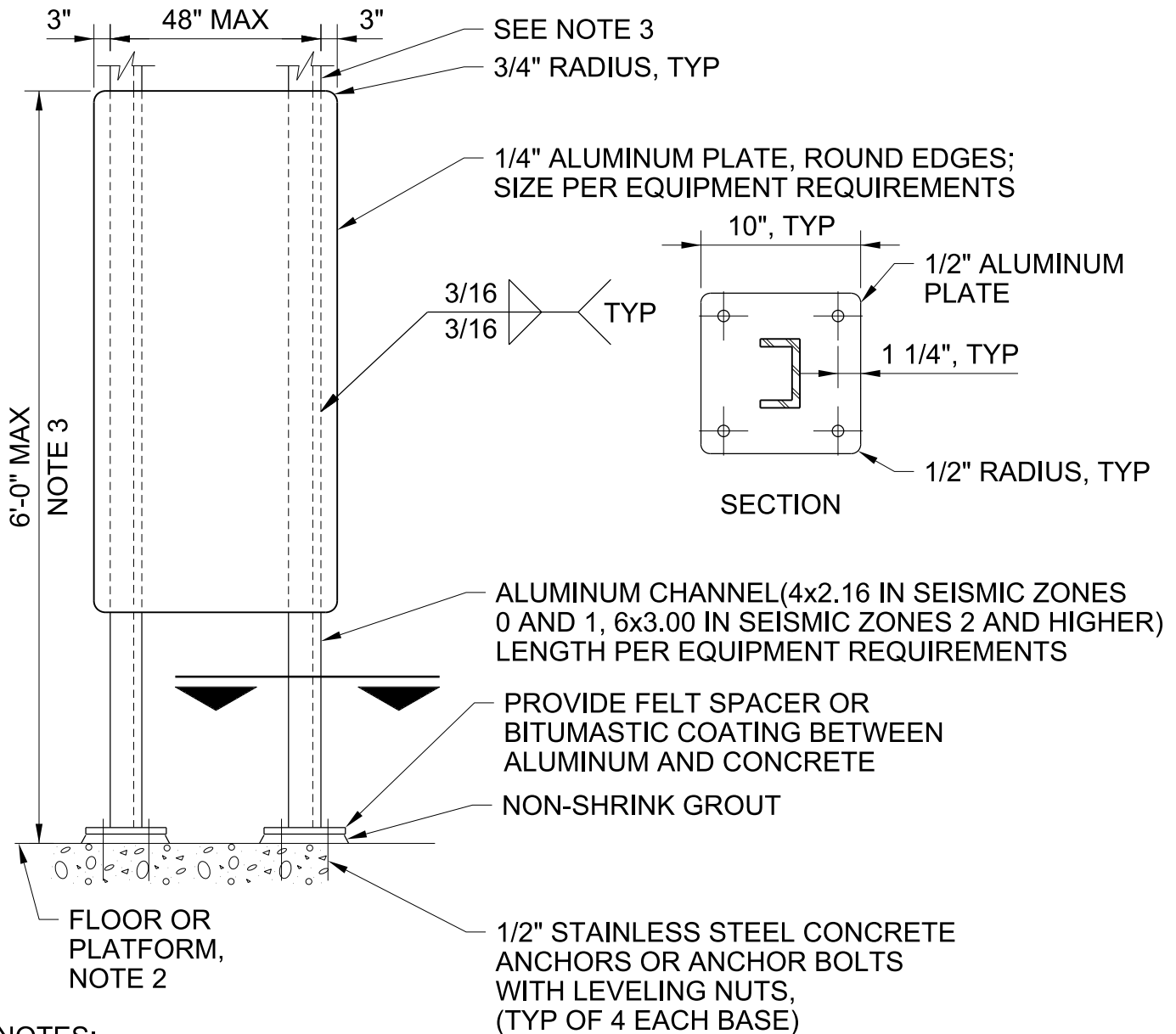


**DEVICE MOUNTING, RAILING
MOUNTED EQUIPMENT SUPPORT**

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-007c



NOTES:

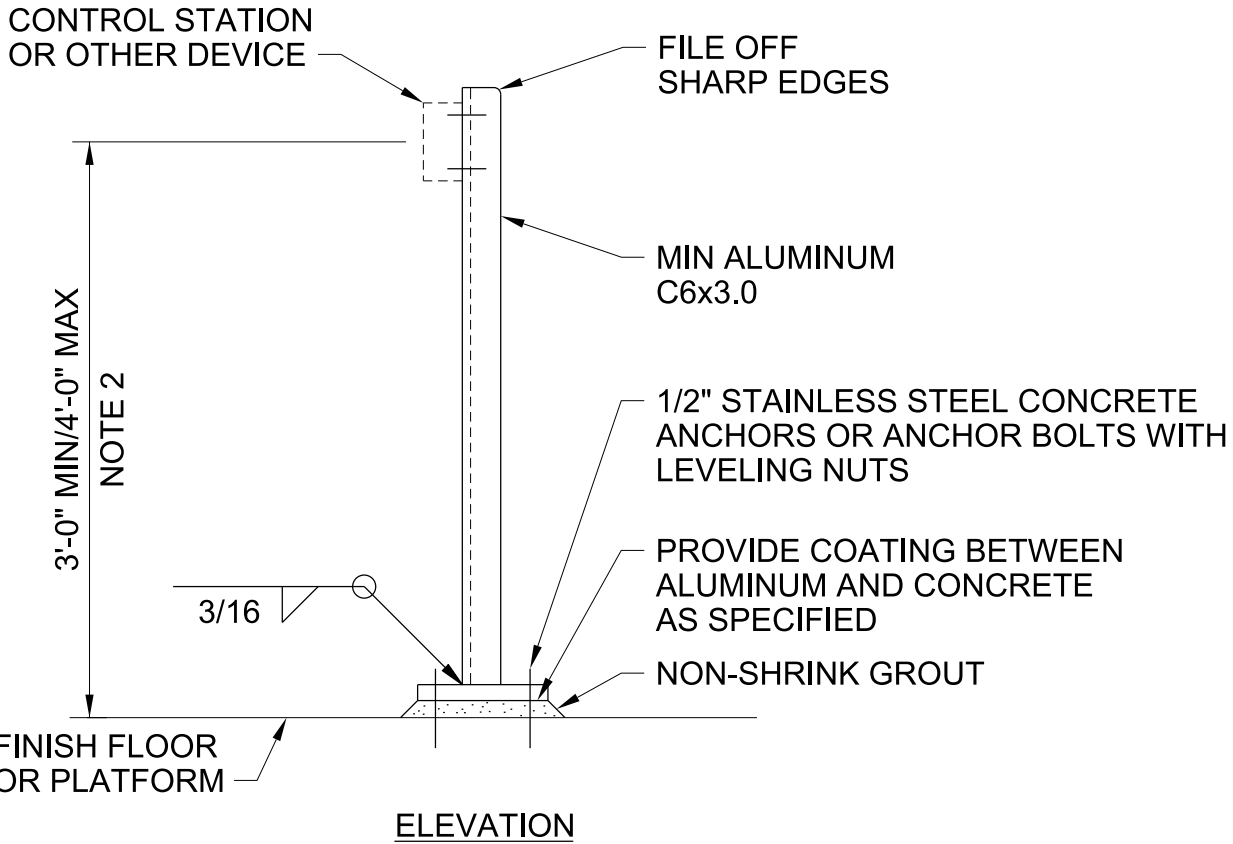
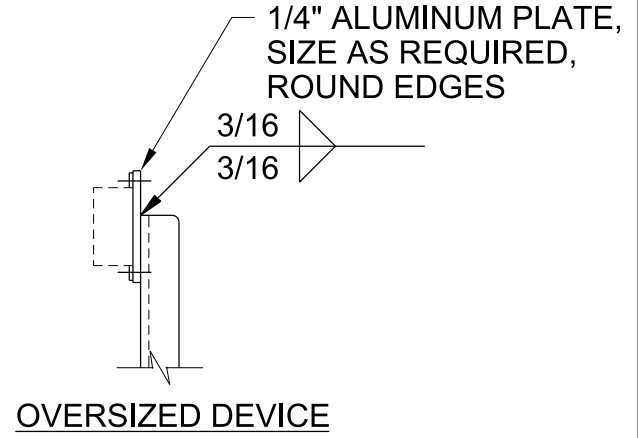
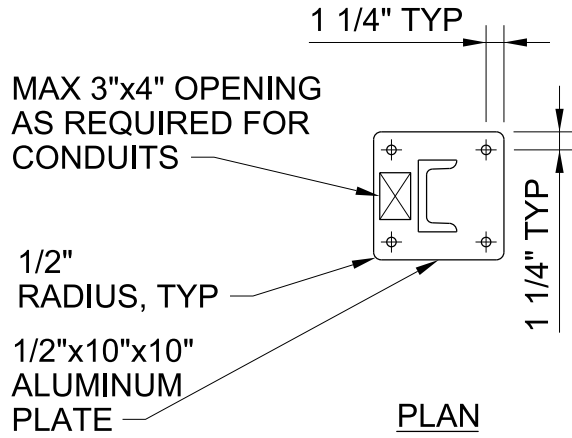
1. USE STAINLESS STEEL MOUNTING HARDWARE. USE WASHER AND SPLIT LOCK WASHER UNDER ALL NUTS.
2. FOR YARD LOCATIONS PROVIDE A 6 INCH THICK CONCRETE PAD AT GRADE WITH #4 BAR @ 12" OC EACH WAY, CENTERED. THE PAD SHALL BE 12 INCHES LONGER THAN THE MOUNTING PLATE BY ONE HALF THE HEIGHT OF THE MOUNTING PLATE ABOVE FINISHED GRADE. MINIMUM WIDTH 24 INCHES.
3. FOR HEIGHTS EXCEEDING 5'-0" OR WEIGHT OF MOUNTED EQUIPMENT EXCEEDING 200 LBS, SIZE POSTS AND CONNECTIONS FOR LATERAL LOADS. EXTEND POSTS TO STRUCTURE ABOVE WHERE REQUIRED BY CALCULATION, SEE GENERAL ELECTRICAL CONSTRUCTION NOTES ON DRAWINGS.

DEVICE MOUNTING, EQUIPMENT PEDESTAL

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-008b



NOTES:

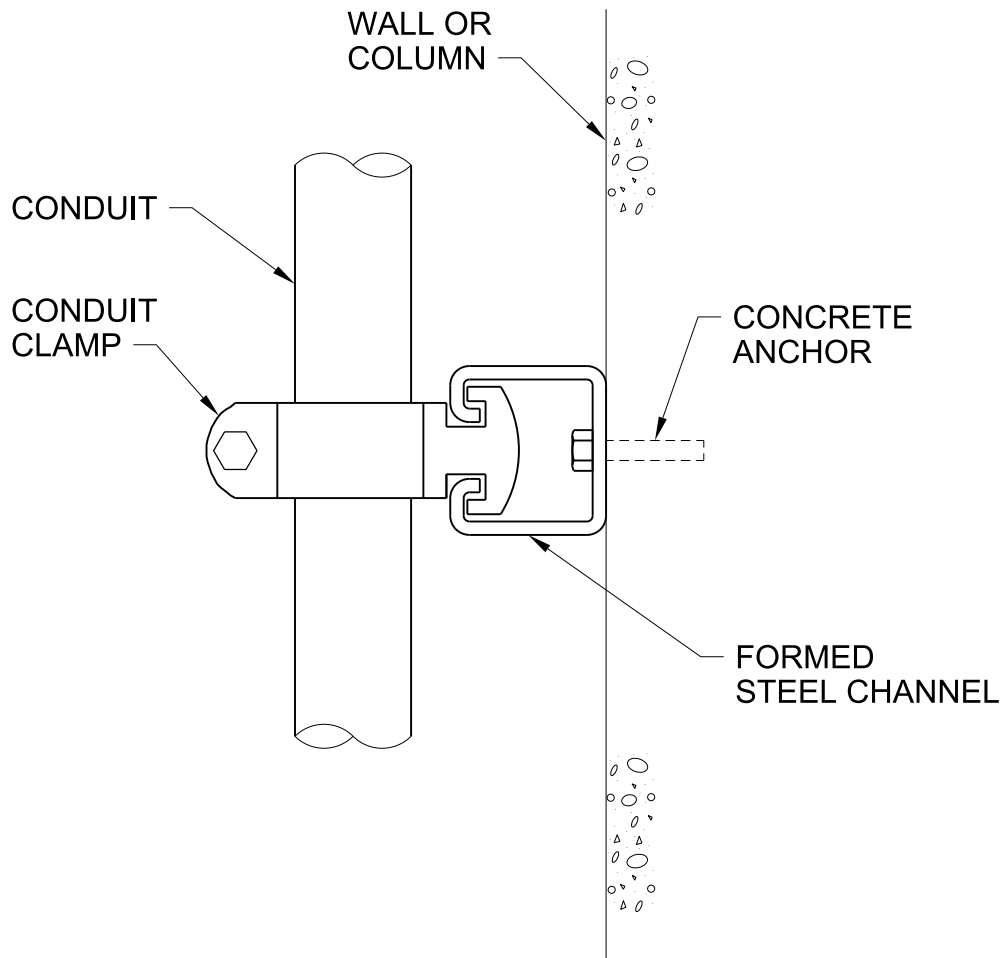
1. ALL MOUNTING HARDWARE SHALL BE STAINLESS STEEL. USE WASHERS AND SPLIT-LOCK WASHERS UNDER ALL NUTS AND BOLTS.
2. FOR HEIGHTS EXCEEDING 4'-0" OR WEIGHTS OF MOUNTED EQUIPMENT EXCEEDING 200 LBS, SIZE POST AND CONNECTION FOR LATERAL LOADS. EXTEND POSTS TO STRUCTURE ABOVE WHERE REQUIRED BY CALCULATION.

DEVICE MOUNTING, PEDESTAL

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-011b



NOTE:

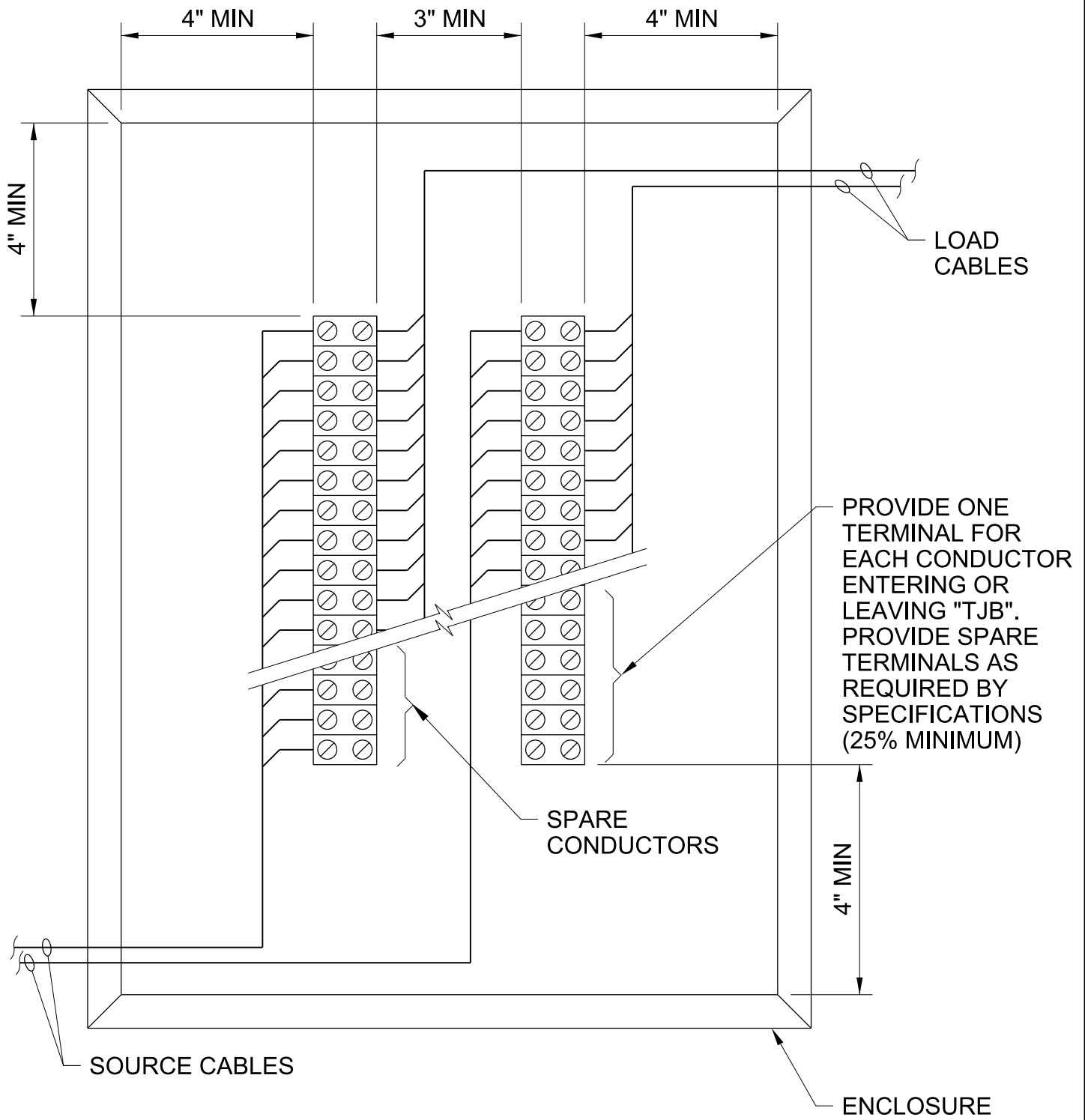
SUPPORT ALL EXPOSED CONDUITS ON FORMED STEEL CHANNELS.

CONDUIT SUPPORT ON STRUCTURE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-017

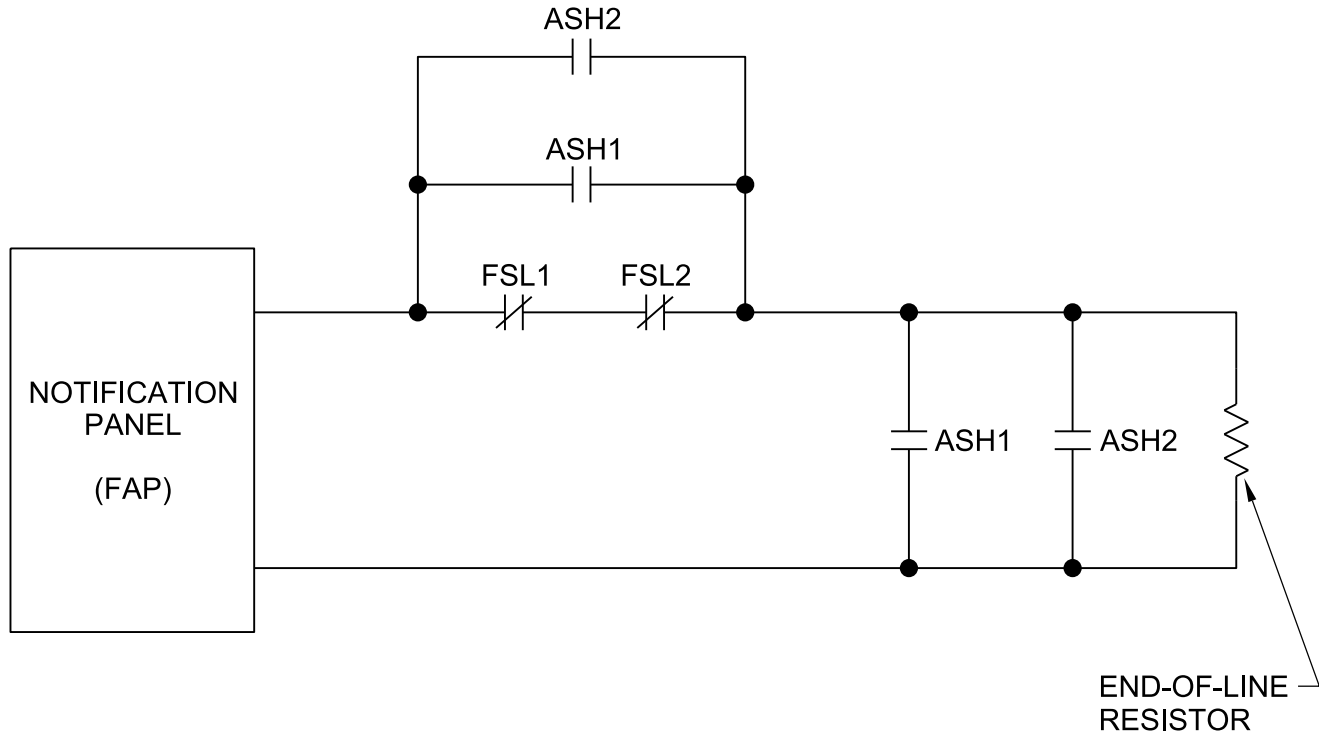


TERMINAL JUNCTION BOX (TJB)

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-102



NOTES:

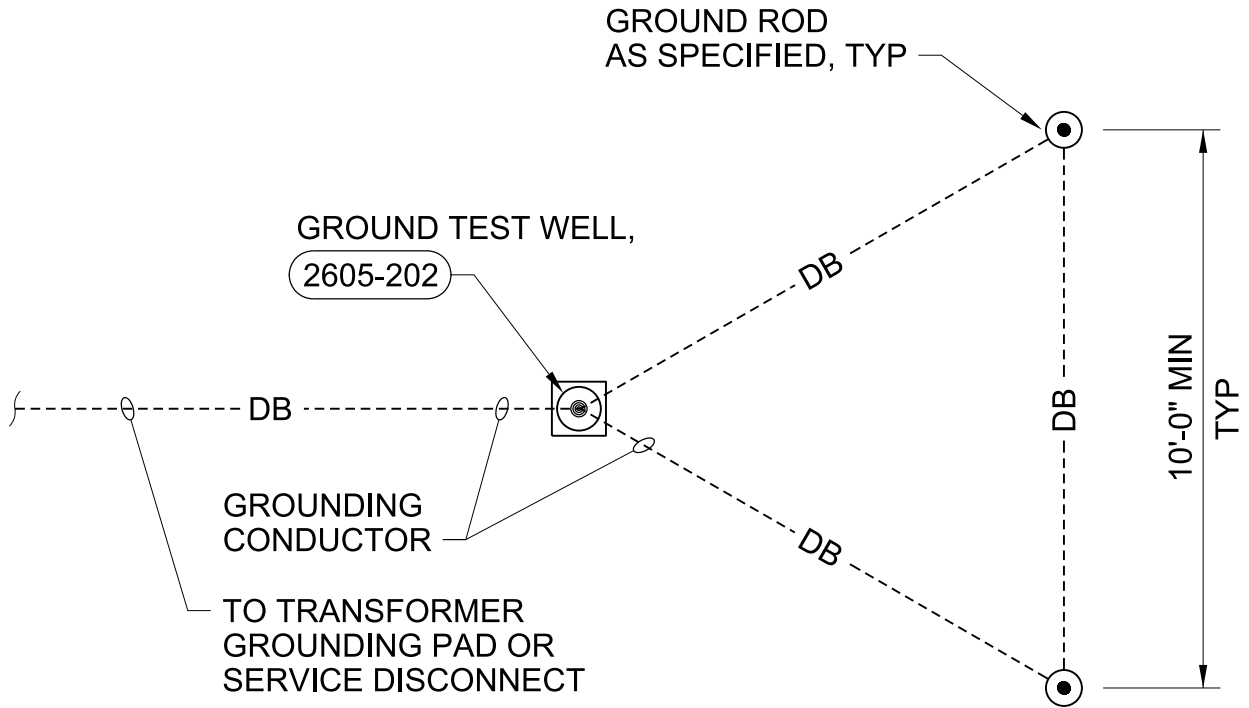
1. FSL CONTACT OPENS ON LOW FLOW.
2. ASH CONTACT CLOSSES ON HIGH ANALYSIS.

**CLASS B CIRCUITRY FOR
MULTIPLE COMBUSTIBLE GAS DETECTORS**

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-103

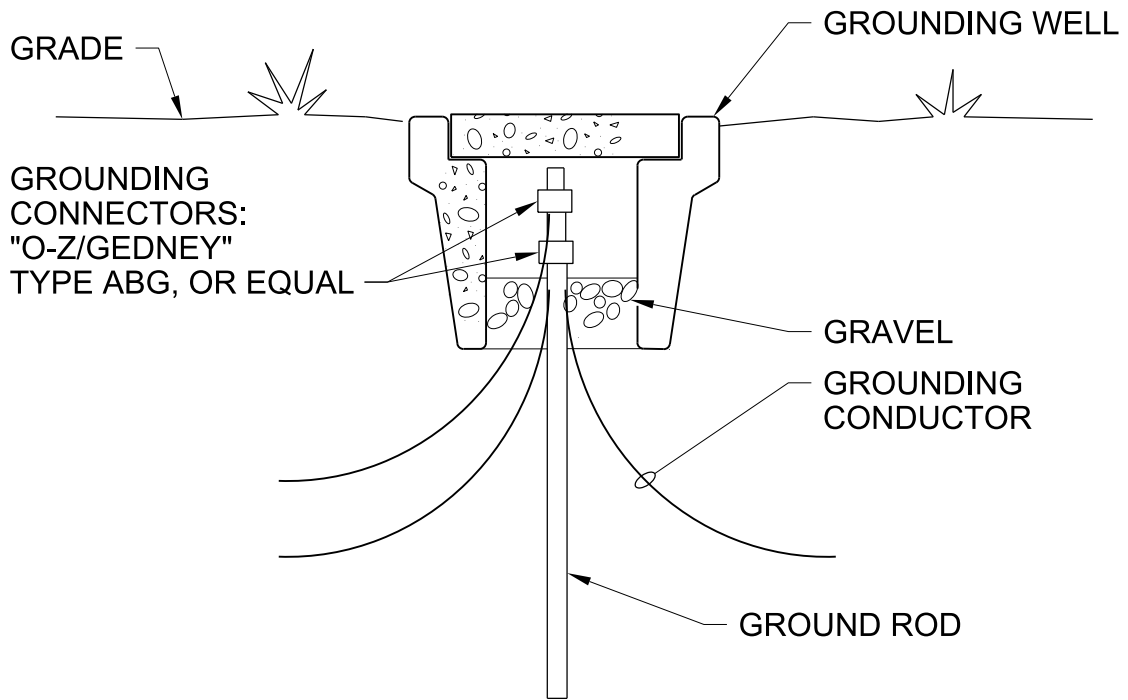


GROUND TRIANGLE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-201



GROUND TEST WELL

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-202

GROUND ROD

TO GROUND TRIANGLE,
2605-201

#4/0 BARE TIN-PLATED CU GROUNDING CONDUCTOR

GROUND CONDUCTOR EMBEDDED IN DUCT BANK (TYP OF 2)

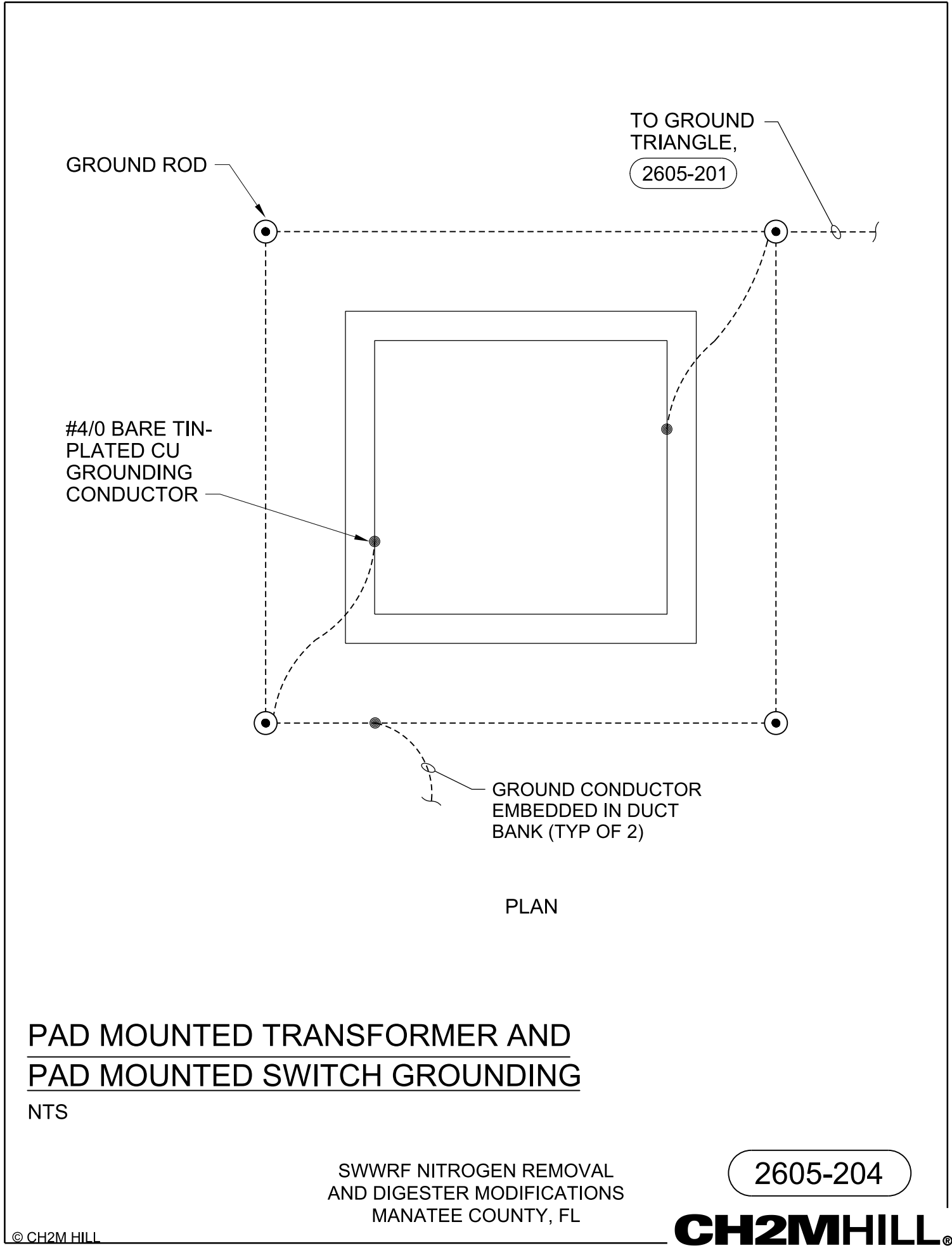
PLAN

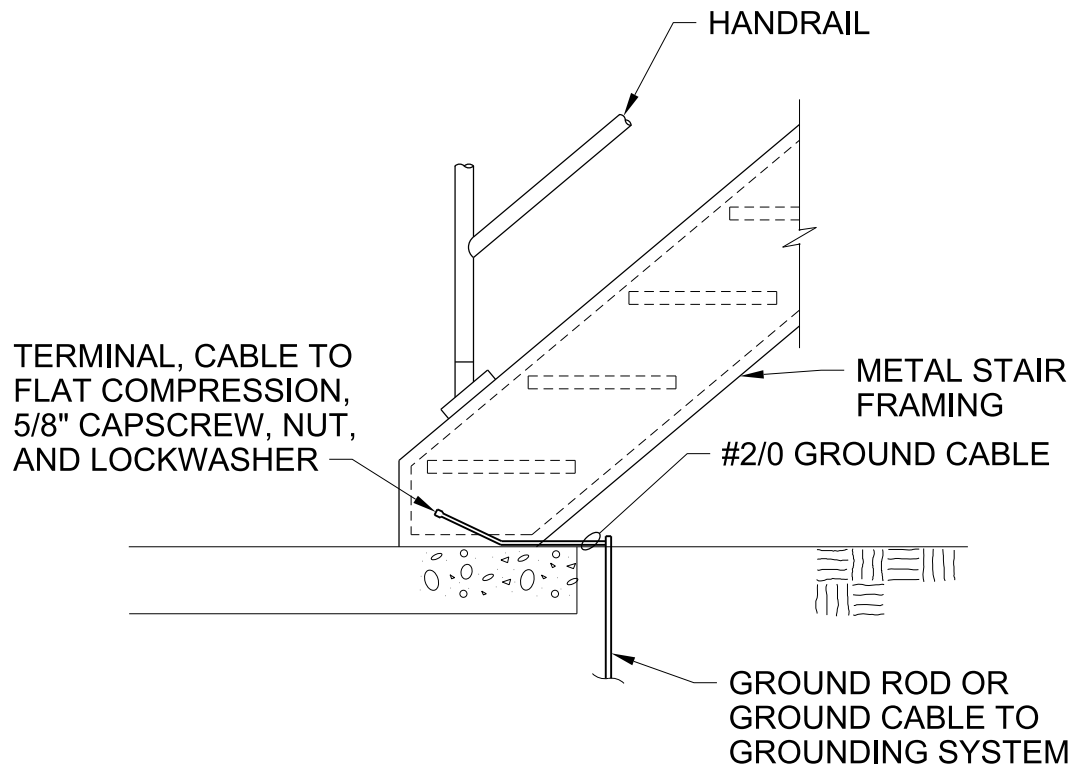
PAD MOUNTED TRANSFORMER AND PAD MOUNTED SWITCH GROUNDING

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-204



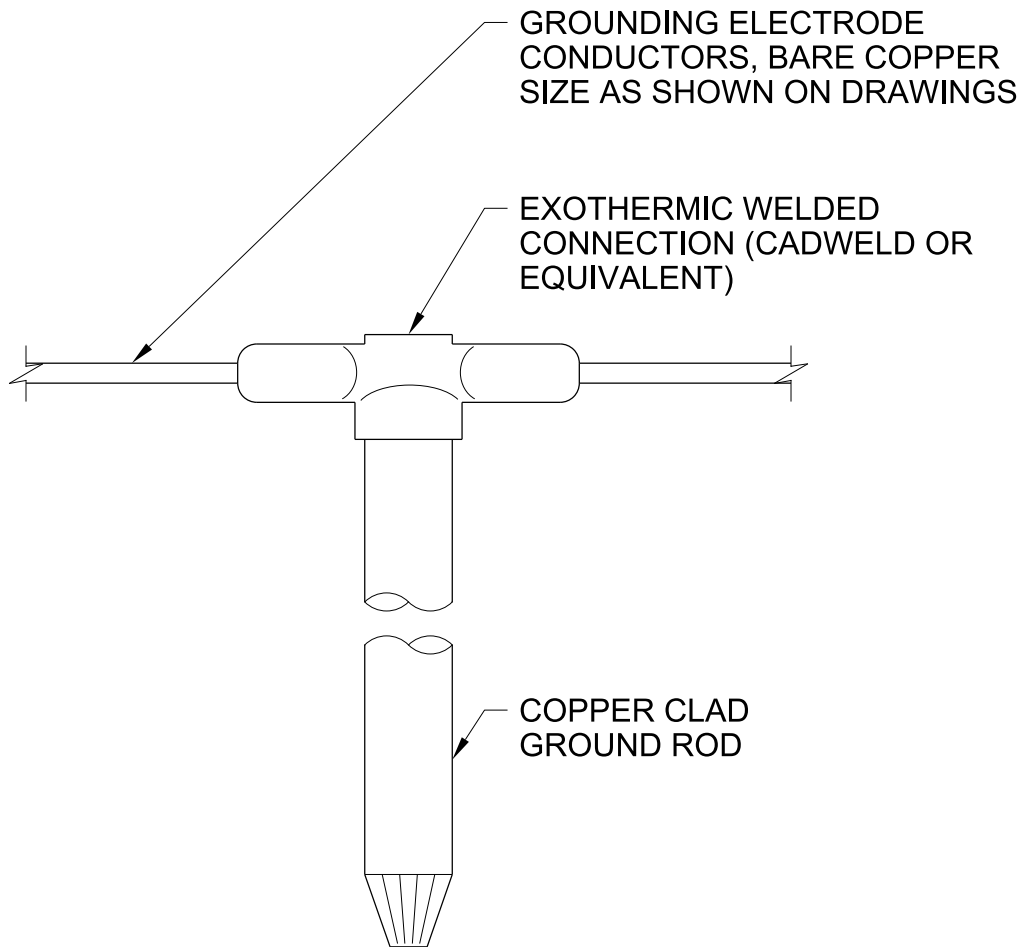


GROUNDING, GENERAL STAIRWAY

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-207

**NOTES:**

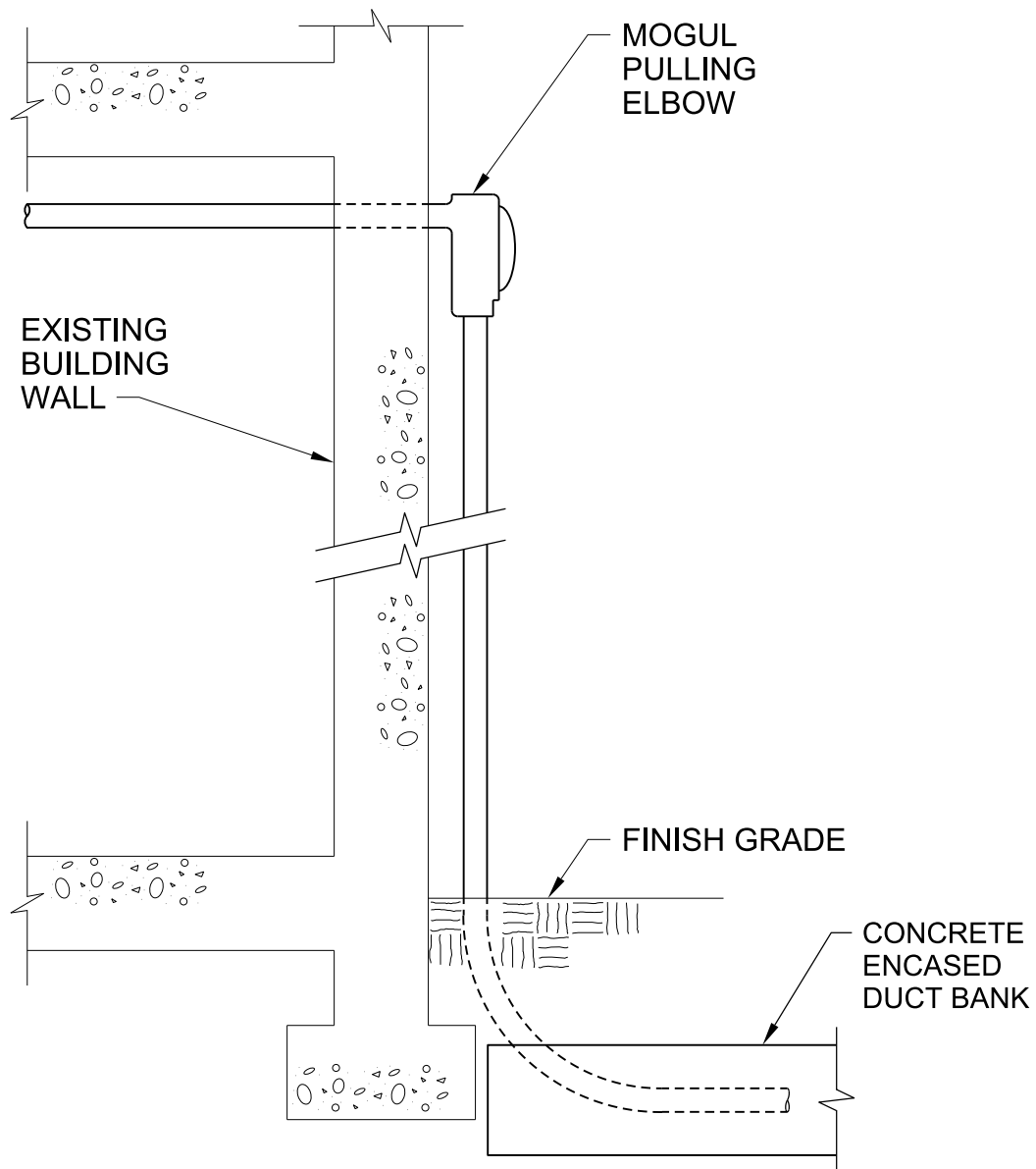
1. TOP OF GROUND ROD SHALL BE SAND BEDDED
6" MIN BELOW GRADE.
2. CONNECTIONS TO EXISTING GROUNDING
ELECTRODE CONDUCTORS SHALL
BE CADWELD OR EQUIVALENT.

GROUND ROD CONNECTION

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-235



NOTES:

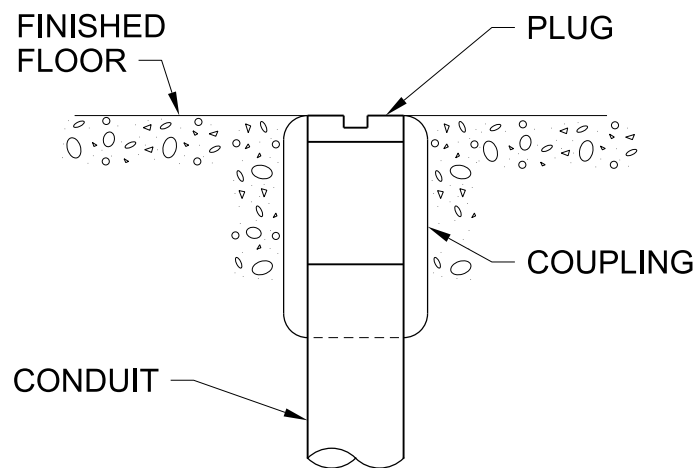
1. INSTALL CONDUITS THROUGH EXISTING WALLS IN ACCORDANCE WITH THIS DETAIL IF NOT OTHERWISE INDICATED.
2. DRILL HOLE USING METHODS THAT LEAVE A SMOOTH OPENING. SEAL OPENING AROUND CONDUIT, INSIDE, AND OUTSIDE, WITH ONE PART POLYURETHANE IMMERSIBLE SEALANT.

CONDUIT ENTRANCE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-304a



NOTE:

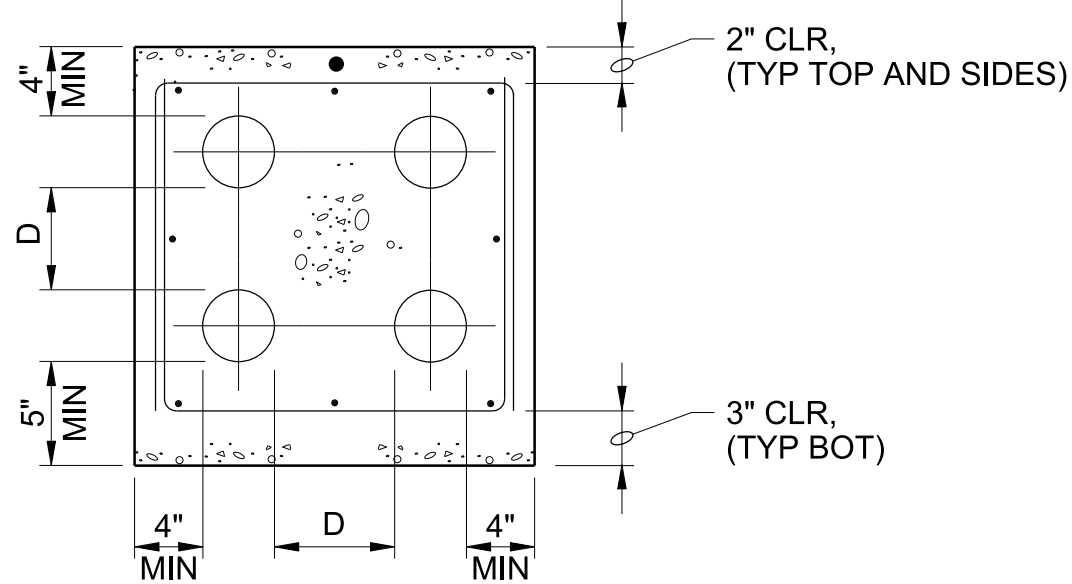
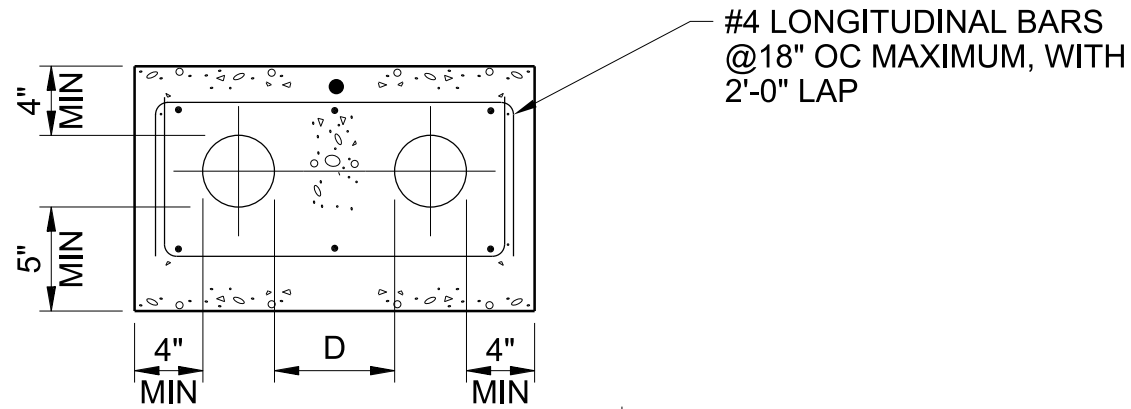
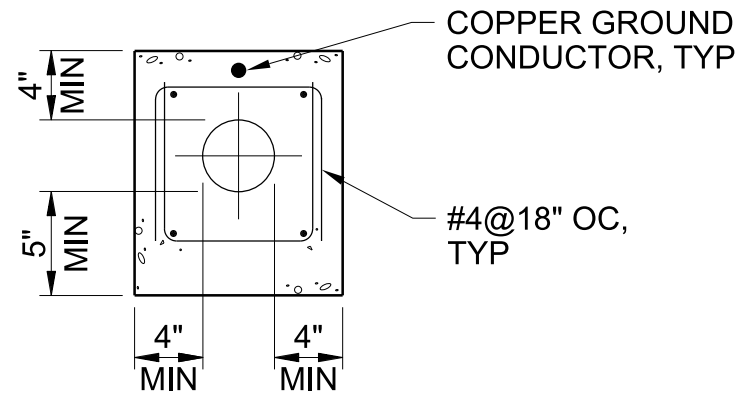
CONDUITS WHICH ARE STUBBED UP IN A CONCRETE SLAB FOR FUTURE EXTENSION SHALL BE INSTALLED IN ACCORDANCE WITH THIS DETAIL.

FLUSH CONDUIT STUB

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

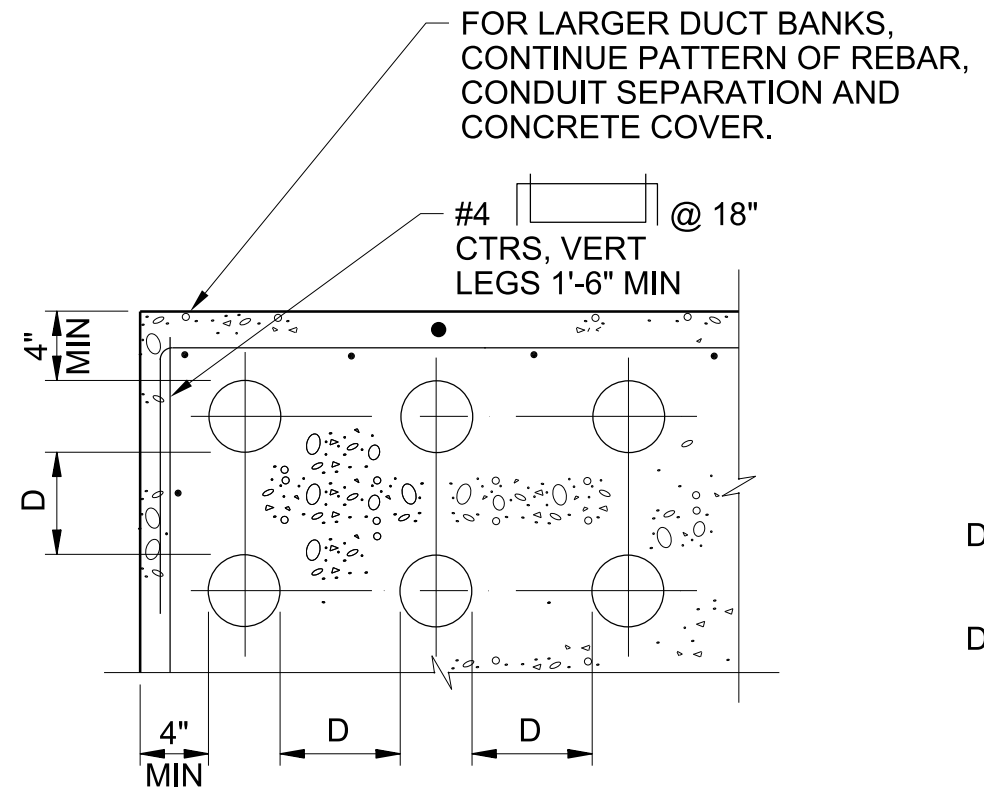
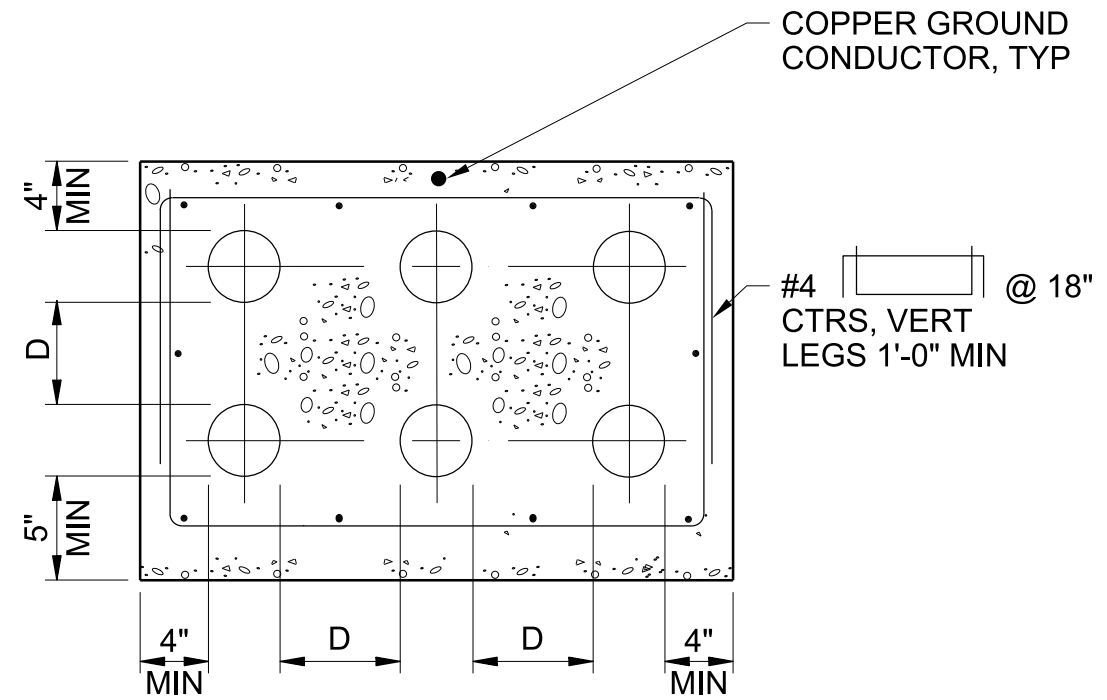
2605-309



NOTE:
 PROVIDE 6" MINIMUM COMPACTED GRAVEL, 3/4" MINUS, UNDER ALL CONCRETE ENCASED DUCT RUNS.

DUCT BANK

NTS



D = 3" FOR 2" AND LARGER CONDUITS
 D = 2" FOR 1 1/2" AND SMALLER CONDUITS

FINISH GRADE

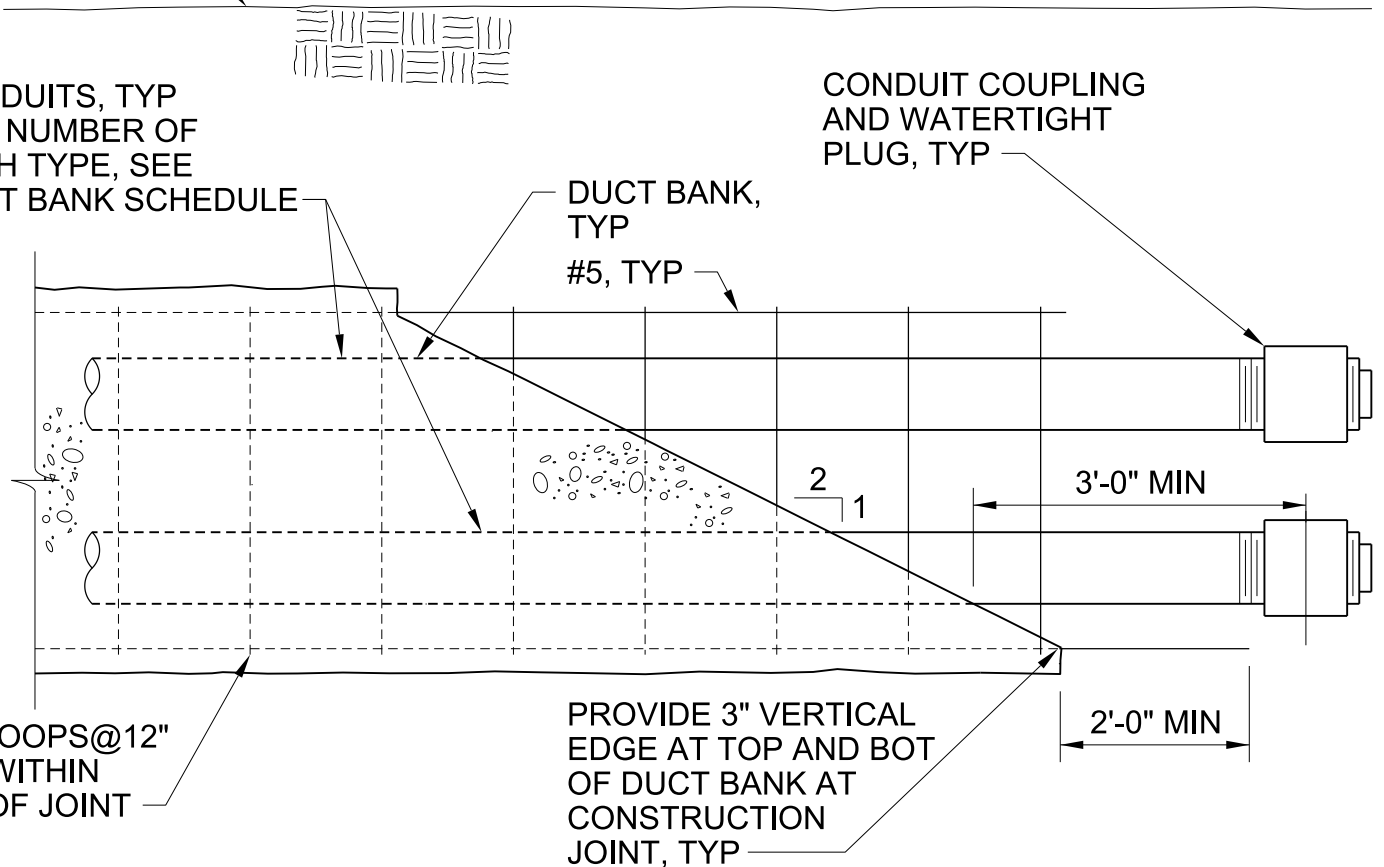
CONDUITS, TYP
FOR NUMBER OF
EACH TYPE, SEE
DUCT BANK SCHEDULE

CONDUIT COUPLING
AND WATERTIGHT
PLUG, TYP

DUCT BANK,
TYP
#5, TYP

#5 HOOPS@12"
OC WITHIN
48" OF JOINT

PROVIDE 3" VERTICAL
EDGE AT TOP AND BOT
OF DUCT BANK AT
CONSTRUCTION
JOINT, TYP



NOTE:

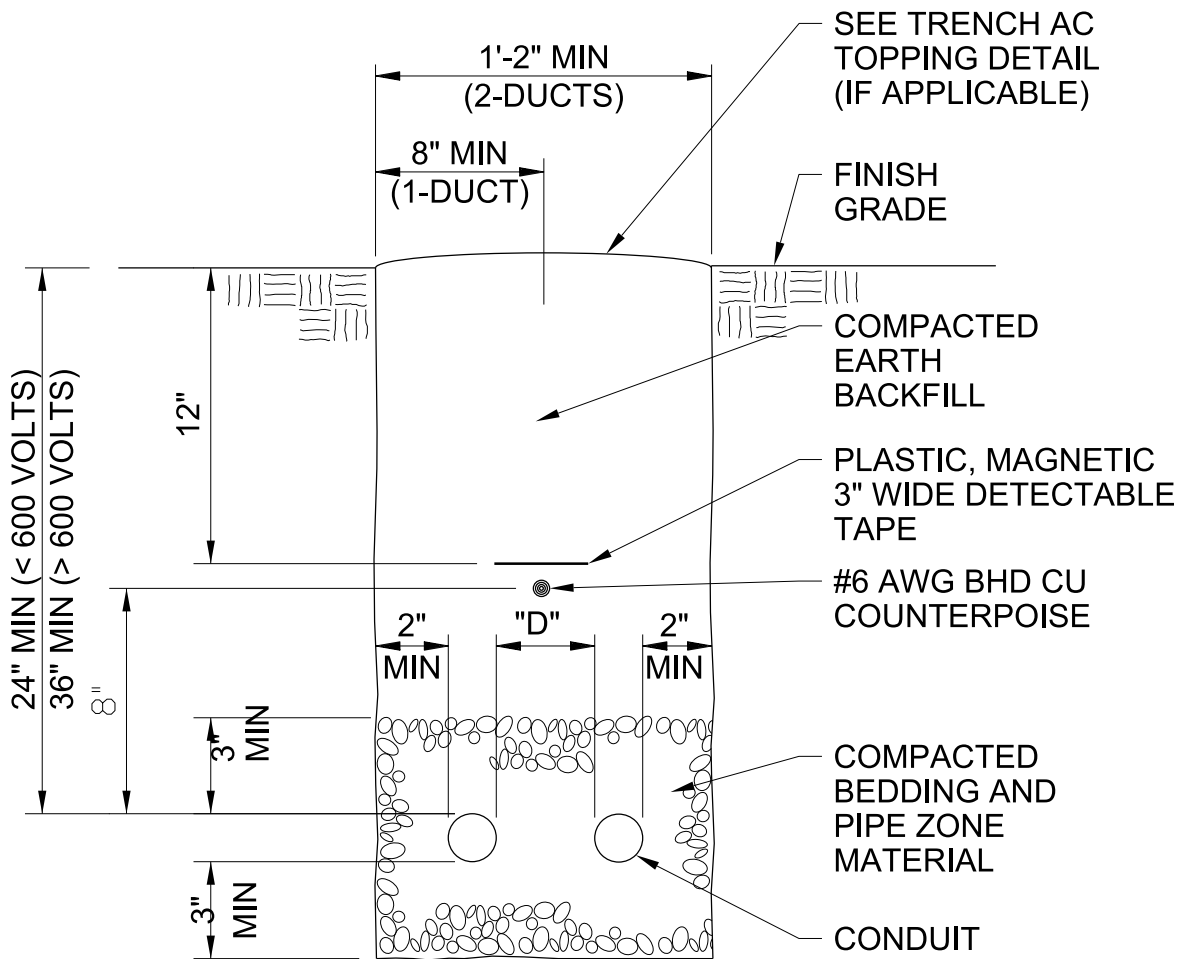
FOR DUCT BANK DETAILS, SEE (2605-400) .

DUCT BANK CONSTRUCTION AT CONTRACT LIMIT

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-401



D = 3" MIN FOR 2" AND LARGER CONDUIT

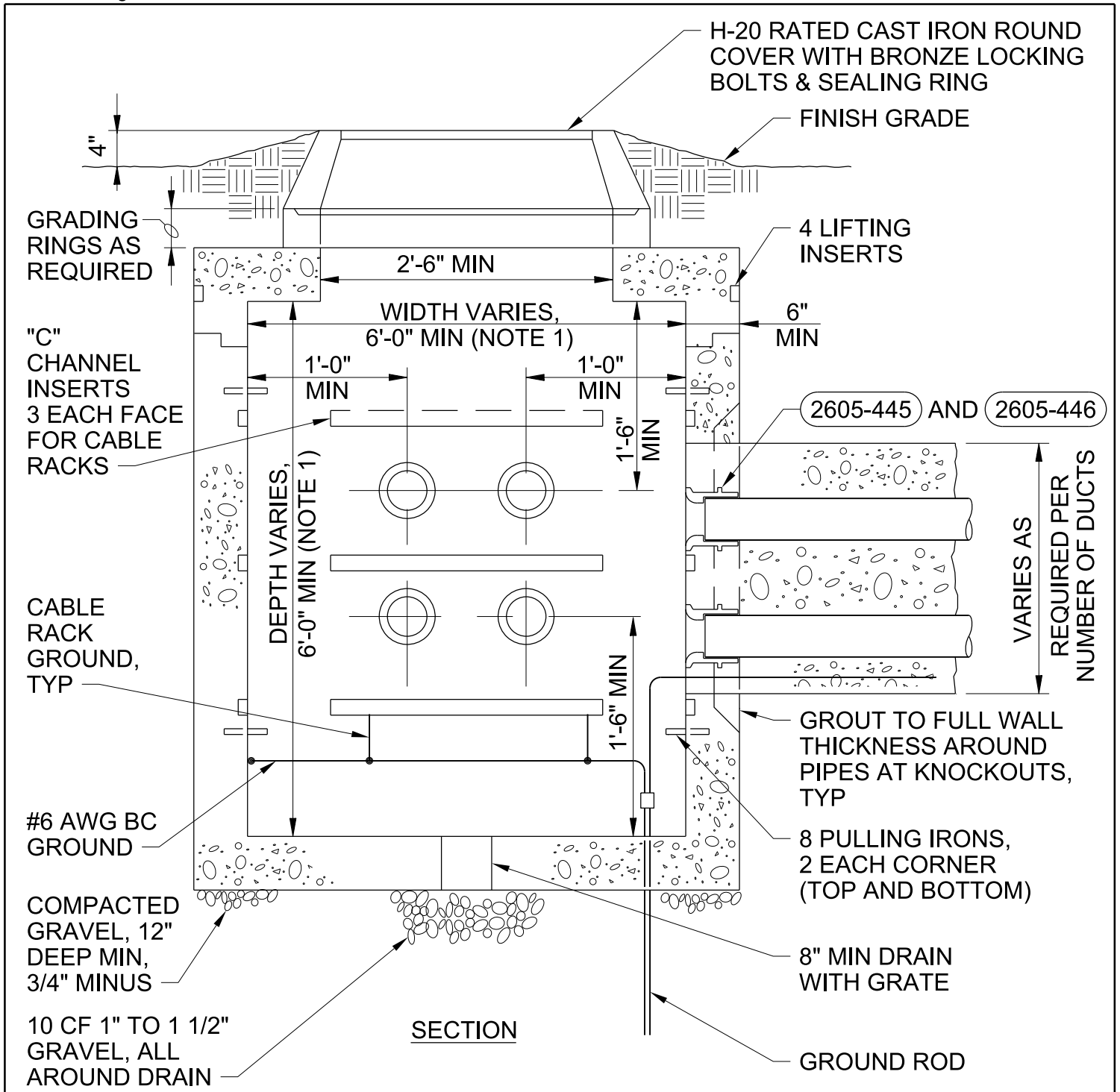
D = 2" MIN FOR 1 1/2" AND SMALLER CONDUIT

TRENCH AND CONDUIT PLACEMENT

NTS

SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-423c



NOTES:

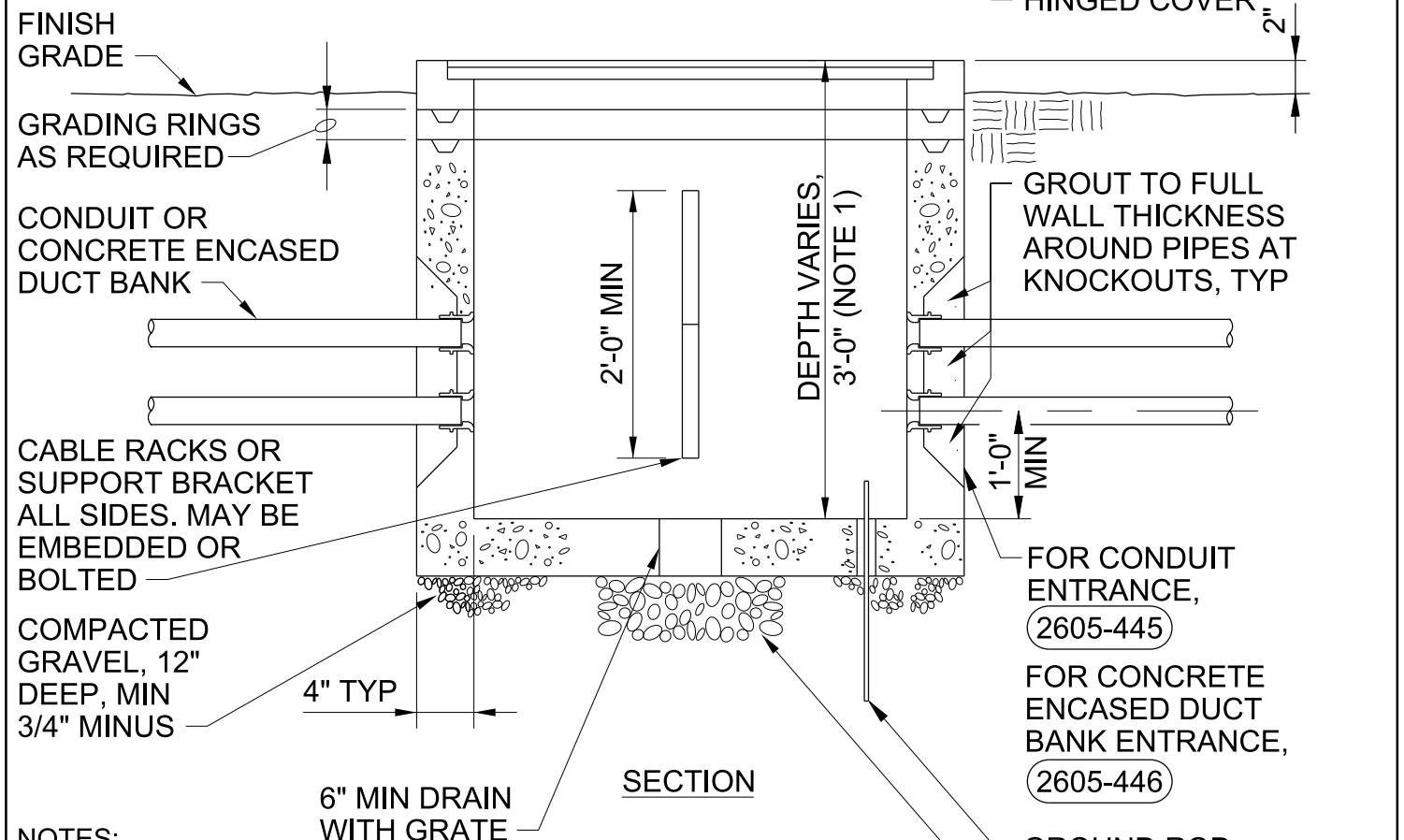
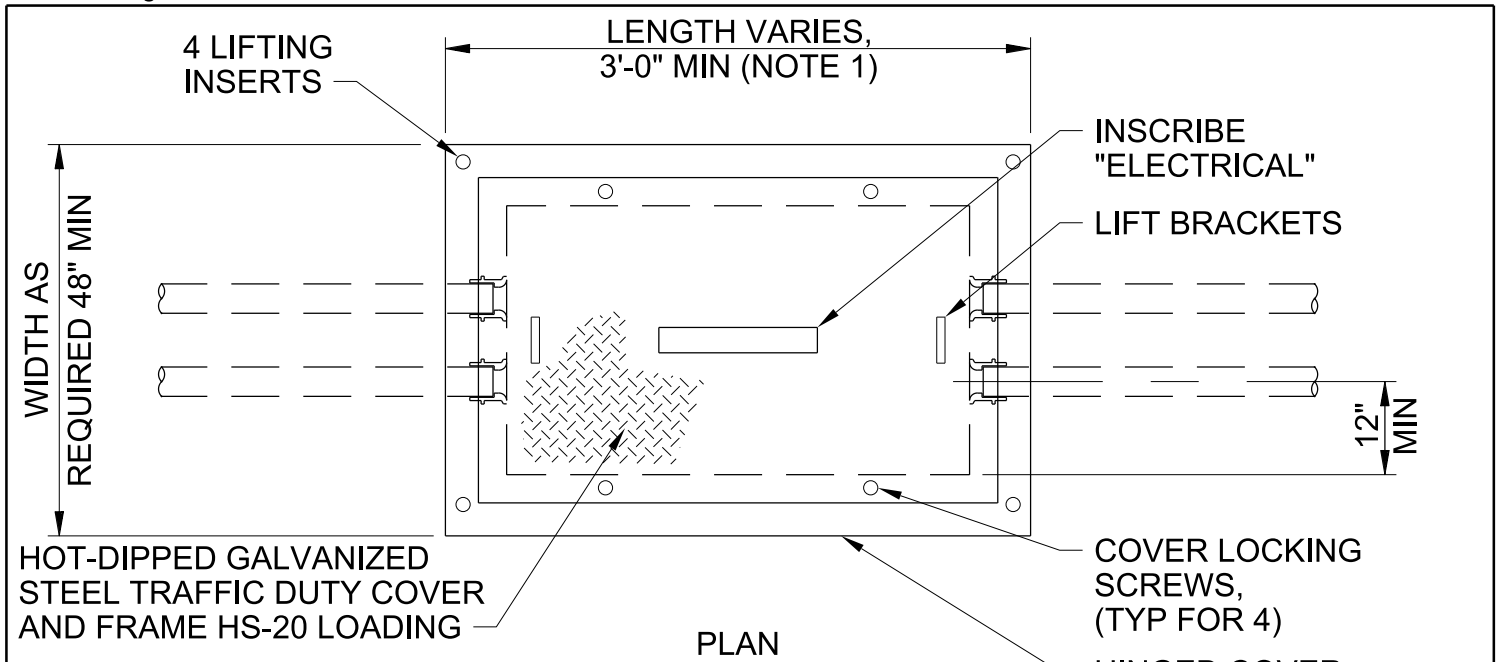
1. MANHOLES SHALL BE SIZED PER NEC REQUIREMENTS (6'-0" WIDE x 6'-0" DEEP MINIMUM).

MANHOLE - WITH GROUNDING

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-443b



NOTES:

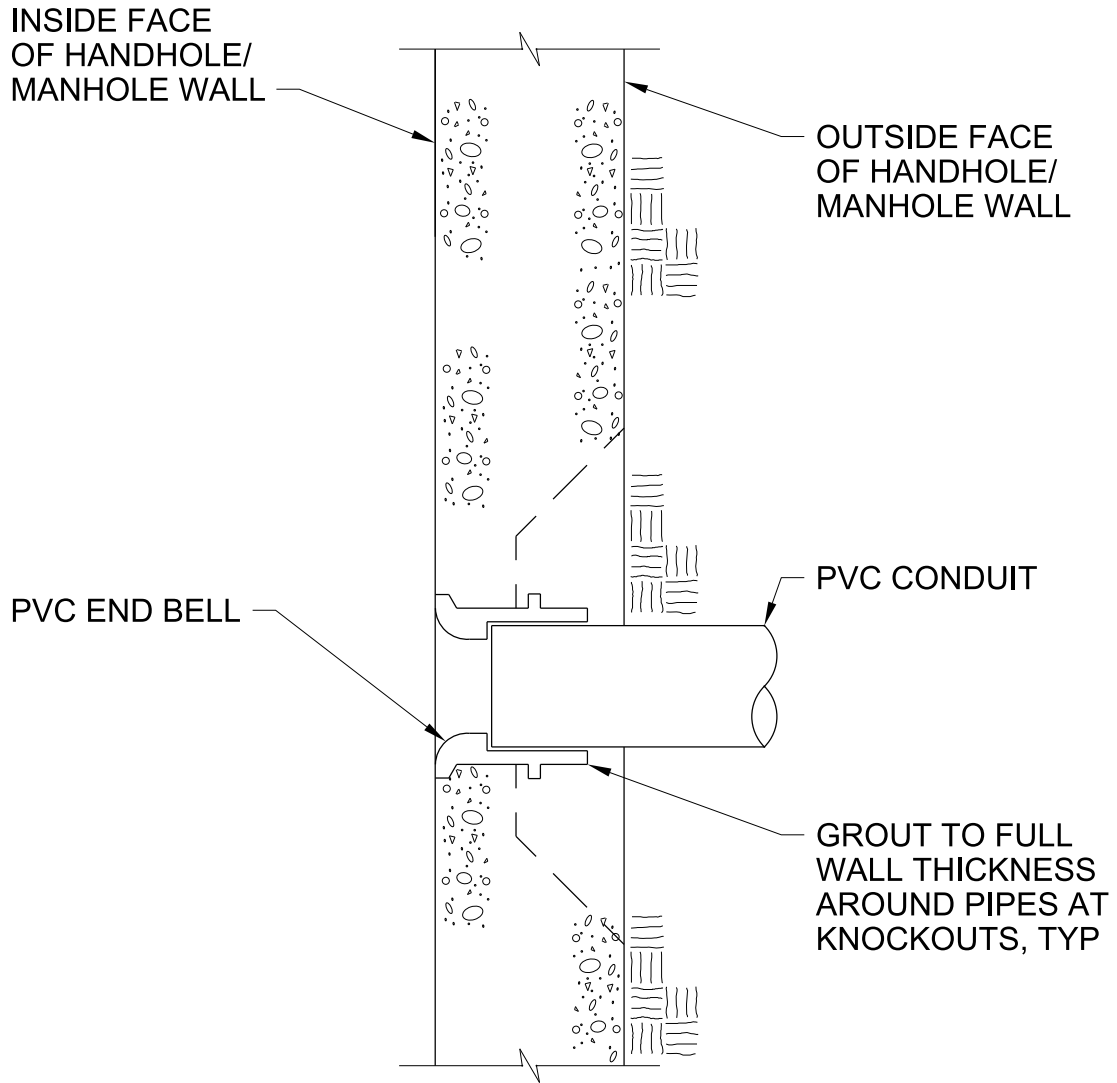
- HANDHOLES SHALL BE SIZED PER NEC REQUIREMENTS (3'-0" WIDE x 3'-0" DEEP MINIMUM).

HANDHOLE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-444

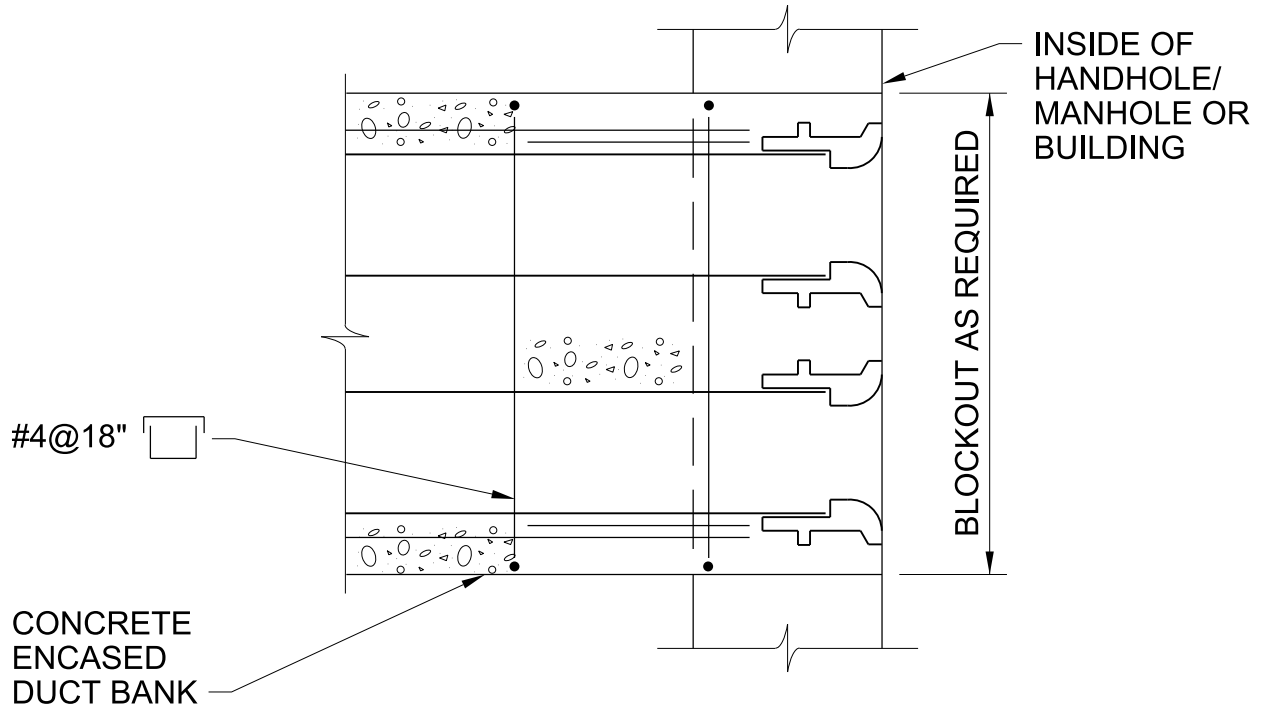


CONDUIT HANDHOLE/MANHOLE ENTRANCE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-445



NOTE:

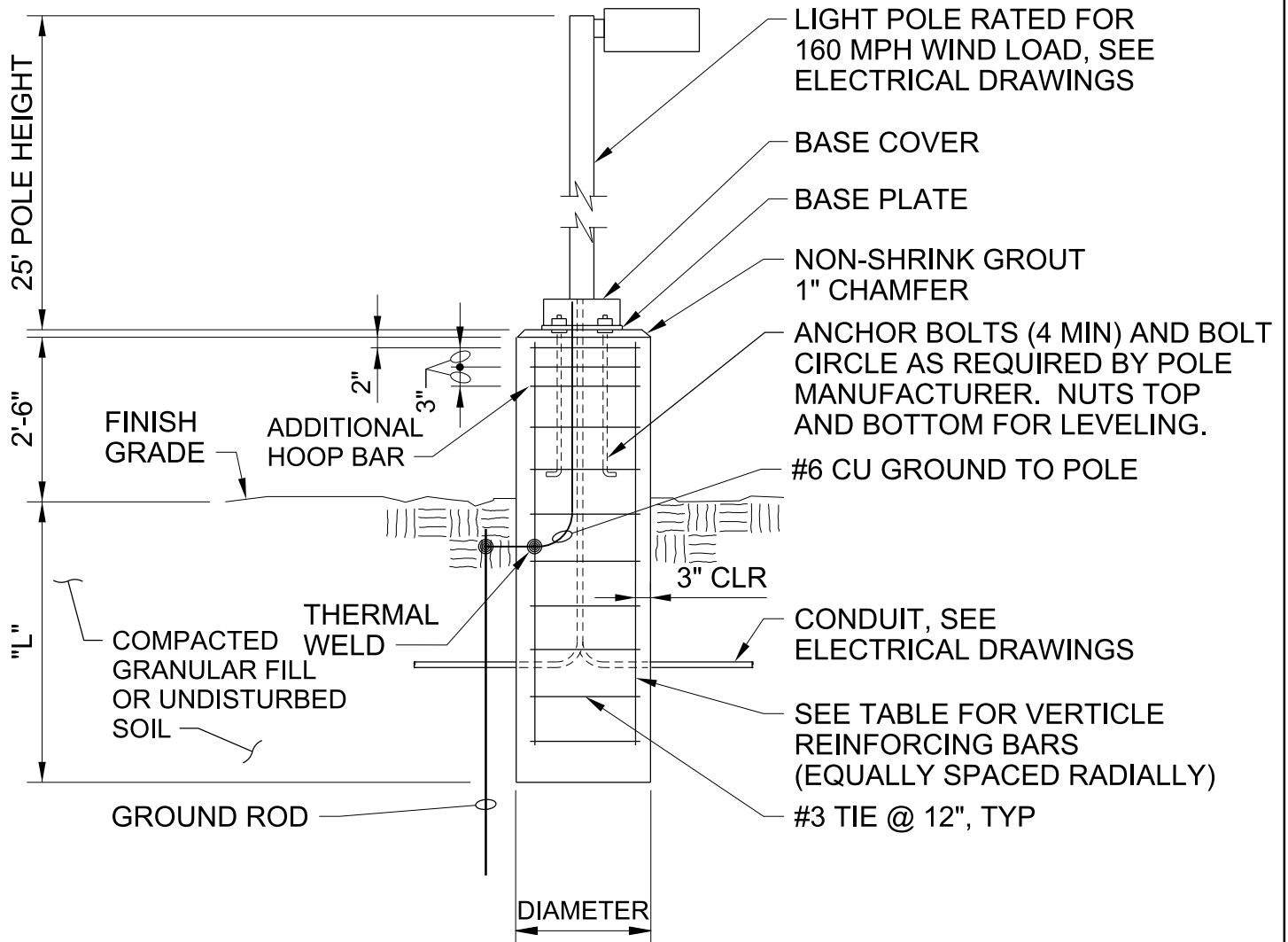
EXTEND REBAR A MINIMUM OF 2' BEYOND THE LIMIT OF EXCAVATION.

CONDUIT HANDHOLE/MANHOLE ENTRANCE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2605-446



MAX POLE HEIGHT	DIAMETER	"L"	VERTICALS
25'	24"	6'-0"	8 - #5

NOTES:

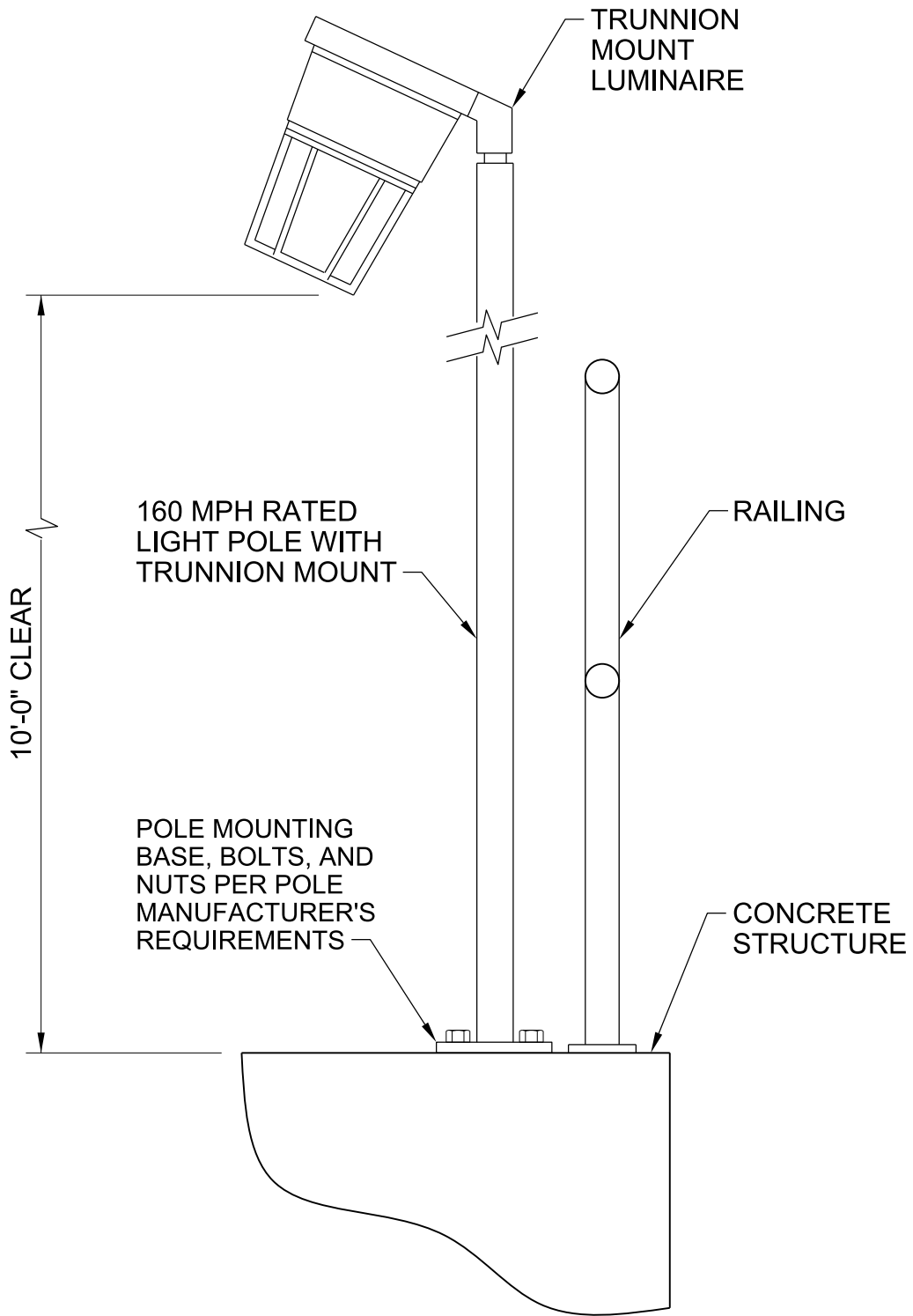
1. USE STAINLESS STEEL NUTS AND LOCKWASHERS.
2. INSTALL 2 CONDUITS (MINIMUM) PER POLE.
3. CONDUITS SHALL BE STUBBED UP TO WITHIN 6 INCHES OF THE POLE HANDHOLE.
4. FOR PROPER ORIENTATION OF POLE, COORDINATE WITH SITE PLANS.

LIGHT POLE FOOTING

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2656-207

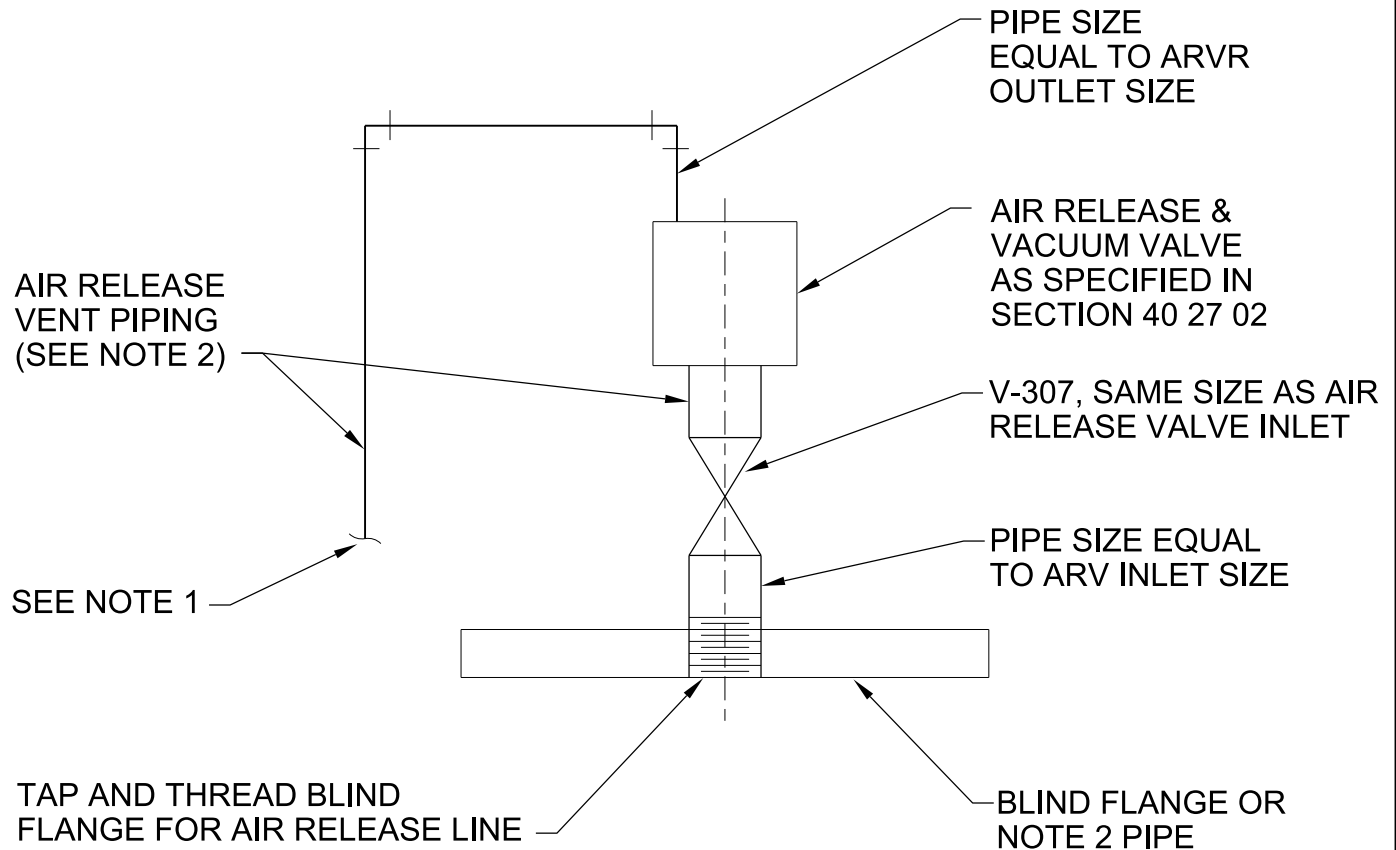


LUMINAIRE MOUNTING AT SPLITTER BOX PLATFORM

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

2656-210



NOTES:

1. ROUTE VENT TO FLOOR DRAIN/TRENCH DRAIN FOR INTERIOR INSTALLATION. FOR EXTERIOR INSTALLATION ROUTE VENT OFF PAD TO GRADE.
2. PIPING MATERIAL AS SPECIFIED IN SECTION 40 05 15 FOR SPECIFIC SERVICE.

AIR RELEASE AND VACUUM RELEASE VALVE ASSEMBLY

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

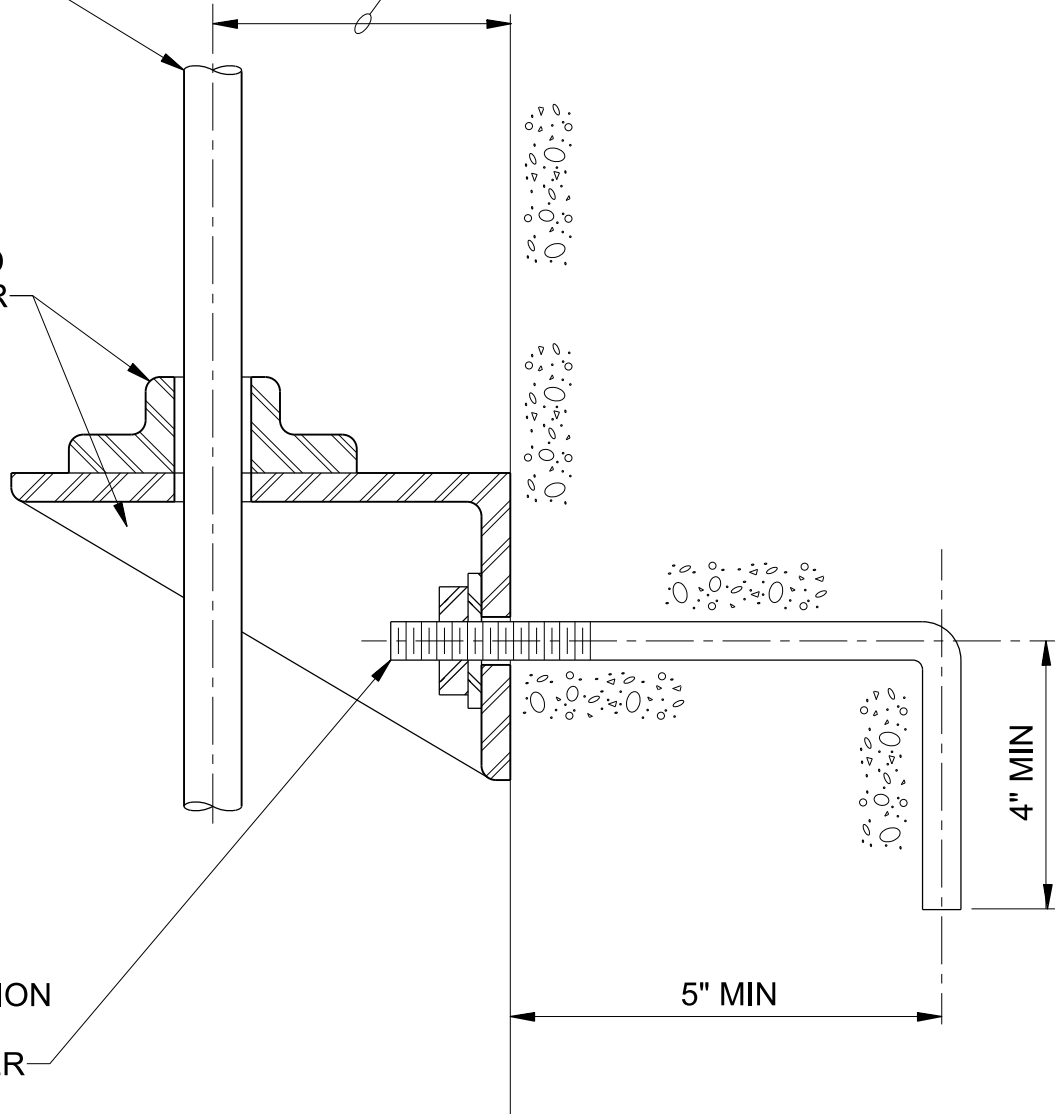
3312-655

CH2MHILL®

STAINLESS STEEL
GATE STEM

DIMENSION AS REQUIRED
BY MANUFACTURER

ADJUSTABLE CAST
IRON STEM GUIDE
WITH STAINLESS
STEEL BOLTS AND
NUTS AS REQUIRED
BY MANUFACTURER



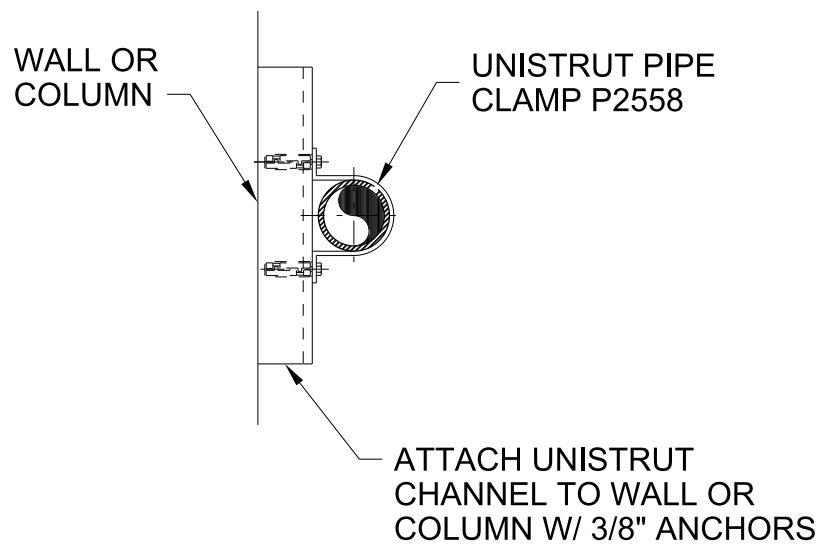
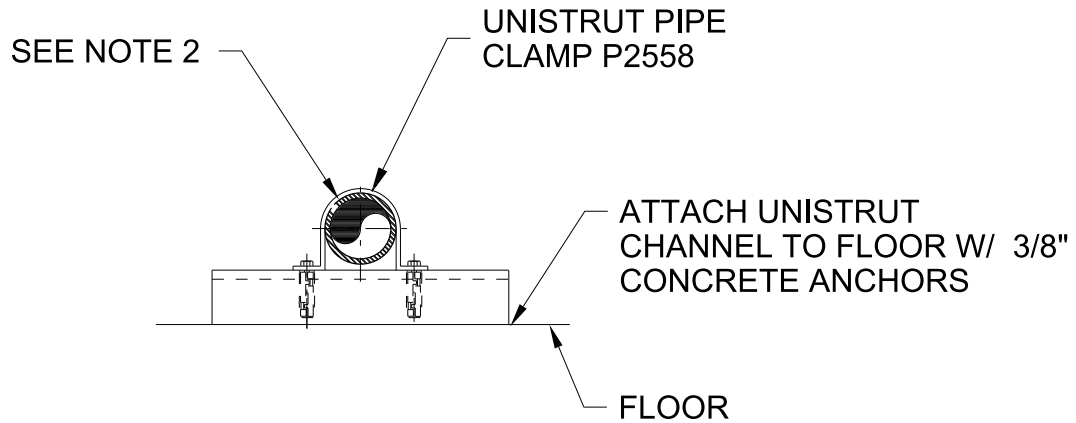
STAINLESS STEEL
ANCHOR BOLTS,
NUTS AND
WASHERS. SIZE,
LENGTH AND
THREAD PROJECTION
AS REQUIRED
BY MANUFACTURER

STEM GUIDE INSTALLATION

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

3520-702



NOTES:

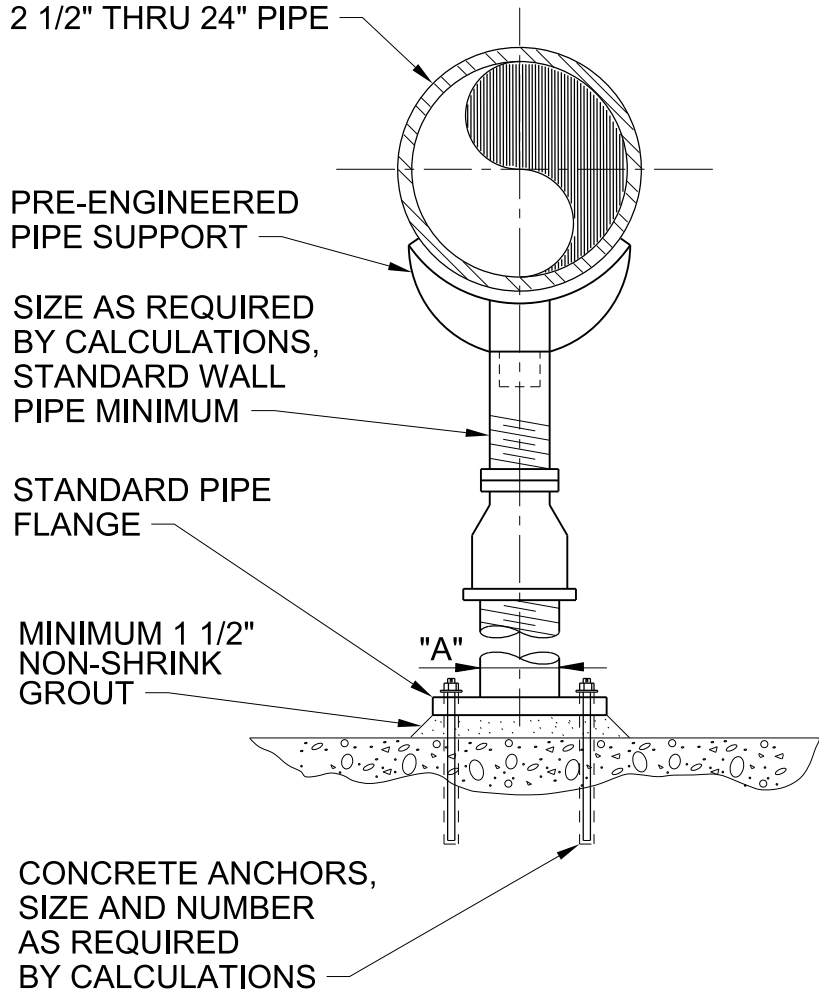
1. FOR MATERIALS OF CONSTRUCTION SEE SPECIFICATIONS SECTION 40 05 15.
2. FOR PVC PIPE USE UNISTRUT P2600 UNICUSHION INSTALLED BY THE MECHANICAL CONTRACTOR.
3. TIGHTEN CLAMP SNUG TO PIPE.

PIPE SUPPORT

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4005-495C



DIMENSION TABLE

PIPE SIZE	"A" MINIMUM NOMINAL PIPE SIZE
2-1/2"	2-1/2"
3"	2-1/2"
4"	3"
6"	3"
8"	3"
10"	3"
12"	3"
14"	4"
16"	4"
20"	6"
24"	6"

NOTE:

SUBMIT FINAL DESIGN AND CALCULATIONS FOR SUPPORT AND ANCHORAGE AS SPECIFIED.

**PIPE SUPPORT
SADDLE SUPPORT PEDESTAL TYPE - ADJUSTABLE**

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4005-500

PRE-ENGINEERED
U-BOLT

2 1/2" THRU 24" PIPE

PRE-ENGINEERED
PIPE SUPPORT

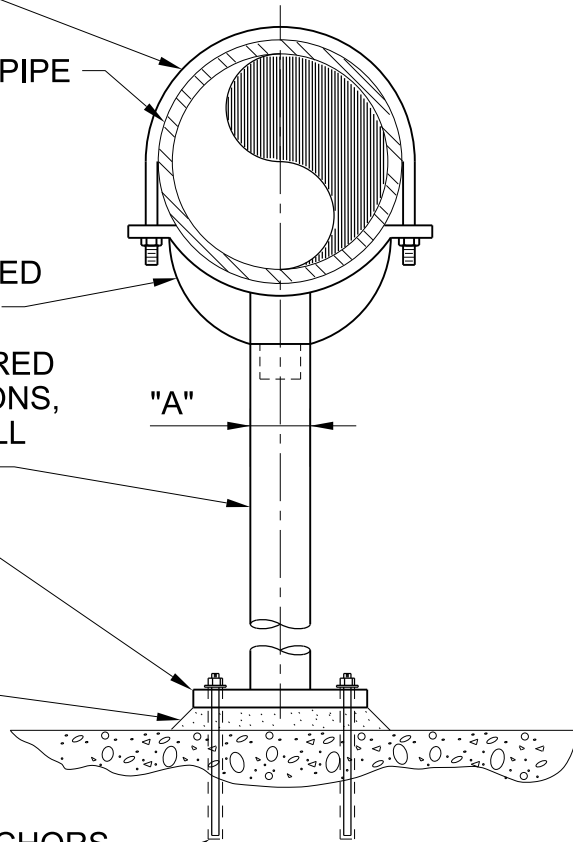
SIZE AS REQUIRED
BY CALCULATIONS,
STANDARD WALL
PIPE MINIMUM

"A"

STANDARD
PIPE FLANGE

MINIMUM 1 1/2"
NON-SHRINK
GROUT

CONCRETE ANCHORS,
SIZE AND NUMBER
AS REQUIRED BY
CALCULATION



DIMENSION TABLE

PIPE SIZE	"A" MINIMUM NOMINAL PIPE SIZE
2-1/2"	2-1/2"
3"	2-1/2"
4"	3"
6"	3"
8"	3"
10"	3"
12"	3"
14"	3"
16"	3"
20"	4"
24"	4"

NOTE:

SUBMIT FINAL DESIGN AND CALCULATIONS FOR SUPPORT AND ANCHORAGE AS SPECIFIED.

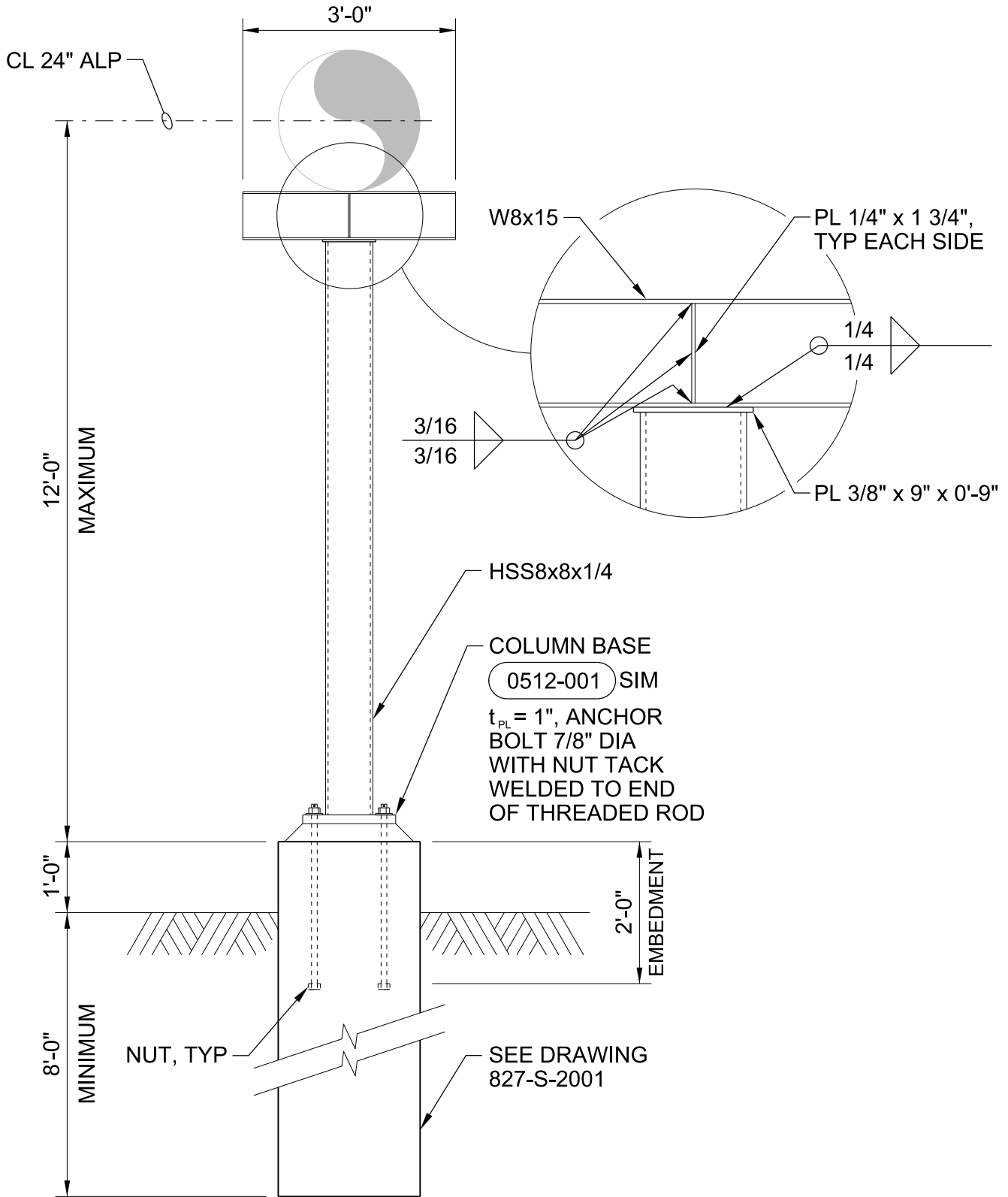
PIPE SUPPORT

SADDLE SUPPORT PEDESTAL TYPE - NON-ADJUSTABLE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4005-501

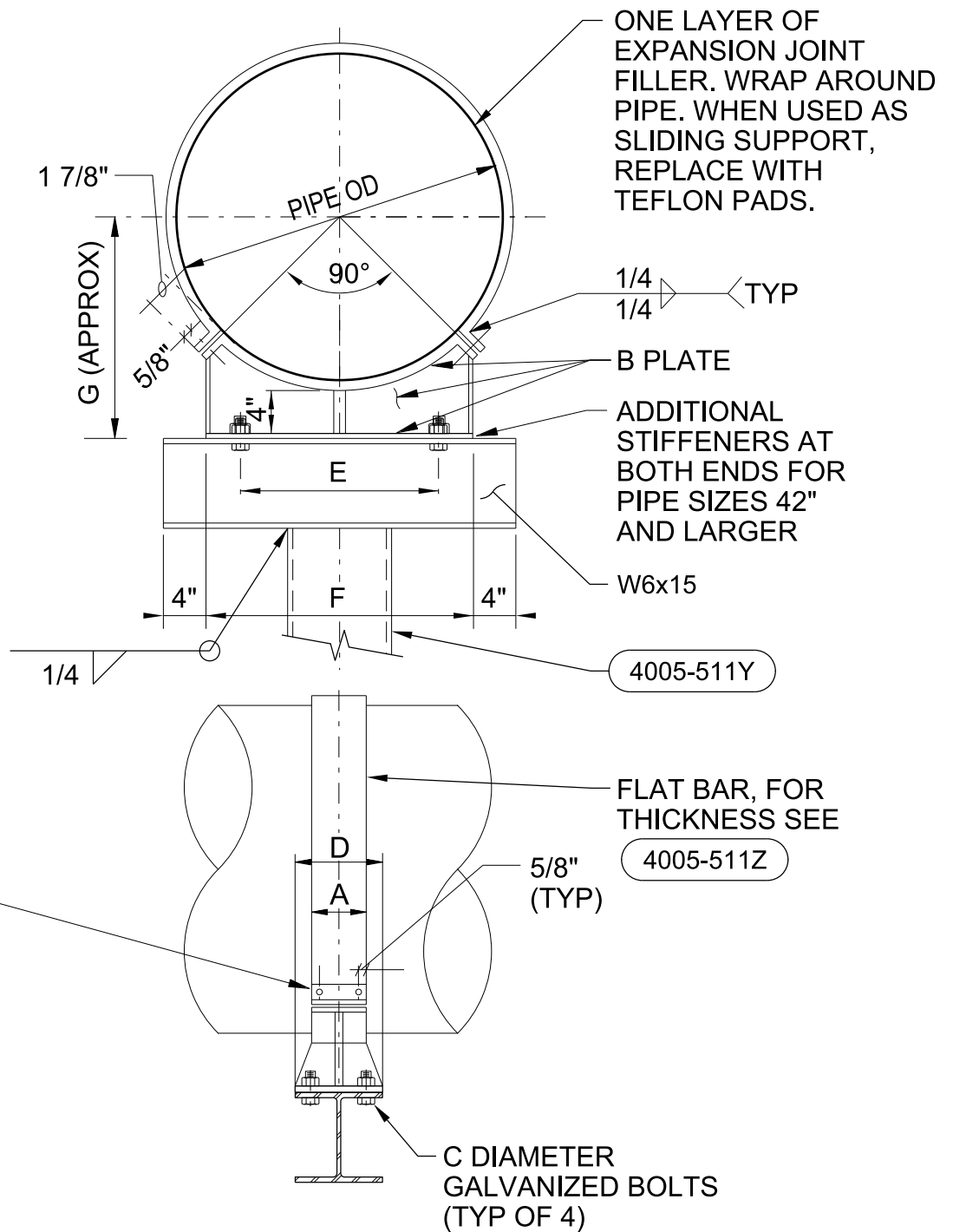


PIPE SUPPORT ELEVATION

NTS

SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4005-510



NOTES:

1. SEE 4005-511Z FOR DIMENSIONAL DATA.

PIPE SUPPORT (FIXED OR SLIDING)

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4005-511X

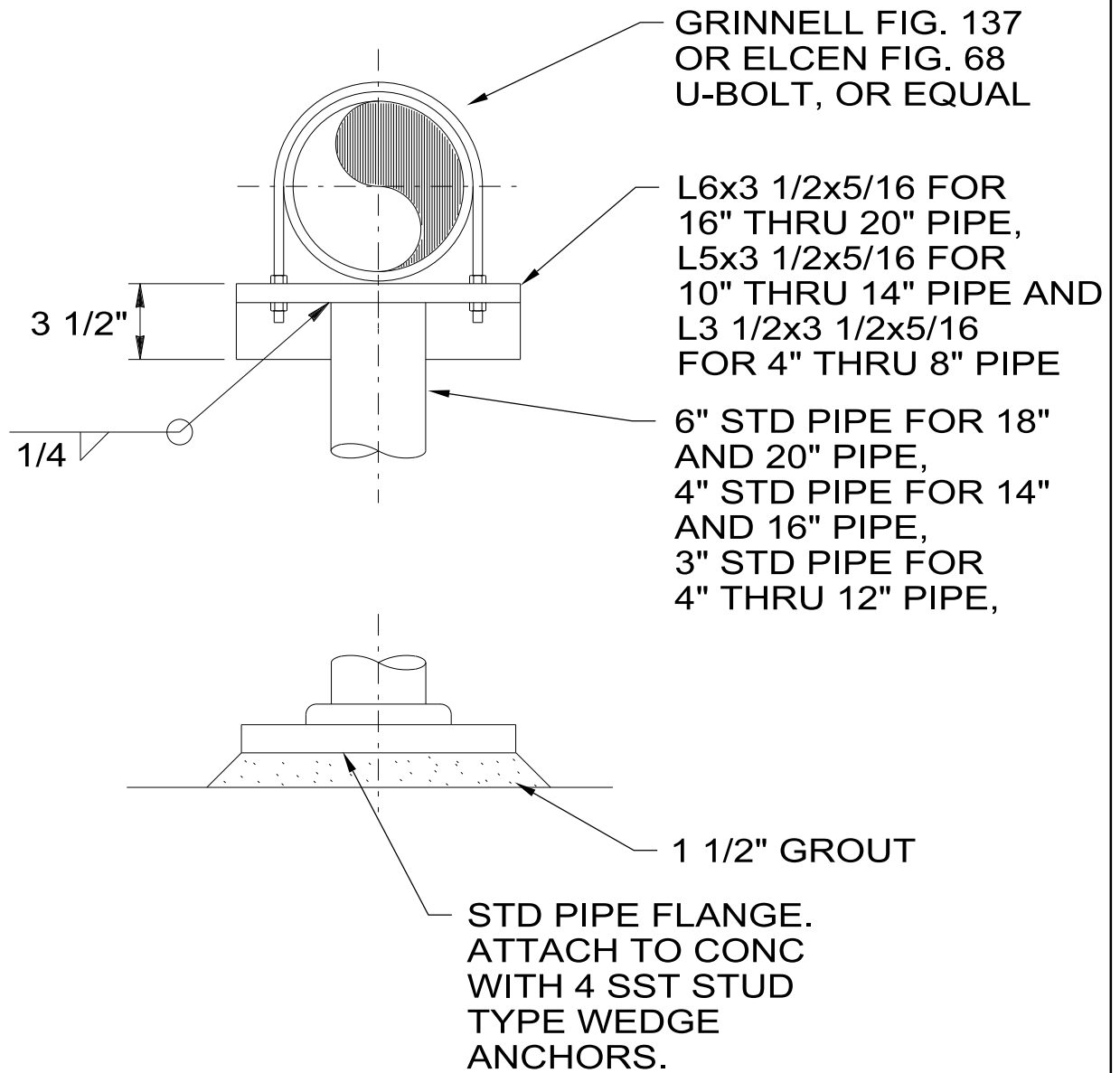
DIMENSIONS IN INCHES							
NOMINAL PIPE SIZE					FLAT BAR		
	A	B	C	D		E	F
6	4	3/8	5/8	6	1/4	4 1/2	8
8	4	3/8	5/8	6	1/4	5	9 1/2
10	4	3/8	5/8	6	1/4	6	11
12	4	3/8	5/8	6	1/4	7	13
14	4	3/8	5/8	6	1/4	8	13
16	4	3/8	5/8	6	1/4	9	15
18	4	3/8	5/8	6	1/4	10	16
20	5	3/8	5/8	6	3/8	10	18
22	5	3/8	5/8	6	3/8	12	19
24	5	3/8	5/8	6	3/8	13	21

PIPE SUPPORT

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4005-511Z

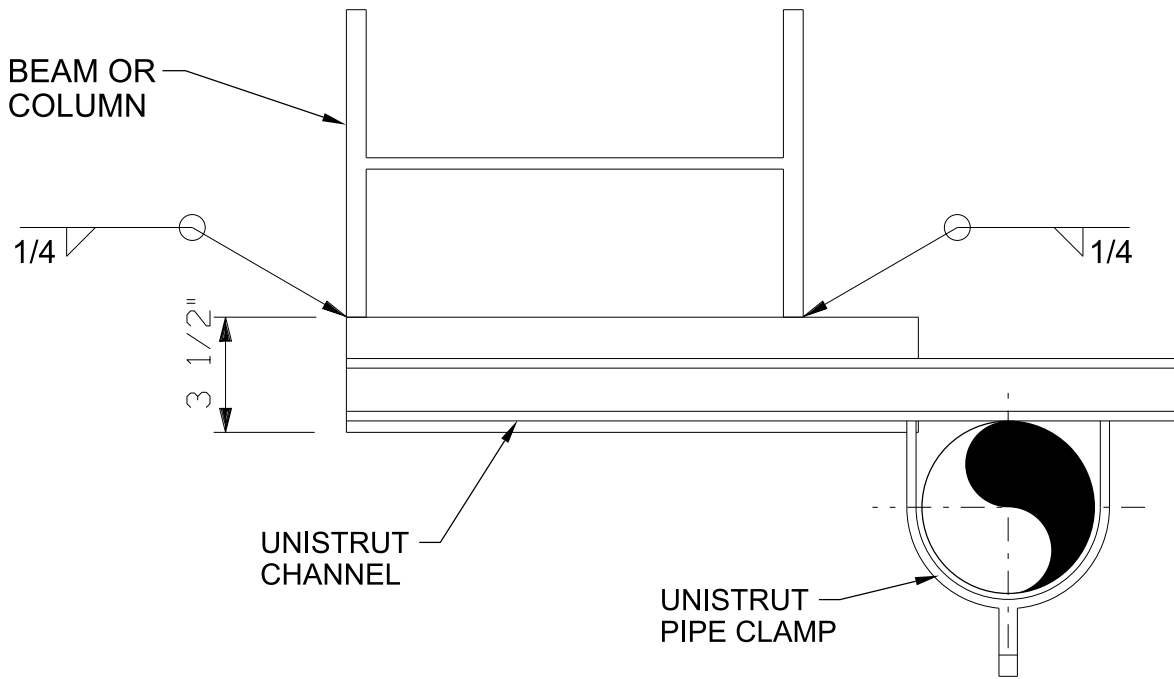


PIPE SUPPORT

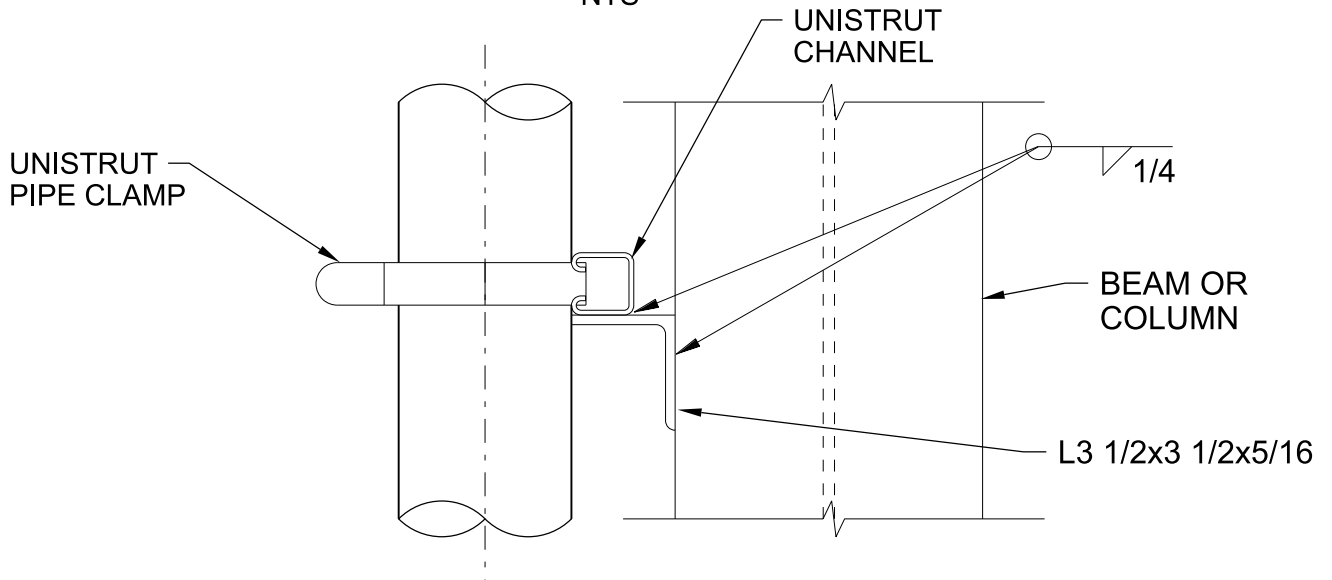
NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4005-513A



PLAN
NTS



SECTION
NTS

NOTE:

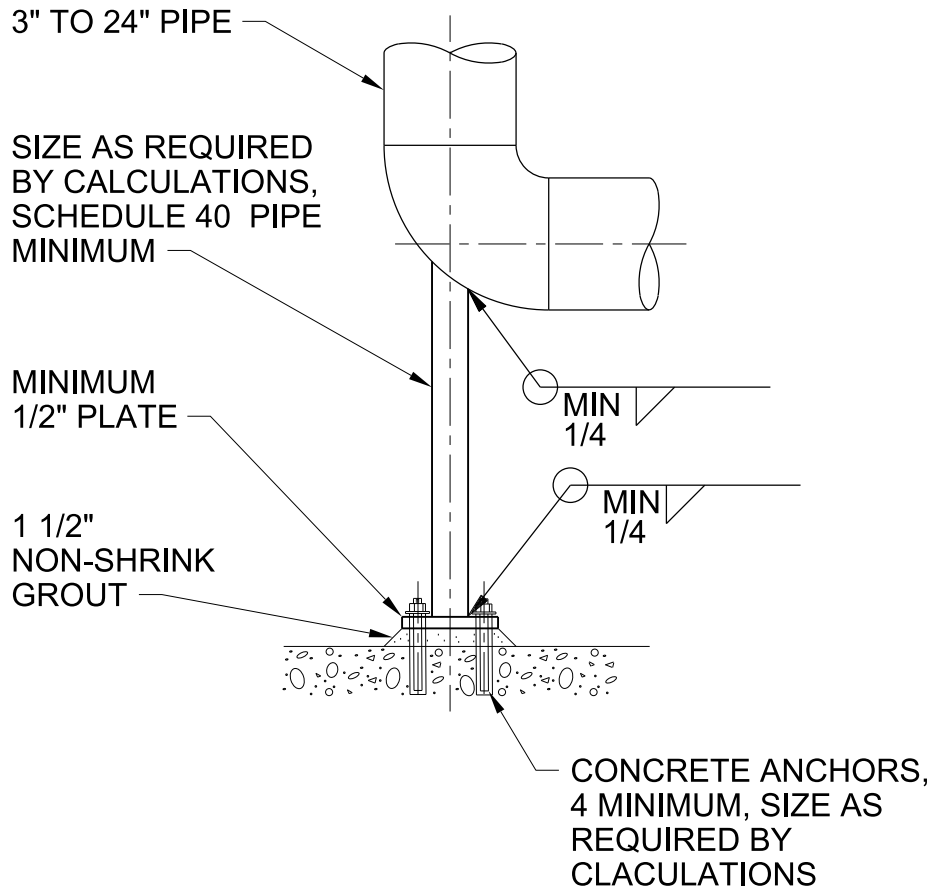
- 1. FOR VERTICAL PIPES ONLY.

PIPE SUPPORT

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4005-513B

**NOTES:**

1. MINIMUM COMPONENT AND CONNECTION SIZES SHOWN. FURNISH LARGER SIZES IF REQUIRED BY CALCULATIONS.
2. SUBMIT FINAL DESIGN AND CALCULATIONS FOR SUPPORT AND ANCHORAGE AS SPECIFIED.

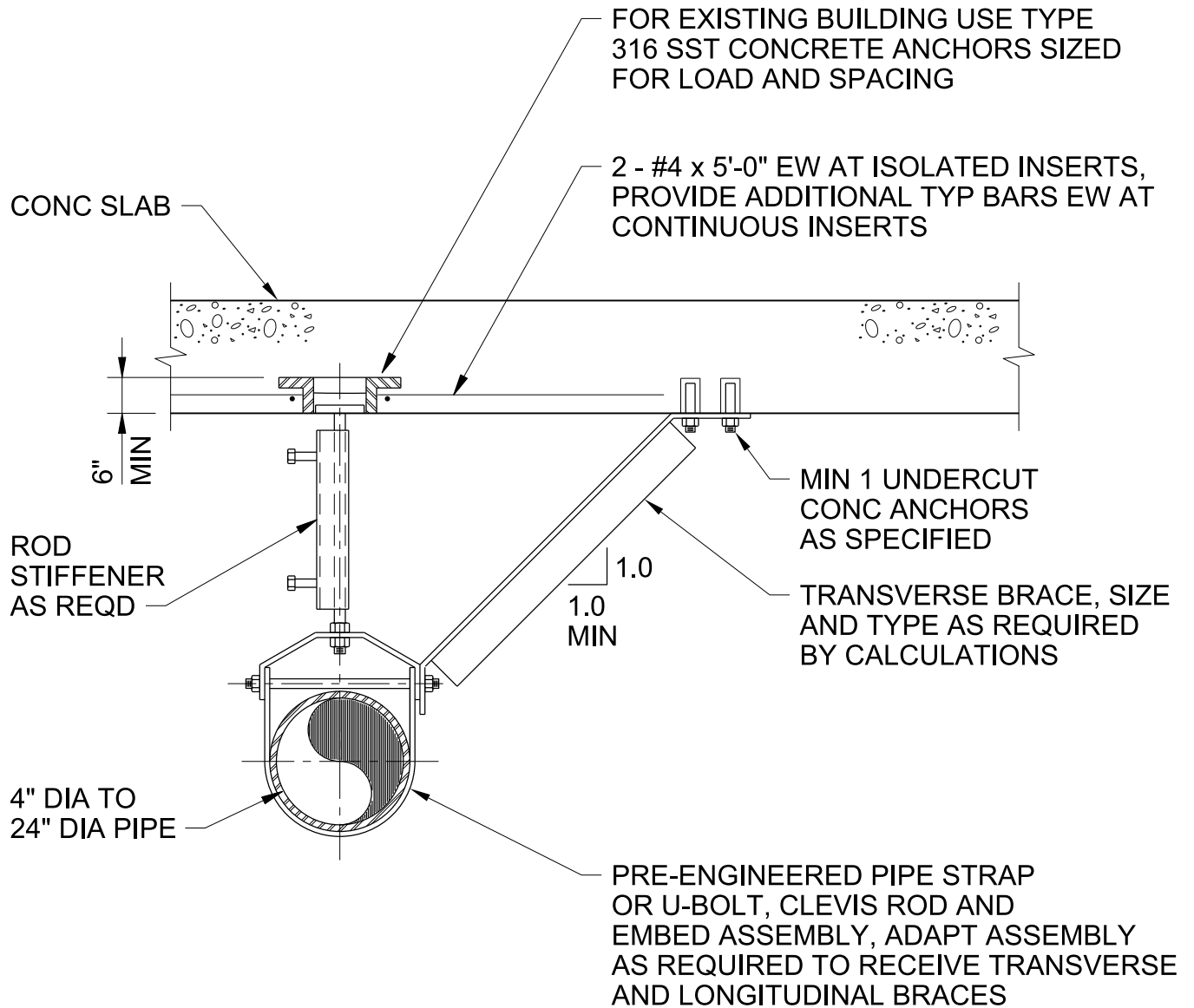
PIPE SUPPORT

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4005-516

CH2MHILL®



NOTES:

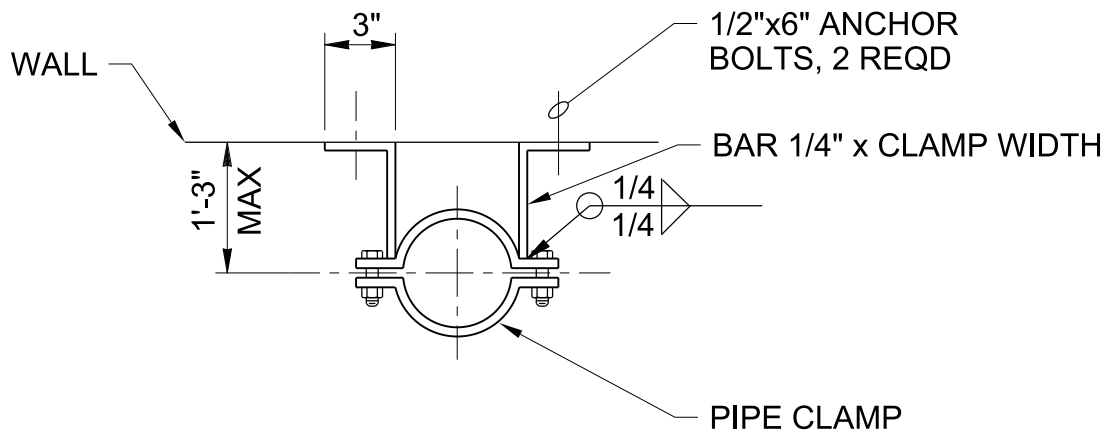
1. SUBMIT FINAL DESIGN DRAWINGS AND CALCULATIONS OF SUPPORTS AND ANCHORS AS SPECIFIED.
2. ADHESIVE ANCHORS SHALL NOT BE USED.

OVERHEAD PIPE HANGER

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4005-550



NOTES:

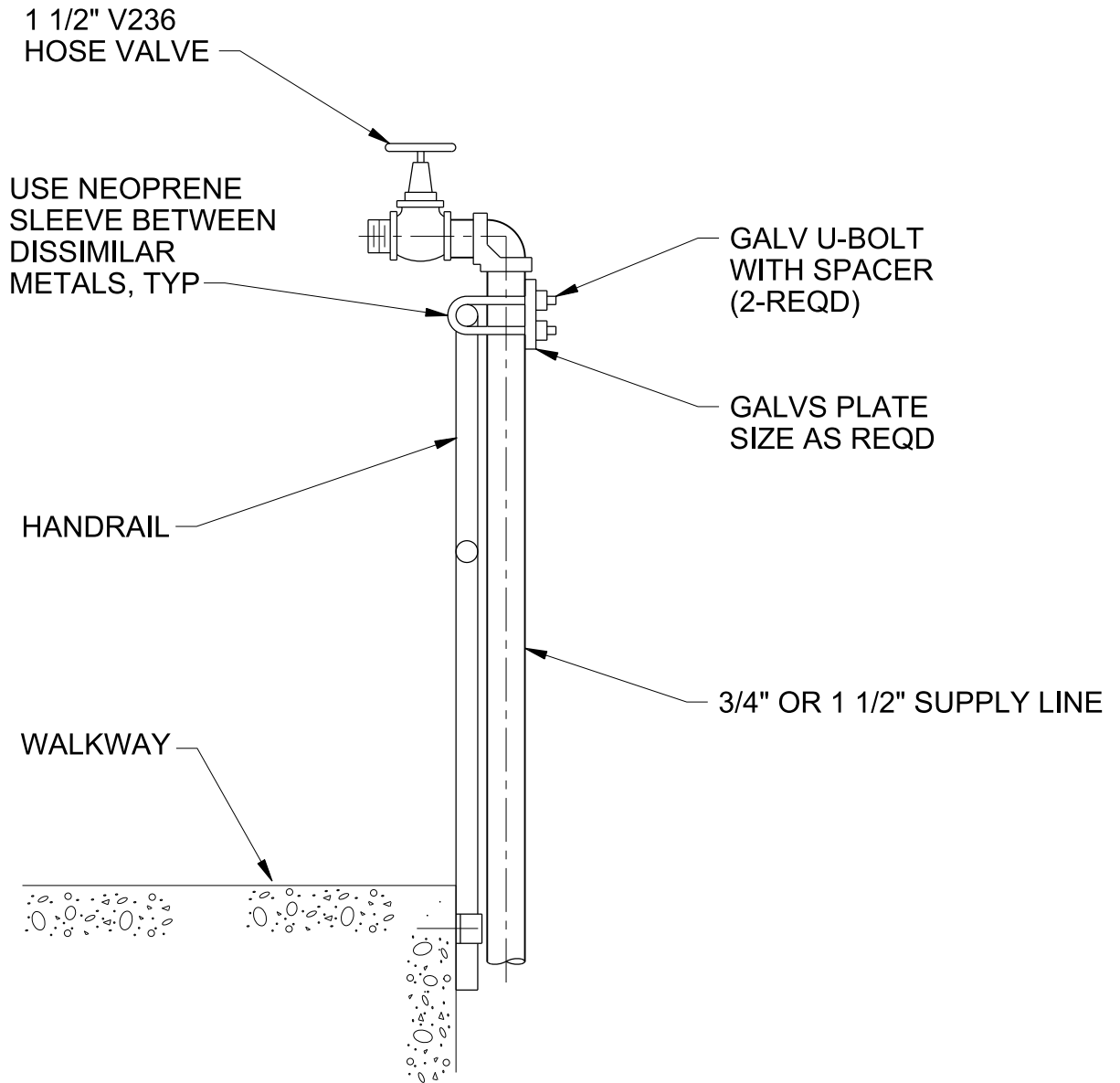
1. ALL MATERIALS TO BE STAINLESS STEEL UNLESS OTHERWISE NOTED.

TYPE B PIPE SWAY BRACE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4005-711

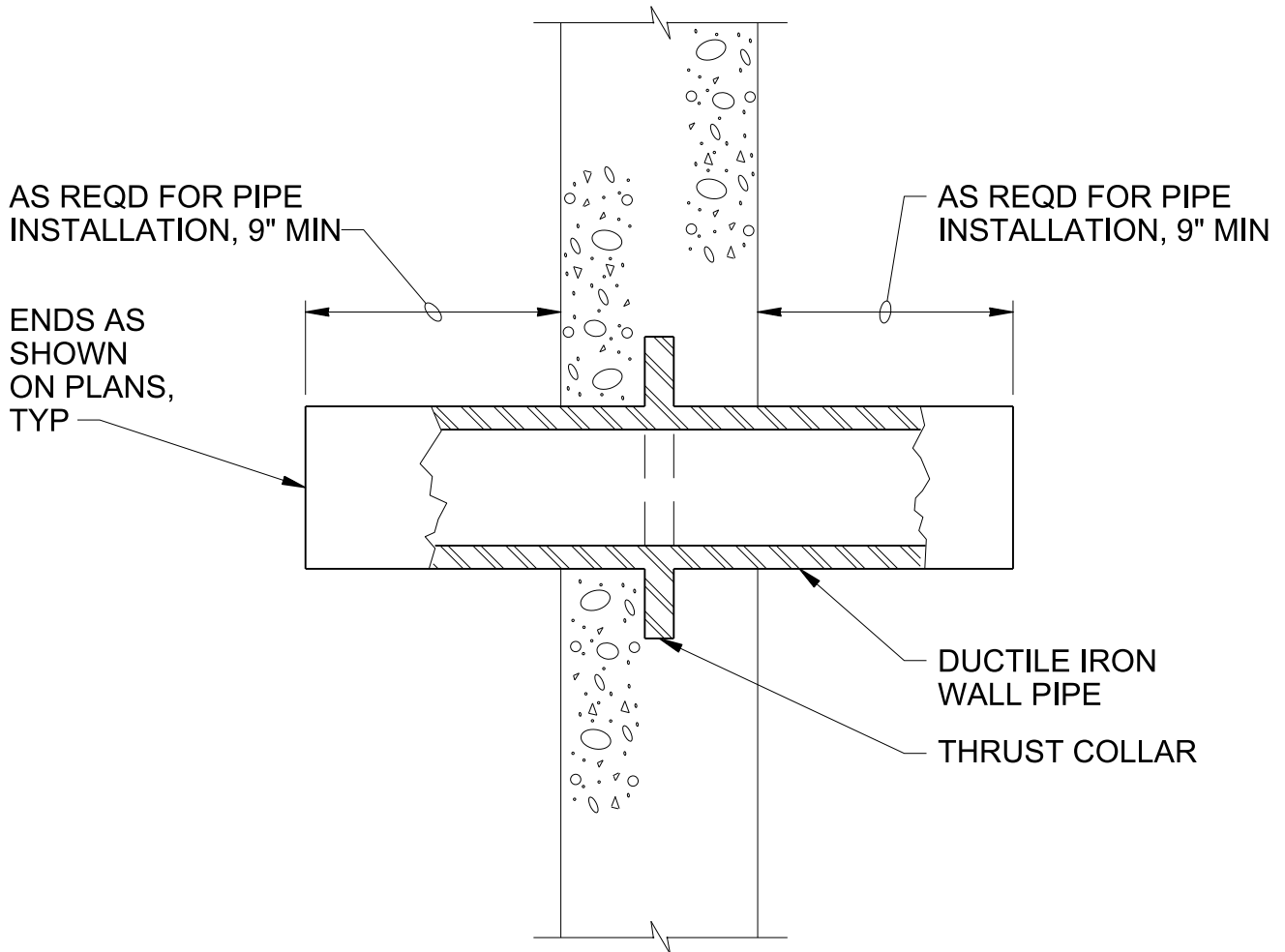


EXTERIOR HOSE VALVE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4027-162



NOTES:

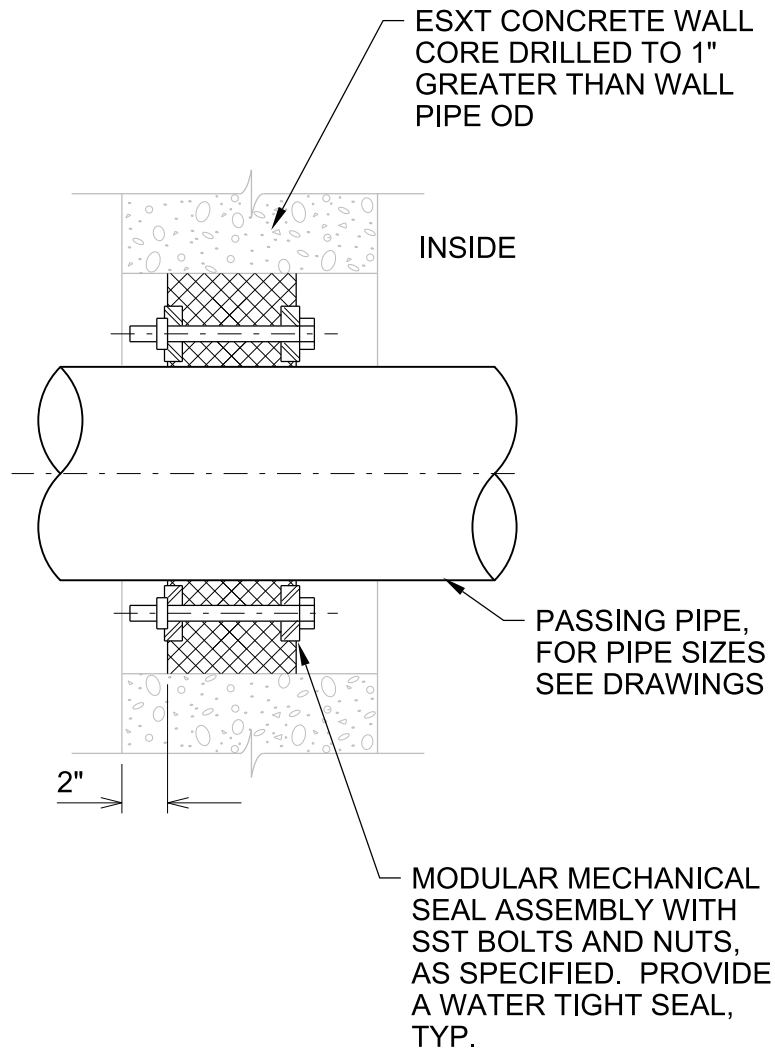
1. COAT WALL PIPE WITH SPECIFIED PAINT SYSTEM PRIOR TO CONCRETE PLACEMENT.

DUCTILE IRON WALL PIPE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4027-600



NOTES:

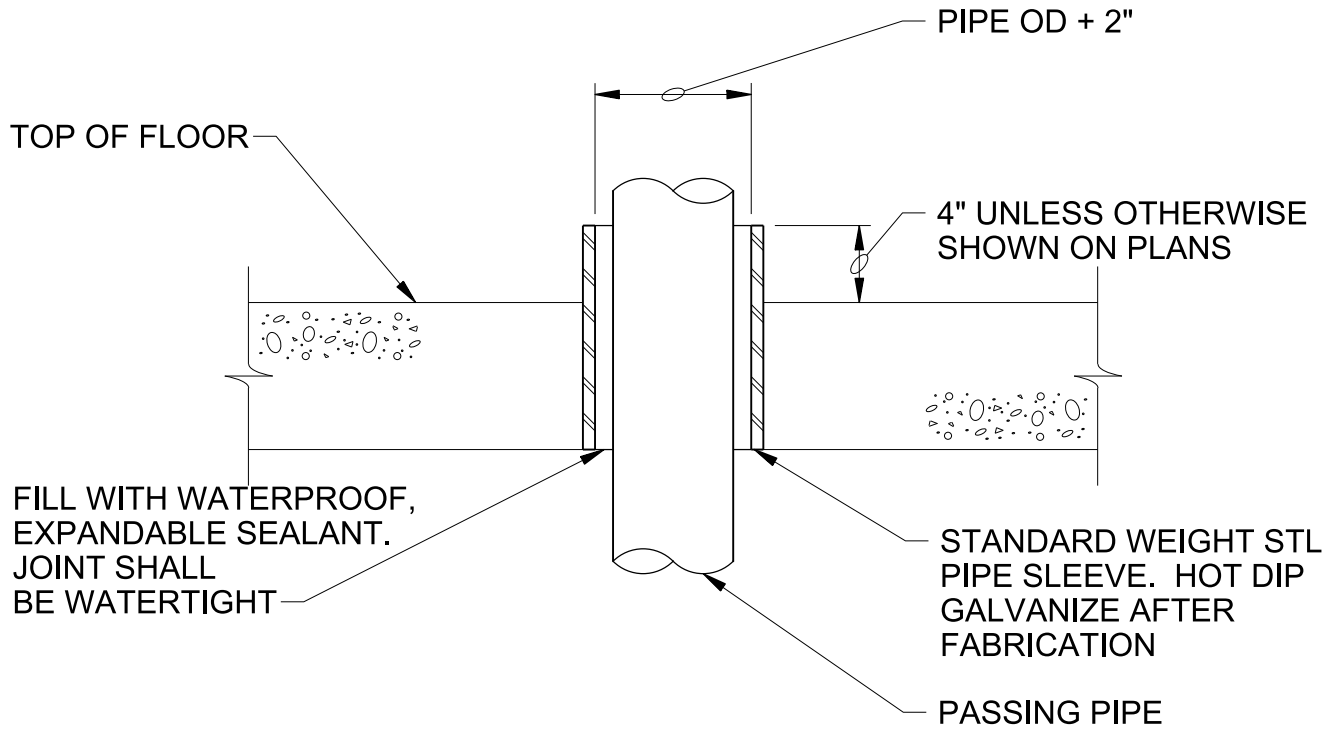
1. CONTRACTOR SHALL LOCATE EXISTING WALL REINFORCING ON EACH FACE WITH COVER METER OR OTHER APPROVED "POSITIVE" METHOD. CORE DRILL HOLE AS REQUIRED BY "LINK SEAL" MFR FOR INSTALLATION OF NEW LINE. APPLY "XYPEX CONCENTRATE" OR APPROVED EQUAL TO THE CORED SURFACES AND TO EACH SIDE OF WALL WITHIN 3" OF CORE. NOTIFY ENGINEER IF ANY REINFORCING BARS ARE CUT PRIOR TO INSTALLATION OF PIPE. HAVE XYPEX REPRESENTATIVES SPECIFY THE EXACT AMOUNT TO BE USED AND PROPER APPLICATION INSTRUCTIONS.

EXISTING WALL PENETRATION

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4027-607A



NOTES:

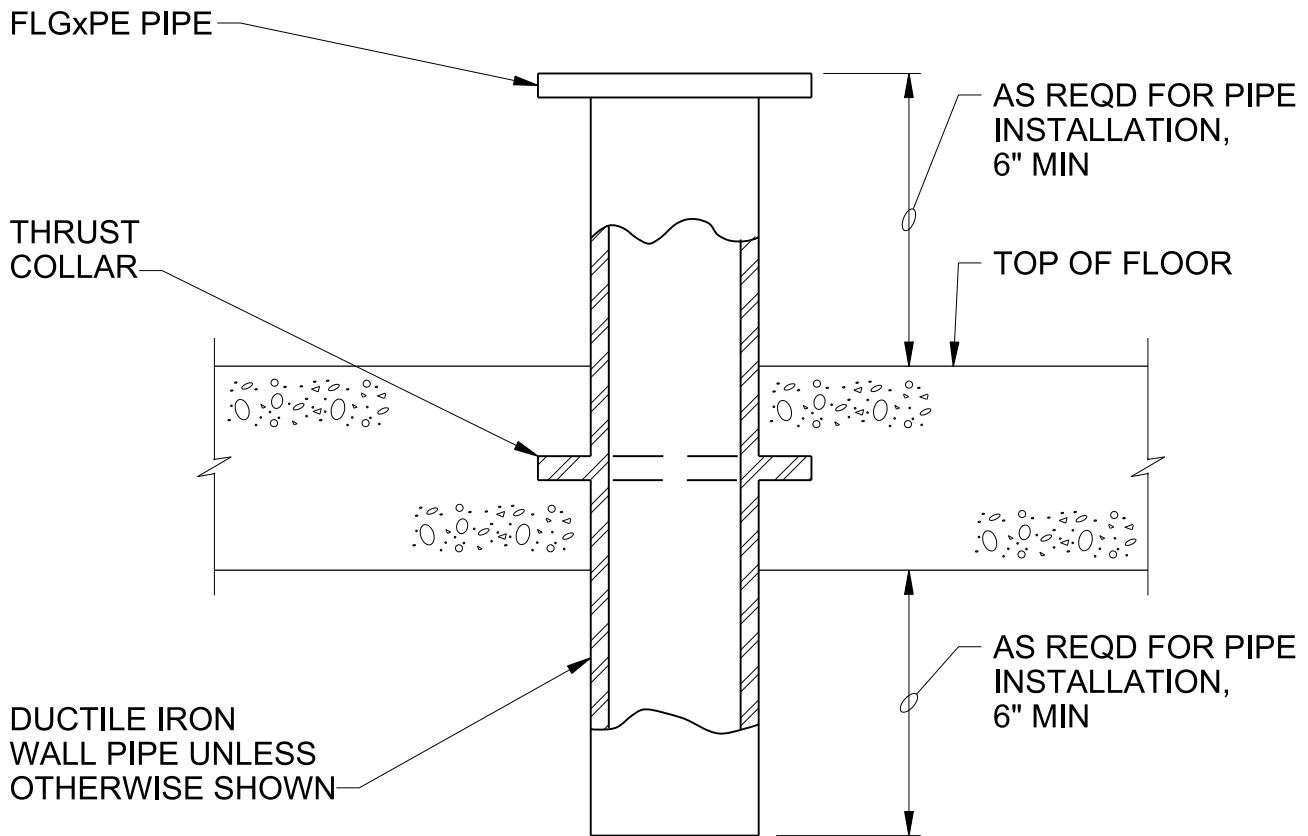
1. COAT FLOOR SLEEVE WITH SPECIFIED PAINT SYSTEM BEFORE CONCRETE PLACEMENT.

FLOOR SLEEVE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4027-620



NOTES:

1. COAT FLOOR PIPE WITH SPECIFIED PAINT SYSTEM PRIOR TO CONCRETE PLACEMENT.

FLOOR PIPE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4027-622

SET COVER OF VALVE BOX AND CONC PAD 1/4 " BELOW GRADE IN PAVEMENT OR SHOULDER, AND FLUSH WITH GRADE ELSEWHERE

CAST IRON LID

PROVIDE 1'-6" SQ x 4" THICK CONC PAD

FINISHED GRADE

COMPACTED BACKFILL

CAST IRON VALVE BOX, SLIDING TYPE, UPPER SECTION

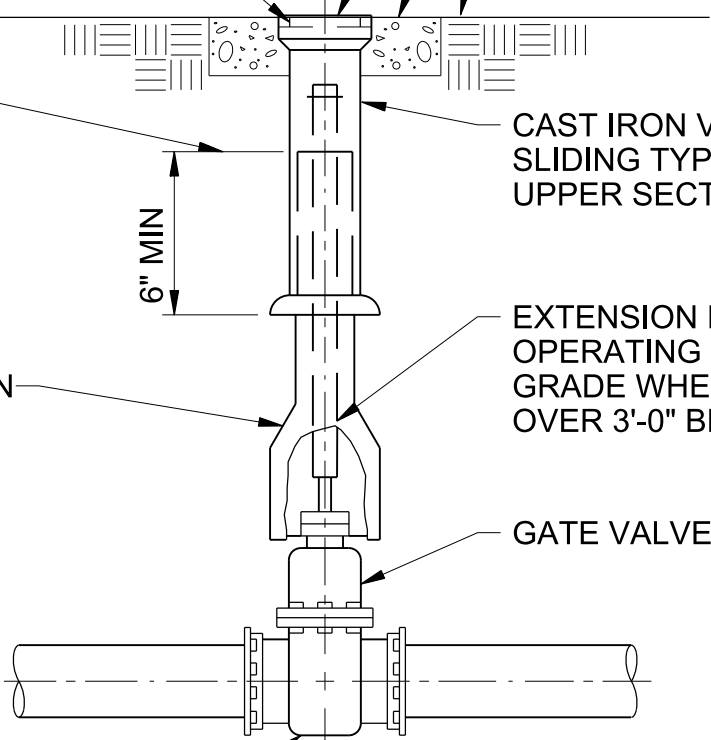
6" MIN

CAST IRON VALVE BOX LOWER SECTION

EXTENSION ROD REQD W/ 2" OPERATING NUT 1'-0" BELOW GRADE WHEN VALVE IS OVER 3'-0" BELOW GRADE

GATE VALVE

VALVE SIZE AND ENDS AS SPECIFIED OR INDICATED ON PLANS



BURIED GATE VALVE BOX

NTS

SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4027-640

SET COVER OF VALVE BOX AND CONC PAD 1/4" BELOW GRADE IN PAVEMENT OR ROAD SHOULDER AND FLUSH WITH FINISH GRADE ELSEWHERE

CAST IRON LID

PROVIDE 1'-6" SQ x 4" THICK CONC PAD

FINISHED GRADE

COMPACTED BACKFILL

6" MIN, 1'-0" MAX

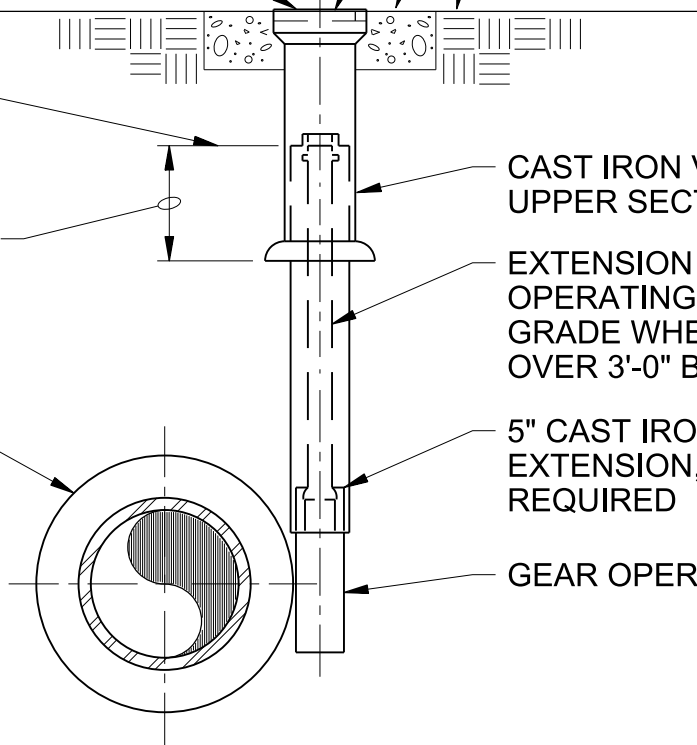
CAST IRON VALVE BOX, UPPER SECTION

EXTENSION ROD REQD W/ 2" OPERATING NUT 1'-0" BELOW GRADE WHEN VALVE IS OVER 3'-0" BELOW GRADE

VALVE ENDS AS SPECIFIED

5" CAST IRON SOIL PIPE EXTENSION, LENGTH AS REQUIRED

GEAR OPERATOR

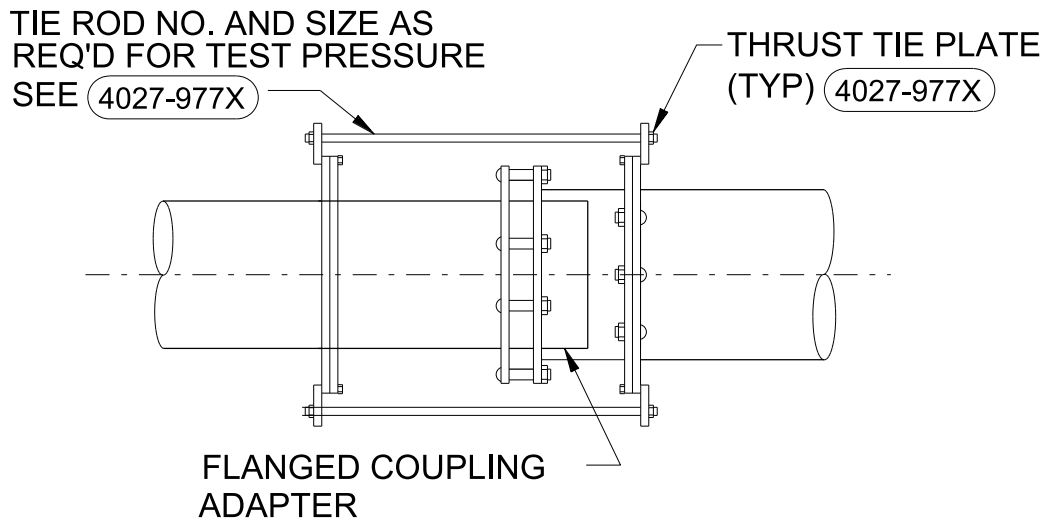


BURIED BUTTERFLY OR PLUG VALVE BOX

NTS

SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4027-641

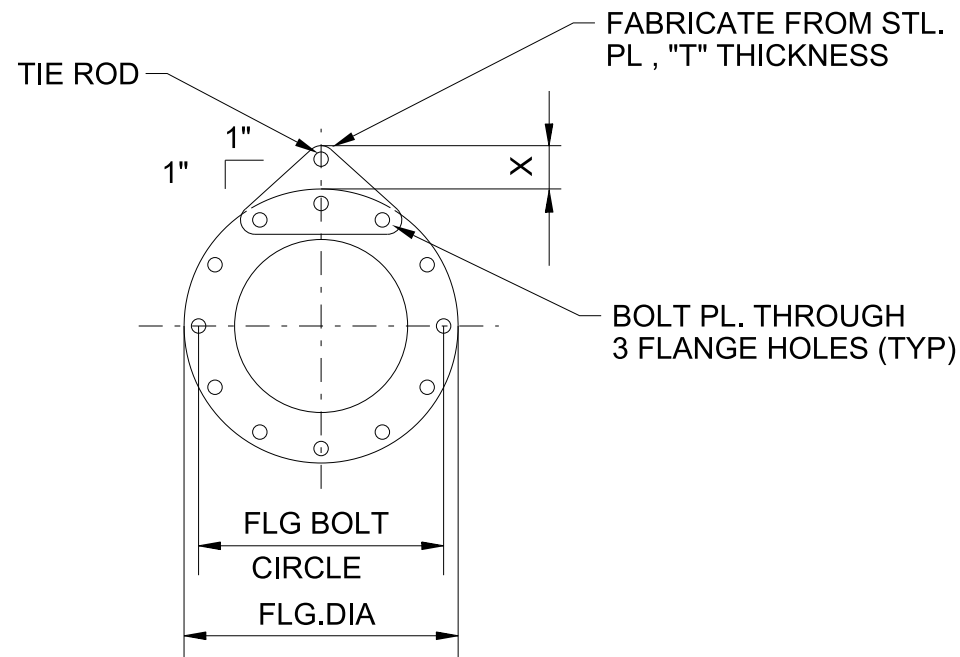


RESTRAINED FLANGED COUPLING ADAPTER

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4027-974Y



TIE ROD SCHEDULE													
TEST PRESSURE		25 PSI		50 PSI		100 PSI		150 PSI		225 PSI		375 PSI	
PIPE DIAM. (IN.)	MINIMUM PIPE WALL THICKNESS (IN.)	TIE RODS		TIE RODS		TIE RODS		TIE RODS		TIE RODS		TIE RODS	
		DIA. (IN.)	NO. REQ'D	DIA. (IN.)	NO. REQ'D	DIA. (IN.)	NO. REQ'D	DIA. (IN.)	NO. REQ'D	DIA. (IN.)	NO. REQ'D	DIA. (IN.)	NO. REQ'D
6	3/16	-	-	-	-	5/8	2	5/8	2	5/8	2	5/8	2
8	3/16	-	-	-	-	5/8	2	5/8	2	5/8	2	3/4	2
10	3/16	-	-	-	-	5/8	2	5/8	2	5/8	2	7/8	2
12	3/16	5/8	2	5/8	2	5/8	2	5/8	2	5/8	2	7/8	4
14	3/16	5/8	2	5/8	2	3/4	2	3/4	2	3/4	4	1	4
16	3/16	5/8	2	5/8	2	3/4	2	7/8	2	7/8	4	1	4
18	1/4	5/8	2	5/8	2	7/8	2	1	2	1	4	1-1/4	4
20	1/4	5/8	2	3/4	2	7/8	2	7/8	4	7/8	4	1-1/4	4
22	1/4	5/8	2	3/4	2	3/4	4	7/8	4	7/8	4	1-1/2	4
24	1/4	5/8	2	3/4	2	7/8	4	1	4	1	6	1-1/2	6
30	1/4	5/8	4	3/4	4	7/8	6	1	6	1	8	1-1/2	8
36	1/4	3/4	4	7/8	4	1	6	1	8	1	8	1-1/2	10
42	1/4	3/4	4	1	4	1	8	1-1/4	8	1-1/4	8	1-3/4	10
48	5/16	7/8	4	7/8	8	1	10	1-1/4	10	1-1/4	10	1-3/4	12
54	5/16	3/4	6	7/8	8	1	12	1-1/4	12	1-1/4	12	1-3/4	14
60	11/32	7/8	6	1	8	1-1/4	10	1-1/4	14	1-1/4	14	1-3/4	16
64	11/32	7/8	6	1	8	1-1/4	10	1-1/4	14	1-1/4	14	1-3/4	16

PIPE SIZE	X	T @ TEST	
		PRESS <150 PSI	150< PRESS <375 PSI
6"	2 3/4 "	5/8 "	5/8 "
8"	2 3/4 "	5/8 "	3/4 "
10"	2 3/4 "	5/8 "	1"
12"	3"	3/4 "	1"
14	3 1/4 "	3/4 "	1"
16"	3 1/4 "	1"	1"
18"	3 1/2 "	1"	1"
20"	3 3/4 "	1"	1 1/2 "
22"	4"	1"	1 3/4 "
24"	4 1/4 "	1 1/4 "	1 3/4 "
30"	4 1/4 "	1 1/4 "	1 3/4 "
36"	4 1/2 "	1 1/2 "	1 3/4 "
42"	4 3/4 "	1 1/2 "	1 7/8 "
48"	4 3/4 "	1 1/2 "	1 7/8 "
54"	4 3/4 "	1 1/2 "	1 7/8 "
60"	4 3/4 "	1 1/2 "	1 7/8 "
64"	4 3/4 "	1 1/2 "	1 7/8 "

NOTES:

1. TIE RODS SHALL CONFORM TO ASTM A193 GRADE B7.
2. NUTS SHALL CONFORM TO ASTM A194 GRADE 2H.
3. PLATE SHALL CONFORM TO ASTM A283 GRADE D.
4. TIE ROD NUTS SHALL BE TIGHTENED GRADUALLY AND EQUALLY IN STAGES TO PREVENT UNEVEN ALIGNMENT AND TO ALLOW EQUAL STRESS ON ALL TIE RODS UNDER PRESSURE. TIGHTEN UNTIL SNUG. THREADS SHALL PROTRUDE FROM NUTS. PEEN THREADS AFTER TIGHTENING NUTS.
5. CONTRACTOR SHALL USE DATA FOR ONLY THOSE PIPE SIZES AND TEST PRESSURES SPECIFIED IN THIS CONTRACT.

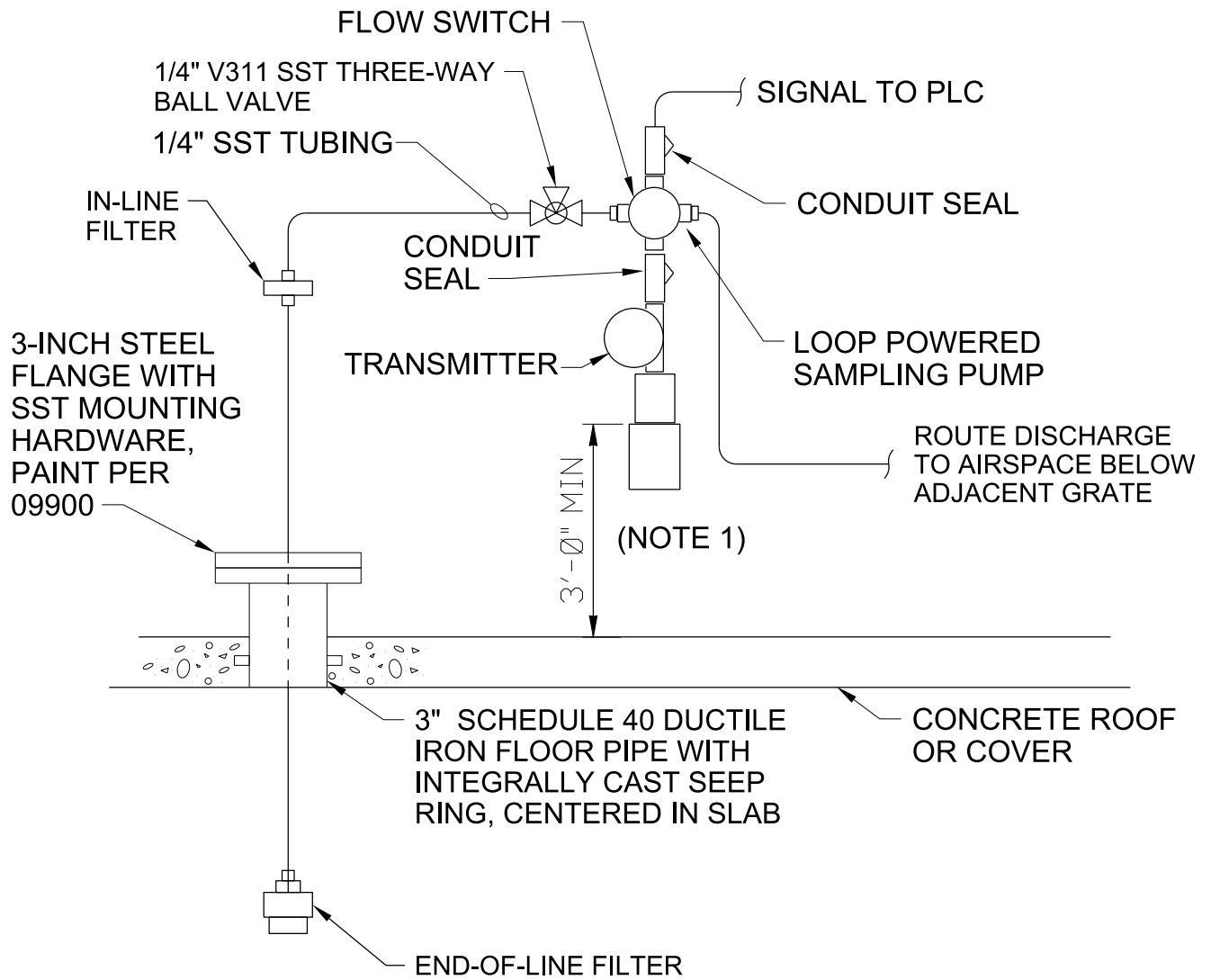
THRUST TIE ROD/ CONNECTION PLATE

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4027-977X





NOTES:

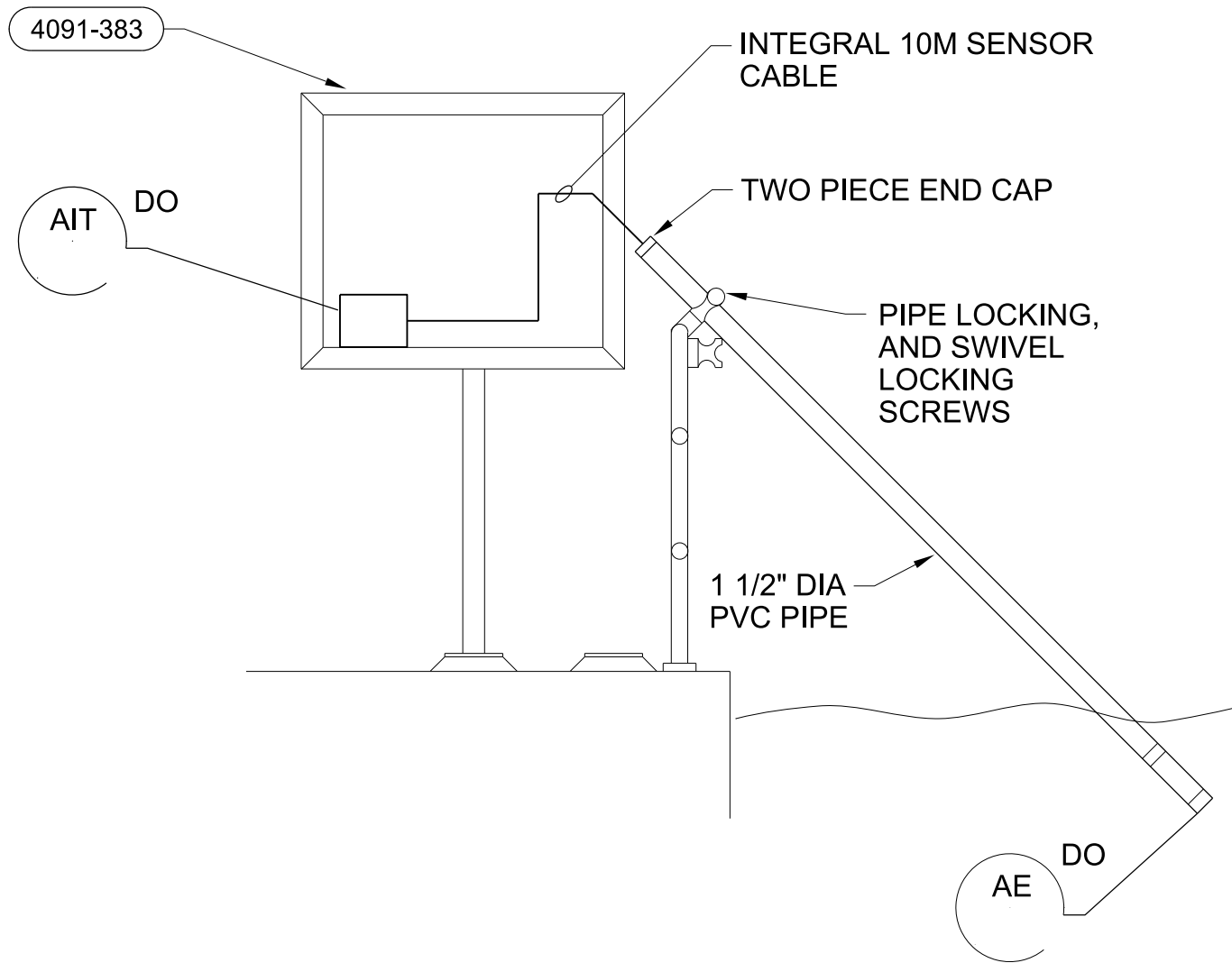
1. SEE DETAIL 4091-302 FOR STANCHION PIPE (SIMILAR).

COMBUSTIBLE GAS UNIT - ROOF MOUNT DETAIL

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4091-151BG

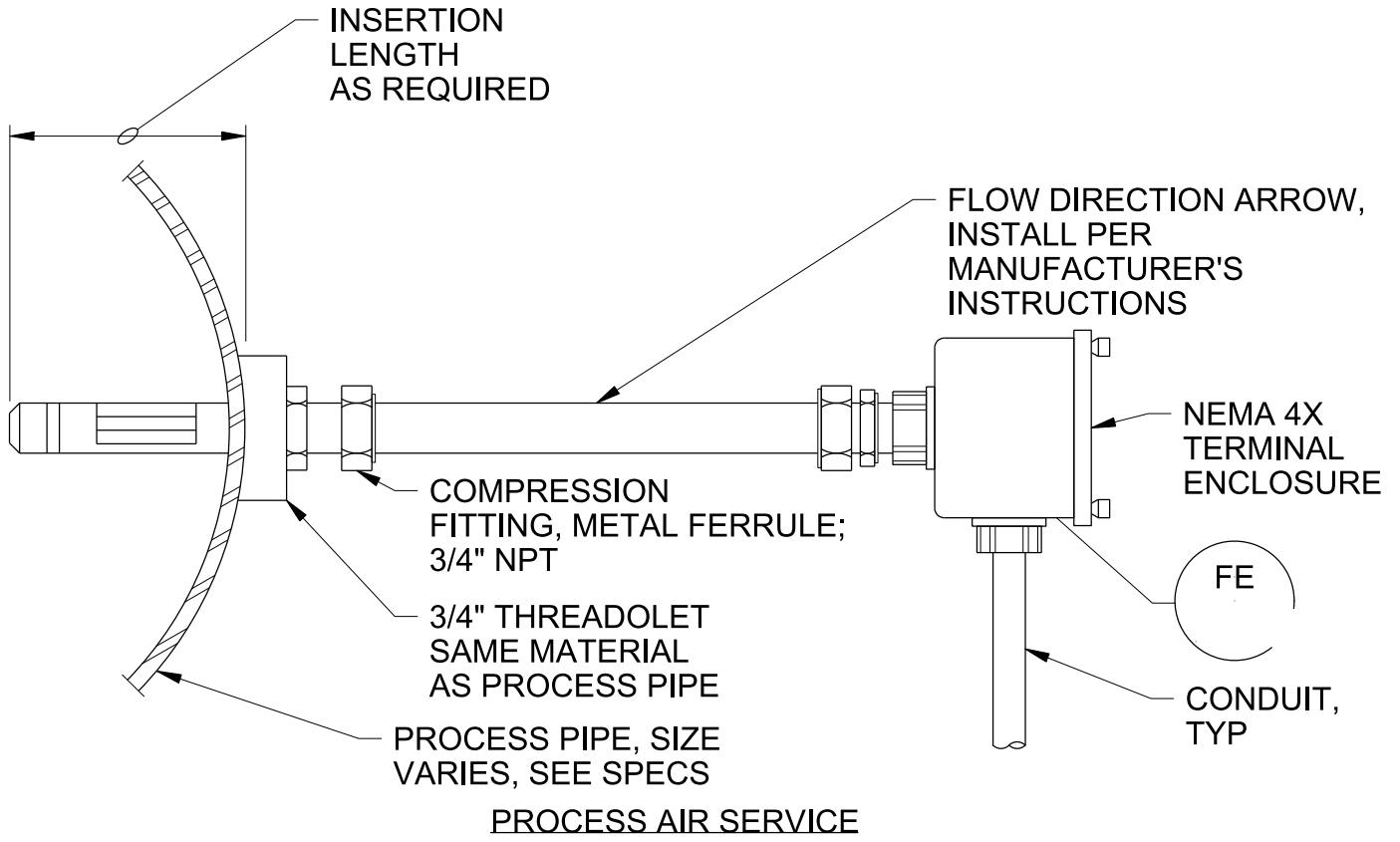
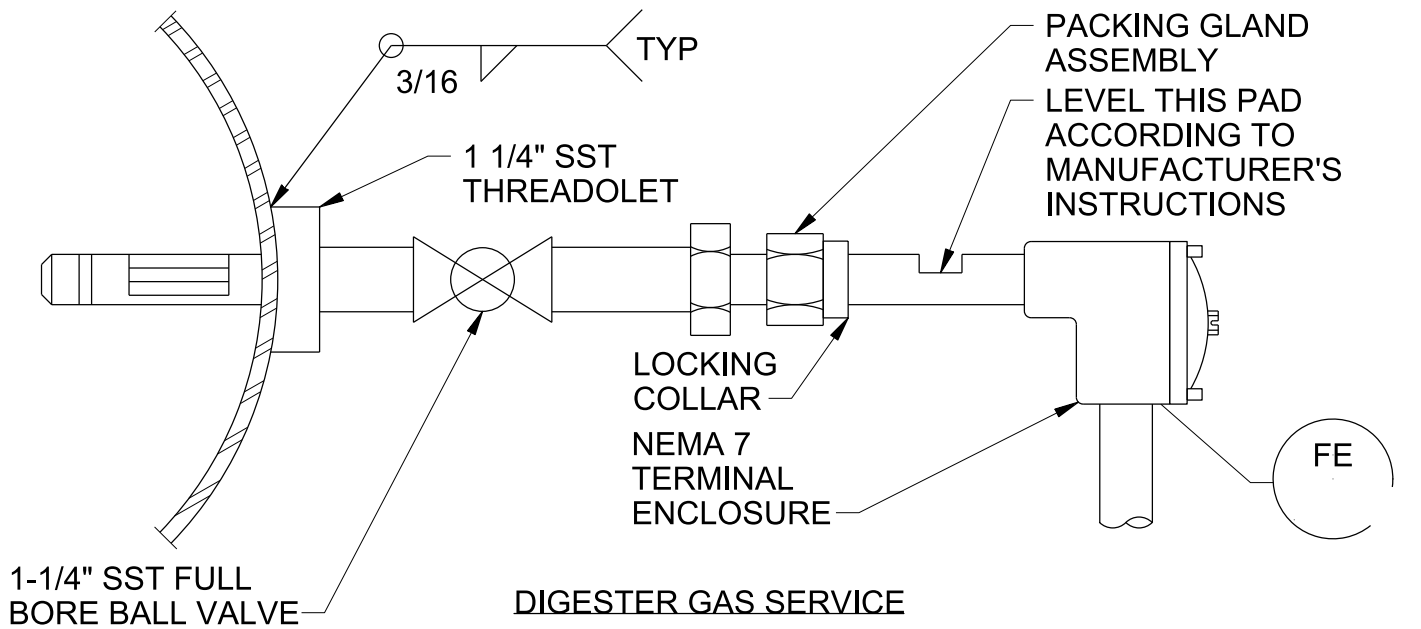


DISSOLVED OXYGEN PROBE INSTALLATION

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4091-162G



NOTES:

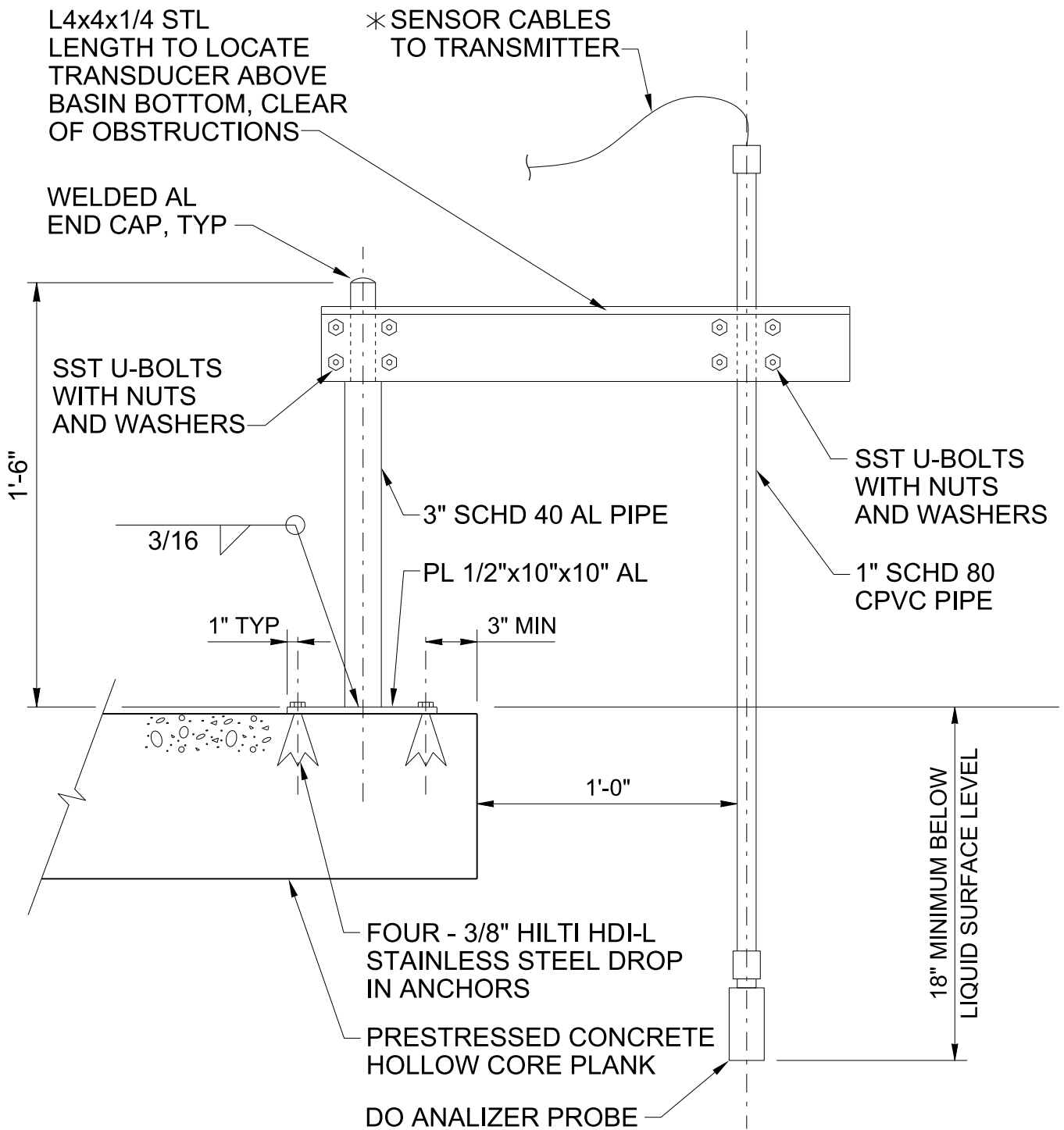
1. INSTALL REMOTE INDICATION TRANSMITTER AS PER (SIMILAR). 4091-302

THERMAL MASS FLOW ELEMENT INSTALLATION

NTS

SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4091-217



NOTES:

1. PAINT ALUMINUM IN CONTACT WITH CONCRETE ACCORDING TO SPECIFICATIONS FOR PAINTING.

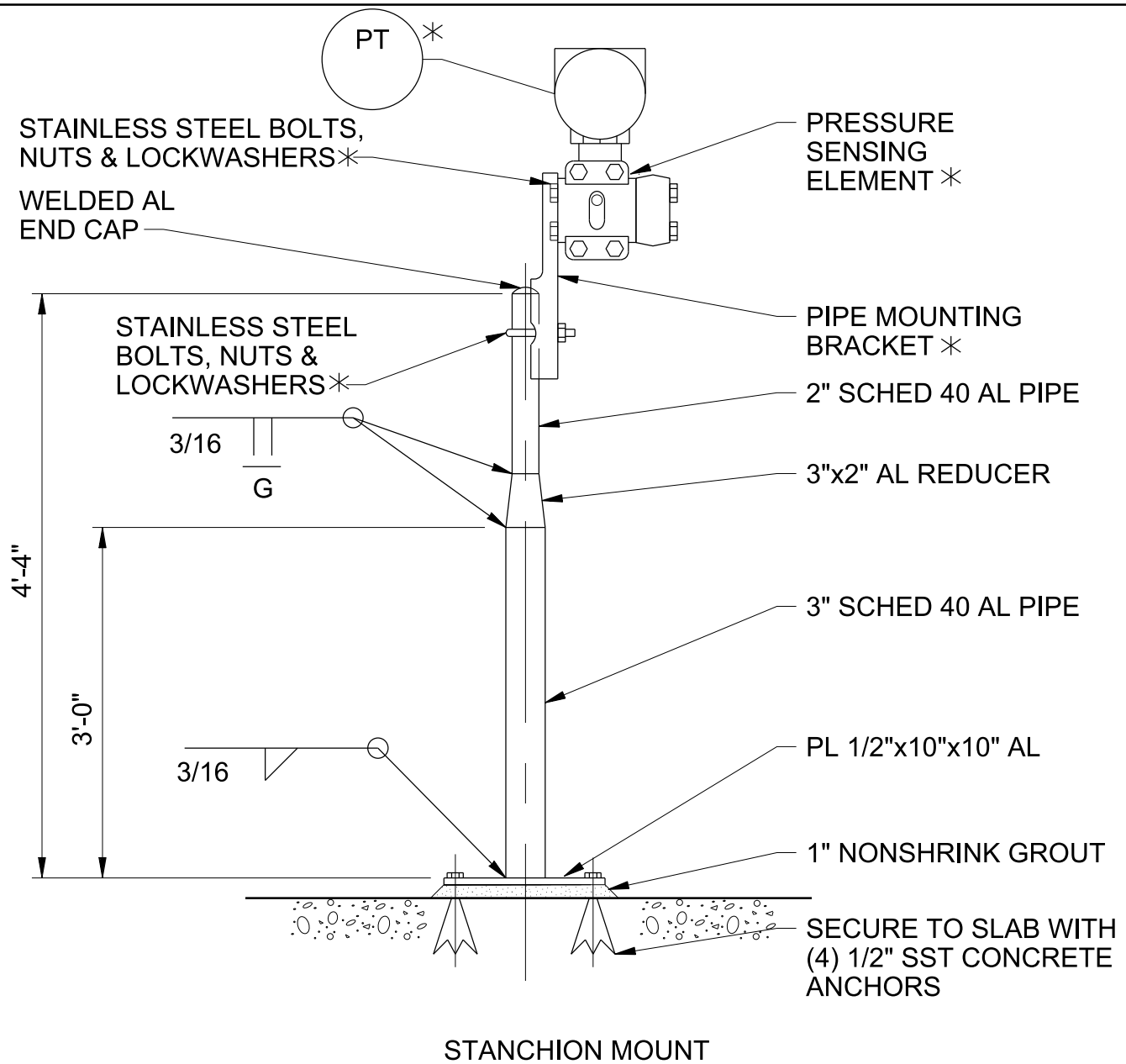
ANALYZER PROBE INSTALLATION

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4091-253CG

CH2MHILL®



STANCHION MOUNT

NOTES:

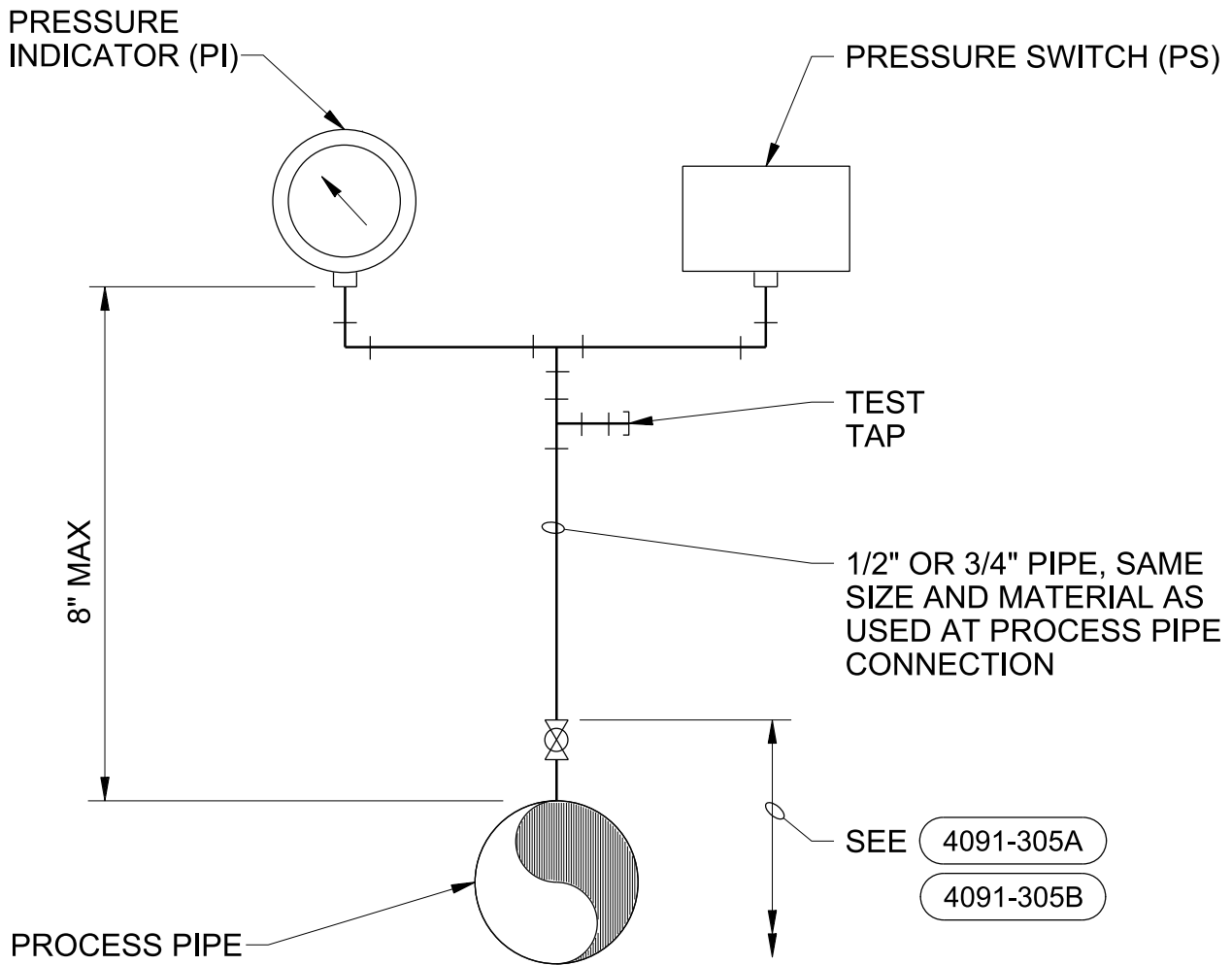
1. PAINT ALUMINUM IN CONTACT WITH CONCRETE ACCORDING TO SPECIFICATIONS FOR PAINTING.
2. ALTERNATIVELY, STANCHION SUPPORT SHALL BE O'BRIEN CORP. MODEL 32FP52 WITH 9 MIL ARC SPRAY ZINC METALLIZED COATING; OR EQUAL.
3. COMPONENTS DESIGNATED BY * ARE SUPPLIED BY INSTRUMENT MANUFACTURER.

PRESSURE AND PRESSURE DIFFERENTIAL TRANSMITTER INSTALLATION

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4091-302



DIRECT MOUNTING

NOTES:

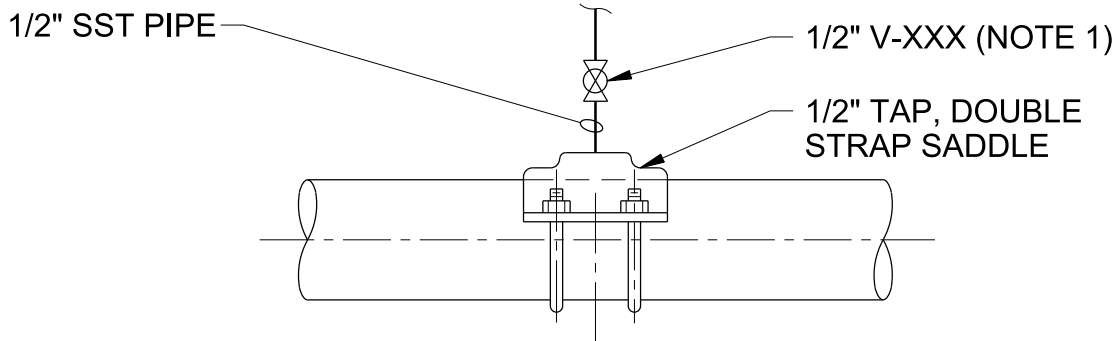
1. INDICATOR AND SWITCH INSTALLATION SHOWN. FOR SINGLE INSTRUMENT INSTALLATIONS, MOUNT DEVICE DIRECTLY ABOVE TEST TAP.

PRESSURE SWITCH & INDICATOR INSTALLATION

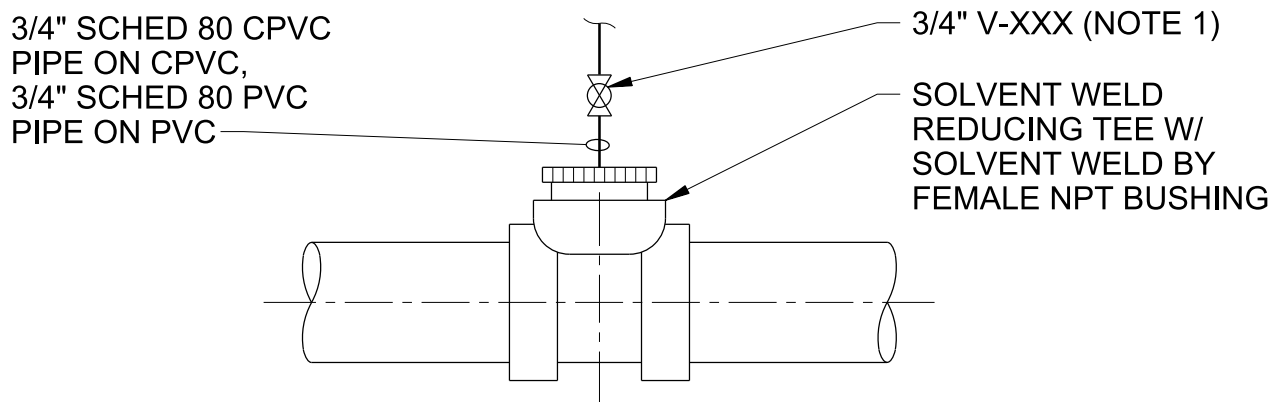
NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4091-304A



CEMENT LINE STEEL PIPE, CAST IRON PIPE AND DUCTILE IRON PIPE



PVC AND CPVC PIPE

NOTES:

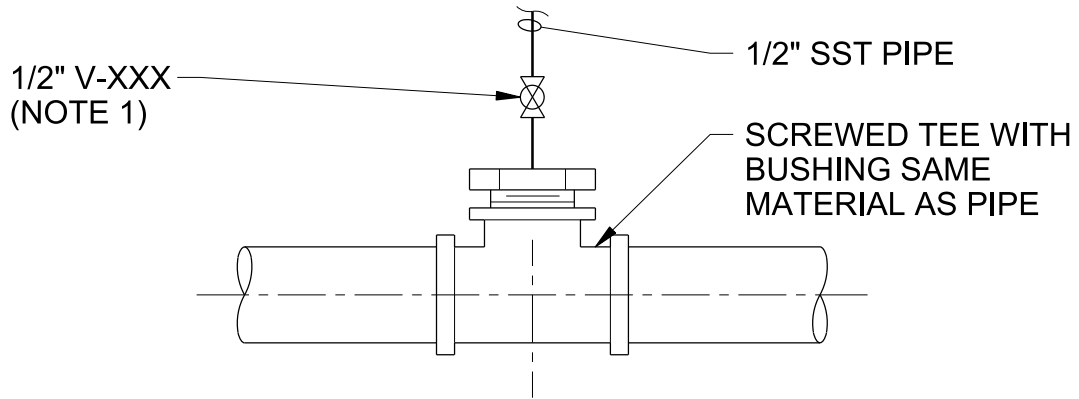
1. SEE 40 27 02B FOR VALVE SPECIFICATIONS.

PRESSURE CONNECTION INSTALLATION

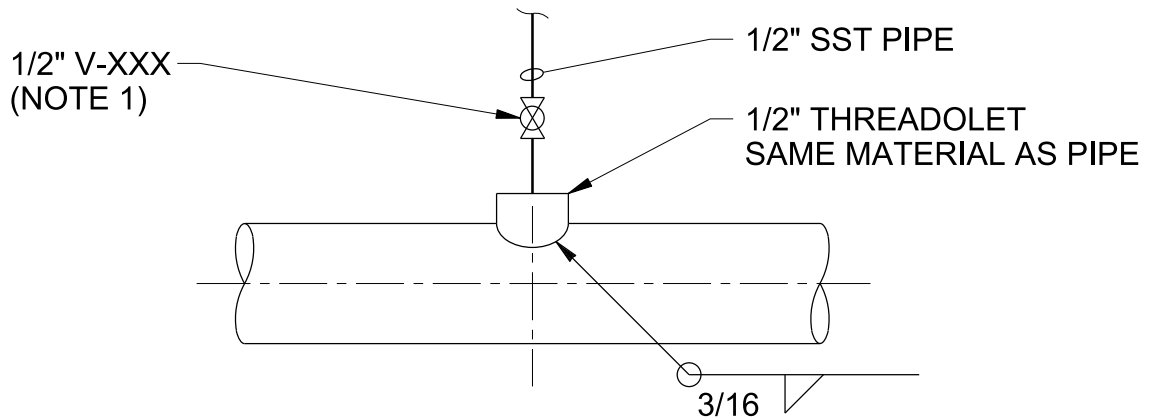
NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

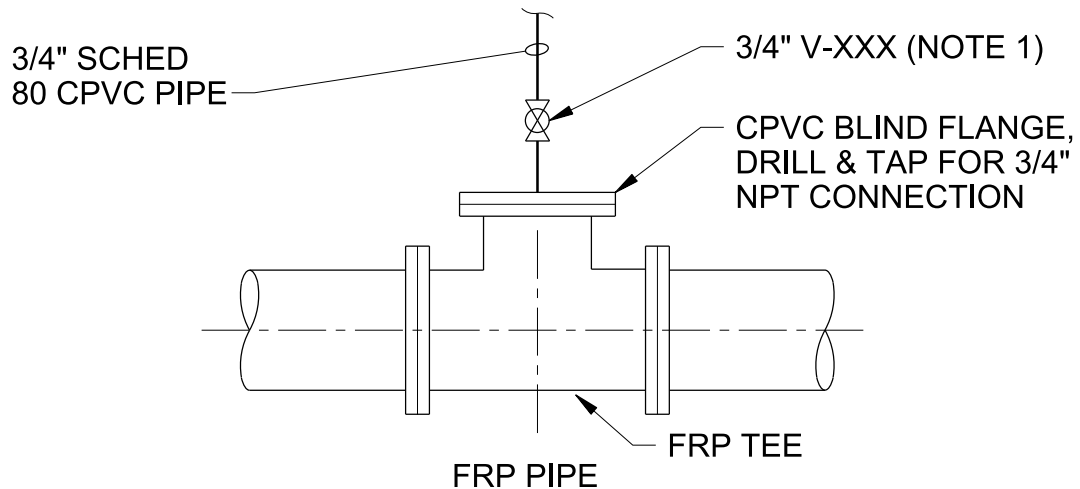
4091-305A



STEEL & SST PIPE 3 1/2" & SMALLER



STEEL & SST PIPE 4" & LARGER



NOTES:

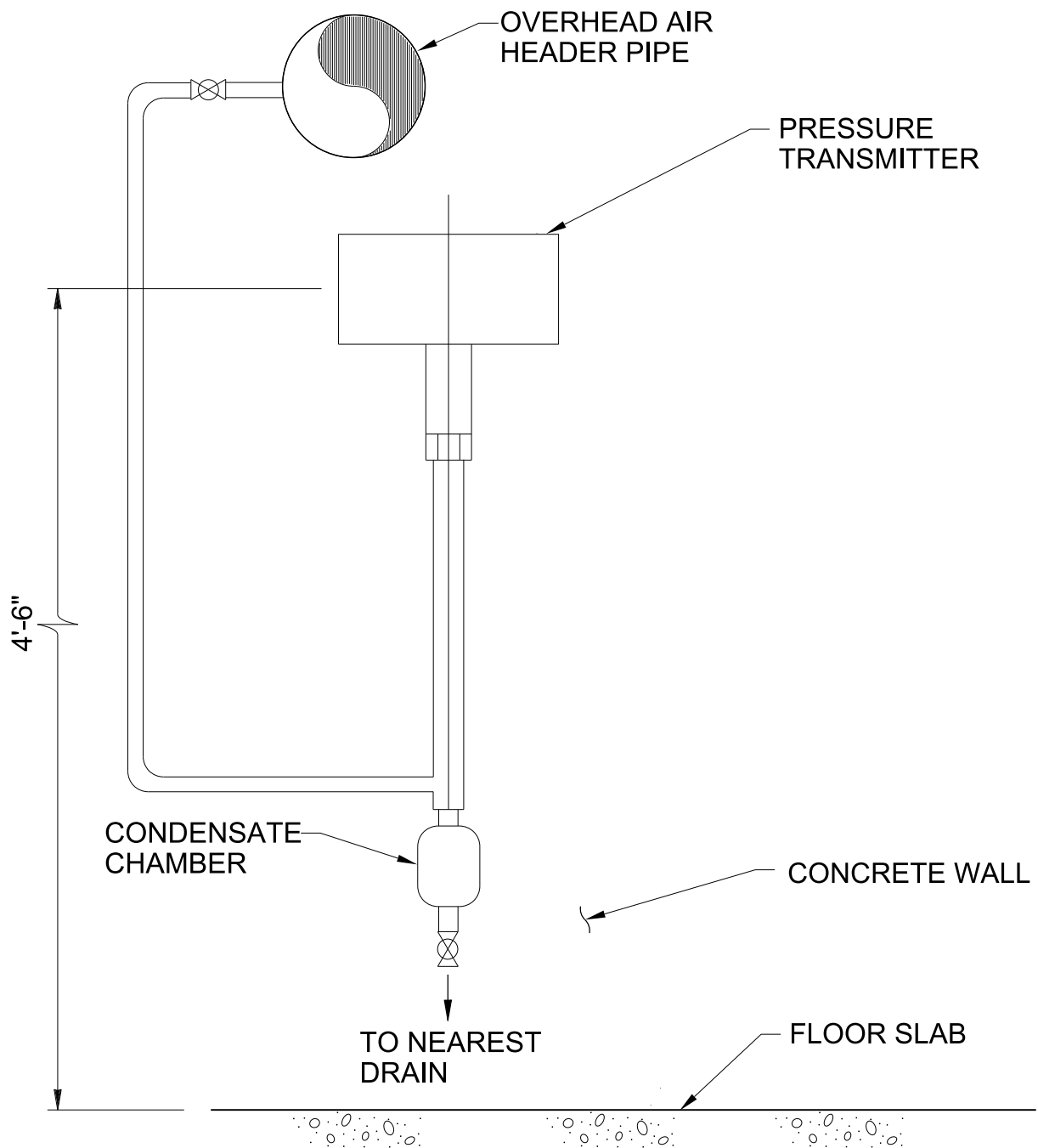
1. SEE 40 27 02B FOR VALVE SPECIFICATIONS.

PRESSURE CONNECTION INSTALLATION

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4091-305B



WALL MOUNT

NOTES:

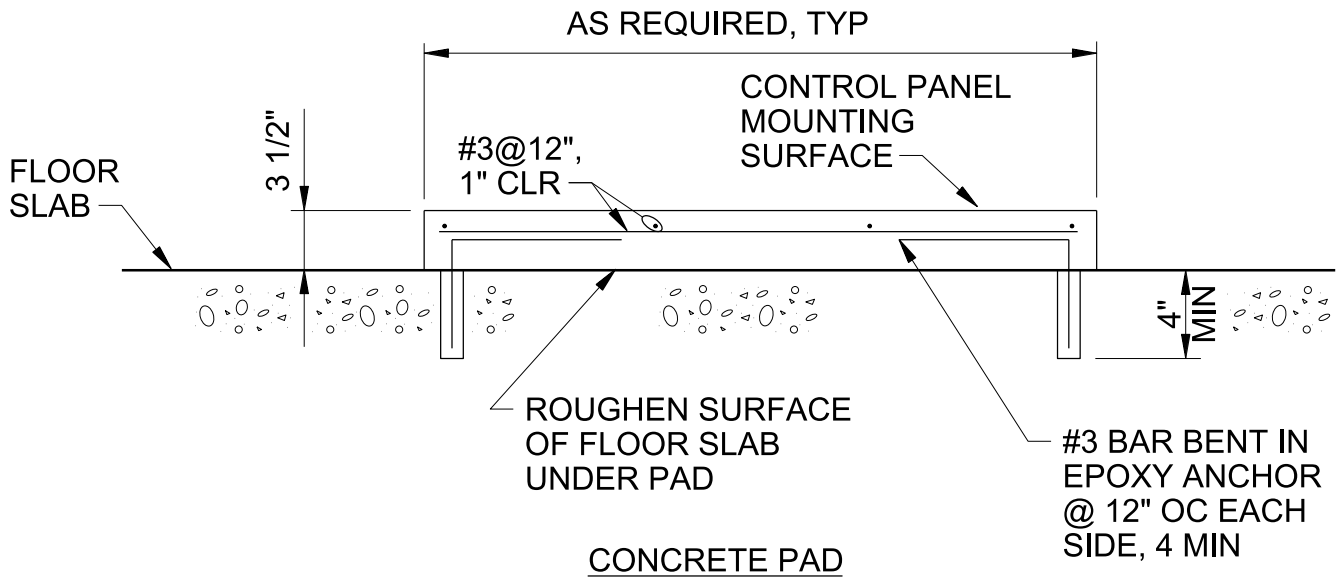
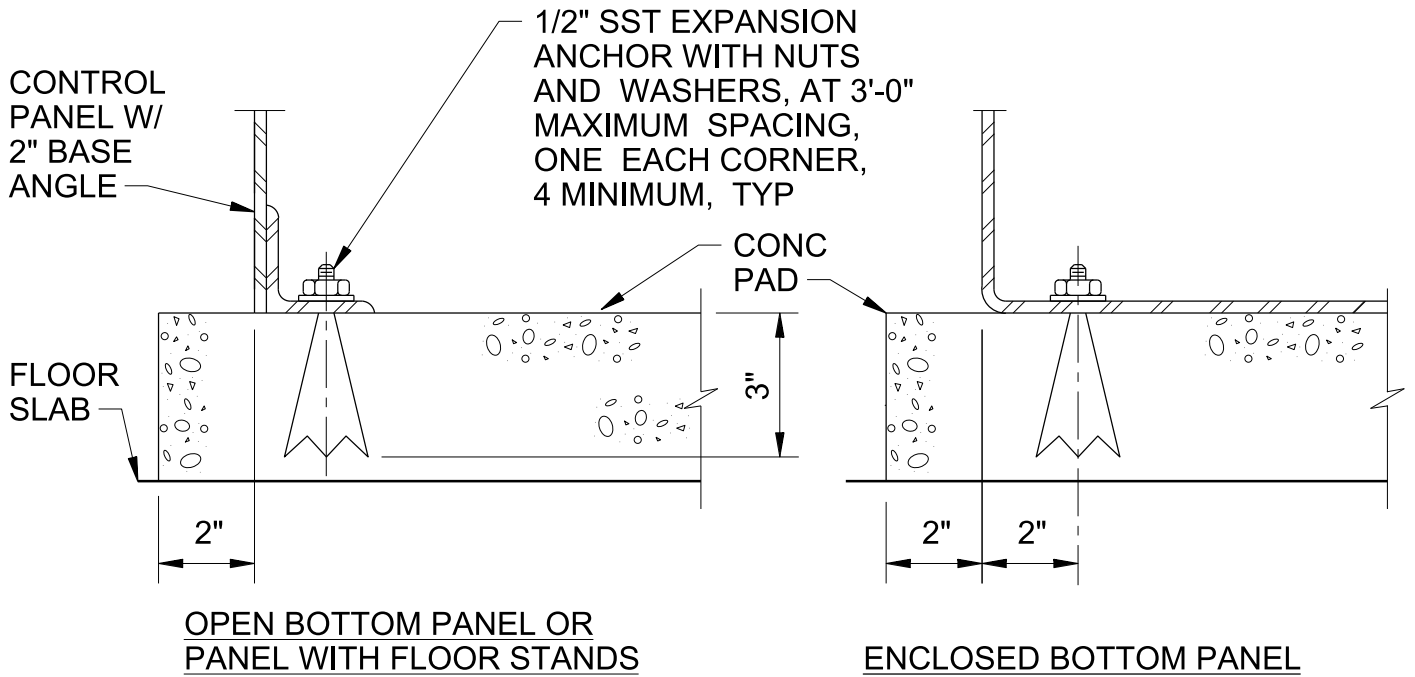
- 1. MOUNT USING (4091-302)

PRESSURE SWITCH OR INDICATOR FOR OVERHEAD AIR HEADER PIPE INSTALLATION

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

(4091-312G)

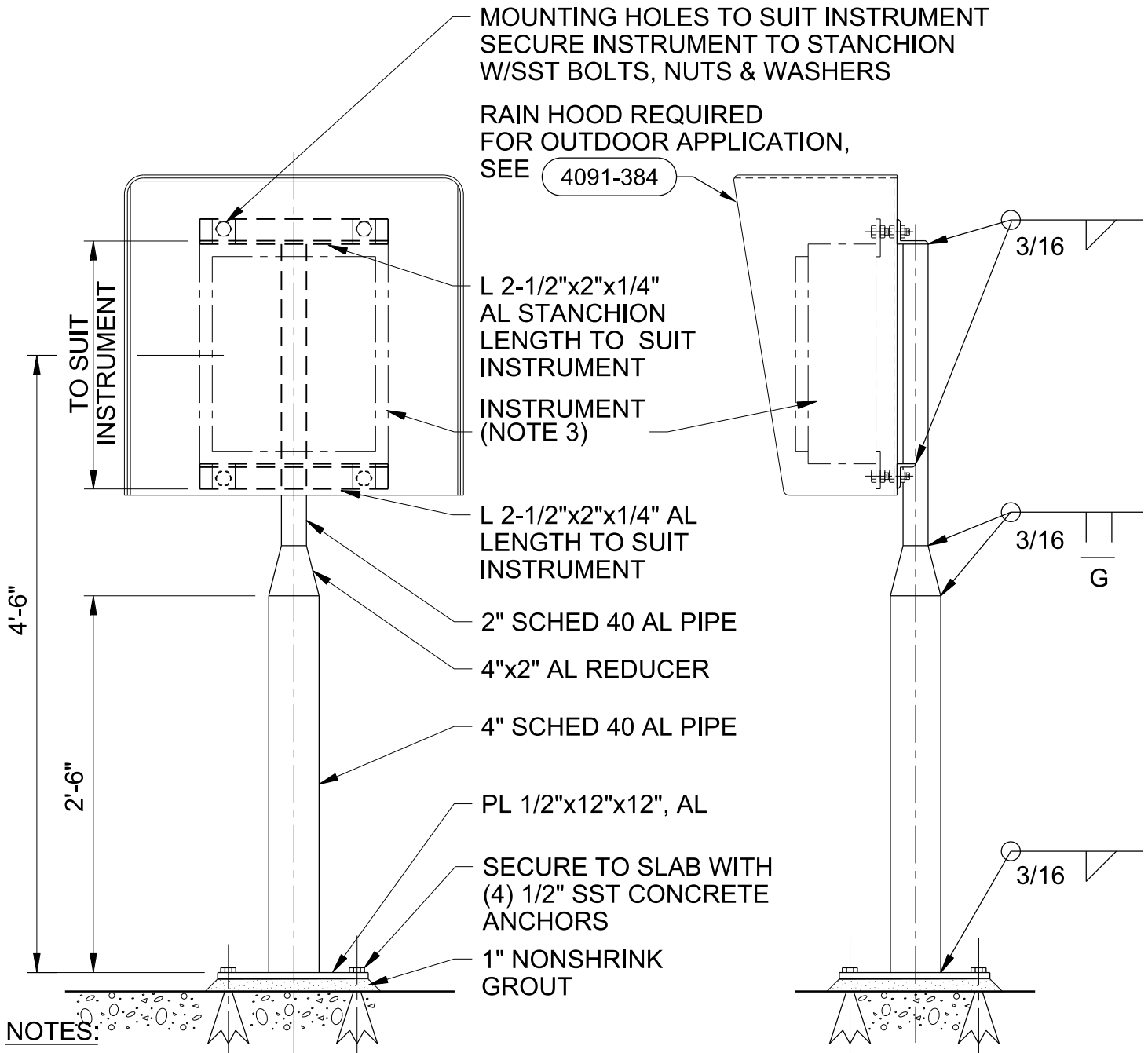


STANDARD FREESTANDING PANEL MOUNTING

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4091-382



MOUNTING HOLES TO SUIT INSTRUMENT
 SECURE INSTRUMENT TO STANCHION
 W/SST BOLTS, NUTS & WASHERS

RAIN HOOD REQUIRED
 FOR OUTDOOR APPLICATION,
 SEE 4091-384

L 2-1/2"x2"x1/4"
 AL STANCHION
 LENGTH TO SUIT
 INSTRUMENT

INSTRUMENT
 (NOTE 3)

L 2-1/2"x2"x1/4" AL
 LENGTH TO SUIT
 INSTRUMENT

2" SCHED 40 AL PIPE

4"x2" AL REDUCER

4" SCHED 40 AL PIPE

PL 1/2"x12"x12", AL

SECURE TO SLAB WITH
 (4) 1/2" SST CONCRETE
 ANCHORS

1" NONSHRINK
 GROUT

NOTES:

1. ROUND OFF ALL EXPOSED EDGES AND CORNERS.
2. PAINT ALUMINUM IN CONTACT WITH CONCRETE ACCORDING TO SPECIFICATIONS FOR PAINTING.
3. FOR MULTIPLE OR SMALLER INSTRUMENTS MOUNT SUITABLE SIZED 10 GA ALUMINUM PANEL THROUGH RAIN HOOD TO STANCHION STANDOFFS. DRILL AND TOP ALUMINUM PANEL AS REQ'D TO MOUNT INSTRUMENTS.

STANCHION SUPPORT - INSTRUMENT MOUNTING STAND

NTS

SWWRF NITROGEN REMOVAL
 AND DIGESTER MODIFICATIONS
 MANATEE COUNTY, FL

4091-383

BACK FORMED OF SINGLE SHEET 10 GA ALUMINUM, TACK WELD TO TOP & SIDES AS REQUIRED

TOP & SIDES FORMED OF SINGLE SHEET 10 GA ALUMINUM

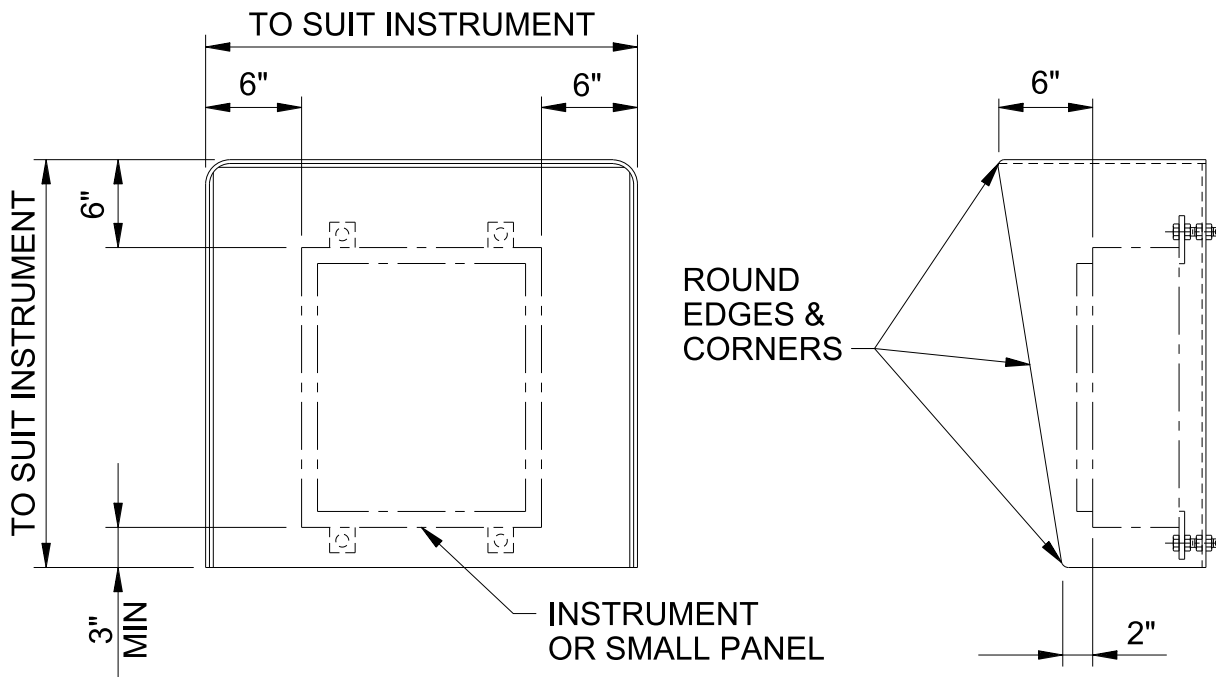
3/8" SST STUD BOLT WITH SST NUTS AND WASHERS, TYP OF 4

INSTRUMENT/HOOD SUPPORT ANGLE OR UNISTRUT (SHOWN) AS APPLICABLE

RAINHOOD

INSTRUMENT MOUNTING FOOT

INSTRUMENT ENCLOSURE



NOTES:

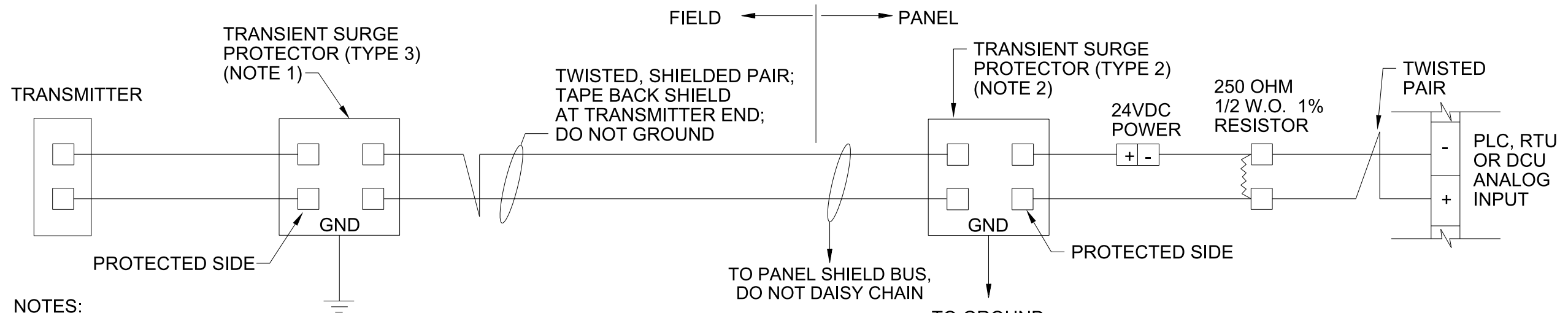
1. ALL EXPOSED EDGES TO BE GROUND SMOOTH AND BURR FREE.
2. MOUNT RAIN HOOD BETWEEN INSTRUMENT AND MOUNTING BRACKET. DRILL HOLES IN RAIN HOOD AS PER MOUNTING HOLES FOR INSTRUMENT, SEE 4091-383

RAIN HOOD INSTALLATION

NTS

SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

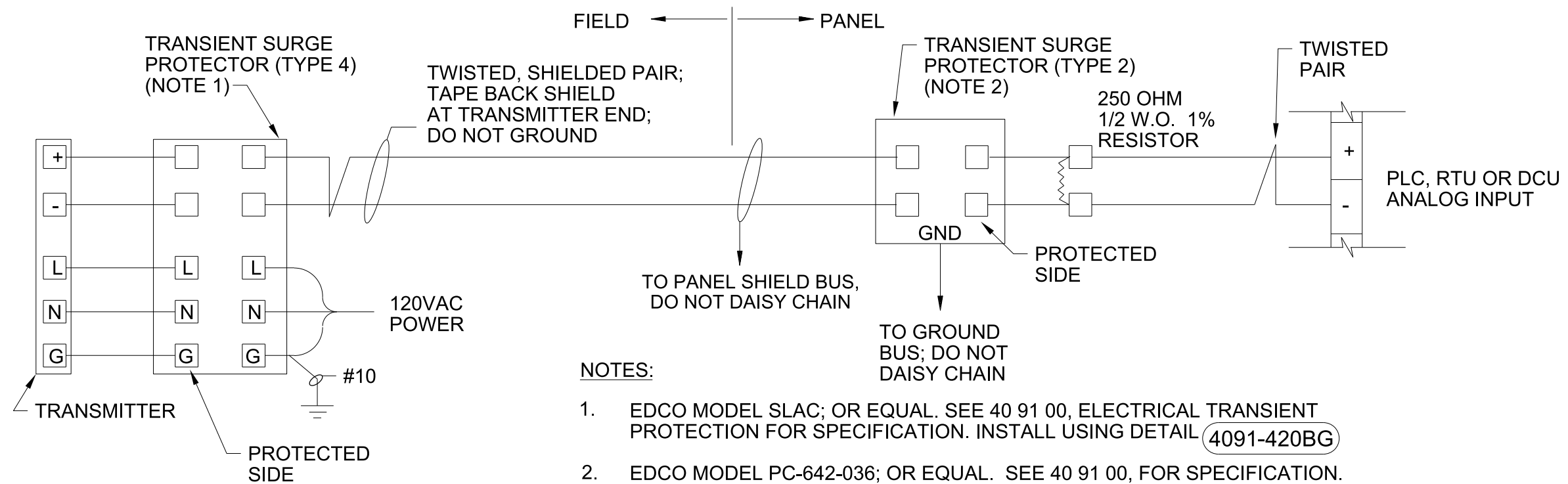
4091-384



NOTES:

1. EDCO MODEL SS64-036-2; OR EQUAL. SEE 40 91 00, ELECTRICAL TRANSIENT PROJECTION FOR SPECIFICATION, INSTALL USING DETAIL 4091-415BG
2. EDCO MODEL PC-642-036; OR EQUAL. SEE 40 91 00, FOR SPECIFICATION.

2-WIRE TRANSMITTER



NOTES:

1. EDCO MODEL SLAC; OR EQUAL. SEE 40 91 00, ELECTRICAL TRANSIENT PROTECTION FOR SPECIFICATION. INSTALL USING DETAIL 4091-420BG
2. EDCO MODEL PC-642-036; OR EQUAL. SEE 40 91 00, FOR SPECIFICATION.

4-WIRE TRANSMITTER

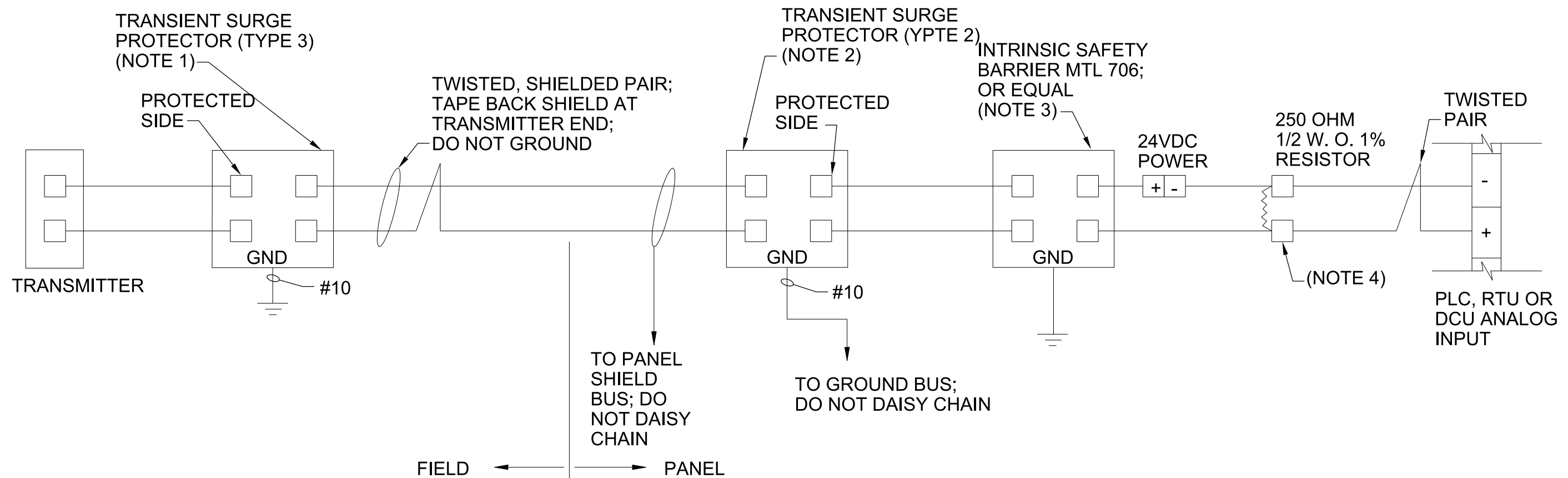
TYPICAL OUTDOOR TRANSMITTERS

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4091-405AG

CH2MHILL



NOTES:

1. EDCO MODEL SS64-036-2; OR EQUAL. SEE 40 91 00, ELECTRICAL TRANSIENT PROJECTION FOR SPECIFICATION, INSTALL USING DETAIL 4091-415BG
2. EDCO MODEL PC-642-036; OR EQUAL. SEE 40 91 00, ELECTRICAL TRANSIENT PROJECTION FOR SPECIFICATION.
3. INSTALL PER MANUFACTURERS RECOMMENDATIONS TO PROVIDE PROTECTION FOR FIELD ELEMENTS IN CLASS 1, DIVISION 2, GROUP D ENVIRONMENTS.
4. LOCATE ADJACENT TO INTRINSIC SAFETY BARRIERS.

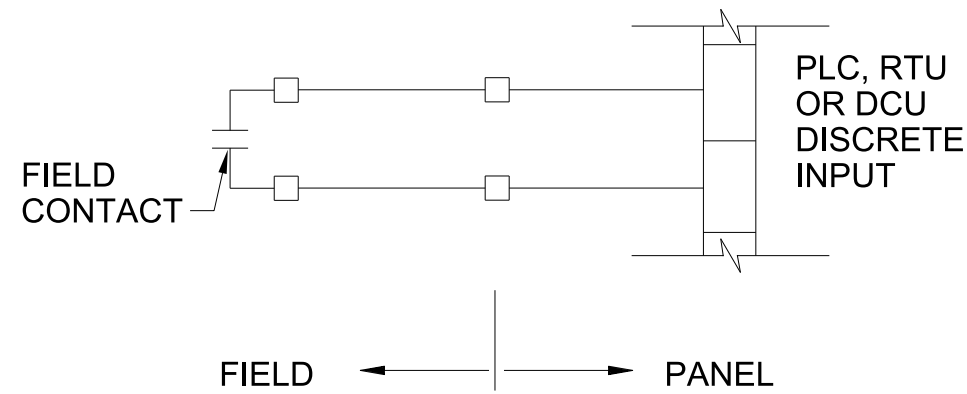
TYPICAL OUTDOOR HAZARDOUS LOCATION 2-WIRE TRANSMITTER

NTS

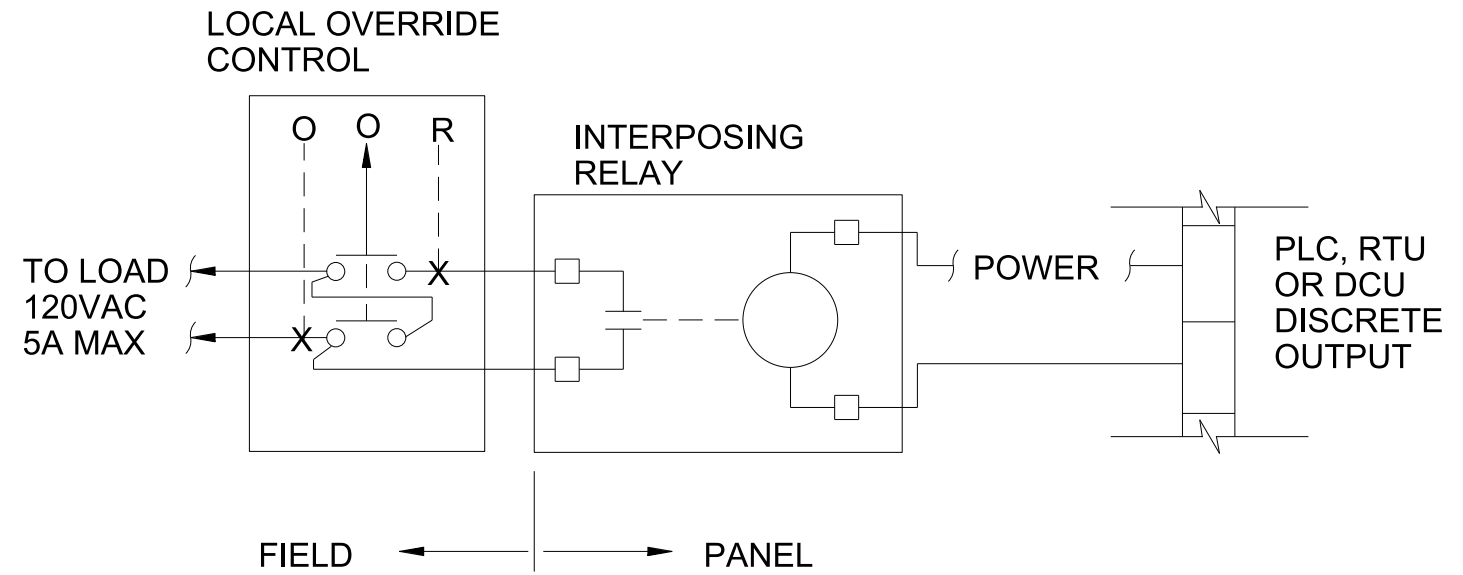
SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4091-407G

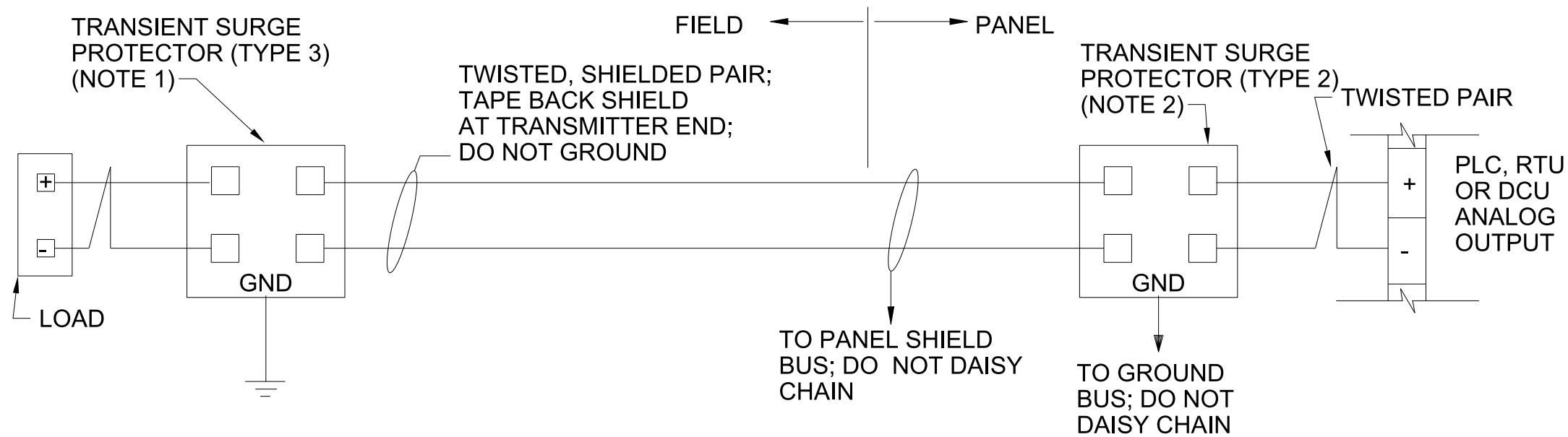
CH2MHILL



TYPICAL DISCRETE INPUT



TYPICAL DISCRETE OUTPUT



TYPICAL OUTDOOR ANALOG OUTPUT

NTS

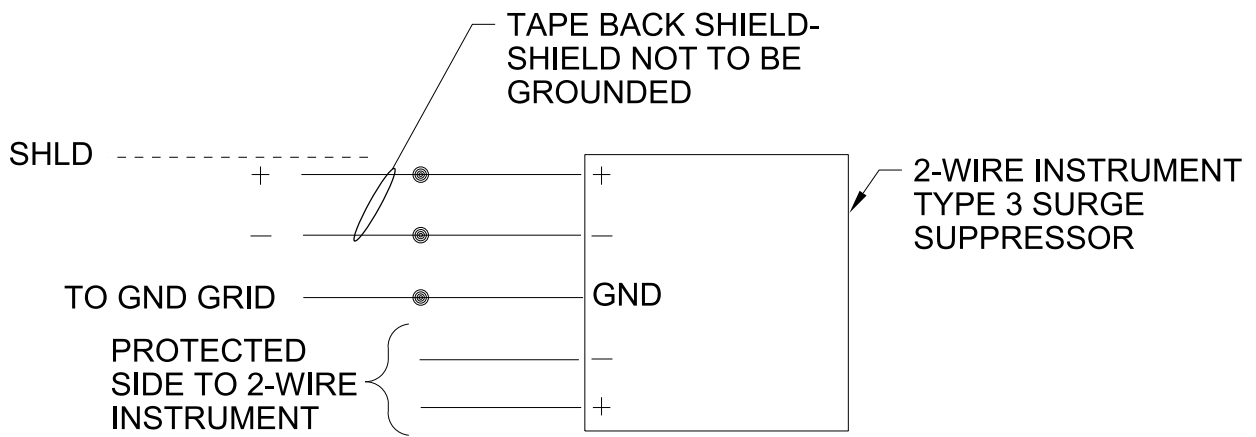
NOTES:

1. EDCO MODEL SS64-036-2; OR EQUAL. SEE 40 91 00, ELECTRICAL TRANSIENT PROJECTION FOR SPECIFICATION, INSTALL USING DETAIL 4091-415BG
2. EDCO MODEL PC-642-036; OR EQUAL. SEE 40 91 00, FOR SPECIFICATION.

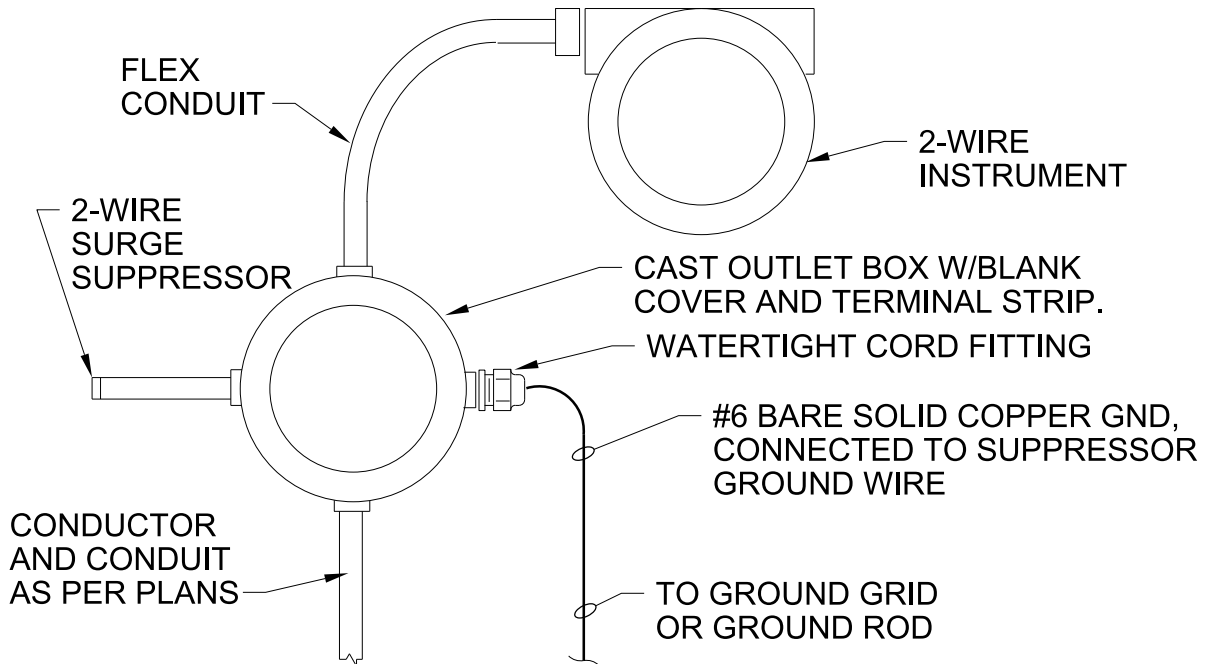
SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4091-408G

CH2MHILL



WIRING DIAGRAM

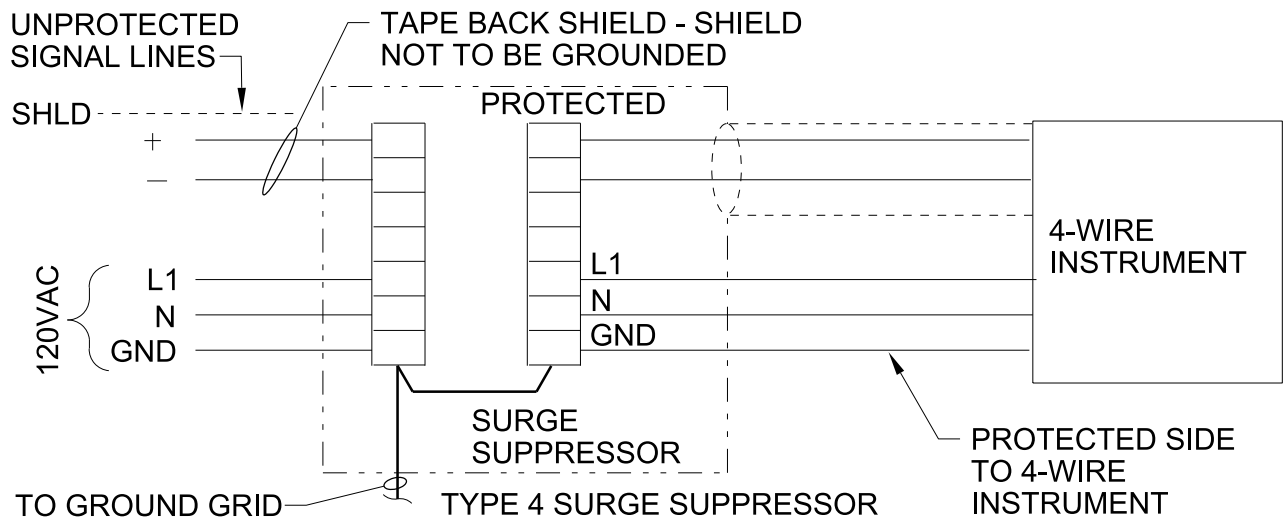


TYPE "3" SURGE SUPPRESSOR INSTALLATION 2-WIRE INSTRUMENT

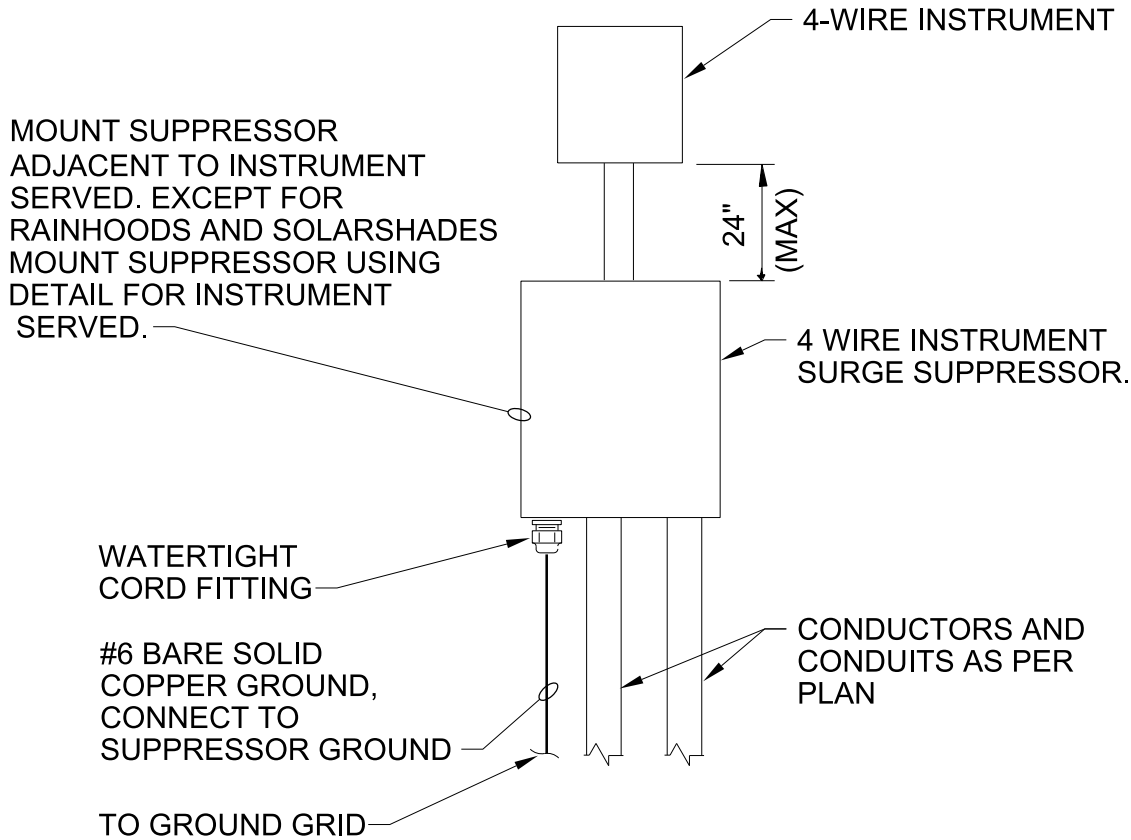
NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4091-415BG



WIRING DIAGRAM

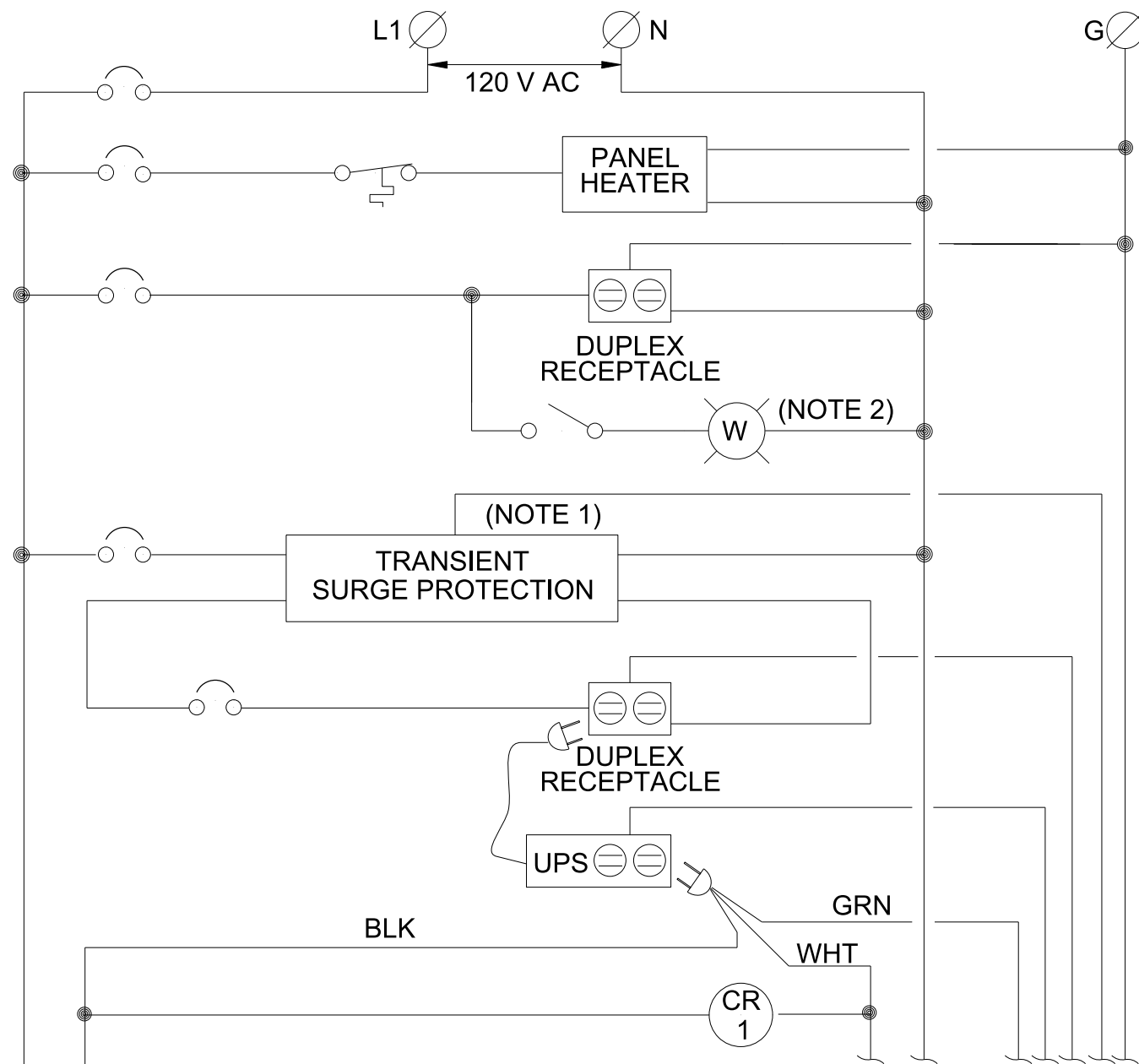


**TYPE "4" SURGE SUPPRESSOR
INSTALLATION 4-WIRE INSTRUMENT**

NTS

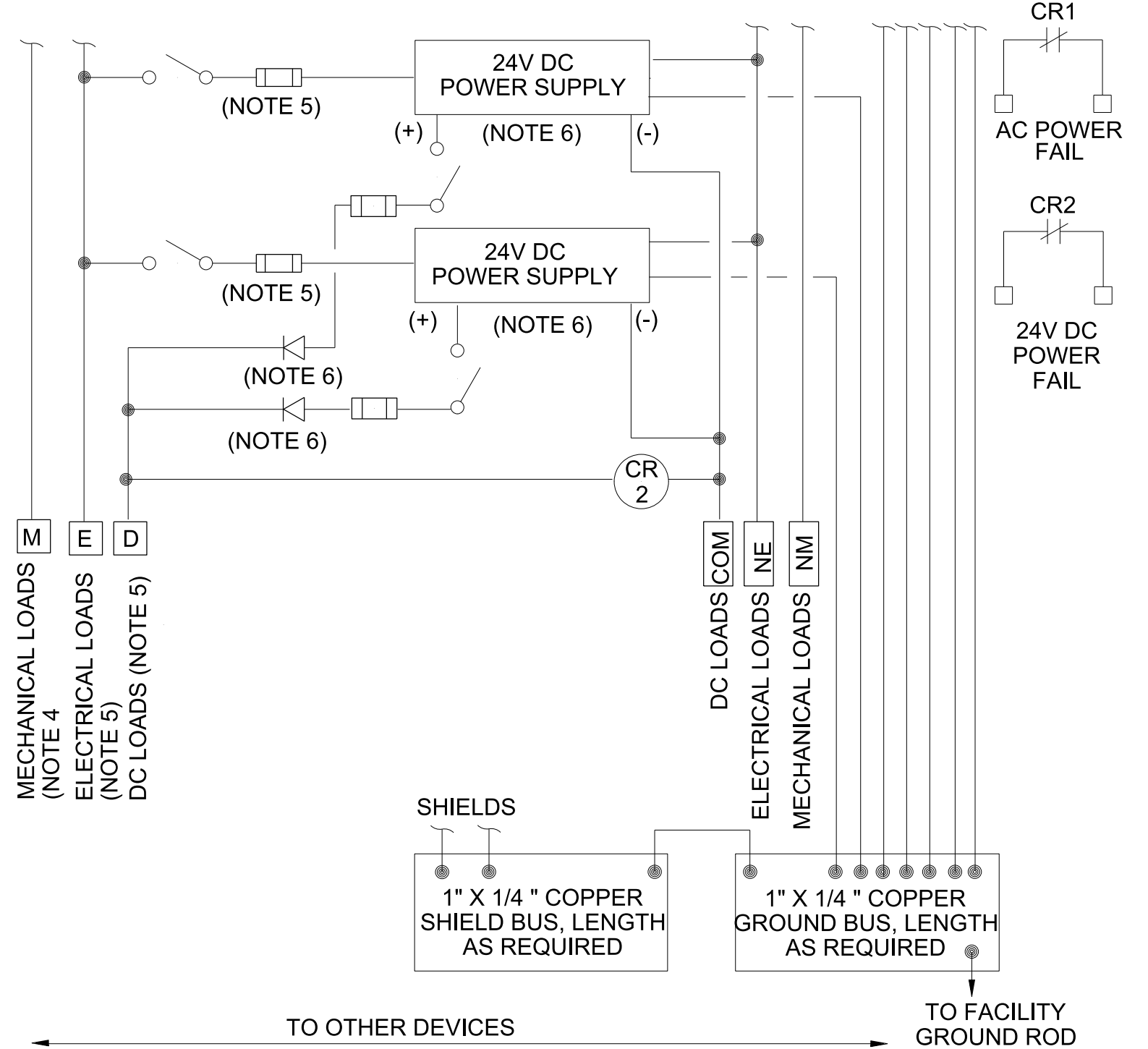
SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4091-420BG



NOTES:

1. IF LOAD EXCEEDS 15 AMPS PROVIDE ADDITIONAL PARALLEL CIRCUITS WITH TRANSIENT SURGE PROTECTION AS SHOWN.
2. PROVIDE APPROPRIATE LIGHTING PACKAGE FOR PANEL SIZE HOFFMAN BULLETIN A-80, OR EQUAL.
3. SCHEMATIC DIAGRAM SHOWN IS A TYPICAL EXAMPLE TO BE USED AS A GUIDE FOR PREPARING DETAILED SCHEMATIC DIAGRAM.
4. PROVIDE PROPERLY SIZED BREAKER FOR EACH LOAD.
5. PROVIDE PROPERLY SIZED FUSE FOR EACH LOAD.
6. PROVIDE ONE MORE (N + 1) DC POWER SUPPLY THAN REQUIRED BY LOAD WITH DIODE AUCTIONEERING.



CONTROL PANEL POWER DISTRIBUTION FOR PANEL WITH UPS

NTS

SWWRF NITROGEN REMOVAL
AND DIGESTER MODIFICATIONS
MANATEE COUNTY, FL

4091-426BG

CH2MHILL