

SUBSTRUCTURE GENERAL NOTES

PAYMENT:

ALL LABOR, MATERIALS (UNCLASSIFIED EXCAVATION, CONCRETE, REINFORCING STEEL, STRUCTURAL STEEL, ACCESS HATCHES, WATER PROOFING AND CONCRETE SEALER), EQUIPMENT, TOOLS AND INCIDENTALS TO CONSTRUCT THE PROPOSED STORMWATER PUMP STATION SHALL BE PAID UNDER THE LUMP SUM CONTRACT BID PRICE FOR STORMWATER PUMP STATION, COMPLETE, AS PER PLAN.

GENERAL:

THE NOTES AND DETAILS INCLUDED APPLY TO THE PORTIONS OF THE CAST-IN-PLACE REINFORCED CONCRETE PUMP STATION BELOW GRADE, THE STRUCTURAL STEEL MONORAIL FRAME, AND ALL OTHER MISCELLANEOUS STRUCTURAL ELEMENTS REQUIRED FOR ITS FUNCTIONALITY AS DETAILED IN THE PLANS AND IN THE FOLLOWING NOTES.

THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER CONSTRUCTION IS FULLY COMPLETE. THE CONTRACTOR IS RESPONSIBLE FOR THE DETERMINATION OF THE CONSTRUCTION/ERECTION SEQUENCE AND SHALL ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENTS CONTAINED WITHIN THIS PLAN SET AND NOTES.

THE CONTRACTOR SHALL SUBMIT A RFI TO THE STRUCTURAL ENGINEER IF CLARIFICATION OR ADDITIONAL DETAIL IS NEEDED FOR ANY PORTION OR COMPONENT OF THE PUMP STATION.

DESIGN SPECIFICATIONS:

THE PUMP STATION STRUCTURE CONFORMS TO THE AMERICAN CONCRETE INSTITUTE'S (ACI) 2019 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318-19) AND THE 2020 CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES (ACI 350-20).

DESIGN CRITERIA:

- 1) **LOADING**  
HORIZONTAL SLABS AND SUPPORT BEAMS: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 10TH EDITION EXCEPT AS MODIFIED HEREIN: HL-93 DESIGN TRUCK AND TANDEM; LIVE LOADING EXCLUDES DESIGN LANE LOAD.  
  
THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF ACCESS HATCH SUPPORTS, HANDRAILS, ACCESS LADDERS AND SUPPORT FRAMEWORK. CONTRACTOR SHALL DESIGN THE LADDERS TO ACCOMMODATE THE WORST CASE OF A 100 PSF LIVE LOAD AND A CONCENTRATED LOAD OF 400 POUNDS PLACED SUCH THAT IT PRODUCES THE MAXIMUM STRESS, PLUS ALL ANTICIPATED DEAD LOADS. PLAN DIMENSIONS AND DETAILS SHOWN THROUGHOUT THE PLANS SHALL BE USED AS A BASELINE FOR THE DESIGN/LAYOUT, HOWEVER IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THE DESIGN/DETAILS MEET THE REQUIRED LOADING AND INSTALLATION WILL NOT COMPROMISE THE STRUCTURAL INTEGRITY OF THE CONCRETE STRUCTURE. CONTRACTOR SHALL ENSURE THE LADDER MEETS ALL CODE SAFETY AND DESIGN REQUIREMENTS. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR REVIEW PRIOR TO CONSTRUCTION OF THE ACCESS HATCHES, ACCESS HATCH SUPPORTS, HANDRAILS, ACCESS LADDERS AND SUPPORT FRAMEWORK.  
  
ACCESS HATCHES AS FOLLOWS:  
ALL ACCESS HATCHES TO BE DESIGNED FOR HL-93 DESIGN TRUCK AND TANDEM; LIVE LOADING EXCLUDES DESIGN LANE LOAD EXCEPT AS NOTED BELOW:  
  
48" X 48" OPENINGS: 300 PSF (LIVE LOAD)
- 2) **FLOOD ELEVATION**  
CONTRACTOR IS RESPONSIBLE FOR BUOYANCY EFFECTS DURING ALL CONSTRUCTION AND TEMPORARY CONDITIONS UNTIL CONSTRUCTION IS COMPLETE, TO BE INCLUDED AS PART OF THEIR MEANS AND METHODS.

MATERIALS:

MATERIALS USED TO CONSTRUCT THE PROPOSED BELOW GRADE PORTIONS OF THE PUMP STATION STRUCTURE SHALL CONFORM TO THE PLAN SPECIFICATIONS AND AS FOLLOWS:

- 1) CONCRETE CLASS QC2 - COMPRESSIVE STRENGTH 4.5 KSI
- 2) REINFORCING STEEL:

2)1) MINIMUM YIELD STRENGTH 60 KSI

2)2) EPOXY COATED
- 3) STRUCTURAL STEEL - ASTM A992 GRADE 50 - YIELD STRENGTH 50 KSI
- 4) FASTENERS:

4)1) ASTM A325 BOLTS

4)2) ASTM A316 BOTLS/ANCHORS (STAINLESS)

FOUNDATIONS:

THE WET WELL FOUNDATION (BASE SLAB), AS DESIGNED, PRODUCES A MAXIMUM SERVICE LOAD PRESSURE OF 8.34 KIPS PER SQUARE FOOT AND A MAXIMUM STRENGTH LOAD PRESSURE OF 8.51 KIPS PER SQUARE FOOT. KEEP FOUNDATIONS FREE OF EXCESS WATER AT ALL TIMES AND REPLACE SOFT OR WEAK SOIL AS DIRECTED BY THE ENGINEER. DO NOT BACKFILL AGAINST WALLS UNTIL THE BEAMS AND SLABS ARE CONSTRUCTED IN THEIR ENTIRETY. BACKFILL AGAINST BOTH SIDES OF THE PUMP STATION EQUALLY UNTIL THE FINAL GRADE IS ATTAINED.

CONCRETE COVER:

UNLESS NOTED OTHERWISE, MINIMUM DEPTH OF THE CONCRETE COVER SHALL BE 2 INCHES, CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH SHALL HAVE A MINIMUM COVER OF 3 INCHES, UNLESS NOTED OTHERWISE.

ITEM 511 - CONCRETE CLASS QC2 WITH QC/QA:

CONCRETE CONSTRUCTION SHALL ADHERE TO CMS 499, 508, 511, AND ACCOMPANYING SPECIFICATIONS WITH THE ADDITIONAL CLARIFICATIONS BELOW.

OPENINGS IN WALL AND SLABS:  
OPENINGS ARE SHOWN FOR BIDDING PURPOSES ONLY. RECONCILE THEIR EXACT LOCATION AND SIZE WITH PROCURED MATERIALS AND PROCESS, ELECTRICAL, AND OTHER TRADES BEFORE PROCEEDING WITH WORK. IF ADDITIONAL OPENINGS ARE REQUIRED OR MODIFICATIONS TO THE LOCATIONS ARE NECESSARY, WHICH HAVE NOT BEEN INCLUDED IN THE PLANS, SECURE APPROVAL WITH THE ENGINEER PRIOR TO PROCEEDING. REQUIRED OPENING DIMENSIONS FOR ACCESS HATCHES SHALL BE CONFIRMED BY CONTRACTOR PRIOR TO PLACEMENT OF CONCRETE.

CONSTRUCTION JOINTS:  
CONSTRUCTION JOINTS ARE PERMITTED ONLY WHERE SHOWN ON THE PLANS OR AS APPROVED BY THE ENGINEER. RECOMMENDED CONSTRUCTION JOINT LOCATIONS HAVE BEEN PROVIDED, HOWEVER THE CONTRACTOR MAY CHOOSE TO INCLUDE ADDITIONAL JOINTS, OR REMOVE THE ORIGINALLY DETAILED CONSTRUCTION JOINT WITH THE APPROVAL OF THE ENGINEER.

CONTRACTOR IS RESPONSIBLE FOR PLAN MODIFICATIONS ASSOCIATED WITH CHANGES IN THE CONSTRUCTION JOINT LOCATION, NUMBER, OR CONFIGURATION. THE ENGINEER MUST APPROVE THE FINAL CONSTRUCTION JOINT LAYOUT PRIOR TO THE CONTRACTOR PROCEEDING WITH CONSTRUCTION OF CAST IN PLACE ELEMENTS.

CONTINUOUS 2X6 KEYED CONSTRUCTION JOINTS SHALL BE PROVIDED AT ALL WALLS. KEYED CONSTRUCTION JOINTS SHALL BE PROVIDED AT ALL LOCATIONS, WHETHER SHOWN OR NOT. CONSTRUCTION JOINTS IN WALLS SHALL NOT BE PLACED AT GREATER THAN 40 FOOT SPACING UNLESS APPROVED BY THE ENGINEER.

TEMPORARY FALSEWORK AND FORMS:  
THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, INSTALLATION, AND REMOVAL OF TEMPORARY FALSEWORK, FORMS, AND BRACING REQUIRED TO CONSTRUCT CAST-IN-PLACE PORTIONS OF THE PROPOSED STRUCTURE IN ACCORD WITH CMS ITEM 508. CAMBER SHOULD BE BUILT INTO THE TEMPORARY SUPPORTS AS NEEDED TO ACCOMMODATE THE ANTICIPATED DEFLECTIONS MENTIONED ABOVE. BEAMS, SLABS, AND DECKS THAT HAVE A MID-SPAN LOW-POINT IN THEIR FINAL CONDITION WILL BE REJECTED DUE TO LACK OF PLAN CONFORMANCE AND MAY BE SUBJECT TO REMOVAL AND REBUILT AT THE CONTRACTORS EXPENSE. ACCEPTANCE TOLERANCE FOR FINAL CAMBER OF BEAMS SHALL BE CONSIDERED TO BE -0 TO +1/2" (POSITIVE SHALL BE CONSIDERED AS UP), ACCEPTABLE TOLERANCE FOR FINAL CAMBER OF SLABS AND DECKS CONSIDERED TO BE -0 TO +1/4" (POSITIVE SHALL BE CONSIDERED UP). ALL COSTS ASSOCIATED WITH FALSEWORK AND FORMS SHALL BE INCLUDED WITH ITEM 511 FOR PAYMENT.

ALL COSTS ASSOCIATED WITH CONCRETE OPENINGS, CONSTRUCTION JOINTS AND KEYWAYS, AND TEMPORARY FLASEWORK/FORMS SHALL BE INCLUDED WITH THE LUMP SUM CONTRACT BID PRICE FOR STORMWATER PUMP STATION, COMPLETE, AS PER PLAN.

ITEM SPECIAL - WATERPROOFING, PVC WATERSTOPS:

WATERSTOPS SHALL BE USED AT ALL CONSTRUCTION JOINTS BELOW THE FINISHED GRADE AT THE SITE. WATERSTOPS SHALL BE POLY VINYL CHLORIDE (PVC) SERRATED TYPE WITHOUT CENTER BULB. WATER STOPS SHALL BE CENTERED ON THE CONSTRUCTION JOINT AND SHALL NOT BE LESS THAN 6 INCHES WIDE AND 3/8 INCH THICK AT CENTER (1/2 INCH MINIMUM THICKNESS AT ENDS).

ALL JOINTS OF PVC WATERSTOPS SHALL BE SPLICED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. OVERLAP SPLICING OF WATERSTOPS SHALL NOT BE PERMITTED. ALL SPLICES SHALL DEVELOP EFFECTIVE WATER-TIGHTNESS FULLY EQUAL TO THAT OF CONTINUOUS WATERSTOP.

CONTRACTOR SHALL UTILIZE THE FOLLOWING PVC WATERSTOPS, OR APPROVED EQUAL:

GREENSTREAK PVC WATERSTOP  
SIKA CORPORATION  
201 POLITO AVENUE  
LYNDHURST NEW JERSEY 07071  
UNITED STATES OF AMERICA  
201-933-8800

DURAJOINT PVC WATERSTOP  
DCA CONSTRUCTION PRODUCTS, LLC  
10421 INDUSTRIAL DRIVE  
GARRETTSVILLE, OHIO 44231  
888-833-8309

EARTHSHIELD PVC WATERSTOP  
J.P. SPECIALTIES, INC.  
25811 JEFFERSON AVENUE  
MURRIETA, CA 92562  
951-763-7077

ALL COSTS ASSOCIATED WITH PVC WATERSTOP MATERIALS LABOR, INCIDENTALS, AND INSTALLATION AND KEYS SHALL BE INCLUDED WITH THE LUMP SUM CONTRACT BID PRICE FOR STORMWATER PUMP STATION, COMPLETE, AS PER PLAN.

ITEM SPECIAL - WATERPROOFING, HYDROPHILIC WATERSTOP:

HYDROPHILIC, OR SWELLING, WATERSTOPS SHALL BE USED AROUND THE PERIMETER OF ALL OPENINGS IN EXTERIOR WALLS OF THE CAST IN PLACE STRUCTURE. THE WATERSTOPS SHALL BE INSTALLED PER THE MANUFACTURE SPECIFICATIONS AND SHALL HAVE NOMINAL MINIMUM CORSS SECTIONAL DIMENSIONS OF 3/8" X 3/8". ALL JOINTS OF THE WATERSTOPS SHALL BE SPLICED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. OVERLAP SPLICING OF WATERSTOPS SHALL NOT BE PERMITTED. ALL SPLICES SHALL DEVELOP EFFECTIVE WATER-TIGHTNESS FULLY EQUAL TO THAT OF CONTINUOUS WATERSTOP.

CONTRACTOR SHALL UTILIZE THE FOLLOWING HYDROPHILIC WATERSTOPS, OR APPROVED EQUAL:

SWELLSTOP  
SIKA CORPORATION  
201 POLITO AVENUE  
LYNDHURST NEW JERSEY 07071  
UNITED STATES OF AMERICA  
201-933-8800

EXPAND-TITE 200  
DCA CONSTRUCTION PRODUCTS, LLC  
10421 INDUSTRIAL DRIVE  
GARRETTSVILLE, OHIO 44231  
888-833-8309

EARTHSHIELD TYPE 20 OR 23  
J.P. SPECIALTIES, INC.  
25811 JEFFERSON AVENUE  
MURRIETA, CA 92562  
951-763-7077

ALL COSTS ASSOCIATED WITH HYDROPHILIC WATERSTOP MATERIALS, LABOR, INCIDENTALS, AND INSTALLATION AND KEYS SHALL BE INCLUDED WITH THE LUMP SUM CONTRACT BID PRICE FOR STORMWATER PUMP STATION, COMPLETE, AS PER PLAN.

ITEM 512 - CONCRETE DAMPPROOFING:

CONTRACTOR SHALL COMPLETELY SEAL THE EXTERIOR LIMITS OF THE BELOW GRADE WALLS STARTING AT THE BOTTOM OF THE BASE SLAB ELEVATIONS, AND ENDING AT 6" BELOW THE TOP OF THE STRUCTURE. THE DAMPPROOFING TOP LIMITS MAY BE MINIMALLY ADJUSTED DOWNWARD SHUCH THAT THE MATERIAL IS NOT VISIBLE IN THE FINAL CONDITION.

CONTRACTOR SHALL UTILIZE THE FOLLOWING DAMPPROOFING MATERIALS, INSTALLED PER MANUFACTURER SPECIFICATION, OR APPROVED EQUAL:

SEALMASTIC EMULSION, TYPE 1 OR TYPE 2  
W.R MEADOWS, INC.  
PO BOX 338  
HAMPSHIRE, IL 60140  
800-342-5976

DEHYDRATINE 75  
EUCUID CHEMICAL  
19215 REDWOOD ROAD  
CLEVELAND, OH 44110  
800-321-7628

HYDROCID 600, 700, 700B  
BASF BUILDING SYSTEMS  
889 VALLEY PARK DRIVE  
SHAKOPEE, MN 55379  
952-496-6000

ALL COSTS ASSOCIATED WITH DAMPPROOFING MATERIALS, LABOR, INCIDENTALS, AND INSTALLATION AND KEYS SHALL BE INCLUDED WITH THE LUMP SUM CONTRACT BID PRICE FOR STORMWATER PUMP STATION, COMPLETE, AS PER PLAN.

ITEM 513 - STRUCTURAL STEEL:

STEEL CONSTRUCTION SHALL ADHERE TO CMS 513 AND ACCOMPANYING SPECIFICATIONS WITH THE ADDITIONAL CLARIFICATIONS BELOW.

STRUCTURAL STEEL MEMBERS, BRACING, COMPONENTS AND CONNECTIONS SHALL BE IN ACCORDANCE WITH AISC ALLOWABLE STRESS DESIGN (ASD) UNLESS NOTED OTHERWISE. STRUCTURAL STEEL DETAILING, FABRICATION AND ERECTION SHALL CONFORM TO THE ANSI/AISC 360 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, AND THE AISC 303 CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES, LATEST EDITION WITH AMENDMENTS.

STRUCTURAL STEEL PLATES AND ROLLED SHAPES OTHER THAN WIDE-FLANGE SHAPES SHALL CONFORM TO ASTM A36, UNLESS NOTED OTHERWISE.

ANCHOR RODS SHALL CONFORM TO ASTM F1554, GRADE 36, UNLESS NOTED OTHERWISE.

FABRICATE AND ERECT STEEL FRAMING SO THAT CAMBER IS UPWARD AFTER INSTALLATION. SPLICE MEMBERS ONLY AT LOCATIONS SPECIFICALLY INDICATED ON THE DRAWINGS. DO NOT FIELD MODIFY STRUCTURAL STEEL WITHOUT PRIOR WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER.

BOLTED CONNECTIONS SHALL CONFORM TO THE SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS. UNLESS NOTED OTHERWISE, BOLTED CONNECTIONS SHALL BE TIGHTENED TO THE SNUG TIGHT CONDITION. BOLTED CONNECTIONS IN BRACE ELEMENTS ARE TO BE FULLY PRETENSIONED WITH CLASS A FAYING SURFACES.

BURNING OR OTHER MODIFICATION OF HOLES IN STRUCTURAL STEEL IS EXPLICITLY PROHIBITED UNLESS WRITTEN PERMISSION IS GRANTED BY THE STRUCTURAL ENGINEER. HOLES THAT MUST BE ENLARGED TO ADMIT BOLTS SHALL BE REAMED.

ALL EXTERIOR STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED IN CONFORMANCE WITH ASTM A123, UNLESS NOTED OTHERWISE.

DO NOT PAINT OR GALVANIZE THE FOLLOWING SURFACES:

- 1) SURFACES TO BE WELDED.
- 2) SURFACES TO RECEIVE BOLTED SLIP-CRITICAL CONNECTIONS.
- 3) SURFACES TO RECEIVE SHEAR STUD CONNECTIONS.

ALL ABRASIONS TO GALVANIZED SURFACES OR SURFACES TO RECEIVE AN ARCHITECTURAL FINISH COAT SHALL BE TOUCHED-UP AFTER ERECTION IS COMPLETE. FOR PAINTED STEEL, USE A PRIMER EQUIVALENT TO THE SHOP PAINT. FOR GALVANIZED STEEL, USE A ZINC-RICH COLD-GALVANIZING PAINT.

BAR GRATING

BAR GRATING SHALL BE 19-W-2 WITH 1/4" THICK BEARING BARS.

FOR SPANS GREATER THAN 8' BAR GRATING SHALL BE 3" DEEP GALVANIZED STEEL SERRATED BAR GRATING (McNICHOLS GHB-300 SERIES OR APPROVED EQUAL).

FOR SPANS GREATER THAN 3' AND LESS THAN 8' BAR GRATING SHALL BE 2" DEEP GALVALIZED STEEL SERRATED BAR GRATING (McNICHOLS GHB-200 SERIES OR APPROVED EQUAL).

FOR SPANS LESS THAN 3' BAR GRATING SHALL BE 3" DEEP GALVANIZED STEEL SERRATED BAR GRATING (McNICHOLS GHB-300 SERIES OR APPROVED EQUAL).

OPENINGS IN AND EDGES OF GRATING SECTIONS SHALL BE Banded WITH BANDING BARS. WELD BANDS TO INTERSECTING MEMBERS. BANDING TO INCLUDE KICK PLATE WHERE REQUIRED BY CODE.

BANDING BAR SHALL BE 1/4-INCH THICK MINIMUM. TOP OF BANDING BAR SHALL BE FLUSH WITH TOP OF GRATING, UNLESS OTHERWISE SHOWN OR INDICATED.

GRATING SHALL BE REMOVABLE. PROVIDE GRATING IN MAX 4'-0" WIDE SECTIONS.

HINGED ACCESS HATCHES:

PROPOSED HINGED ACCESS HATCHES IN THE TOP SLAB SHALL BE ASSISTED OPENING AND SHALL BE LOCKABLE WITH MATCHING KEYS. ASSIST SYSTEM ON THE ACCESS HATCHES SHALL NOT REQUIRE ELECTRIC AND SHALL BE SUFFICIENTLY SIZED TO ALLOW A SINGLE PERSON TO OPEN THE DOOR. THE WATER-TIGHT HATCHES SHALL BE CORROSION RESISTANT AND SHALL BE FABRICATED WITH GALVANIZED STEEL, STAINLESS STEEL, OR ALUMINUM.

THE DESIGN CONFIGURATION SHALL MEET THE OPENING REQUIREMENTS WITHOUT ENCROACHMENTS INTO THE STRUCTURAL CONCRETE OR REINFORCING BARS. ACCESS HATCHES SHALL BE FABRICATED TO PERMIT NO FIXED INTERMEDIATE SUPPORTS IN THE OPENING. REMOVABLE SUPPORTS ARE PERMITTED TO GAIN FULL ACCESS IF DOUBLE-LEAF HATCHES ARE PROPOSED.

CONTRACTOR SHALL UTILIZE THE FOLLOWING MANUFACTURERS, OR APPROVED EQUAL:

THE BILCO COMPANY  
PO BOX 1203  
NEW HAVEN, CT 06505  
203-934-6363

BABCOCK-DAVIS  
9300 73RD AVENUE NORTH  
BROOKLYN PARK, MN 55428  
888-412-3726

ALL COSTS ASSOCIATED WITH HINGED DOOR DESIGN, MATERIALS, LABOR, INCIDENTALS, AND INSTALLATION AND KEYS SHALL BE INCLUDED WITH THE LUMP SUM CONTRACT BID PRICE FOR STORMWATER PUMP STATION, COMPLETE, AS PER PLAN.

CONSTRUCTION SEQUENCE:

THE FOLLOWING SEQUENCE OF CONSTRUCTION IS RECOMMENDED BY THE DESIGNER TO MINIMIZE POTENTIAL STRUCTURAL CRACKING, DISTORTION, AND UPLIFT PRIOR TO FULL COMPLETION OF THE PUMP STATION.

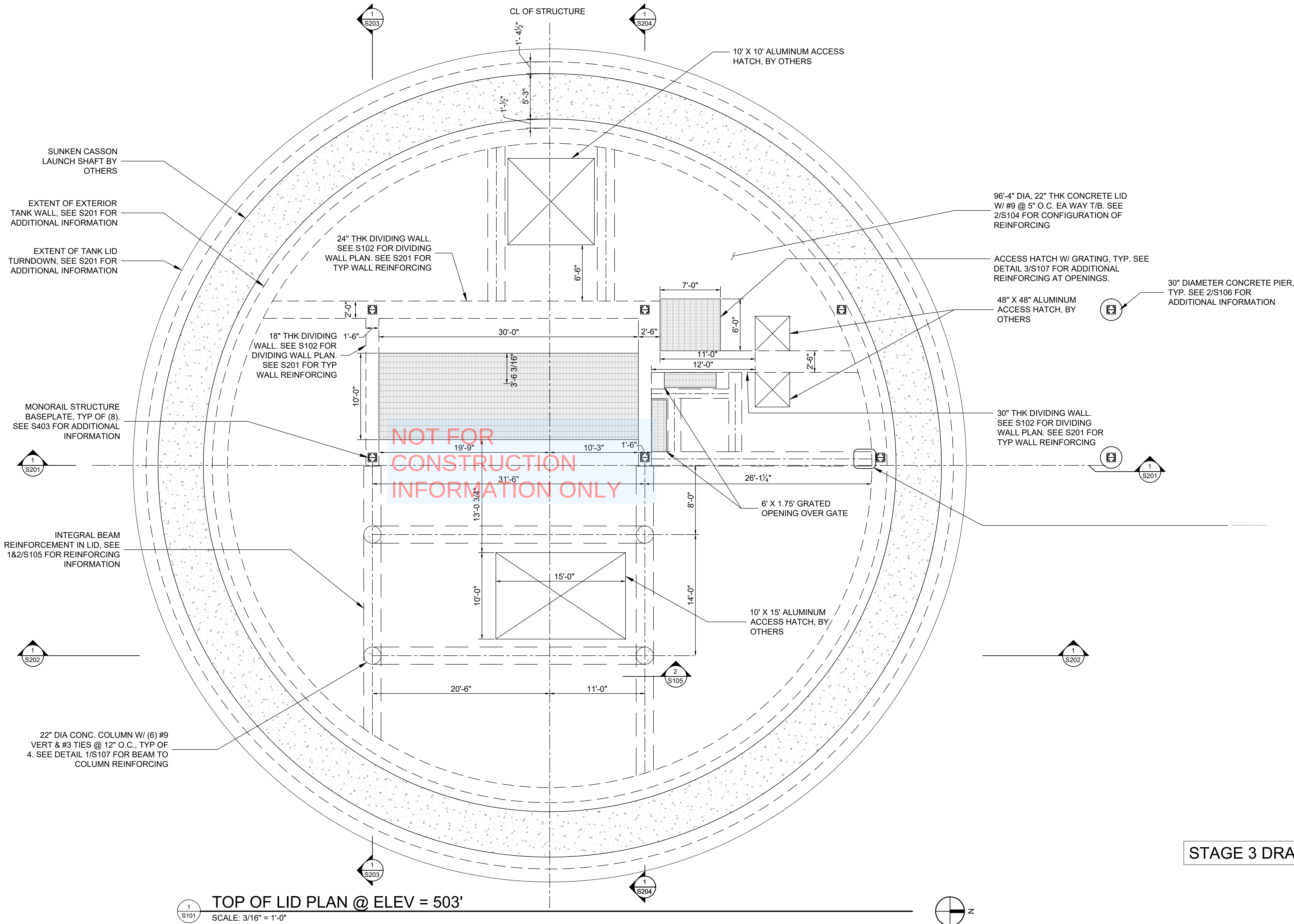
1. PLACE TEMPORARY SHORING AS NEEDED TO CONSTRUCT THE BELOW GRADE PORTIONS OF THE PUMP STATION.
2. PLACE DE-WATERING SYSTEM IF REQUIRED TO RESULT IN A WATER-FREE WORK SITE. REFER TO GENERAL NOTES OF ROADWAY PLANS.
3. CONSTRUCT ALL PROPOSED CAST-IN-PLACE CONCRETE STRUCTURAL BASE SLAB/FOUNDATION, EXTERIOR AND INTERIOR WALLS, BEAMS, AND SLABS. APPLY DAMPROOFING AS SPECIFIED FOR BELOW GRADE EXTERIOR WALLS AND FOUNDATIONS.
4. INSTALL PROPOSED PUMPS, PIPE NETWORK, AND ALL MISCELLANEOUS ATTACHMENTS AND CONNECTIONS AS DETAILED IN THE PLANS.
5. INSTALL ALL PROPOSED GRATING AND/OR ACCESS HATCHES, INCLUDING SUPPORT STRUCTURE AS REQUIRED.
6. ANY REMAINING TASKS MAY BE COMPLETED UNDER THE CONTRACTORS DIRECTION WITH CONSIDERATION OF SCHEDULE AND PROPER ORDER TO ELIMINATE REWORK. NO COMPENSATION WILL BE GIVEN FOR REWORK AS A RESULT OF TASKS THAT WERE COMPLETED "OUT-OF-ORDER".

STAGE 3 DRAWINGS

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|                      |       |
|----------------------|-------|
| DESIGN AGENCY        |       |
| TDS                  |       |
| REVIEWER             |       |
| XXX MM/YYYY          |       |
| PROJECT ID           |       |
| 2020.03346           |       |
| SHEET IDENTIFICATION |       |
| S001                 |       |
| SHEET                | TOTAL |
| 38                   | 99    |



1  
S101

TOP OF LID PLAN @ ELEV = 503'

SCALE: 3/16" = 1'-0"

STAGE 3 DRAWINGS

HAM-75-1.25 PUMP STATION  
STRUCTURAL DESIGN  
DRAWINGS

DESIGN AGENCY  
**AMERICAN  
STRUCTUREPOINT  
INC.**

DESIGNER  
TDS

REVIEWER  
XXX MM/YYYY

PROJECT ID  
2020.03346

SHEET IDENTIFICATION  
S101

| SHEET | TOTAL |
|-------|-------|
| 38    | 99    |



DESIGN AGENCY

AMERICAN  
STRUCTUREPOINT  
INC.

SIGNER

TDS

REVIEWER

XXX MM/YYYY

PROJECT ID

2020.03346

MEET IDENTIFICATION

S102

MEET

TOTAL

38

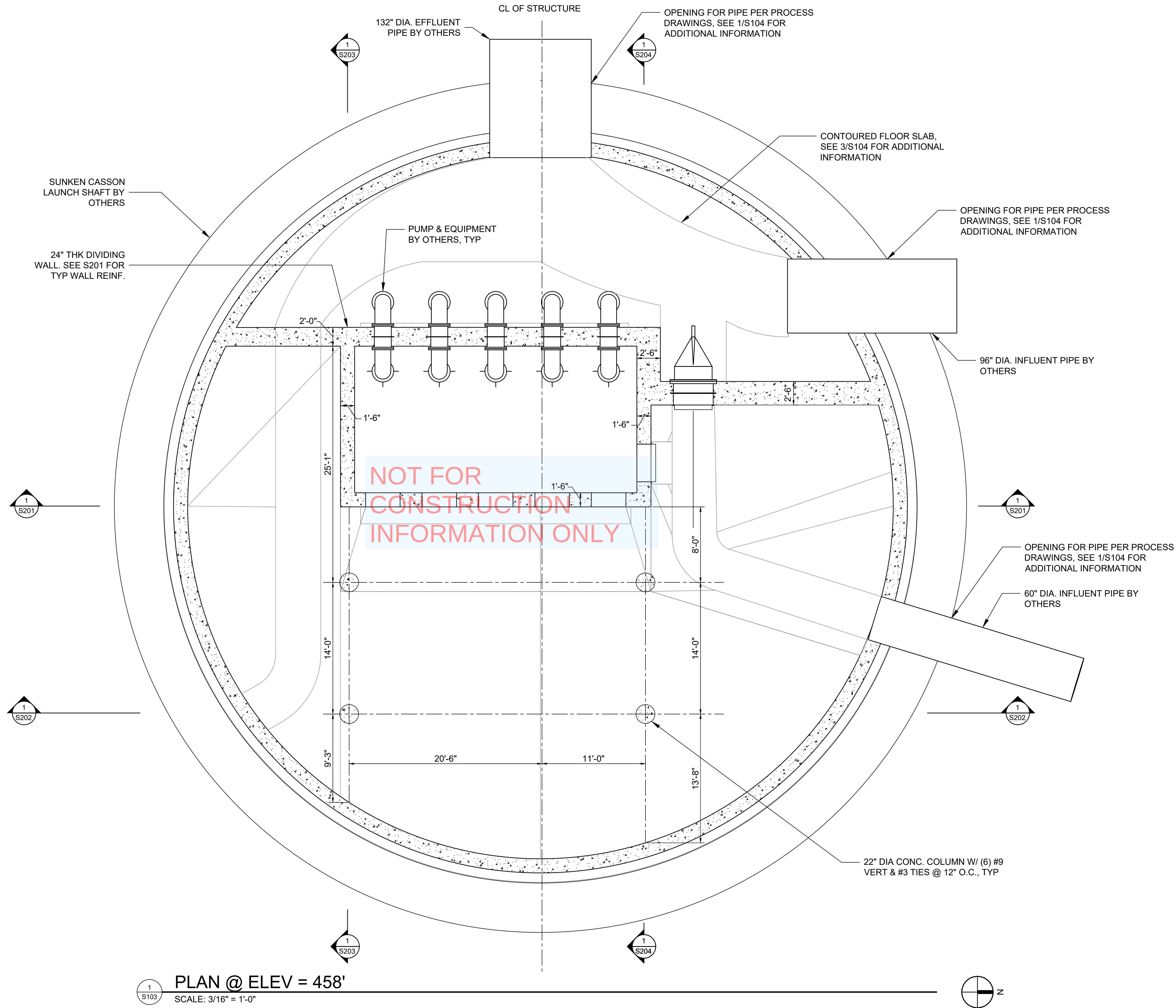
99



1  
S102

PLAN @ ELEV = 470'

SCALE: 3/16" = 1'-0"



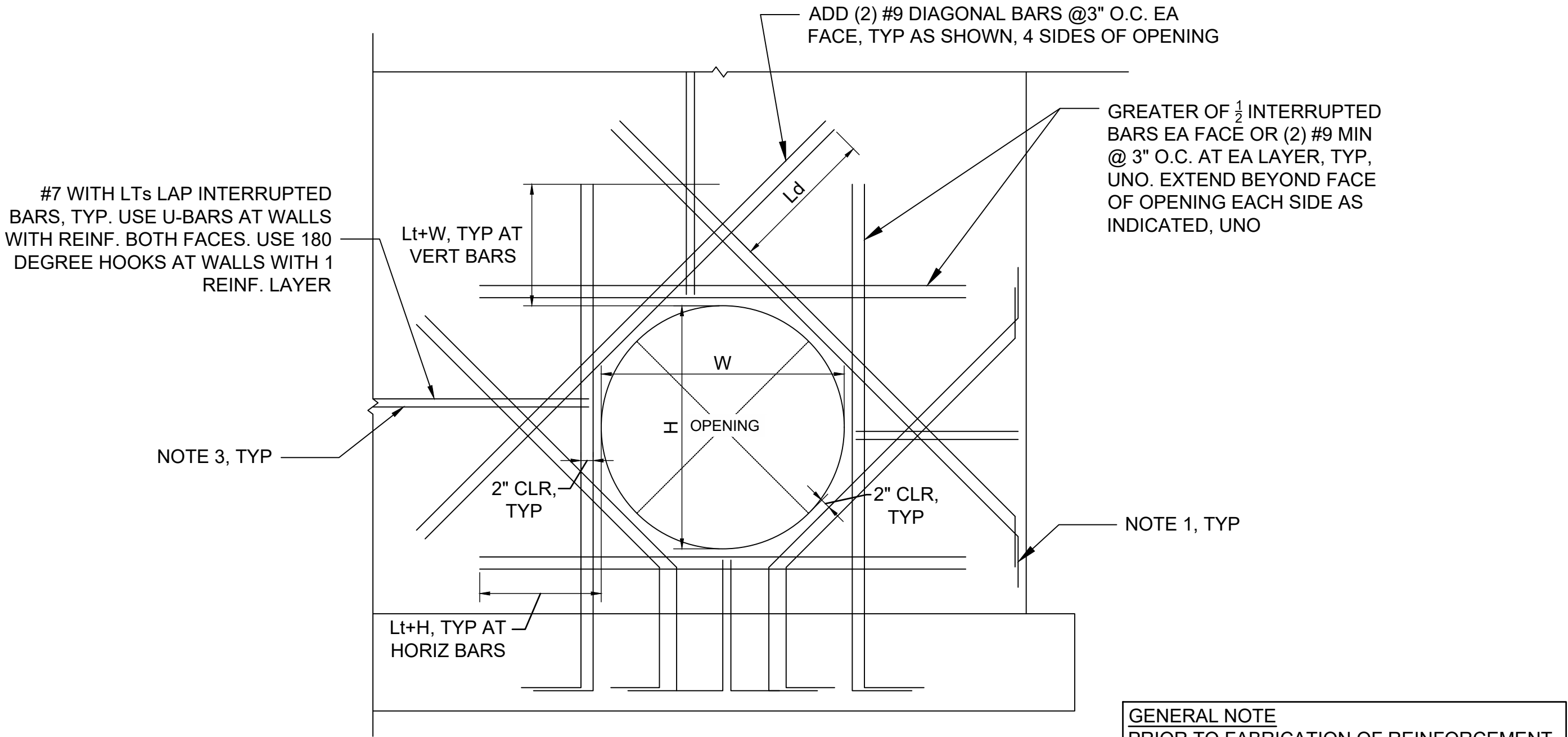
1 S103  
**PLAN @ ELEV = 458'**  
SCALE: 3/16" = 1'-0"

STAGE 3 DRAWINGS

HAM-75-1.25 PUMP STATION  
STRUCTURAL DESIGN  
DRAWINGS

DESIGN AGENCY  
**AMERICAN  
STRUCTUREPOINT  
INC.**

|                      |             |
|----------------------|-------------|
| DESIGNER             | TDS         |
| REVIEWER             | XXX MM/YYYY |
| PROJECT ID           | 2020.03346  |
| SHEET IDENTIFICATION | S103        |
| SHEET                | TOTAL       |
| 38                   | 99          |



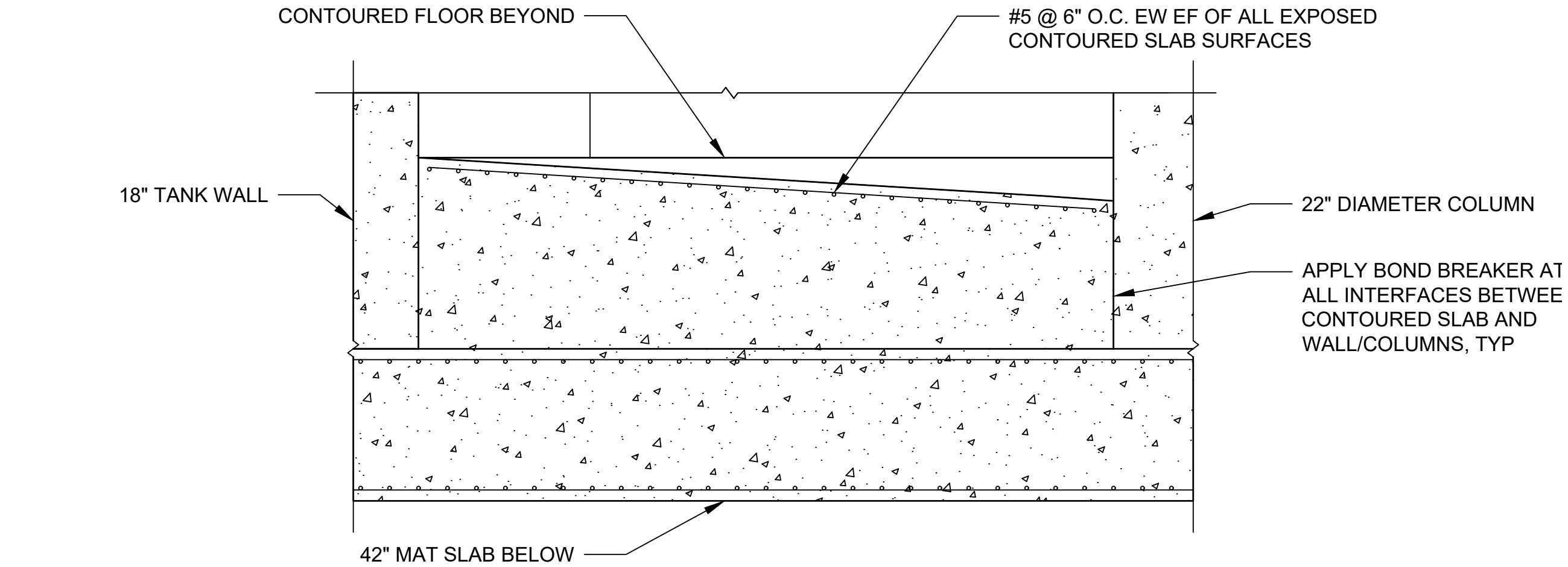
**TYPICAL EXTRA LARGE CONCRETE WALL  
OPENING DETAIL (ROUND OPENING)**

SCALE: 3/4" = 1'-0"

NOTES:

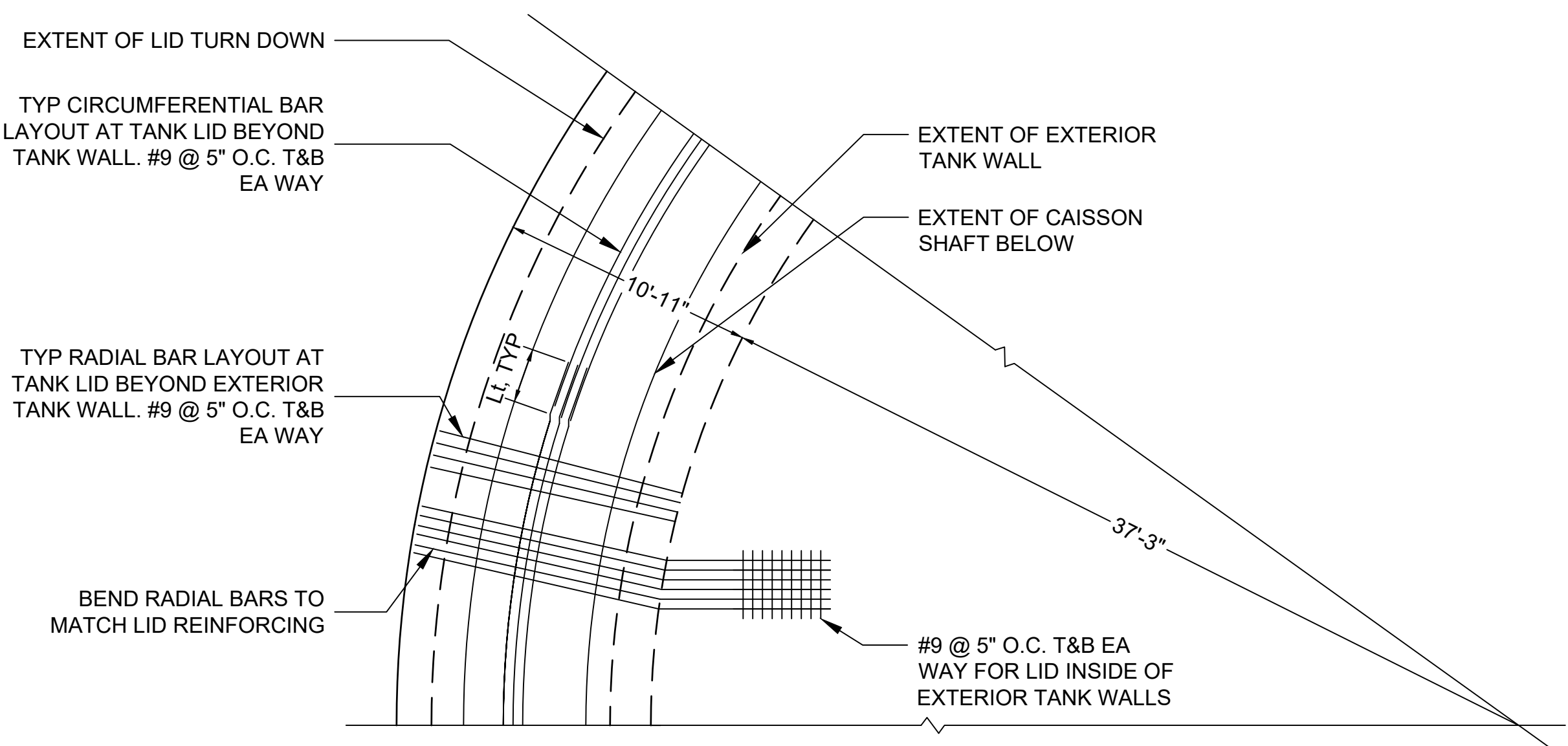
1. PROVIDE STANDARD HOOK WHEN EDGE OF WALL IS TOO CLOSE TO OPENING TO ALLOW STRAIGHT BAR EMBEDMENT INDICATED.
2. VERIFY ALL OPENINGS (INCLUDING PIPING/CONDUIT PENETRATIONS) NOT SHOWN ON STRUCTURAL DRAWINGS WITH THE STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION.
3. SEE PLANS FOR DETAILS AND REQUIRED WALL REINFORCEMENT.
4. UNINTERRUPTED WALL REINFORCEMENT NOT SHOWN FOR CLARITY. ADJUST WALL REINFORCEMENT TO MINIMIZE NUMBER OF INTERRUPTED BARS.

GENERAL NOTE  
PRIOR TO FABRICATION OF REINFORCEMENT,  
CONTRACTOR SHALL REVIEW REQUIRED  
OPENINGS WITH ALL TRADES REQUIRING  
PENETRATIONS. FOR OPENINGS THAT  
EXCEED THE LIMITATIONS OF THIS DETAIL,  
COORDINATE REQUIREMENTS WITH THE  
STRUCTURAL ENGINEER PRIOR TO  
FABRICATION OF REINFORCEMENT



**CONTOURED SLAB REINFORCING DETAIL**

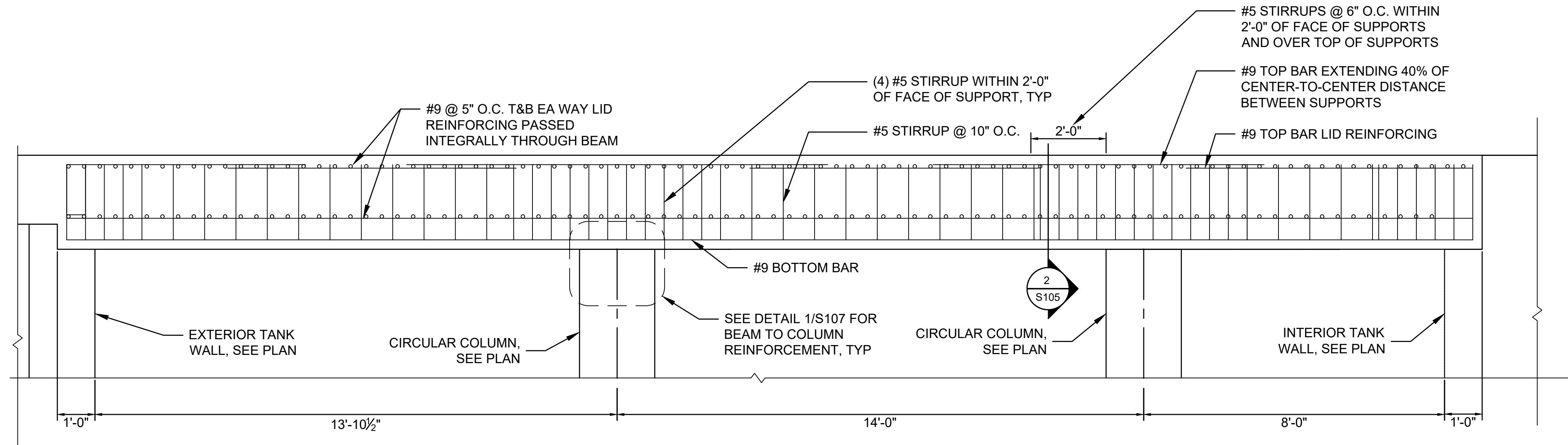
SCALE: 3/8" = 1'-0"



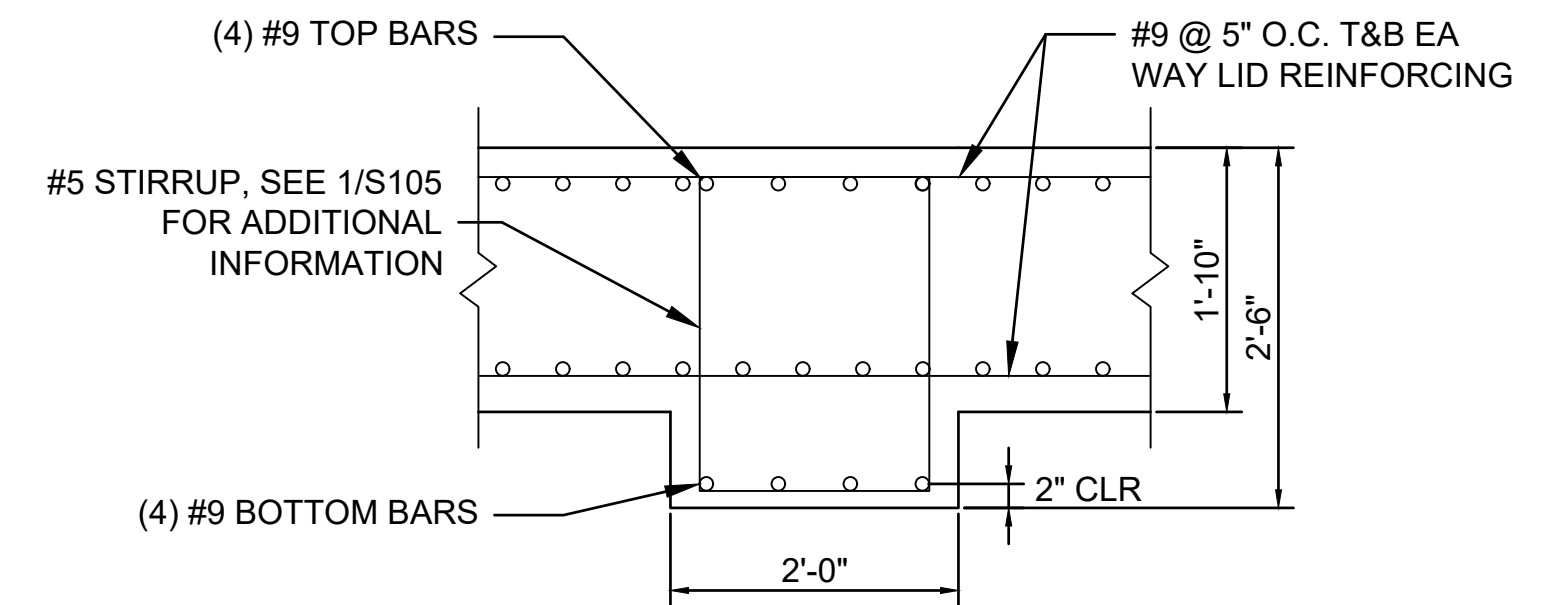
**TANK LID REINFORCING DETAIL**

SCALE: 3/16" = 1'-0"

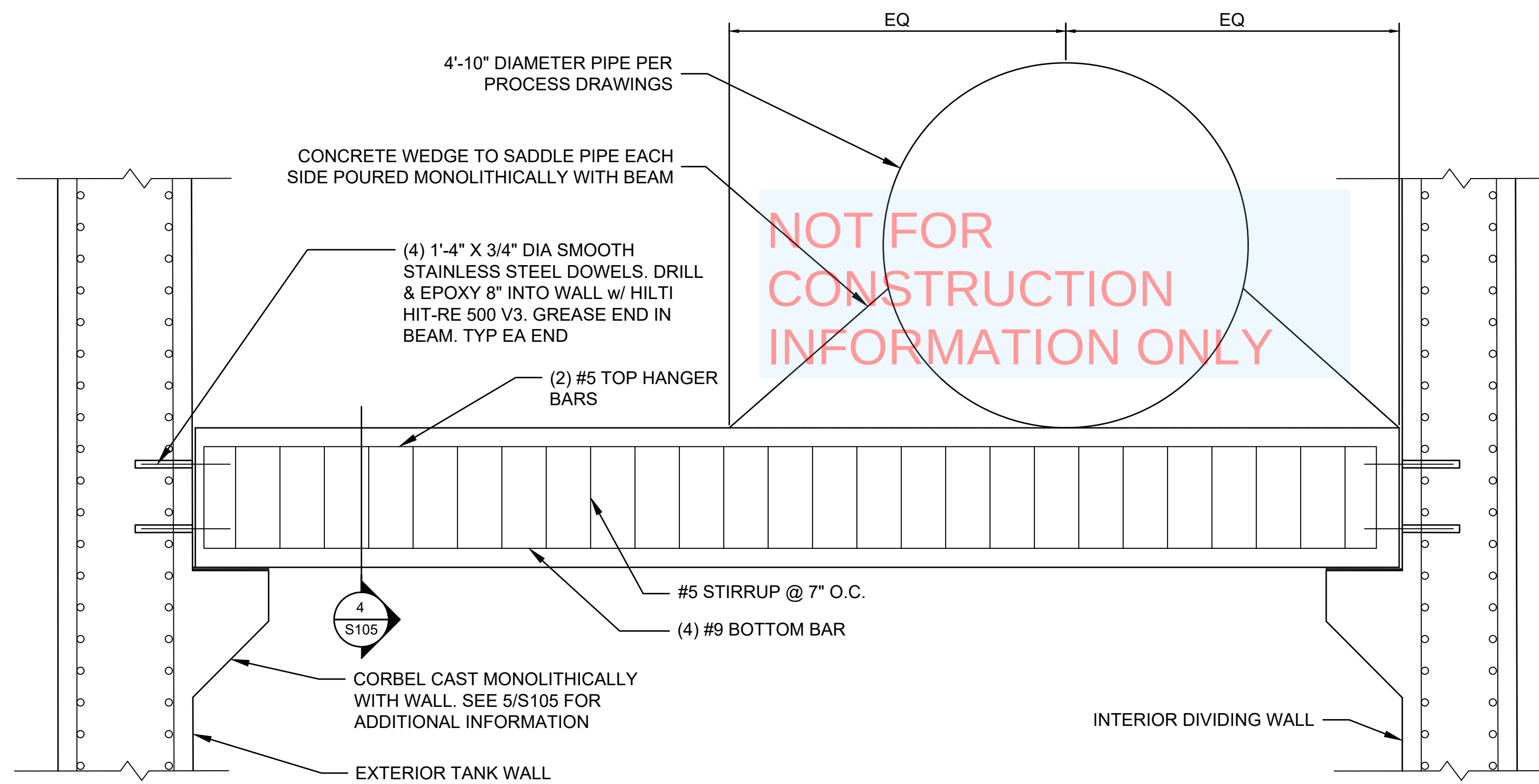
STAGE 3 DRAWINGS



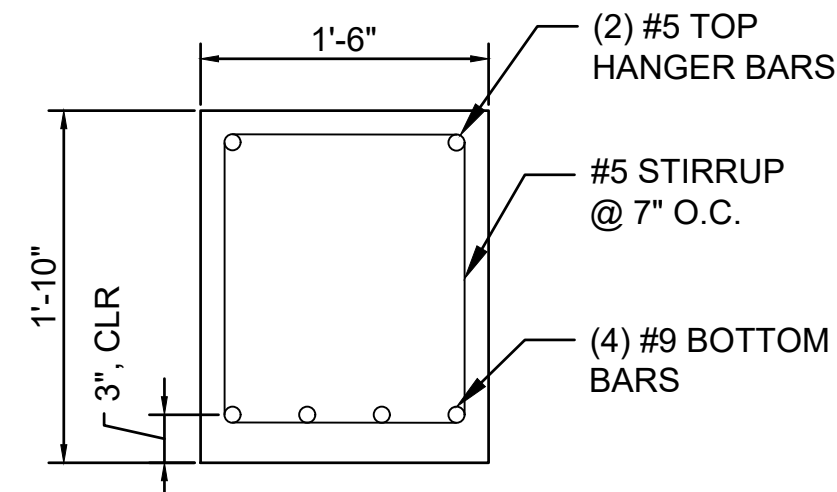
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S105  
**TYPICAL MULTI SPAN INTEGRAL BEAM DETAIL**  
SCALE: 1/2" = 1'-0"



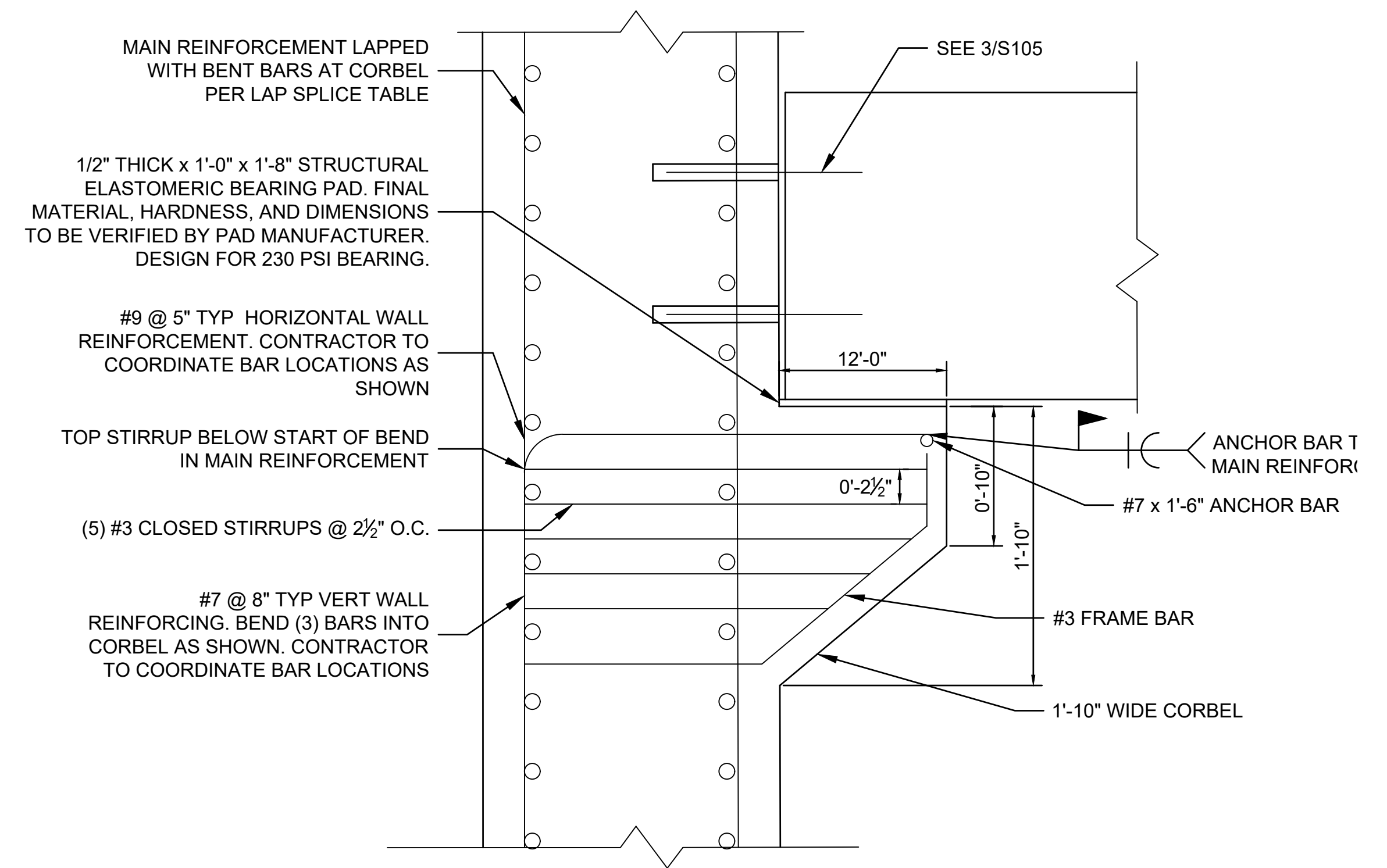
2  
S105  
**TYPICAL MULTI SPAN INTEGRAL BEAM SECTION**  
SCALE: 3/4" = 1'-0"



3  
S105  
**SADDLE BEAM DETAIL**  
SCALE: 1/2" = 1'-0"

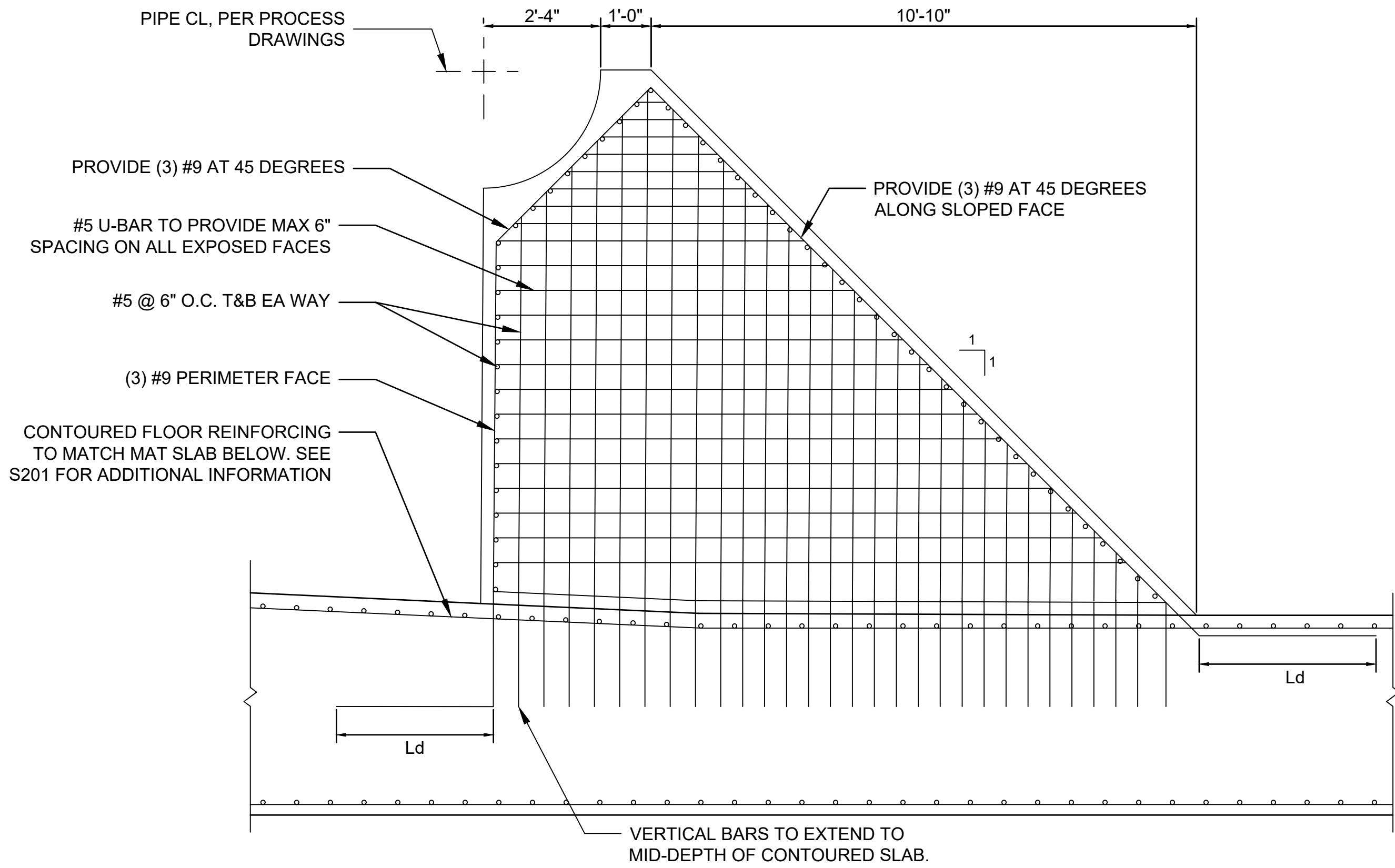
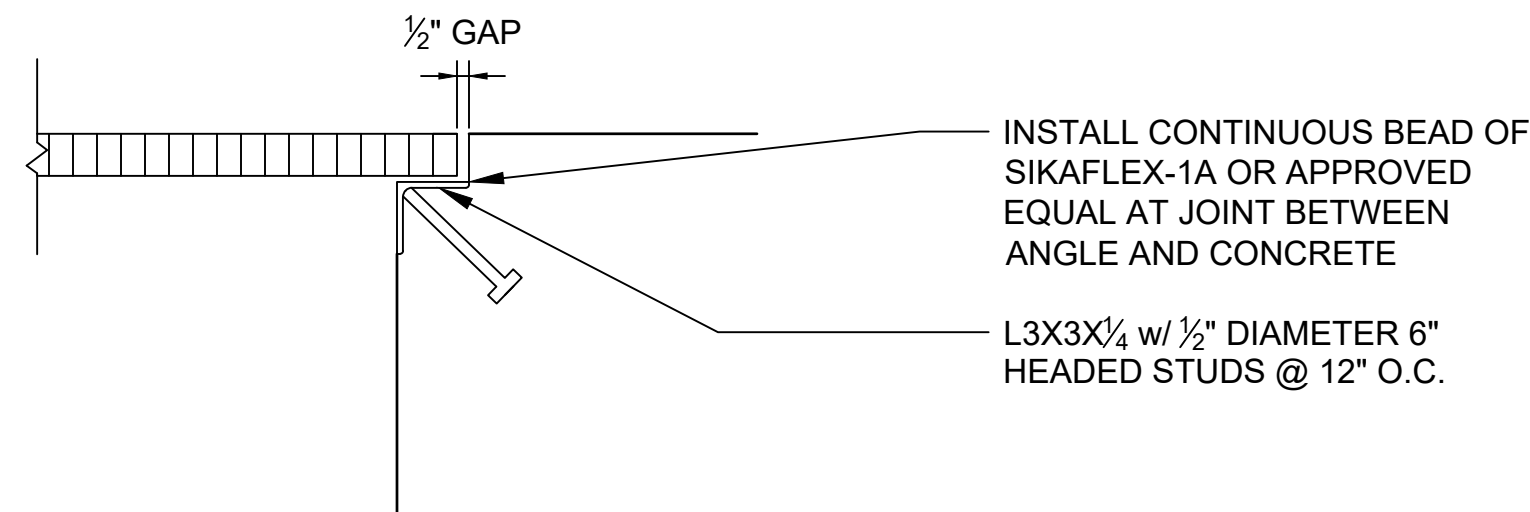
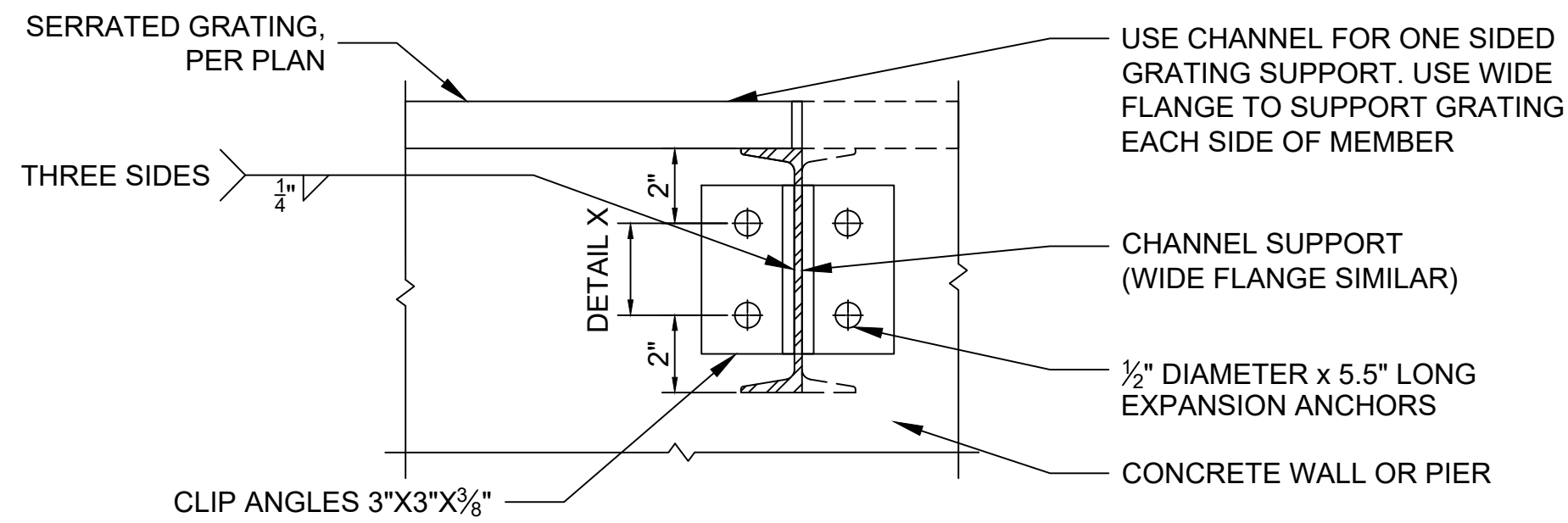
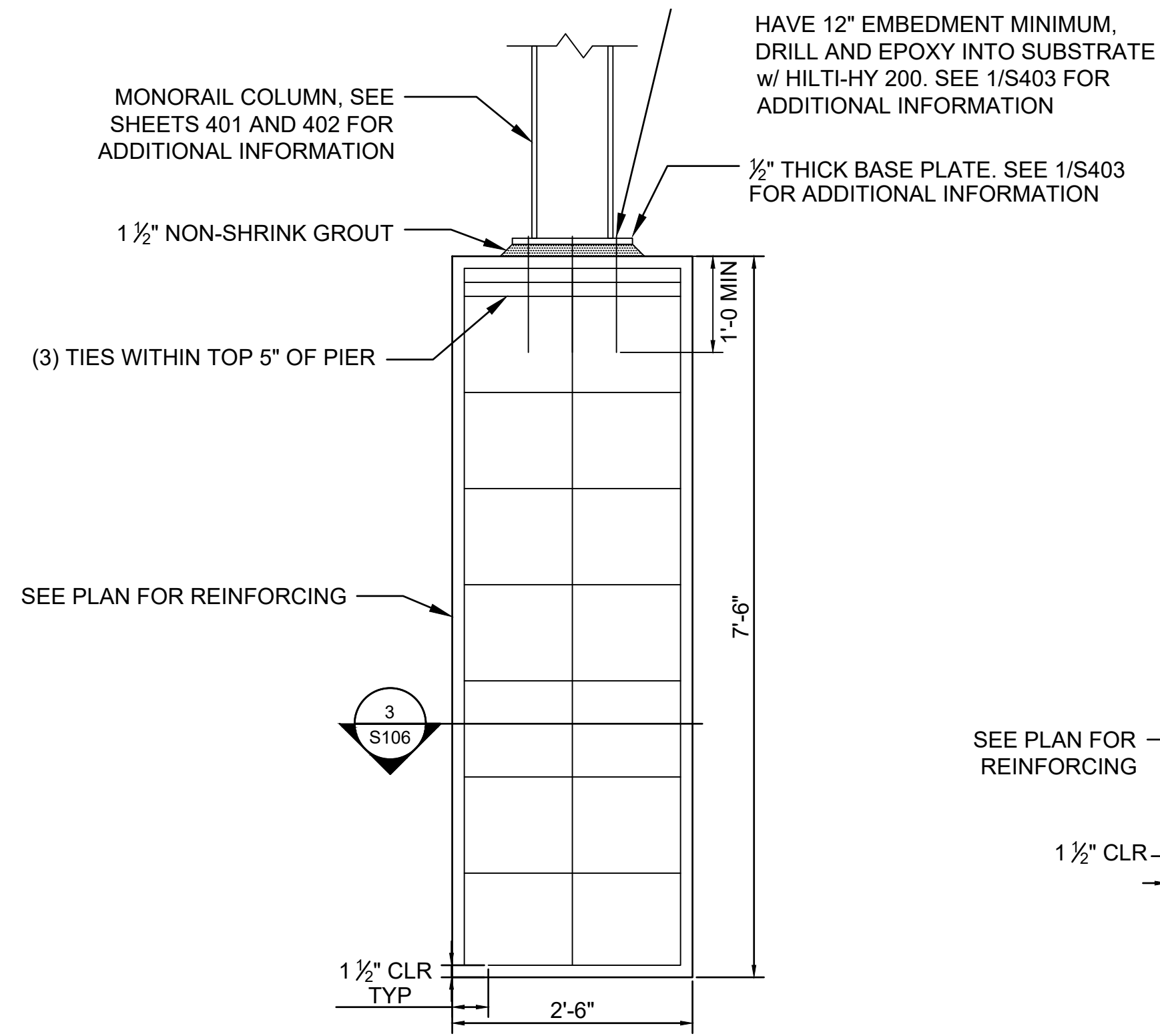
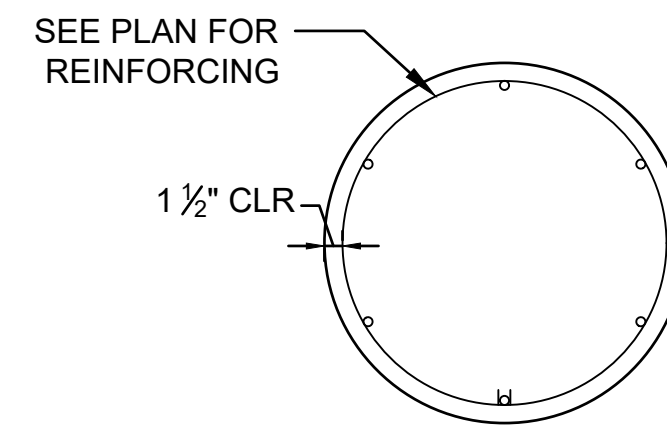


4  
S105  
**SADDLE BEAM DETAIL**  
SCALE: 3/4" = 1'-0"

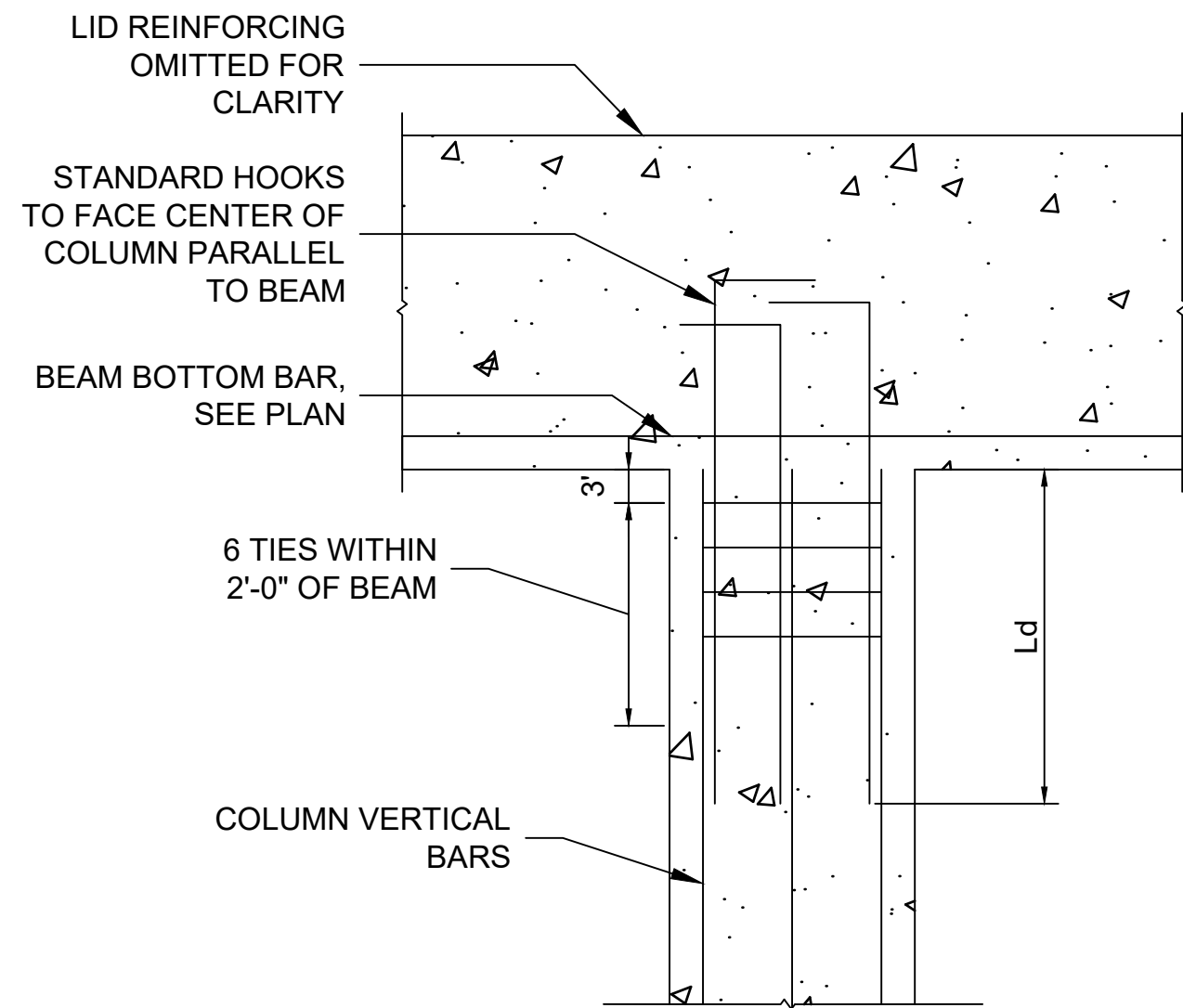


5  
S105  
**CORBEL DETAIL**  
SCALE: 1-1/2" = 1'-0"

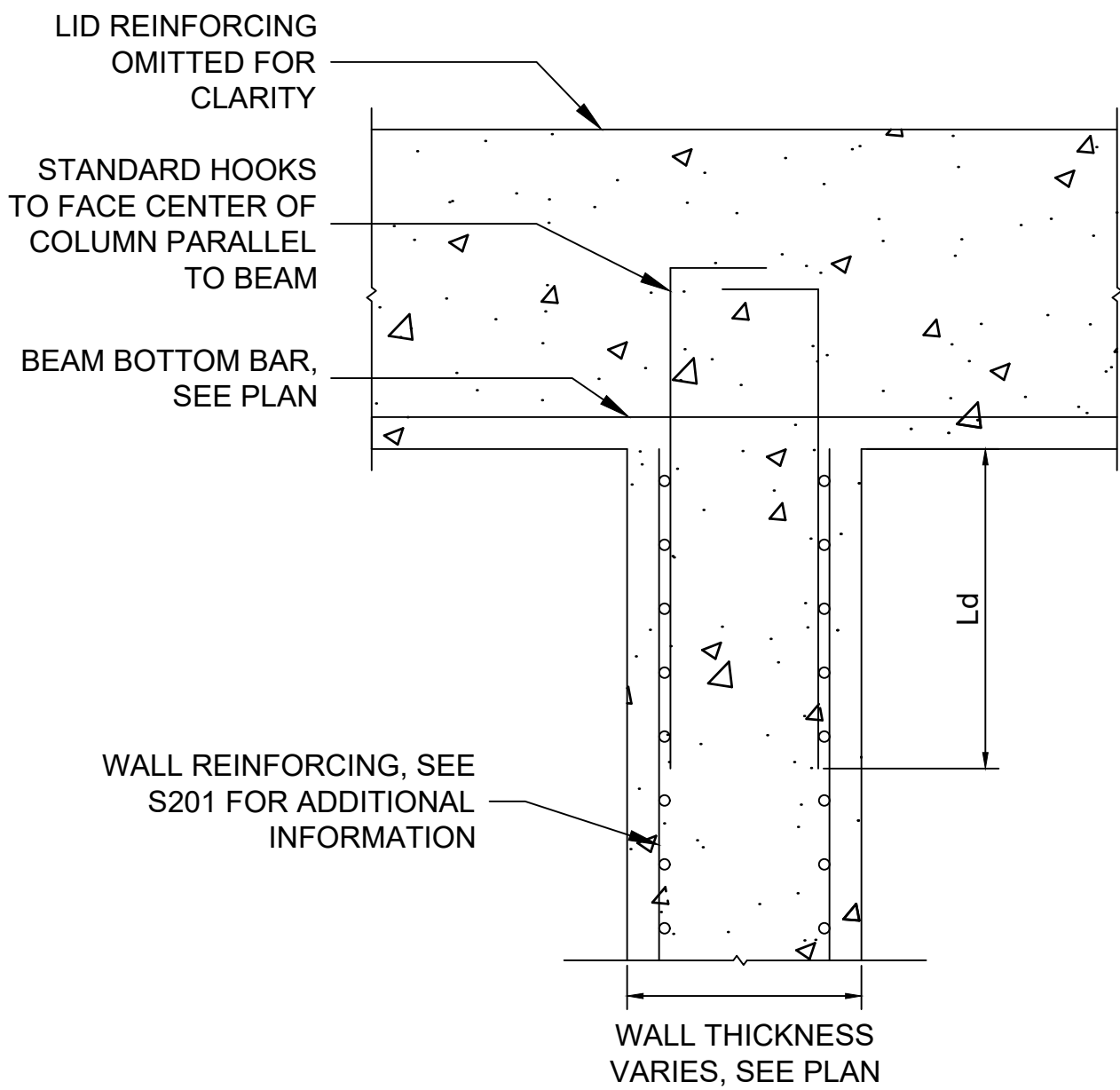
STAGE 3 DRAWINGS

1  
S106**THRUST BLOCK DETAIL**  
SCALE: 1/2" = 1'-0"4  
S106**GRATING SUPPORT DETAIL**  
N.T.S.5  
S106**GRATING SUPPORT DETAIL**  
N.T.S.2  
S106**FOOTING DETAIL**  
SCALE: 3/4" = 1'-0"3  
S106**FOOTING SECTION**  
SCALE: 3/4" = 1'-0"

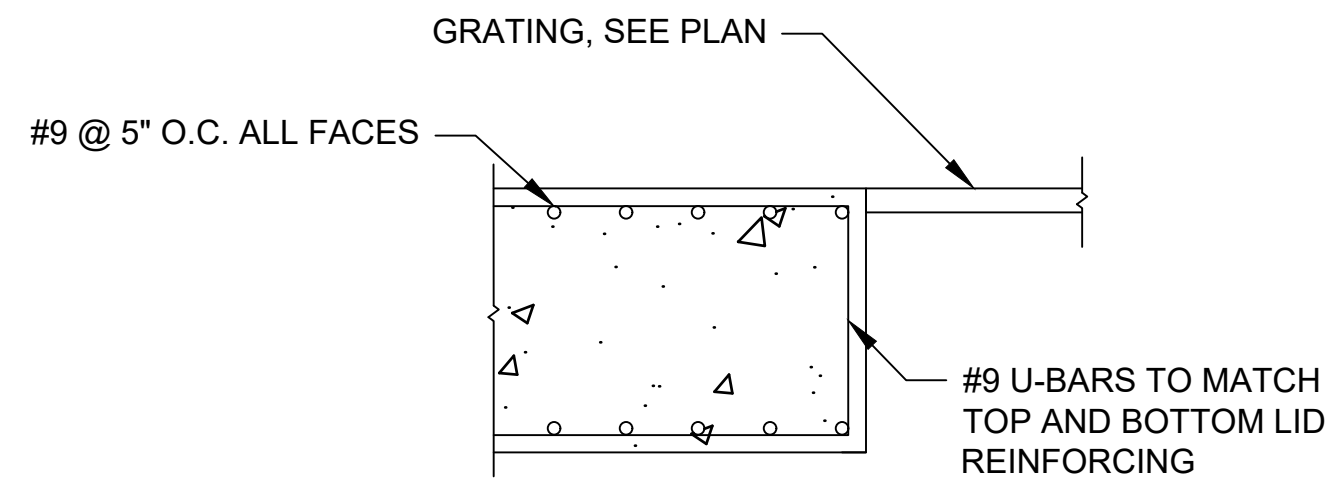
STAGE 3 DRAWINGS

1  
S107**BEAM TO COLUMN CONNECTION DETAIL**

SCALE: NTS

2  
S107**BEAM TO WALL CONNECTION DETAIL**

SCALE: NTS

3  
S107**ADDITIONAL REINFORCEMENT AT OPENING  
NOT ADJACENT TO INTEGRAL LID BEAMS**

SCALE: NTS

NOT FOR  
CONSTRUCTION  
INFORMATION ONLY

STAGE 3 DRAWINGS

DESIGN AGENCY

AMERICAN  
STRUCTUREPOINT  
INC.

DESIGNER

TDS

REVIEWER

XXX MM/YYYY

PROJECT ID

2020.03346

SHEET IDENTIFICATION

S107

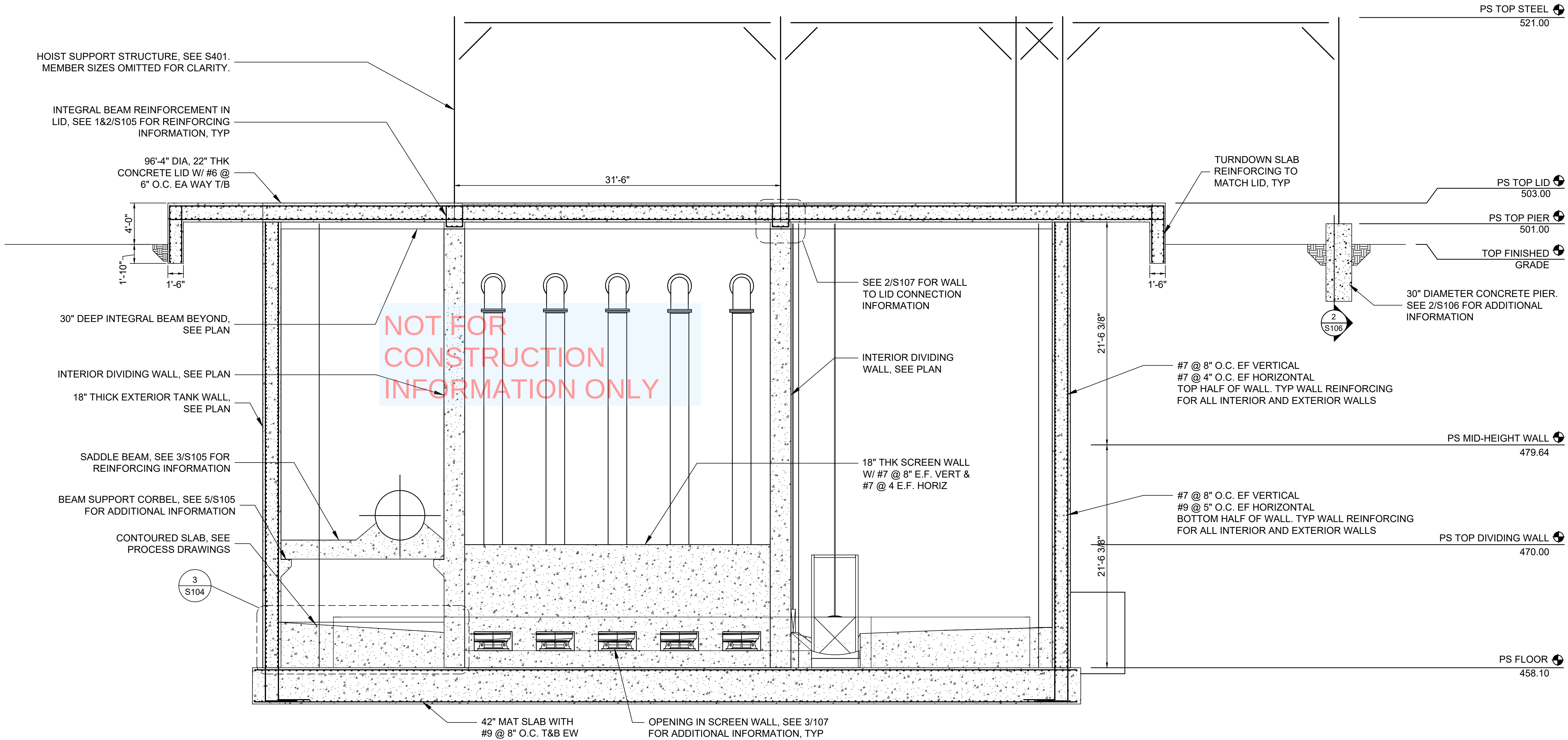
SHEET

38

TOTAL

99

HAM-75-1.25 PUMP STATION  
STRUCTURAL DESIGN  
DRAWINGS



1 SECTION  
S201 SCALE: 3/16" = 1'-0"

STAGE 3 DRAWINGS

HAM-75-1.25 PUMP STATION  
STRUCTURAL DESIGN  
DRAWINGS

DESIGN AGENCY

AMERICAN  
STRUCTUREPOINT  
INC.



DESIGNER

TDS

REVIEWER

XXX MM/YYYY

PROJECT ID

2020.03346

SHEET IDENTIFICATION

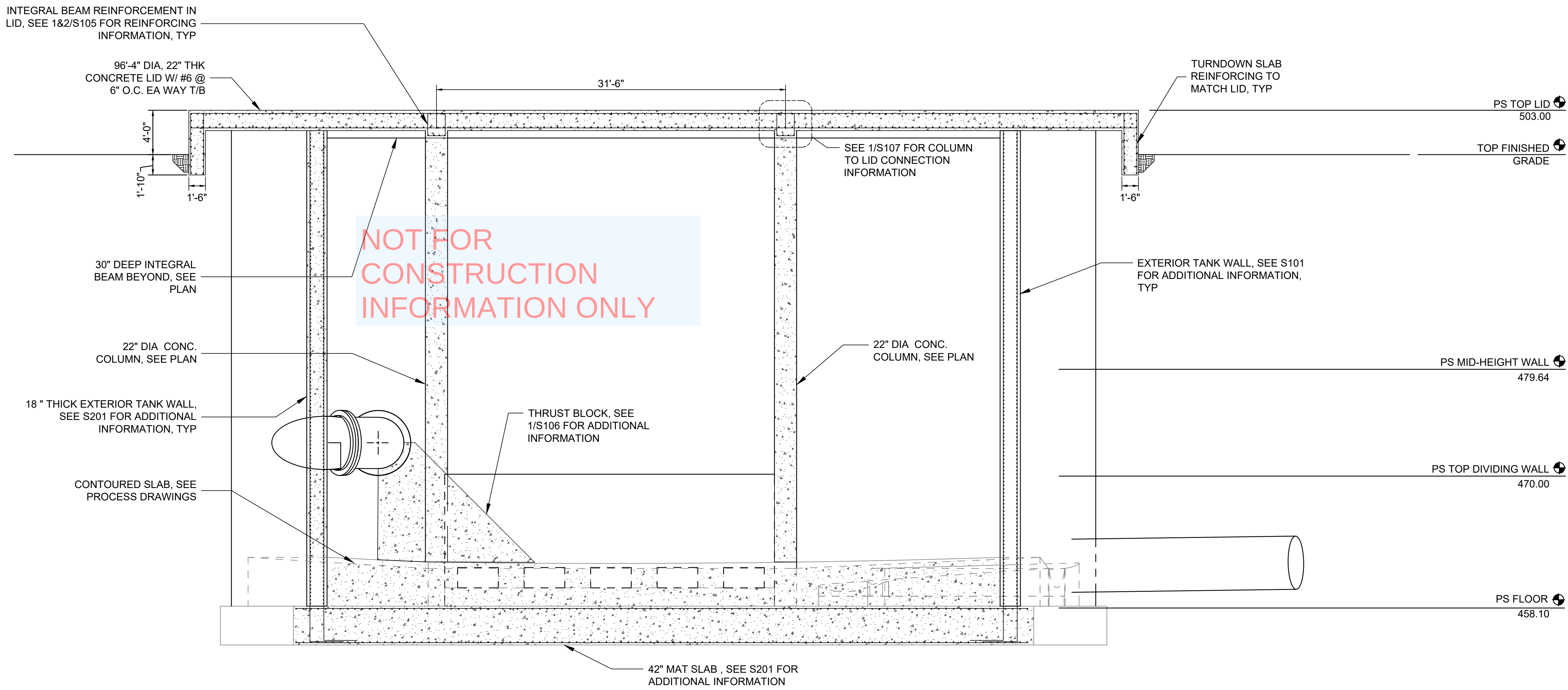
S201

SHEET

38

TOTAL

99

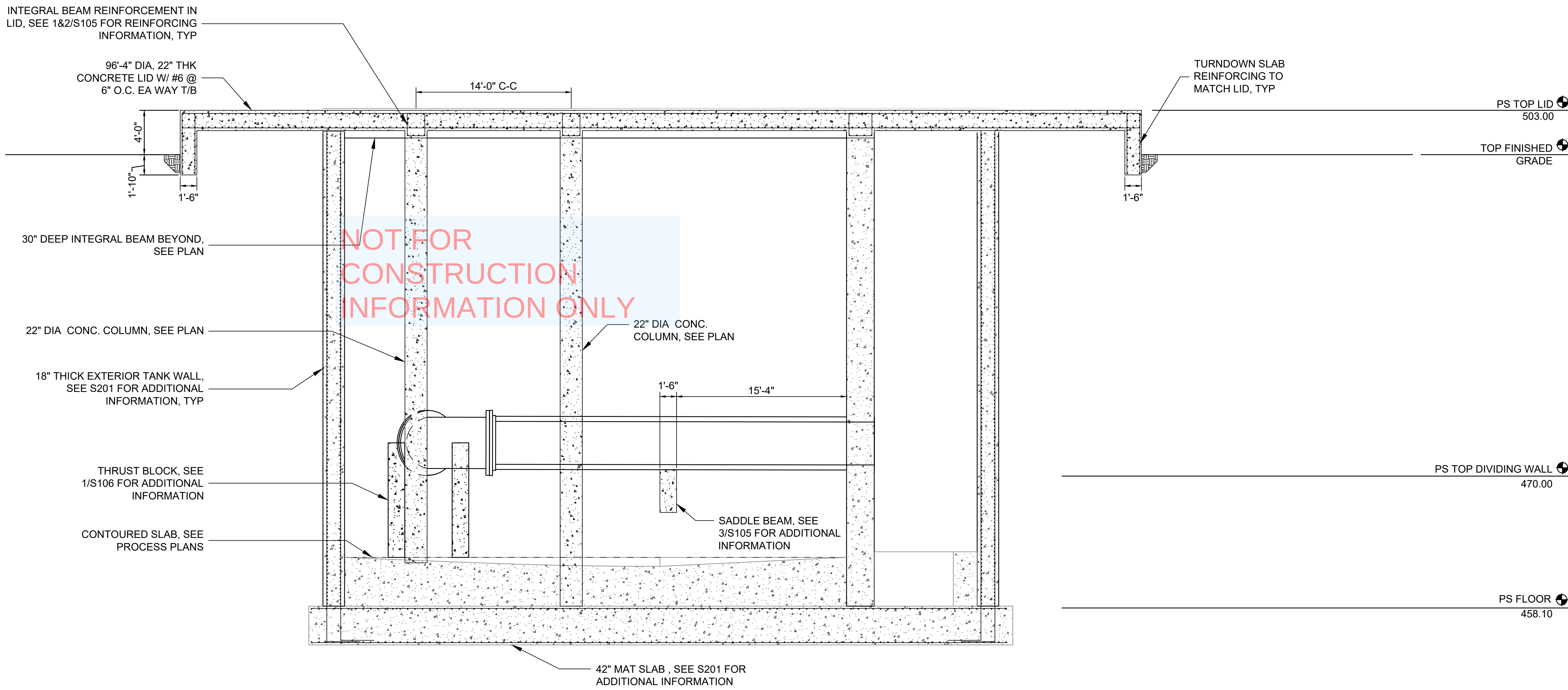


SECTION  
SCALE: 3/16" = 1'-0"

STAGE 3 DRAWINGS

HAM-75-1.25 PUMP STATION  
STRUCTURAL DESIGN  
DRAWINGS

|                                    |       |
|------------------------------------|-------|
| DESIGN AGENCY                      |       |
| AMERICAN<br>STRUCTUREPOINT<br>INC. |       |
| DESIGNER                           |       |
| TDS                                |       |
| REVIEWER                           |       |
| XXX MM/YYYY                        |       |
| PROJECT ID                         |       |
| 2020.03346                         |       |
| SHEET IDENTIFICATION               |       |
| S202                               |       |
| SHEET                              | TOTAL |
| 38                                 | 99    |

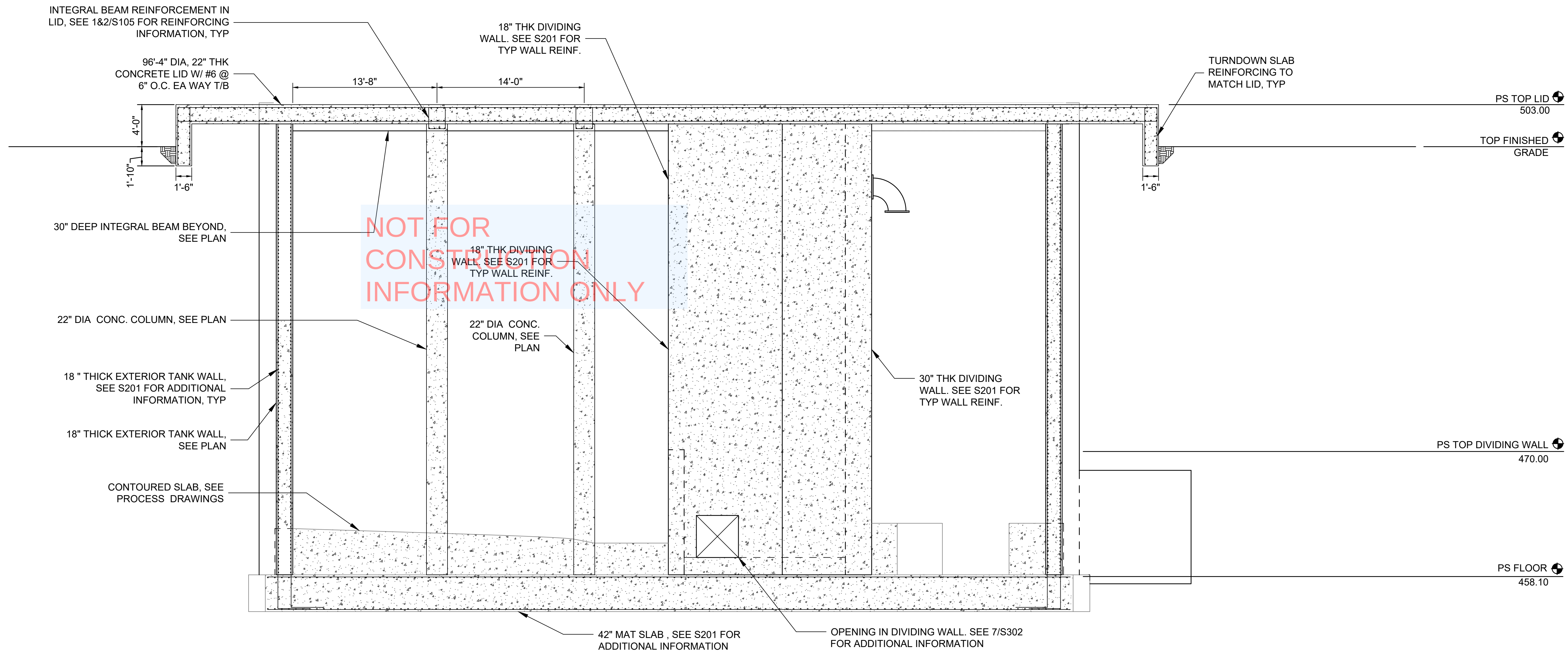


1 SECTION  
S203 SCALE: 3/16" = 1'-0"

STAGE 3 DRAWINGS

HAM-75-1.25 PUMP STATION  
STRUCTURAL DESIGN  
DRAWINGS

|                                    |       |
|------------------------------------|-------|
| DESIGN AGENCY                      |       |
| AMERICAN<br>STRUCTUREPOINT<br>INC. |       |
| DESIGNER                           |       |
| TDS                                |       |
| REVIEWER                           |       |
| XXX MM/YYYY                        |       |
| PROJECT ID                         |       |
| 2020.03346                         |       |
| SHEET IDENTIFICATION               |       |
| S203                               |       |
| SHEET                              | TOTAL |
| 38                                 | 99    |



1  
SECTION  
SCALE: 3/16" = 1'-0"

STAGE 3 DRAWINGS

HAM-75-1.25 PUMP STATION  
STRUCTURAL DESIGN  
DRAWINGS

DESIGN AGENCY

AMERICAN  
STRUCTUREPOINT  
INC.

DESIGNER

TDS

REVIEWER

XXX MM/YYYY

PROJECT ID

2020.03346

SHEET IDENTIFICATION

S204

SHEET

TOTAL

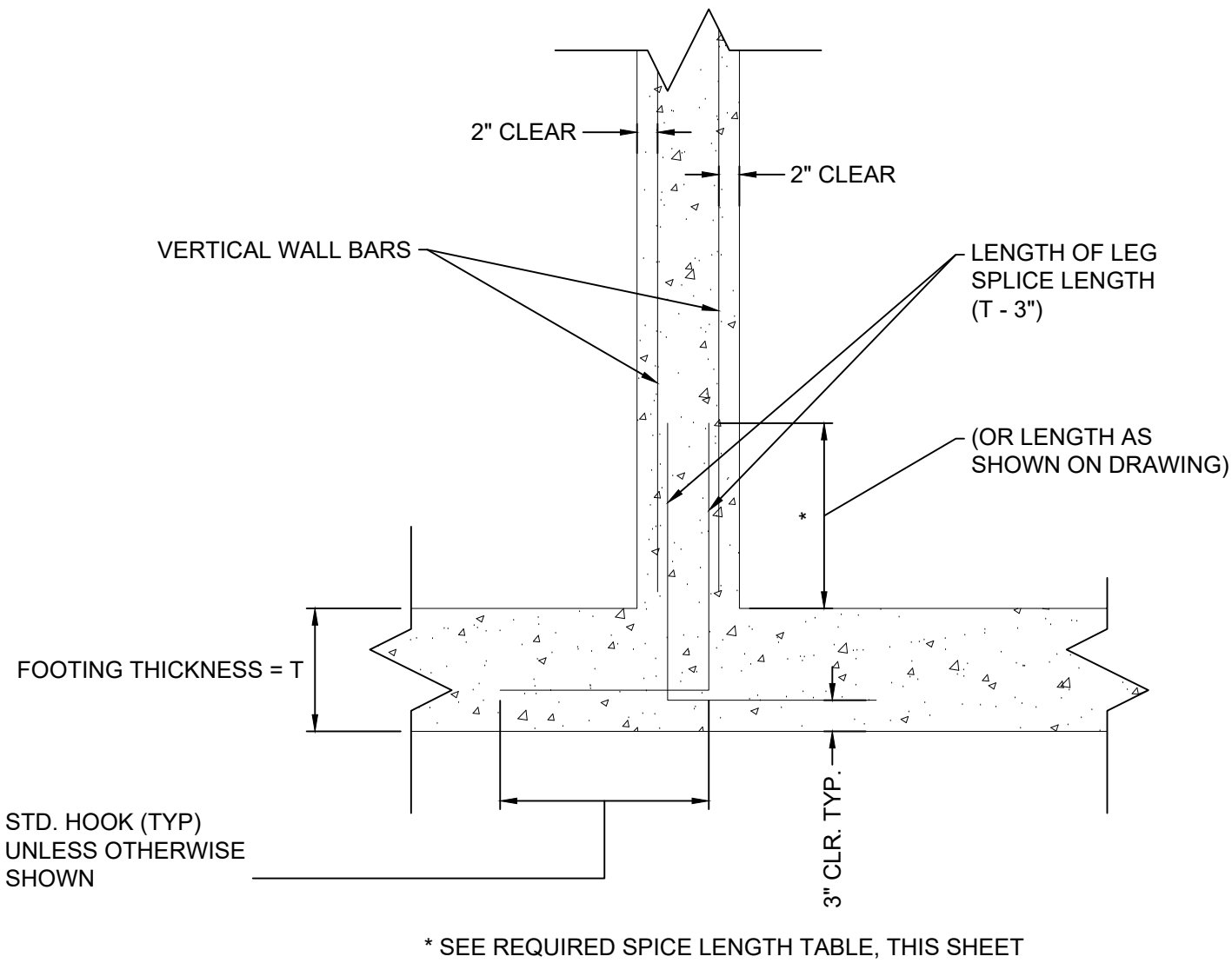
38

99

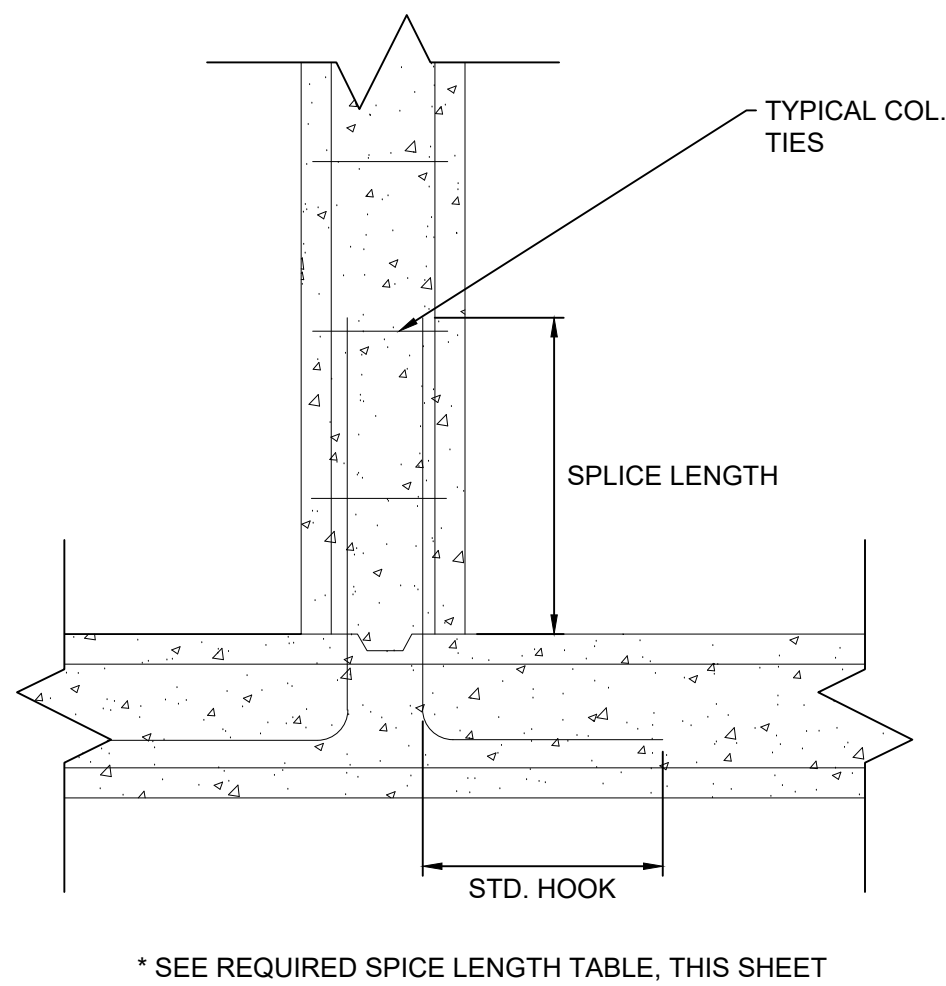
NOTES:

- db = DIAMETER OF BAR BEING DEVELOPED  
Lt = "CLASS B" TENSION LAP SPLICE LENGTH  
Lc = COMPRESSION LAP SPLICE LENGTH  
Ld = TENSION DEVELOPMENT LENGTH OF STRAIGHT BARS  
Ldh = TENSION DEVELOPMENT LENGTH OF HOOKED BARS  
Ldt = TENSION DEVELOPMENT LENGTH OF HEADED BARS  
Ldc = COMPRESSION DEVELOPMENT LENGTH OF STRAIGHT BARS
- TABULATED VALUES ARE CALCULATED PER THE PROVISIONS OF ACI 318
- TABULATED VALUES ARE FOR NON-EPOXY-COATED GRADE 60 REINFORCEMENT IN NORMAL WEIGHT CONCRETE.
- WHERE BARS OF DIFFERENT SIZES ARE LAPPED IN TENSION, THE LAP LENGTH SHALL BE THE LARGER OF Ld OF THE LARGER BAR AND Lt OF THE SMALLER BAR.
- WHERE BARS OF DIFFERENT SIZES ARE LAPPED IN COMPRESSION, THE LAP LENGTH SHALL BE THE LARGER OF Ldc OF THE LARGER BAR AND Lc OF THE SMALLER BAR.
- TABULATED VALUES FOR Lt ASSUME THE FOLLOWING:  
A) MINIMUM CLEAR SPACING BETWEEN REBAR IS THE GREATER OF THE BAR DIAMETER AND 1 INCH.  
B) MINIMUM CLEAR COVER IS 3/4 INCHES OR GREATER.  
C) BARS BEING SPLICED ARE NOT REQUIRED TO BE ENCLOSED WITHIN REINFORCEMENT ACTING AS CONFINEMENT TIES
- TABULATED VALUES FOR Ld ASSUME ONE OF THE FOLLOWING CONDITIONS IS PROVIDED; WHERE THESE CONDITIONS AREN'T ABLE TO BE MET, CONTACT ENGINEER OF RECORD FOR CONDITION SPECIFIC VALUES:  
A) BARS BEING DEVELOPED ARE ENCLOSED WITHIN REINFORCEMENT ACTING AS CONFINEMENT TIES, AND CLEAR SPACING OF BARS BEING DEVELOPED IS GREATER THAN OR EQUAL TO db, AND CLEAR COVER TO BAR BEING DEVELOPED IS GREATER THAN OR EQUAL TO db  
B) CLEAR SPACING OF BARS BEING DEVELOPED IS GREATER THAN OR EQUAL TO 2 TIMES db, AND CLEAR COVER TO BAR BEING DEVELOPED IS GREATER THAN OR EQUAL TO db
- TABULATED VALUES FOR Ldt ARE ONLY VALID FOR NORMAL WEIGHT CONCRETE WITH CLEAR COVER NOT LESS THAN 2 TIMES db AND CLEAR SPACING NOT LESS THAN 4 TIMES db (CLEAR COVER AND SPACING REQUIREMENTS LISTED IN THE GENERAL NOTES APPLY TO THE HEAD/ANCHOR, CLEAR COVER AND SPACING IN THIS PROVISION ARE WITH RESPECT TO THE REINFORCING ONLY)
- THIS TABLE IS NOT VALID FOR BUNDLED BARS.

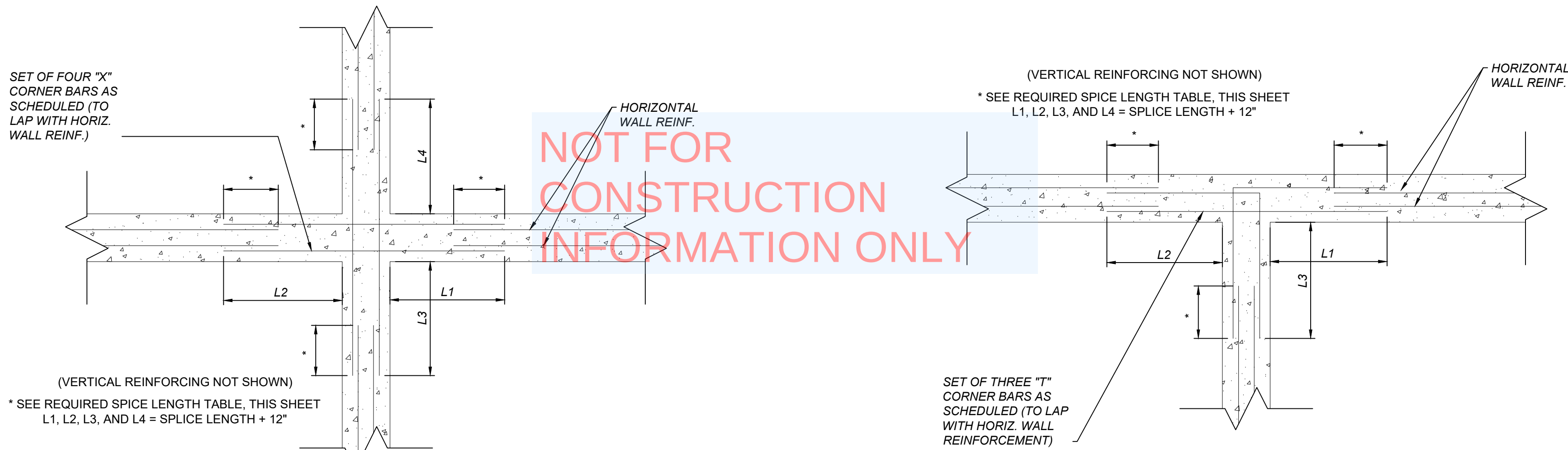
| EPOXY COATED REINFORCING BAR LAP LENGTHS: Lt, Lc AND DEVELOPMENT LENGTHS: Ld, Ldh, Ldt, Ldc (INCHES) |     |    |    |     |     |     |
|------------------------------------------------------------------------------------------------------|-----|----|----|-----|-----|-----|
| f'c = 4500 PSI                                                                                       |     |    |    |     |     |     |
| BAR SIZE                                                                                             | Lt  | Lc | Ld | Ldh | Ldt | Ldc |
| #3                                                                                                   | 19  | 12 | 19 | 9   | 8   | 8   |
| #4                                                                                                   | 25  | 15 | 24 | 11  | 10  | 9   |
| #5                                                                                                   | 34  | 19 | 30 | 15  | 11  | 12  |
| #6                                                                                                   | 46  | 23 | 36 | 17  | 14  | 14  |
| #7                                                                                                   | 75  | 27 | 53 | 20  | 16  | 16  |
| #8                                                                                                   | 92  | 30 | 59 | 22  | 18  | 18  |
| #9                                                                                                   | 112 | 34 | 67 | 26  | 21  | 21  |
| #10                                                                                                  | 135 | 39 | 75 | 30  | 23  | 23  |
| #11                                                                                                  | 158 | 43 | 84 | 32  | 26  | 26  |



2 S301 TYPICAL WALL FOOTING DOWELS N.T.S.

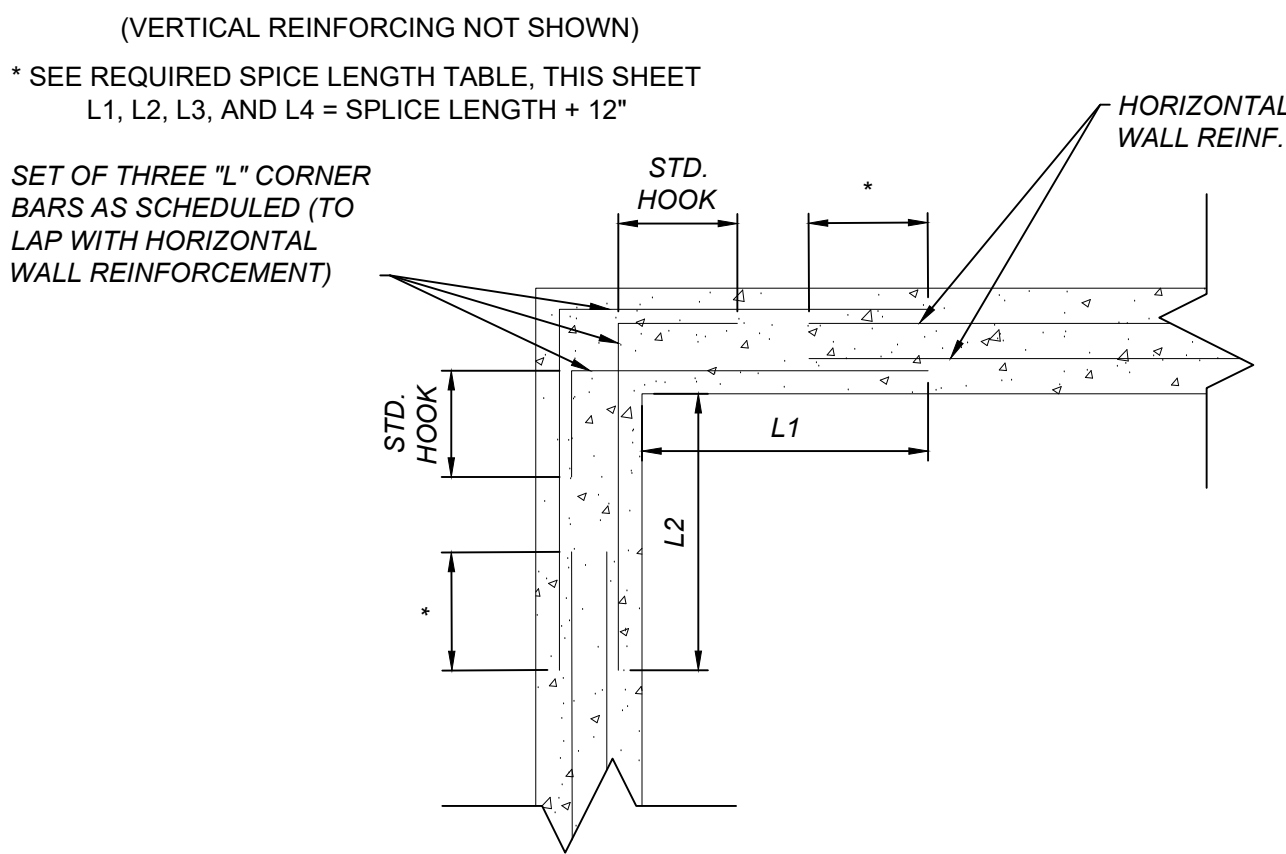


5 S301 TYPICAL COLUMN FOOTING DOWELS N.T.S.



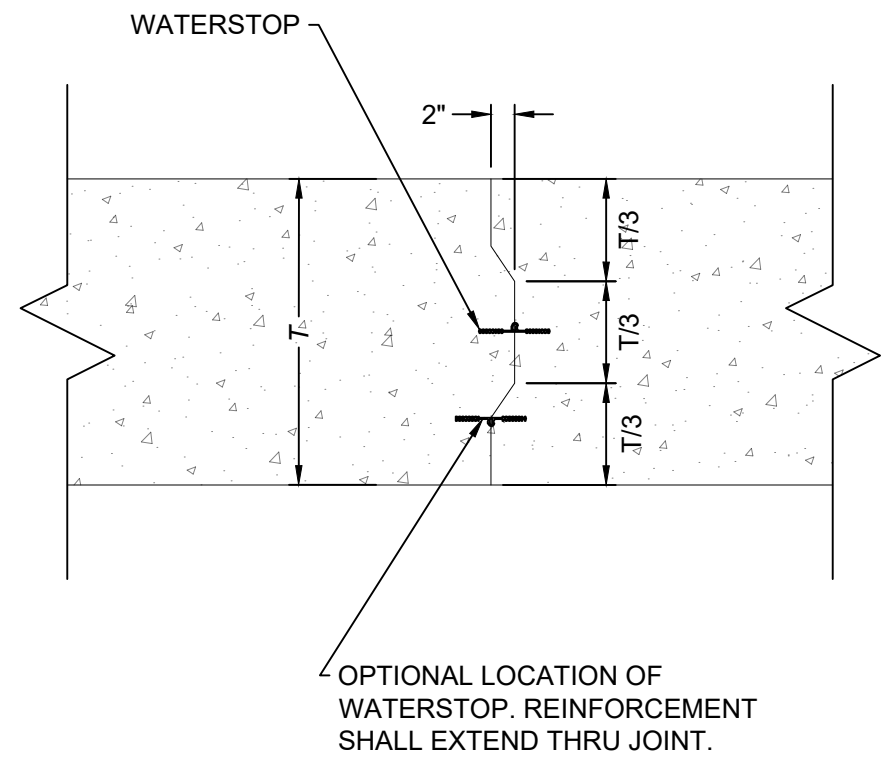
3 S301 TYPICAL REINFORCEMENT AT INTERSECTING WALLS N.T.S.

4 S301 TYPICAL REINFORCEMENT AT INTERSECTING WALLS N.T.S.



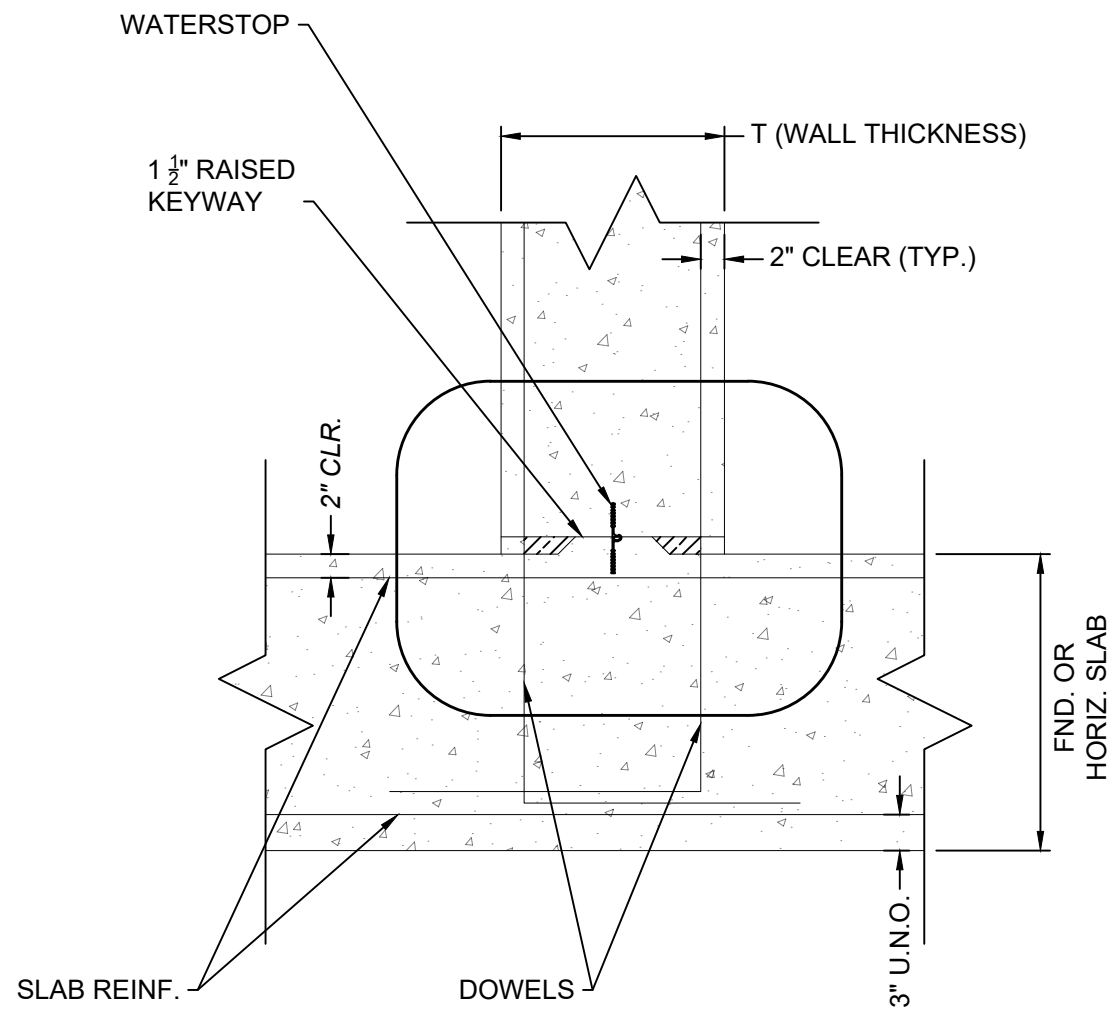
6 S301 TYPICAL REINFORCEMENT AT INTERSECTING WALLS N.T.S.

STAGE 3 DRAWINGS

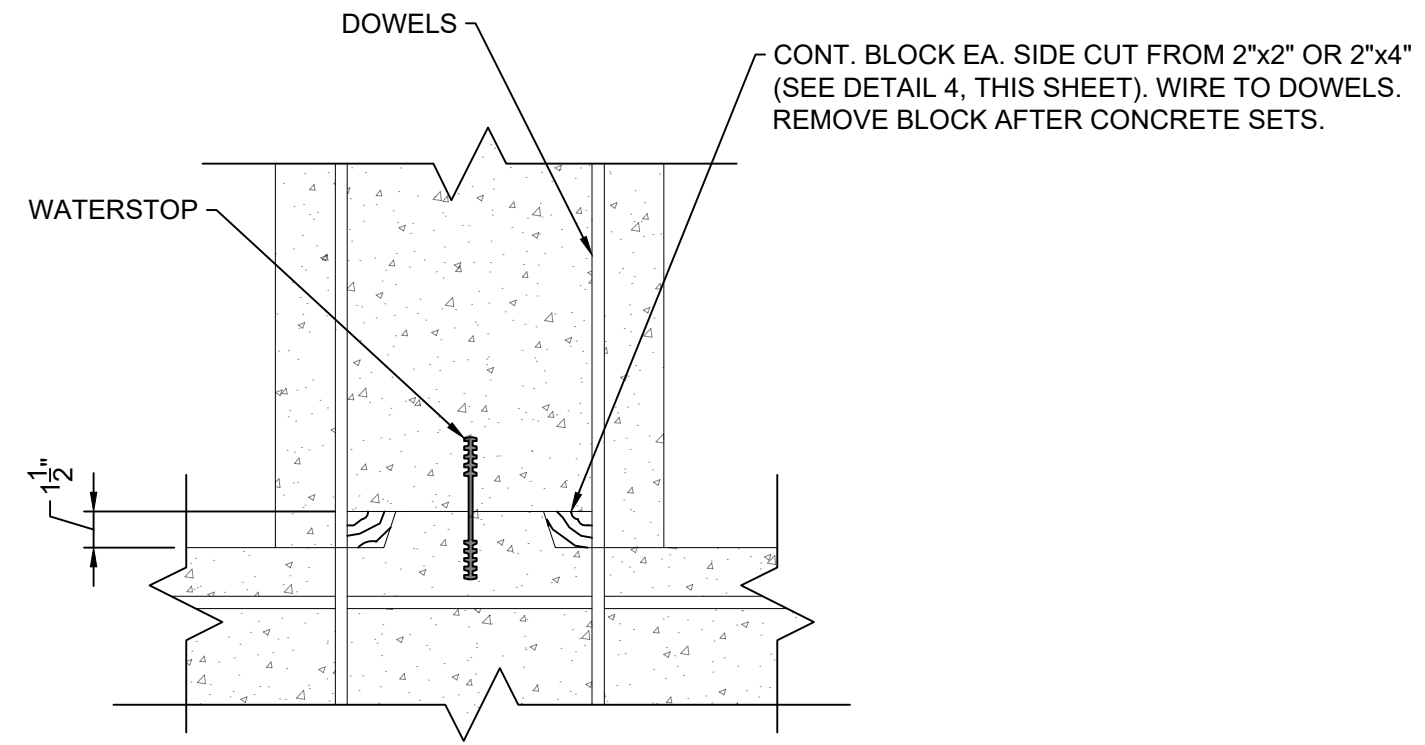


PROVIDE WATERSTOP IN ALL CONSTRUCTION JOINTS.  
WAIT MINIMUM 12 HOURS BETWEEN ADJACENT CONCRETE POURS.

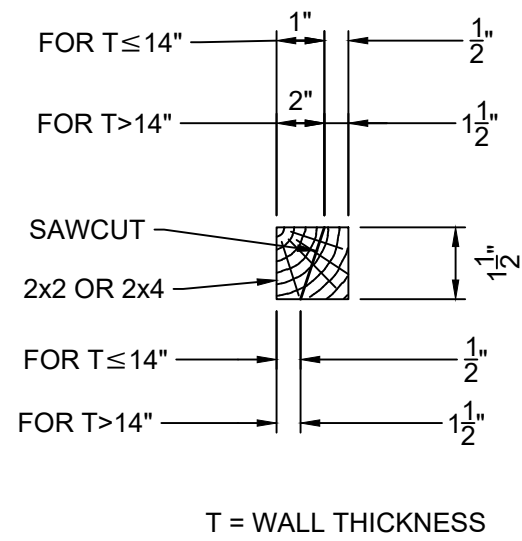
1  
S302 N.T.S. **SLAB/WALL CONSTRUCTION JOINT**



2  
S302 N.T.S. **WALL-TO-SLAB CONSTRUCTION JOINT**

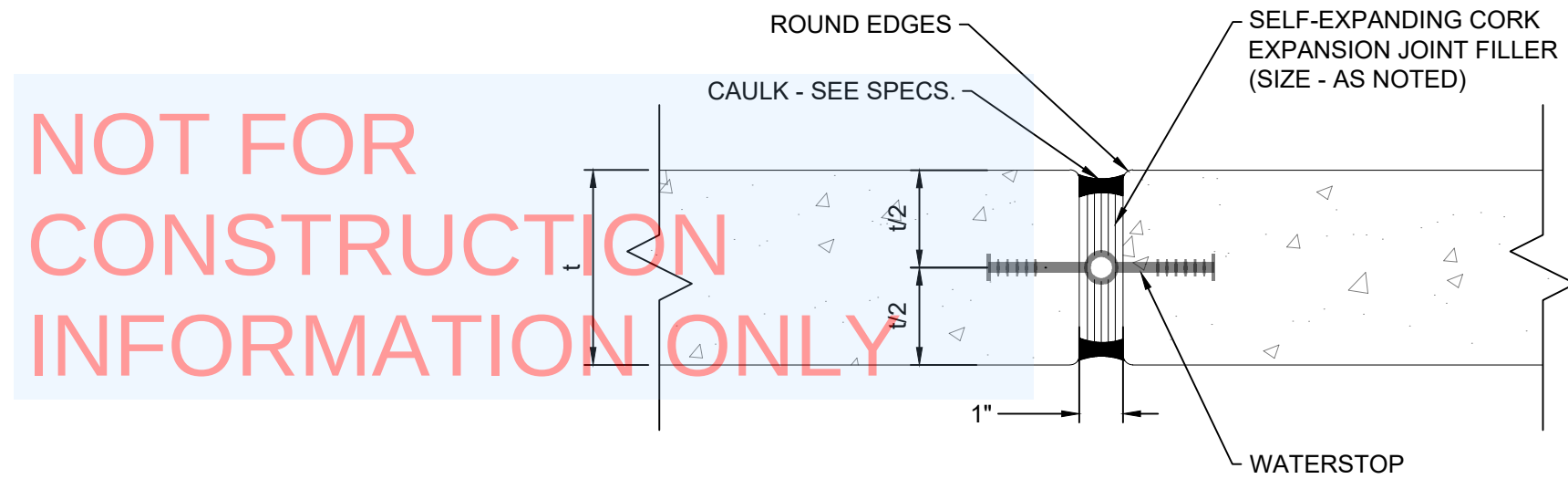


3  
S302 N.T.S. **BLOCKING PLACEMENT DETAIL**



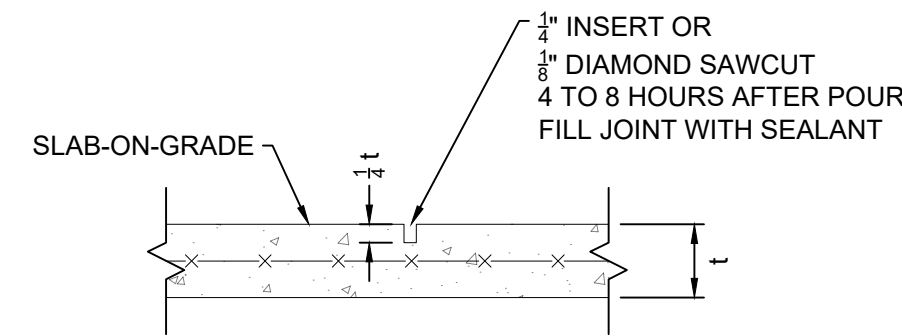
4  
S302 N.T.S. **BLOCKING DETAIL FOR CONSTRUCTION JOINT**

NOTE: REINFORCING SHALL NOT EXTEND THRU  
JOINT. CAULKING NOT REQUIRED ON  
BOTTOM OF FOOTING.



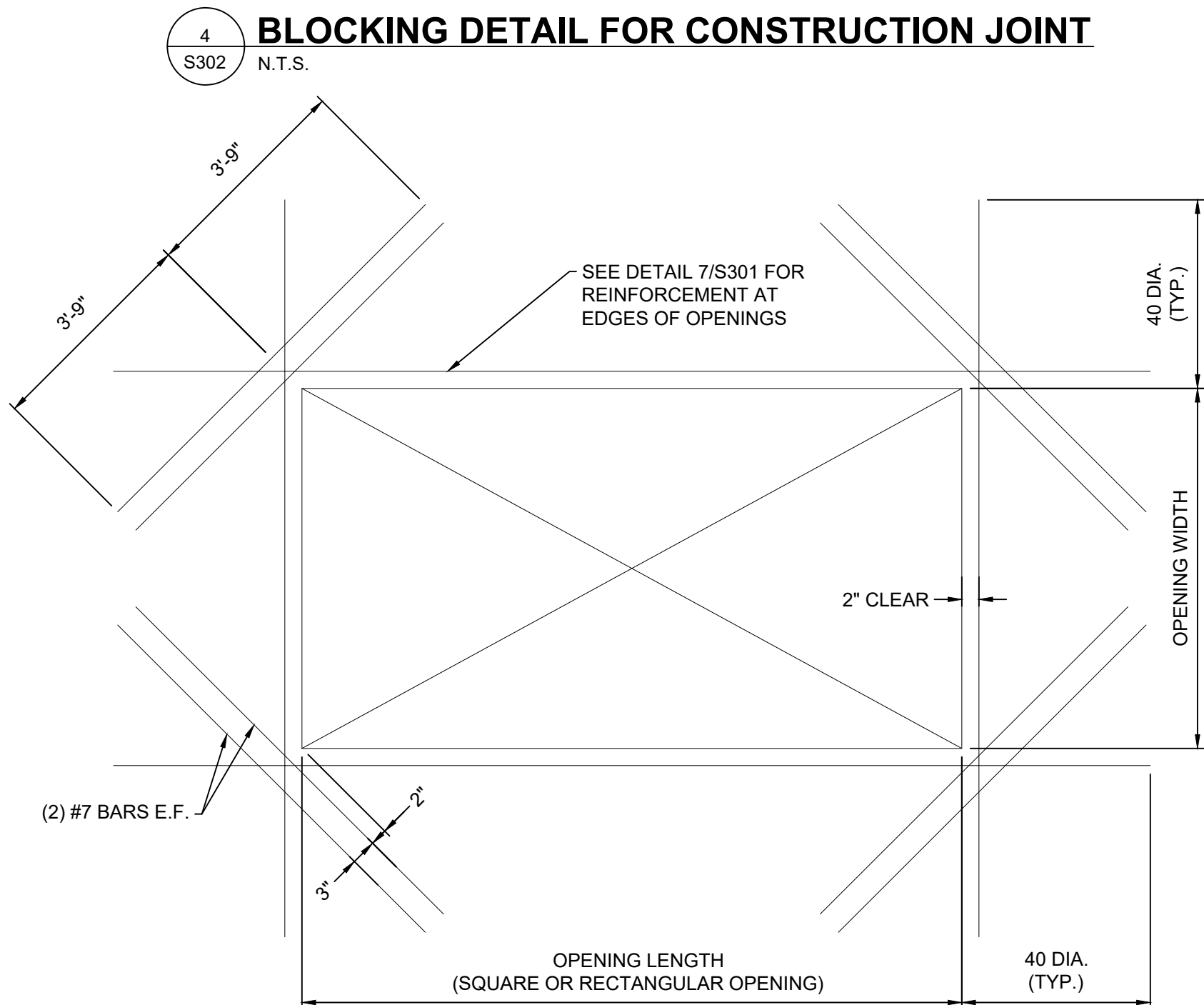
5  
S302 N.T.S. **SLAB/WALL EXPANSION JOINT**

MAXIMUM SPACING OF CONTROL JOINTS = 21 IN FEET.



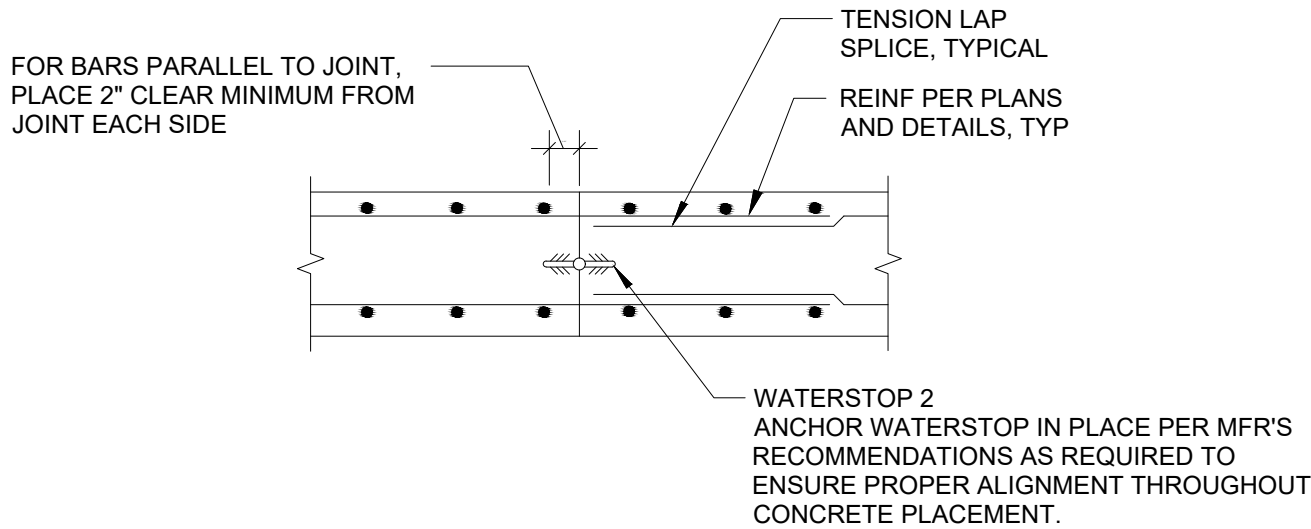
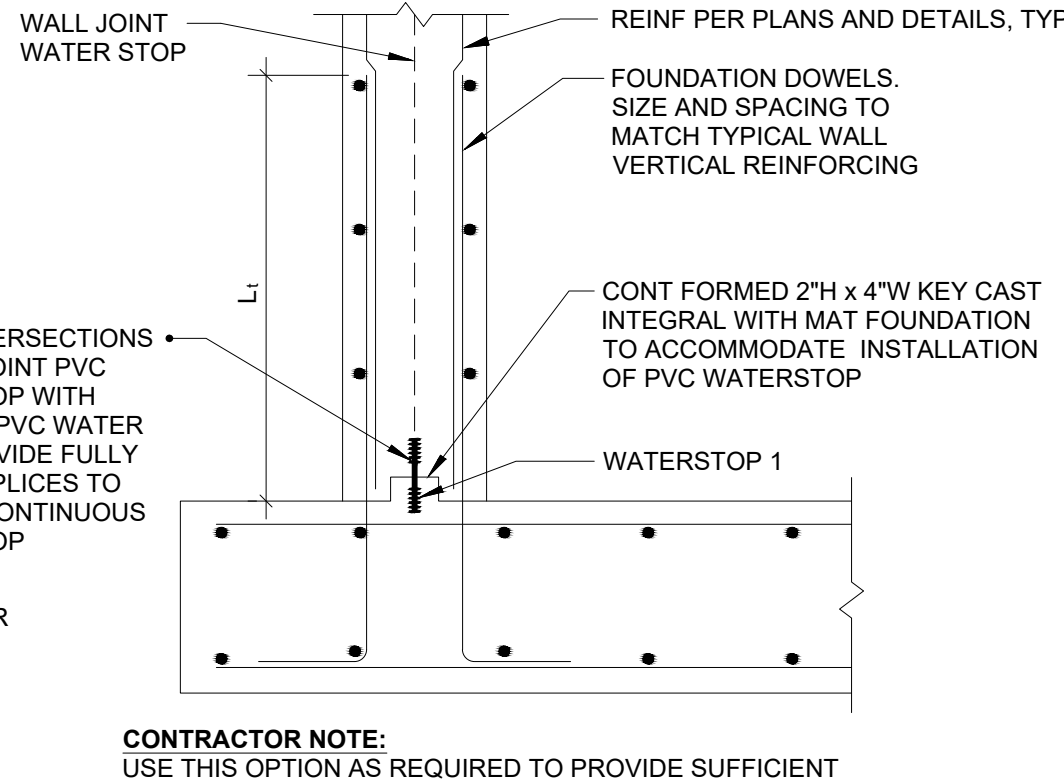
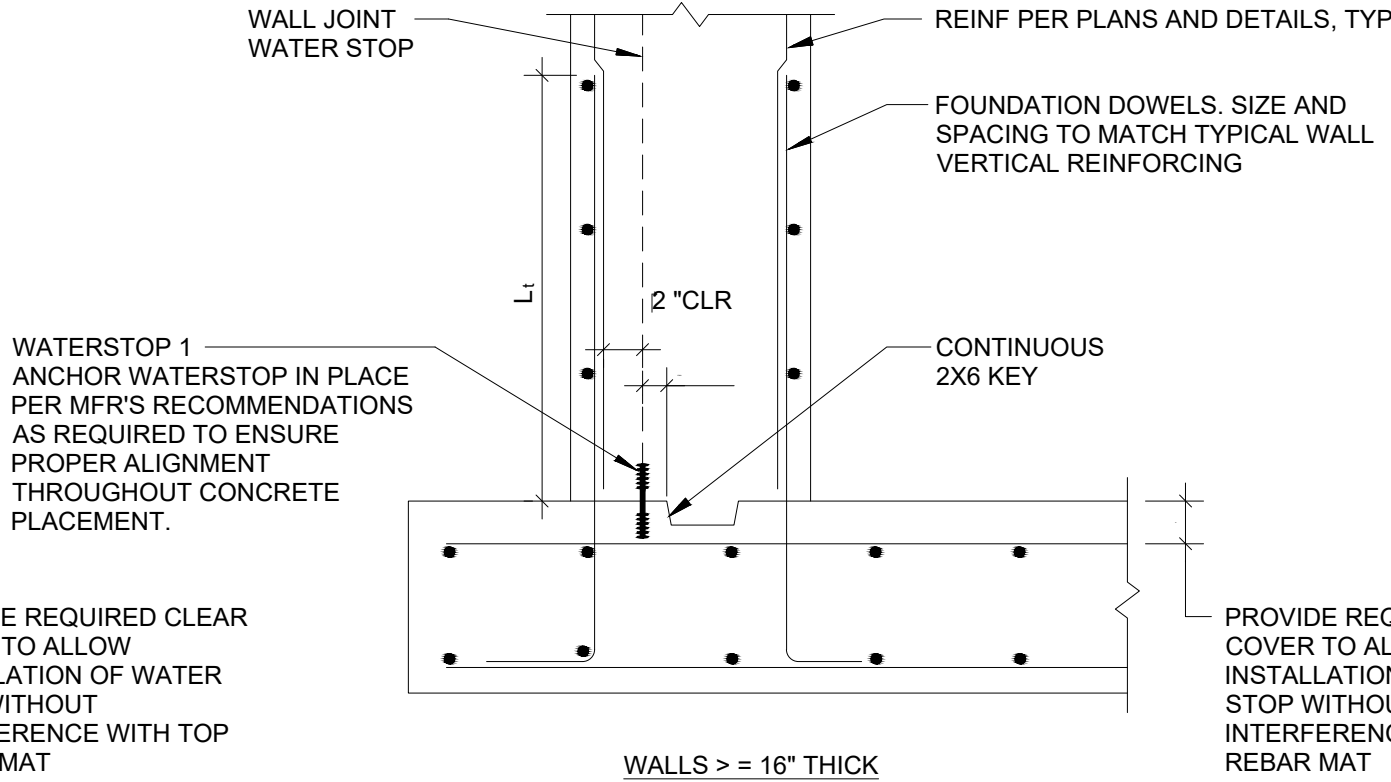
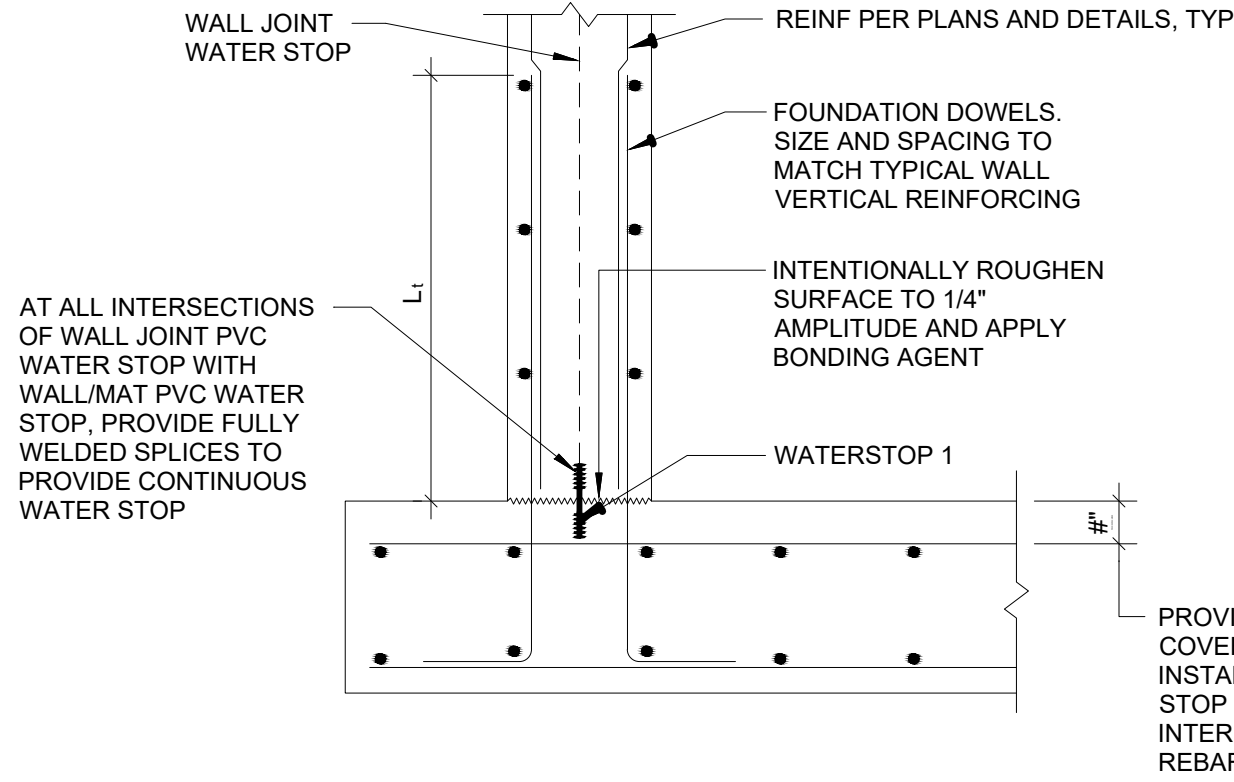
SAWCUT SLAB AS SOON AS CONDITIONS  
PERMIT ACCESS TO SLAB.

6  
S302 N.T.S. **CONTROL JOINT DETAIL**



7  
S302 N.T.S. **TYPICAL REINFORCEMENT AT OPENING**

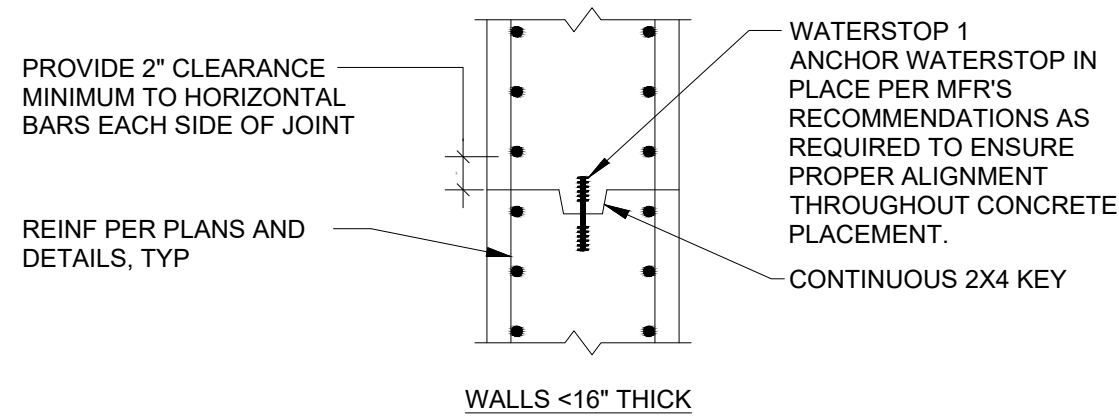
STAGE 3 DRAWINGS



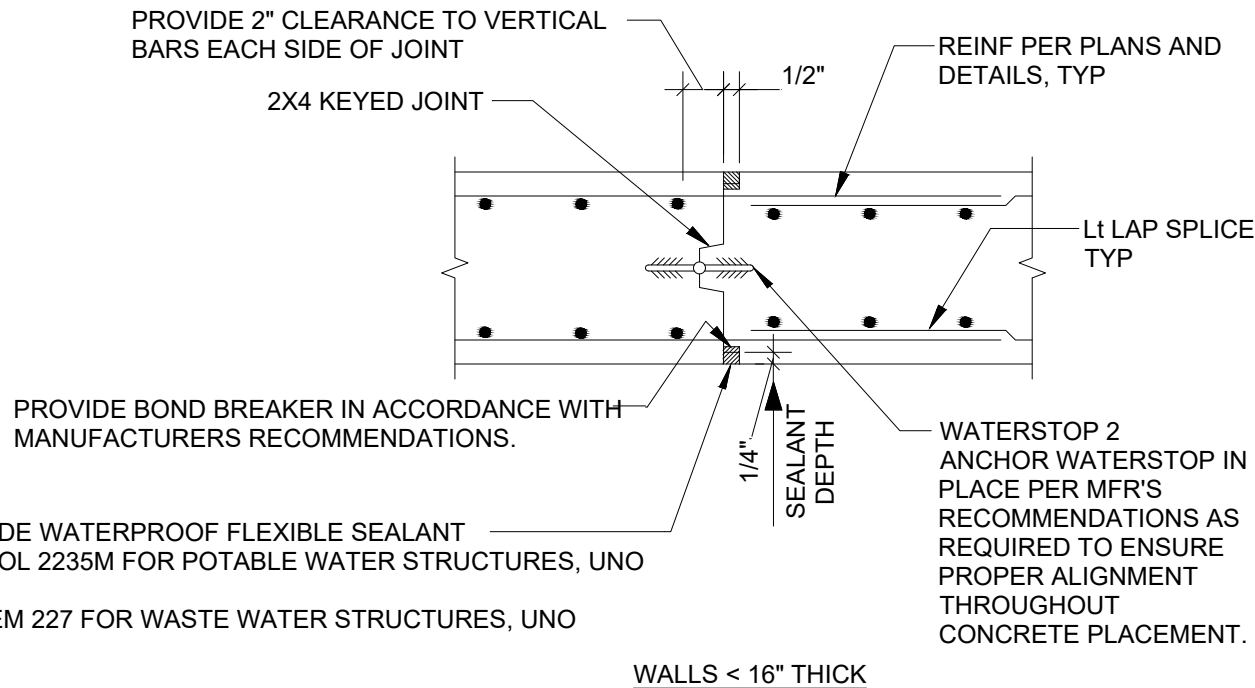
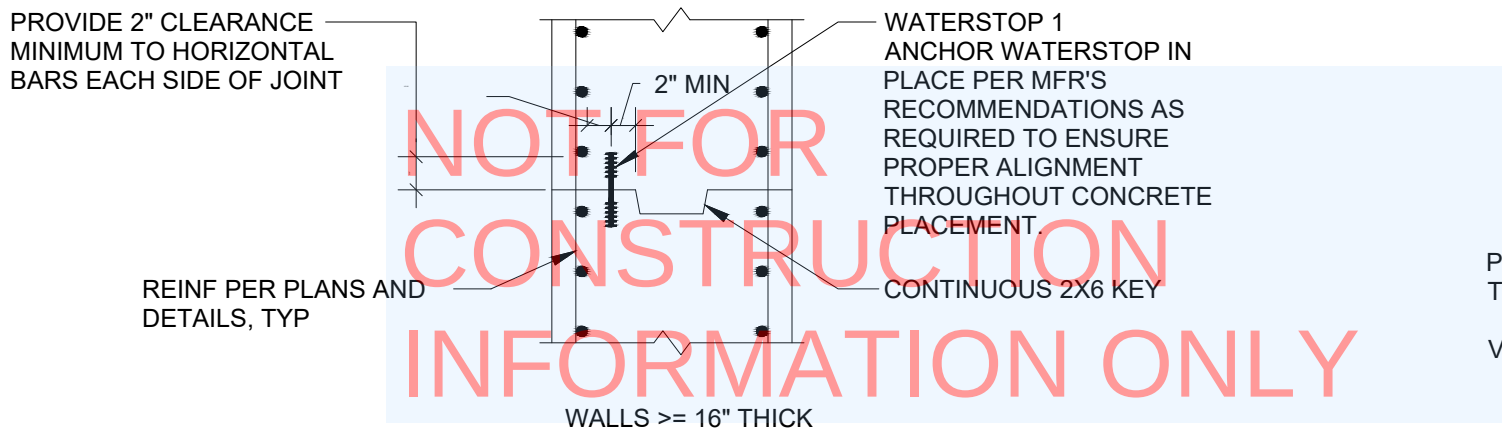
NOTES:  
1. CONSTRUCTION JOINTS IN MAT FOUNDATIONS (IF USED) MUST ALIGN EXACTLY WITH VERTICAL WALL CONSTRUCTION JOINTS.

1 TYPICAL WALL ON MAT FOUNDATION CONSTRUCTION JOINT DETAIL  
S303 N.T.S.

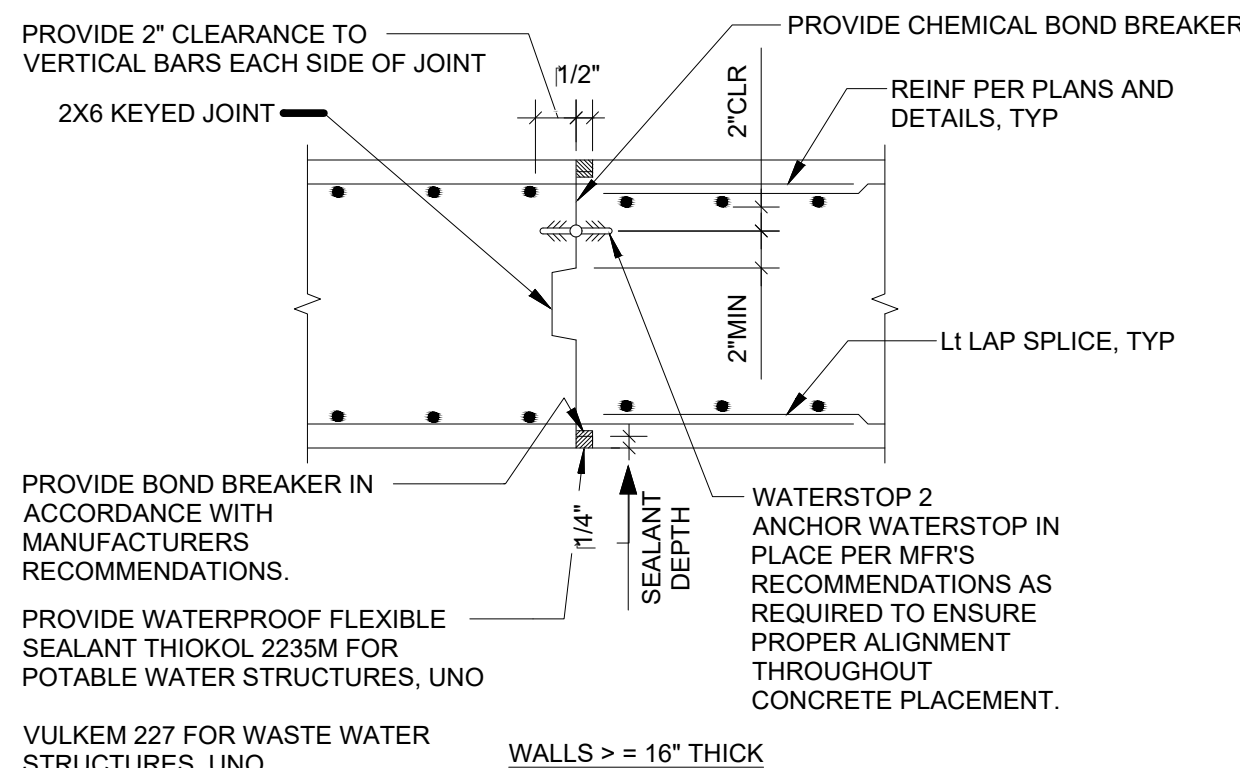
2 TYPICAL TANK MAT FOUNDATION CONSTRUCTION JOINT  
S303 N.T.S.



NOTE:  
1. CONTRACTOR SHALL PROVIDE FOR REVIEW ALL PROPOSED HORIZONTAL CONSTRUCTION JOINTS PRIOR TO COMMENCEMENT OF WALL CONSTRUCTION.

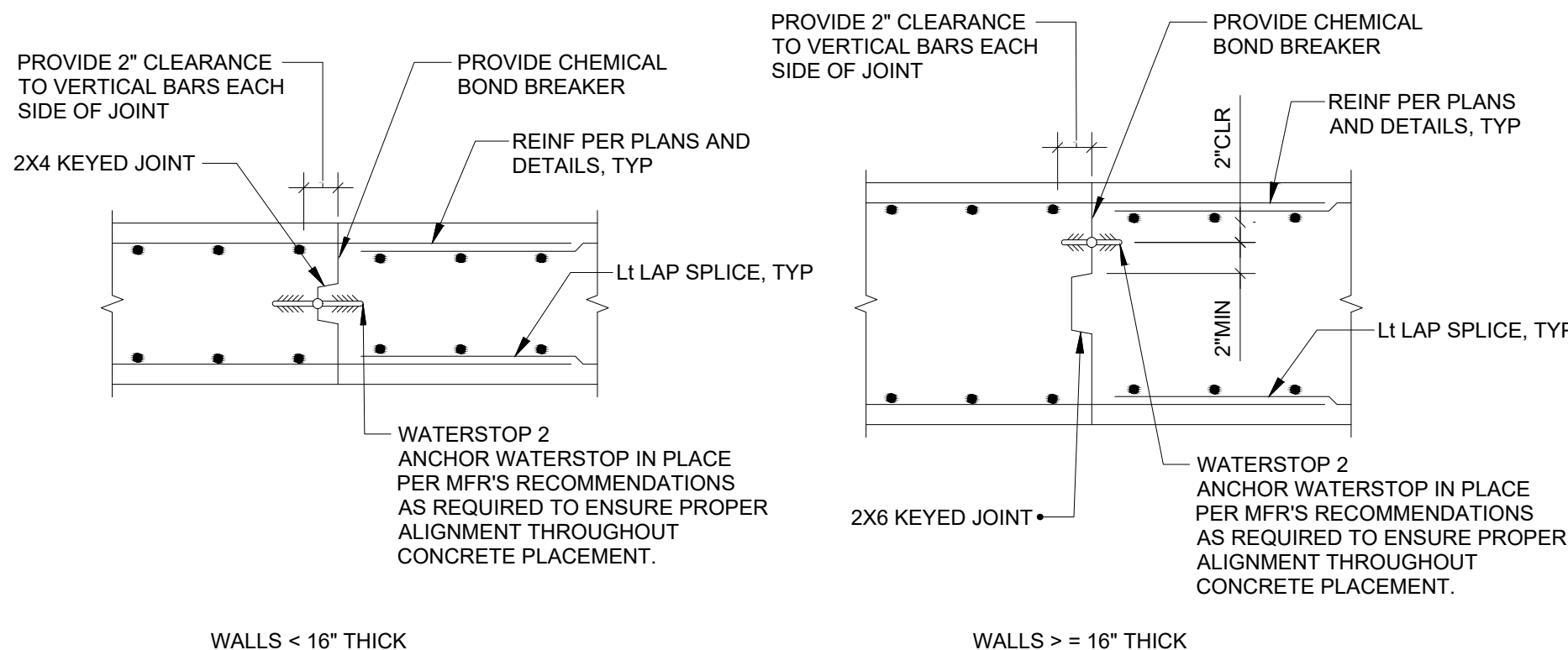


NOTES:  
1. SEE PLANS FOR LOCATIONS REQUIRED.  
2. CONTINUE SEALANT AROUND ENDS OF WALLS/SLABS.  
3. INSTALL SEALANT IN STRICT CONFORMANCE WITH MANUFACTURER'S WRITTEN REQUIREMENTS.

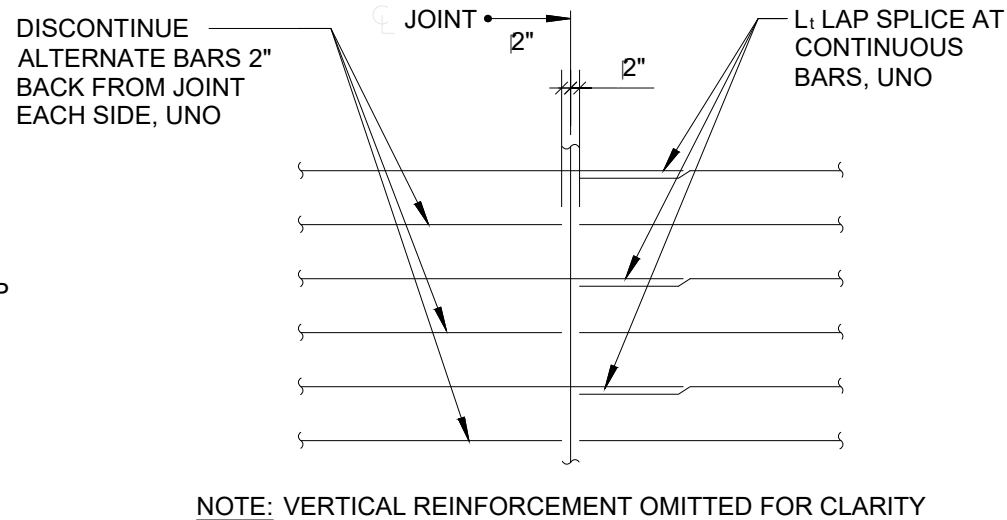
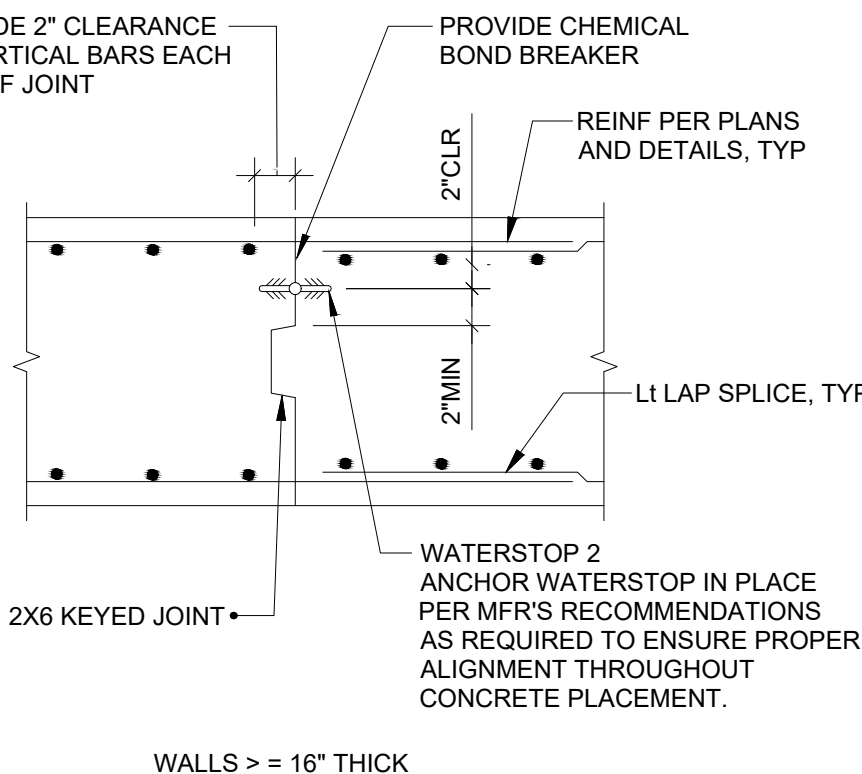


3 TYPICAL TANK WALL HORIZONTAL CONSTRUCTION JOINT  
S303 N.T.S.

4 TYPICAL TANK WALL VERTICAL CONSTRUCTION JOINT (WITH SEALANT)  
S303 N.T.S.



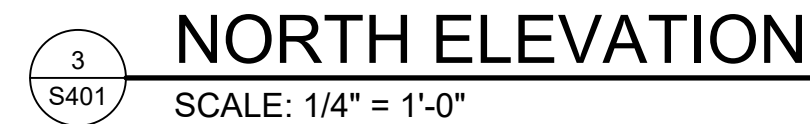
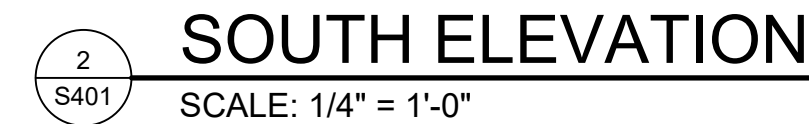
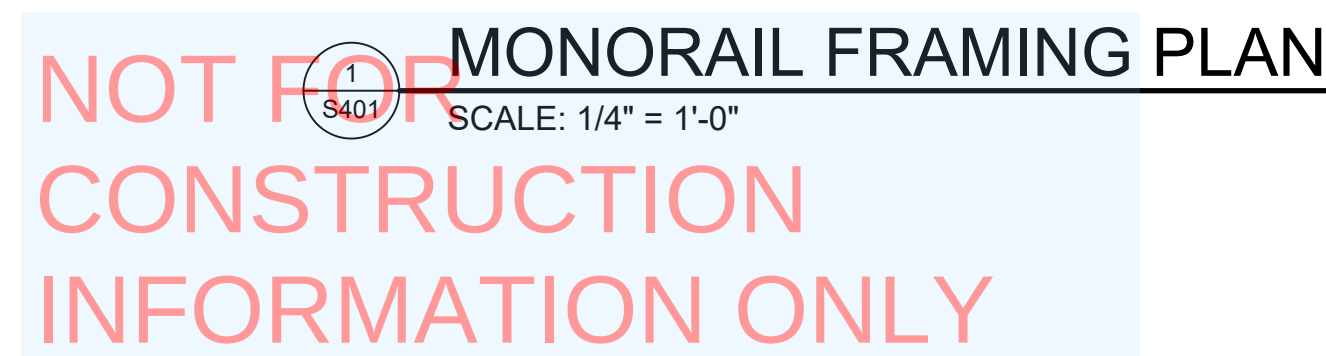
NOTES:  
1. SEE PLANS FOR LOCATIONS REQUIRED.



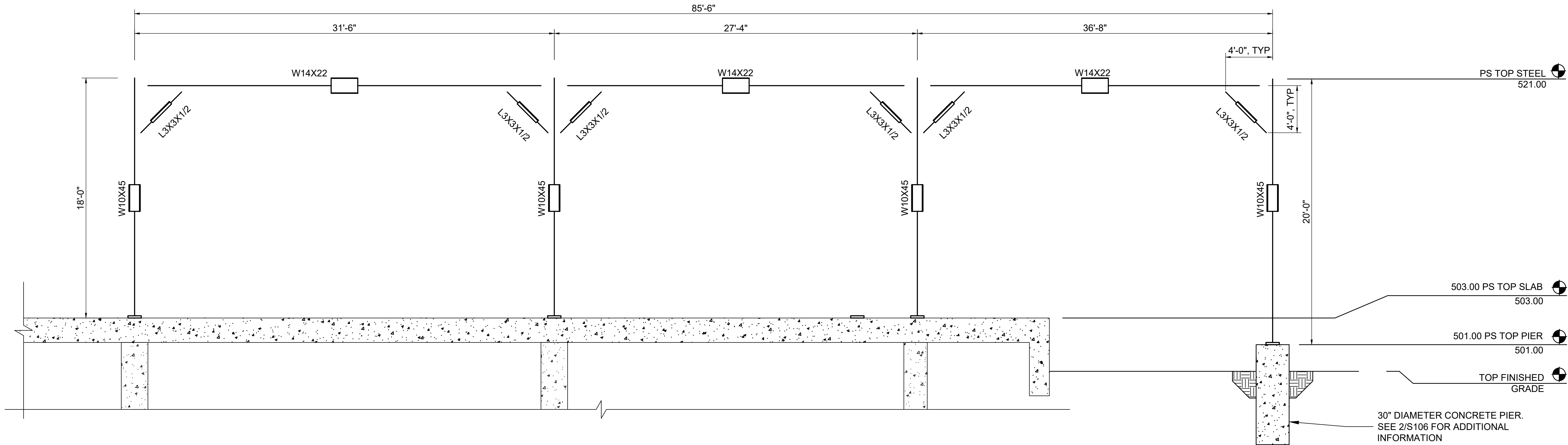
ELEVATION

5 TYPICAL TANK WALL VERTICAL CONSTRUCTION JOINT AND CONTRACTION JOINT #CJ1  
S303 N.T.S.

STAGE 3 DRAWINGS



## STAGE 3 DRAWINGS

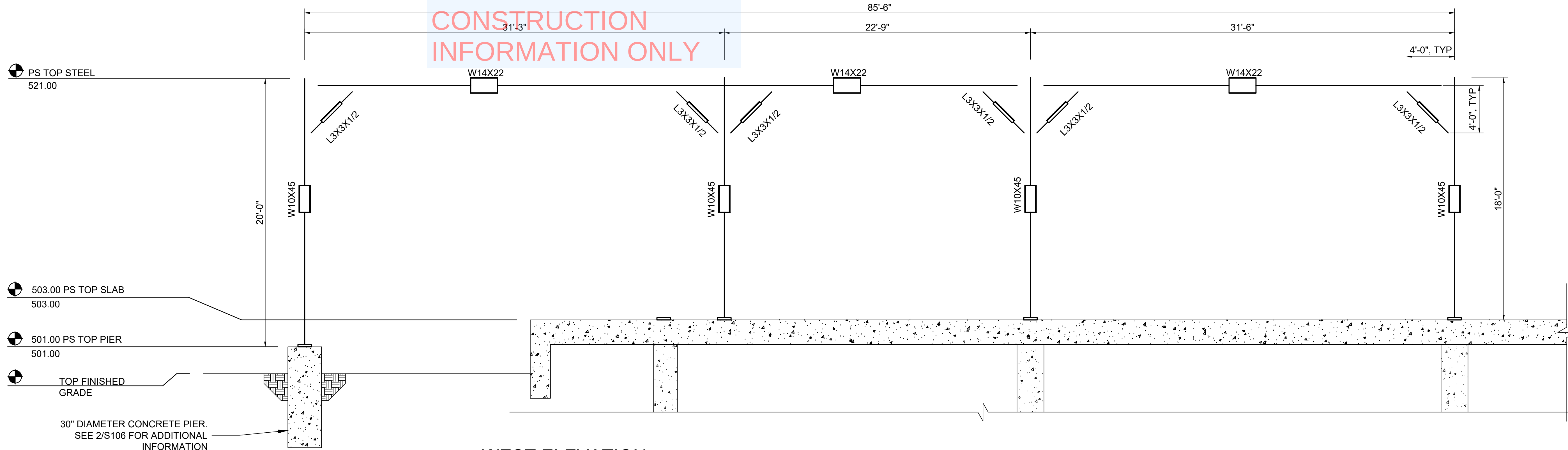


1  
S402

EAST ELEVATION

SCALE: 1/4" = 1'-0"

NOT FOR  
CONSTRUCTION  
INFORMATION ONLY

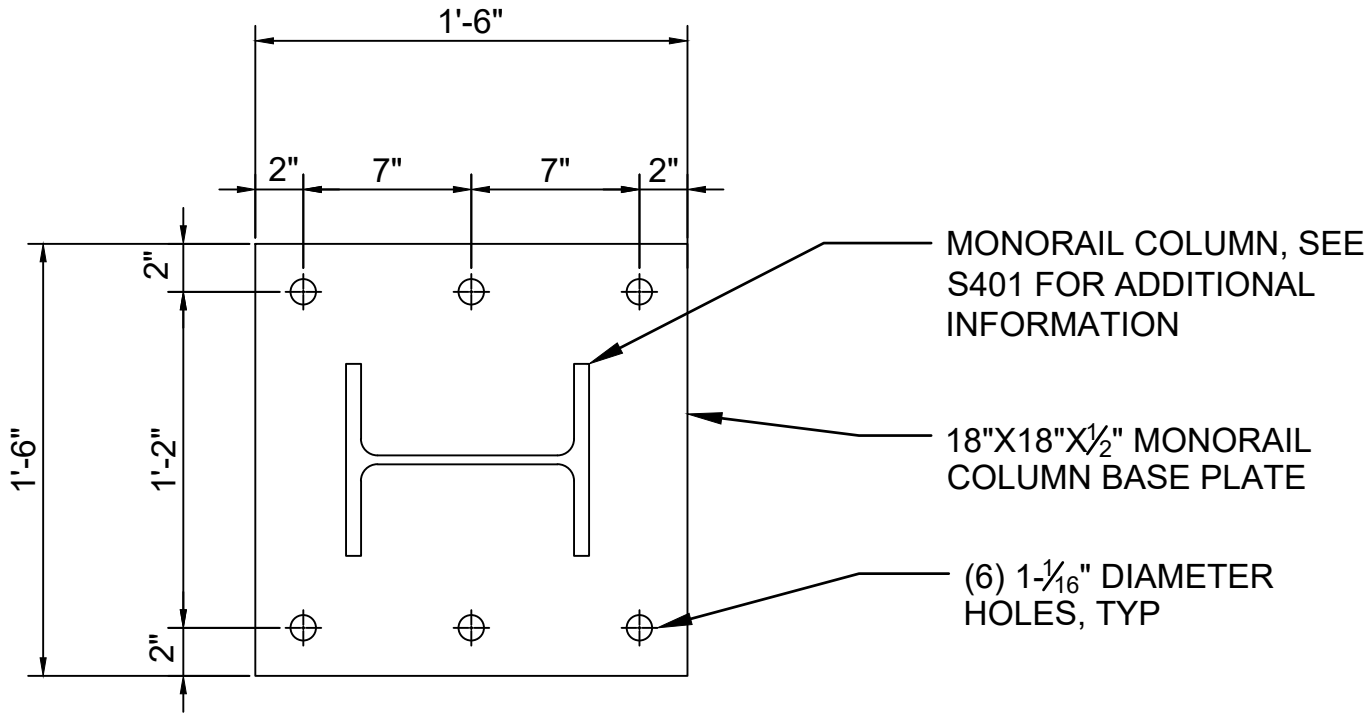


2  
S402

WEST ELEVATION

SCALE: 1/4" = 1'-0"

STAGE 3 DRAWINGS



1  
S403

**MONORAIL BASEPLATE DETAIL**

SCALE: 1-1/2" = 1'-0"

| ENVELOPE REACTIONS FOR STRUCTURAL STEEL CONNECTIONS |                                  |                                  |
|-----------------------------------------------------|----------------------------------|----------------------------------|
| MEMBER SIZE                                         | MAXIMUM POSITIVE REACTION (KIPS) | MAXIMUM NEGATIVE REACTION (KIPS) |
| W8X24                                               | 7.5                              | -7.5                             |
| W14X22                                              | 7                                | -7                               |
| W16X36                                              | 15                               | -15                              |
| L3X3X $\frac{1}{2}$                                 | 22.5                             | -25                              |
| L4X4X $\frac{5}{8}$                                 | 3.2                              | -3.2                             |
| S10X35                                              | 10.5                             | -0.5                             |

- NOTES:
- THE VALUES LISTED IN THE TABLE ABOVE SHALL BE USED TO DESIGN THE STRUCTURAL CONNECTIONS FOR EACH ASSOCIATED MEMBER SIZE.
  - THE VALUES LISTED ABOVE ARE END REACTIONS (SHEAR FOR WIDE FLANGE SECTIONS AND AXIAL FOR ANGLES). POSITIVE INDICATES TENSION AND NEGATIVE INDICATES COMPRESSION FOR THE ANGLES. POSITIVE INDICATES UPWARD SHEAR AND NEGATIVE INDICATES DOWNWARD SHEAR FOR WIDE FLANGE MEMBERS.
  - THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FROM A QUALIFIED STEEL FABRICATOR FOR THE STRUCTURAL STEEL AND CONNECTIONS SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF OHIO.
  - ALL CONNECTIONS SHALL CONFORM TO THE ANSI/AISC 360 SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS, THE AISC303 CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES, AND THE SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS, LATEST EDITIONS WITH AMENDMENTS.
  - CONNECTIONS BETWEEN THE S10X35 AND OTHER MEMBERS SHALL BE USE A MINIMUM OF 4 BOLTS FOR STABILITY.
  - ALL OTHER CONNECTIONS SHALL USE A MINIMUM OF 2 BOLTS.

2  
S403

**ENVELOPE REACTIONS FOR STRUCTURAL STEEL CONNECTIONS**

SCALE: NTS

NOT FOR  
CONSTRUCTION  
INFORMATION ONLY

STAGE 3 DRAWINGS