GENERAL NOTES

1. ALL STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE MECHANICAL, ELECTRICAL, AND CIVIL DRAWINGS AND SPECIFICATIONS.
2. CONTRACTORS SHALL VERIFY ALL EXISTING CONDITIONS, DIMENSIONS, ELEVATIONS, ETC., IN FIELD AND NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES PRIOR TO THE START OF CONSTRUCTION OR SHOP DRAWINGS.
3. THE DRAWINGS ARE INTENDED TO REQUIRE AND TO INCLUDE ALL LABOR, MATERIAL AND EQUIPMENT PROPER FOR THE WORK.
4. ALL WORK SHALL COMPLY WITH ALL LOCAL, STATE AND NATIONAL CODES AND REQUIREMENTS.
5. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND SAFETY PROCEDURES. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACTS OR OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR THEIR AGENTS OR EMPLOYEES OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK.
6. OBSERVE ALL OSHA AND OTHER APPLICABLE SAFETY REQUIREMENTS INCLUDING THE USE OF SAFETY GLASSES, HARD HATS, AND PROTECTION OF AREA WHEN WORKING OVERHEAD. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR CONSTRUCTION SAFETY AT ALL TIMES.
7. COORDINATE WORK OF ALL DISCIPLINES (ARCH., STRUCT., ELECT., ETC.) WITH EXISTING CONDITIONS, SPECIAL REQUIREMENTS, CONSTRUCTION SCHEDULE AND OTHER CONTRACTORS PERFORMING WORK AT THE SITE.
8. THE CONTRACTOR SHALL DESIGN AND PROVIDE ANY TEMPORARY SHORING, BRACING, ETC., AS NEEDED FOR THE WORK SO AS NOT TO ENDANGER THE STRUCTURAL INTEGRITY OF ANY EXISTING FEATURE.
9. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR ANY DAMAGE DONE TO EXISTING FEATURES AS A RESULT OF THIS WORK. DAMAGED ITEMS SHALL BE REPLACED IN KIND AND AT NO ADDITIONAL COST TO THE OWNER.
10. SEE SPECIFICATIONS FOR FULL SCOPE OF REQUIREMENTS APPLICABLE TO THIS PROJECT.
11. SHOP DRAWINGS: REPRODUCTION OF DESIGN DRAWINGS SHALL NOT BE PERMITTED FOR SHOP DRAWING SUBMISSIONS. THE GENERAL CONTRACTOR/CONSTRUCTION MANAGER SHALL REVIEW AND PROVIDE REVIEW STAMP ON SHOP DRAWING SUBMISSIONS PRIOR TO SUBMITTAL TO ARCHITECT/ENGINEER INDICATING UNDERSTANDING AND ACCEPTANCE OF SUBMITTAL AND CONFIRMING CONFORMANCE TO PROJECT PLANS/SPECIFICATIONS.

FOUNDATIONS

1. THE CONTRACTORS ATTENTION IS DIRECTED TOWARDS THE EARTHWORK REQUIREMENTS OF THE PROJECT GEOTECHNICAL INTERPRETIVE REPORT (SPECIFICATIONS APPENDIX M) PREPARED BY CDM SMITH. DATED MAY 2023 (PROJECT NO.: 195150185). ALL EARTHWORK AND FOUNDATION PREPARATION WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THIS REPORT, TO THE SATISFACTION OF THE SITE GEOTECHNICAL ENGINEER.
2. MAXIMUM ALLOWABLE BEARING PRESSURE=3,000psf
3. ALL COLUMN AND WALL FOOTINGS SHALL BEAR ON APPROVED, UNDISTURBED NATIVE SOILS.

CONCRETE WORK

1. SUBMITTALS
   - SUBMIT SHOP DRAWINGS SHOWING FABRICATION, BENDING AND PLACEMENT OF CONCRETE REINFORCEMENT. DETAILING SHALL COMPLY WITH THE ACI DETAILING MANUAL.
   - SUBMIT CONCRETE MIX PROPORTIONS WITH SUPPORTING TEST DATA, MATERIAL CERTIFICATIONS AND PRODUCT DATA, TO DEMONSTRATE COMPLIANCE WITH THE REQUIREMENTS BELOW AND THE PROJECT SPECIFICATIONS.
2. COMPLY WITH THE FOLLOWING CODES AND STANDARDS:
   - ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS".
   - ACI 305, ACI 306, ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".
   - ACI DETAILING MANUAL, LATEST EDITION.
   - ACI 347 "RECOMMENDED PRACTICE FOR CONCRETE FORM WORK".
   - CONCRETE REINFORCING STEEL INSTITUTE (CRSI), "MANUAL OF STANDARD PRACTICE".
   - ACI 304 "RECOMMENDED PRACTICE FOR MEASURING, MIXING, TRANSPORTING AND PLACING CONCRETE".
3. MATERIALS:
   - REINFORCING BARS – ASTM A615, GRADE 60, DEFORMED.
   - WELDED WIRE FABRIC (WWF) – ASTM A185, FLAT SHEETS.
   - SUPPORTS FOR REINFORCEMENT:
     - FOR SLABS-ON-GRADE USE CONCRETE BRICKS OR CHAIRS TO SUPPORT AND MAINTAIN PROPER LOCATION OF WWF AND REINFORCING BARS.
     - BOLSTERS, CHAIRS, SPACERS, ETC. SHALL BE WIRE BAR TYPE SUPPORTS COMPLYING WITH CRSI SPECS. FOR EXPOSED TO VIEW SURFACES WHERE SUPPORTS ARE IN CONTACT WITH FORMS, PROVIDE SUPPORTS WITH LEGS WHICH ARE PROTECTED BY PLASTIC OR STAINLESS STEEL.
   - PORTLAND CEMENT–ASTM C150, TYPE II.
   - AGGREGATES–ASTM C33.
   - AIR ENTRAINING ADMIXTURE–ASTM C260, CERTIFIED BY MANUFACTURER TO BE COMPATIBLE WITH OTHER REQUIRED ADMIXTURES.
   - PROHIBITED ADMIXTURES–CALCIUM CHLORIDE THYOCYANATES OR ADMIXTURES CONTAINING MORE THAN 0.1% CHLORIDE IONS ARE NOT PERMITTED.
4. PROPORTIONING AND DESIGN OF MIXES:
   - PREPARE DESIGN MIXES FOR EACH TYPE, AND STRENGTH OF CONCRETE BY EITHER LABORATORY TRIAL BATCH OR FIELD EXPERIENCE METHODS AS SPECIFIED IN ACI 318.
   - NORMAL WEIGHT CONCRETE–MINIMUM 28 COMPRESSIVE STRENGTH – COORDINATE WITH SPECIFICATIONS.
5. FORM WORK:
   - PROVIDE OPENINGS IN CONCRETE FORM WORK TO ACCOMMODATE WORK OF OTHER TRADES.
6. CONCRETE SHALL BE READY MIXED PER ASTM C94. JOB SITE MIXING SHALL NOT BE PERMITTED.
7. CONCRETE PLACEMENT:
   - THE ADDITION OF WATER TO THE CONCRETE MIX AT THE JOB SITE IS NOT PERMITTED UNLESS SPECIFICALLY ALLOWED BY THE OWNER'S REPRESENTATIVE.
   - PROTECT CONCRETE WORK FROM THE DETRIMENTAL EFFECTS OF COLD TEMPERATURES IN COMPLIANCE WITH ACI 306.
   - PROTECT CONCRETE WORK FROM THE DETRIMENTAL EFFECTS OF HOT WEATHER OR WINDY CONDITIONS IN COMPLIANCE WITH ACI 305.
   - PLACE FLOOR SLABS TO SURFACE LEVEL TOLERANCES OF FF20–FL17.
8. CONCRETE FINISHES:
   - FORMED SURFACES EXPOSED TO VIEW – SMOOTH RUBBED FINISH.
   - SLAB FINISH – PROVIDE TROWEL FINISH.
9. PROVIDE MOISTURE CURE TO SLAB SURFACES FOR 7 DAYS BY EITHER COVERING THE CONCRETE WITH WATER, APPLYING A CONTINUOUS WATER–FOG SPRAY, OR COVERING WITH AN ABSORPTIVE COVER. CHEMICAL CURING COMPOUNDS WILL NOT BE ALLOWED ON FLOOR SLABS.
10. THE OWNER WILL EMPLOY A TESTING AGENCY TO PERFORM SAMPLING AND TESTING AND SUBMIT TEST REPORTS.
11. SAMPLING AND TESTING OF CONCRETE SHALL INCLUDE:
    - SLUMP–ASTM C143–ONE TEST AT POINT OF PLACEMENT FOR EACH TRUCK LOAD OF EACH TYPE OF CONCRETE UNTIL CONCRETE CONSISTENCY IS UNIFORM, AND AT LEAST EVERY THIRD TRUCK THEREAFTER; ADDITIONAL TESTS WHEN CONCRETE CONSISTENCY SEEMS TO HAVE CHANGED.
    - AIR ENTRAINMENT–ASTM C173 VOLUMETRIC METHOD, OR ASTM C231 PRESSURE METHOD, ONE FOR EACH DAY'S PLACEMENT OF EACH TYPE OF AIR ENTRAINED CONCRETE.
    - CONCRETE TEMPERATURE–TEST HOURLY WHEN AIR TEMPERATURE IS 41°F AND BELOW OR WHEN 80°F AND ABOVE; AND EACH TIME A SET OF COMPRESSION TEST CYLINDERS IS MADE.
    - COMPRESSION TEST SPECIMENS–ASTM C31–ONE SET OF 6 CYLINDERS FOR EACH COMPRESSIVE STRENGTH TEST. MOLD AND STORE CYLINDERS FOR LABORATORY CURED TEST SPECIMENS.
    - COMPRESSIVE STRENGTH TESTS–ASTM C39–ONE SET FOR EACH DAY'S PLACEMENT EXCEEDING 5 CUBIC YARDS PLUS ADDITIONAL SETS FOR EACH 50 CUBIC YARDS OVER AND ABOVE THE FIRST 25 CUBIC YARDS OF EACH CONCRETE CLASS PLACED IN ONE DAY; TWO SPECIMENS TESTED AT 7 DAYS, TWO SPECIMENS TESTED AT 28 DAYS, AND TWO SPECIMENS RETAINED IN RESERVE FOR LATER TESTING IF REQUIRED.
12. REINFORCING SHOWN ON PRECAST STRUCTURES REPRESENT MINIMUM REINFORCING.
13. "T" DIMENSION TO BE DETERMINED PER PRE–CAST CONCRETE VAULT MANUFACTURER.

MASONRY

1. SEE STRUCTURAL AND CIVIL DRAWINGS FOR LOCATION, SIZE AND SPACING OF REINFORCED MASONRY.
2. SUBMITTALS
   - SUBMIT SHOP DRAWINGS FOR FABRICATION, BENDING AND PLACEMENT OF MASONRY REINFORCEMENT.
   - SUBMIT DESIGN MIXES FOR EACH TYPE GROUT AT LEAST 15 DAYS OF REINFORCEMENT COMPLYING WITH ACI DETAILING MANUAL. PRIOR TO START OF WORK.
3. MATERIALS
   - MORTAR: ASTM C270, TYPE S. NO MASONRY CEMENT WILL BE ALLOWED.
   - f'm=1,500 psi
   - REINFORCEMENT BARS: ASTM A615 GRADE 60.
   - JOINT REINFORCEMENT: TRUSS TYPE WITH 0.148 INCH DIAMETER
   - FINE GROUT: ASTM C476.
4. TESTING PROCEDURE:
   - BLOCKS SHALL BE TESTED PER ASTM C–140 FOR STRENGTH, ABSORPTION AND SIZE.
   - STRENGTH OF MASONRY CONSTRUCTION SHALL BE DETERMINED BY PRISM TESTS MADE IN ACCORDANCE WITH ASTM E–447. ONE SET OF PRISMS (3 EACH) SHALL BE PREPARED AND TESTED EVERY 3000 SQ. FT. OF WALL CONSTRUCTED.
   - GROUT COMPRESSIVE STRENGTH SHALL BE DETERMINED IN ACCORDANCE WITH ASTM C–1019. GROUT SLUMP SHALL BE DETERMINED IN ACCORDANCE WITH ASTM C–143. ONE SET OR MORTAR CUBES (3 EACH) SHALL BE PREPARED EVERY 5000 SQ. FT. OF WALL CONSTRUCTED.
5. PROTECT MASONRY WORK FROM DAMAGE DUE TO OTHER WORK AND THE WEATHER AS RECOMMENDED BY NCMA. ALL UNITS SHALL BE LAID WITH FULL MORTAR COVERAGE ON HORIZONTAL AND VERTICAL FACE SHELLS. SOLID UNITS SHALL BE LAID WITH FULL HEAD AND BED JOINTS, 3/8" THICK. LAY IN FULL RUNNING BOND UNLESS INDICATED OTHERWISE.
6. PLACE HORIZONTAL REINFORCING ON FULL MORTAR BED AT 16" O.C. MIN. OR AS INDICATED ON DRAWINGS. VERTICAL REINFORCING IN MASONRY WHERE SHOWN SHALL BE PLACED IN GROUT FILLED CORES AND PROPERLY LOCATED AS INDICATED. SPLICES SHALL BE MINIMUM 36 X BAR DIAMETER.
7. USE LOW–LIFT GROUTING TECHNIQUES TO FILL CORES, UNLESS HIGH–LIFT GROUTING (VERTICAL PLACEMENT >4'0") IS APPROVED BY THE OWNER'S REPRESENTATIVE IN WRITING.
8. USE UNIT TEST METHOD, ACCORDING TO ASTM C –140, TO VERIFY MATERIALS PROPERTIES.
9. ALL EXPOSED MORTAR JOINTS SHALL BE TOOLED.

STRUCTURAL STEEL

1. STRUCTURAL STEEL WORK INCLUDES ALL STRUCTURAL STEEL TO BE FURNISHED AND ERECTED, BEAMS, COLUMNS, CHANNELS, ANGLES, JOISTS, LINTELS, BEARING PLATES, ETC., AS INDICATED ON THE DRAWINGS.
2. COMPLY WITH THE FOLLOWING CODES AND STANDARDS:
   - AISC STEEL CONSTRUCTION MANUAL, ASD, 15TH EDITION
   - AMERICAN WELDING SOCIETY (AWS) D1.1 "STRUCTURAL WELDING CODE STEEL", 2020.
   - CURRENT OSHA ERECTION AND FABRICATION REQUIREMENTS.
3. MATERIALS:
   - BEAMS, GIRDERS AND COLUMNS: ASTM A992
   - ANGLES, BARS AND PLATES: ASTM A–36.
   - TUBE STEEL: ASTM A500, GRADE B Fy=46 KSI
   - PIPE: SCHEDULE 40 CONFORMING TO ASTM A53, GRADE B. U.N.O.
   - HIGH STRENGTH BOLTS: ASTM F3125; GRADE A325.
   - WELDS: E70XX ELECTRODES.
4. ALL STRUCTURAL STEEL SHOP CONNECTIONS SHALL BE WELDED AND ALL FIELD CONNECTIONS SHALL BE HIGH–STRENGTH BOLTED UNLESS SHOWN OTHERWISE.
5. ALL BOLTS SHALL BE TIGHTENED TO THE SNUG TIGHT CONDITION UNLESS NOTED OTHERWISE. SLIP CRITICAL BOLTS SHALL BE USED AT ALL MOMENT CONNECTIONS.
6. PROVIDE ANCHORS AND OTHER DEVICES TO BE BUILT INTO CONCRETE WORK.
7. STEEL SHALL RECEIVE ONE COAT OF PRIMER PAINT, UNLESS NOTED OTHERWISE.
8. SHOP DRAWINGS: SUBMIT SHOP DRAWINGS INCLUDING COMPLETE DETAILS AND SCHEDULES FOR FABRICATION AND ASSEMBLY OF STRUCTURAL STEEL MEMBERS, PROCEDURES AND DIAGRAMS.
9. ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED.
10. ALL CONNECTIONS SHALL BE DELEGATED DESIGN AS EITHER BOLTED OR WELDED CONNECTIONS.
11. ALL WELDED CONNECTIONS SHALL BE A MINIMUM OF 3/16" FILLET WELDED ALL AROUND (TYP. U.N.O.)

NO.	DATE	BY	CHK'D	REVISION

CONTRACT NO. :	6543	FILE NO. :	6543_S–504
ACCESSION NO. :	----	SECTION NO. :	W10
DATE:	AUGUST 2025	DESIGNED BY:	GB
		DRAWN BY:	CI
		CHECKED BY:	MS
SCALE:	----	APPROVED BY:	JM

COMMONWEALTH OF MASSACHUSETTS — ZHANXIAO MA — No. 57635 — REGISTERED PROFESSIONAL ENGINEER — 8/25/2025

MASSACHUSETTS WATER RESOURCES AUTHORITY

PREPARED BY : Stantec — 45 BLUE SKY DRIVE, 3RD FLOOR, BURLINGTON, MA 01803, www.stantec.com

WESTON AQUEDUCT SUPPLY MAIN 3
REHABILITATION OF WATER MAINS
SECTION W10

STRUCTURAL GENERAL NOTES

DRAWING NO. S–001

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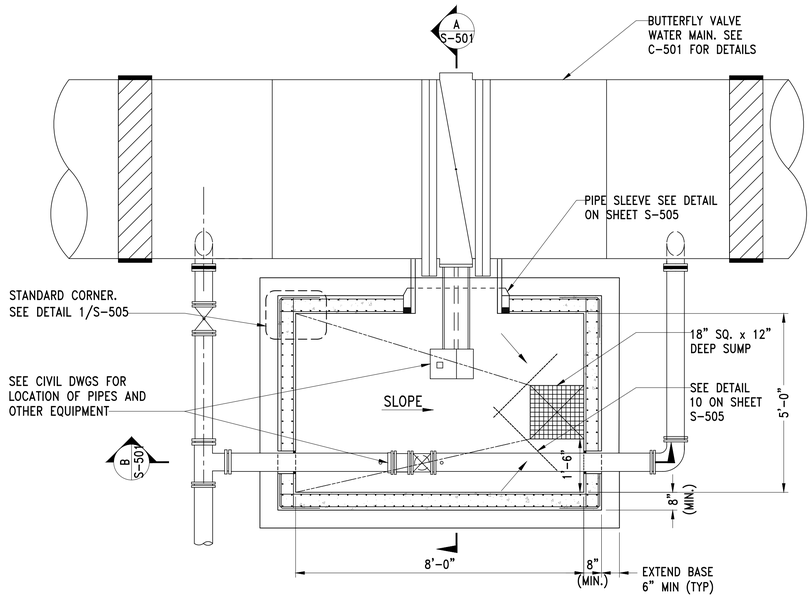

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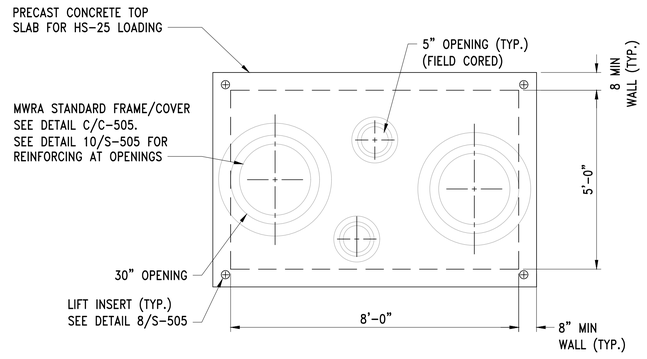

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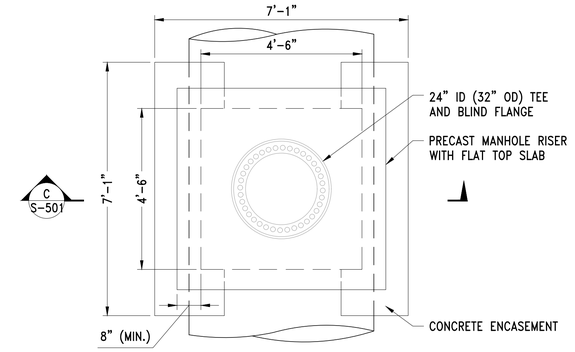

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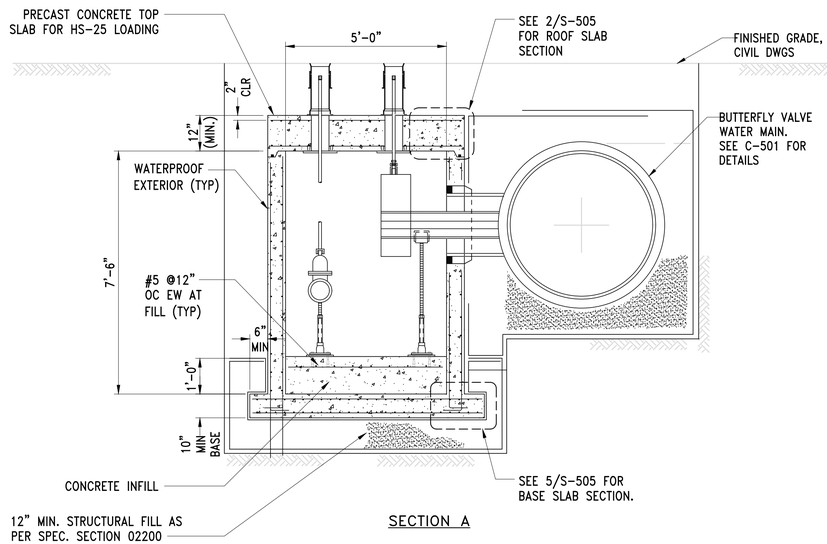
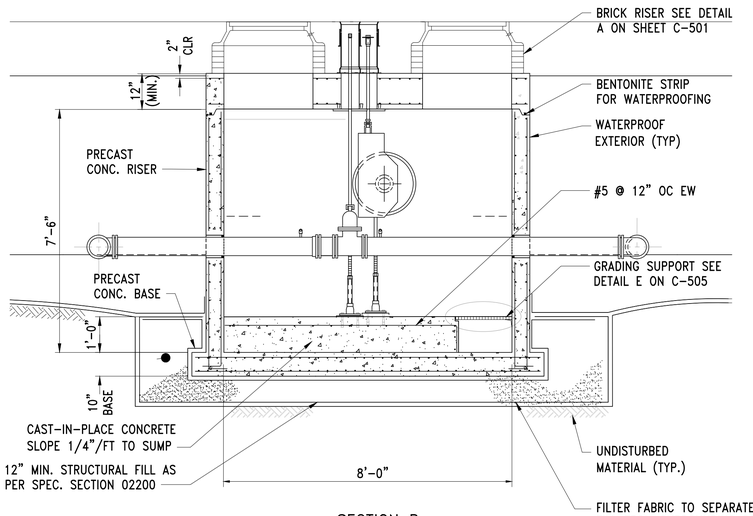


SECTION A



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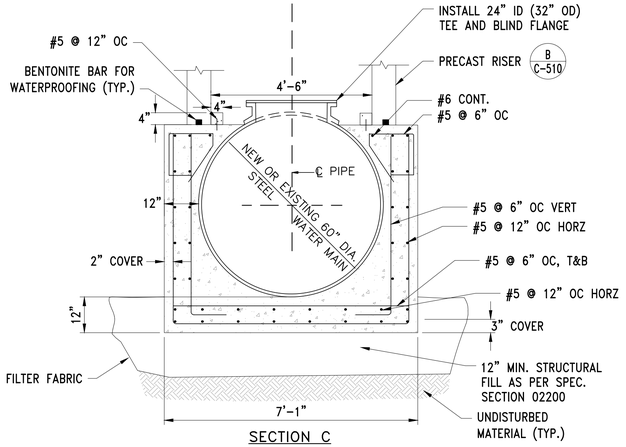

SECTION C

DETAIL 2 – LOCATION TABLE
ACCESS MANHOLE

PIPE LINE	PLAN SHEET	STATION	DEPTH-FT
WASM 4	C-101	117+01	2.2
WASM 4	C-102	139+27	1.5
WASM 3	C-102	144+24	1.8

BUTTERFLY VALVE VAULT
SCALE: NTS
PRECAST STRUCTURE

1

CONCRETE ENCASEMENT AT ACCESS MANHOLE
SCALE: NTS

2

NO.	DATE	BY	CHK'D	REVISION

CONTRACT NO. : 6543
ACCESSION NO. : ----
DATE: AUGUST 2025
SCALE: AS NOTED

FILE NO. : 6543_S-501-502
SECTION NO. : W10
DESIGNED BY: JM
DRAWN BY: DM
CHECKED BY: PD
APPROVED BY: JM

COMMONWEALTH OF MASSACHUSETTS
ZHANXIAO MA
NO. 39633
REGISTERED PROFESSIONAL ENGINEER
8/25/2025

MASSACHUSETTS WATER RESOURCES AUTHORITY

PREPARED BY :
Stantec
45 BLUE SKY DRIVE, 3RD FLOOR
BURLINGTON, MA 01803
www.stantec.com

WESTON AQUEDUCT SUPPLY MAIN 3
REHABILITATION OF WATER MAINS
SECTION W10

BUTTERFLY VALVE VAULT & CONCRETE
ENCASEMENT DETAILS

DRAWING NO.
S-501

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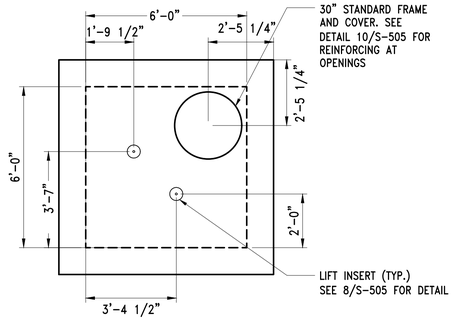

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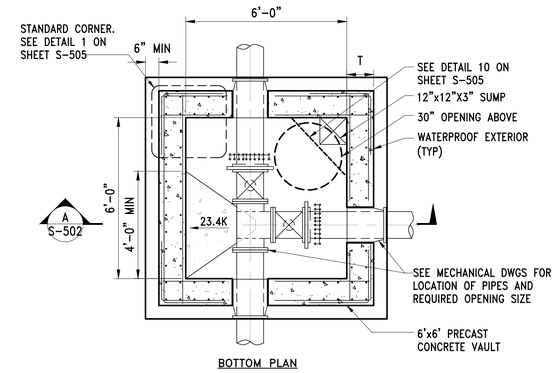

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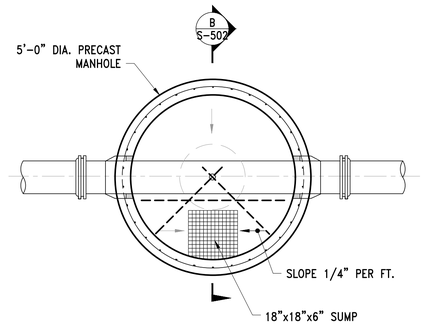

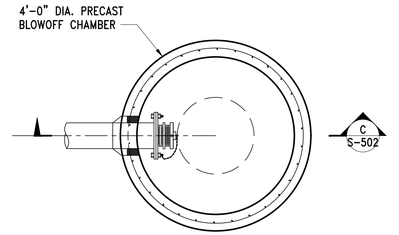

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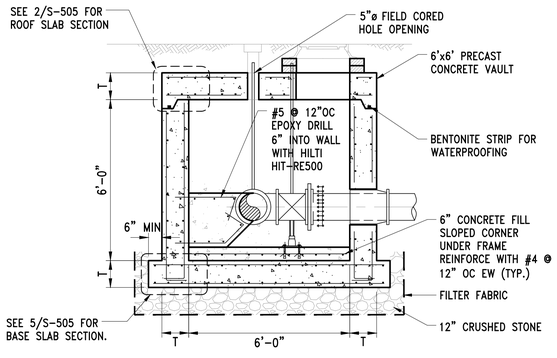
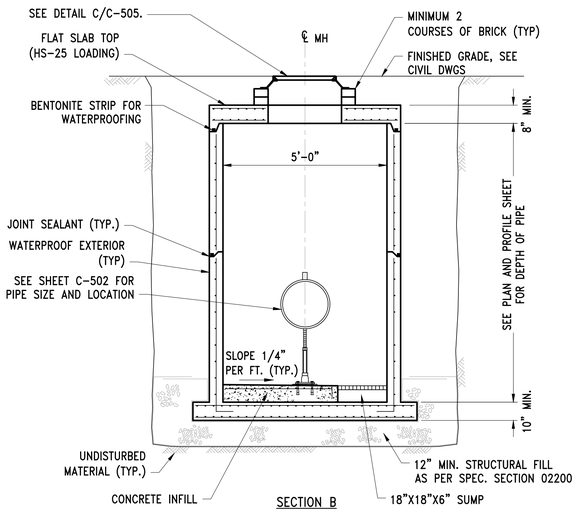


SECTION A



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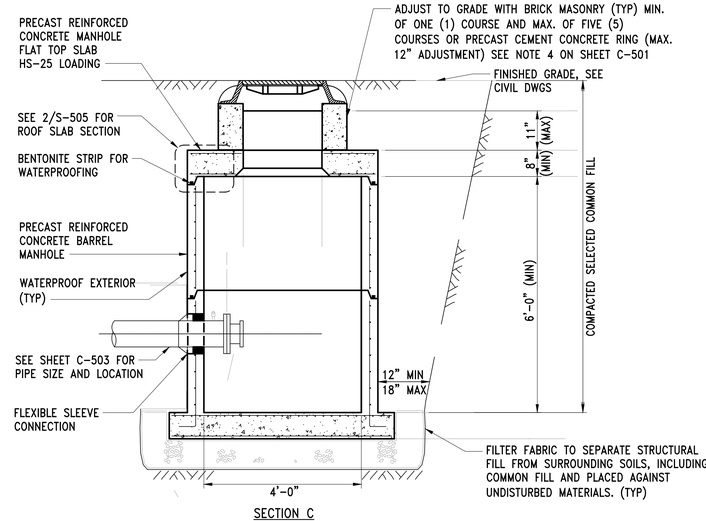

SECTION C

12" GATE VALVE VAULT — 1

SCALE: NTS

PRECAST STRUCTURE

PITOT CHAMBER — 2

SCALE: NTS

PRECAST STRUCTURE

NEW BLOWOFF CHAMBER — 3

SCALE: NTS

PRECAST STRUCTURE

NO.	DATE	BY	CHK'D	REVISION

CONTRACT NO. :	6543	FILE NO. :	6543_S-501-502
ACCESSION NO. :	----	SECTION NO. :	W10
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		DRAWN BY:	DM
		CHECKED BY:	PD
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COMMONWEALTH OF MASSACHUSETTS — ZHANXIAO MA — REGISTERED PROFESSIONAL ENGINEER — 8/25/2025

MASSACHUSETTS WATER RESOURCES AUTHORITY

PREPARED BY : Stantec — 45 BLUE SKY DRIVE, 3RD FLOOR, BURLINGTON, MA 01803, www.stantec.com

WESTON AQUEDUCT SUPPLY MAIN 3
REHABILITATION OF WATER MAINS
SECTION W10

GATE VALVE VAULT, PITOT CHAMBER, AND BLOWOFF CHAMBER DETAILS

DRAWING NO. S-502

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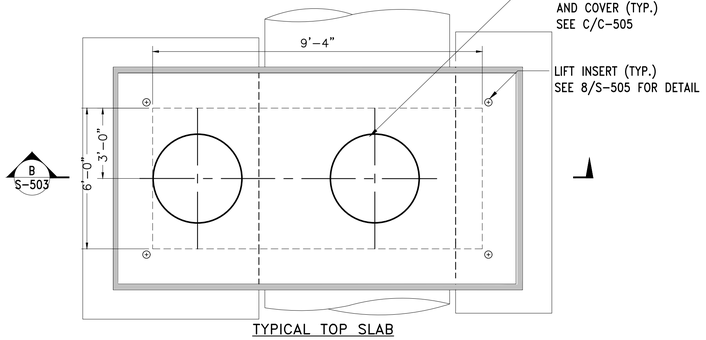

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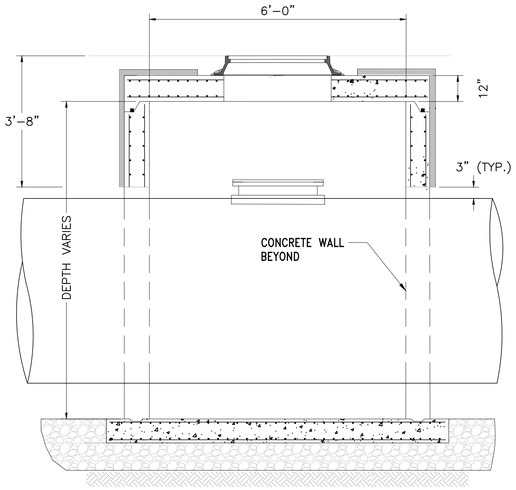
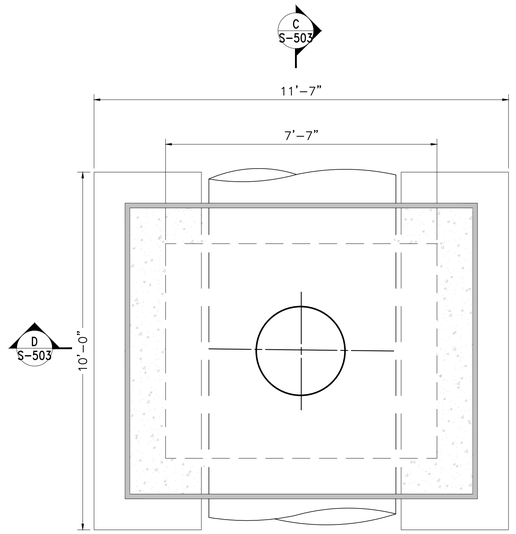


SECTION A



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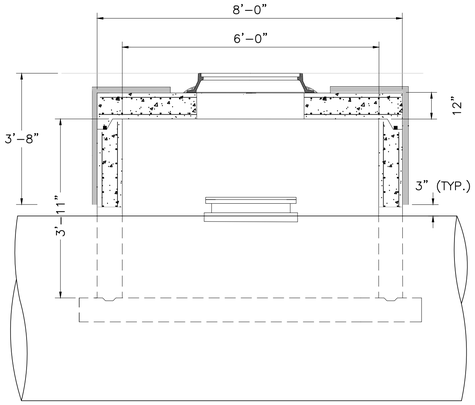
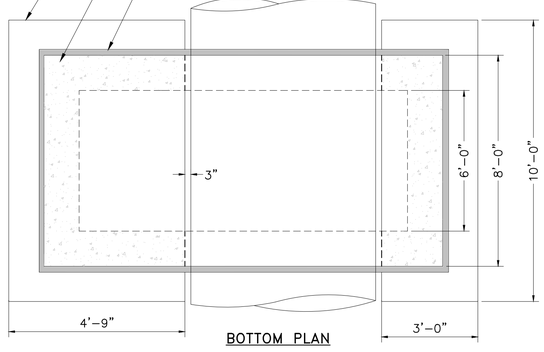


SECTION C



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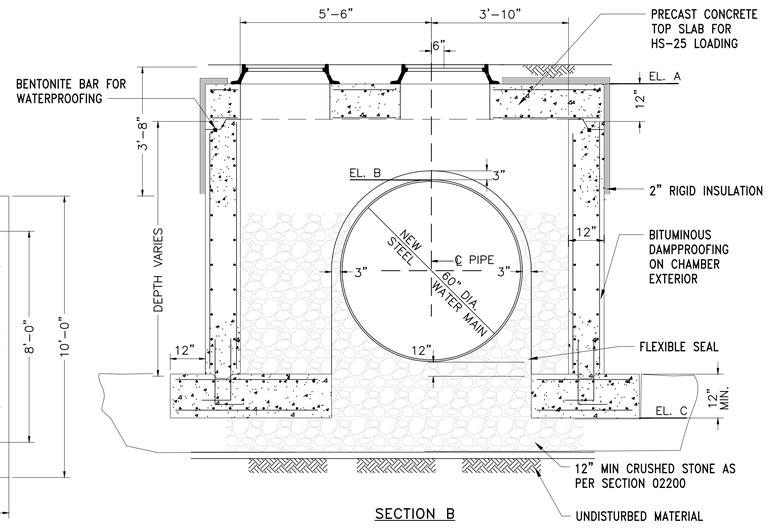
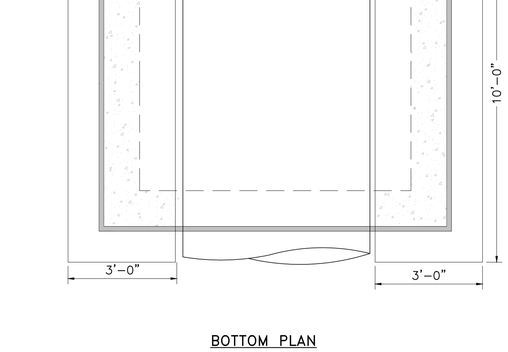


SECTION B



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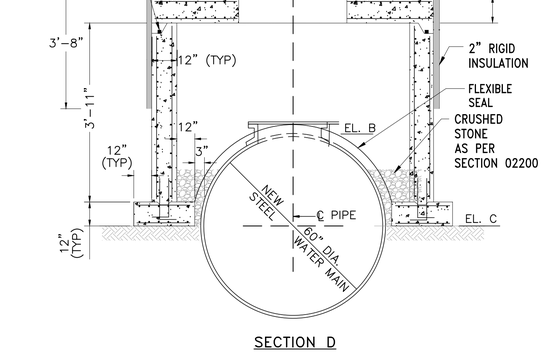

SECTION D

NEW AIR RELEASE MANHOLE ASSEMBLY (1)

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

DETAIL 1 – LOCATION TABLE
AIR RELEASE MANHOLE ASSEMBLY

PIPE LINE	PLAN SHEET	STATION	ELEV. A	ELEV. B	ELEV. C
WASM 3	C-105	0+68	47.0	44.0	36.9
WASM 3	C-105	26+10	68.0	65.4	58.3

TYPICAL ACCESS VAULT (2)

SCALE: N.T.S.
PRECAST STRUCTURE

DETAIL 2 – LOCATION TABLE
ACCESS VAULT

PIPE LINE	PLAN SHEET	STATION	ELEV. A	ELEV. B	ELEV. C
WASM 3	C-104	20+98	60.2	56.8	54.3

NO.	DATE	BY	CHK'D	REVISION

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DATE: AUGUST 2025
SCALE: AS NOTED

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ZHANXIAO MA
COMMONWEALTH OF MASSACHUSETTS
NO. 59633
REGISTERED
PROFESSIONAL ENGINEER
8/25/2025

MASSACHUSETTS WATER RESOURCES AUTHORITY

PREPARED BY :
Stantec
45 BLUE SKY DRIVE, 3RD FLOOR
BURLINGTON, MA 01803
www.stantec.com

WESTON AQUEDUCT SUPPLY MAIN 3
REHABILITATION OF WATER MAINS
SECTION W10

AIR VALVE VAULT & ACCESS VAULT

DRAWING NO.
S-503

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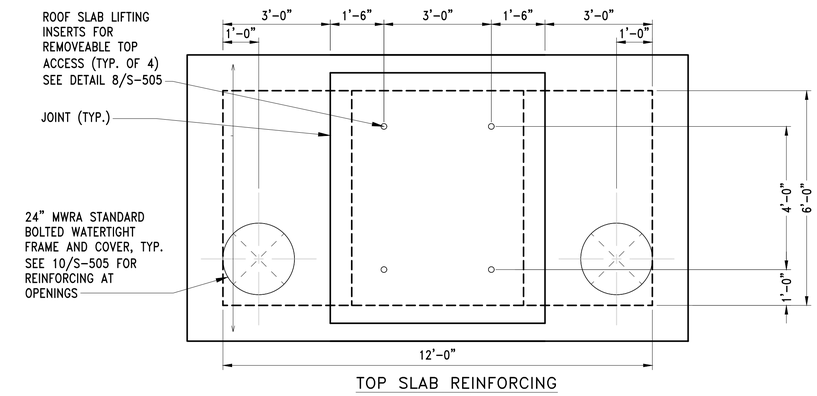
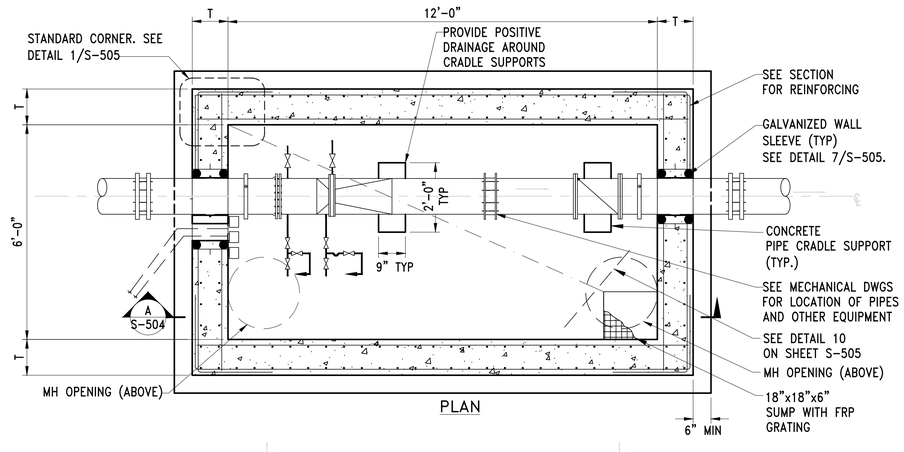
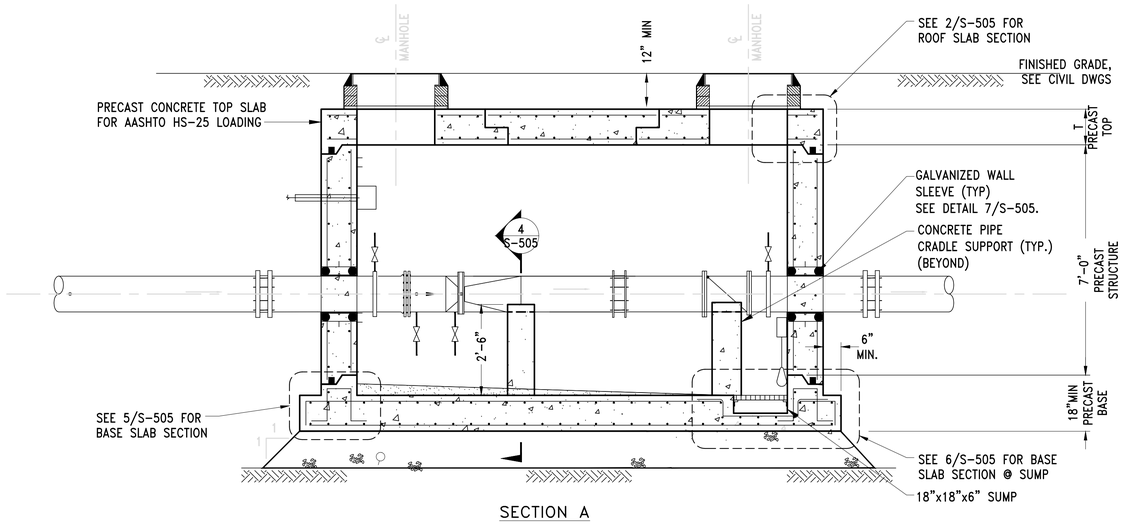


TOP SLAB REINFORCING



PLAN

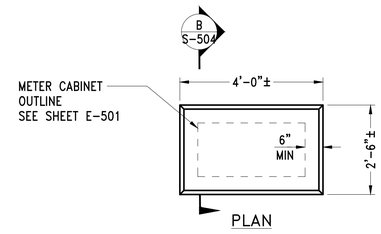


SECTION A

MWRA REVENUE METER VAULT — 1

SCALE: NTS

PRECAST STRUCTURE WITH REMOVABLE PRECAST ACCESS



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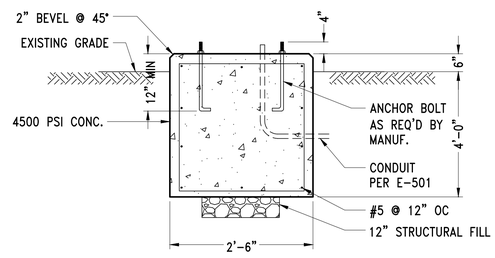

SECTION B

METER CABINET FOUNDATION — 2

SCALE: NTS

NO.	DATE	BY	CHK'D	REVISION

CONTRACT NO. :	6543	FILE NO. :	6543_S-504
ACCESSION NO. :	----	SECTION NO. :	W10
DATE:	AUGUST 2025	DESIGNED BY:	JM
		DRAWN BY:	DM
		CHECKED BY:	PD
SCALE:	AS NOTED	APPROVED BY:	JM

COMMONWEALTH OF MASSACHUSETTS — ZHANXIAO MA — 49633 — REGISTERED PROFESSIONAL ENGINEER — 8/25/2025

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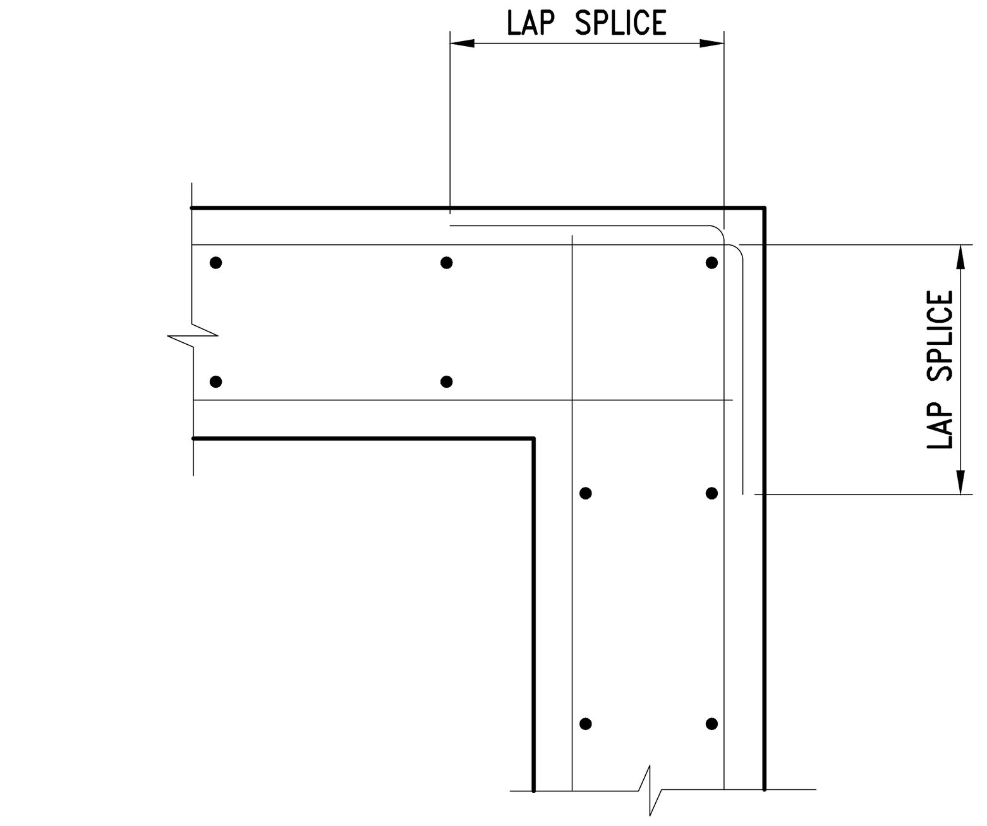
SECTION W10

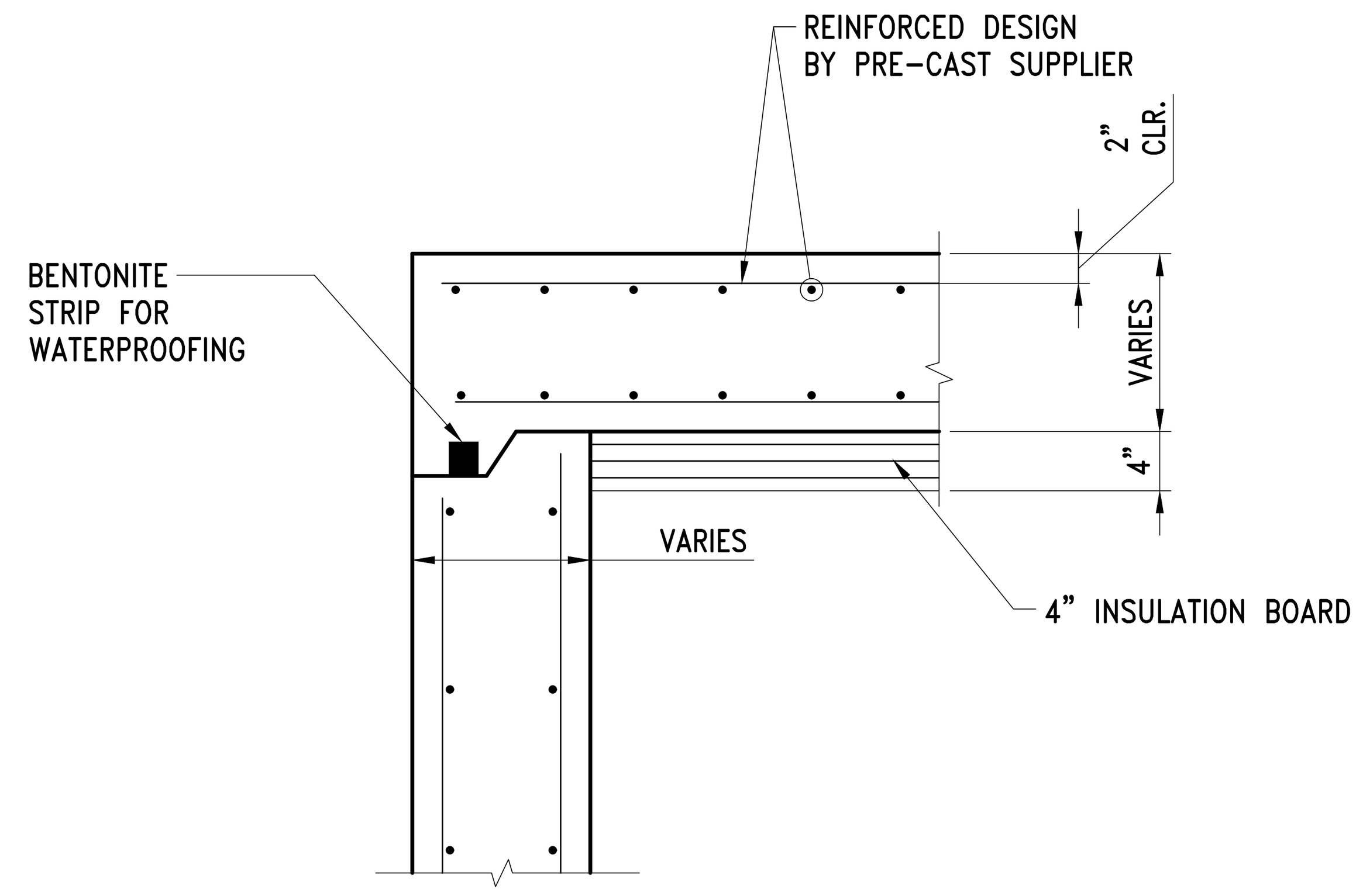
MWRA METER VAULT

DRAWING NO. S-504

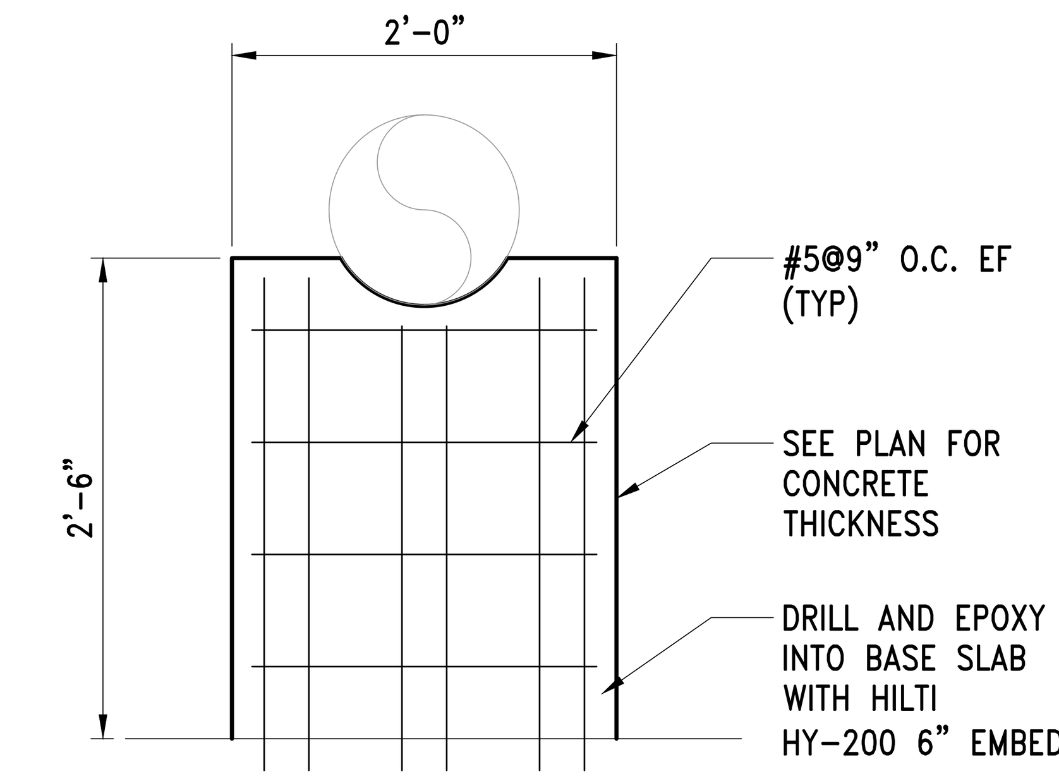
49 OF 83



TYPICAL WALL CORNER DETAIL (1)
SCALE: 3" = 1'-0"

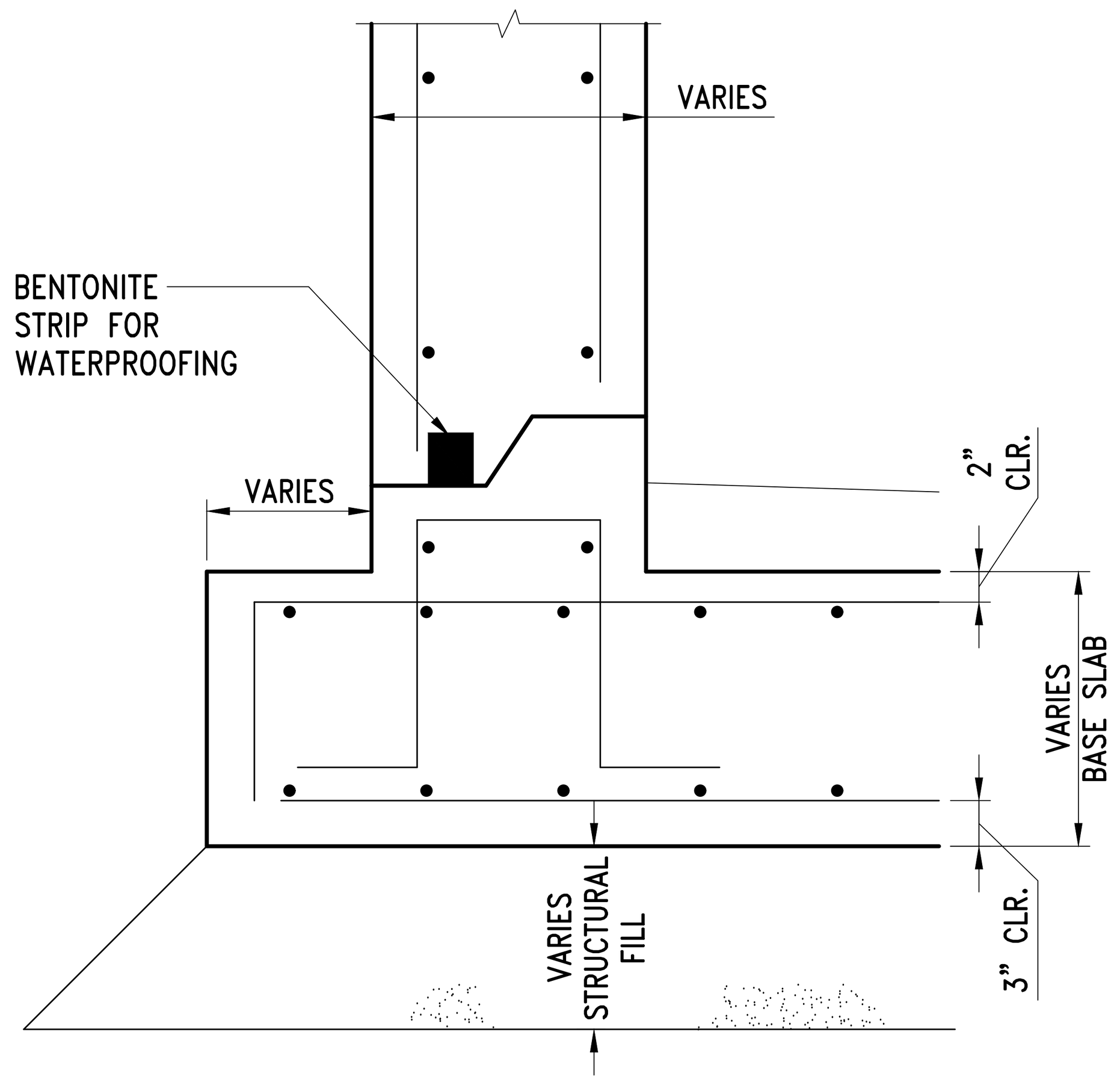


ROOF SLAB SECTION (2)
SCALE: 1" = 1'-0"
PRECAST STRUCTURE

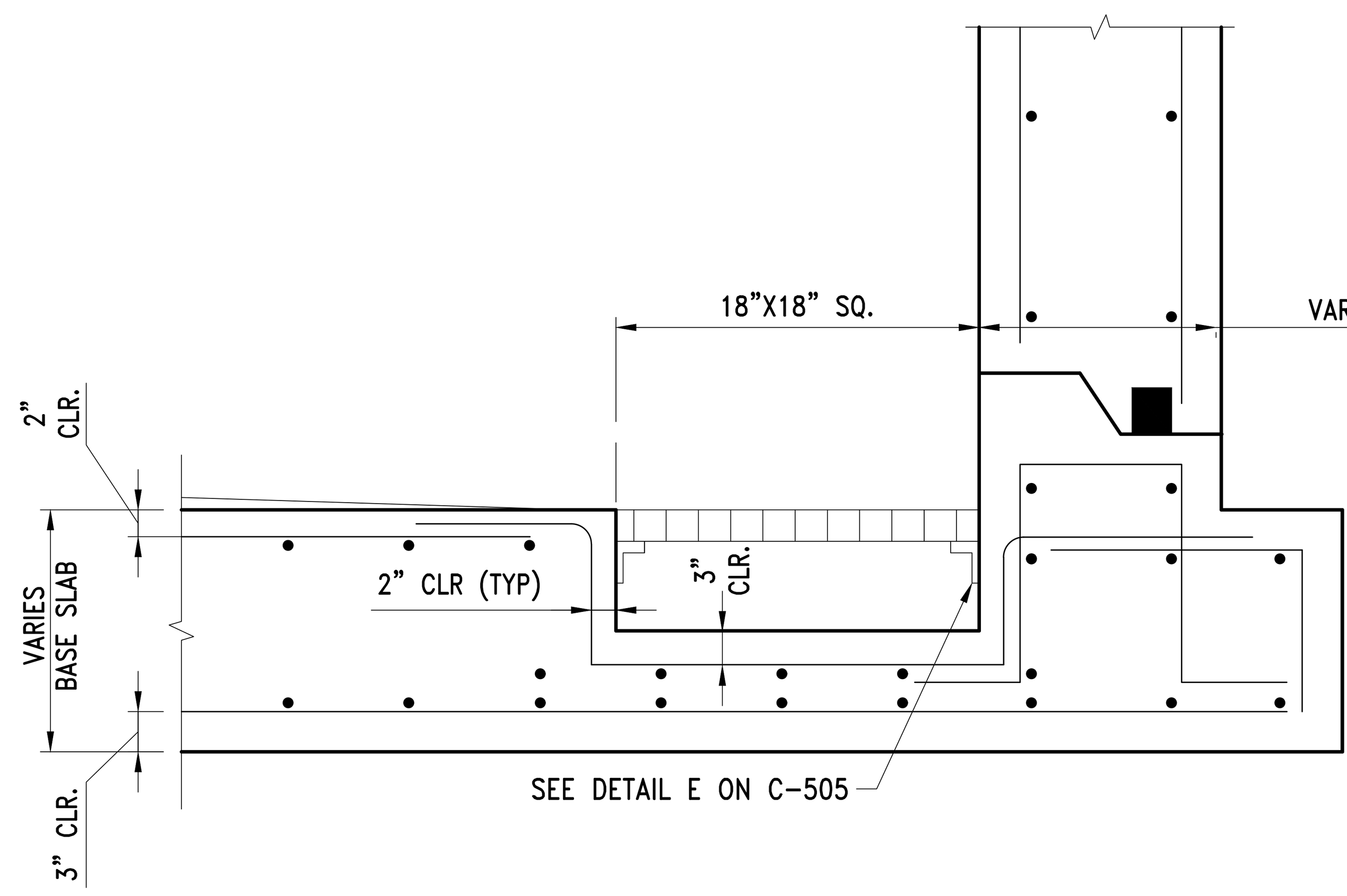


PIPE CRADLE SECTION (4)
N.T.S.

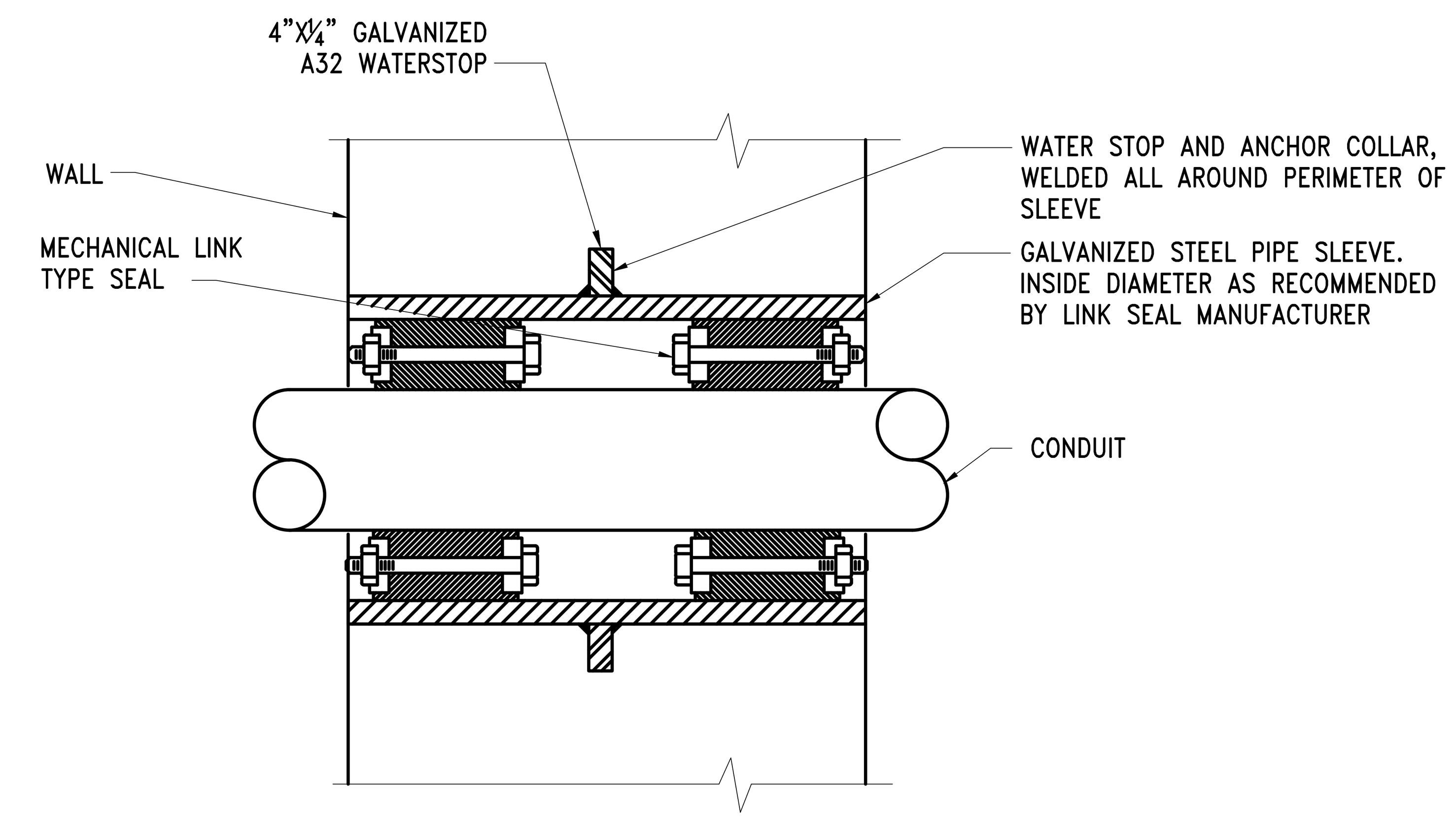
CAST-IN-PLACE STRUCTURE



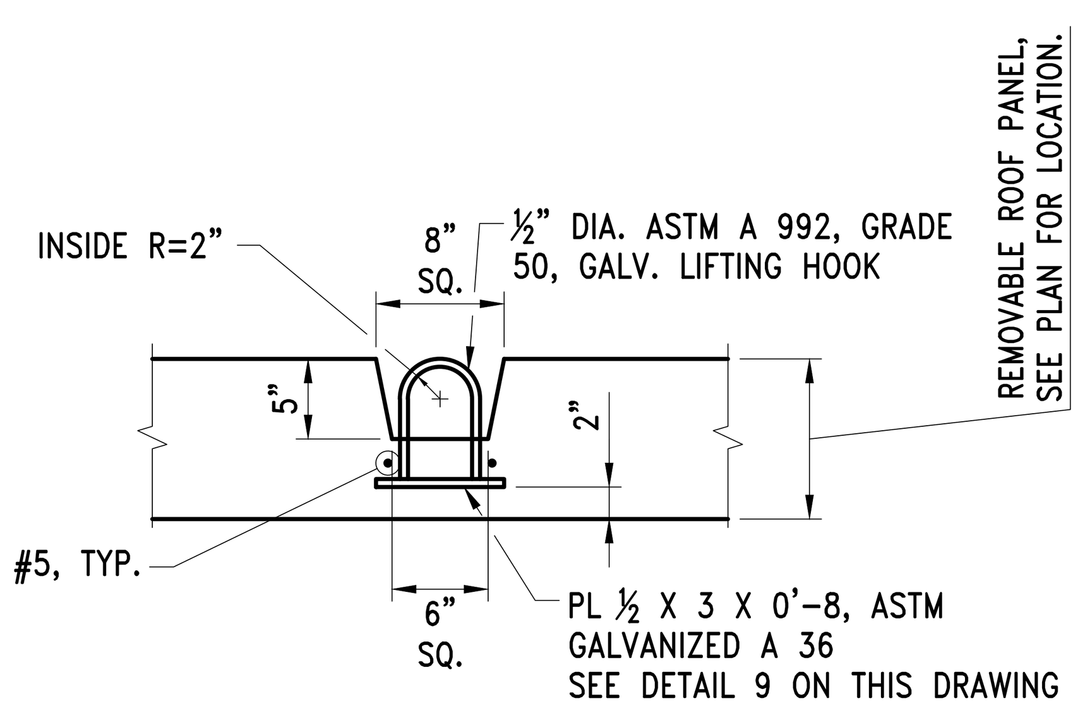
BASE SLAB SECTION (5)
SCALE: 1" = 1'-0"



BASE SLAB SECTION @ SUMP (6)
SCALE: 1" = 1'-0"

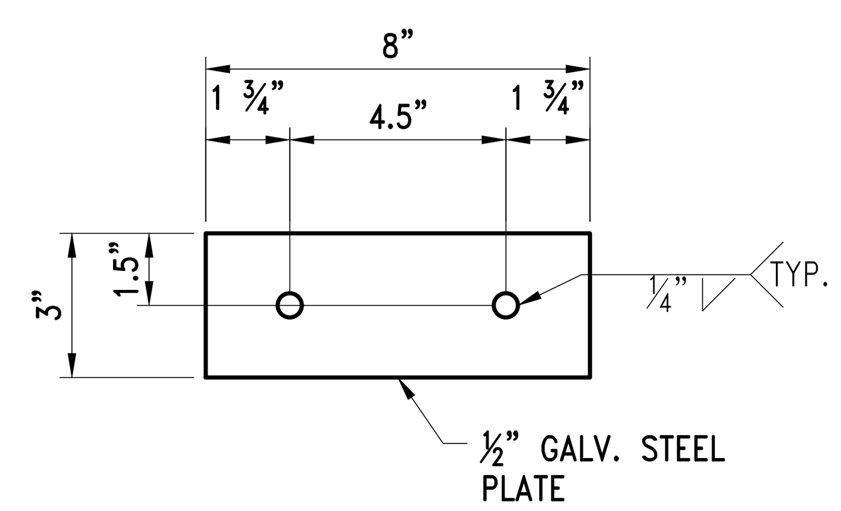


GALVANIZED WALL SLEEVE
WITH MECHANICAL SEALS DETAIL (7)
SCALE: NTS



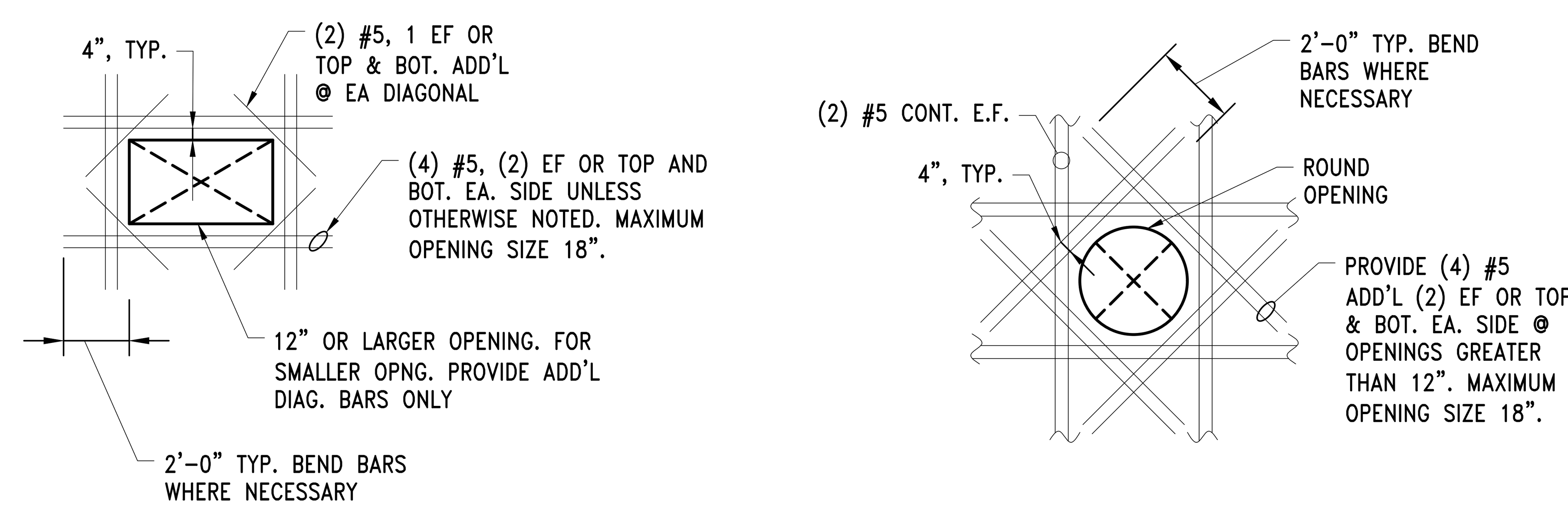
NOTE: DETAIL SHOWS MIN. PRE-CAST VAULT MANUFACTURER TO PROVIDE DESIGN AND CALCULATION OF HOOK FOR EACH PRECAST ELEMENT

LIFTING HOOK DETAIL (8)
SCALE: 1" = 1'-0"

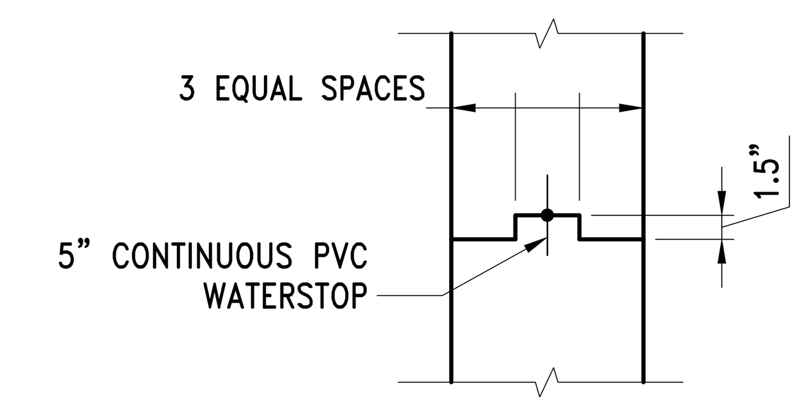


NOTE: DETAIL SHOWS MIN. PRE-CAST VAULT MANUFACTURER TO PROVIDE DESIGN AND CALCULATION OF HOOK FOR EACH PRECAST ELEMENT

LIFTING HOOK PLATE DETAIL (9)
SCALE: 3" = 1'-0"



TYPICAL ADDITIONAL REINFORCEMENT FOR
ROUND AND RECTANGULAR OPENINGS (10)
SCALE: NTS



WATERSTOP AND KEY DETAIL (11)
SCALE: 1" = 1'-0"

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STRUCTURAL DETAILS

DRAWING NO.
S-505