

Northern Kentucky Water District
2835 Crescent Springs Road
Erlanger, KY 41018

STANDARD DRAWING DETAILS

2010-00038

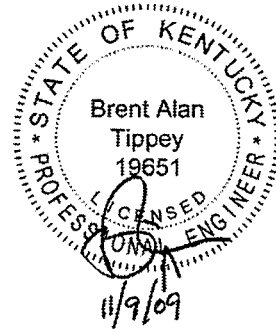
for the construction of the
Fort Thomas Treatment Plant and Memorial Parkway Treatment Plant Advanced Treatment

Contract No. _____



CH2MHILL
CH2M HILL

300 E-Business Way, Suite 400
Cincinnati, Ohio 45241



HDR
HDR/Quest

2517 Sir Barton Way
Lexington, Kentucky 40509

November 12, 2009

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Project No. 380723

Copy No. _____

MEMORIAL PARKWAY WTP ADVANCED TREATMENT

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MEMORIAL PARKWAY WTP ADVANCED TREATMENT

Section

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MEMORIAL PARKWAY WTP ADVANCED TREATMENT

Section

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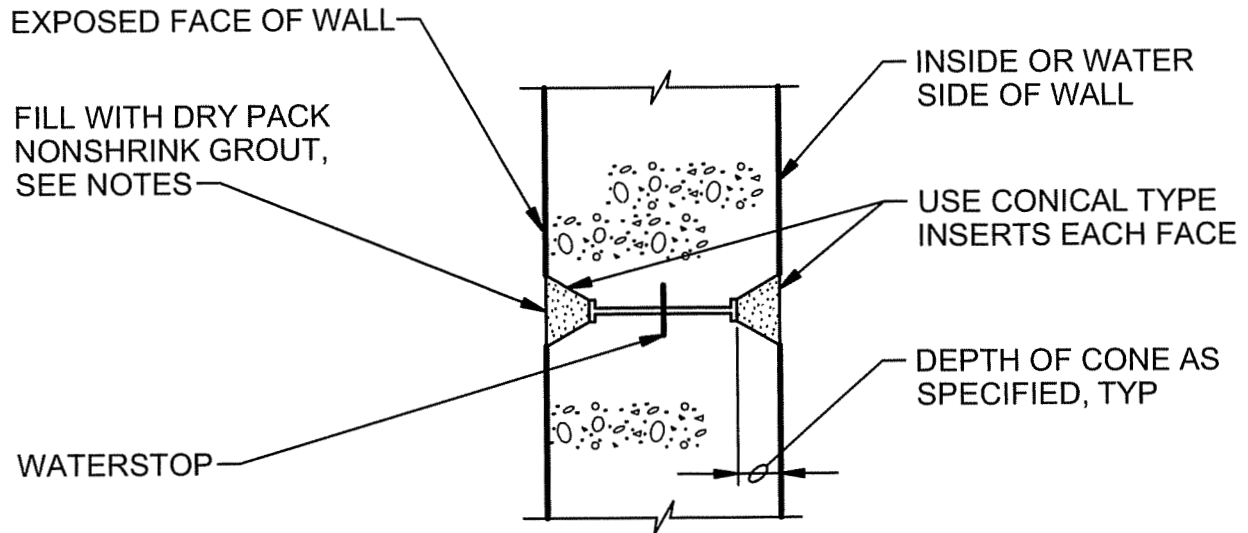
MEMORIAL PARKWAY WTP ADVANCED TREATMENT

Section

4442-660
4442-715

Vertical Turbine Pump Seal Water Piping
Small Sump Support

END OF SECTION



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.
2. DRY PACK METHOD SHALL BE AS SPECIFIED USING STEEL TOOLS.
3. NOTE: TAPERED TIES MAY BE USED FOR WALLS GRESTER THAN 24" THICK.

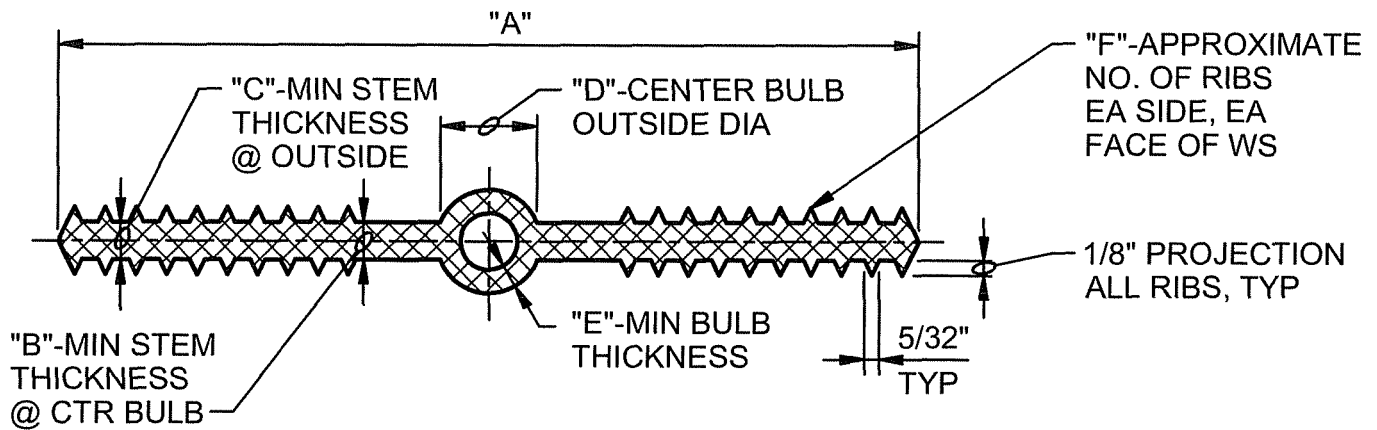
FORM SNAP-TIE HOLE

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0310-051

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SIZE	"A"	"B"	"C"	"D"	"E"	"F"
4"x3/16"	4"	3/16"	3/16"	3/4"	1/4"	4
6"x3/8"	6"	3/8"	3/8"	7/8"	1/4"	6
9"x3/8"	9"	3/8"	3/8"	1"	1/4"	8

NOTES:

1. NON-ROUND CENTER BULBS SHALL HAVE A MINIMUM OUTSIDE DIMENSION OF 'D'.
2. SEE SPLICE DETAIL (0315-011)
3. BULB TYPE WATERSTOP SHOWN IS REQUIRED FOR EXPANSION AND CONTROL JOINTS. SIMILAR WATERSTOPS WITHOUT CENTER BULB MAY BE SUBSTITUTED AT CONSTRUCTION JOINTS.
4. USE 6 INCH WATERSTOPS IN ALL CONSTRUCTION JOINTS UNLESS SPECIFICALLY SHOWN OTHERWISE.

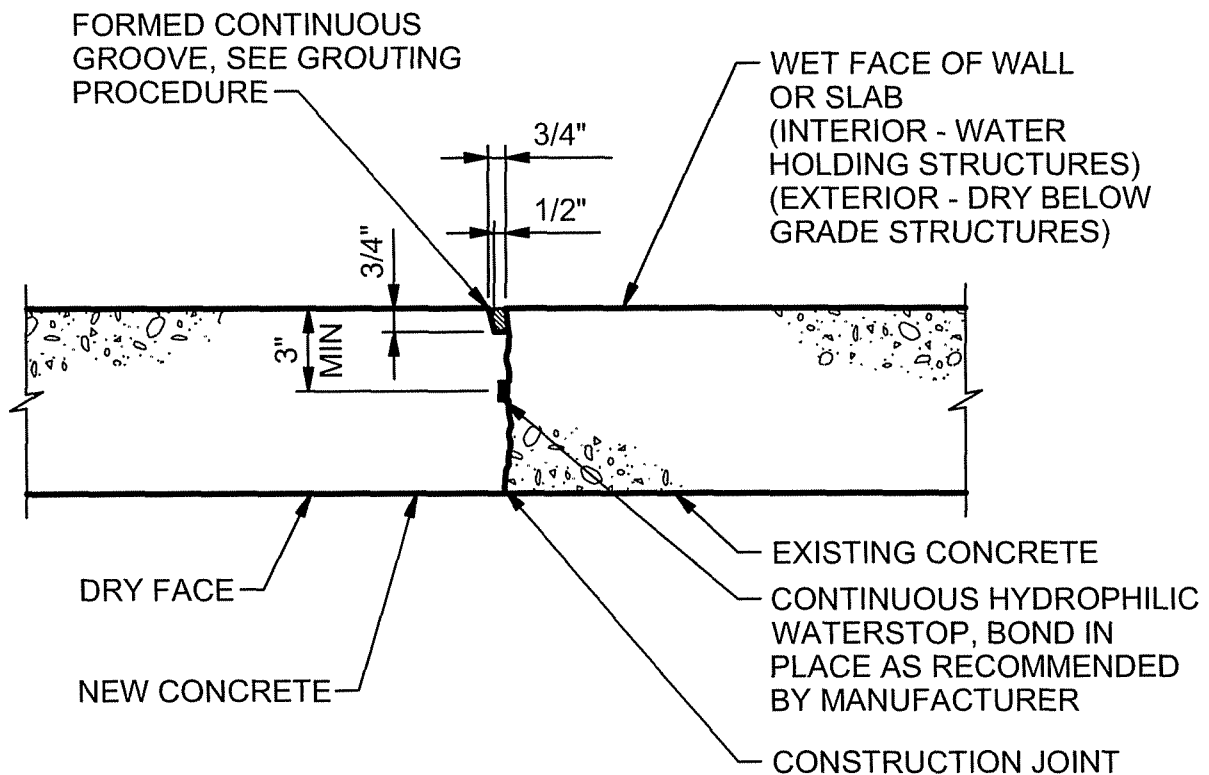
PLASTIC WATERSTOP

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ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0315-001

CH2MHILL



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.

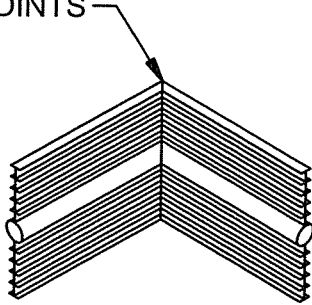
HYDROPHILIC/GROOVE WATERSTOP

NTS

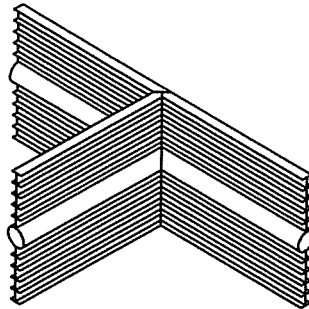
ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0315-003

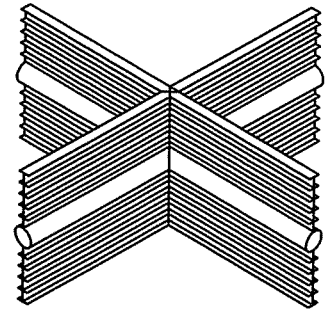
MITER CORNERS OF VERTICAL JOINTS & WELD SIMILAR AS SHOWN BELOW FOR IN-PLANE JOINTS



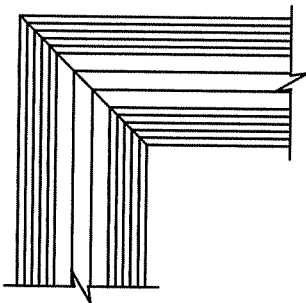
VERTICAL ELL



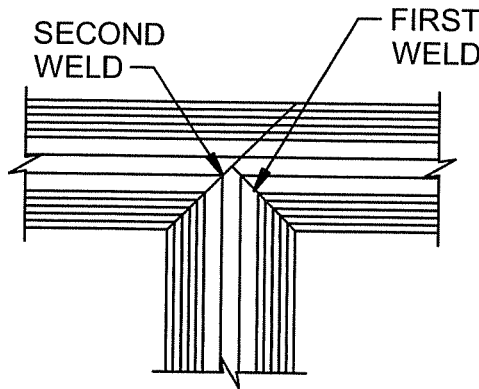
VERTICAL TEE



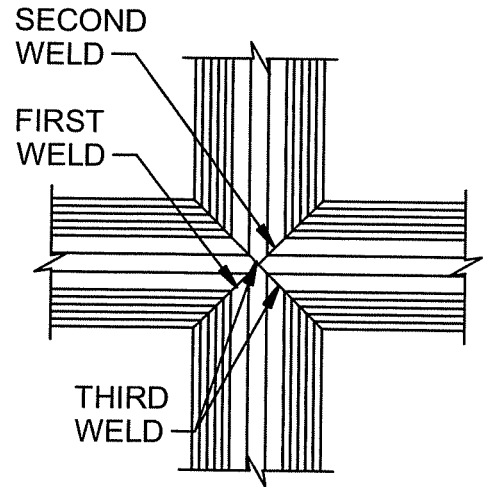
VERTICAL CROSS



FLAT ELL



FLAT TEE



FLAT CROSS

NOTE:

ALL WELDS SHALL BE PER WATERSTOP MANUFACTURER'S RECOMMENDATIONS.

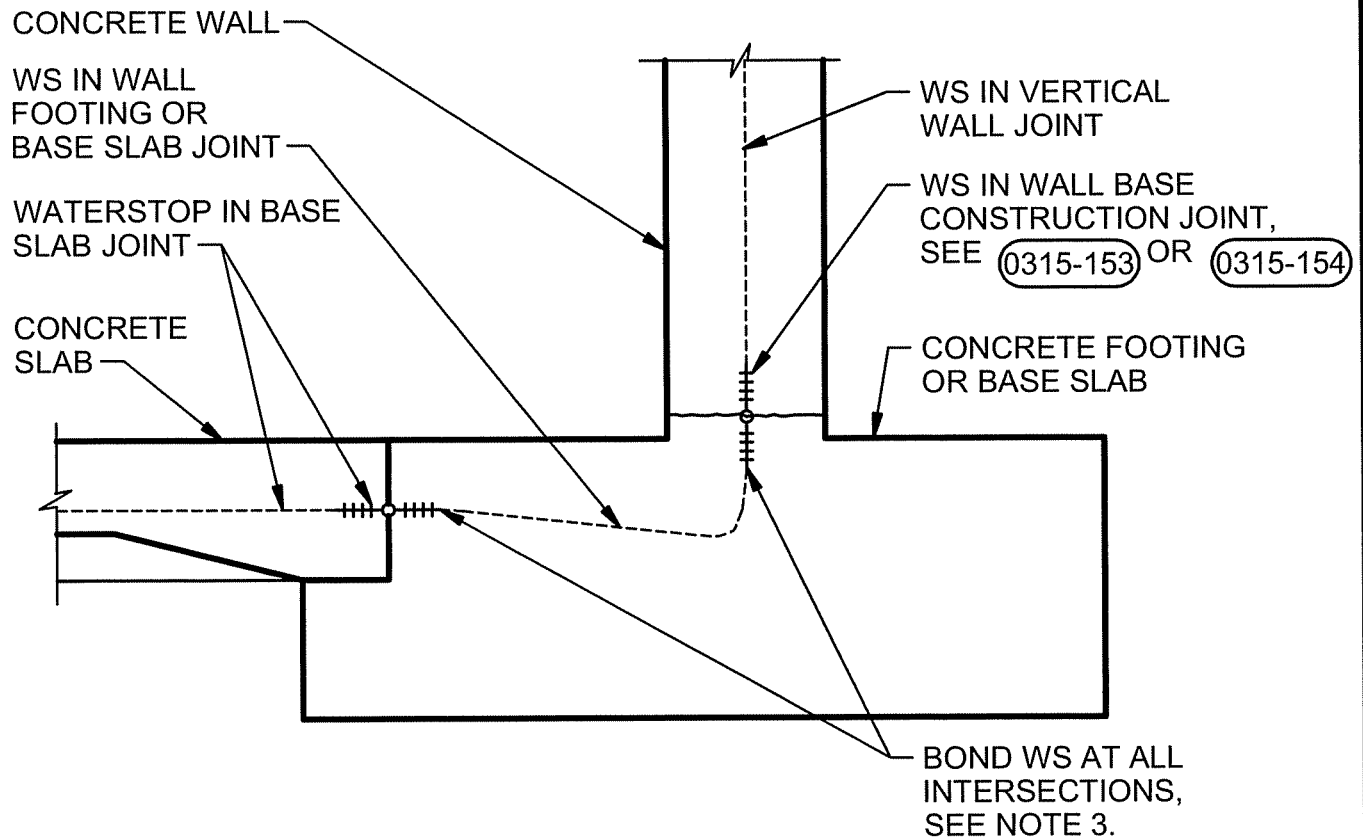
WATERSTOP JOINTS

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ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0315-011

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NOTES:

1. SUBMIT DETAILS OF SPLICING AND LOCATION.
2. BOND OR SPLICE ALL HORIZONTAL TRANSVERSE WATERSTOPS IN BASE SLAB JOINTS TO CONTINUOUS LONGITUDINAL WATERSTOP IN WALL BASE FOR COMPLETE SEAL.
3. BOND OR SPLICE ALL VERTICAL WATERSTOPS IN WALL JOINTS TO LONGITUDINAL WATERSTOP IN WALL BASE FOR COMPLETE SEAL, SEE (0315-011) FLAT CROSS JOINT.
4. FOR CONCRETE PLACEMENT SEQUENCE, SEE (0315-133)
5. FOR PLASTIC WATERSTOP DETAILS, SEE (0315-001)

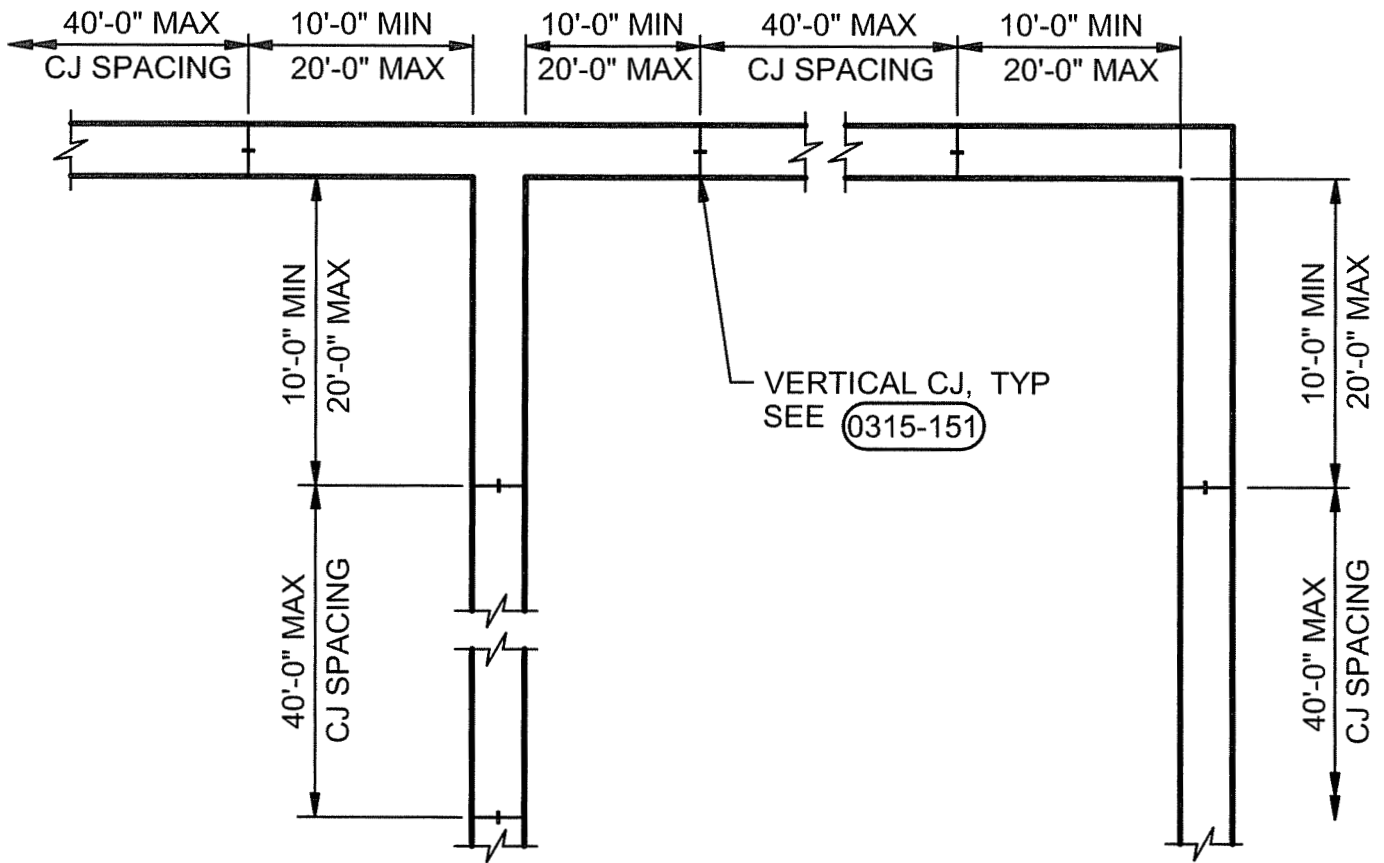
WATERSTOP CONNECTION

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ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

(0315-012)

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PLAN

NOTES:

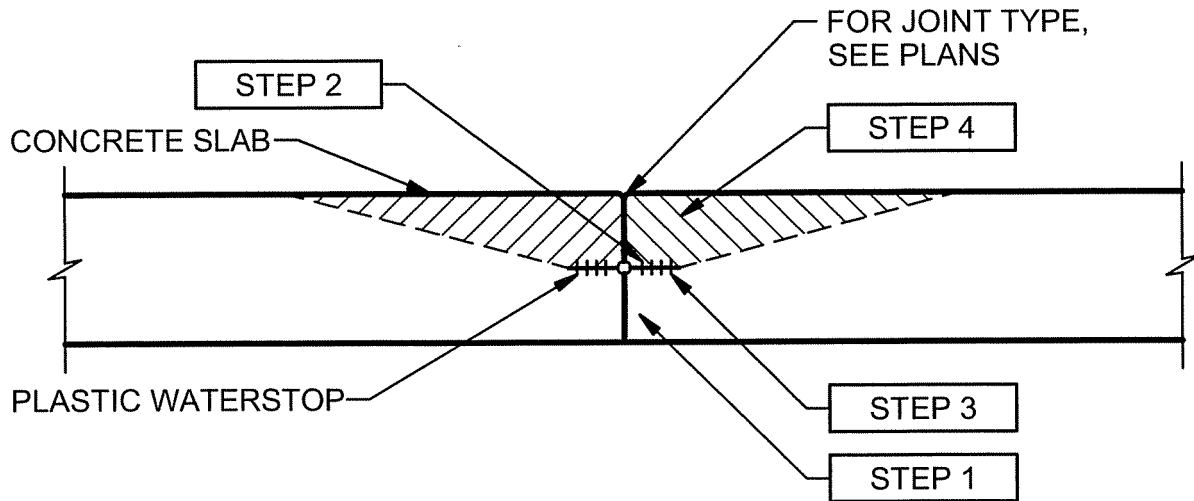
1. COORDINATE CONSTRUCTION JOINT LOCATIONS AND TIME BETWEEN CONCRETE POURS WITH SPECIFICATION 03 30 00.
2. LOCATE WALL CONSTRUCTION JOINTS AS SHOWN, UNLESS INDICATED OTHERWISE.
3. CONSTRUCTION JOINTS SHALL BE LOCATED SUCH THAT THEIR ASPECT RATIO DOES NOT EXCEED 1.5 TO 1.

WALL CONSTRUCTION JOINT SPACING

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0315-131



NOTES:

PLACEMENT SEQUENCE SHOWN REQUIRED ON BOTH SIDES OF JOINTS, IN ALL CONCRETE SLAB AND FOOTING POURS WITH HORIZONTALLY PLACED PLASTIC WATERSTOPS.

STEP 1

PLACE CONCRETE BELOW WATERSTOP FIRST, REMOVE ALL AIR VOIDS BY VIBRATING THOROUGHLY.

STEP 2

TO CONFIRM THERE ARE NO AIR VOIDS, LIFT WATERSTOP. A CONTINUOUS IMPRESSION OF THE WATERSTOP, INCLUDING EDGE OF BULB, SHOULD BE VISIBLE IN THE FRESH CONCRETE. CONTINUE THIS PROCEDURE ALONG THE ENTIRE POURED JOINT, END TO END. IF A CONTINUOUS IMPRESSION IS CONFIRMED, PROCEED WITH STEP 4. IF A VOID LARGER THAN 1/4 INCH IN DIAMETER IS PRESENT ANYWHERE IN THE WATERSTOP IMPRESSION, PROCEED WITH STEP 3.

STEP 3

IF A VOID LARGER THAN 1/4 INCH IN DIAMETER IS PRESENT IN THE WATERSTOP IMPRESSION, ADDITIONAL CONCRETE SHALL BE PLACED UNDER THE WATERSTOP, VIBRATED, AND STEP 2 REPEATED.

STEP 4

FINISH PLACING CONCRETE ABOVE THE WATERSTOP TO TOP OF SLAB.

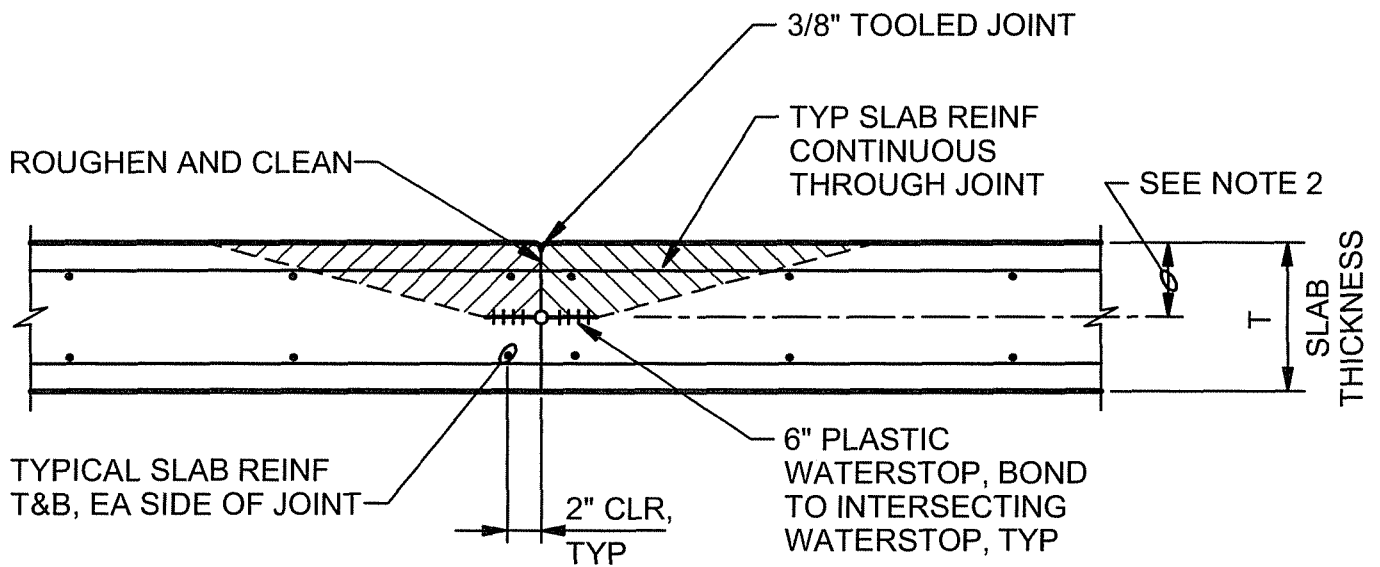
CONCRETE PLACEMENT SEQUENCE

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MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0315-133

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NOTE:

1. FOR CONCRETE PLACEMENT AROUND WATERSTOP, SEE (0315-133)
2. WATERSTOP DEPTH = $T/2$ OR 5 1/2" MAXIMUM WHEN USED IN CONJUNCTION WITH DETAIL (0315-153) BUT 6 1/2" MAXIMUM WHEN USED IN CONJUNCTION WITH DETAIL (0315-154).

SLAB CONSTRUCTION JOINT

NTS

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 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

(0315-142)

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INTERMEDIATE SLAB,
SEE PLANS FOR
ELEVATION, THICKNESS
& REINFORCING

WATERSIDE

DRY SIDE

CONTINUOUS KEYWAY,
3/4" x SLAB DEPTH + 1"

3/4"

POUR WALLS
CONTINUOUS PAST
INTERMEDIATE SLAB

GROOVE, TYP ALL
WATERSIDE EDGES
OF INTERMEDIATE
SLAB FOR COMPLETE
SEAL (0315-003)

HYDROPHILIC WATERSTOP

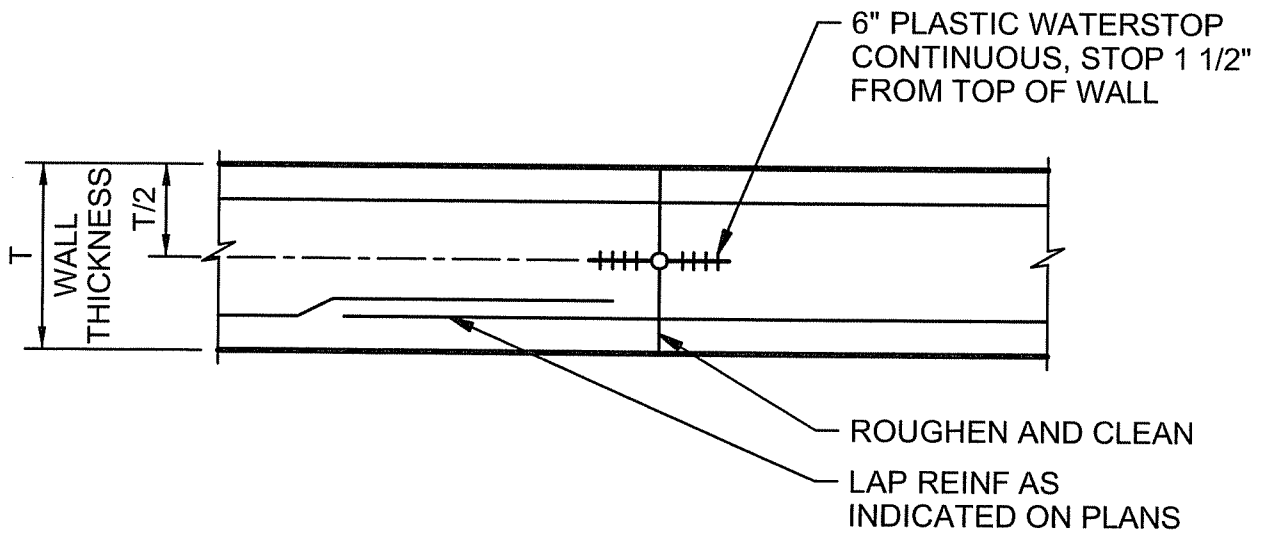
CONTRACTORS
OPTION TO
PROVIDE DOWELS
W/ MECHANICAL
THREADED
CONNECTORS TO
FACILITATE WALL
FORMING

SLAB CONSTRUCTION JOINT AT WALL

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0315-143



PLAN

NOTES:

1. ALL REINFORCING CONTINUOUS ACROSS JOINT.
2. FOR LOCATIONS, SEE (0315-131)

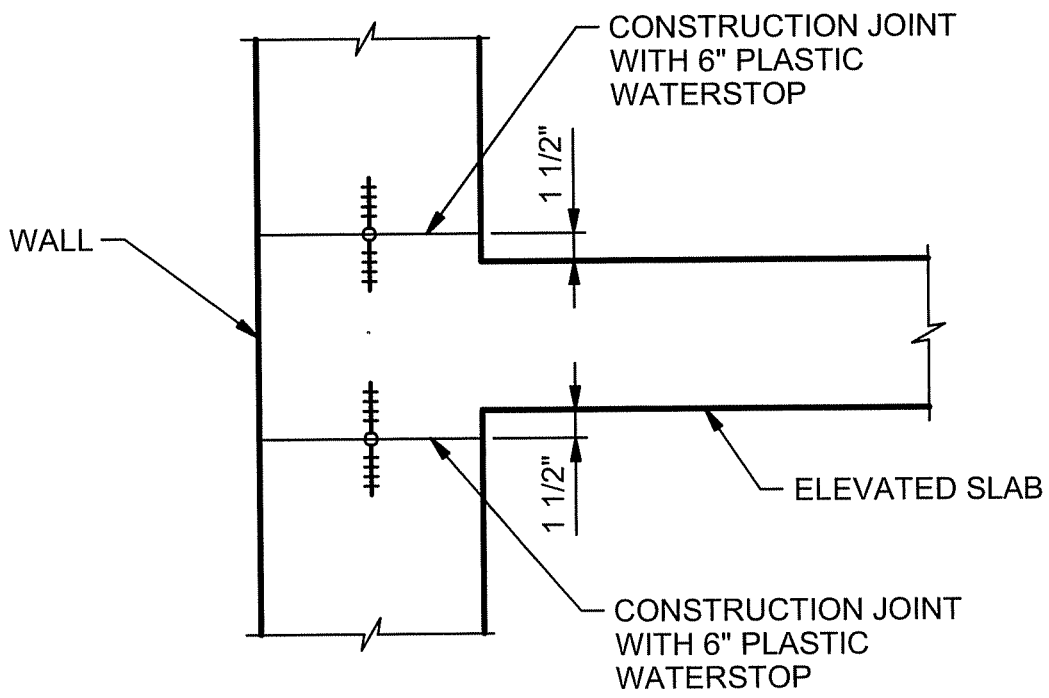
WALL VERTICAL CONSTRUCTION JOINT

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 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0315-151

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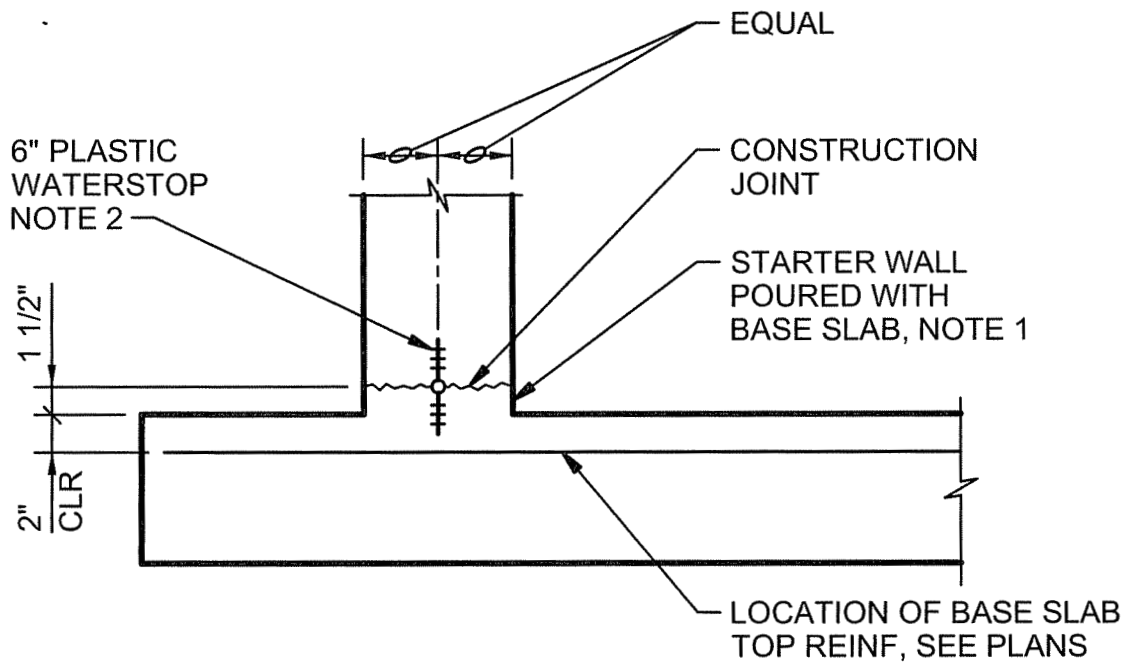
WALL CONSTRUCTION JOINT AT ELEVATED SLAB

NTS

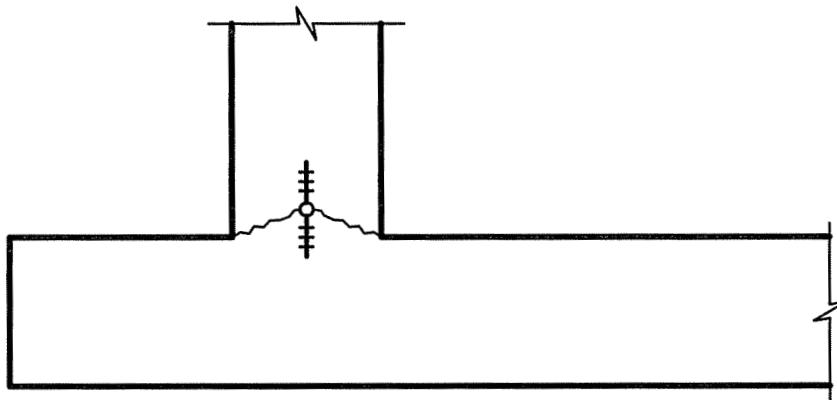
ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0315-152

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TYPICAL BASE



UNACCEPTABLE BASE

NOTES:

1. STARTER WALL REQUIRED FOR ALL CONSTRUCTION JOINTS WITH WATERSTOPS, UNLESS SPECIFICALLY INDICATED OTHERWISE.
2. FOR WALLS W/SINGLE MAT OF REINFORCING LOCATE WATERSTOP ON LIQUID FACE, 1" CLEAR OF REINFORCING.
3. SECURE WATERSTOP IN-PLACE AS SPECIFIED.

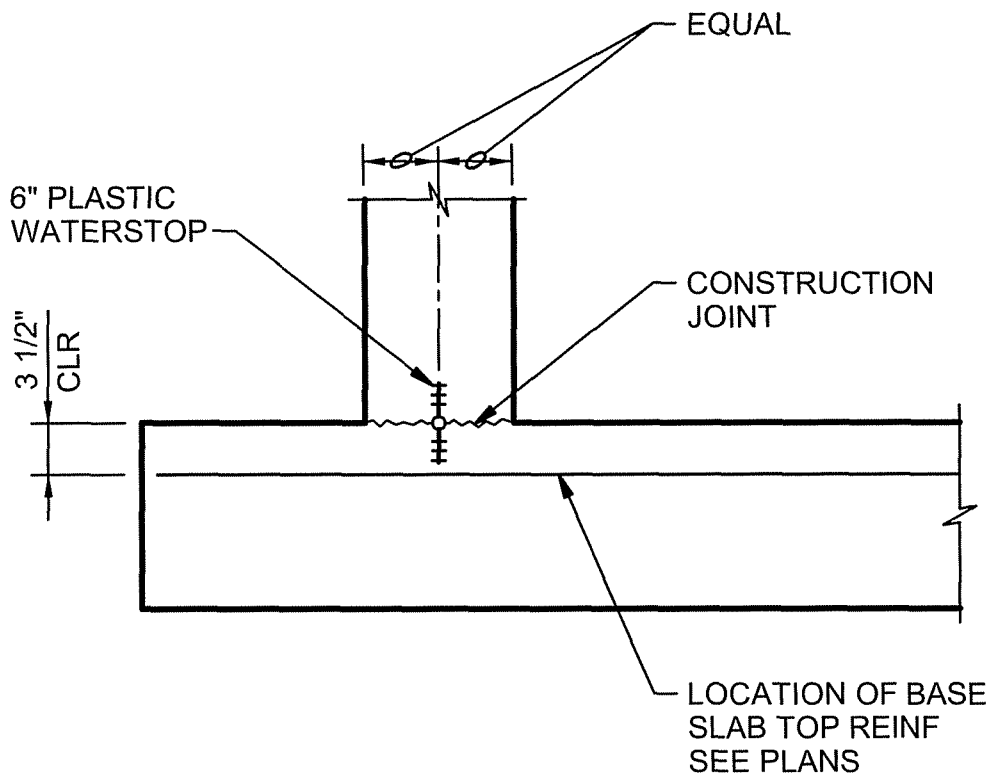
WALL BASE CONSTRUCTION JOINT

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ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0315-153

CH2MHILL



NOTES:

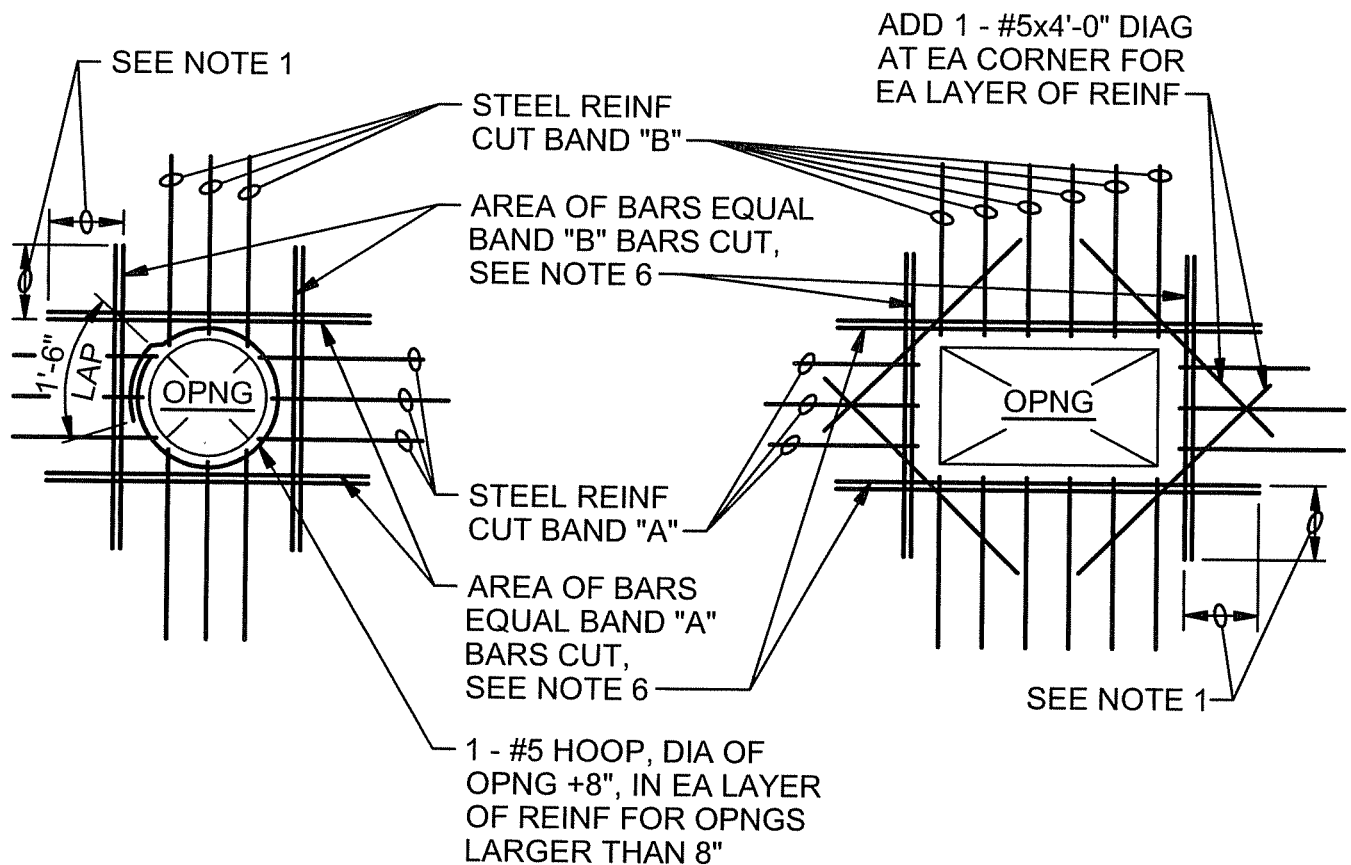
1. FOR WALLS WITH SINGLE MAT OF REINFORCING LOCATE WATERSTOP ON LIQUID FACE, 1" CLEAR OF REINFORCEMENT.
2. SECURE WATERSTOP IN-PLACE AS SPECIFIED.

WALL BASE CONSTRUCTION JOINT

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

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).
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.

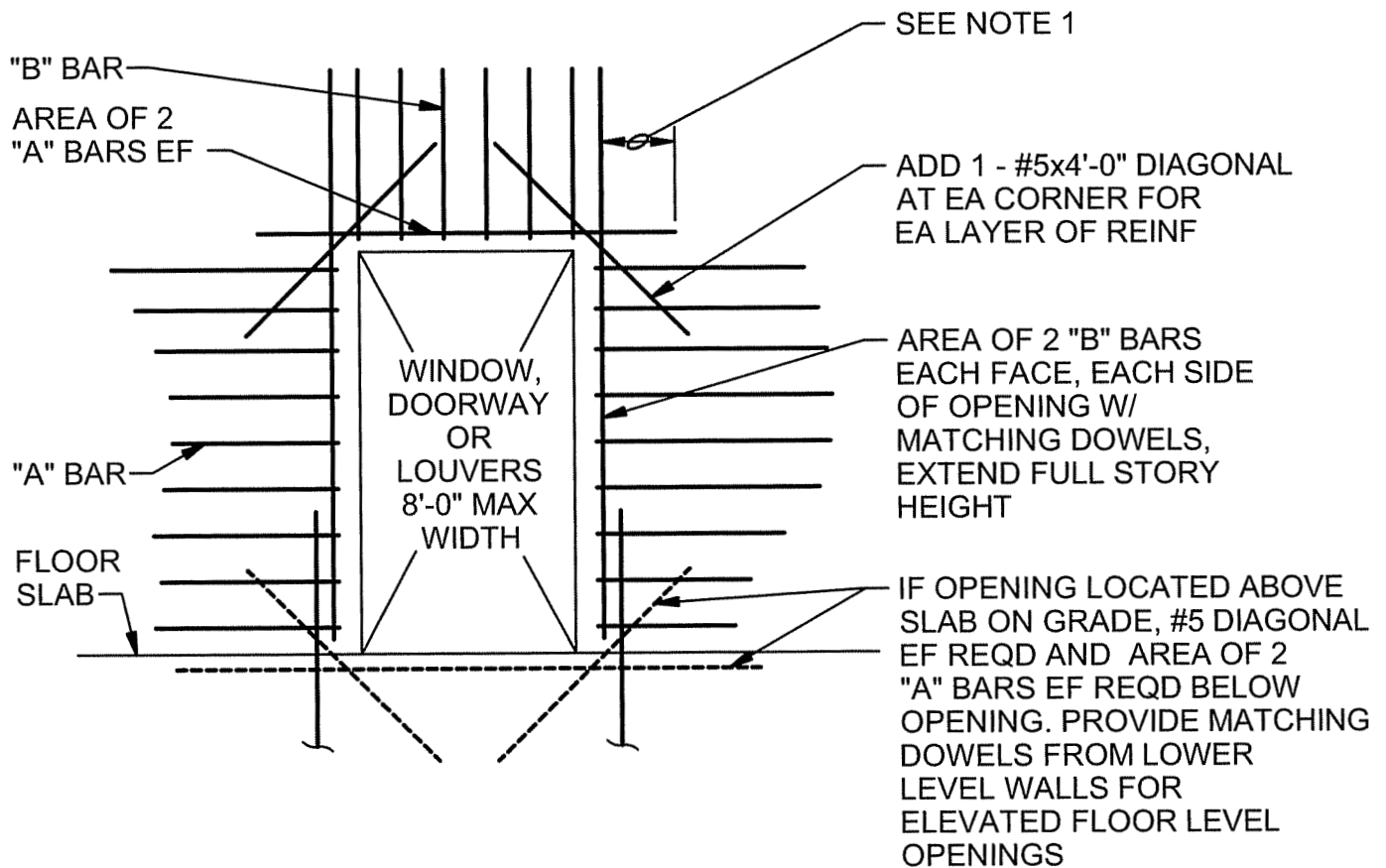
OPENING REINFORCING

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0330-001

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ELEVATION

NOTES:

1. PROVIDE MINIMUM LAP, SEE GENERAL STRUCTURAL NOTES.
2. TYPICAL FOR ALL OPENINGS IN ABOVE GROUND BUILDING CONCRETE WALLS UNLESS INDICATED OTHERWISE ON PLANS.
3. DO NOT WELD REINFORCEMENT TO PIPE SLEEVES AND INSERTS.

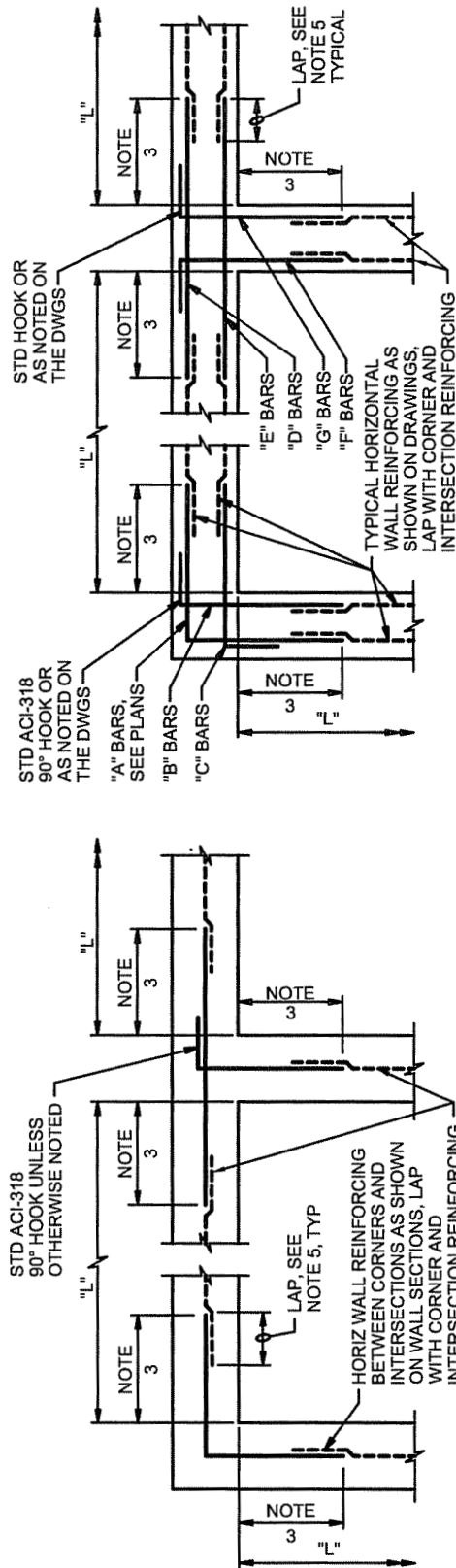
OPENING REINFORCING

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0330-002

CH2MHILL



DOUBLE REINFORCING MAT

SINGLE REINFORCING MAT

NOTES:

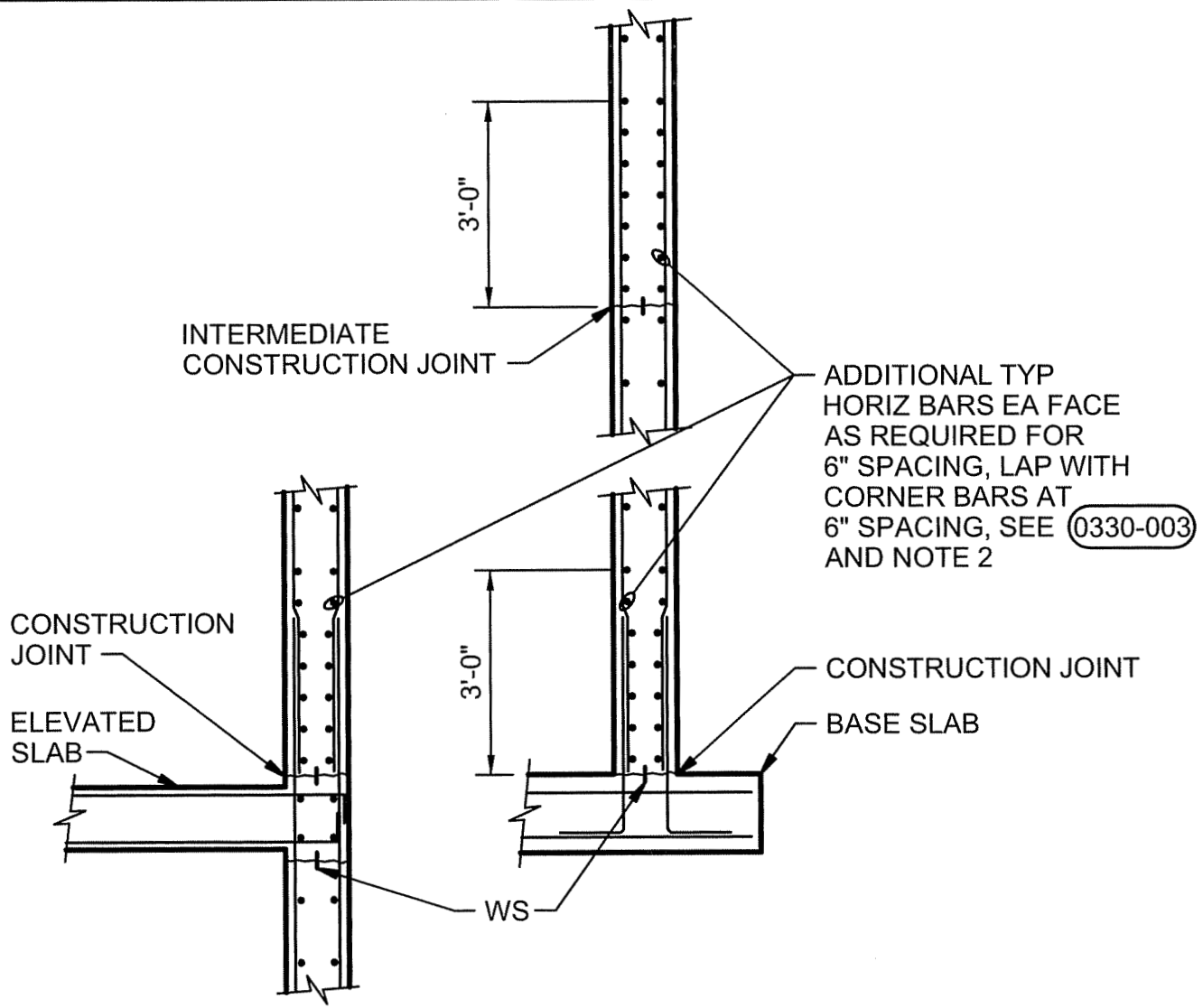
1. TYPICAL HORIZONTAL WALL CORNER AND INTERSECTION REINFORCING LAYOUT IS SHOWN TO AVOID CONGESTION AND PERMIT PROPER PLACEMENT, FOR SIZE AND SPACING SEE PLANS. ALL HORIZONTAL REINFORCING AT CORNERS AND INTERSECTIONS SHALL BE FABRICATED AND INSTALLED WITH SPLICES LOCATED WHERE SHOWN REGARDLESS OF BAR SIZE AND SPACING.
2. WHERE THE CORNER OR INTERSECTION REINFORCING SIZE AND SPACING IS NOT SHOWN, NOTED OR TABULATED ON THE PLANS, THE SIZE AND SPACING SHALL BE THE SAME AS THE WALL HORIZONTAL REINFORCING SHOWN ON THE WALL SECTIONS OR AS NOTED FOR THE REINFORCING BETWEEN THE CORNERS OR INTERSECTIONS.
3. EXCEPT WHERE OTHERWISE SHOWN ON THE DRAWINGS, THE LENGTH INDICATED AS "NOTE 3" SHALL BE THE LESSER OF L/4, 10 FEET, OR 1.0 TIMES THE HEIGHT OF THE WALL, EXCEPT THAT IN NO CASE SHALL IT BE LESS THAN 2 FEET.
4. L = LENGTH OF WALL PARALLEL TO THE BAR LENGTH IN QUESTION.
5. EXCEPT WHERE OTHERWISE SHOWN ON THE DRAWINGS, THE LENGTH INDICATED AS "NOTE 5" SHALL BE EQUAL TO ONE "LAP LENGTH" AS REQUIRED BY THE GENERAL STRUCTURAL NOTES. USE THE LAP LENGTH AS REQUIRED FOR THE SMALLER OF THE TWO REINFORCING BARS BEING SPLICED.
6. UNLESS OTHERWISE NOTED, "B" AND "C" BARS ARE THE SAME SIZE AND SPACING AND, "F" AND "G" BARS ARE THE SAME SIZE AND SPACING.

TYPICAL WALL CORNER AND INTERSECTION REINFORCING

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 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0330-003



WALL SECTION

NOTES:

1. PROVIDE ADDITIONAL HORIZONTAL BARS AS SHOWN IN THE FIRST THREE FEET ABOVE ALL HORIZONTAL WALL CONSTRUCTION JOINTS IN HYDRAULIC AND BELOW-GRADE STRUCTURES.
2. PROVIDE ADDITIONAL HORIZONTAL CORNER BARS EACH FACE AS REQUIRED FOR 6" SPACING TO LAP WITH THE ADDITIONAL TYPICAL HORIZONTAL BARS SHOWN.

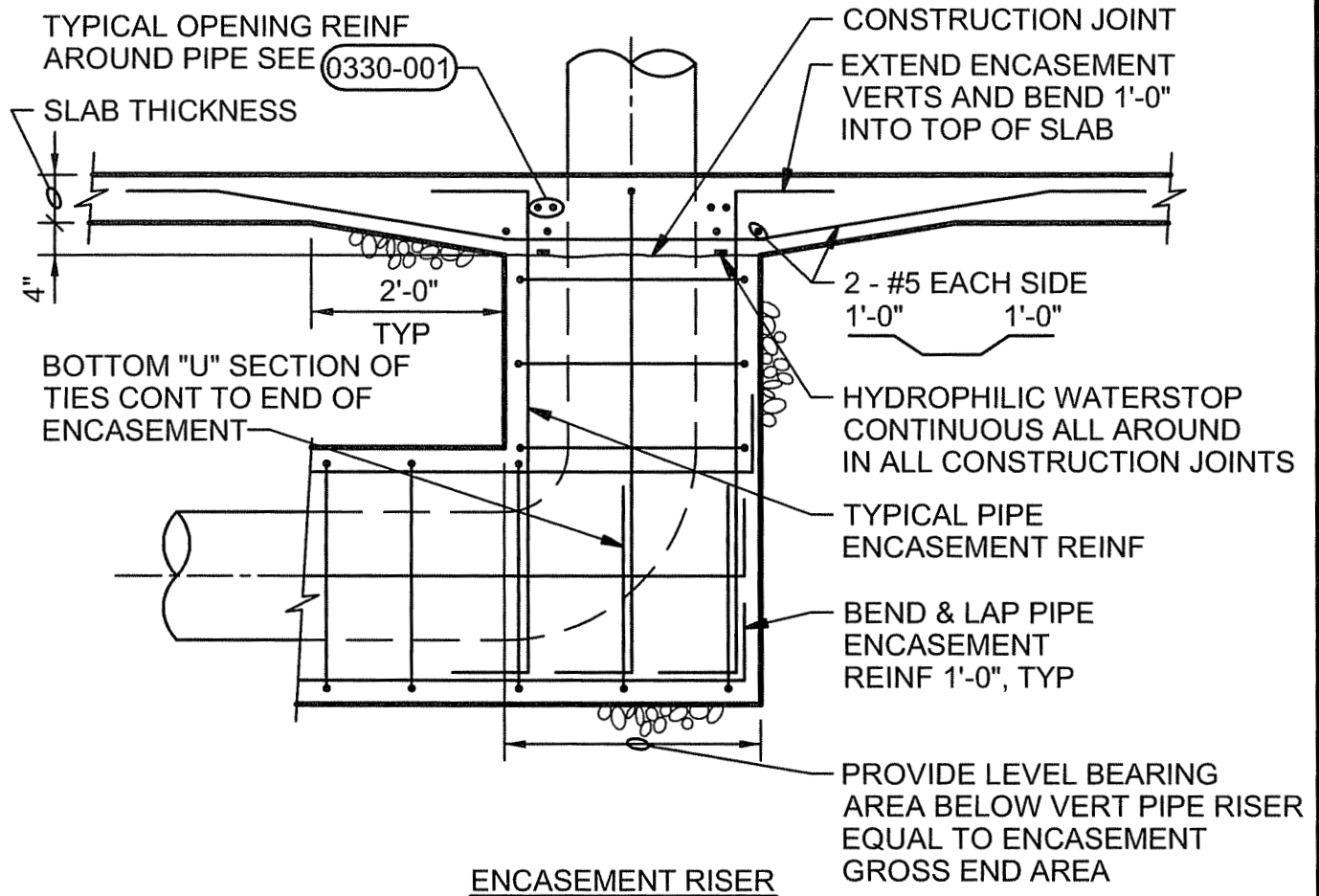
ADDITIONAL REINFORCING AT HORIZ CONSTRUCTION JOINT

NTS

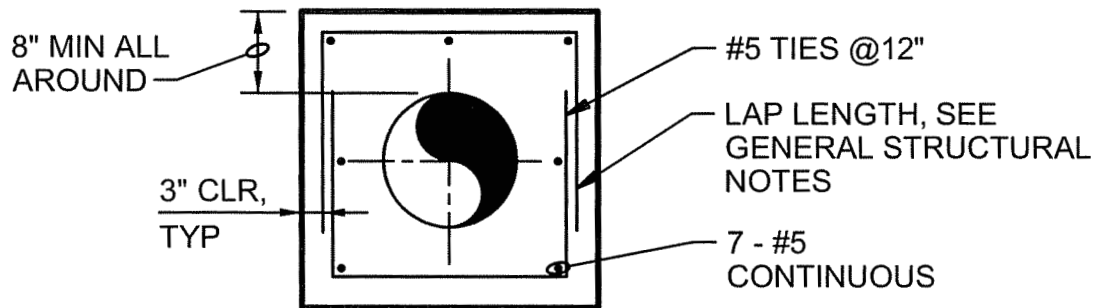
ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0330-004

CH2MHILL



ENCASEMENT RISER



SECTION

NOTES:

1. SECTION APPLIES TO PIPES W/ DIAMETERS 18" AND SMALLER. FOR 20" DIAMETER PIPES AND LARGER, SEE 0330-017
2. WHEN PIPE ENCASEMENT IS CLOSER THAN 4" TO SLAB ABOVE, TIE SLAB & ENCASEMENT TOGETHER. SEE 0330-018

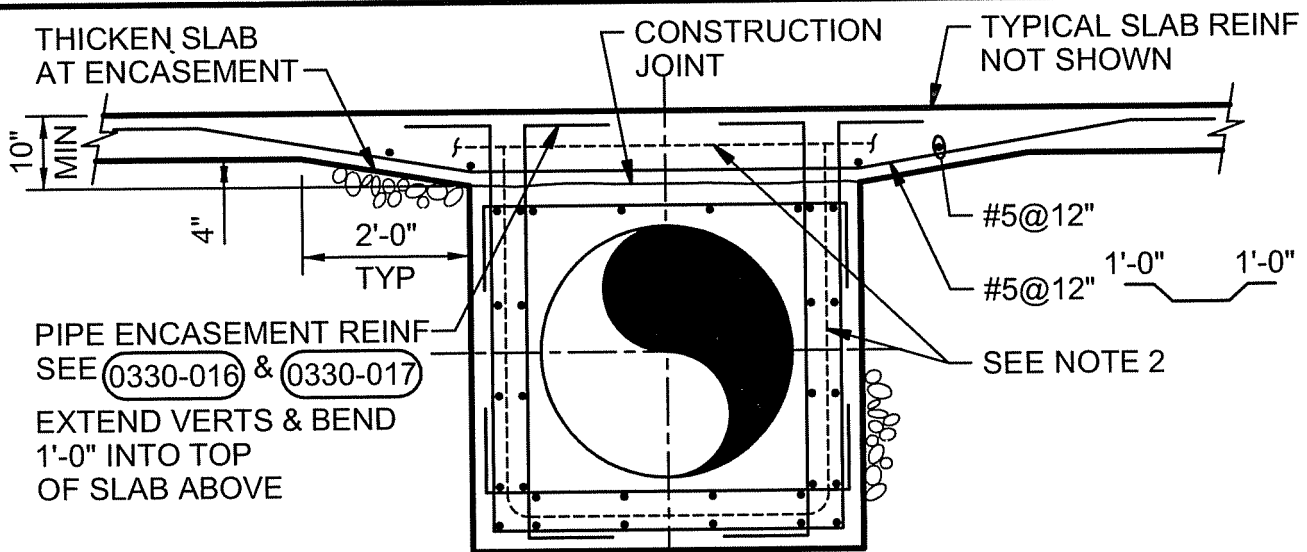
PIPE ENCASEMENT

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 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0330-016

CH2MHILL



PIPE ENCASEMENT REINF
SEE (0330-016) & (0330-017)
EXTEND VERTS & BEND
1'-0" INTO TOP
OF SLAB ABOVE

SEE NOTE 2

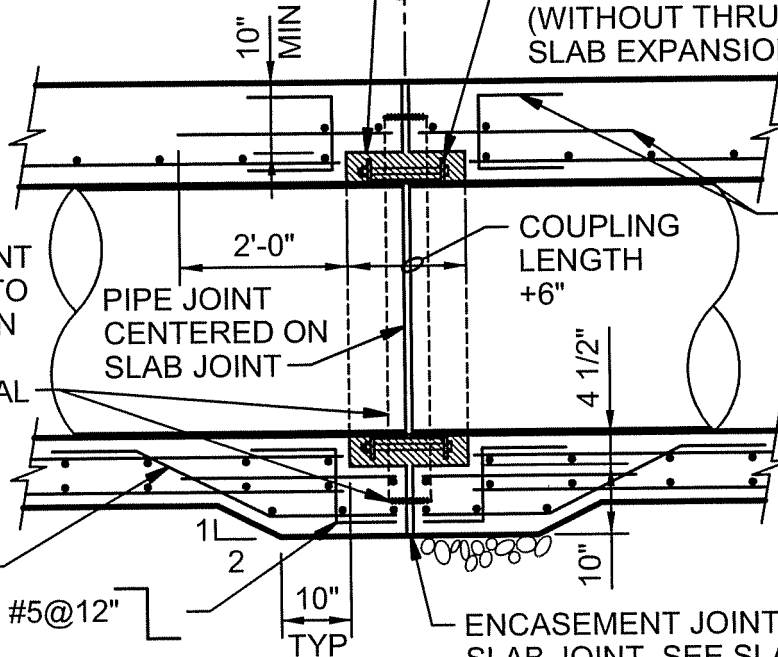
CLOSED CELLULAR SPONGE
RUBBER ALL AROUND COUPLING
TO ALLOW JOINT MOVEMENT (1" MIN)

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"

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.

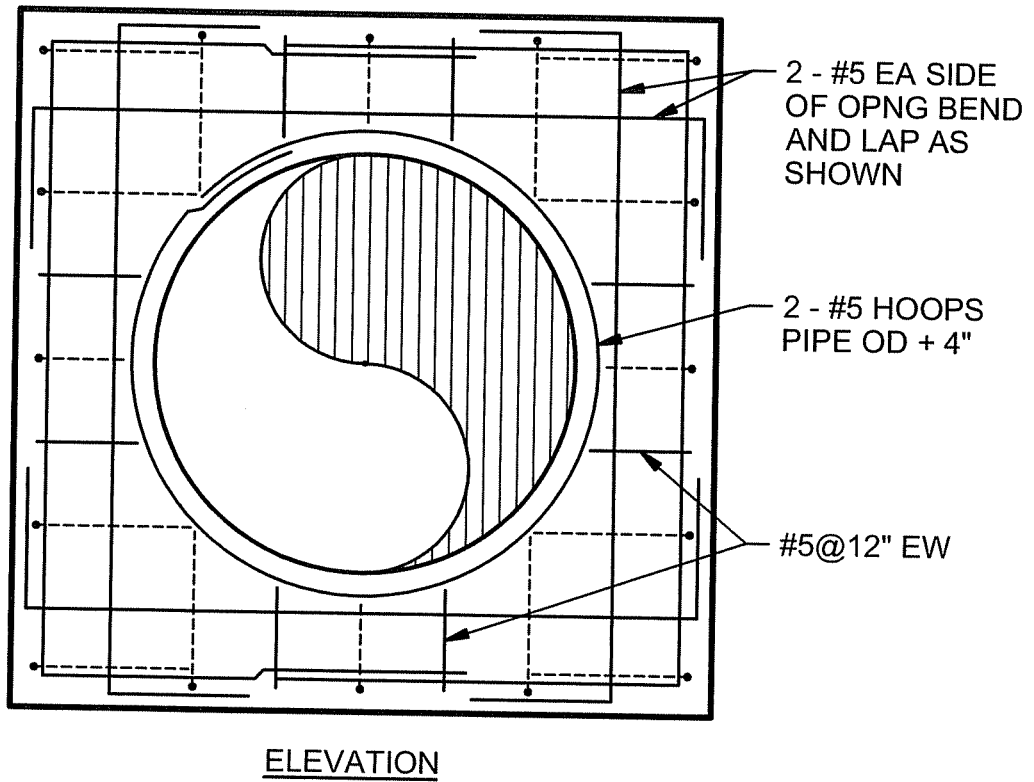
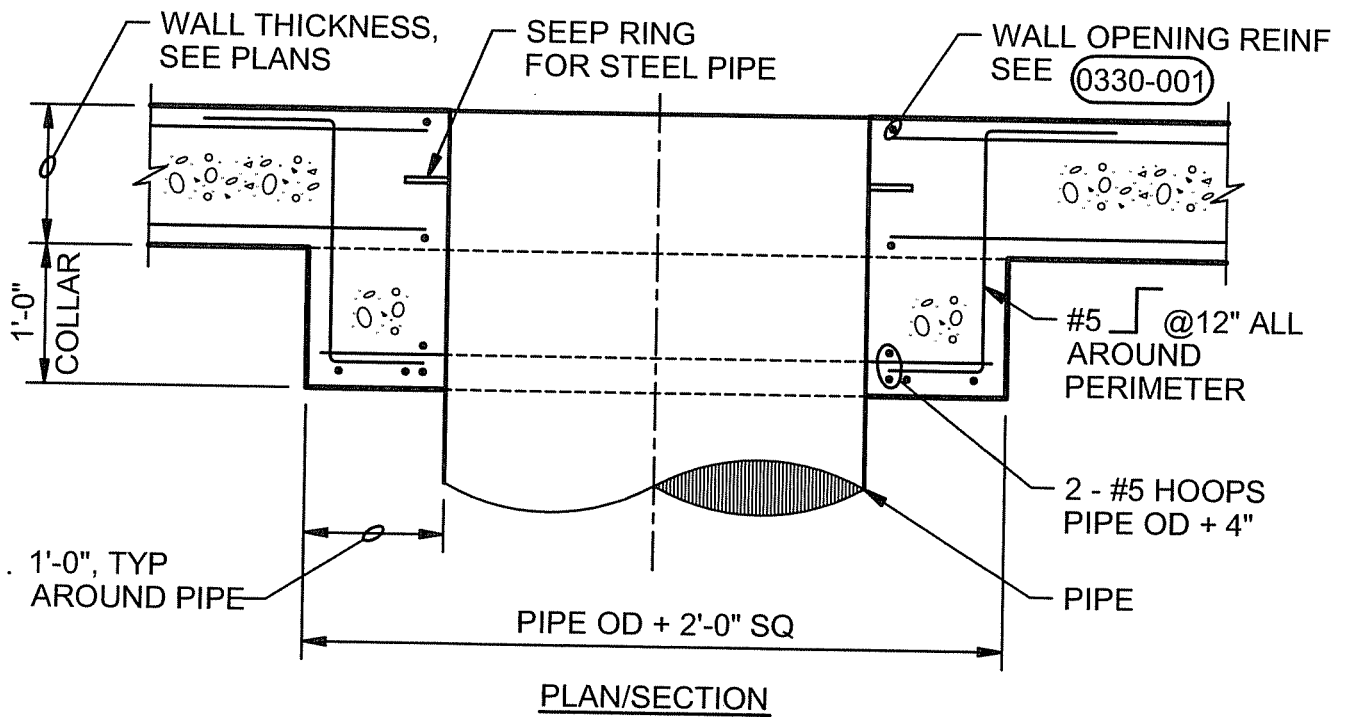
PIPE ENCASEMENT AT SLAB

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MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0330-018

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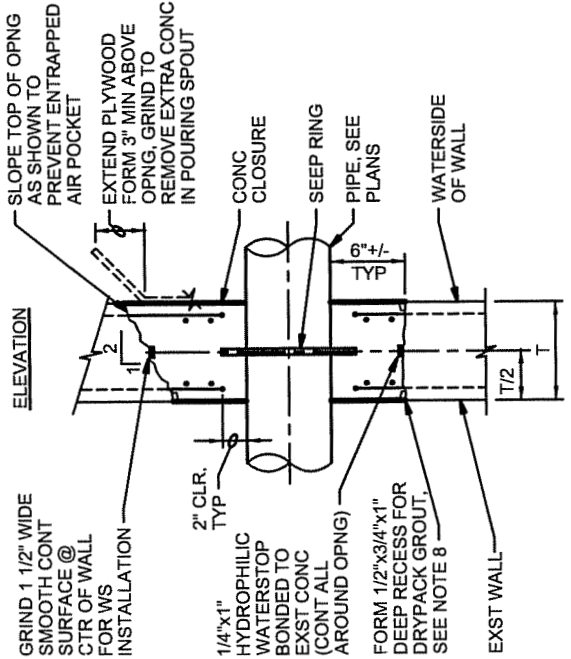
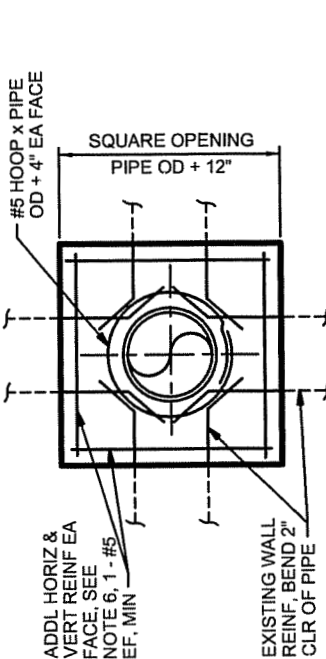


PIPE COLLAR

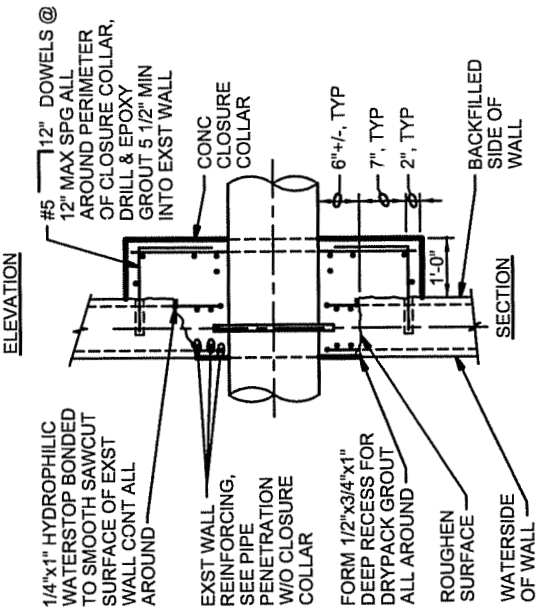
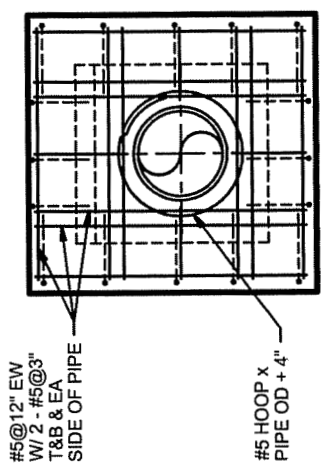
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 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0330-021



WITHOUT CLOSURE COLLAR



WITH CLOSURE COLLAR

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 VERTICAL REINFORCING TO HAVE COMBINED AREA EQUAL TO AREA OF VERTICAL 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 FOUR 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.

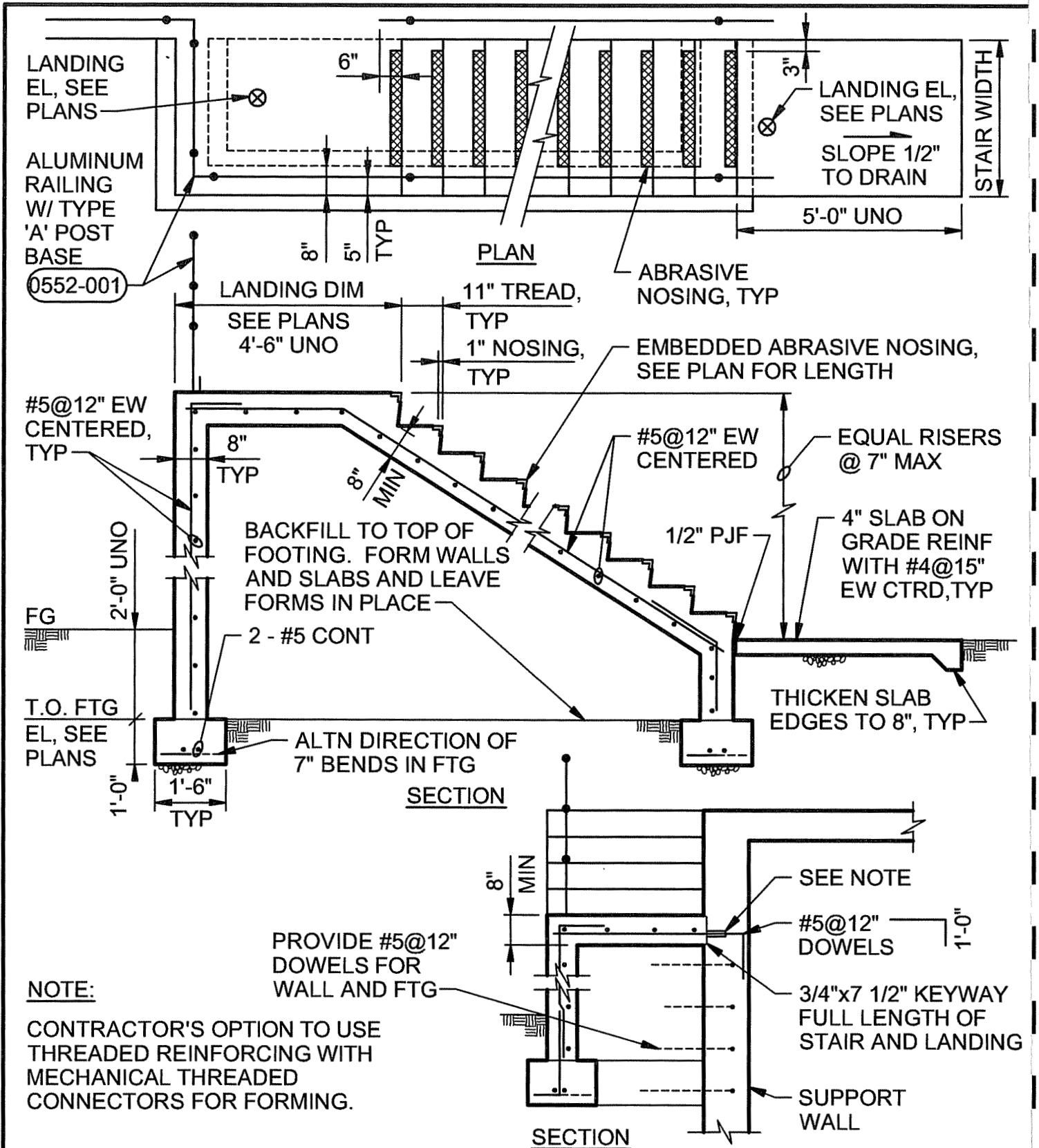
PIPE PENETRATION - EXISTING WALL

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 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0330-022





NOTE:

CONTRACTOR'S OPTION TO USE THREADED REINFORCING WITH MECHANICAL THREADED CONNECTORS FOR FORMING.

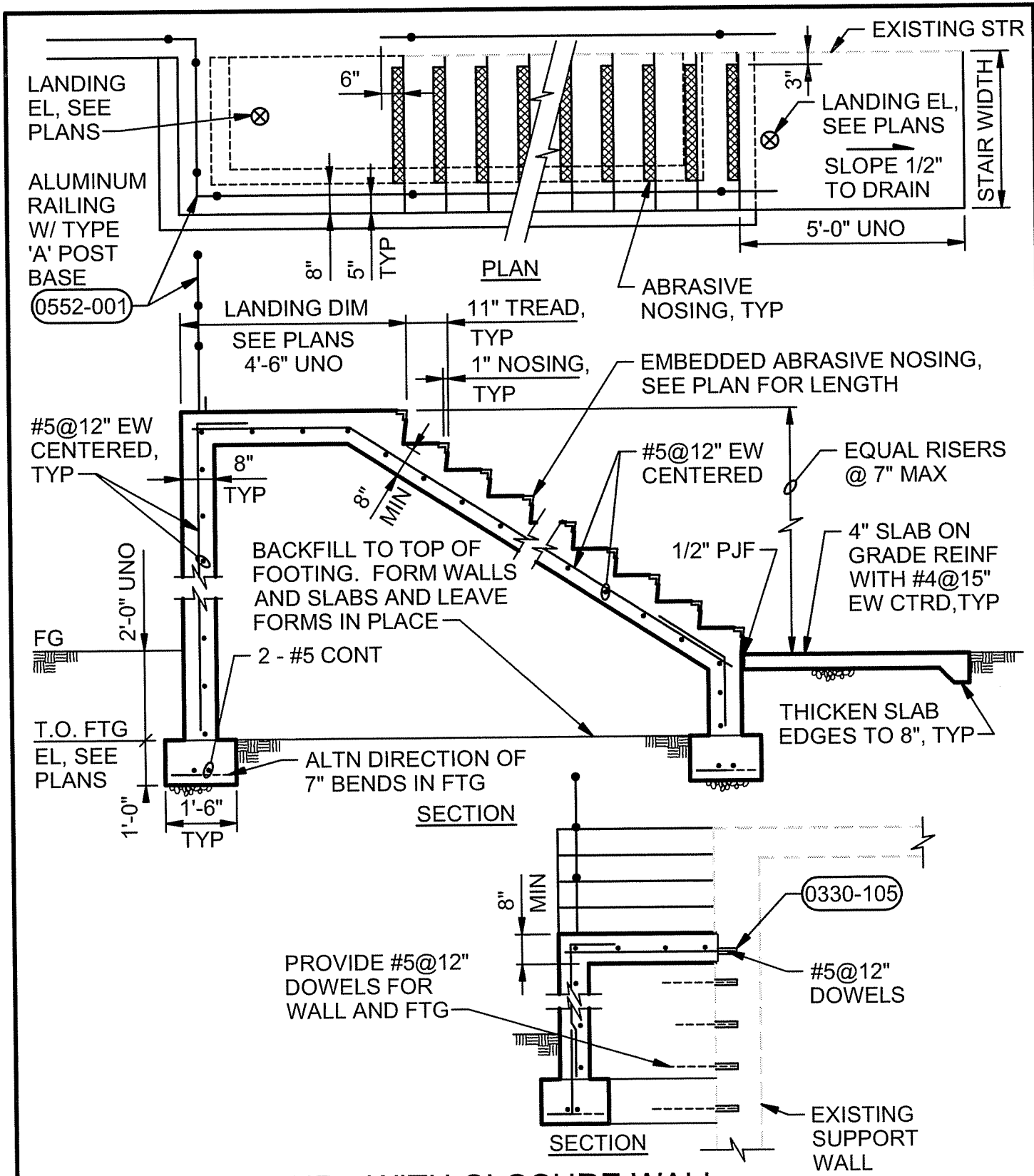
CONCRETE STAIR - WITH CLOSURE WALL

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ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0330-048

CH2MHILL



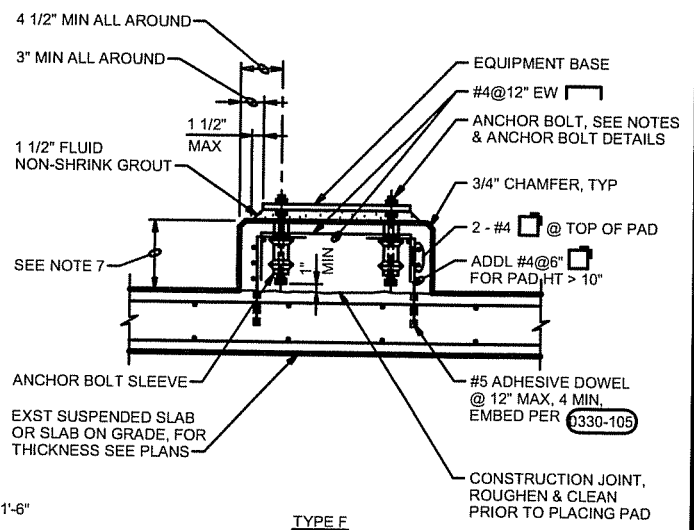
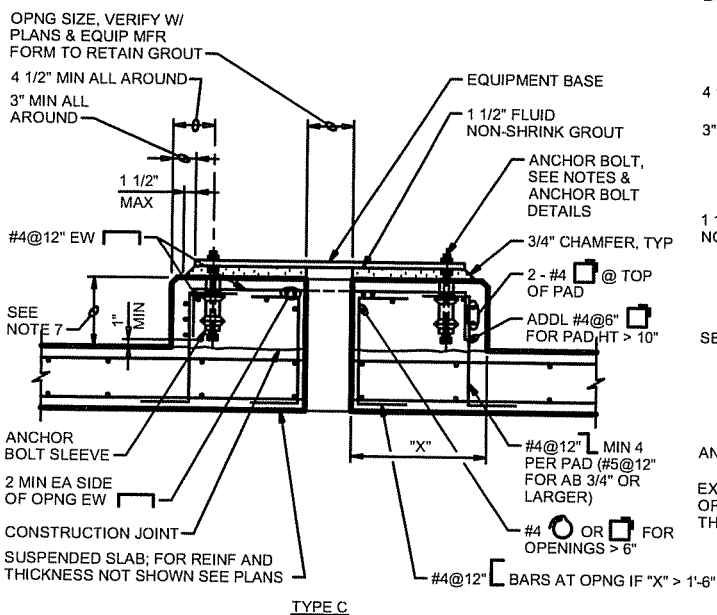
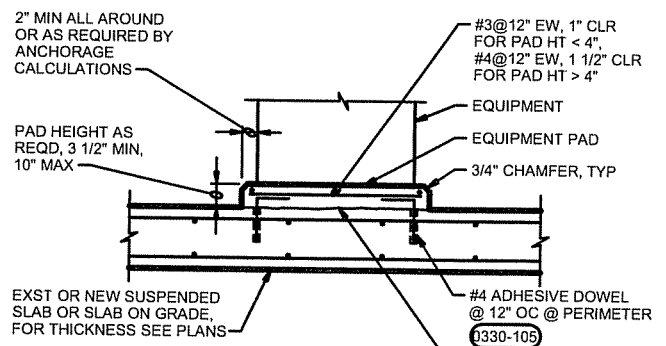
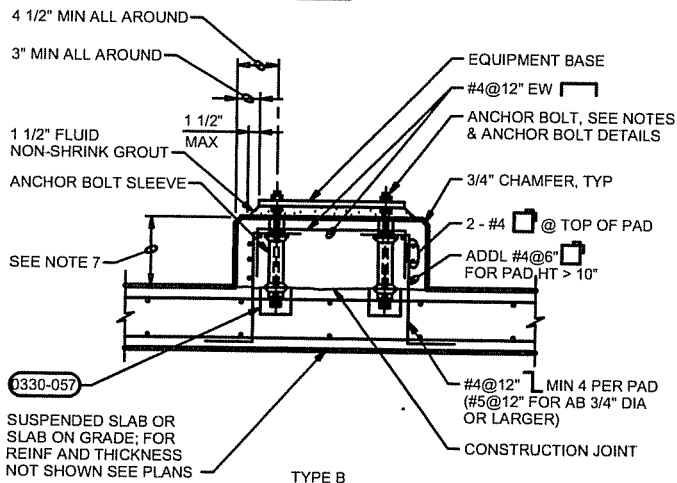
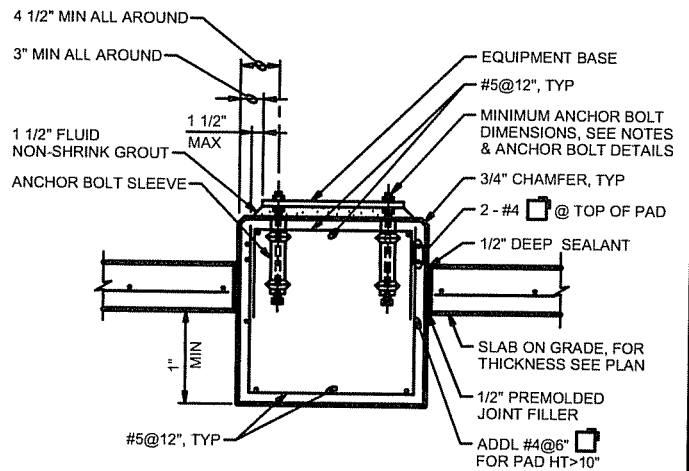
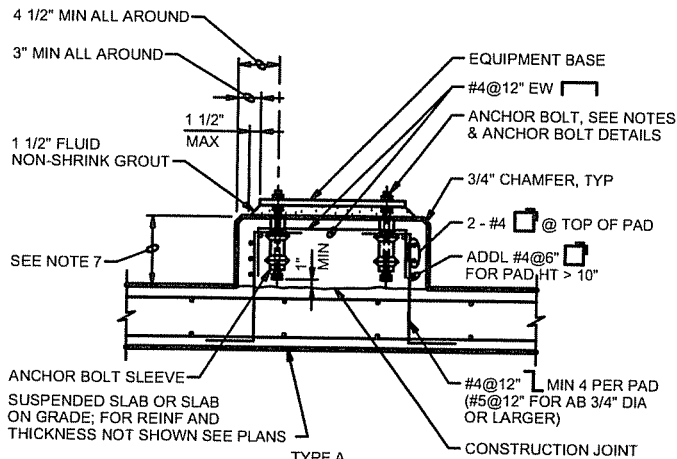
CONCRETE STAIR - WITH CLOSURE WALL

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ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0330-049

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- 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.

GENERAL NOTE:
 FOR GENERAL NOTES SEE DETAIL 2 OF 2.

CONCRETE EQUIPMENT PADS

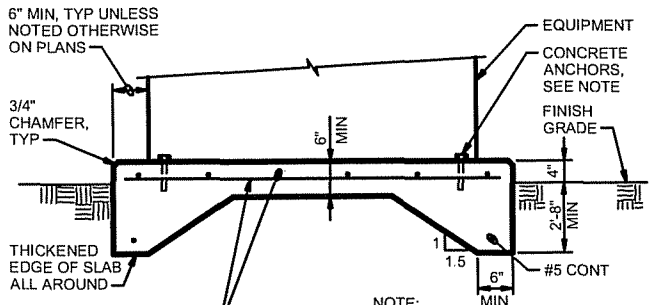
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 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

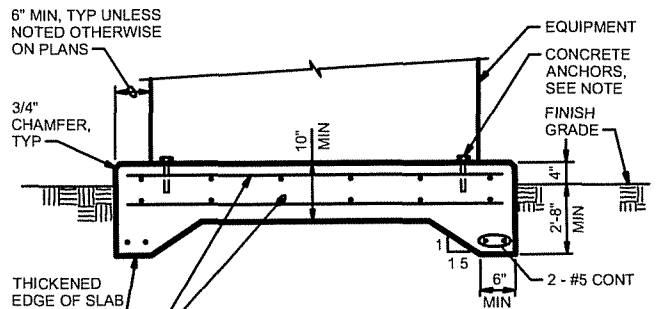
DETAIL 1 OF 2

0330-056

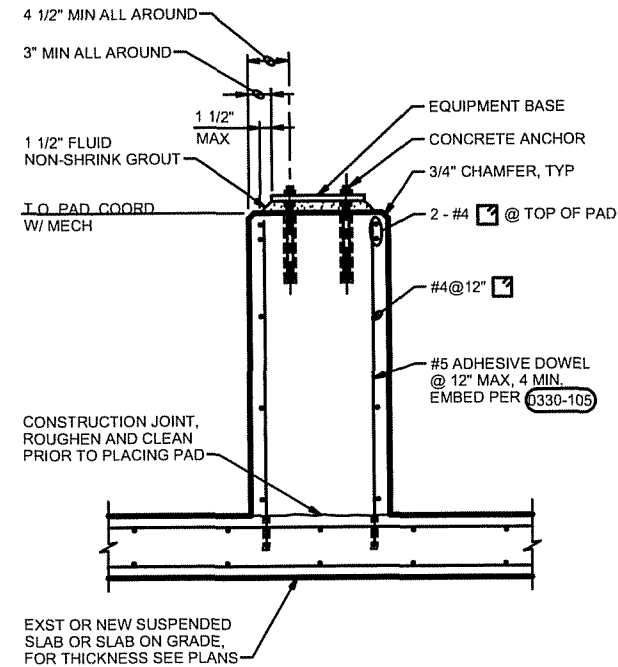
CH2MHILL



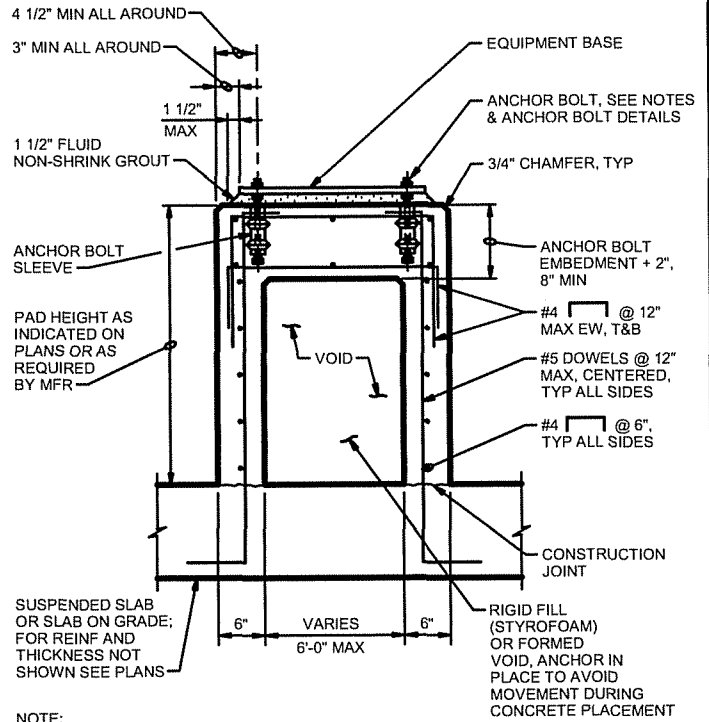
TYPE G



TYPE H



TYPE J



TYPE K

NOTES:

- PAD SIZE SHALL BE MINIMUM INDICATED OR AS SHOWN ON THE PLANS OR AS INDICATED BY THE MANUFACTURER AND APPROVED BY THE ENGINEER
- 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
- ANCHOR BOLT SLEEVES SHALL BE USED TO PROVIDE MINIMUM ANCHOR BOLT MOVEMENT OF 1/2" IN ALL HORIZONTAL DIRECTIONS. THE MINIMUM SLEEVE LENGTH SHALL BE 8 TIMES THE BOLT DIAMETER
- ANCHOR BOLT SLEEVES SHALL HAVE A MINIMUM INTERNAL DIAMETER 1" GREATER THAN BOLT DIAMETER AND A MAXIMUM INTERNAL DIAMETER 3" GREATER THAN ANCHOR BOLT DIAMETER. SLEEVES SHALL BE FILLED WITH NON-SHRINK GROUT AFTER BOLTS ARE ALIGNED. SEE 0330-057
- EQUIPMENT BASES SHALL BE INSTALLED LEVEL UNLESS INDICATED OTHERWISE.
- 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
- 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
- TYPE "D" PAD SHALL BE USED ONLY WHERE SPECIFICALLY INDICATED. PLACE THE SURROUNDING FLOOR SLAB AFTER THE EQUIPMENT PAD
- 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 PADS

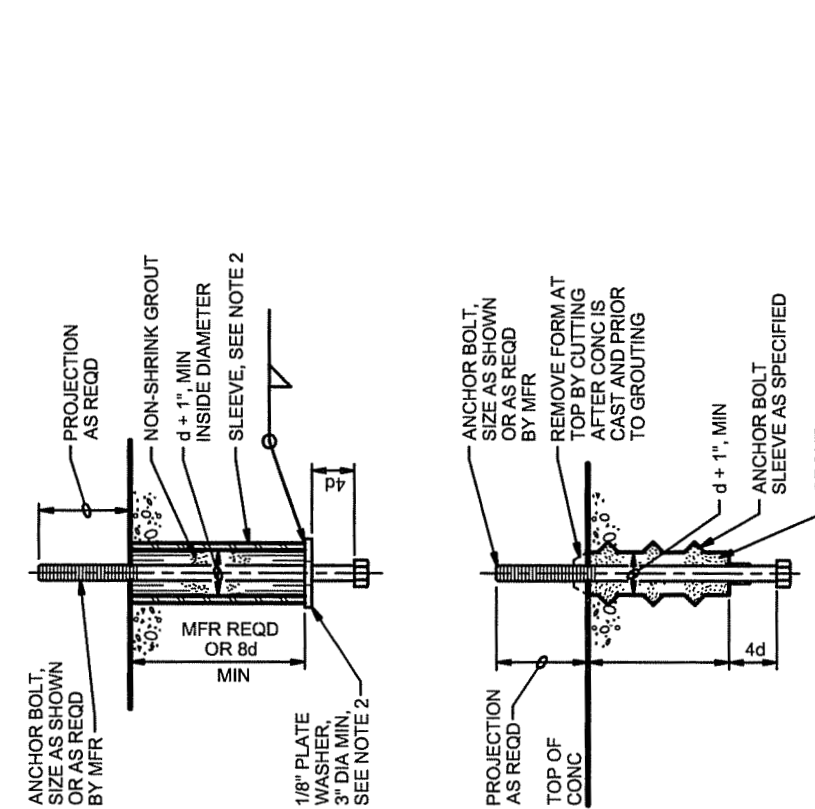
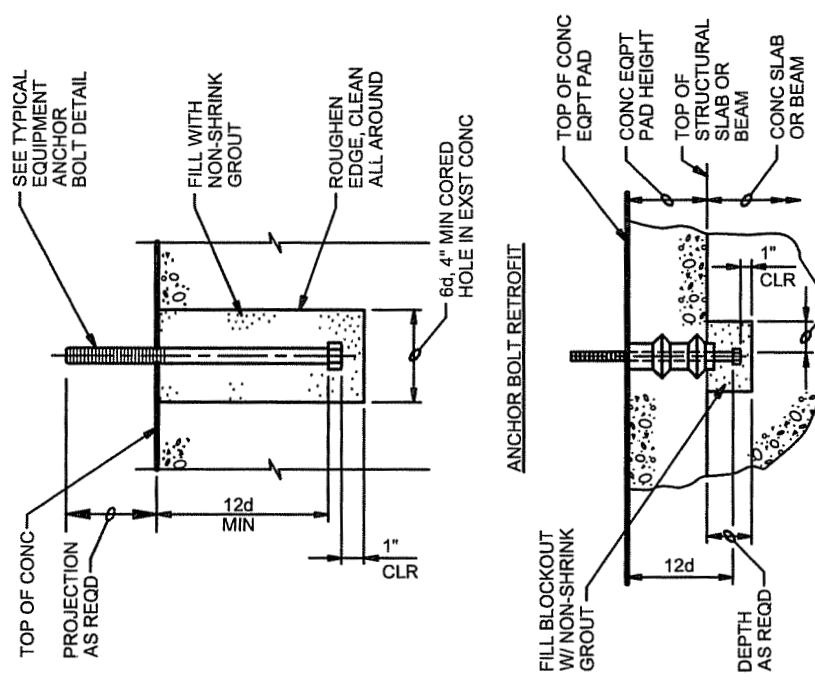
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ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

DETAIL 2 OF 2

0330-056

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NOTES:
 1. FOR CONCRETE EQUIPMENT PAD DETAILS AND NOTES NOT SHOWN SEE 0330-056
 2. MATERIAL TO MATCH BOLT.

MACHINERY ANCHOR BOLT DETAIL

ANCHOR BOLT RETROFIT

ELEVATION ANCHOR BOLT BLOCKOUT

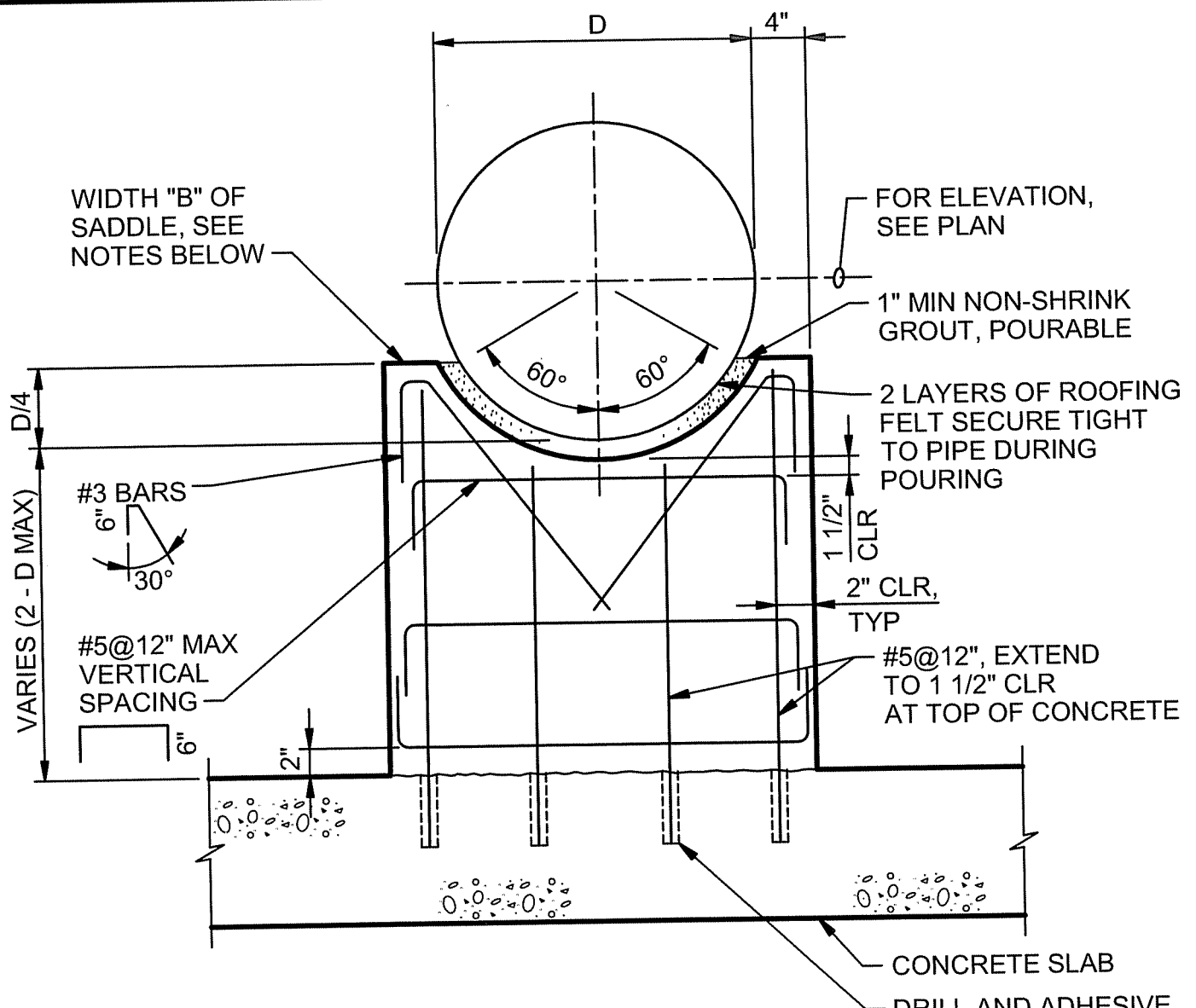
ANCHOR BOLT DETAILS

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ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0330-057





NOTES:

1. THICKNESS "B" OF SADDLE
 B = 6" WHEN: D < 12"
 B = 8" WHEN: 12" ≤ D < 24"
 B = 10" WHEN: 24" ≤ D < 36"
 B = 12" WHEN: 36" ≤ D < 48"
2. FOR "B"=10" OR THICKER, USE 2 LAYERS OF REINFORCING, TURN HORIZONTAL BARS 90° TO HOOK AROUND VERTICALS , 1 1/2" CLEAR OF CONCRETE
3. FORM 3/4" BEVEL ON ALL EXPOSED CORNERS OF SUPPORT.

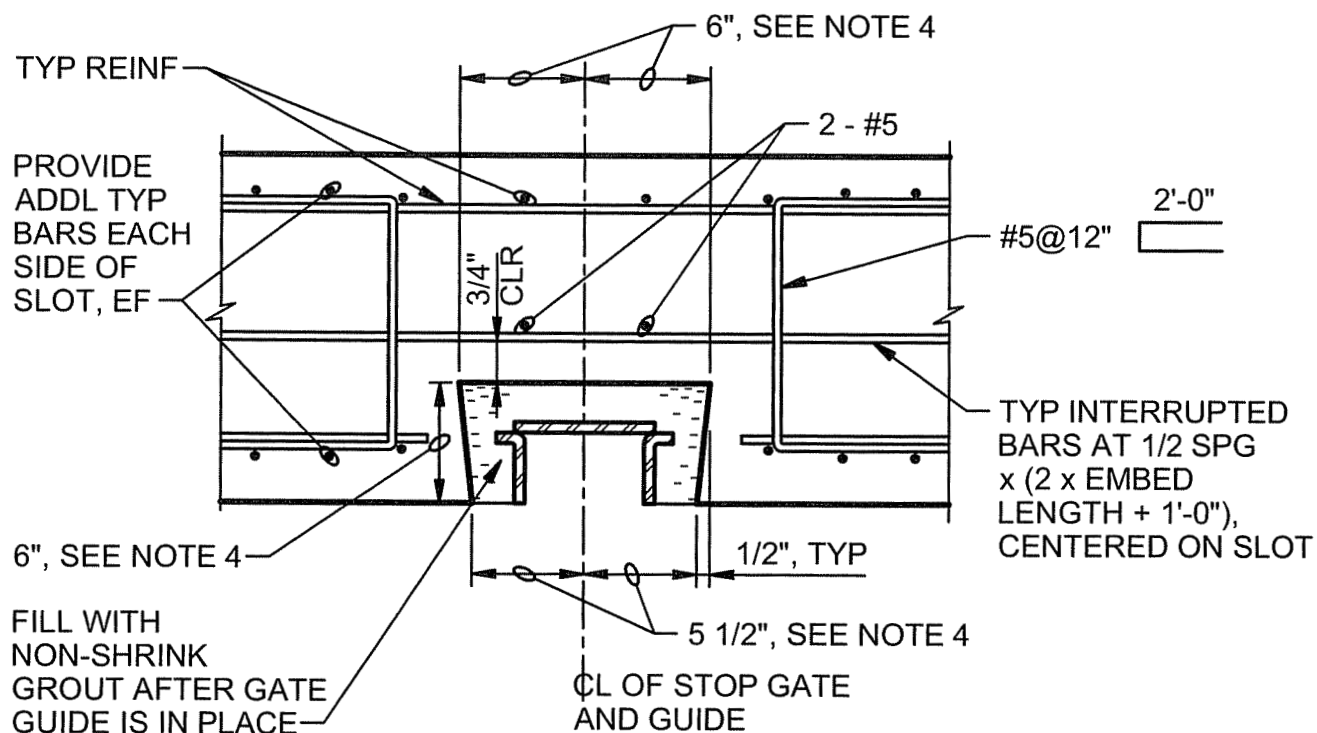
CONCRETE PIPE SADDLE

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ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0330-061

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PLAN
(BASE SLAB SECTION SIMILAR)

FLUSH BLOCKOUT

NOTES:

1. FLUSH BLOCKOUT TYPICAL UNLESS OTHERWISE NOTED OR SHOWN ON PLANS.
2. REINFORCEMENT DETAILS ARE FOR BLOCKOUT AT STRAIGHT RUN WALL. MODIFY TO FIT CONDITIONS OF WALL SHOWN ON PLANS.
3. WALL BLOCKOUT SHOWN. BLOCKOUT CONTINUES THROUGH CHANNEL BASE SLAB. REINFORCE BASE SLAB SIMILARLY.
4. VERIFY WITH MANUFACTURER.

BLOCKOUT FOR STOP LOG OR GATE GUIDE

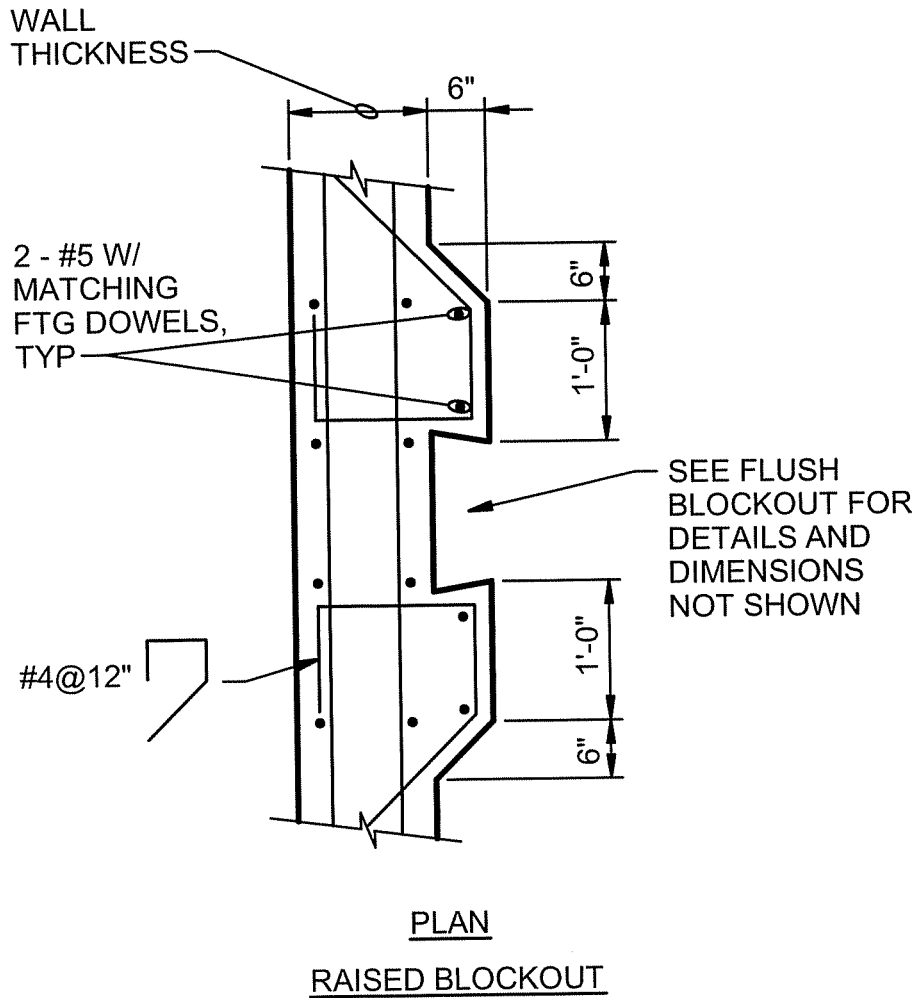
NTS

DETAIL 1 OF 2

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0330-076

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NOTE:

STOP PIERS AT UNDERSIDE OF GRATING

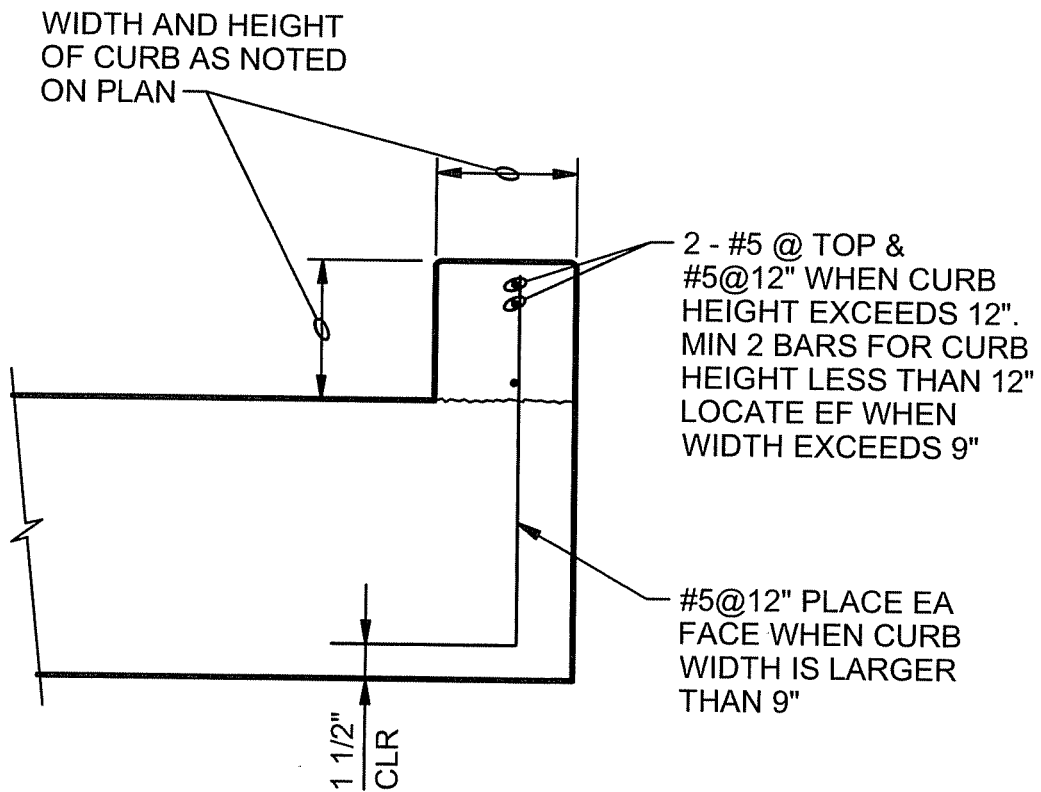
STOP LOG/GATE GUIDE

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ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

DETAIL 2 OF 2

0330-076



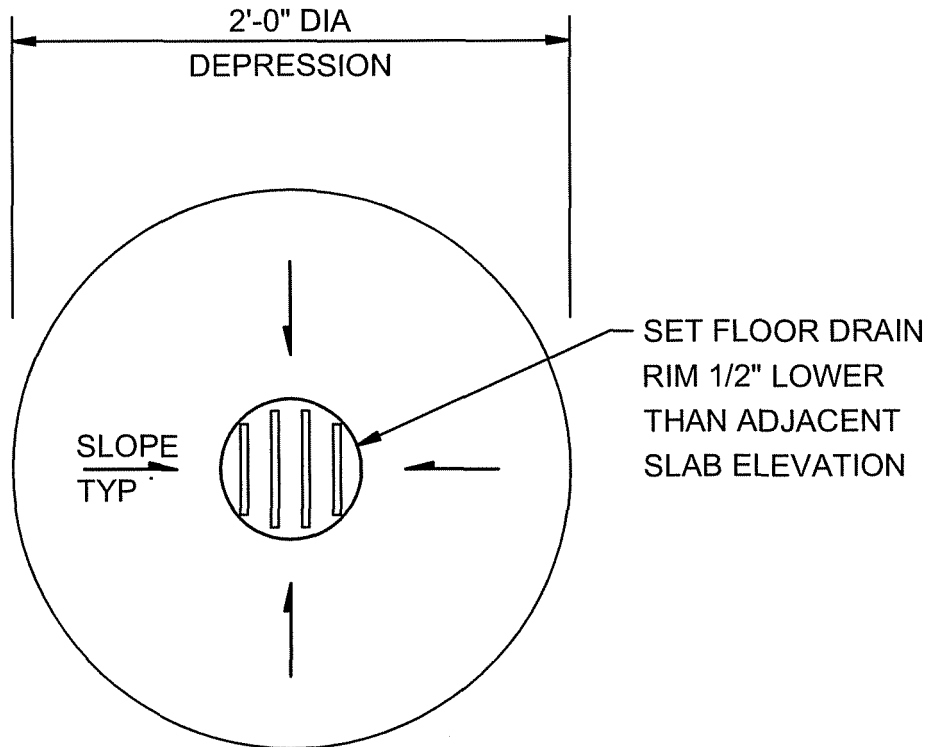
CONCRETE CURB

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ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0330-080

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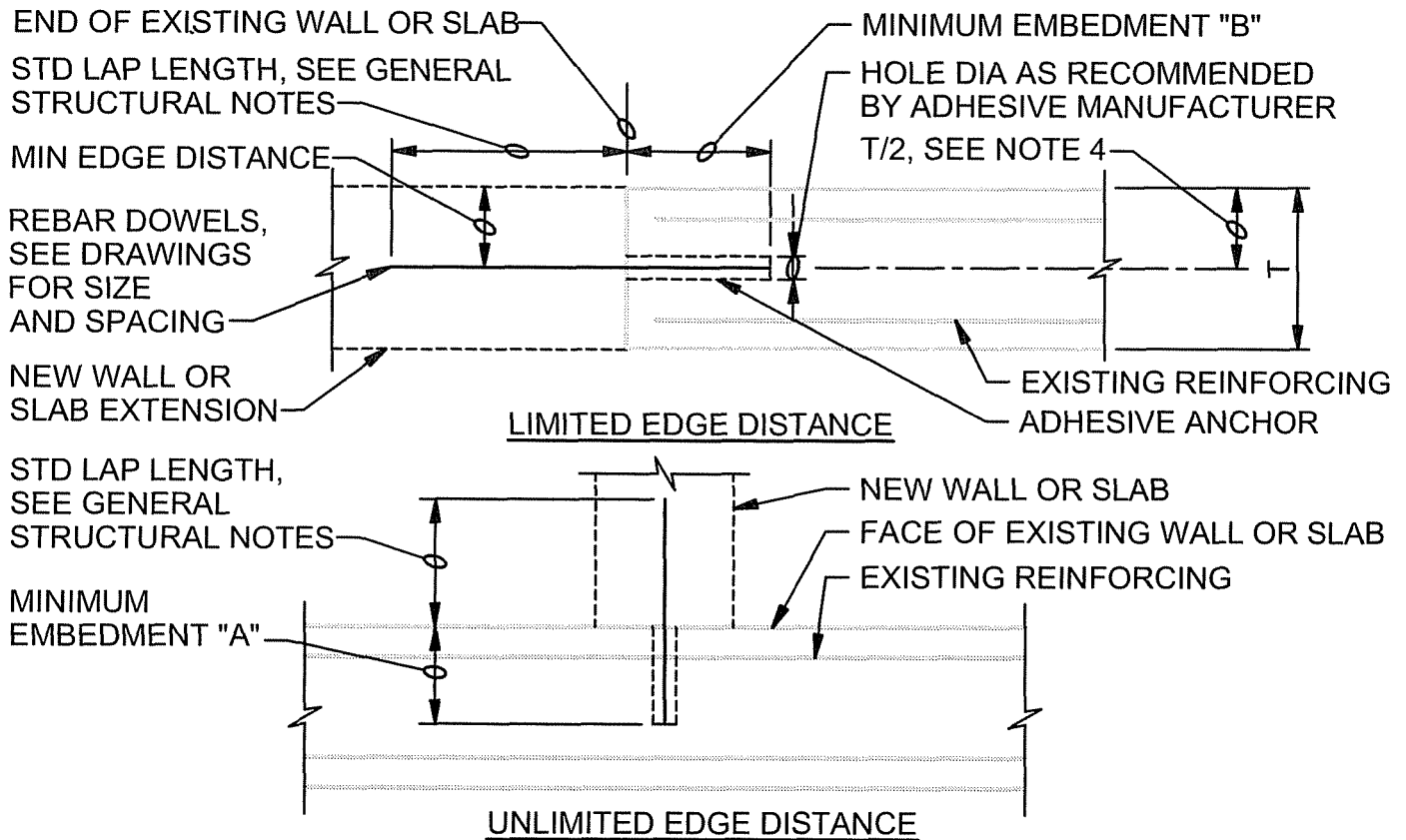


FLOOR DRAIN

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0330-082



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.

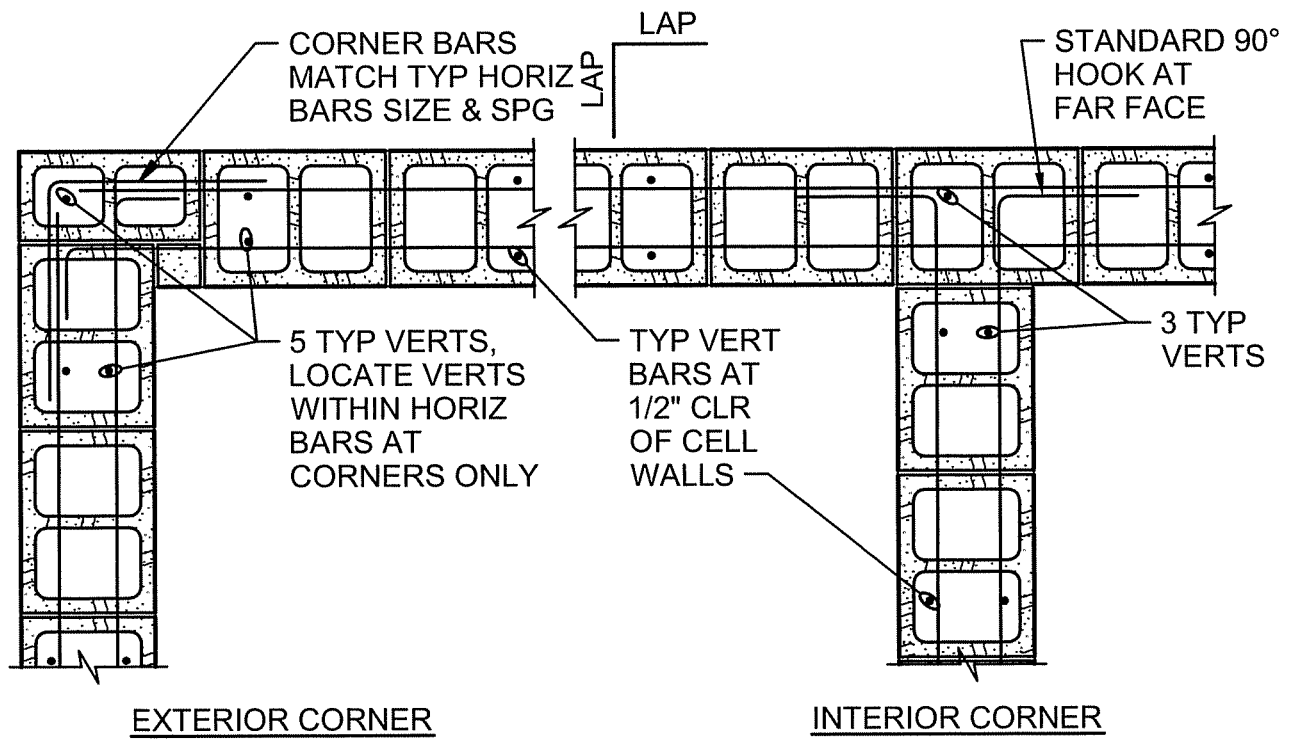
ADHESIVE DOWEL

NTS

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 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0330-105

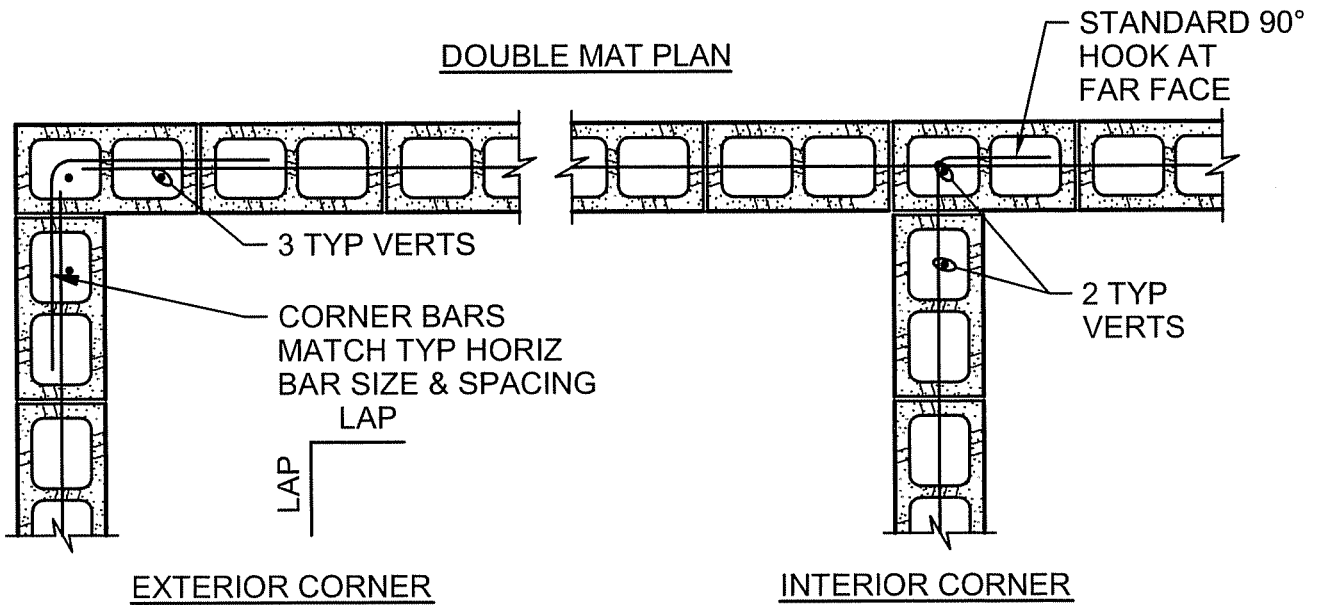
CH2MHILL



EXTERIOR CORNER

INTERIOR CORNER

DOUBLE MAT PLAN



EXTERIOR CORNER

INTERIOR CORNER

SINGLE MAT PLAN

NOTES:

1. LAP=48 BAR DIAMETERS OR 2'-0" MINIMUM UNLESS OTHERWISE NOTED.
2. PROVIDE A STANDARD 90° HOOK EACH END ON ANY HORIZONTAL BAR BETWEEN OPENINGS, CONTROL JOINTS, OR CORNERS LESS THAN 6'-0" IN LENGTH.

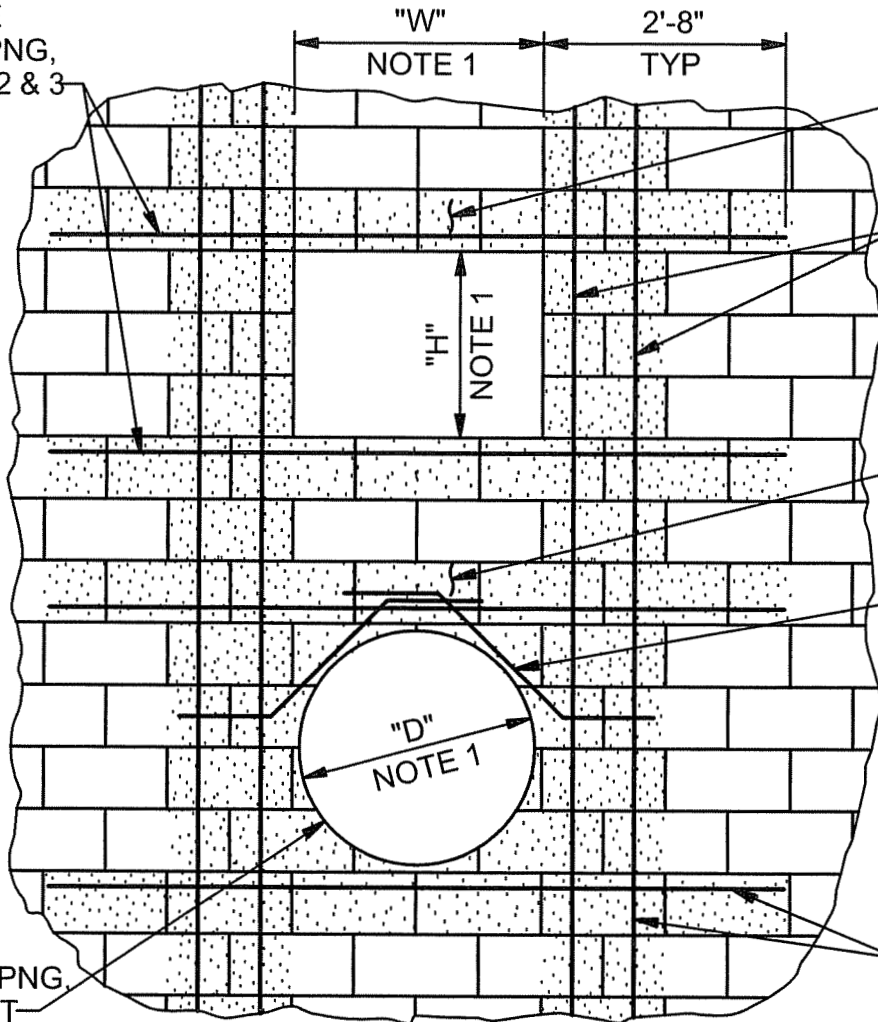
CMU WALL CORNERS (SINGLE & DOUBLE MAT)

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0422-001

2 - #5 ABOVE
& BELOW OPNG,
SEE NOTES 2 & 3



8" LINTEL
BLOCK

2 TYP WALL
VERTICAL BARS
(FULL HT) EA
SIDE OF OPNG,
SEE NOTE 4

8" BOND BEAM

#4 TOP ARCH
BARS, NOTE 5
1'-0"

REINF SIM AS
SHOWN FOR
RECTANGULAR
OPNG ABOVE

SAW CUT
BLOCK FOR
CIRCULAR OPNG,
SOLID GROUT

NOTES:

1. TYPICAL FOR ALL OPENINGS WITH (W, H, OR D) 2'-0" OR GREATER AND 4'-0" OR LESS, UNLESS NOTED OTHERWISE. SEE PLANS FOR LARGER OPENINGS.
2. AT ADJACENT OPENINGS WITH LESS THAN 8'-0" WALL BETWEEN, CONTINUE HORIZONTAL REINFORCING TO 2'-8" BEYOND FURTHEST OPENING.
3. AT OPENINGS LOCATED WITHIN 2'-8" OF CORNER, CONTINUE HORIZONTAL REINFORCING AROUND CORNER PER DETAIL **0422-001**
4. LOCATE VERTICAL BARS CENTERED IN 2 ADJACENT CELLS IN 8" WALLS, AND EACH FACE IN SINGLE GROUT CELL IN 12" WALLS. LAP 48 BAR DIAMETERS WITH MATCHING FOUNDATION DOWELS.
5. LOCATE #4 ARCH BARS CENTERED IN 8" WALLS, AND EACH FACE IN 12" WALLS.

CMU OPENING REINFORCING

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ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0422-002

CH2MHILL

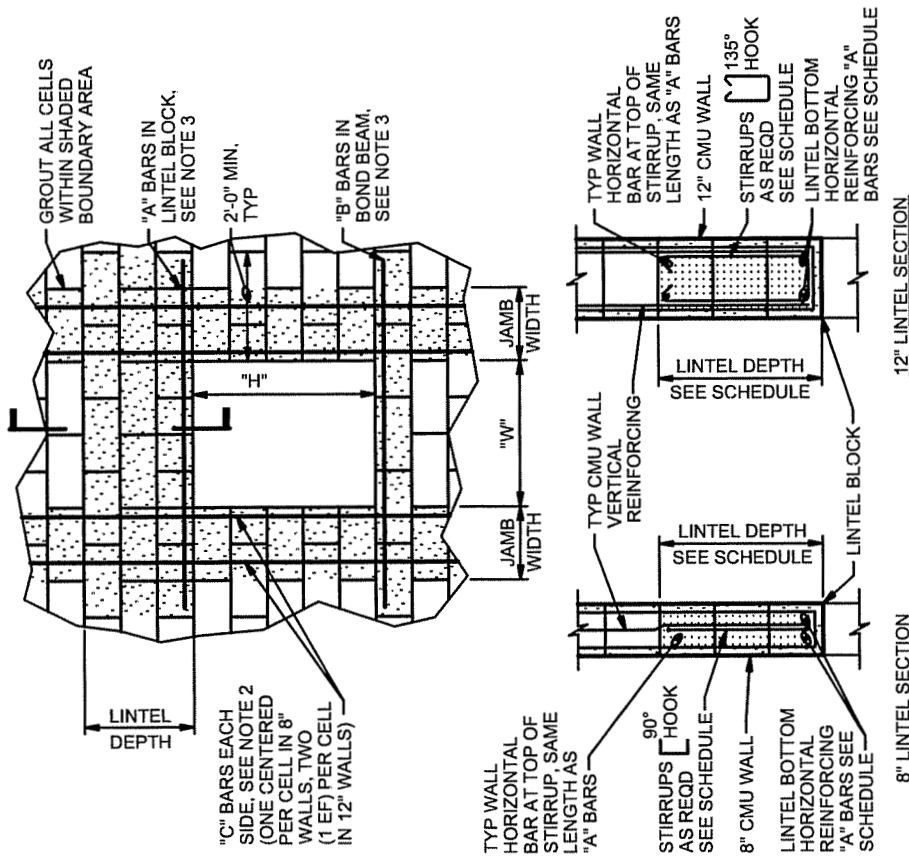
CMU OPENING REINFORCING

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

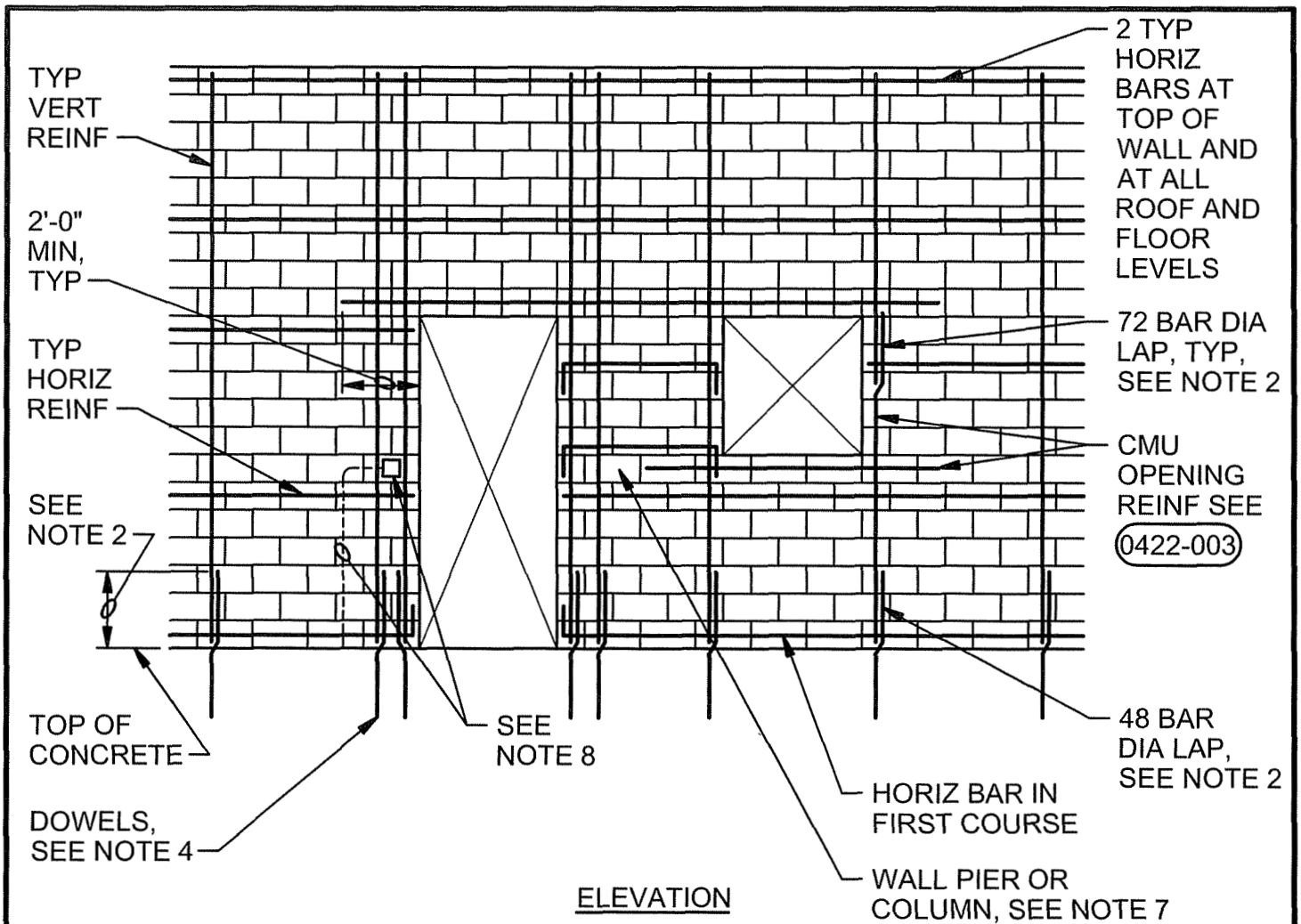
0422-003

CH2MHILL



CMU OPENING REINF SCHEDULE													
8" WALLS					12" WALLS								
W	LINTEL DEPTH	STIRRUP SIZE, SPG	"A" BARS	"B" BARS	"C" BARS	JAMB WIDTH	W	LINTEL DEPTH	STIRRUP SIZE, SPG	"A" BARS	"B" BARS	"C" BARS	JAMB WIDTH
≤2'-8"	8"	-	1	1	1	8"	≤2'-8"	8"	-	2	2	2	8"
>2'-8" ≤4'-0"	16"	-	2	1	1	8"	>2'-8" ≤4'-0"	16"	-	2	2	2	8"
>4'-0" ≤6'-0"	24"	#3@8"	2	1	2	16"	>4'-0" ≤6'-0"	24"	#3@8"	2	2	4	16"
>6'-0" ≤8'-0"	32"	#3@16"	2	2	3	24"	>6'-0" ≤8'-0"	32"	#3@16"	2	2	6	24"
>8'-0" ≤10'-0"	48"	#3@24"	2	2	3	24"	>8'-0" ≤10'-0"	48"	#3@24"	2	2	6	24"

- NOTES:**
1. USE BAR QUANTITIES AND SIZES GIVEN IN LINTEL SCHEDULE UNLESS OTHERWISE NOTED ON THE DRAWINGS.
 2. EXTEND "C" BARS 48 BAR DIAMETERS OR 2'-0" MINIMUM BEYOND TOP AND BOTTOM OF OPENING EXCEPT THAT WHEN "H" OR "W" EXCEEDS 2'-0", "C" BARS SHALL EXTEND FULL HEIGHT. WHERE THERE IS LESS THAN 8'-0" BETWEEN ADJACENT OPENINGS, EXTEND REINFORCING CONTINUOUS TO 2'-8" BEYOND FURTHEST OPENING.
 3. "A" AND "B" BARS SHALL EXTEND 48 BAR DIAMETERS OR 2'-0" MINIMUM EACH SIDE OF THE OPENINGS.
 4. FOR BAR SIZES, MATCH TYPICAL WALL REINFORCING AS SHOWN ON THE BUILDING WALL SECTIONS.



NOTES:

1. FOR TYPICAL WALL REINFORCING, SEE WALL SECTIONS AND DETAILS FOR EACH FACILITY. FOR MINIMUM REINFORCING REQUIREMENTS, SEE GENERAL STRUCTURAL NOTES.
2. LAP VERTICAL REINFORCING WITH WALL DOWELS 48 BAR DIAMETERS (2'-0" MIN), LAP ALL OTHER VERTICAL BARS 72 BAR DIAMETERS.
3. STAGGER SPLICES IN ADJACENT HORIZONTAL BARS IN THE SAME COURSE BY 2'-0".
4. PROVIDE DOWEL BARS IN FOUNDATION TO MATCH ALL VERTICAL REINFORCING.
5. FOR ADDED REINFORCING AT WALL INTERSECTIONS AND CORNERS, SEE (0422-001)
6. GROUT EACH SIDE OF OPENING AS NOTED IN TYPICAL OPENING REINFORCING DETAIL (0422-003)
7. FOR HORIZONTAL REINFORCING AT OPENINGS SEE COLUMN AND PIER DETAILS.
8. DO NOT PLACE VERTICAL CONDUIT IN THE SAME CELL AS VERTICAL REINFORCING.

REINFORCED CMU WALL

NTS

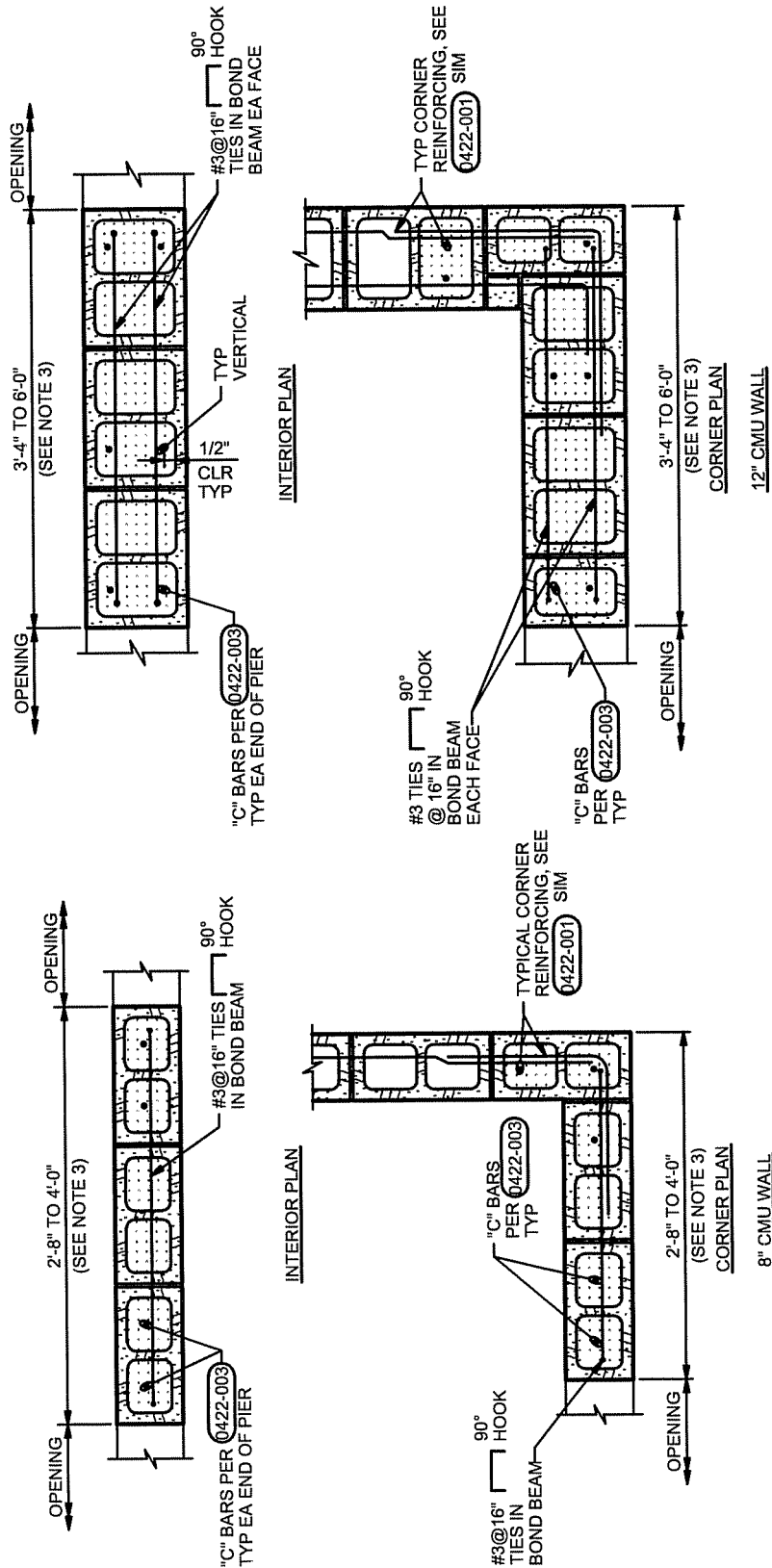
ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

(0422-004)

CH2MHILL

CMU WALL PIER

NTS



NOTES:

- SOLID GROUT PIERS FULL WALL HEIGHT.
- WHERE PIERS ARE CENTERED BELOW BEAM BEARING, REDUCE TIE SPACING TO 8".
- FOR 8" CMU WALL PIERS 2'-0" AND LESS, AND FOR 12" CMU WALL PIERS 2'-8" AND LESS, SEE WALL COLUMN DETAIL 0422-006

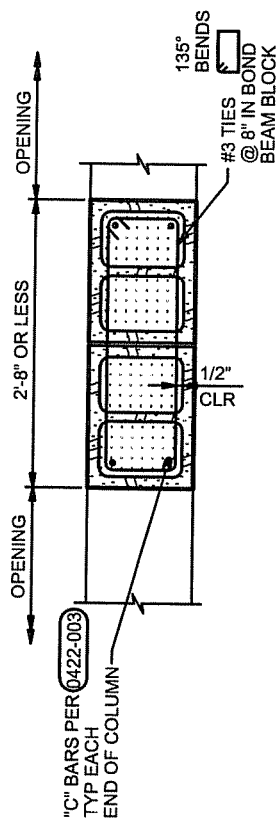
ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0422-005

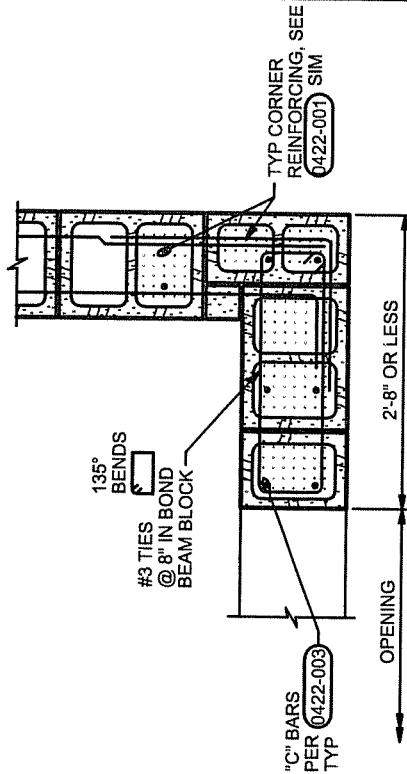


CMU WALL COLUMN

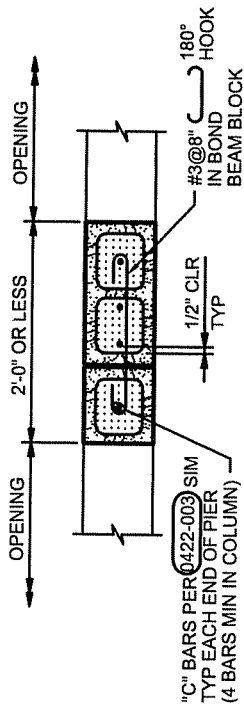
NTS



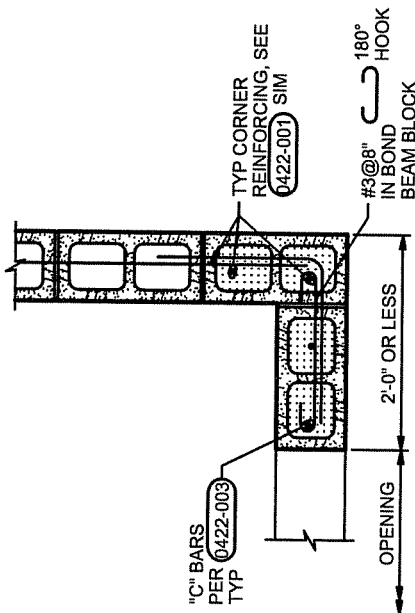
INTERIOR PLAN



CORNER PLAN



INTERIOR PLAN



CORNER PLAN

NOTE:

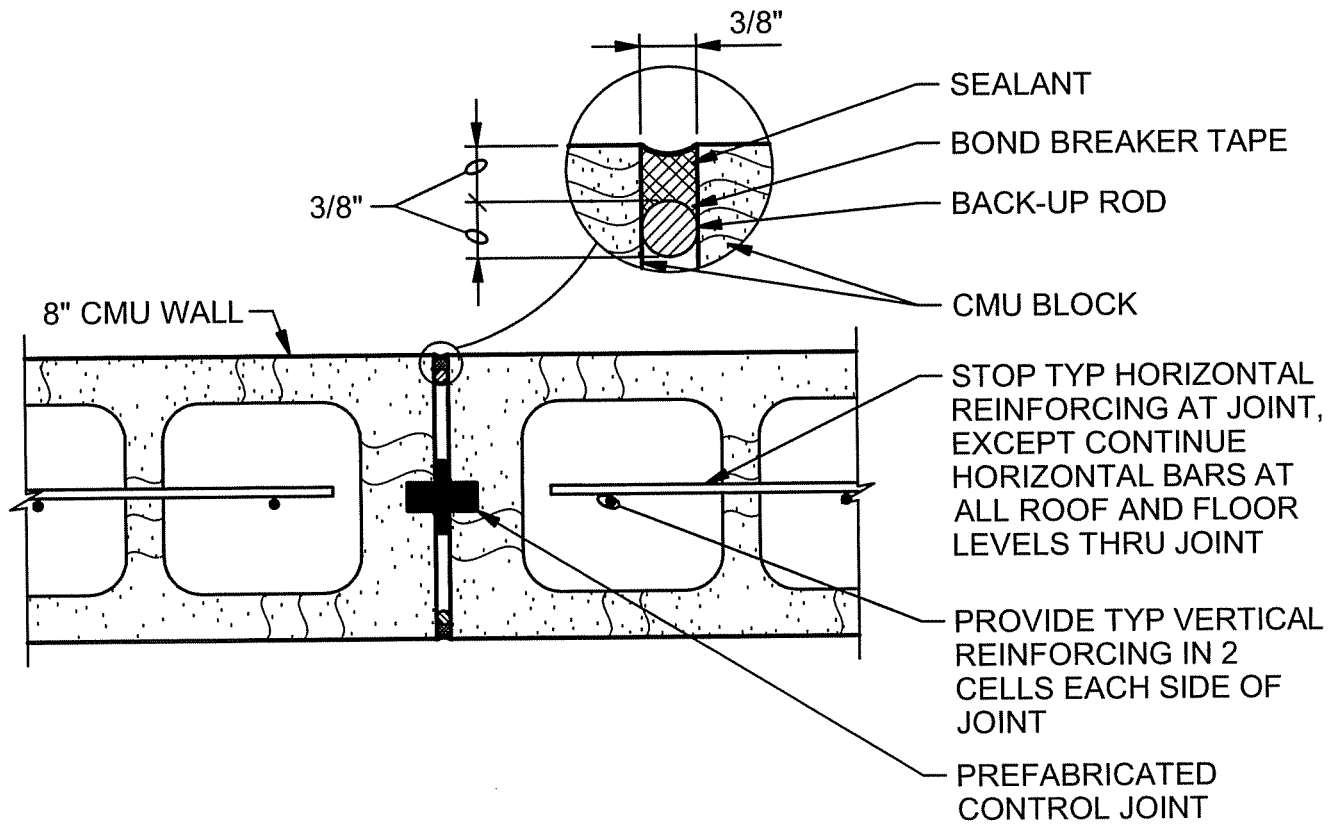
GROUT WALL COLUMNS FULL WALL HEIGHT.

8" CMU WALL

12" CMU WALL

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0422-006



NOTE:

12" CMU WALL WITH 2 LAYERS OF REINFORCING IS SIMILAR.

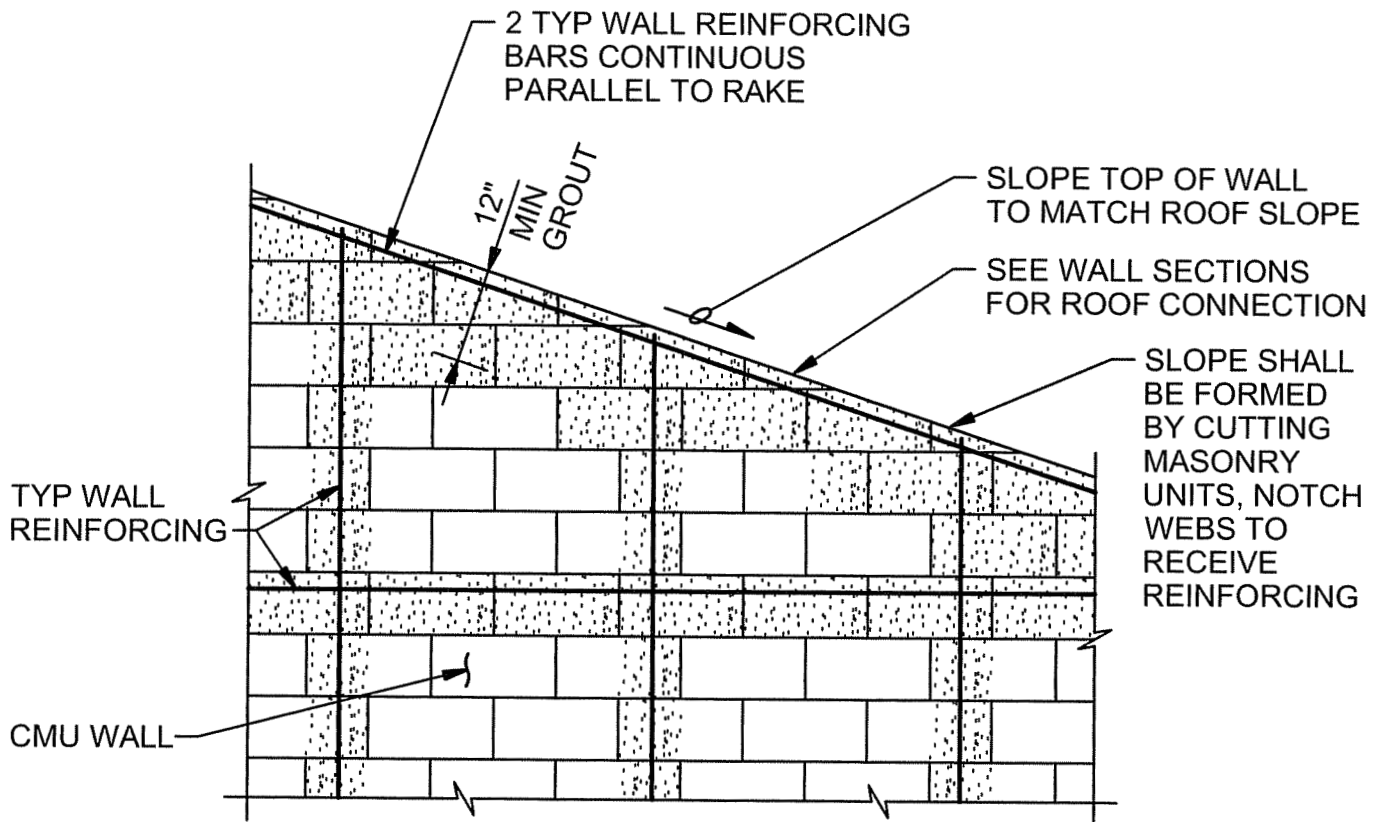
CMU CONTROL JOINT

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0422-031

CH2MHILL



NOTE:

GROUT MINIMUM 12" AT TOP OF WALL.

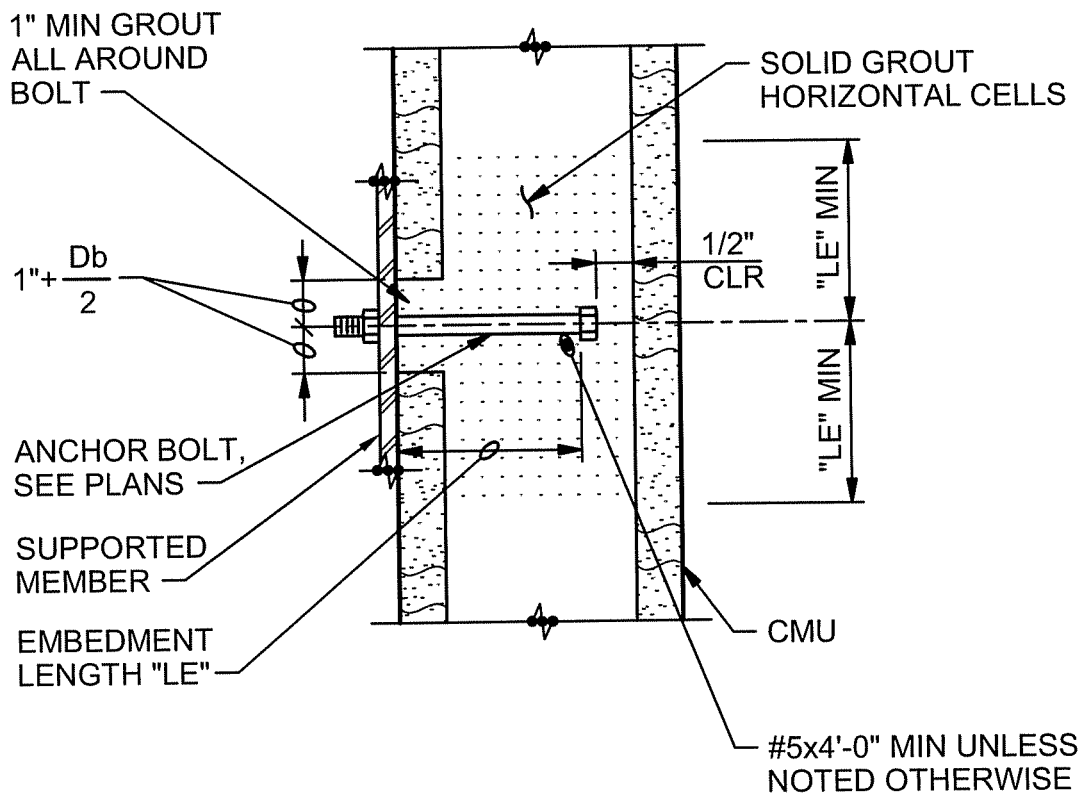
CMU WALL AT RAKE

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0422-041

CH2MHILL



NOTE:

D_b = DIAMETER OF BOLT

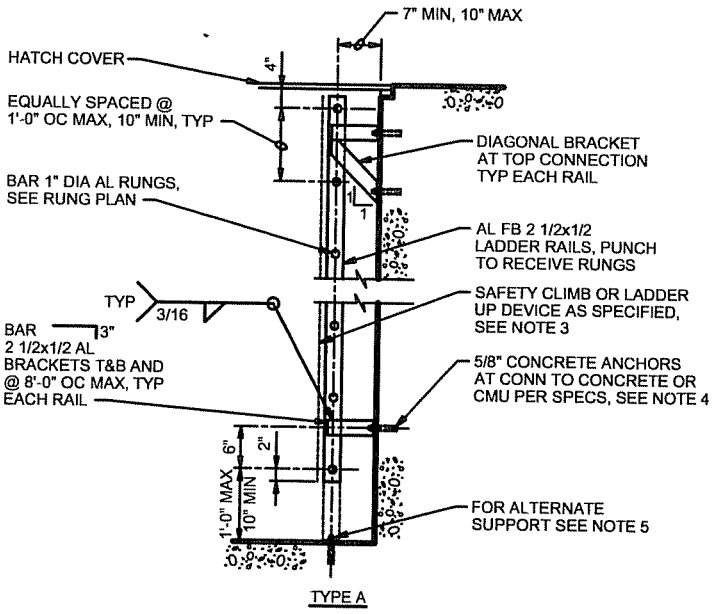
MASONRY ANCHOR BOLT

NTS

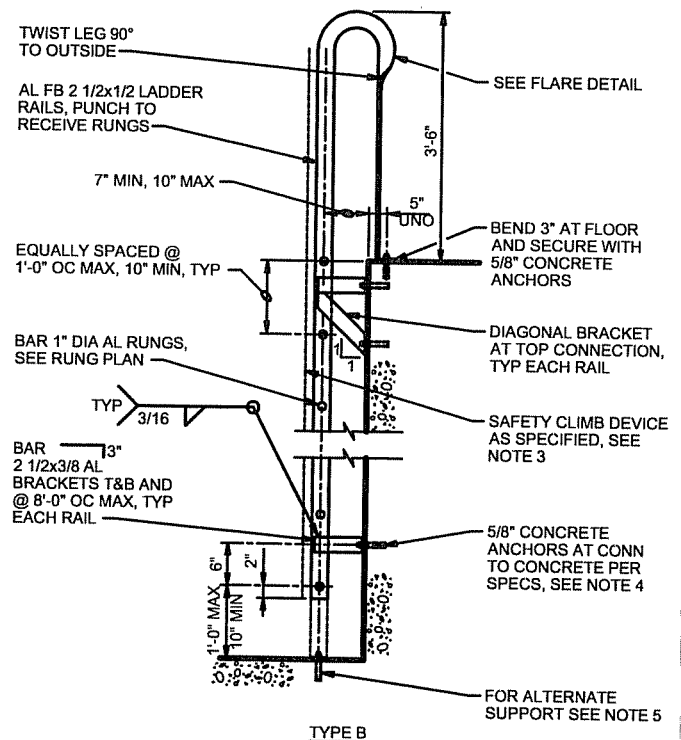
ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0422-046

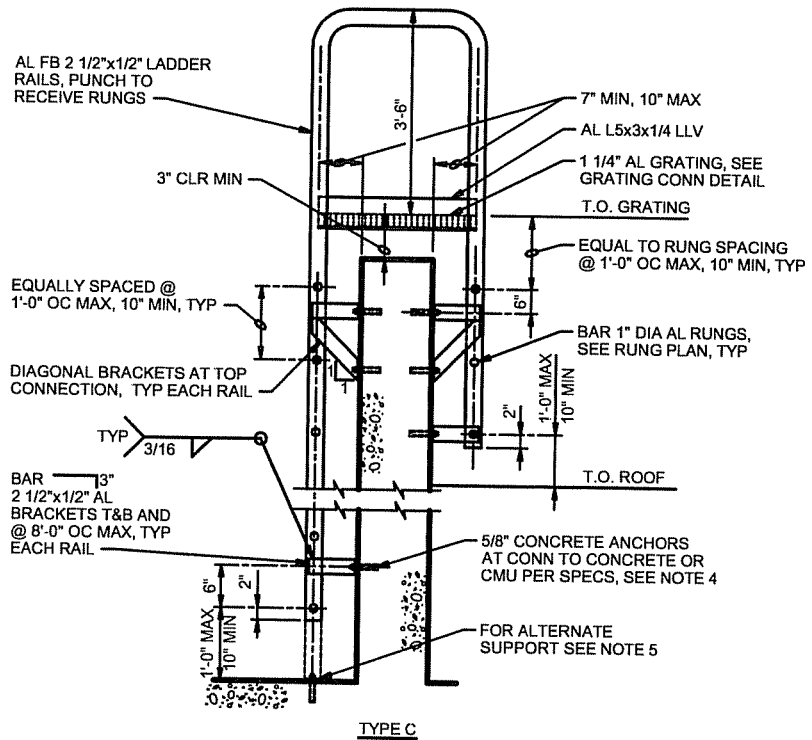
CH2MHILL



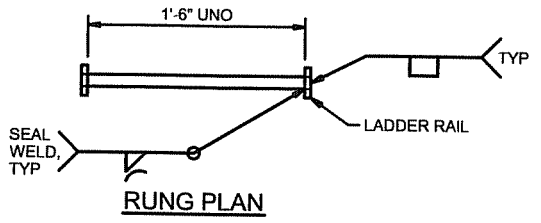
TYPE A
FLAT BAR LADDER UNDER COVER



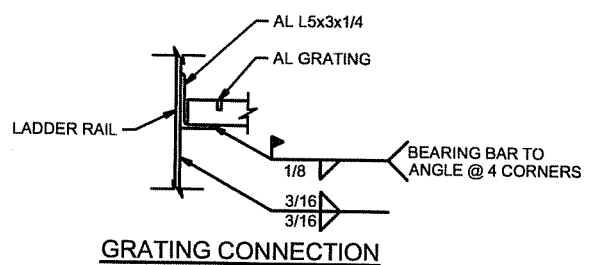
TYPE B
FLAT BAR LADDER WITH EXTENSION



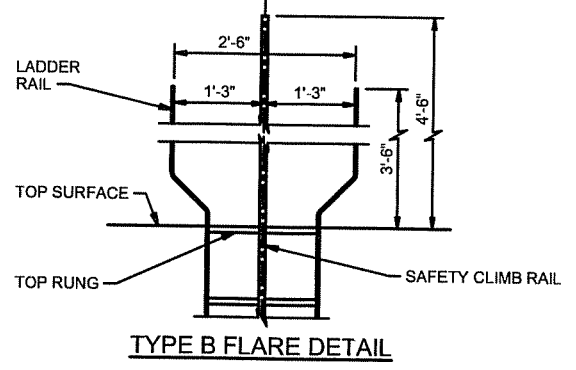
TYPE C
FLAT BAR LADDER UP AND OVER



RUNG PLAN



GRATING CONNECTION



TYPE B FLARE DETAIL

NOTES:

1. PROVIDE PROTECTION FOR ALUMINUM IN CONTACT WITH CONCRETE AS SPECIFIED.
2. AT CONTRACTOR'S OPTION, PRE-ENGINEERED PIPE LADDER AS SPECIFIED MAY BE USED IN LIEU OF FLAT BAR LADDERS
3. PROVIDE SAFETY CLIMB DEVICE FOR LADDERS 20' OR GREATER. FOR TYPE A LESS THAN 20' PROVIDE LADDER UP DEVICE.
4. PROVIDE SST CONCRETE ANCHORS LOCATED BELOW MAXIMUM WATER SURFACE.
5. FOR INTERIOR, DRY AREAS, EXTEND RAILS AND BEND 3° AT FLOOR. SECURE WITH 5/8" CONCRETE ANCHORS.

FLAT BAR LADDER - ALUMINUM

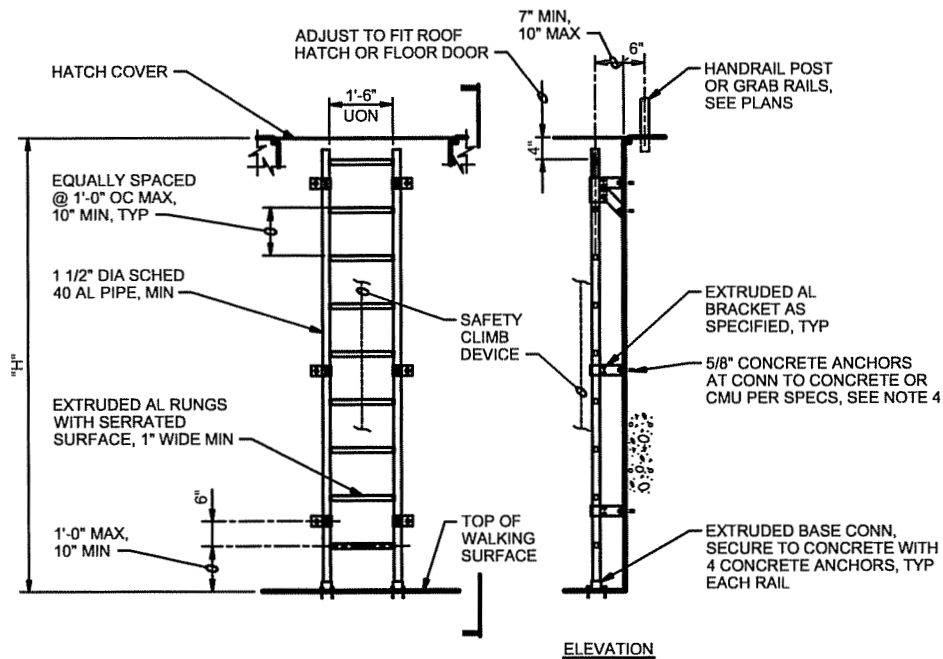
NTS

DETAIL 1 OF 2

0551-101

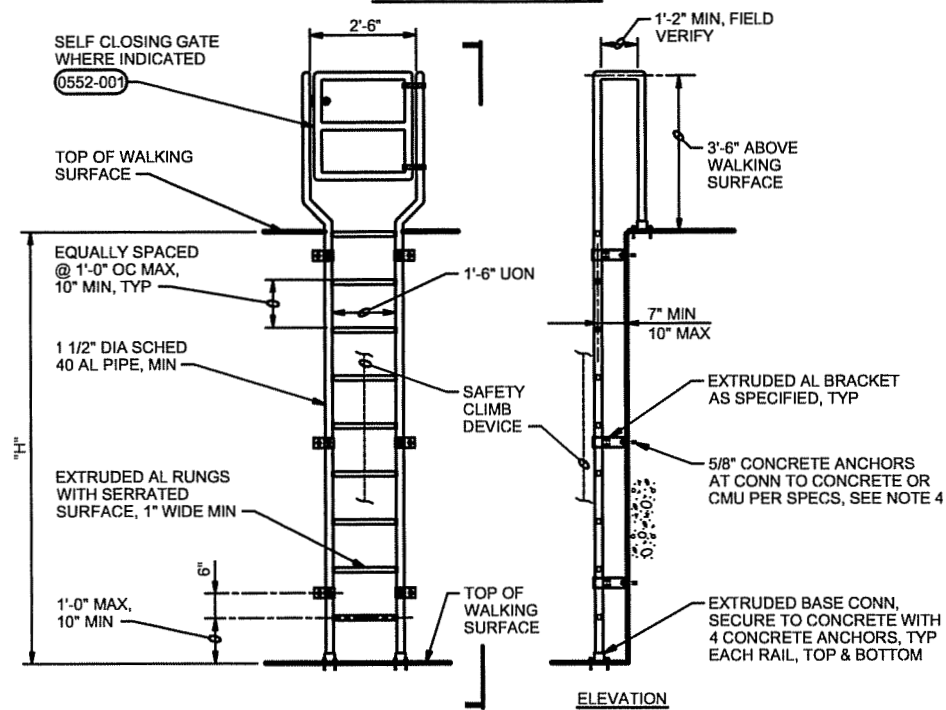
ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY





TYPE G

PIPE LADDER UNDER COVER



TYPE H

PIPE LADDER WITH EXTENSION

NOTES:

1. PROVIDE PROTECTION FOR ALUMINUM IN CONTACT WITH CONCRETE AS SPECIFIED.
2. PROVIDE LADDER SAFETY POST AS SPECIFIED, WHERE INDICATED.
3. PROVIDE SAFETY CLIMB RAIL WITH BELT & EXTENSION RAIL AS SPECIFIED WHERE INDICATED.
4. PROVIDE SST CONC ANCHORS WHEN LOCATED BELOW MAXIMUM WATER SURFACE

PRE-ENGINEERED PIPE LADDER - ALUMINUM

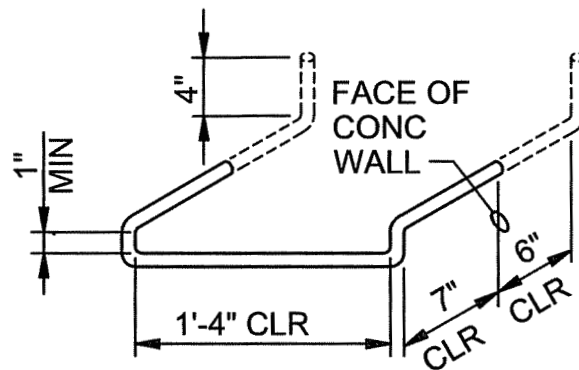
NTS

DETAIL 2 OF 2

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0551-101

CH2MHILL



NOTES:

1. RUNGS SHALL BE FABRICATED FROM 1" DIA GRADE 60 STL BAR .
2. RUNGS SHALL BE EQUALLY SPACED VERTICALLY AT 12" OC MAX.
3. RUNGS SHALL BE POLYPROPYLENE ENCASED, WITH MATERIAL CONFORMING TO ASTM D4101.

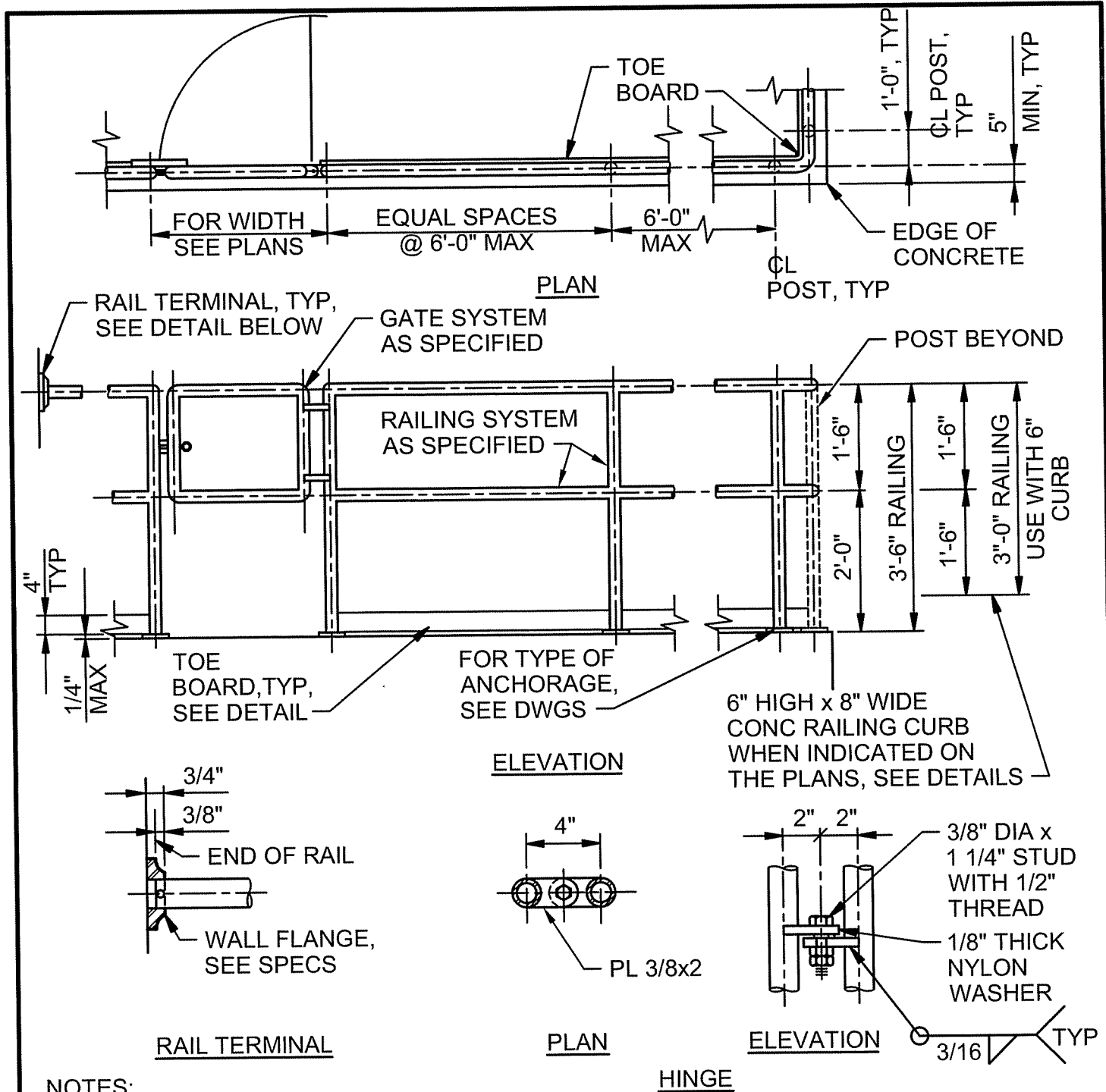
INDIVIDUAL RUNG LADDER

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0551-146

CH2MHILL



NOTES:

1. FASTEN RAIL TO WALL FLANGE PER MANUFACTURERS 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 - TWO RAIL - ALUMINUM

NTS

DETAIL 1 OF 7

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0552-001

CH2MHILL

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

3'-6"
2'-10"

1'-0"
MIN

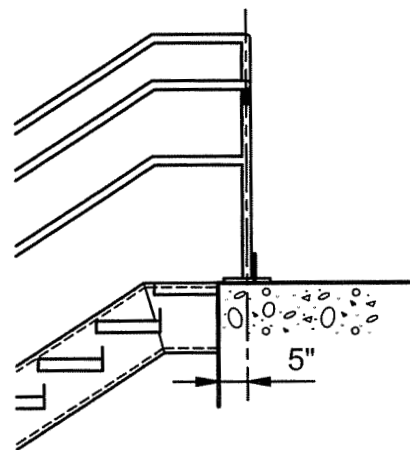
1'-9"
2'-10"
3'-6"

SEE RAILING POST
ANCHORAGE DETAIL

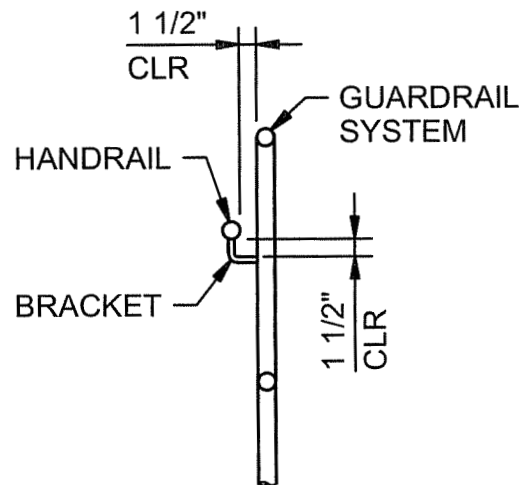
METAL STRINGER SHOWN,
CONC STAIRS SIM

SEE NOTE 2

11" 4"



RAILING DETAIL WITHOUT LANDING



RAILING SECTION

NOTES:

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

RAILING - TWO RAIL STAIR - ALUMINUM (IBC)

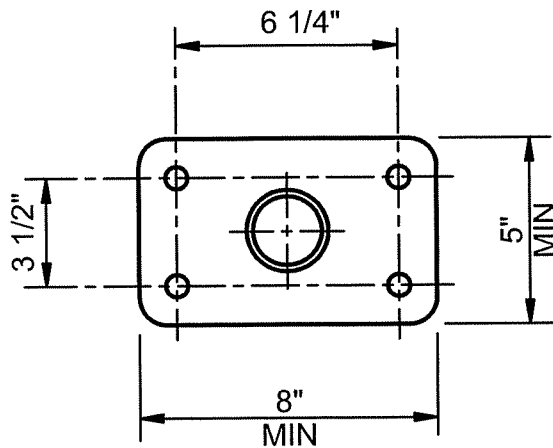
NTS

DETAIL 2 OF 7

0552-001

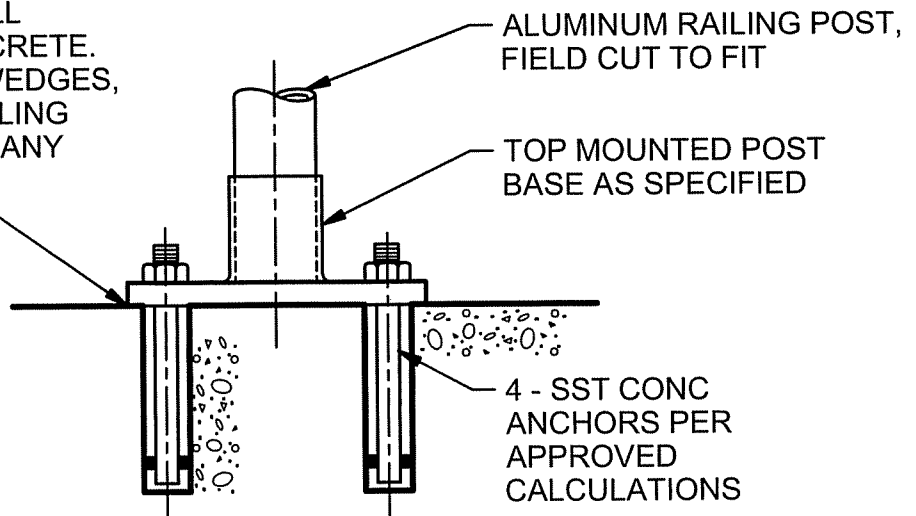
ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

CH2MHILL



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

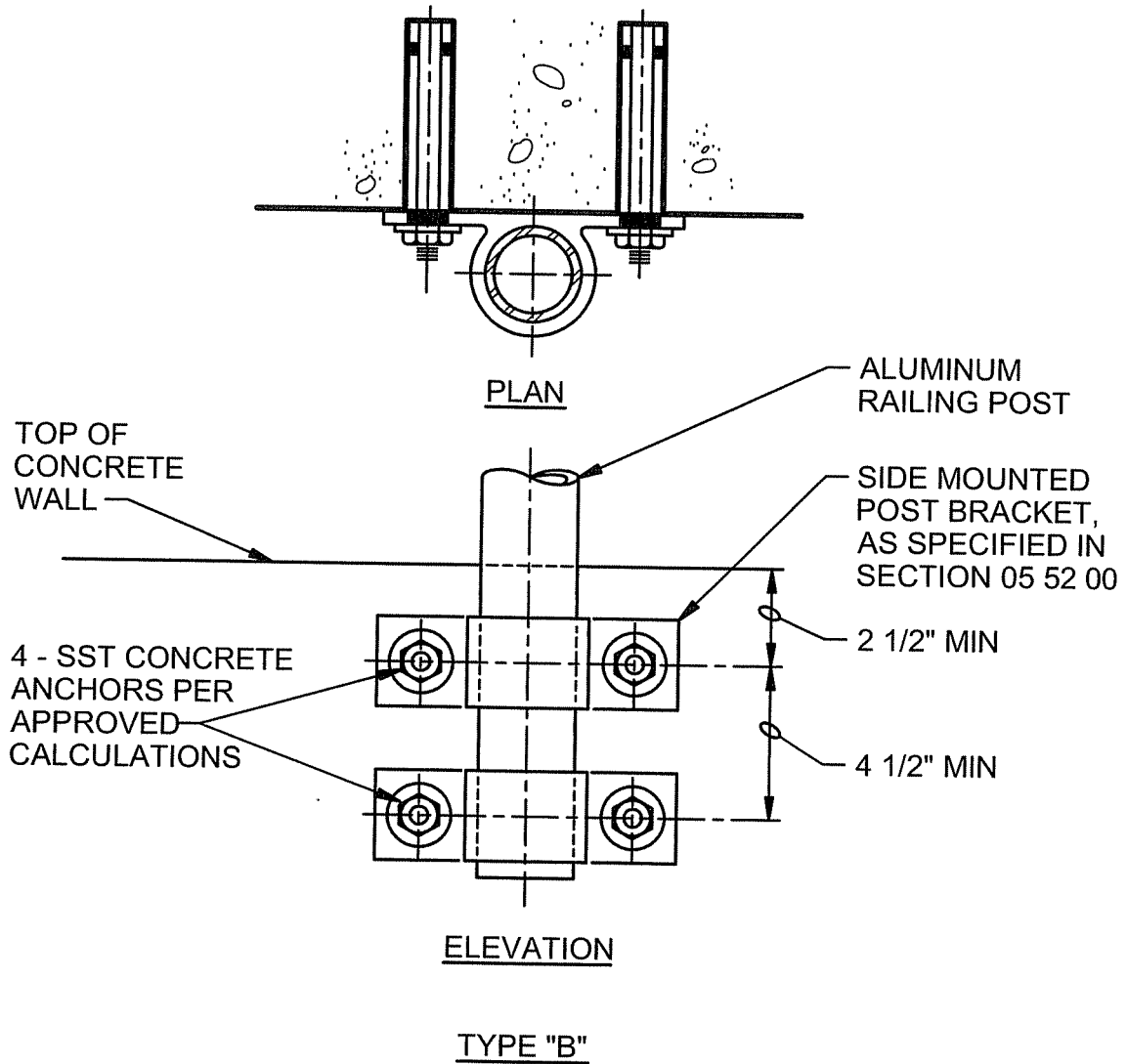
NTS

DETAIL 3 OF 7

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0552-001

CH2MHILL



NOTES:

1. PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE PER SPECIFICATIONS.
2. USE SIDE MOUNTED POST BRACKET AS A TEMPLATE FOR THE ANCHOR BOLTS.

RAILING POST ANCHORAGE TYPE B - ALUMINUM

NTS

DETAIL 4 OF 7

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0552-001

REMOVABLE 1 1/2"
SCHD 80 AL
POST (1.90 OD)
@ 4'-0" MAX SPG

3/4" CHAMFER, TYP

6"
CURB

3/16

6"

6"

SST PL 3/8x4" DIA
W/ 2 1/8" DIA HOLE

REINF CURB W/ #4@12
DOWELS & 2 - #4 CONT,
1 EA SIDE OF POST
SLEEVE

2 1/2" DIA x 5 3/8" LONG
SCHD 40 SST PIPE

3/16

PROVIDE TUBE 3/8" OD x
22 GA DRAIN FOR ALL
EXTERIOR APPLICATIONS

SST BOT PL
1/4x3 1/2" SQ

SST PIPE 1 1/4" DIA x 1 1/4"
LONG CENTERED

TYPE "E"

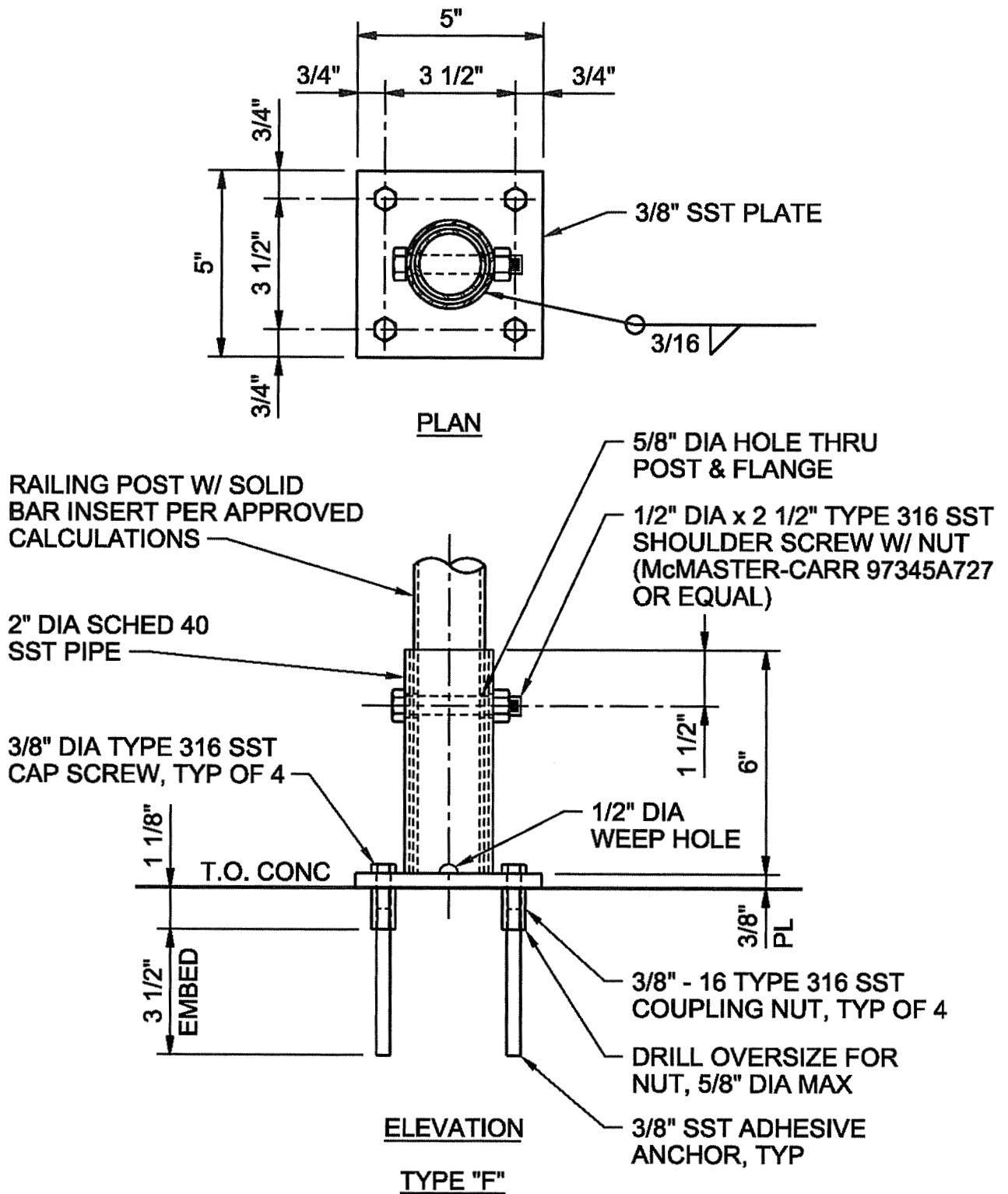
RAILING POST ANCHORAGE TYPE E -
REMOVABLE - ALUMINUM

NTS

DETAIL 5 OF 7

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0552-001



**RAILING POST ANCHORAGE TYPE F -
REMOVABLE - ALUMINUM**

NTS

DETAIL 6 OF 7

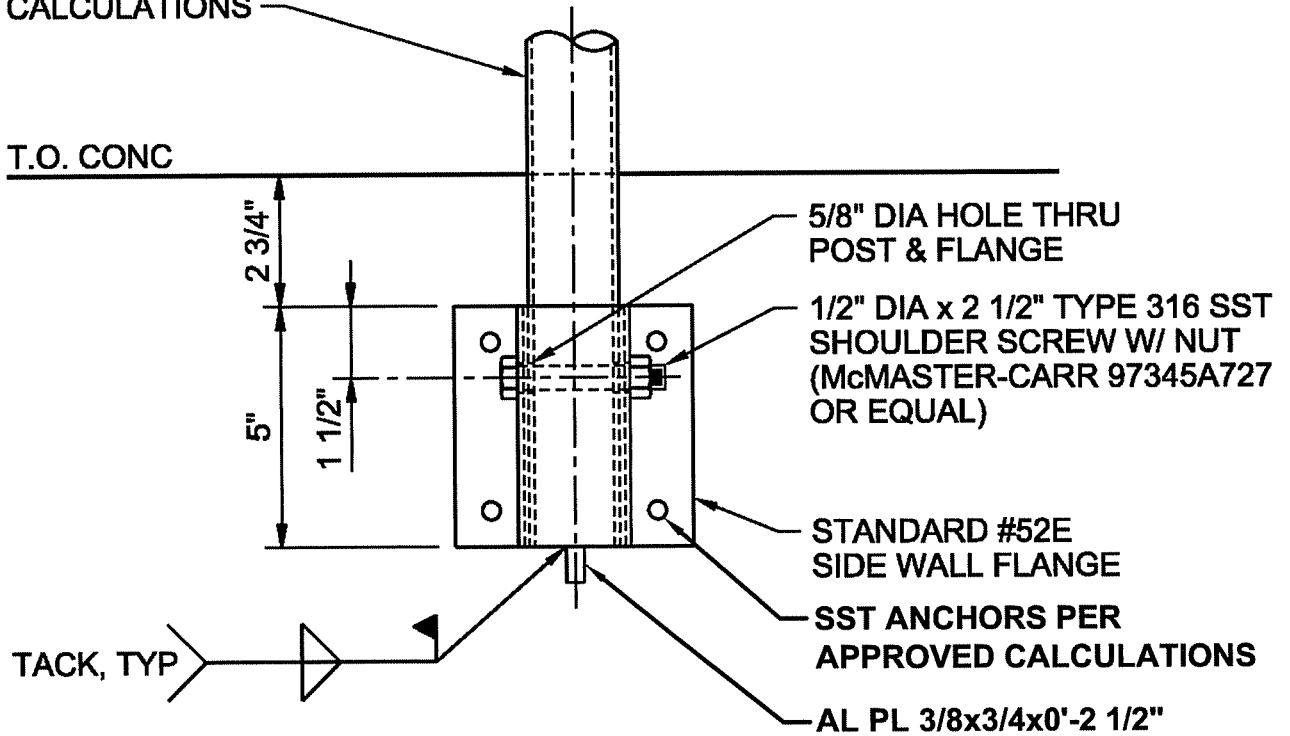
0552-001

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

CH2MHILL

RAILING POST W/ SOLID
BAR INSERT PER APPROVED
CALCULATIONS

T.O. CONC



ELEVATION

TYPE "G"

RAILING POST ANCHORAGE TYPE G -
REMOVABLE - ALUMINUM

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

DETAIL 7 OF 7

0552-001

PROVIDE SOLID BLOCKING
IN STUD WALLS AND GROUT
CELLS IN CMU WALLS AT
EACH BRACKET

1 1/2" MIN CLR

ATTACH WALL
BRACKET TO WALL
AS SPECIFIED

PLAN

EQUALLY SPACED
6'-0" MAXIMUM

CONTINUE SLOPED
HANDRAIL ONE
TREAD WIDTH
PAST LAST RISER

RETURN END
OF HANDRAIL
TO WALL AT
BOTH ENDS

6" MAX

LOCATION OF
TOP RISER

WALL BRACKETS AS
SPECIFIED, ATTACH TO
RAILS AS RECOMMENDED
BY MANUFACTURER

2'-10"

1'-0"

11"

2'-10"

6" MAX

METAL OR CONCRETE
STAIRWAY, SEE PLANS

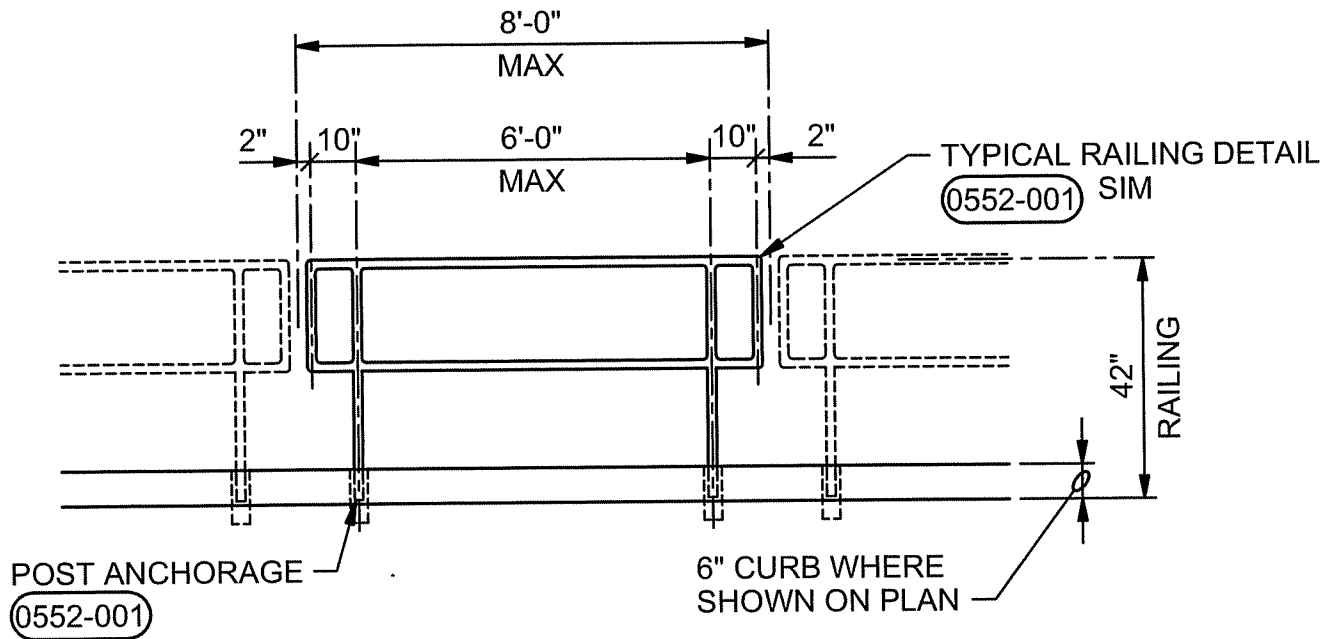
WALL HANDRAIL - ALUMINUM (ADA)

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0552-003

CH2MHILL



NOTES:

1. DETAIL SHOWN AT CURBED OPENING. WHERE NO CURB, PROVIDE 6" EDGE DISTANCE AND STIFFENED KICK PLATE ATTACHED TO REMOVABLE RAILING.
2. FABRICATE REMOVABLE RAILING IN MAXIMUM 8'-0" SECTIONS WITH 2 POSTS EACH SECTION.

RAILING - REMOVABLE TWO RAIL - ALUMINUM

NTS

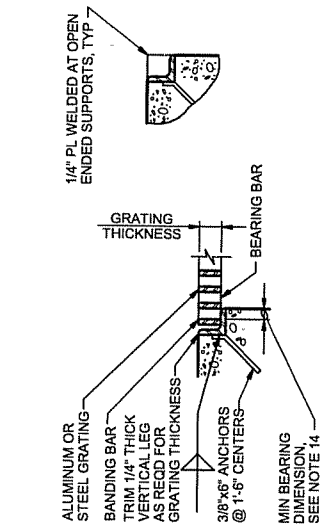
ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0552-004

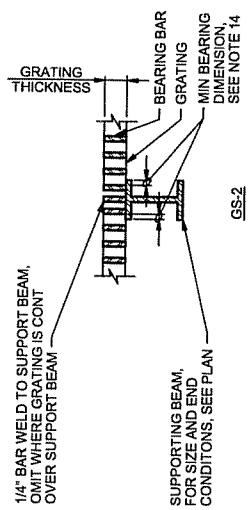
CH2MHILL

STANDARD GRATING

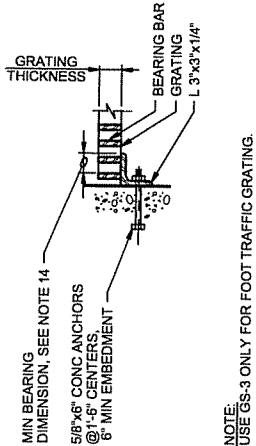
NTS



GS-1

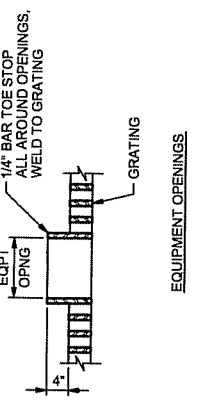


GS-2



GS-3

- GENERAL NOTES:**
1. EXTEND GRATING CONTINUOUSLY OVER GATE GUIDES AND GATES.
 2. NOTCH GRATING SUPPORTS AT GATES AS REQUIRED.
 3. GRATING SPAN — SEE PLAN.
 4. WIDTH OF GRATING SECTIONS SHALL NOT EXCEED 3'-0".
 5. SHOP DRAWINGS BASED ON FIELD DIMENSIONS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO FABRICATION.
 6. 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.
 7. UNLESS NOTED OTHERWISE ON PLANS, GRATING THICKNESS SHALL BE AS TABULATED IN "GRATING THICKNESS TABLE" FOR APPLICABLE TRAFFIC.
 8. BEARING BAR THICKNESS FOR GRATING TO BE 3/16" MINIMUM.
 9. BAND ALL EDGES WITH 3/16" x DEPTH OF BEARING BAR.
 10. PROVIDE MISCELLANEOUS GRATING FASTENERS AS REQUIRED.



EQUIPMENT OPENINGS

11. TYPE OF MATERIAL USED SHALL BE AS SHOWN ON PLANS OR AS SPECIFIED. THIS STANDARD DETAILS INCLUDES 2 TYPES, ALTHOUGH BOTH MAY NOT BE INCLUDED IN PROJECT.
12. THE HORIZONTAL CLEARANCE BETWEEN THE GRATING AND GRATING SUPPORTS SHALL NOT BE LESS THAN 1/4" NOR GREATER THAN 1/2" AND AS SPECIFIED.
13. ALL GRATING SECTIONS, WHEN IN PLACE, SHALL ALWAYS BE FIRMLY ANCHORED TO THEIR SUPPORTS AS SPECIFIED.
14. 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"

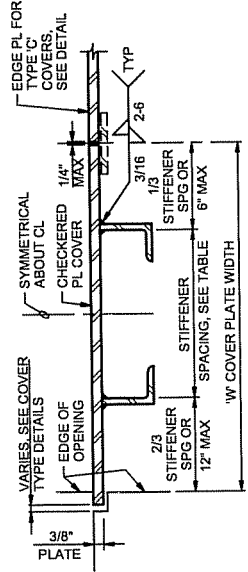
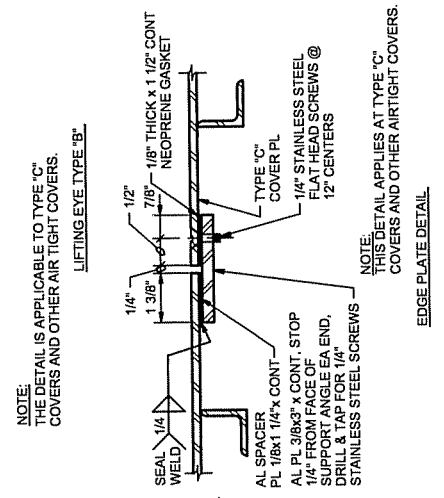
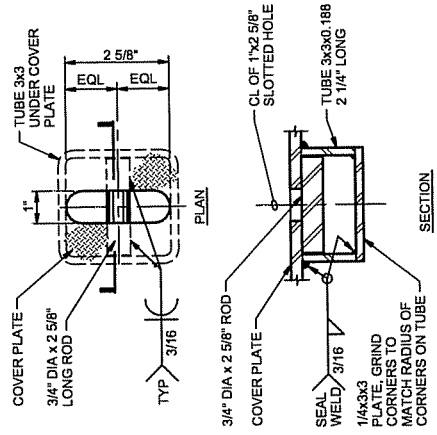
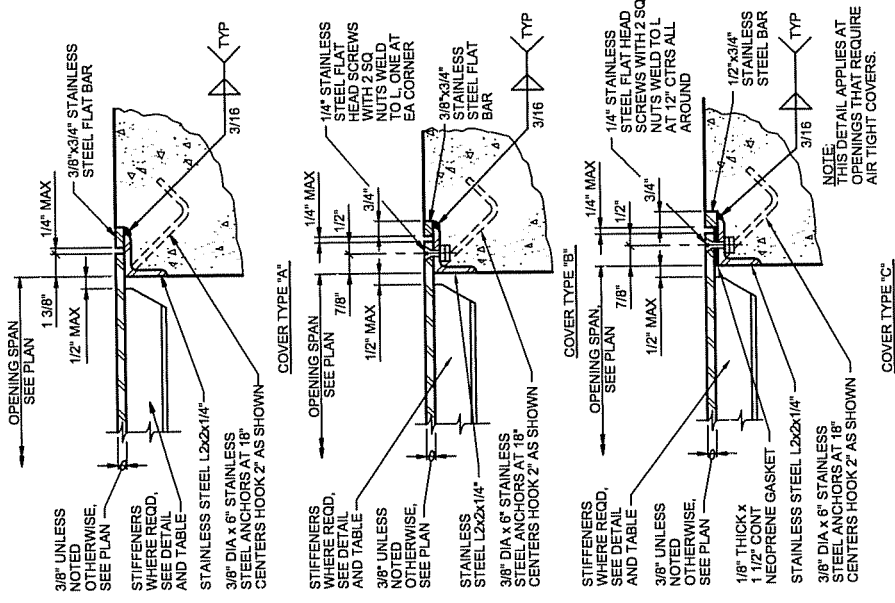
FOOT TRAFFIC		
MAXIMUM SPAN	GRATING THICKNESS TABLE	
	ALUMINUM	STEEL
3'-6"	1 1/4"	1"
4'-0"	1 1/2"	1"
4'-6"	1 3/4"	1"
5'-0"	1 3/4"	1 1/4"
5'-6"	2"	1 1/4"
6'-0"	2 1/4"	1 1/2"
6'-6"	2 1/4"	1 1/2"
7'-0"	2 1/2"	1 3/4"
8'-0"	2 1/2"	1 3/4"

HEAVY VEHICULAR TRAFFIC (HS 20-44)		
MAXIMUM SPAN	ALUMINUM	
	STEEL	ALUMINUM
1'-0"	2"x3/16"	DO NOT USE ALUMINUM GRATING
1'-6"	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"	

VEHICULAR TRAFFIC NOTE:

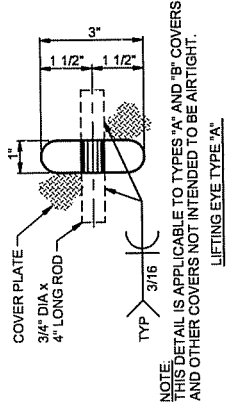
STEEL GRATING BEARING BARS FOR VEHICULAR TRAFFIC SHALL BE SPACED AT 1.78" OC; ALUMINUM GRATING BEARING BARS FOR VEHICULAR TRAFFIC SHALL BE SPACED AT 1.316" OC.
INCREASE GRATING THICKNESSES SHOWN IN TABLES BY 1/4" FOR GRATING WITH SERRATED SLIP RESISTANT SURFACES.

LIGHT VEHICULAR TRAFFIC (WHEEL LOAD = 2000 POUNDS OR LESS)		
MAXIMUM SPAN	ALUMINUM	
	STEEL	ALUMINUM
1'-0"	1 3/4"x3/16"	1 3/4"x3/16"
1'-6"	1 3/4"x3/16"	1 3/4"x3/16"
2'-0"	2"x3/16"	2"x3/16"
2'-6"	2 1/4"x3/16"	2 1/4"x3/16"
3'-0"	2 1/2"x3/16"	2 1/2"x3/16"
4'-0"	2 1/2"x1/4"	DO NOT USE ALUMINUM GRATING
5'-0"	2 1/2"x3/8"	
6'-0"	2 1/2"x3/8"	
7'-0"	3"x3/8"	



OPENING SPAN LENGTH 'L'	STIFFENER SIZE	MAX STIFFENER SPACING	MAX PLATE WIDTH 'W'
L-2'-8"	NONE	-	5'-0"
2'-8"-L-3'-6"	L2x1 1/2x1/4	1'-8"	4'-0"
3'-6"-L-4'-0"	L2 1/2x1 1/2x1/4	1'-8"	4'-0"
4'-0"-L-4'-6"	L2 1/2x1 1/2x1/4	1'-3"	4'-0"
4'-6"-L-5'-0"	L3x2x1/4	1'-8"	4'-0"
5'-0"-L-5'-6"	L3x2x1/4	1'-3"	3'-0"
5'-6"-L-6'-0"	L3 1/2x2 1/2x1/4	1'-8"	3'-0"
6'-0"-L-6'-6"	L3 1/2x2 1/2x1/4	1'-3"	2'-6"
6'-6"-L-7'-0"	L4x3x1/4	1'-3"	2'-6"
7'-0"-L-7'-6"	L4x3x1/4	1'-0"	2'-0"

- NOTES:
- STIFFENERS TO BE PLACED LONG LEG VERTICAL.
 - SPAN DIRECTION OF PLATE TO BE PARALLEL TO STIFFENERS, AND SHALL BE SHORT DIMENSION OF OPENING UNLESS NOTED OTHERWISE ON PLANS.
 - MAXIMUM ALLOWABLE UNIFORM DESIGN LOAD = 300psf.
 - MAXIMUM WEIGHT OF COVER PLATE TO BE 125 POUNDS.
 - COVER PLATES AND STIFFENERS ARE ALUMINUM PLATES AND ANGLES.
 - COVER PLATES TO HAVE A MINIMUM OF TWO EYES AS SHOWN IN LIFTING EYE DETAILS.



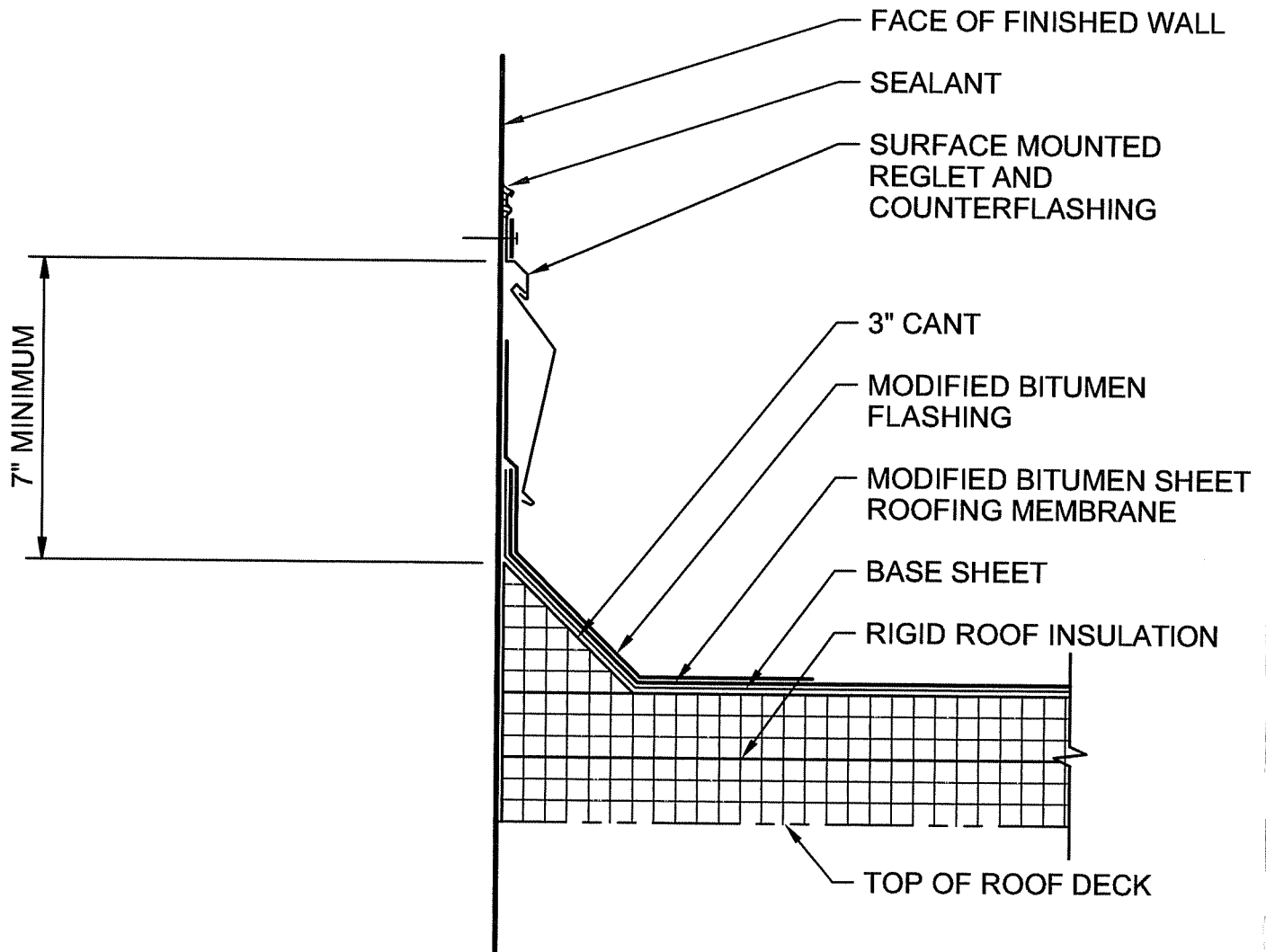
CHECKERED FLOOR PLATE - ALUMINUM

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0554-001

CH2MHILL

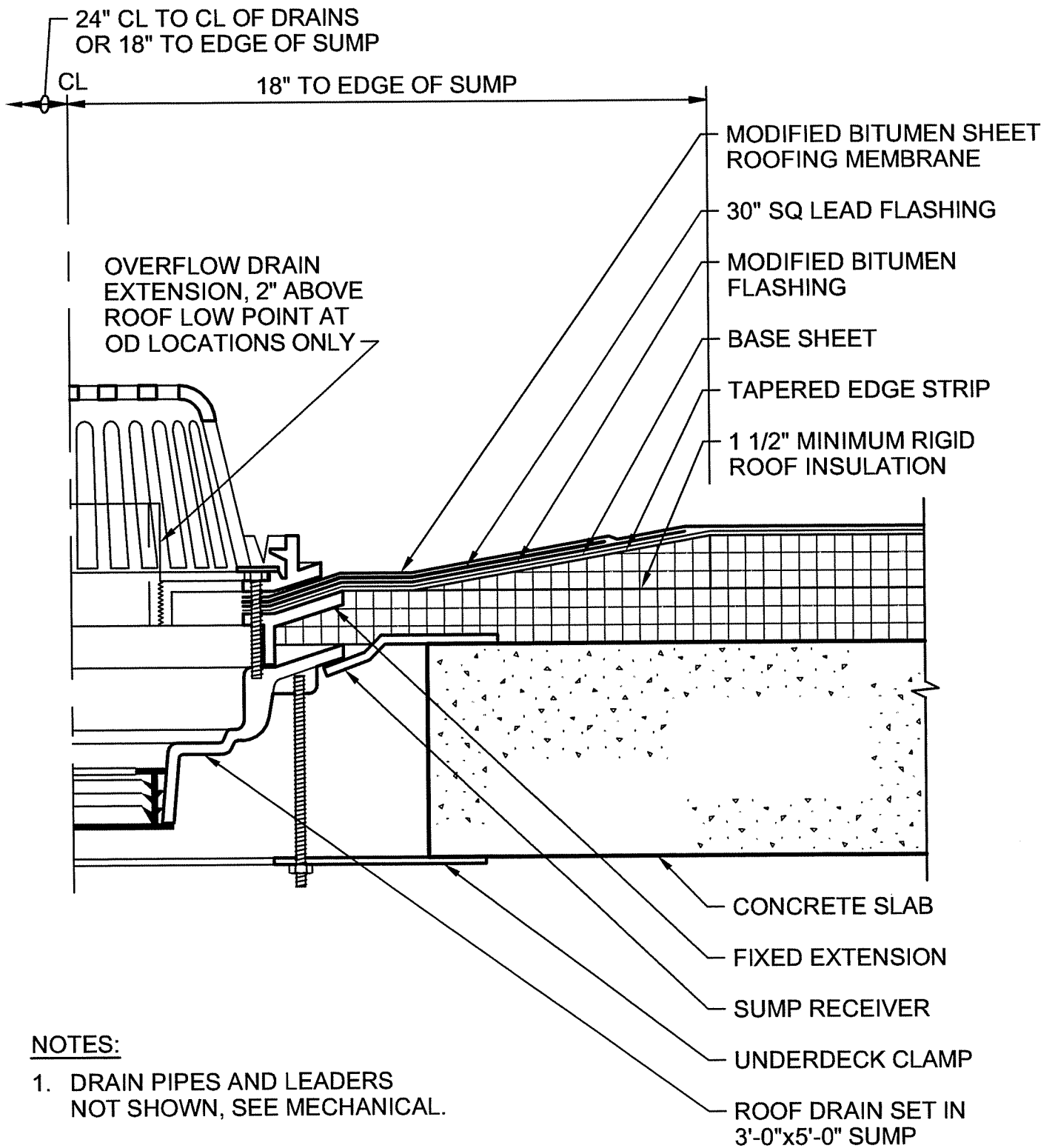


BASE FLASHING

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0752-004



NOTES:

1. DRAIN PIPES AND LEADERS NOT SHOWN, SEE MECHANICAL.

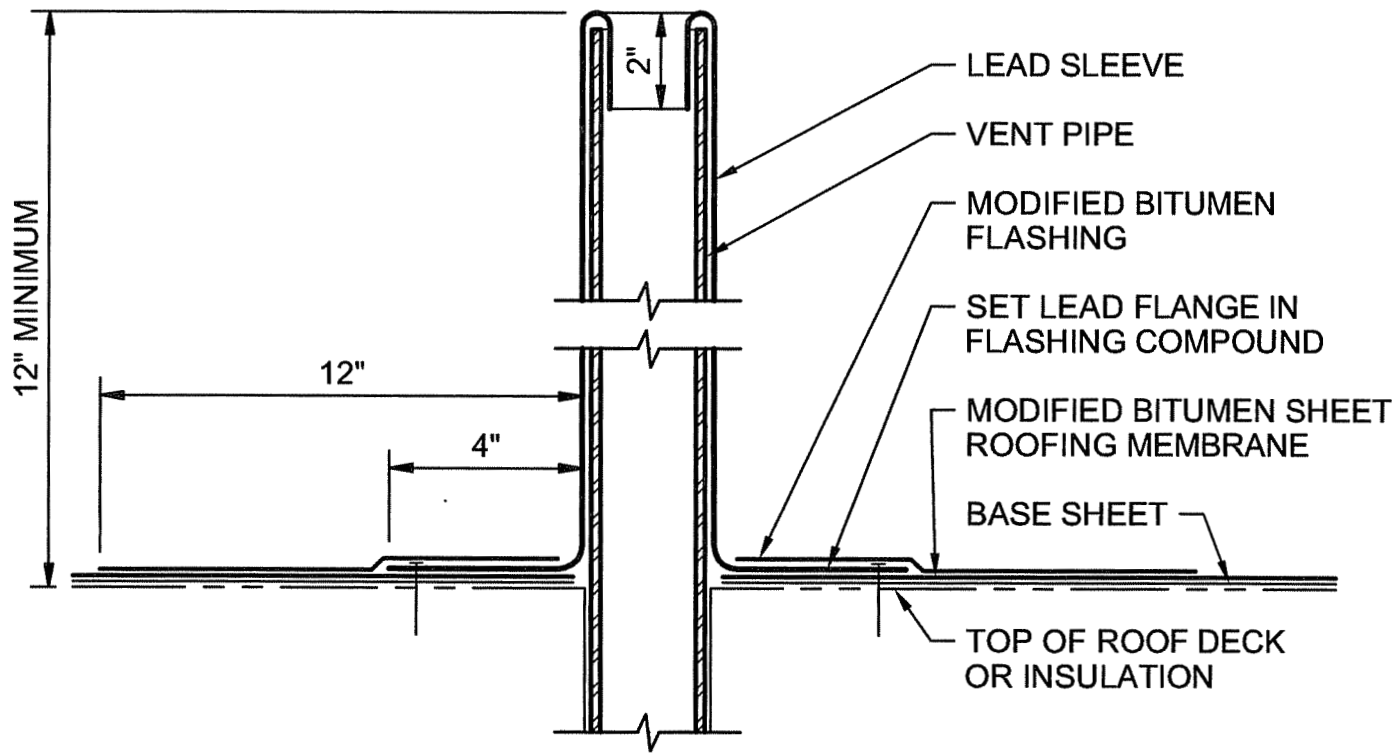
ROOF/OVERFLOW DRAIN (CONCRETE DECK)

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0752-005

CH2MHILL



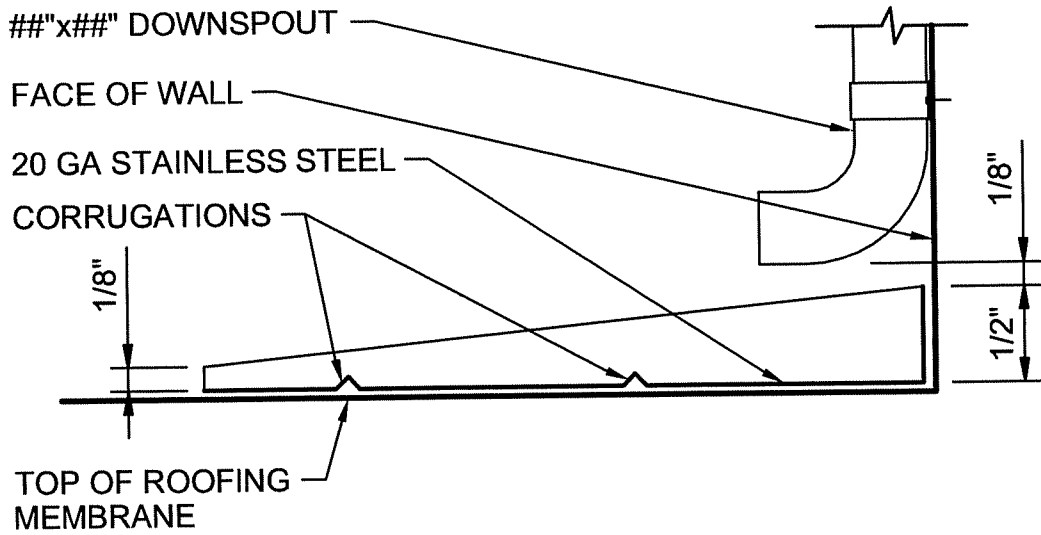
- LEAD SLEEVE
- VENT PIPE
- MODIFIED BITUMEN FLASHING
- SET LEAD FLANGE IN FLASHING COMPOUND
- MODIFIED BITUMEN SHEET ROOFING MEMBRANE
- BASE SHEET
- TOP OF ROOF DECK OR INSULATION

VENT THROUGH ROOF

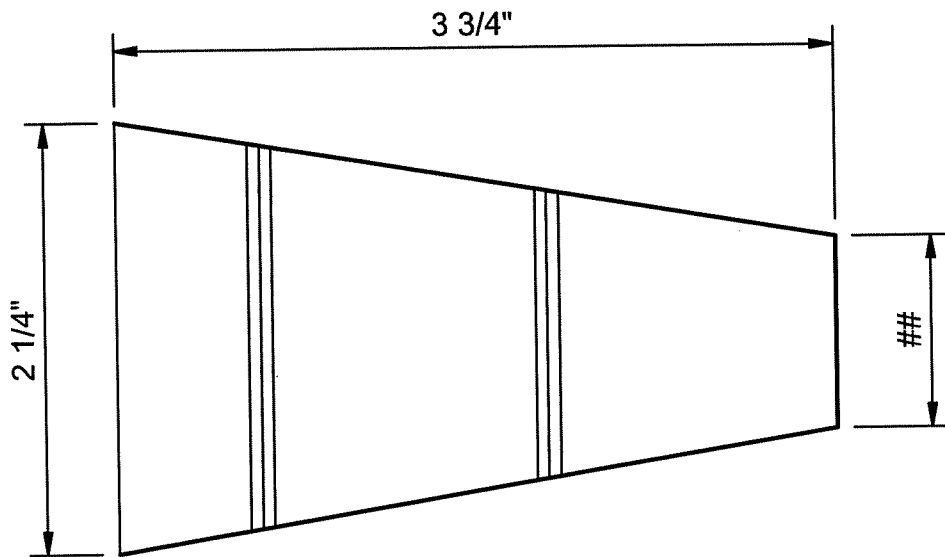
NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0752-007



SECTION



PLAN

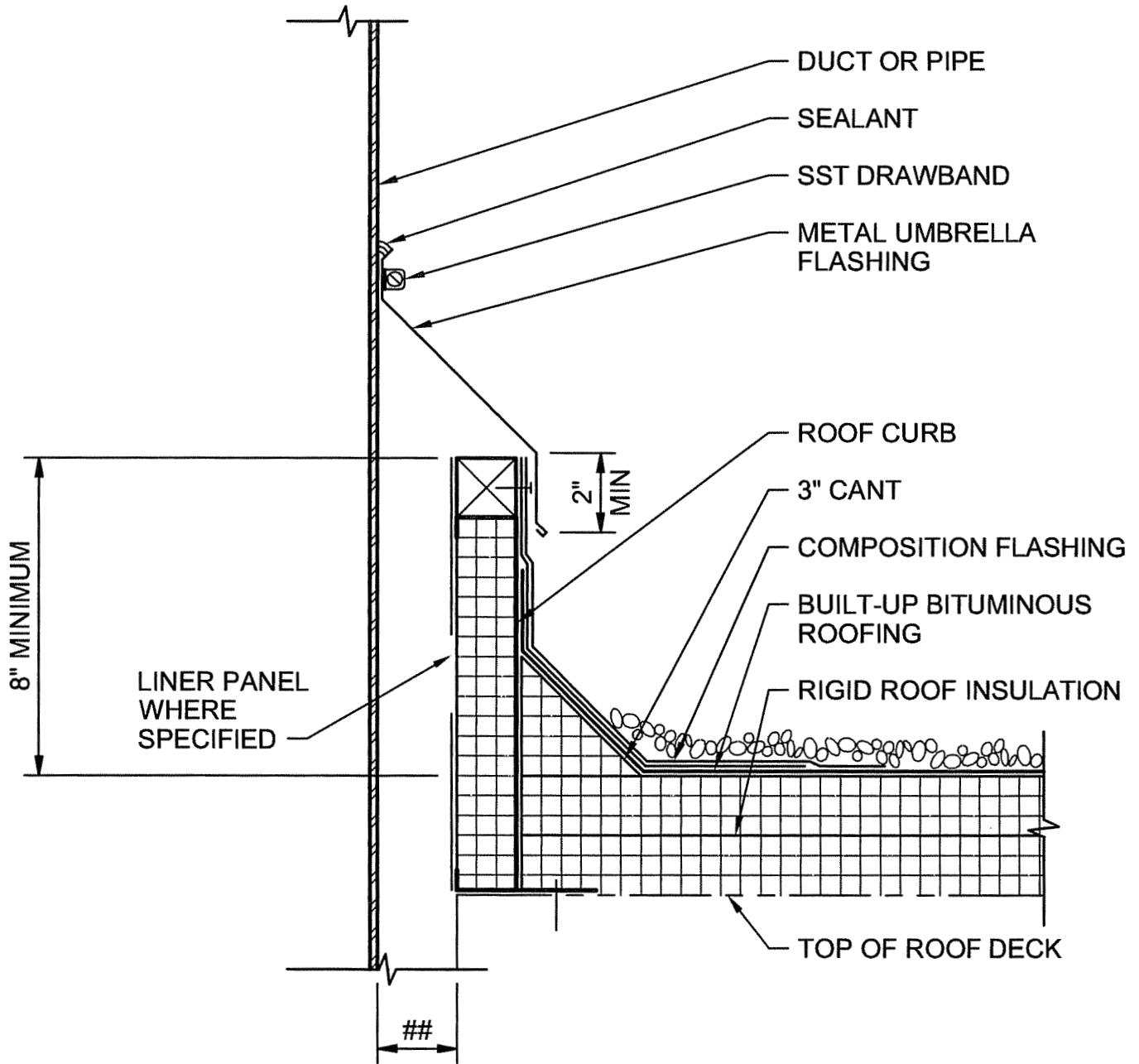
SPLASH PAN

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0762-004

CH2MHILL



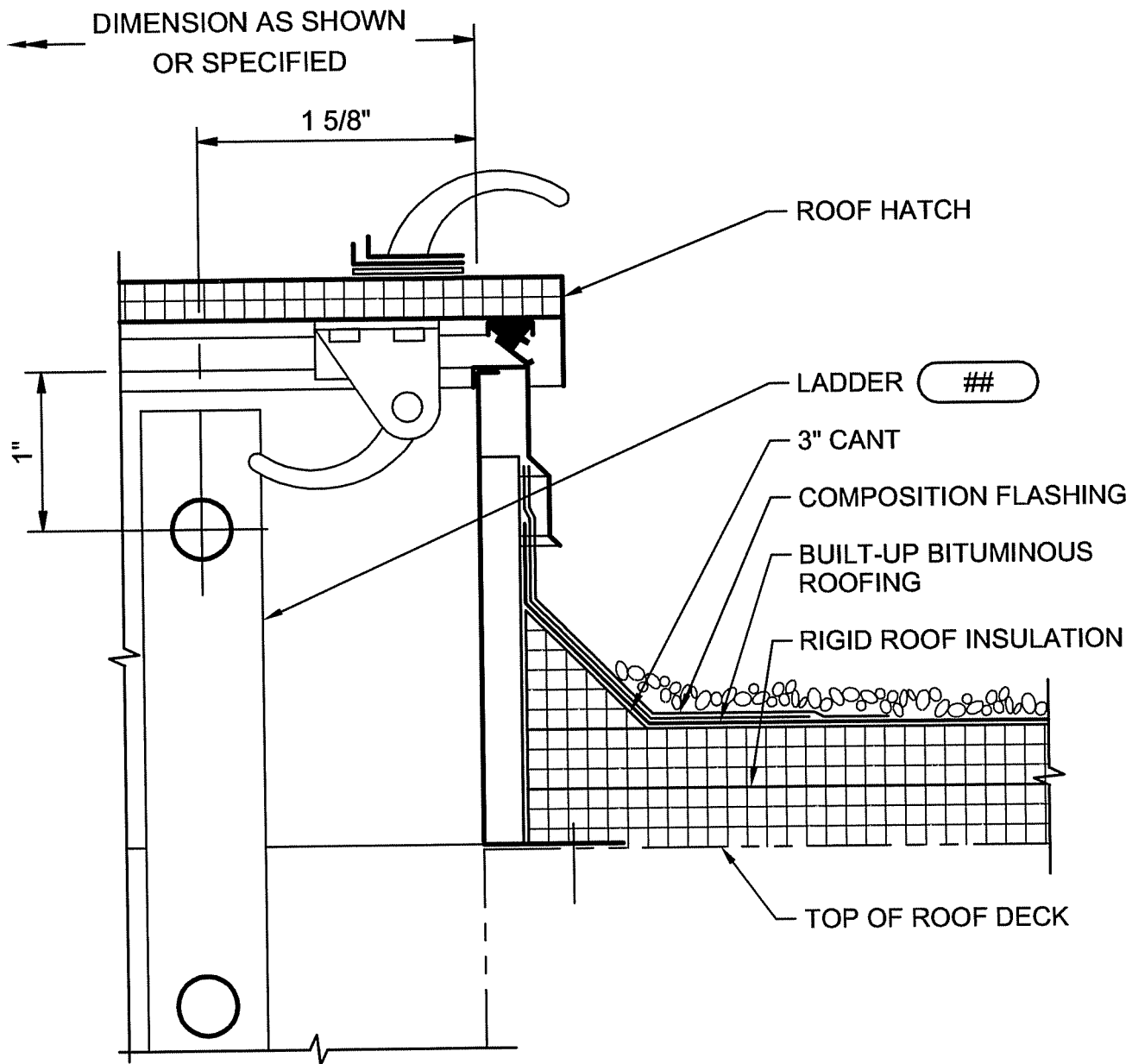
DUCT/PIPE PENETRATION

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0770-002

CH2MHILL

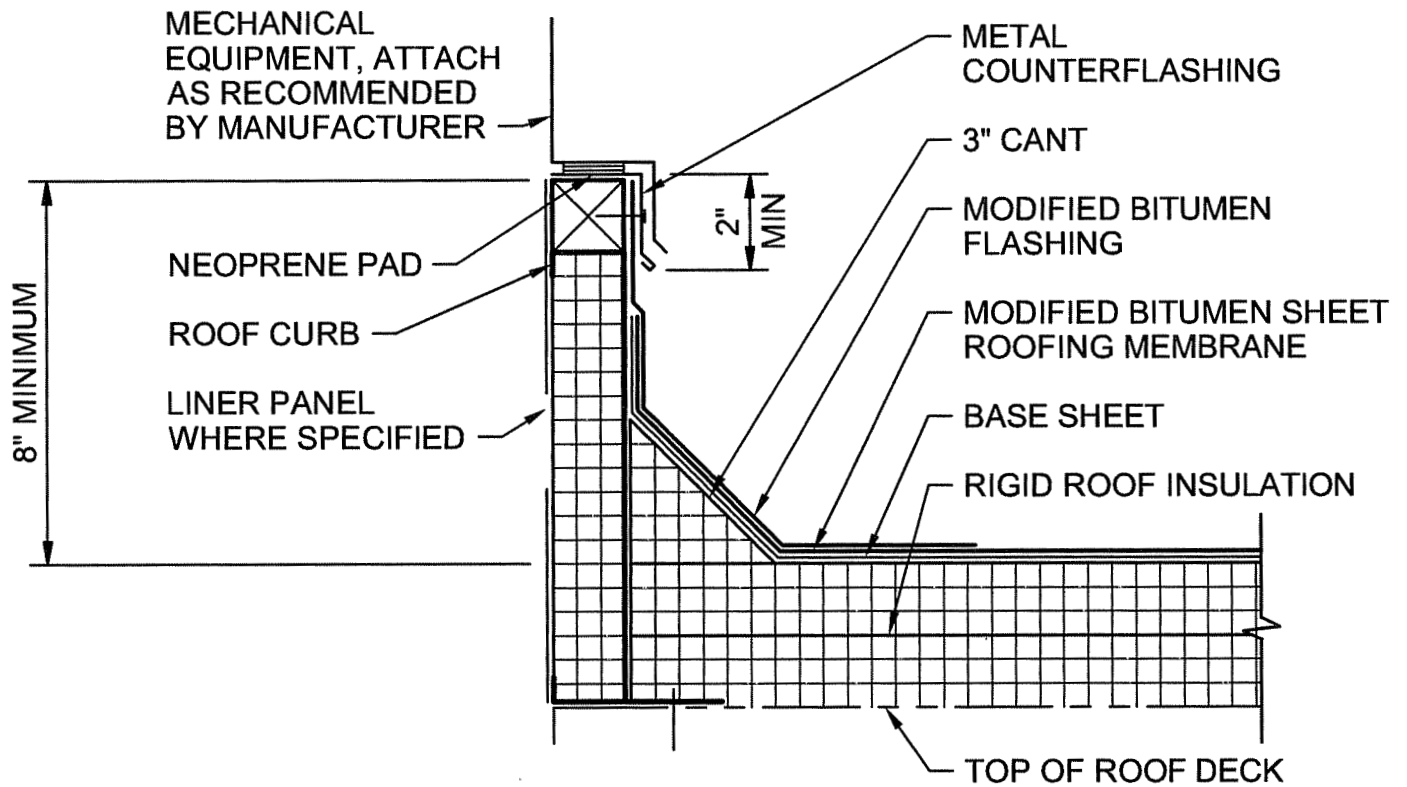


ROOF HATCH
NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0770-008

CH2MHILL



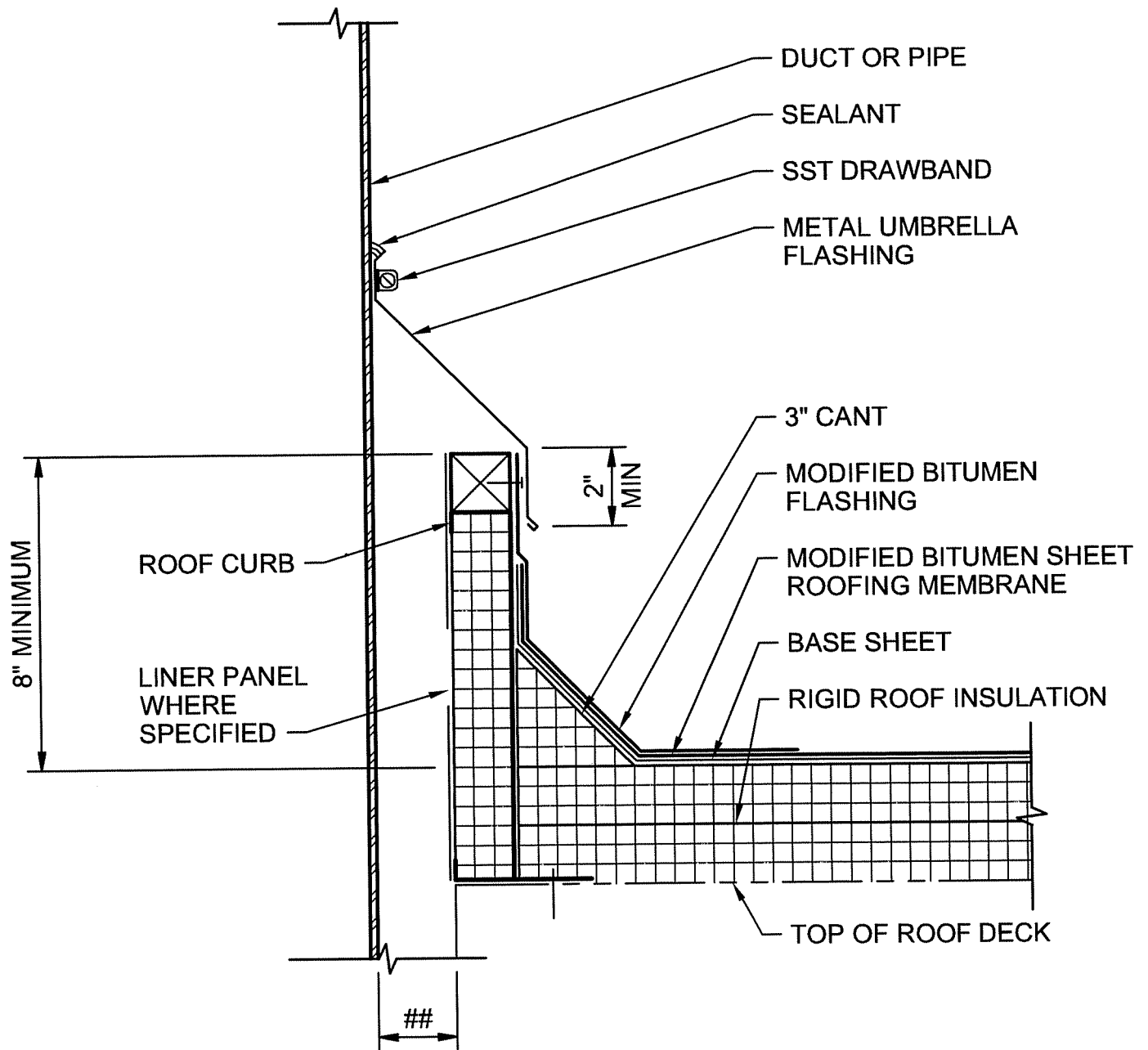
MECHANICAL EQUIPMENT CURB

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0770-016

CH2MHILL

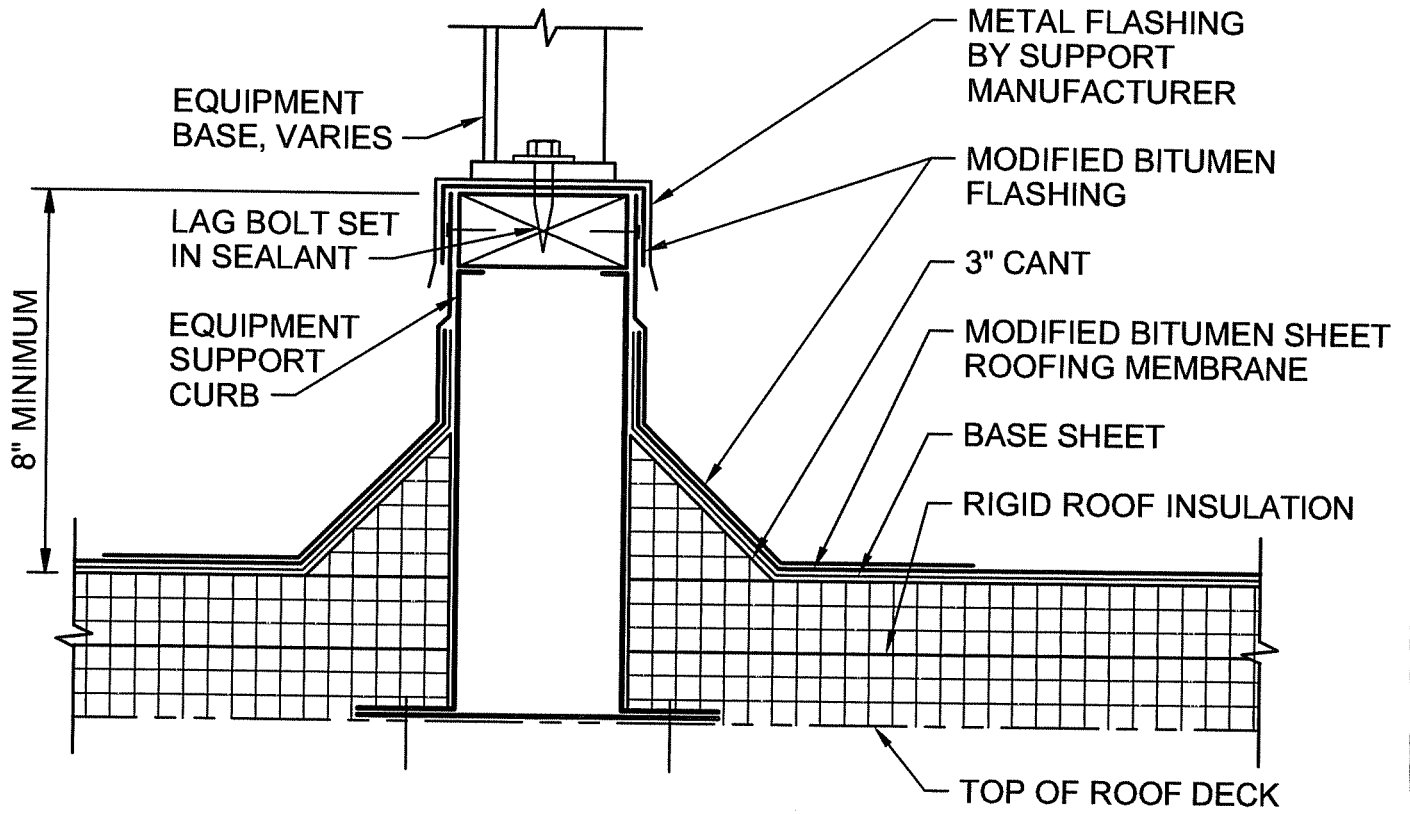


DUCT/PIPE PENETRATION

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0770-017

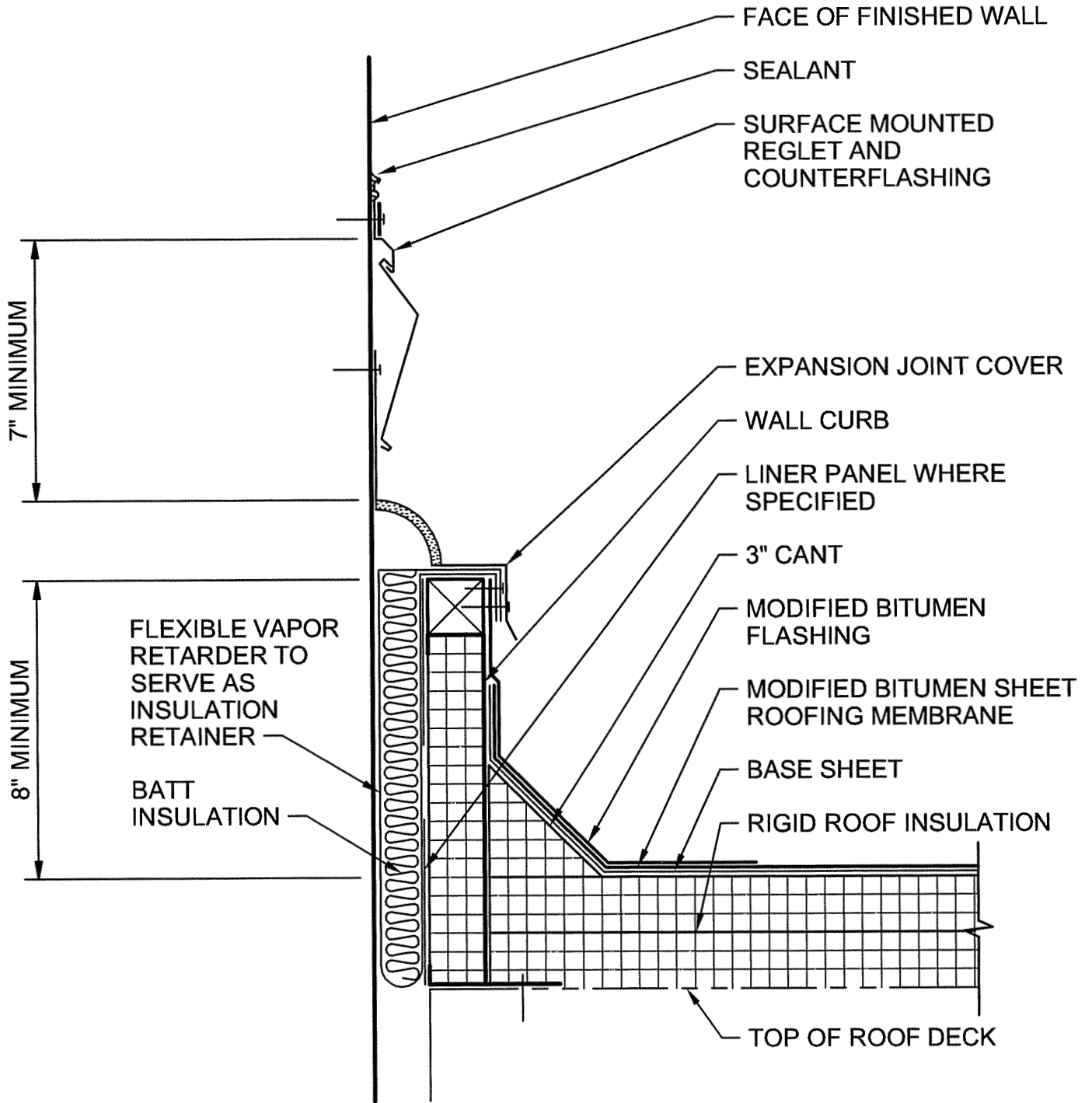


EQUIPMENT SUPPORT CURB

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0770-019



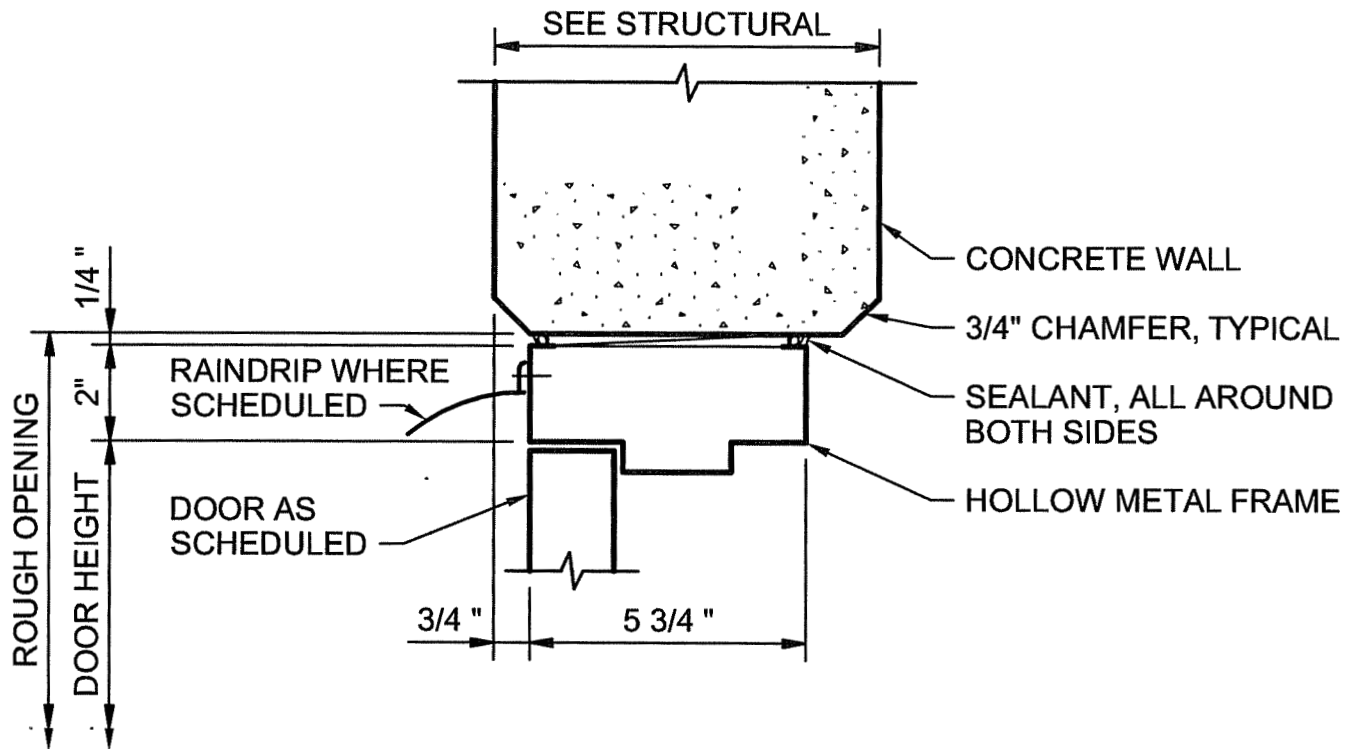
EXPANSION JOINT (AT WALL)

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0770-022

CH2MHILL

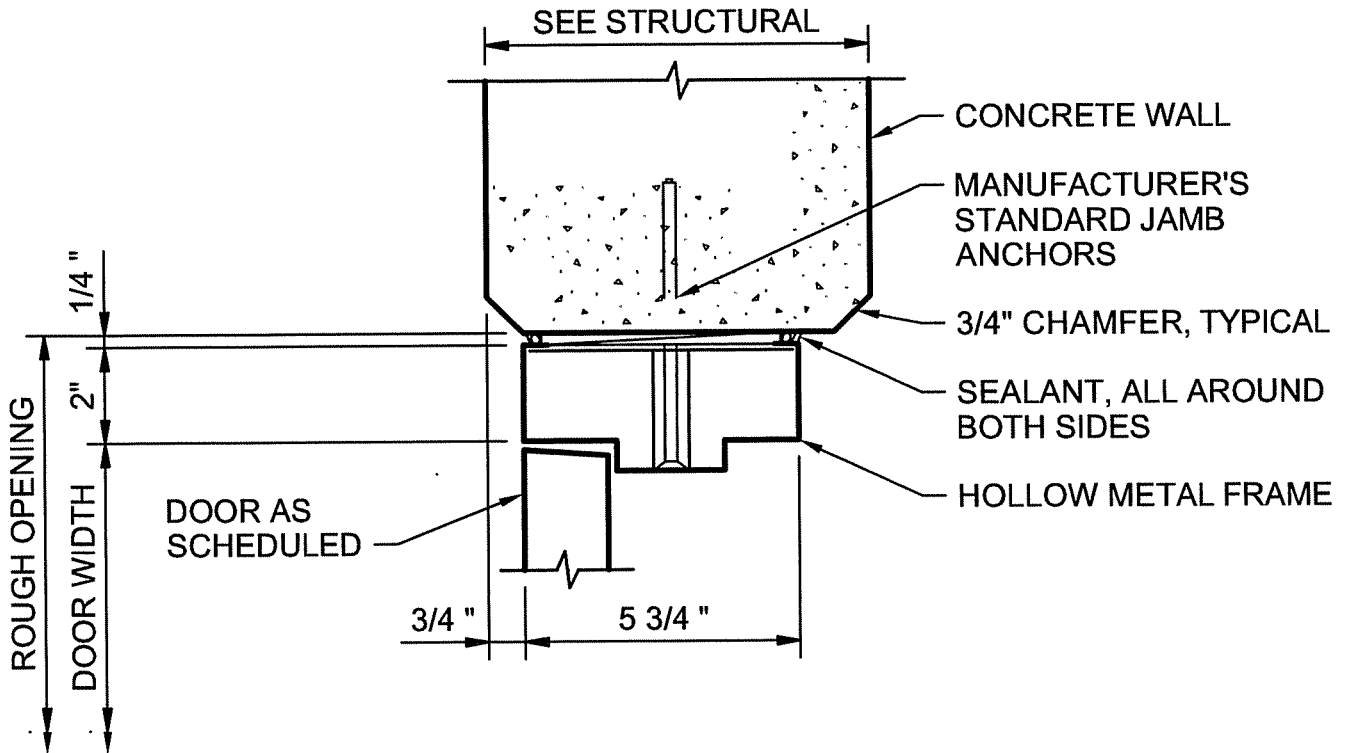


DOOR HEAD

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0811-001



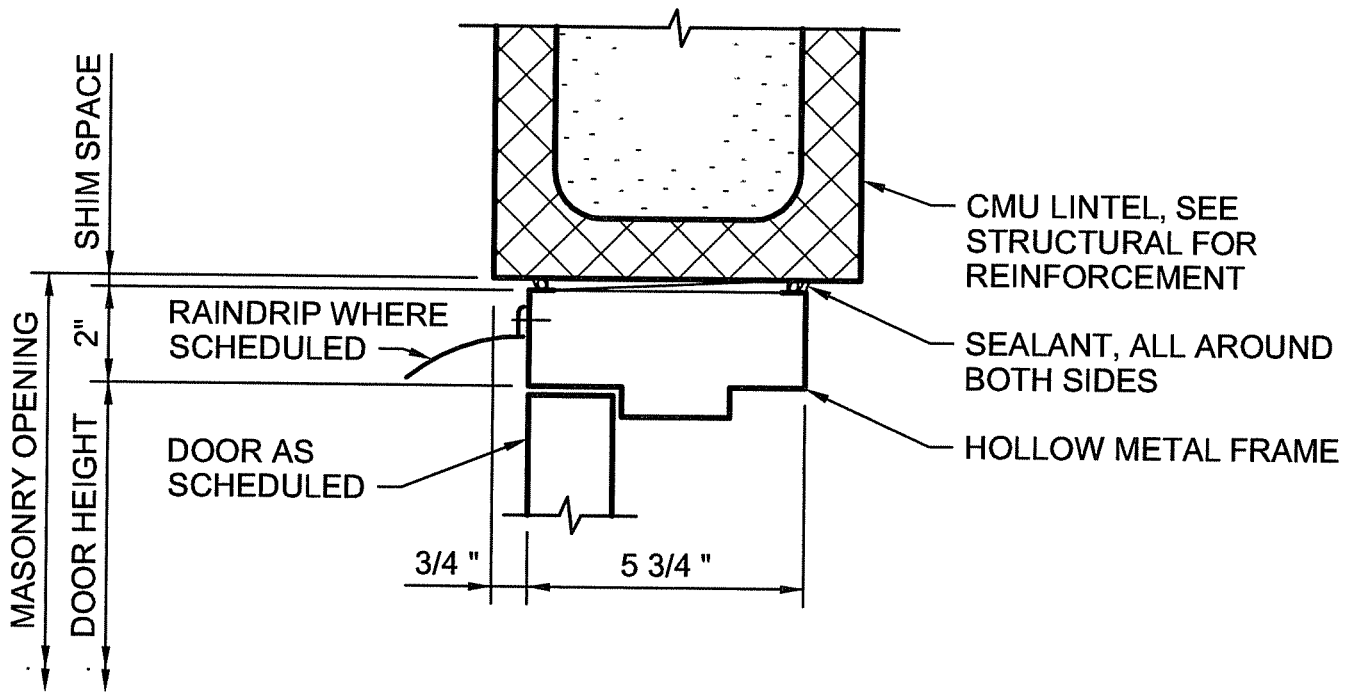
DOOR JAMB

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0811-002

CH2MHILL

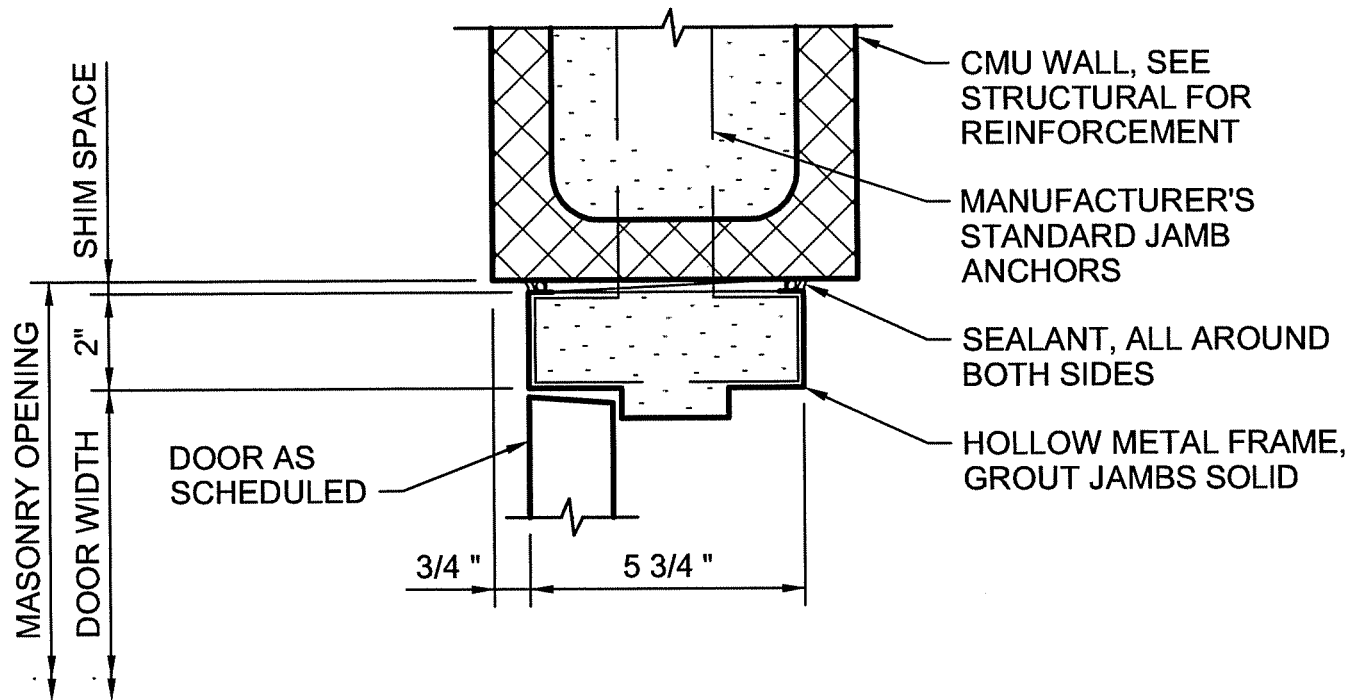


DOOR HEAD

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0811-003

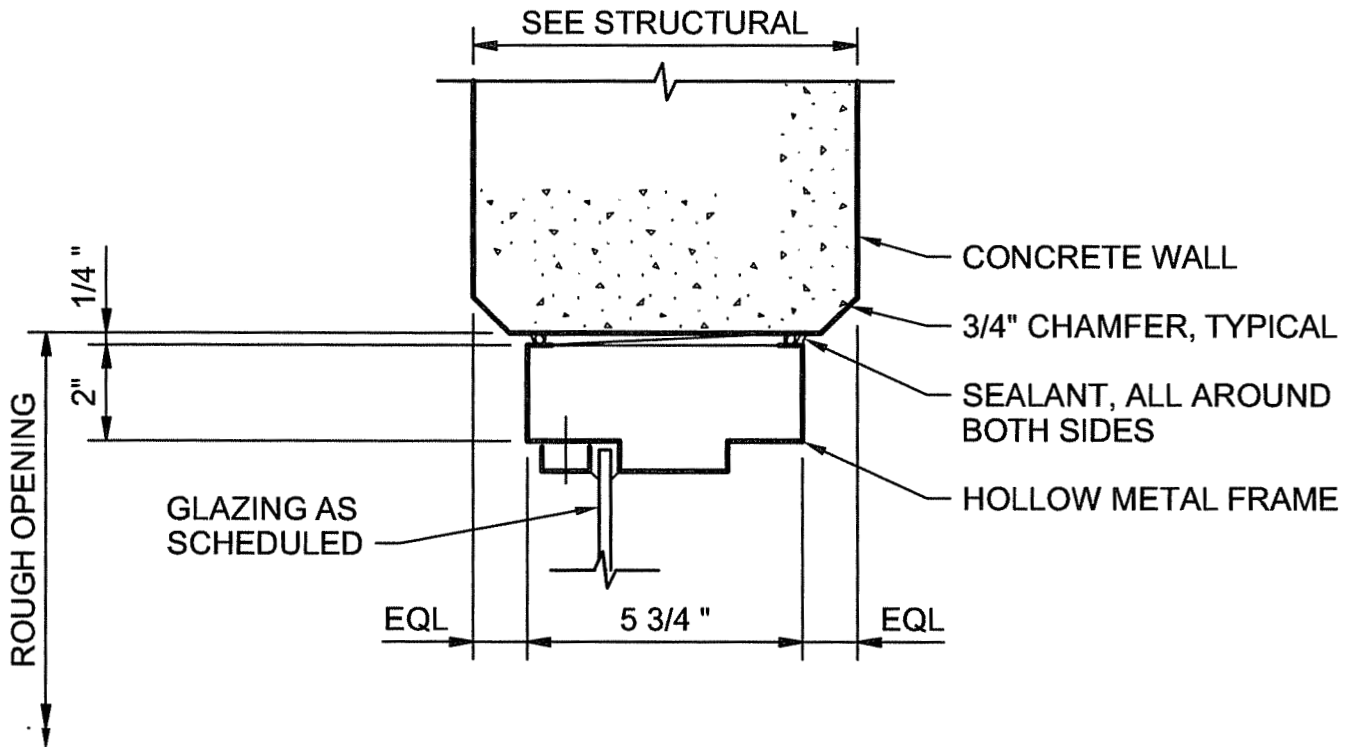


DOOR JAMB

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0811-004

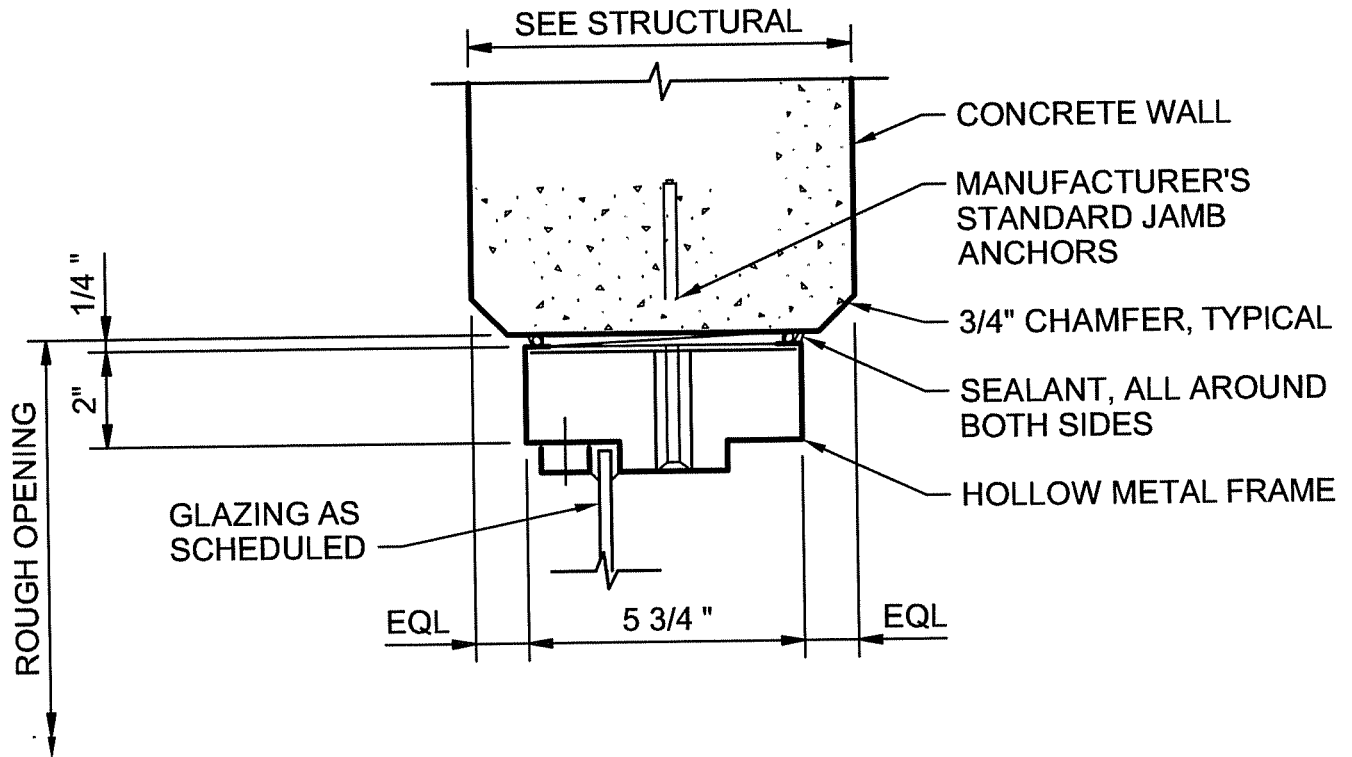


RELIGHT/SIDELIGHT/TRANSOM HEAD

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0811-007

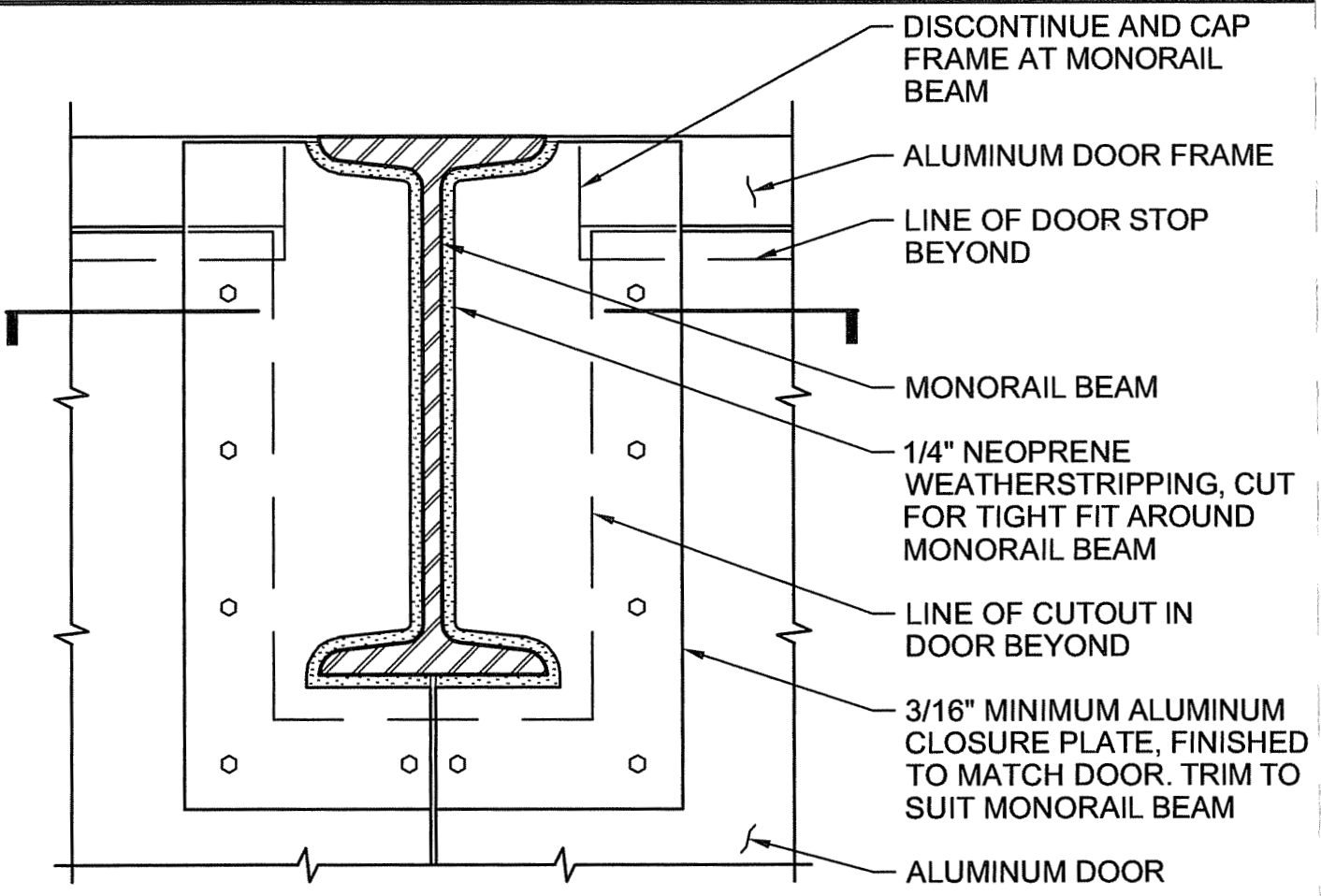


RELIGHT/SIDELIGHT/TRANSOM JAMB

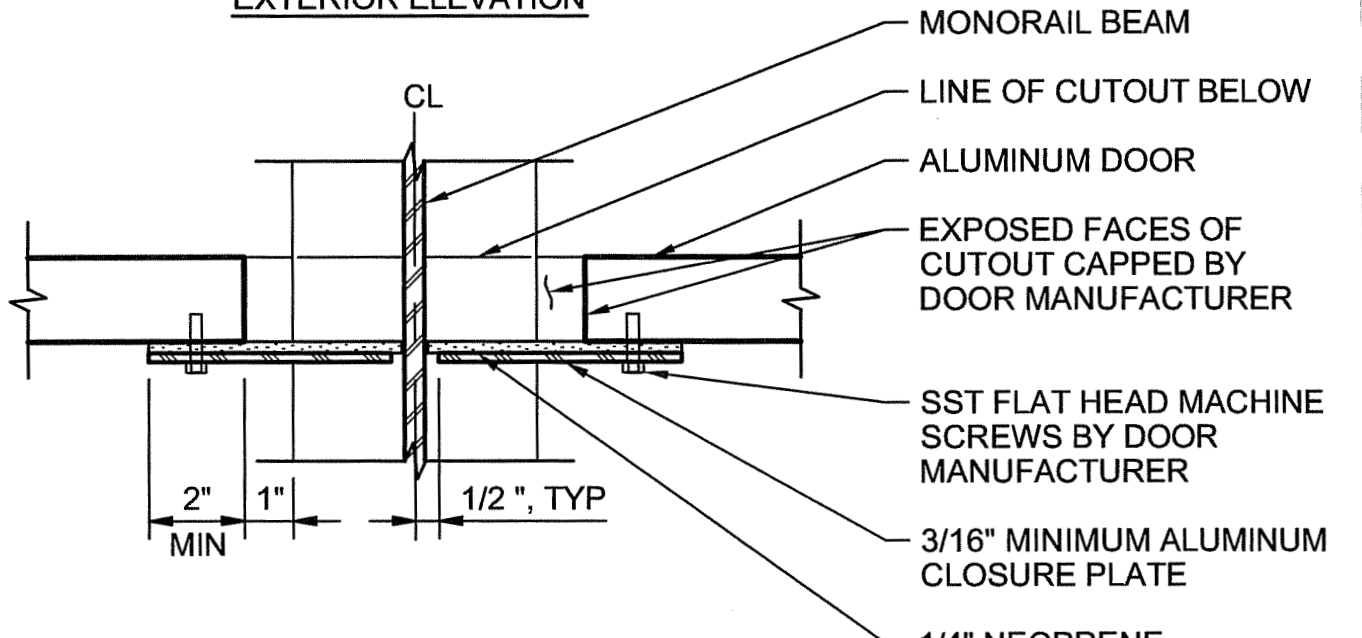
NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0811-008



EXTERIOR ELEVATION



HORIZONTAL SECTION THROUGH MONORAIL BEAM

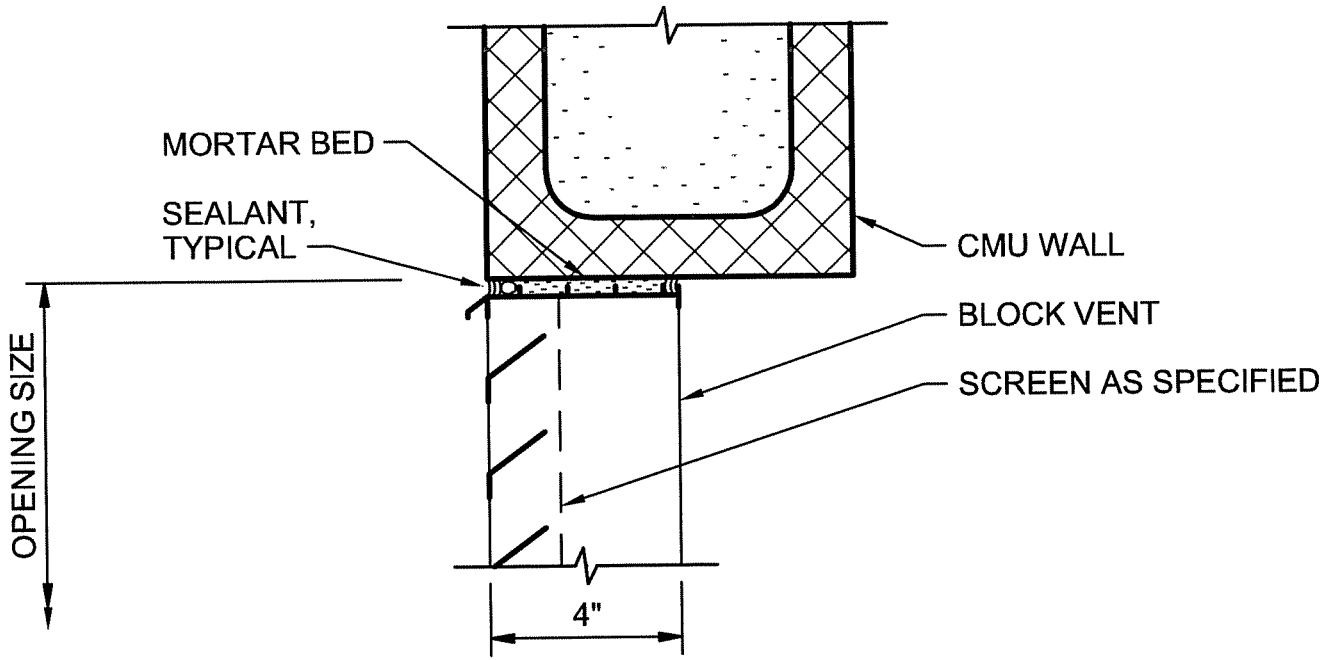
MONORAIL PENETRATION (DISCONTINUOUS FRAME)

NTS

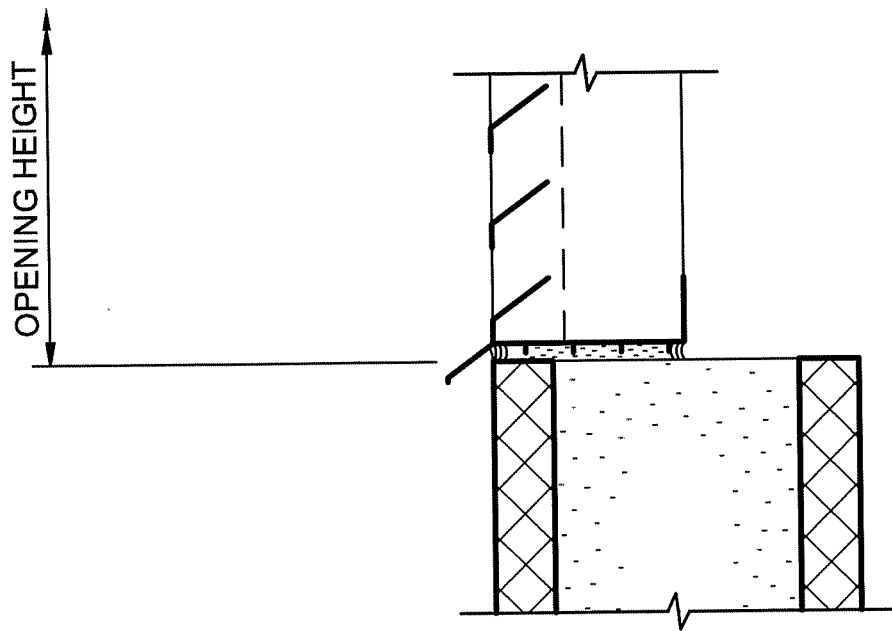
ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

0811-070

CH2MHILL



(JAMB SIMILAR)
HEAD



SILL

BLOCK VENT HEAD AND SILL

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

0890-005



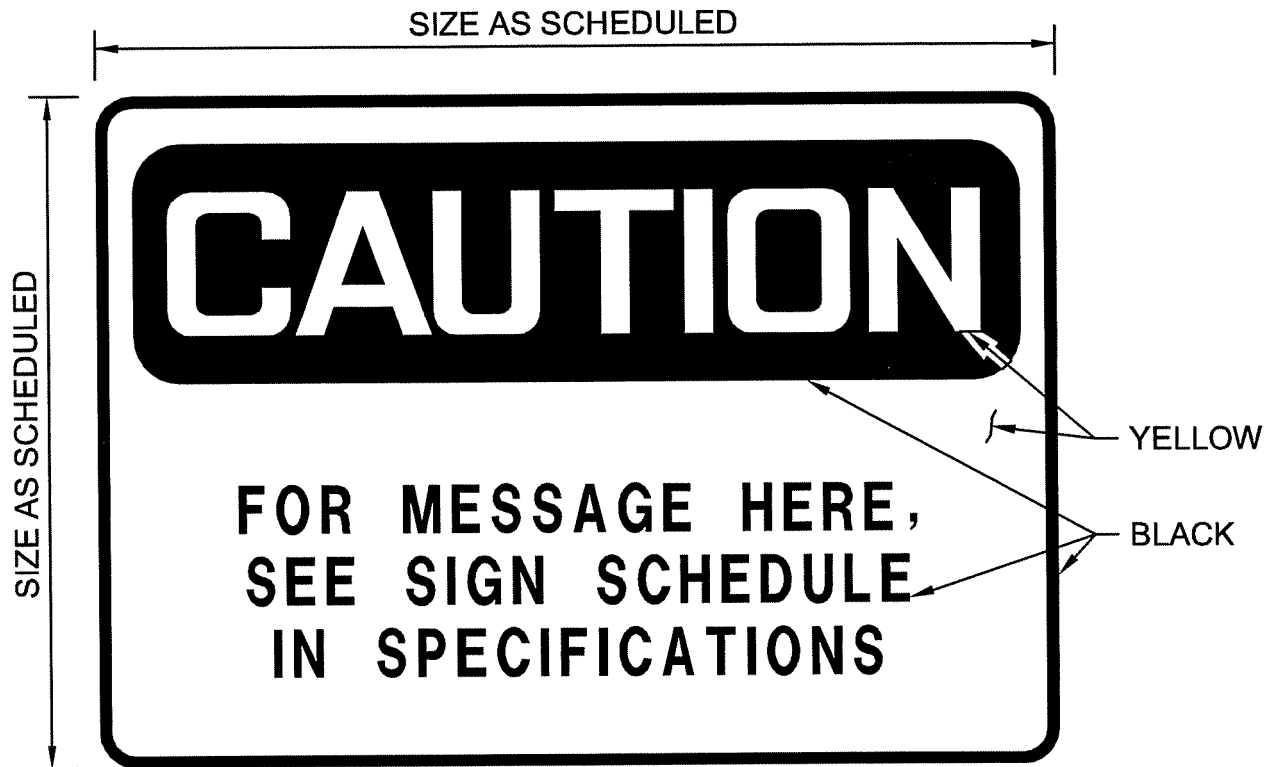
DANGER SIGN

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

1014-001

CH2MHILL

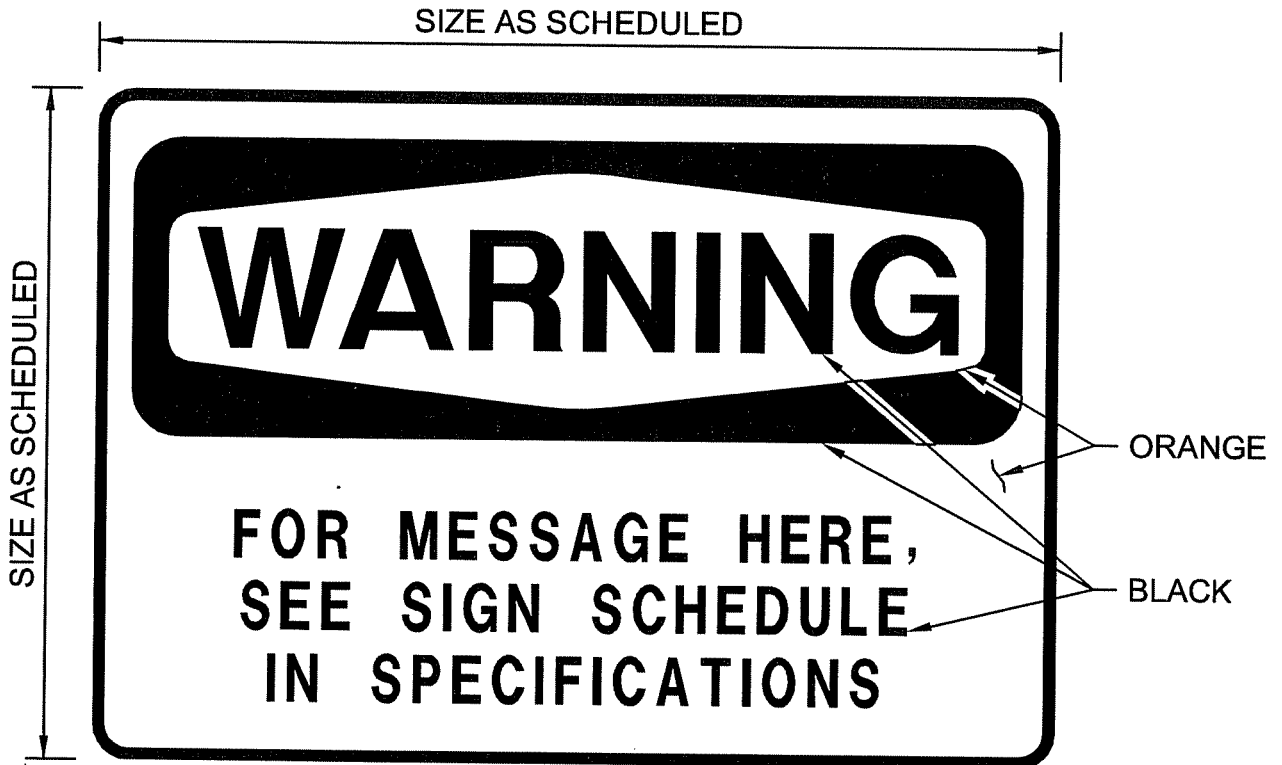


CAUTION SIGN

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

1014-002

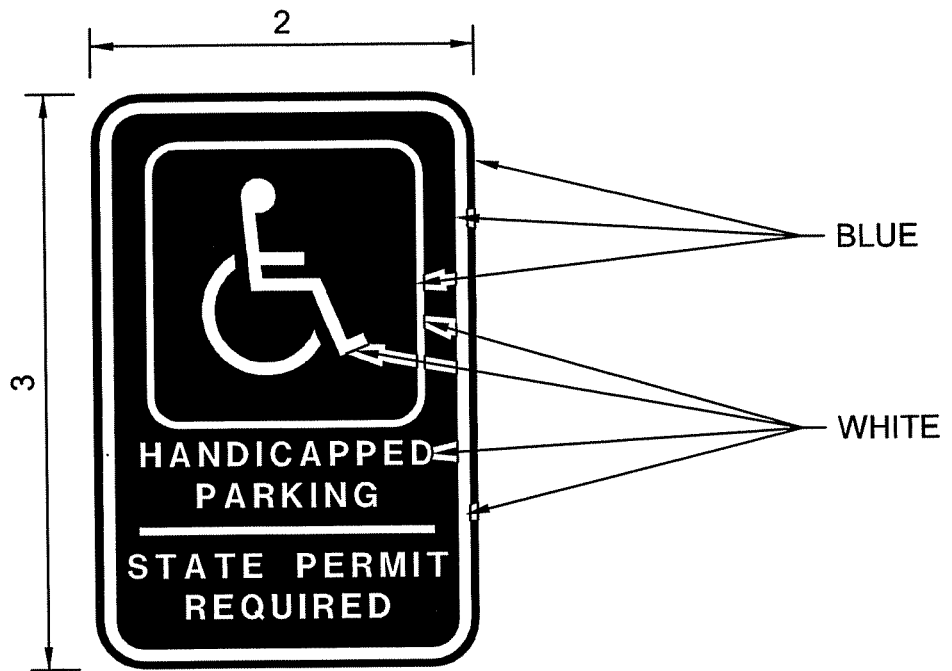


WARNING SIGN

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

1014-003

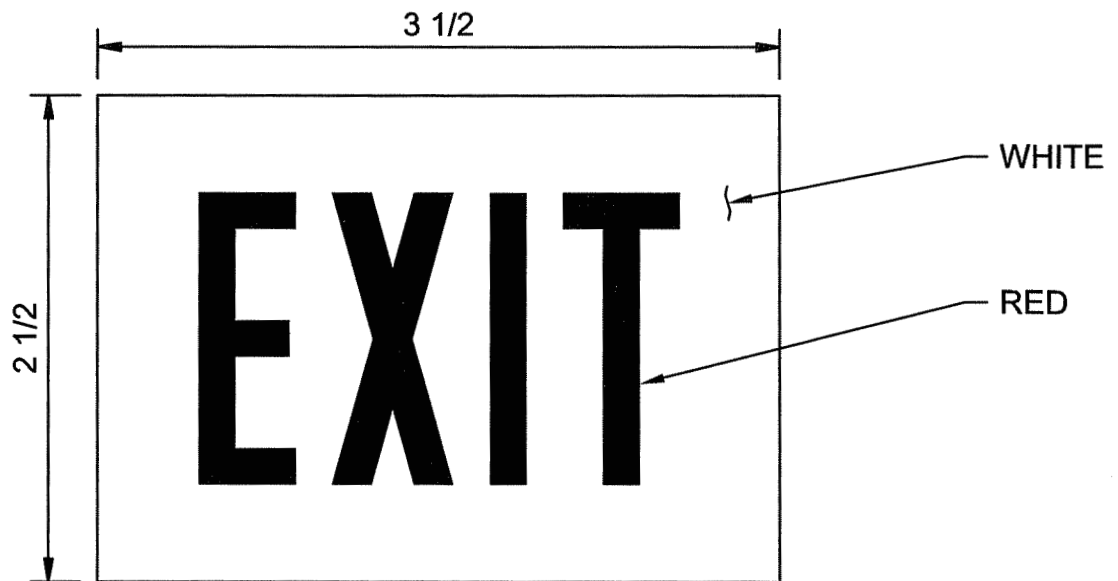


HANDICAPPED PARKING SIGN

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

1014-004



EXIT SIGN

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

1014-005

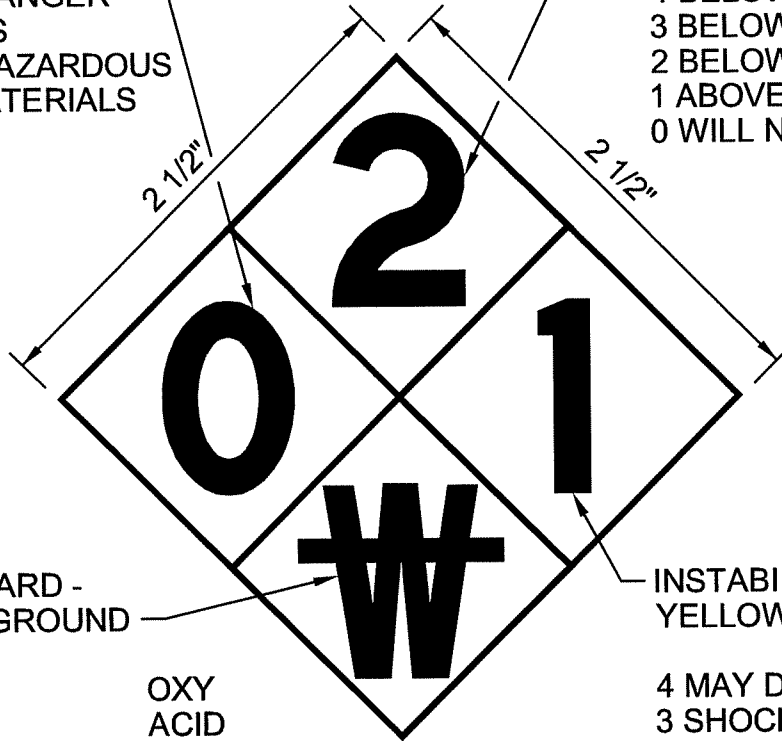
CH2MHILL

HEALTH HAZARD -
BLUE BACKGROUND

- 4 DEADLY
- 3 EXTREME DANGER
- 2 HAZARDOUS
- 1 SLIGHTLY HAZARDOUS
- 0 NORMAL MATERIALS

FLAMMABILITY HAZARD -
RED BACKGROUND

- FLASH POINTS
- 4 BELOW 73 F
- 3 BELOW 100 F
- 2 BELOW 200 F
- 1 ABOVE 200 F
- 0 WILL NOT BURN



SPECIAL HAZARD -
WHITE BACKGROUND

- OXIDIZER
- ACID
- ALKALI
- CORROSIVE
- USE NO WATER
- RADIATION HAZARD

- OXY
- ACID
- ALK
- COR
- W
- 

INSTABILITY HAZARD -
YELLOW BACKGROUND

- 4 MAY DETONATE
- 3 SHOCK & HEAT MAY DETONATE
- 2 VIOLENT CHEMICAL CHANGE
- 1 UNSTABLE IF HEATED
- 0 STABLE

NOTES:

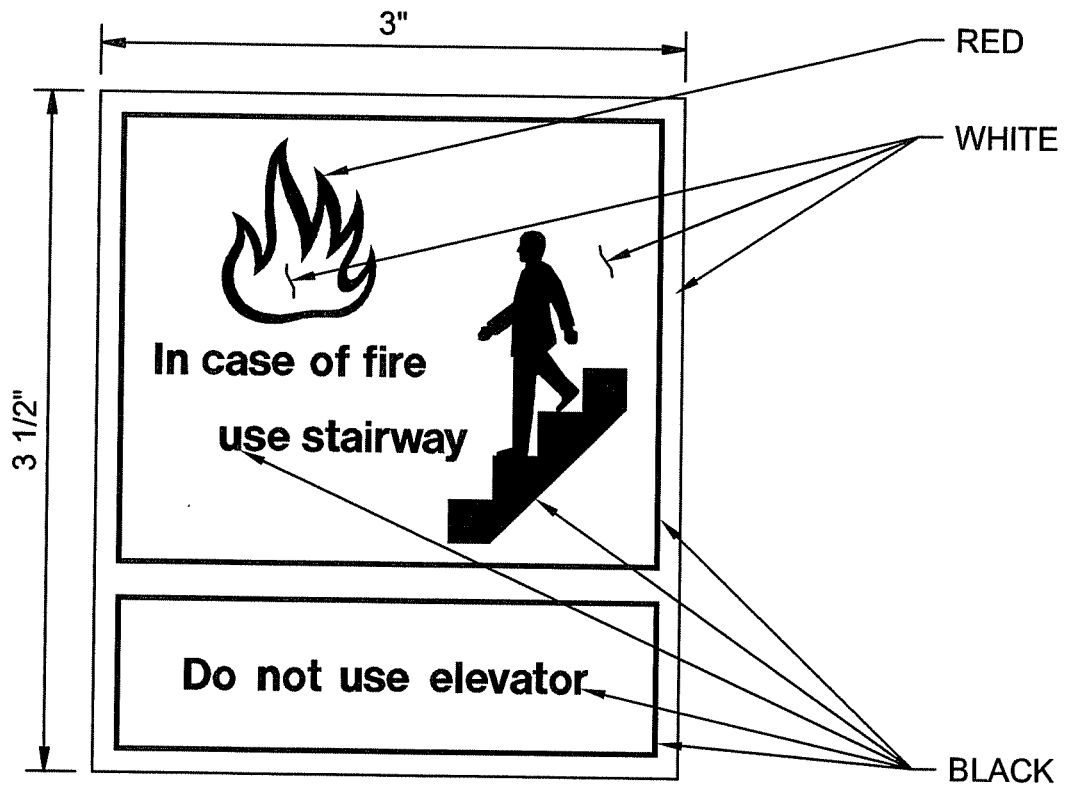
1. LETTER HEIGHT: 4"
LETTER COLOR: BLACK
2. NUMBERS AND LETTERS ON ABOVE SIGNAL DETAIL
ARE EXAMPLES ONLY. SEE SPECIFICATION 10 14 00
FOR REQUIREMENTS ON THIS PROJECT.

HAZARDOUS MATERIAL SIGNAL

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

1014-006

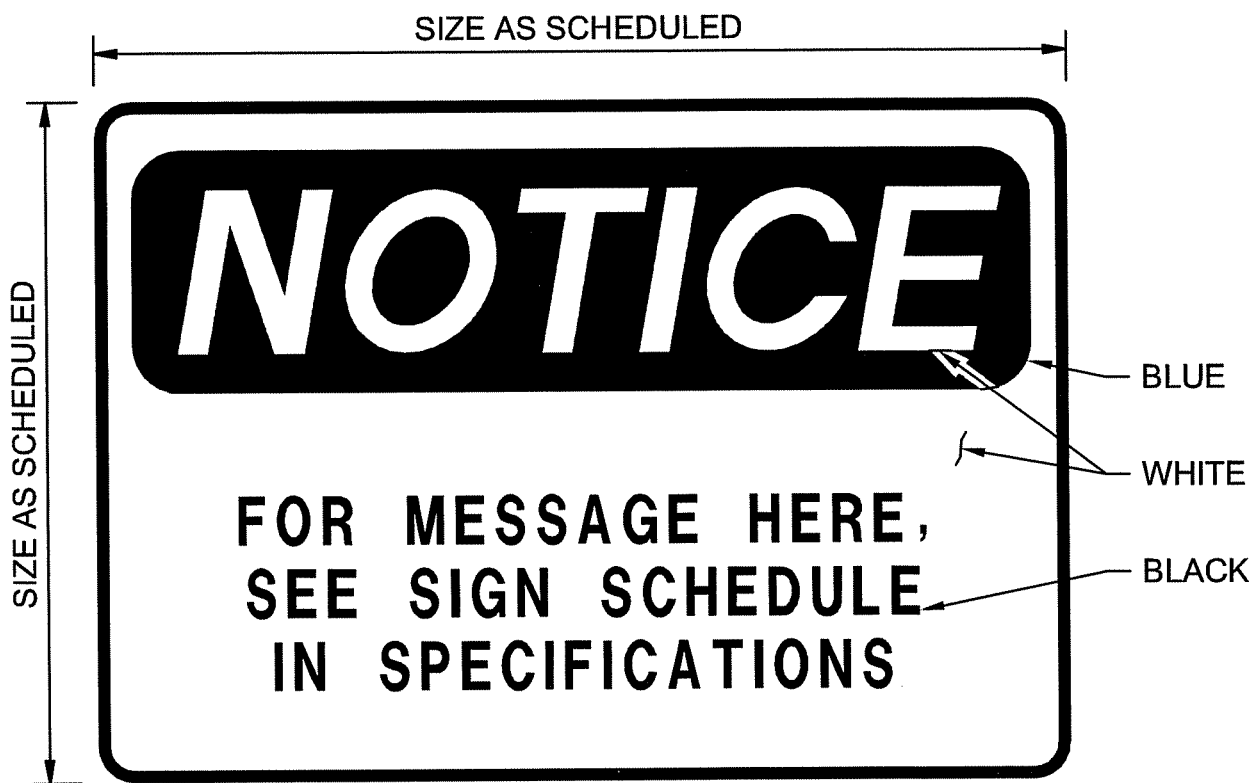


ELEVATOR WARNING SIGN

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

1014-007

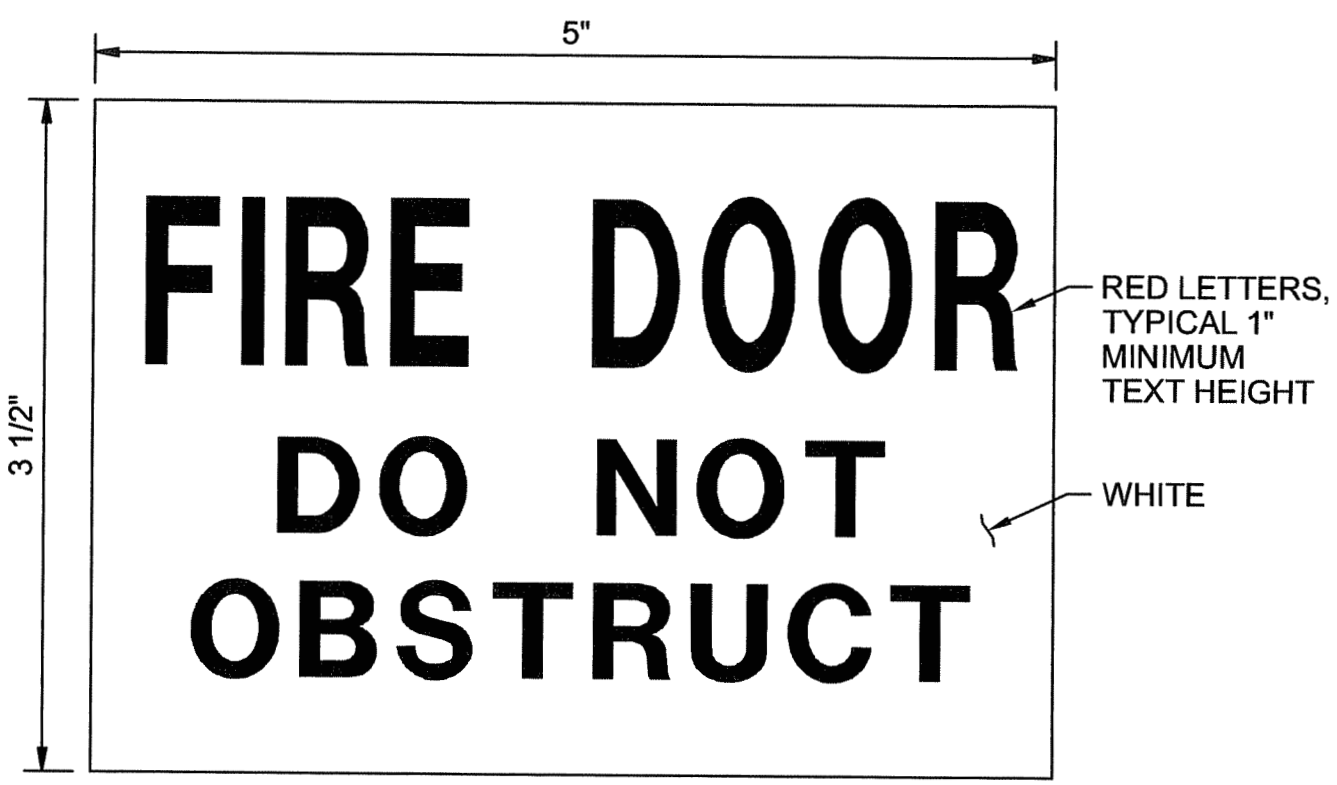


NOTICE SIGN

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

1014-008

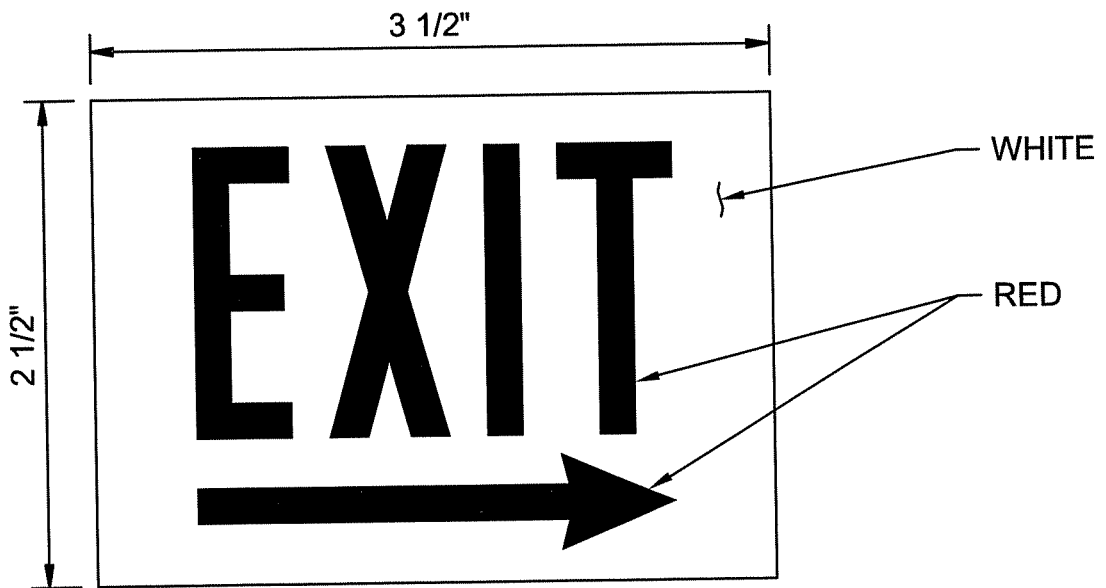


FIRE DOOR SIGN

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

1014-009



NOTES:

1. DIRECTION ARROW POINTS TO LEFT OR RIGHT, AS SCHEDULED.
2. AT 2-SIDED SIGNS, DIRECTION ARROW POINTS TO LEFT ON ONE FACE AND TO RIGHT ON OTHER FACE. FURNISH BRACKET FOR WALL MOUNTING.

EXIT SIGN

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

1014-010

CH2MHILL



EXIT WARNING SIGN

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

1014-011



SAFETY FIRST SIGN

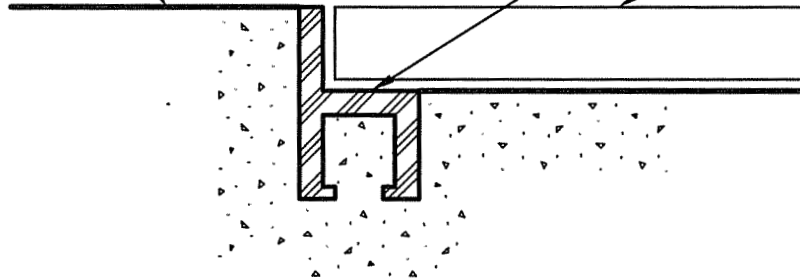
NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

1014-012

CH2MHILL

FLOORING AS
SCHEDULED



MAT FRAME AS SPECIFIED

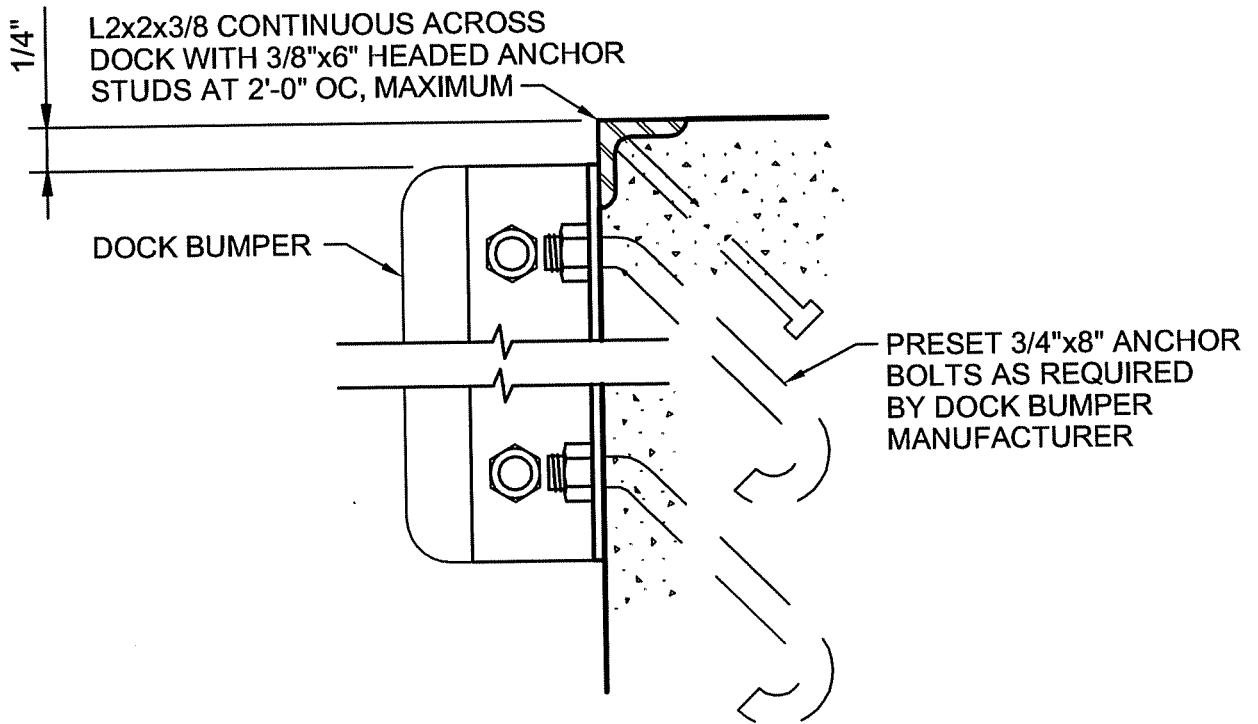
FLOOR MAT AS SPECIFIED

FLOOR MAT AND FRAME

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

1080-002



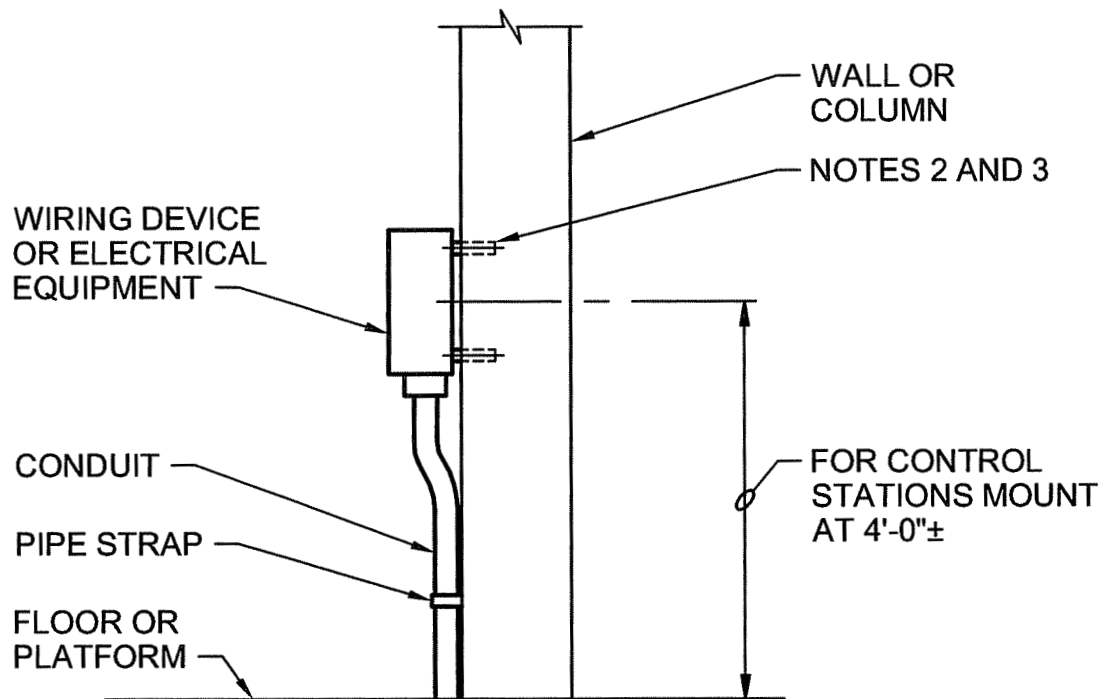
DOCK BUMPER

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

1080-003

CH2MHILL



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.

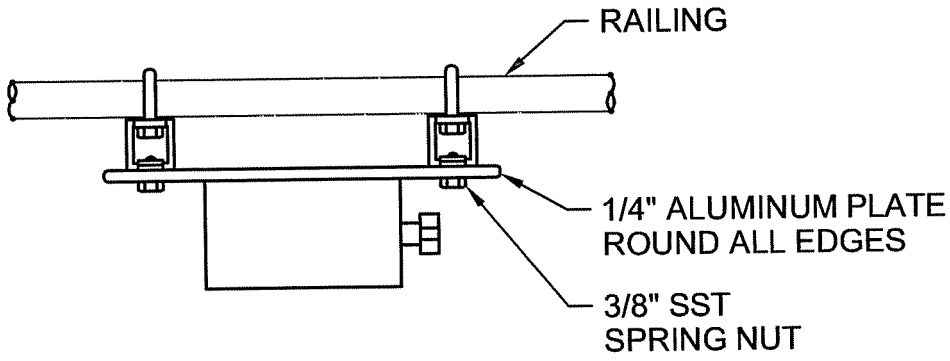
WALL OR COLUMN MOUNTED DEVICE

NTS

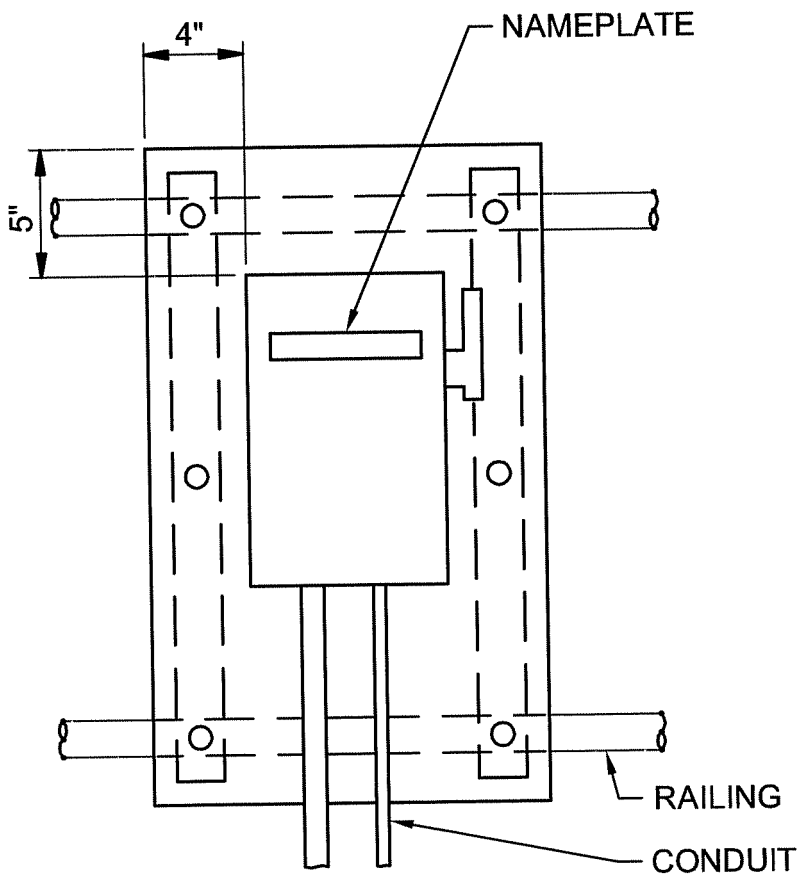
ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

2605-002

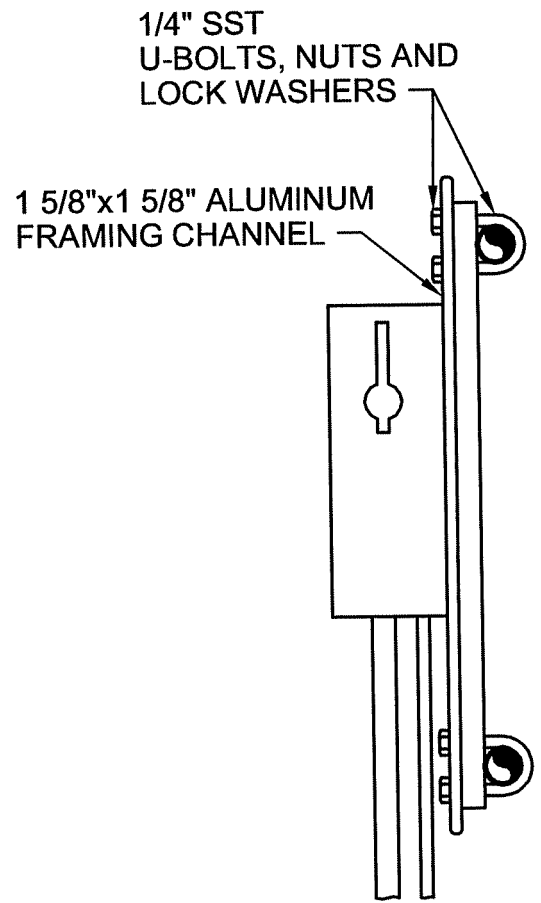
CH2MHILL



TOP



FRONT



SIDE

NONFUSED DISCONNECT SWITCH MOUNTING

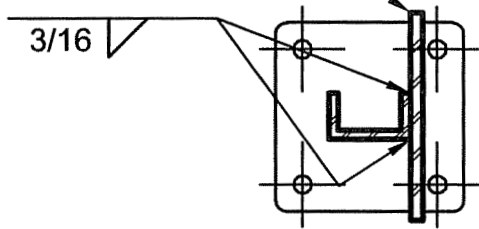
NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

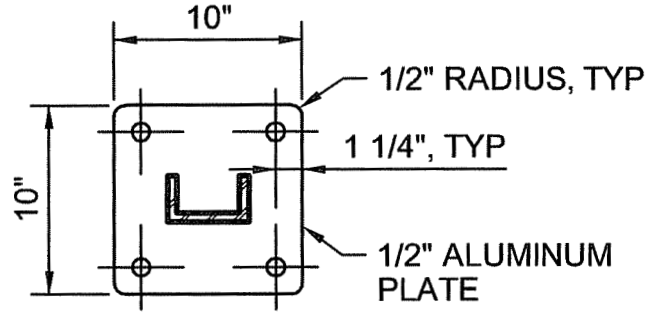
2605-003b

CH2MHILL

1/4" ALUMINUM MOUNTING PLATE,
(18" MAX, WIDTH), ROUND EDGES,
1/2" RADIUS, TYP

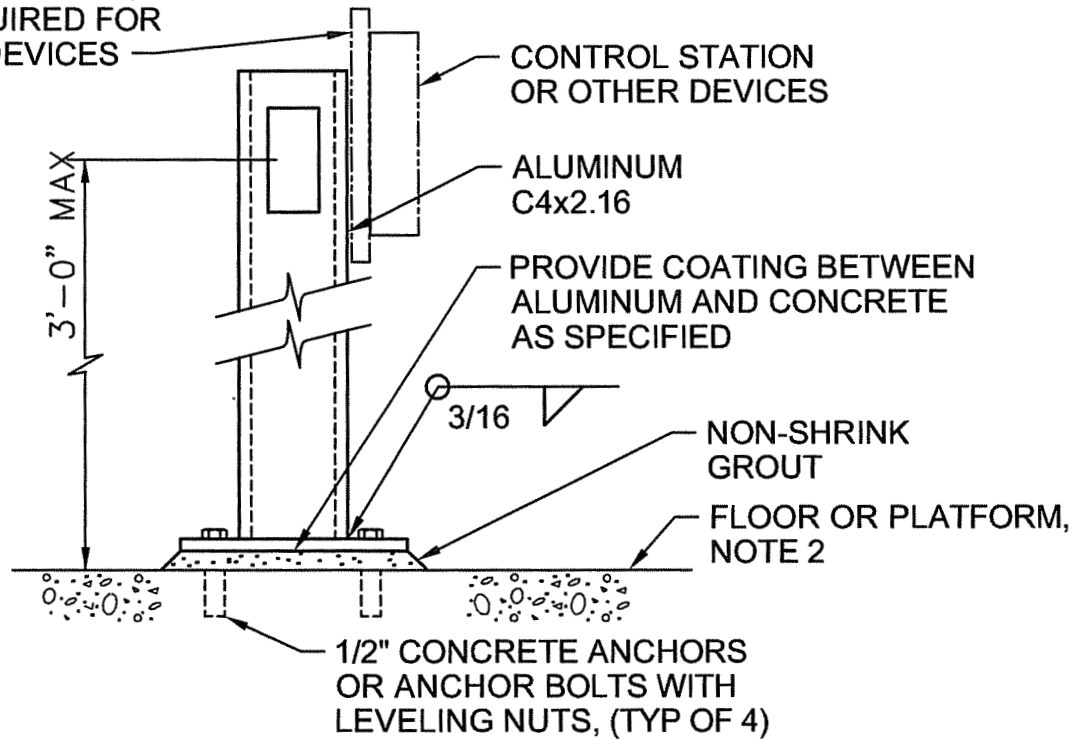


OVERSIZED DEVICES



PLAN

1/4" ALUMINUM PLATE,
SIZE AS REQUIRED FOR
OVERSIZED DEVICES



ELEVATION

NOTES:

1. USE STAINLESS STEEL MOUNTING HARDWARE. USE WASHERS AND SPLIT-LOCK WASHERS UNDER ALL NUTS.
2. FOR YARD LOCATIONS, PROVIDE 2'-0" SQUARE x 6" THICK CONCRETE PAD AT GRADE WITH 3#4 REBAR EACH WAY, CENTERED.
3. CONTROL STATIONS DEVICES AND EQUIPMENT HAVING A FRONTAL AREA NOT GREATER THAN 2'-0" SQ FT SHALL BE PEDESTAL MOUNTED UNLESS OTHERWISE INDICATED.

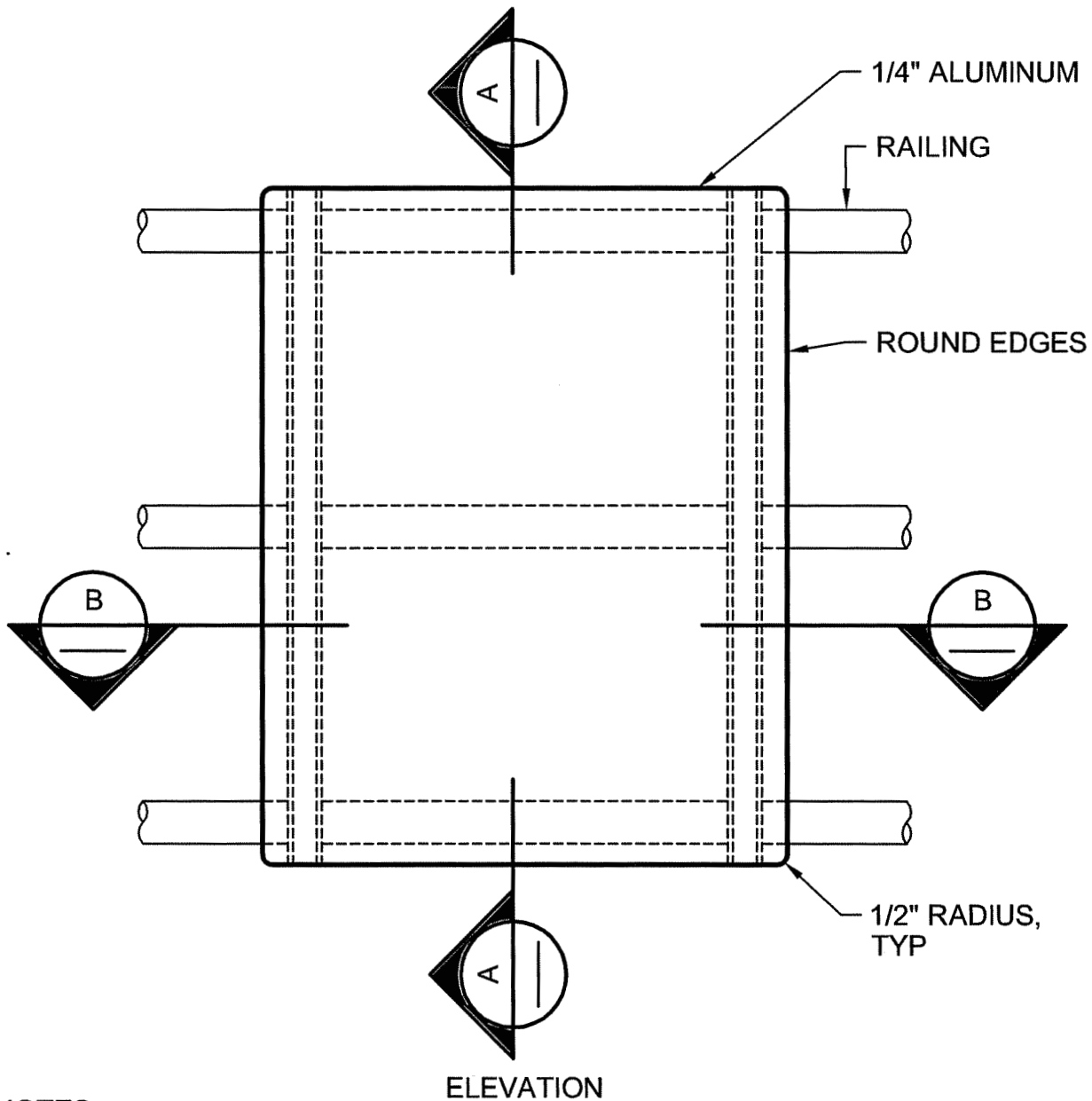
EQUIPMENT MOUNTING PEDESTAL

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2605-005b

CH2MHILL



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".

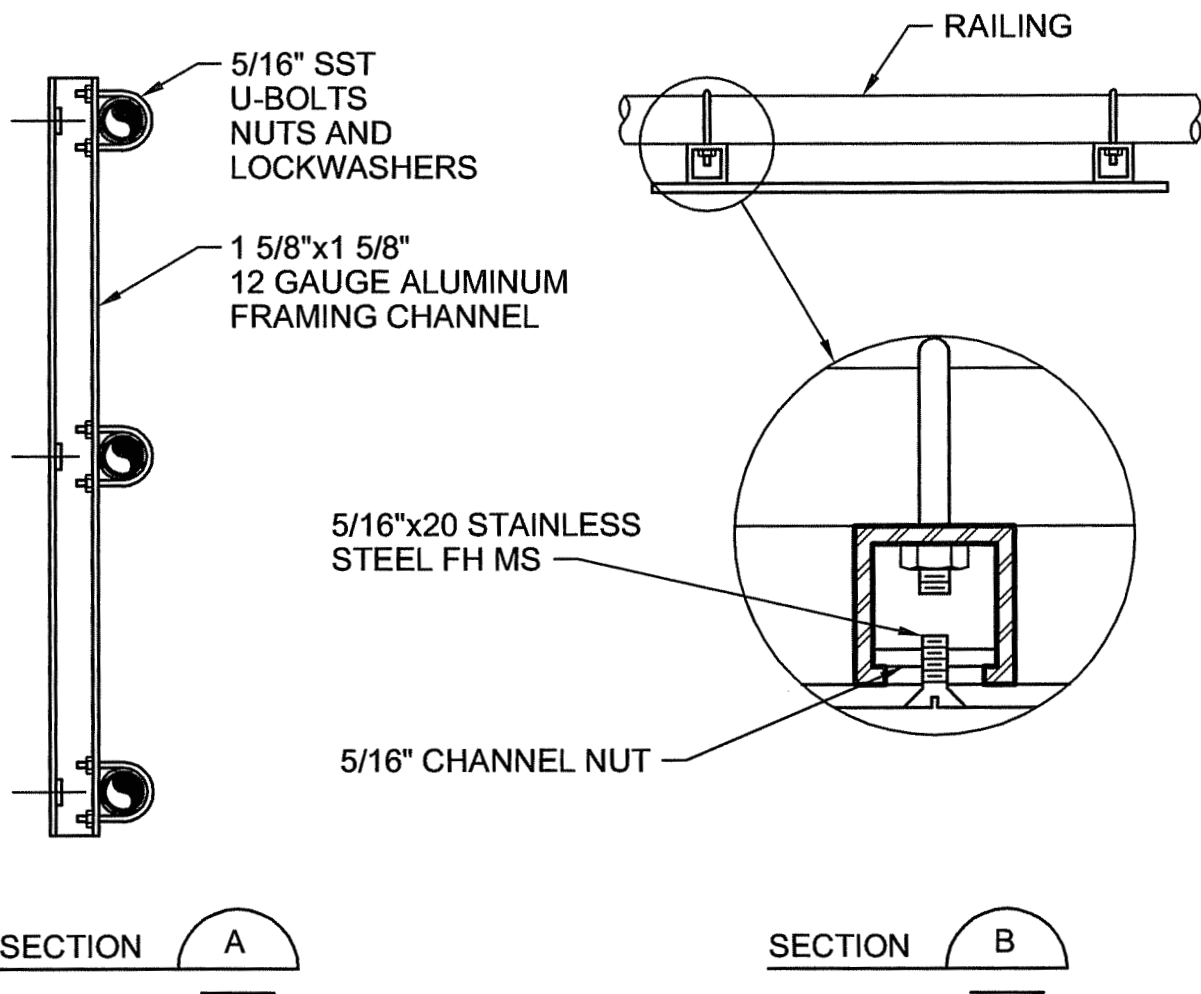
RAILING MOUNTED EQUIPMENT SUPPORT

NTS

DETAIL 1 OF 2

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

2605-007



RAILING MOUNTED EQUIPMENT SUPPORT

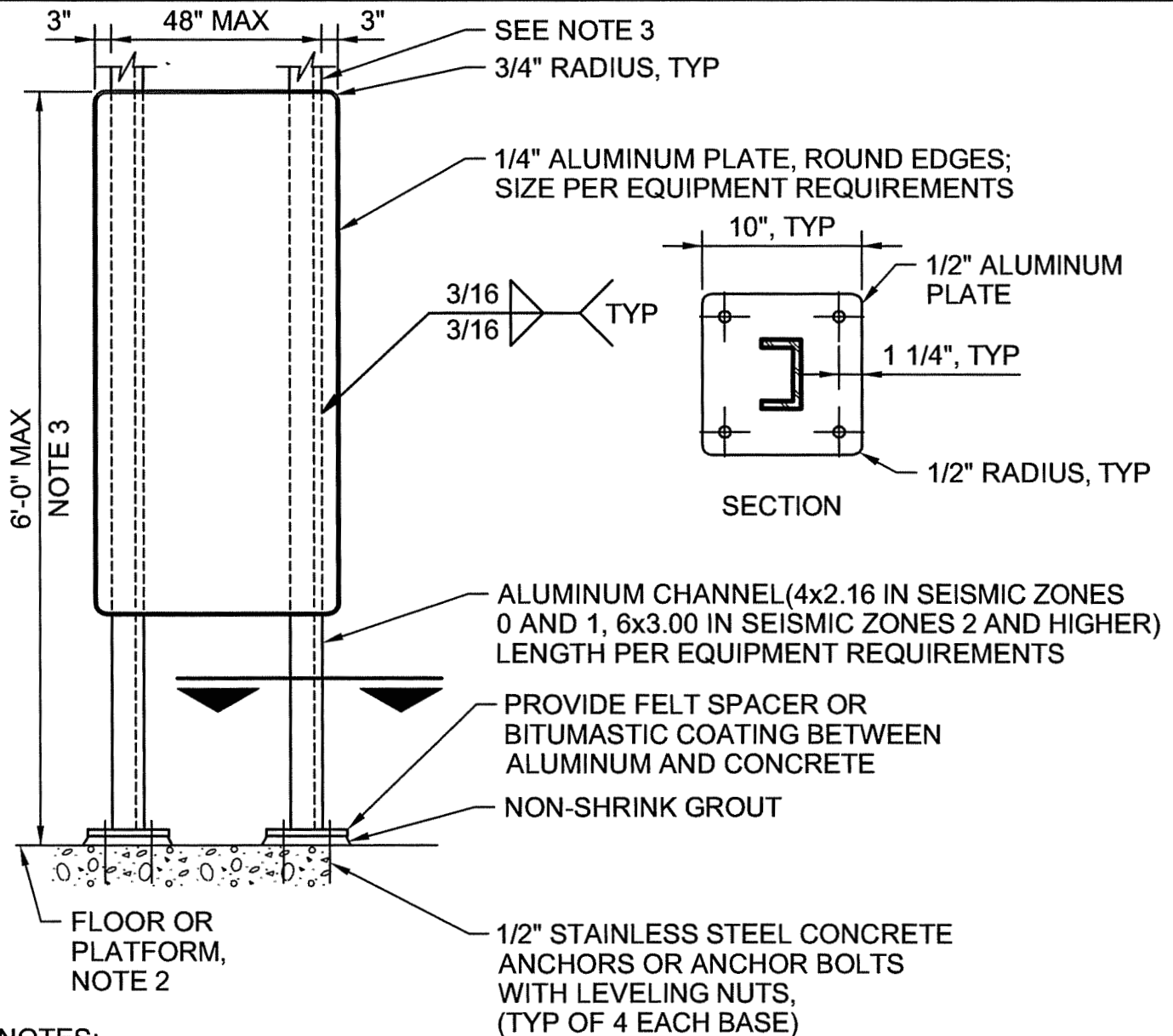
NTS

DETAIL 2 OF 2

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2605-007

CH2MHILL



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.

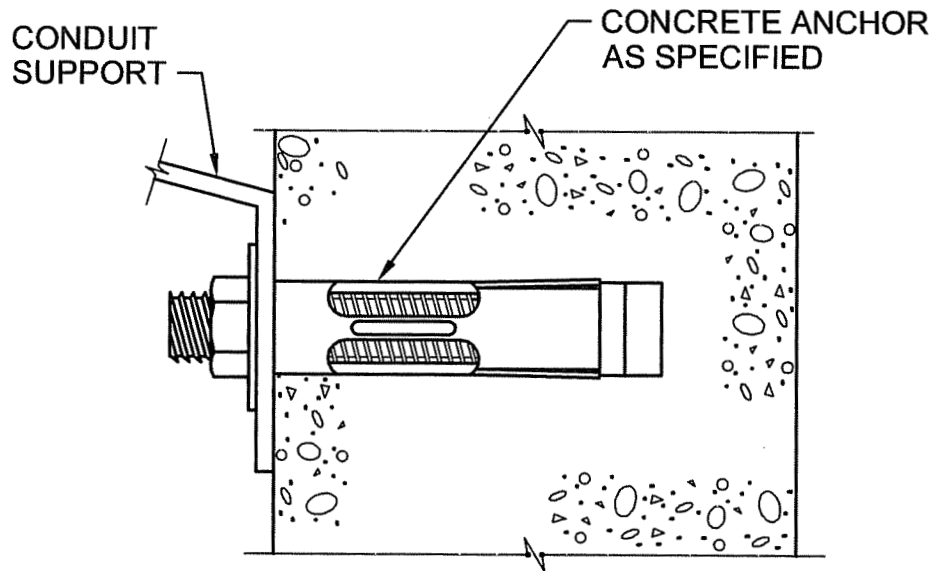
ELECTRICAL EQUIPMENT SUPPORT

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

2605-008b

CH2MHILL

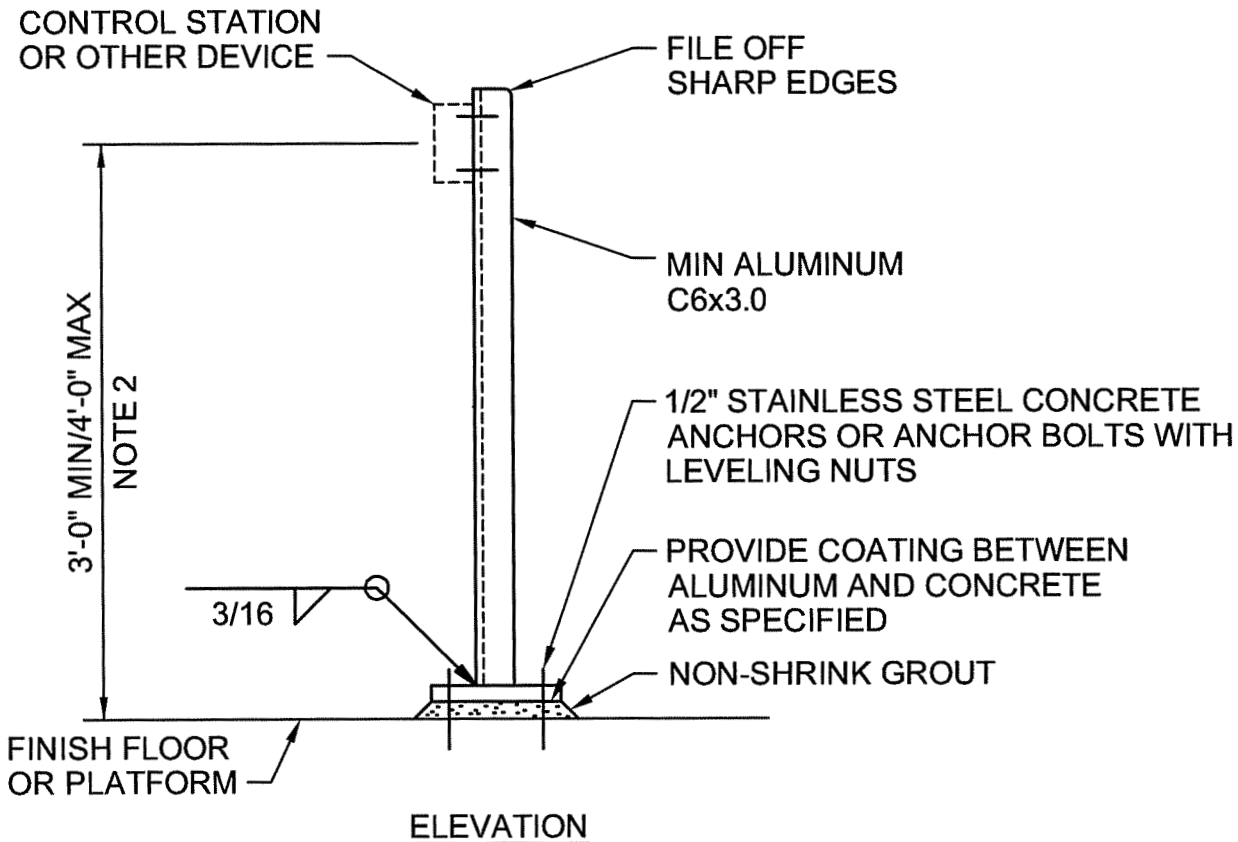
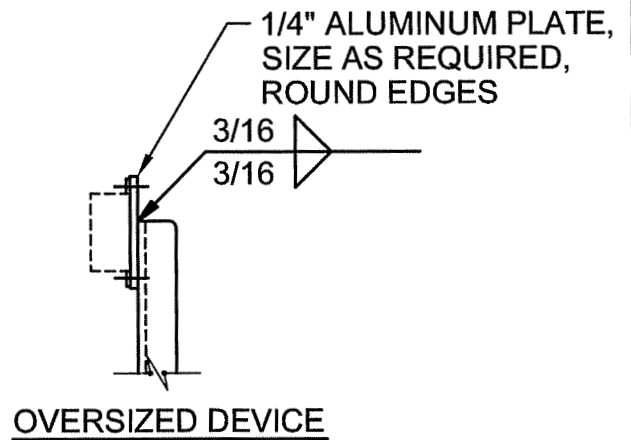
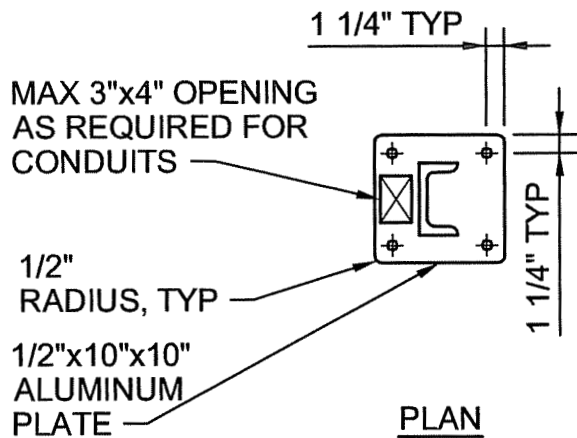


CONCRETE ANCHOR INSTALLATION

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2605-010



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.

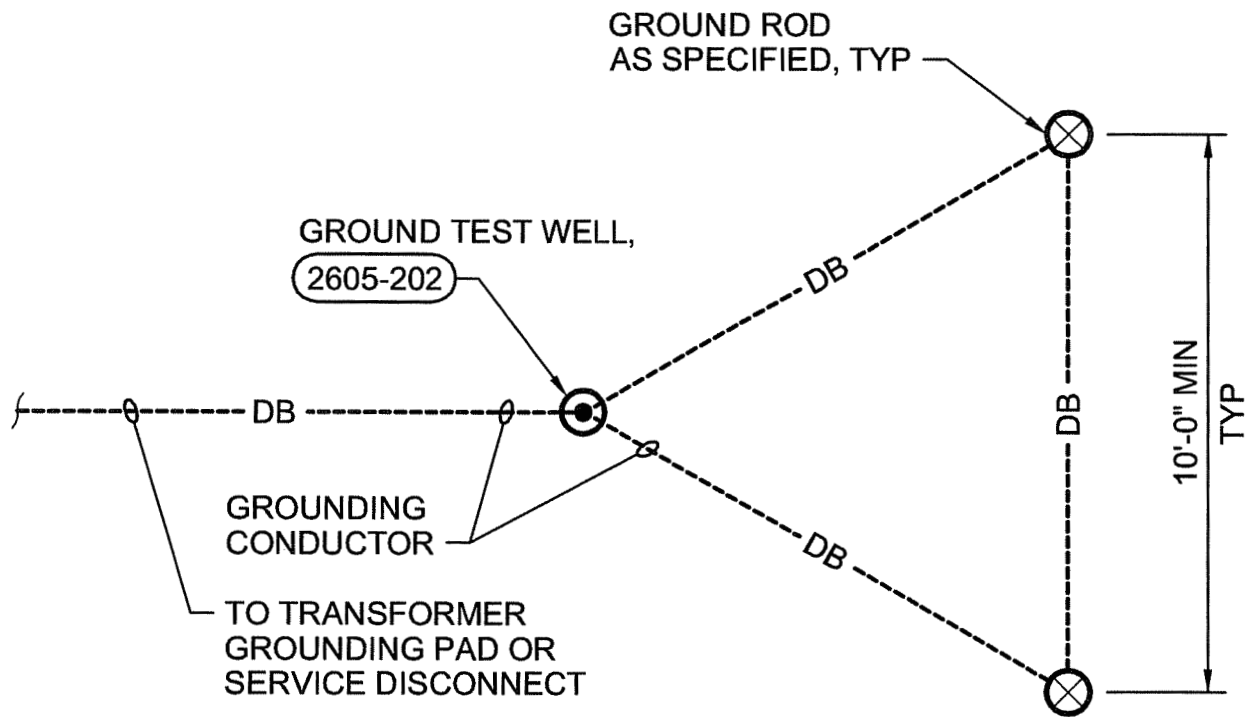
PEDESTAL MOUNTED DEVICE

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2605-011b

CH2MHILL

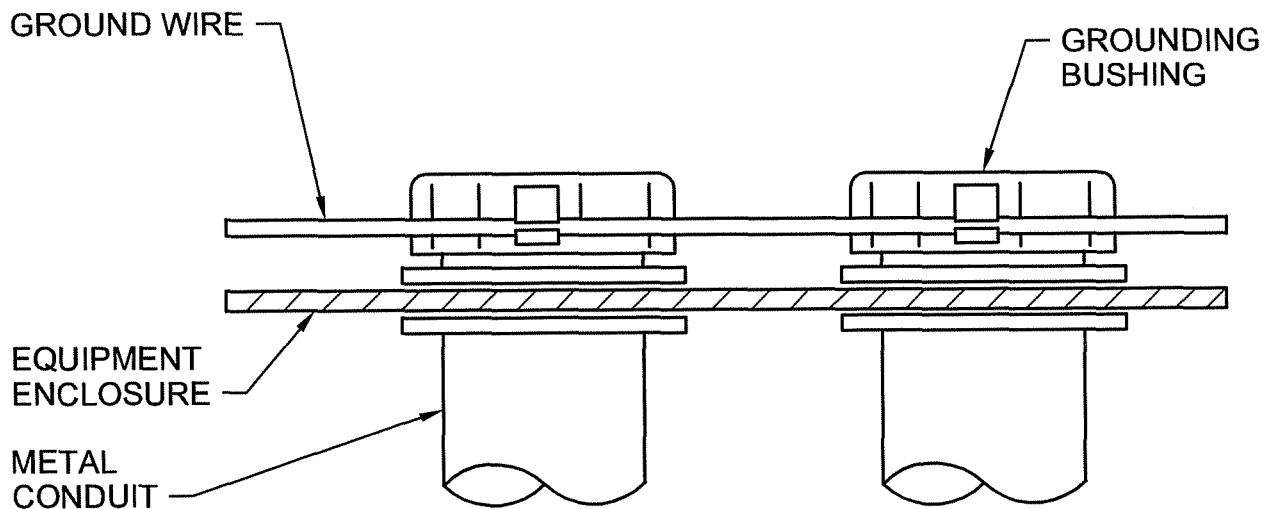


GROUND TRIANGLE

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2605-201



NOTE:

THE ENDS OF ALL CONDUITS REQUIRED TO BE GROUNDED BY THE SPECIFICATIONS SHALL BE GROUNDED IN ACCORDANCE WITH THIS DETAIL.

CONDUIT GROUNDING

NTS

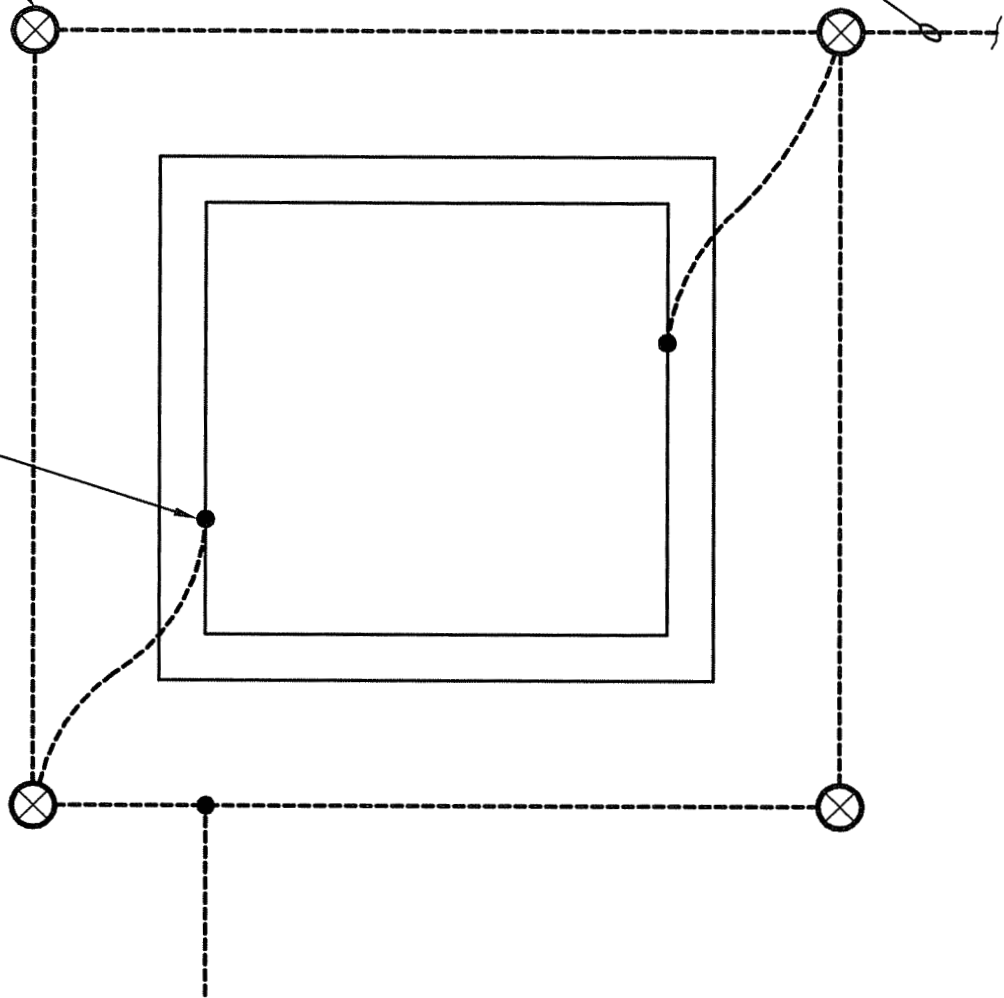
ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

2605-203

GROUND ROD

TO GROUND TRIANGLE,
2605-201

#2/0 BARE CU
GROUNDING
CONDUCTOR



PROVIDE GROUND CONDUCTOR
FROM EACH TRANSFORMER RING
TO EACH MCC GROUND BUS

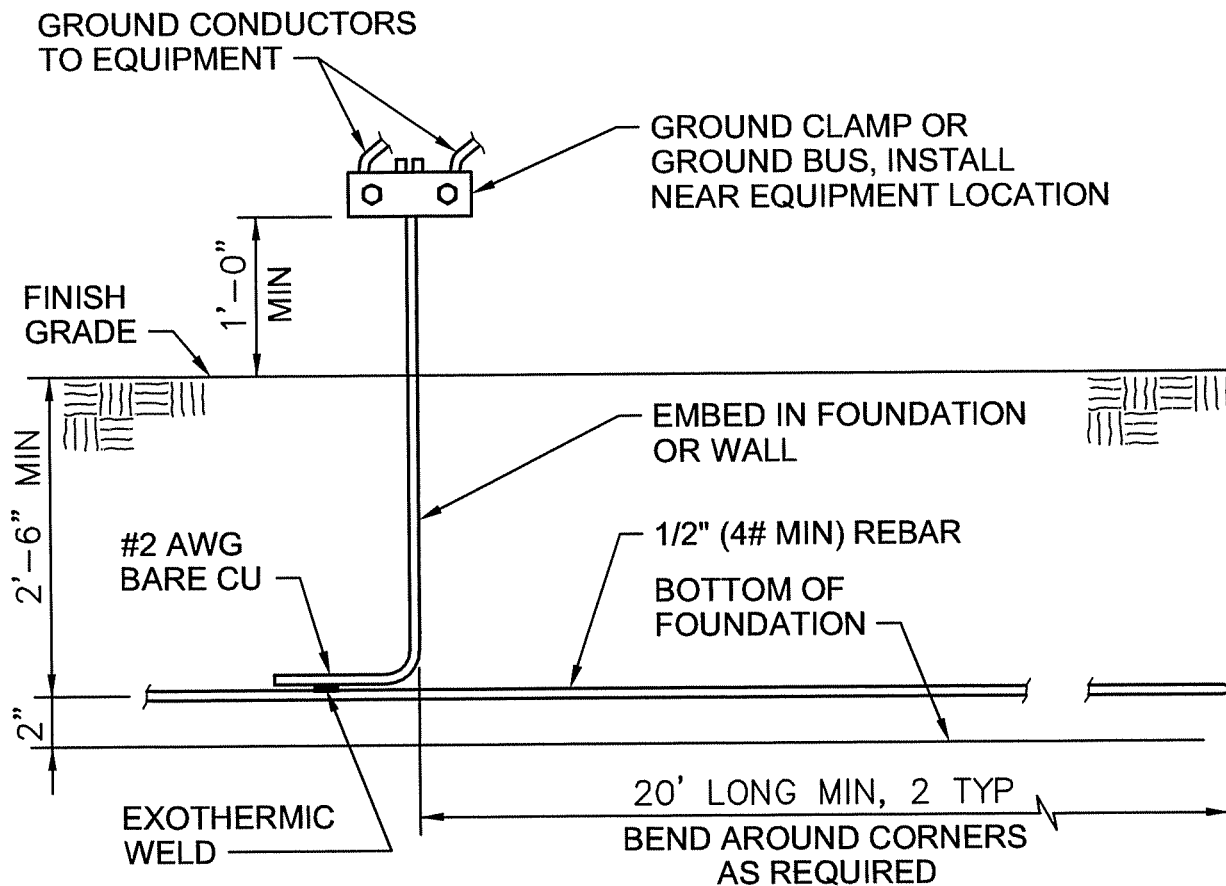
PLAN

PAD MOUNTED TRANSFORMER AND PAD MOUNTED SWITCH GROUNDING

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2605-204



NOTE:

WHERE MULTIPLE INSTRUMENT SURGE SUPPRESSOR GROUNDS MUST BE CONNECTED IN ONE LOCATION, INSTALL A GROUND BUS.

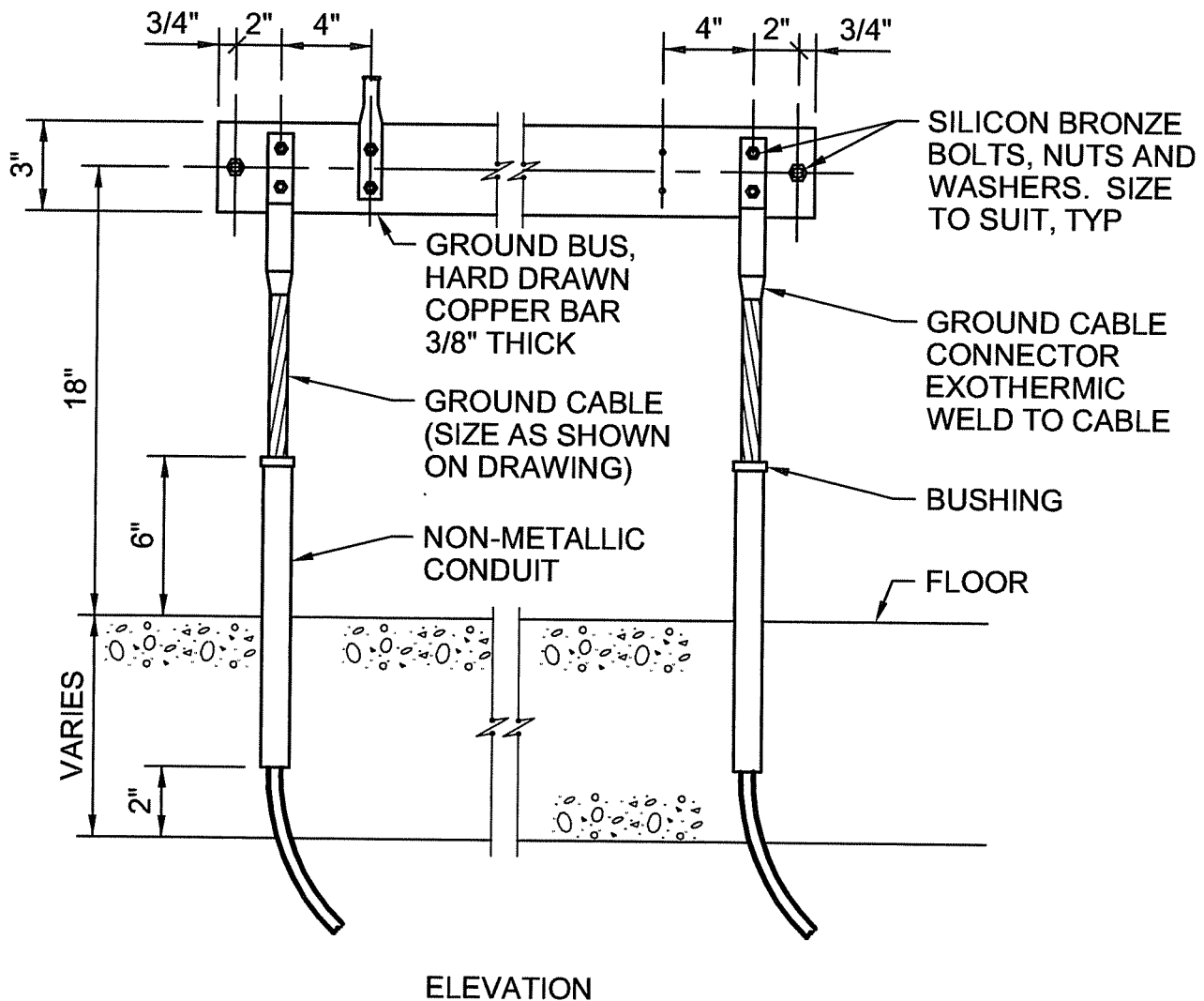
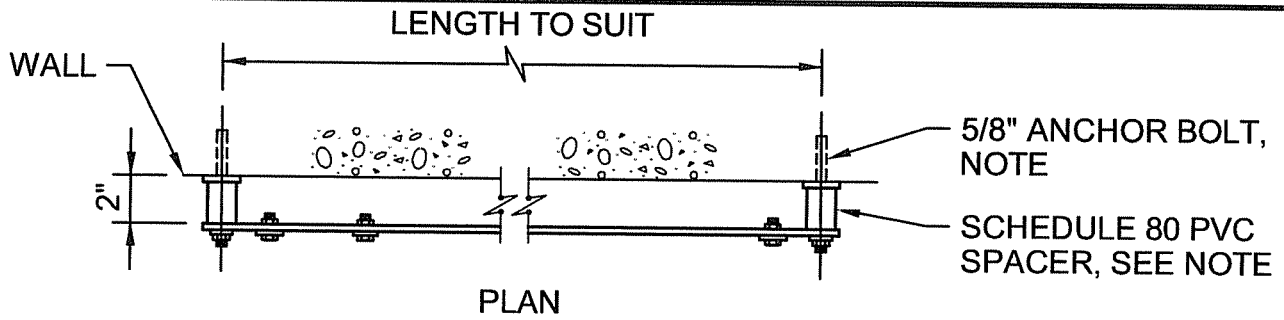
GROUND ELECTRODE

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

2605-206

CH2MHILL



NOTE:

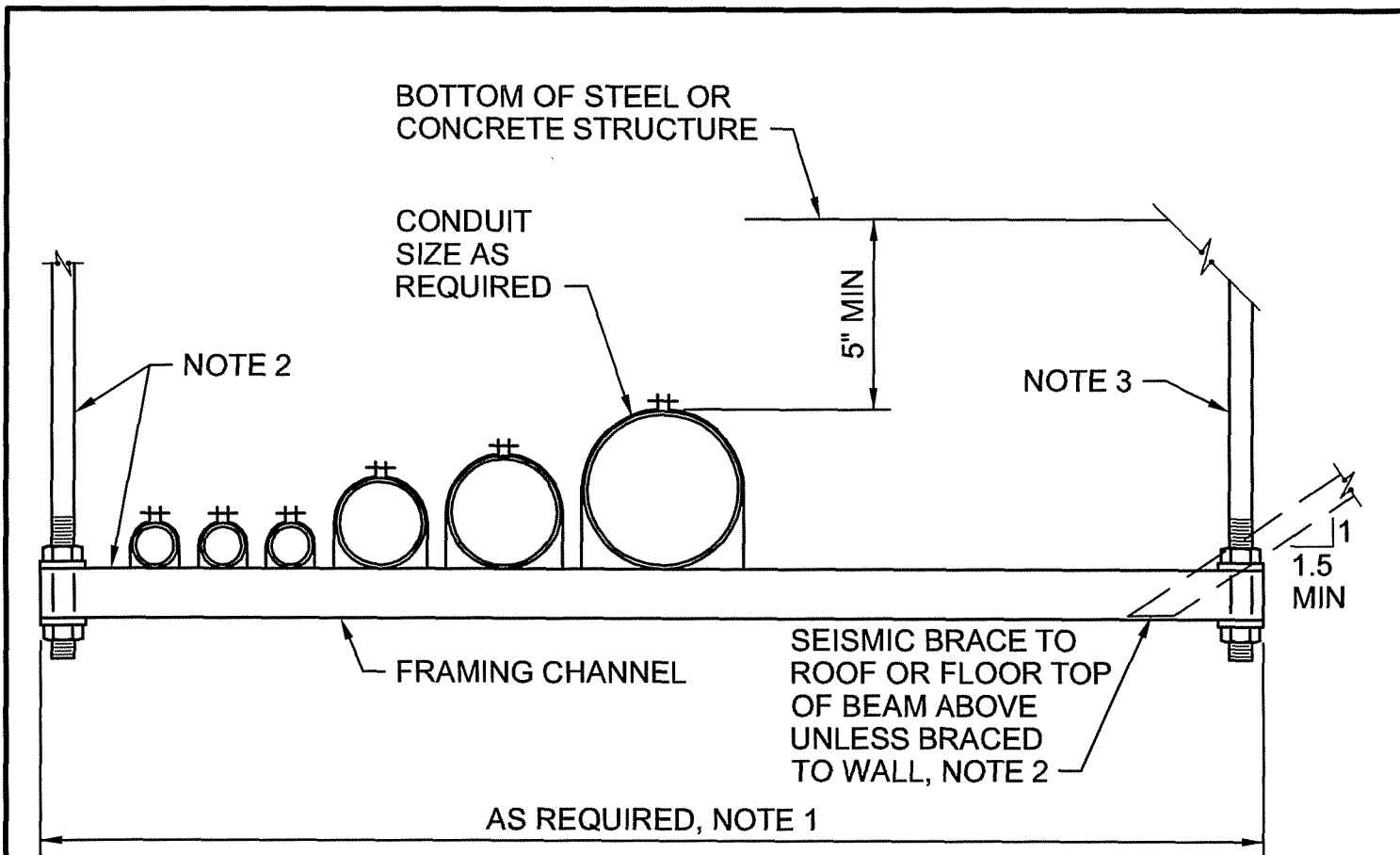
MAXIMUM SPAN BETWEEN SUPPORTS NOT TO EXCEED 24".

GROUND BUS

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

2605-208



SINGLE RACK

NOTES:

1. LENGTH VARIES WITH NUMBER OF CONDUITS TO BE SUPPORTED AND SPACING BETWEEN CONDUITS.
2. DETERMINE SPAN AND TYPE OF SUPPORTS, LOCATE SUPPORTS, AND SIZE SUPPORT RODS, CONNECTIONS AND BRACES PER MANUFACTURER'S RECOMMENDATIONS AND SEISMIC REQUIREMENTS.
3. AT STEEL STRUCTURE, USE GRINNEL MALLEABLE BEAM CLAMP. AT CONCRETE STRUCTURE, USE UNIVERSAL CONCRETE INSERT, UNISTRUT CHANNEL WITH #4 x 3'-0" BELOW, OR GRINNEL FIGURE 52 ATTACHMENT PLATE, SIMILAR. TYPE AND SIZE AS REQUIRED BY TOTAL LOADS.
4. USE STAINLESS STEEL HARDWARE IN WET AND/OR CORROSIVE AREAS.
5. SPACE CONDUIT SUFFICIENTLY TO ALLOW REMOVAL OF ONE CONDUIT WITHOUT DISTURBING ADJACENT CONDUITS.

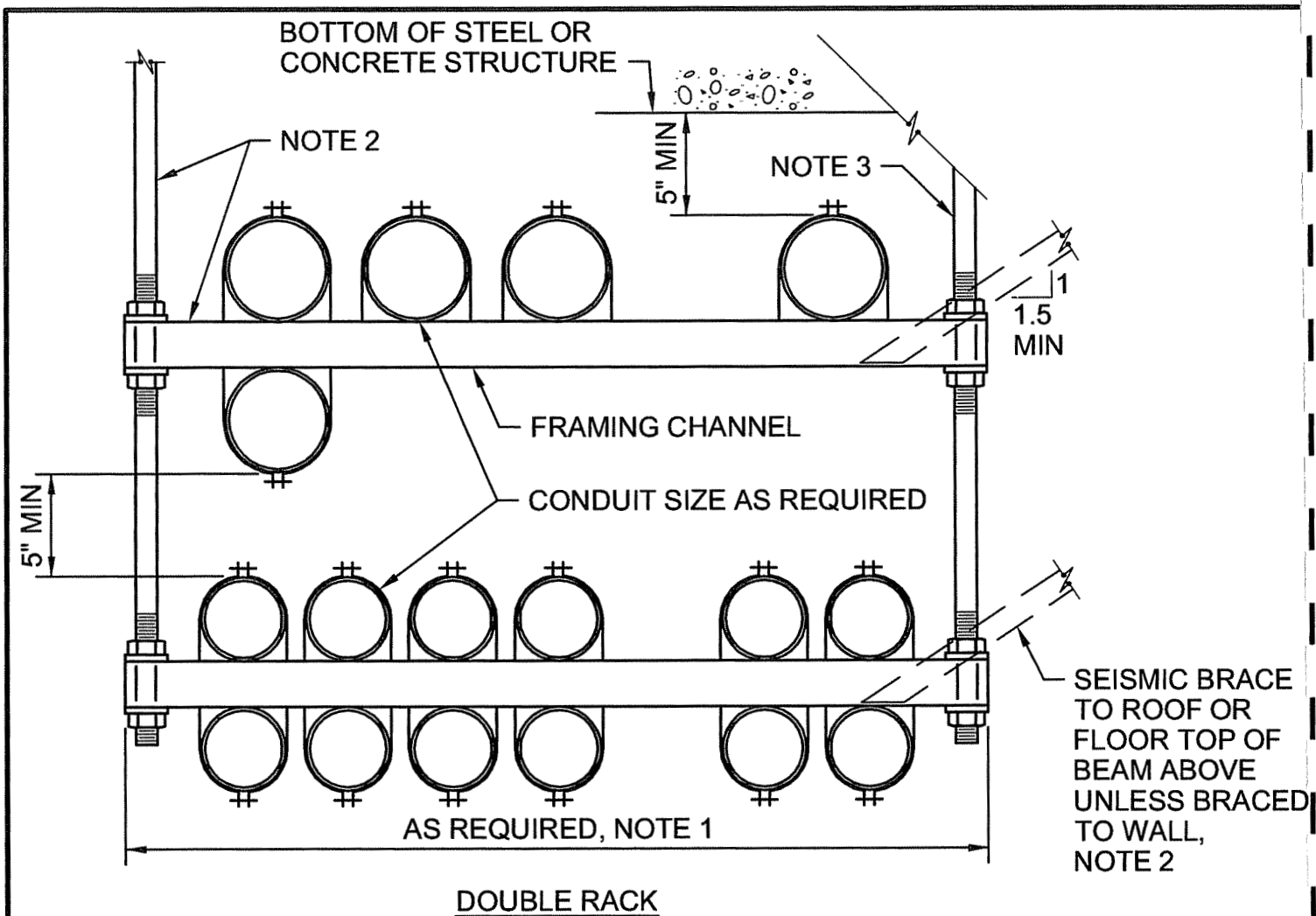
CONDUIT RACKING SYSTEM

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

2605-300

CH2MHILL



NOTES:

1. LENGTH VARIES WITH NUMBER OF CONDUITS TO BE SUPPORTED AND SPACING BETWEEN CONDUITS.
2. DETERMINE SPAN AND TYPE OF SUPPORTS, LOCATE SUPPORTS, AND SIZE SUPPORT RODS, CONNECTIONS AND BRACES PER MANUFACTURER'S RECOMMENDATIONS AND SEISMIC REQUIREMENTS.
3. AT STEEL STRUCTURE, USE GRINNEL MALLEABLE BEAM CLAMP. AT CONCRETE STRUCTURE, USE UNIVERSAL CONCRETE INSERT, UNISTRUT CHANNEL WITH #4 x 3'-0" BELOW, OR GRINNEL FIGURE 52 ATTACHMENT PLATE, SIMILAR. TYPE AND SIZE AS REQUIRED BY TOTAL LOADS.
4. USE STAINLESS STEEL HARDWARE IN WET AND/OR CORROSIVE AREAS.
5. SPACE CONDUIT SUFFICIENTLY TO ALLOW REMOVAL OF ONE CONDUIT WITHOUT DISTURBING ADJACENT CONDUITS.

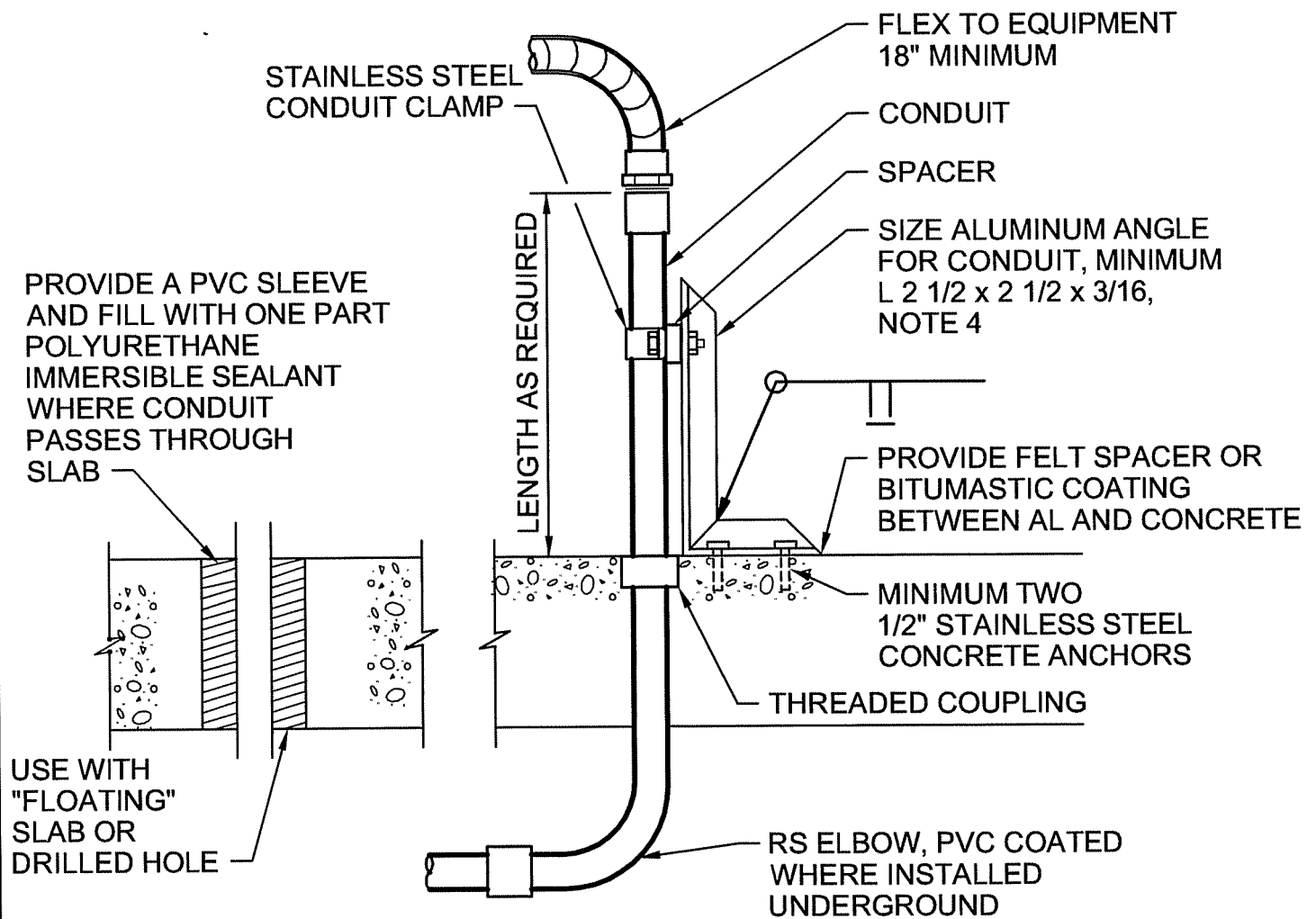
CONDUIT RACKING SYSTEM

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

2605-301

CH2MHILL



NOTES:

1. PROVIDE SUPPORT FOR ALL METAL CONDUITS WHICH EXTEND MORE THAN 18 INCHES OUT OF THE SLAB WITHIN 3 INCHES OF THE END OF THE CONDUIT.
2. PROVIDE SUPPORT FOR ALL PVC CONDUIT WITHIN 3 INCHES OF THE END OF THE CONDUIT.
3. THIS DETAIL SHALL BE USED FOR SUPPORT OF ALL CONDUITS WHICH ARE NOT OTHERWISE SUPPORTED IN A RIGID MANNER SUCH AS AGAINST AN EQUIPMENT BASE, WALL, COLUMN, ETC, AS REQUIRED ABOVE.
4. FOR ANY ANGLE GREATER THAN 2'-6" TALL, SIZE ANGLE SUPPORT AND ANCHORS FOR SEISMIC LOADS.

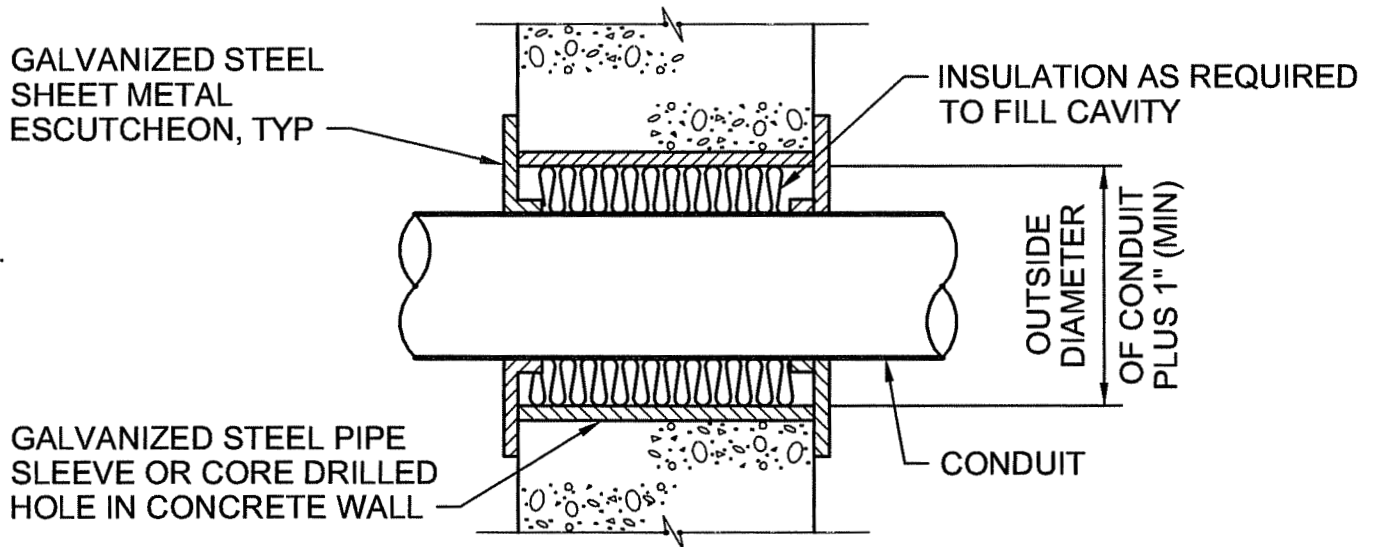
CONDUIT TRANSITION AND SUPPORT

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

2605-305

CH2MHILL



NOTE:

CONDUITS WHICH INDIVIDUALLY PASS THRU AN INTERIOR WALL SHALL BE INSTALLED IN ACCORDANCE WITH THIS DETAIL. IF WALL IS A FIRE WALL, FILL CAVITY WITH FIRE STOP SEALANT SPECIFIED IN SECTION 07 84 00.

INTERIOR WALL PENETRATION

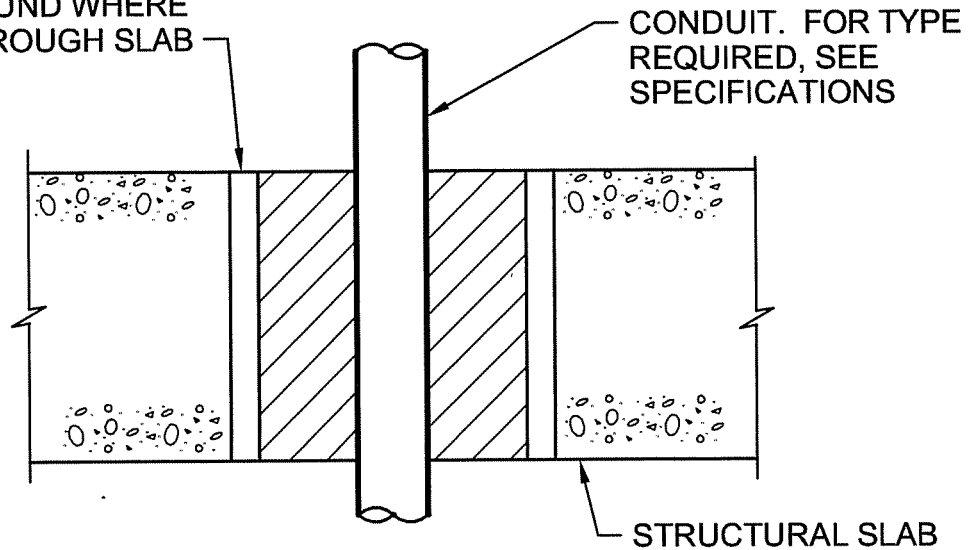
NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

2605-306

CH2MHILL

PROVIDE A PVC SLEEVE AND
FILL WITH A SUITABLE PLASTIC
EXPANDABLE COMPOUND WHERE
CONDUIT PASSES THROUGH SLAB



NOTE:

ALL CONDUITS THROUGH CONCRETE FLOOR SLABS AND
EQUIPMENT PADS SHALL BE INSTALLED IN ACCORDANCE
WITH THIS DETAIL.

SLAB PENETRATION

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2605-310

CH2MHILL

FLEXIBLE NEOPRENE SLEEVE
CROUSE-HINDS "XD", APPLETON
"DF" OR APPROVED EQUAL

PREMOLDED JOINT
FILLER

ADAPTER REQUIRED
FOR PVC CONDUITS

CONDUIT, SIZE
PER PLANS

3/4"

CLOSED CELL
NEOPRENE

STAINLESS STEEL
CLAMP, TYP

HUB

GRS CONDUIT,
TYP

NOTE 3

PROVIDE CONTINUOUS
GROUND PATH PER
NEC REQUIREMENTS

NOTES:

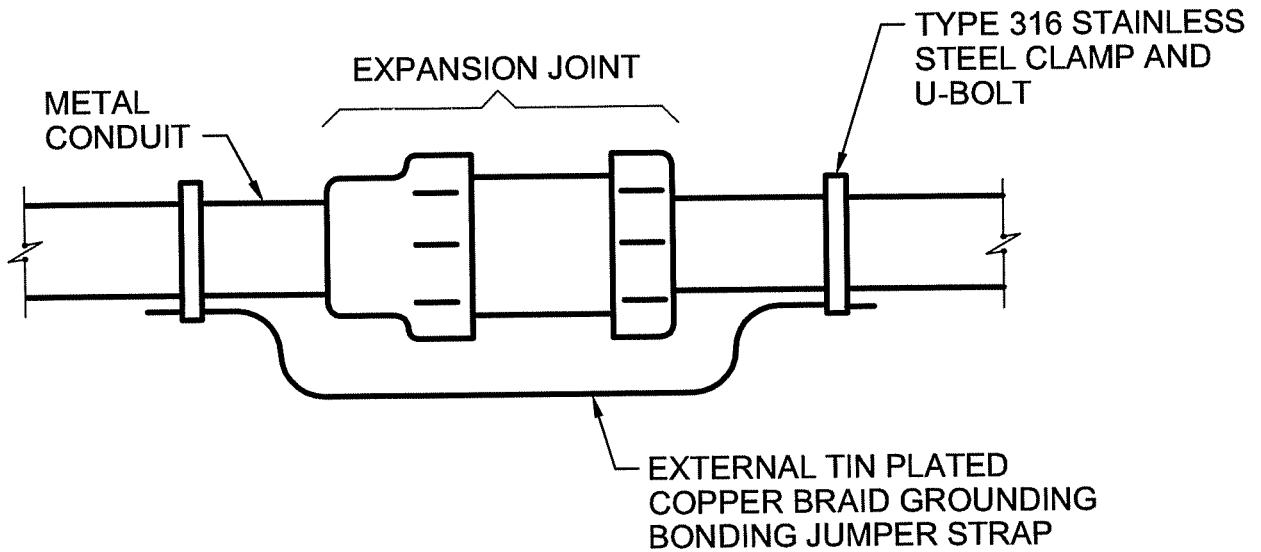
1. DETAIL APPLIES TO CONDUIT EMBEDDED IN STRUCTURAL CONCRETE AT BUILDING INTERFACES AND AT STRUCTURAL EXPANSION JOINTS.
2. DETAIL APPLIES TO ALL EXPANSION JOINTS FOR THE UNDERGROUND CONCRETE ENCASED CONDUITS.
3. PVC CONDUIT INSTALLATIONS SHALL HAVE 18 INCHES (MIN) LENGTH OF GRS CONDUIT EACH SIDE OF FITTING.

EXPANSION/DEFLECTION COUPLING

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2605-315



NOTE:

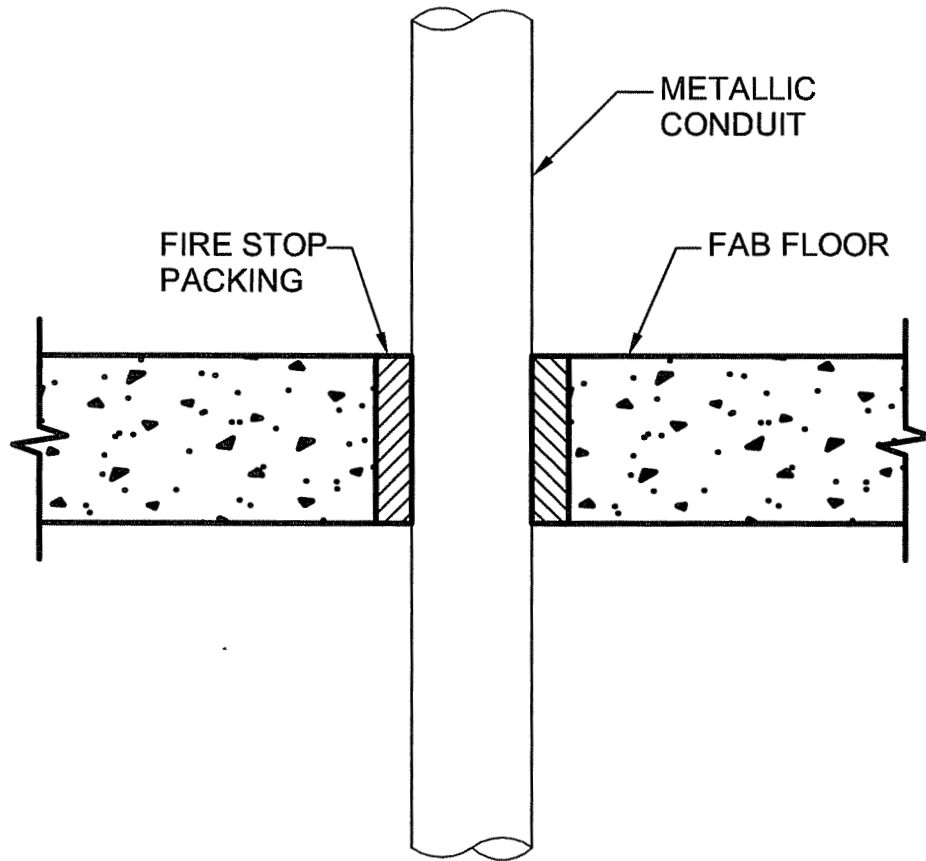
COUPLINGS TO BE INSTALLED AT CONCRETE EXPANSION JOINTS OR 100' INTERVALS.

CONDUIT EXPANSION JOINT

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

2605-317

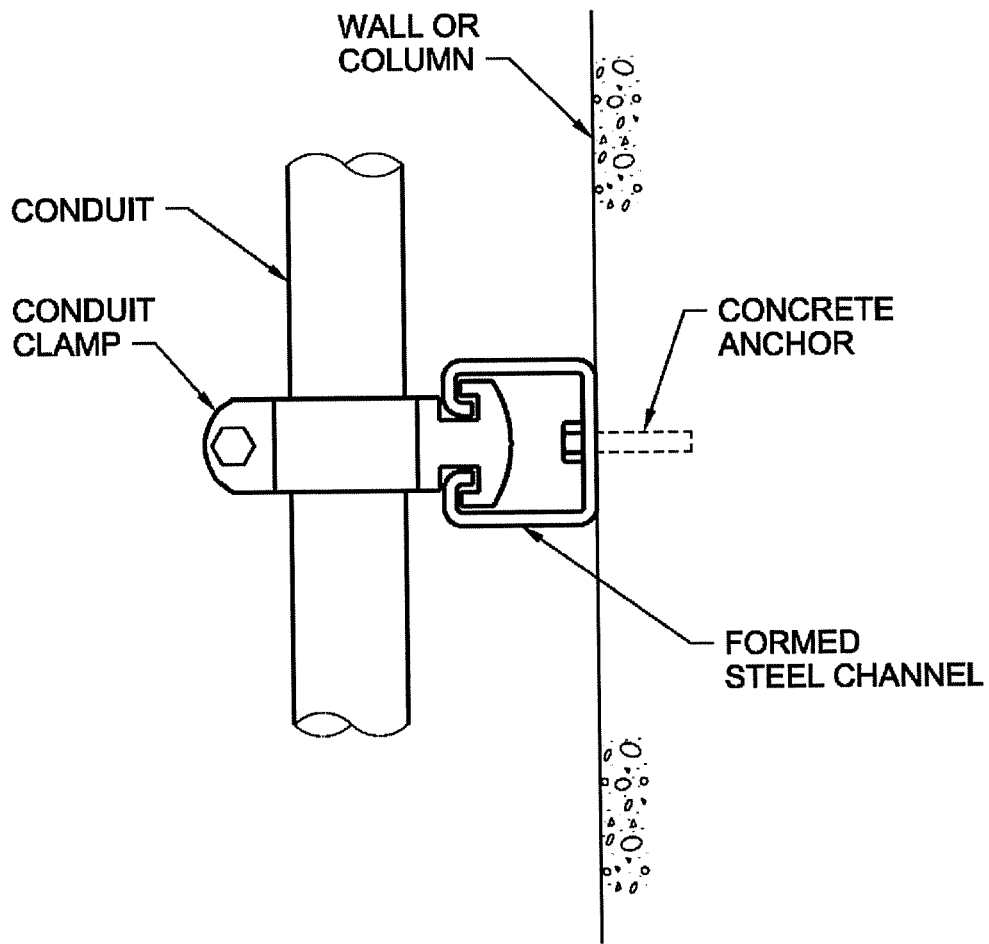


CONDUIT FLOOR PENETRATION

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2605-346



NOTE:

SUPPORT ALL EXPOSED CONDUITS ON FORMED STEEL CHANNELS.

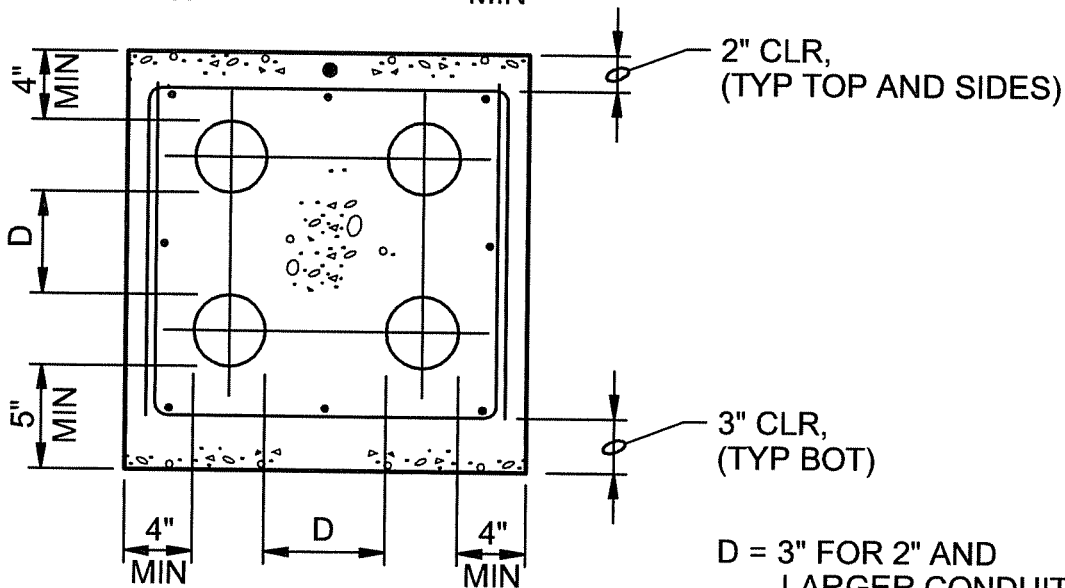
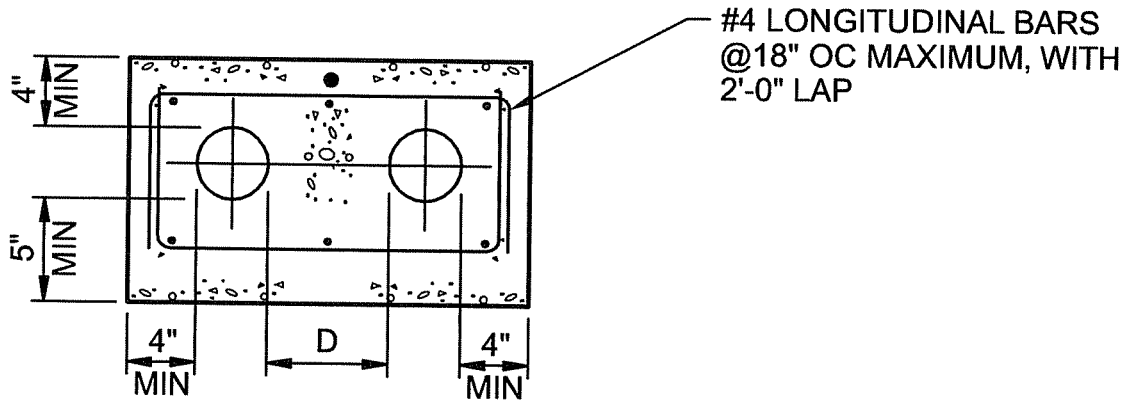
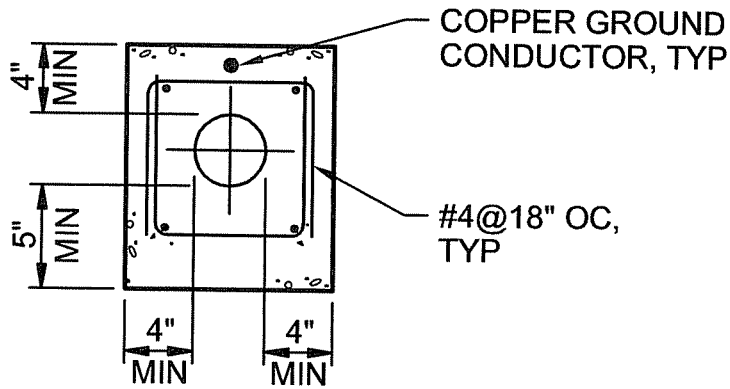
CONDUIT SUPPORT ON STRUCTURE

NTS

ADVANCED TREATMENT
FORT THOMAS WTP
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2605-348

CH2MHILL



D = 3" FOR 2" AND LARGER CONDUITS

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

NOTE:

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

DUCT BANK

NTS

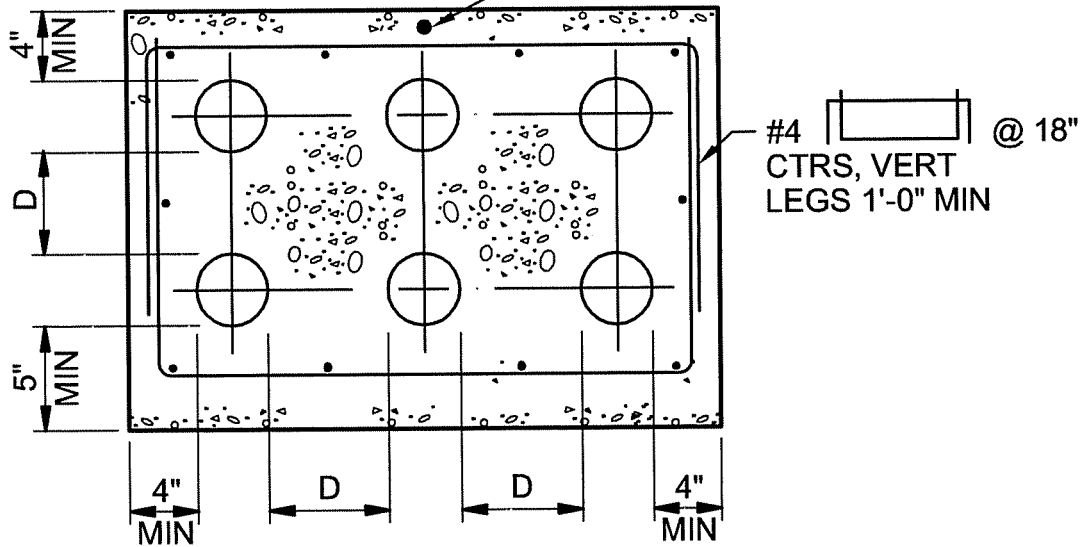
USE WITH 2605-400c.

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

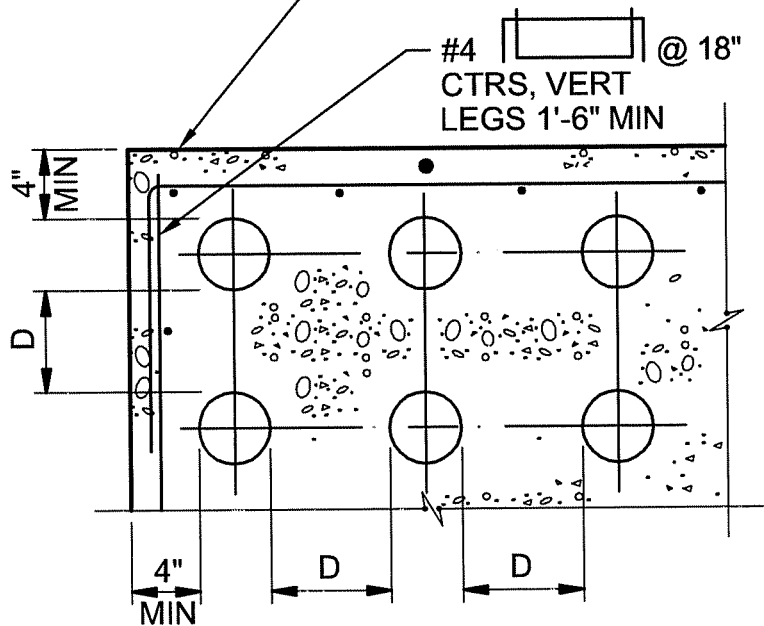
DETAIL 1 OF 2

2605-400

COPPER GROUND
CONDUCTOR, TYP



FOR LARGER DUCT BANKS,
CONTINUE PATTERN OF REBAR,
CONDUIT SEPARATION AND
CONCRETE COVER.



DUCT BANK

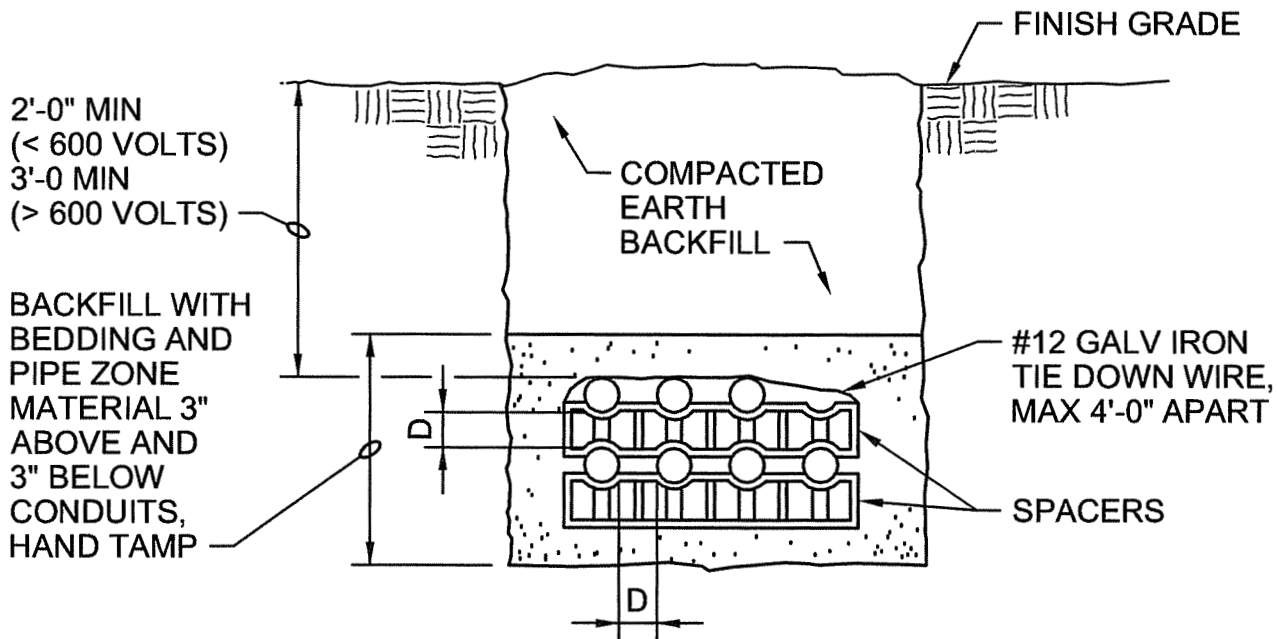
NTS

DETAIL 2 OF 2

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2605-400

CH2MHILL



D = 3"MIN FOR 2"-6" CONDUIT
 D = 2"MIN FOR <2 INCH CONDUIT

NOTE:

INSTALLATION OF DIRECT BURIAL DUCT BANKS WHICH INCLUDE THREE OR MORE CONDUITS OR DUCTS SHALL BE MADE IN ACCORDANCE WITH THIS DETAIL.

TYPICAL UNDERGROUND CONDUIT

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

2605-420

CH2MHILL

SIZE OPENINGS
AS REQUIRED BY
TRANSFORMER
OR SWITCH
MANUFACTURER

4'-0" PIGTAIL, TYP

GROUND
ROD, TYP

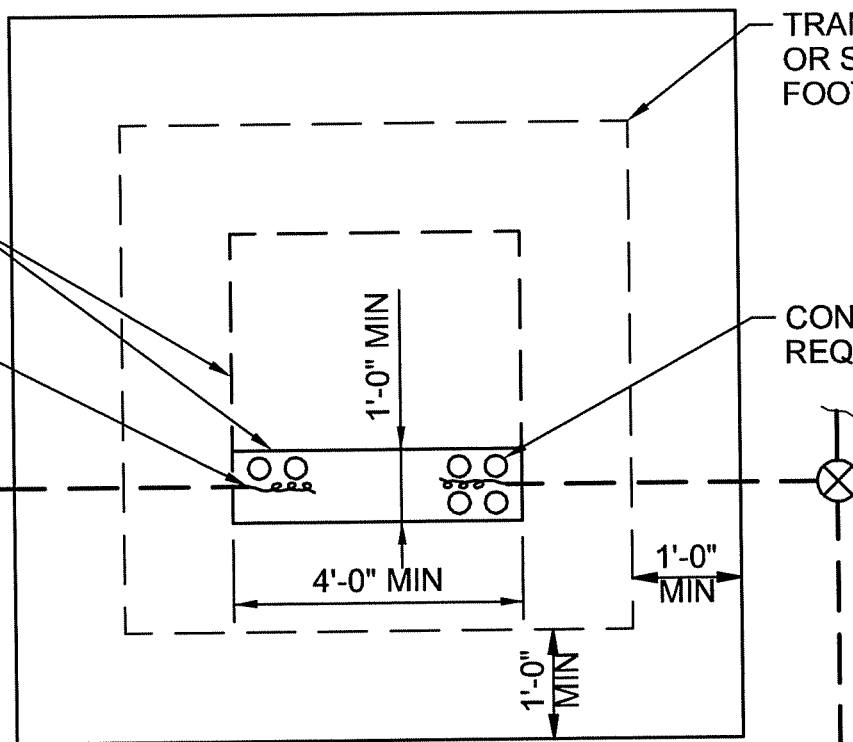
GROUND
CONDUCTOR,
TYP

EQUIPMENT BASE,
(0330-056), TYPE G OR H

GROUNDING LOOP AS
SHOWN ON PLANS, TYP

TRANSFORMER
OR SWITCH
FOOTPRINT

CONDUITS AS
REQUIRED, TYP



PLAN

NOTES:

1. COORDINATE ALL FINAL PAD DIMENSIONS WITH THE ELECTRICAL UTILITY OR MANUFACTURER'S APPROVED SHOP DRAWINGS.
2. ANCHOR EQUIPMENT TO CONCRETE PAD WITH SST CONCRETE ANCHORS SPECIFIED. SUPPLY ANCHORAGE CALCULATIONS, AS SPECIFIED, FOR ALL EQUIPMENT OVER 400 POUNDS LOCATED IN SEISMIC ZONES 2 OR GREATER.

TRANSFORMER OR SWITCH PAD

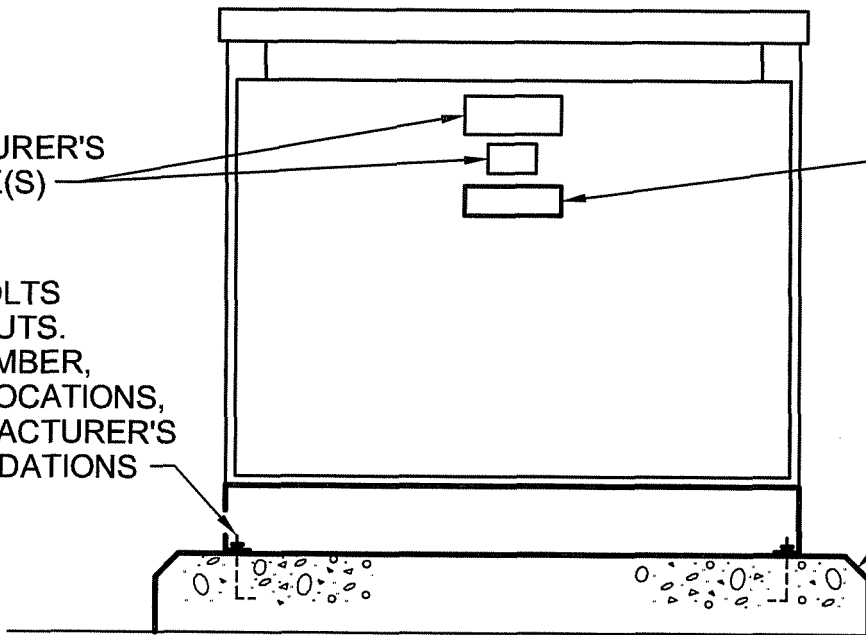
NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2612-001

MANUFACTURER'S
NAMEPLATE(S)

ANCHOR BOLTS
WITH SST NUTS.
INSTALL NUMBER,
SIZE, AND LOCATIONS,
PER MANUFACTURER'S
RECOMMENDATIONS



OSHA/NEC
PLACARD,
2624-201

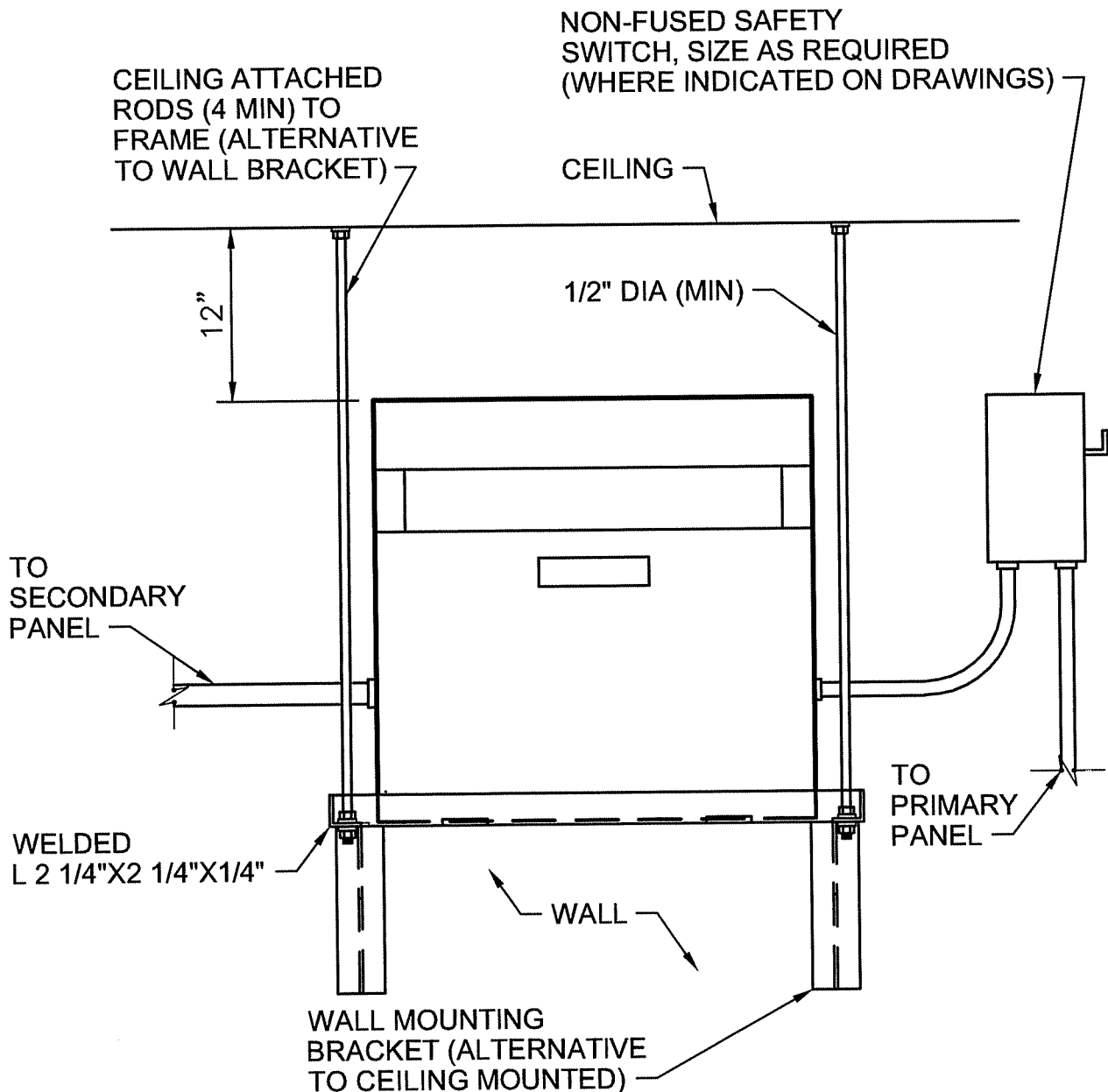
EQUIPMENT PAD
TYPE "F", SEE
STRUCTURAL
DETAILS

TRANSFORMER

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2622-006



NOTE:

WHERE WALL MOUNTING BRACKETS ARE USED THEY SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE REINFORCING OF THE WALL TO ASSURE THAT IT IS CAPABLE OF SUPPORTING THE LOAD.

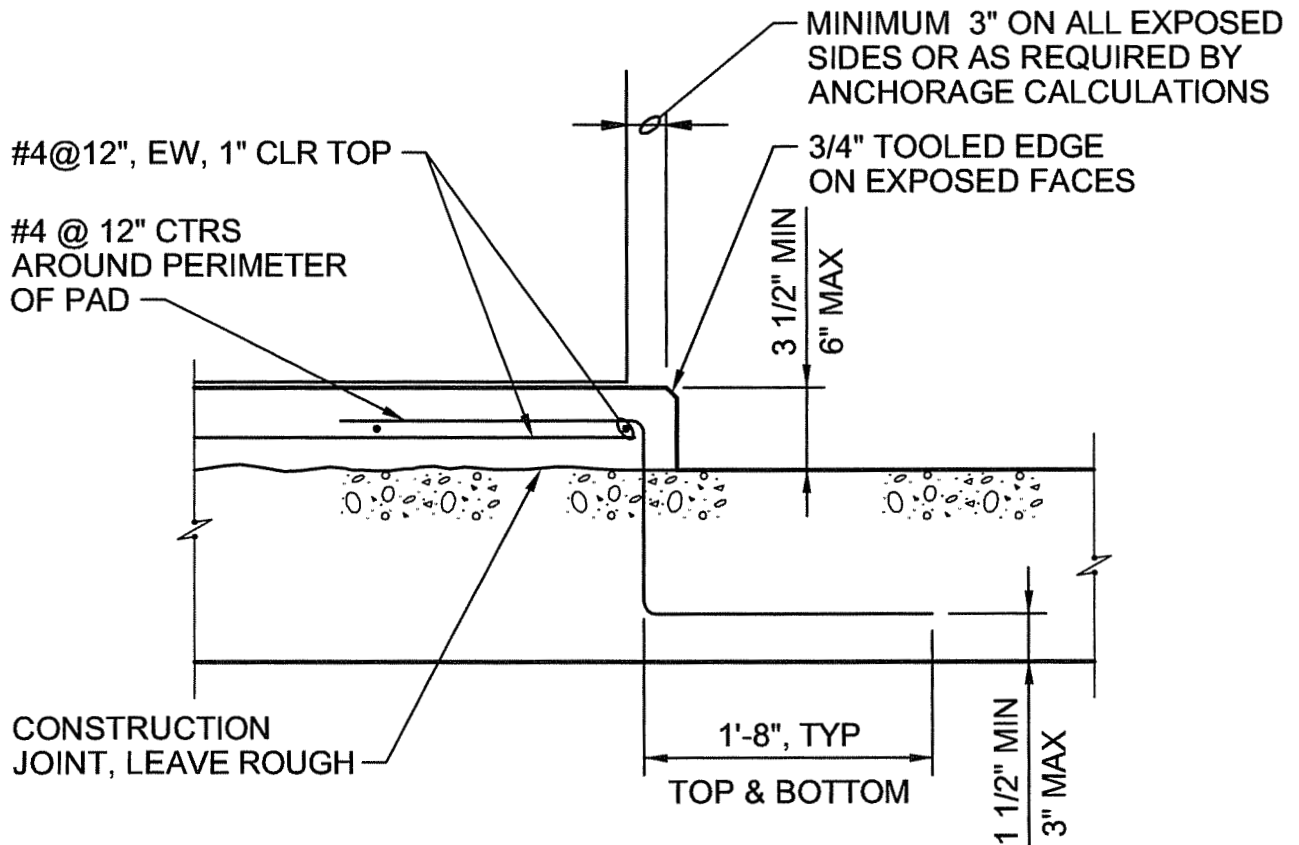
LARGE DRY TYPE TRANSFORMERS SHALL ONLY BE WALL OR CEILING MOUNTED WHERE THERE IS NO REASONABLE ALTERNATIVE AND THEIR INSTALLATION SHOULD BE REVIEWED WITH A STRUCTURAL ENGINEER.

DRY TYPE TRANSFORMER INSTALLATION

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

2622-007



NOTE:

ANCHOR EQUIPMENT TO CONCRETE PAD WITH SST CONCRETE ANCHORS SPECIFIED. SUPPLY ANCHORAGE CALCULATIONS, AS SPECIFIED, FOR ALL EQUIPMENT OVER 400 POUNDS LOCATED IN SEISMIC ZONES 2 OR GREATER.

CONCRETE PAD SECTION

NTS

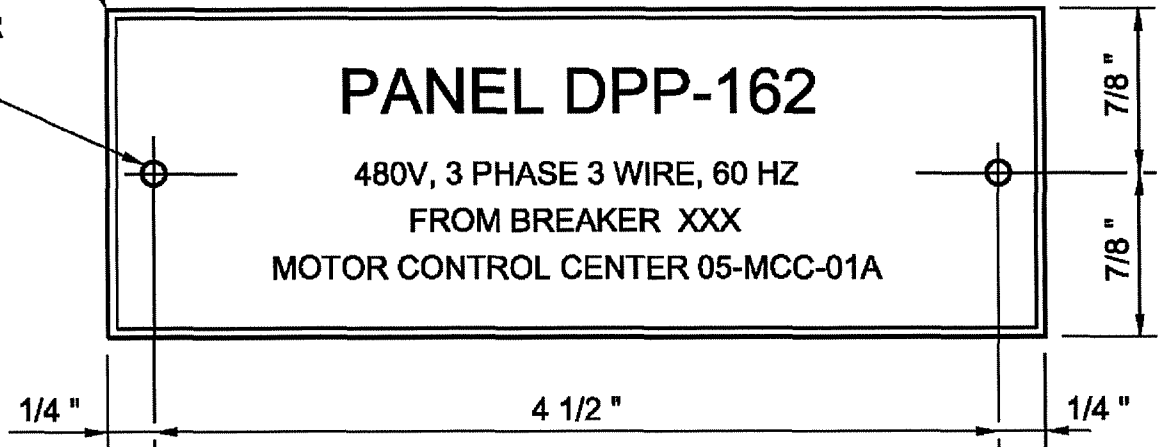
ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2624-001

CH2MHILL

BEVELED EDGES

1/8" HOLE FOR
POP RIVET,
(2 PLACES)



TOP ROW: 3/8" LETTERS
OTHER ROWS: 1/8" LETTERS
1/4" SPACING BETWEEN FIRST 2 ROWS
1/8" SPACING BETWEEN OTHER ROWS

COLOR SCHEDULE		
PANEL TYPE	BACKGROUND	LETTERING
208/120 VOLT, 60 HZ	WHITE	BLACK
480 VOLT, 60 HZ	WHITE	BLACK
EMERGENCY SERVICES	RED	BLACK

REQUIRED DATA

FIRST LINE: PANEL DESIGNATION
SECOND LINE: PHASE, VOLTAGE, FREQUENCY
THIRD AND FOURTH LINES: POWER SOURCE AND BREAKER

XXX = BASED ON FINAL DESIGN SHOP DRAWING

PANELBOARD NAMEPLATE

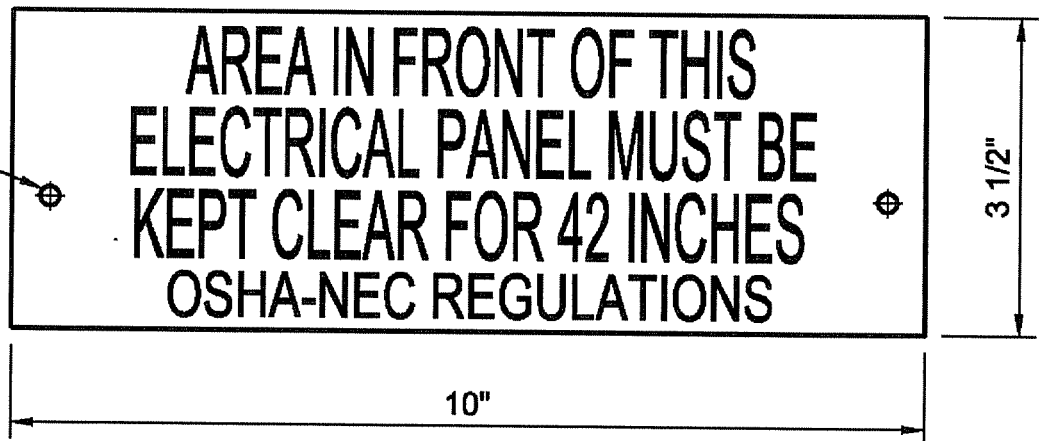
NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2624-200

CH2MHILL

1/8" HOLE FOR
POP RIVET,
(2 PLACES)



TOP 3 ROWS: 3/4 " LETTERS
BOTTOM ROW: 1/2 " LETTERS
BLACK LETTERING ON WHITE BACKGROUND

OSHA/NEC PLACARD

NTS

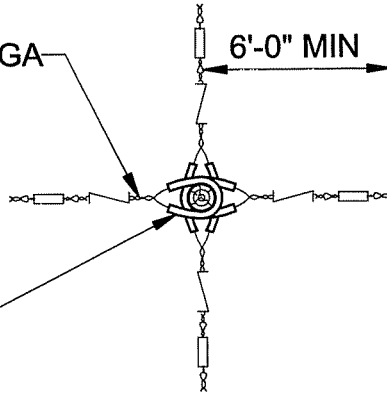
ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

2624-201

TWISTED GALVANIZED WIRE 12 GA

6'-0" MIN

RUBBER 2 PLY REINFORCED GARDEN HOSE, MIN 1/2" DIA



PLAN

GALVANIZED 6 1/2" TURNBUCKLE

1/2"x3"x12" WOOD OR STEEL FLAG PAINTED WHITE

SAUCER

1'-0"

TREE WRAPPING FASTENED NEAR TOP AND BOTTOM WITH CORD

MULCH

REMOVE BURLAP FROM TOP 1/3 OF BALL

FINISH GRADE

GROUND ANCHOR

INSTALL 4" DRAIN TILE PLANTING SOIL

2'-6" MIN

6'-0" MIN

TYPICAL SECTION

LARGE TREE PLANTING

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

3293-610

CORD TO SECURE WRAPPING MATERIAL

NO. 18 TIE WIRE

TWO LOOPS OF RUBBER GARDEN HOSE

WRAPPING 6" TO 10" WIDE

STAKING DETAIL

(3) 2"x2" WOOD STAKES

SAUCER

FINISH GRADE

CUT AND REMOVE BURLAP FROM TOP 1/3 OF BALL

PLANTING SOIL

STAKES 1'-6" DEEPER THAN BOTTOM OF PIT

5'-0"

MULCH

LIGHTLY COMPACTED MOUND

6"

MIN 2 x ROOT BALL DIA

NOTE:

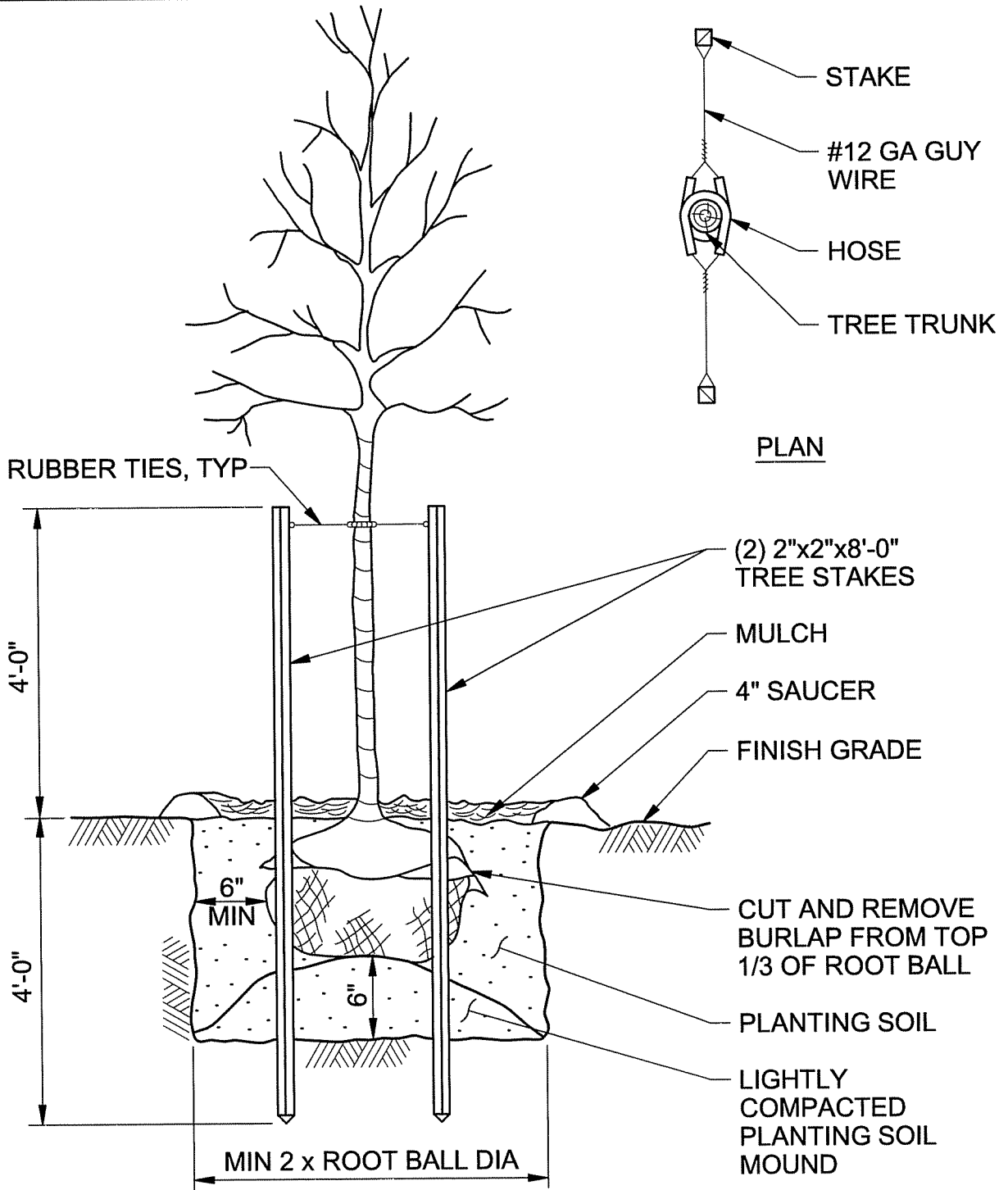
TREE SHALL BEAR SAME RELATION TO FINISH GRADE AS IT BORE TO PREVIOUS GRADE.

MEDIUM TREE PLANTING

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

3293-611



NOTE:

TREE SHALL BEAR SAME RELATION TO FINISH GRADE AS IT BORE TO PREVIOUS GRADE.

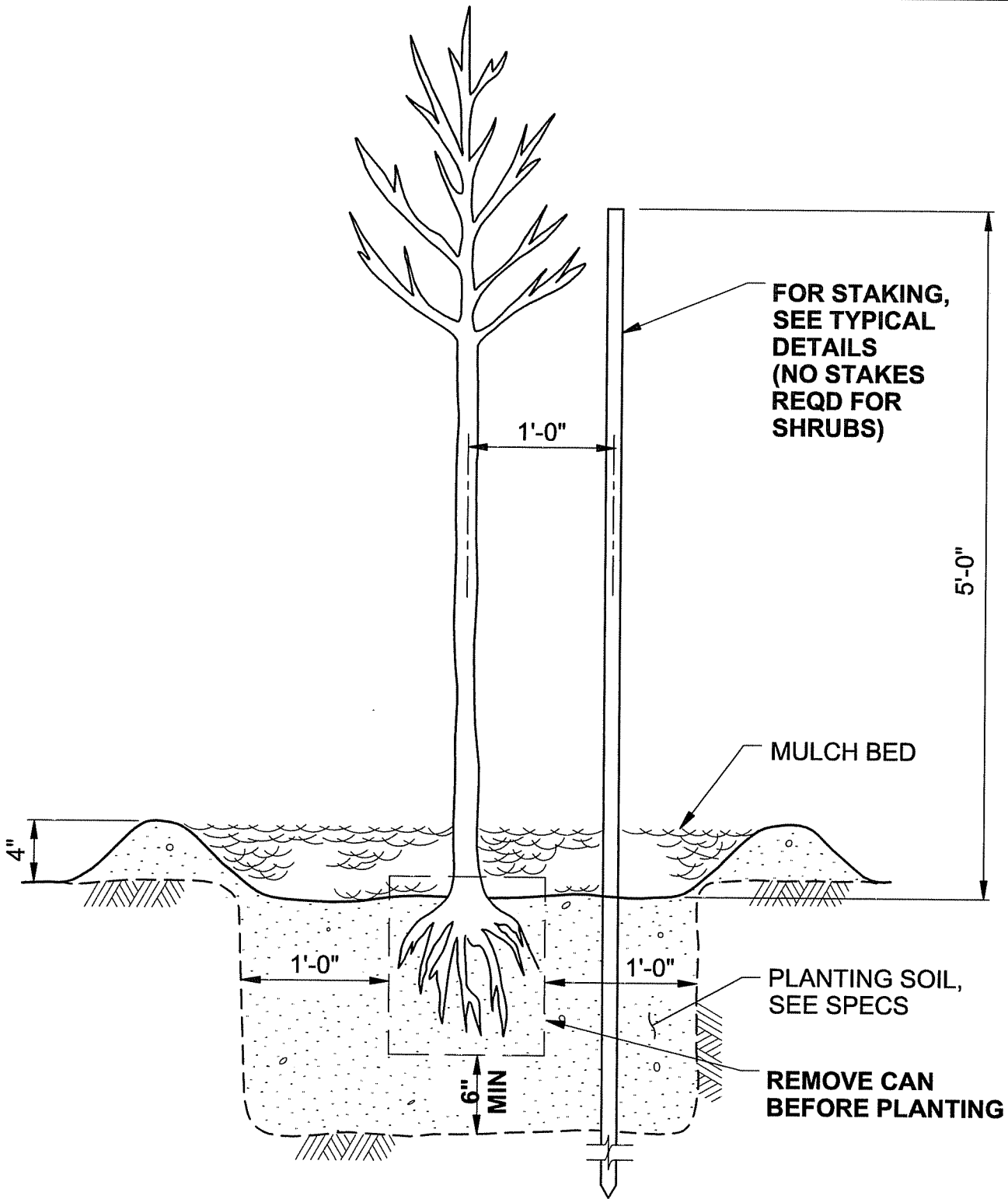
SMALL TREE PLANTING

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

3293-612

CH2MHILL

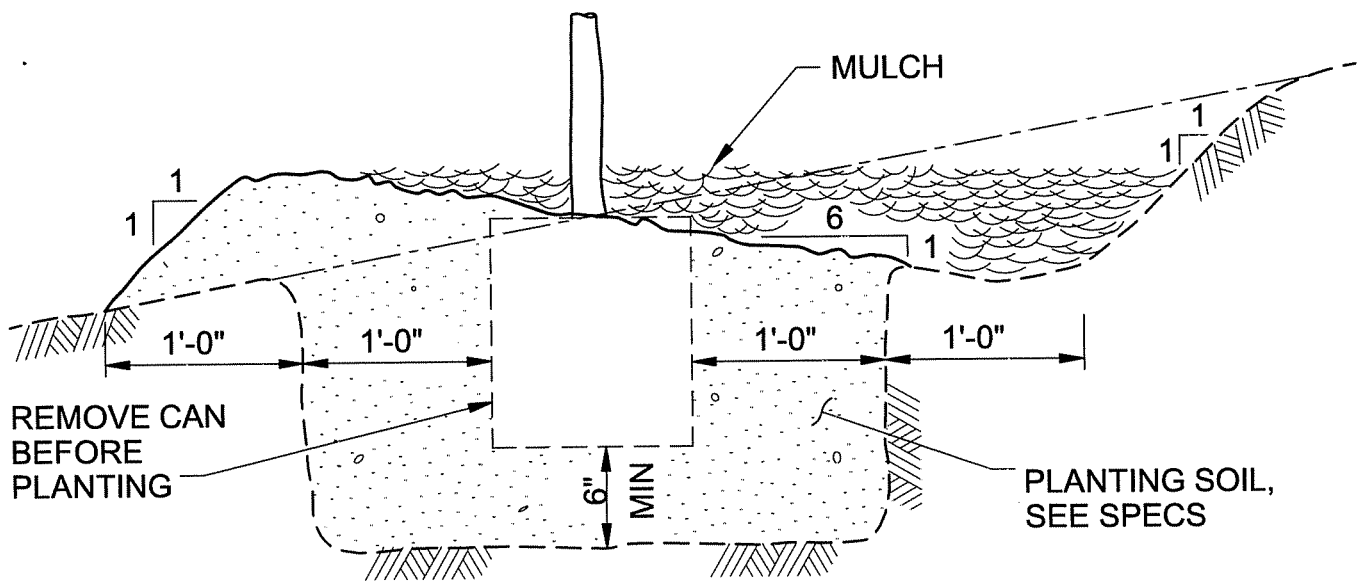


CONTAINER TREE PLANTING

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

3293-613



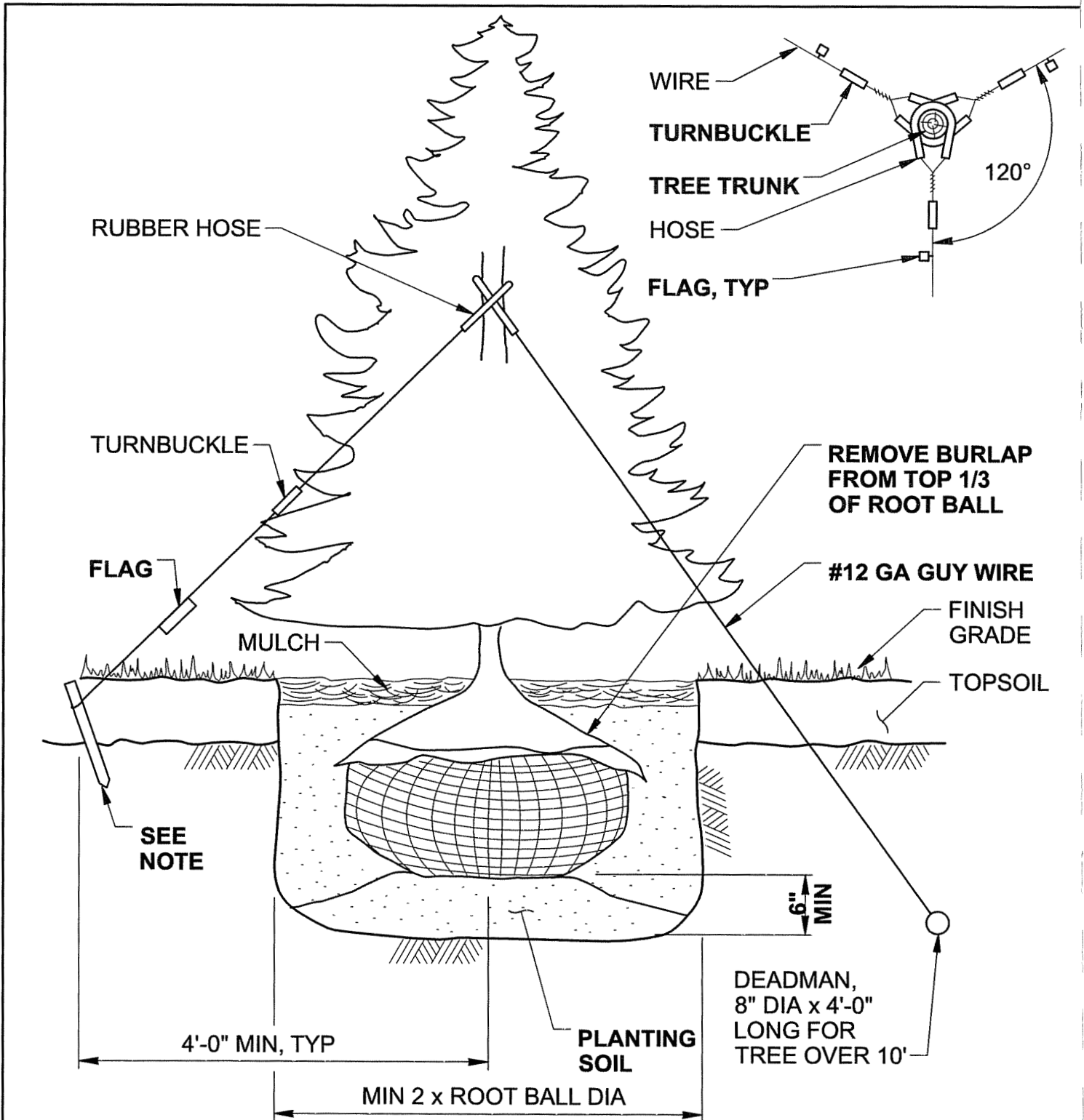
TREE PLANTING ON SLOPE

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

3293-614

CH2MHILL



NOTE:

3'-0" LONG 2"x2" WOOD STAKE FOR TREES UNDER 10'.

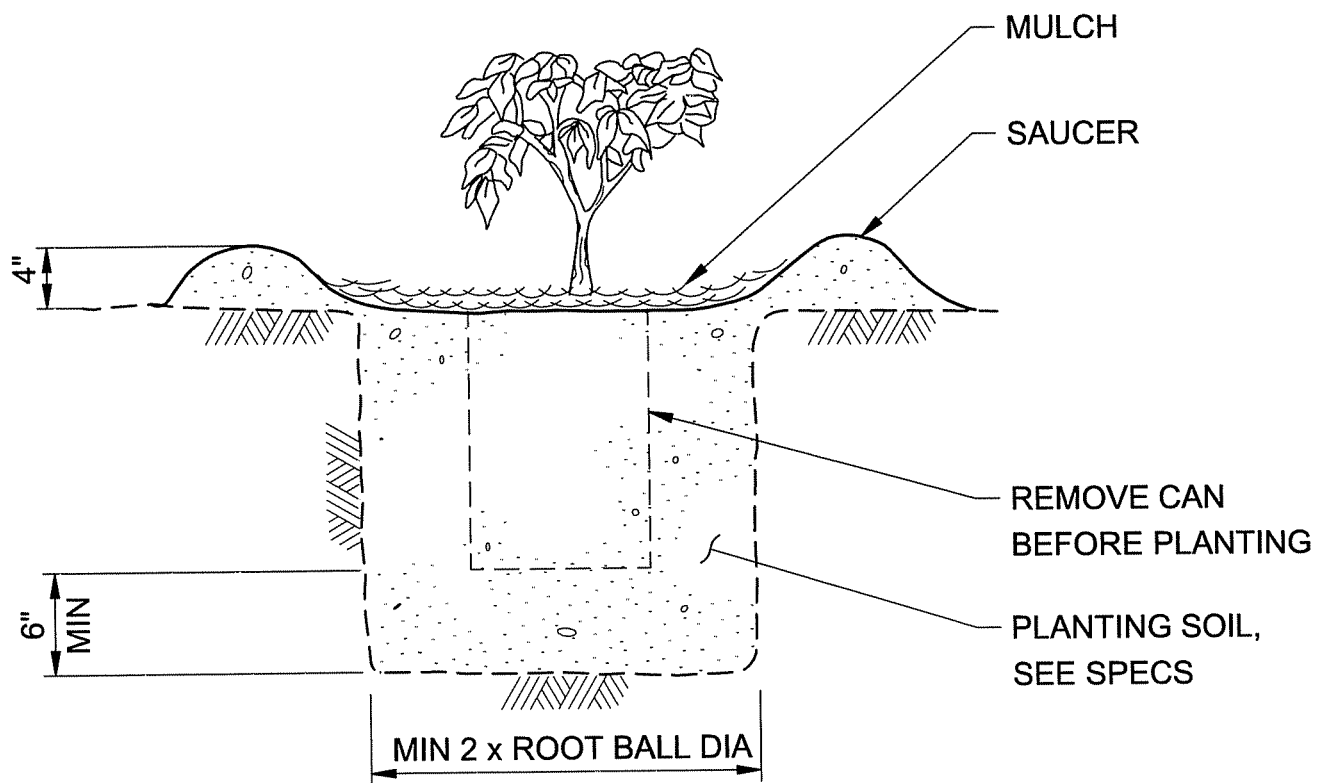
EVERGREEN TREE PLANTING

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

3293-620

CH2MHILL

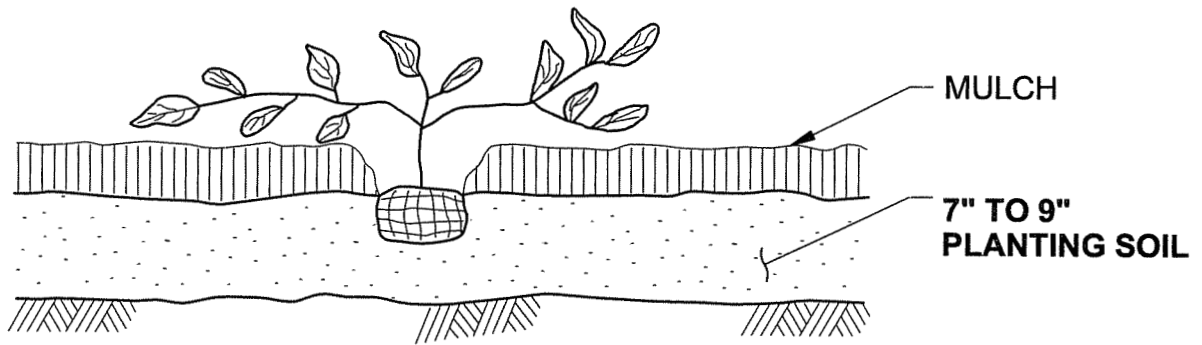


SHRUB PLANTING FROM CONTAINER

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

3293-630

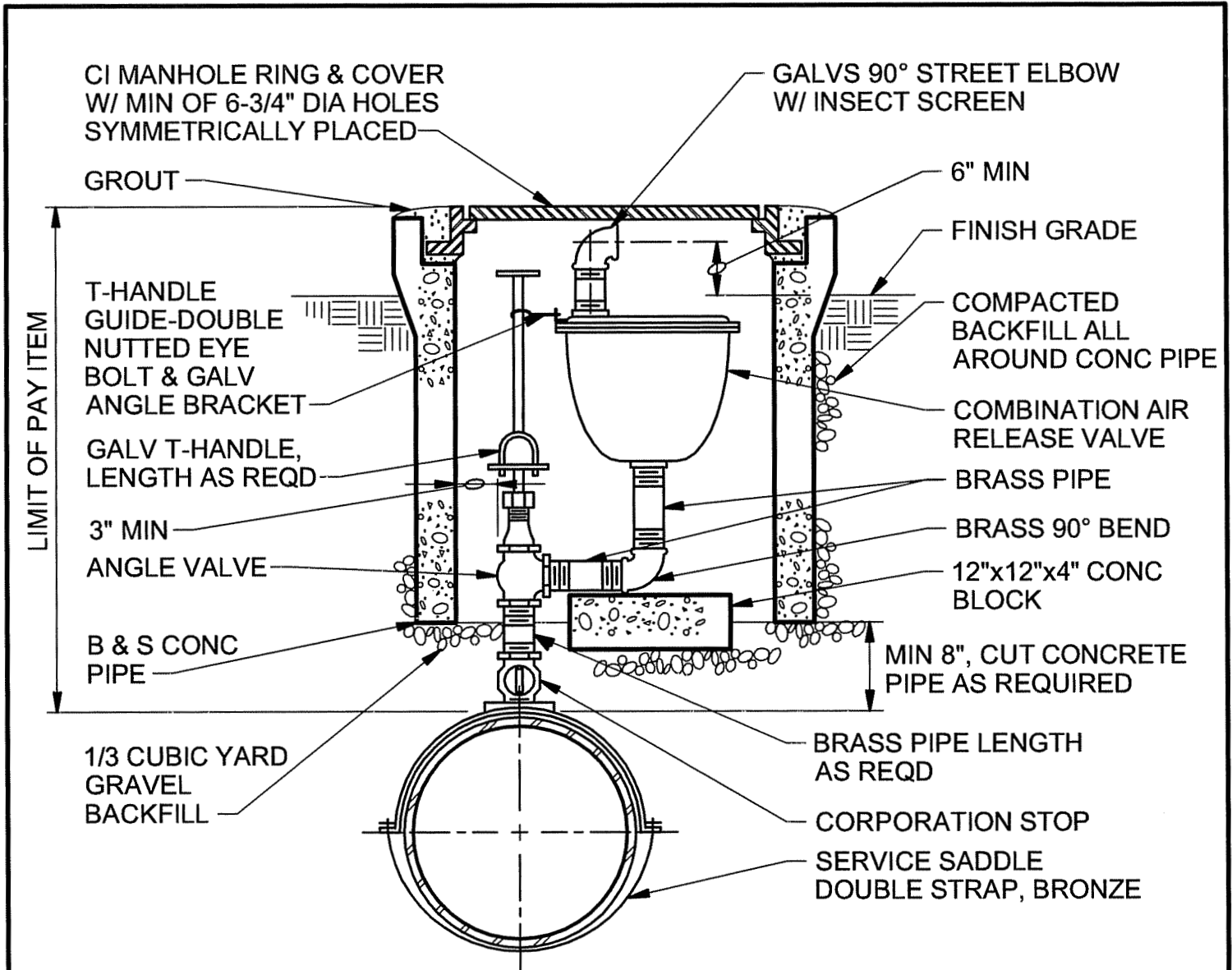


GROUND COVER PLANTING

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

3293-635



NOTES:

1. CORPORATION STOP, PIPE AND ACCESSORIES AND ANGLE VALVE TO BE SAME DIAMETER AS COMBINATION AIR RELEASE VALVE INLET.
2. PAY ITEM INCLUDES SERVICE SADDLE.

SEE APPROPRIATE NOTES WITH DETAIL NO. 3312-651 TYPE 'B' COMBINATION AIR RELEASE VALVE ASSEMBLY. USE THIS TYPE WHERE CARV CAN BE CENTERED OVER THE PIPE LINE. REFERENCE MASTER SPECIFICATION NO. XXXXX.

TYPE A COMBINATION AIR RELEASE VALVE ASSEMBLY
UP TO AND IN

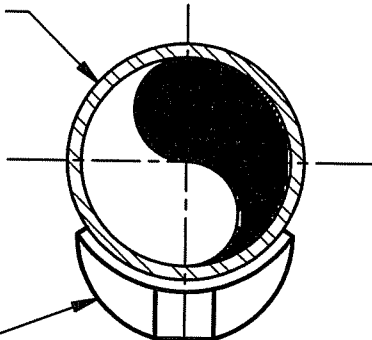
NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

3312-650

CH2MHILL

2 1/2" THRU 36" PIPE



ADJUSTABLE
PIPE SADDLE
SUPPORT

STD PIPE FLANGE.
ATTACH TO CONC
WITH ANCHORS

1 1/2" GROUT

CONCRETE
ANCHORS,
PER APPROVED
CALCULATIONS

DIMENSION TABLE

PIPE SIZE	A
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"
30"	6"
36"	6"

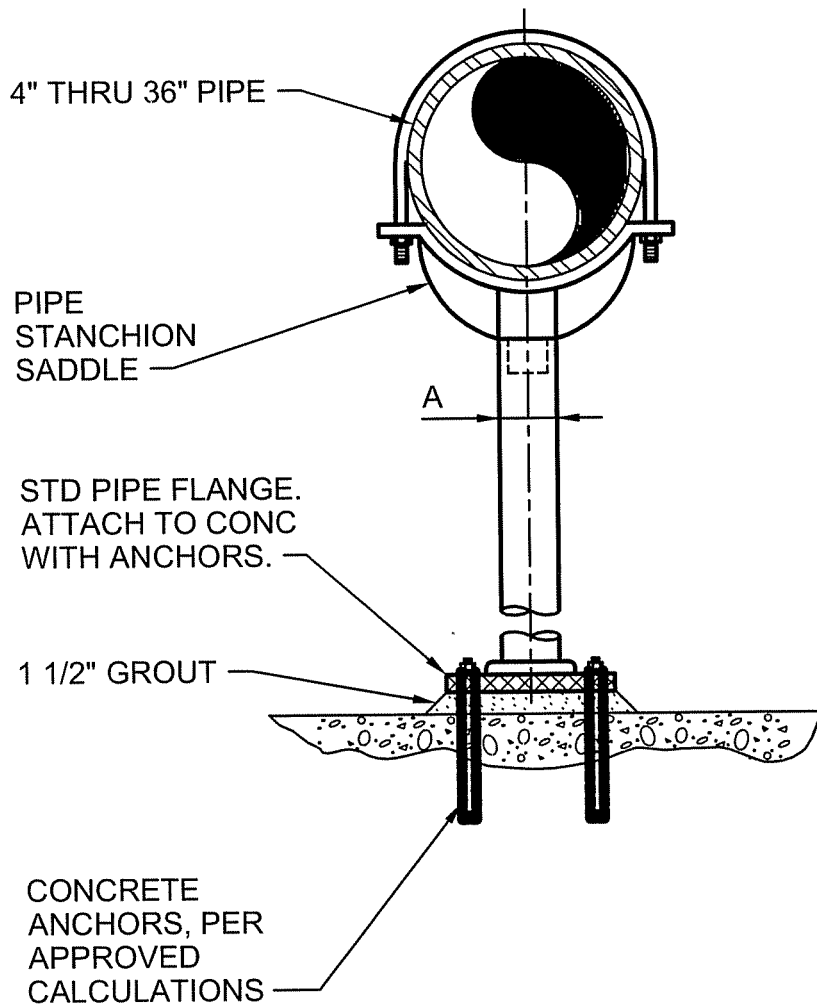
PIPE SUPPORT

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4005-500

CH2MHILL



DIMENSION TABLE	
PIPE SIZE	A
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"
30"	4"
36"	4"

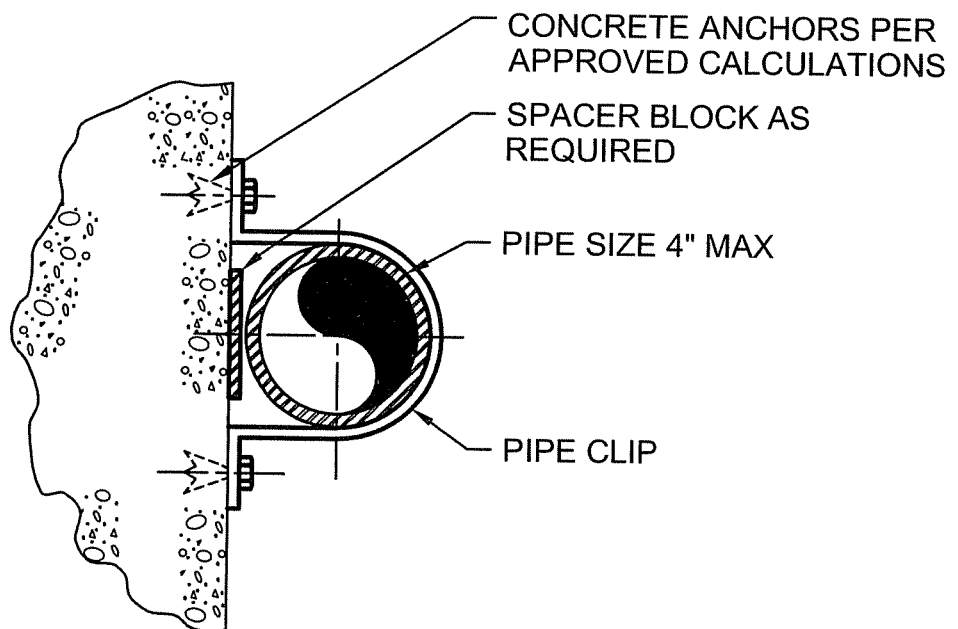
PIPE SUPPORT

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4005-501

CH2MHILL



NOTES:

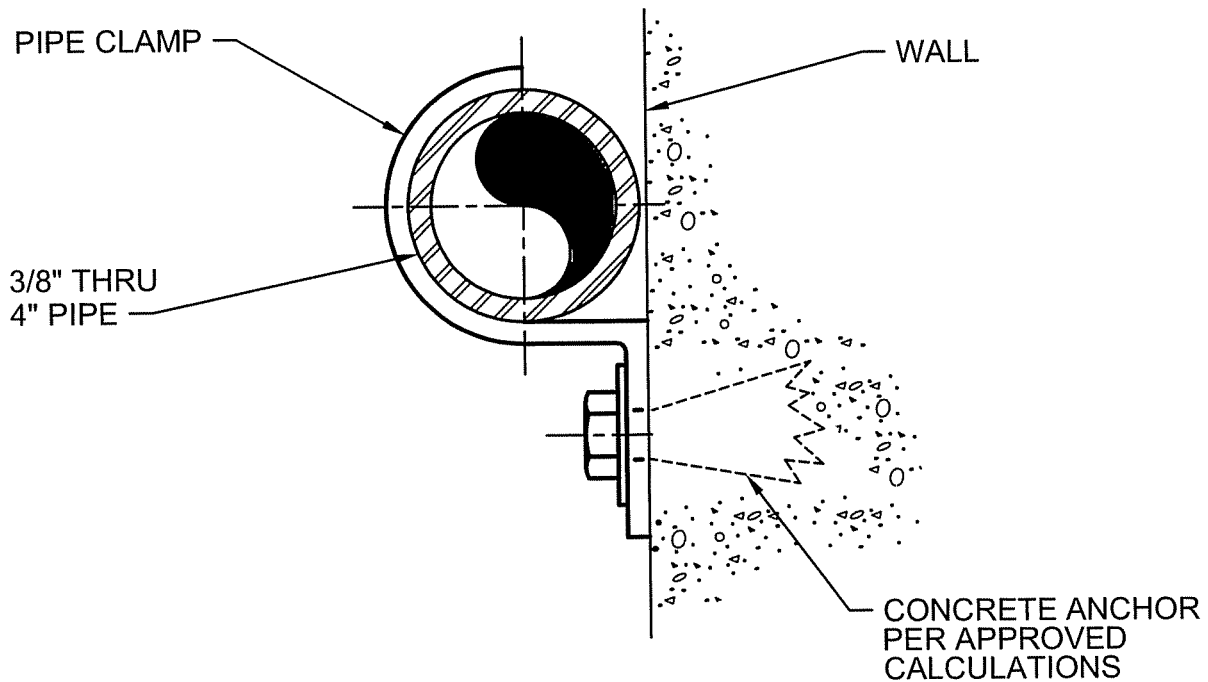
1. FOR VERTICAL PIPES ONLY.
2. PROVIDE PIPE PROTECTION BARRIER AS SPECIFIED. FABRICATE OVERSIZE STRAP WHERE REQUIRED.

PIPE SUPPORT - WALL MOUNT

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4005-503



NOTES:

1. FOR INSTALLATION OF PIPES ON WALLS ONLY.
2. NOT FOR USE HORIZONTALLY ON CEILINGS OR BOTTOMS OF BEAMS.
3. PROVIDE PIPE PROTECTION BARRIER AS SPECIFIED.

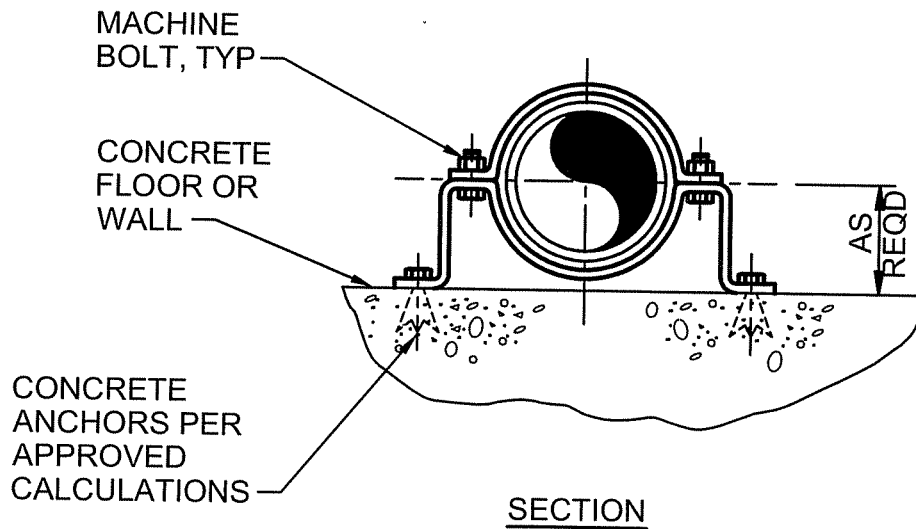
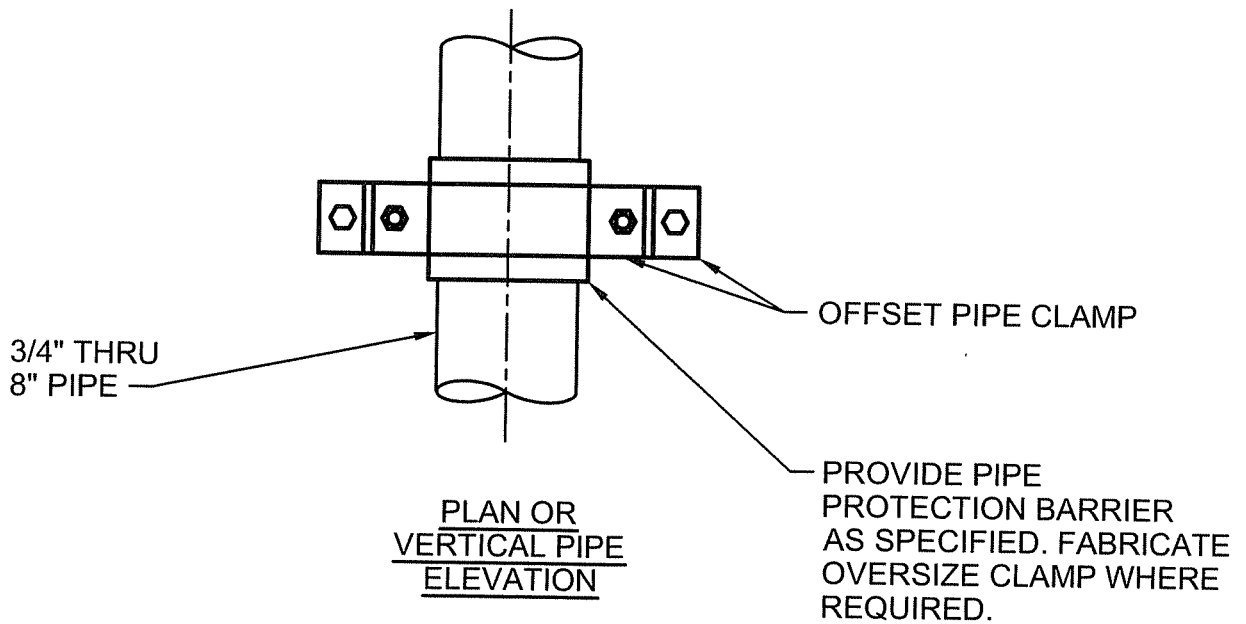
PIPE SUPPORT - WALL MOUNTED

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4005-504

CH2MHILL



PIPE SUPPORT - WALL MOUNTED

NTS

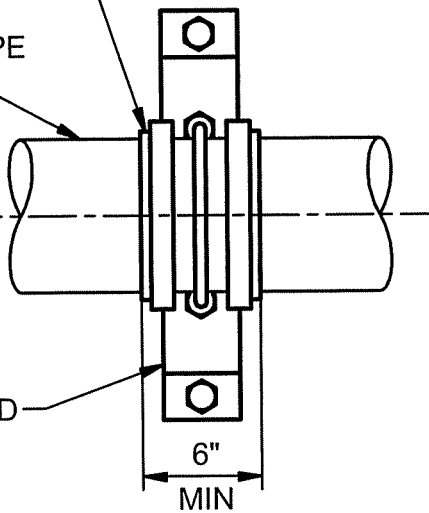
ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4005-505

18 GA GALV SHEET
SLEEVE STRAPPED
AROUND PIPE W/SST
HOSE CLAMPS

PLASTIC PIPE
6" OR 8"

BAR 3x3/8
GALVANIZED



PLAN

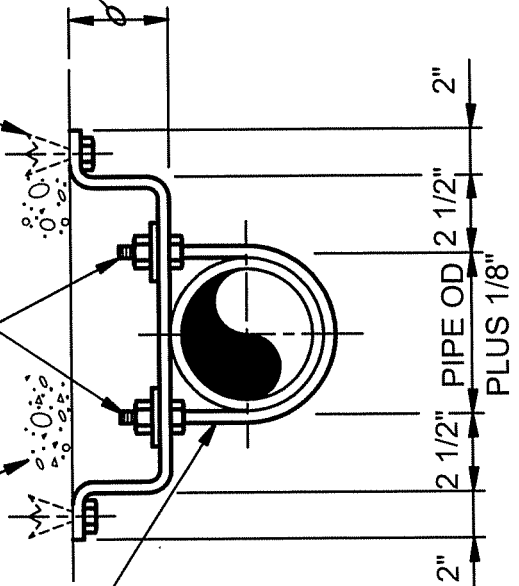
2" PIPE OD
PLUS 1/2"

CONC
ANCHORS, PER
APPROVED
CALCULATIONS

HEX NUT
W/LOCK
WASHER

CONC
WALL

1/4" U-BOLT
GALVANIZED



SECTION

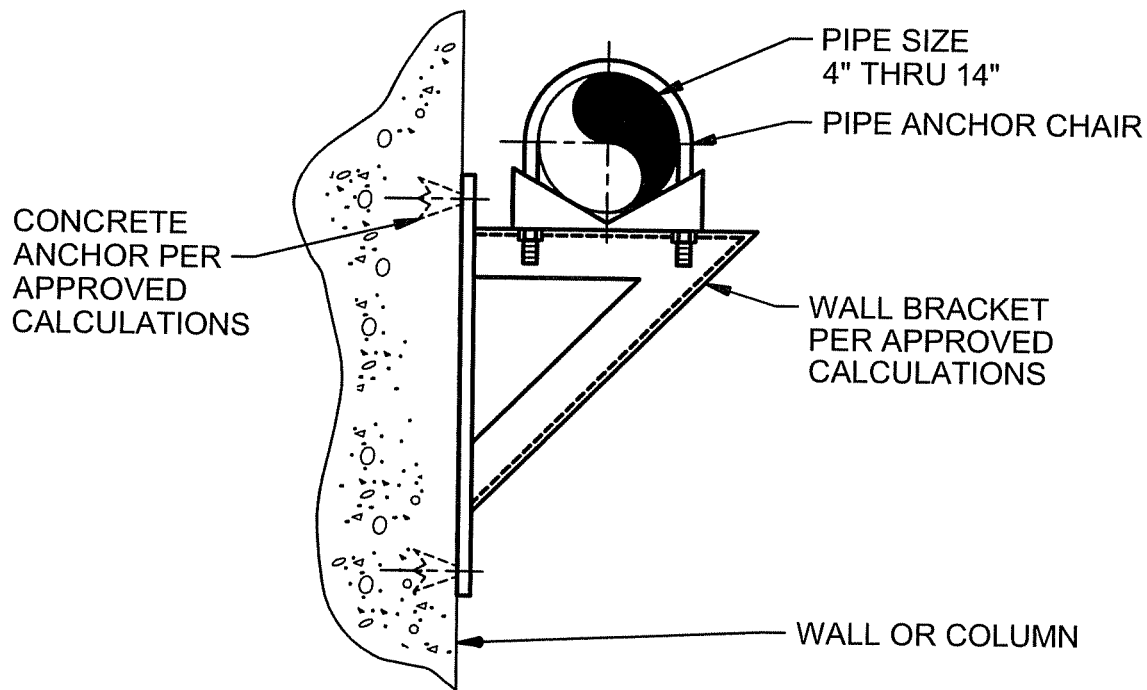
PIPE SUPPORT - WALL MOUNTED

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4005-506

CH2MHILL



NOTES:

1. HOT DIP GALVANIZE AFTER FABRICATION.
2. WALL BRACKET SHALL BE MEDIUM OR HEAVY DUTY DEPENDING ON PIPE LOAD REQUIREMENTS.

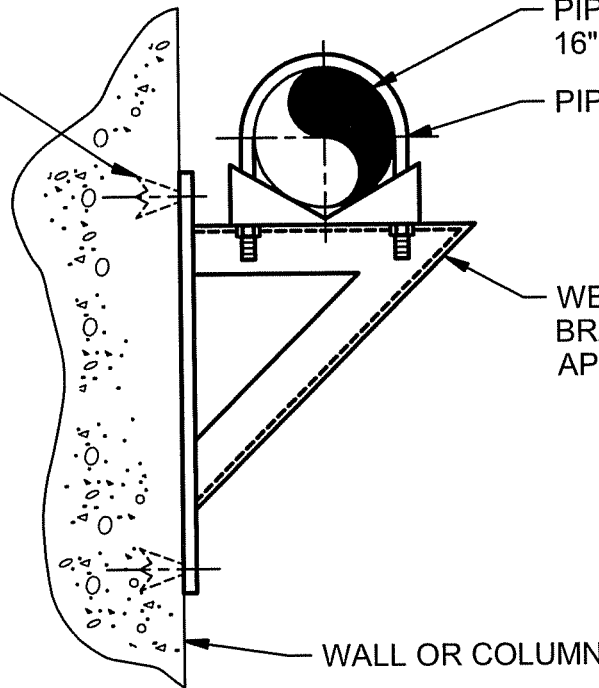
PIPE SUPPORT - WALL MOUNTED MEDIUM

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4005-508

CONCRETE ANCHOR, PER APPROVED CALCULATIONS

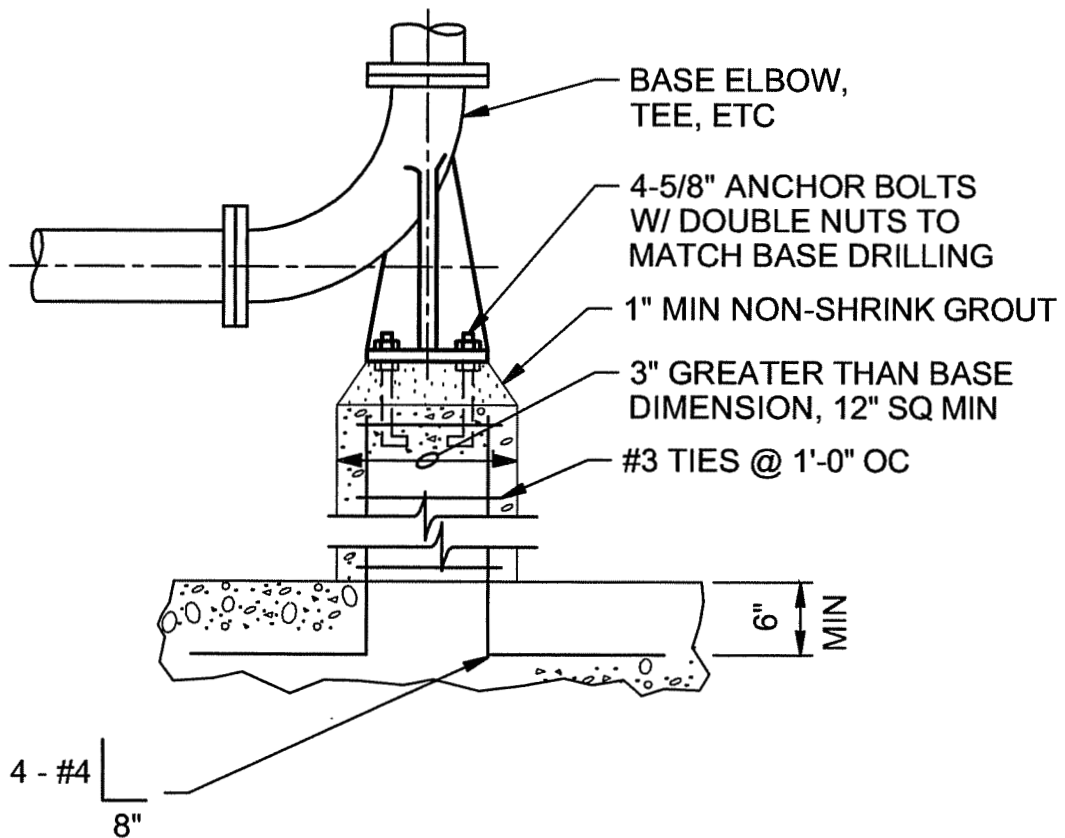


PIPE SUPPORT - WALL MOUNTED HEAVY

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4005-510



NOTES:

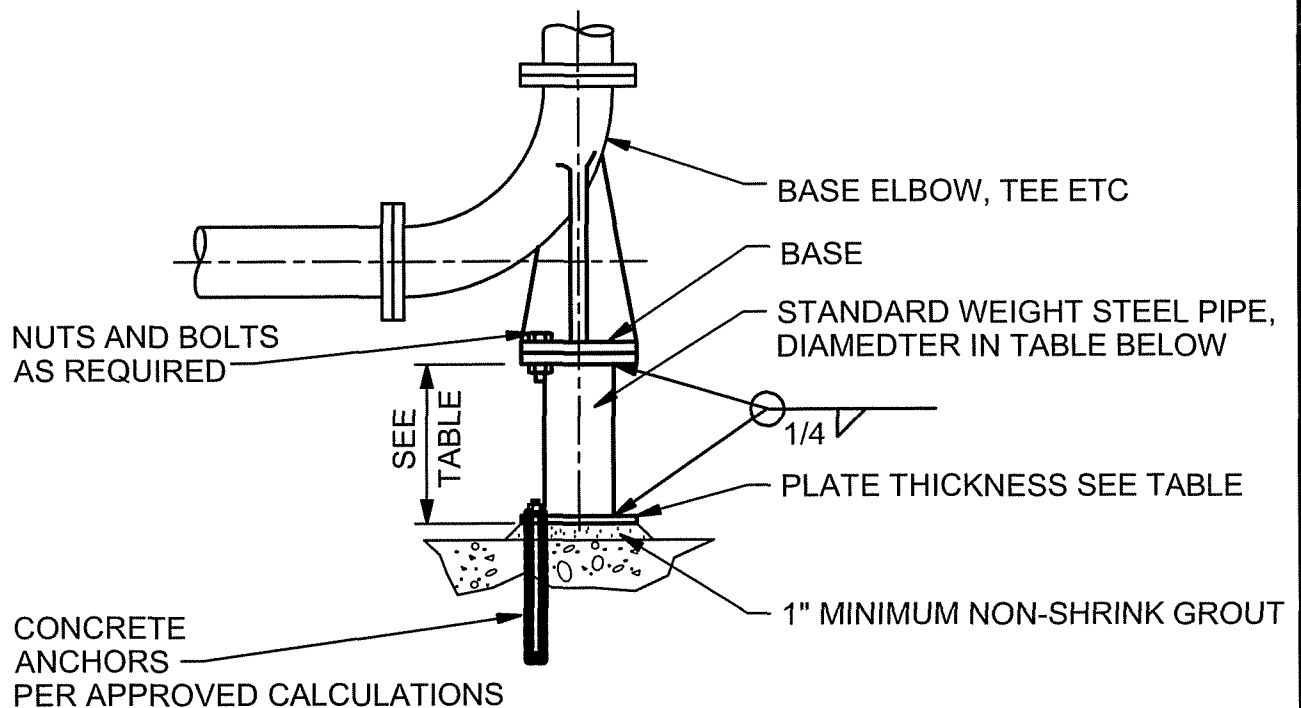
1. ALSO USE FOR SUPPORT OF HORIZONTAL TEE OR CROSS.

BASE BEND

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4005-517



DIMENSION TABLE				
PIPE SIZE	SUPPORT DIAMETER	PLATE		ANCHOR BOLT DIAMETER
		DIAMETER	THICKNESS	
3"	1 1/2"	5"	3/8"	3/8"
4"	2"	6"	3/8"	3/8"
6"	3"	7"	3/8"	3/8"
8" and 10"	4"	9"	1/2"	1/2"
12" thru 16"	6"	11"	1/2"	1/2"
18" thru 24"	8"	13 1/2"	5/8"	5/8"
30"	10"	16"	5/8"	5/8"
36"	12"	19"	5/8"	5/8"
42"	16"	23 1/2"	3/4"	3/4"
48"	18"	25"	3/4"	3/4"
54"	20"	30"	3/4"	3/4" (USE 6)
60"	24"	32"	3/4"	3/4" (USE 6)

NOTES:

1. ALSO USE FOR SUPPORT OF HORIZONTAL TEE OR CROSS.

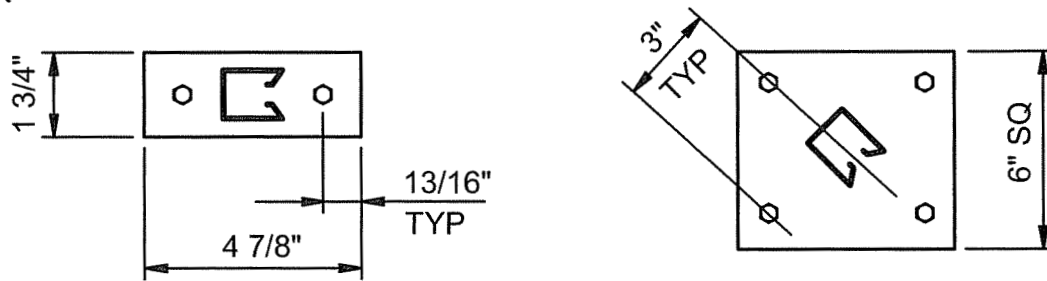
BASE BEND

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4005-518

CH2MHILL



STRUCTURAL
CHANNEL BRACKET
SEE NOTE 3

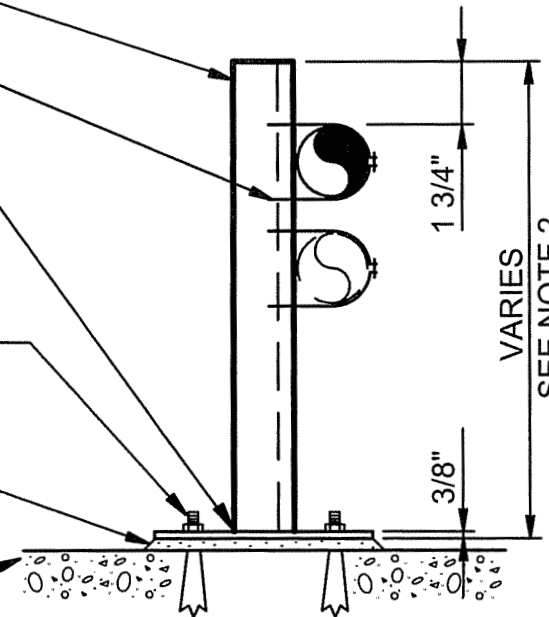
PIPE CLAMP

ALL
EXTERIOR
WALLS $\frac{3}{16}$

CONCRETE
ANCHORS, PER
APPROVED CALCULATIONS

1" MIN NON-
SHRINK GROUT

FINISHED
CONCRETE



NOTES:

1. MAXIMUM PIPE SIZE TO BE SUPPORTED WITH THIS PIPE SUPPORT IS 4".
2. LENGTH IS DEPENDENT ON PIPE SPACING AND DISTANCE OF PIPE FROM BASE.
3. USE 1 5/8 "x2 7/16 " CHANNEL MINIMUM FOR SINGLE PIPE OR USE 1 5/8 "x3 1/4 " CHANNEL MINIMUM FOR TWO OR MORE PIPES

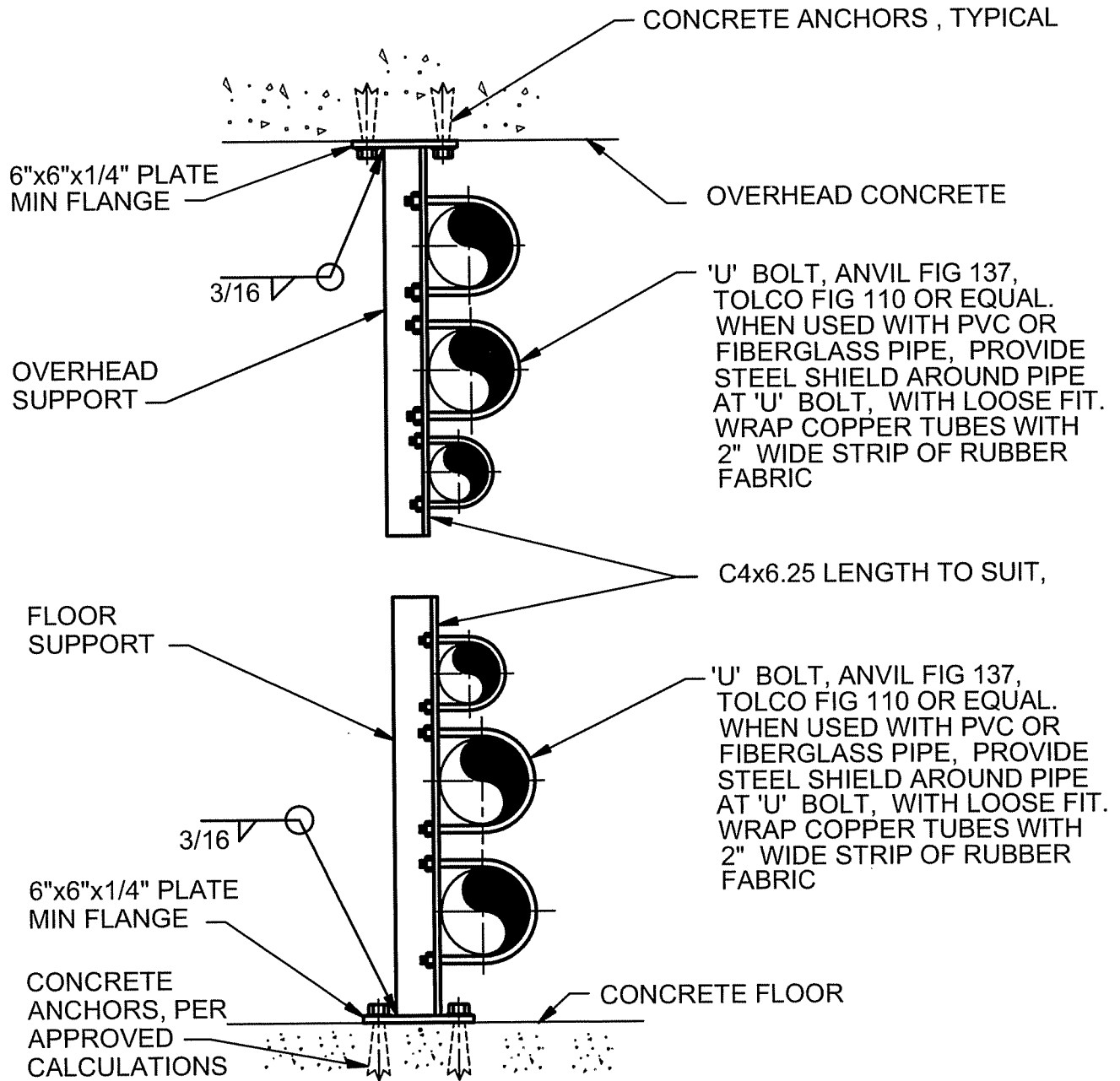
PIPE SUPPORT

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4005-524

CH2MHILL



NOTES:

1. CHANNEL, 'U' BOLT, LOCKWASHERS, NUTS, FLANGE AND ANCHORS TO BE MATERIAL AS SPECIFIED.

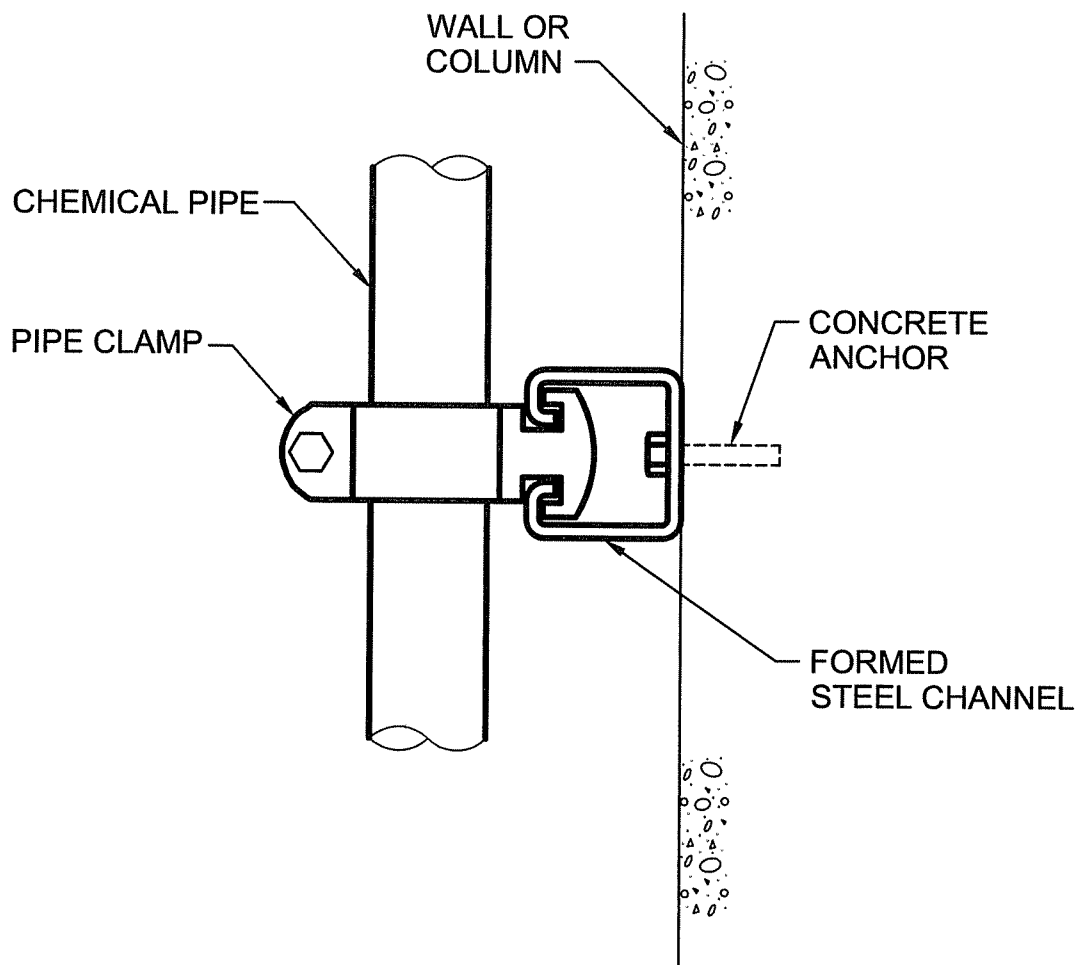
PIPE SUPPORT

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4005-525

CH2MHILL



NOTE:

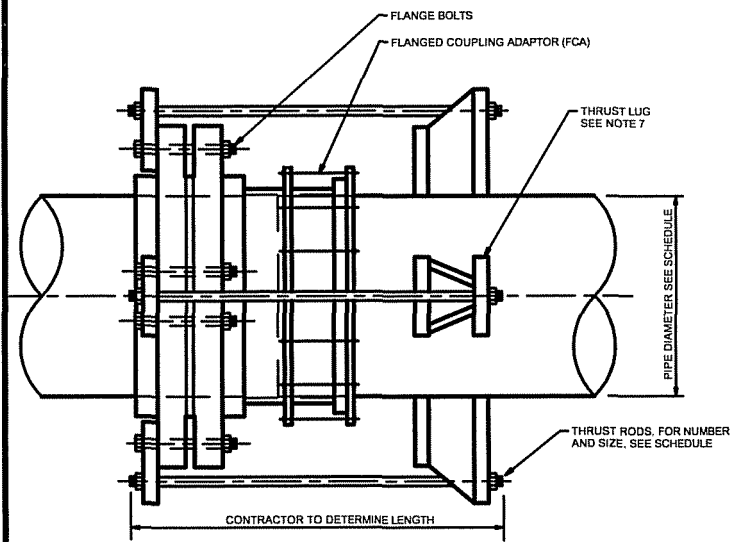
SUPPORT ALL EXPOSED SMALL DIAMETER (≤ 2 ") CHEMICAL PIPING ON FORMED STEEL CHANNELS.

SMALL CHEMICAL PIPING SUPPORT ON STRUCTURE

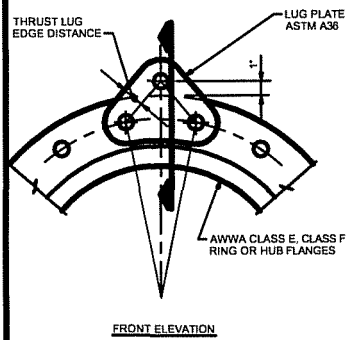
NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

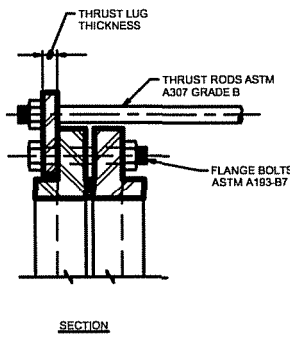
4005-526



PLAN



FRONT ELEVATION



SECTION

LUG

- NOTES:**
- THRUST RODS SHALL CONFORM TO ASTM A307 GRADE B. NUTS SHALL CONFORM TO ASTM A563.
 - LUG PLATES SHALL CONFORM TO ASTM A36.
 - THRUST ROD NUTS SHALL BE TIGHTENED GRADUALLY AND EQUALLY IN STAGES TO PREVENT UNEVEN ALIGNMENT AND TO ALLOW EQUAL STRESS ON ALL RODS UNDER PRESSURE. TIGHTEN UNTIL SNUG. THREADS SHALL PROTRUDE FROM NUTS. PEEN THREADS AFTER TIGHTENING NUTS.
 - LUG PLATES SHALL BE EQUALLY SPACED AROUND PIPE.
 - PROVIDE CATHODIC PROTECTION FOR COUPLINGS AS NOTED ON PLANS OR IN THE SPECIFICATIONS.
 - CONTRACTOR SHALL USE SCHEDULE DATA FOR ONLY THOSE PIPE SIZES AND TEST PRESSURES SPECIFIED IN THIS CONTRACT.
 - FOR THRUST LUG DIMENSIONS SEE LUG SCHEDULE ON DETAIL 15540. ADJUST HEIGHT OF THRUST ROD LUG SO THAT THRUST ROD IS PARALLEL TO PIPE AXIS.

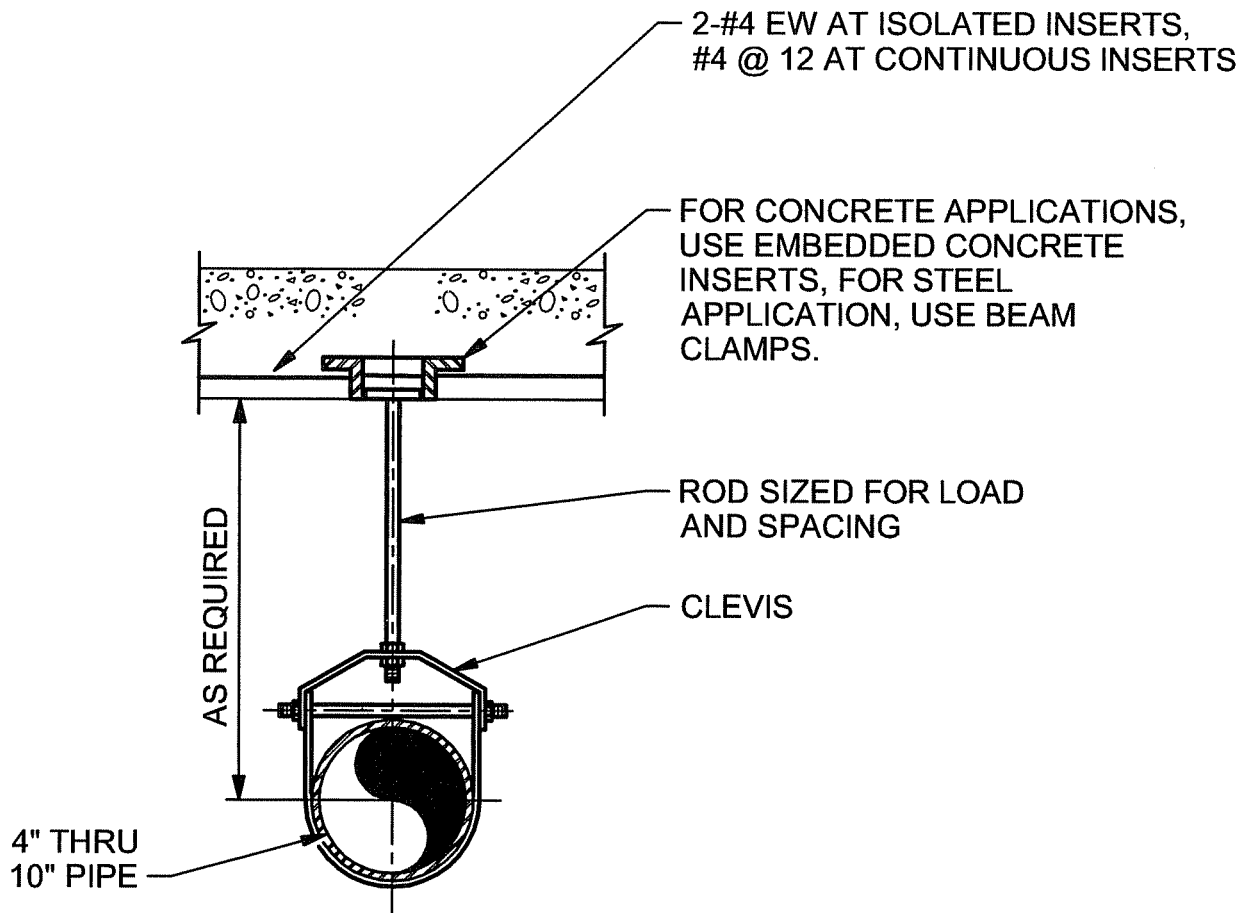
THRUST ROD AND LUG PLATE SCHEDULE										
WORKING PRESSURE (PSI)	AWWA C207 FLANGE CLASS	NUMBER OF THRUST RODS	PUBLISHED FLANGE THICKNESS (IN)	REDUCED FLANGE THICKNESS (IN)	THRUST ROD DIA. (IN)	THRUST ROD FORCE (KIP)	THRUST LUG THICKNESS (IN)	THRUST LUG EDGE DISTANCE (IN)	REDUCED FLANGE BOLT SPEC	
100	6" Class E	4	1.31	0.67	1.2	0.25	1.50	1.50	A 193, B7	
100	6" Class F	6	1.31	0.75	0.63	1.0	0.25	1.50	A 193, B7	
100	8" Class E	4	1.50	0.80	0.63	2.0	0.38	1.50	A 193, B7	
100	8" Class F	6	1.31	0.67	0.63	1.5	0.38	1.50	A 193, B7	
100	10" Class E	6	1.50	0.83	0.63	2.0	0.38	1.50	A 193, B7	
100	10" Class F	8	1.50	0.99	0.63	1.7	0.38	1.50	A 193, B7	
100	12" Class E	6	1.75	1.06	0.63	3.0	0.38	1.50	A 193, B7	
100	12" Class F	8	1.63	1.13	0.63	2.4	0.38	1.50	A 193, B7	
100	14" Class E	8	1.88	1.17	0.63	3.0	0.38	1.50	A 193, B7	
100	14" Class F	10	1.94	1.26	0.63	2.5	0.38	1.50	A 193, B7	
100	16" Class E	6	2.00	1.30	0.63	3.6	0.38	1.50	A 193, B7	
100	16" Class F	10	2.14	1.37	0.63	3.1	0.38	1.50	A 193, B7	
100	18" Class E	8	2.13	1.37	0.63	4.2	0.50	1.53	A 193, B7	
100	18" Class F	12	2.25	1.49	0.63	3.2	0.50	1.53	A 193, B7	
100	20" Class E	10	2.38	1.49	0.63	4.7	0.50	1.53	A 193, B7	
100	20" Class F	12	2.33	1.61	0.63	3.9	0.50	1.53	A 193, B7	
100	22" Class E	10	2.50	1.58	0.63	4.9	0.50	1.53	A 193, B7	
100	22" Class F	12	2.50	1.72	0.63	4.7	0.50	1.53	A 193, B7	
100	24" Class E	10	2.63	1.70	0.63	5.8	0.50	1.53	A 193, B7	
100	24" Class F	12	2.69	1.85	0.63	5.8	0.50	1.53	A 193, B7	
100	30" Class E	14	2.88	2.02	0.75	6.3	0.50	1.53	A 193, B7	
100	30" Class F	16	3.15	2.16	0.75	7.2	0.50	1.53	A 193, B7	
100	36" Class E	18	3.13	2.34	0.75	6.0	0.50	1.53	A 193, B7	
100	36" Class F	18	3.48	2.46	0.68	6.9	0.50	2.63	A 193, B7	
100	42" Class E	18	3.38	2.65	0.88	9.5	0.63	2.00	A 193, B7	
100	42" Class F	18	3.81	2.76	0.88	10.5	0.63	2.63	A 193, B7	
100	48" Class E	20	3.50	2.83	0.88	10.1	0.63	2.00	A 193, B7	
100	48" Class F	20	4.50	3.06	1.00	12.8	0.63	2.63	A 193, B7	
200	6" Class E	4	1.31	0.66	0.63	2.5	0.38	1.50	A 193, B7	
200	6" Class F	6	1.31	1.06	0.63	2.1	0.38	1.50	A 193, B7	
200	8" Class E	4	1.50	1.14	0.63	4.0	0.50	1.50	A 193, B7	
200	8" Class F	6	1.31	1.24	0.63	3.2	0.38	1.50	A 193, B7	
200	10" Class E	6	1.50	1.32	0.63	4.1	0.50	1.50	A 193, B7	
200	10" Class F	8	1.50	1.40	0.63	3.4	0.50	1.50	A 193, B7	
200	12" Class E	6	1.75	1.53	0.63	6.0	0.50	1.50	A 193, B7	
200	12" Class F	8	1.63	1.59	0.63	4.7	0.50	1.53	A 193, B7	
200	14" Class E	8	1.88	1.66	0.75	7.3	0.63	1.50	A 193, B7	
200	14" Class F	10	1.84	1.78	0.63	6.0	0.50	1.53	A 193, B7	
200	16" Class E	8	2.00	1.83	0.75	7.2	0.63	1.50	A 193, B7	
200	16" Class F	10	2.14	1.94	0.75	8.3	0.63	1.80	A 193, B7	
200	18" Class E	10	2.13	1.94	0.75	8.3	0.63	1.53	A 193, B7	
200	18" Class F	12	2.25	2.11	0.75	8.5	0.63	1.53	A 193, B7	
200	20" Class E	10	2.38	2.11	0.75	8.2	0.63	1.53	A 193, B7	
200	20" Class F	12	2.33	2.27	0.75	7.8	0.63	1.80	A 193, B7	
200	22" Class E	10	2.50	2.24	0.88	9.7	0.63	1.80	A 193, B7	
200	22" Class F	12	2.50	2.44	0.88	9.3	0.75	1.80	A 193, B7	
200	24" Class E	10	2.63	2.41	0.88	11.8	0.75	1.80	A 193, B7	
200	24" Class F	12	2.69	2.62	0.88	11.1	0.75	2.00	A 193, B7	
200	30" Class E	14	2.88	2.66	1.00	12.6	0.75	1.80	A 193, B7	
200	30" Class F	14	3.15	3.05	1.00	14.8	0.75	2.31	A 193, B7	
200	36" Class E	18	3.13	3.31	1.13	15.7	0.75	2.00	A 193, B7	
200	36" Class F	18	3.48	3.47	1.13	17.7	0.75	2.63	A 193, B7	
200	42" Class E	18	3.38	3.75	1.13	19.0	0.88	2.00	A 193, B7	
200	42" Class F	18	3.81	3.90	1.25	21.1	0.88	2.63	A 193, B7	
200	48" Class E	20	3.50	4.14	1.25	20.2	0.88	2.00	A 193, B7	
200	48" Class F	20	4.50	4.35	1.38	25.5	0.88	2.63	A 193, B7	
300	6" Class E	4	1.31	1.18	0.63	3.7	0.50	1.50	A 193, B7	
300	6" Class F	6	1.31	1.30	0.63	3.1	0.50	1.50	A 193, B7	
300	8" Class E	4	1.50	1.39	0.63	6.1	0.50	1.50	A 193, B7	
300	8" Class F	6	1.31	1.51	0.63	4.8	0.50	1.50	A 193, B7	
300	10" Class E	6	1.50	1.63	0.63	6.1	0.50	1.50	A 193, B7	
300	10" Class F	8	1.50	1.72	0.63	5.1	0.50	1.50	A 193, B7	
300	12" Class E	6	1.75	1.88	0.88	9.0	0.63	1.50	A 193, B7	
300	12" Class F	8	1.63	1.95	0.75	7.1	0.63	1.53	A 193, B7	
300	14" Class E	8	1.88	2.03	0.88	10.8	0.75	1.50	A 193, B7	
300	14" Class F	10	1.84	2.18	0.75	7.5	0.63	1.53	A 193, B7	
300	16" Class E	8	2.00	2.24	0.88	10.8	0.75	1.50	A 193, B7	
300	16" Class F	10	2.14	2.38	0.88	9.4	0.63	1.80	A 193, B7	
300	18" Class E	8	2.13	2.30	1.00	12.5	0.75	1.53	A 193, B7	
300	18" Class F	12	2.25	2.58	0.88	9.7	0.75	1.69	A 193, B7	
300	20" Class E	10	2.38	2.50	1.00	12.2	0.75	1.53	A 193, B7	
300	20" Class F	12	2.33	2.78	0.88	11.7	0.75	1.80	A 193, B7	
300	22" Class E	10	2.50	2.74	1.00	14.8	0.75	1.80	A 193, B7	
300	22" Class F	12	2.50	2.99	1.00	14.0	0.88	1.80	A 193, B7	
300	24" Class E	10	2.63	2.95	1.13	17.3	0.88	2.00	A 193, B7	
300	24" Class F	12	2.69	3.21	1.13	18.7	0.88	2.00	A 193, B7	
300	30" Class E	14	2.88	3.50	1.13	19.0	0.88	1.80	A 193, B7	
300	30" Class F	14	3.15	4.00	1.25	21.8	0.88	2.31	A 193, B7	
300	36" Class E	18	3.13	4.26	1.25	23.8	1.00	2.00	A 193, B7	
300	36" Class F	18	3.48	4.49	1.38	29.9	0.88	2.63	A 193, B7	
300	42" Class E	18	3.38	4.59	1.38	28.5	1.00	2.00	A 193, B7	
300	42" Class F	18	3.81	4.78	1.50	31.8	1.00	2.63	A 193, B7	
300	48" Class E	20	3.50	5.07	1.50	30.2	1.13	2.00	A 193, B7	
300	48" Class F	22	4.50	5.33	1.63	38.3	1.13	2.63	A 193, B7	

THRUST TIE FOR STEEL PIPE

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4005-542





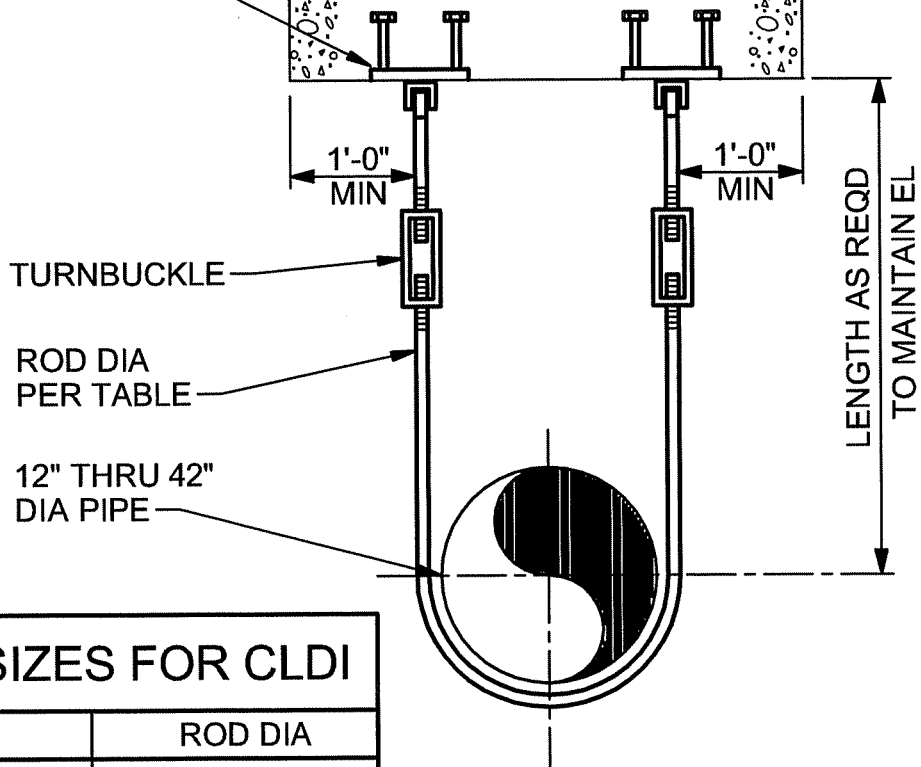
PIPE HANGER

NTS

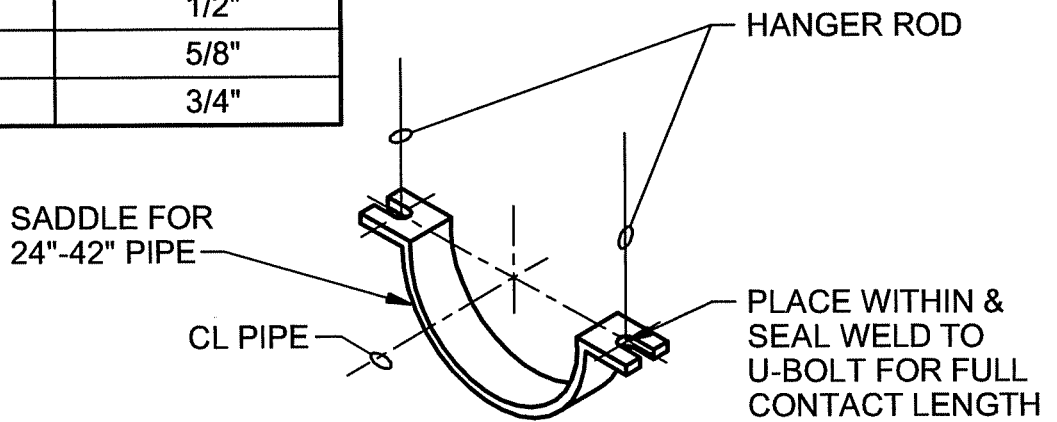
ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4005-550

CONCRETE EMBEDDED
INSERTS, TYPICAL



ROD SIZES FOR CLDI	
PIPE DIA	ROD DIA
12" THRU 16"	1/2"
18" AND 20"	5/8"
24"	3/4"



NOTES:

- HANGERS FOR PIPES 24" AND LARGER SHALL BE EQUIPPED WITH 1/4"x4" STEEL PLATE SADDLE.

PIPE HANGER

NTS

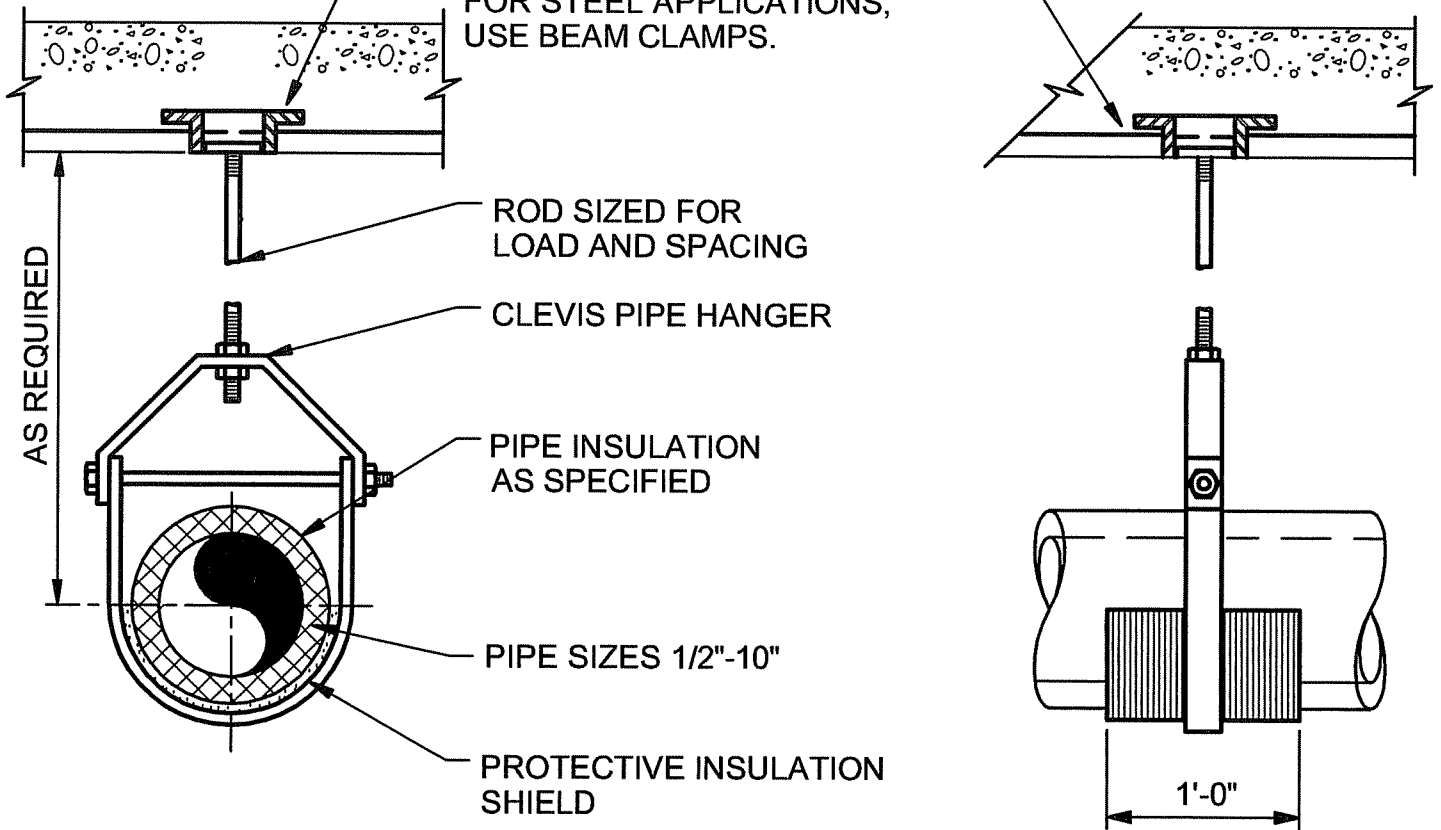
ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4005-554

CH2MHILL

2 -#4 EW AT ISOLATED INSERTS,
#4 @ 12 AT CONTINUOUS INSERTS

FOR CONCRETE APPLICATIONS,
USE EMBEDDED CONCRETE INSERTS.
FOR STEEL APPLICATIONS,
USE BEAM CLAMPS.



NOTES:

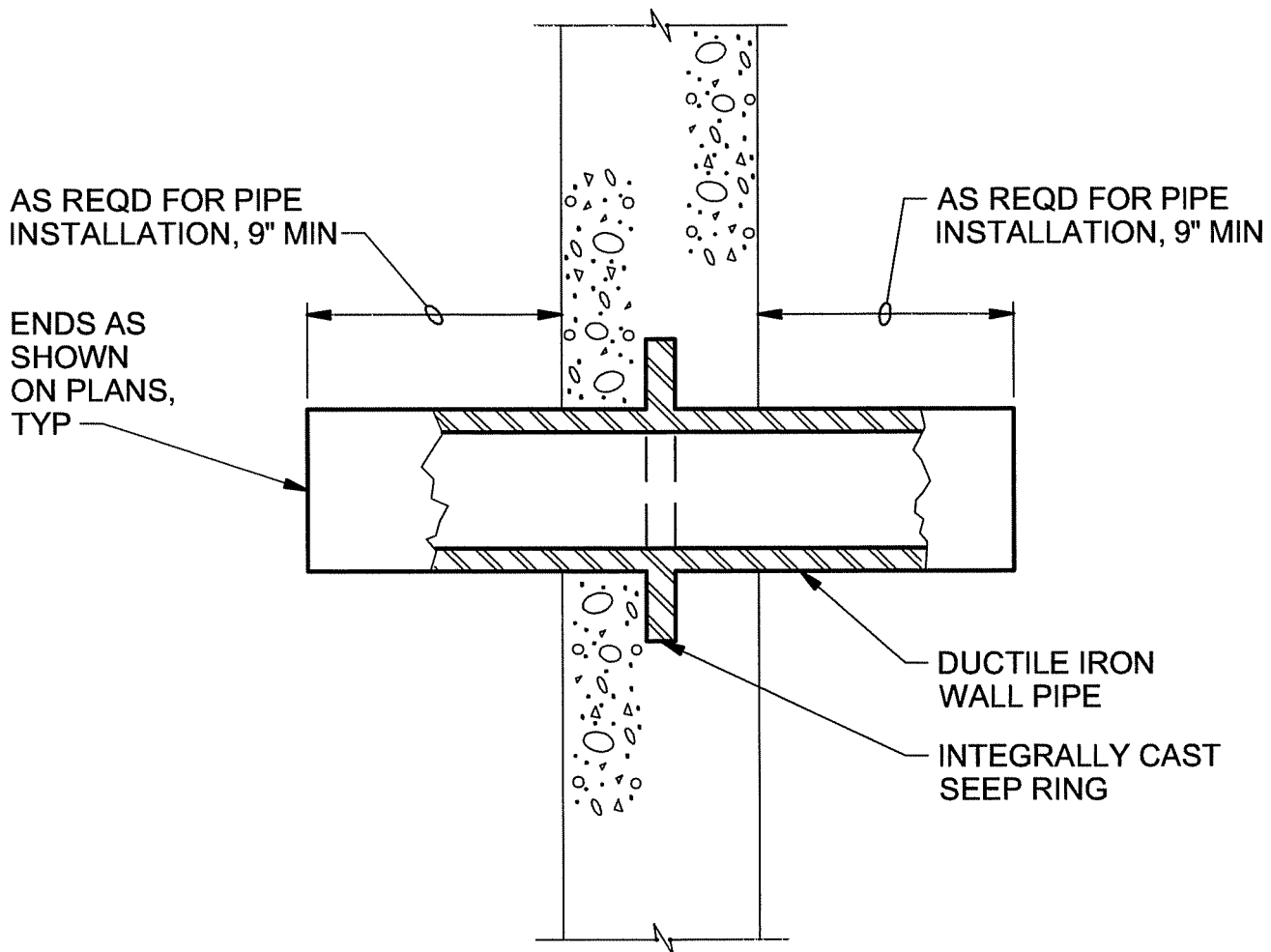
1. PIPE HANGERS SHALL BE OVERSIZED AS REQUIRED TO ACCOMMODATE THICKNESS OF INSULATION SPECIFIED. HANGER SHALL NOT COME INTO CONTACT WITH THE INSULATION DIRECTLY, EITHER AT THE VERTICAL YOKE OR AT THE POINT OF SUPPORT. FOR REQUIREMENTS ON INSULATION SHIELD USED WITH PIPE HANGERS, SEE SPECIFICATIONS.

PIPE HANGER

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4005-557



NOTES:

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

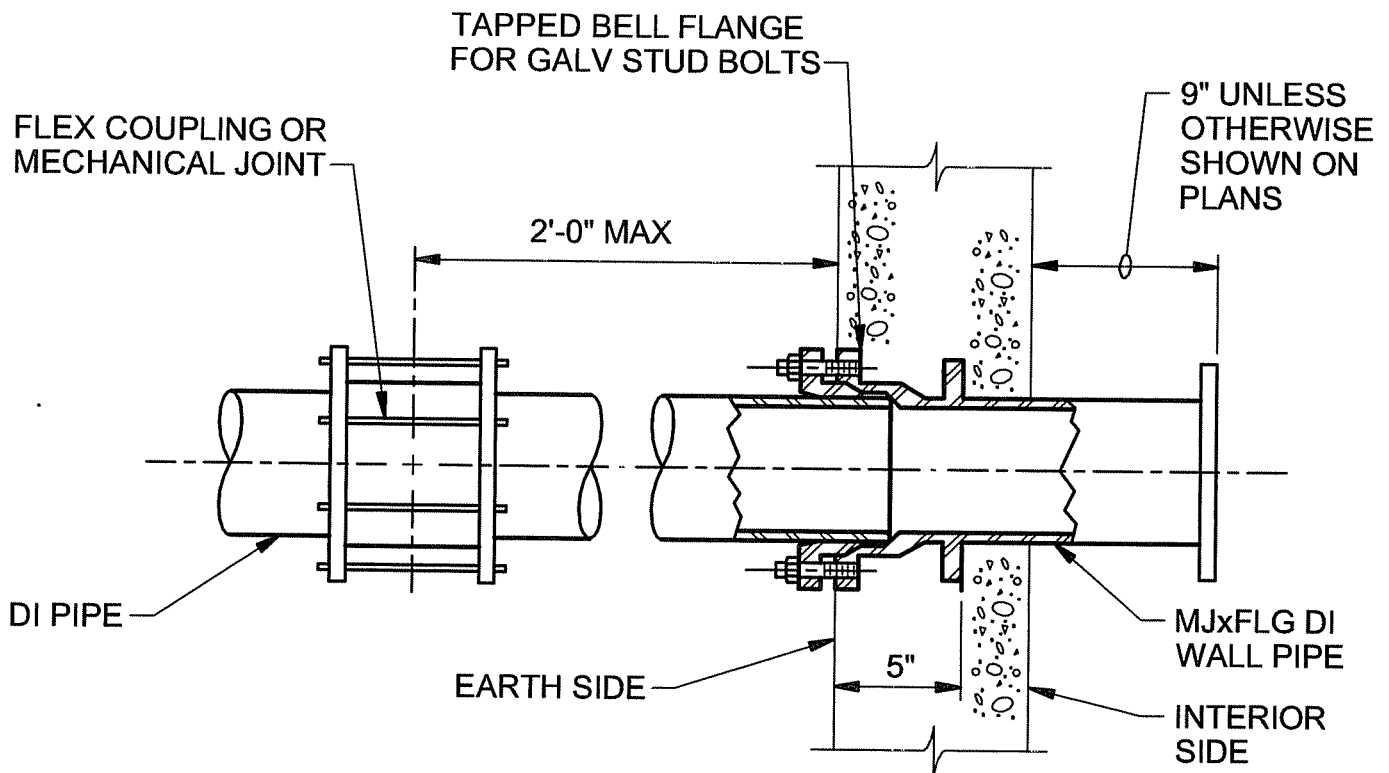
DUCTILE IRON WALL PIPE

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4027-600

CH2MHILL



NOTES:

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

MECHANICAL JOINT WALL PIPE

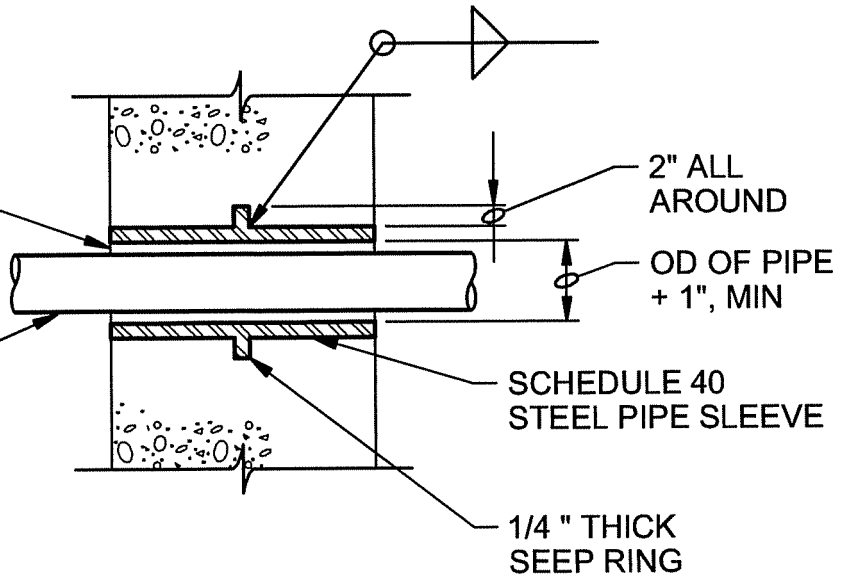
NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4027-601

FILL ANNULAR SPACE
WITH WATERPROOF
DOW CORNING 732 RTV
SILICONE SEALANT,
JOINT SHALL BE
WATERTIGHT

PASSING PIPE



NOTES:

1. DO NOT USE WHERE SUBJECT TO HYDROSTATIC PRESSURE. PAINT ENTIRE SLEEVE AND SEEP RING AS SPECIFIED.

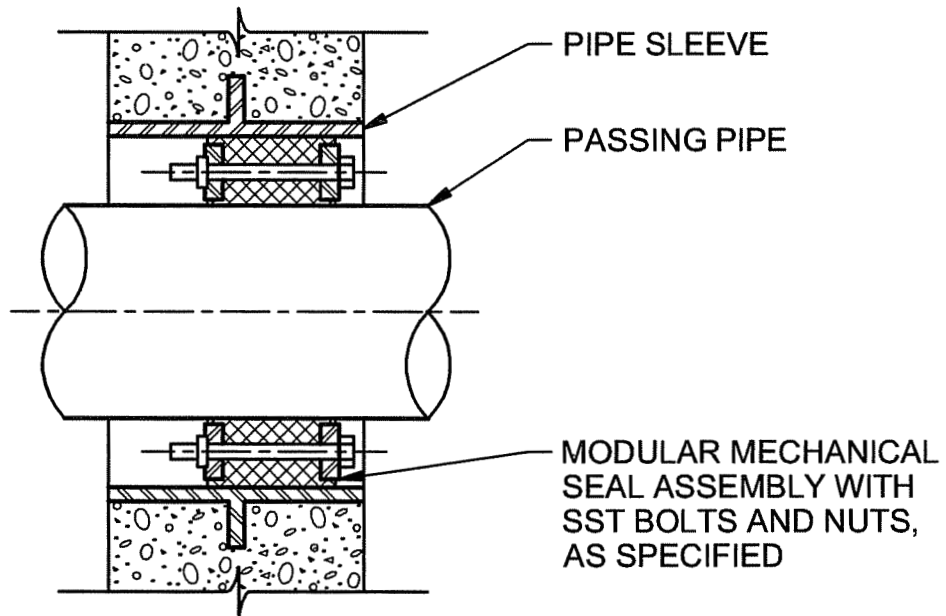
TYPE B PIPE SLEEVE

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4027-604

CH2MHILL

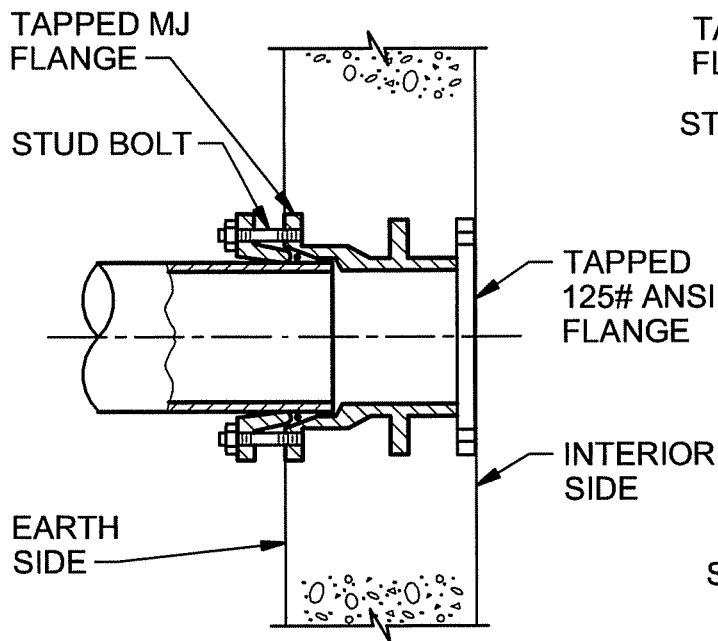


WALL PIPE PENETRATION SEAL

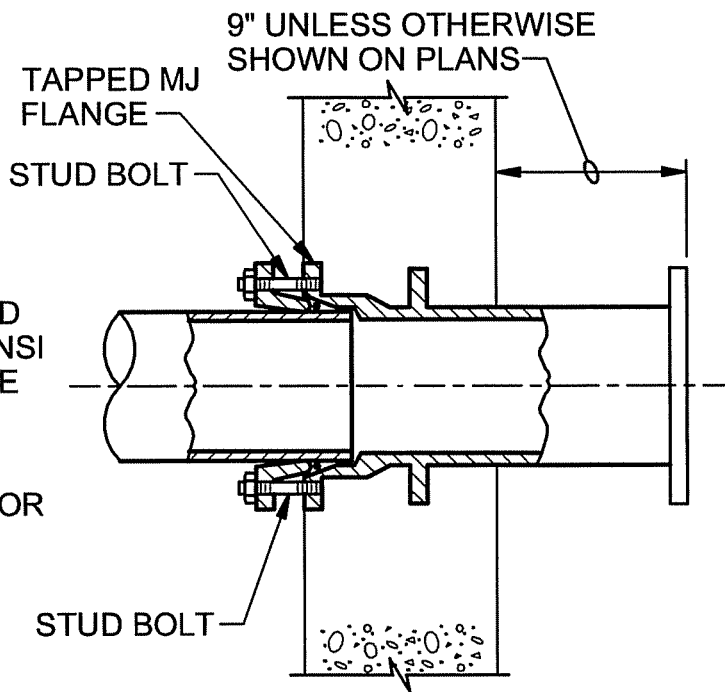
NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

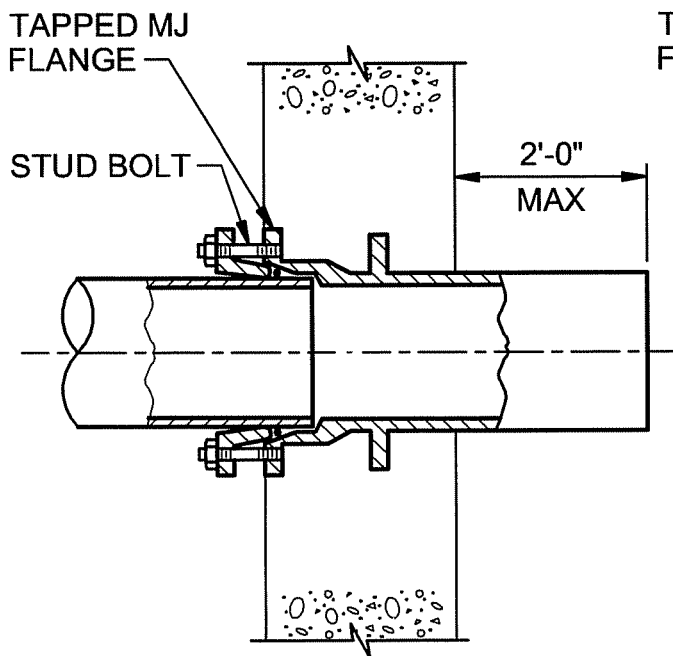
4027-607



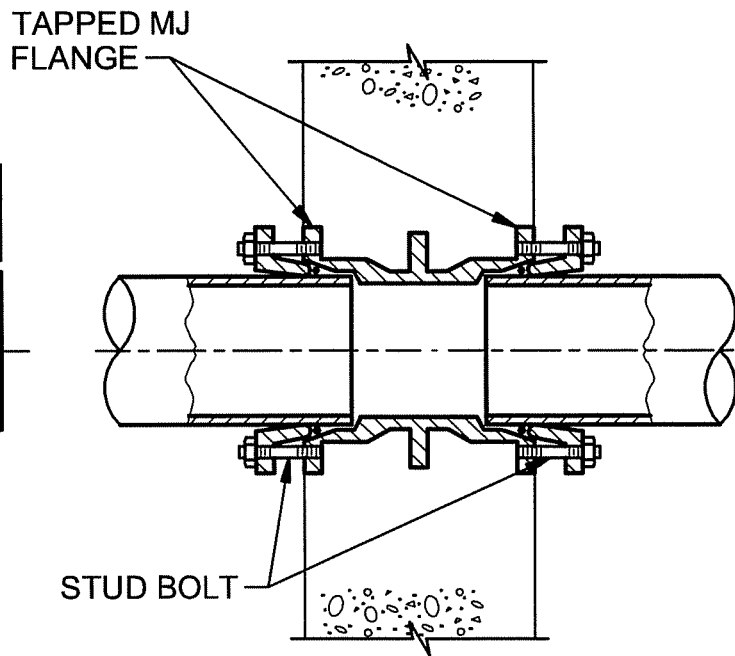
MECHANICAL JOINT X FLUSH FLANGE



MECHANICAL JOINT X FLANGE



MECHANICAL JOINT X PLAIN END



MECHANICAL JOINT X MECHANICAL JOINT

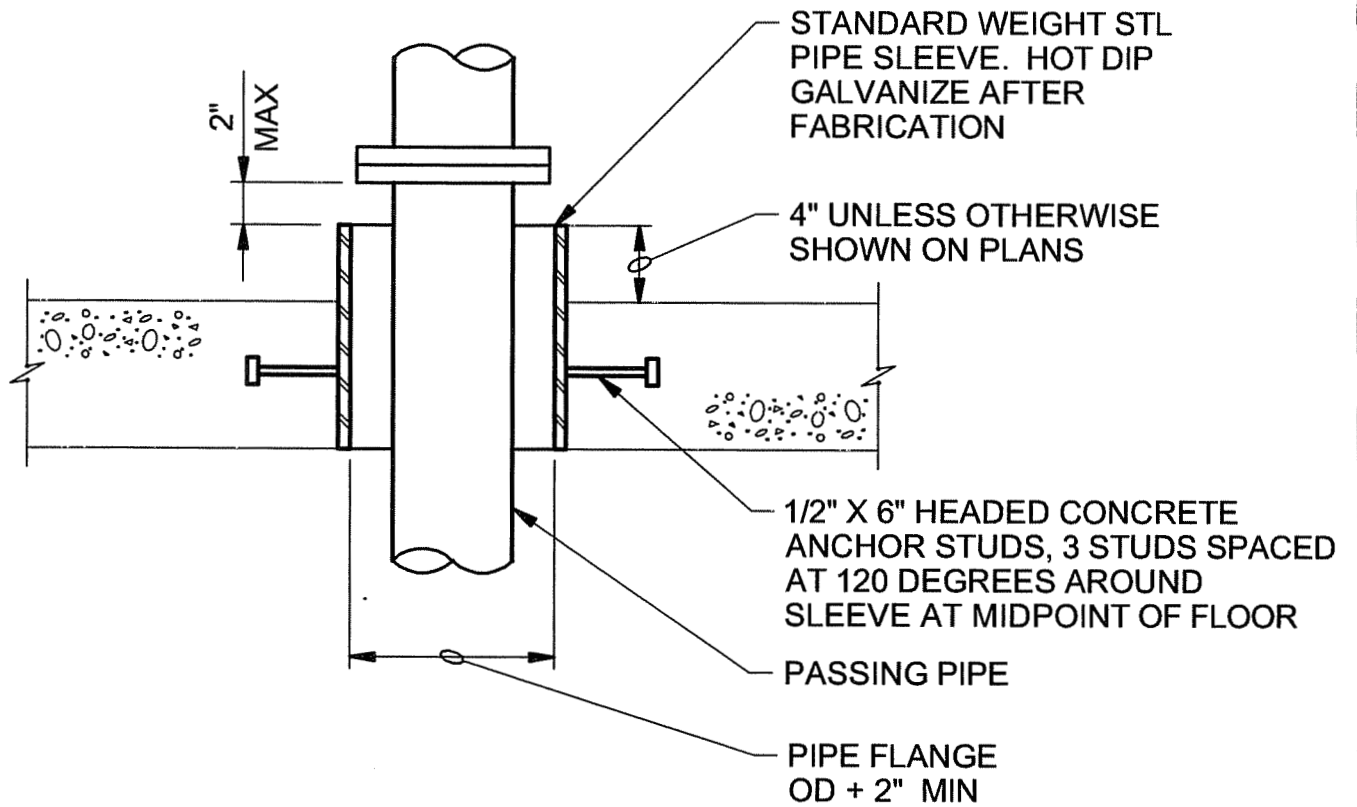
DUCTILE IRON WALL PIPES

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4027-609

CH2MHILL



FLOOR SLEEVE

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4027-621

FLGxPE PIPE

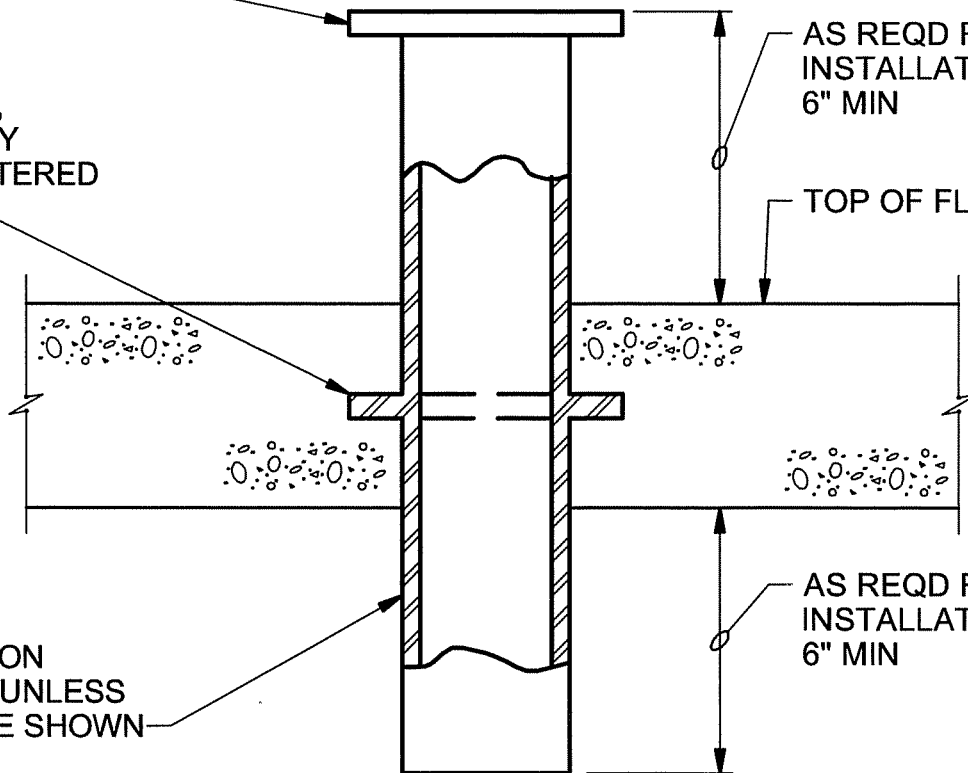
SEEP RING,
INTEGRALLY
CAST, CENTERED
IN SLAB

DUCTILE IRON
WALL PIPE UNLESS
OTHERWISE SHOWN

AS REQD FOR PIPE
INSTALLATION,
6" MIN

TOP OF FLOOR

AS REQD FOR PIPE
INSTALLATION,
6" MIN



NOTES:

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

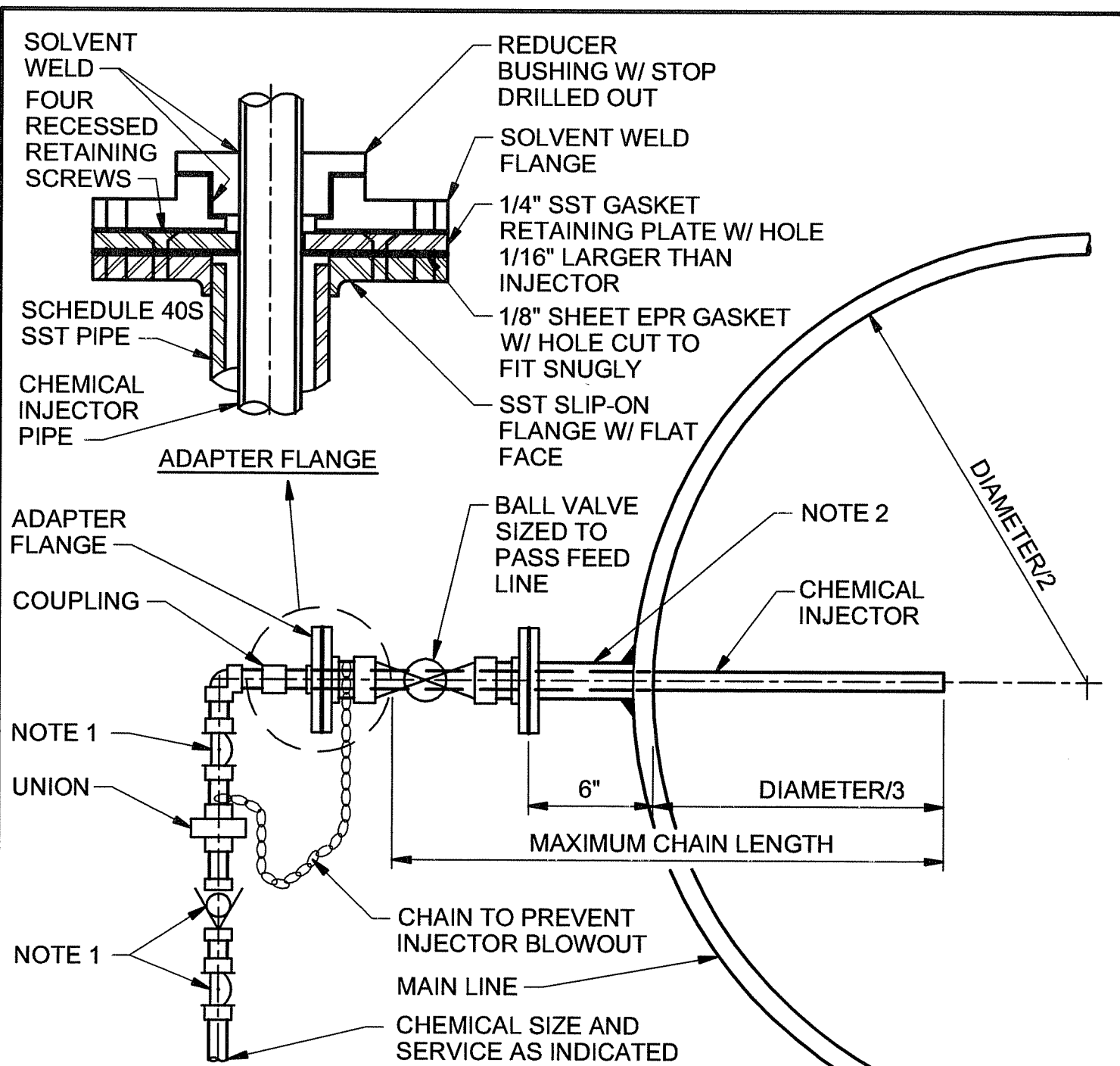
FLOOR PIPE

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4027-622

CH2MHILL



NOTES:

1. VALVE SIZE, TYPE, AND MATERIAL TO MATCH FEED LINE SIZE AND TYPE AS SPECIFIED FOR SERVICE. GAS SERVICE CHECK VALVES SHALL BE INSTALLED FOR VERTICAL UPFLOW ONLY.
2. BRANCH NOZZLE 1 1/2" AND SMALLER MAY BE CONNECTED TO DUCTILE IRON PIPE WITH A SERVICE SADDLE.

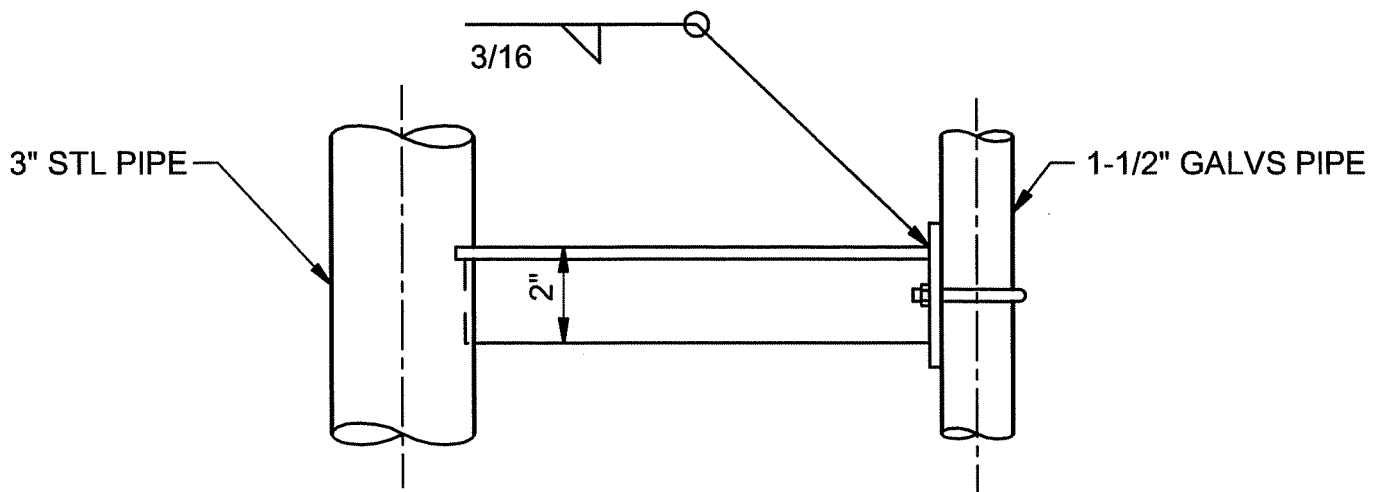
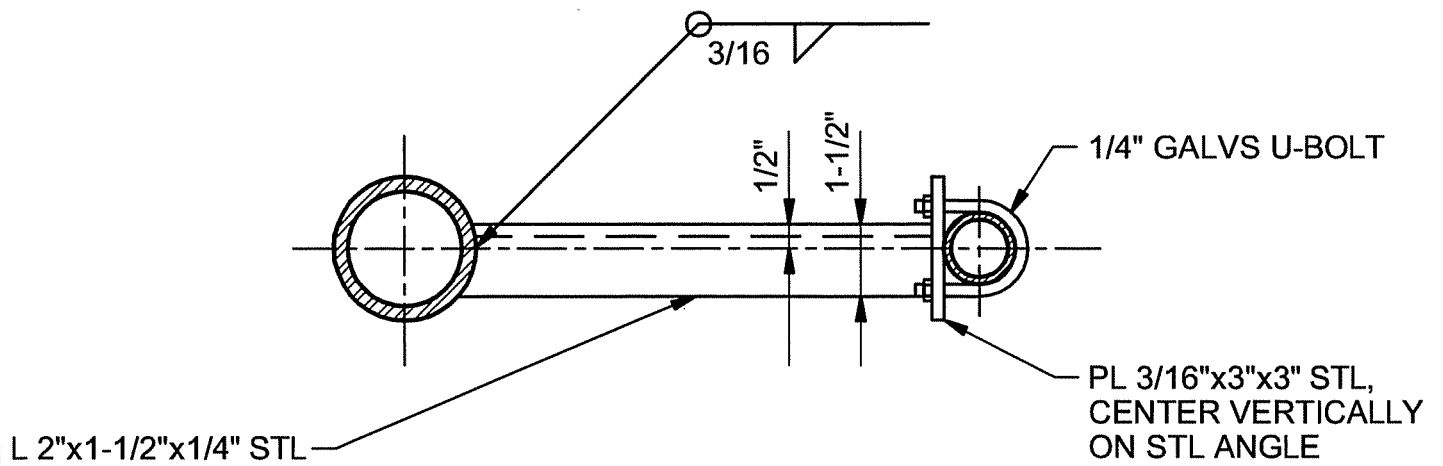
CHEMICAL INJECTOR

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4027-957

CH2MHILL



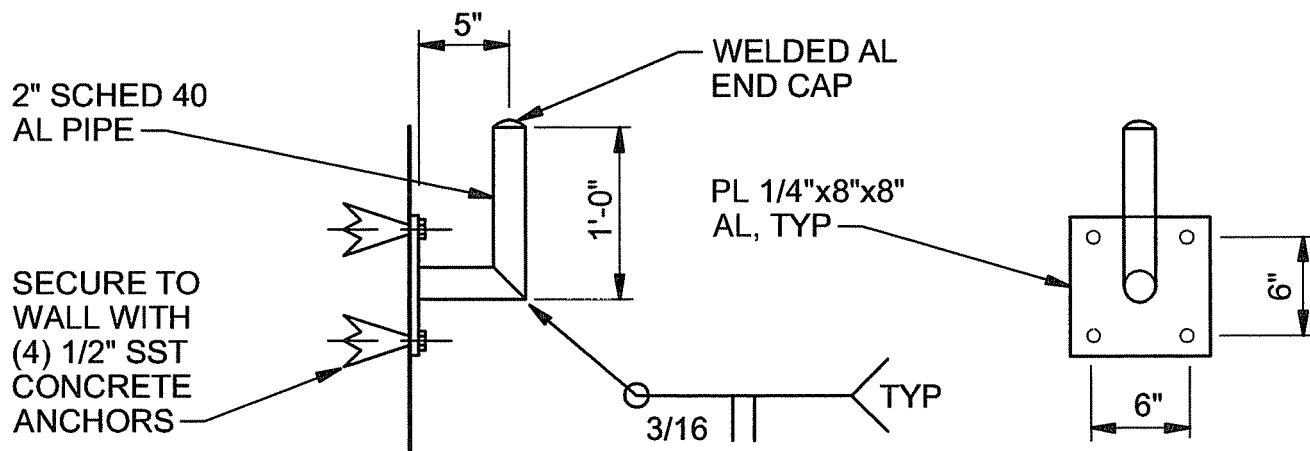
SUPPORT BRACKET

NTS

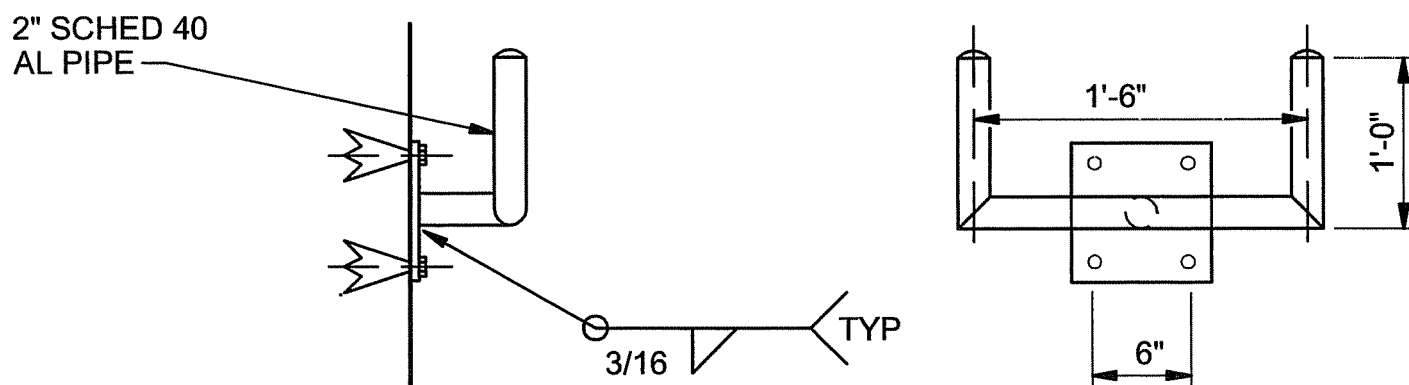
ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4090-391B

CH2MHILL



SINGLE PIPE MOUNT



DUAL PIPE MOUNT

NOTES:

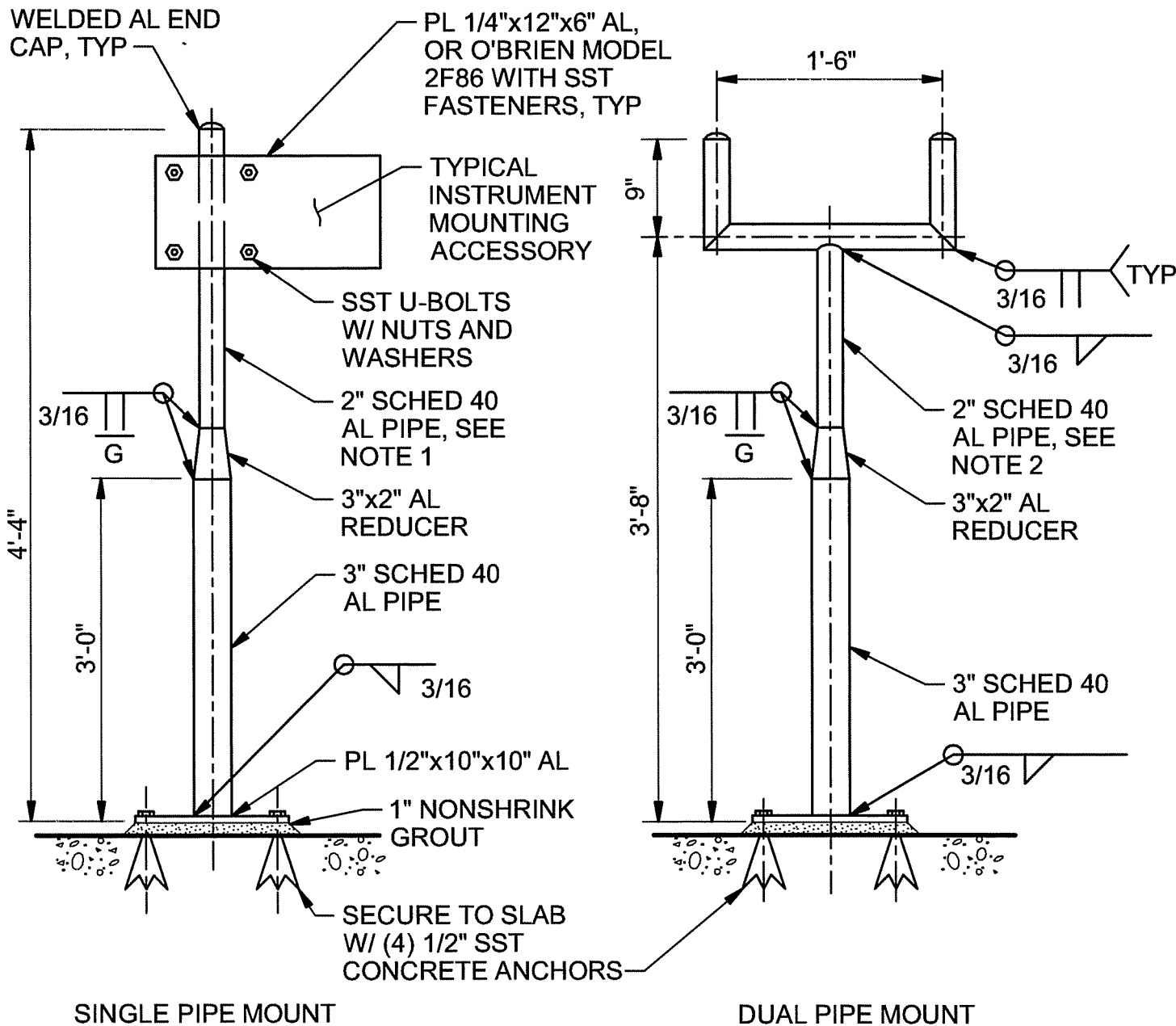
1. ALTERNATIVELY, SINGLE PIPE WALL MOUNT BRACKET SHALL BE O'BRIEN MODEL WE16M WITH 9 MIL ARC SPRAY ZINC METALLIZED COATING; OR EQUAL.
2. ALTERNATIVELY, DUAL PIPE WALL BRACKET SHALL BE O'BRIEN MODEL WTM-AT3M WALL BRACKET WITH MODEL S24M & A8M(2) ACCESSORIES, ALL WITH 9 MIL ARC SPRAY ZINC METALLIZED COATING, OR EQUAL.
3. INSTALL MOUNTING BRACKET SUCH THAT CENTERLINE OF INSTRUMENT OR DEVICE SUPPORTED IS APPROXIMATELY 4'-6" ABOVE FLOOR.
4. PAINT ALUMINUM IN CONTACT WITH CONCRETE ACCORDING TO SPECIFICATIONS FOR PAINTING.

WALL MOUNTED INSTRUMENT PIPE STANDS

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4090-400



NOTES:

1. ALTERNATIVELY, STANCHION SUPPORT SHALL BE O'BRIEN MODEL FP52 WITH 9 MIL ARC SPRAY ZINC METALLIZED COATING; OR EQUAL.
2. ALTERNATIVELY, DUAL SUPPORT SHALL BE O'BRIEN MODEL FP40 STANCHION WITH MODEL AFM, S24M & A8M(2) ACCESSORIES, ALL WITH 9 MIL ARC SPRAY ZINC METALLIZED COATING; OR EQUAL.
3. PAINT ALUMINUM IN CONTACT WITH CONCRETE ACCORDING TO SPECIFICATIONS FOR PAINTING.

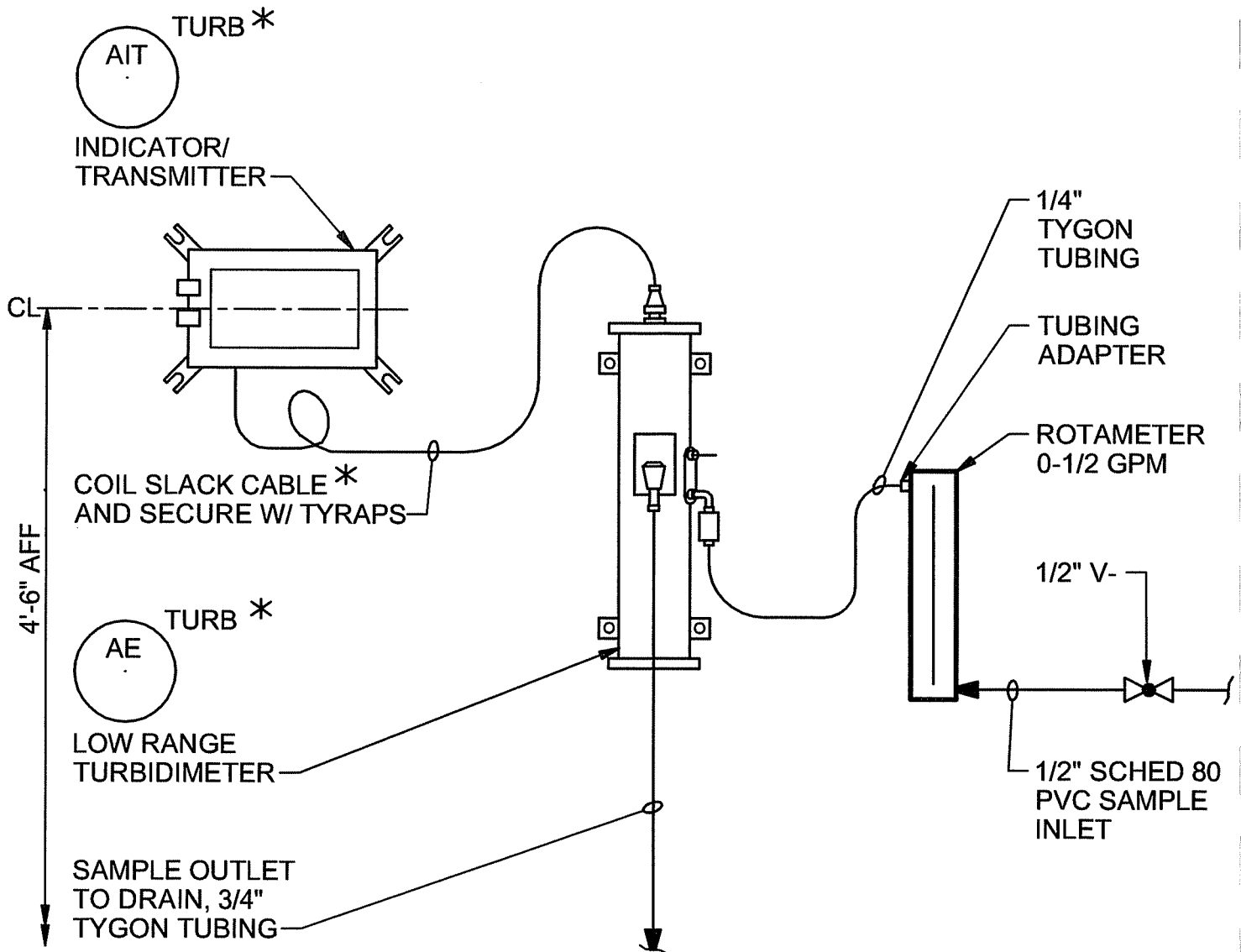
FLOOR MOUNTED INSTRUMENT PIPE STANDS

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4090-401

CH2MHILL



NOTES:

1. LOCATE INSTRUMENTS AS SHOWN ON PLANS.
2. SECURE INSTRUMENTS TO WALL WITH (4) 1/2" SST CONCRETE ANCHORS.
3. COMPONENTS DESIGNATED BY * ARE SUPPLIED BY INSTRUMENT MANUFACTURER.

LOW RANGE TURBIDIMETER INSTALLATION

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4091-144

CH2MHILL

BY MECHANICAL CONTRACTOR

PROCESS CONNECTION

BY I & C CONTRACTOR

MOUNT TRANSMITTER/INDICATOR BELOW ELEMENT CONNECTION

3-VALVE EQUALIZATION MANIFOLD

TO PURGE STATION WHERE REQUIRED

3/8" SST TUBING, TYP

3/8" SST DRAIN VALVE & TEST TAP AT LOW POINT

NOTES:

1. ALL LINES SHALL HAVE A CONTINUOUS SLOPE OF 1/4" PER FOOT MIN (1" PER FOOT PREFERRED).

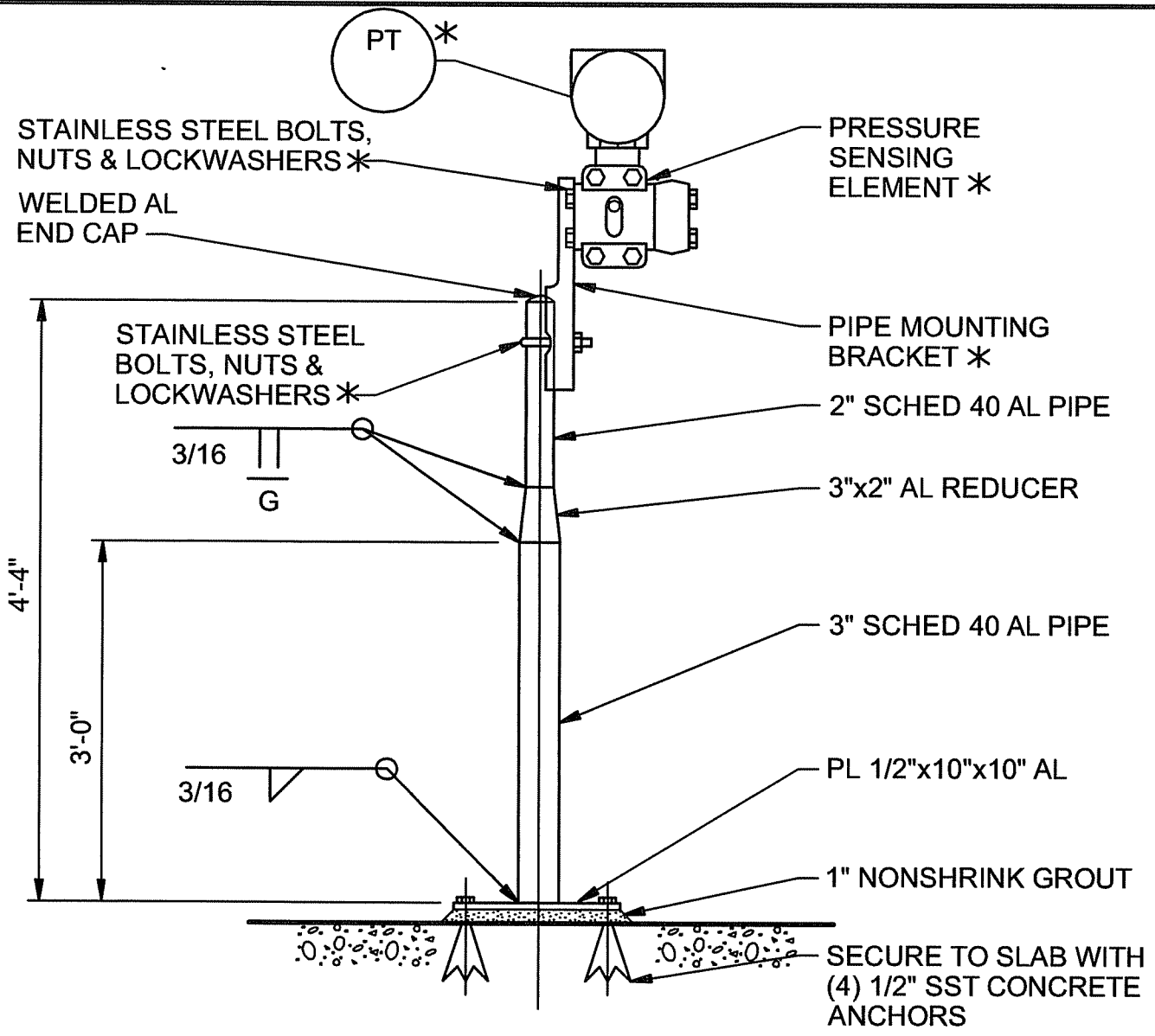
PRESSURE DIFFERENTIAL TRANSMITTER/INDICATOR FOR LEVEL SERVICE

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4091-249

CH2MHILL



STANCHION MOUNT

NOTES:

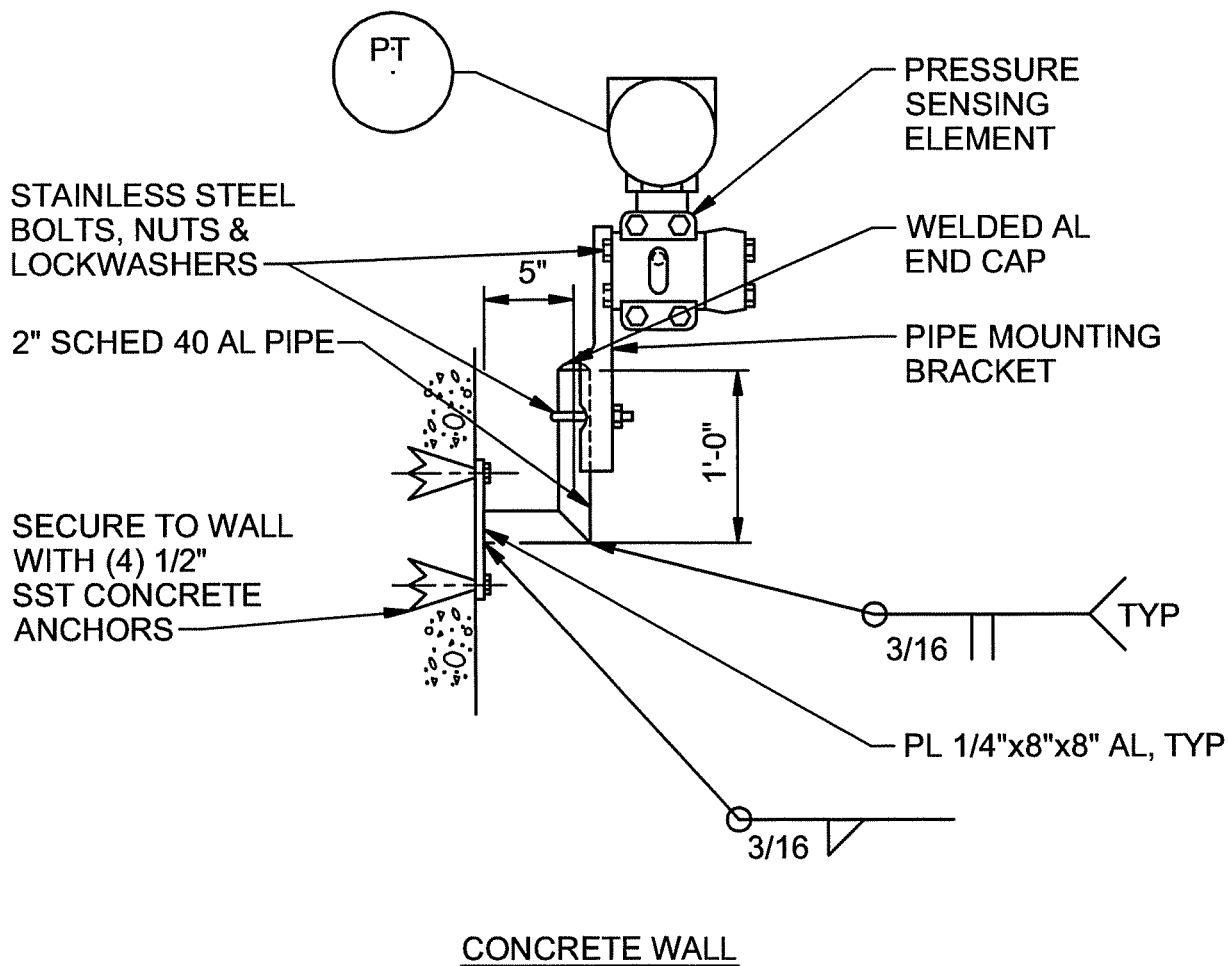
1. PAINT ALUMINUM IN CONTACT WITH CONCRETE ACCORDING TO SPECIFICATIONS FOR PAINTING.
2. ALTERNATIVELY, STANCHION SUPPORT SHALL BE O'BRIEN CORP. MODEL 32FP52 WITH 9 MIL ARC SPRAY ZINC METALLIZED COATING; OR EQUAL.
3. COMPONENTS DESIGNATED BY * ARE SUPPLIED BY INSTRUMENT MANUFACTURER.

PRESSURE AND PRESSURE DIFFERENTIAL TRANSMITTER INSTALLATION

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4091-302



NOTES:

1. ALTERNATIVELY, WALL MOUNT BRACKET SHALL BE O'BRIEN CORP. MODEL WE16M WITH 9 MIL ARC SPRAY ZINC METALLIZED COATING, OR EQUAL.
2. PAINT ALUMINUM IN CONTACT WITH CONCRETE ACCORDING TO SPECIFICATIONS FOR PAINTING.
3. ALL MOUNTING BRACKETS ARE TO BE INSTALLED APPROXIMATELY 4'-0" ABOVE FLOOR OR AS REQUIRED BY PROCESS CONNECTION, SEE X.

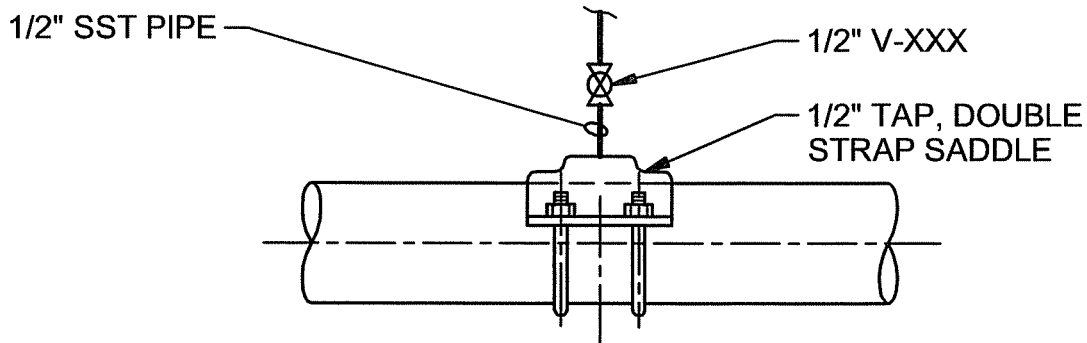
PRESSURE AND PRESSURE DIFFERENTIAL TRANSMITTER INSTALLATION

NTS

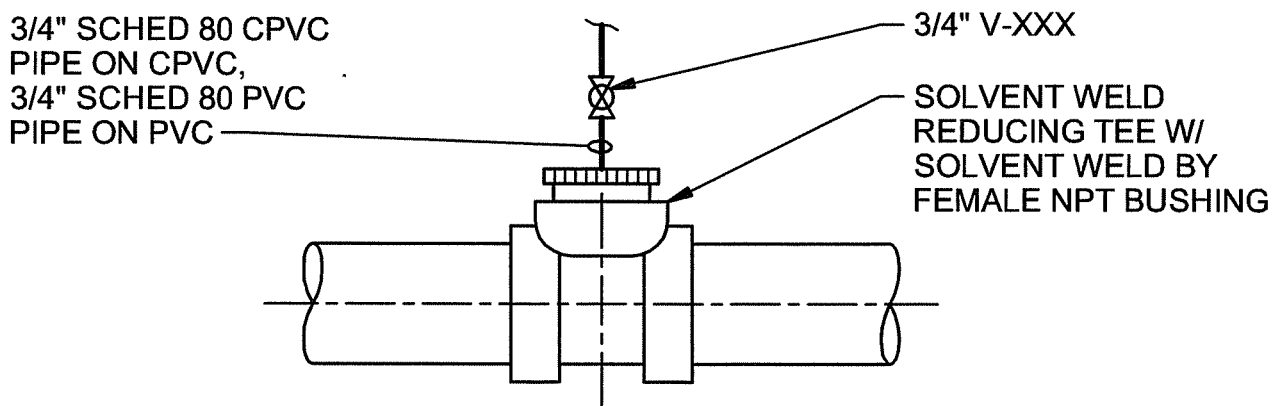
ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4091-303

CH2MHILL



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



PVC AND CPVC PIPE

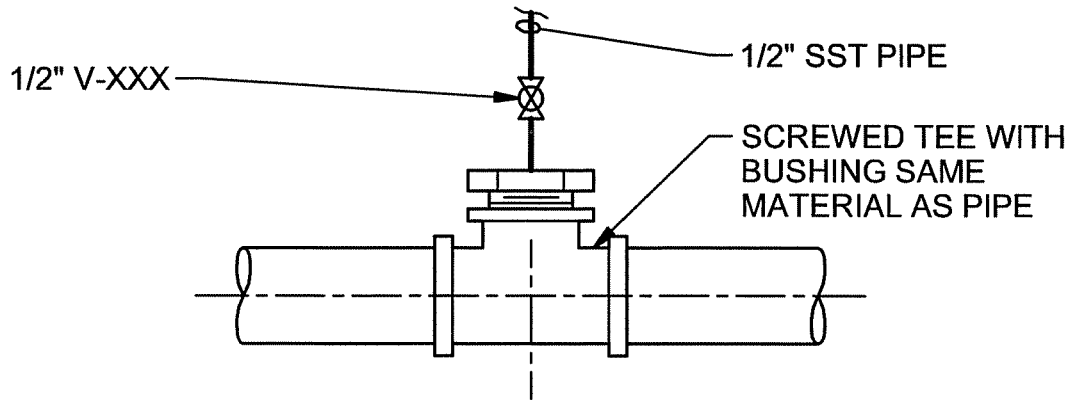
PRESSURE CONNECTION INSTALLATION

NTS

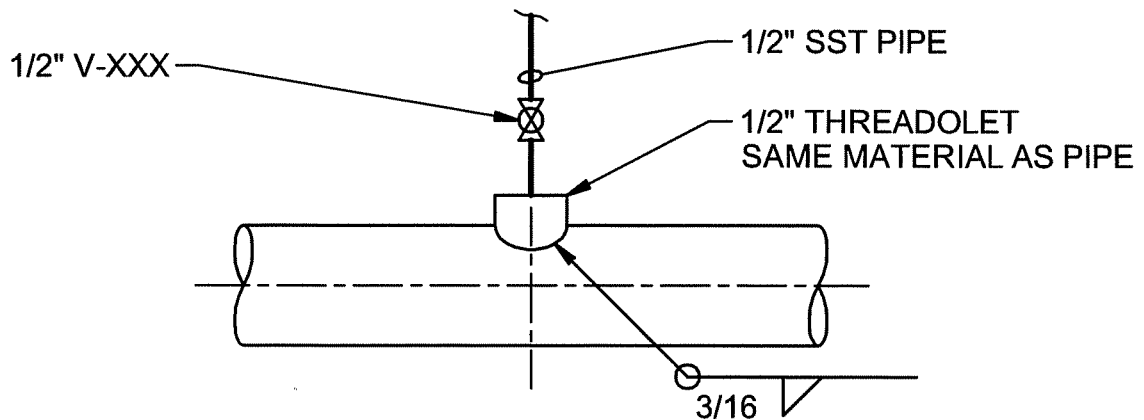
DETAIL 1 OF 2

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

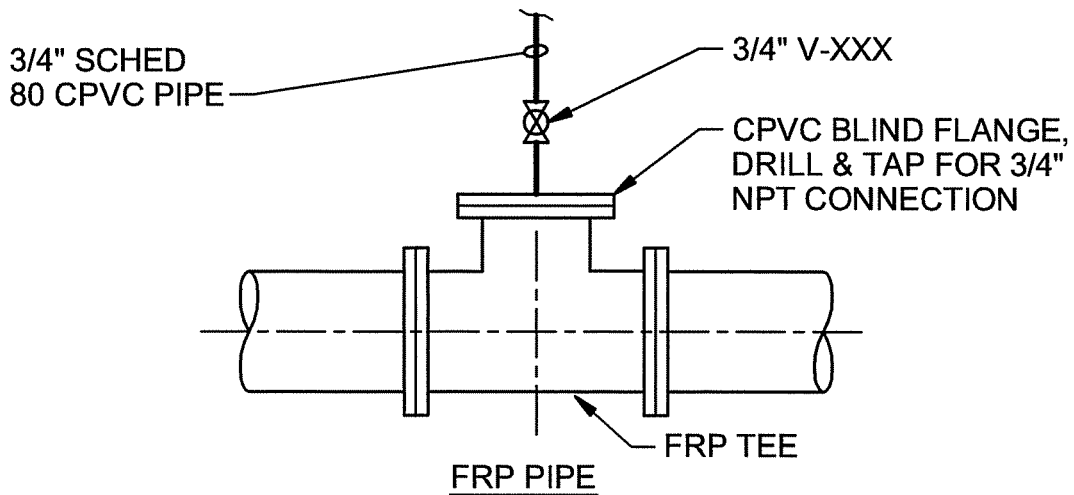
4091-305



STEEL & SST PIPE 3 1/2" & SMALLER



STEEL & SST PIPE 4" & LARGER



PRESSURE CONNECTION INSTALLATION

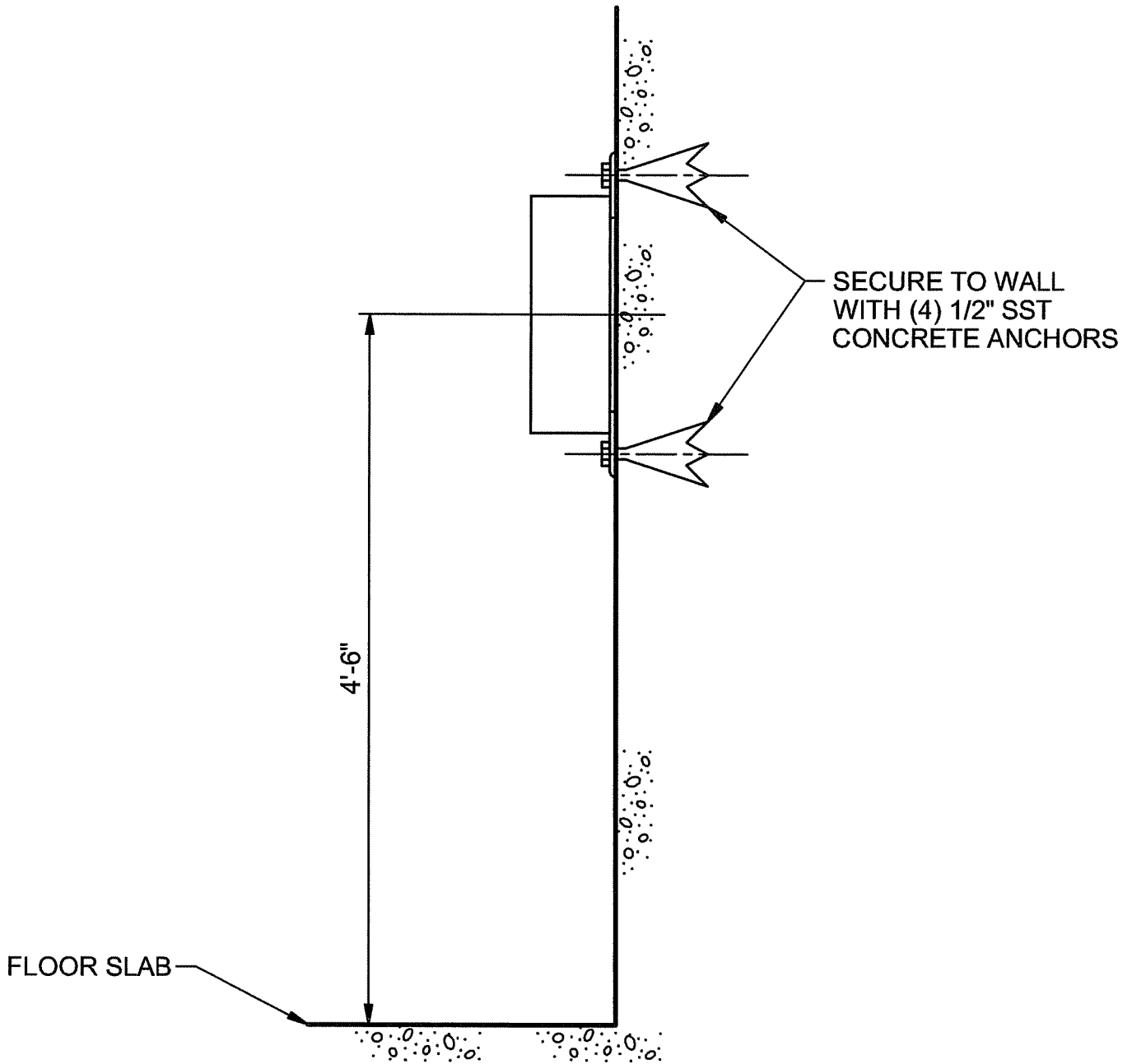
NTS

DETAIL 2 OF 2

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4091-305

CH2MHILL



WALL MOUNTED PANEL OR INSTRUMENT INSTALLATION

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4091-388

SECURE TO WALL
W/ (4) 3/16" CONC
ANCHORS

L 2"x1-1/2"x1/4" STL

3/16

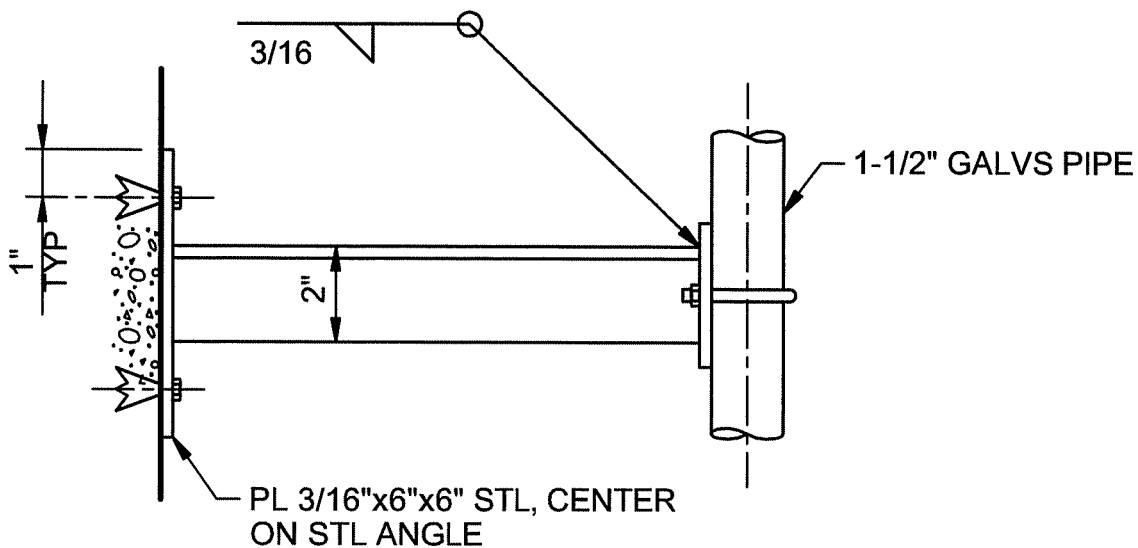
1/2"

1-1/2"

1/4" GALVS U-BOLT

PL 3/16"x3"x3" STL,
CENTER VERTICALLY
ON STL ANGLE

PLAN



ELEVATION

SUPPORT BRACKET

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4091-391

SET REGULATOR
OUTLET PRESSURE
AS RECOMMENDED
BY PUMP MFR

STUFFING BOX W/
SINGLE MECH
SEAL OR PACKING
AS SPECIFIED

3/8" FEMALE CPLG

3/8" SOFT COPPER
THROTTLE BUSHING.
BLEED-OFF TO
SUMP IF REQD

3/4" COPPER PIPE PUMP
FRAME DRAIN

HUB DRAIN
OR SCUPPER

W2

1/2" SERVICE
WATER SUPPLY

1/2" NEEDLE VALVE

UNION

STRAINER

PRESSURE GAUGE

SIGHT
INDICATOR
FOR MECH
SEAL ONLY,
AS SPCED

3/8" SEAL
WATER HOSE

FEMALE CPLG

3/8" SOFT
COPPER

DISCHARGE
HEAD

NOTES:

1. USE COPPER TUBE ADAPTERS AND BUSHINGS AS REQUIRED FOR ALL CONNECTIONS TO PUMP.

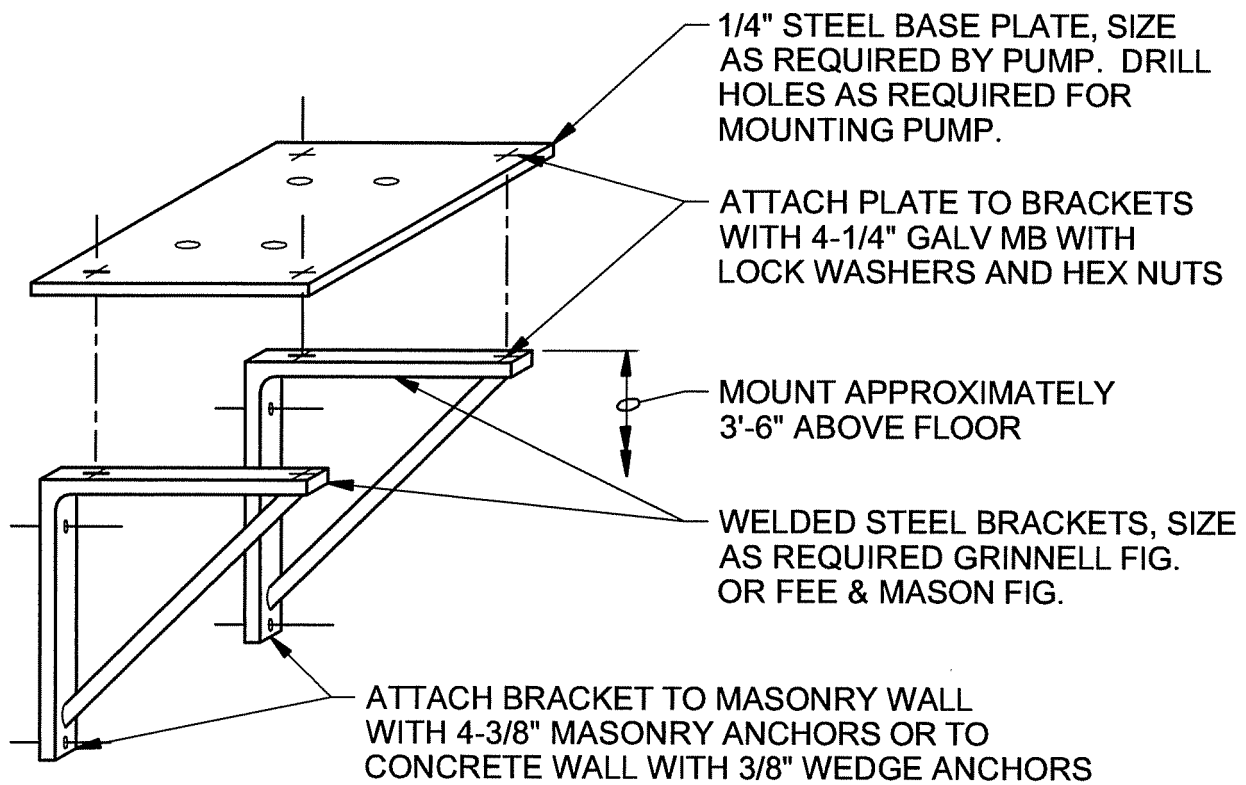
VERTICAL TURBINE PUMP SEAL WATER PIPING

NTS

ADVANCED TREATMENT
MEMORIAL PARKWAY TREATMENT PLANT
NORTHERN KENTUCKY WATER DISTRICT
FORT THOMAS, KENTUCKY

4442-660

CH2MHILL



NOTES:

1. HOT DIP GALVANIZE ENTIRE ASSEMBLY AFTER FABRICATION.

SMALL PUMP SUPPORT

NTS

ADVANCED TREATMENT
 MEMORIAL PARKWAY TREATMENT PLANT
 NORTHERN KENTUCKY WATER DISTRICT
 FORT THOMAS, KENTUCKY

4442-715

CH2MHILL