



City of Nampa Wastewater Treatment Plant Phase I Upgrades: Group A—Liquid Stream Upgrades

Volume 5—Design Details

CH2MHILL[®]
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CONTRACT DOCUMENTS

City of Nampa, Idaho
Nampa WWTP Phase 1 Upgrades - Project Group A
Index for Design Details

Detail Number	Detail Description
SERIES	0300 CONCRETE
0310-051	FORM SNAP-TIE HOLE
0315-001	PLASTIC WATERSTOP
0315-003	HYDROPHILIC/GROOVE WATERSTOP
0315-011	WATERSTOP JOINTS
0315-012	WATERSTOP CONNECTION
0315-021	WATERSTOP PROTECTOR
0315-131	WALL CONSTRUCTION JOINT SPACING
0315-133	CONCRETE PLACEMENT SEQUENCE
0315-141	SLAB CONSTRUCTION JOINT
0315-142	SLAB CONSTRUCTION JOINT
0315-151	WALL VERTICAL CONSTRUCTION JOINT
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0315-211	BASE SLAB EXPANSION JOINT
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0315-232	WALL VERTICAL EXPANSION JOINT
0315-233	WALL VERTICAL EXPANSION JOINT
0315-239	WALL EXPANSION JOINT TREATMENT
0315-253	WALL OR SLAB FUTURE CONSTRUCTION
0330-001	OPENING REINFORCING
0330-002	OPENING REINFORCING
0330-003	TYPICAL WALL CORNER AND INTERSECTION REINFORCING
0330-004	REINFORCING AT HORIZONTAL CONSTRUCTION JOINT
0330-005	VERTICAL WALL REINFORCING / DOWEL PLACEMENT
0330-016	PIPE ENCASEMENT
0330-017	PIPE ENCASEMENT
0330-018	PIPE ENCASEMENT AT SLAB
0330-020	CONCRETE CLOSURE COLLAR
0330-021	PIPE COLLAR

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Detail Number	Detail Description
SERIES	0300 CONCRETE (CONTINUED)
0330-041	SLAB AT DOOR OPENING
0330-051	STAIR LANDING
0330-056	CONCRETE EQUIPMENT PAD - TYPE A DETAIL 1 OF 5
0330-056	CONCRETE EQUIPMENT PAD - TYPE C DETAIL 2 OF 5
0330-056	CONCRETE EQUIPMENT PAD - TYPE G DETAIL 3 OF 5
0330-056	CONCRETE EQUIPMENT PAD - TYPE H DETAIL 4 OF 5
0330-056	CONCRETE EQUIPMENT PAD – NOTES DETAIL 5 OF 5
0330-057	ANCHOR BOLT DETAILS
0330-061A	PIPE SUPPORT – CONCRETE SADDLE – DETAIL 1 OF 2
0330-061B	PIPE SUPPORT – CONCRETE SADDLE – DETAIL 2 OF 2
0330-080	CONCRETE CURB
0330-083	CONCRETE STEP
0330-101	CONNECTION OF NEW CONCRETE TO EXISTING
0330-105	ADHESIVE DOWEL
SERIES	0400 MASONRY
0422-001	CMU WALL CORNERS (SINGLE AND DOUBLE MAT)
0422-002	CMU OPENING REINFORCING
0422-003	CMU OPENING REINFORCING
0422-004	REINFORCED CMU WALL
0422-005	CMU WALL PIER
0422-006	CMU WALL COLUMN
0422-046	MASONRY ANCHOR BOLT
SERIES	0500 METALS
0514-020	TYPICAL BEAM CONNECTION – ALUMINUM
0514-056	BEAM/WALL CONNECTION - ALUMINUM
0521-002	STEEL JOIST SEAT/EXTERIOR WALL
0521-022	TYPICAL K JOIST BRIDGING
0521-023	JOIST BRIDGING/WALL CONNECTION
0531-001	DECKING LEDGER SUPPORT ANGLE

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Detail Number	Detail Description
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SERIES	0500 METALS (CONTINUED)
0531-016	METAL DECK/NON-BEARING WALL CLOSURE PLATE
0531-021	ROOF DECK OPENING
0551-001A	STAIR DETAILS – ALUMINUM DETAIL 1 OF 2
0551-001B	STAIR DETAILS – ALUMINUM DETAIL 2 OF 2
0551-002	STAIR LANDING WITH SUPPORTS – ALUMINUM
0552-001	RAILING - 3 RAIL – ALUMINUM - DETAIL 1 OF 4
0552-001	RAILING W/ EXTENSION – 3 RAIL STAIR – ALUMINUM - DETAIL 2 OF 4
0552-001	RAILING POST ANCHORAGE TYPE A – ALUMINUM DETAIL 3 OF 4
0552-001	RAILING POST ANCHORAGE TYPE D – ALUMINUM DETAIL 4 OF 4
0553-001	HYDROPHILIC/GROOVE WATERSTOP
0554-001	CHECKERED FLOOR PLATE – ALUMINUM
0558-002	BEAM SEAT CLOSURE PLATE
0559-031	WEIR DETAILS
<hr/>	
SERIES	0600 WOOD, PLASTIC, AND COMPOSITES
0682-041	WEIR DETAILS
<hr/>	
SERIES	0700 THERMAL AND MOISTURE PROTECTION
0753-002	COPING (MASONRY WALL)
0753-004	BASE FLASHING
0753-006	ROOF/OVERFLOW DRAIN (METAL DECK)
0762-003	OVERFLOW/ROOF DRAIN NOZZLE
0762-004	SPLASHBLOCK
<hr/>	
SERIES	0800 OPENINGS
0811-003	HM DOOR HEAD (CMU)
0811-004	HM DOOR JAMB (CMU)
0851-002	WINDOW HEAD AND SILL
0871-001	DOOR SILL
0890-002	LOUVER HEAD AND SILL

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Detail Number	Detail Description
SERIES 1000 SPECIALTIES	
1014-013	ROOF DRAIN SIGN
1014-014	OVERFLOW ROOF DRAIN SIGN
1014-015	PEPS ELECTRICAL BUILDING SIGN
1014-016	AERATION BASIN 3 SIGN
SERIES 2200 PLUMBING	
2210-725	TYPICAL HOSE REEL – POST MOUNT
SERIES 2300 HVAC	
2331-102	TYPICAL DUCT SUPPORT
2377-100	CONDENSATE DRAIN TRAP
SERIES 2600 ELECTRICAL	
2605-002	DEVICE MOUNTING, WALL OR COLUMN
2605-003b	DEVICE MOUNTING, NON FUSED DISCONNECT SWITCH
2605-004	DEVICE MOUNTING, AT RAILING
2605-005b	DEVICE MOUNTING, MOTOR CONTROL STATION
2605-007b	DEVICE MOUNTING, RAILING MOUNTED EQUIPMENT SUPPORT
2605-007c	DEVICE MOUNTING, RAILING MOUNTED EQUIPMENT SUPPORT
2605-011a	DEVICE MOUNTING, PEDESTAL
2605-011b	DEVICE MOUNTING, PEDESTAL
2605-013	DEVICE MOUNTING, AT RAILING
2605-100b	TERMINATION OF SHIELDED INSTRUMENTATION CABLE
2605-101	MSC CABLE TERMINATION
2605-202	GROUND TEST WELL
2605-203	CONDUIT GROUNDING
2605-204	PAD MOUNTED TRANSFORMER GROUNDING
2605-206	GROUND ELECTRODE
2605-208	GROUND BUS
2605-300	CONDUIT RACKING SYSTEM
2605-301	CONDUIT RACKING SYSTEM

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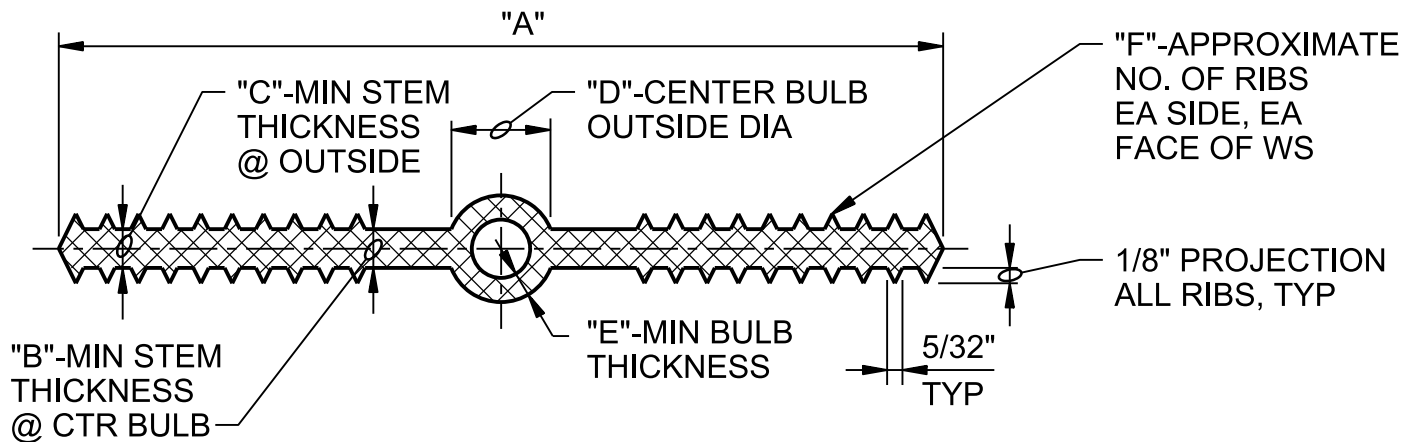
Detail Number	Detail Description
SERIES	2600 ELECTRICAL (CONTINUED)
2605-302	CONDUIT RACKING SYSTEM, VERTICAL
2605-303	CONDUIT TO EQUIPMENT FROM CEILING
2605-304	CONDUIT ENTRANCE
2605-305	CONDUIT TRANSITION AND SUPPORT
2605-307	CONDUIT UNDERGROUND ENTRANCE
2605-308b	WATERTIGHT WALL CONDUIT SEAL
2605-309	FLUSH CONDUIT STUB
2605-310	SLAB PENETRATION
2605-312	FLASHING
2605-400b	DUCT BANK
2605-400c	DUCT BANK
2605-420	UNDERGROUND CONDUIT IN NON-PAVED AREAS
2605-423b	TRENCH AND CONDUIT PLACEMENT
2605-424	TRAFFIC TRENCH AC TOPPING
2605-443a	MANHOLE-WITH GROUNDING
2605-443b	MANHOLE-WITH GROUNDING
2605-444	HANDHOLE
2605-445	CONDUIT HANDHOLE/MANHOLE ENTRANCE
2605-446	CONDUIT HANDHOLE/MANHOLE ENTRANCE
2605-448	CABLE RACK
2605-700	CABLE TRAY SUPPORT
2605-702	CONDUIT DROP INTO CABLE TRAY
2605-703	OVERHEAD FEED FROM CABLE TRAY
2605-704	UNDERFLOOR FEED FROM CABLE TRAY
2622-006	TRANSFORMER MOUNTING
2622-007	DRY TYPE TRANSFORMER MOUNTING
2650-003	TYPICAL LIGHT POLE BASE IN SUPPORT WALL
2650-004	TYPICAL LIGHT POLE BASE TO STEEL SUPPORT BEAMS
2650-102	EXTERIOR BUILDING LIGHT CONTROL
2650-105	MULTI-POLE LIGHTING CONTACTOR CONTROL
2656-207	PAVED AREA LIGHT POLE FOOTING

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Detail Number	Detail Description
SERIES 3100 EARTHWORK	
3123-120	TYPICAL PIPE TRENCH CROSSING
3123-918	LAWN AREA TRENCH BACKFILL SECTION
3125-142	INFILTRATION TRENCH & GALLERY
SERIES 3200 EXTERIOR IMPROVEMENTS	
3212-211	TYPICAL AC PAVEMENT SECTION
3213-241	TYPICAL CONCRETE STOOP
3213-247	SIDEWALK-STOOP (& STOOP-FFE) INTERFACE
3215-260	GRAVEL SURFACING
3231-410	CHAIN LINK FENCE
SERIES 3300 UTILITIES	
3305-731	PIPE CONNECTION – CONC TO DI
3305-741	PIPE VENT
SERIES 3400 TRANSPORTATION	
3471-810	TYPICAL BOLLARD
SERIES 4000 PROCESS INTEGRATION	
4005-500	PIPE SUPPORT – SADDLE SUPPORT PEDESTAL TYPE – ADJUSTABLE
4005-501	PIPE SUPPORT – SADDLE SUPPORT PEDESTAL TYPE – NON-ADJUSTABLE
4005-503	PIPE SUPPORT – WALL MOUNT
4005-508	PIPE SUPPORT – WALL MOUNTED MEDIUM
4005-511	PIPE FLANGE SUPPORT
4005-554	OVERHEAD PIPE HANGER
4027-154	NON-FREEZE POST HYDRANT
4027-602	MECHANICAL JOINT WALL PIPE
4027-604	TYPE B PIPE SLEEVE
4027-605	STEEL WALL PIPE
4027-607	WALL PIPE PENETRATION SEAL
4027-610	WALL PENETRATION SEAL

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Detail Number	Detail Description
SERIES	4000 PROCESS INTEGRATION (CONTINUED)
4027-642	STOP AND DRAIN VALVE BOX
4091-162G	DISSOLVED OXYGEN PROBE INSTALLATION
4091-210	THERMAL MASS FLOW ELEMENT INSTALLATION FOR PROCESS AIR SERVICE
4091-219	MAGNETIC FLOWMETER INSTALLATION
4091-253	ULTRASONIC LEVEL ELEMENT INSTALLATION – CONCRETE ROOF
4091-265	SUBMERSIBLE LEVEL TRANSDUCER STILLING WELL
4091-275F	TYPICAL FLOAT TYPE LEVEL SWITCH INSTALLATION
4091-304A	PRESSURE SWITCH AND INDICATOR INSTALLATION
4091-304D	OFFLINE ANNULAR SEAL FOR PRESSURE INSTRUMENTS
4091-305A	PRESSURE CONNECTION INSTALLATION
4091-305B	PRESSURE CONNECTION INSTALLATION
4091-382	CASE MOUNTED INSTRUMENTS – STANCHION
4091-383	STANCHION SUPPORT FOR CASE MOUNTED INSTRUMENTS
4091-384	RAIN HOOD INSTALLATION
4091-385	TYPICAL HANDRAIL MOUNTING FOR CASE MOUNTED INSTRUMENTS
4091-386	SHORT WALL MOUNTED PANEL INSTRUMENT INSTALLATION
4091-388	WALL MOUNTED PANEL OR INSTRUMENT INSTALLATION
4091-391	SUPPORT BRACKET
4091-406BG	TYPICAL POWER PANEL DISTRIBUTION FOR PANELS WITH EXTERNAL LOCAL UPS



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

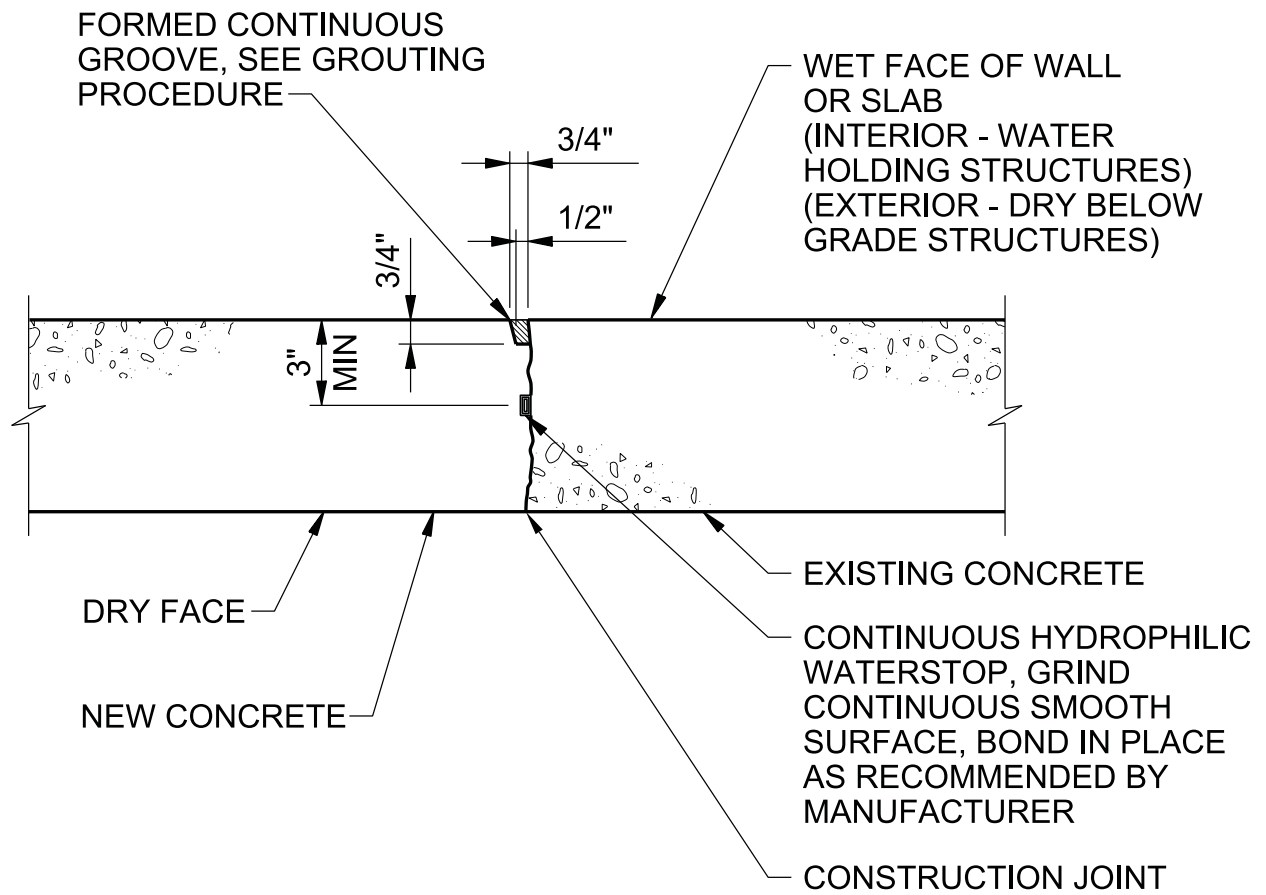
NOTES:

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

NTS

0315-001

**NOTE:**

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

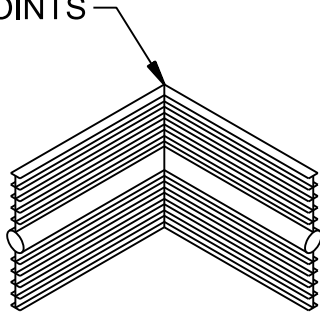
GROUTING PROCEDURE:

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.

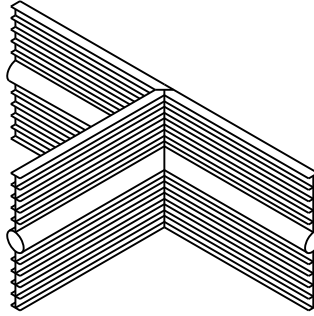
HYDROPHILIC/GROOVE WATERSTOP

0315-003

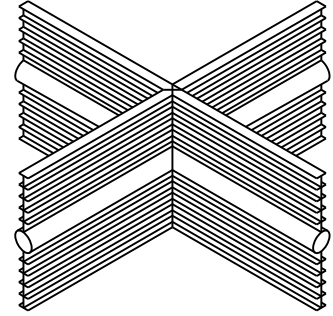
MITER CORNERS OF VERTICAL JOINTS & WELD SIMILAR AS SHOWN BELOW FOR IN-PLANE JOINTS



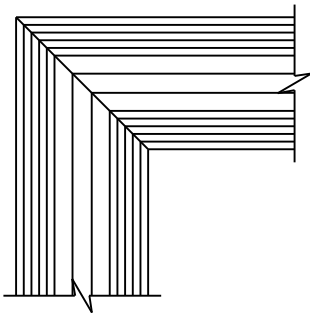
VERTICAL ELL



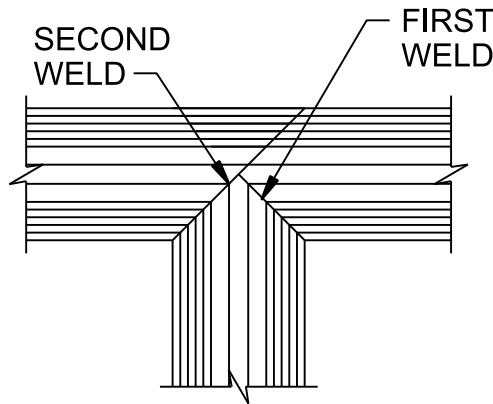
VERTICAL TEE



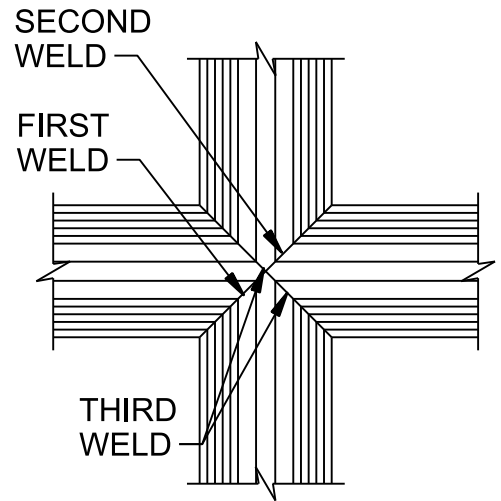
VERTICAL CROSS



FLAT ELL



FLAT TEE



FLAT CROSS

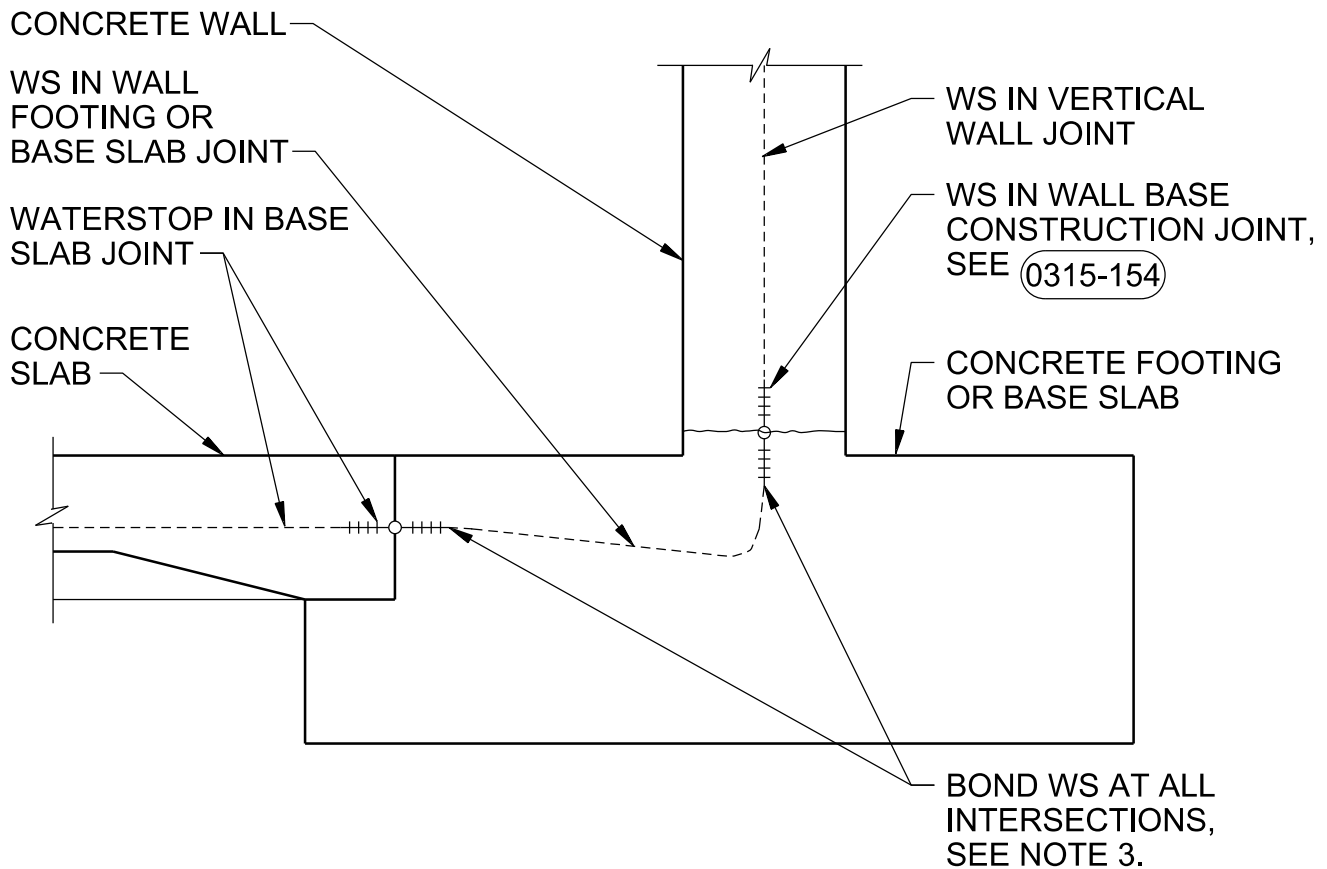
NOTE:

ALL WELDS SHALL BE PER WATERSTOP MANUFACTURER'S RECOMMENDATIONS.

WATERSTOP JOINTS

NTS

0315-011



NOTES:

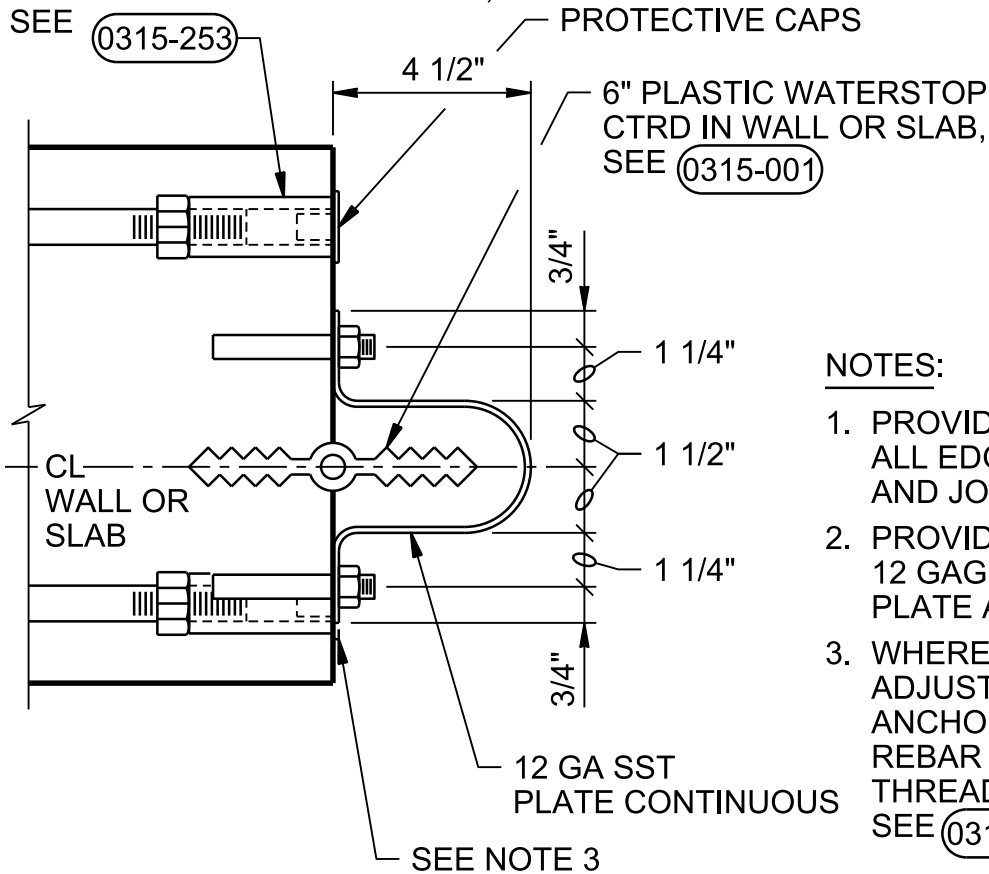
1. SUBMIT DETAILS OF SPLICING AND LOCATION.
2. BOND OR SPLICE ALL HORIZONTAL TRANSVERSE WATERSTOPS IN BASE SLAB JOINTS TO CONTINUOUS LONGITUDINAL WATERSTOP IN WALL BASE FOR COMPLETE SEAL.
3. BOND OR SPLICE ALL VERTICAL WATERSTOPS IN WALL JOINTS TO LONGITUDINAL WATERSTOP IN WALL BASE FOR COMPLETE SEAL,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

WATERSTOP CONNECTION

NTS

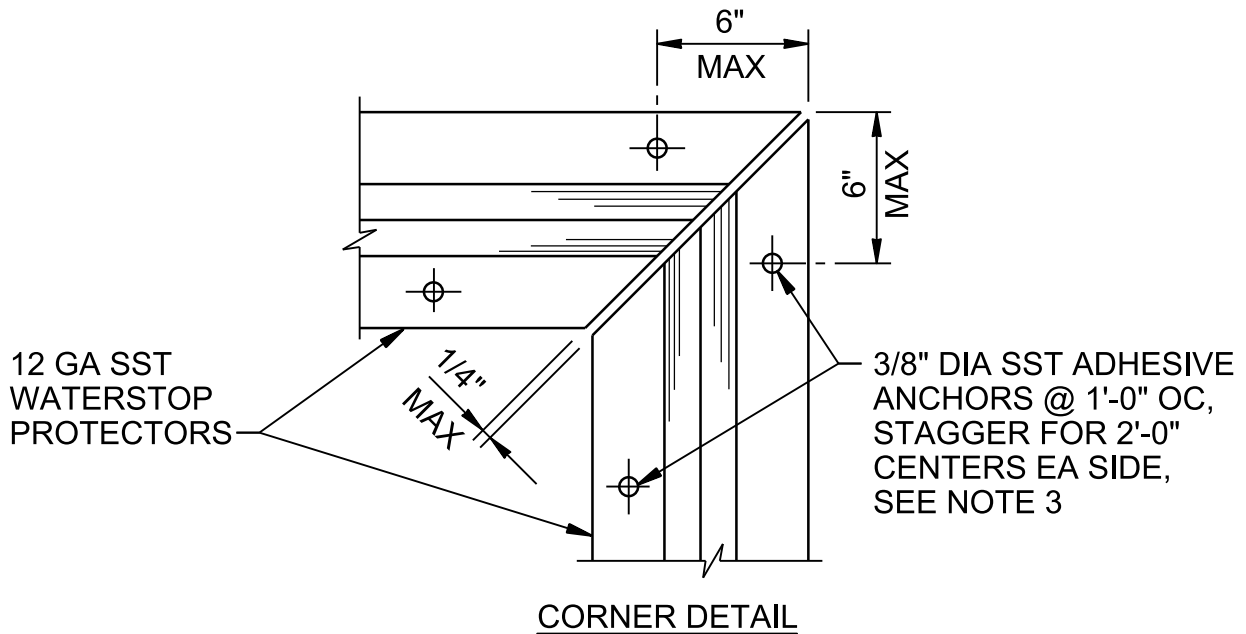
0315-012

DOWELS W/ MECHANICAL
THREADED CONNECTORS
FOR FUTURE CONSTRUCTION,
SEE (0315-253)



NOTES:

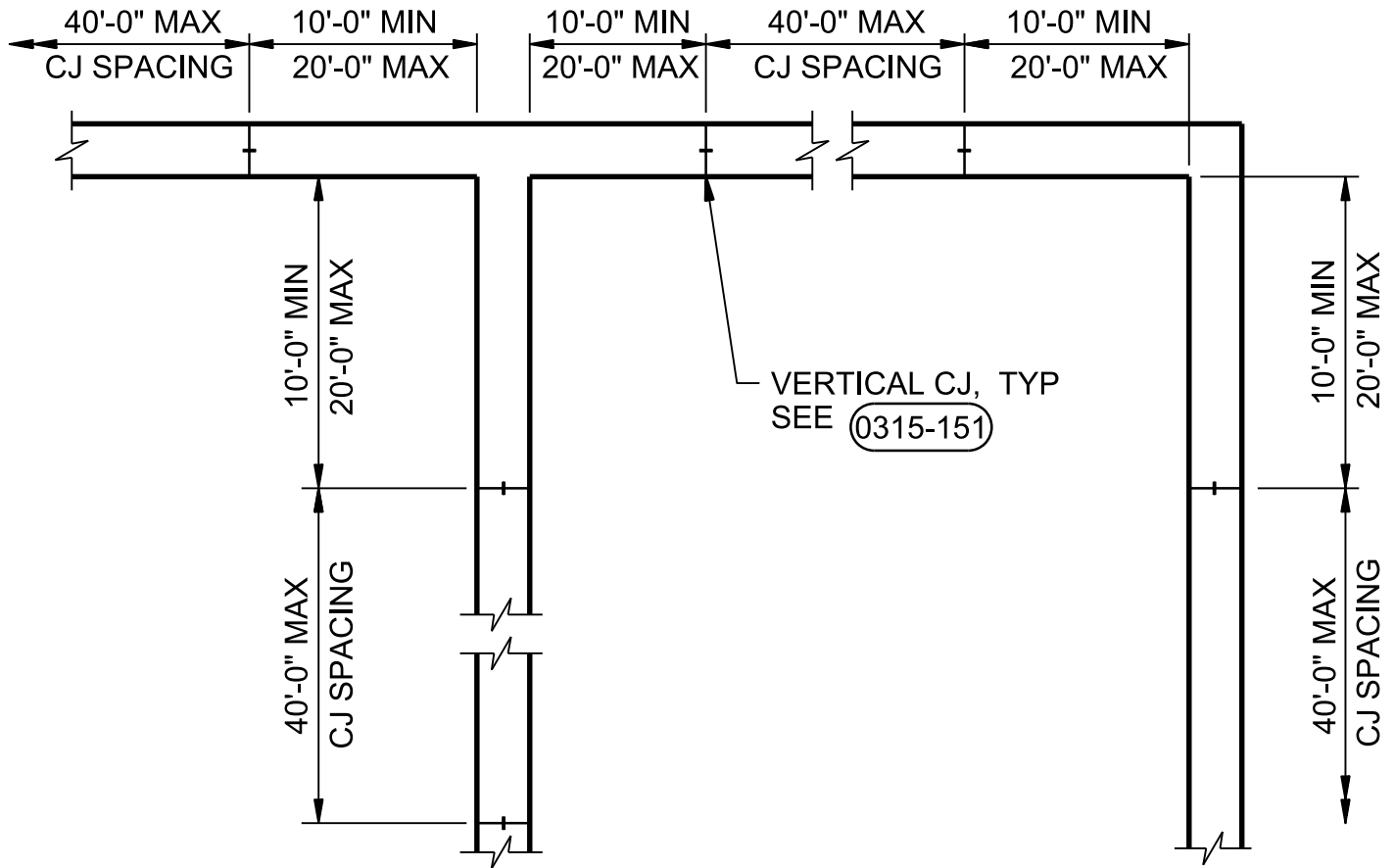
1. PROVIDE SEALANT AT ALL EDGES, CORNERS, AND JOINTS.
2. PROVIDE WATERTIGHT 12 GAGE SST CLOSURE PLATE AT FREE ENDS.
3. WHERE APPLICABLE, ADJUST SPACING OF ANCHORS TO CLEAR REBAR MECHANICAL THREADED CONNECTORS, SEE (0315-253).



WATERSTOP PROTECTOR

NTS

0315-021



PLAN

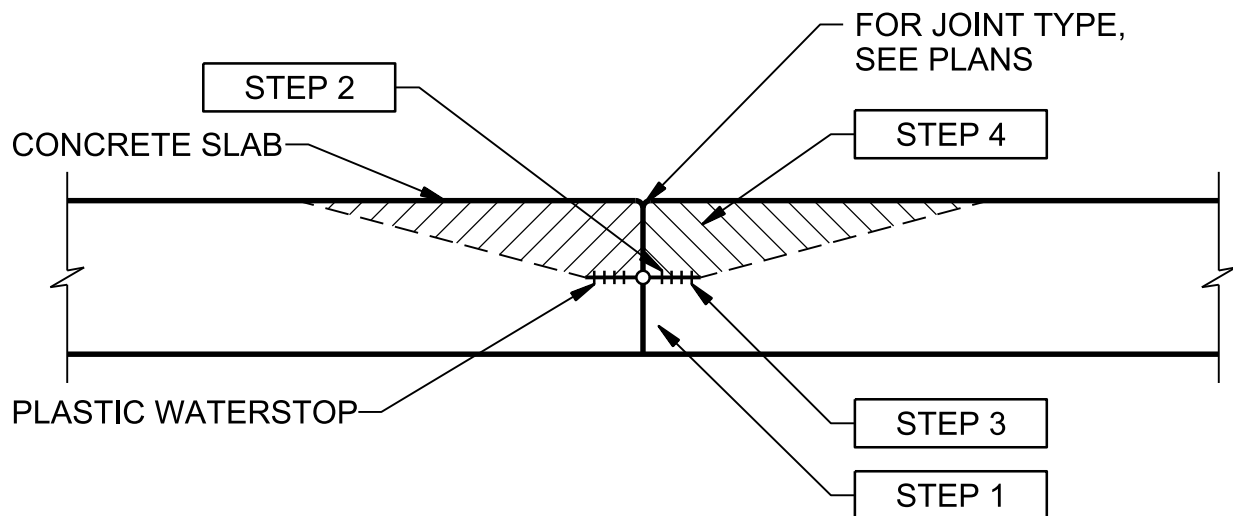
NOTES:

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.

WALL CONSTRUCTION JOINT SPACING

NTS

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.

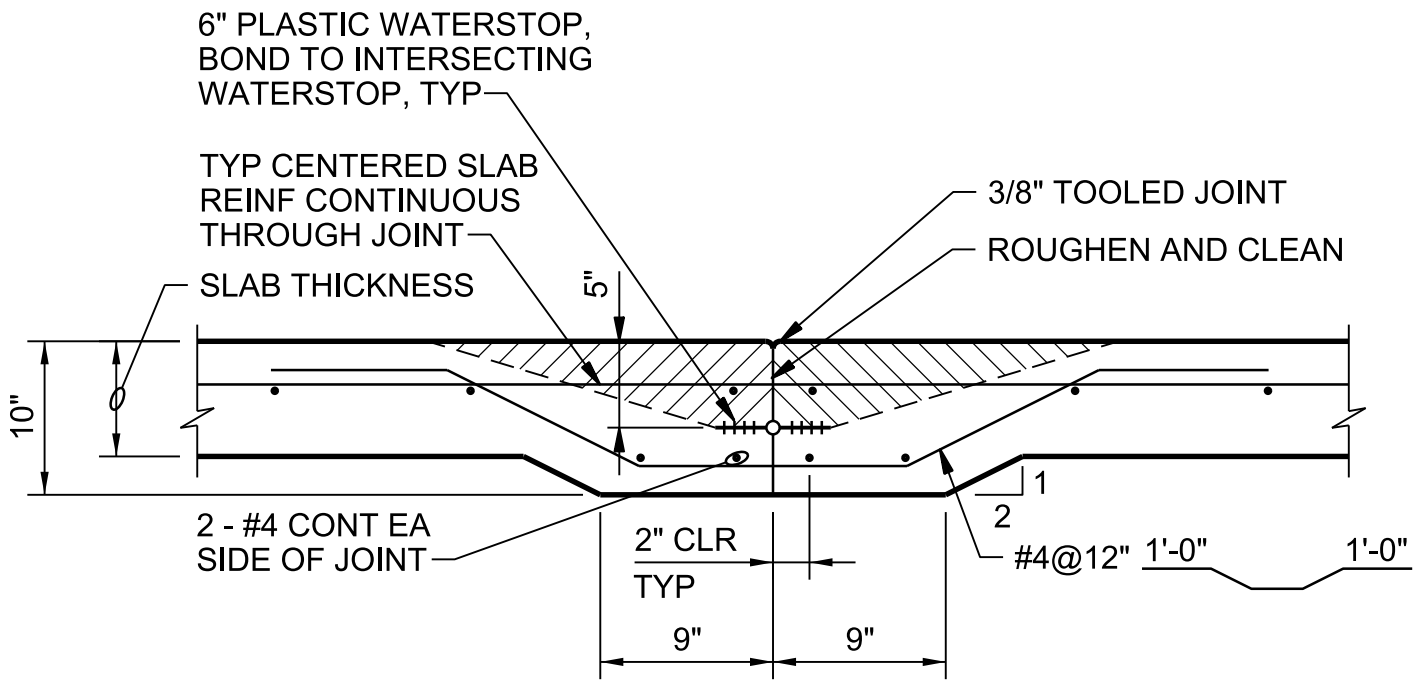
STEP 4

FINISH PLACING CONCRETE ABOVE THE WATERSTOP TO TOP OF SLAB.

CONCRETE PLACEMENT SEQUENCE

NTS

0315-133



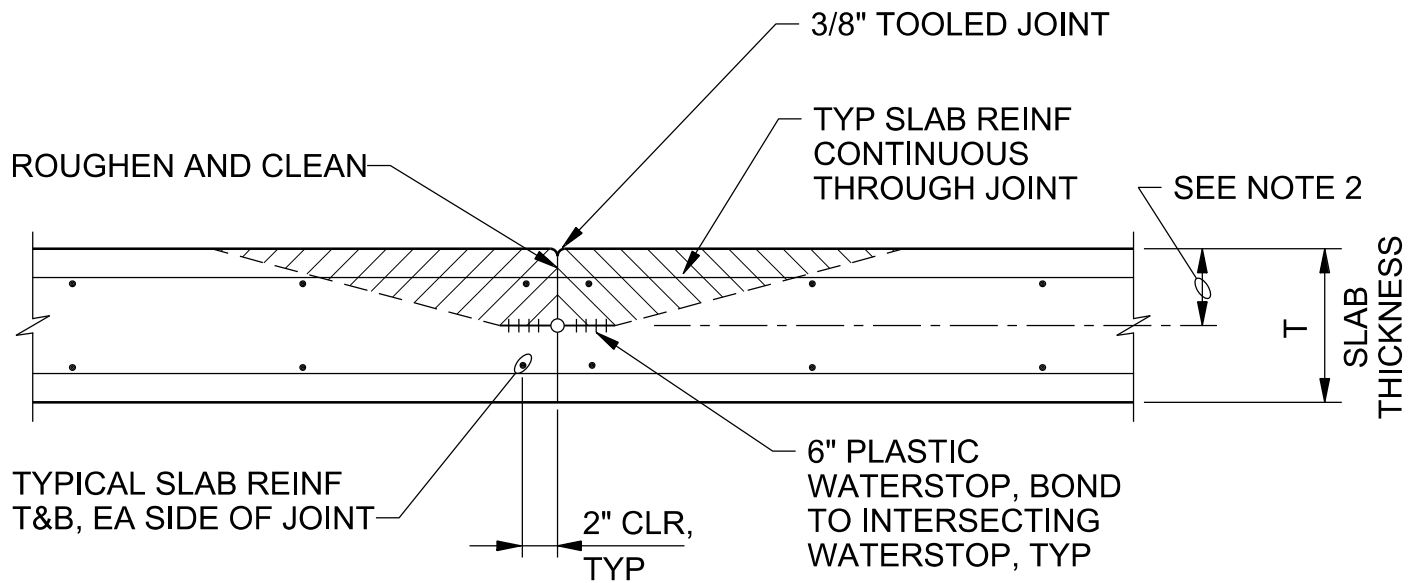
NOTE:

FOR CONCRETE PLACEMENT AROUND WATERSTOP, SEE (0315-133)

SLAB CONSTRUCTION JOINT

NTS

0315-141



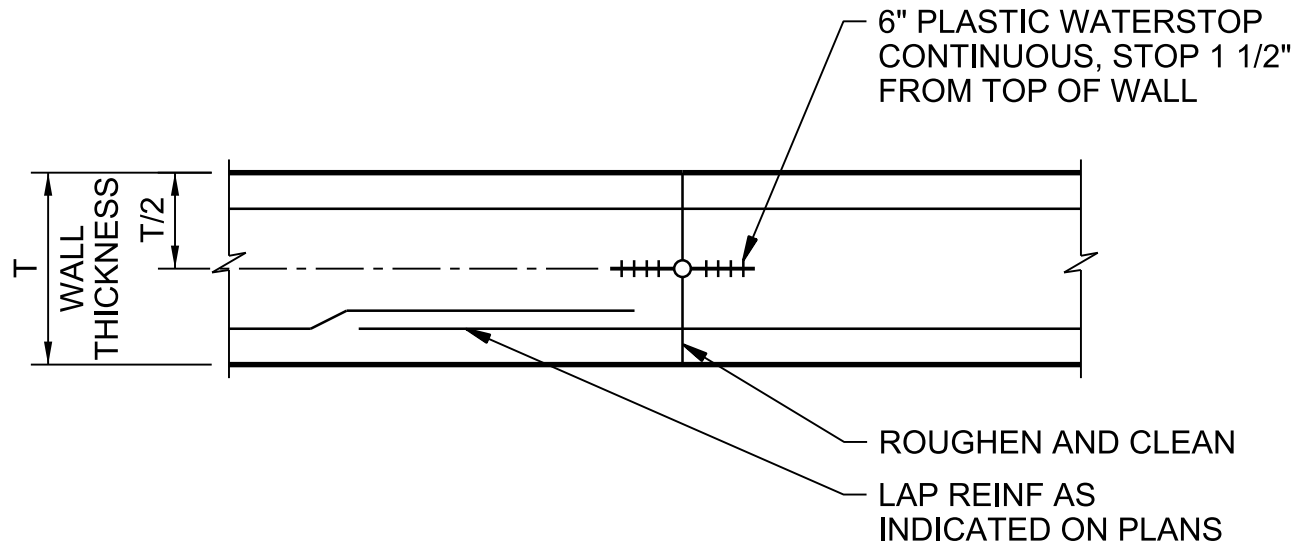
NOTE:

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

SLAB CONSTRUCTION JOINT

NTS

0315-142

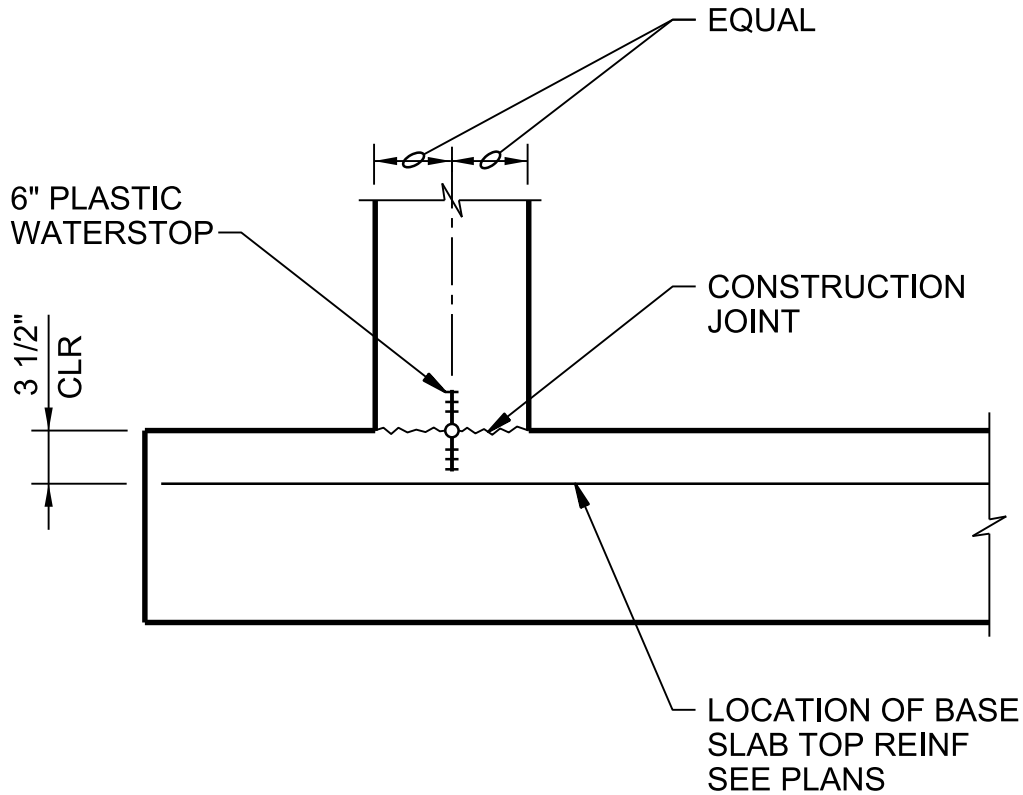
PLANNOTES:

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

WALL VERTICAL CONSTRUCTION JOINT

NTS

0315-151



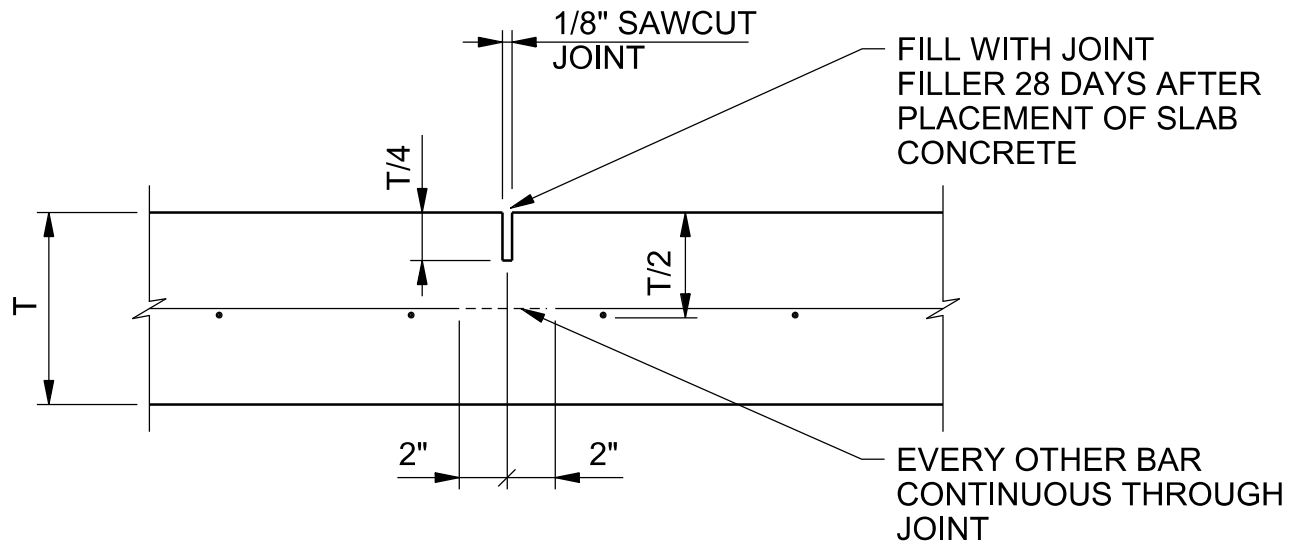
NOTES:

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

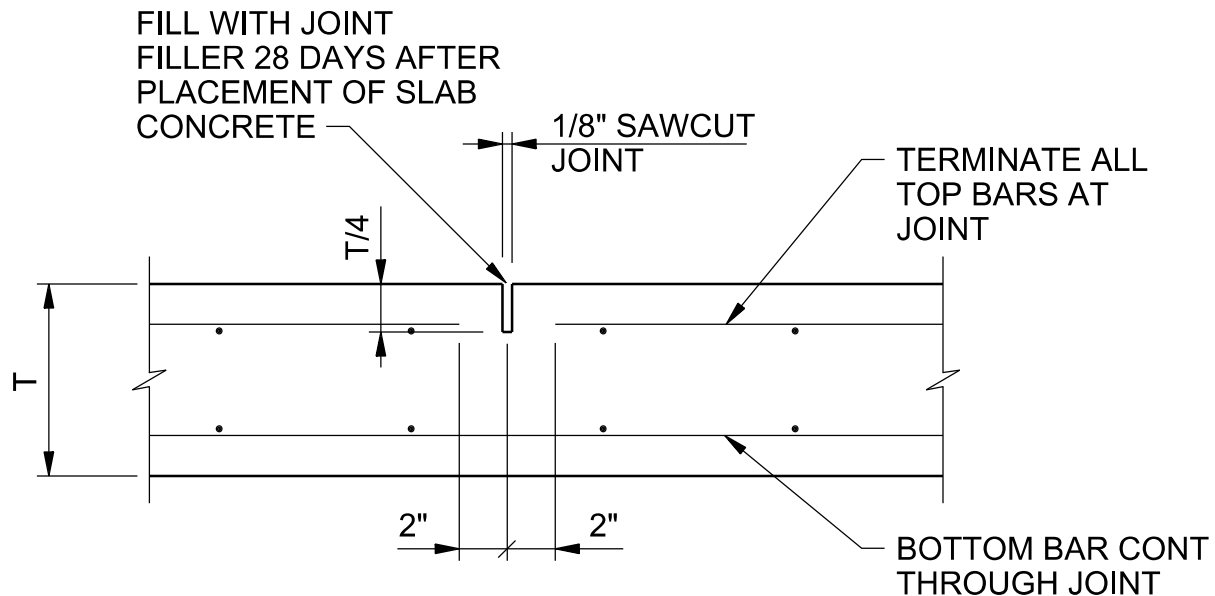
WALL BASE CONSTRUCTION JOINT

NTS

0315-154



SINGLE REINFORCING MAT



DOUBLE REINFORCING MAT

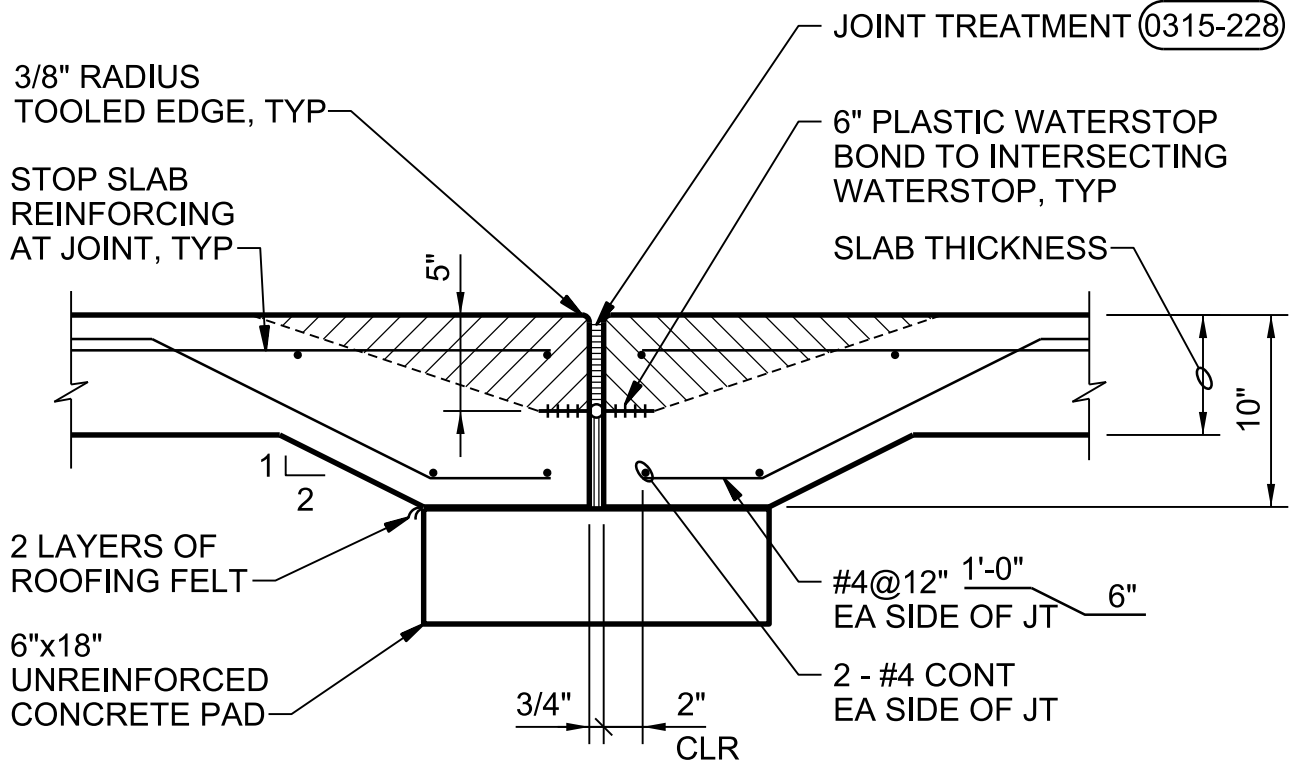
NOTES:

1. CONTRACTOR SHALL USE STRING LINE OR OTHER POSITIVE MEANS TO PLACE REINFORCING AND LOCATE SAWCUT.

BUILDING SLAB ON GRADE SAWN CONTROL JOINT

NTS

0315-192



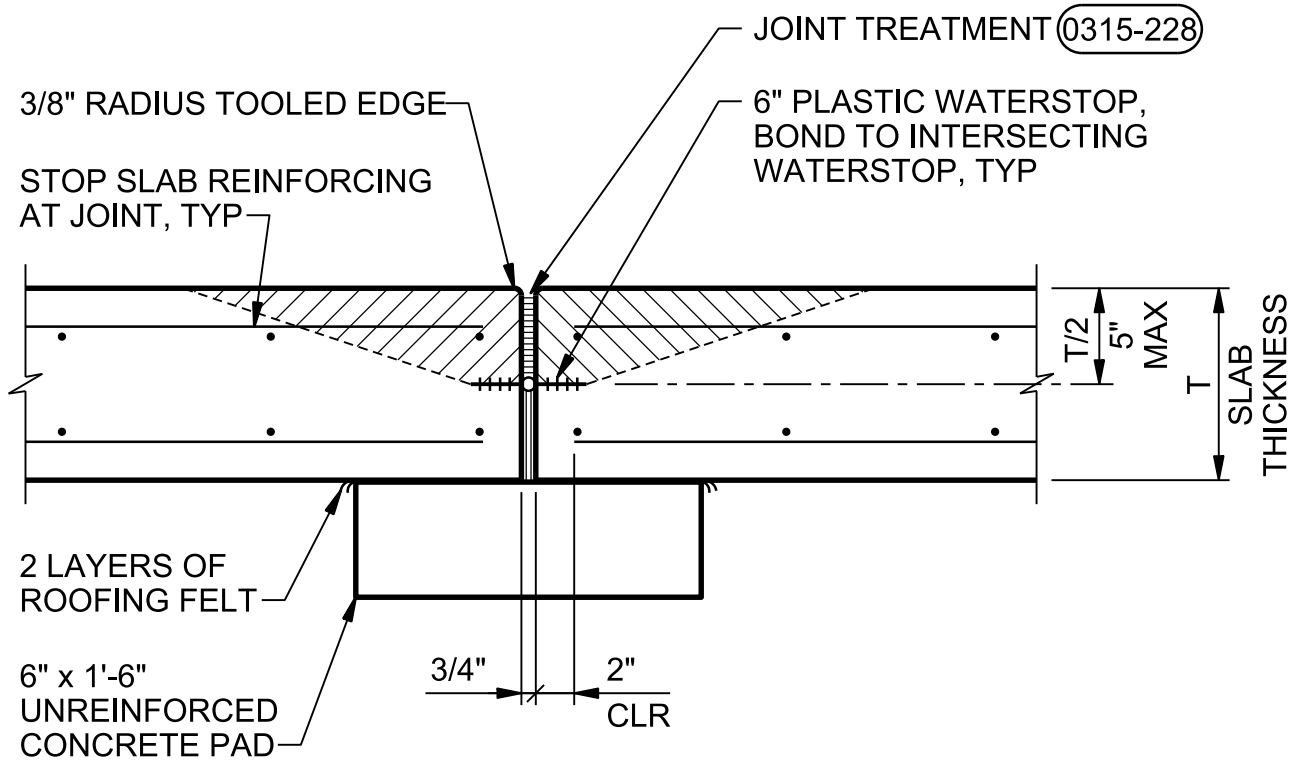
NOTE:

FOR CONCRETE PLACEMENT AROUND WATERSTOP, SEE (0315-133)

BASE SLAB EXPANSION JOINT

NTS

0315-211

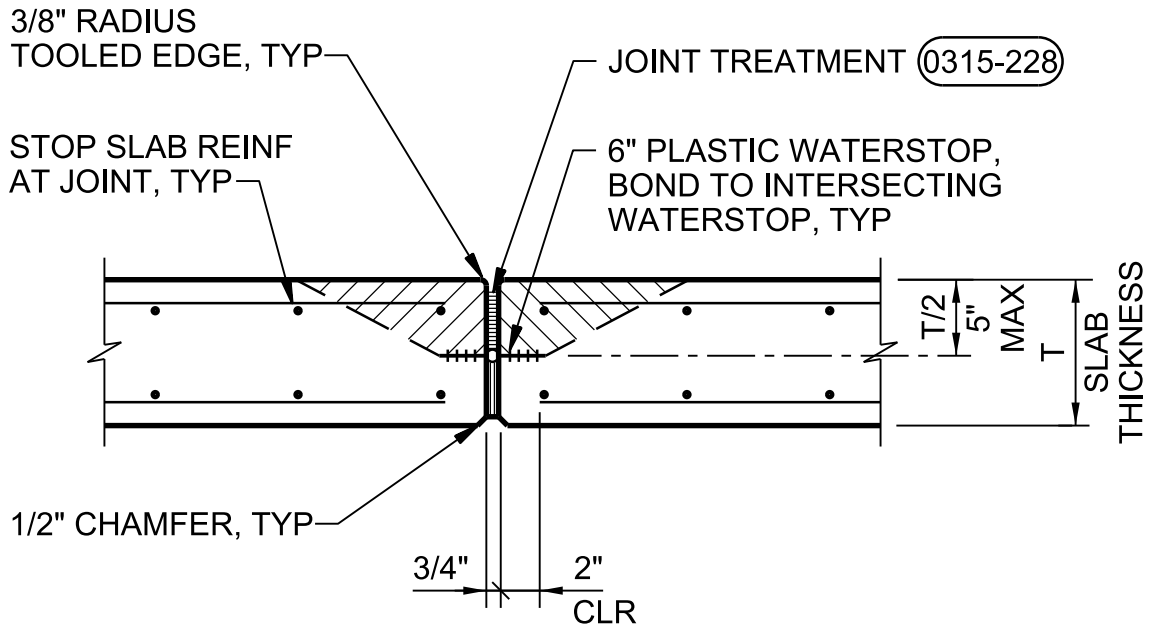
**NOTE:**

FOR CONCRETE PLACEMENT AROUND WATERSTOP, SEE (0315-133)

BASE SLAB EXPANSION JOINT

NTS

0315-212

**NOTE:**

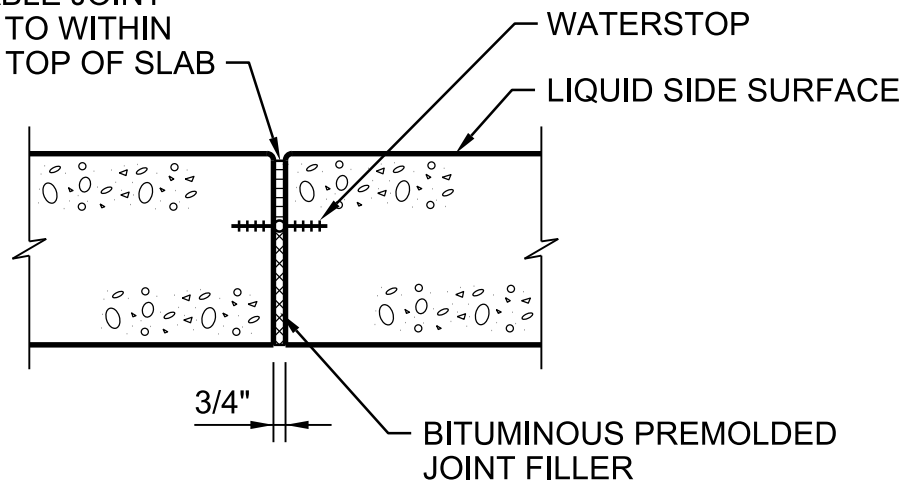
FOR CONCRETE PLACEMENT AROUND WATERSTOP, SEE (0315-133)

ELEVATED SLAB EXPANSION JOINT

NTS

0315-216

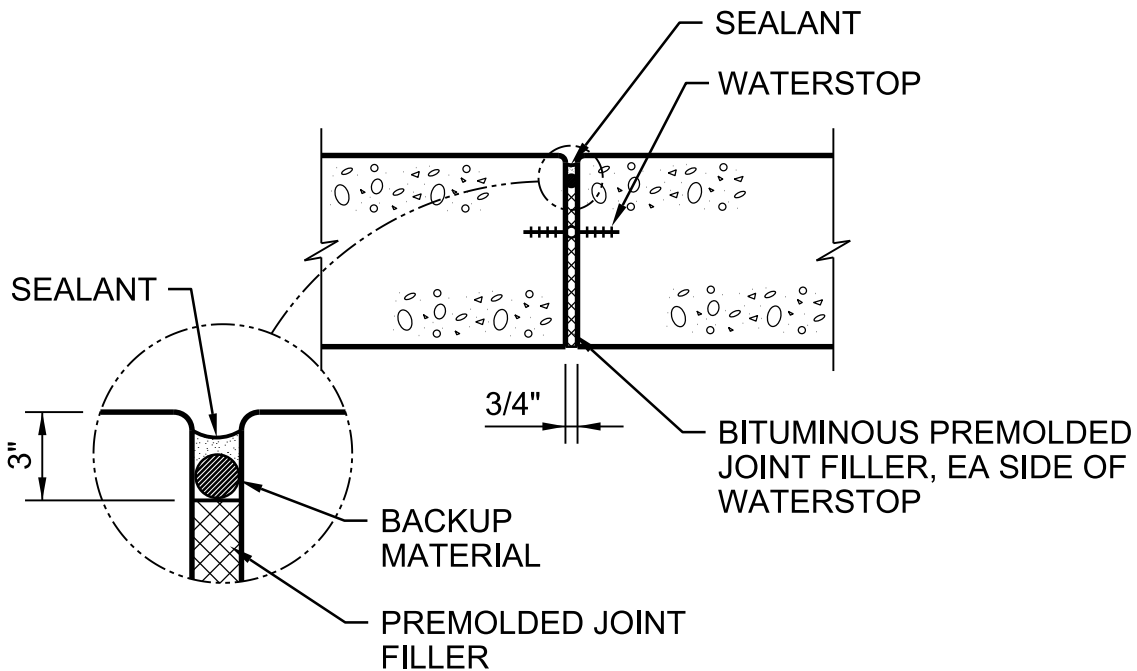
POURABLE JOINT FILLER TO WITHIN
1/2" OF TOP OF SLAB



SECTION

AT LIQUID HOLDING SLABS

(SEE NOTE 2)



SECTION

AT NON-LIQUID HOLDING SLABS

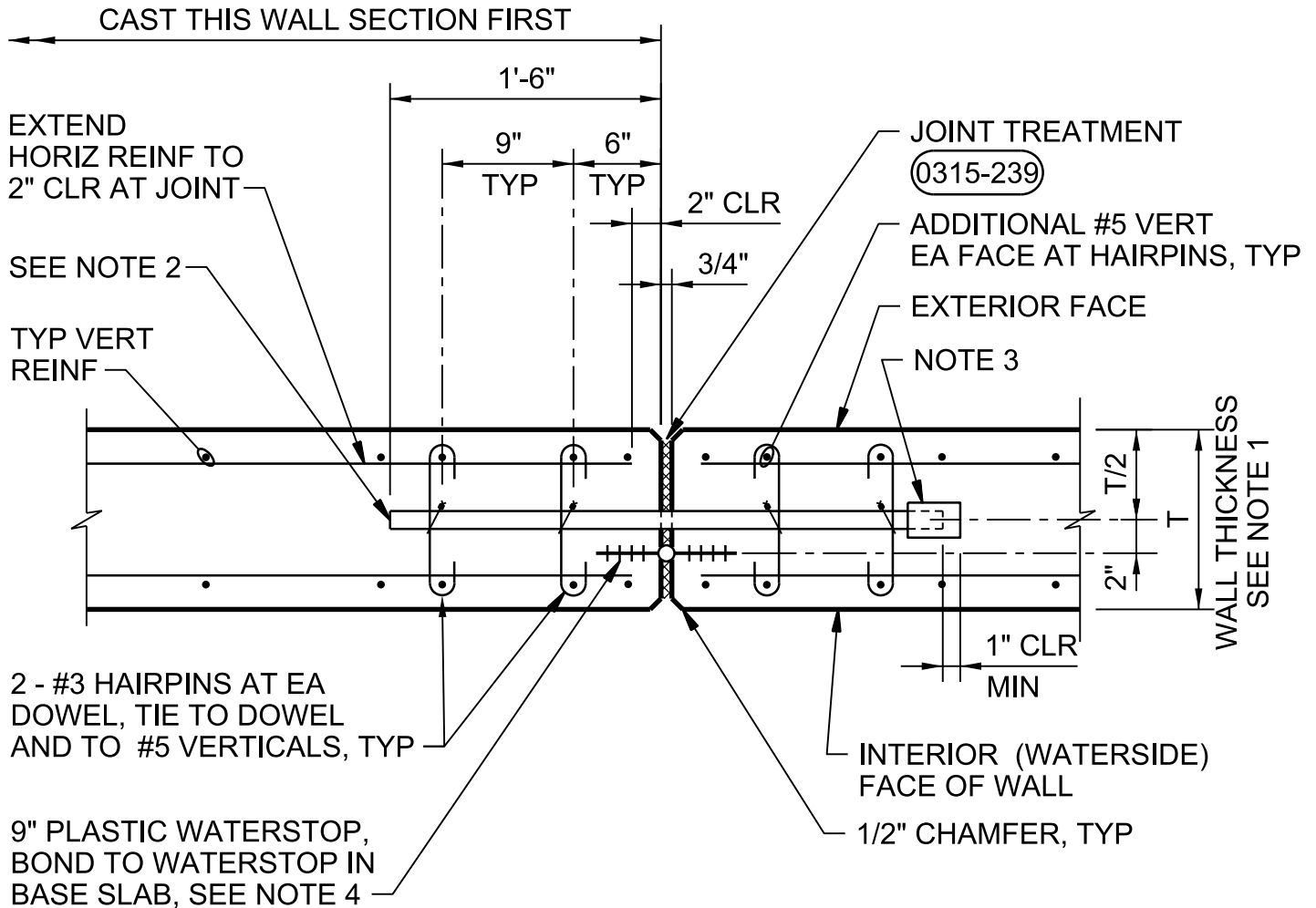
NOTES:

1. ATTACH PREMOLDED JOINT FILLER WITH 8d GALVANIZED NAILS @ 1'-0" SPACING EMBEDDED IN FIRST SLAB POUR.
2. LIQUID HOLDING SLABS INCLUDING AREAS FOR TEMPORARY SECONDARY CONTAINMENT.

SLAB EXPANSION JOINT TREATMENT

NTS

0315-228



PLAN

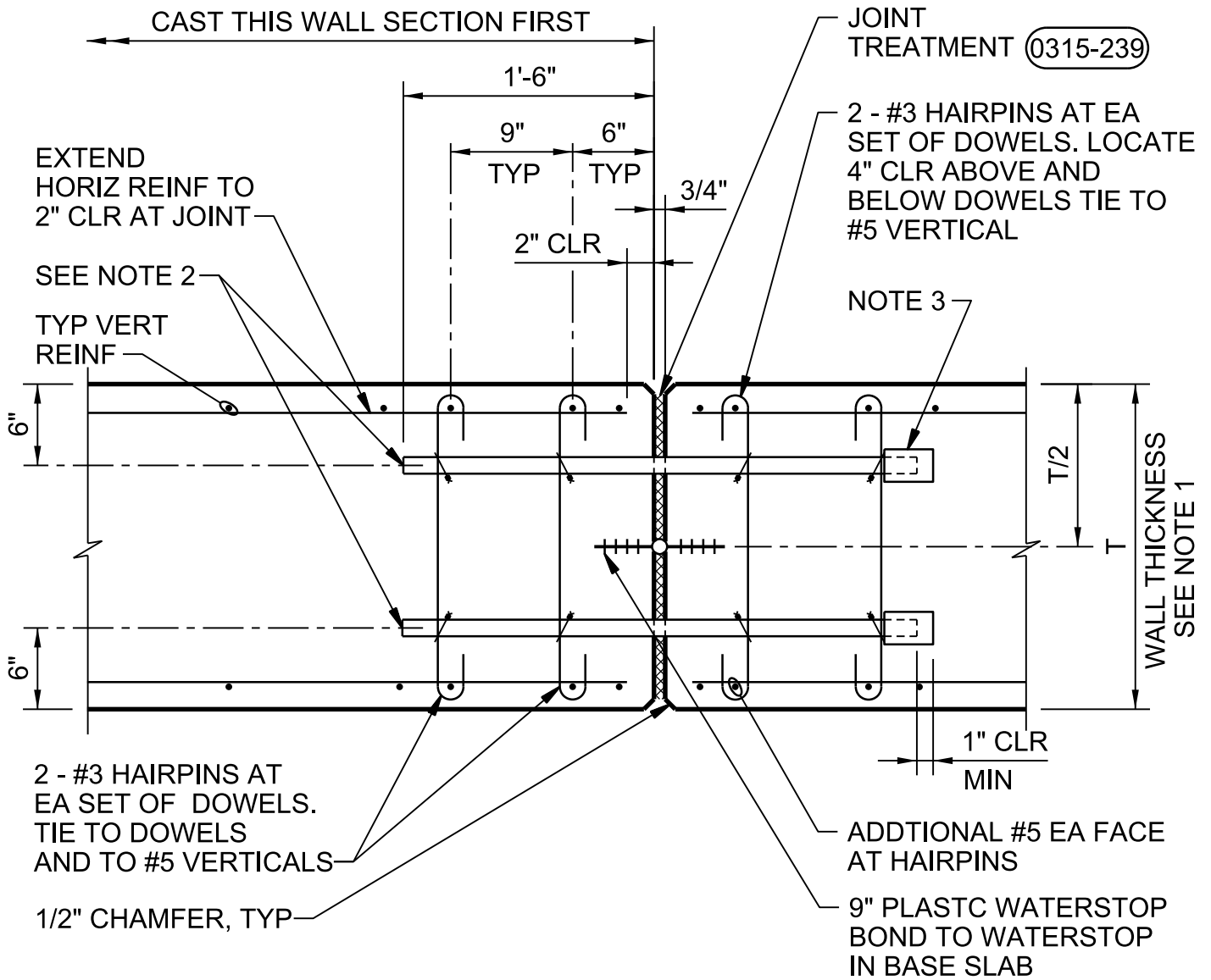
NOTES:

1. FOR WALLS WITH THICKNESS OF 10" THRU 24". FOR 10" WALLS LOCATE DOWELS 4" FROM FACE OF WALL INSTEAD OF T/2 INDICATED.
2. 1" DIA x 3'-0" SMOOTH COATED BAR DOWELS. LOCATE AT 1'-0" MAX FROM TOP AND 2'-0" FROM BOTTOM OF WALL AND AT 2'-0" MAX SPACING. ALIGN AND TIE-IN-PLACE TO REINF COATING SHALL CONSIST OF A CORROSION RESISTANT COATING PLUS A LUBRICANT COATING AS SPECIFIED.
3. 1" ID x 2" PLASTIC CAP WITH 1" POLYSTYRENE BETWEEN END OF DOWEL AND END CAP. TAPE TO BAR FOR WATERTIGHT SEAL.
4. BEND VERTICAL JOINT WATERSTOP OVER TO CENTERLINE OF WALL IN BOTTOM 2'-0" OF WALL, AND SPLICE TO WATERSTOP IN WALL BASE CONSTRUCTION JOINT. SEE (0315-012)

WALL VERTICAL EXPANSION JOINT

NTS

0315-232



PLAN

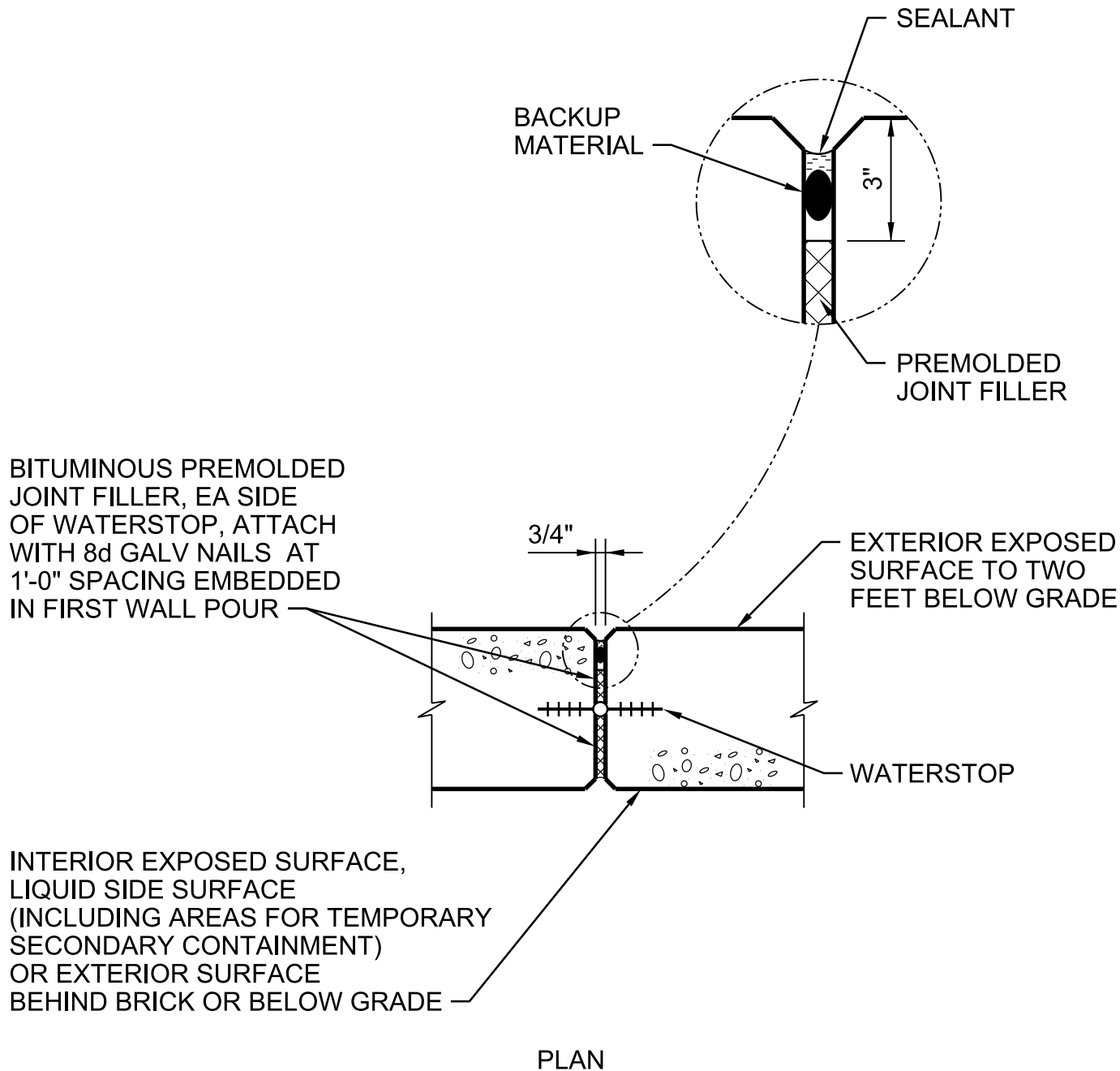
NOTES:

1. FOR WALLS GREATER THAN 24" THICK.
2. 1" DIA x 3'-0" SMOOTH COATED STEEL BAR DOWELS. LOCATE AT 1'-0" MAX FROM T & B OF WALL AND AT 2'-0" MAX SPACING. ALIGN AND TIE IN PLACE TO REINFORCING. COATING SHALL CONSIST OF A CORROSION RESISTANT COATING PLUS A LUBRICANT COATING AS SPECIFIED.
3. 1" ID x 2" PLASTIC EXP CAP WITH 1" POLYSTYRENE BETWEEN END OF DOWEL AND END OF CAP. TAPE TO BAR FOR WATERTIGHT SEAL.

WALL VERTICAL EXPANSION JOINT

NTS

0315-233



WALL EXPANSION JOINT TREATMENT

NTS

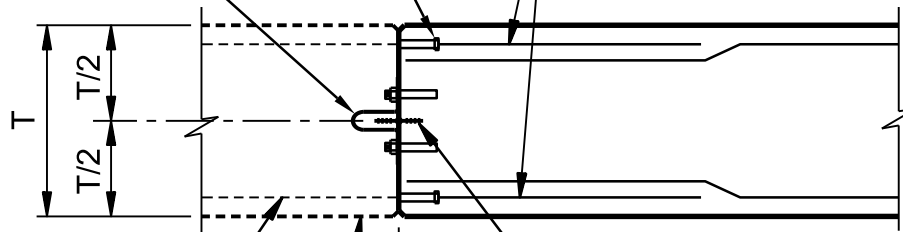
0315-239



MECHANICAL THREADED CONNECTORS
ON DOWELS. THREAD DOWELS TO
MIDPOINT OF COUPLING SLEEVE AND
LOCK IN PLACE W/ LOCKNUT, TYP

WATERSTOP
PROTECTOR (0315-021)

DOWELS TO MATCH SIZE AND
SPACING OF CONCRETE SLAB
OR WALL REINF OR AS NOTED
ON PLANS



FUTURE REINF THREADED
INTO MECHANICAL
THREADED CONNECTORS

6" PLASTIC WATERSTOP

FUTURE CONSTRUCTION JOINT

FUTURE CONCRETE SLAB OR WALL

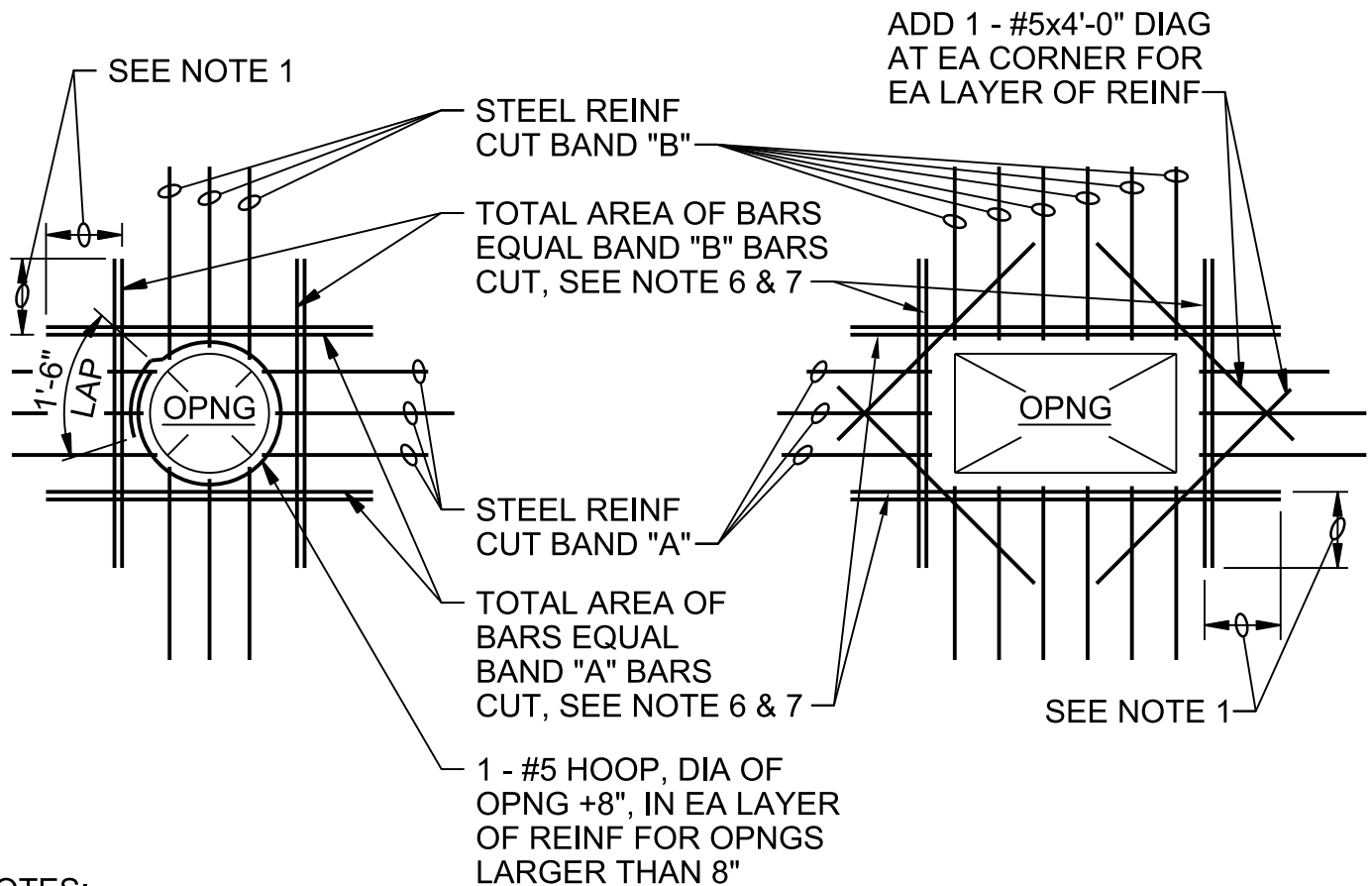
NOTES:

1. DETAILS SHOWN ARE APPLICABLE FOR FUTURE EXPANSION AT A CONSTRUCTION JOINT.
2. PROVIDE PROTECTIVE INSERTS FOR THREADED CONNECTORS.

WALL OR SLAB FUTURE CONSTRUCTION

NTS

0315-253



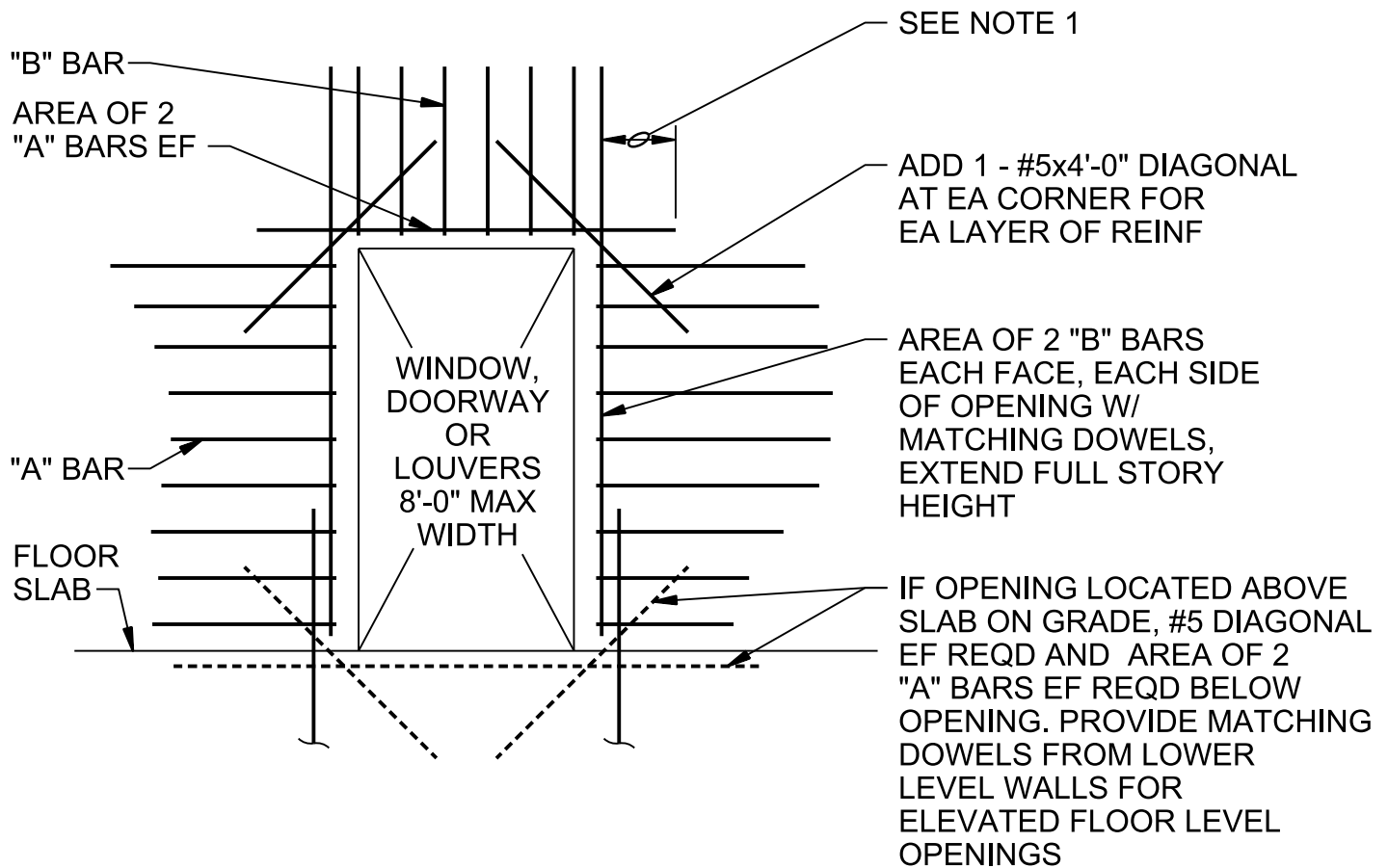
NOTES:

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

OPENING REINFORCING

NTS

0330-001



ELEVATION

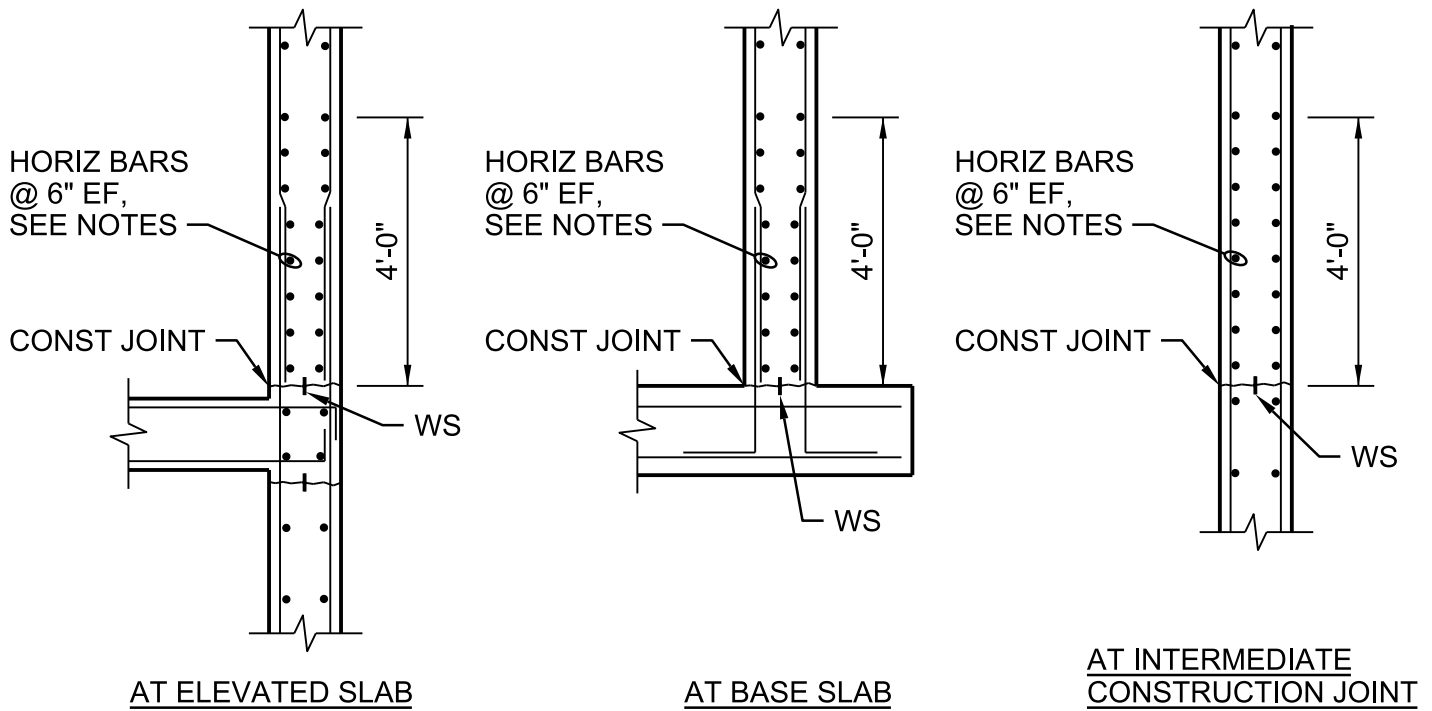
NOTES:

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

0330-002



NOTES:

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

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

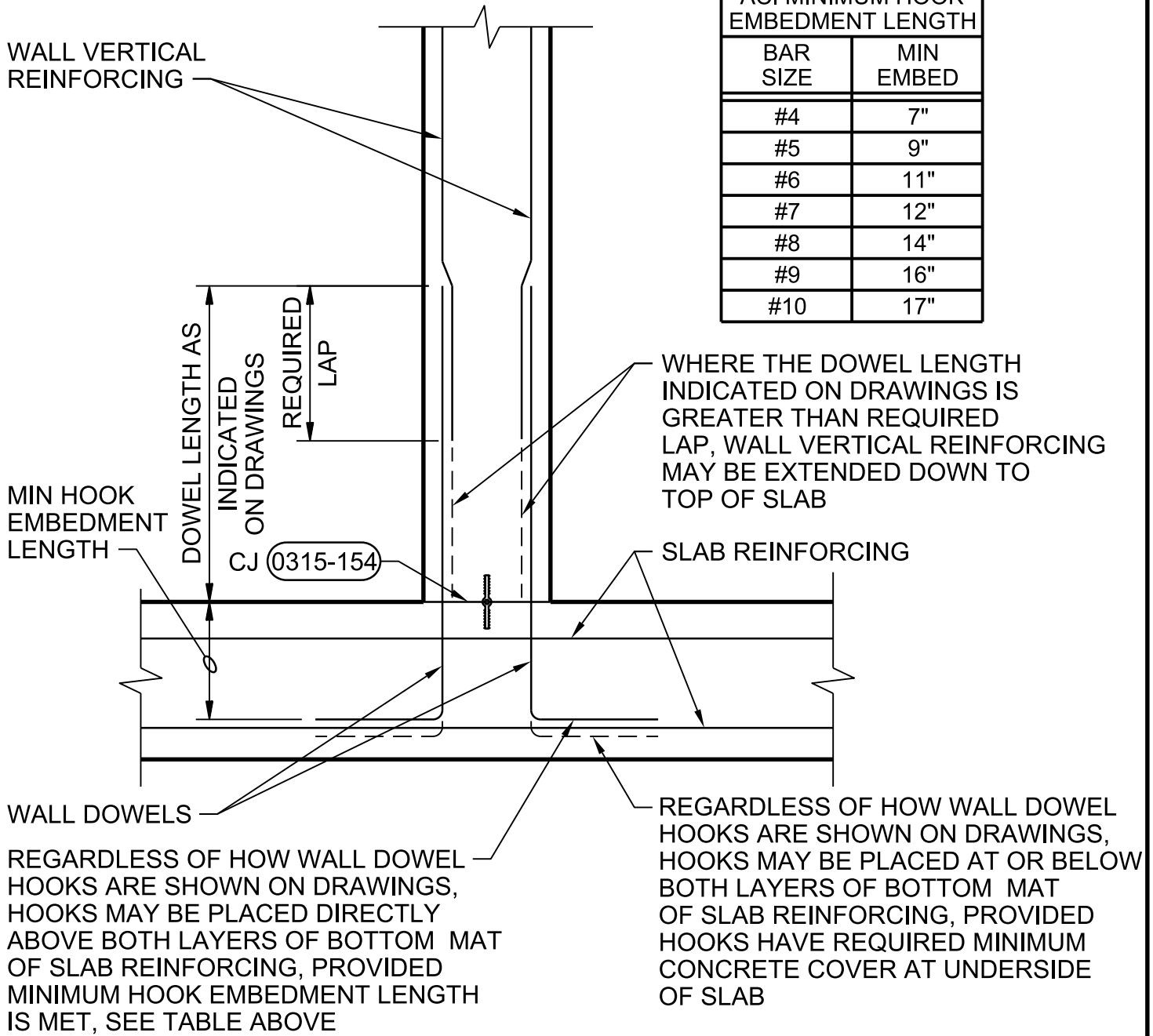
3. PROVIDE CORNER BARS AT 6" SPACING EACH FACE TO LAP WITH THE BARS SHOWN ABOVE, SEE (0330-003).

REINFORCING AT HORIZONTAL CONSTRUCTION JOINT

NTS

0330-004

ACI MINIMUM HOOK EMBEDMENT LENGTH	
BAR SIZE	MIN EMBED
#4	7"
#5	9"
#6	11"
#7	12"
#8	14"
#9	16"
#10	17"



NOTE:

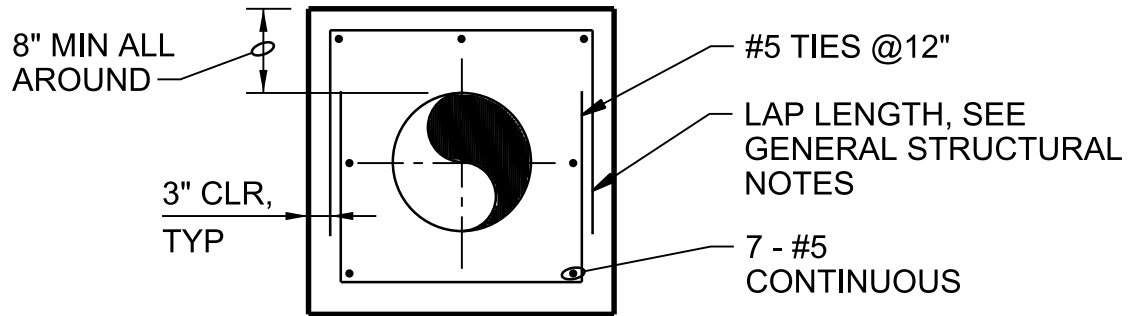
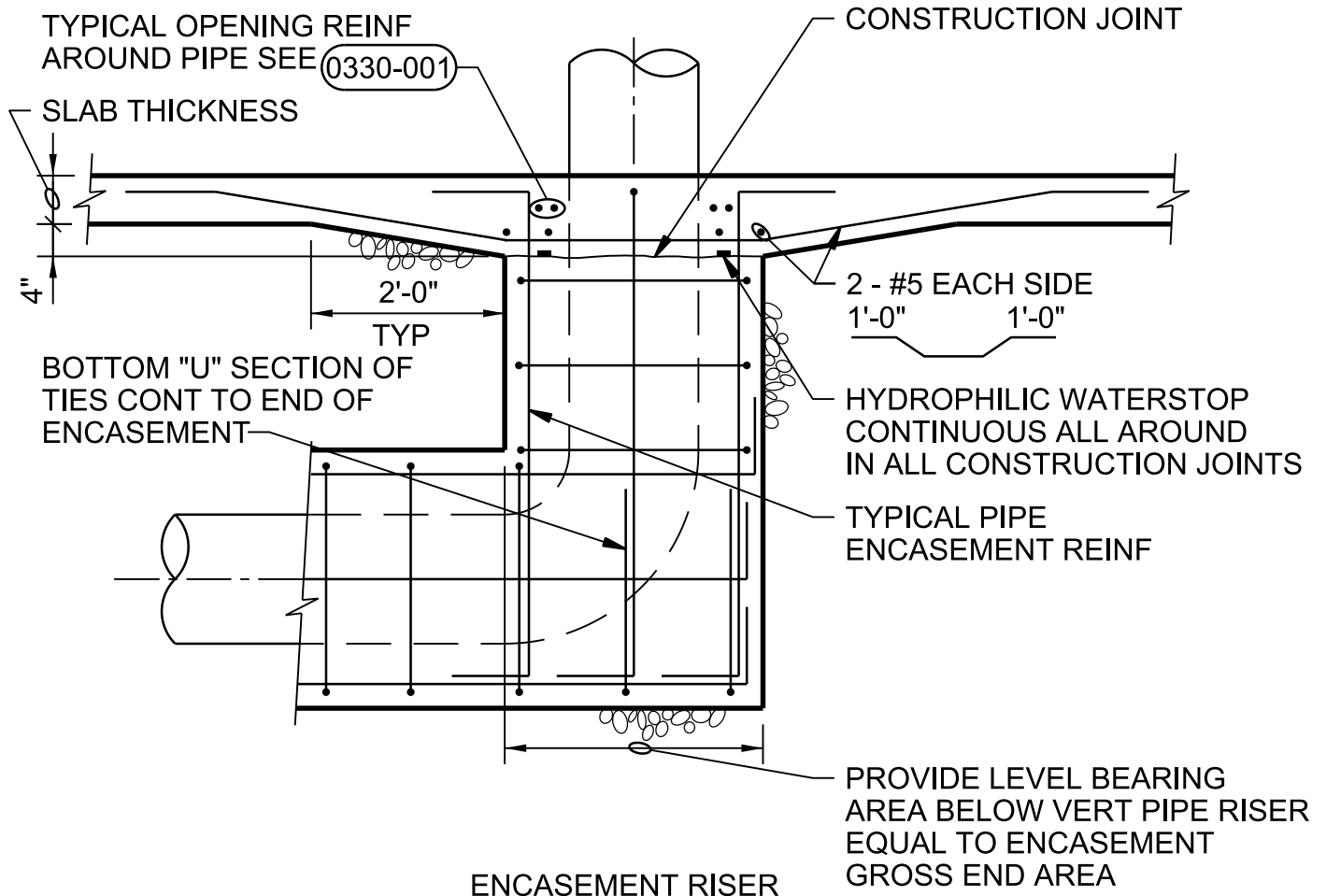
1. UNLESS NOTED OTHERWISE, ALL DOWEL HOOKS SHALL EXTEND TO AND BE TIED OFF TO BOTTOM MAT OF SLAB REINFORCING.

2. HOOKS FOR WALL DOWELS MAY BE PLACED IN ANY ORIENTATION IN PLAN.

VERTICAL WALL REINFORCING / DOWEL PLACEMENT

NTS

0330-005



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

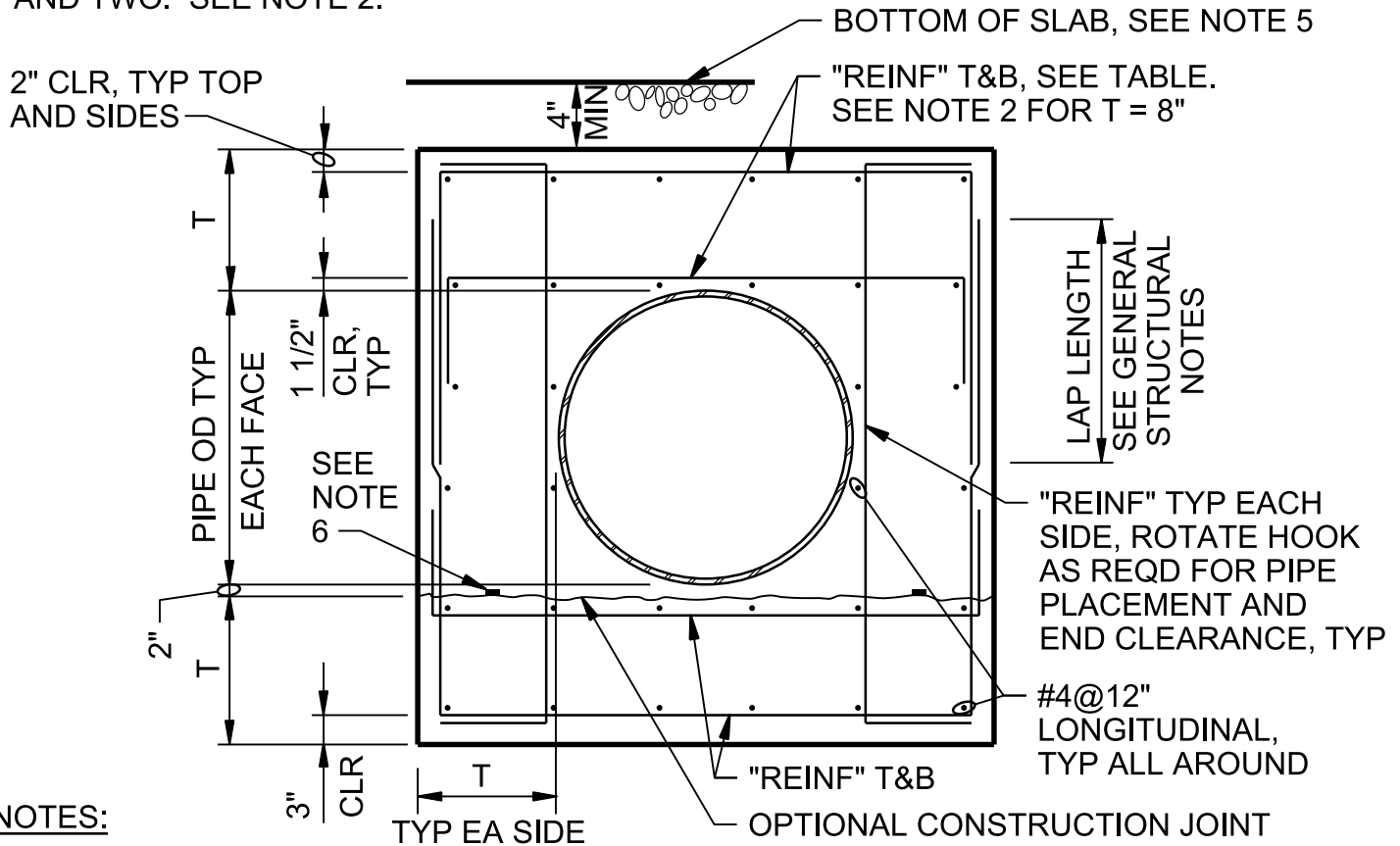
NTS

0330-016

PIPE ENCASEMENT TABLE

PIPE DIA (IN.)	H=10 FEET		H=20 FEET		H=30 FEET		H=40 FEET	
	T (in)	REINF	T (in)	REINF	T (in)	REINF	T (in)	REINF
20 THRU 30	8	#5@12"	10	#5@12"	10	#5@12"	10	#6@12"
36 THRU 42	10	#5@12"	10	#6@12"	10	#7@12"	10	#6@6"
48 THRU 54	10	#6@12"	10	#7@12"	10	#7@6"	12	#7@6"
UP TO 60	10	#6@12"	10	#6@6"	14	#7@6"	14	#7@6"

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



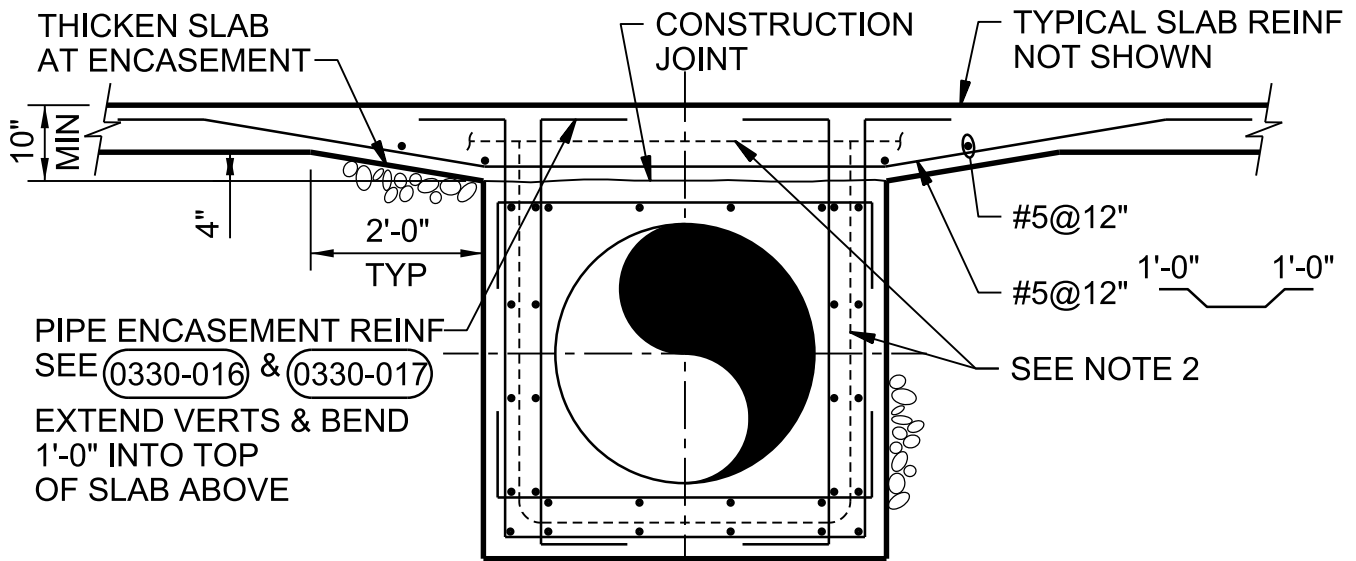
NOTES:

1. THIS DETAIL APPLIES TO PIPE DIAMETER OF 20" AND LARGER. FOR SMALLER THAN 20", SEE DETAIL (0330-016) .
2. FOR T=8" REINFORCING SHALL BE ONE LAYER AND CENTERED IN SLABS OR WALLS. SIM (0330-016) .
3. FOR ENCASEMENT AT PIPE RISER, SEE (0330-016) .
4. "H" IS FILL HEIGHT OR WATER DEPTH OR COMBINATION ABOVE PIPE.
5. WHEN PIPE ENCASEMENT CLOSER THAN 4" TO SLAB ABOVE, TIE SLAB & ENCASEMENT TOGETHER. SEE (0330-018) .
6. HYDROPHILIC WATERSTOP CONTINUOUS ALL AROUND IN ALL CONSTRUCTION JOINTS.

PIPE ENCASEMENT

NTS

0330-017



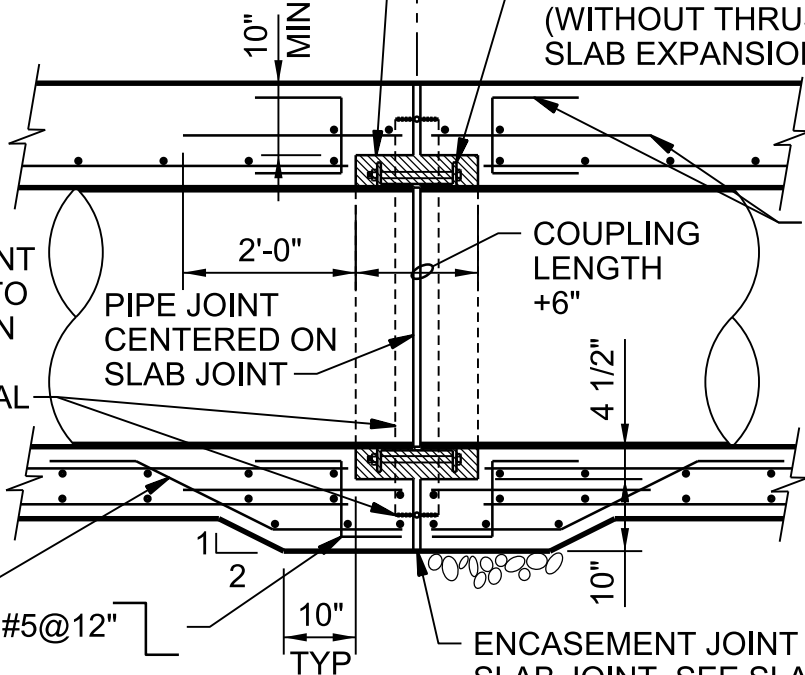
CLOSED CELLULAR SPONGE RUBBER ALL AROUND COUPLING TO ALLOW JOINT MOVEMENT (1" MIN)

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

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

NOTES:

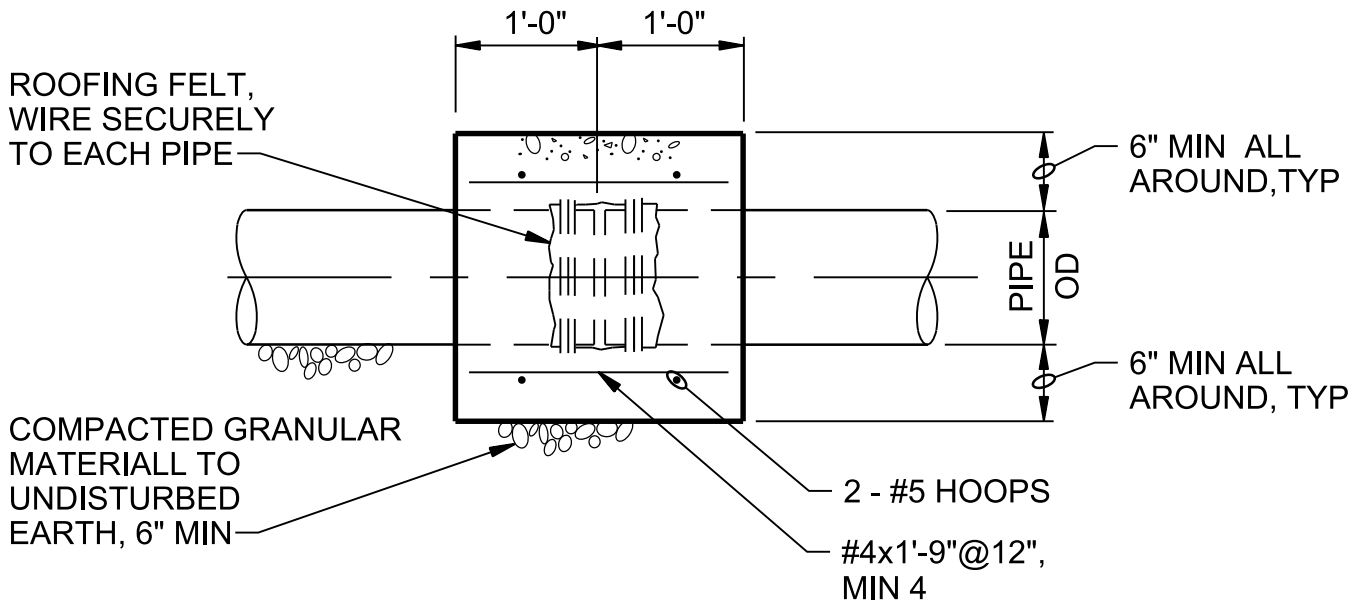
JOINT DETAIL

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

PIPE ENCASEMENT AT SLAB

NTS

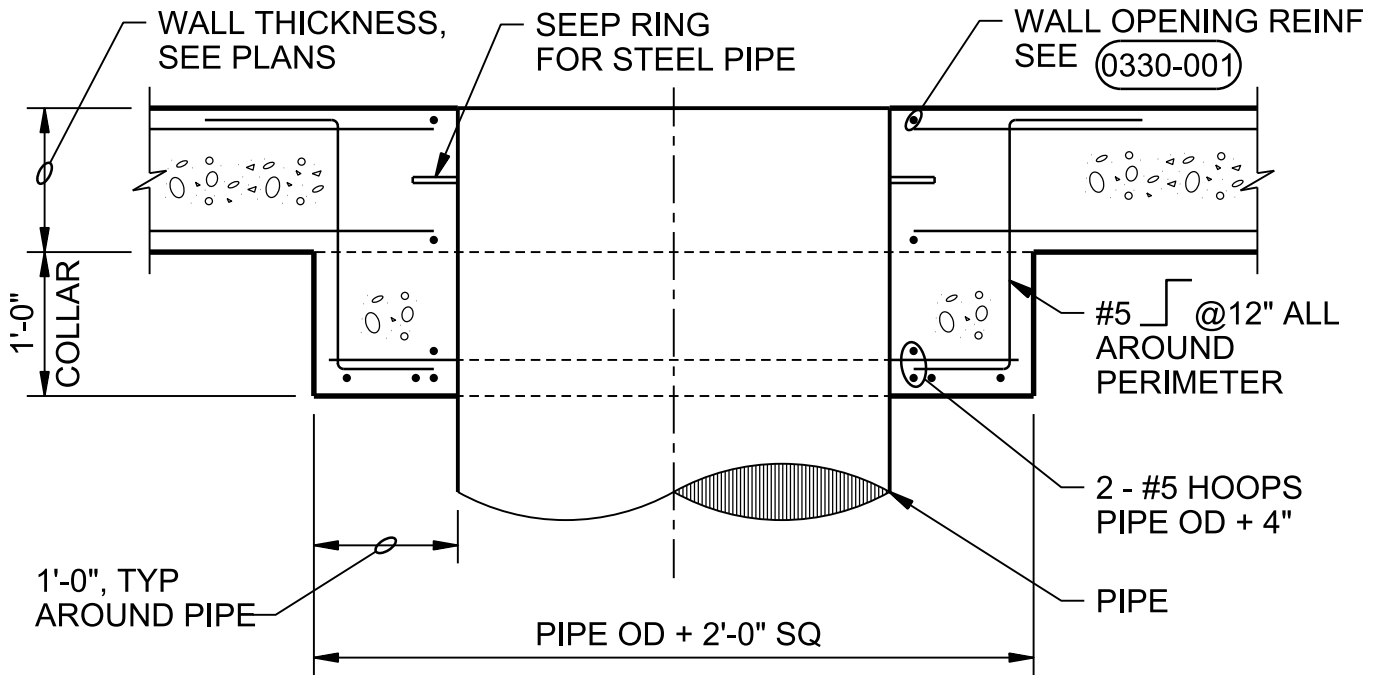
0330-018



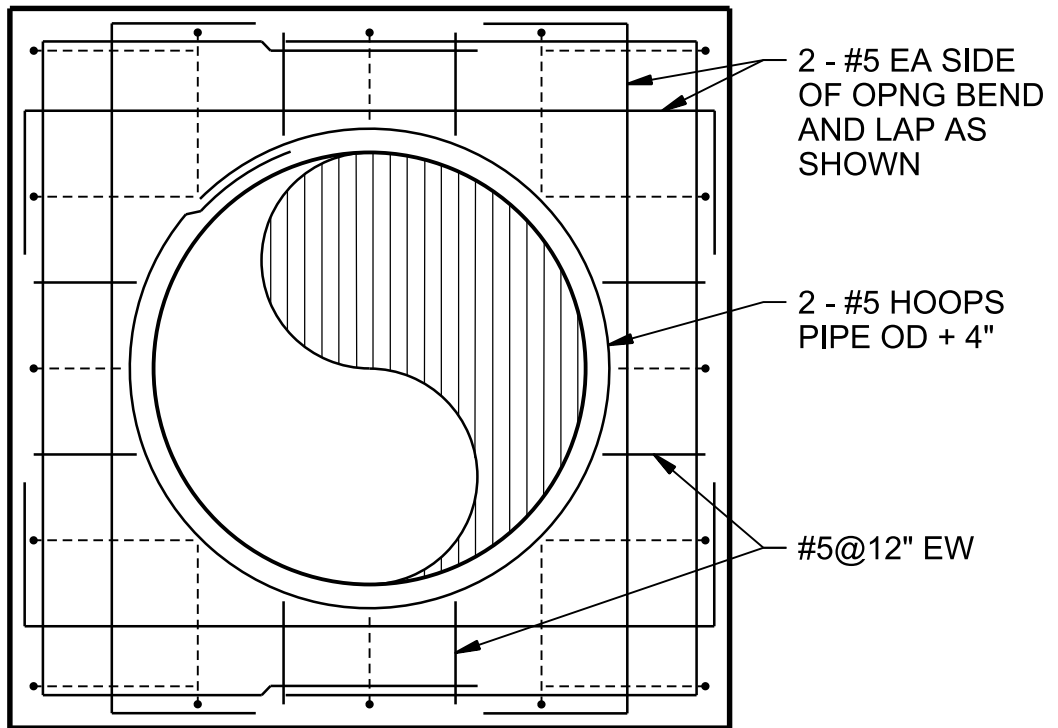
CONCRETE CLOSURE COLLAR

NTS

0330-020



PLAN/SECTION



ELEVATION

PIPE COLLAR

NTS

0330-021

DOOR
OPENING

EXTERIOR
SURFACE

2 LAYERS
ROOFING FELT

2 ADDL #5 x OPNG
WIDTH + 2'-0"
EA END

EXTERIOR FDN WALL
STEP DOWN 1'-0"
@ DOOR OPNG

PJF BEYOND AT BLDG
WALL & SLAB EDGE

ADDL #4@12" 4'-0"
ALTN W/
TYP FOR
6" SPACING

TYPICAL
SLAB
REINF

ADDL #5 x OPNG
WIDTH + 2'-0" EA END

1'-0"
MIN

TYP SLAB
THICKNESS

2'-0"

EXTERIOR

DOOR OPENING
IN INTERIOR
BEARING WALL

1/2" PJF

2 LAYERS
ROOFING FELT

2 ADDL #5 x OPNG
WIDTH + 2'-0"
EA END, TYP

INTERIOR FDN WALL
STEP DOWN 1'-0"
@ DOOR OPNG

PJF BEYOND AT BLDG
WALL & SLAB EDGE

ADDL #4@12" 4'-0"
ALTN W/ TYP FOR
6" SPACING

TYPICAL
SLAB
REINF CONT

2 ADDL #5 x OPNG
WIDTH + 2'-0" EA END

1'-0"
MIN

TYP SLAB
THICKNESS

2'-0"

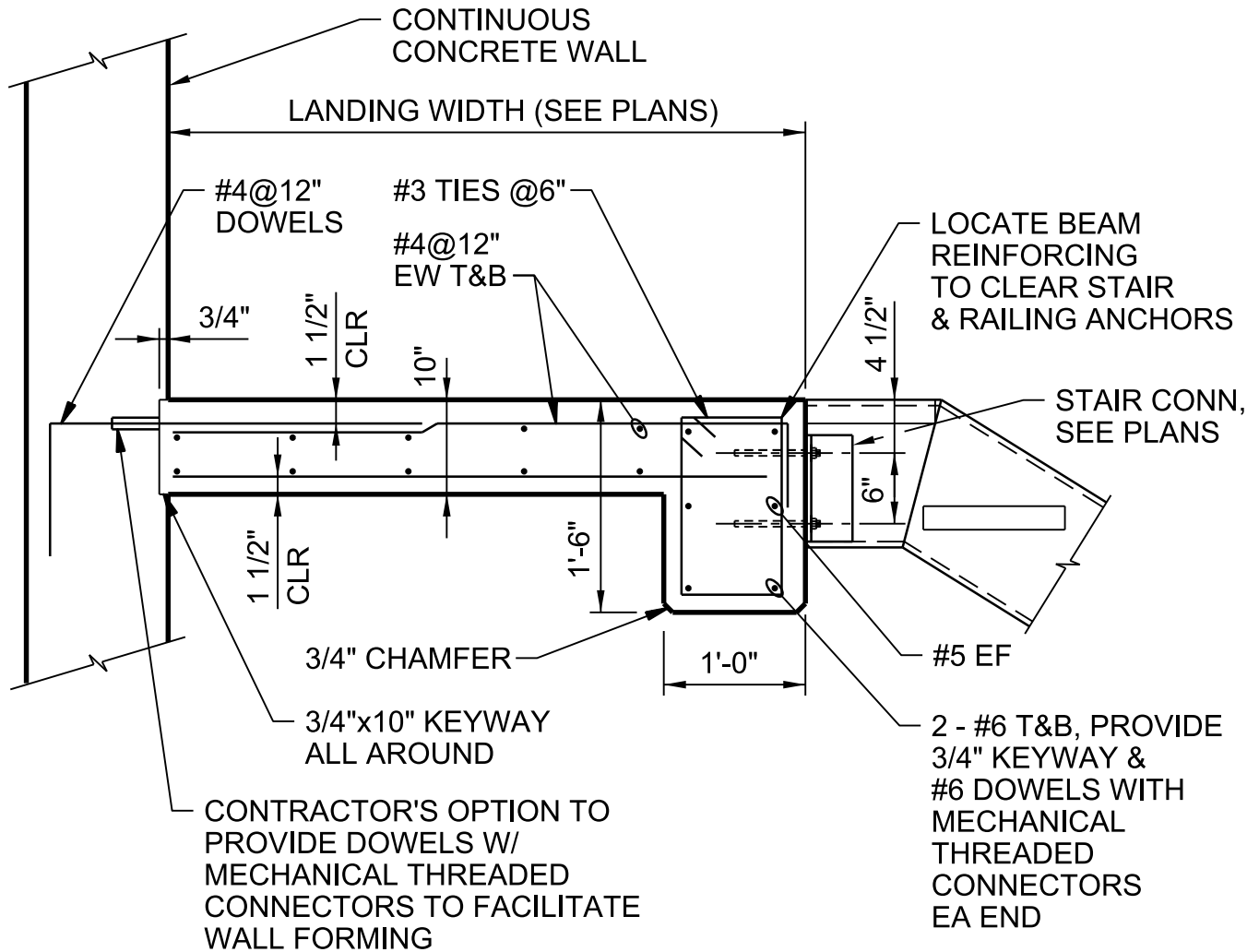
TYP

INTERIOR

SLAB AT DOOR OPENING

NTS

0330-041



NOTE:
FOR RAILING SEE PLANS.

STAIR LANDING

NTS

0330-051

2" MIN ALL AROUND
OR AS REQUIRED BY
ANCHORAGE
CALCULATIONS

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

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

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

EQUIPMENT

EQUIPMENT PAD

3/4" CHAMFER, TYP

#4 ADHESIVE DOWEL
@ 12" OC @ PERIMETER
(0330-101)

CONSTRUCTION JOINT,
ROUGHEN & CLEAN PRIOR
TO PLACING PAD

NOTES:

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

TYPE A

GENERAL NOTE:

FOR GENERAL NOTES SEE DETAIL 5 OF 5.

CONCRETE EQUIPMENT PAD - TYPE A

NTS

DETAIL 1 OF 5

(0330-056)

CH2MHILL

OPNG SIZE, VERIFY W/
PLANS & EQUIP MFR
FORM TO RETAIN GROUT

4 1/2" MIN ALL AROUND

3" MIN ALL
AROUND

1 1/2"
MAX

#4@12" EW

SEE
NOTE 7

1"
MIN

ANCHOR
BOLT SLEEVE

2 MIN EA SIDE
OF OPNG EW

CONSTRUCTION JOINT

SUSPENDED SLAB; FOR REINF AND
THICKNESS NOT SHOWN SEE PLANS

TYPE C

EQUIPMENT BASE


1 1/2" FLUID
NON-SHRINK GROUT


ANCHOR BOLT,
SEE NOTES &
ANCHOR BOLT
DETAILS


3/4" CHAMFER, TYP

2 - #4  @ TOP
OF PAD

ADDL #4@6" 
FOR PAD HT > 10"

#4@12"  MIN 4
PER PAD (#5@12"
FOR AB 3/4" OR
LARGER)

#4  OR  FOR
OPENINGS > 6"

#4@12"  BARS AT
OPNG IF "X" > 1'-6"

GENERAL NOTE:

FOR GENERAL NOTES SEE DETAIL 5 OF 5.

CONCRETE EQUIPMENT PAD - TYPE C

NTS

DETAIL 2 OF 5

0330-056

6" MIN, TYP UNLESS NOTED OTHERWISE ON PLANS

3/4" CHAMFER, TYP

THICKENED EDGE OF SLAB ALL AROUND

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

EQUIPMENT

CONCRETE ANCHORS, SEE NOTE

FINISH GRADE

4" MIN
6" MIN

#5 CONT

6" MIN

1
1.5
6" MIN

NOTE:

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

TYPE G

GENERAL NOTE:

FOR GENERAL NOTES SEE DETAIL 5 OF 5.

CONCRETE EQUIPMENT PAD - TYPE G

NTS

DETAIL 3 OF 5

0330-056

6" MIN, TYP UNLESS NOTED OTHERWISE ON PLANS

3/4" CHAMFER, TYP

THICKENED EDGE OF SLAB ALL AROUND

#5@12" EW T&B

EQUIPMENT

CONCRETE ANCHORS, SEE NOTE

FINISH GRADE

4"
1'-0" MIN

2 - #5 CONT

6" MIN

10" MIN

1
1.5

NOTE:

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

TYPE H

GENERAL NOTE:

FOR GENERAL NOTES SEE DETAIL 5 OF 5.

CONCRETE EQUIPMENT PAD - TYPE H

NTS

DETAIL 4 OF 5

0330-056

NOTES:

1. PAD SIZE SHALL BE MINIMUM INDICATED OR AS SHOWN ON THE PLANS OR AS INDICATED BY THE MANUFACTURER AND APPROVED BY THE ENGINEER.
2. THE SIZE, NUMBER, TYPE, LOCATION, AND THREAD PROJECTION OF THE ANCHOR BOLTS SHALL BE DETERMINED BY THE EQUIPMENT MANUFACTURER AND AS APPROVED BY THE ENGINEER. ANCHOR BOLTS SHALL BE HELD IN POSITION WITH A TEMPLATE OR OTHER ACCEPTABLE MEANS, MATCHING THE BASE PLATE, WHILE PAD IS BEING PLACED.
3. 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.
4. 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) .
5. EQUIPMENT BASES SHALL BE INSTALLED LEVEL UNLESS INDICATED OTHERWISE.
6. 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.
7. 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.
8. TYPE "D" PAD SHALL BE USED ONLY WHERE SPECIFICALLY INDICATED. PLACE THE SURROUNDING FLOOR SLAB AFTER THE EQUIPMENT PAD.
9. AT CONTRACTOR'S OPTION, CONCRETE ANCHORS MAY BE USED IN LIEU OF CAST-IN-PLACE ANCHOR BOLTS FOR EQUIPMENT ANCHOR BOLTS LESS THAN 3/4" DIAMETER WHEN APPROVED BY THE EQUIPMENT MANUFACTURER AND APPROVED BY THE ENGINEER. ANCHORS SHALL BE INSTALLED WITH 4" MINIMUM EDGE DISTANCE IN EACH DIRECTION.

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

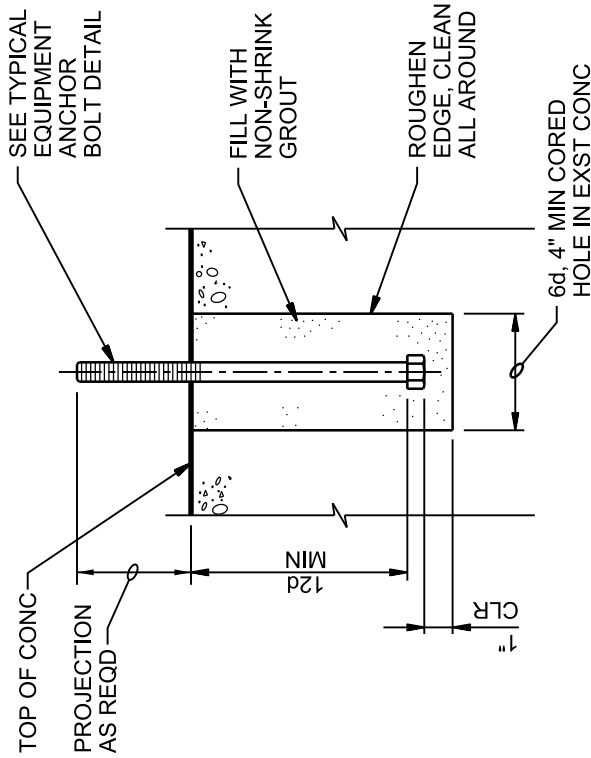
CONCRETE EQUIPMENT PAD NOTES

NTS

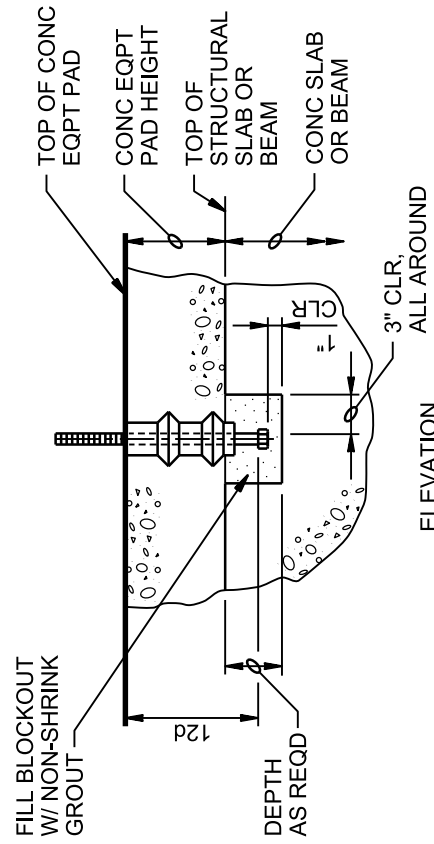
DETAIL 5 OF 5

(0330-056)

CH2MHILL

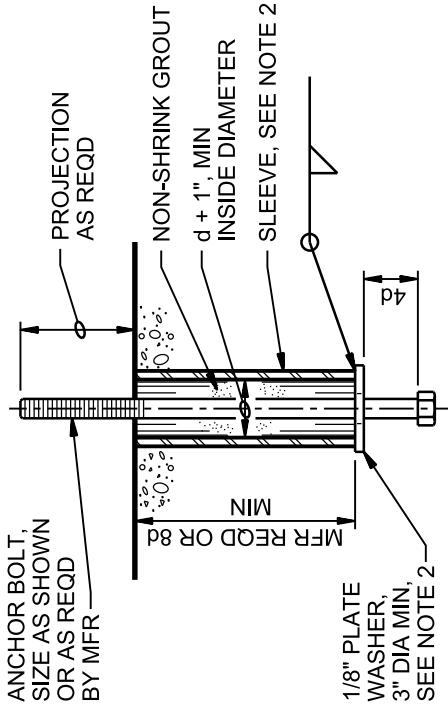


ANCHOR BOLT RETROFIT

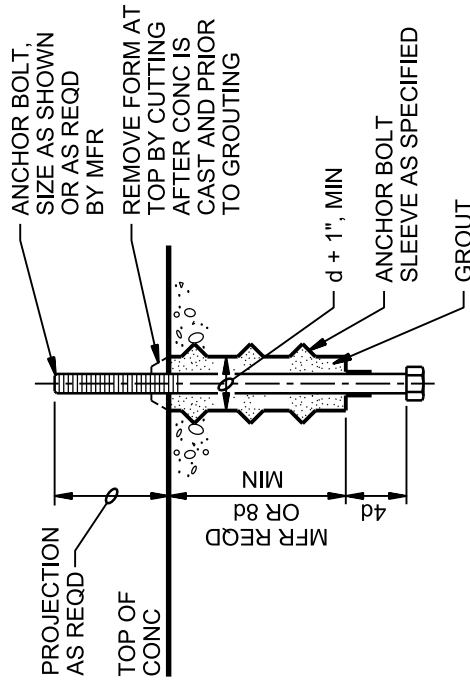


ELEVATION

ANCHOR BOLT BLOCKOUT



MACHINERY ANCHOR BOLT DETAIL



NOTES:

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

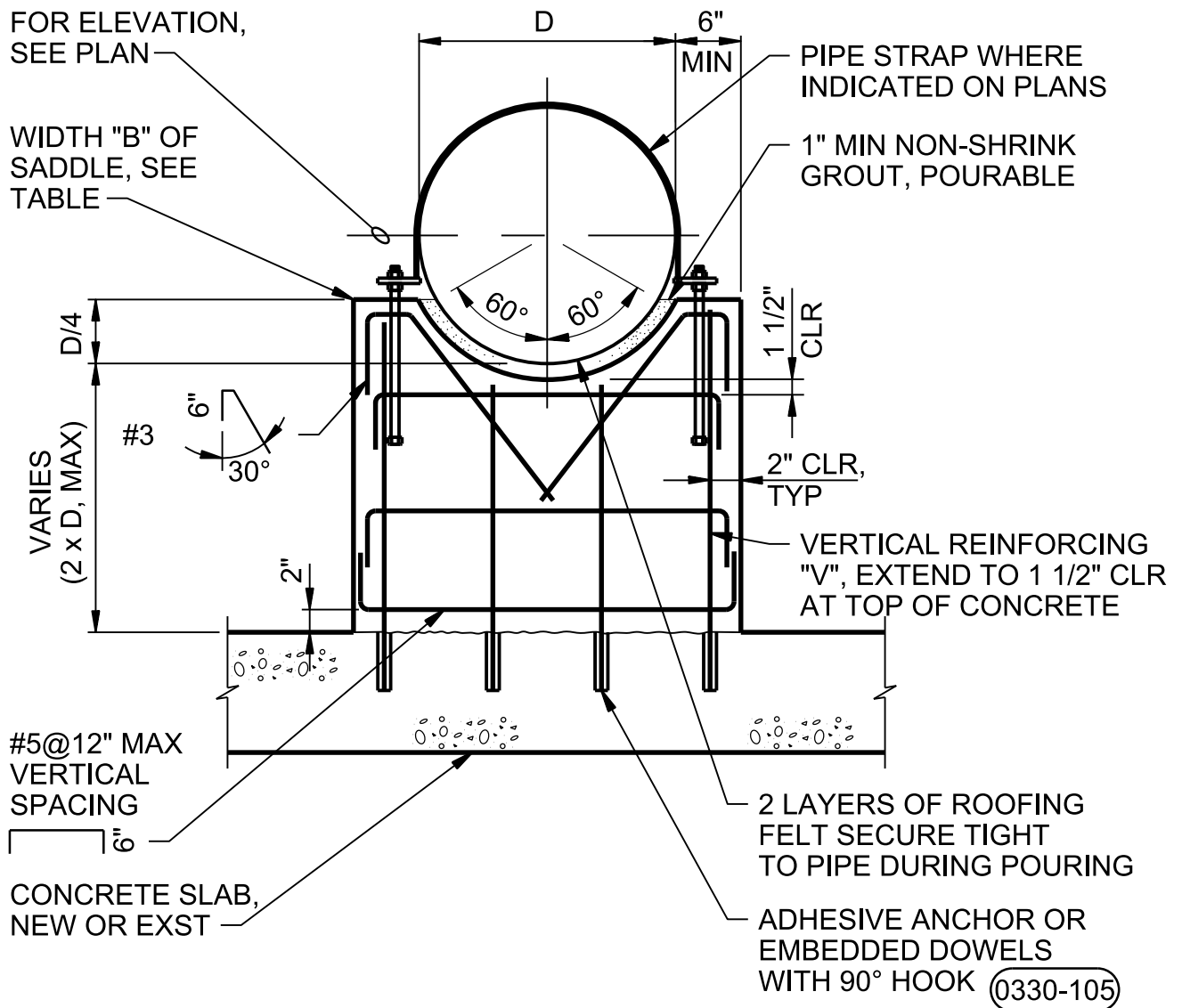
ANCHOR BOLT DETAILS

NTS

0330-057

FOR ELEVATION,
SEE PLAN

WIDTH "B" OF
SADDLE, SEE
TABLE



TYPE "A" SADDLE

PIPE SUPPORT - CONCRETE SADDLE

NTS

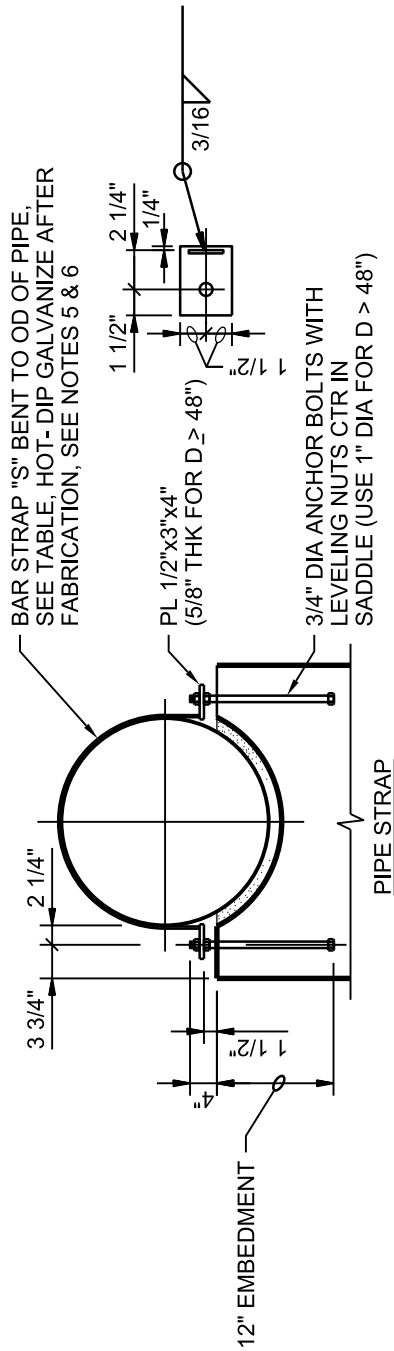
DETAIL 1 OF 2

0330-061

CH2MHILL

PIPE SUPPORT - CONCRETE SADDLE

NTS



PIPE SADDLE TABLE

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

NOTES:

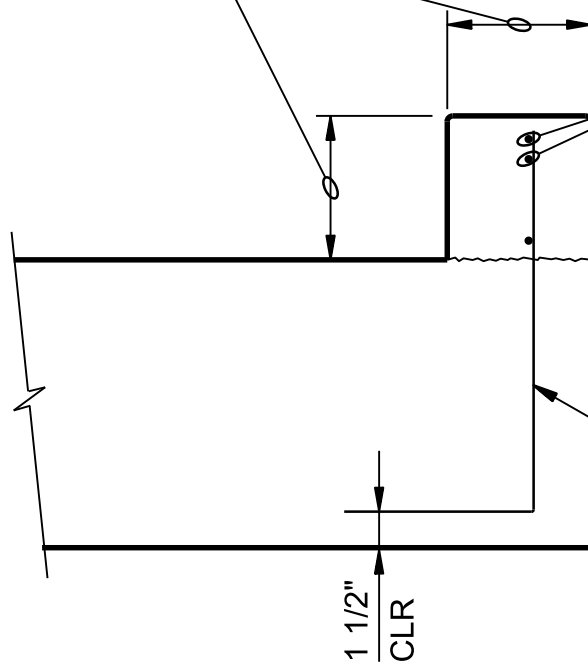
- FOR "B"=10" OR THICKER, USE 2 LAYERS OF REINFORCING, TURN HORIZONTAL BARS 90° TO HOOK AROUND VERTICALS , 1 1/2" CLEAR OF CONCRETE
- FORM 3/4" BEVEL ON ALL EXPOSED CORNERS OF SUPPORT.
- USE TYPE 'A' SADDLE IN ALL LOCATIONS WHERE A SLAB (NEW OR EXISTING) OCCURS. USE TYPE 'B' IN OTHER LOCATIONS.
- FOR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

DETAIL 2 OF 2

0330-061



WIDTH AND HEIGHT
OF CURB AS NOTED
ON PLAN



2 - #5 @ TOP &
#5@12" WHEN CURB
HEIGHT EXCEEDS 12".
MIN 2 BARS FOR CURB
HEIGHT LESS THAN 12"
LOCATE EF WHEN
WIDTH EXCEEDS 9"

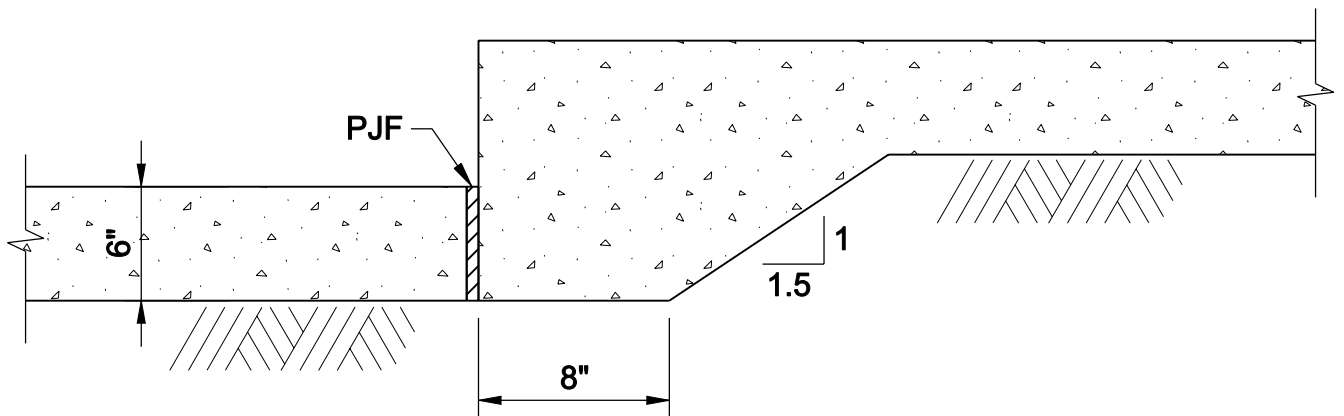
#5@12" PLACE EA
FACE WHEN CURB
WIDTH IS LARGER
THAN 9"

1 1/2"
CLR

CONCRETE CURB

NTS

0330-080



NOTES:

1. GRADE SURROUNDING GRAVEL TO SLOPE AWAY FROM CONCRETE SIDEWALK AND STEP.

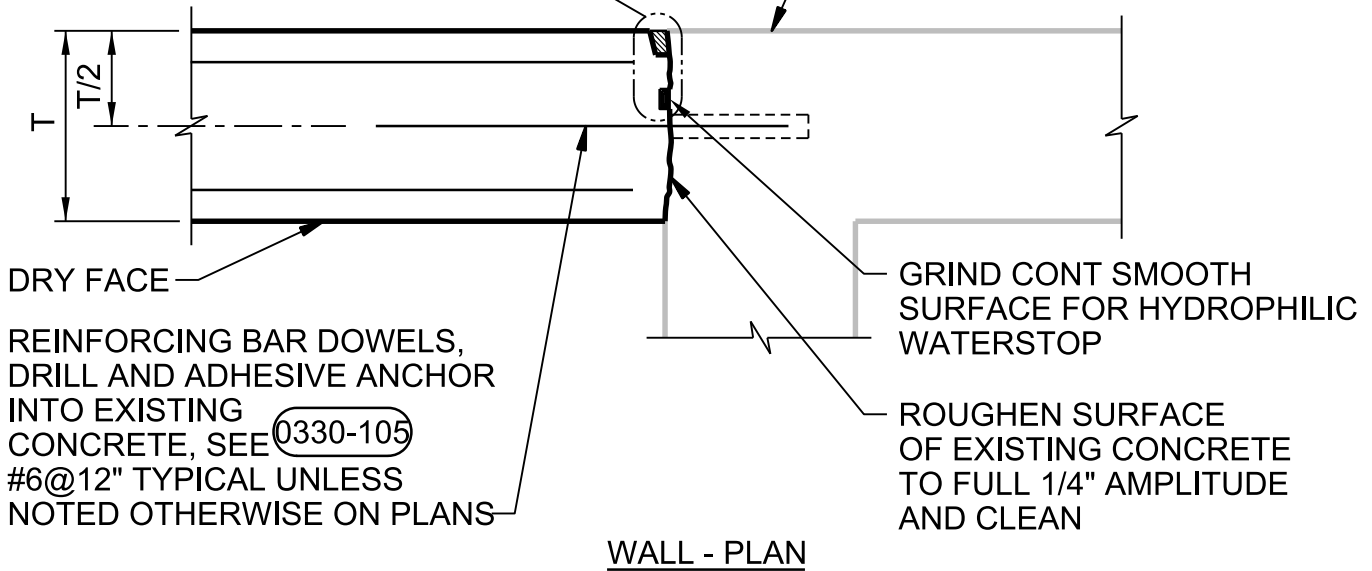
CONCRETE STEP

NTS

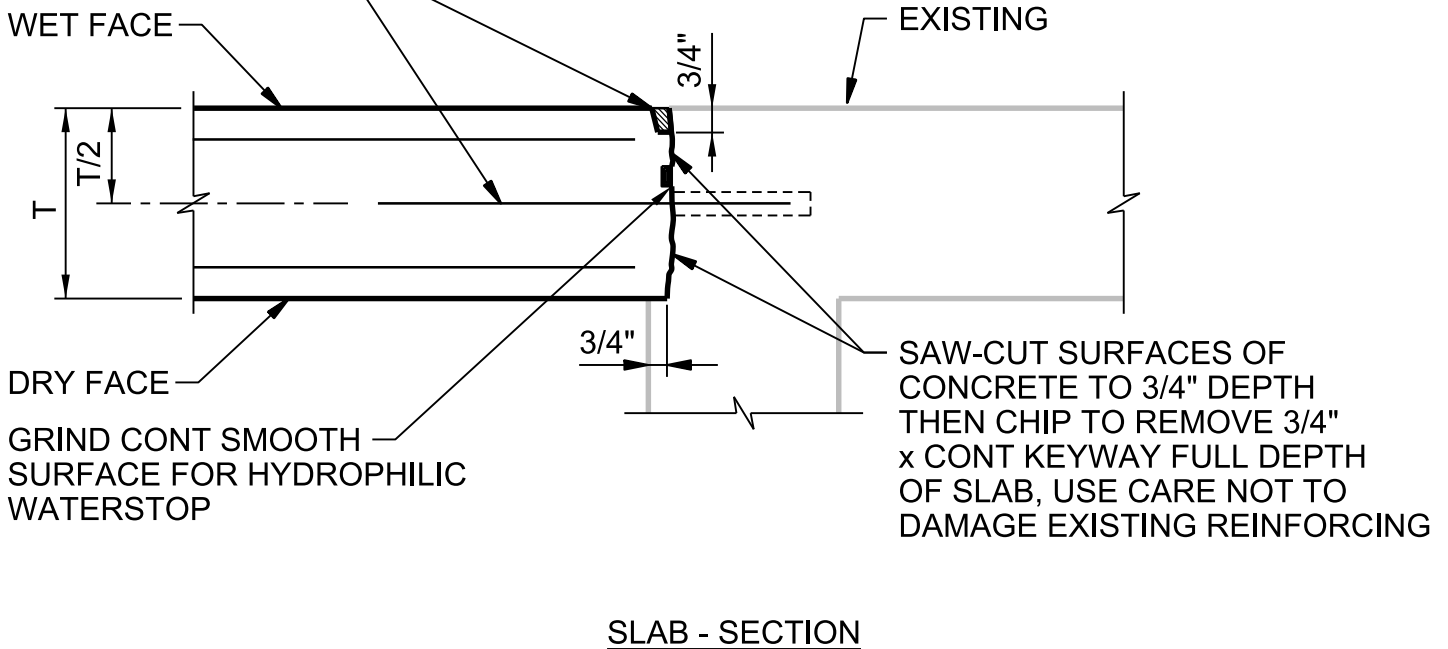
0330-083

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

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



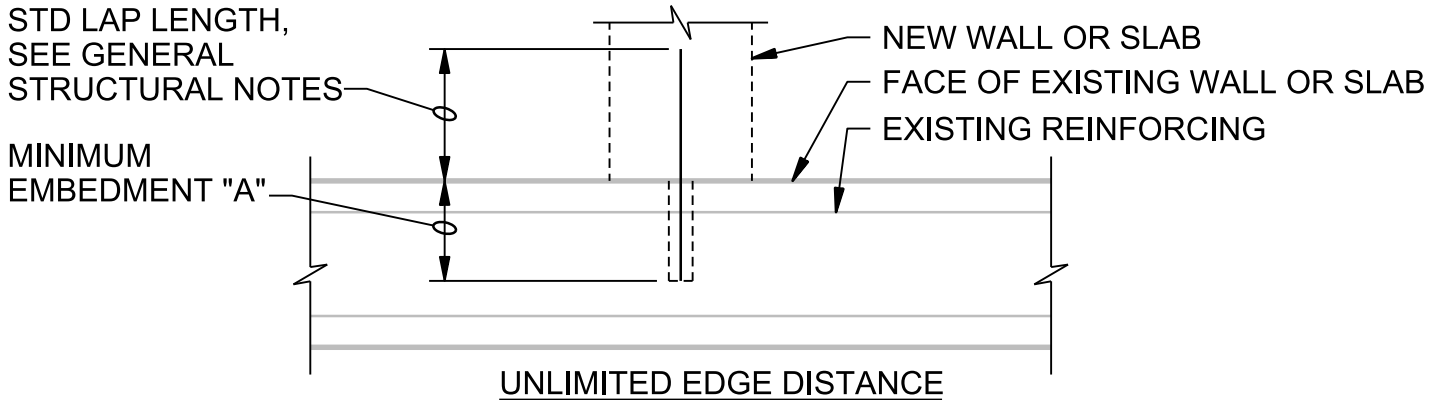
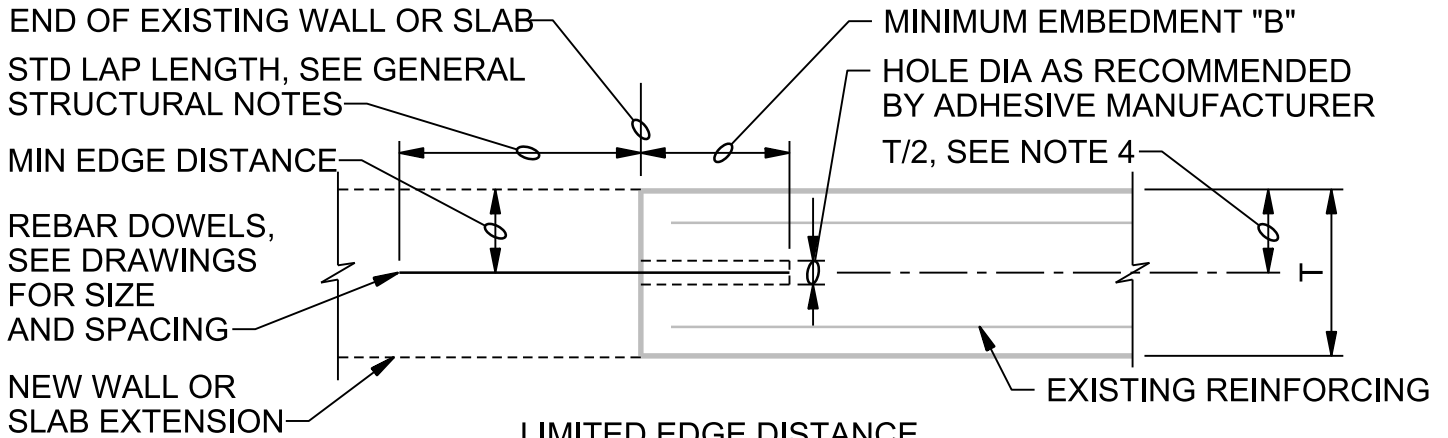
SEE NOTES ABOVE



CONNECTION OF NEW CONCRETE TO EXISTING

NTS

0330-101



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

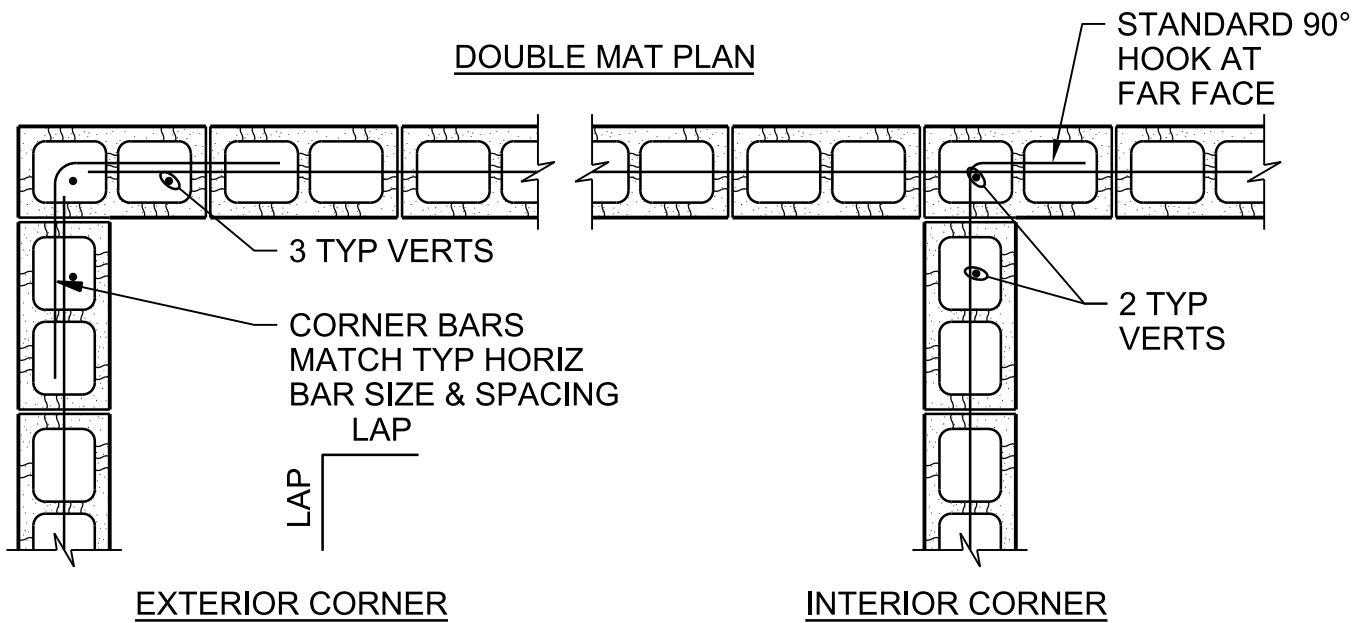
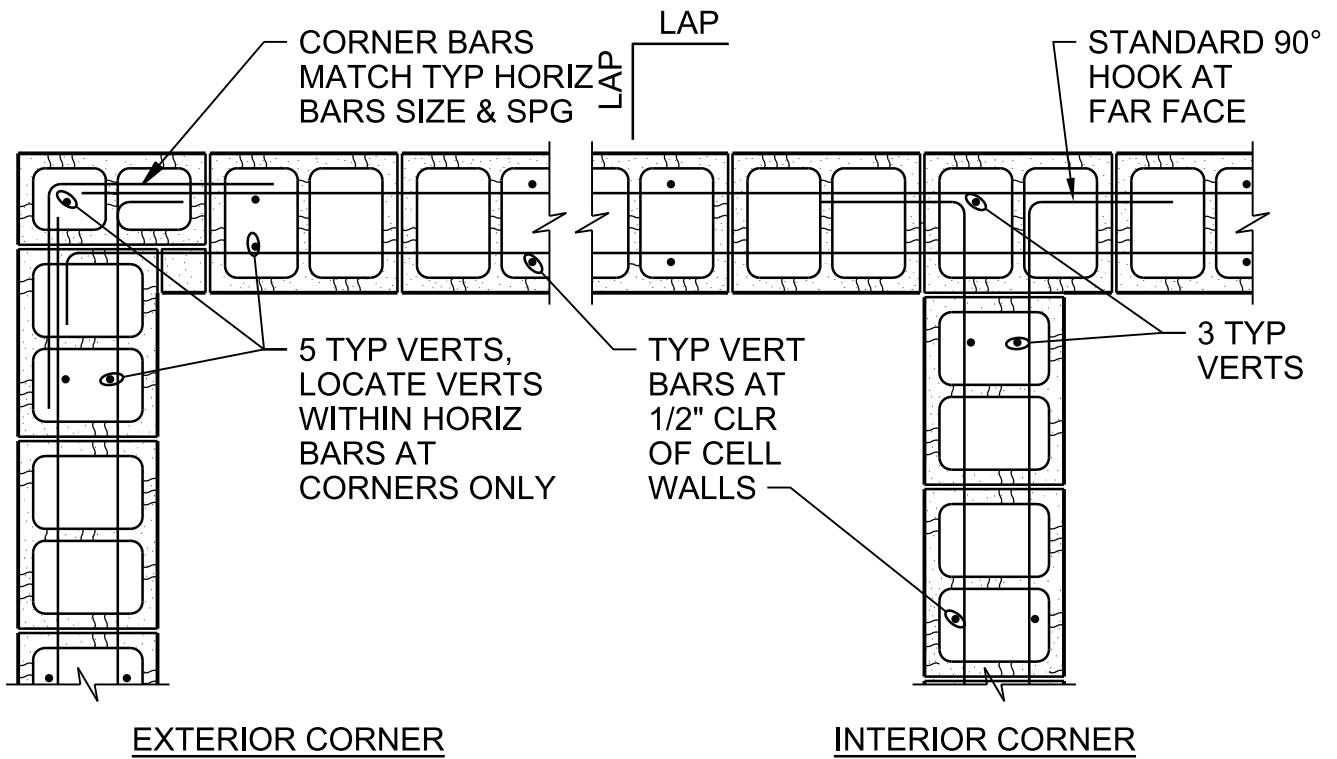
NOTES:

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

ADHESIVE DOWEL

NTS

0330-105



NOTES:

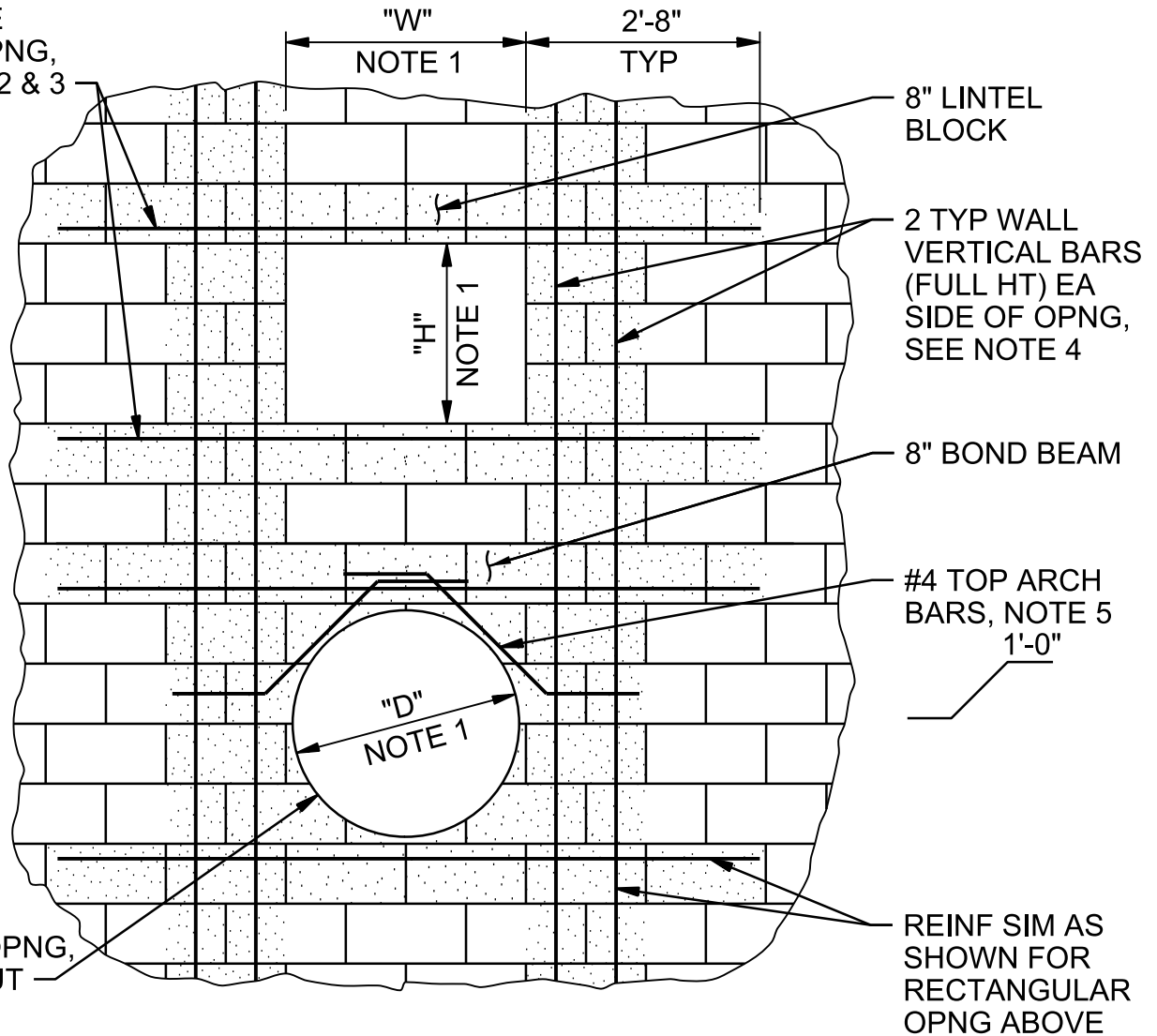
1. LAP=48 BAR DIAMETERS OR 2'-0" MINIMUM UNLESS OTHERWISE NOTED.
2. PROVIDE A STANDARD 90° HOOK EACH END ON ANY HORIZONTAL BAR BETWEEN OPENINGS, CONTROL JOINTS, OR CORNERS LESS THAN 6'-0" IN LENGTH.

CMU WALL CORNERS (SINGLE & DOUBLE MAT)

NTS

0422-001

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



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

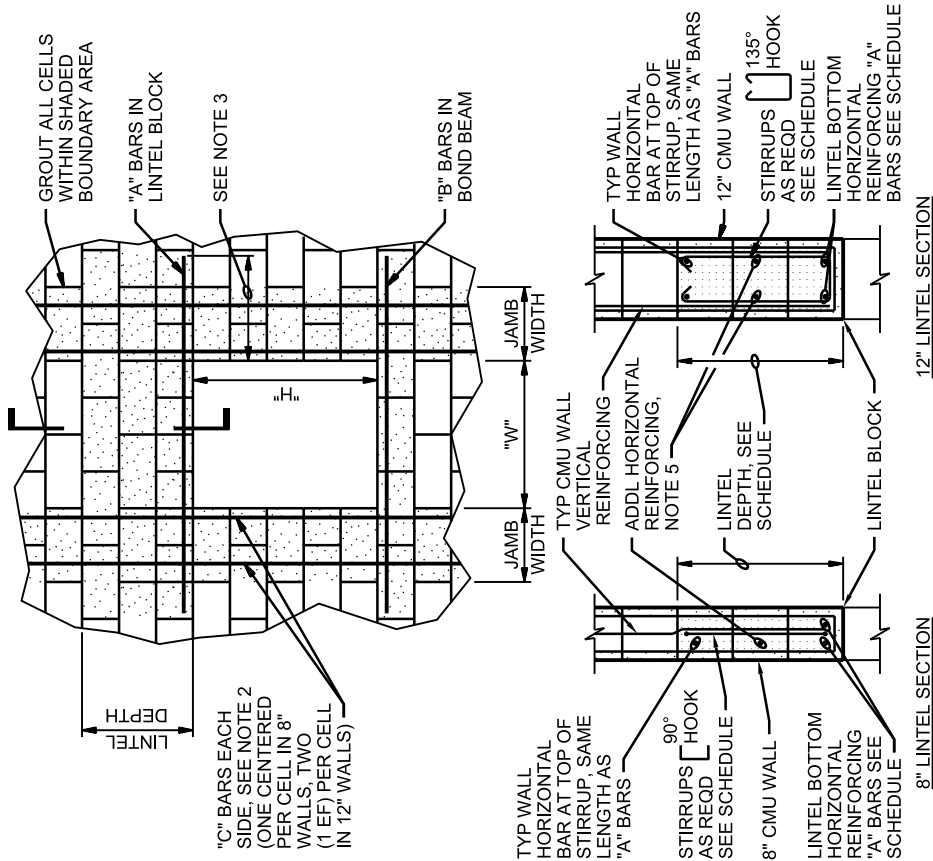
NTS

0422-002

CMU OPENING REINFORCING

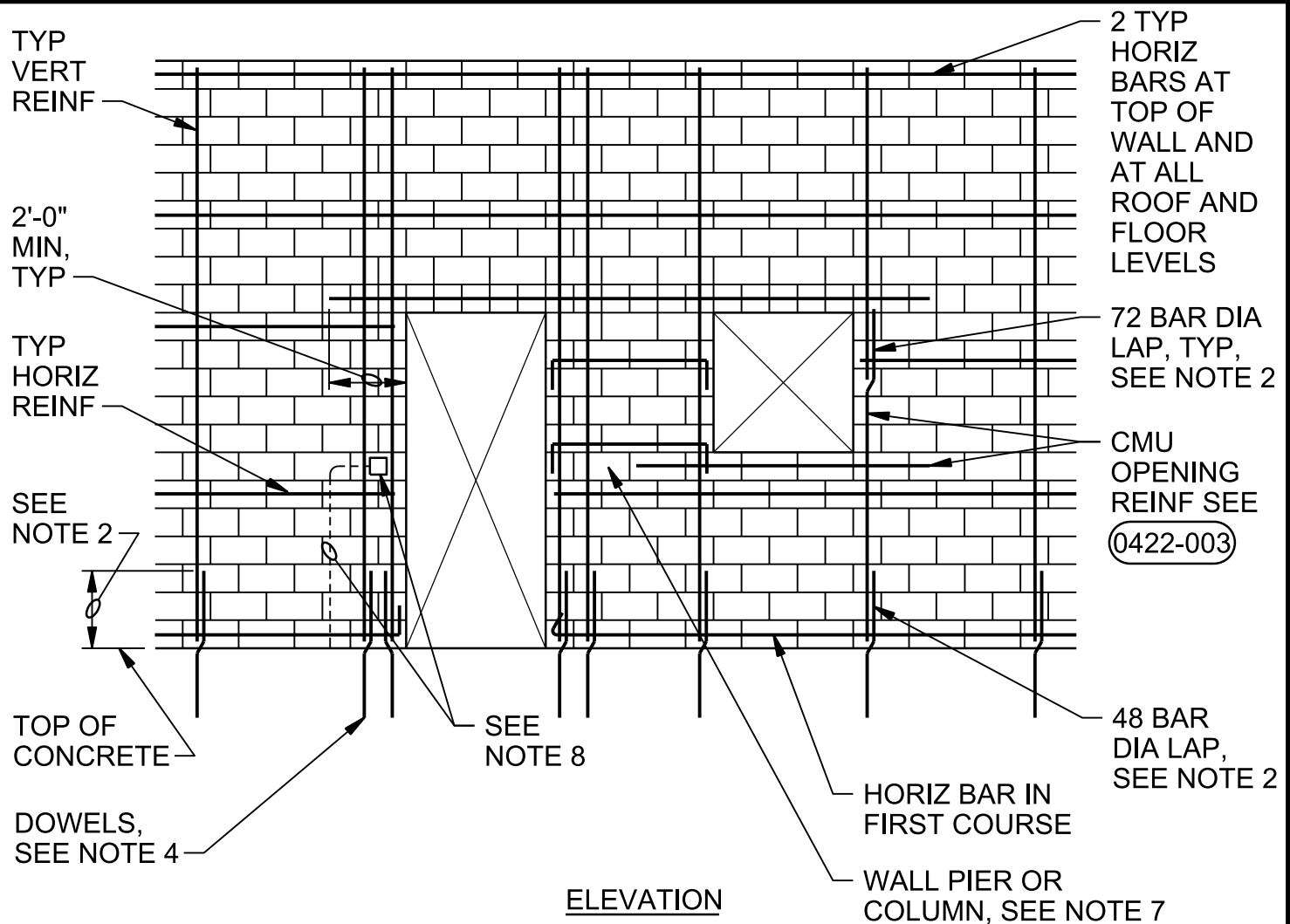
NTS

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



- NOTES:**
- USE BAR QUANTITIES AND SIZES GIVEN IN LINTEL SCHEDULE UNLESS OTHERWISE NOTED ON THE DRAWINGS.
 - EXTEND "C" BARS 48 BAR DIAMETERS, BUT NOT LESS THAN 2'-0" 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.
 - "A" AND "B" BARS SHALL EXTEND 48 BAR DIAMETERS, BUT NOT LESS THAN 2'-0" EACH SIDE OF THE OPENINGS.
 - FOR BAR SIZES, MATCH TYPICAL WALL REINFORCING AS SHOWN ON THE BUILDING WALL SECTIONS.
 - FOR LINTEL DEPTHS EQUAL TO OR GREATER THAN 48", PROVIDE ADDITIONAL LAYER OF HORIZONTAL REINFORCEMENT AT 12" FROM BOTTOM OF LINTEL. MATCH SIZE OF TYPICAL WALL HORIZONTAL REINFORCEMENT.

0422-003

**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.

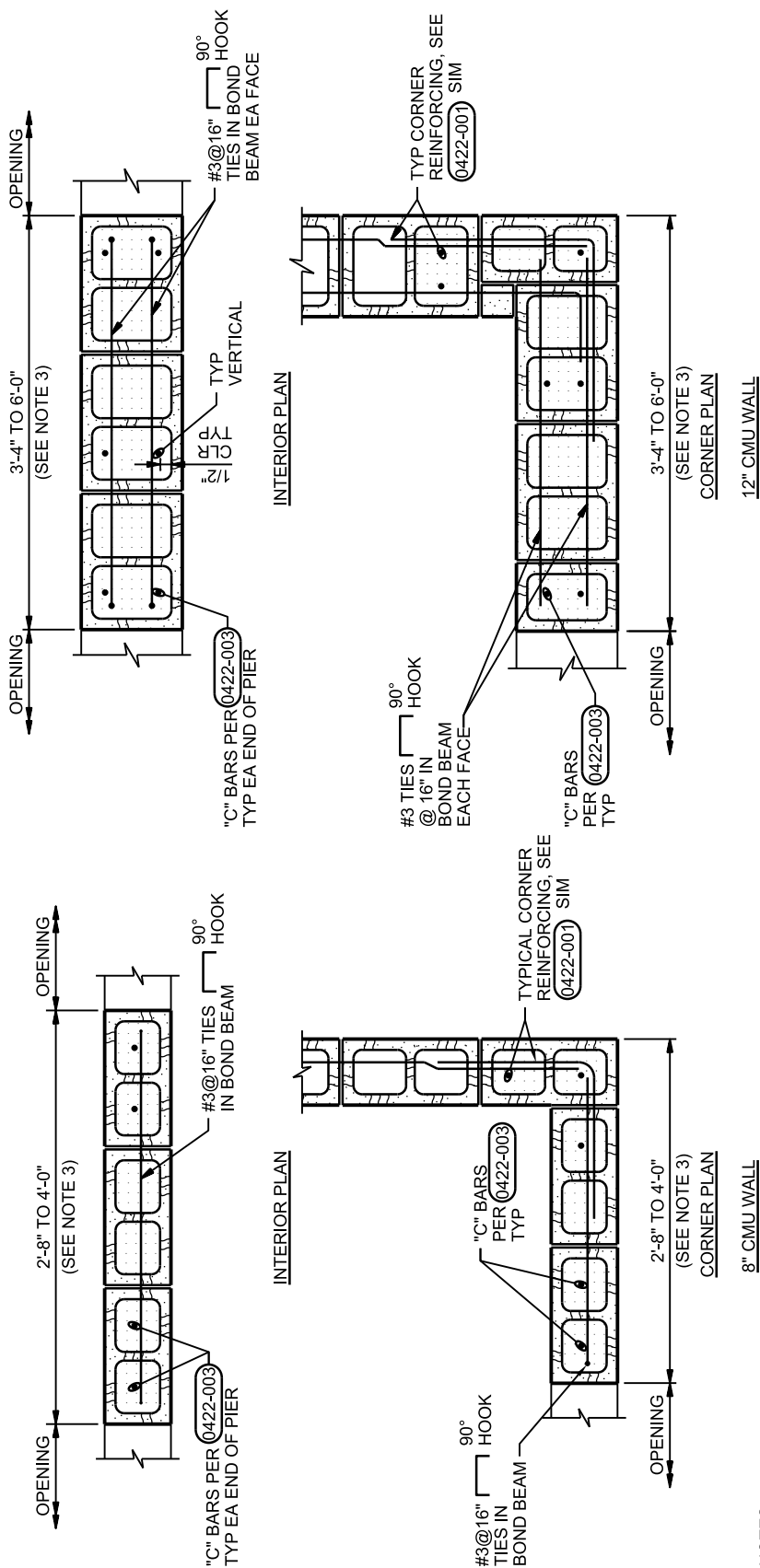
REINFORCED CMU WALL

NTS

0422-004

CMU WALL PIER

NTS

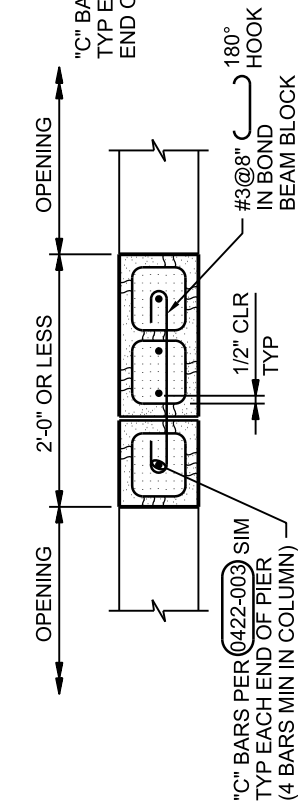


- NOTES:**
- SOLID GROUT PIERS FULL WALL HEIGHT.
 - WHERE PIERS ARE CENTERED BELOW BEAM BEARING, REDUCE TIE SPACING TO 8".
 - FOR 8" CMU WALL PIERS 2'-0" AND LESS, AND FOR 12" CMU WALL PIERS 2'-8" AND LESS, SEE WALL COLUMN DETAIL (0422-006)

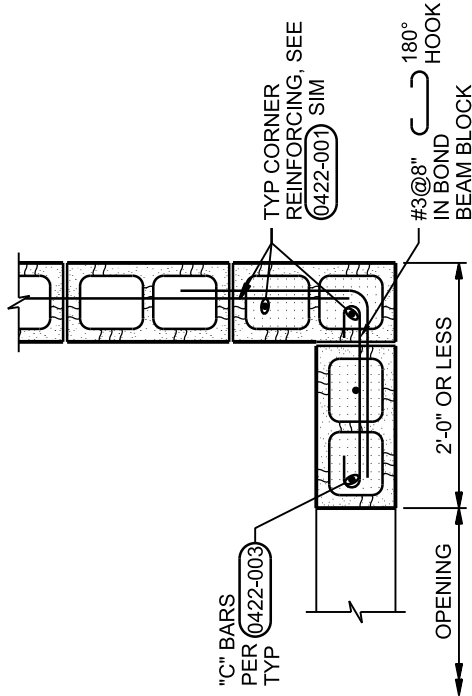
0422-005

CMU WALL COLUMN

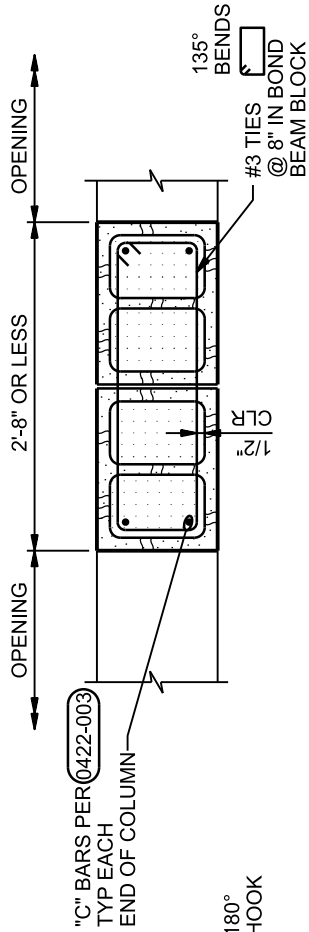
NTS



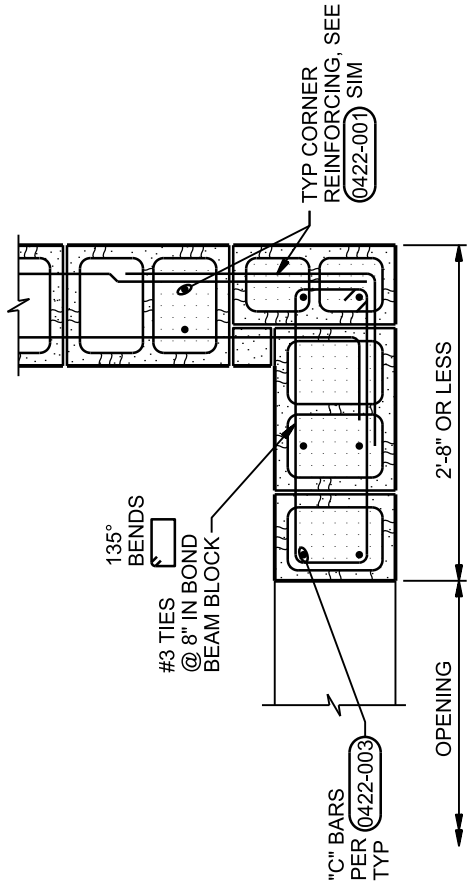
INTERIOR PLAN



8" CMU WALL



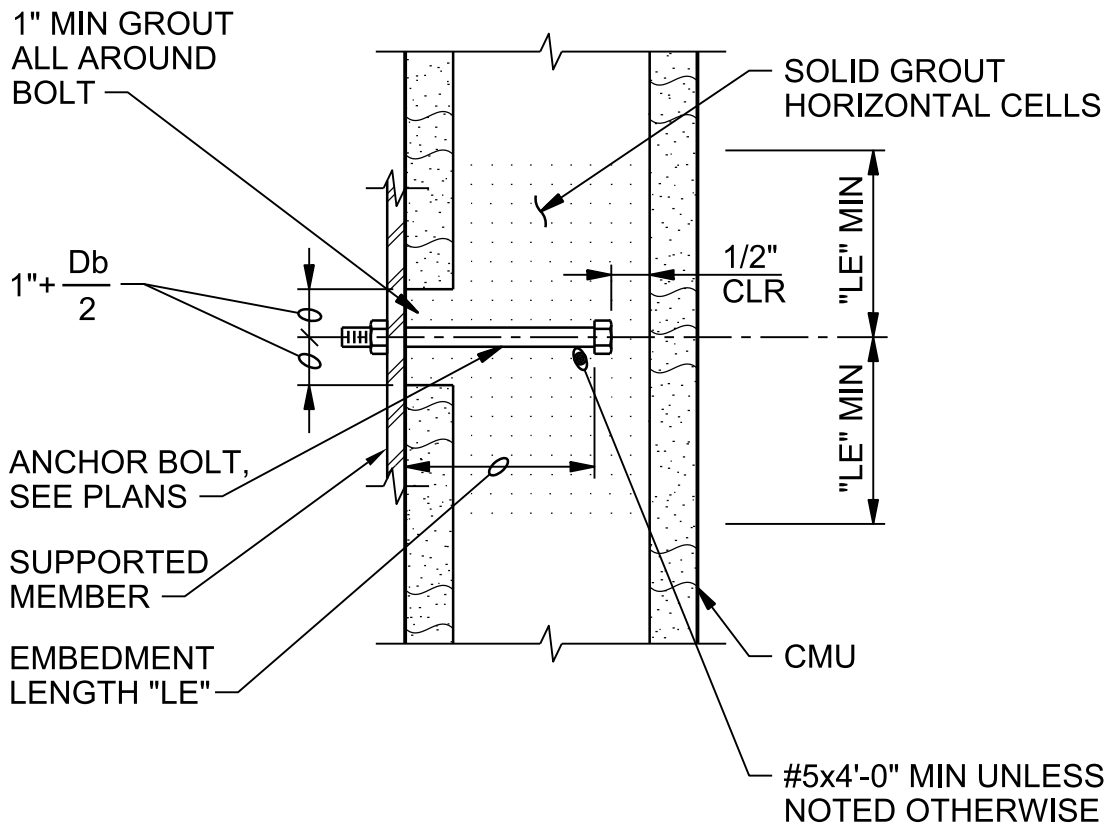
INTERIOR PLAN



12" CMU WALL

NOTE:
GROUT WALL COLUMNS FULL WALL HEIGHT.

0422-006



NOTE:

D_b = DIAMETER OF BOLT

MASONRY ANCHOR BOLT

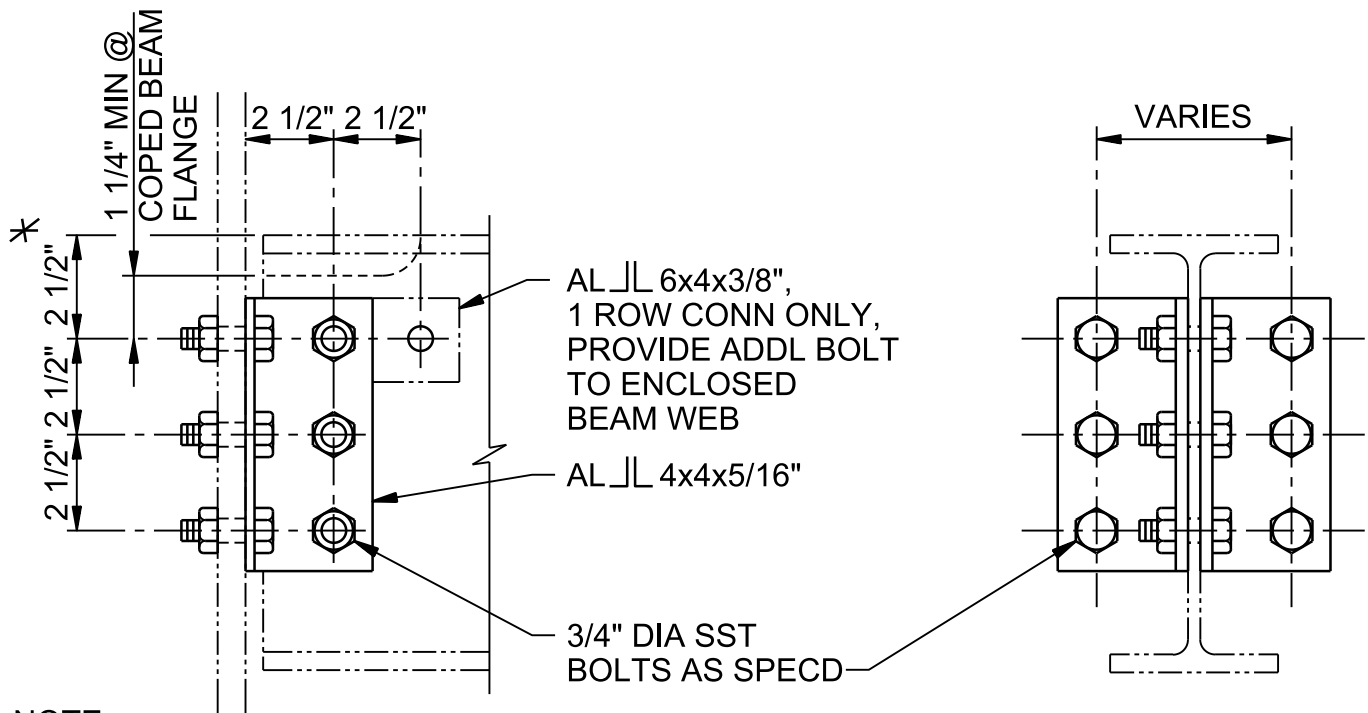
NTS

0422-046

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

NOTES:

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



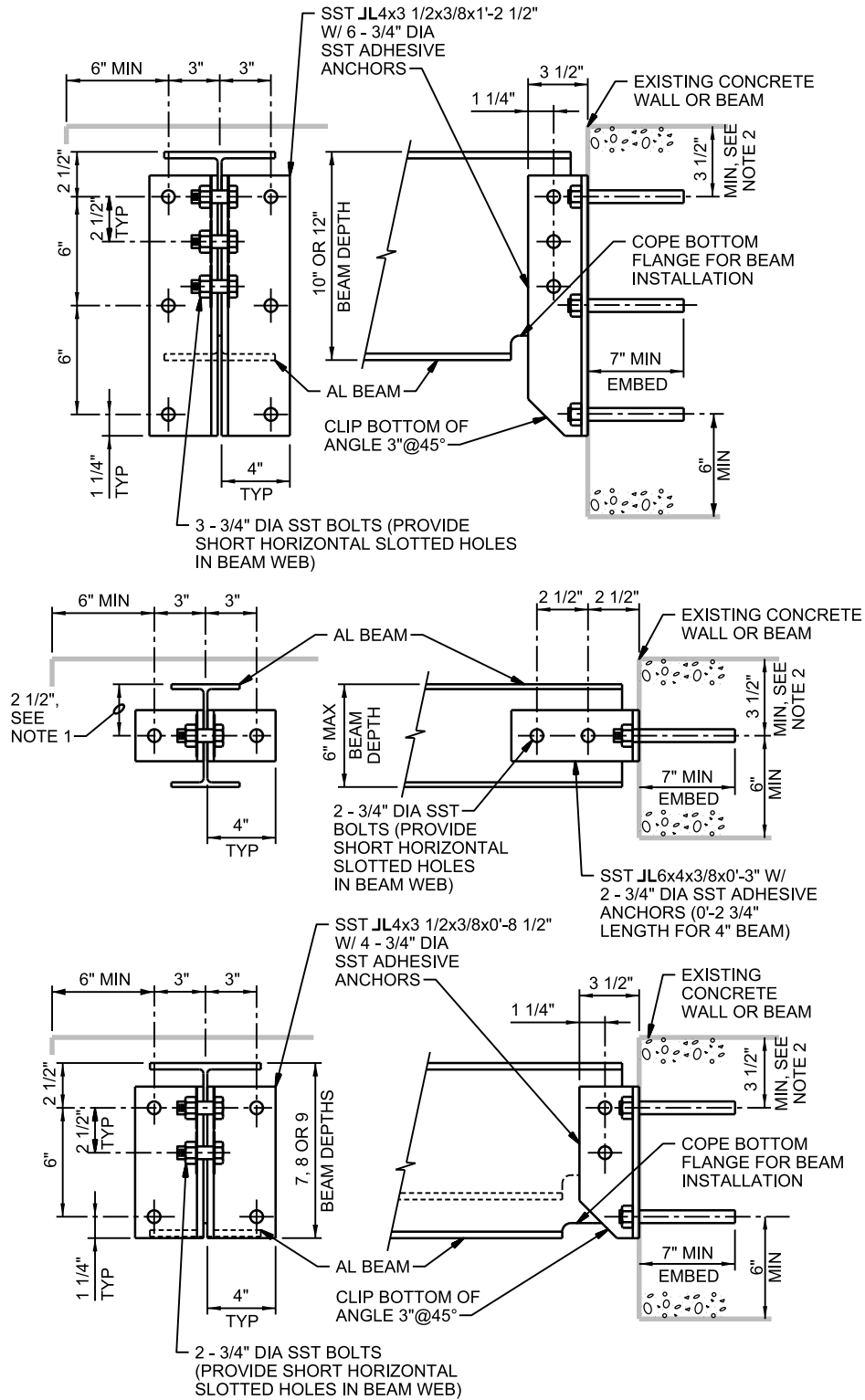
NOTE:

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

TYPICAL BEAM CONNECTION - ALUMINUM

NTS

0514-020



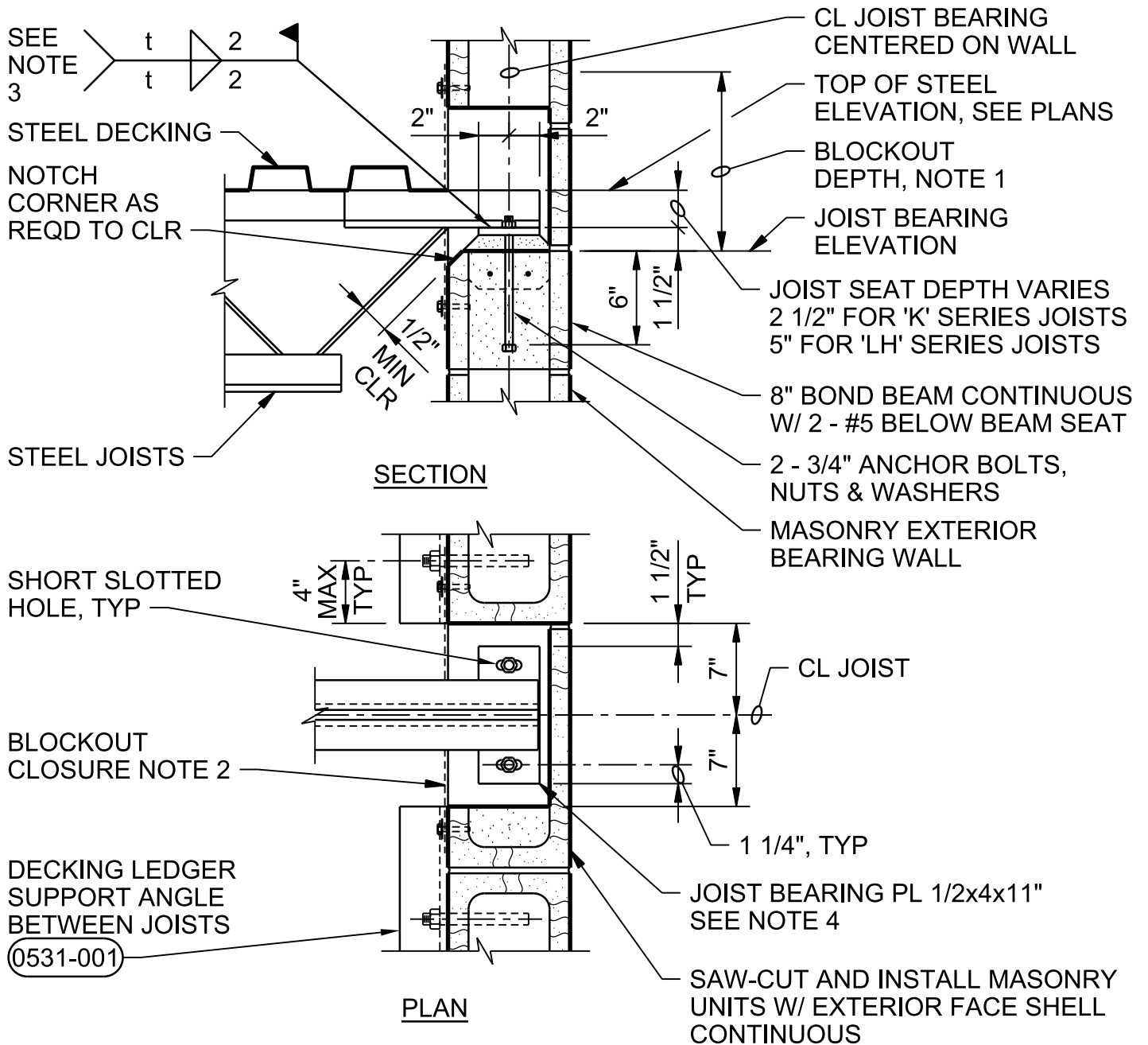
NOTES:

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

BEAM/WALL CONNECTION - ALUMINUM

NTS

0514-056



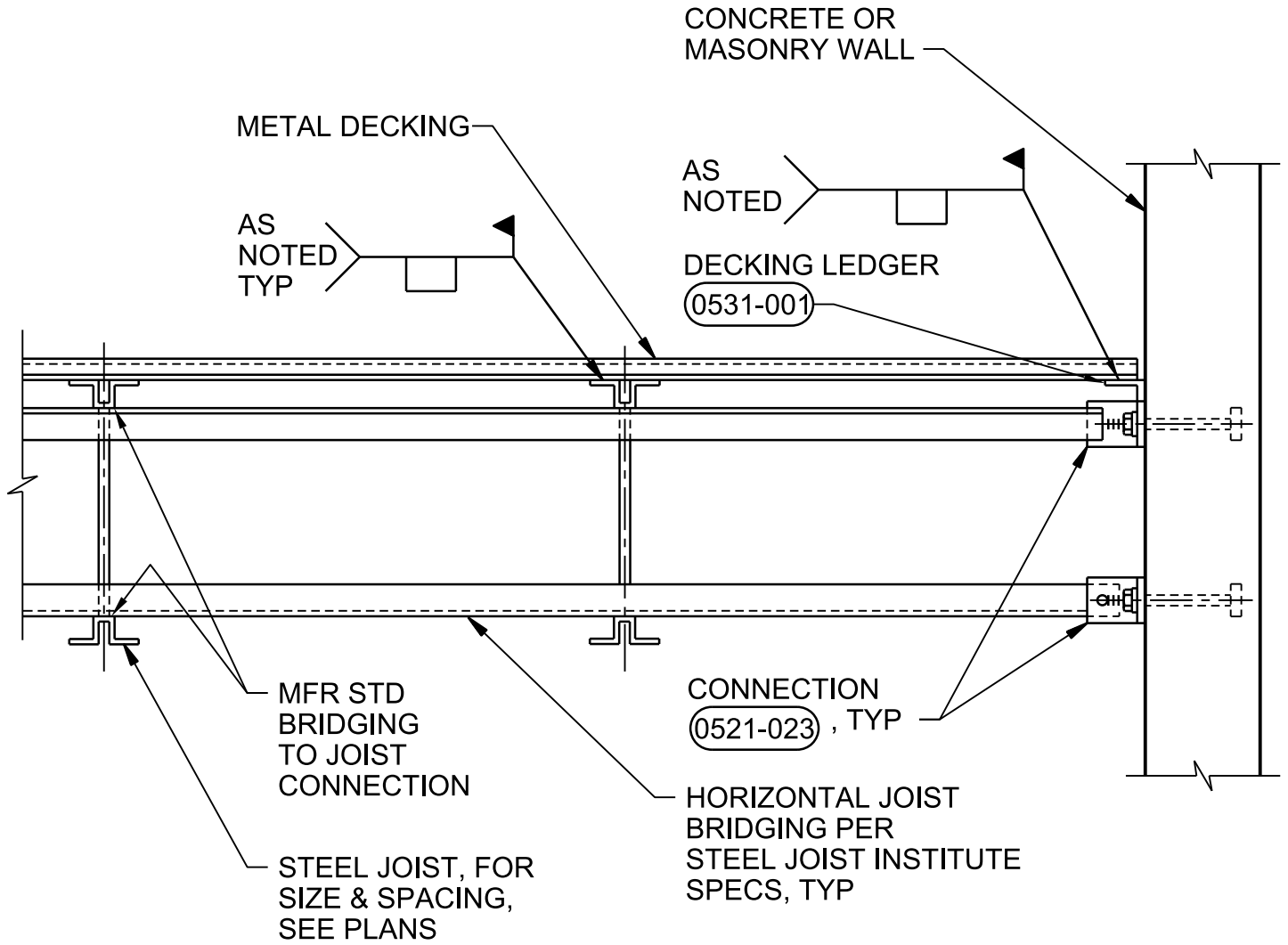
NOTES:

1. PROVIDE BLOCKOUT DEPTH AS REQUIRED FOR SETTING JOISTS, 8" MIN, OR SET JOISTS BEFORE COMPLETING WALL ABOVE.
2. PROVIDE CLOSURE PLATES EACH SIDE OF WALL BLOCKOUT SIMILAR TO (0558-002) FILL VOID AROUND JOIST WITH FIRESAFING.
3. USE 1/8" WELD FOR K SERIES JOIST AND 1/4" WELD FOR LH SERIES JOIST. t = FILLET WELD SIZE.
4. FOR SPANS SHORTER THAN 40 FEET, PROVIDE BEARING PLATE 1/2x4x11" WITH TWO 5/8x6" HEADED ANCHOR STUDS AT 6" GAGE.

STEEL JOIST SEAT/EXTERIOR WALL

NTS

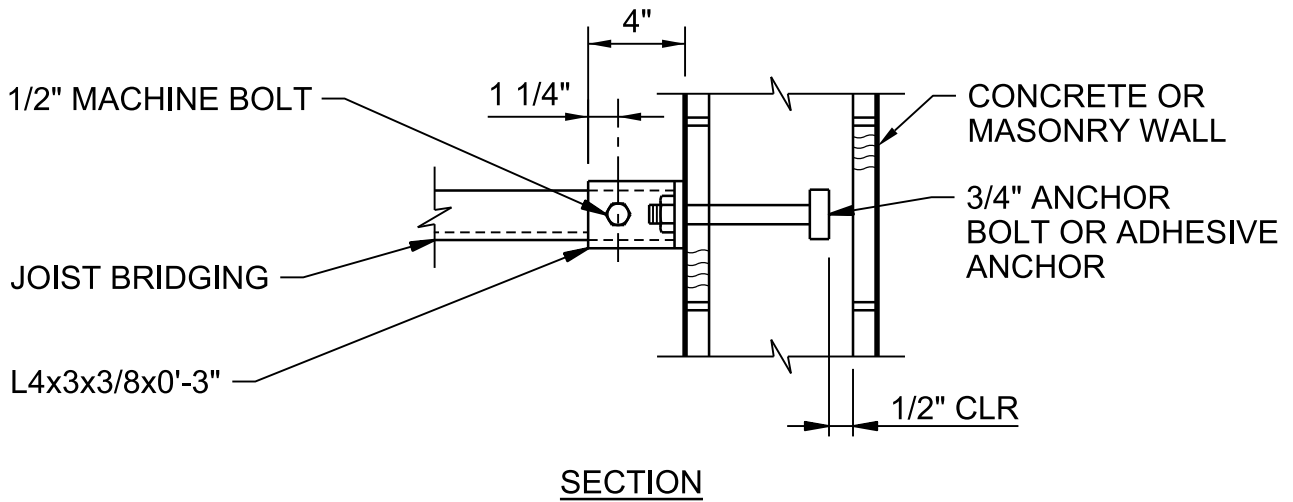
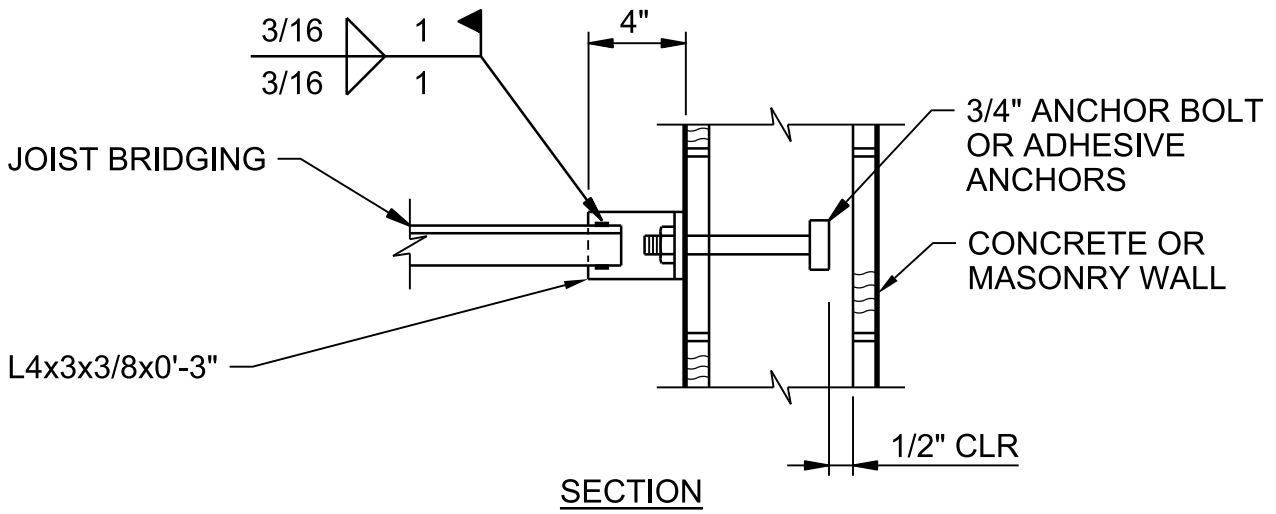
0521-002



TYPICAL K JOIST BRIDGING

NTS

0521-022

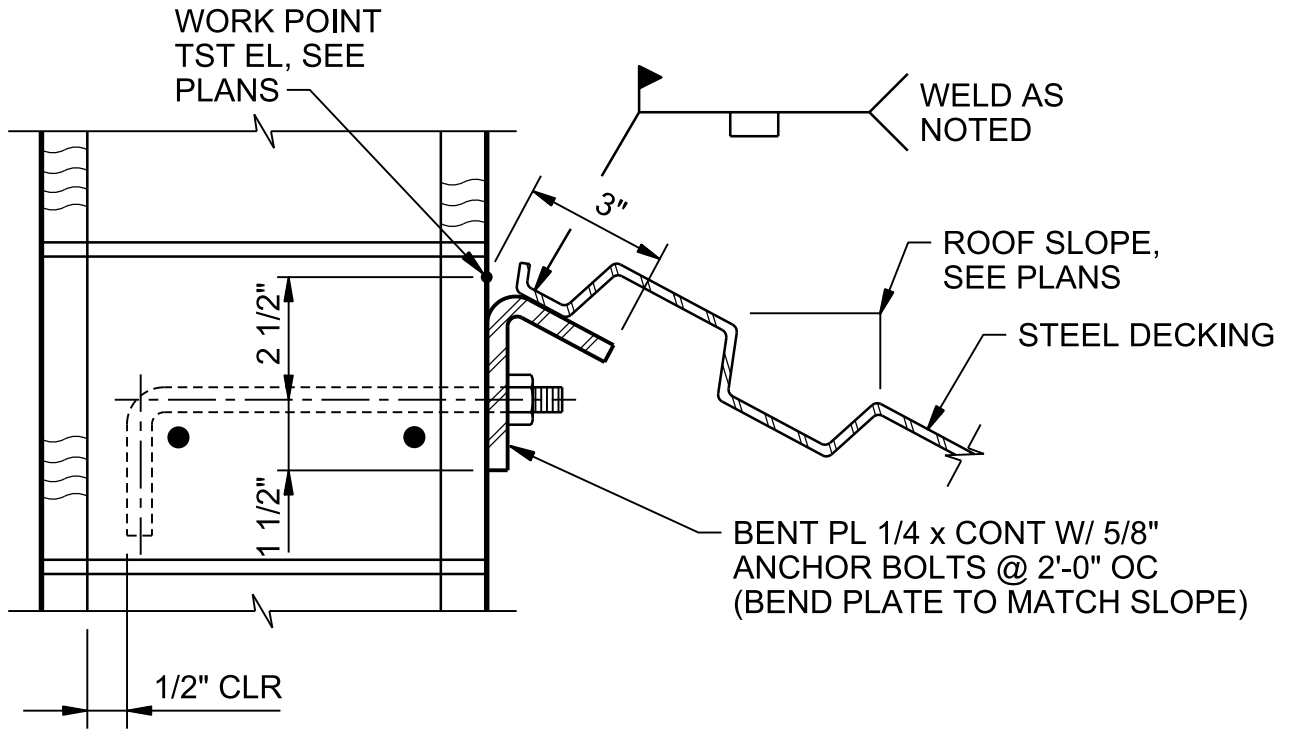
**NOTES:**

1. MINIMUM BRIDGING CONNECTION SHOWN. COORDINATE WITH JOIST MANUFACTURER REQUIREMENTS
2. OPTION 1 OR 2 CAN BE USED FOR TOP OR BOTTOM BRIDGING CONNECTIONS, OR COMBINED CONNECTION CAN BE USED.

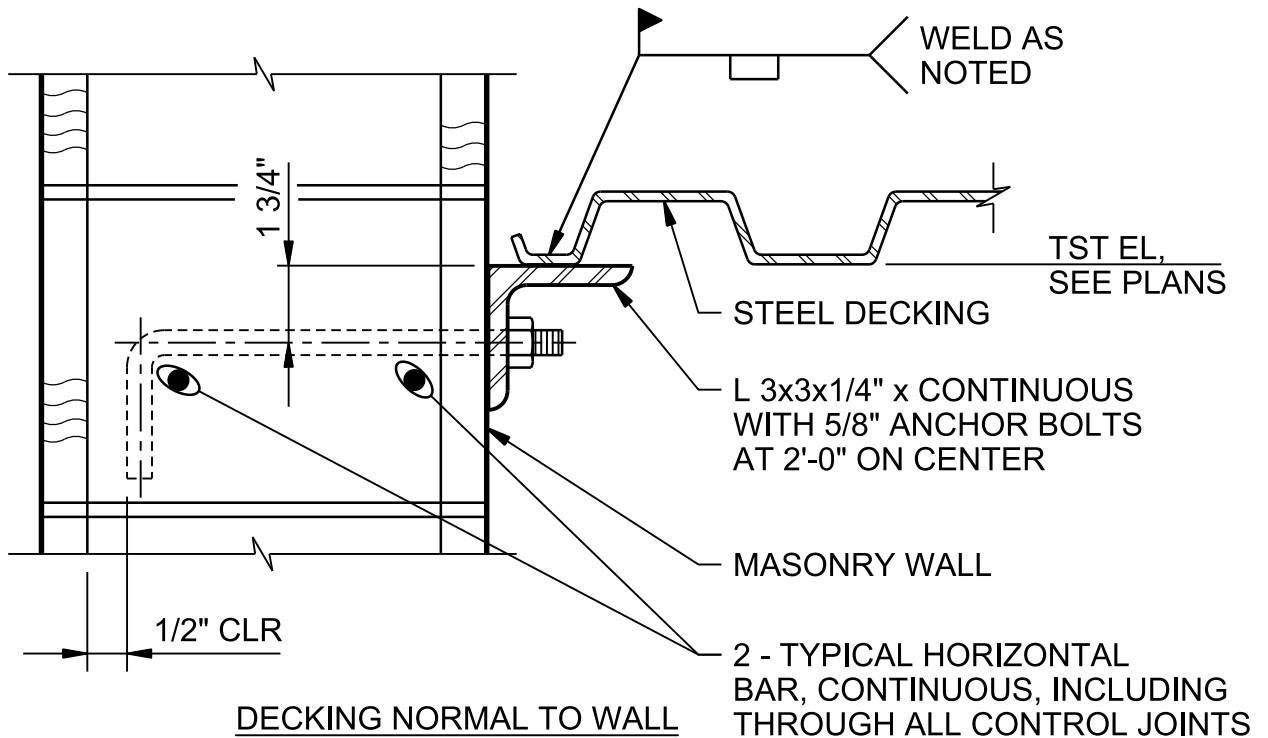
JOIST BRIDGING/WALL CONNECTION

NTS

0521-023



DECKING AT ANGLE TO WALL

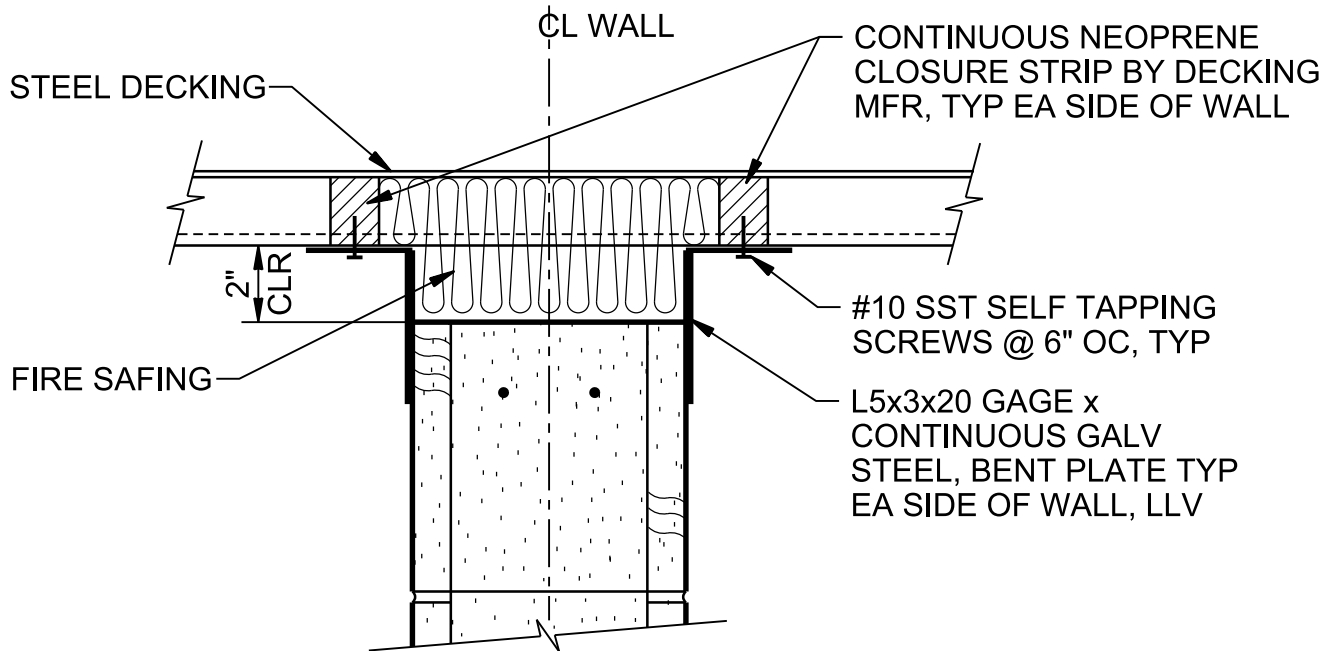


DECKING NORMAL TO WALL

DECKING LEDGER SUPPORT ANGLE

NTS

0531-001

**NOTE:**

NEOPRENE CLOSURE STRIPS NOT REQUIRED WHERE DECKING SPAN IS PARALLEL TO WALL.

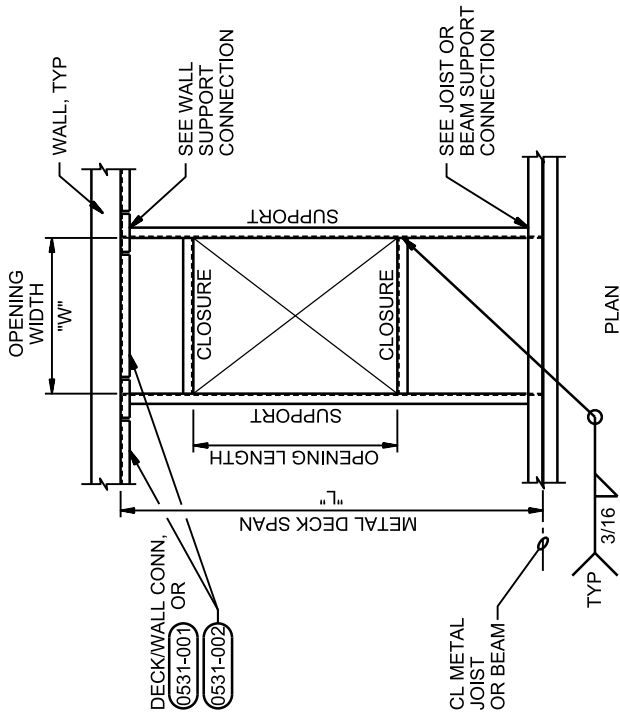
METAL DECK/NON-BEARING WALL CLOSURE PLATE

NTS

0531-016

ROOF DECK OPENING

NTS



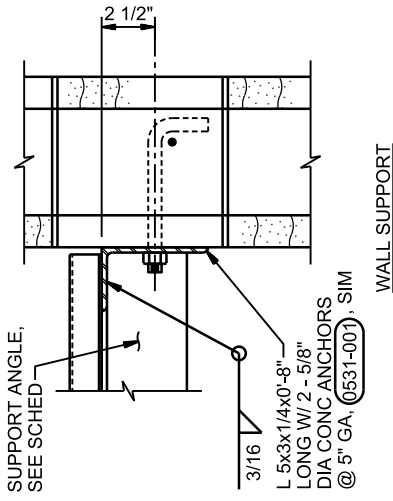
OPENING	CLOSURE	SUPPORT
2'-0" < W ≤ 4'-0"	L 3x3x1/4	L 4x3x1/4 (LLV)
4'-0" < W ≤ 6'-0"	L 4x3x1/4 (LLV)	L 5x3x1/4 (LLV)
6'-0" < W	NA	NA

DECK SPAN	SUPPORT
L ≤ 6'-0"	L 4x3x1/4 (LLV)
6'-0" < L ≤ 7'-6"	L 5x3x1/4 (LLV)
7'-6" < L	NA

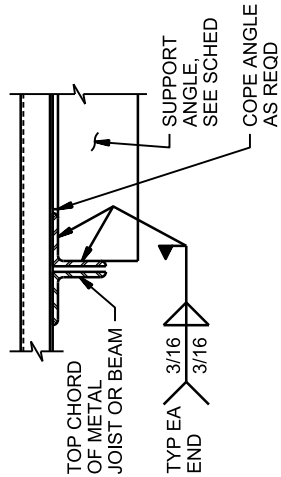
OPENINGS 2'-1" TO 6'-0"

NOTES:

1. ATTACH METAL DECKING TO ALL SUPPORTS PERPENDICULAR TO DECKING SPAN WITH SPECIFIED FASTENERS AT EACH VALLEY OF DECKING. ATTACH METAL DECKING TO SUPPORTS PARALLEL TO SPAN @ 6" ON CENTER. WHERE VALLEY OF DECKING DOES NOT FALL AT SUPPORTS PARALLEL TO DECK SPAN, PROVIDE FILLER PIECES FOR EQUAL ATTACHMENTS.
2. REFER TO SPECIFICATIONS FOR SMALLER DECK OPENING REINFORCEMENT.

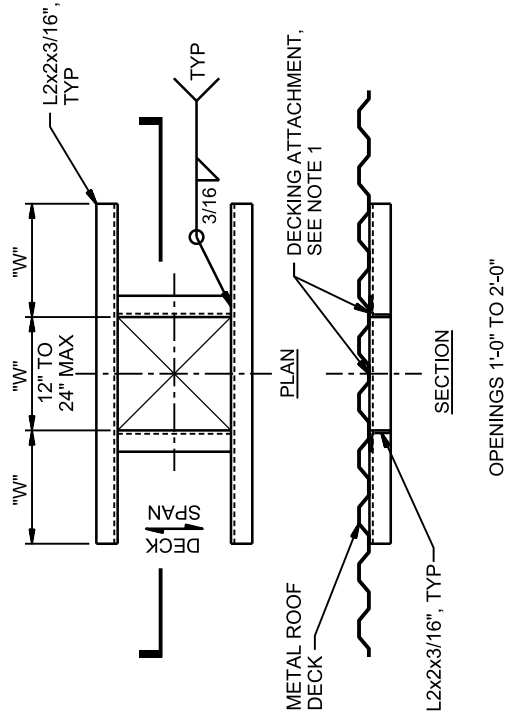


WALL SUPPORT

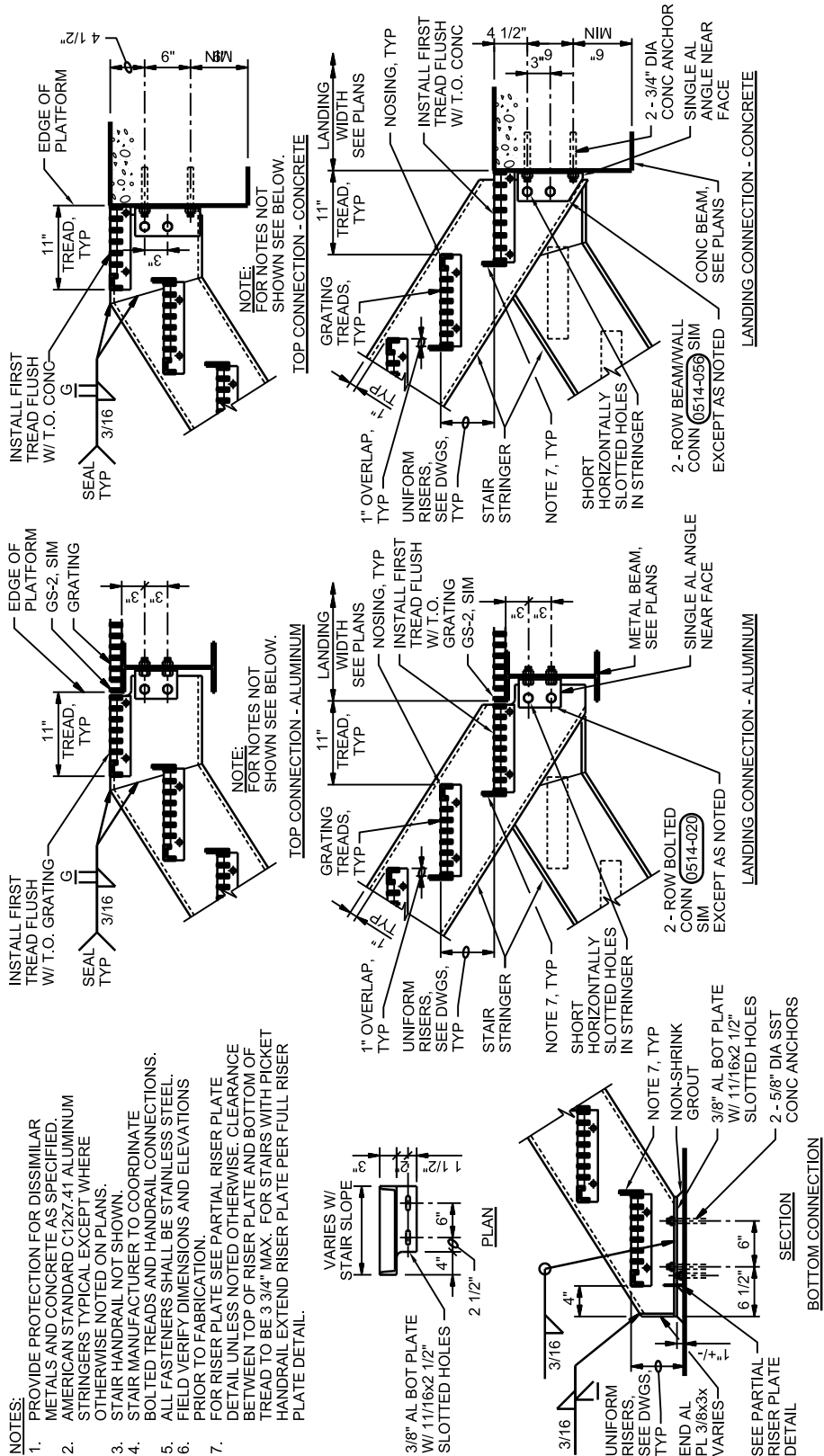


JOIST OR BEAM SUPPORT

FRAMING CONNECTIONS



0531-021



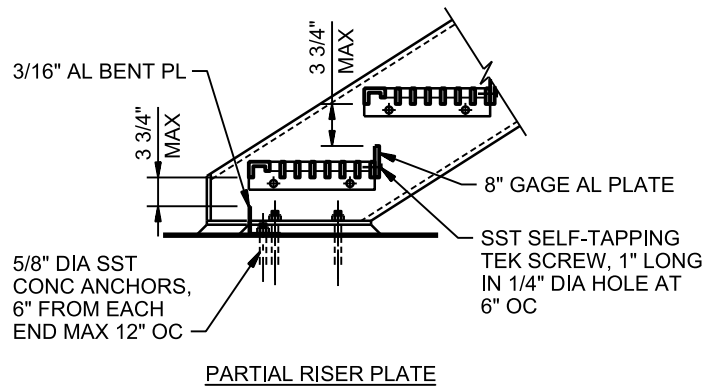
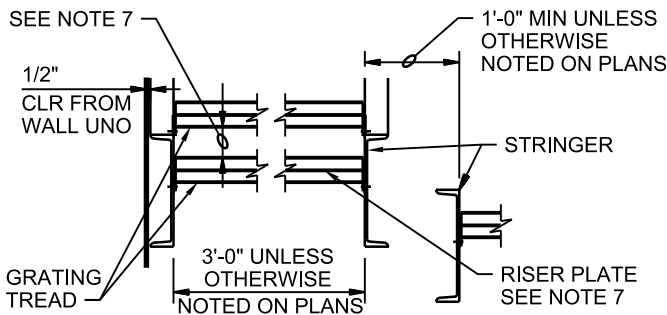
STAIR DETAILS - ALUMINUM

NTS

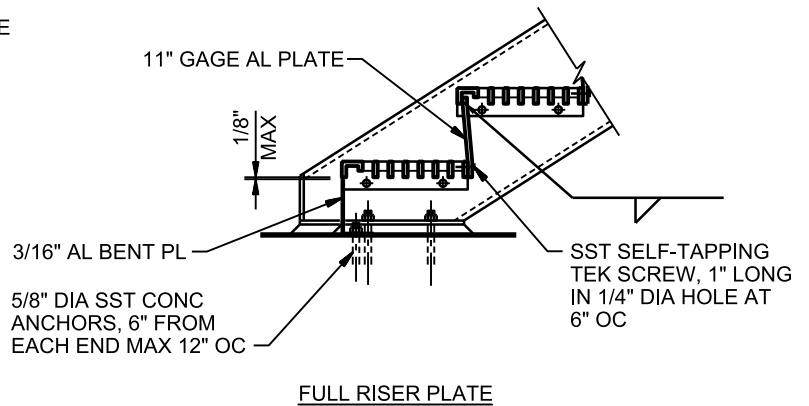
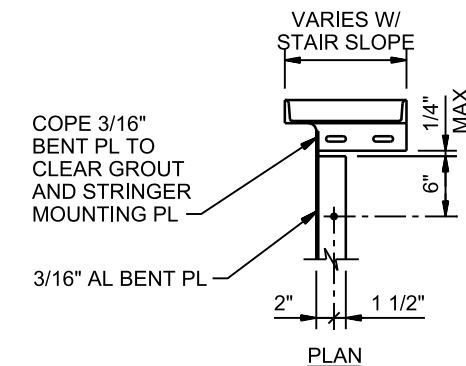
DETAIL 1 OF 2

0551-001

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



STAIR TREADS



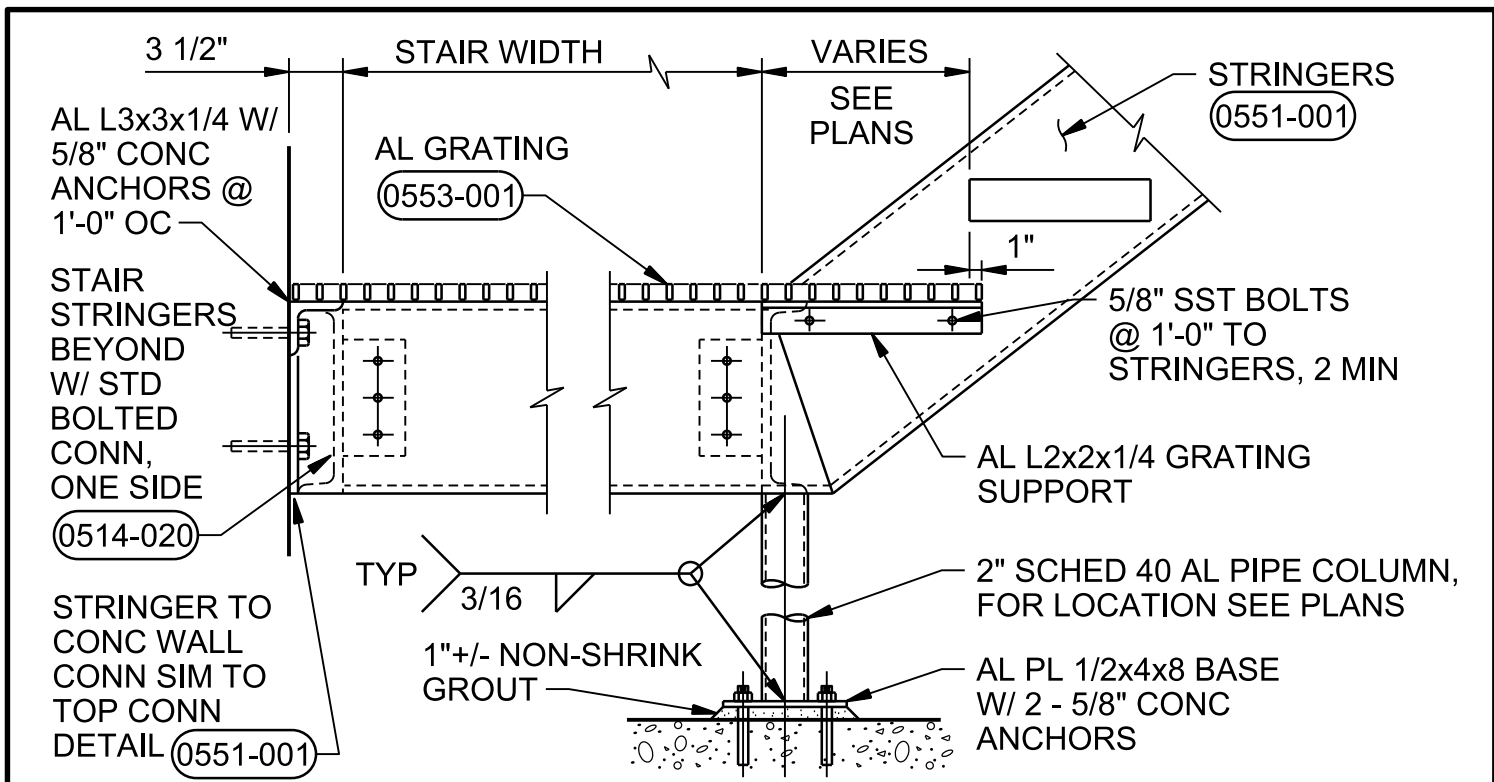
BOTTOM CLOSURE PLATE

STAIR DETAILS - ALUMINUM

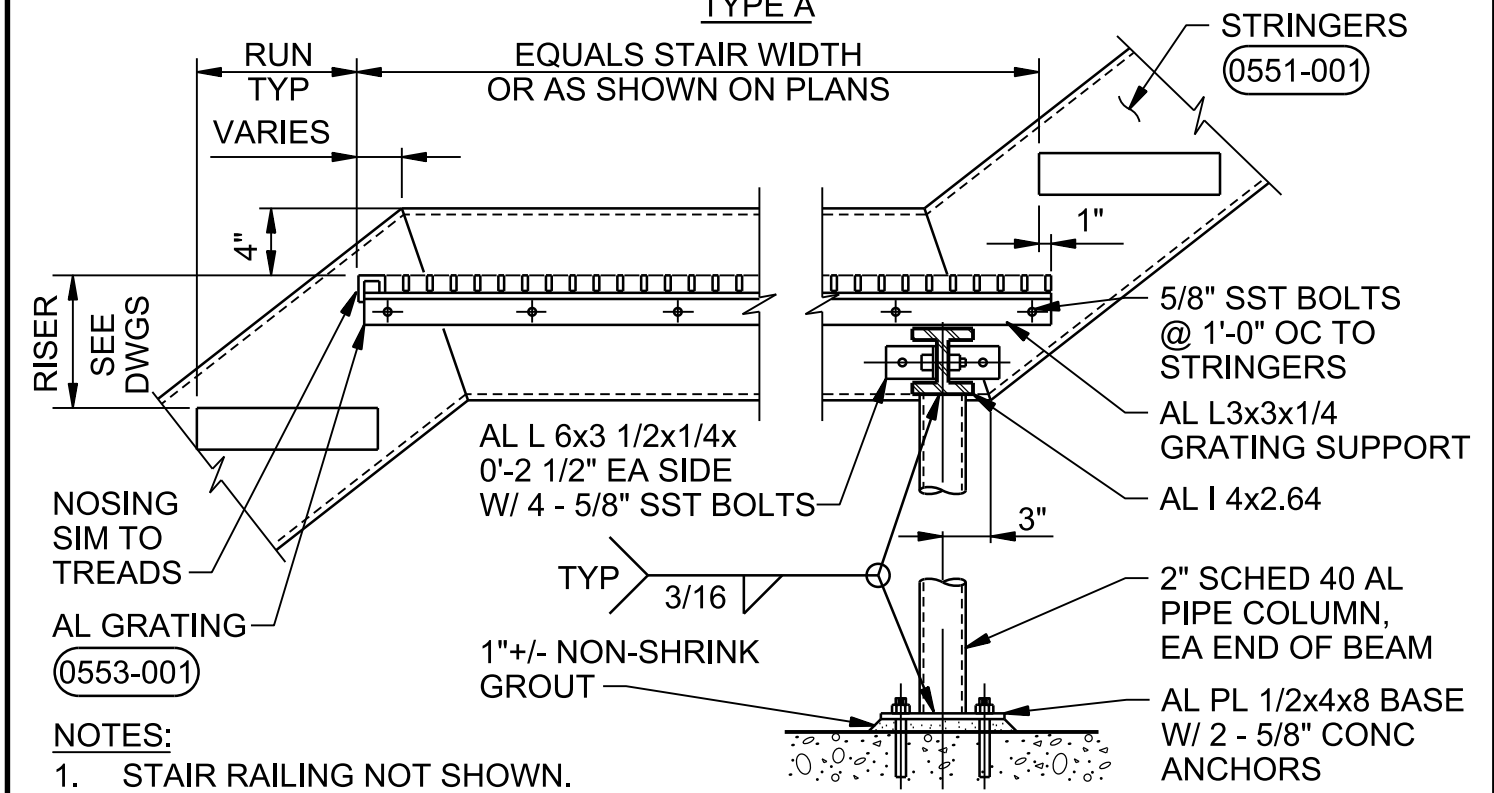
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DETAIL 2 OF 2

0551-001



TYPE A



TYPE B

NOTES:

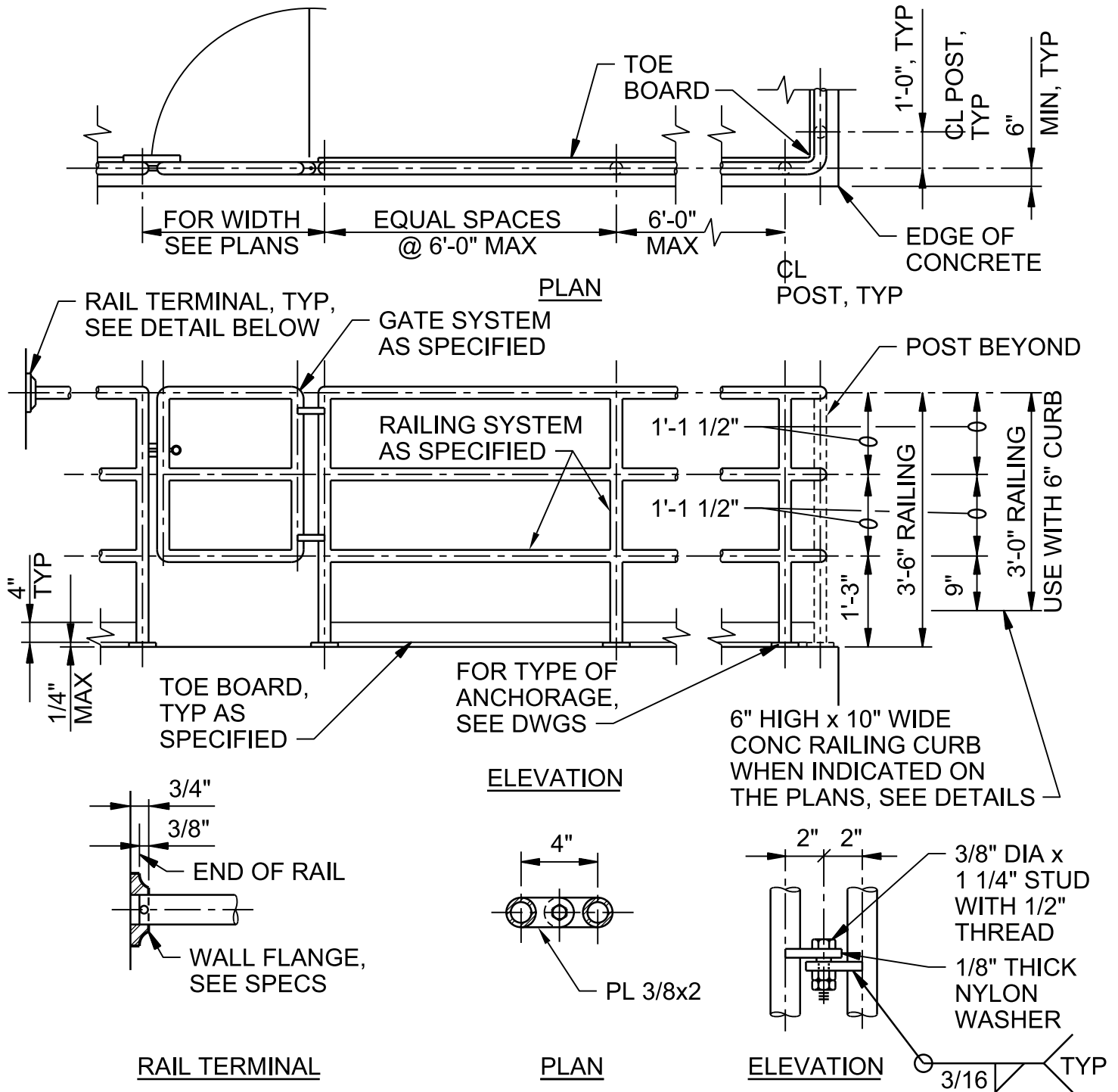
1. STAIR RAILING NOT SHOWN.
2. PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE

STAIR LANDING WITH SUPPORTS - ALUMINUM

NTS

0551-002





NOTES:

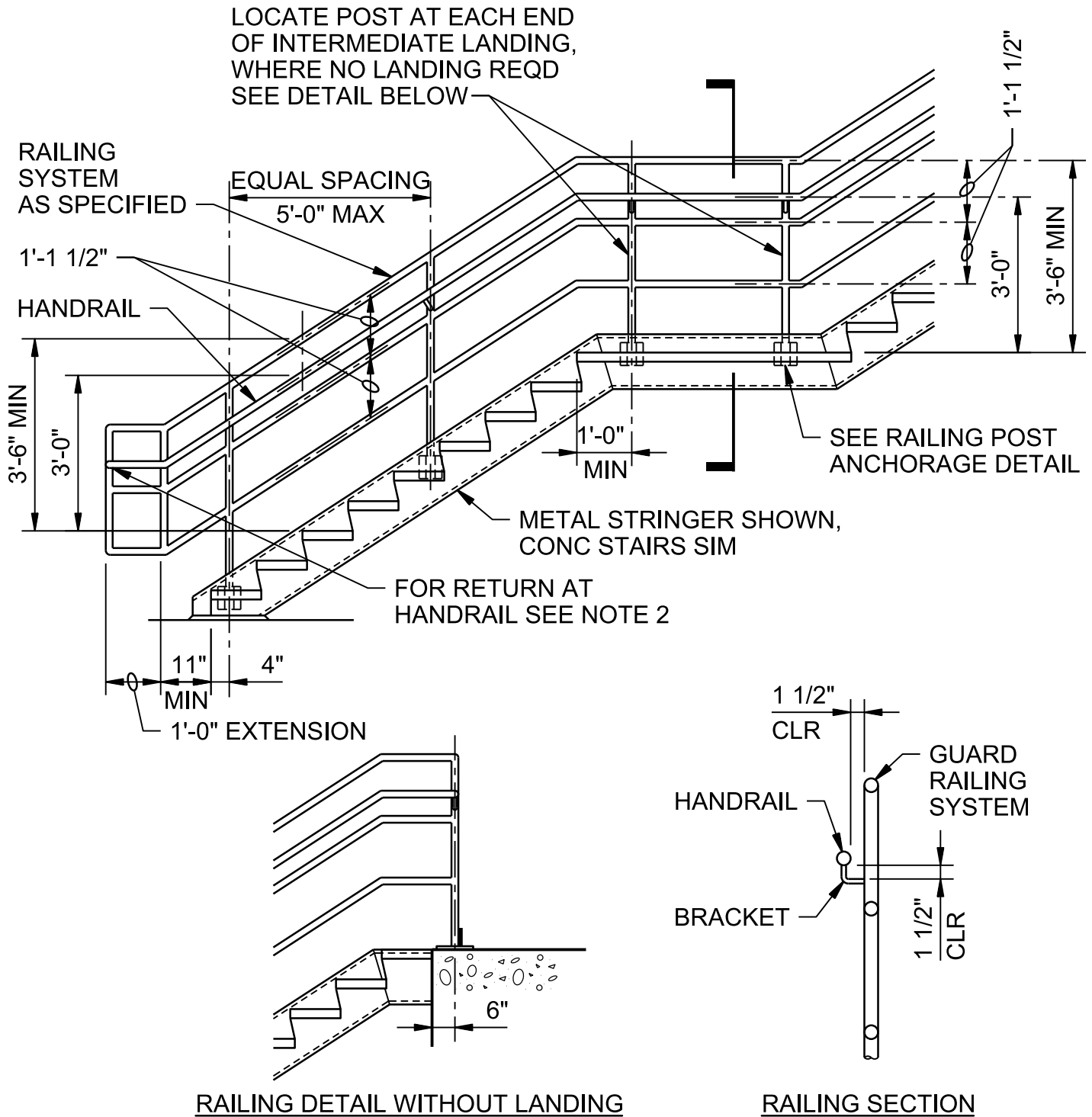
1. FASTEN RAIL TO WALL FLANGE PER MANUFACTURER'S RECOMMENDATIONS.
2. WALL FLANGE TO BE MOUNTED TO WALL WITH (2) 3/8" DIA SST WEDGE ANCHORS.
3. AT CONTRACTOR'S OPTION FABRICATE HINGES OR PROVIDE OTHER HINGES AS SPECIFIED. ANODIZE FINISH AFTER ALL WELDING AS SPECIFIED.

RAILING - 3 RAIL - ALUMINUM

NTS

DETAIL 1 OF 4

0552-001



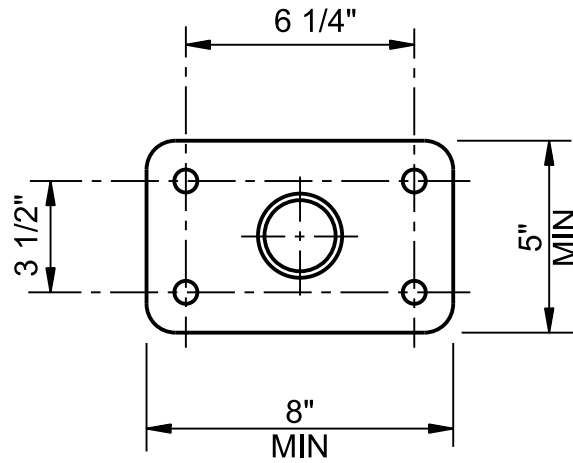
1. PROVIDE TOE BOARD AT LANDING WHERE REQUIRED.
2. RETURN ENDS OF HANDRAIL TO GUARD AT BOTH ENDS.

RAILING W/ EXTENSION - 3 RAIL STAIR - ALUMINUM

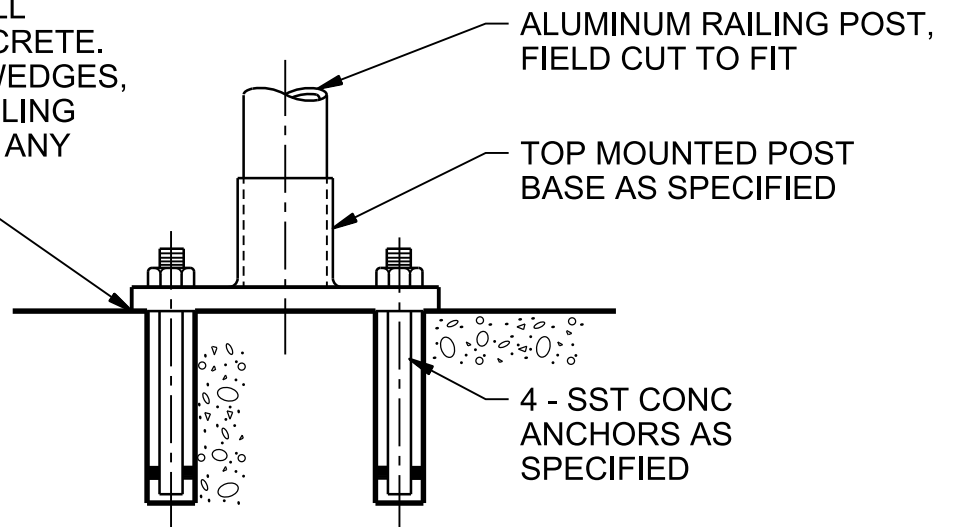
NTS

DETAIL 2 OF 4

0552-001

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

ELEVATIONTYPE "A"NOTE:

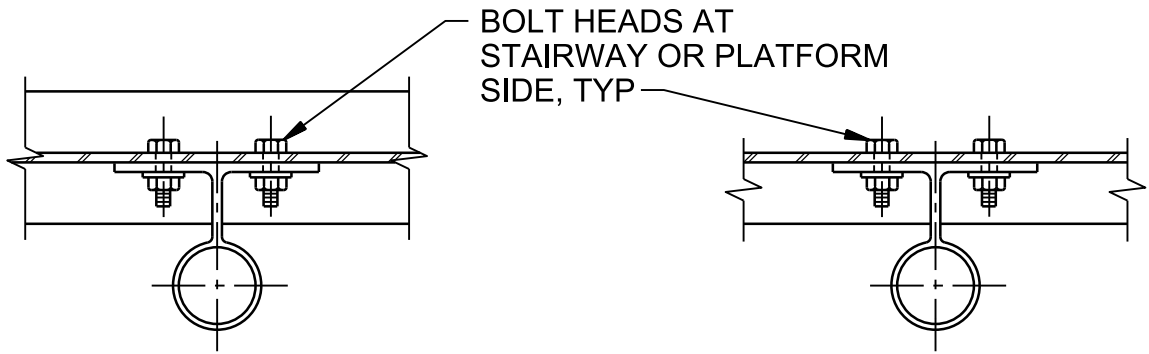
PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE PER SPECIFICATIONS.

RAILING POST ANCHORAGE TYPE A - ALUMINUM

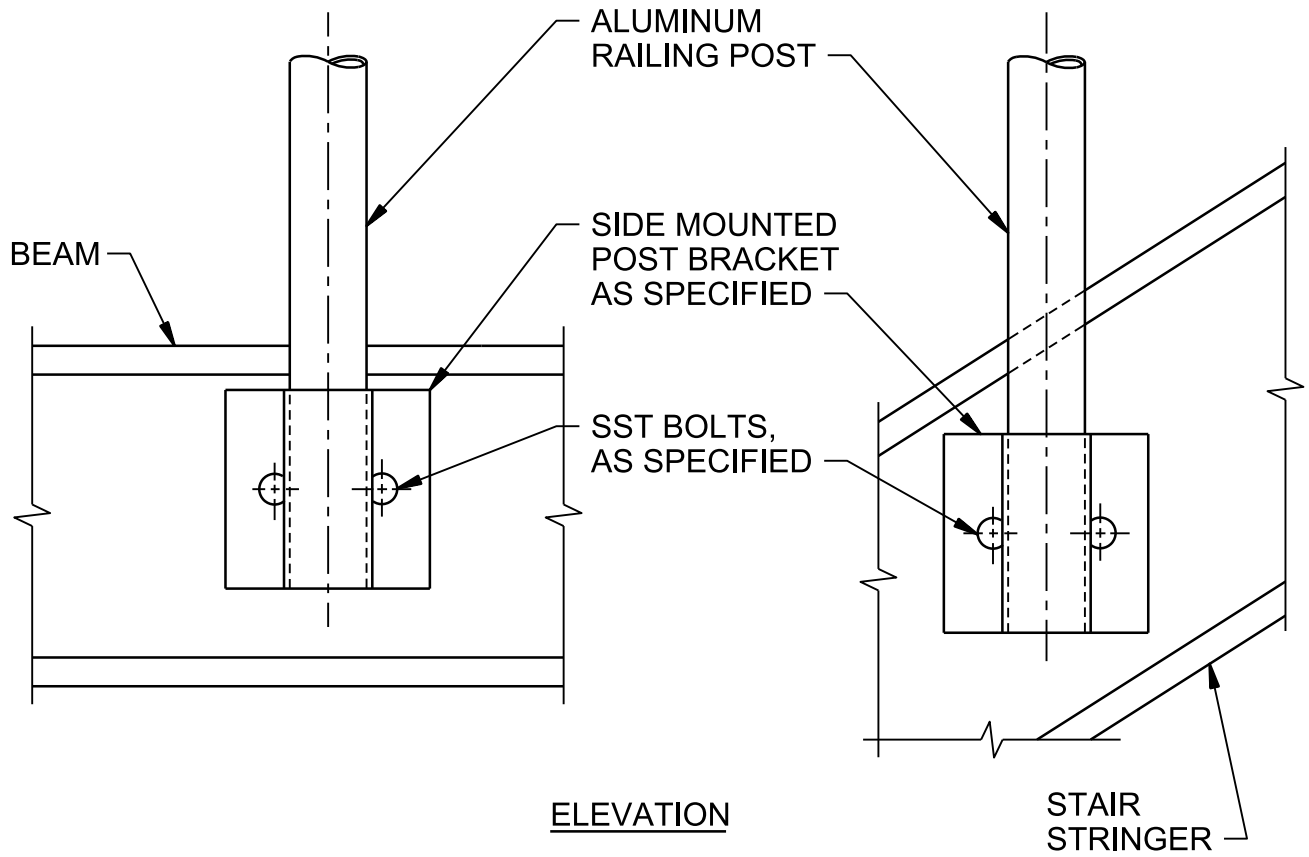
NTS

DETAIL 3 OF 4

0552-001



PLAN



ELEVATION

TYPE "D"

NOTE:

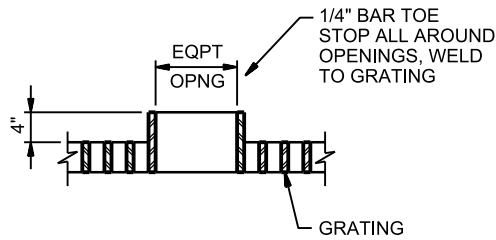
PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE PER SPECIFICATIONS.

RAILING POST ANCHORAGE TYPE D - ALUMINUM

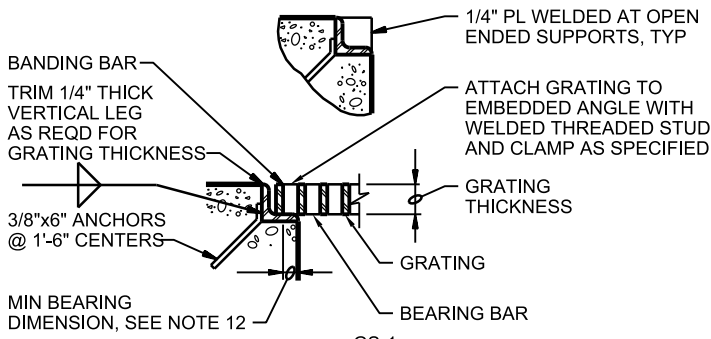
NTS

DETAIL 4 OF 4

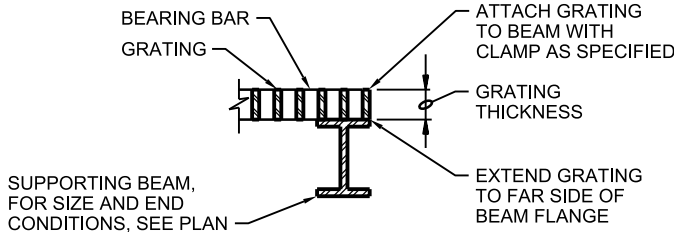
0552-001



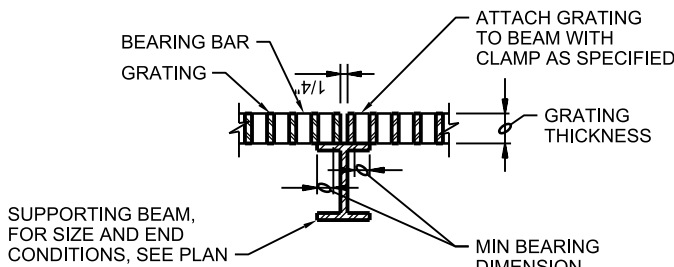
EQUIPMENT OPENINGS



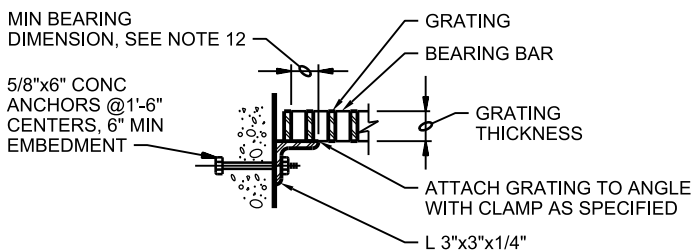
GS-1



GS-2 - ONE SIDED



GS-2 - TWO SIDED



GS-3

LIGHT DUTY GRATING (100 PSF)		
GRATING THICKNESS TABLE		
MAXIMUM SPAN	STEEL	ALUMINUM
3'-6"	1"	1 1/4"
4'-0"	1"	1 1/2"
4'-6"	1"	1 3/4"
5'-0"	1 1/4"	1 3/4"
5'-6"	1 1/4"	2"
6'-0"	1 1/2"	2 1/4"
6'-6"	1 1/2"	2 1/4"
7'-0"	1 3/4"	2 1/2"

GENERAL NOTES:

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

HYDROPHILIC/GROOVE WATERSTOP

NTS

0553-001

CH2MHILL

EXTEND PLATES TO
CLOSE OPENING ABOVE
BEAM WHERE WALL IS
CONTINUOUS

FABRICATE CLOSURE
PLATE W/ MAX 3/16"
GAP AROUND BEAM

TOP OF WALL

4"
SEE NOTE

FILL WALL
BLOCKOUT
W/ FIRE SAFING

EDGE OF
BLOCKOUT FOR
BEAM SEAT,
SEE (0512-066) & (0512-067)

20 GA GALV STL CLOSURE
PLATES EA FACE OF WALL
BLOCKOUT, ATTACH TO
WALL W/ 1/4" DIA SST
SLEEVE ANCHORS
AT 6" MAX SPACING

1"
3"
TYP
SIDES
& BOT

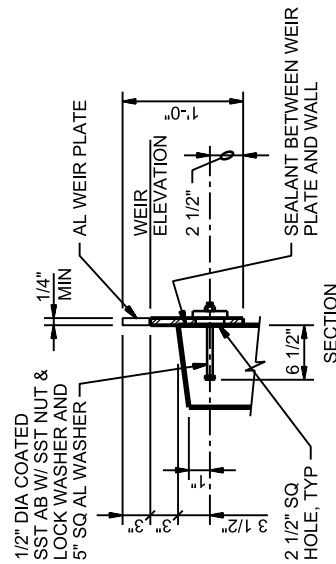
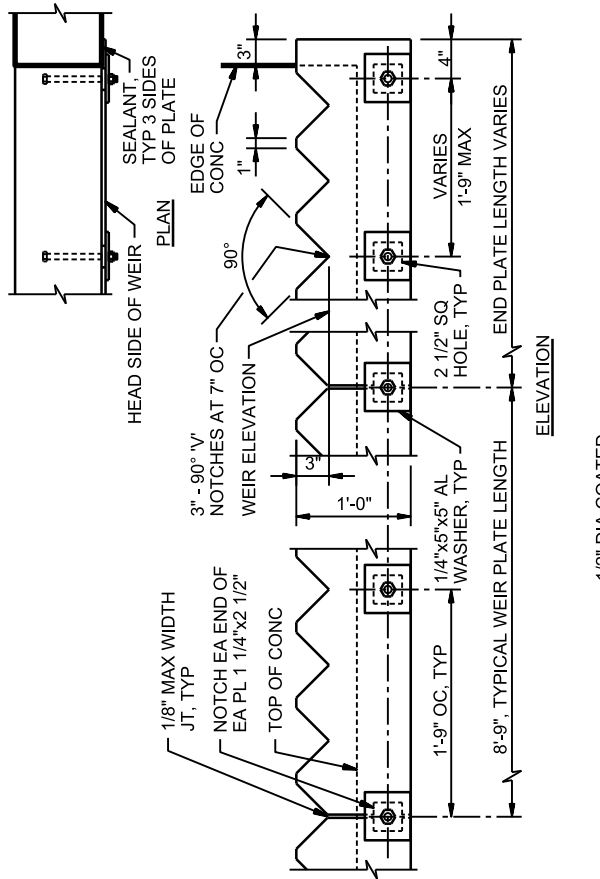
NOTE:

FOR DETAIL (0512-067) CLOSURES, LOCATE ANCHORS SO THEY DO NOT CONFLICT WITH LEDGER ANGLE.

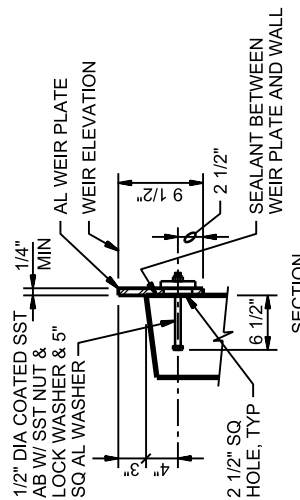
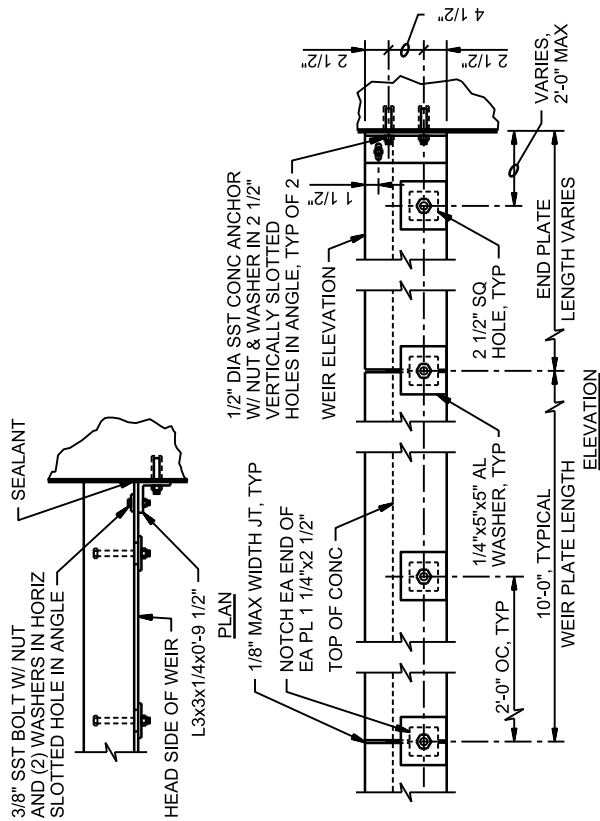
BEAM SEAT CLOSURE PLATE

NTS

0558-002



V-NOTCH WEIR - TYPE B



STRAIGHT EDGE WEIR - TYPE A

- NOTES:
1. ALL PARTS EXCEPT FASTENERS SHALL BE ALUMINUM AS SPECIFIED.
 2. ALL FASTENERS SHALL BE SST AS SPECIFIED.
 3. STEEL TROWEL TOP OF CONCRETE WALL TO OBTAIN SMOOTH, DENSE FINISH.
 4. PROVIDE CONTINUOUS SEALANT BETWEEN WEIR PLATE AND CONCRETE WALL AND BETWEEN END OF WEIR PLATE AND CONCRETE WALL.

WEIR DETAILS

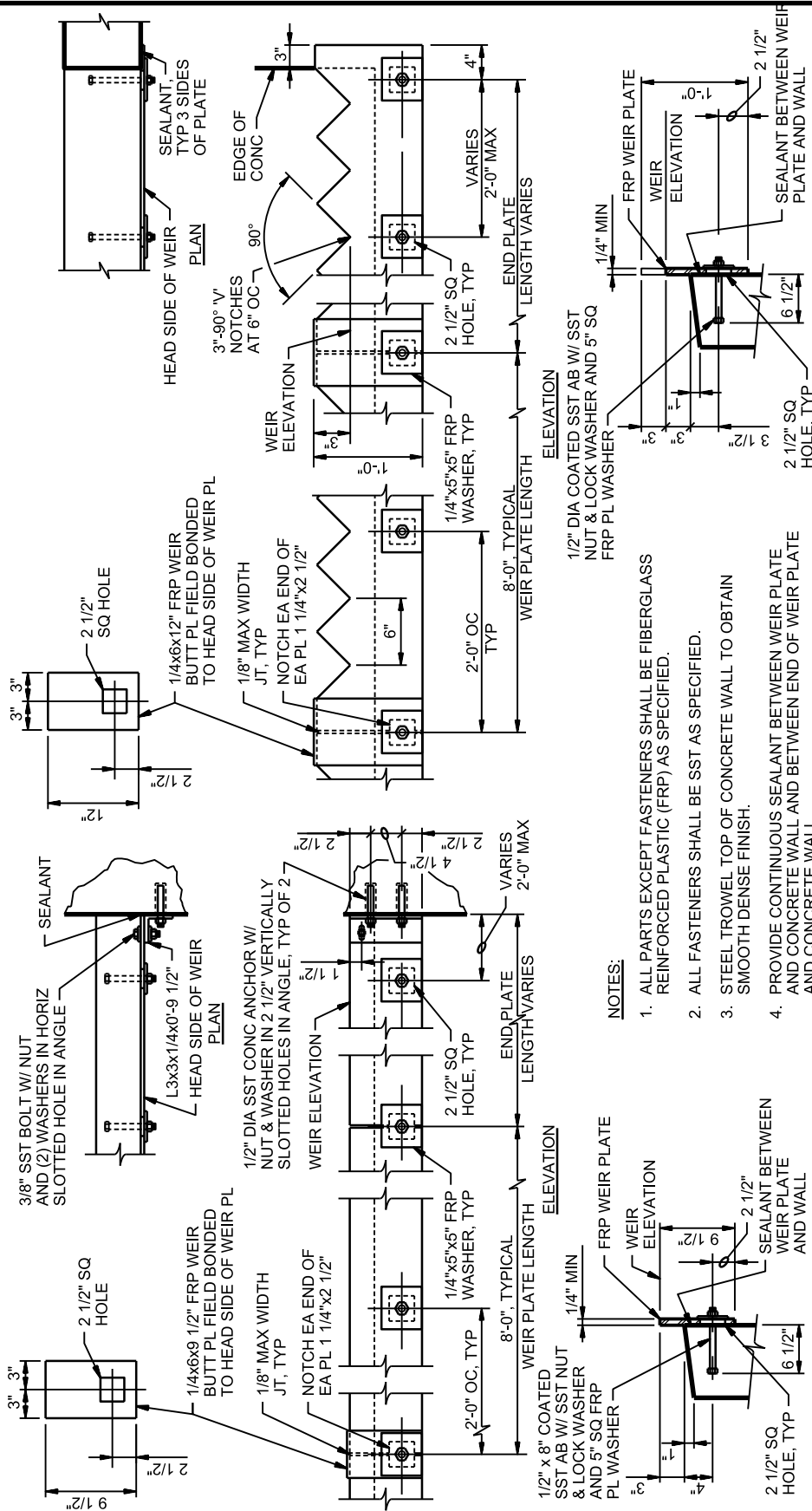
NTS ALUMINUM

0559-031

WEIR DETAILS

NTS

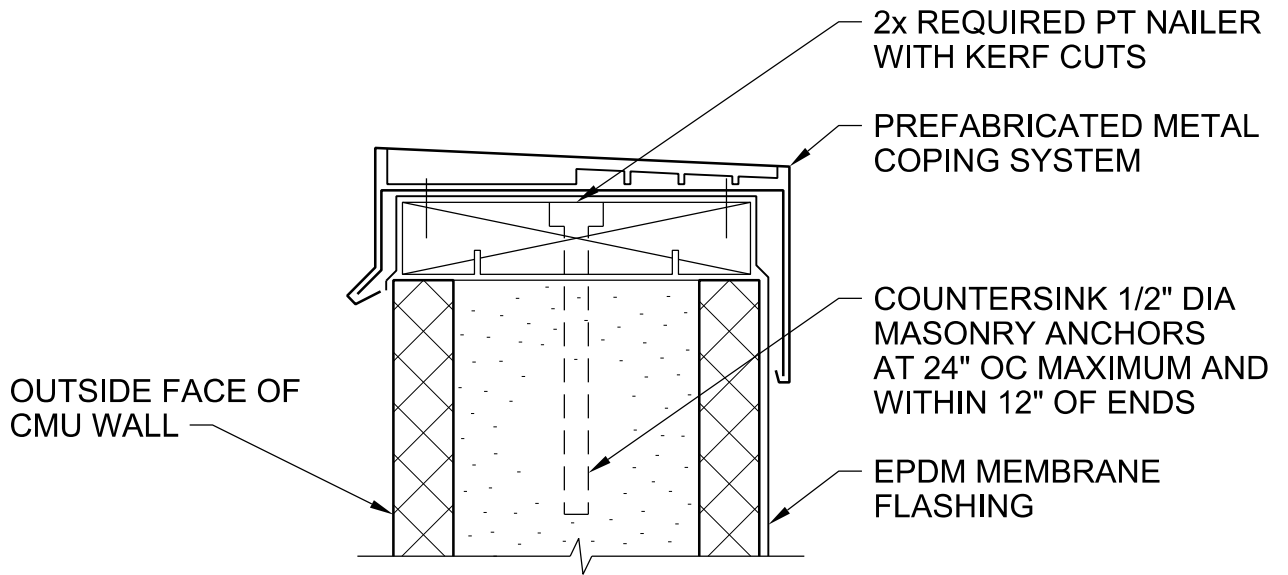
FRP



SECTION
V-NOTCH WEIR - TYPE B

SECTION
STRAIGHT EDGE WEIR - TYPE A

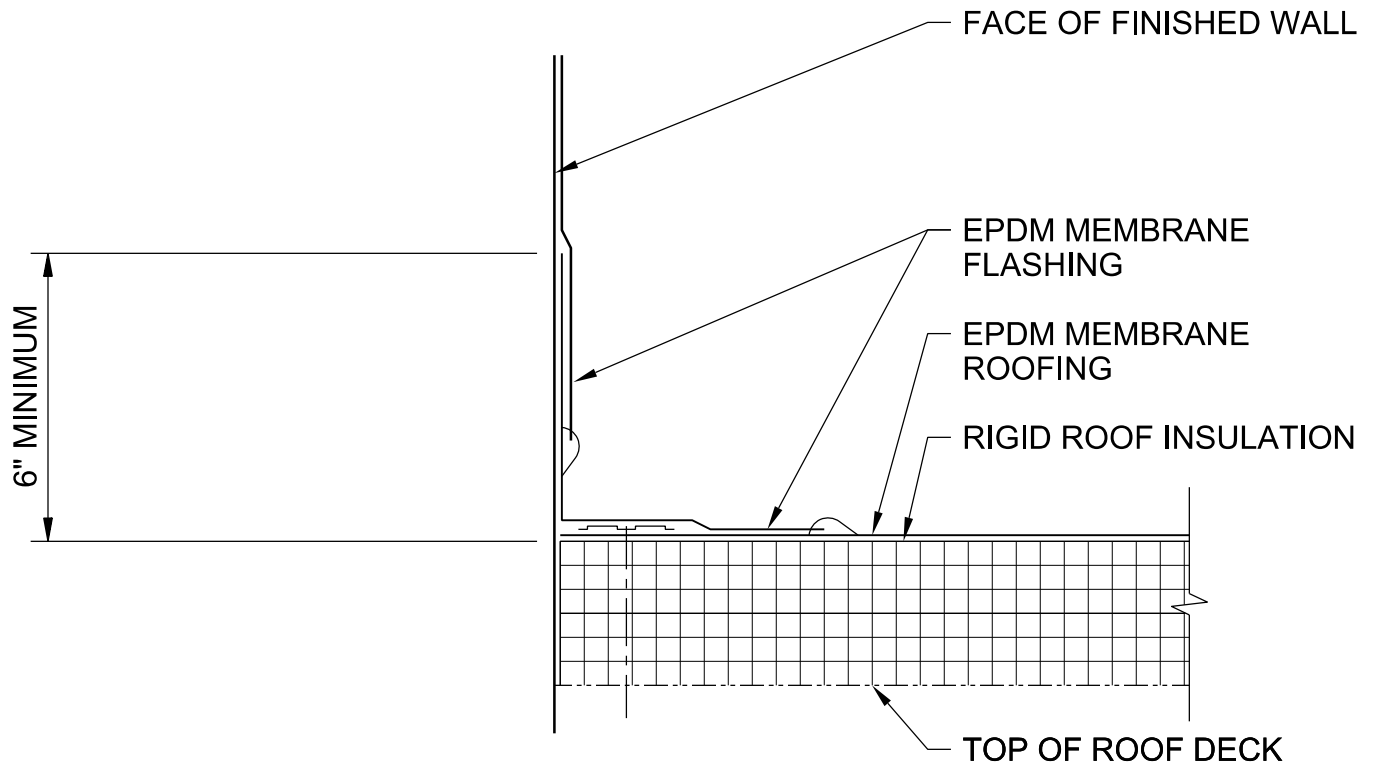
0682-041



COPING (MASONRY WALL)

NTS

0753-002

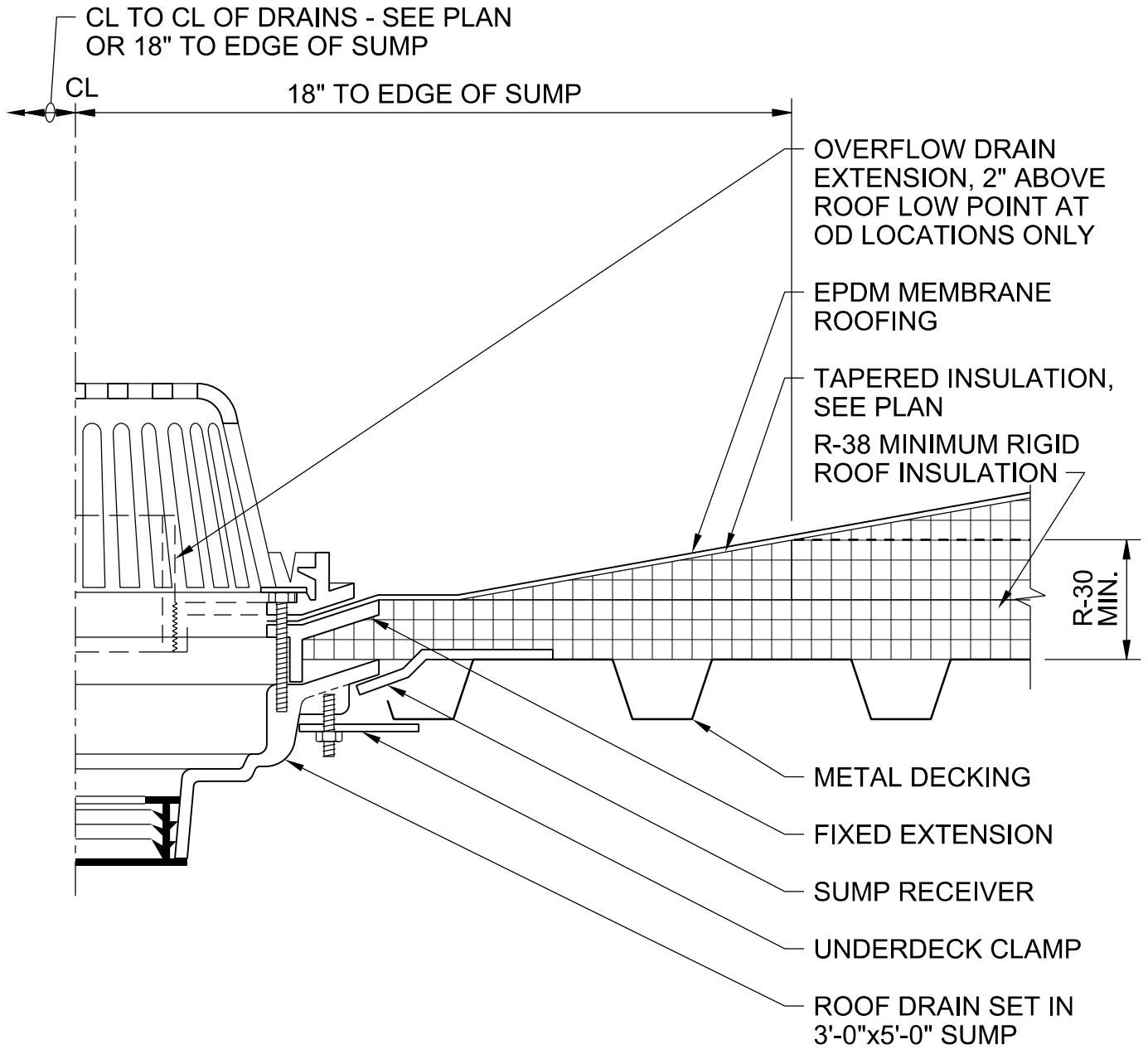


BASE FLASHING

NTS

0753-004

CH2MHILL



NOTES:

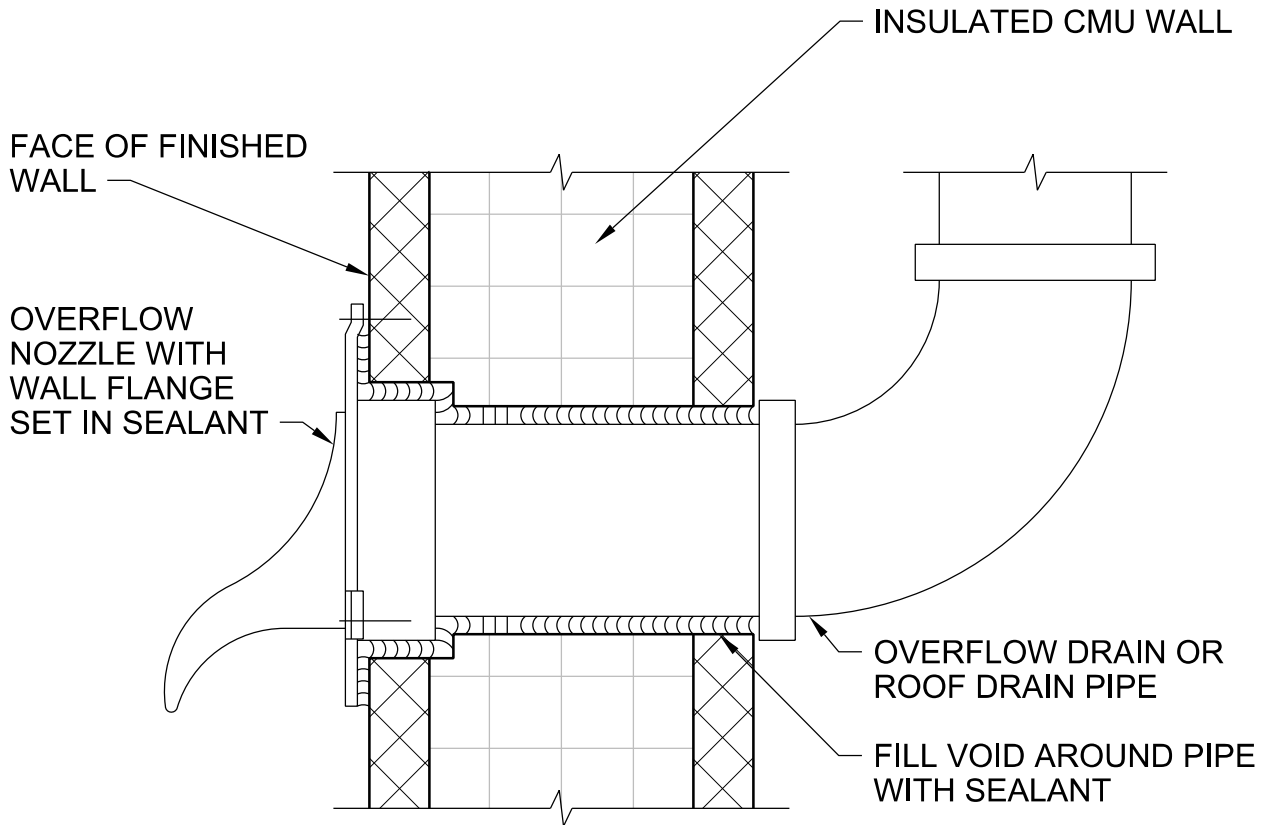
1. DRAIN PIPES AND LEADERS
NOT SHOWN, SEE MECHANICAL.

ROOF/OVERFLOW DRAIN (METAL DECK)

NTS

0753-006

CH2MHILL

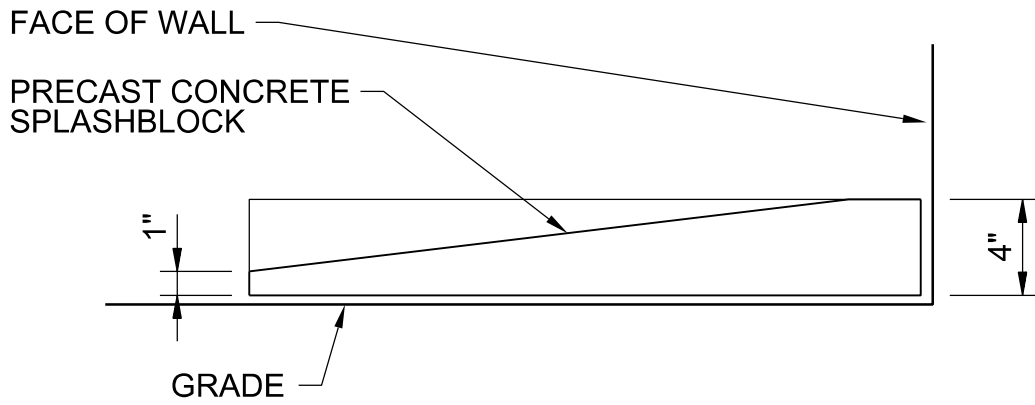


OVERFLOW/ROOF DRAIN NOZZLE

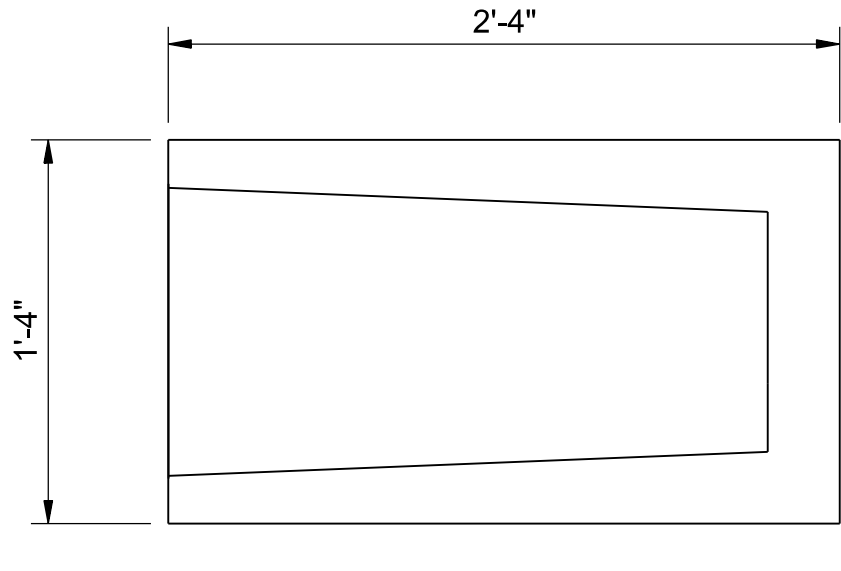
NTS

0762-003

CH2MHILL



SECTION

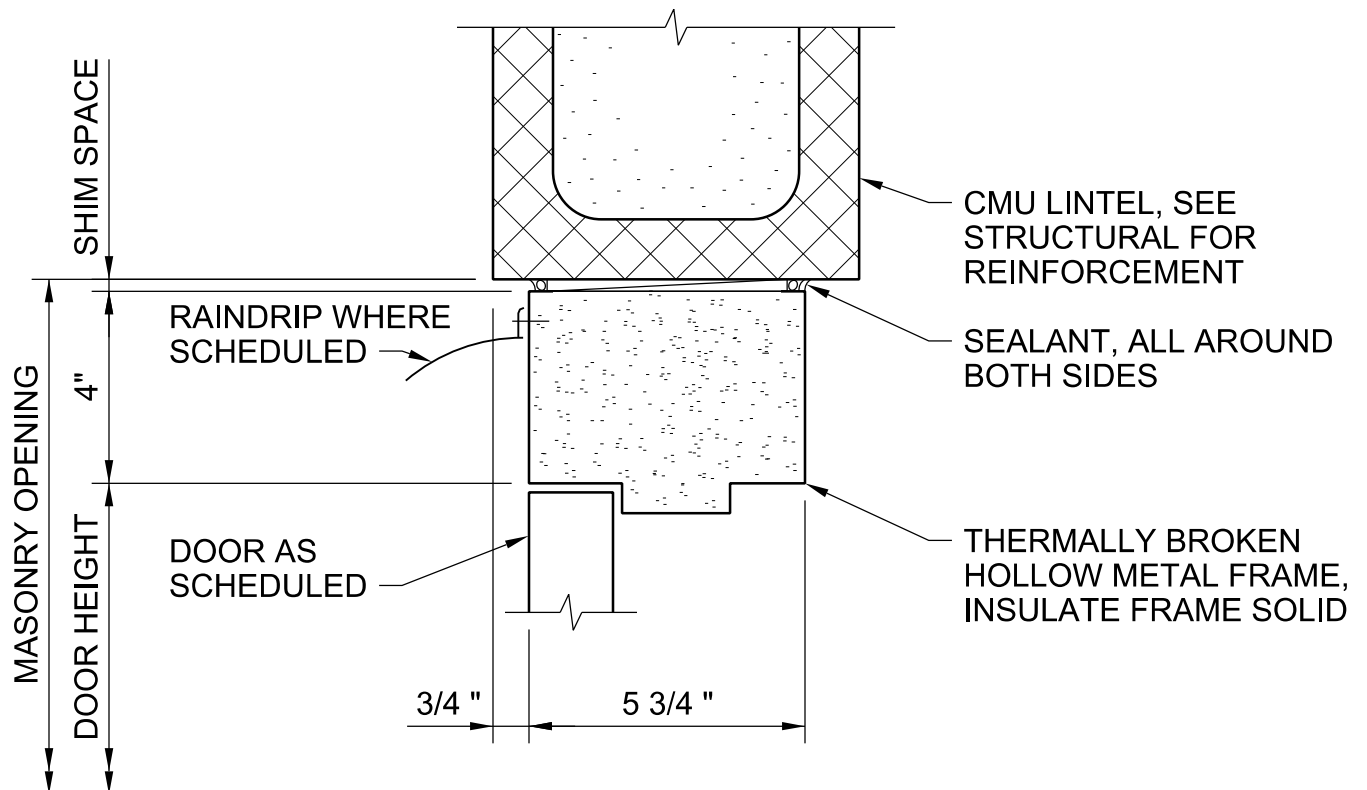


PLAN

SPLASHBLOCK

NTS

0762-004

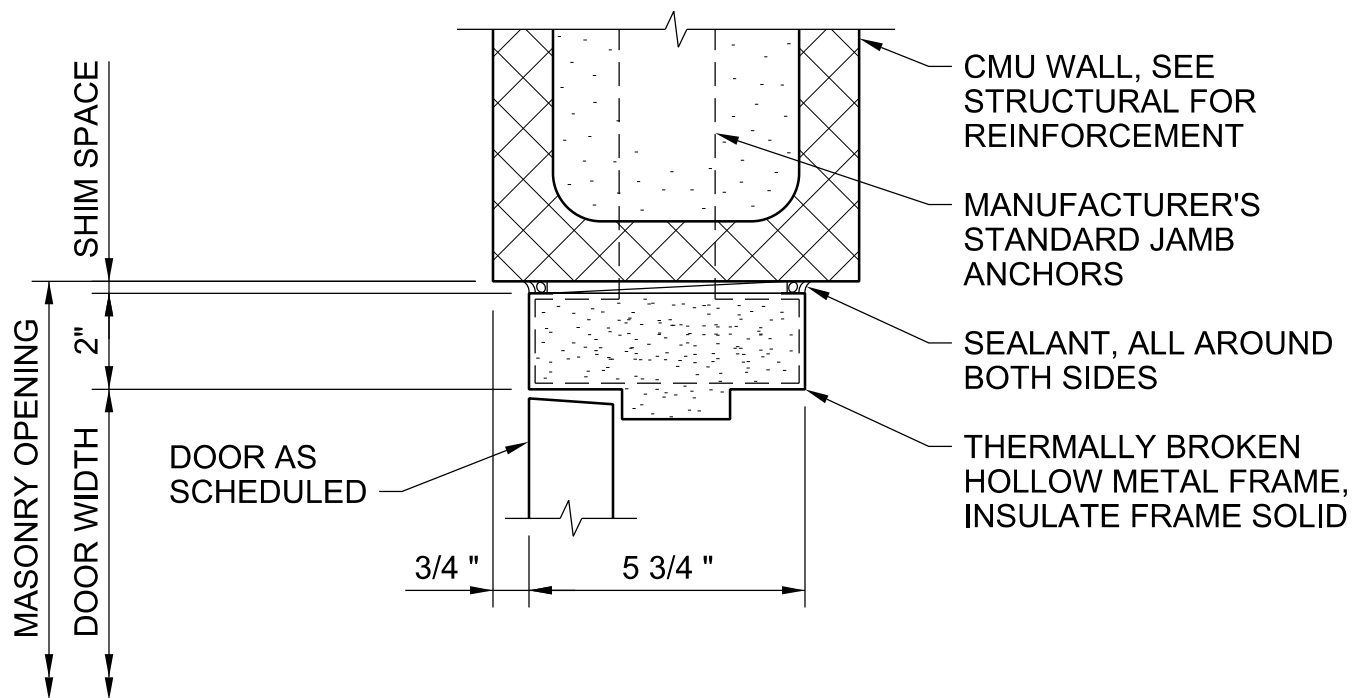


HM DOOR HEAD (CMU)

NTS

0811-003

CH2MHILL

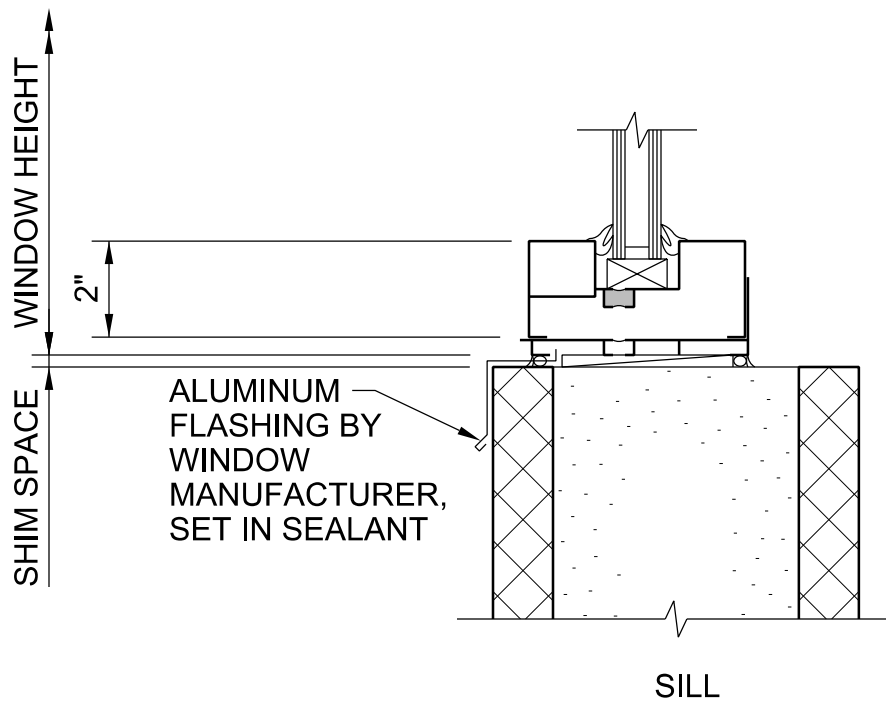
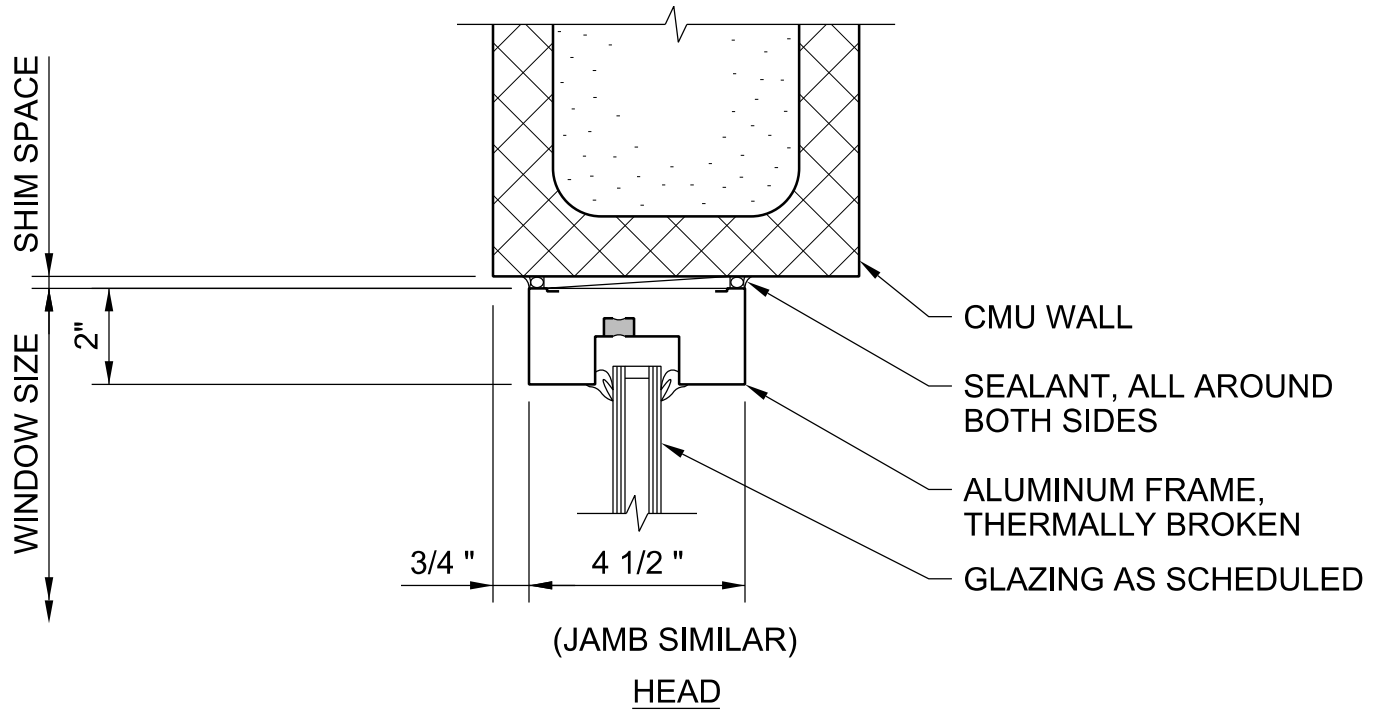


HM DOOR JAMB (CMU)

NTS

0811-004

CH2MHILL

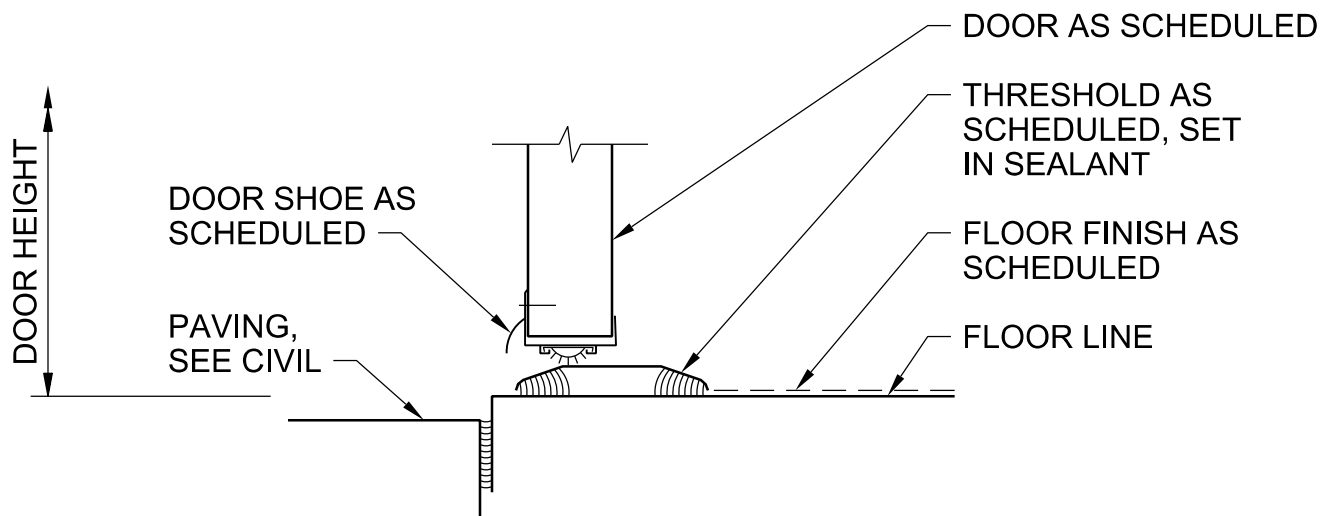


WINDOW HEAD AND SILL

NTS □

0851-002

CH2MHILL

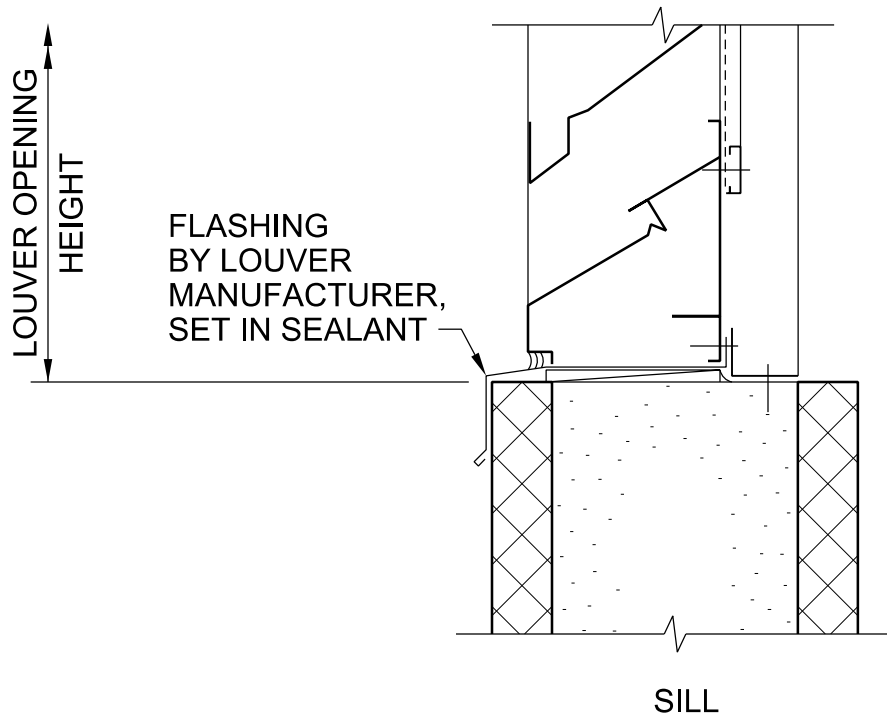
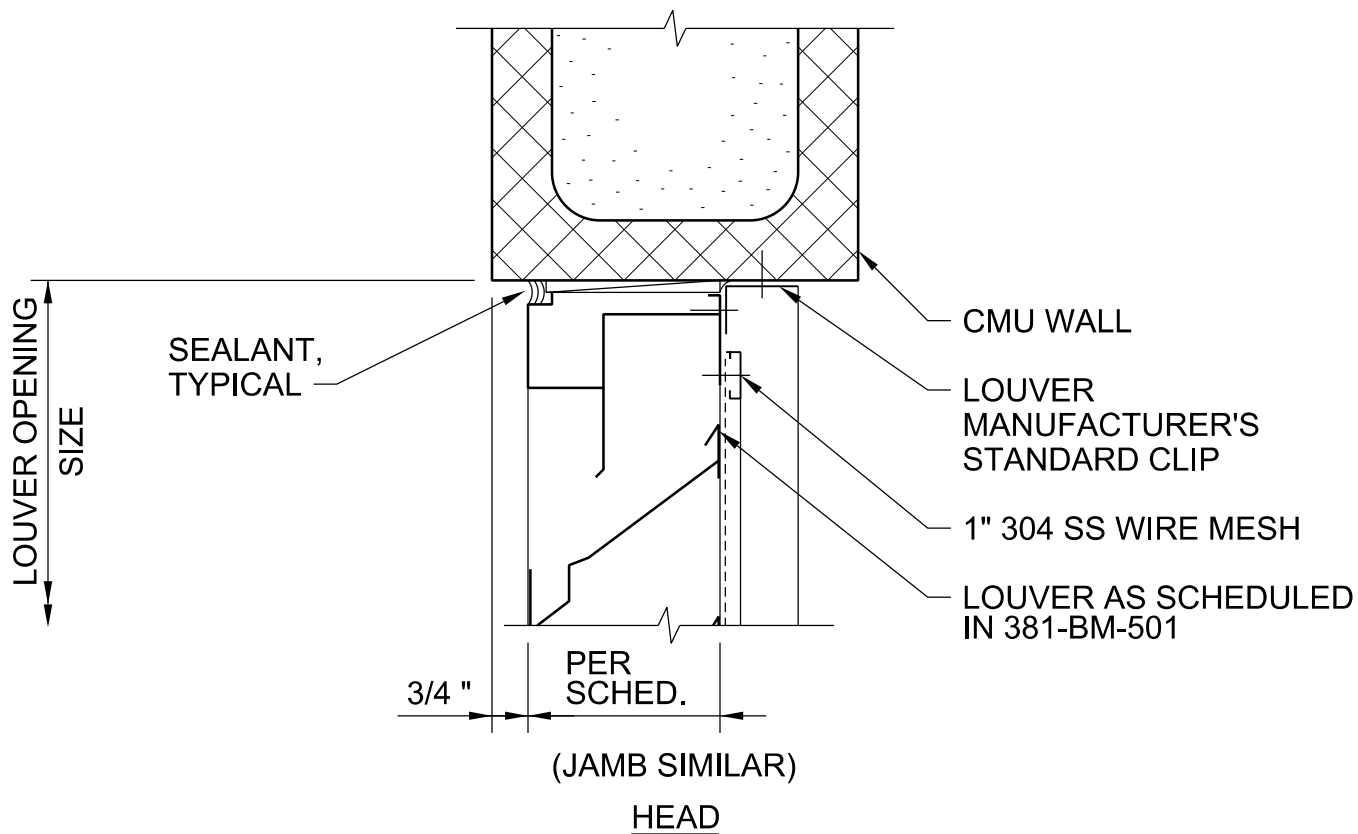


DOOR SILL

NTS

0871-001

CH2MHILL

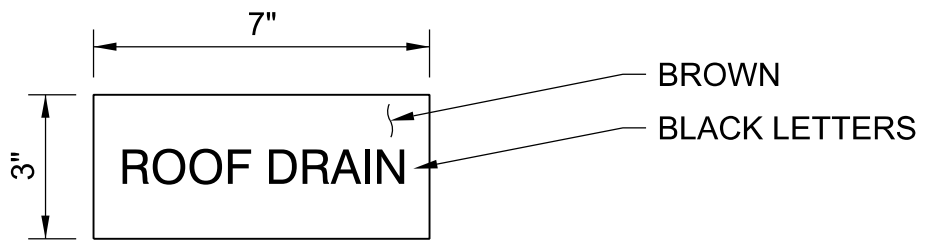


LOUVER HEAD AND SILL

NTS

0890-002

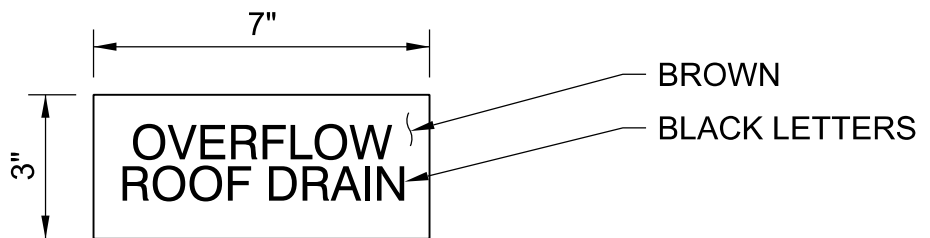
CH2MHILL



ROOF DRAIN SIGN

NTS

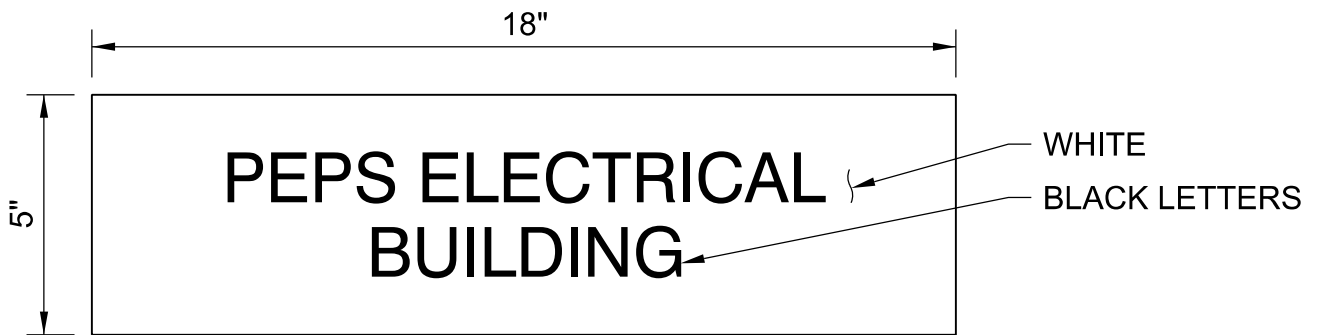
1014-013



OVERFLOW ROOF DRAIN SIGN

NTS

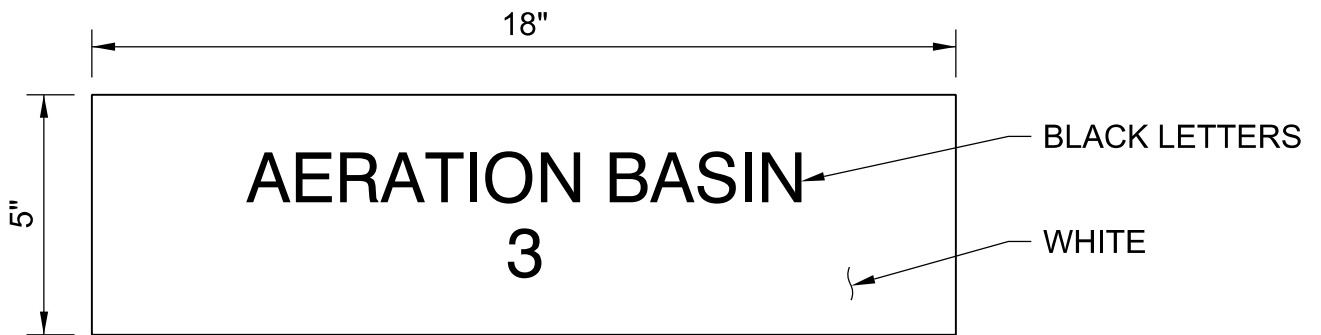
1014-014



PEPS ELECTRICAL BUILDING SIGN

NTS

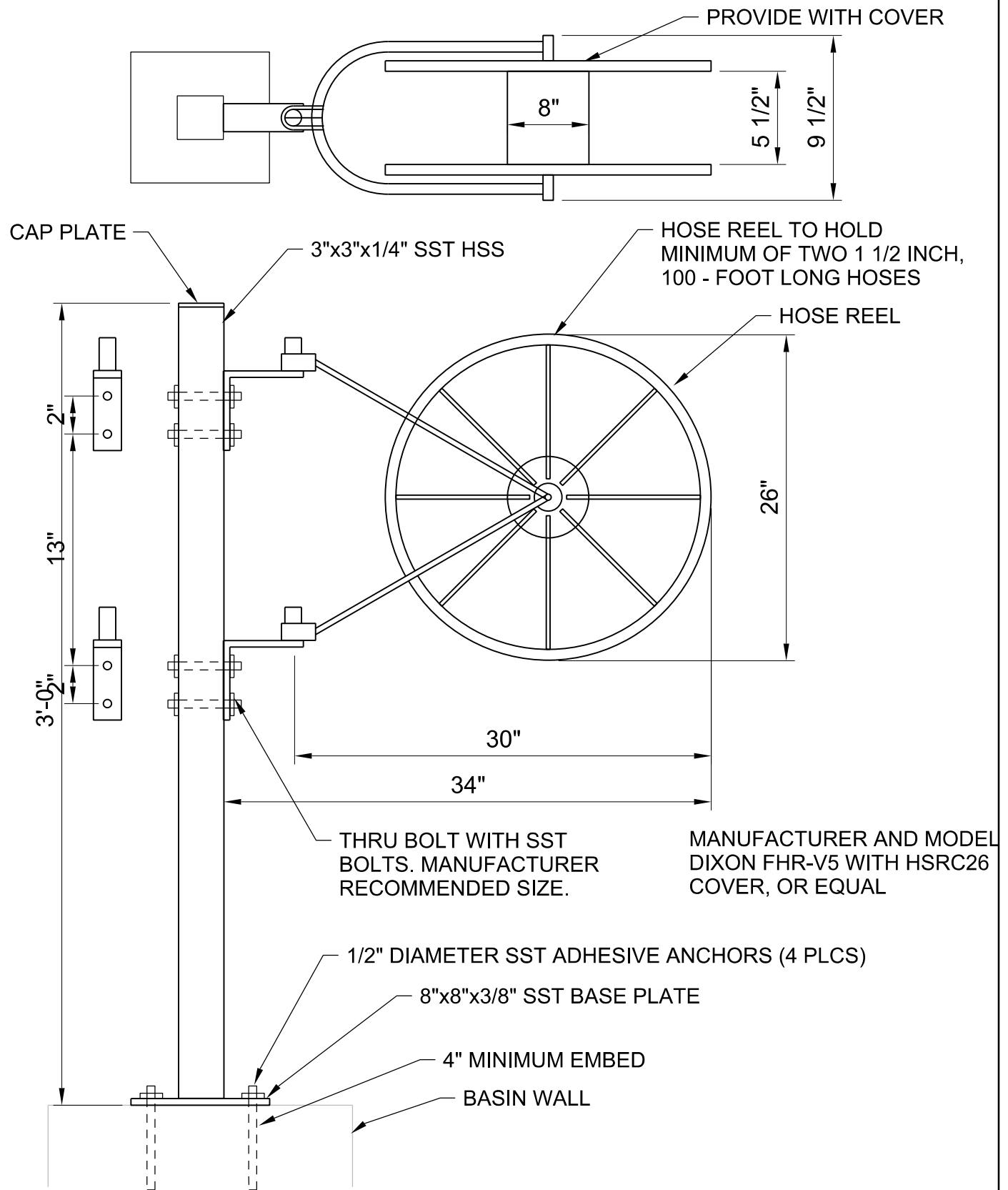
1014-015



AERATION BASIN 3 SIGN

NTS

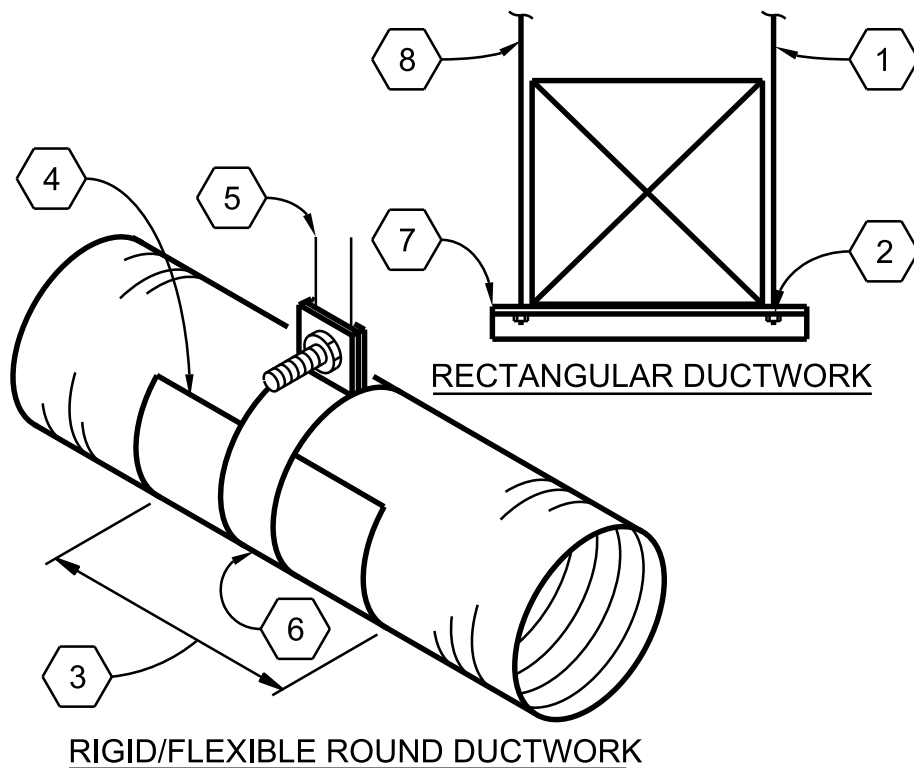
1014-016



TYPICAL HOSE REEL - POST MOUNT

NTS

2210-725



1. ATTACH TO STRUCTURE WITH BEAM CLAMPS OR MASONRY EXPANSION BOLTS
2. NUT WITH LOCK WASHER
3. LENGTH EQUALS DIAMETER OF DUCT
4. STAINLESS STEEL SHEET METAL SADDLE
5. ATTACH TO STRUCTURE PER SMACNA RECOMMENDATIONS
6. 1" MIN BAND CLAMP
7. KINDORF HANGER WITH ALL THREAD ROD IN TRAPEZE CONFIGURATION
8. ALL-THREAD ROD

GENERAL NOTES

- A. DO NOT USE POWDER POWERED FASTENING SYSTEMS TO ATTACH SUPPORTS TO STRUCTURE.
- B. SUPPORT SYSTEM MUST NOT DAMAGE DUCT, INSULATION, OR CAUSE DUCT SHAPE DEFORMATION.
- C. HANGER SIZES SHALL BE IN ACCORDANCE WITH SMACNA, LATEST EDITION.
- D. ALL SUPPORTS TO BE OF HOT DIPPED GALVANIZED STEEL CONSTRUCTION.

TYPICAL DUCT SUPPORT

NTS

2331-102