

UNIVERSITY OF MISSOURI - COLUMBIA GENERAL SITE - REPLACE UTILITIES NEAR MEMORIAL UNION PROJECT NUMBER: CP230201

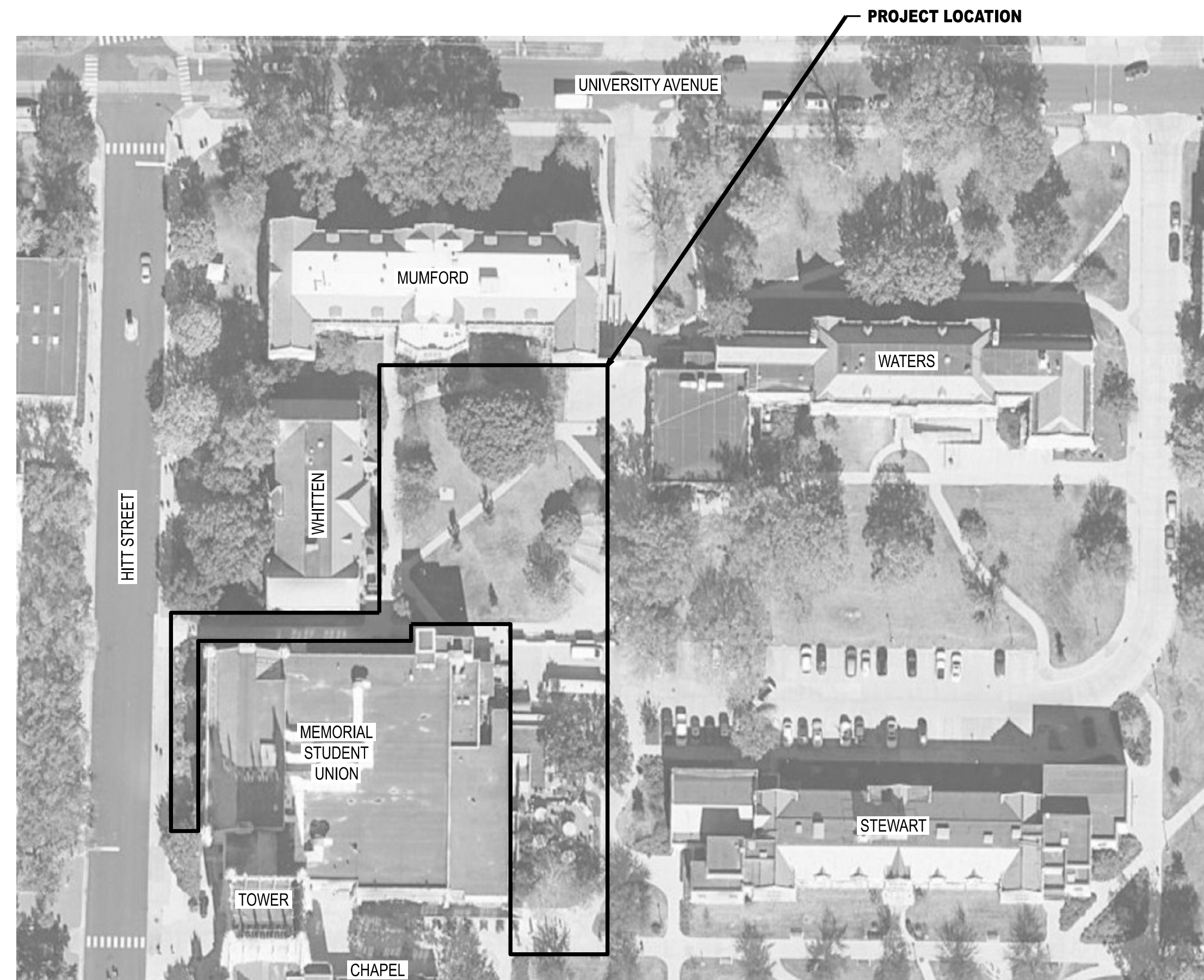
AT: UNIVERSITY OF MISSOURI - COLUMBIA, MISSOURI
FOR: THE CURATORS OF THE UNIVERSITY OF MISSOURI
ISSUED FOR BID: 01/10/2025

SPECIAL INSPECTIONS (IBC CHAPTER 17):

- 1) All concrete waterproofing shall be fully placed and inspected by the owner prior to proceeding to the next step of installation. Owner shall receive 24 hour notice of inspections being required. These inspections for approval shall include:
 - a) Substrate conditions and preparations
 - b) Flashing installation
 - c) Membrane installation
 - d) Protection and drainage installation
 - 2) The owner will contract with an independent testing firm to complete ultrasonic shear wave weld inspections on owner selected field welds. If the results of these tests indicate poor quality welds, those "failed" welds shall be replaced at no additional cost to the project. If further ultrasonic inspection is required to assure quality weld workmanship, these tests shall be at the expense of the contractor, and any and all defective welds shall be replaced at no additional cost to the project.
 - 3) Placing of concrete and reinforcing steel (continuous of concrete sampling / periodic of reinforcing).
 - 4) In-situ soils, excavations, filling, and compaction (periodic).
- The contractor shall request special inspection of the items listed above prior to those items becoming inaccessible and unobservable due to progression of the work.

DELEGATED DESIGN:

Contractor is responsible for the design of shoring, earth retention systems, temporary excavations support, existing utility protection systems, and associated items as needed to facilitate completion of this work. Design shall be completed by a licensed professional structural engineer registered in the State of Missouri. Designs shall be submitted to review by project engineer.



PROJECT LOCATION
SCALE: NONE

INDEX OF DRAWINGS

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		DESCRIPTION
GENERAL DRAWINGS		
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0	CE 3	STORM SEWER PLAN
0	CE 4	STORM SEWER LINE 1 PROFILE AND DETAILS
0	CE 5	WATERLINE PLAN
0	CE 6	STEAM CHASE LOCATION PLAN
0	CE 7	SITE PLAN
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0	M002	MECHANICAL SUPPORTS - SYMBOLS, NOTES, AND LEGEND
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ARCHITECTURAL DRAWINGS		
0	A100	WATERPROOFING EXTERIOR ELEVATION
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0	A300	RAMP GUARDRAIL AND SCREEN
ELECTRICAL DRAWINGS		
0	E101	ELECTRICAL SITE PLAN
0	E200	ELECTRICAL DETAILS

OWNER'S REPRESENTATIVE:

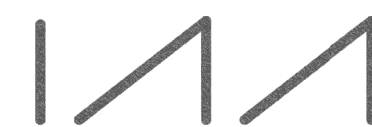
BRANDON REDINGTON
112 GENERAL SERVICES BUILDING
COLUMBIA, MO 65211
573-405-0083
PROJECT CP230201

DESIGN CONSULTANTS:

MECHANICAL AND ELECTRICAL
PRVN CONSULTANTS, INC.
1617 SECOND AVE. SUITE 110
ROCK ISLAND, IL 61201
563.263.5160
PROJECT 24084

CROCKETT
ENGINEERING CONSULTANTS

STRUCTURAL AND CIVIL
CROCKETT ENGINEERING CONSULTANTS
1000 W NIFONG BLVD, BUILDING 1
COLUMBIA, MO 65203
573.447.0292
PROJECT xxxxx



ARCHITECT
INTERNATIONAL ARCHITECTS ATELIER
912 BROADWAY BLVD, SUITE 300
KANSAS CITY, MO 64105
816.471.6522

THIS SHEET HAS BEEN SIGNED,
SEALED, AND DATED ELECTRONICALLY

ENGINEER / ARCHITECT OF RECORD:
JAMES NONNENMANN, PE
LICENSE NO. PE-5053025612
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE 110
ROCK ISLAND, IL 61201
PHONE: 563-263-5160

0	01/10/25	ISSUED FOR BID	DRAWN BY: M.A.O.	CHECKED BY: J.J.N.
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PRVN CONSULTANTS, INC.
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MISSOURI CERTIFICATE OF
AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
GENERAL SITE - REPLACE UTILITIES
NEAR MEMORIAL UNION
COLUMBIA, BOONE COUNTY, MISSOURI 65203
COVER SHEET, PROJECT LOCATION PLAN
AND DRAWING INDEX

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP230201

CONSULTANT
PROJECT NUMBER
24084

SHEET
G000

PROJECT BENCHMARK:

TBM #1 - CHISELED SQUARE IN CONCRETE WELL WALL LOCATED ON THE NORTH SIDE OF MEMORIAL STUDENT UNION, APPROXIMATELY 95 FEET EAST OF THE NORTHWEST CORNER OF MEMORIAL STUDENT UNION.

ELEVATION = 768.63'

UTILITY COMPANIES:

LOCATES:
MISSOURI ONE CALL INC.
1022 B NORTHEAST DRIVE
JEFFERSON CITY, MO 65109
1-800-344-7483



TELEPHONE:
UNIVERSITY OF MISSOURI, DIVISION OF I.T.
615 LOCUST ST.
COLUMBIA, MO 65211
573-882-5000

FIBER/CABLE TELEVISION:
CENTURYLINK
625 CHERRY STREET
COLUMBIA, MO 65205
573-886-3700

STEAM & MEDIUM VOLTAGE ELECTRIC:
CHARTER COMMUNICATIONS
1510 CHARTER BOONE
INDUSTRIAL BOULEVARD
COLUMBIA, MO 65202
573-875-8875

WATER:
ENERGY MANAGEMENT
417 S. 5TH ST.
COLUMBIA, MO 65211
573-882-3094

STORM/SANITARY SEWER & SECONDARY ELECTRIC:
UNIVERSITY CAMPUS FACILITY OPERATIONS
180 GENERAL SERVICES BUILDING
COLUMBIA, MO 65211
573-882-8211

NATURAL GAS:
AMEREN MISSOURI
2001 MAGUIRE BLVD.
COLUMBIA, MO 65201
573-876-3030

CABLE TELEVISION:
MEDIACOM
1211 WILKES BLVD.
COLUMBIA, MO 65201
856-633-4226

GENERAL NOTES:

CONTRACTOR WILL BE RESPONSIBLE FOR PLACEMENT AND MAINTENANCE OF TRAFFIC CONTROL DEVICES NECESSARY TO COMPLETE THEIR PORTION OF WORK. THE DEVICES AND METHODS EMPLOYED WILL COMPLY WITH THE CURRENT VERSION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD).

EXISTING UTILITIES SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL COORDINATE LOCATES PRIOR TO ANY EXCAVATION.

ALL EXCAVATION TO BE IN ACCORDANCE WITH SECTIONS 319.010-319.050, REVISED STATUTES OF THE STATE OF MISSOURI. SUCH COMPLIANCE SHALL NOT, HOWEVER, EXCUSE ANY PERSON MAKING ANY EXCAVATION FROM DOING SO IN A CAREFUL AND PRUDENT MANNER, NOR SHALL IT EXCUSE SUCH PERSON FROM LIABILITY FOR ANY DAMAGE OR INJURY TO UNDERGROUND UTILITIES RESULTING FROM THE EXCAVATION.

IT IS THE INTENT OF THESE PLANS TO COMPLY WITH THE REQUIREMENTS OF THE MOENR CLEAN WATER COMMISSION.

THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EROSION CONTROL DEVICES AND REMOVING THEM ONCE THE SITE IS STABILIZED.

STORM WATER OR OTHER SOURCES OF WATER SHALL NOT BE ALLOWED TO ENTER ACTIVE STEAM SYSTEMS.

CONTRACTOR TO PROTECT ALL EXISTING UTILITIES, STRUCTURES, AND PAVEMENT THAT IS TO REMAIN. ALL DAMAGED ITEMS OUTSIDE THE SCOPE OF WORK TO BE REPLACED OR REPAIRED TO ORIGINAL CONDITION AT THE CONTRACTORS EXPENSE.

ALL PAVEMENTS, SIDEWALKS, ABANDONED SEWERS, PIPELINES, EXCESS EARTHWORK, OR OTHER OBSTRUCTIONS TO CONSTRUCTION THAT ARE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS SPECIFICALLY NOTED AND SHALL BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH STATE REGULATION TO CSR 80-2.010 (9)(A).

ALL SLOPES ARE 3:1 OR FLATTER UNLESS OTHERWISE NOTED.

ALL DISTURBED AREAS WITHIN THE "LIMITS OF DISTURBANCE" SHALL BE FINE GRADED AND LEFT (6" FOR TURF AREAS OR 18" FOR PLANTER BED AREAS) BELOW FINAL GRADE BY CONTRACTOR. FINAL TOPSOIL AND VEGETATION WILL BE REESTABLISHED BY OWNER.

TOTAL DISTURBED AREA ON SITE = 0.40 AC.

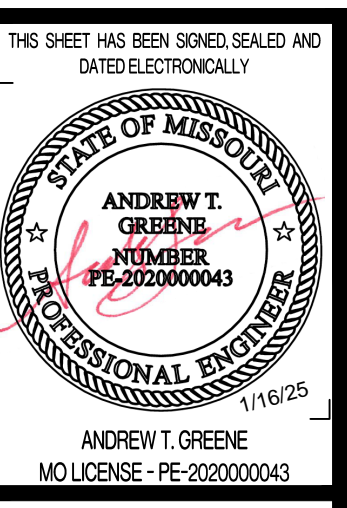
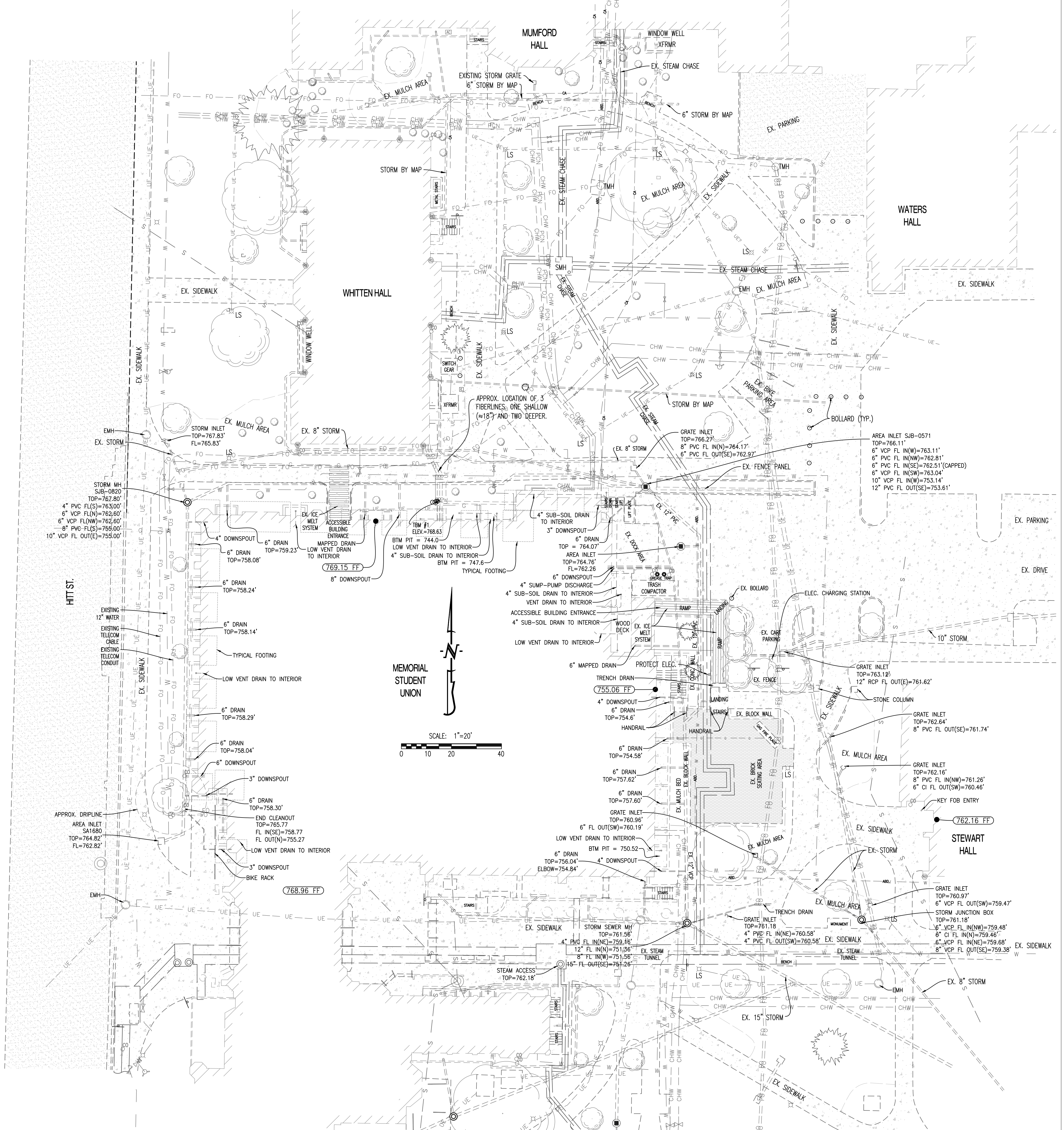
MISSOURI DNR LAND DISTURBANCE PERMIT NOT NEEDED FOR THIS PROJECT.

THE PROJECT REQUIRES OUTAGES TO SITE UTILITY SYSTEMS. CONTRACTOR SHALL COMPLETE ALL RELATED WORK TO THE MAXIMUM EXTENT POSSIBLE PRIOR TO THE START OF OUTAGES. CONTRACTOR SHALL HAVE ALL REQUIRED MATERIALS ON SITE PRIOR TO START OF OUTAGES.

TIE-INS TO UNIVERSITY UTILITY SYSTEMS SHALL BE MADE ON WEEKENDS OR NIGHTS AND WORK SHALL BE DONE AROUND-THE-CLOCK UNTIL THE TIE-IN IS COMPLETED.

SITE LEGEND OF SYMBOLS:

	EXISTING CURB	FF-XXXX	FINISH FLOOR OF STRUCTURE
	PROPOSED CURB	XXXX.XX TC	PROPOSED TOP OF CURB ELEVATION
	EXISTING STRUCTURE	XXXX.XX TP	PROPOSED TOP OF PAVEMENT ELEVATION
	EXISTING TREELINE	XXXX.XX FO	PROPOSED FINISH GRADE ELEVATION
	PROPOSED TREELINE	XXXX.XX TW	PROPOSED TOP OF WALL
	EDGE OF WATERWAY	XX	LOT NUMBER
	EXISTING WATERLINE	X	STORM SEWER STRUCTURE LABEL
	PROPOSED WATERLINE	X	SANITARY SEWER STRUCTURE LABEL
	EXISTING GAS LINE	HP.	HIGH POINT
	PROPOSED GAS LINE	LP.	LOW POINT
	EXISTING UNDERGROUND TELEPHONE	EXISTING SIGNS	
	EXISTING UNDERGROUND CABLE TELEVISION	EXISTING POWER POLE	
	EXISTING HIGH VOLTAGE ELECTRIC	EXISTING GAS VALVE	
	EXISTING OVERHEAD ELECTRIC	EXISTING WATER VALVE	
	EXISTING UNDERGROUND ELECTRIC	EXISTING GAS METER	
	EXISTING OVERHEAD ELEC. & TV	EXISTING WATER METER	
	EXISTING OVERHEAD ELEC., TV & TELE.	EXISTING FIRE HYDRANT	
	EXISTING SANITARY SEWER	MANHOLE	
	PROPOSED SANITARY SEWER	EXISTING SANITARY SEWER LATERAL	
	EXISTING MINOR CONTOUR	PROPOSED SANITARY SEWER LATERAL	
	EXISTING MAJOR CONTOUR	PROPOSED TRACER WIRE TEST STATION BOX	
	PROPOSED MINOR CONTOUR	EXISTING AIR CONDITIONER	
	PROPOSED MAJOR CONTOUR	EXISTING TELEPHONE PEDESTAL	
	DEMOLITION LIMITS	EXISTING ELECTRICAL TRANSFORMER	
	SILT FENCE/STRAW WADDOLE	EXISTING ELECTRIC METER	
	CONSTRUCTION BARRIER FENCING	EXISTING LIGHT POLE	
	TREE PROTECTION FENCING		
	EXISTING GUY WIRE		



CHECKED BY: WTE
DRAWN BY: ATG
ISSUE FOR BID
01/16/25

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MISSOURI CERTIFICATE OF
AUTHORITY ENGINEERING - 2023017805



UNIVERSITY OF MISSOURI - COLUMBIA
GENERAL SITE - REPLACE UTILITIES
NEAR MEMORIAL UNION
COLUMBIA, BOONE COUNTY, MISSOURI 65203
EXISTING SITE PLAN AND CIVIL NOTES

UNIVERSITY OF MISSOURI
PROJECT NUMBER

CP230201

CONSULTANT
PROJECT NUMBER

220449

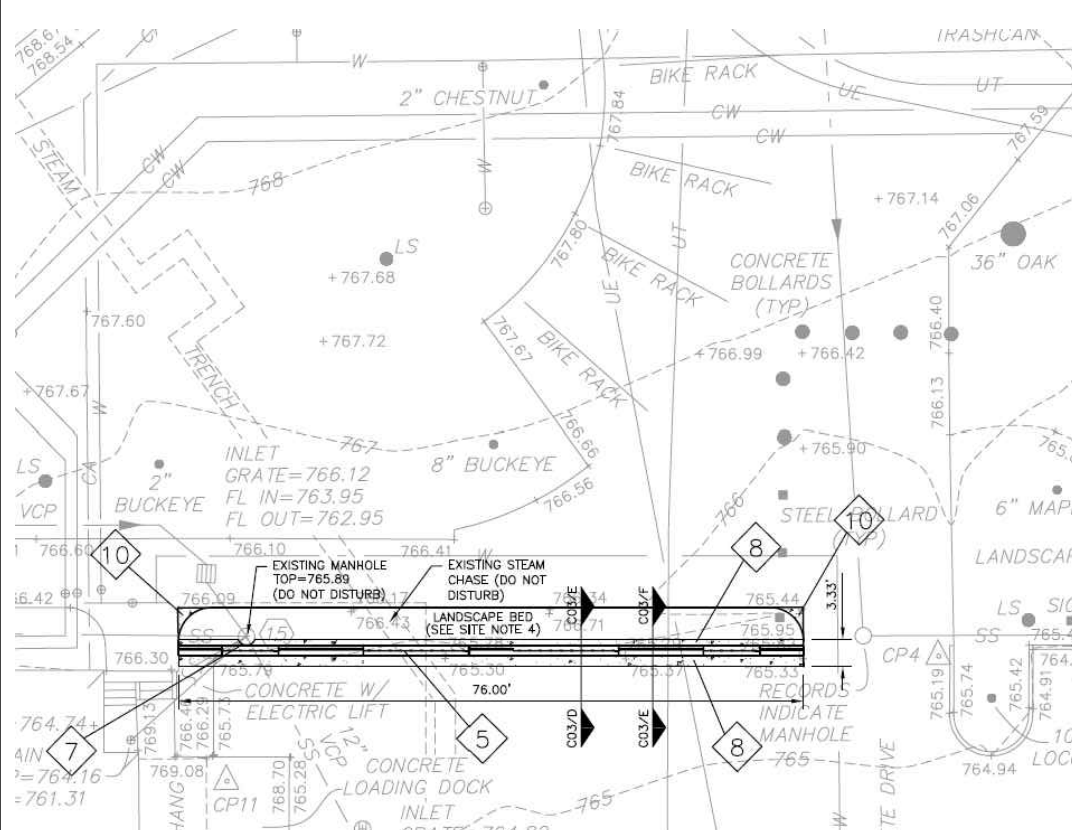
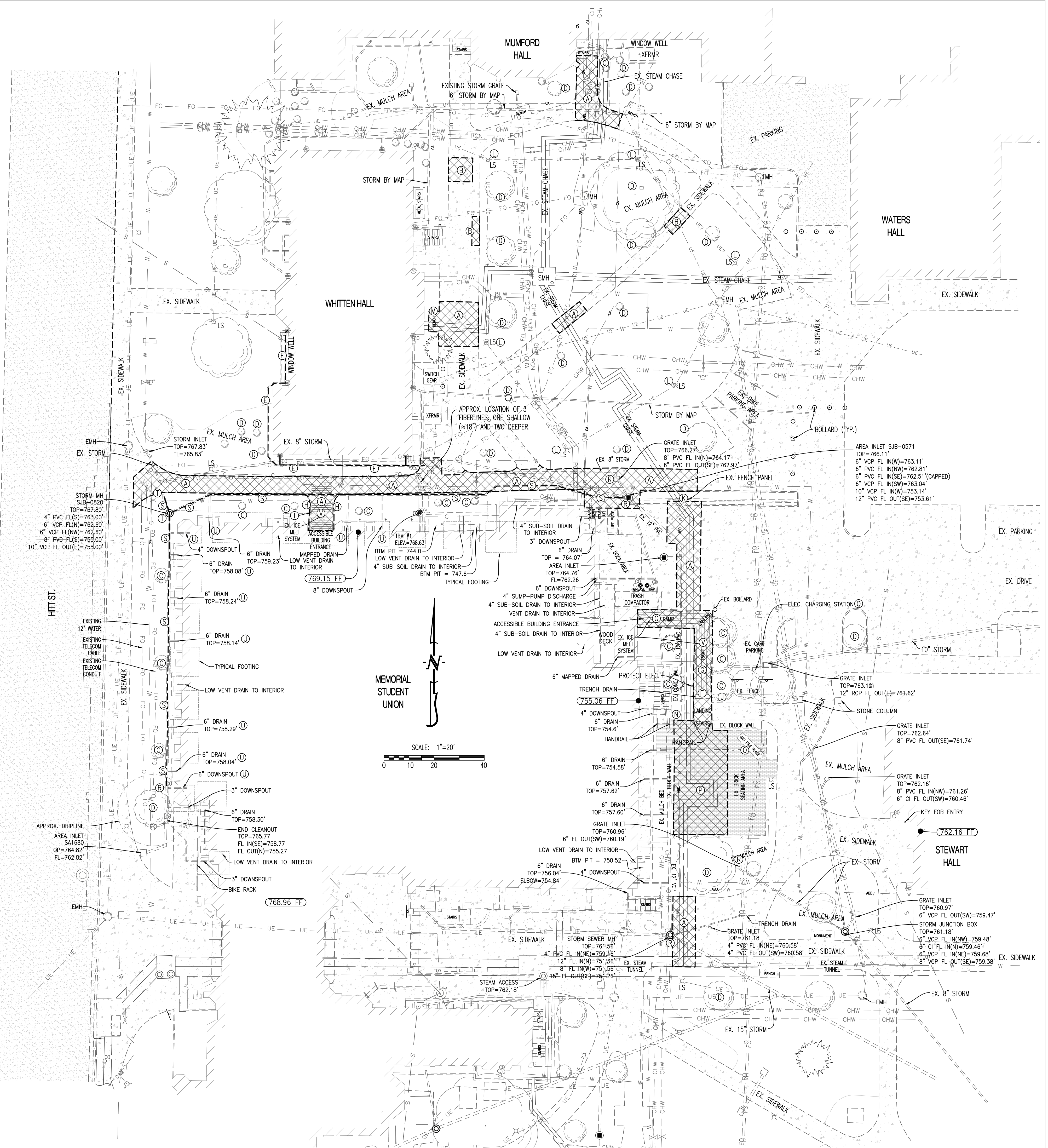
SHEET
CE1

LEGEND OF LABELS

- (A) REMOVE EXISTING CONCRETE PAVEMENT FOR UTILITY CONSTRUCTION AS SHOWN. EXACT PAVEMENT REMOVAL LIMITS SHALL BE TO NEAREST SAW JOINT IN CONCRETE PAVEMENT. PROVIDE CLEAN, FULL DEPTH SAW CUT IN EXISTING PAVEMENT TO REMAIN TO PROVIDE A CLEAN CONNECTION TO THE NEW PAVEMENT.
- (B) REMOVE EXISTING BROKEN CONCRETE SIDEWALK PANELS AS SHOWN. EXACT PAVEMENT REMOVAL LIMITS SHALL BE TO NEAREST SAW JOINT IN CONCRETE PAVEMENT. PROVIDE CLEAN, FULL DEPTH SAW CUT IN EXISTING PAVEMENT TO REMAIN TO PROVIDE A CLEAN CONNECTION TO THE NEW PAVEMENT. COORDINATE WITH OWNER ON WHICH EXACT PANELS ARE TO BE REMOVED.
- (C) EXISTING TREE/LANDSCAPE AREA TO BE REMOVED AS REQUIRED FOR UTILITY WORK. ALL TREES, MULCH, PLANTS, BUSHES, ETC. TO BE DISPOSED OF OFF-SITE. REMOVE ENTIRE ROOT BALL OF TREES.
- (D) EXISTING TREE TO BE PROTECTED. REFER TO TREE PROTECTION FENCING PLAN ON CE 9 & CE 10.
- (E) EXISTING DOWNSPOUT COLLECTOR AND LEADERS TO DOWNSPOUTS TO BE REMOVED AS SHOWN. REFER TO NEW PLAN FOR REPLACEMENT.
- (F) EXISTING STORM SEWER TRENCH DRAIN TO BE SALVAGED AND REINSTALLED IN REBUILT RAMP.
- (G) EXISTING CONCRETE RAMP WITH WALLS TO BE REMOVED AS SHOWN.
- (H) EXISTING RAILING TO BE REMOVED.
- (I) EXISTING DOOR OPENER TO BE SALVAGED FOR REINSTALLATION.
- (J) REMOVE AND REPLACE FENCE AS NEEDED.
- (K) WORK AROUND PORTION OF EXISTING WALL FOR UTILITY CONSTRUCTION AS NEEDED. INTENT OF ORIGINAL WALL DESIGN INCLUDED GAP IN FOOTING TO ALLOW FOR ACCESS TO STEAM CHASE. NOTIFY OWNER IF ANY PART OF THE WALL OR FOOTING MUST BE REMOVED AND REPLACED. REFER TO ORIGINAL CONSTRUCTION DETAIL FOR REFERENCE ON THIS SHEET.
- (L) REMOVE SIX (6) EXISTING LIGHT POLES FOR NEW POLE INSTALLATION. REFER TO MEP PLANS.
- (M) REMOVE EXISTING BENCH DURING DEMOLITION AND STORE FOR REINSTALLATION AFTER NEW PAVEMENT HAS BEEN INSTALLED.
- (N) EXISTING SMALL BLOCK WALL TO BE REMOVED AND REPLACED AS NEEDED FOR CHASE CONSTRUCTION.
- (O) EXISTING GAS FIREPLACE TO REMAIN.
- (P) SALVAGE PORTION OF BRICK PAVEMENT AREA FOR CHASE LID CONSTRUCTION. REINSTALL PAVERS TO MATCH EXISTING CONDITIONS.
- (Q) CART CHARGING STATION TO REMAIN.
- (R) EXISTING STORM STRUCTURE TO REMAIN.
- (S) REMOVE EXISTING STORM PIPING AS SHOWN.
- (T) REMOVE EXISTING STORM STRUCTURE.
- (U) PROTECT EXISTING DOWNSPOUT AND VENT WELL LINES FROM BUILDING TO REMOVED STORM SEWER. CONTRACTOR SHALL ALLOW OWNER TO INSPECT CONDITION OF EXISTING LINES FROM BUILDING. A CHANGE ORDER MAY BE ISSUED TO REPLACE ANY DAMAGED PIPING AS ENCOUNTERED. LINES WILL BE RECONNECTED TO REPLACEMENT STORM SEWER.
- (V) EXISTING ICE MELT SYSTEM TO BE REMOVED AND REPLACED IN NEW SIDEWALK. REFER TO MEP PLANS.

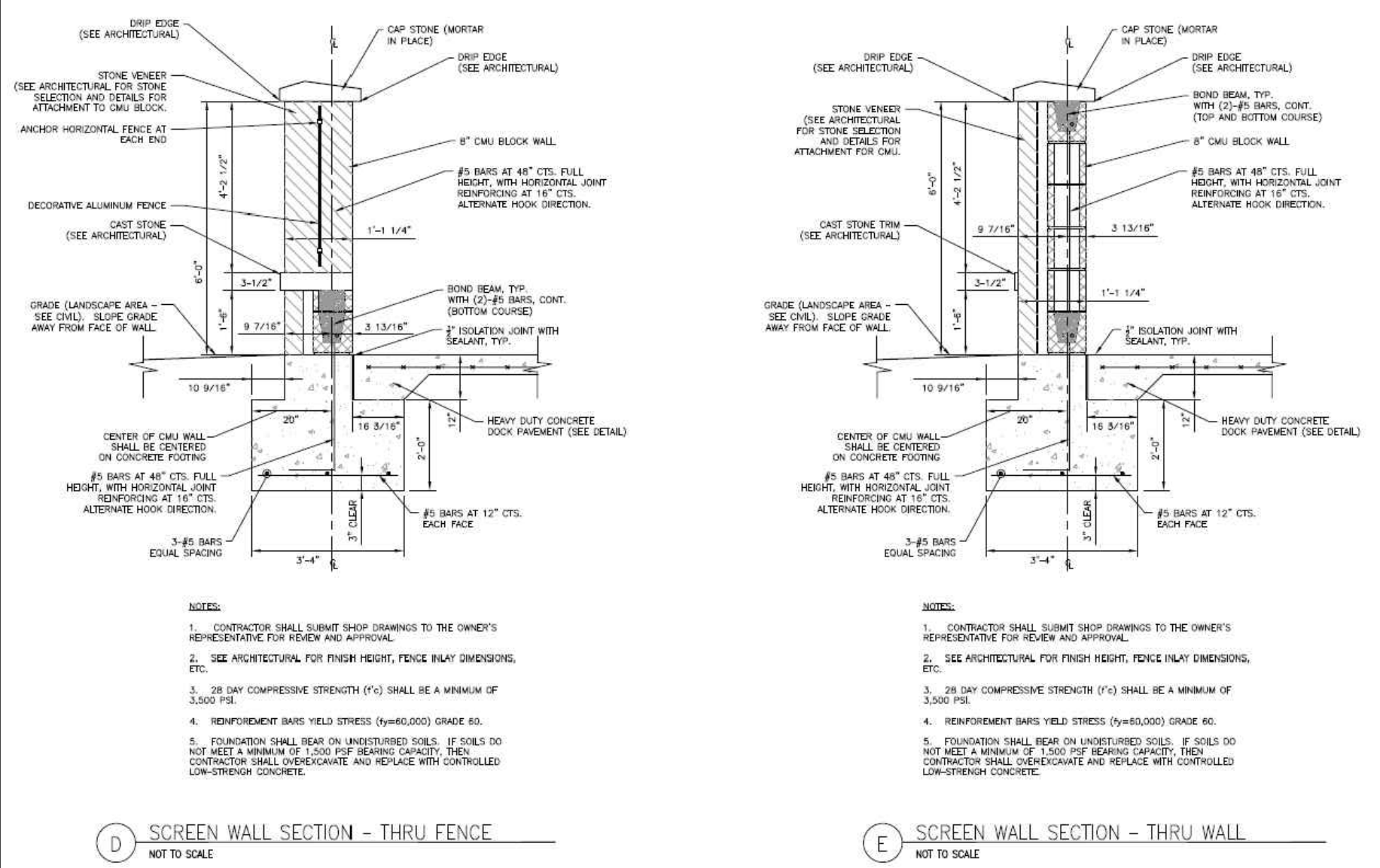
GENERAL DEMOLITION NOTES:

1. CONTRACTOR SHALL TAKE CAUTION TO PROTECT EXISTING UTILITIES THAT ARE TO REMAIN.
2. CERTAIN AREAS MAY BE REQUIRED TO BE REMOVED IN PHASES. CONTRACTOR TO COORDINATE TIMING WITH OWNER.
3. ITEMS OUTSIDE CONSTRUCTION LIMITS OR CALLED OUT TO REMAIN SHALL BE PROTECTED AS REQUIRED. CONTRACTOR SHALL REPAIR/REPLACE DAMAGED ITEMS OUTSIDE PROJECT SCOPE OF WORK AT NO EXPENSE TO THE OWNER.
4. CONCRETE TO BE REMOVED TO THE NEAREST SAW JOINT, BUT NOT LESS THAN THE DEMOLITION LIMITS SHOWN ON THE PLAN.
5. CONTRACTOR TO COORDINATE WITH OWNER PRIOR TO DISCONNECTING ANY UTILITIES.

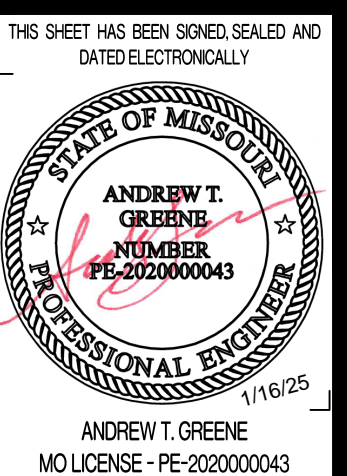


- KEYED NOTES**
- (NEW TRANSFORMER AND PAD (SEE ELECTRICAL))
 - (NEW UNDERGROUND ELECTRIC DUCTBANK (SEE ELECTRICAL FOR ROUTING))
 - (PROTECT EXISTING UTILITIES TO CONFORM POTENTIAL CONFLICTS)
 - (SCREEN FENCE AND GATE - SEE ADD FOR SCREEN FENCE/GATE PRODUCT INFORMATION)
 - (STONE/CONC AND FENCE PANEL SCREEN WALL (SEE DRAWING CDS))
 - (EXISTING STEAM CHASE UNDER ALTERNATE #1 - NEW SCREEN WALL - PROTECT EXISTING STEAM CHASE)
 - (CAST WALL FOOTING AROUND MANHOLE)
 - (SCREEN WALL FOOTING (BELOW GRADE))
 - (REMOVE ANY CHASE TO REPAIR/REPLACE WALL AS A RESULT OF REMOVAL AND REINSTALLATION OF UNDERGROUND ELECTRIC)
 - (NEW SIDEWALK - FROM PAVED AND UNPAVED AREA OF REMOVED LANDSCAPE ISLAND)
 - (ELEVATOR ADDITION - SEE ARCHITECTURAL)
 - (ELECTRICAL TO STOP AT AREA THAT WALL - NEW CONDUIT WILL SPIN ACROSS AREA WITH SUPPORTS (SEE ELECTRICAL DRAWINGS))
 - (WATER AT BUILDING WATER SERVICE - FOLLOW ALL STANDARDS FOR CONSTRUCTION. CONSTRUCT NEW MAIN TAP, GATE VALVE, AND WATER LINE)
 - (WATER LINE TO FUTURE AREA THAT WALL THROUGH AREA MAY VARY INTO BUILDING. (SEE ELECTRICAL DRAWINGS FOR WATER LINE HEAT TREAT APPLICATION))
 - (NEW ADA COMPLIANT ENTRY RAMP)
 - (SEE ADD DETAIL V)
- LEGEND**
- (WE) MATCH EXISTING
 - (CONCRETE WALL (SEE CDS))

ORIGINAL WALL CONSTRUCTION PLAN (FOR REFERENCE)



ORIGINAL WALL CONSTRUCTION DETAIL (FOR REFERENCE)



01/16/25
 DRAWN BY: WTE
 CHECKED BY: WTE
 01/16/25
 ISSUE FOR BID
 DRAWN BY: ATG

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 1617 SECOND AVE. STE. 110
 ROCK ISLAND, IL 61201
 PHONE 562.263.9161
 MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 202007805



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 GENERAL SITE - REPLACE UTILITIES
 NEAR MEMORIAL UNION
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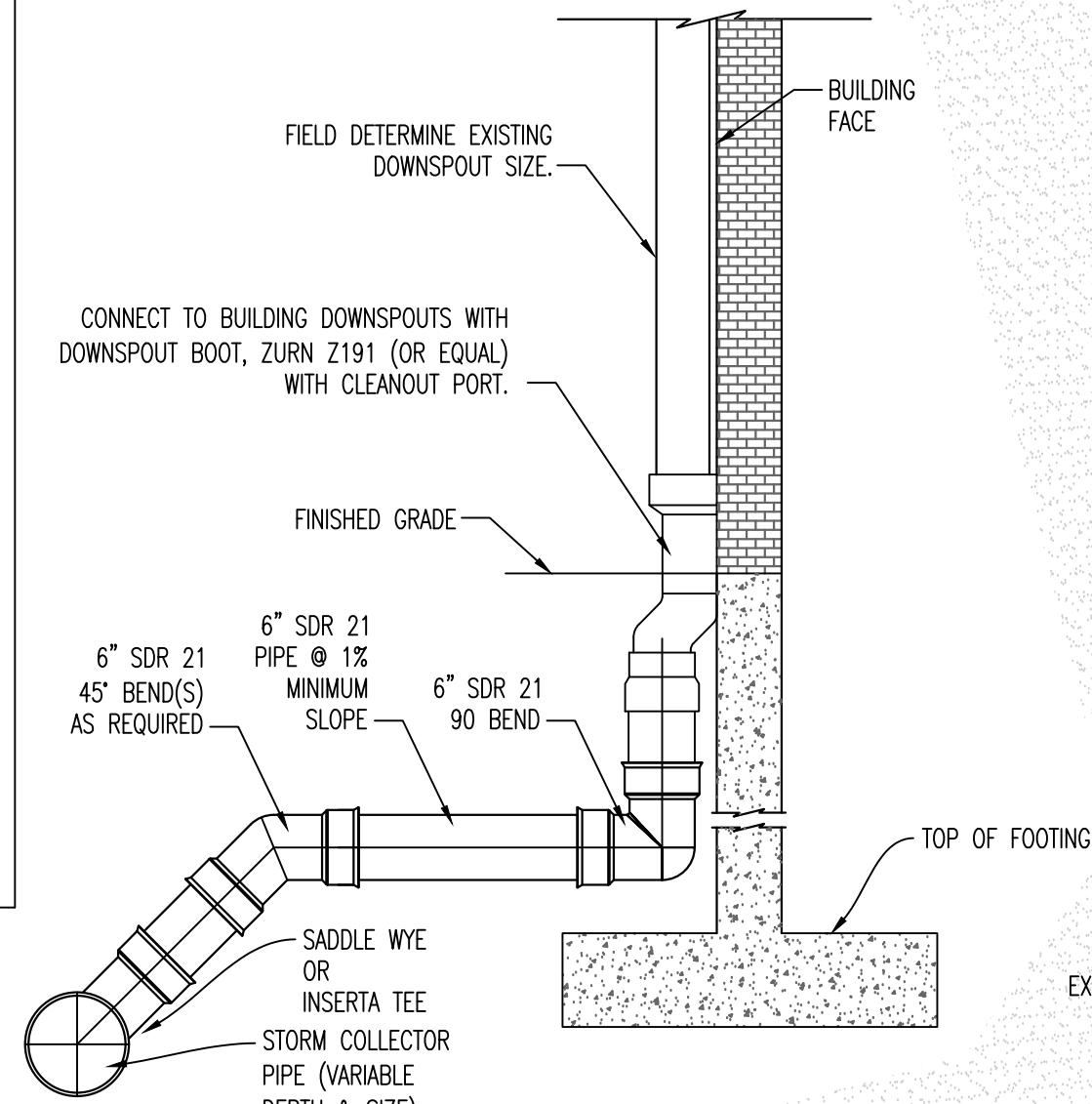
UNIVERSITY OF MISSOURI PROJECT NUMBER
 CP230201
 CONSULTANT PROJECT NUMBER
 220449
 SHEET
 CE 2

LEGEND OF LABELS

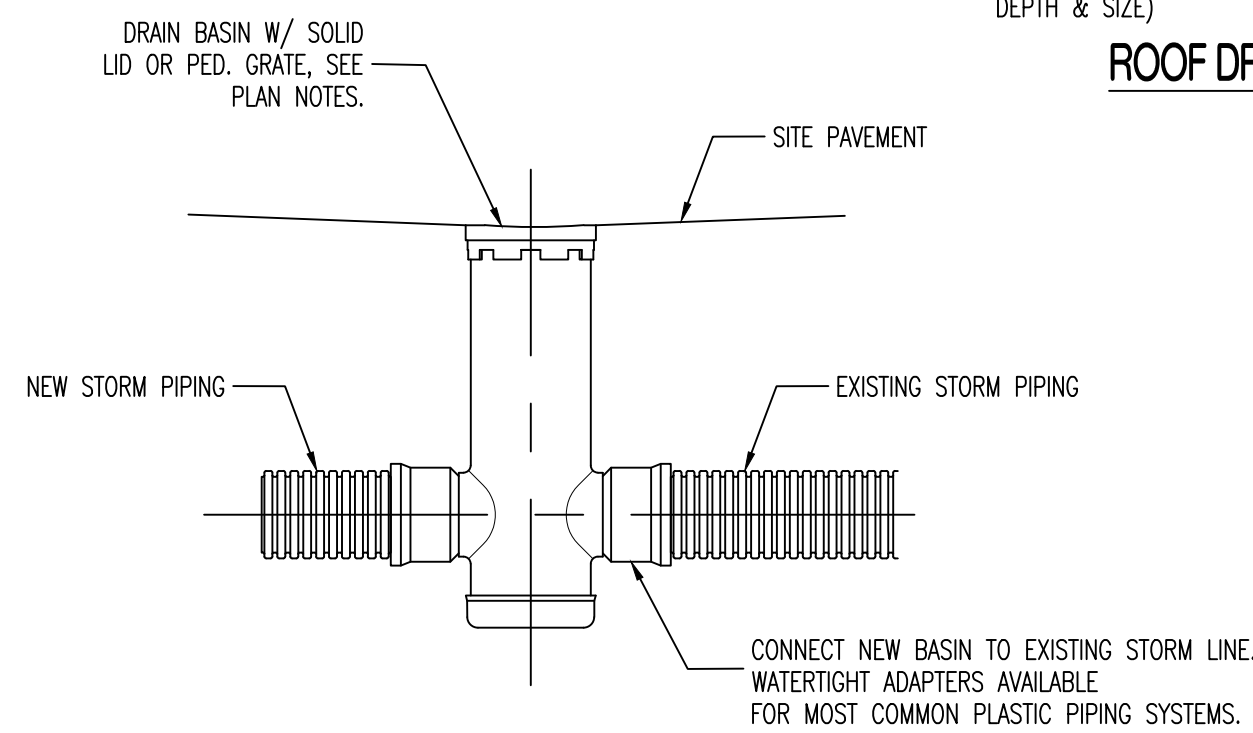
- (A) INSTALL 6" SDR 21 PVC DOWNSPOUT LEADERS @ 1.0% MINIMUM SLOPE AS SHOWN. CONNECT TO BUILDING DOWNSPOUTS WITH DOWNSPOUT BOOT, ZURN Z191 (OR EQUAL) WITH CLEANOUT PORT. WYE INTO COLLECTOR PIPE AS SHOWN. REFER TO DETAIL ON THIS SHEET.
- (B) INSTALL 8" SDR 21 PVC DOWNSPOUT COLLECTOR PIPING @ 1.0% MINIMUM SLOPE AS SHOWN. CONNECT TO NEW BASIN AS SHOWN. CONTRACTOR SHALL FIELD VERIFY FLOWLINE OF CONNECTION TO EXISTING PIPING. CONTRACTOR SHALL BEGIN INSTALLATION OF PIPING AT LOWEST POINT POSSIBLE (AT CONNECTION TO EXISTING PIPING AT NEW BASIN) AND RUN @ 1.0% SLOPE. IF 1.0% MINIMUM SLOPE IS NOT OBTAINABLE, CONSULT WITH ENGINEER. THE INTENT IS TO REPLACE THE PIPING IN PLACE WITHOUT ADJUSTMENT TO OTHER UTILITIES AND AT AN ALLOWABLE MINIMUM SLOPE.
- (C) EXISTING 8" STORM SEWER TO REMAIN TO CONNECT NEW PIPING AND BASIN TO. EXACT LOCATION IS UNKNOWN. CONTRACTOR SHALL FIELD VERIFY SIZE AND ALL FLOWLINE ELEVATIONS FOR NEW STORM SEWER.
- (D) INSTALL 18" NYLOPLAST DRAIN BASIN WITH H-20 SOLID LID IN-LINE OF EXISTING STORM SEWER LINE. TOP = 768.40'
EXISTING FL IN NORTH = FIELD DETERMINE
NEW FL IN WEST = FIELD DETERMINE - 0.1' ABOVE FLOWLINE OUT.
EXISTING FL OUT EAST = FIELD DETERMINE
- (E) REINSTALL TRENCH DRAIN IN REBUILT RAMP.
- (F) INSTALL CLEANOUT EXTENSION ON STORM SEWER RUN AS SHOWN. REFER TO DETAILS ON THIS SHEET.
- (G) APPROXIMATE LOCATION OF 3 FIBER CROSSINGS, ONE SHALLOW (≈18") AND TWO DEEPER.
- (H) REMOVED.
- (I) RECONNECT EXISTING DOWNSPOUT AND VENT WELL LINES FROM BUILDING TO NEW STORM SEWER WITH MANUFACTURED ADAPTOR (INSERTA TEE, OR EQUAL). PERFORM CORING INTO NEW PIPING WITH CORE BIT TO CONNECT ADAPTOR. INSTALL PER MANUFACTURER'S INSTRUCTIONS. CONTRACTOR SHALL ALLOW OWNER TO INSPECT CONDITION OF THESE EXISTING LINES FROM BUILDING. CONTRACTOR TO PROVIDE UNIT PRICE WITH BIDDING DOCUMENTS TO PROVIDE LINING OF DRAIN LINES AS DETERMINED TO BE NEEDED BY THE OWNER FOLLOWING INSPECTION. A CHANGE ORDER MAY BE ISSUED TO REPLACE ANY DAMAGED PIPING UNSUITABLE FOR LINING.
- (J) INSTALL 4" PERFORATED SDR 21 PVC FOUNDATION DRAIN AT 0.5% SLOPE TO GENERALLY FOLLOW STORM SEWER GRADE AS SHOWN ON PLAN. INSTALL 1" CLEAN ROCK BETWEEN WATERPROOFED BUILDING AND PERFORATED DRAIN PER DIAGRAM ON SHEET A200. INSTALL GEOTEXTILE FILTER FABRIC BETWEEN GRANULAR MATERIAL AND SOIL TO PREVENT DRAIN CLOGGING. TERMINATE PERFORATED PIPE IN AREA WELL WITH LAMBS TONGUE ON INSIDE OF AREA WELL.

UTILITY PROTECTION DURING SHORING/EXCAVATION

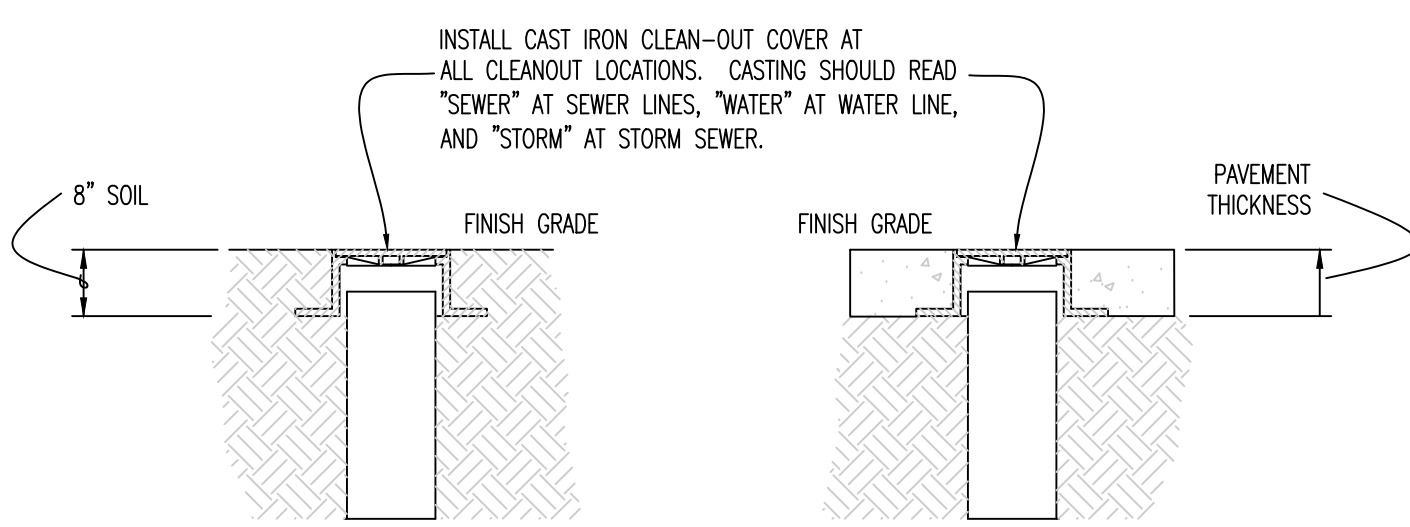
NOTE:
ALL EXISTING UTILITIES SHALL TO BE PROTECTED DURING WORK, EXCAVATION AND/OR SHORING. UTILITY SHALL REMAIN ACTIVE DURING WORK AND SHALL BE PROTECTED FROM SHIFTING, SAGGING OR OTHER DAMAGE. REFER TO SPECIFICATIONS. DESIGN OF SHORING SHALL BE THE CONTRACTOR'S RESPONSIBILITY.



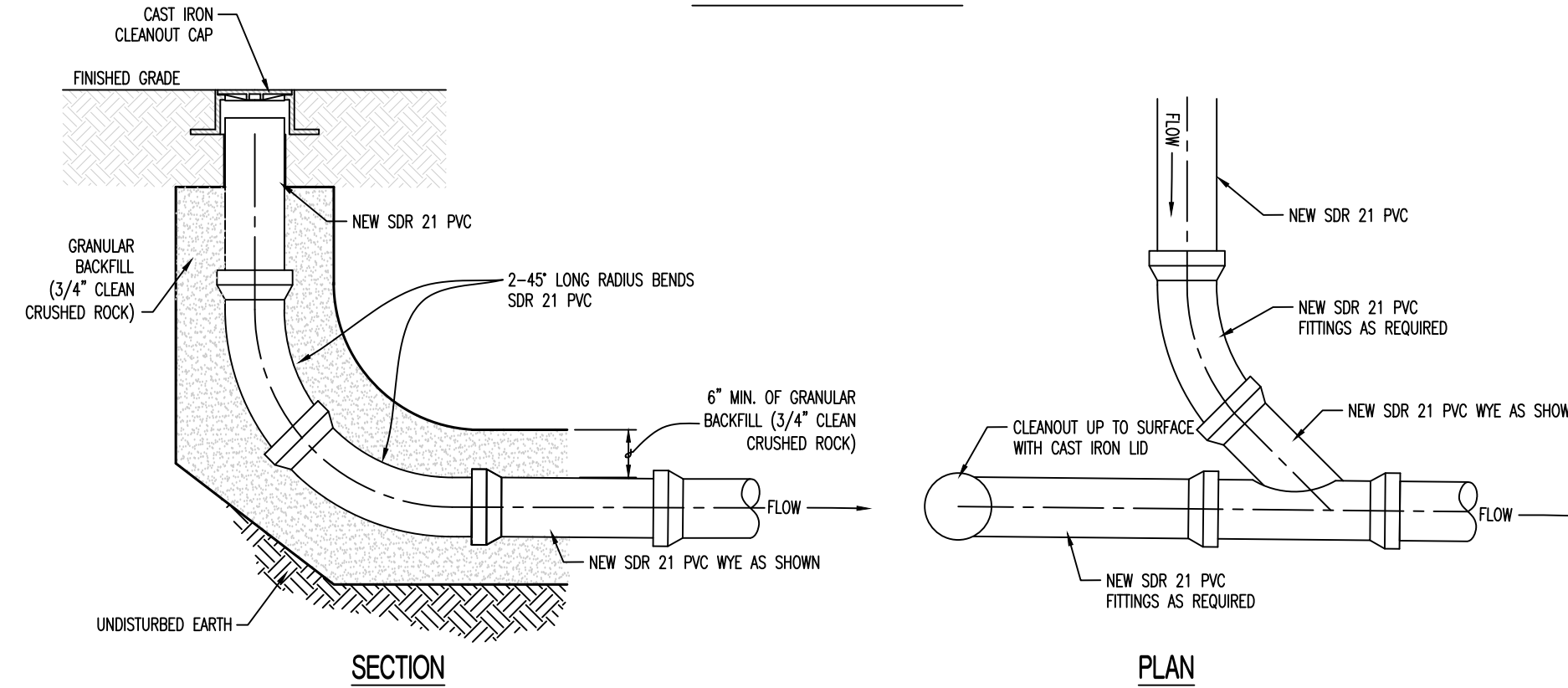
ROOF DRAIN DETAIL



TYPICAL INSTALLATION OF NYLOPLAST DRAIN BASIN



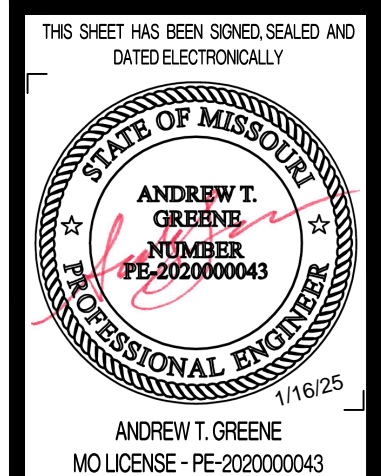
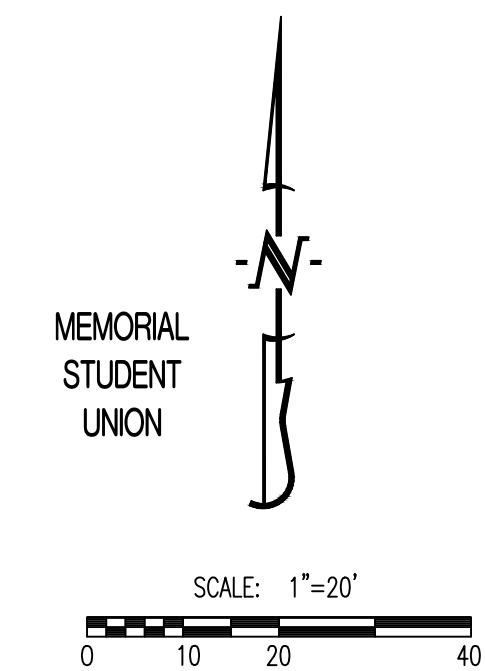
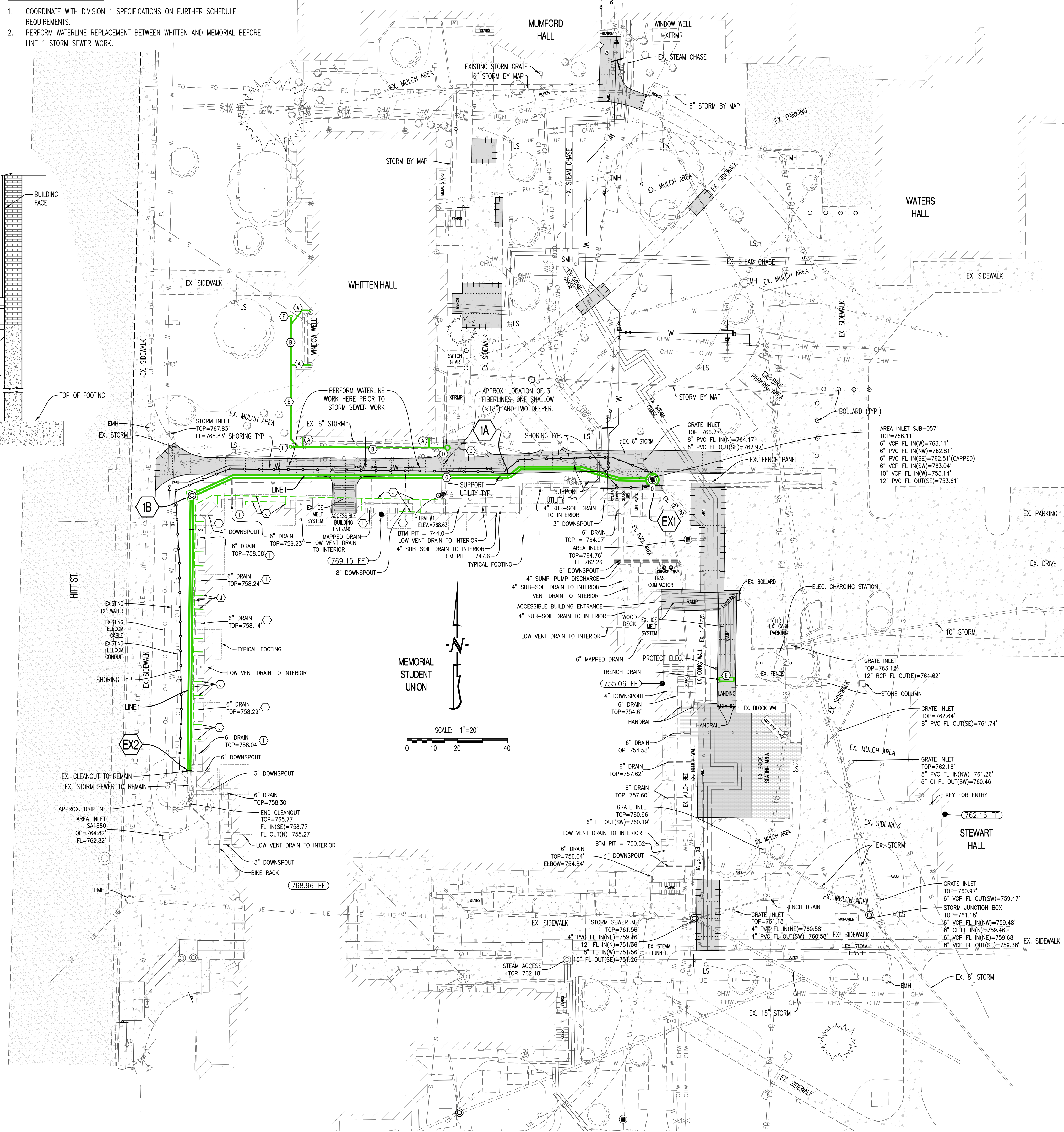
CLEANOUT COVERS



STORM SEWER CLEANOUT

SCHEDULE NOTES:

1. COORDINATE WITH DIVISION 1 SPECIFICATIONS ON FURTHER SCHEDULE REQUIREMENTS.
2. PERFORM WATERLINE REPLACEMENT BETWEEN WHITTEN AND MEMORIAL BEFORE LINE 1 STORM SEWER WORK.



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CHECKED BY: WTE

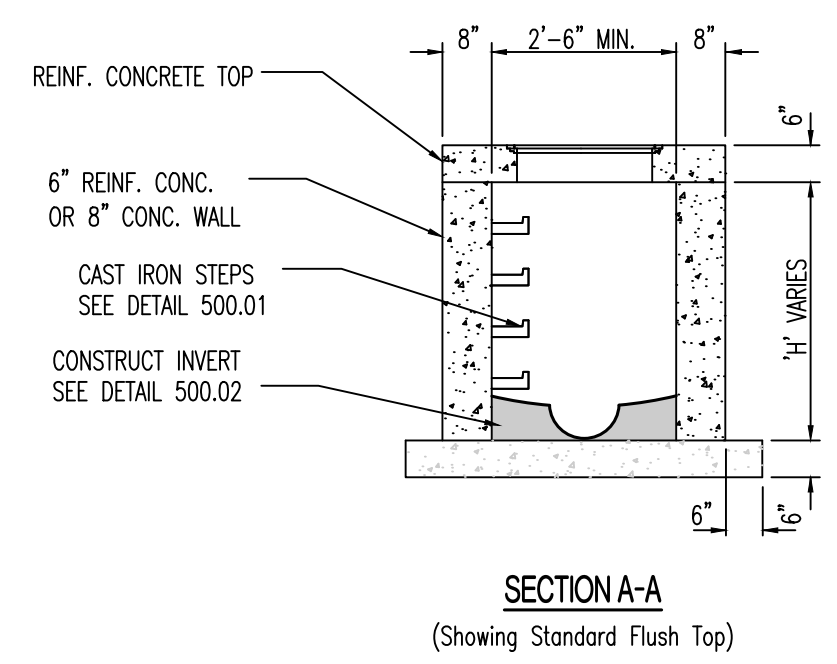
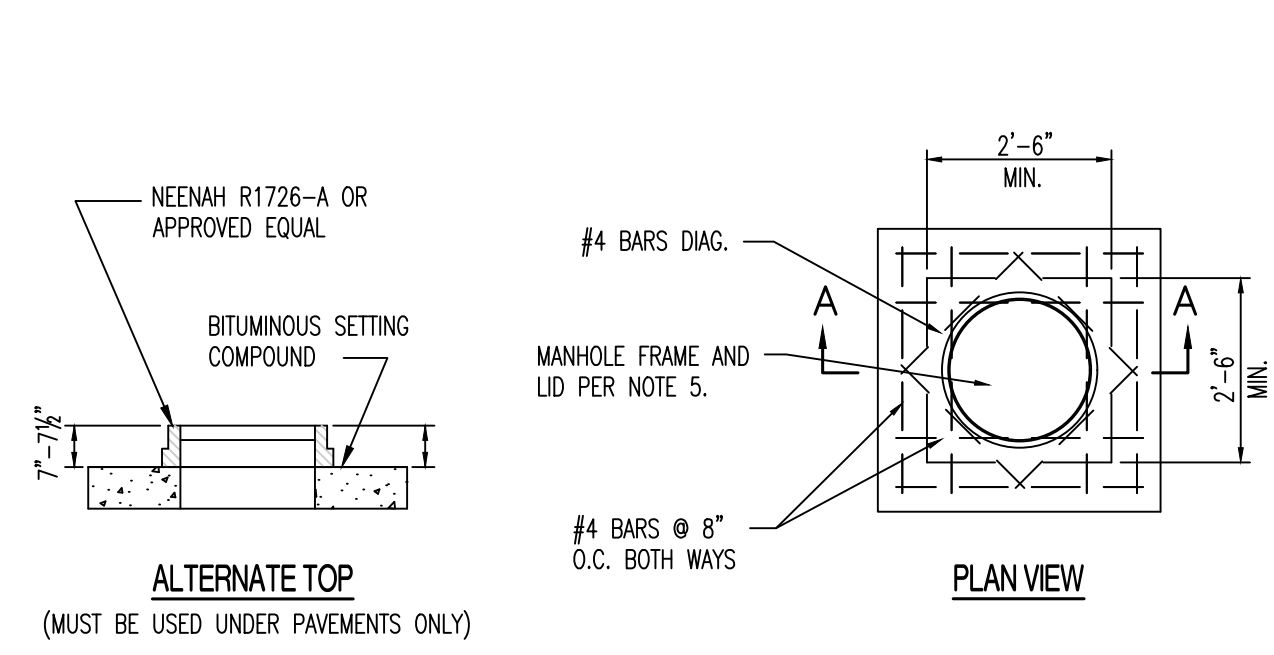
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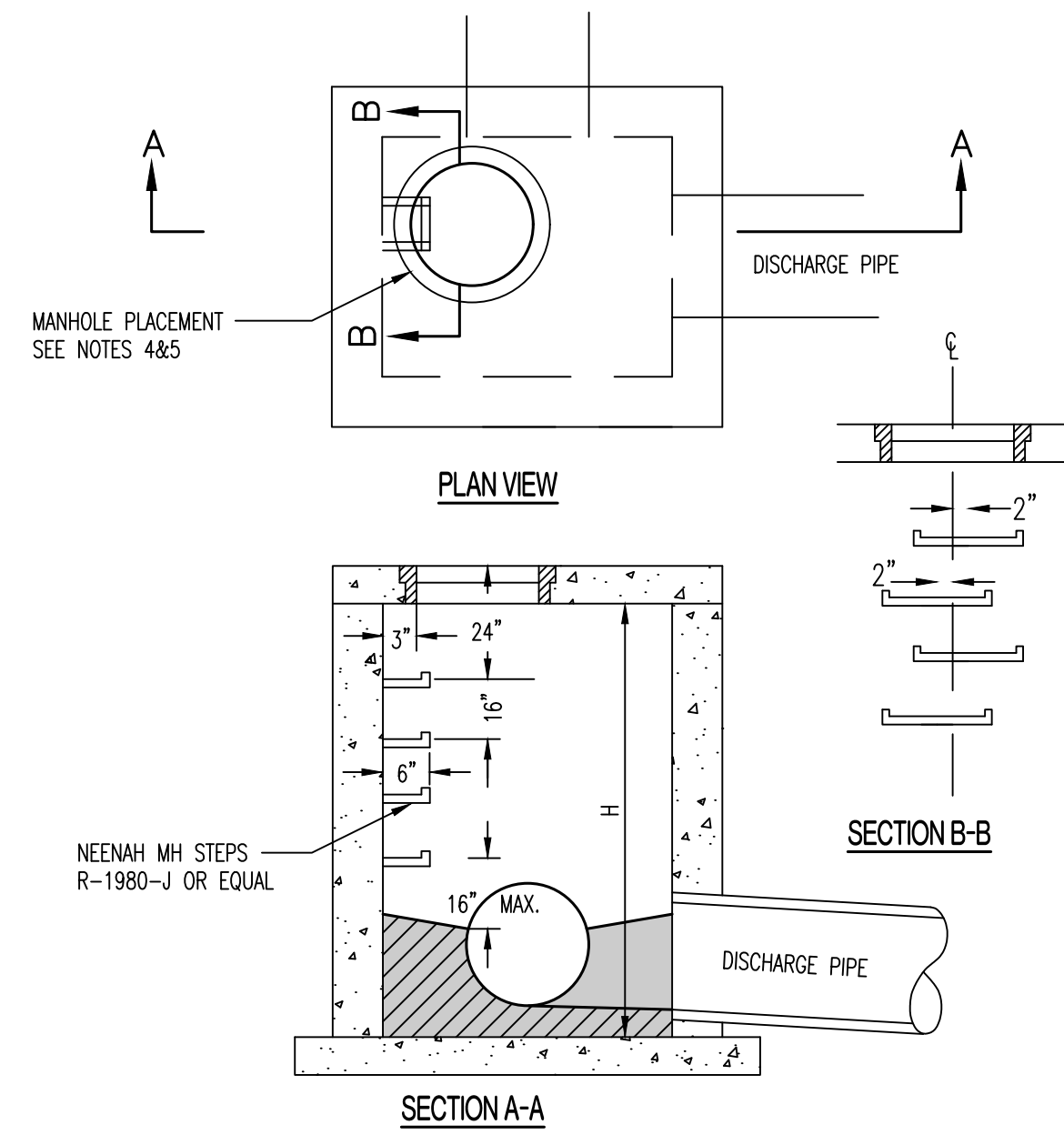
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PROJECT NUMBER
CP230201
CONSULTANT
PROJECT NUMBER
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SHEET
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STORM SEWER PLAN



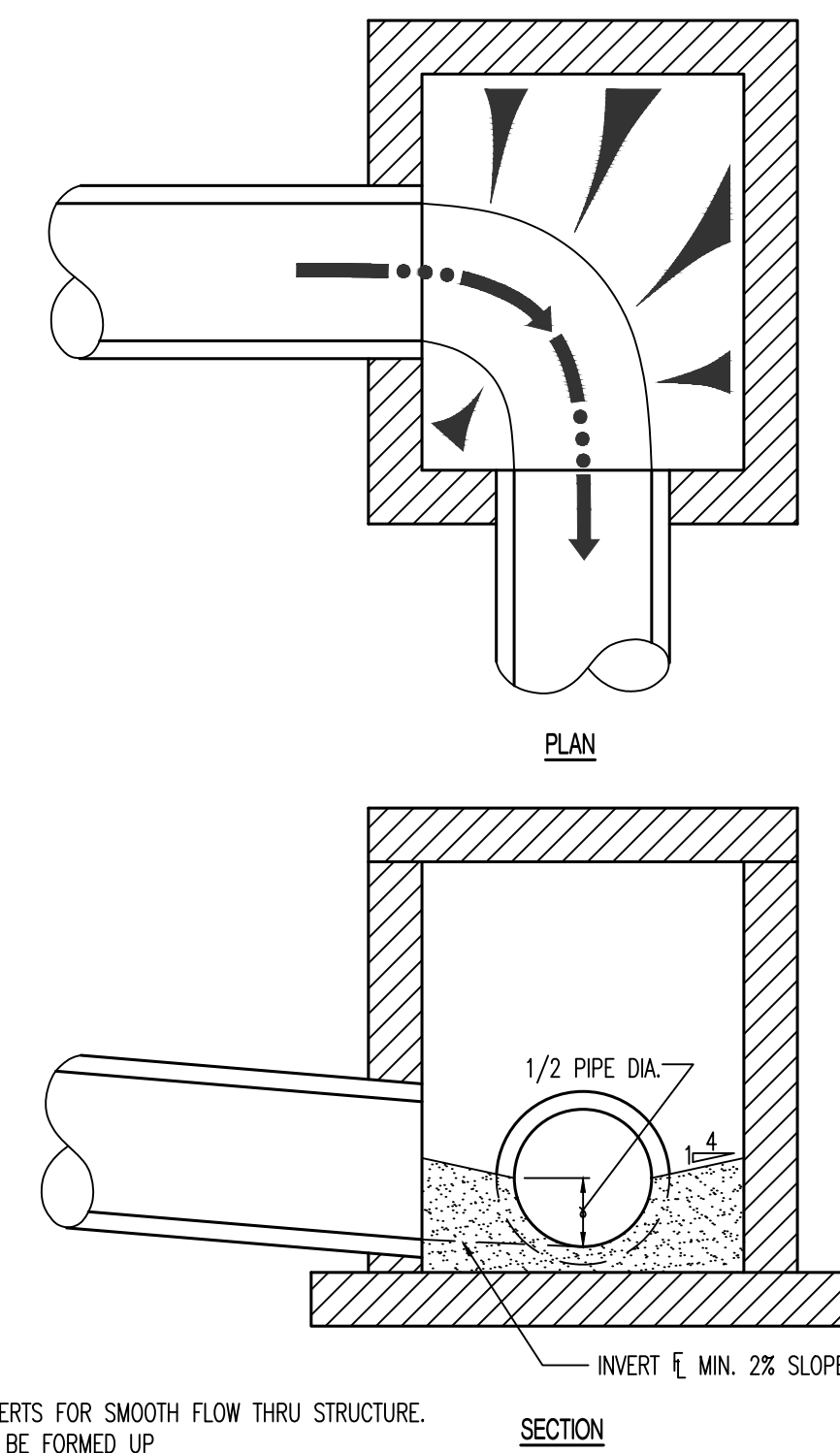
NOTES:

1. CONCRETE SHALL BE CLASS E FOR BASES AND D FOR WALLS AND TOP.
2. REINFORCING STEEL SHALL BE GRADE 60
3. INSTALL WEEP HOLES AS PER DETAIL 500.04
4. STRUCTURES WHERE H>8' SHALL BE REINFORCED CONCRETE (#4 BARS AT 12" CTRS. BOTH WAYS AND #4 BARS DIAGONAL AT PIPE OPENINGS)
5. FRAME AND LID SHALL BE NEENAH R-1960-A (TYPE C LID) OR APPROVED EQUAL. SEE DETAIL 500.01 FOR PLACEMENT.



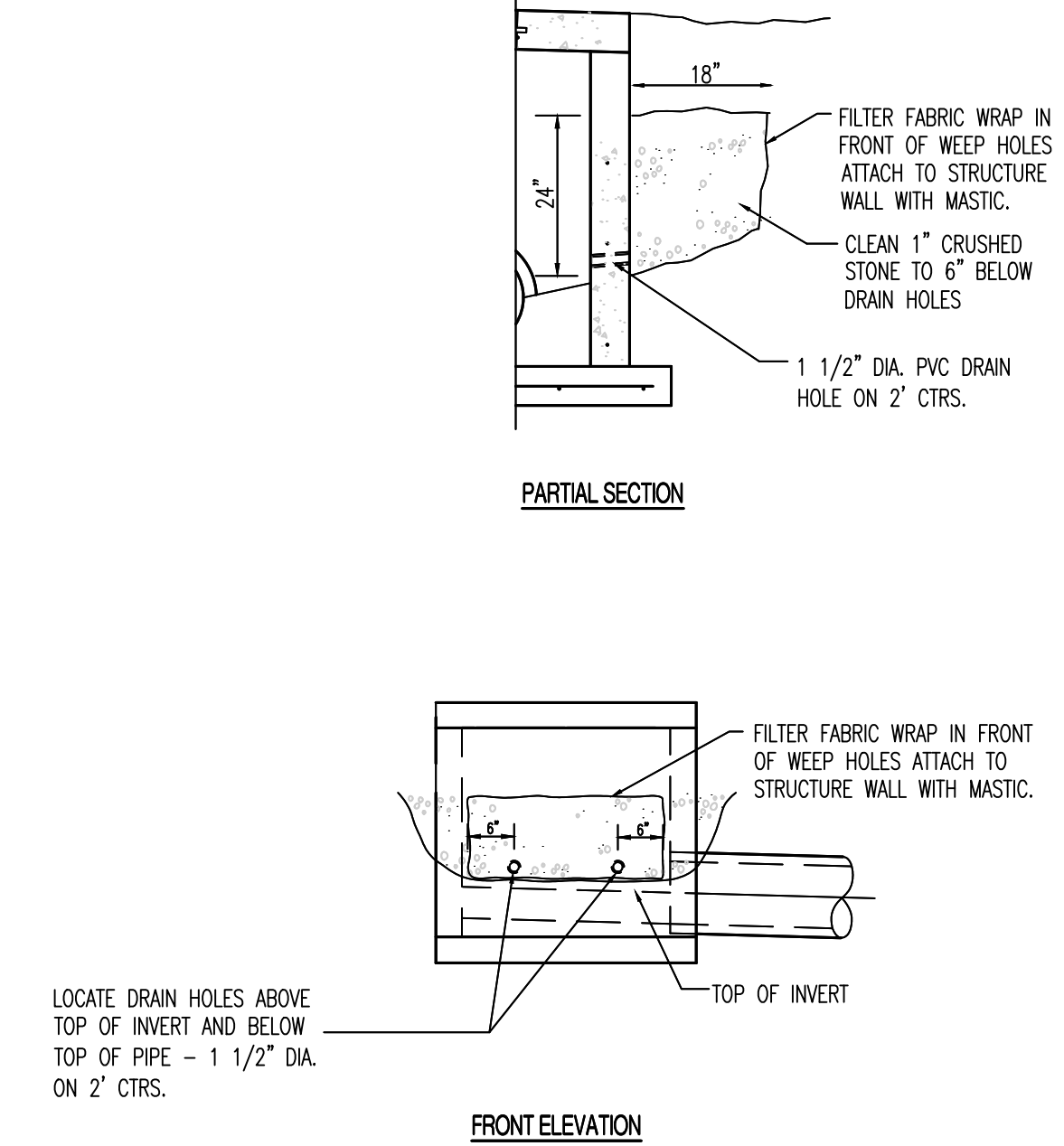
NOTES:

1. STEPS NOT REQUIRED WHERE H IS LESS THAN 4'.
2. CAST IRON STEPS SHALL BE AMERICAN ML-10-NCR OR EQUAL
3. STEPS SHALL BE PLACED ON VACANT WALL WHEN POSSIBLE
4. MANHOLE RING SHALL BE OFFSET TOWARD WALL WITH STEPS.
5. MANHOLE RING SHALL BE CENTERED ON CENTERLINE OF STEPS
6. STAGGER STEPS 2" EACH WAY FROM CENTERLINE OF MANHOLE RING.
7. TOP STEP 24" BELOW TOP OF SLAB
8. STEP SPACING TO BE 16", BOTTOM STEP TO BE NO HIGHER THAN 16" FROM INVERT.



NOTES:

1. FORM ALL INVERTS FOR SMOOTH FLOW THRU STRUCTURE.
2. INVERT SHALL BE FORMED UP
3. INVERT SHALL BE CLASS E CONCRETE, THE PIPE DIAMETER.



NOTE:

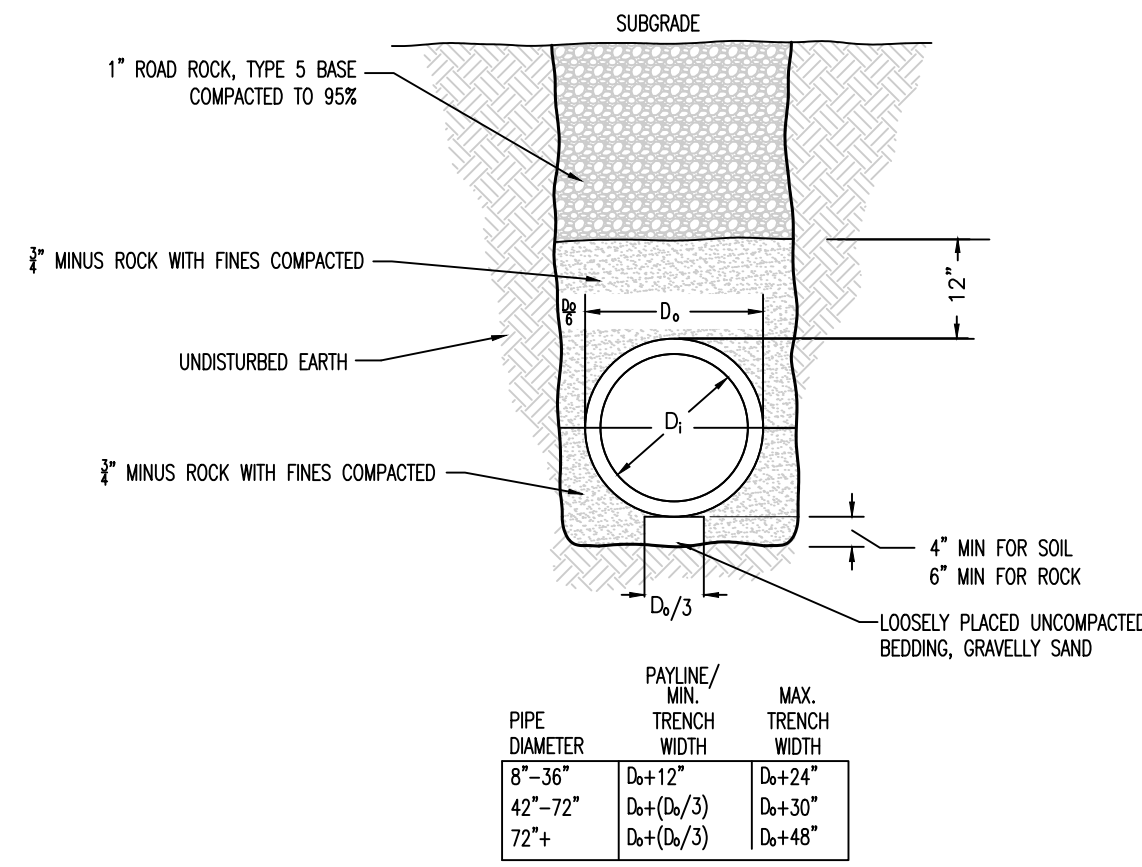
1. PLACE WEEP HOLES ON UPSTREAM FACE OF ALL STRUCTURES AND ALSO ON ROADWAY FACE OF CURB INLET STRUCTURES.
2. WEEP HOLE FILTER FABRIC SHALL CONSIST OF A NON-WOVEN, POLYPROPYLENE TYPE FABRIC SUCH AS: AMOCO 4553 NON-WOVEN GEOTEXTILE FABRIC OR APPROVED EQUAL.

JUNCTION BOX

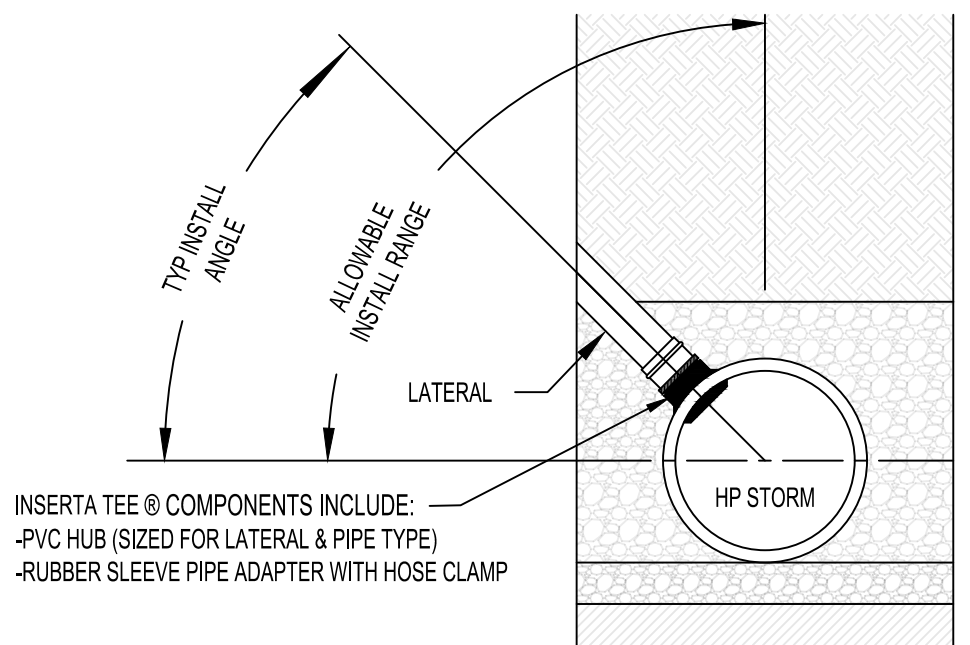
DRAINAGE STRUCTURE STEPS

DRAINAGE STRUCTURE INVERT

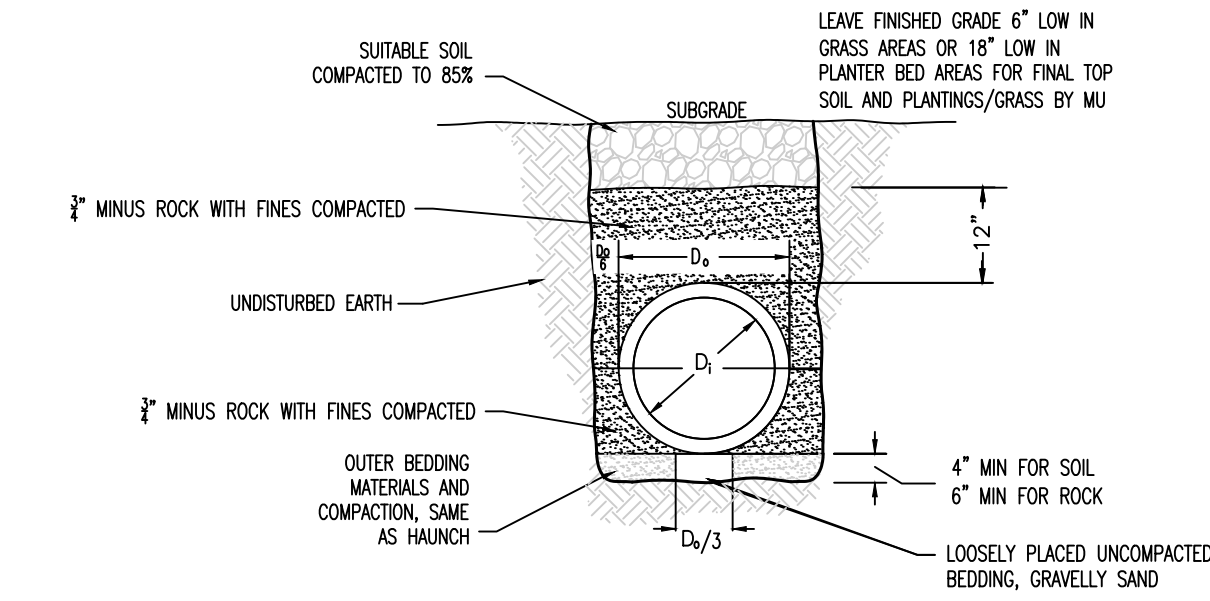
DRAINAGE STRUCTURE WEEP HOLES



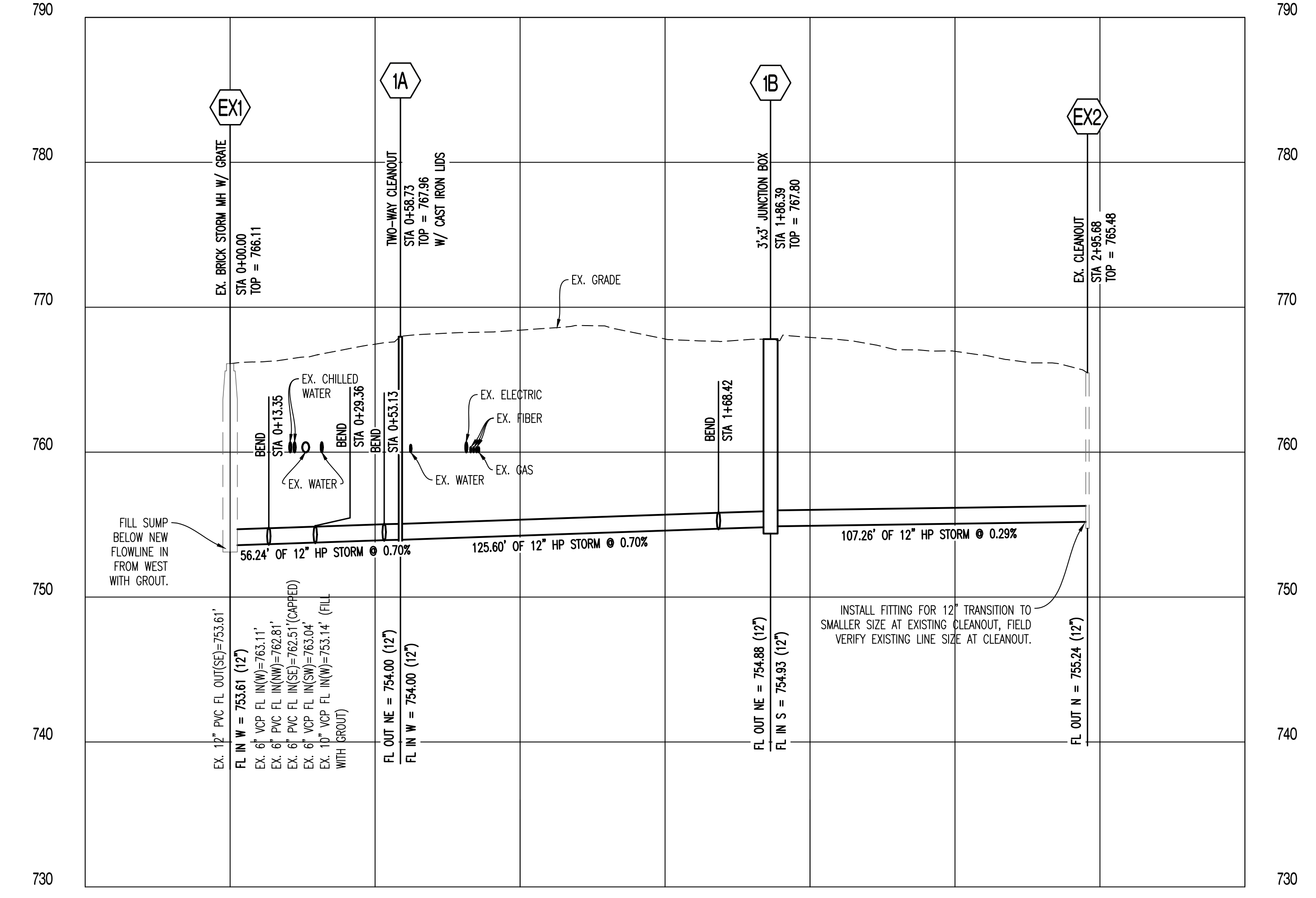
PIPE EMBEDMENT (UNDER PAVEMENT)



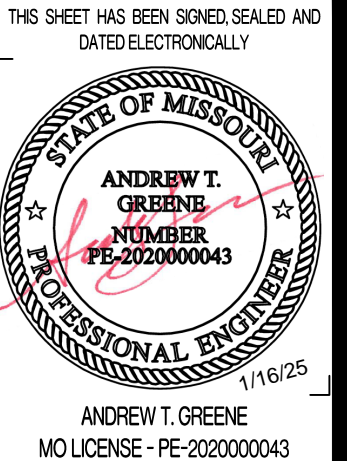
TYPICAL MANUFACTURED FITTING FOR DRAIN CONNECTION TO STORM SEWER MAIN



PIPE EMBEDMENT (NOT UNDER PAVEMENT)



SCALE:
HORIZ 1" = 30'
VERT 1" = 6'



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GENERAL SITE - REPLACE UTILITIES
NEAR MEMORIAL UNION
COLUMBIA, BOONE COUNTY, MISSOURI 65203
STORM SEWER LINE 1 PROFILE AND DETAILS

UNIVERSITY OF MISSOURI
PROJECT NUMBER

CP230201

CONSULTANT PROJECT NUMBER

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WATERLINE LEGEND OF LABELS:

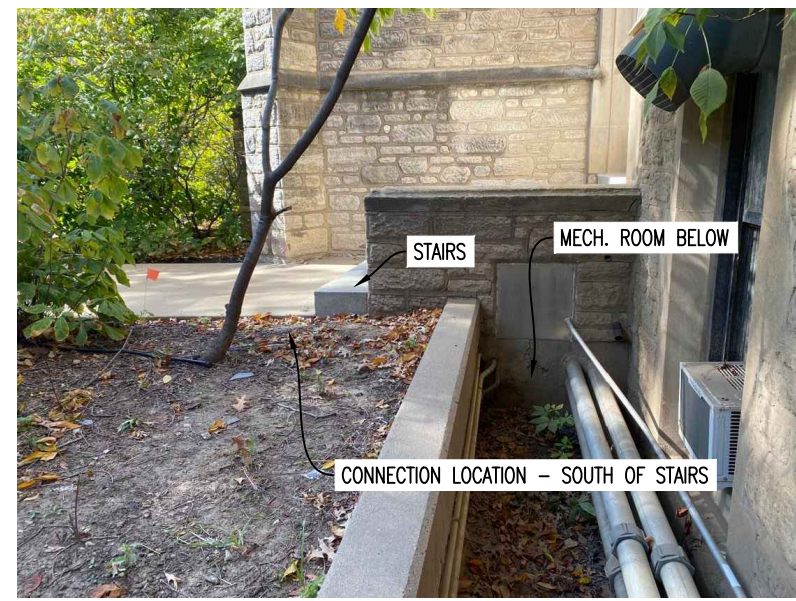
- (A) INSTALL 8" C-900 PVC WATERLINE WITH FITTINGS AS REQUIRED.
- (B) WHEN CROSSING STEAM, INSTALL 8" DUCTILE IRON WATERLINE WITH FITTINGS AS REQUIRED. CENTER A FULL STICK OF PIPE OVER CROSSING TO LOCATE JOINTS AS FAR AWAY AS POSSIBLE.
- (C) INSTALL 6" C-900 PVC WATERLINE WITH FITTINGS AS REQUIRED.
- (D) WHEN CROSSING STEAM, INSTALL 6" DUCTILE IRON WATERLINE WITH FITTINGS AS REQUIRED. CENTER A FULL STICK OF PIPE OVER CROSSING TO LOCATE JOINTS AS FAR AWAY AS POSSIBLE.
- (E) INSTALL 2" C901 HDPE WATERLINE WITH FITTINGS AS REQUIRED.
- (F) INSTALL 8" 22.5' BEND.
- (G) INSTALL 8" 45' BEND.
- (H) INSTALL 4" C-900 PVC WATERLINE WITH FITTINGS AS REQUIRED.
- (I) INSTALL 6" 45' BEND.
- (J) EXISTING FIRE HYDRANT TO REMAIN.
- (K) INSTALL CAP TO ABANDON IN PLACE WATERLINE AS SHOWN. CAP OR PLUG SHALL BE INSTALLED AT ALL BREAKS IN ABANDONED PIPING.
- (L) ABANDON WATERLINE.

WATER LINE DEMOLITION NOTES:

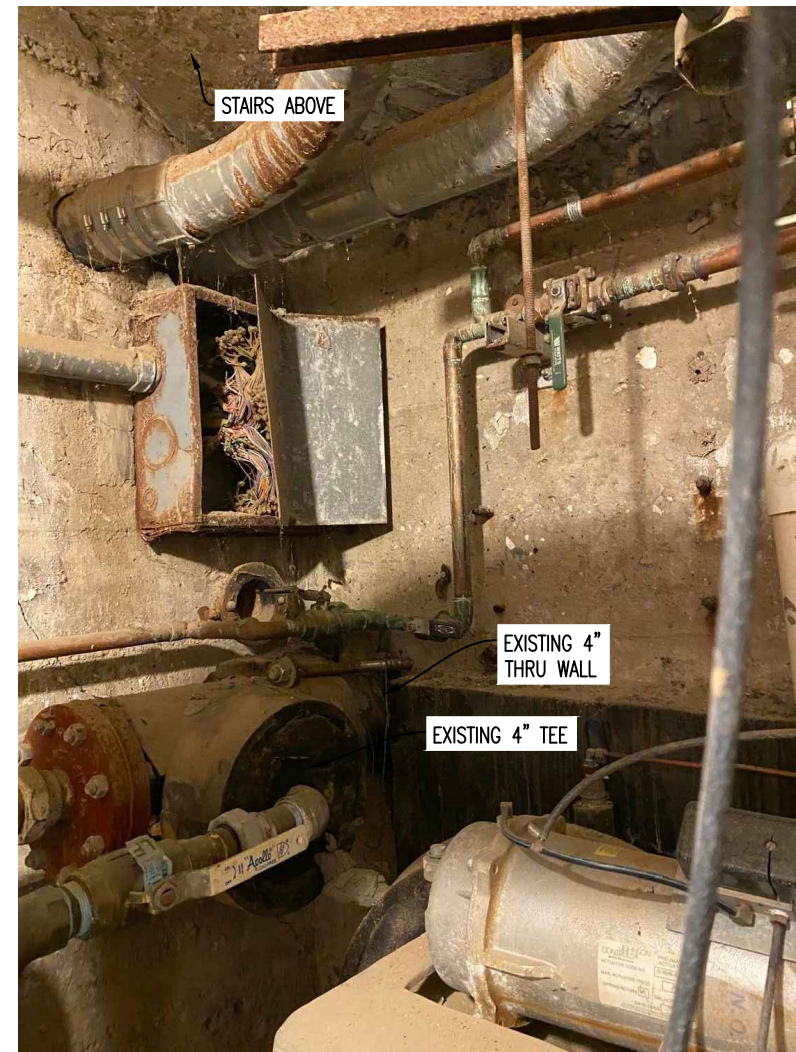
- FOR WATER LINES TO BE ABANDONED.
 - WATER LINES NO LONGER IN SERVICE SHALL BE CUT AT THE TEE/CONNECTION TO ACTIVE MAIN/PIPING AND SHALL BE CAPPED TO ELIMINATE DEAD LEGS OF WATER PIPING.
 - WATER LINES NO LONGER IN SERVICE SHALL BE ABANDONED IN PLACE.
 - WATER PIPING SHALL BE CAPPED AT EACH BREAK SO THAT THERE ARE NO OPEN-ENDED SEGMENTS OF PIPING.
 - VALVE BOXES SHALL BE REMOVED FROM ALL ABANDONED WATER LINES.
 - WATER REVENUE METERS SHALL BE RETURNED TO OWNER.

SCHEDULE NOTES:

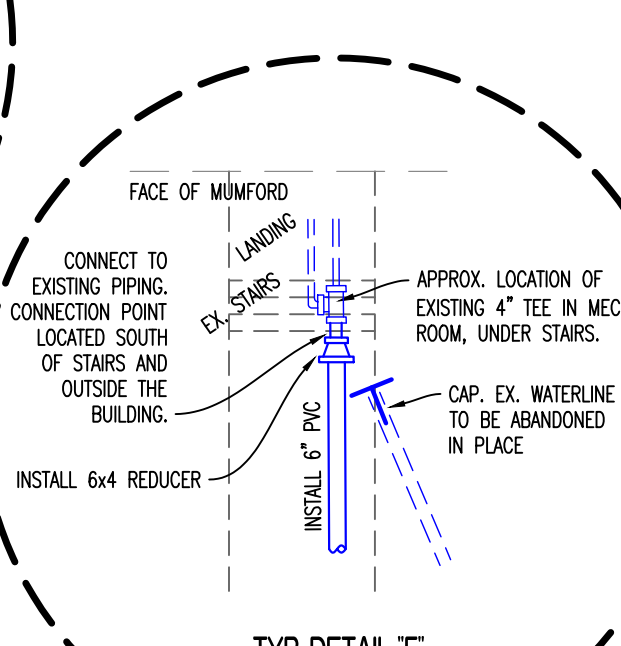
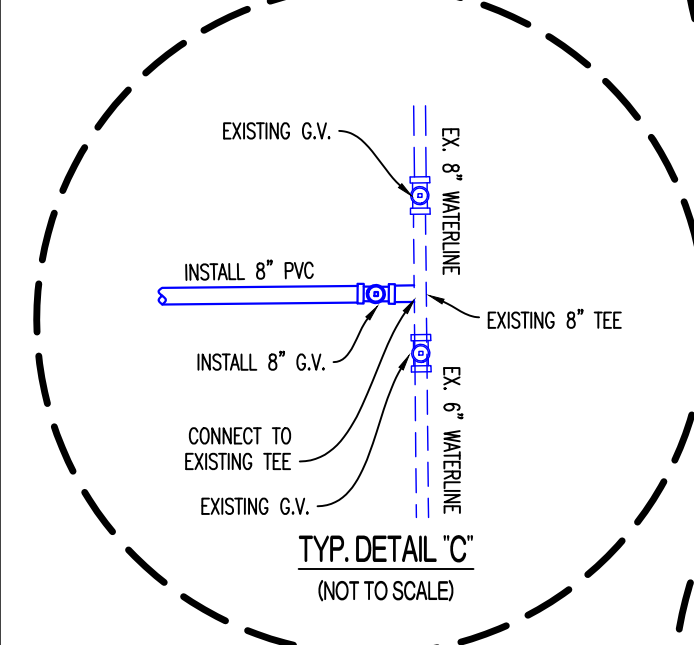
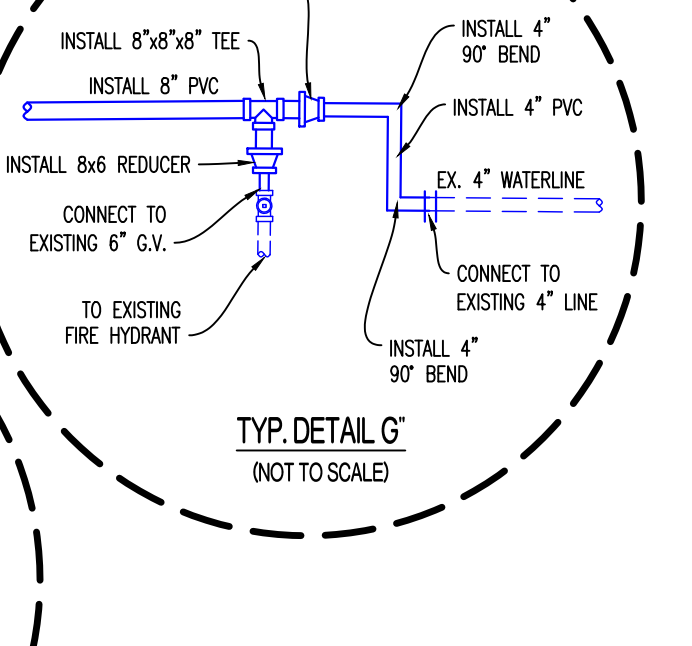
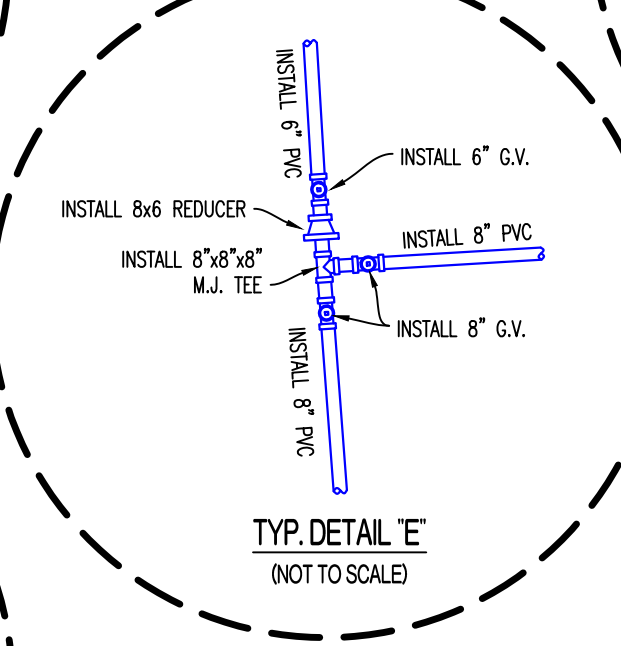
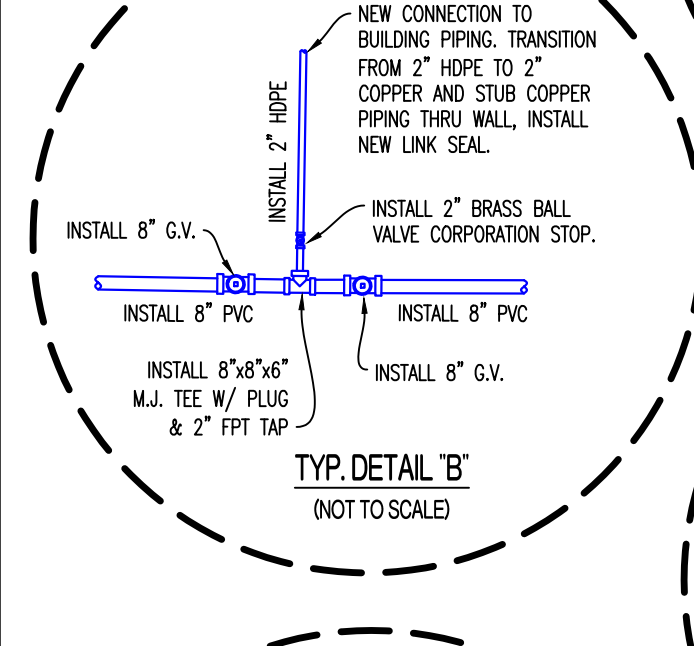
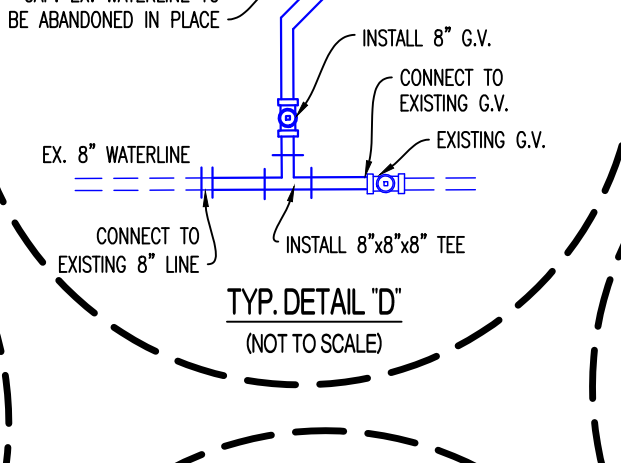
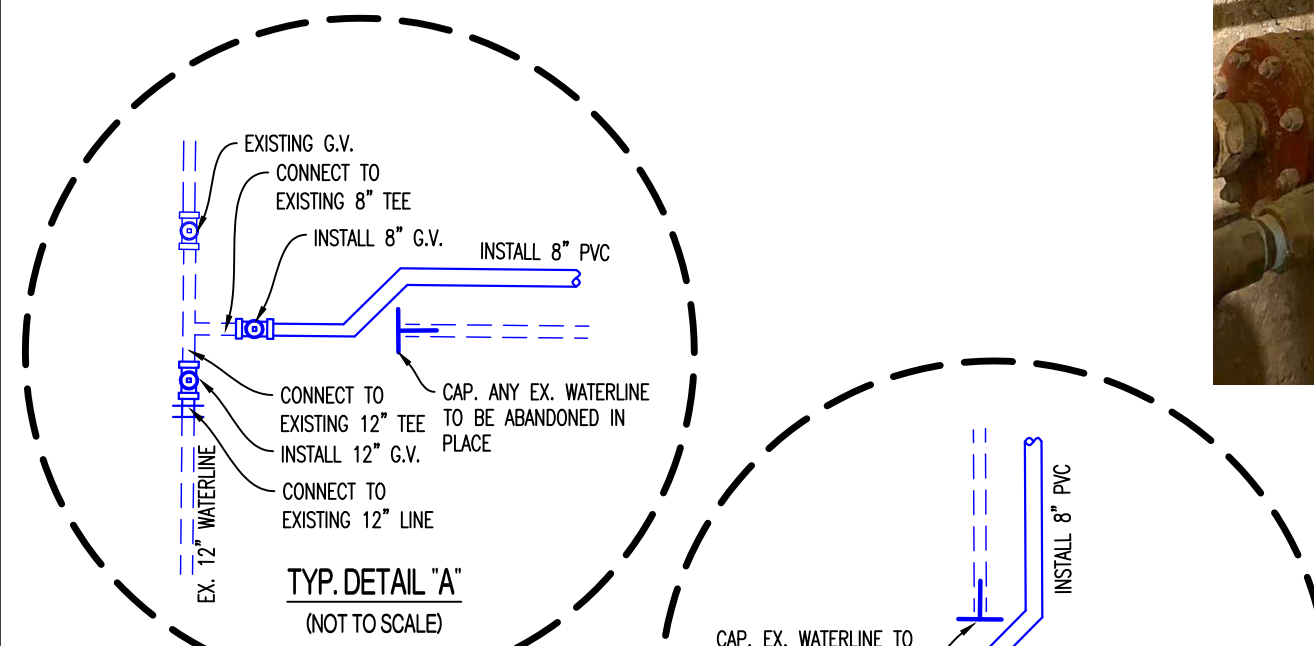
- COORDINATE WITH DIVISION 1 SPECIFICATIONS ON FURTHER SCHEDULE REQUIREMENTS.
- PRESSURE TESTING AND DISINFECTION OF THE NEW WATERLINES SHALL BE PERFORMED BY THE FRIDAY PRIOR TO THE TIE-IN TO THE EXISTING SYSTEM.
- PERFORM WATERLINE REPLACEMENT BETWEEN WHITTEN AND MEMORIAL BEFORE LINE 1 STORM SEWER WORK.



MUMFORD PICTURE (FOR REFERENCE)

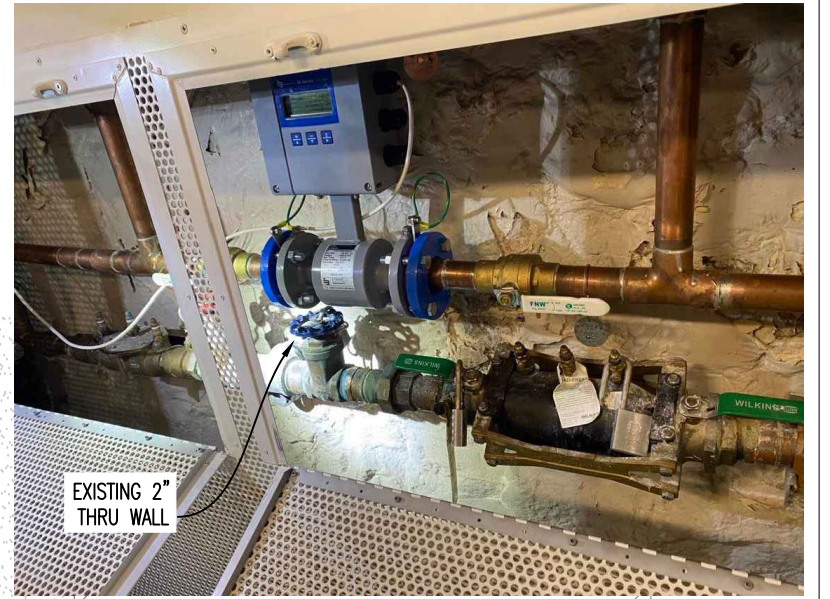
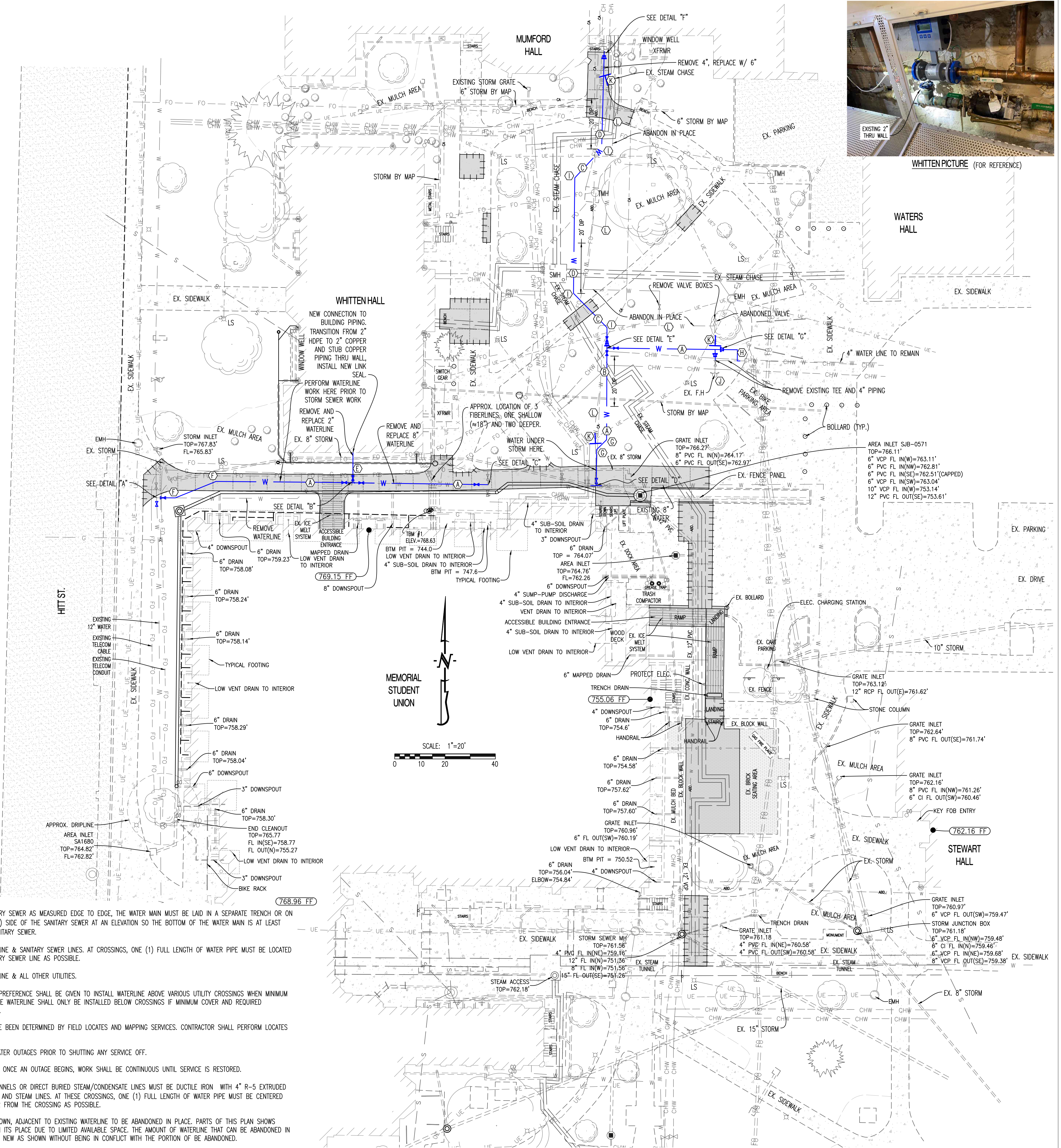


MUMFORD PICTURE (FOR REFERENCE)

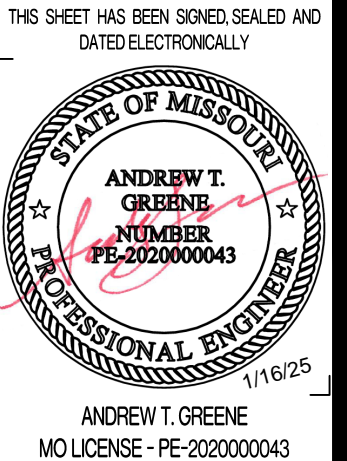


WATERLINE CONSTRUCTION NOTES:

- WHERE WATER MAIN IS LESS THAN 10' FROM SANITARY SEWER AS MEASURED EDGE TO EDGE, THE WATER MAIN MUST BE LAID IN A SEPARATE TRENCH OR ON AN UNDISTURBED EARTH SHELF LOCATED ON ONE (1) SIDE OF THE SANITARY SEWER AT AN ELEVATION SO THE BOTTOM OF THE WATER MAIN IS AT LEAST EIGHTEEN INCHES (18") ABOVE THE TOP OF THE SANITARY SEWER.
- MAINTAIN 18" VERTICAL SEPARATION BETWEEN WATERLINE & SANITARY SEWER LINES. AT CROSSINGS, ONE (1) FULL LENGTH OF WATER PIPE MUST BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE SANITARY SEWER LINE AS POSSIBLE.
- MAINTAIN 12" VERTICAL SEPARATION BETWEEN WATERLINE & ALL OTHER UTILITIES.
- MINIMUM COVER OF 42" REQUIRED ON WATERLINES. PREFERENCE SHALL BE GIVEN TO INSTALL WATERLINE ABOVE VARIOUS UTILITY CROSSINGS WHEN MINIMUM COVER AND SEPARATION REQUIREMENTS ARE MET. THE WATERLINE SHALL ONLY BE INSTALLED BELOW CROSSINGS IF MINIMUM COVER AND REQUIRED SEPARATION FROM OTHER UTILITIES IS NOT POSSIBLE.
- ALL UTILITIES SHOWN ARE FOR REFERENCE AND HAVE BEEN DETERMINED BY FIELD LOCATES AND MAPPING SERVICES. CONTRACTOR SHALL PERFORM LOCATES PRIOR TO WORK.
- CONTRACTOR SHALL COORDINATE WITH OWNER ON WATER OUTAGES PRIOR TO SHUTTING ANY SERVICE OFF.
- ALL WATER OUTAGES SHALL BE KEPT TO A MINIMUM. ONCE AN OUTAGE BEGINS, WORK SHALL BE CONTINUOUS UNTIL SERVICE IS RESTORED.
- LINES PASSING DIRECTLY OVER OR UNDER STEAM TUNNELS OR DIRECT BURIED STEAM/CONDENSATE LINES MUST BE DUCTILE IRON WITH 4" R-5 EXTRUDED POLYSTYRENE INSULATION BOARD BETWEEN THE PIPE AND STEAM LINES. AT THESE CROSSINGS, ONE (1) FULL LENGTH OF WATER PIPE MUST BE CENTERED ON THE CROSSING SO BOTH JOINTS WILL BE AS FAR FROM THE CROSSING AS POSSIBLE.
- IT IS THE INTENT TO INSTALL NEW WATERLINE AS SHOWN, ADJACENT TO EXISTING WATERLINE TO BE ABANDONED IN PLACE. PARTS OF THIS PLAN SHOWS REMOVAL OF EXISTING WATERLINE TO INSTALL NEW IN ITS PLACE DUE TO LIMITED AVAILABLE SPACE. THE AMOUNT OF WATERLINE THAT CAN BE ABANDONED IN PLACE CAN INCREASE IF THERE IS ROOM TO INSTALL NEW AS SHOWN WITHOUT BEING IN CONFLICT WITH THE PORTION OF BE ABANDONED.



WHITTEN PICTURE (FOR REFERENCE)



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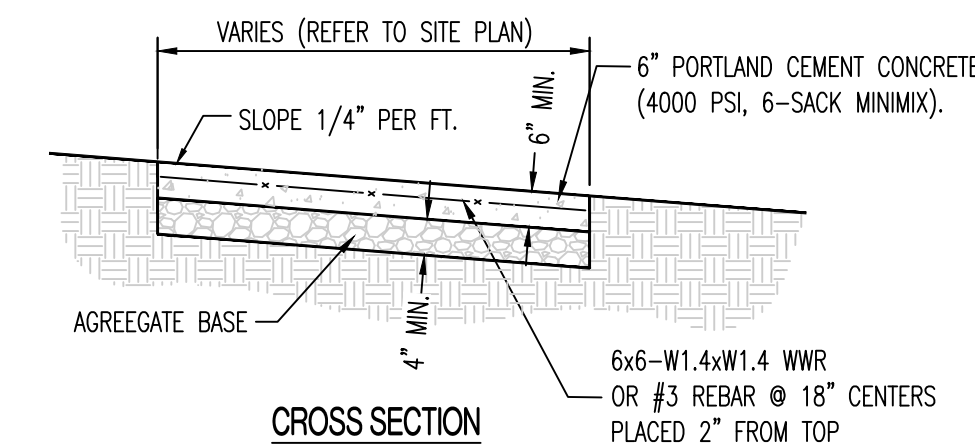
UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP230201
 CONSULTANT
 PROJECT NUMBER
220449
 SHEET
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LEGEND OF LABELS

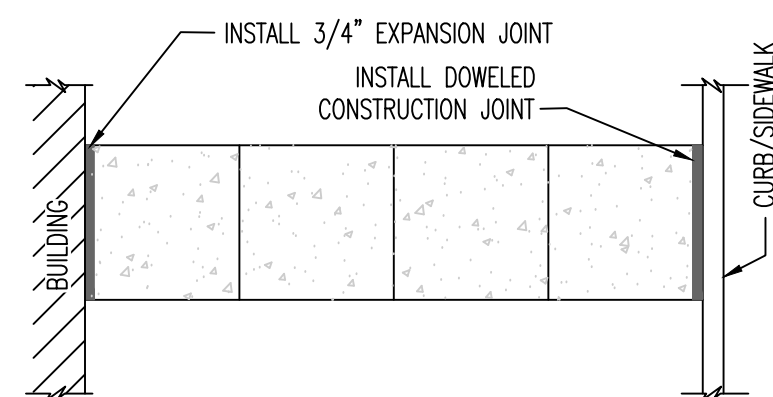
- (A) PATCH CONCRETE DRIVE PAVEMENT AS SHOWN. MATCH EXISTING SLOPE AND GRADE. REFER TO DETAIL ON THIS SHEET. CONCRETE FOR THIS AREA SHALL BE HIGH EARLY STRENGTH, REFER TO SPECIFICATIONS FOR REQUIREMENTS.
- (B) REPLACE CONCRETE CURB SECTION INTEGRAL TO PAVEMENT REPLACEMENT AS SHOWN. MATCH EXISTING SLOPE AND GRADE. REFER TO DETAIL ON THIS SHEET.
- (C) PATCH TYPICAL CONCRETE SIDEWALK AS SHOWN. MATCH EXISTING SLOPE AND GRADE. REFER TO CROSS SECTION ON THIS SHEET.
- (D) INSTALL 3/4" EXPANSION JOINT BETWEEN PAVEMENT AND BUILDING/STAIRS.
- (E) REPLACE FENCE AS NEEDED.
- (F) INSTALL DOWELED CONSTRUCTION JOINT TO EXISTING PAVEMENT WITH SEALANT AS SHOWN. REFER TO DETAIL ON THIS SHEET.
- (G) INSTALL TYPE C SAW JOINT WITH SEALANT AS SHOWN (TYPICAL). REFER TO JOINT DETAILS ON THIS SHEET.
- (H) REINSTALL BENCH.
- (I) INSTALL NEW BLACK RAILING TO MATCH EXISTING.
- (J) RECONSTRUCT CONCRETE ADA RAMP WITH RAILING (PER ALLOWANCE) AS SHOWN. NEW RAMP WILL NOT HAVE SIDE WALLS. REFER TO GRADING PLAN FOR GRADES. REFER TO STRUCTURAL PLANS FOR FURTHER INFORMATION. REFER TO ARCHITECTURAL PLANS FOR RAILING.
- (K) REFER TO MEP PLANS FOR NEW LIGHT POLES IN THIS AREA.
- (L) REINSTALL SALVAGED PAVERS TO MATCH EXISTING CONDITIONS.
- (M) EXISTING GAS FIREPLACE TO REMAIN.
- (N) SMALL BLOCK RETAINING WALL TO BE REINSTALLED.
- (O) ICE MELT SYSTEM TO BE REPLACED IN NEW SIDEWALK. REFER TO MEP PLANS.

NOTES:

- HARD SURFACE DIMENSIONS SHOWN ON THIS PLAN ARE FOR REFERENCE ONLY. REMOVAL AND REPLACEMENT LIMITS SHALL BE TO NEAREST SAW JOINT IN PAVEMENT.



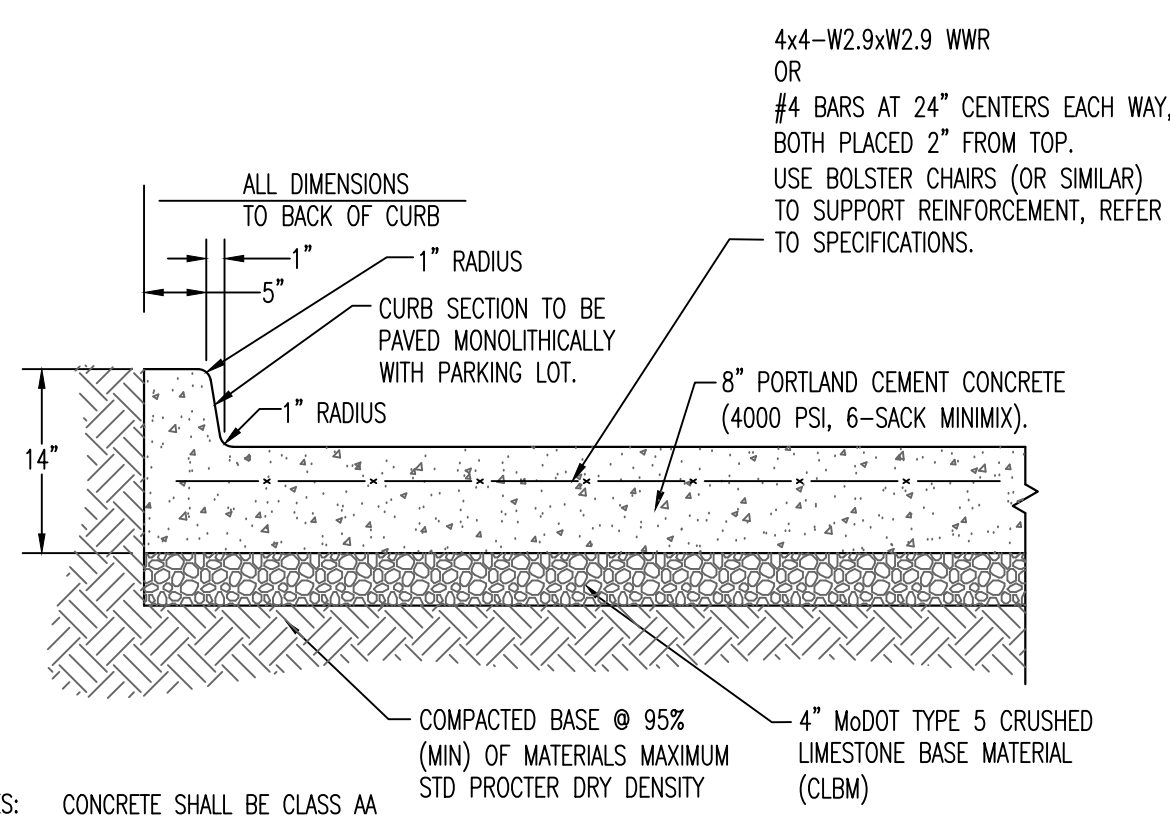
CROSS SECTION



TYPICAL LOCATION OF EXPANSION JOINT AT BUILDING/CURB

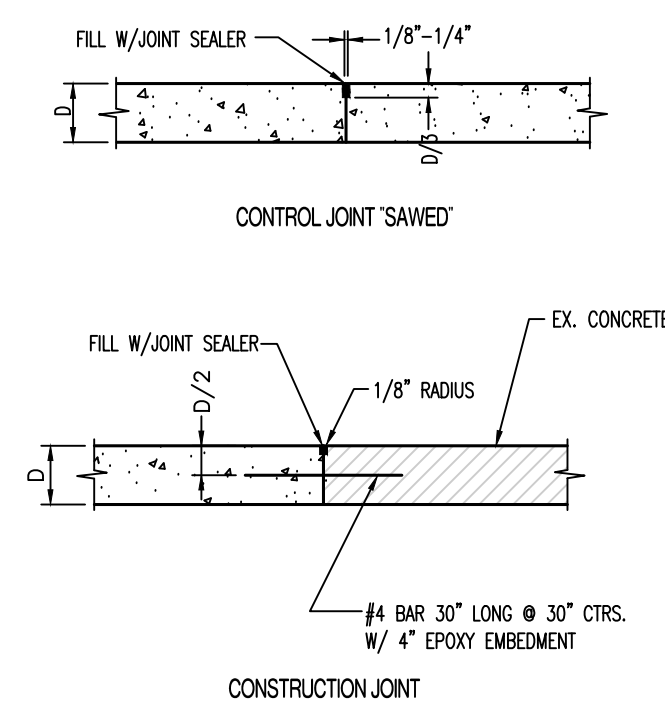
- NOTE:**
- SIDEWALK SHALL BE 6" THICK CLASS A CONCRETE ON 4" AGGREGATE BASE.
 - INSTALL 3/4" EXPANSION JOINT AT BUILDING/STRUCTURES.
 - INSTALL DOWELED CONSTRUCTION JOINT AT EXISTING PAVEMENTS.
 - INSTALL 1/2" EXPANSION JOINT EVERY 100'.
 - INSTALL TRANSVERSE SAW JOINTS AT SPACING = SIDEWALK WIDTH.

TYPICAL PRIVATE SIDEWALK

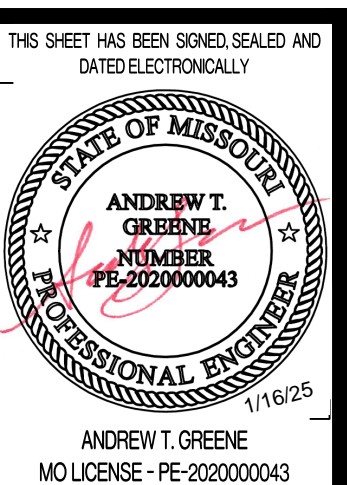
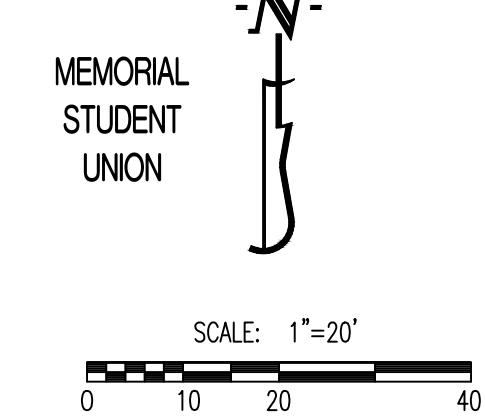
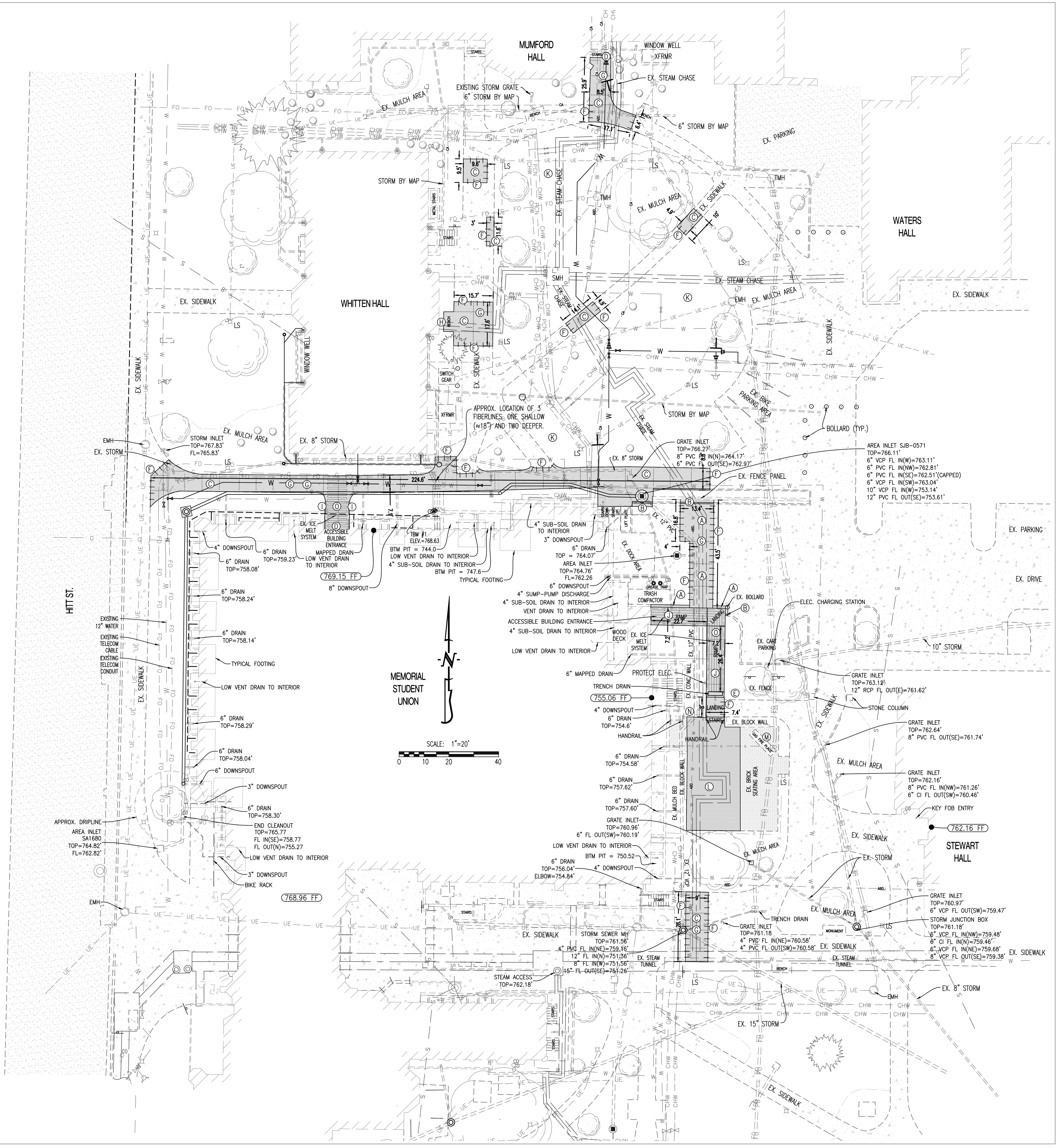


NOTES: CONCRETE SHALL BE CLASS AA REINFORCING STEEL SHALL BE GRADE 60

CONCRETE PAVEMENT W/ INTEGRAL CURB (HEAVY DUTY)



JOINT DETAILS (P.C. CONCRETE PAVEMENT)



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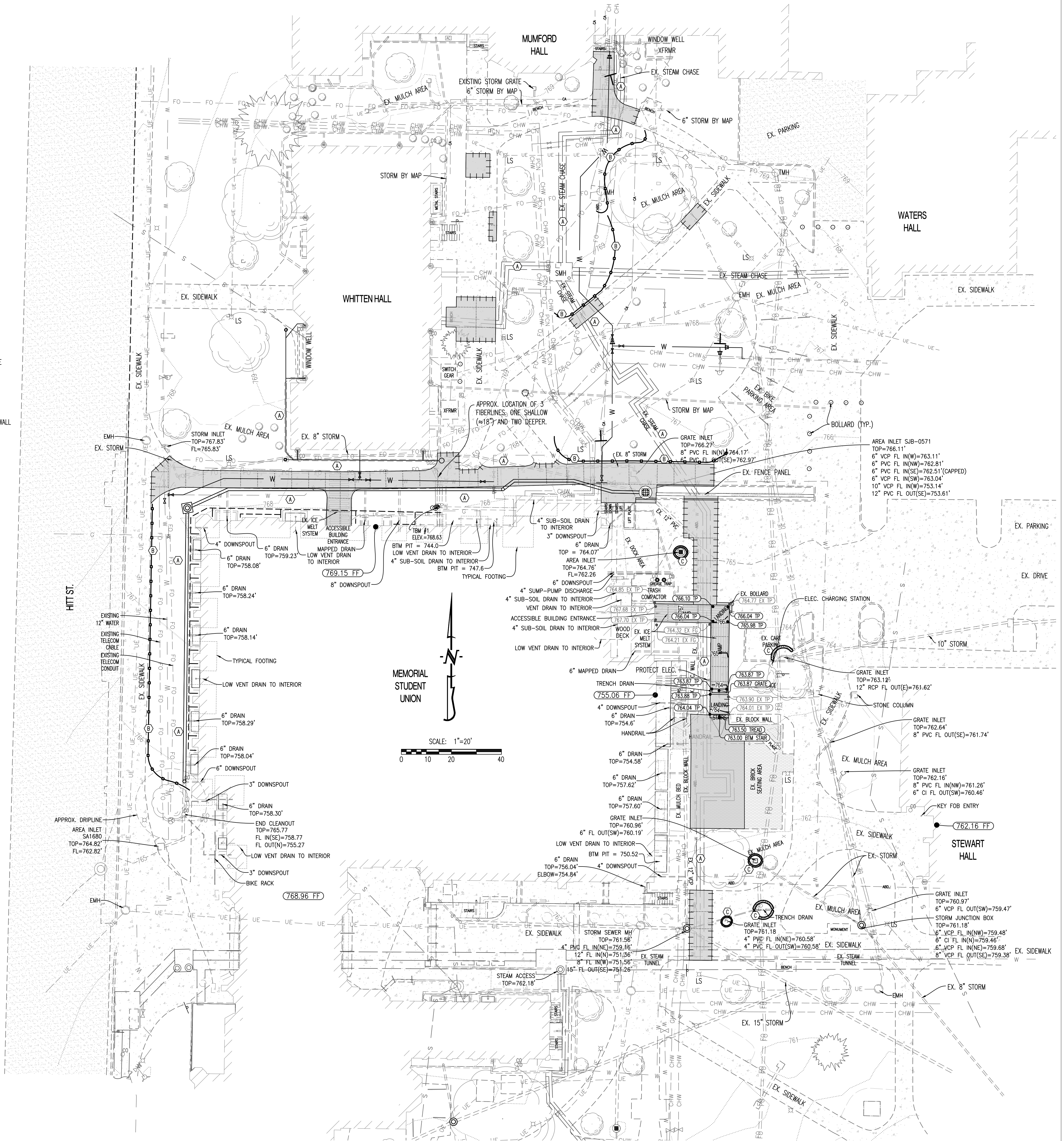
LEGEND OF LABELS	
(A)	ALL DISTURBED AREAS WITHIN THE PROJECT LIMITS, THAT ARE NOT TO BE PAVED, SHALL BE FINE GRADED BY CONTRACTOR TO AN ELEVATION OF 6" BELOW FINAL GRADE FOR TURF AREAS AND 18" BELOW FINAL GRADE FOR LANDSCAPE PLANTER AREAS. FINAL TOP SOIL PLACEMENT AND VEGETATION WILL BE REESTABLISHED BY OWNER.
(B)	INSTALL SILT FENCE OR STRAW WADDE (OR EQUAL) AS EROSION CONTROL DEVICE AS SHOWN.
(C)	INSTALL GUTTER BUDDY, SILT FENCE, STRAW WADDE OR EQUAL AT INLETS AS SHOWN. THESE SHALL REMAIN IN PLACE UNTIL VEGETATION HAS BEEN REESTABLISHED.

- GENERAL LANDSCAPE NOTES:**
- VEHICLES ARE TO USE DESIGNATED CONSTRUCTION ENTRANCES AS INDICATED ON DRAWINGS OR CONSTRUCTION DOCUMENTS. IF NO CONSTRUCTION ROUTE IS INDICATED VEHICLES ARE RESTRICTED TO PAVED AREAS. ALL CONSTRUCTION EQUIPMENT AND OR VEHICLES SHALL VERIFY THE WEIGHT LIMIT AND RESTRICTION ON PAVEMENT PRIOR TO CONSTRUCTION AND NOTIFY OWNERS REPRESENTATIVE OF THE PLANNED ROUTE.
 - THERE SHALL BE NO VEHICLE MOVEMENT IN ANY LANDSCAPED, SHRUB OR PERENNIAL AREAS, MULCH BED AND/OR TREE CANOPY DRIP AND ROOT ZONES, WITHOUT PRIOR MODIFICATIONS AND APPROVAL FROM LANDSCAPE SERVICES. LANDSCAPE SERVICES REQUIRES ONE WEEK NOTICE PRIOR TO ANY VEHICLE MOVEMENT IN THESE AREAS.
 - VEHICLE ACCESS SHALL NOT BREAK OR RUB TREE BRANCHES. OWNER WILL PRUNE TREE BRANCHES TO PROVIDE CLEARANCE AROUND BUILDING ENTRANCE. OWNER REQUIRES ONE WEEKS NOTICE FOR THIS WORK TO BE DONE.
 - DO NOT COMPACT GRADE WITHIN THE DRIP LINE OF TREES TO REMAIN. PROVIDE APPROVED FENCING TO PREVENT DRIVING OR EQUIPMENT PARKING WITHIN DRIP LINE OF TREES, PRIOR TO CONSTRUCTION OR WORK IN THE PROJECT AREA. MU'S CAMPUS STANDARD 6' CHAIN LINK FENCE AND POST SHALL BE USED UNLESS OTHERWISE NOTED AND/OR APPROVED BY OWNERS REPRESENTATIVE.
 - CONTRACTOR SHALL RIP THE SUB-SOIL TO A MINIMUM DEPTH OF 6" WITH A MAXIMUM DISTANCE BETWEEN RIPS OF 12" TO BREAK UP COMPACTION. CONTRACTOR SHALL THEN COMPACT THE SUB-SOIL TO 85% (IN NON-PAVED AREAS) OR 95% (IN PAVED AREAS) OF THE MATERIAL'S STANDARD PROCTOR DRY DENSITY. CONTRACTOR SHALL LEAVE THE AREA 6" BELOW THE FINISHED GRADE IN TURF AREAS AND 18" BELOW THE FINISHED GRADE IN PLANTER BED AREAS.
 - FINAL 6" OF TOP SOIL PLACEMENT AND TURF ESTABLISHMENT BY MU.
 - THE CONTRACTOR SHALL ADJUST EXISTING AND NEW YARD BOXES VALVE BOXES, PULL BOXES, CLEANOUTS, AND MANHOLE LID RINGS ETC. (INCLUDES IRRIGATION, SEWERS, WATER AND ELECTRIC), TO THE INDICATED FINAL FINISH GRADE WHERE NEW FINISHED GRADE ELEVATIONS ARE PROVIDED, INDICATED, OR OTHERWISE IMPLIED.
 - THE OWNER WILL WATER AND MAINTAIN ALL SEED AND LANDSCAPING.
 - IRRIGATION LINES AND VALVES EXIST IN THE AREA. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO THE SYSTEM AS CAUSED BY CONSTRUCTION. WITHIN REASON AND WHEN POSSIBLE, THE NEW WORK SHALL BE INSTALLED TO AVOID LANDSCAPING COMPONENTS. IF AVOIDANCE IS NOT POSSIBLE, CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL, REPAIR AND/OR RE-INSTALLATION OF THE IRRIGATION AS REQUIRED TO COMPLETE THE WORK AS SHOWN AND TO LEAVE THE OWNER WITH AN IRRIGATION SYSTEM IN THE SAME CONDITION AS WHEN WORK BEGAN.
 - WHERE SITE ACCESS REQUIRES CROSSING TURF, MULCH AREAS, TREE ROOT SYSTEMS, TREE CANOPY ZONES, OR IRRIGATION SYSTEMS, THE CONTRACTOR SHALL USE ALTERNAMATS BY DICA OR APPROVED EQUAL.
 - REFER TO DIVISION 1 SPECIFICATIONS - SPECIAL CONDITIONS FOR FURTHER INSTRUCTIONS.

- GENERAL EROSION CONTROL NOTES:**
- THE CONTRACTOR SHALL PROVIDE FOR CONTROL OF SURFACE EROSION AND SEDIMENT DEPOSITION DURING ALL PHASES OF CONSTRUCTION AND UNTIL THE OWNER ACCEPTS THE WORK AS SUBSTANTIALLY COMPLETE.
 - CONTRACTOR IS RESPONSIBLE FOR KEEPING ALL ROADWAYS AND SIDEWALKS ADJACENT TO THE CONSTRUCTION SITE FREE OF DIRT AND DEBRIS RESULTING FROM ACTIVITIES RELATED TO THE CONSTRUCTION OF THIS PROJECT.
 - CONTRACTOR SHALL KEEP THE ENTIRE PROJECT SITE FREE OF DEBRIS AND TRASH AT ALL TIMES. CONTRACTOR SHALL EXECUTE WORK USING METHODS THAT MINIMIZE EXCESSIVE NOISE OR DUST EMISSIONS. CONTRACTOR SHALL PROVIDE METHODS, MEANS AND FACILITIES TO PREVENT CONTAMINATION OF SOIL OR WATER FROM DISCHARGE OF REGULATED MATERIALS (I.E., DIESEL FUEL) USED DURING CONSTRUCTION.
 - CONTRACTOR MUST INSTALL AND MAINTAIN THE EROSION CONTROL MEASURES SHOWN ON THIS PLAN. IF THE ENGINEER, OWNER'S REPRESENTATIVE, DETERMINES THAT THE INSTALLATION OF THE MAINTENANCE IS INADEQUATE, THE CONTRACTOR MUST IMMEDIATELY CORRECT AT THEIR EXPENSE. IF IT IS DETERMINED THAT ADDITIONAL EROSION CONTROL MEASURES ARE NEEDED THE CONTRACTOR WILL BE DIRECTED TO INSTALL AND MAINTAIN THOSE MEASURES.
 - THE CONTRACTOR SHALL INSPECT THE LAND DISTURBANCE SITE AT LEAST ONCE EVERY SEVEN (7) DAYS AND WITHIN TWENTY-FOUR (24) HOURS FOLLOWING EACH RAINFALL EVENT OF 1/2" OR MORE WITHIN ANY TWENTY-FOUR (24) HOUR PERIOD. THE CONTRACTOR SHALL ALSO INSPECT AND ASSURE THAT ALL SEDIMENT CONTROL DEVICES ARE IN WORKING CONDITION PRIOR TO ANY FORECASTED RAINFALL.
 - THE CONTRACTOR SHALL REMOVE SEDIMENT FROM THE FLOW AREAS AND MAKE ALL NECESSARY REPAIRS TO MAINTAIN THE INTEGRITY OF THE SEDIMENT CONTROL MEASURES. SEDIMENT SHALL BE REMOVED ONCE IT REACHED 1/2 THE INSTALLED HEIGHT OF MEASURE.
 - SOME OF THE EROSION AND SEDIMENT CONTROL MEASURES, WILL REQUIRE THE CONTRACTOR TO INSTALL, REMOVE, AND REINSTALL THE MEASURES AS CONSTRUCTION PROCEEDS. THE PHASING OF THIS WORK IS DEPENDENT ENTIRELY ON THE CONTRACTOR'S SCHEDULE, AND IS NOT SPECIFIED HEREIN. HOWEVER, THE CONTRACTOR SHALL COORDINATE THESE ACTIONS WITH THE ENGINEER AT THE TIMES ADJUSTMENTS ARE NEEDED.
 - CONTRACTOR SHALL DIRECT CONCRETE TRUCKS TO WASHOUT AT PLANT.

LEGEND OF SYMBOLS:

---XXX---	EXISTING MINOR CONTOUR
---XXX---	EXISTING MAJOR CONTOUR
XXX.XX TC	PROPOSED TOP OF CURB ELEVATION TC = (TP+6") UNLESS NOTED OTHERWISE
XXX.XX TP	PROPOSED TOP OF PAVEMENT ELEVATION
XXX.XX FG	PROPOSED FINISHED GRADE ELEVATION
XXX.XX FF	PROPOSED FINISHED FLOOR AT DOOR
XXX.XX TW	PROPOSED FINISHED GRADE AT TOP OF WALL
XXX.XX EX	EXISTING SPOT ELEVATION MODIFIER



THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

STATE OF MISSOURI
 ANDREW T. GREENE
 PROFESSIONAL ENGINEER
 NUMBER PE-202000043
 MO LICENSE PE-202000043
 1/16/25

CROCKETT
 ENGINEERING CONSULTANTS

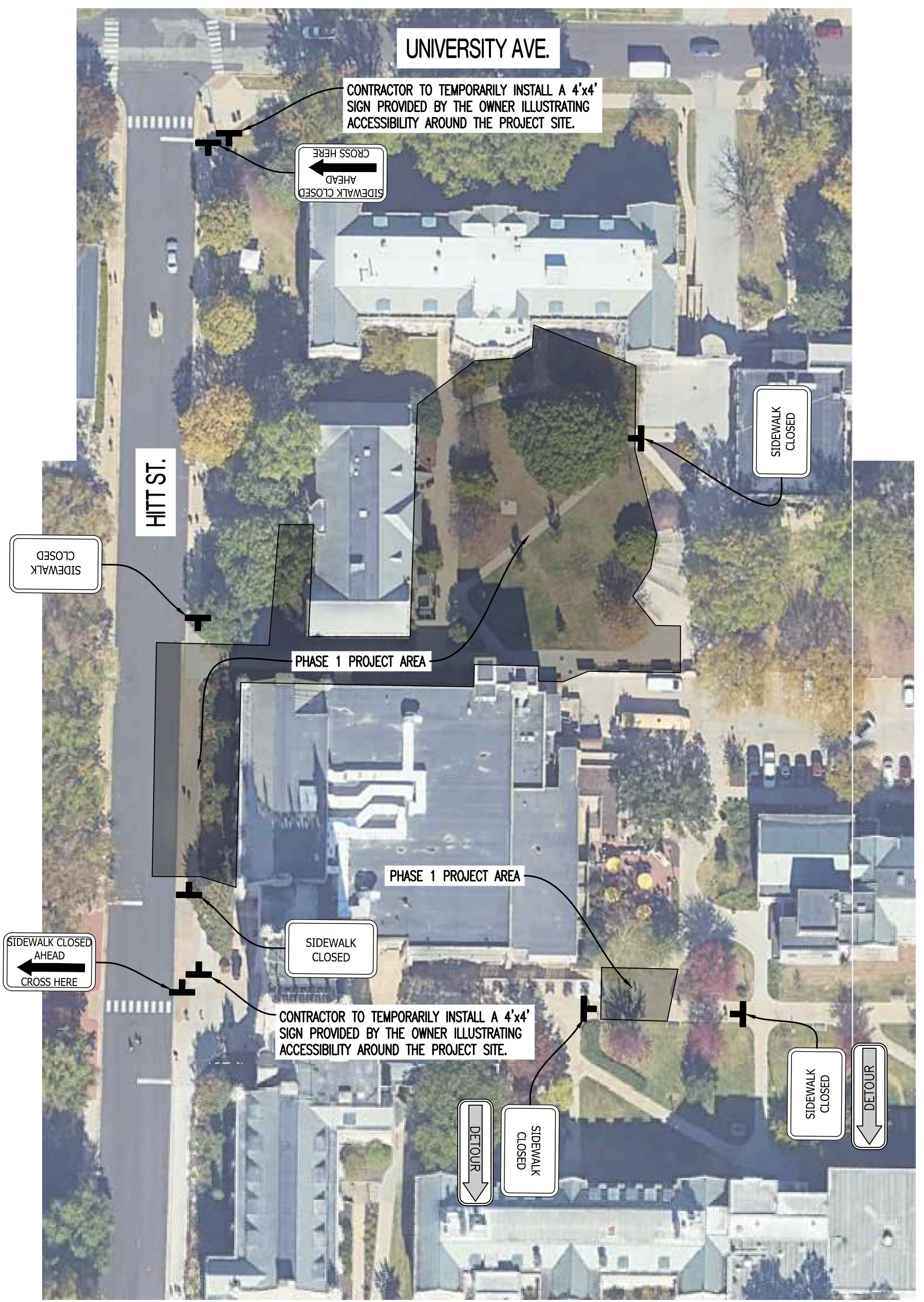
CHECKED BY: WTE
 DRAWN BY: ATG
 ISSUE FOR BID
 01/16/25

PRV CONSULTANTS, INC.
 107 SECOND AVE. STE. 110
 ROCK ISLAND, IL 61201
 PHONE 562.263.9161
 MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 202017805

UNIVERSITY OF MISSOURI - COLUMBIA
 GENERAL SITE - REPLACE UTILITIES
 NEAR MEMORIAL UNION
 COLUMBIA, BOONE COUNTY, MISSOURI 65203

GRADING AND EROSION CONTROL PLAN

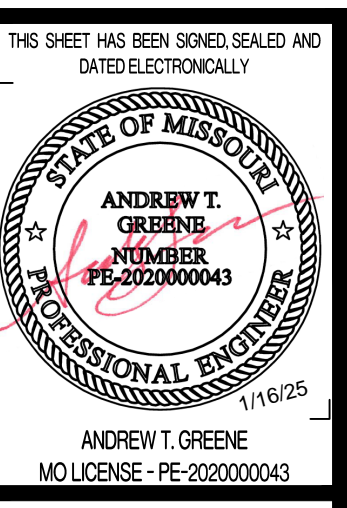
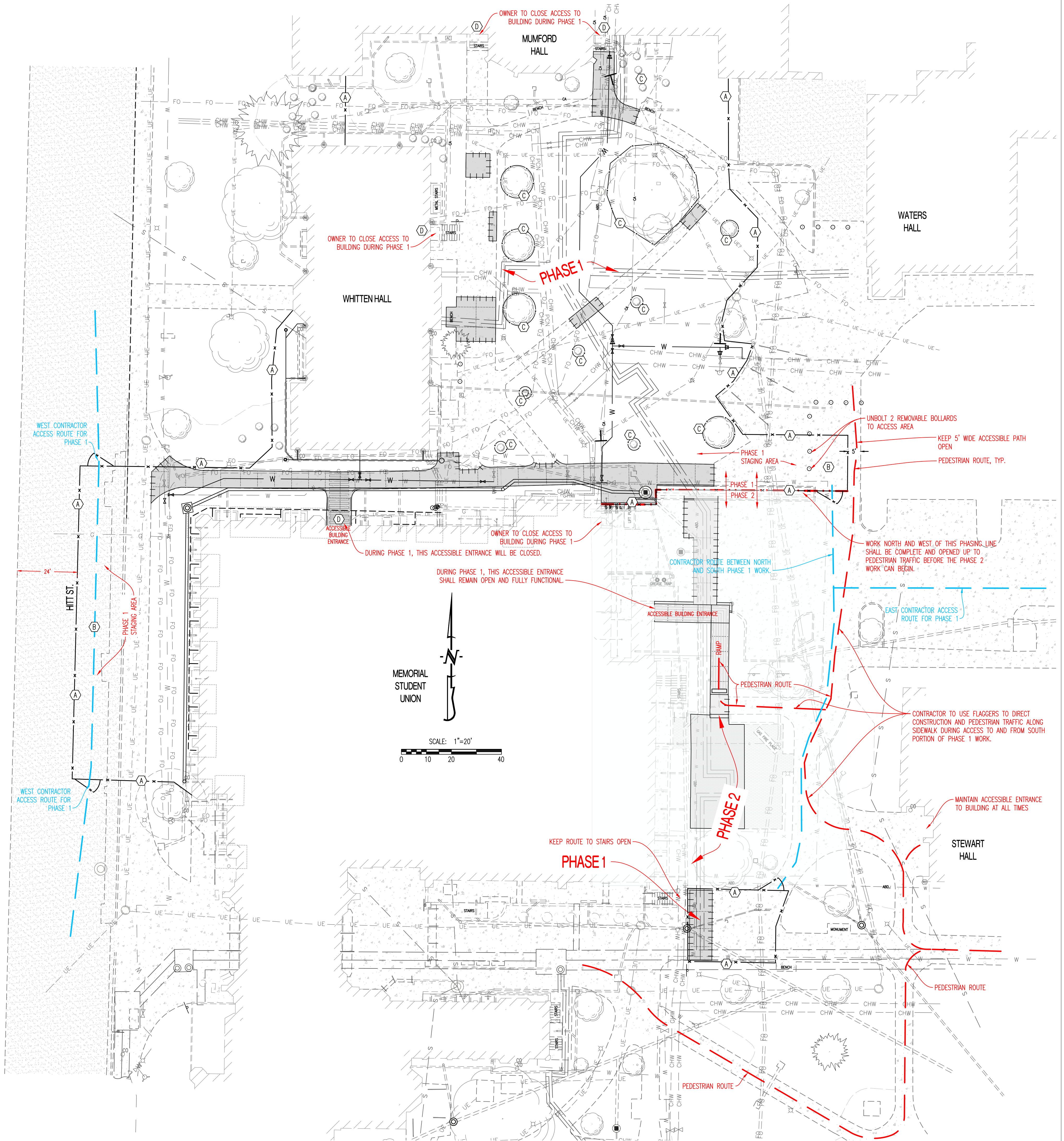
UNIVERSITY OF MISSOURI
 PROJECT NUMBER
 CP230201
 CONSULTANT
 PROJECT NUMBER
 220449
 SHEET
 CE 8



SIDEWALK SIGNAGE PLAN
NOT TO SCALE

LEGEND OF LABELS:

- (A) CONTRACTOR TO INSTALL 6' TALL CHAIN LINK FENCE WITH GATES AS SHOWN FOR LIMITS OF WORK AREA. FENCE SHALL REMAIN IN PLACE THROUGHOUT PROJECT DURATION.
- (B) CONTRACTOR TO USE EXISTING PAVING AS CONSTRUCTION ENTRY AND EXIT AND STAGING AREA WITHIN THE FENCE LIMITS. ALL CONSTRUCTION TRAFFIC SHALL UTILIZE THIS ENTRY AND EXIT TO THE PROJECT. ANY DAMAGED PAVEMENT DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR. CONTRACTOR SHALL CLEAN/POWER WASH CONSTRUCTION AREA PAVEMENT ONCE WORK IS COMPLETE.
- (C) EXISTING TREE TO BE PROTECTED. INSTALL TREE PROTECTION FENCING AS SHOWN. REFER TO DETAIL ON CE 10. CONTRACTOR SHALL NOT DISTURB AREAS WITHIN DRIP LINE OF TREE TO BE PROTECTED.
- (D) WORK WITH OWNERS REPRESENTATIVE TO RESTRICT ACCESS TO DOORWAYS LEADING INTO FENCED CONSTRUCTION AREAS, AS NEEDED.



CROCKETT
ENGINEERING CONSULTANTS

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MISSOURI CERTIFICATE OF
AUTHORITY ENGINEERING - 2022017805



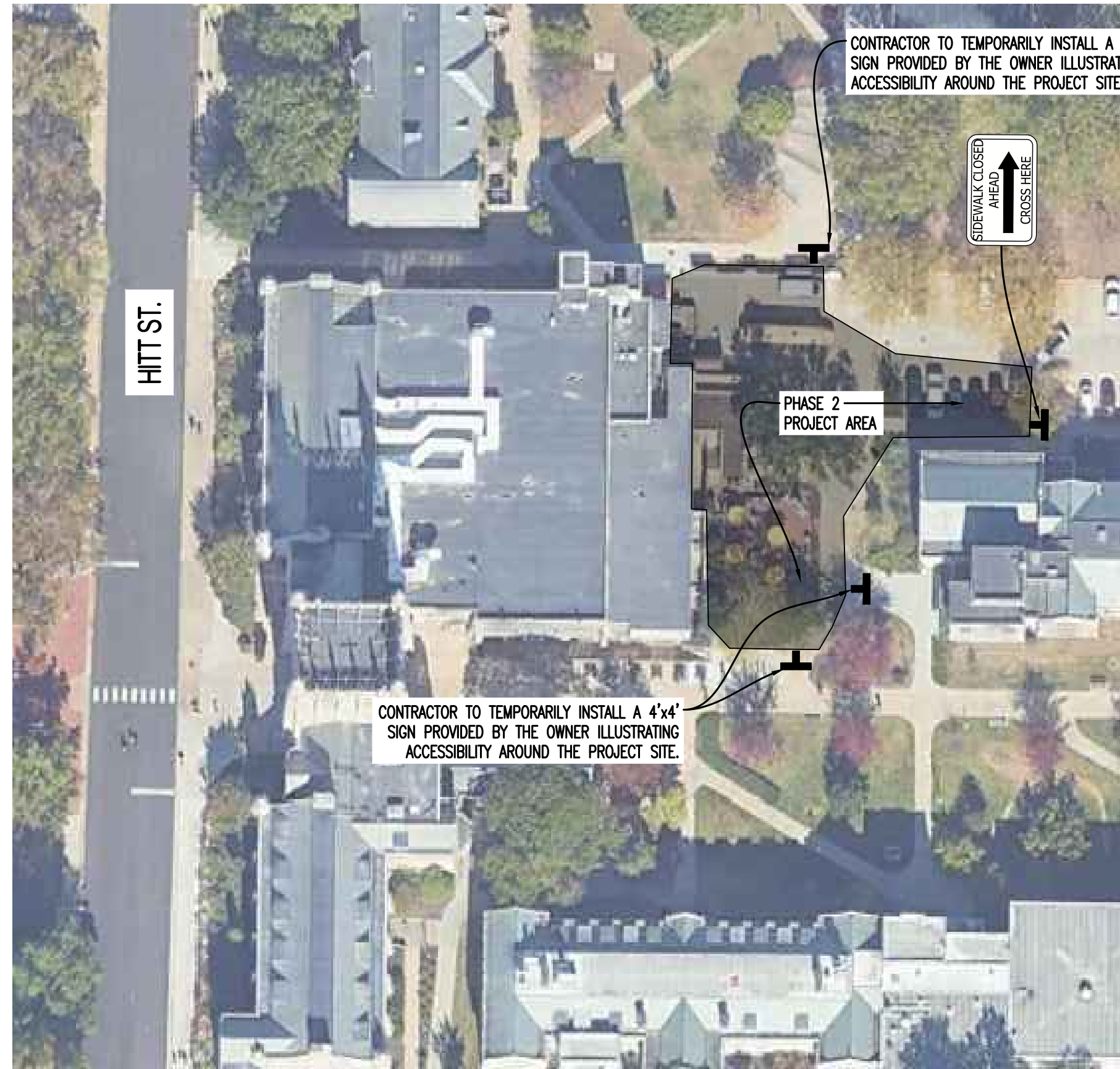
UNIVERSITY OF MISSOURI - COLUMBIA
GENERAL SITE - REPLACE UTILITIES
NEAR MEMORIAL UNION
COLUMBIA, BOONE COUNTY, MISSOURI 65203

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP230201

CONSULTANT
PROJECT NUMBER
220449

SHEET
CE 9

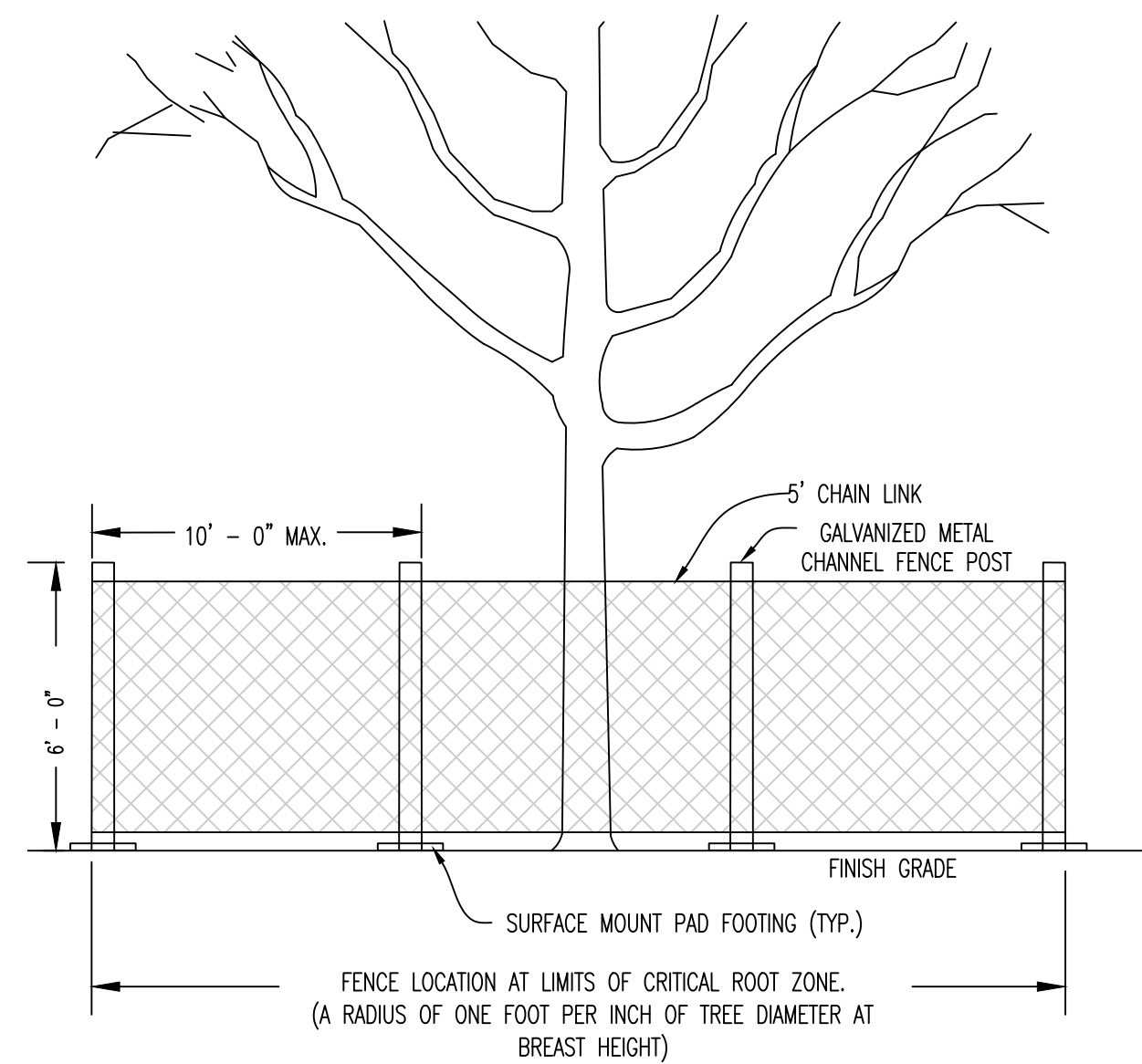
PHASING PLAN - PHASE 1



SIDEWALK SIGNAGE PLAN
NOT TO SCALE

LEGEND OF LABELS:

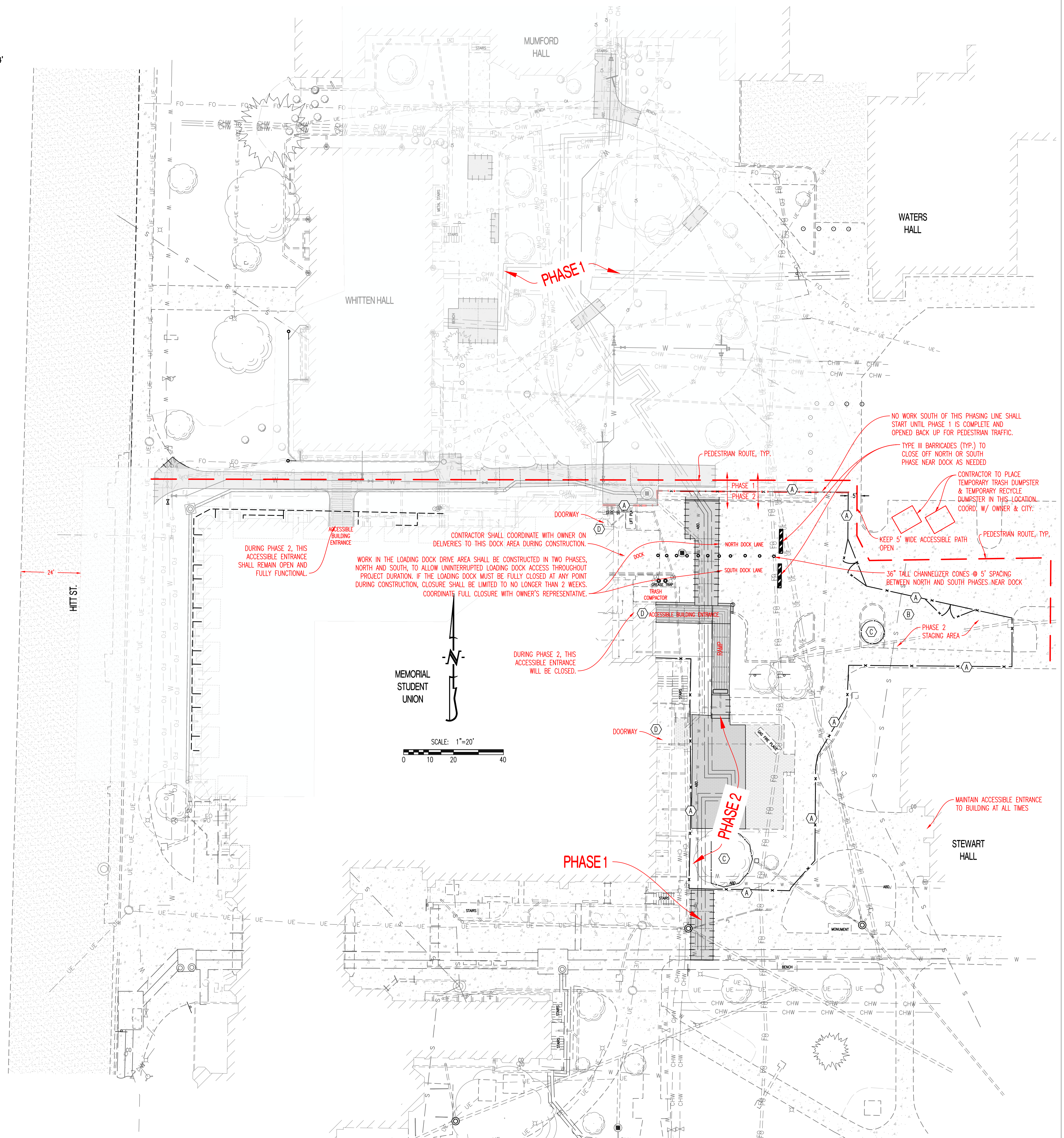
- (A) CONTRACTOR TO INSTALL 6' TALL CHAIN LINK FENCE WITH GATES AS SHOWN FOR LIMITS OF WORK AREA. FENCE SHALL REMAIN IN PLACE THROUGHOUT PROJECT DURATION.
- (B) CONTRACTOR TO USE EXISTING PAVING AS CONSTRUCTION ENTRY AND EXIT AND STAGING AREA WITHIN THE FENCE LIMITS. ALL CONSTRUCTION TRAFFIC SHALL UTILIZE THIS ENTRY AND EXIT TO THE PROJECT. ANY DAMAGED PAVEMENT DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR. CONTRACTOR SHALL CLEAN/POWER WASH CONSTRUCTION AREA PAVEMENT ONCE WORK IS COMPLETE.
- (C) EXISTING TREE TO BE PROTECTED. INSTALL TREE PROTECTION FENCING AS SHOWN. REFER TO DETAIL ON CE 10. CONTRACTOR SHALL NOT DISTURB AREAS WITHIN DRIP LINE OF TREE TO BE PROTECTED.
- (D) WORK WITH OWNERS REPRESENTATIVE TO RESTRICT ACCESS TO DOORWAYS LEADING INTO FENCED CONSTRUCTION AREAS, AS NEEDED.



NOTES:

1. MAKE CLEAN SAWCUTS ON ROOTS EXPOSED BY GRADING AND BACKFILL IMMEDIATELY W/ TOPSOIL THOROUGHLY.
2. MAINTAIN FENCE TO KEEP IT ANCHORED FIRMLY TO POST WITHOUT SAGGING.
3. ANCHOR FENCE TO POSTS WITH WIRES OR PLASTIC TIES.
4. REMOVE FENCING AND TIES FROM SITE WHEN DIRECTED BY OWNER/ENGINEER OR AT SUBSTANTIAL COMPLETION OF PROJECT.

TREE PROTECTION FENCE



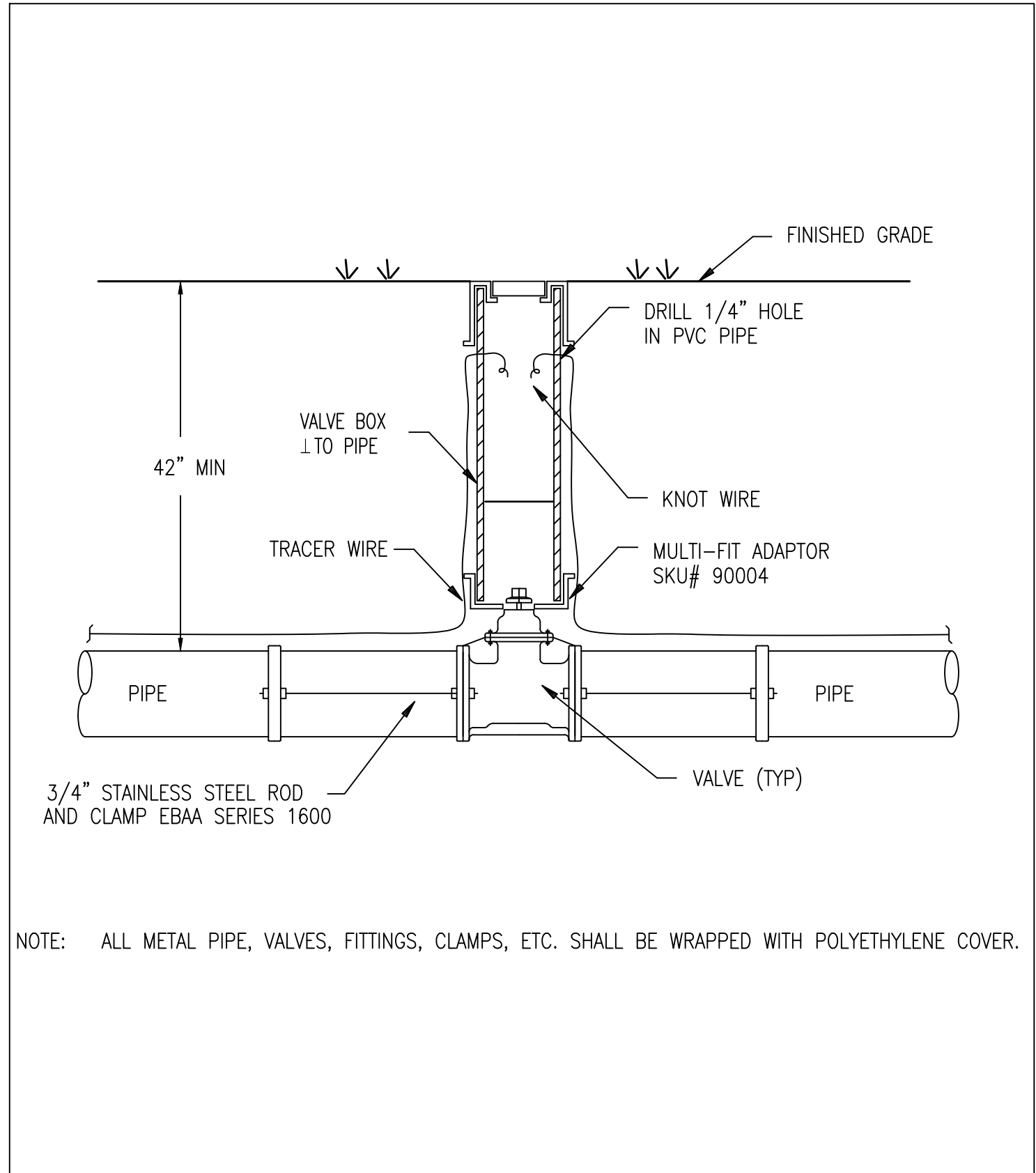
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PRV CONSULTANTS, INC.
1617 SECOND AVE. STE. 110
ROCK ISLAND, IL 61201
PHONE 562.263.9161
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 202307805

UNIVERSITY OF MISSOURI - COLUMBIA
GENERAL SITE - REPLACE UTILITIES
NEAR MEMORIAL UNION
COLUMBIA, BOONE COUNTY, MISSOURI 65203

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP230201
CONSULTANT
PROJECT NUMBER
220449
SHEET
CE 10

PHASING PLAN - PHASE 2



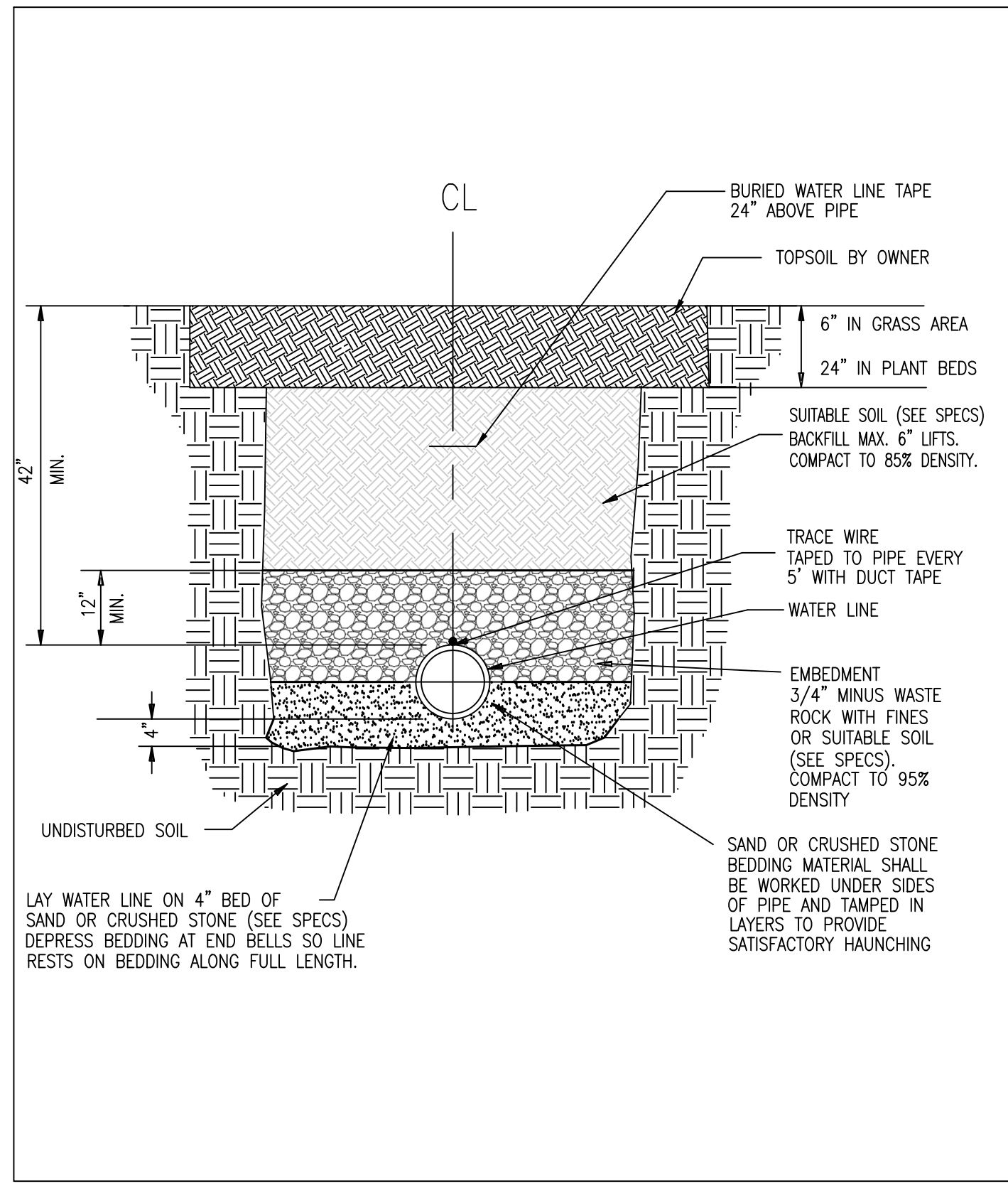
NOTE: ALL METAL PIPE, VALVES, FITTINGS, CLAMPS, ETC. SHALL BE WRAPPED WITH POLYETHYLENE COVER.

REV	DATE	PROJECT NUMBER
0	10/26/06	
1	07/17/09	
2	06/05/14	
4	12/7/21	

Construction Standard Gate Valve

Energy Management
Campus Facilities
UNIVERSITY OF MISSOURI-COLUMBIA

DRAWING NOT TO SCALE
DATE: 12/18/02



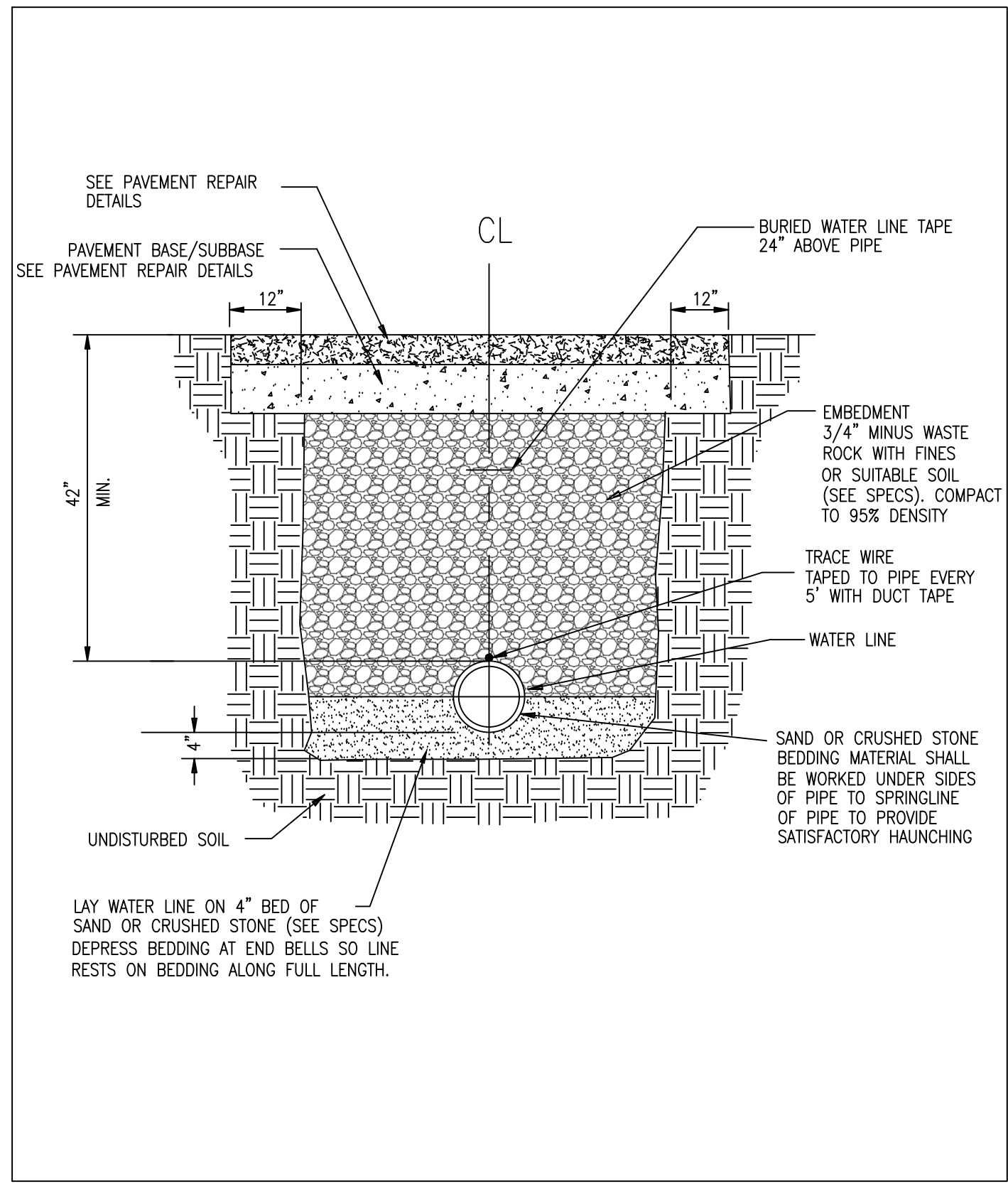
LAY WATER LINE ON 4" BED OF SAND OR CRUSHED STONE (SEE SPECS) DEPRESS BEDDING AT END BELLS SO LINE RESTS ON BEDDING ALONG FULL LENGTH.

REV	DATE	PROJECT NUMBER
2	8/10/06	
3	1/6/14	
4	6/5/14	
5	11/05/15	

Construction Standard Trench at Grass & Plantings

Energy Management
Campus Facilities
UNIVERSITY OF MISSOURI

DRAWING NOT TO SCALE
DATE: 12/22/02



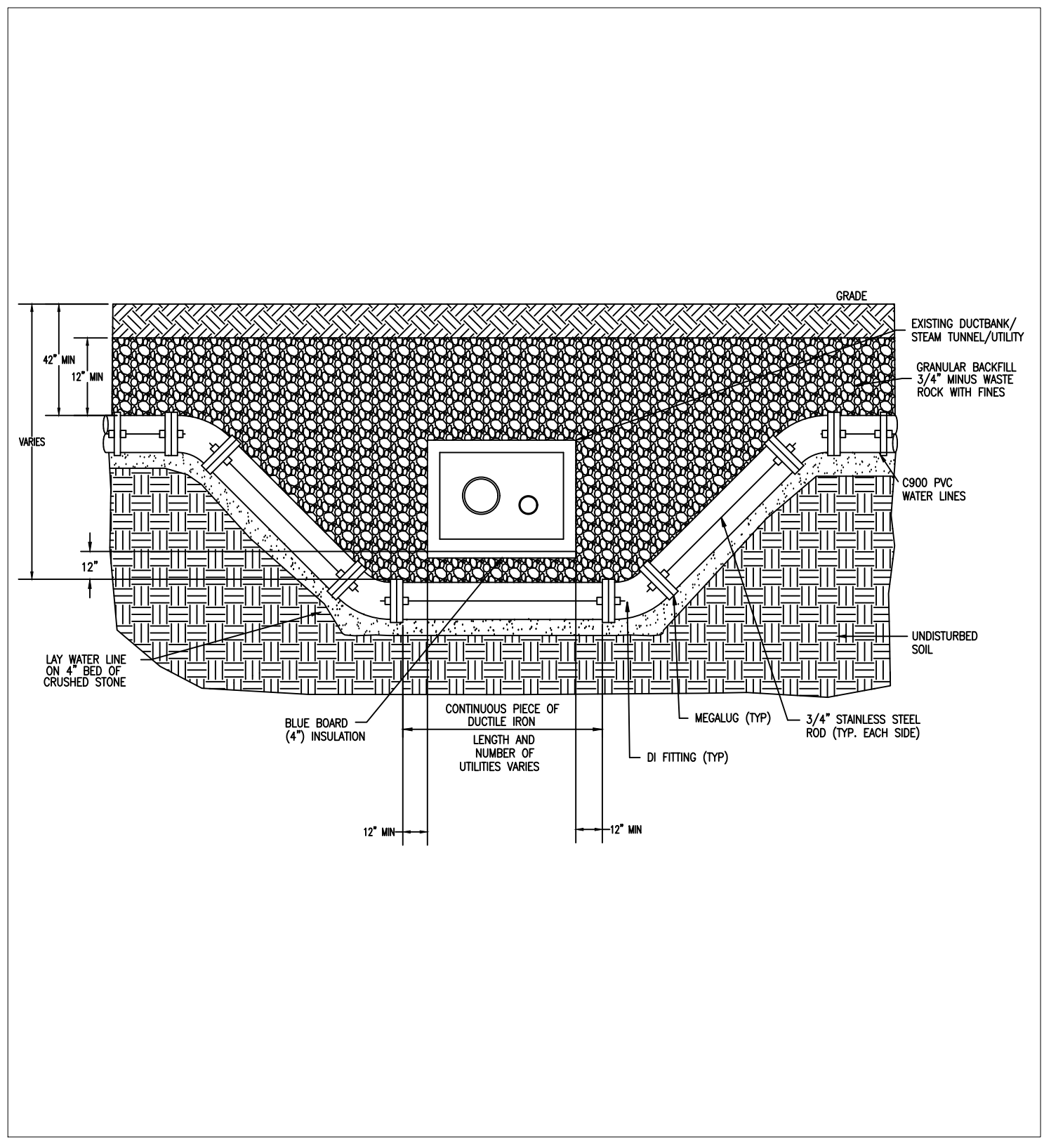
LAY WATER LINE ON 4" BED OF SAND OR CRUSHED STONE (SEE SPECS) DEPRESS BEDDING AT END BELLS SO LINE RESTS ON BEDDING ALONG FULL LENGTH.

REV	DATE	PROJECT NUMBER
1	8/10/06	
2	1/6/14	
3	6/5/14	
4	11/05/15	

Construction Standard Trench at Paving

Energy Management
Campus Facilities
UNIVERSITY OF MISSOURI

DRAWING NOT TO SCALE
DATE: 12/22/02



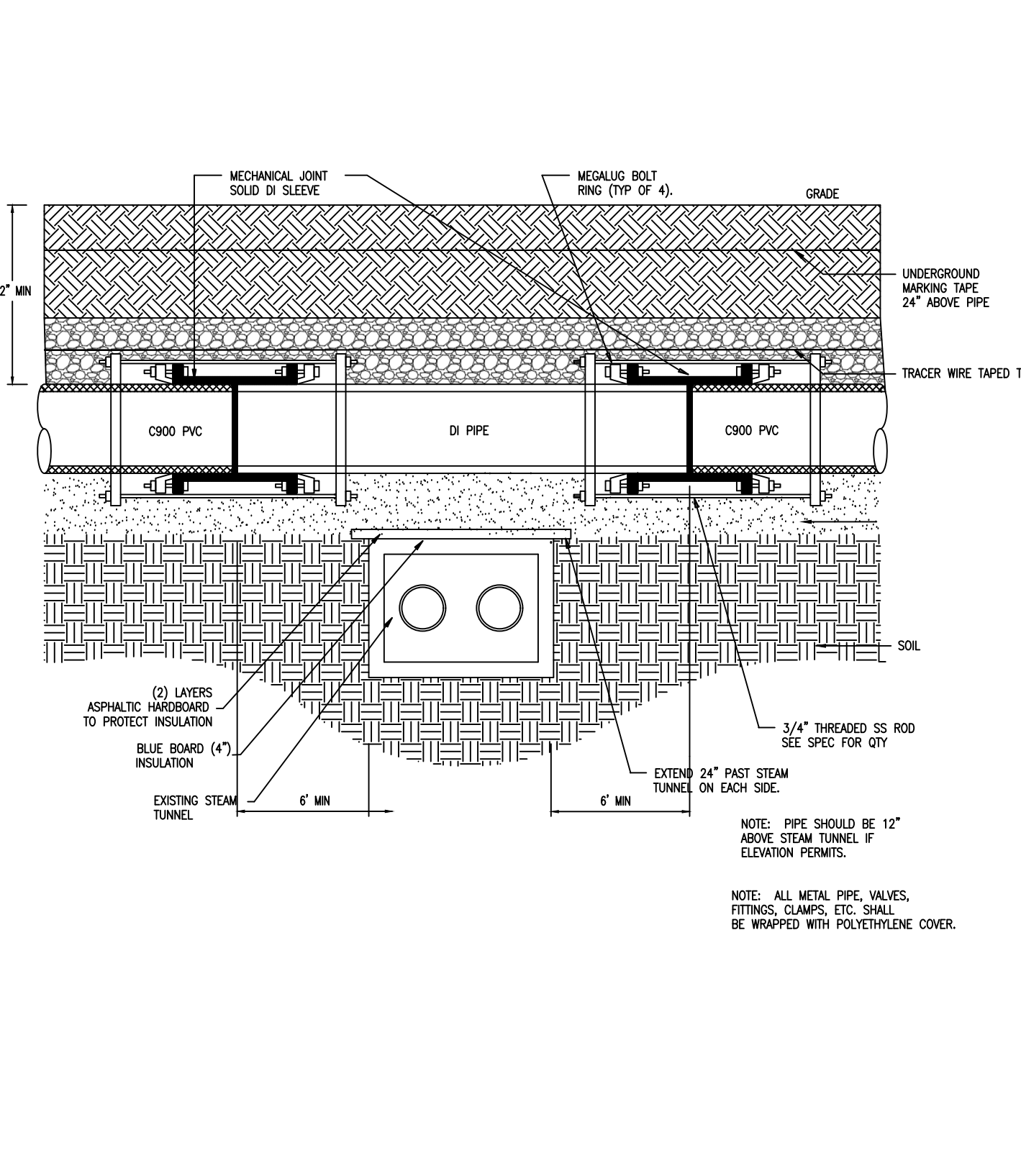
NOTE: ALL METAL PIPE, VALVES, FITTINGS, CLAMPS, ETC. SHALL BE WRAPPED WITH POLYETHYLENE COVER.

REV	DATE	PROJECT NUMBER
0	12/22/02	
1	8/15/11	
2	6/05/14	
3	11/05/15	

Construction Standards Vertical Offset

Energy Management
Campus Facilities
UNIVERSITY OF MISSOURI

DRAWING NOT TO SCALE
DATE: 12/22/02



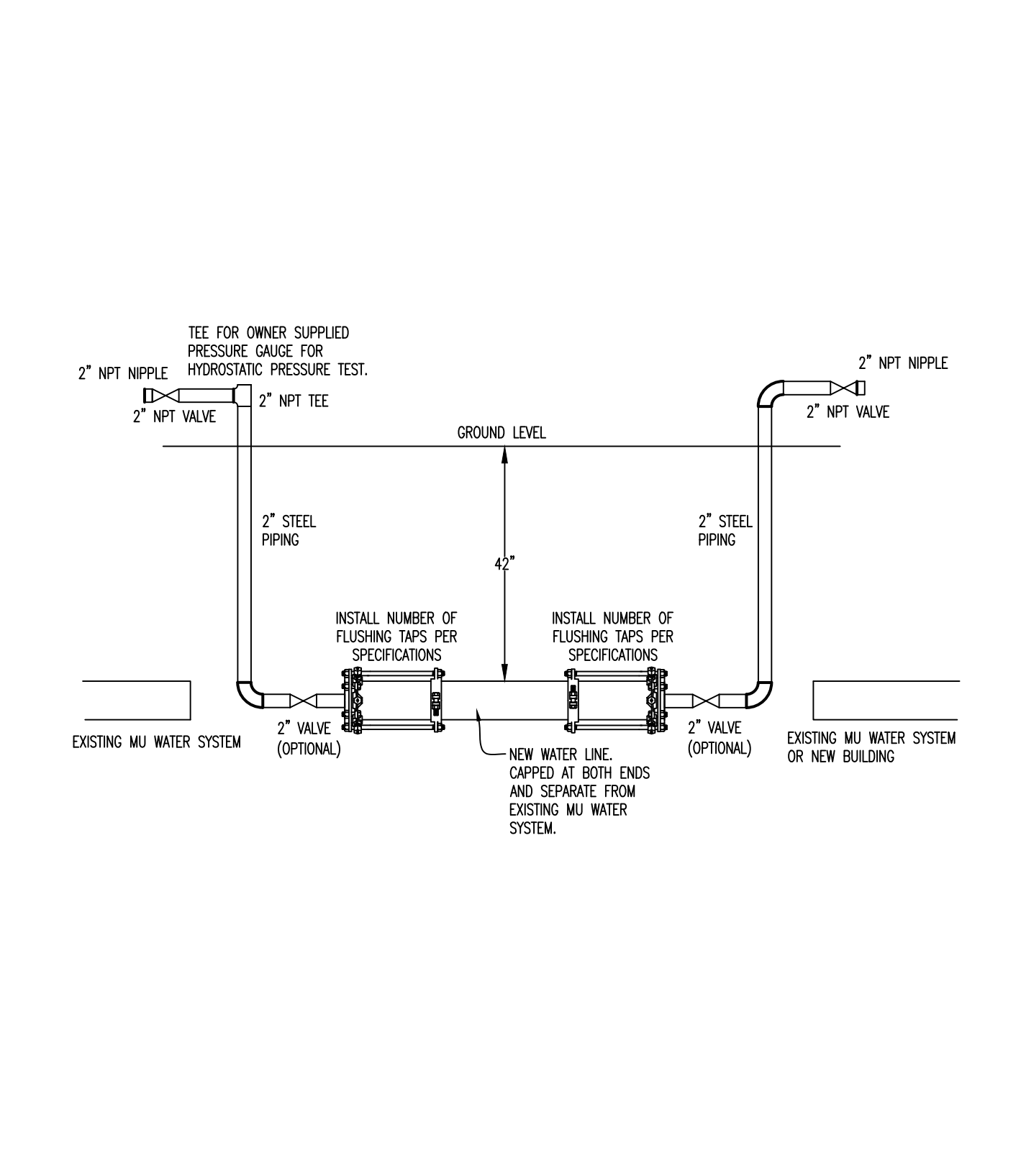
NOTE: PIPE SHOULD BE 12" ABOVE STEAM TUNNEL IF ELEVATION PERMITS.

REV	DATE	PROJECT NUMBER
1	7/11/05	
2	8/15/11	
3	6/05/14	
4	11/05/15	

Construction Standard Steam Tunnel Crossing

Energy Management
Campus Facilities
UNIVERSITY OF MISSOURI

DRAWING NOT TO SCALE
DATE: 12/18/02



NOTE: PIPE SHOULD BE 12" ABOVE STEAM TUNNEL IF ELEVATION PERMITS.

REV	DATE	PROJECT NUMBER
0		

Taps for Flushing and Disinfection of Water Lines

Energy Management
Campus Facilities
UNIVERSITY OF MISSOURI-COLUMBIA

DRAWING NOT TO SCALE
DATE: 1/4/14

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

STATE OF MISSOURI
ANDREW T. GREENE
NUMBER PE-202000043
PROFESSIONAL ENGINEER
1/10/25
ANDREW T. GREENE
MO LICENSE - PE-202000043

CROCKETT ENGINEERING CONSULTANTS

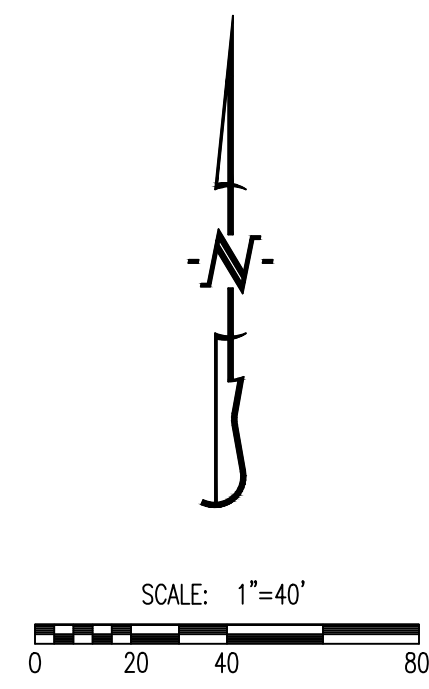
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CHECKED BY: WTE

PRVN CONSULTANTS, INC.
1617 SECOND AVE. STE. 110
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PHONE 562.263.9161
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 202007865

UNIVERSITY OF MISSOURI - COLUMBIA
GENERAL SITE - REPLACE UTILITIES
NEAR MEMORIAL UNION
COLUMBIA, BOONE COUNTY, MISSOURI 65203

WATERLINE CONSTRUCTION DETAILS

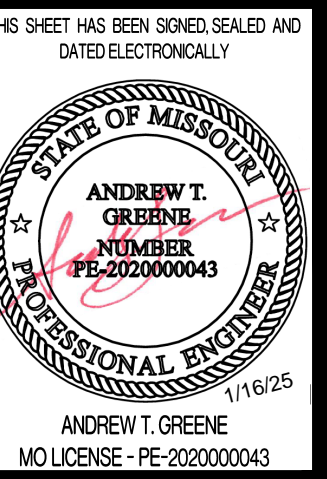
UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP230201
CONSULTANT PROJECT NUMBER
220449
SHEET
CE 11



GENERAL NOTES

- TRAFFIC CONTROL DEVICES SHALL COMPLY WITH THE MUTCD.
- CONTRACTOR SHALL MAINTAIN A MINIMUM LANE WIDTH OF 10' AT ALL TIMES FOR ANY OPEN LANE OF TRAFFIC.
- CONTRACTOR SHALL REFER TO THE CURRENT EDITION OF THE MDOOT MANUAL OF TRAFFIC CONTROL FOR FIELD OPERATIONS FOR INFORMATION ON THE PROPER DEPLOYMENT OF TRAFFIC CONTROL DEVICES.
- CONTRACTOR SHALL KEEP ALL ADJACENT DRIVEWAYS OPEN AT ALL TIMES.
- CONTRACTOR SHALL NOTIFY CITY OF COLUMBIA PRIOR TO ANY CLOSURE MADE ACCORDING TO THIS PLAN. ALL TIMES FOR CLOSURE SHALL BE APPROVED BY THE CITY OF COLUMBIA PRIOR TO IMPLEMENTATION OF THIS PLAN.
- CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE BSD RIGHT OF WAY TECHNICIAN (874-7474), IMMEDIATELY PRIOR TO CLOSURE OF STREET, DURING CONSTRUCTION FOR INSPECTIONS AND AGAIN WHEN WORK IS COMPLETE AND STREET IS REOPENED.

TRAFFIC CONTROL DEVICE LEGEND	
	PLACE STANDARD HIGHWAY SIGN (MUTCD SIGN # W20-1 SHOULD READ "ROAD WORK AHEAD"). SIGN SHALL BE 24" X 24" MIN.
	PLACE STANDARD HIGHWAY SIGN (MUTCD SIGN # G20-2 SHOULD READ "END ROAD WORK"). SIGN SHALL BE 24" X 18" MIN.
	PLACE STANDARD HIGHWAY SIGN (MUTCD SIGN # R9-11L/R SHOULD READ "SIDEWALK CLOSED AHEAD CROSS HERE"). SIGN SHALL BE 24" X 18" MIN.
	PLACE STANDARD HIGHWAY SIGN (MUTCD SIGN # R9-9 SHOULD READ "SIDEWALK CLOSED"). SIGN SHALL BE 24" X 18" MIN.



CROCKETT
ENGINEERING CONSULTANTS

CHECKED BY: WTE
DRAWN BY: ATG
ISSUE FOR BID
01/16/25

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ROCK ISLAND, IL 61201
PHONE 562.263.3160
MISSOURI CERTIFICATE OF
AUTHORITY ENGINEERING - 202307865

UNIVERSITY OF MISSOURI - COLUMBIA
GENERAL SITE - REPLACE UTILITIES
NEAR MEMORIAL UNION
COLUMBIA, BOONE COUNTY, MISSOURI 65203
PHASE 1 TRAFFIC CONTROL PLAN - HITT STREET

UNIVERSITY OF MISSOURI
PROJECT NUMBER

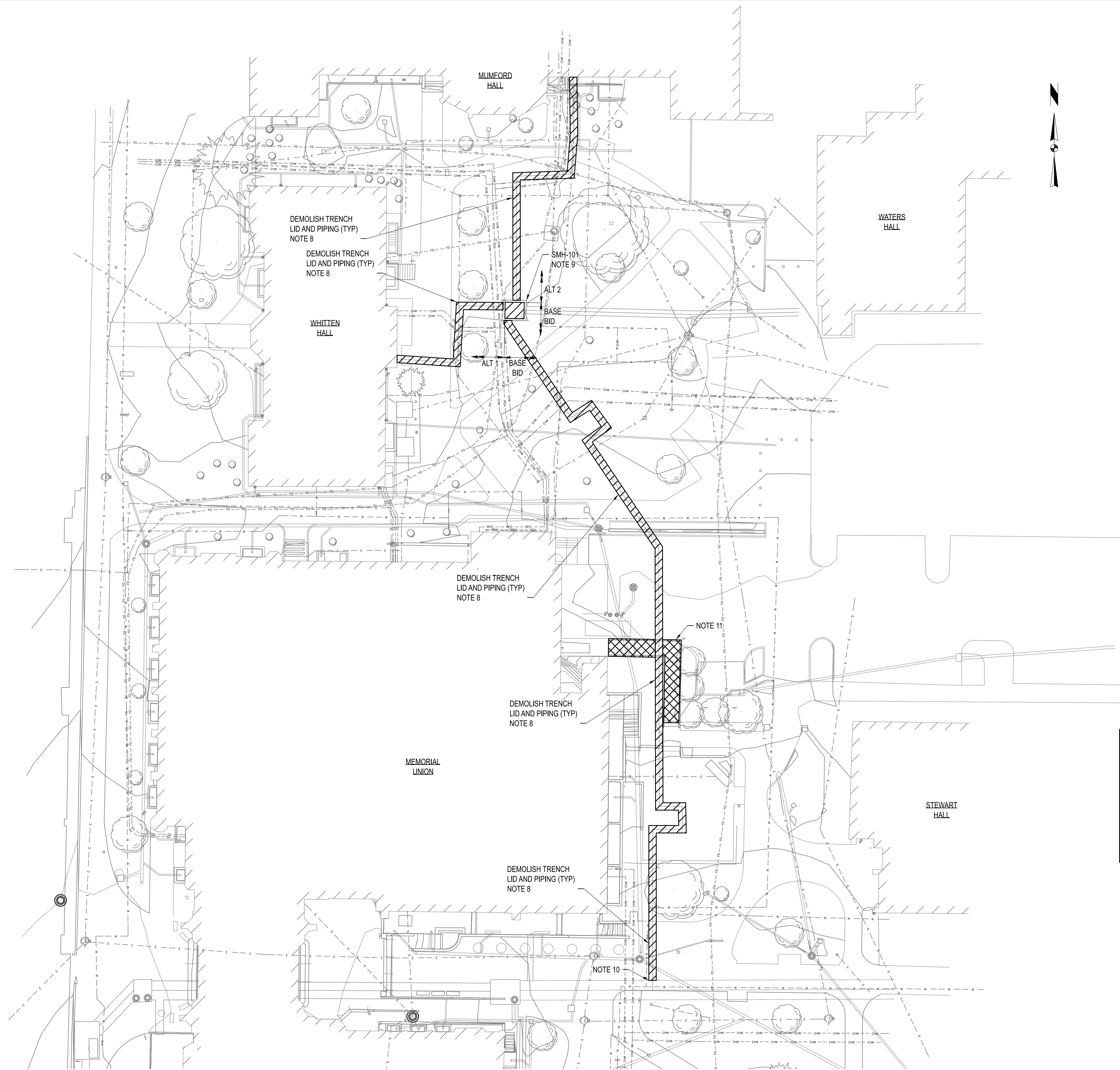
CP230201

CONSULTANT
PROJECT NUMBER



220449

SHEET

CE 12

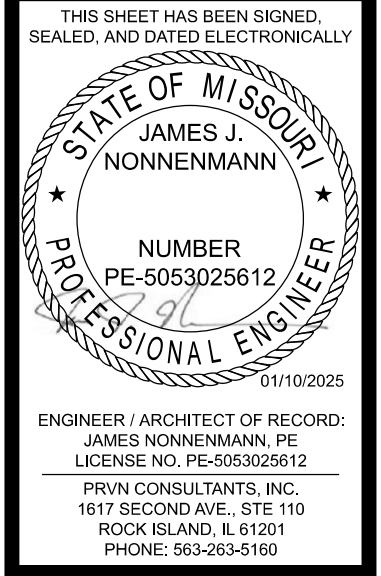


- NOTES:**
1. FIELD VERIFY ALL SIZES BEFORE COMMENCEMENT OF DEMOLITION ACTIVITIES.
 2. PROTECT ALL EQUIPMENT AND ACCESSORIES TO REMAIN FROM DAMAGE DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.
 3. EXERCISE CARE TO PERFORM WORK WITHOUT DAMAGING EXISTING INSULATION. NOTIFY OWNER IMMEDIATELY IF INSULATION IS DAMAGED. REPAIR INSULATION AS REQUIRED.
 4. TEMPORARY CAPS, COVERS, OR BLIND FLANGES SHALL BE PROVIDED TO PROTECT PIPING AND EQUIPMENT TO REMAIN FROM ENTRY OF FOREIGN MATERIALS DURING CONSTRUCTION ACTIVITIES.
 5. PROTECT ALL ELECTRICAL CABLING, BOXES, RACEWAY, AND CONDUIT FROM DAMAGE DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.
 6. PROVIDE DUST PROTECTION FOR EXISTING EQUIPMENT, PIPING, AND OWNER OCCUPIED AREAS DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.
 7. CONTRACTOR RESPONSIBLE FOR PROTECTING EXISTING STEAM SYSTEM AND CHASES FROM WATER INFILTRATION THROUGHOUT THE DURATION OF CONSTRUCTION.
 8. EXISTING STEAM CHASE TO BE EXCAVATED AND EXPOSED. DEMOLISH CHASE LID AND ALL PIPING AND SUPPORTS. ABATE ASBESTOS AS NEEDED. CONTRACTOR SHALL NOTIFY ENGINEER WHEN SECTIONS OF STEAM CHASE ARE CLEARED OF PIPING AND READY FOR INSPECTION. ENGINEER WILL DETERMINE EXTENT OF CHASE REPAIRS REQUIRED. CONTRACTOR SHALL MAKE REPAIRS PER DETAILS ON S110. CONTRACTOR SHALL INCLUDE UNIT PRICING FOR CRACK AND SPALL REPAIRS SHOWN ON S110 AS INSTRUCTED IN THE PROJECT MANUAL.
 9. LID ON EXISTING SMH-101 TO BE DEMOLISHED SEE DRAWING S101. DEMOLISH SMH-101 PIPING AND SUPPORTS SEE DRAWINGS D110 AND M110. ABATE ASBESTOS AS NEEDED.
 10. DISCONNECT EXISTING MPS AND PC SERVICES AT ELBOWS TURNING WEST IN TUNNEL.
 11. SEE DRAWING S100 FOR STRUCTURAL DETAILS ON RAMP RECONSTRUCTION AND DRAWING M130 FOR MECHANICAL DETAILS ON GLYCOL SYSTEM IN RAMP.

- LEGEND:**
-  ITEMS TO BE REFURBISHED
 -  ITEMS TO BE DEMOLISHED AND REBUILT

- ASBESTOS NOTES - CAUTION!!!**
1. STEAM CHASE WATERPROOFING MAY CONTAIN ASBESTOS. ONCE EXCAVATED TO BE EXPOSED, THE WATERPROOFING SHALL BE TESTED FOR ACM. ASBESTOS ABATEMENT MAY BE REQUIRED TO REMOVE STEAM CHASE LID SHALL BE PROVIDED BY CONTRACTOR.
 2. MPS/PC PIPING INSULATION WITHIN CHASE MAY CONTAIN ASBESTOS. ONCE EXPOSED, THE WATERPROOFING SHALL BE TESTED FOR ACM. ASBESTOS ABATEMENT SHALL BE PROVIDED BY CONTRACTOR.

OVERALL DEMOLITION SITE PLAN
SCALE: 1"=20'-0"



ENGINEER / ARCHITECT OF RECORD:
 JAMES NONNENMANN, PE
 LICENSE NO. PE-5053025612
 PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE 110
 ROCK ISLAND, IL 61201
 PHONE: 563-263-5160

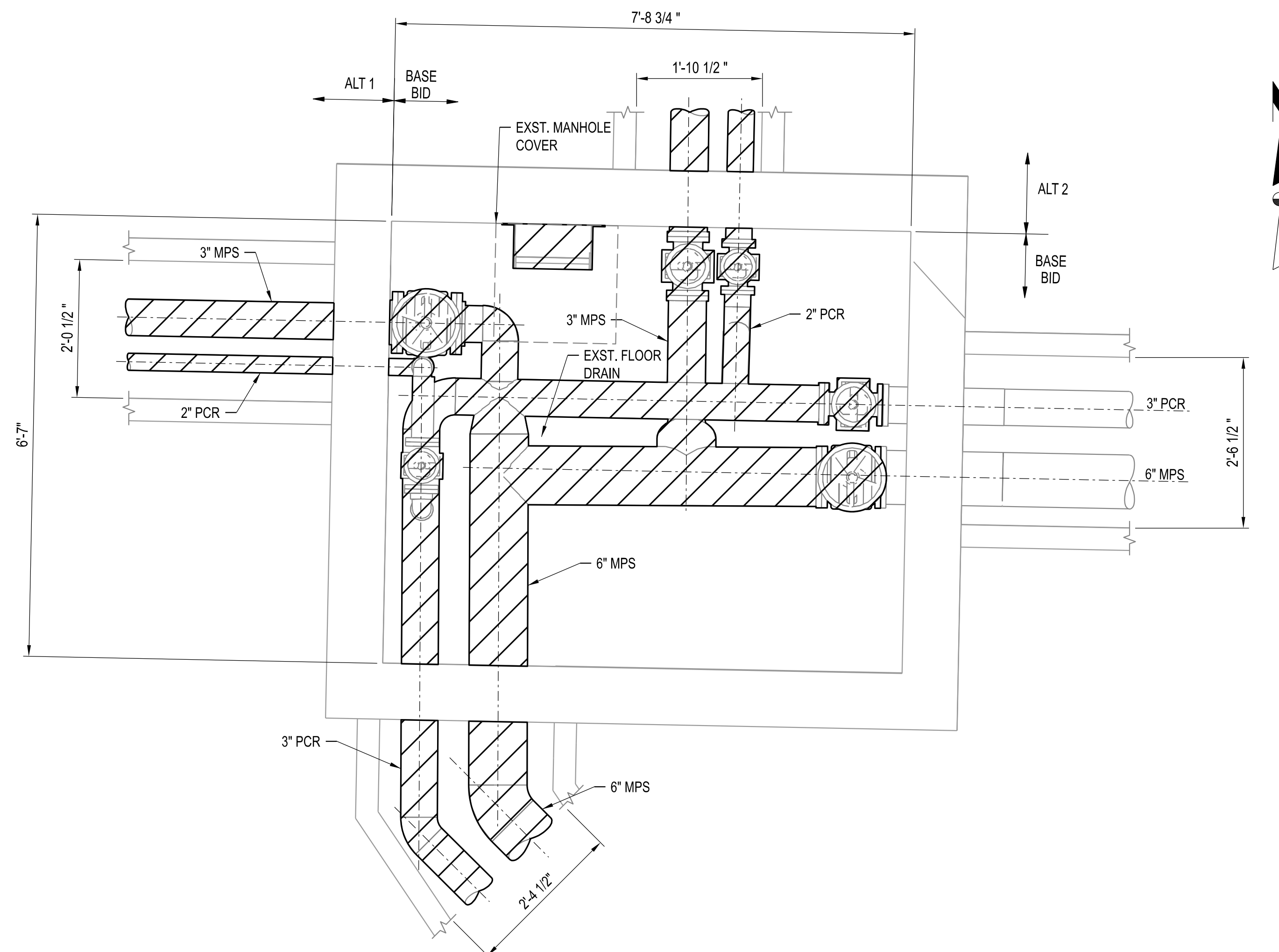
PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE 563.263.5160
 MISSOURI CERTIFICATE OF
 AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
 GENERAL SITE - REPLACE UTILITIES
 NEAR MEMORIAL UNION
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 OVERALL DEMOLITION SITE PLAN

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP230201

CONSULTANT
 PROJECT NUMBER
24084

SHEET
D100

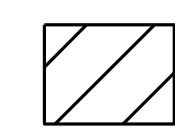


SMH-101 DEMOLITION PLAN
SCALE: 3/4" = 1'-0"

NOTES:

1. FIELD VERIFY ALL SIZES BEFORE COMMENCEMENT OF DEMOLITION ACTIVITIES.
2. PROTECT ALL EQUIPMENT AND ACCESSORIES TO REMAIN FROM DAMAGE DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.
3. EXERCISE CARE TO PERFORM WORK WITHOUT DAMAGING EXISTING INSULATION. NOTIFY OWNER IMMEDIATELY IF INSULATION IS DAMAGED. REPAIR INSULATION AS REQUIRED.
4. TEMPORARY CAPS, COVERS, OR BLIND FLANGES SHALL BE PROVIDED TO PROTECT PIPING AND EQUIPMENT TO REMAIN FROM ENTRY OF FOREIGN MATERIALS DURING CONSTRUCTION ACTIVITIES.
5. PROTECT ALL ELECTRICAL CABLING, BOXES, RACEWAY, AND CONDUIT FROM DAMAGE DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.
6. PROVIDE DUST PROTECTION FOR EXISTING EQUIPMENT, PIPING, AND OWNER OCCUPIED AREAS DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.
7. CONTRACTOR RESPONSIBLE FOR PROTECTING EXISTING STEAM SYSTEM AND CHASES FROM WATER INFILTRATION THROUGHOUT THE DURATION OF CONSTRUCTION.

LEGEND:

 ITEMS TO BE DEMOLISHED

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
JAMES S. NONNENMANN
PROFESSIONAL ENGINEER
NUMBER PE-505302612

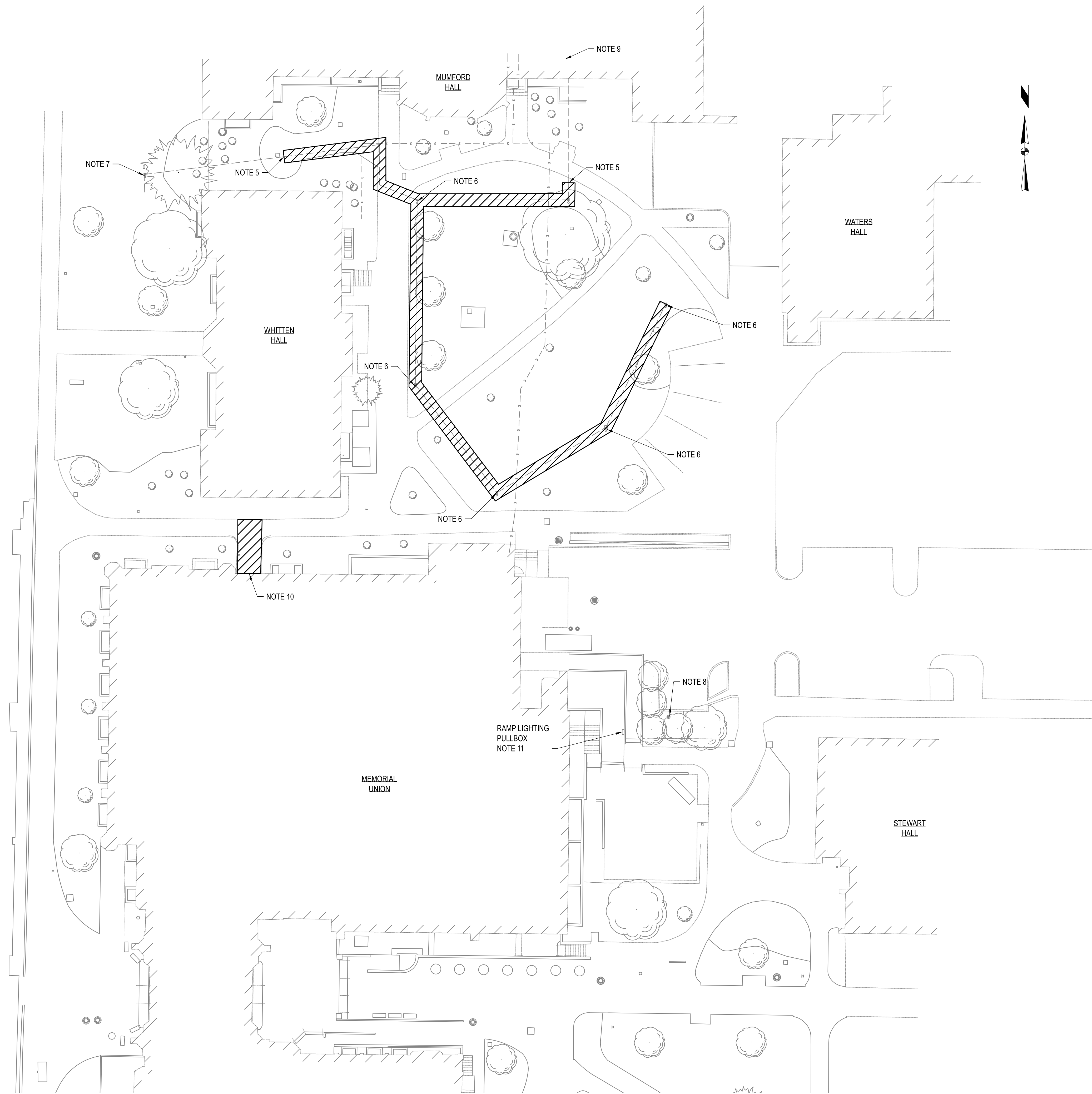
ENGINEER / ARCHITECT OF RECORD:
JAMES S. NONNENMANN, PE
LICENSE NO. PE-505302612
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE: 563-263-5160

0	01/10/25	ISSUED FOR BID	CHECKED BY: J.J.N.
		DRAWN BY: M.A.O.	

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UNIVERSITY OF MISSOURI - COLUMBIA
GENERAL SITE - REPLACE UTILITIES
NEAR MEMORIAL UNION
COLUMBIA, BOONE COUNTY, MISSOURI 65203
SMH-101 DEMOLITION PLAN

UNIVERSITY OF MISSOURI PROJECT NUMBER	CP230201
CONSULTANT PROJECT NUMBER	24084
SHEET	D110



- NOTES:**
- ALL EXISTING CONDITIONS SHOWN HAVE BEEN DETERMINED FROM CASUAL FIELD OBSERVATIONS AND AS-BUILT DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXACT FIELD CONDITIONS (QUANTITIES, LOCATIONS, ETC) PRIOR TO BEGINNING WORK.
 - ALL DEVICES AND EQUIPMENT SHOWN LIGHT AND CONTINUOUS ON THIS SHEET ARE EXISTING EQUIPMENT TO REMAIN. ALL DEVICES AND EQUIPMENT SHOWN BOLD AND DASHED ON THIS SHEET ARE TO BE DISCONNECTED, REMOVED AND DISPOSED OF BY THE ELECTRICAL CONTRACTOR, UNLESS OTHERWISE INDICATED. THE OWNER SHALL BE GIVEN SALVAGE RIGHTS TO ALL EQUIPMENT INDICATED FOR REMOVAL WITHOUT RE-INSTALLATION. CONTRACTOR SHALL DISPOSE OF ALL UNSALVAGED EQUIPMENT IN AN ENVIRONMENTALLY ACCEPTABLE MANNER.
 - WHEN A DEVICE IS DESIGNATED TO BE REMOVED, THE ELECTRICAL CONTRACTOR SHALL REMOVE ALL ASSOCIATED WIRE AND CONDUIT BACK TO THE NEAREST DEVICE TO REMAIN OR TO THE PANEL, UNLESS OTHERWISE INDICATED. CONTINUITY OF CONDUCTORS FEEDING DEVICES TO REMAIN SHALL BE MAINTAINED DURING CONSTRUCTION.
 - PORTIONS OF EXISTING CONDUIT UNDER SIDEWALKS MAY REMAIN FOR RE-USE.
 - INTERCEPT EXISTING SITE LIGHTING CIRCUIT. REMOVE PORTION OF SITE LIGHTING CIRCUIT THAT IS FED FROM MUMFORD HALL, ROOM 31, PANEL LP4-BE, CIRCUITS 1 AND 3. SEE SHEET E101 FOR NEW WORK.
 - REMOVE EXISTING SITE LIGHTING CIRCUIT RACEWAYS, CONDUCTORS, FIXTURES, POLES, AND CONCRETE BASES. TURN FIXTURES AND POLES OVER TO OWNER.
 - EXISTING SITE LIGHTING FIXTURE AND POLE TO REMAIN.
 - PROTECT GOLF CART RECEPTACLE AND ASSOCIATED INFRASTRUCTURE DURING CONSTRUCTION.
 - AT INTERIOR OF MUMFORD HALL IN RESEARCH 29 AND 29A, PROVIDE RELOCATION OF (2) DRYERS. FOR EACH DRYER ACCOUNT FOR (1) 20A, 120V FAN CKT AND (1) 30A, 208V HEATER CKT. PROVIDE FOR DISCONNECTION, RELOCATION, AND RE-INSTALLATION OF EACH DRYER. SEE SHEET M120 FOR MORE INFORMATION ON DRYER LOCATIONS.
 - DISCONNECT POWER SUPPLY TO ICE MELT SYSTEM IN NORTH ADA ENTRANCE RAMP TO ALLOW FOR RAMP DEMOLITION. RECORD DOCUMENTS SHOW THE TRACE CABLE IS RAYCHEM VIAGARD EM2-XR WITH VIA-DU-20 MULTI SENSOR CONTROL. A 208V 1 PHASE POWER CIRCUIT EXTENDS FROM PANEL P3 IN THE SERVICE ENTRANCE. NEW ICE MELT CABLE WILL BE INSTALLED DURING RAMP RECONSTRUCTION. EXISTING POWER SUPPLY TO ICE MELT SYSTEM TO BE REUSED.
 - CONTRACTOR TO DISCONNECT POWER SUPPLY TO EXISTING CONCRETE-EMBEDDED RAMP LIGHTS TO PREPARE THEM TO BE DEMOLISHED. EXISTING POWER SUPPLY WILL BE REUSED FOR NEW POLE MOUNTED FIXTURE. SEE NEW WORK DRAWING E101 FOR MORE DETAILS.

LEGEND:
 ITEMS TO BE DEMOLISHED

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
 JEFFERY GAMBELL
 PROFESSIONAL ENGINEER
 NUMBER PE-2000179300
 01/10/25

ENGINEER / ARCHITECT OF RECORD:
 JEFFERY GAMBELL, PE
 LICENSE NO. PE-2000179300
 PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE: 563-263-5160

0	01/10/25	ISSUED FOR BID	CHECKED BY: J.T.G.
		DRAWN BY: M.A.C.	

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 MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
 GENERAL SITE - REPLACE UTILITIES
 NEAR MEMORIAL UNION
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 ELECTRICAL DEMOLITION SITE PLAN

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP230201

CONSULTANT
 PROJECT NUMBER
24084

SHEET
D101

ELECTRICAL DEMOLITION SITE PLAN
 SCALE: 1"=20'-0"



PROJECT ABBREVIATIONS

AC	AIR COMPRESSOR	EA	EXHAUST AIR	KW	KILOWATT	RP	RESERVOIR PUMP
ACID	SULFURIC ACID	EAT	ENTERING AIR TEMPERATURE	LAT	LEAVING AIR TEMPERATURE	S	SOUTH
AD	AIR DRYER	EF	EXHAUST FAN	LB	POUND	S (#)	STEAM AT PRESSURE LISTED
ADDL	ADDITIONAL	EL	ELEVATION	LOR	LOCAL OFF REMOTE	SAN	SANITARY SEWER
AFF	ABOVE FINISHED FLOOR	EWT	ENTERING WATER TEMPERATURE	LS	LEVEL SWITCH	SC	SPEED COMMAND
AHU	AIR HANDLING UNIT	ETC	ET CETERA	LT	LEVEL TRANSMITTER	SCH	SCHEDULE
AI	ANALOG INPUT	EXST	EXISTING	LWT	LEAVING WATER TEMPERATURE	SEL	SELECT
AT	AMP TRIP	F	FAHRENHEIT	M	METER	SI	STATUS INDICATOR
BDW	BLOW-DOWN WATER	FACP	FIRE ALARM CONTROL PANEL	MAU	MAKEUP AIR UNIT	SIC	STATUS INDICATOR CONTROL
BI	BRINE	FC	FAIL CLOSED	MAX	MAXIMUM	SIZ	STATUS INDICATOR CONTROL DRIVE
BFP	BACK FLOW PREVENTER	FCU	FAN COIL UNIT	MBH	1000 BTU PER HOUR	SP	SPRINKLER
BMS	BUILDING MANAGEMENT SYSTEM OR BURNER MANAGEMENT SYSTEM	FD	FLOOR DRAIN, FIRE DAMPER	MCC	MOTOR CONTROL CENTER	SPCF	SPEED POINT CONTROL FLOW
BP	BRINE PUMP	FL	FAIL LAST	MIN	MINIMUM, MINUTE	SQ	SQUARE
BOD	BOTTOM OF DUCT	FLA	FULL LOAD AMPS	MISC	MISCELLANEOUS	SOV	SOLENOID VALVE
C	COIL	FLT	FLOW TRANSMITTER	MOV	MOTOR OPERATED VALVE	SSP	SOUTH STEAM PLANT
CA	COMPRESSED AIR	FM	FLOW METER	MPH	MILES PER HOUR	STA	STATION
CCUT	COUPLING CAPACITIVE VOLTAGE TRANSFORMER	FPM	FEET PER MINUTE	NC	NORMALLY CLOSED	STR	STORM SEWER
CFM	CUBIC FEET PER MINUTE	FO	FAIL OPEN	NG	NATURAL GAS	SW	SOFT WATER
CFS	CHEMICAL FEED SUPPLY	FOR	FUEL OIL RETURN	NO	NORMALLY OPEN	TES	TERMINAL ENERGY SYSTEM
CHLR	CHILLER	FOS	FUEL OIL SUPPLY	NPT	NATIONAL PIPE THREAD	TG	TEMPERATURE GAUGE
CO	CLEANOUT	FS	FLOW SWITCH	NS	RUN STATUS	T	TANK
COL	COLUMN	FT	FLOW TRANSMITTER, FOOT, FEET	NSA	RUN STATUS AUTO	TRS	TEMPERATURE SENSOR
COMM	COMMUNICATION	GA	GAUGE	NTS	NOT TO SCALE	TS	TRANSFER SWITCH
COND	CONDENSATE	GPM	GALLONS PER MINUTE	OFD	OVER FLOW DRAIN	TT	TEMPERATURE TRANSMITTER
CR	CONDENSER WATER RETURN	H	HEIGHT	P&ID	PIPING & INSTRUMENTATION DIAGRAM	TW	THERMOWELL
CS	CONDENSER WATER SUPPLY	HHWR	HEATING HOT WATER RETURN	PCR	PUMPED CONDENSATE RETURN	TYP	TYPICAL
CT	COOLING TOWER	HHWS	HEATING HOT WATER SUPPLY	PCT	PUMPED CONDENSATE TRANSFER	UH	UNIT HEATER
CTP	CONDENSATE TRANSFER PUMP	HOV	HYDRAULIC OPERATED VALVE	PCW	PROCESS COLD WATER	UTIL	UTILITY
CTHH	CONTROL TRANSMITTER HIGH HIGH	HP	HORSEPOWER	PG	PRESSURE GAUGE	V	VENT
CTL	CONTROL	HRS	HOUR	PMP	PUMP	VFD	VARIABLE FREQUENCY DRIVE
CTL	CONTROL VALVE	HSS	HAND START SWITCH	PS	PRESSURE SWITCH	VP	VACUUM PUMP
CWR	CHILLED WATER RETURN	HST	HAND STOP TRANSMITTER	PSIG	POUNDS PER SQUARE INCH	VS	VARIABLE SPEED
CWS	CHILLED WATER SUPPLY	HVAC	HEATING, VENTILATION AND AIR CONDITIONING	PSV	PRESSURE SUSTAINING VALVE	VTR	VENT THROUGH ROOF
DB	DUCT BANK	HWR	HOT WATER RETURN	PT	PRESSURE TRANSMITTER	W	WIDTH, WATER, WIDE, WATT
DCS	DISTRIBUTED CONTROL SYSTEM	HWS	HOT WATER SUPPLY	PWS	POTABLE WATER SUPPLY OR PROCESS WATER SUPPLY	WCCUP	WEST CENTRAL UTILITY PLANT
DEG	DEGREES	HZ	HERTZ	RA	RETURN AIR	WE	WITH EQUIPMENT
DIA	DIAMETER	ID	INSIDE DIAMETER, IDENTIFICATION	RD	RADIAL	WTR	WATER
DN	DOWN	IT	INDICATING TRANSMITTER	RD	ROOF DRAIN	XLG	INDICATING LIGHT GREEN
DWG	DRAWING	KV	KILOVOLT	REC	RECEIVER	XLR	INDICATING LIGHT RED
		KVA	KILOVOLT AMPERE	R.O.	REVERSE OSMOSIS	XSS	PLC/DCS START SWITCH
						XST	PLC/DCS STOP SWITCH

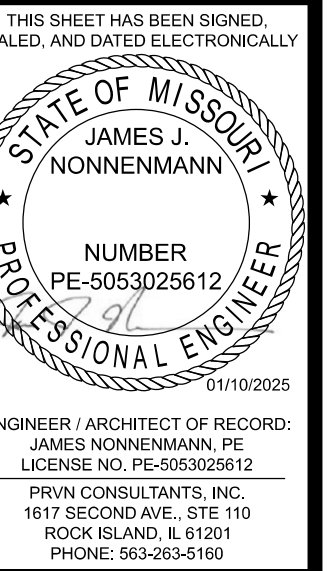
PHASING NOTES

- THE FOLLOWING ITEMS SHALL BE INCLUDED IN THE PHASE 1 CONSTRUCTION SCHEDULE. WORK TO BE COMPLETED BETWEEN MAY 19, 2025 AND AUGUST 15, 2025 AND SHALL INCLUDE ALL NECESSARY TRAFFIC AND PEDESTRIAN CONTROL.
1. STORM SEWER REPLACEMENT ALONG THE WEST AND NORTH SIDES OF MEMORIAL UNION
 2. STORM SEWER REPLACEMENT ALONG THE WEST AND SOUTH SIDE OF WHITTEN HALL.
 3. WATER LINE WORK BETWEEN MEMORIAL UNION AND WHITTEN, AND IN THE WHITTEN / MUMFORD COURTYARD.
 4. REFURBISHMENT OF SMH-101.
 5. REFURBISHMENT OF STEAM CHASES BETWEEN SMH-101 AND WHITTEN HALL AND MUMFORD HALL.
 6. REPLACEMENT OF MPS AND PC SERVICES FROM SMH-101 TO WHITTEN HALL AND MUMFORD HALL.
 7. START REFURBISHMENT OF STEAM CHASE AND REPLACEMENT OF MPS AND PC SERVICES FROM SMH-101 TO UTILITY TUNNEL.
 8. REFURBISHMENT OF SECTION OF STEAM CHASE ADJACENT TO UTILITY TUNNEL AND REPLACEMENT OF MPS AND PC SERVICES TO ALLOW FOR REOPENING OF SIDEWALK.
 9. ELECTRICAL REPLACEMENT WORK IN WHITTEN AND MUMFORD COURTYARD.
 10. REPLACE ELECTRICAL ICE MELT SYSTEM IN MEMORIAL UNION NORTH ADA RAMP.
 11. WATERPROOFING EXPOSED SURFACES OF MEMORIAL UNION FOUNDATION.
 12. PAVING AND SITE RESTORATION.

- THE FOLLOWING ITEMS SHALL BE INCLUDED IN THE PHASE 2 CONSTRUCTION SCHEDULE. WORK TO BE COMPLETED BETWEEN AUGUST 18, 2025 AND NOVEMBER 14, 2025 AND SHALL INCLUDE ALL NECESSARY TRAFFIC AND PEDESTRIAN CONTROL.
1. REFURBISHMENT OF THE BALANCE OF STEAM CHASE AND REPLACEMENT OF MPS AND PC SERVICES FROM SMH-101 TO UTILITY TUNNEL.
 2. REMOVAL OF MEMORIAL UNION EAST ADA RAMP.
 3. RECONSTRUCTION OF MEMORIAL UNION EAST ADA RAMP WITH GLYCOL ICE MELT SYSTEM.
 4. PAVING AND SITE RESTORATION.

GENERAL CONSTRUCTION NOTES

1. CONTRACTOR AND SUB -CONTRACTORS OF EACH TRADE SHALL BE RESPONSIBLE FOR INCLUDING WORK ASSOCIATED WITH FIRE PROTECTION OF ALL SPECIFIC TRADE RELATED PENETRATIONS THROUGH RATED WALLS AND FLOOR/CEILING ASSEMBLIES. FIRE SAFING RELATED TO PENETRATIONS BY EACH TRADE SHALL BE PERFORMED BY INDIVIDUALS EXPERIENCED WITH INSTALLING UL RATED PENETRATION ASSEMBLIES.
2. CONTRACTORS SHALL INFILL AND PAINT ALL PENETRATIONS FROM REMOVAL OF EXISTING EQUIPMENT, PIPING, AND ELECTRICAL CONDUIT. COORDINATE INFILLS WITH ALL TRADES. ALL PENETRATIONS ARE NOT SHOWN ON PLANS. UNLESS NOTED OTHERWISE, INFILL REMAINING PENETRATIONS ABOVE CEILINGS WITH 5/8" GYPSUM BOARD AND METAL STUDS. USE TYPE X GYPSUM BOARD AND AN APPROVED UL LISTED ASSEMBLY AT WALLS REQUIRED TO MAINTAIN FIRE RESISTANCE RATING. UNLESS NOTED OTHERWISE, INFILL EXISTING PENETRATIONS BELOW CEILINGS WITH MATERIALS MATCHING EXISTING ADJACENT CONSTRUCTION. FINISH EXPOSED INFILLED AREAS TO MATCH ADJACENT FINISHES. WHERE EXISTING MATERIAL CANNOT BE MATCHED, COORDINATE WITH DESIGN PROFESSIONAL.
3. ALL NEW PENETRATIONS CREATED AS PART OF THIS PROJECT ARE REQUIRED TO BE SEALED. ALL EXISTING PENETRATIONS UTILIZED FOR NEW WORK ARE REQUIRED TO BE SEALED, WHERE EXISTING PENETRATIONS ARE LARGER THAN NEEDED FOR NEW WORK, PENETRATION IS REQUIRED TO BE INFILLED AROUND THE NEW WORK TO ALLOW FOR TIGHT SEAL.
4. WORK INCLUDES PARTIAL (CUTOUT) DEMOLITION OF SELECT ELEMENTS TO ALLOW FOR THE INSTALLATION OF NEW UTILITIES AND EQUIPMENT. CONTACT DESIGN PROFESSIONAL IF DEMOLITION IMPACTS THE STABILITY OF WALLS, SUPPORTING ELEMENTS, ETC. REPAIR ALL DEMOLITION NECESSARY FOR INSTALLATION WITH MATERIALS AND FINISHES MATCHING ADJACENT CONSTRUCTION.
5. ALL CONNECTIONS TO INSTRUMENTATION, PIPING SYSTEMS, EQUIPMENT, AND ALL OTHER ITEMS SHOWN ARE BASED UPON THE ENGINEER'S RECOMMENDED MANUFACTURER AND MODEL. IF CONNECTION SIZES OR TYPES DIFFER FROM THAT SHOWN ON THE CONTRACT DRAWINGS, CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE APPROPRIATE CONNECTIONS. CONNECTIONS PROVIDED MUST MEET SPECIFICATIONS.
6. ALL SYSTEM SHUTDOWNS AND STARTUPS SHALL BE COORDINATED AND SUPERVISED BY OWNER'S REPRESENTATIVE.
7. COORDINATE ALL WORK WITH SITE/CIVIL PORTION OF THE PROJECT.
8. SITE DRAWINGS ARE DERIVED FROM UNIVERSITY PROVIDED SITE SURVEY AND CIVIL CONSULTANT SURVEY. CONTRACTOR TO FIELD VERIFY AND COORDINATE WITH EXACT LOCATIONS AND REPORT ANY DISCREPANCIES WITH THE OWNER'S REPRESENTATIVE.
9. ANY DAMAGE TO THE SITE (SIDEWALKS, CURBS, ETC) OR TO THE BUILDING AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT SHALL BE FIXED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL ASBESTOS-CONTAINING MATERIAL ASSOCIATED WITH THIS PROJECT. COORDINATE REMOVAL WITH OWNER'S REPRESENTATIVE.
11. THESE PLANS ARE DIAGRAMMATIC IN NATURE SINCE THEY REFLECT ONLY THE AVAILABLE INFORMATION OBTAINED FROM EXISTING PLANS, SPECIFICATIONS, AND FIELD SURVEYS. THE EXACT LOCATION OF EXISTING DUCTWORK, PIPING, AND EQUIPMENT MAY DEVIATE FROM THE LOCATION INDICATED ON THE DRAWINGS. THE CONTRACTOR SHALL BE PREPARED TO MAKE SOME ALTERATIONS TO NEW AND/OR EXISTING SERVICES TO FIT ACTUAL JOB CONDITIONS.
12. COORDINATE MATERIAL LAYDOWN AREA WITH OWNER'S REPRESENTATIVE AND CIVIL DRAWINGS.



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UNIVERSITY OF MISSOURI - COLUMBIA
 GENERAL SITE - REPLACE UTILITIES
 NEAR MEMORIAL UNION
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 MECHANICAL NOTES AND PHASING NOTES

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP230201
 CONSULTANT
 PROJECT NUMBER
24084
 SHEET
M000

ISA INSTRUMENT TAG IDENTIFICATION

	DEVICE	DCS	COMPUTER FUNCTION	PLC
FIELD MOUNTED				
CONTROL PANEL MOUNTED (FRONT)				
CONTROL PANEL MOUNTED (REAR)				
AUXILIARY PANEL MOUNTED (FRONT)				

ADDITIONAL ISA INSTRUMENT TAGS

	PURGE OR FLUSHING DEVICE		INSTRUMENTS SHARING COMMON HOUSING
	PANEL MOUNTED PATCHBOARD POINT 12		PILOT LIGHT
	REST FOR LATCH-TYPE ACTUATOR		PILOT LIGHT CONTROL PANEL MOUNTED
	UNDEFINED INTERLOCK LOGIC		PILOT LIGHT AUXILIARY PANEL MOUNTED

INSTRUMENT LOCATIONS

	PROCESS TAP LOCATION
	INSTRUMENT MOUNTING LOCATION
	INSTRUMENT MOUNTED AT PROCESS TAP LOCATION

INSTRUMENT TAG DESIGNATIONS

CONTROL LOOP	FUNCTION CODE	ZZ	I/O TYPE
XXX	YYYY	ZZ	
		AI	ANALOG INPUT
		AO	ANALOG OUTPUT
		DI	DISCRETE INPUT
		DO	DISCRETE OUTPUT
		V	VIRTUAL

INSTRUMENT INSTALLATION NOTES

- PROVIDE 1/2" TAPS FOR ALL PRESSURE INSTRUMENTS AND 3/4" TAPS FOR TEMPERATURE INSTRUMENTS, UNLESS OTHERWISE INDICATED.
- IMPULSE TUBING SHALL BE ROUTED EFFICIENTLY TO MINIMIZE LENGTH BETWEEN PROCESS CONNECTIONS AND DEVICE. LINES SHALL BE ROUTED PARALLEL TO BUILDING LINES WHEREVER POSSIBLE.
- PROVIDE LIQUID TRAP AND DRAIN AT ALL LOW POINTS AND VAPOR VENT AT HIGH POINTS OF IMPULSE TUBING RUNS.
- IMPULSE TUBING SHALL BE SLOPED AT MINIMUM 1" PER FOOT. SLOPE SHALL BE AWAY FROM PROCESS CONNECTIONS FOR LIQUID SERVICE AND TOWARD PROCESS CONNECTIONS FOR GAS SERVICE.
- IMPULSE TUBING SHALL BE SUPPORTED CONTINUOUSLY FROM BUILDING STRUCTURAL MEMBERS OR SUPPLEMENTAL STEEL. IMPULSE TUBING SHALL NOT BE SUPPORTED FROM EQUIPMENT OR OTHER PIPING.

VALVES AND PIPING ACCESSORIES

	WAFER CHECK VALVE		NEEDLE VALVE (N.O.)		THREE-WAY VALVE		SINGLE-ACTING PNEUMATIC CYLINDER, SPRING OPPOSED		SPRING OPPOSED PNEUMATIC OPERATED W/ POSITIONER
	CHECK VALVE		NEEDLE VALVE (N.C.)		FOUR-WAY VALVE		SINGLE-ACTING PNEUMATIC CYLINDER, SPRING OPPOSED W/ POSITIONER		BACKFLOW PREVENTER
	BALL CHECK VALVE		BALL VALVE (N.O.)		SELF CONTAINED PRESSURE REDUCING (REGULATING) VALVE		DOUBLE-ACTING PNEUMATIC CYLINDER		SAFETY VALVES
	STOP CHECK VALVE		BALL VALVE (N.C.)		SELF CONTAINED BACK PRESSURE REDUCING (REGULATING) VALVE		DOUBLE-ACTING PNEUMATIC CYLINDER WITH POSITIONER		PIPE PLUG
	GATE VALVE (N.O.)		PINCH VALVE		EXTERNAL TAP PRESSURE REDUCING (REGULATING) VALVE		PNEUMATIC OPERATED		PAIR FLANGES
	GATE VALVE (N.C.)		CONCENTRIC REDUCER		EXTERNAL TAP BACK PRESSURE REDUCING (REGULATING) VALVE		PNEUMATIC OPERATED W/ POSITIONER		BLIND FLANGE
	GLOBE VALVE (N.O.)		ECCENTRIC REDUCER		AUTOMATIC SHUT OFF VALVE		SINGLE-ACTING PNEUMATIC CYLINDER		ORIFICE
	GLOBE VALVE (N.C.)		UNION		SINGLE-ACTING PNEUMATIC CYLINDER WITH POSITIONER		SPRING OPPOSED PNEUMATIC OPERATED		EXPANSION ELEMENT
	BUTTERFLY VALVE		FLEXIBLE HOSE		Y TYPE STRAINER		CLEANOUT (C.O.)		WELD CAP
	PLUG VALVE		BLEEDER VALVE		DRAIN		REMOVABLE CAP		VENT
	V-BALL VALVE				12" (SYS. CODE)		PIPE SIZE AND SYSTEM CODE		

IN-LINE INSTRUMENTS

	FLUME		ORIFICE PLATE W/ METER		MAGNETIC FLOW METER
	WEIR		PITOT TUBE		THERMAL FLOWMETER
	VORTEX FLOW METER		VENTURI		PROPELLER METER
	POSITIVE DISPLACEMENT FLOW METER		TARGET		ULTRASONIC METER
	V-CONE FLOW METER		FLOW NOZZLE		VARIABLE AREA FLOW INSTRUMENT (ROTAMETER)

SECTION, VIEW, OR DETAIL CALLOUTS

	SECTION MARKER IDENTIFYING PLANE OF CUT
	TYPICAL VIEW DIRECTION
	DETAIL CALLOUT

PUMPS

	CENTRIFUGAL PUMP W/ ELECTRIC MOTOR (TYP)		REGENERATIVE BLOWER
	VACUUM PUMP		GEAR PUMP
	BLOW-THRU ROTARY VALVE		ROTARY VALVE
	AIR OPERATED DOUBLE DIAPHRGM PUMP		DEHUMIDIFIER

SECTION OR DETAIL IDENTIFIERS

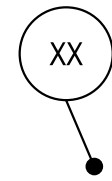
	SECTION TOP IDENTIFIER
	SECTION BOTTOM IDENTIFIER
	DETAIL TOP IDENTIFIER
	DETAIL BOTTOM IDENTIFIER

TOP IDENTIFIER: SECTION OR DETAIL CALLOUT WITH SHEET NUMBER IT IS LOCATED ON
BOTTOM IDENTIFIER: SHEET NUMBERS WHERE DETAIL OR SECTION IS INDICATED

GENERAL SYMBOLS

	NORTH ARROW		CENTER LINE
	REVISION INDICATOR: # - REVISION NUMBER X - PART OF ADDENDUM TO CONTRACT FOR INSTANCES WHEN ONLY A PORTION OF DRAWING IS MODIFIED BY ADDENDUM. THE AFFECTED AREA IS "CLOUDED."		HIDDEN LINE
	COLUMN IDENTIFICATION: # - COLUMN IDENTIFIER		SURFACE BREAK LINE
	STREAM IDENTIFIER		MATCH LINE
	ELEVATION DESIGNATION EL 100'-0"		GRATING COVER (PLAN)
	EXISTING OBJECT LINE		CHECKERED PLATE COVER (PLAN)
	OUTLINE OF NEW OR RELOCATED OBJECT		GUARDRAIL/HANDRAIL
	OUTLINE OF FUTURE OBJECT		CENTERLINE
	TIE POINT DESIGNATOR		DIAMETER OR ROUND SQUARE
	KEY NOTE IDENTIFIER		TP
			EXISTING NEW

LEGEND



PIPE SUPPORT DESIGNATOR
XX: PIPE SUPPORT TYPE
FOR PIPE SUPPORT DETAILS,
SEE SHEET M150

MSS SPACING TABLES

STD WT STEEL PIPING:

MSS RECOMMENDED MAXIMUM SUPPORT SPANS		
PIPE SIZE	WATER SERVICE	VAPOR SERVICE
½"	7'	8'
¾"	7'	9'
1"	7'	9'
1 ½"	9'	12'
2"	10'	13'
2 ½"	11'	14'
3"	12'	15'
4"	14'	17'
6"	17'	21'
8"	19'	24'
10"	22'	26'
12"	23'	30'
14"	25'	32'
16"	27'	35'
18"	28'	
20"	30'	
24"	32'	
30"	33'	

COPPER PIPING:

MSS RECOMMENDED MAXIMUM SUPPORT SPANS		
PIPE SIZE	WATER SERVICE	VAPOR SERVICE
½"	5 (FT.)	5 (FT.)
¾"	5	5
1"	6	6
1 ½"	8	8
2"	8	8
2 ½"	9	9
3"	10	10
4"	12	12

GENERAL NOTES

- ALL WORK SHOWN ON THE PIPE SUPPORT SHEETS SHALL BE PROVIDED BY THIS CONTRACT UNLESS OTHERWISE INDICATED.
- THE LEGEND IS GENERAL IN NATURE AND MAY INCLUDE INFORMATION NOT RELEVANT TO THIS PROJECT. REFER TO THE PLANS FOR SPECIFIC SYMBOLS AND ABBREVIATIONS.
- THE ADJACENT FACILITY WILL REMAIN IN OPERATION THROUGHOUT CONSTRUCTION. PERFORM CONSTRUCTION ACTIVITIES TO NOT INTERFERE WITH NORMAL OPERATIONS AND MAINTENANCE ACTIVITIES CONDUCTED BY OWNER.

INSTALLATION NOTES

- PREPARATION
 - DO NOT DRILL OR CUT STRUCTURAL MEMBERS.
- INSTALLATION – INSERTS
 - INSTALL INSERTS FOR PLACEMENT IN CONCRETE FORMS.
 - INSTALL INSERTS FOR SUSPENDING HANGERS FROM REINFORCED CONCRETE SLABS AND SIDES OF REINFORCED CONCRETE BEAMS.
 - PROVIDE HOOKED ROD TO CONCRETE REINFORCEMENT SECTION FOR INSERTS CARRYING PIPE 4" AND LARGER.
 - WHERE CONCRETE SLABS FORM FINISHED CEILING, LOCATE INSERTS FLUSH WITH SLAB SURFACE.
 - WHERE INSERTS ARE OMITTED OR CONCRETE IS EXISTING, DRILL INTO CONCRETE SLAB AND USE EXPANSION ANCHOR BOLTS WITH CONCRETE SINGLE LUG PLATE, CONCRETE CLEVIS PLATE, OR CONCRETE ROD ATTACHMENT, WHICHEVER IS MORE APPROPRIATE FOR THE APPLICATION.
- INSTALLATION – PIPE HANGERS AND SUPPORTS
 - INSTALL IN ACCORDANCE WITH ASME B31.1, ASME B31.9, MSS SP 58, MSS SP 69, MSS SP 89, AND THE INTERNATIONAL PLUMBING CODE.
 - INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
 - SUPPORT HORIZONTAL PIPING AS SCHEDULED.
 - COORDINATE SUPPORT LOCATIONS WITH BUILDING STRUCTURE PRIOR TO ERECTION OF PIPING. ALSO, REFER TO APPROVED SHOP DRAWINGS OF EQUIPMENT AND APPROVED PIPING LAYOUT AND HANGER LAYOUT DRAWINGS WHEN LOCATING HANGERS. ARRANGEMENT OF SUPPORTS SHALL FACILITATE OPERATING, SERVICING, AND REMOVAL OF VALVES, STRAINERS, AND PIPING SPECIALTIES. HANGER PARTS MUST BE MARKED AT THE FACTORY WITH A NUMBERING SYSTEM KEYED TO HANGER LAYOUT DRAWINGS. LAYOUT DRAWINGS MUST BE AVAILABLE AT THE SITE.
 - THE CONTRACTOR SHALL PROVIDE ALL SUPPLEMENTAL STEEL REQUIRED TO INSTALL PIPE SUPPORTS AS SHOWN OR AS REQUIRED IN THE CONTRACT DOCUMENTS. ALL STRUCTURAL ATTACHMENTS SHALL BE WELDED UNLESS OTHERWISE SPECIFIED OR DETAILED. THE CONTRACTOR SHALL INSTALL SPRING HANGER CANS FURNISHED BY THE OWNER AND SPRING SUPPORT FURNISHED BY THE OWNER.
 - INSTALL HANGERS WITH MINIMUM 4" SPACE BETWEEN FINISHED COVERING AND ADJACENT WORK.
 - PLACE HANGERS WITHIN 12" OF EACH HORIZONTAL ELBOW.
 - USE HANGERS WITH 2" MINIMUM VERTICAL ADJUSTMENT.
 - SUPPORT HORIZONTAL CAST IRON PIPE ADJACENT TO EACH HUB, WITH FIVE (5) FEET MAXIMUM SPACING BETWEEN HANGERS.
 - SUPPORT VERTICAL PIPING AT EVERY OTHER FLOOR. SUPPORT VERTICAL CAST IRON PIPE AT EACH FLOOR AT HUB.
 - WHERE PIPING IS INSTALLED IN PARALLEL AND AT SAME ELEVATION, PROVIDE MULTIPLE PIPE OR TRAPEZE HANGERS.
 - SUPPORT RISER PIPING INDEPENDENTLY OF CONNECTED HORIZONTAL PIPING.
 - DESIGN HANGERS FOR PIPE MOVEMENT WITHOUT DISENGAGEMENT OF SUPPORTED PIPE.
 - PROVIDE CLEARANCE IN HANGERS AND FROM STRUCTURE AND OTHER EQUIPMENT FOR INSTALLATION OF INSULATION.
- INSTALLATION – FLASHING
 - PROVIDE FLEXIBLE FLASHING AND METAL COUNTERFLASHING WHERE PIPING PENETRATES WEATHER OR WATER-PROOFED WALLS, FLOORS, AND ROOFS.
 - FLASH VENT AND SOIL PIPES PROJECTING 3" MINIMUM ABOVE FINISHED ROOF SURFACE WITH SEALANT WORKED 1" MINIMUM INTO HUB, 8" MINIMUM CLEAR ON SIDES WITH 24" X 24" SHEET SIZE. FOR PIPES THROUGH OUTSIDE WALLS, TURN FLANGES BACK INTO WALL AND CAULK, METAL COUNTER-FLASH, AND SEAL.
 - SEAL FLOOR DRAINS WATERTIGHT TO ADJACENT MATERIALS.
 - ADJUST STORM COLLARS TIGHT TO PIPE WITH BOLTS AND CAULK AROUND TOP EDGE. USE STORM COLLARS ABOVE ROOF JACKS. SCREW VERTICAL FLANGE SECTION TO FACE OF CURB.
- INSTALLATION – EQUIPMENT BASES AND SUPPORTS
 - USE TEMPLATES FURNISHED WITH EQUIPMENT. (IF NOT FURNISHED, MAKE A TEMPLATE.) INSTALL ANCHOR BOLTS AND ACCESSORIES FOR MOUNTING AND ANCHORING EQUIPMENT PER MSS-SP 89.
 - SET SLEEVES IN POSITION IN FORMS. PROVIDE REINFORCING AROUND SLEEVES.
 - SIZE SLEEVES LARGE ENOUGH TO ALLOW FOR MOVEMENT DUE TO EXPANSION AND CONTRACTION. PROVIDE FOR CONTINUOUS INSULATION WRAPPING.
 - INSTALL CHROME-PLATED STEEL ESCUTCHEONS AT FINISHED SURFACES.
- PIPE SUPPORTS FOR INSULATED COLD PIPING SYSTEMS SHALL BE SIZED FOR THE OUTSIDE DIAMETER OF THE INSULATED PIPE, AND AN INSULATION PROTECTION SHIELD SHALL BE INSTALLED BETWEEN THE SUPPORT AND THE INSULATION. RIGID INSULATION INSERTS SHALL BE INSTALLED BETWEEN THE PIPE AND THE INSULATION SHIELDS FOR PIPING LARGER THAN 2" OR WHEN NEEDED TO PREVENT CRUSHING OF THE INSULATION. INSERTS SHALL BE OF THE SAME THICKNESS AS THE ADJACENT INSULATION AND SHALL BE VAPOR SEALED.
- INSULATED HOT PIPING SYSTEMS SHALL BE SUPPORTED BY CLEVISES, CLAMPS, SUPPORT SADDLES, OR ROLLERS. PIPE CLAMPS SHALL BE ATTACHED DIRECTLY TO THE PIPE (UNLESS DETAILED OTHERWISE). SUPPORT SADDLES AND ROLLERS SHALL BE SIZED FOR THE OUTSIDE DIAMETER OF THE INSULATED PIPE, AND AN INSULATION PROTECTION SADDLE SHALL BE INSTALLED AT THE SUPPORT. THE INSULATION PROTECTION SADDLE SHALL BE SIZED IN ACCORDANCE WITH MSS STANDARDS. IF PIPE SIZE IS LARGER THAN SCHEDULED IN MSS SP TABLE, USE 10 GAUGE.
- NO PIPING SHALL BE SUPPORTED FROM THE PIPE ABOVE OR ANY OTHER PIPE.
- UNLESS OTHERWISE INDICATED ON THE DRAWINGS OR ACCEPTABLE TO OWNER'S REPRESENTATIVE, PIPING SHALL BE SUPPORTED APPROXIMATELY 1 ½" OUT FROM THE FACE OF WALLS AND AT LEAST 3" BELOW CEILINGS.



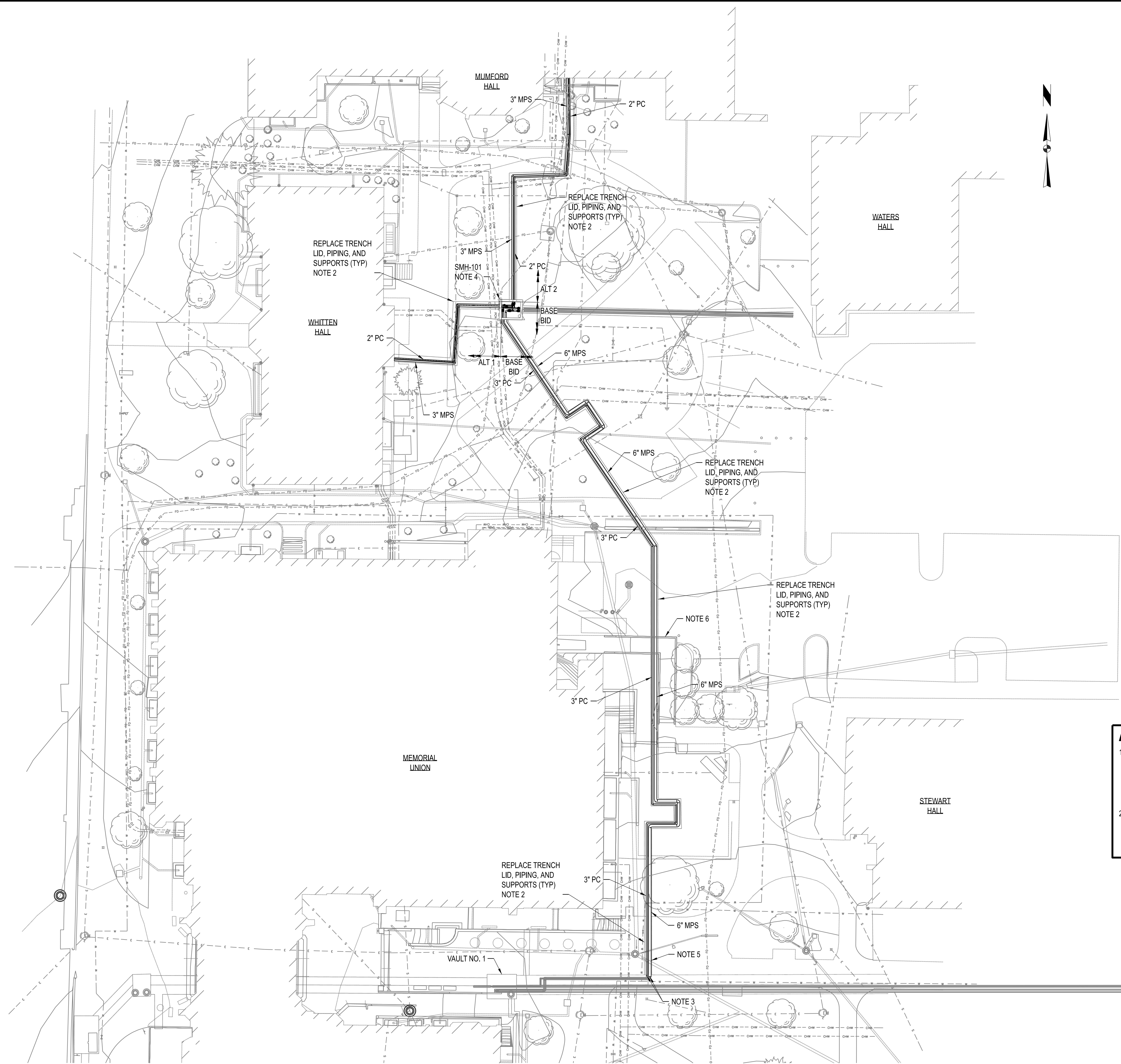
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AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
GENERAL SITE - REPLACE UTILITIES
NEAR MEMORIAL UNION
COLUMBIA, BOONE COUNTY, MISSOURI 65203
MECHANICAL SUPPORTS - SYMBOLS, NOTES, AND LEGEND

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP230201
CONSULTANT
PROJECT NUMBER
24084
SHEET
M002

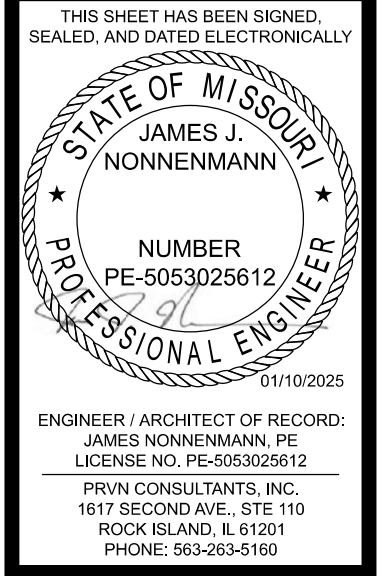


- NOTES:**
1. CONTRACTOR SHALL NOTIFY ENGINEER WHEN SECTIONS OF STEAM CHASE ARE CLEARED OF PIPING AND READY FOR INSPECTION. ENGINEER WILL DETERMINE EXTENT OF CHASE REPAIRS REQUIRED. CONTRACTOR SHALL MAKE REPAIRS PER DETAILS ON S110. CONTRACTOR SHALL INCLUDE UNIT PRICING FOR CRACK AND SPALL REPAIRS SHOWN ON S110 AS INSTRUCTED IN THE PROJECT MANUAL.
 2. INSTALL NEW PIPING, ANCHORS, AND SUPPORTS IN CHASE. REFER TO THERMAL EXPANSION PLANS FOR SUPPORT TYPE AND SPACING, AND MECHANICAL DETAILS FOR SUPPORT CONSTRUCTION. SEE STRUCTURAL DRAWINGS FOR CHASE REPAIR AND NEW LID CONSTRUCTION DETAILS.
 3. CONNECT NEW 6" MPS AND 3" PC TO EXISTING ELBOWS IN TUNNEL.
 4. EXISTING SMH-101 TO REMAIN AND BE REFURBISHED. SEE M110 FOR MECHANICAL WORK. SEE STRUCTURAL DRAWINGS FOR STRUCTURAL MODIFICATIONS AND WATERPROOFING REQUIREMENTS.
 5. REFURBISH SECTION OF STEAM CHASE ADJACENT TO UTILITY TUNNEL AND REPLACE MPS AND PC SERVICES DURING PHASE 1 TO ALLOW FOR SIDEWALK REOPENING.
 6. REFER TO SHEET M130 FOR ICE MELT SYSTEM TO BE INSTALLED IN NEW RAMP.

ASBESTOS NOTES - CAUTION!!!

1. STEAM CHASE WATERPROOFING MAY CONTAIN ASBESTOS. ONCE EXCAVATED TO BE EXPOSED, THE WATERPROOFING SHALL BE TESTED FOR ACM. ASBESTOS ABATEMENT MAY BE REQUIRED TO REMOVE STEAM CHASE LID SHALL BE PROVIDED BY CONTRACTOR.
2. MPS/PC PIPING INSULATION WITHIN CHASE MAY CONTAIN ASBESTOS. ONCE EXPOSED, THE WATERPROOFING AND PIPE INSULATION SHALL BE TESTED FOR ACM. ASBESTOS ABATEMENT SHALL BE PROVIDED BY CONTRACTOR.

OVERALL MECHANICAL SITE PLAN
SCALE: 1"=20'-0"



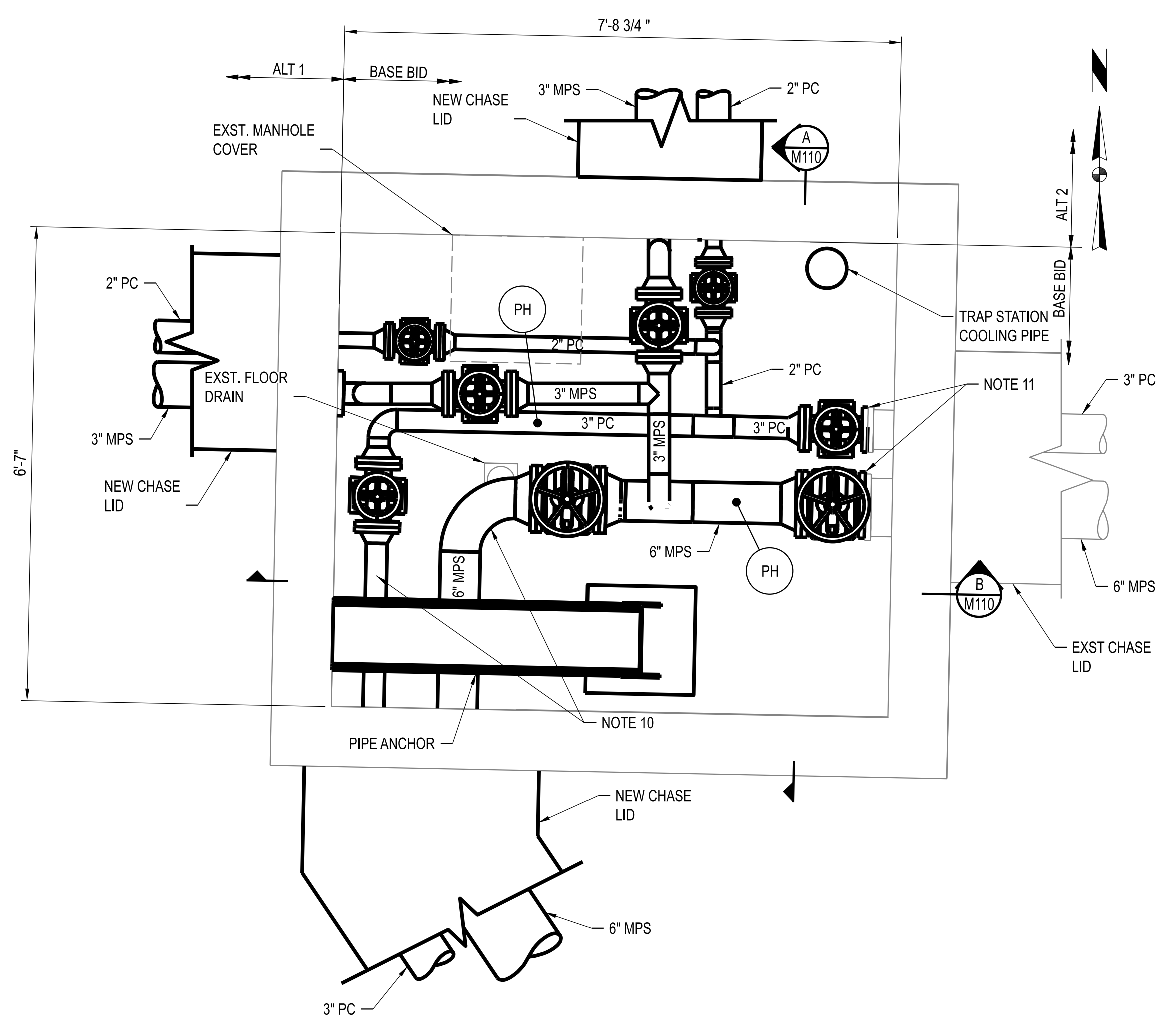
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.
 ENGINEER / ARCHITECT OF RECORD:
 JAMES NONNENMANN, PE
 LICENSE NO. PE-5053025612
 PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE: 563-263-5160

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 MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

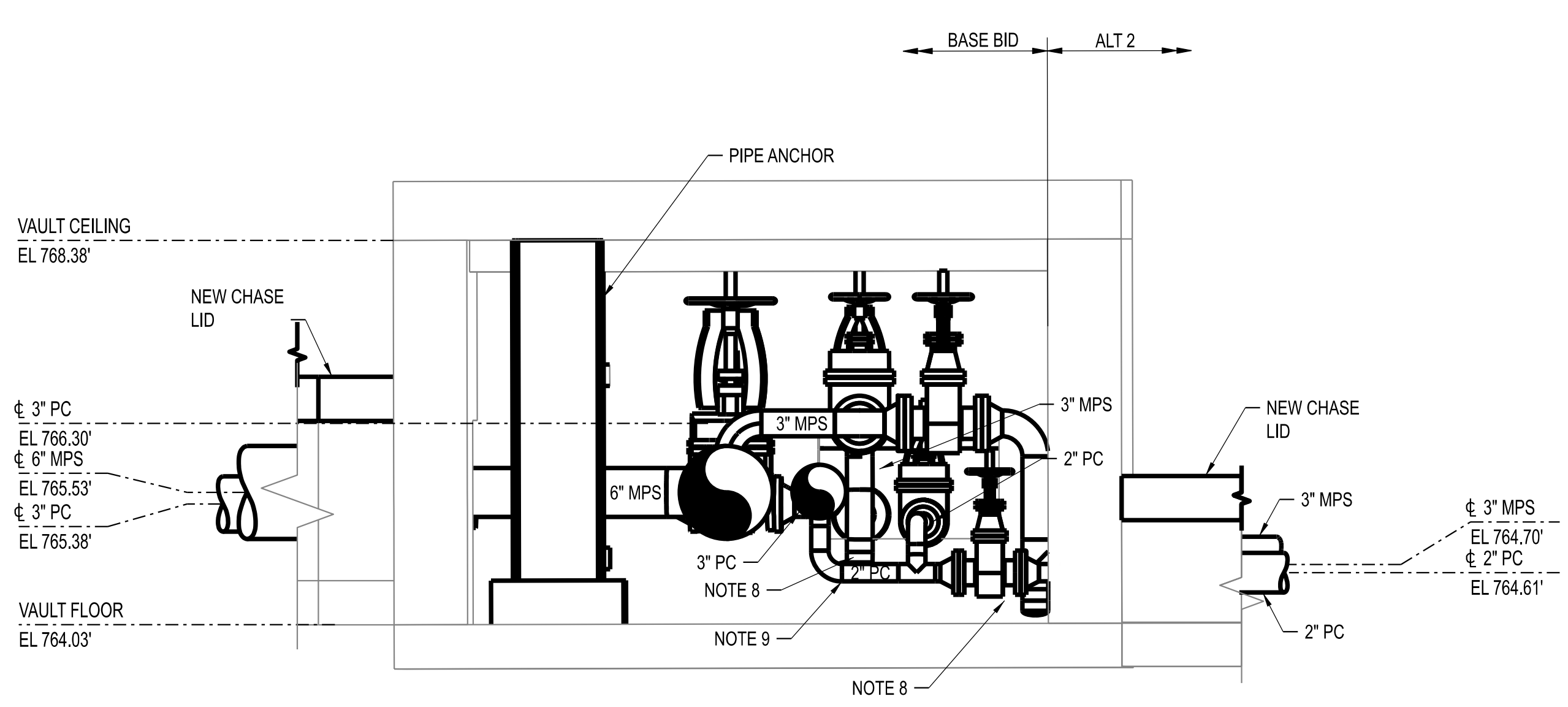
UNIVERSITY OF MISSOURI - COLUMBIA
 GENERAL SITE - REPLACE UTILITIES
 NEAR MEMORIAL UNION
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 OVERALL MECHANICAL SITE PLAN

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP230201
 CONSULTANT
 PROJECT NUMBER
24084
 SHEET
M100

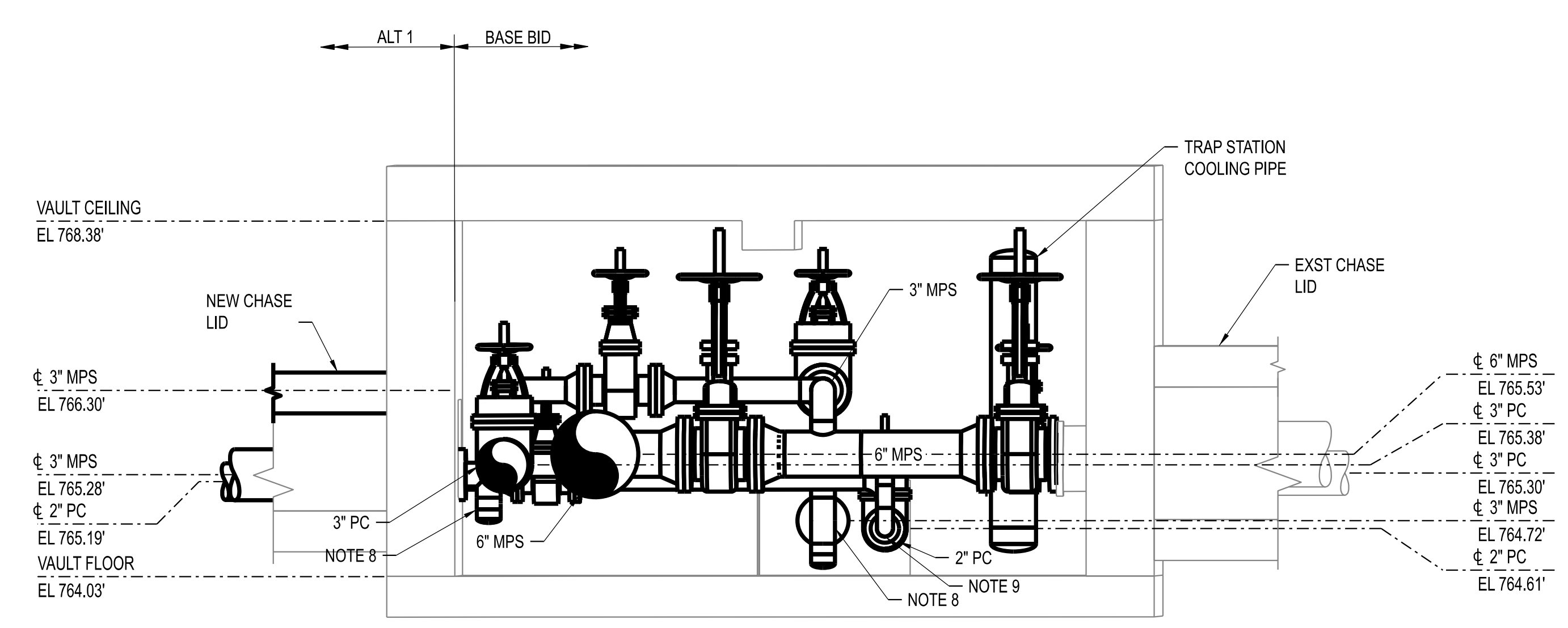
0 01/10/25 ISSUED FOR BID
 DRAWN BY: M.A.C.
 CHECKED BY: J.J.N.



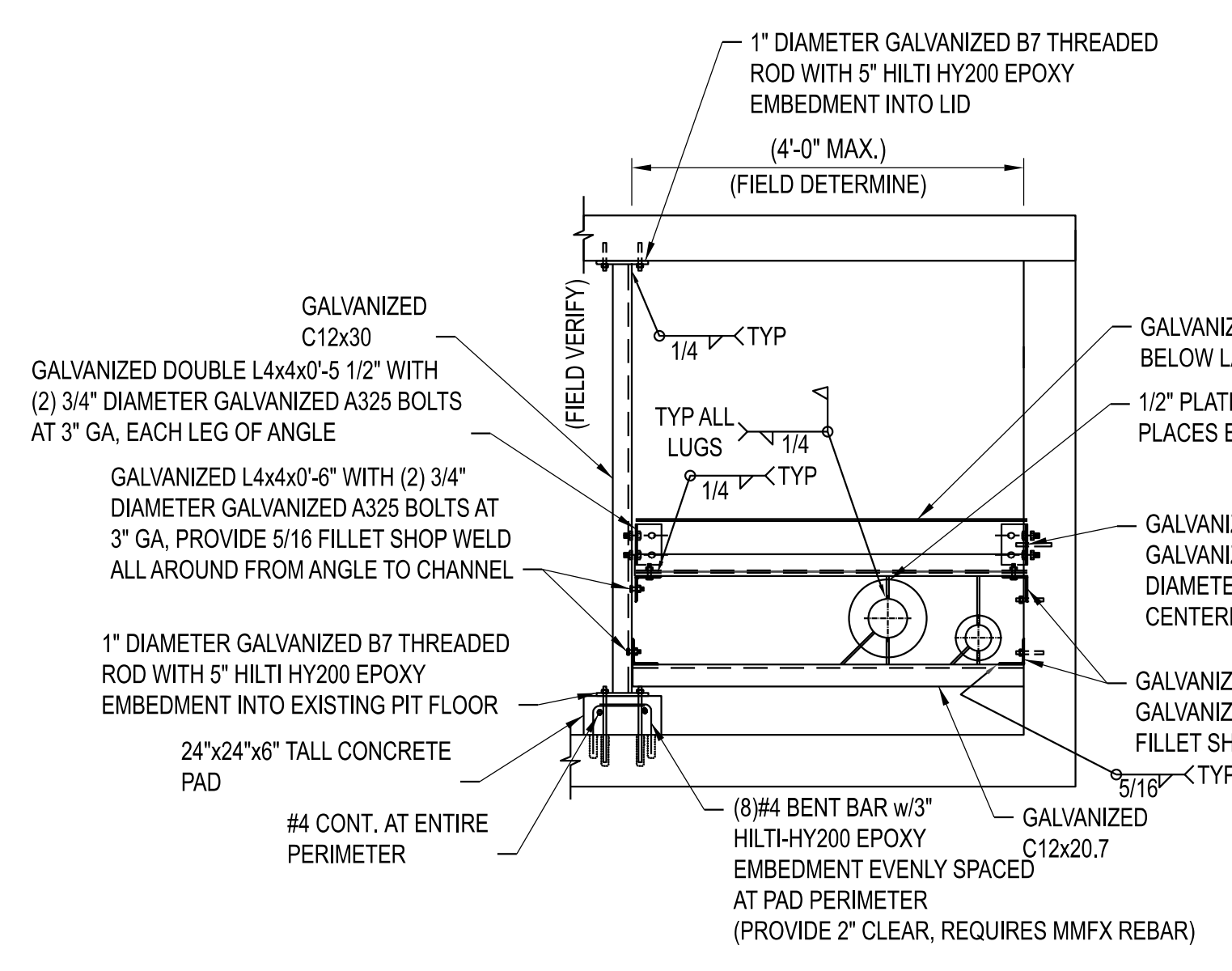
SMH-101 MECHANICAL PLAN
SCALE: 3/4" = 1'-0"



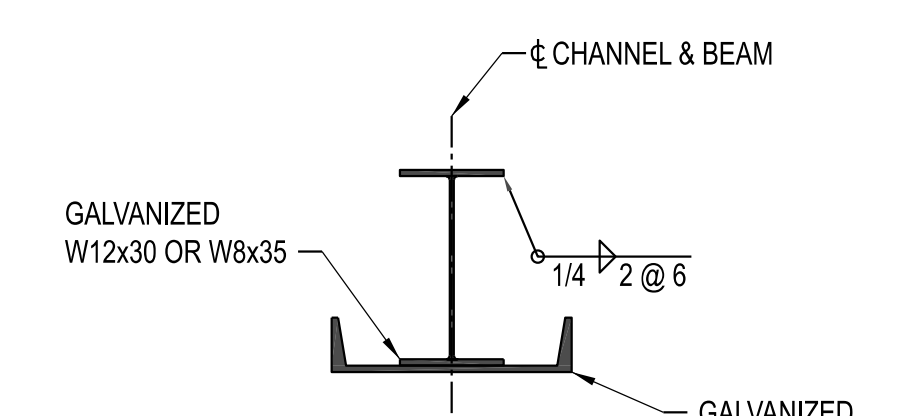
SECTION A-M110 (LOOKING WEST)
SCALE: 3/4" = 1'-0"



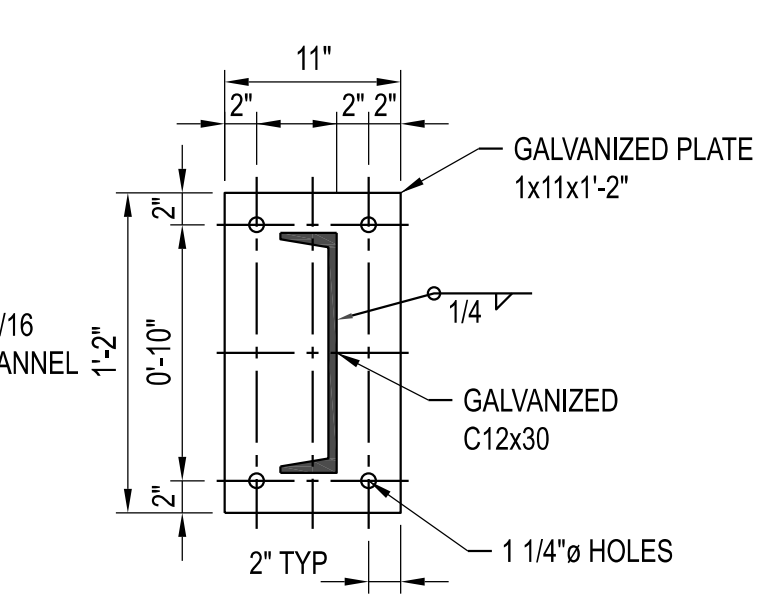
SECTION B-M110 (LOOKING NORTH)
SCALE: 3/4" = 1'-0"



PARTIAL DETAIL



CHANNEL TO BEAM CONNECTION



CAP/BASE PLATE

SMH-101 PIPE ANCHOR - NEW WORK
SCALE: NONE

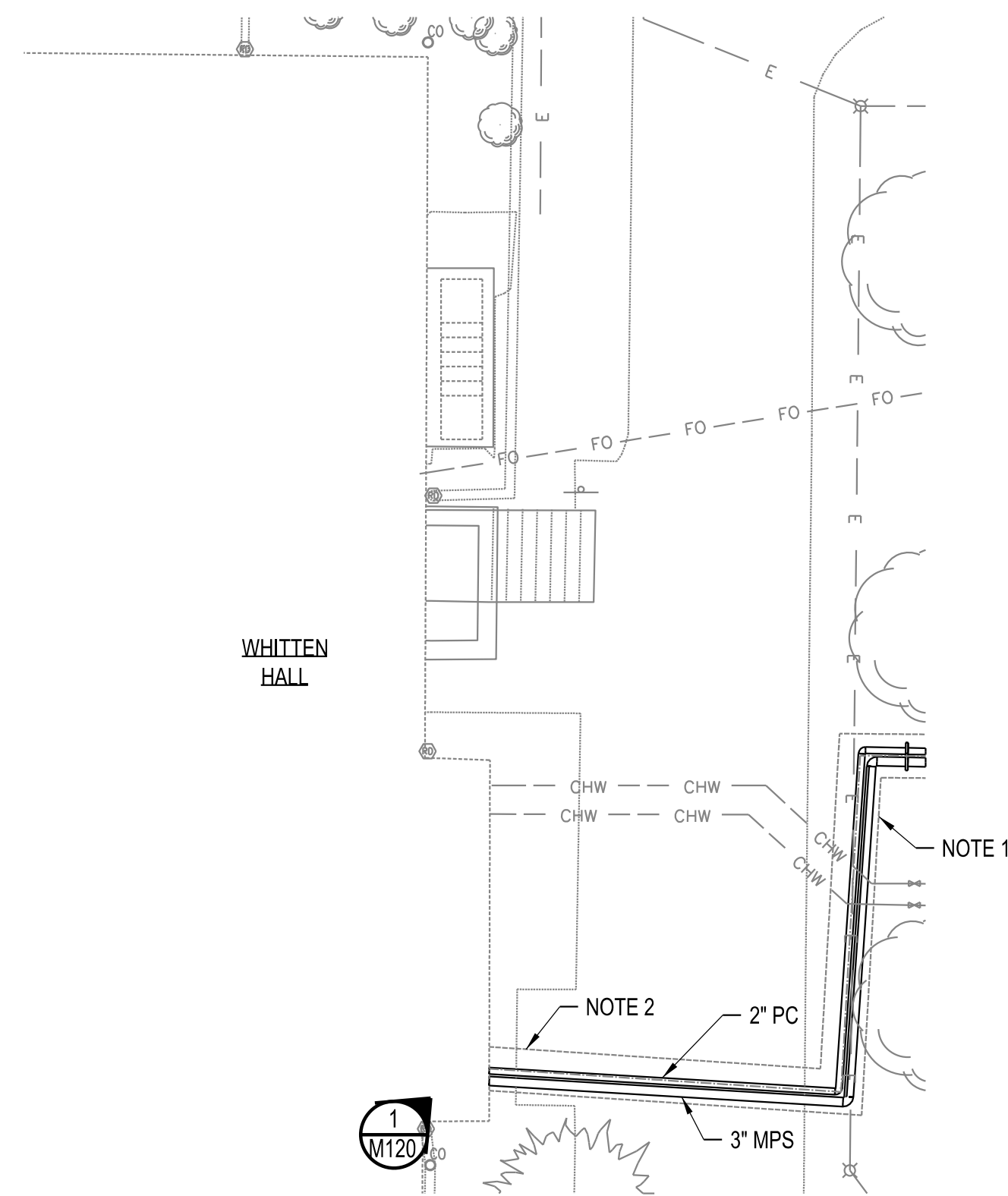
- NOTES:**
1. PROVIDE ALL NECESSARY PIPE AND TUBING FITTINGS, INCLUDING REDUCERS, TO PROPERLY MATCH ACTUAL CONNECTION TYPES AND SIZES ON EQUIPMENT, VALVES, INSTRUMENTS, SPECIALTIES, AND OTHER PIPING. VERIFY PRIOR TO FABRICATION.
 2. RELOCATE EXST SMALL BORE CONDUIT AND PIPING AS REQUIRED FOR NEW CONSTRUCTION, AT NO ADDITIONAL COST TO OWNER.
 3. PROTECT ALL EQUIPMENT, PIPING, VALVES, TUBING, AND ACCESSORIES TO REMAIN FROM DAMAGE DURING DEMOLITION AND CONSTRUCTION ACTIVITIES. PIPING INSULATION (WHERE IT EXISTS) MAY BE REMOVED AS REQUIRED FOR NEW TIE POINT CONNECTIONS, BUT SHALL BE REPLACED IN KIND WHEN WORK IS COMPLETED.
 4. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO DEMOLITION AND CONSTRUCTION ACTIVITIES.
 5. COORDINATE CONNECTIONS TO EXISTING SERVICES WITH OWNER'S REPRESENTATIVE.
 6. CONTRACTOR SHALL PROTECT EXISTING UTILITIES IN SMH-101, SURROUNDING PIPE CHASES, AND OTHER EXISTING UNDERGROUND UTILITIES DURING CONSTRUCTION.
 7. CONTRACTOR RESPONSIBLE FOR PROTECTING EXISTING STEAM SYSTEM AND CHASES FROM WATER INFILTRATION THROUGHOUT THE DURATION OF CONSTRUCTION.
 8. INSTALL NEW STEAM TRAP STATION PER DETAIL ON M150. COORDINATE WITH MU UTILITIES ON TRAP INSTALLATION LOCATION.
 9. INSTALL LOW POINT DRAIN ON COMBINED CONDENSATE SERVICE.
 10. CONTRACTOR SHALL NOT CONNECT SERVICES UNTIL HYDROSTATIC TESTING OF NEW PIPING IN CHASE BETWEEN SMH-101 AND TUNNEL HAS BEEN COMPLETED.
 11. EXISTING FLANGES MAY BE REUSED WITH NEW VALVES. CONTRACTOR SHALL INSPECT THE CONDITION OF THE EXISTING FLANGES PRIOR TO INSTALLING NEW VALVES, AND ALERT MU CONSTRUCTION MANAGER IF DAMAGE IS NOTICED.

0	01/10/25	ISSUED FOR BID	CHECKED BY: J.J.N.
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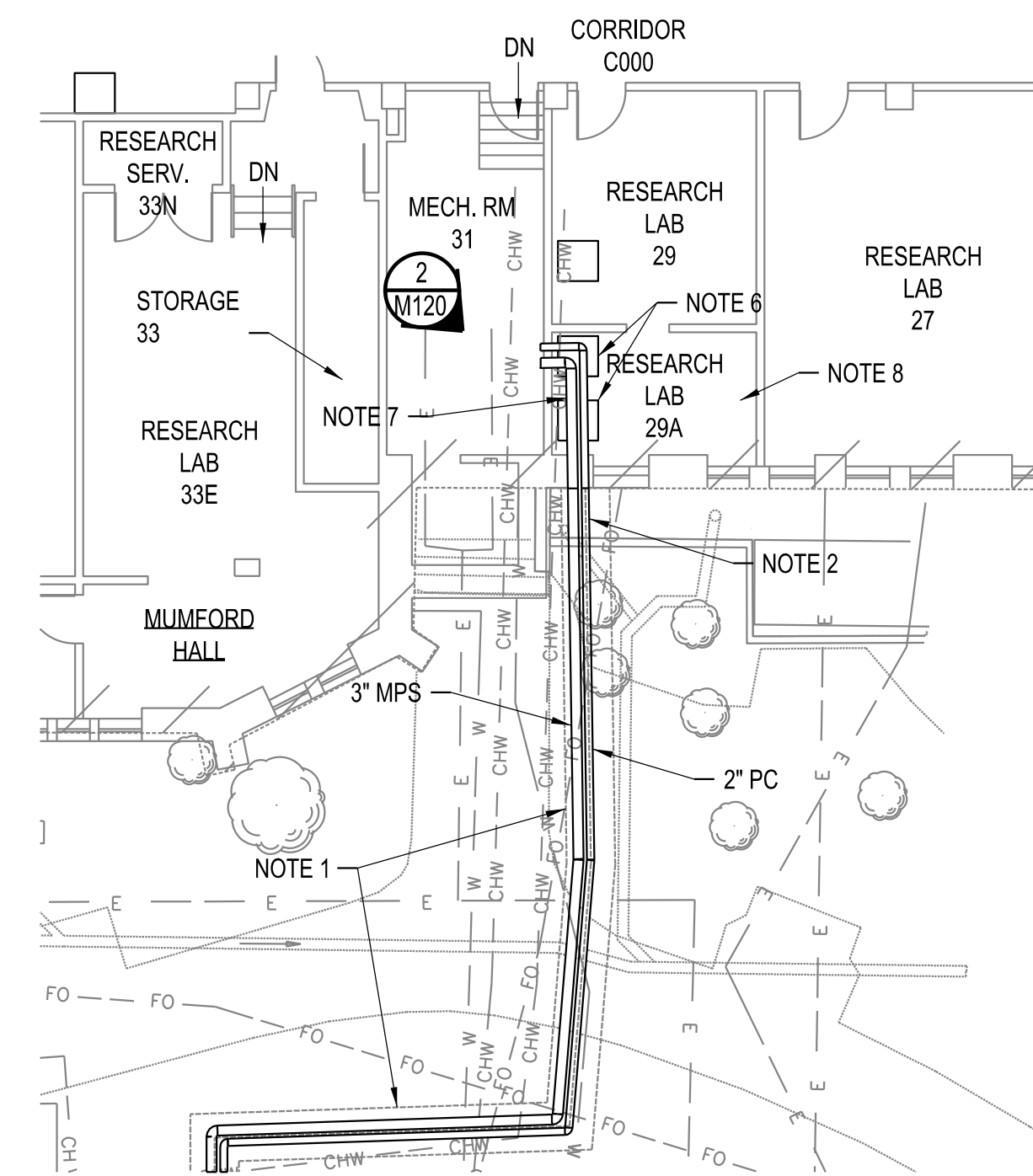
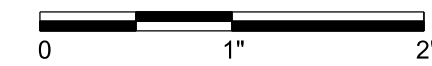
UNIVERSITY OF MISSOURI - COLUMBIA
GENERAL SITE - REPLACE UTILITIES
NEAR MEMORIAL UNION
COLUMBIA, BOONE COUNTY, MISSOURI 65203
SMH-101 PLAN AND SECTIONS

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP230201
CONSULTANT
PROJECT NUMBER
24084
SHEET
M110



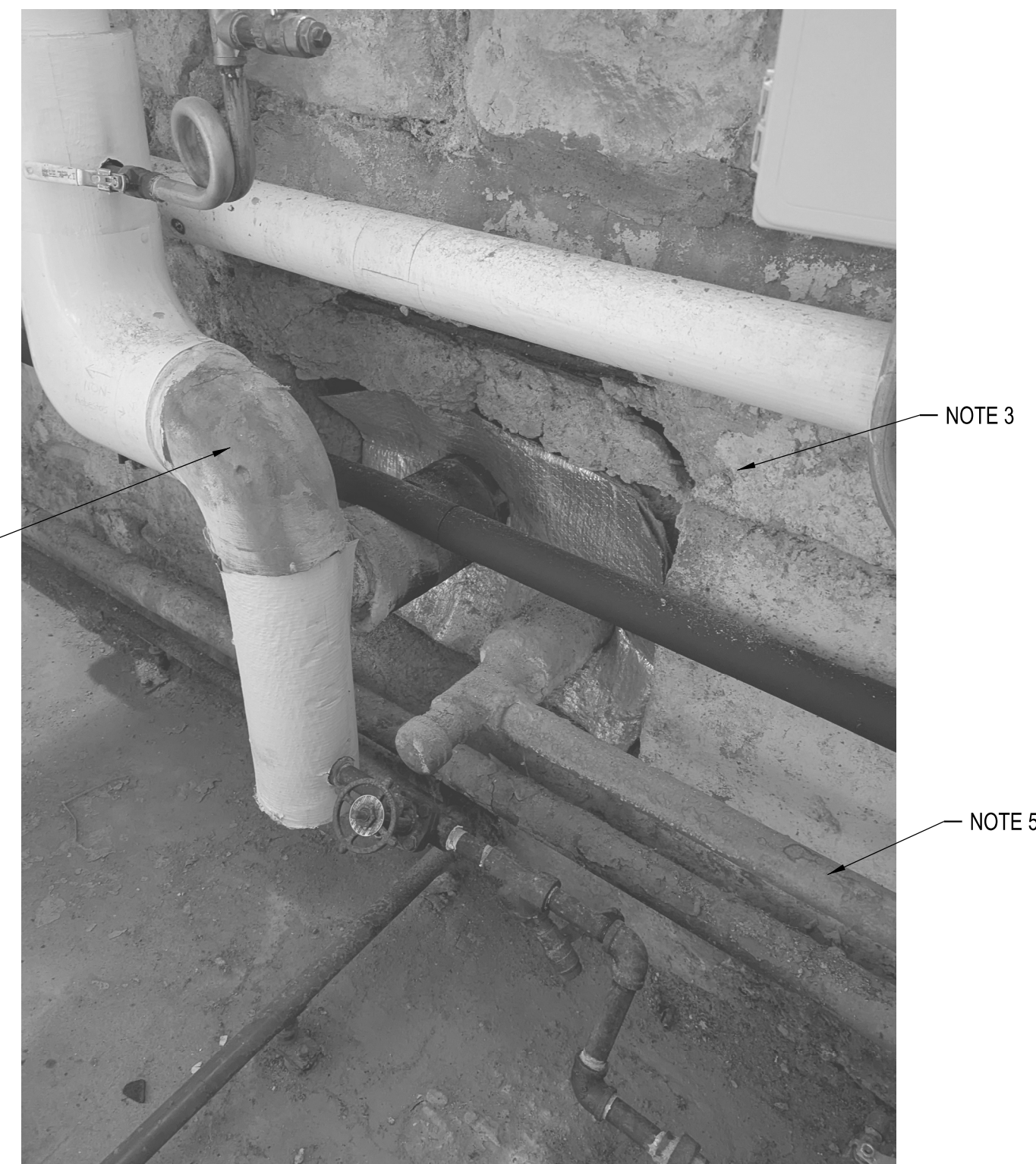
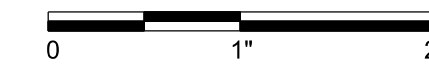
WHITTEN HALL MECHANICAL PLAN (ALT 1)

SCALE: 1"=10'-0"

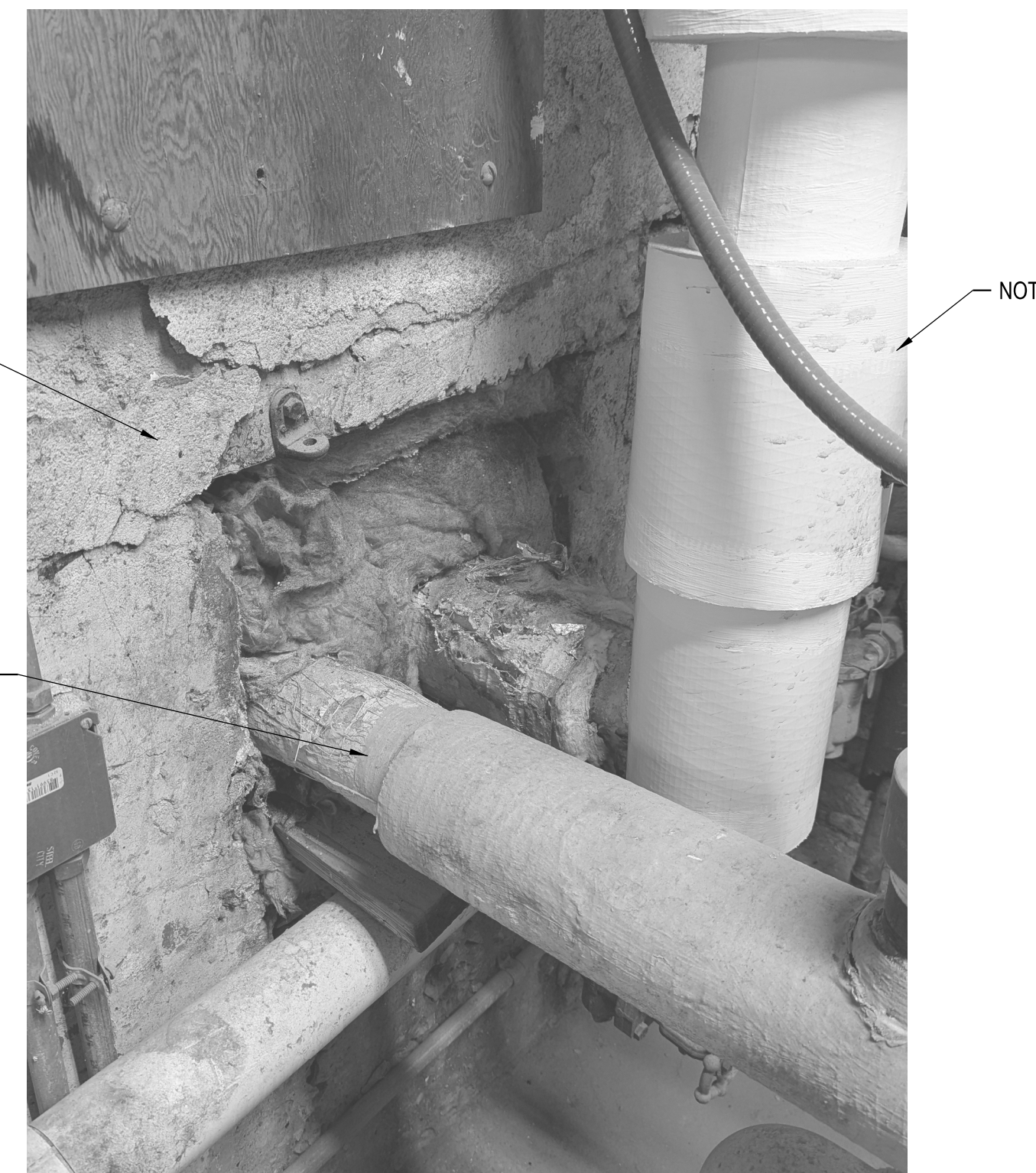


MUMFORD HALL MECHANICAL PLAN (ALT 2)

SCALE: 1"=10'-0"



1 WHITTEN HALL UTILITY ENTRANCE (ALT 1)
M120



2 MUMFORD HALL UTILITY ENTRANCE (ALT 2)
M120

NOTES:

- CONTRACTOR SHALL NOTIFY ENGINEER WHEN SECTIONS OF STEAM CHASE ARE CLEARED OF PIPING AND READY FOR INSPECTION. ENGINEER WILL DETERMINE EXTENT OF CHASE REPAIRS REQUIRED. CONTRACTOR SHALL MAKE REPAIRS PER DETAILS ON S110. CONTRACTOR SHALL INCLUDE UNIT PRICING FOR CRACK AND SPALL REPAIRS SHOWN ON S110 AS INSTRUCTED IN THE PROJECT MANUAL.
- PROVIDE AND INSTALL NEW CHASE VENT. SEE DETAIL ON DRAWING M150. ROUTE VENT PIPING SUCH THAT VENT OUTLET IS IN LANDSCAPED AREA.
- PROVIDE NEW 3/8 INCH THICK GALVANIZED STEEL PLATE TO COVER THE CHASE OPENING INTO THE MECHANICAL ROOM. PLATE SHALL BE SPLIT HORIZONTALLY AND FORM AROUND THE PIPING INSULATION. OVERLAP THE FOUNDATION WALLS 4" ON EACH SIDE. SECURE THE PLATE TO THE FOUNDATION WALL WITH 3/8" WEDGE ANCHORS WITH 4" EMBEDMENT, SPACED AT 8 INCH CENTERS. DRY PACK 4000 PSI NON-SHRINK GROUT AROUND PERIMETER BETWEEN PLATE AND FOUNDATION. SEAL HORIZONTAL SEAM AND AROUND PIPING WITH SIKAFLEX SEALANT.
- STEAM WILL NOW ENTER THE BUILDING ON THE SOUTH SIDE WITH THE NEW PIPING ARRANGEMENT IN THE REFURBISHED CHASE. INSTALL NEW DRIP LEG AND RECONNECT TO EXISTING TRAP STATION. INSTALL NEW 3" GATE VALVE IN HORIZONTAL RUN AND RECONNECT TO EXISTING RISER.
- PROVIDE NEW 2" PC PIPING TO DISCHARGE OF EXISTING CONDENSATE RECEIVER.
- CONTRACTOR SHALL RELOCATE TWO SOIL DRYING CABINETS FROM SOIL RESEARCH LAB 29A. ONE WILL BE STORED IN A LOCATION IN MUMFORD HALL AS DIRECTED BY THE MU CONSTRUCTION MANAGER. ONE DRYING CABINET IS TO BE INSTALLED IN RESEARCH LAB 29 AND RECONNECTED FOR USE FOR THE DURATION OF THE PROJECT. CONTRACTOR SHALL EXTEND DUCTWORK TO TEMPORARY LOCATION AND PROVIDE ELECTRICAL WORK AS NOTED ON E101. AFTER COMPLETION OF CHASE WORK, BOTH DRYERS ARE TO BE RELOCATED TO THEIR ORIGINAL POSITIONS AND RECONNECTED. THE SOIL RESEARCH LAB SHALL ONLY BE OUT OF SERVICE FOR A MAXIMUM OF 4 DAYS, WHICH SHALL INCLUDE A SATURDAY AND SUNDAY. COORDINATE OUTAGE WITH MU CONSTRUCTION MANAGER.
- STEAM CHASE RUNS UNDER THE FLOOR UNDERNEATH THE SOIL DRYING CABINETS. ONCE CABINETS ARE RELOCATED, REMOVE FLOOR TO ACCESS CHASE AND COMPLETE MECHANICAL WORK. FLOOR PATCH SHALL MATCH EXISTING FLOOR SLAB THICKNESS AND UTILIZE #4 REBAR 18" LONG EPOXIED INTO THE PERIMETER OF THE OPENING AT 12" CENTERS. EMBEDMENT SHALL BE 8".
- ACCESS TO THE SOIL GRINDER MUST BE MAINTAINED FOR THE DURATION OF THE PROJECT. ERECT A TEMPORARY BARRIER TO SEPARATE WORK FROM THE GRINDER STATION.
- INSTALL NEW DRIP LEG AND RECONNECT TO EXISTING STEAM TRAP. MODIFY RISER PIPING TO INSTALL NEW 3" GATE VALVE.
- RECONNECT CONDENSATE PIPING AT MECHANICAL ROOM ENTRANCE. INSTALL NEW GATE VALVE AT CONNECTION.

ASBESTOS NOTES - CAUTION!!!

- STEAM CHASE WATERPROOFING MAY CONTAIN ASBESTOS. ONCE EXCAVATED TO BE EXPOSED, THE WATERPROOFING SHALL BE TESTED FOR ACM. ASBESTOS ABATEMENT MAY BE REQUIRED TO REMOVE STEAM CHASE LID SHALL BE PROVIDED BY CONTRACTOR.
- MPS/PC PIPING INSULATION WITHIN CHASE MAY CONTAIN ASBESTOS. ONCE EXPOSED, THE WATERPROOFING AND PIPE INSULATION SHALL BE TESTED FOR ACM. ASBESTOS ABATEMENT SHALL BE PROVIDED BY CONTRACTOR.

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

ENGINEER / ARCHITECT OF RECORD:
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			DRAWN BY: M.A.O.

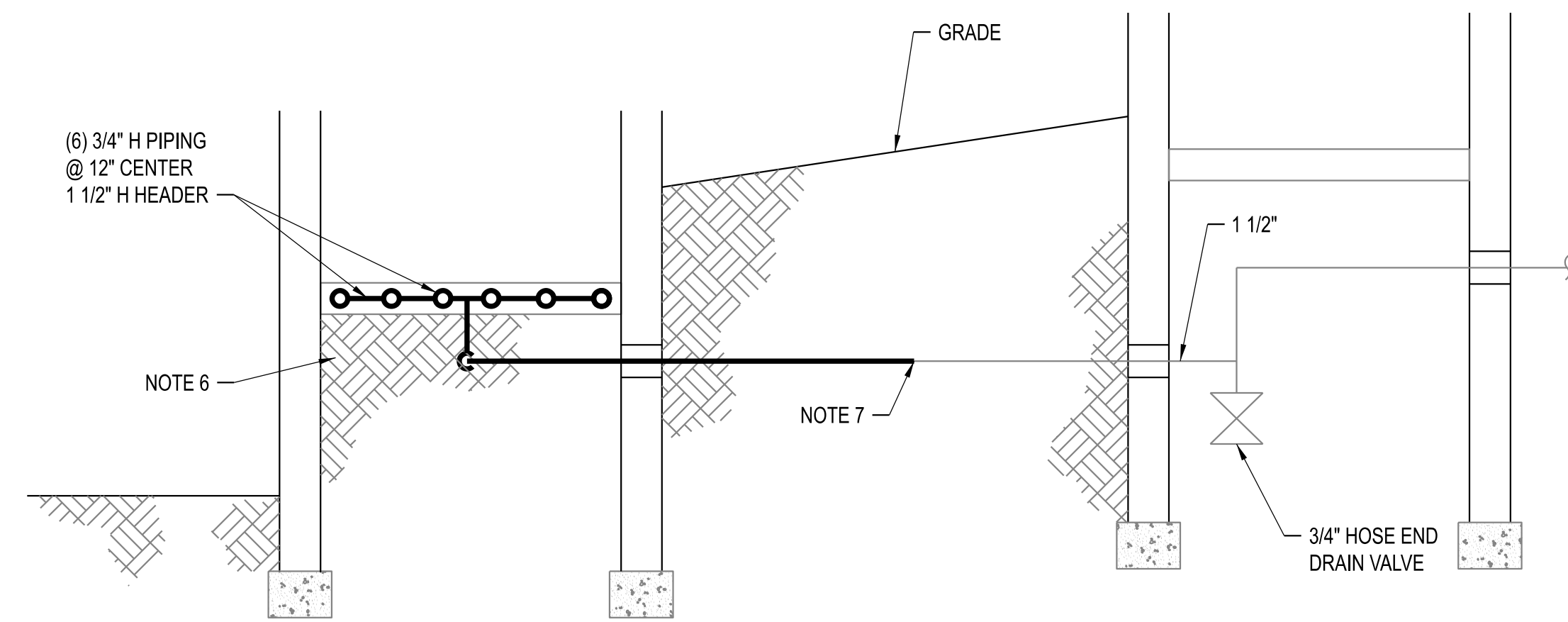
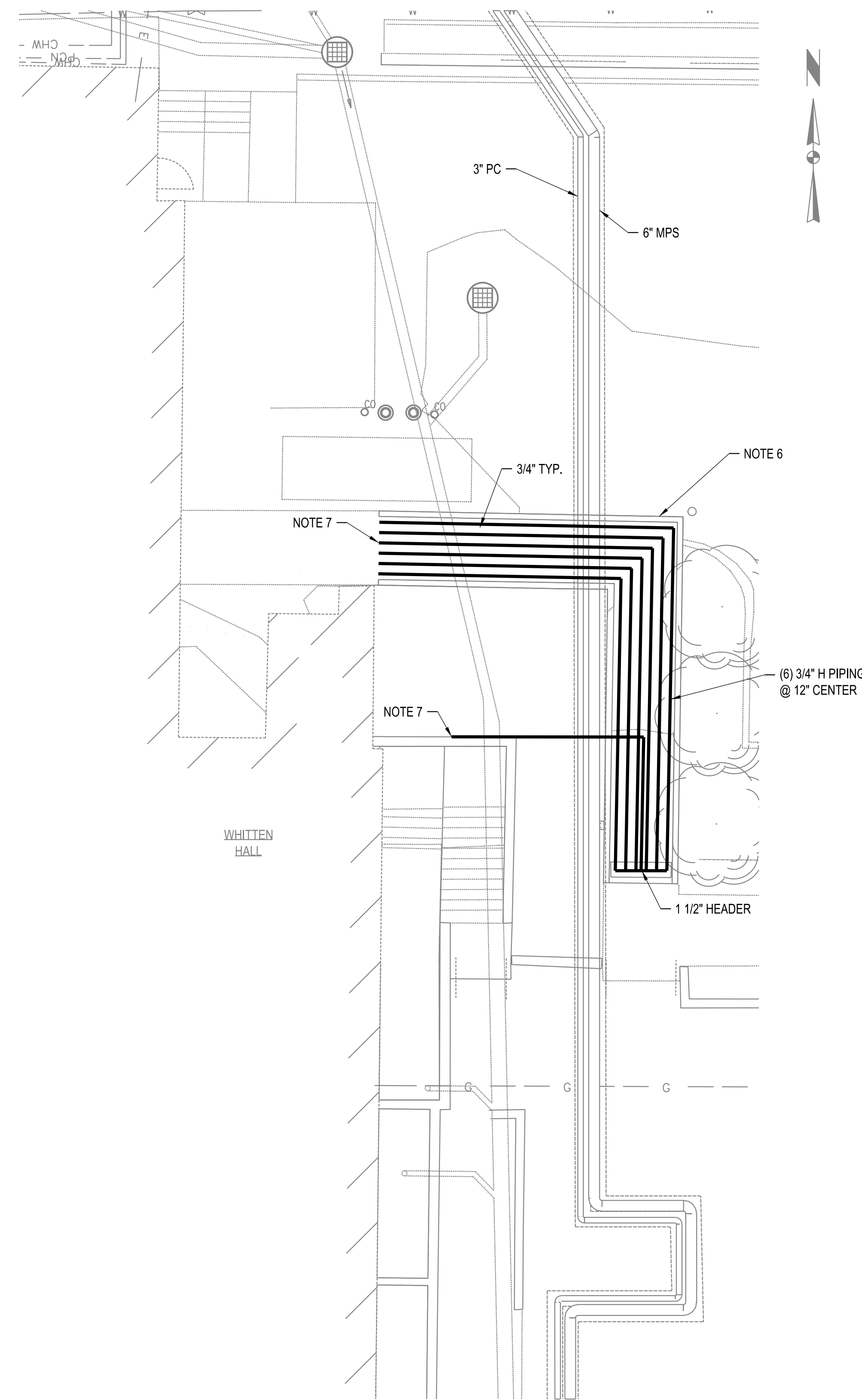
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MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
GENERAL SITE - REPLACE UTILITIES
NEAR MEMORIAL UNION
COLUMBIA, BOONE COUNTY, MISSOURI 65203
WHITTEN HALL AND MUMFORD HALL MECHANICAL PLAN

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP230201

CONSULTANT
PROJECT NUMBER
24084

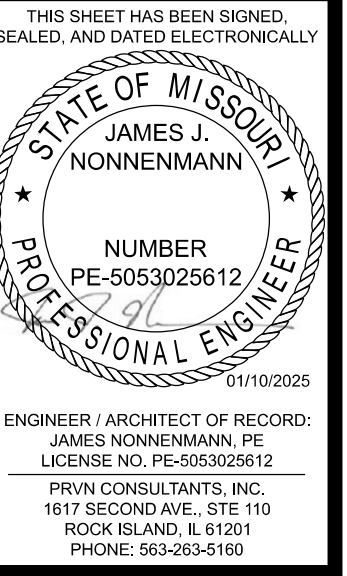
SHEET
M120



GLYCOL PIPING SCHEDULE	
PIPE SIZE	1 1/2" AND 3/4"
PIPE MATERIAL	HDPE DR11

EAST ADA RAMP GLYCOL PIPING PLAN
 SCALE: 1/8"=1'-0"
 0 1' 2'

- NOTES:**
1. PROVIDE ALL NECESSARY PIPE AND TUBING FITTINGS, INCLUDING REDUCERS, TO PROPERLY MATCH ACTUAL CONNECTION TYPES AND SIZES ON EQUIPMENT, VALVES, INSTRUMENTS, SPECIALTIES, AND OTHER PIPING. VERIFY PRIOR TO FABRICATION.
 2. RELOCATE EXST SMALL BORE CONDUIT AND PIPING AS REQUIRED FOR NEW CONSTRUCTION, AT NO ADDITIONAL COST TO OWNER.
 3. PROTECT ALL EQUIPMENT, PIPING, VALVES, TUBING, AND ACCESSORIES TO REMAIN FROM DAMAGE DURING DEMOLITION AND CONSTRUCTION ACTIVITIES. PIPING INSULATION (WHERE IT EXISTS) MAY BE REMOVED AS REQUIRED FOR NEW TIE POINT CONNECTIONS, BUT SHALL BE REPLACED IN KIND WHEN WORK IS COMPLETED.
 4. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO DEMOLITION AND CONSTRUCTION ACTIVITIES.
 5. COORDINATE CONNECTIONS TO EXISTING SERVICES WITH OWNER'S REPRESENTATIVE.
 6. COORDINATE WITH STRUCTURAL DRAWINGS FOR RAMP CONSTRUCTION.
 7. RECONNECT TO EXISTING PIPING.



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UNIVERSITY OF MISSOURI - COLUMBIA
 GENERAL SITE - REPLACE UTILITIES
 NEAR MEMORIAL UNION
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 EAST ADA RAMP GLYCOL PIPING

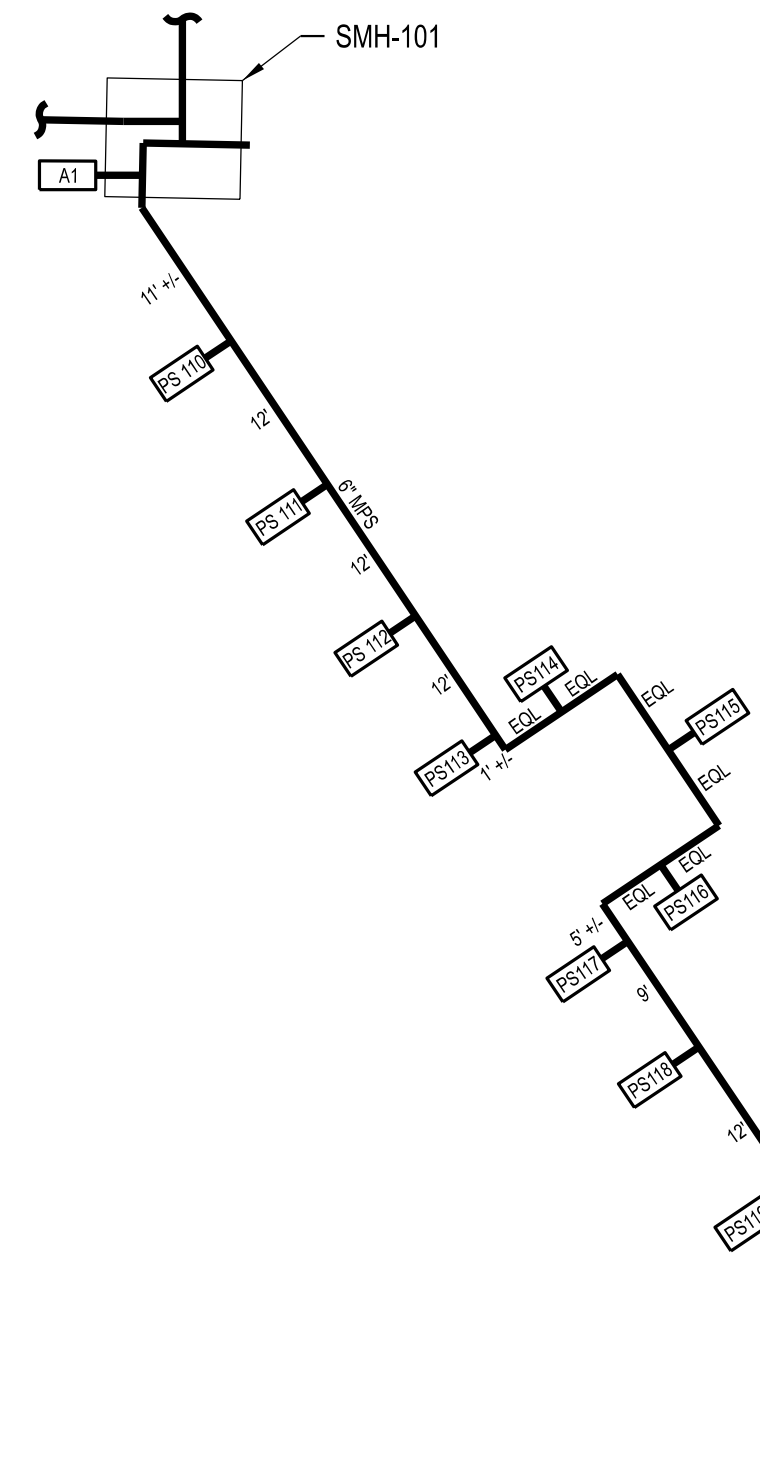
UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP230201

CONSULTANT
 PROJECT NUMBER
24084

SHEET
M130

0 01/10/25 ISSUED FOR BID
 DRAWN BY: M.A.O.
 CHECKED BY: J.J.N.

NOTE 1



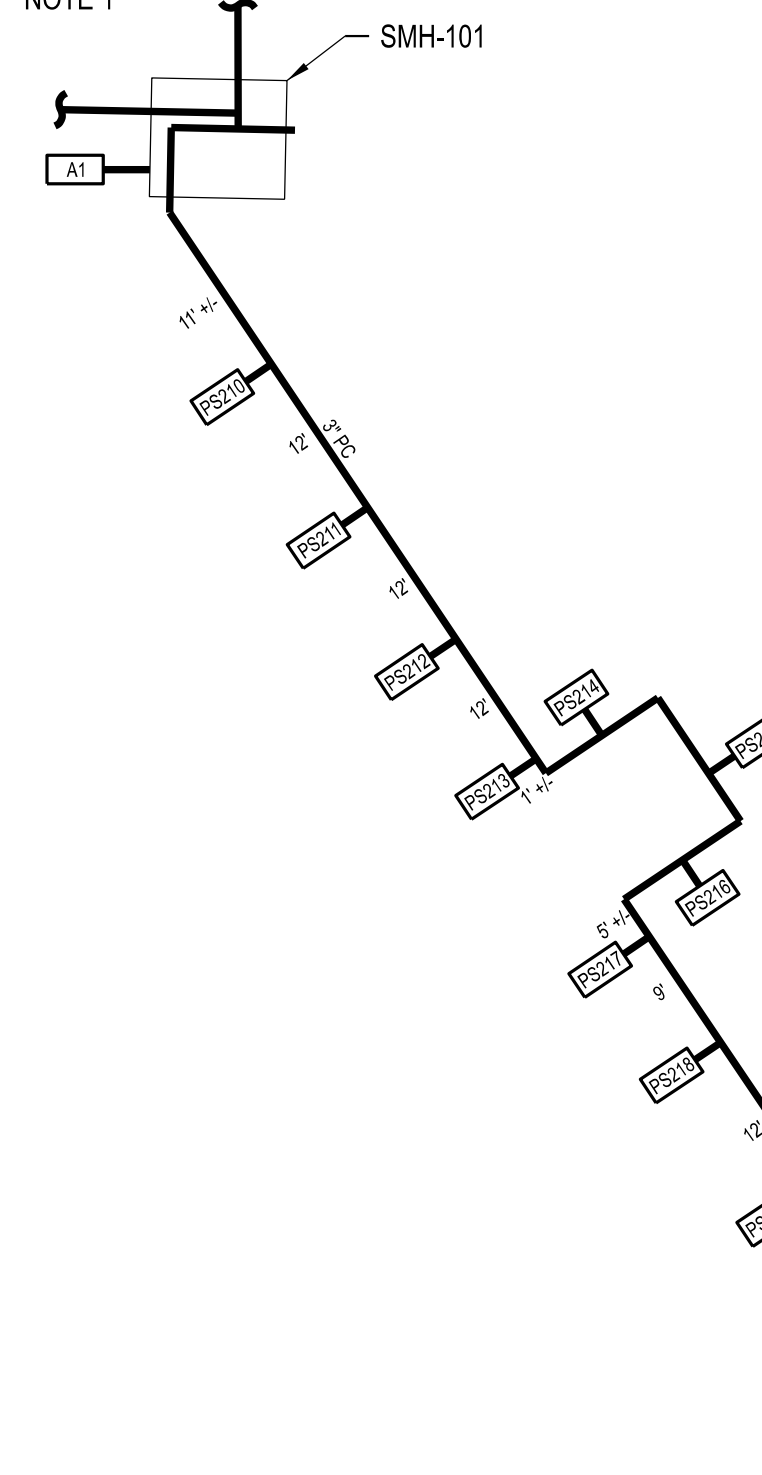
MPS GUIDE SUPPORT SCHEDULE					
DESIGNATION	NORTH (IN.)	EAST (IN.)	VERTICAL (IN.)	PIPE OD (IN.)	INSULATION THICKNESS (IN.)
G105	-2.344	0	-0.064	6	3

MPS PIPE SUPPORT SCHEDULE				
DESIGNATION	NORTH (IN.)	EAST (IN.)	PIPE OD (IN.)	INSULATION THICKNESS (IN.)
PS110	-0.294	0.041	6	3
PS111	-0.612	0.144	6	3
PS112	-0.783	0.468	6	3
PS113	-0.616	1.295	6	3
PS114	0.115	1.132	6	3
PS115	0.723	1.125	6	3
PS116	0.993	0.471	6	3
PS117	1.312	-0.338	6	3
PS118	0.806	-0.656	6	3
PS119	0.445	-0.614	6	3
PS120	0.250	-0.328	6	3
PS121	0.054	-0.043	6	3
PS122	-0.097	0.017	6	3
PS123	-0.419	0.003	6	3
PS124	-0.740	-0.040	6	3
PS125	-1.062	-0.117	6	3
PS126	-1.384	-0.215	6	3
PS127	-1.706	-0.292	6	3
PS128	-2.028	-0.260	6	3
PS129	-2.672	-0.714	6	3
PS130	-2.084	1.366	6	3
PS131	-1.581	1.563	6	3
PS132	-0.662	1.115	6	3
PS133	-0.322	0.456	6	3
PS134	-0.323	0.168	6	3
PS135	-0.645	0.637	6	3
PS136	-0.968	1.241	6	3

NOTE 3

THERMAL EXPANSION PLAN - STEAM
NO SCALE

NOTE 1



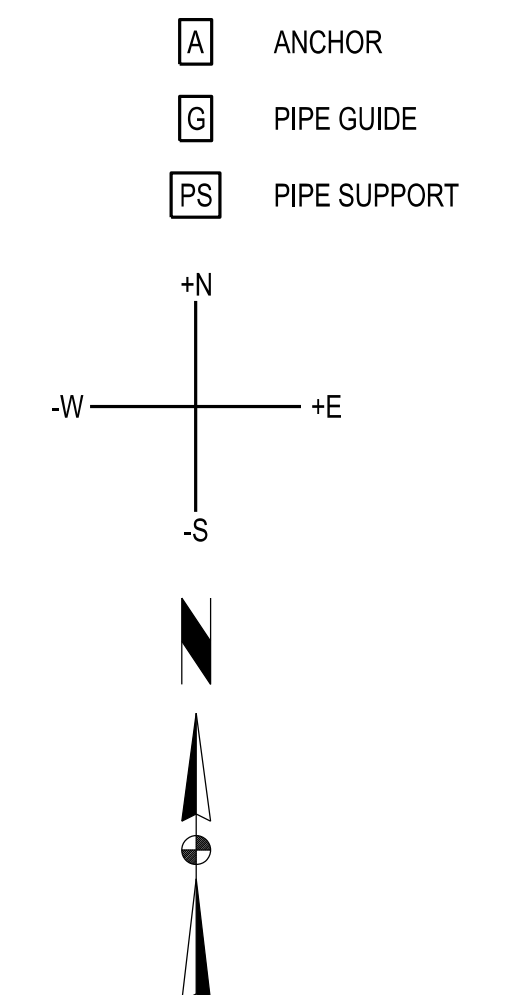
PC GUIDE SUPPORT SCHEDULE				
DESIGNATION	NORTH/SOUTH (IN.)	EAST/WEST (IN.)	UP/DOWN (IN.)	INSULATION THICKNESS (IN.)
G210	-0.961	0	-0.026	3

PC PIPE SUPPORT SCHEDULE				
DESIGNATION	NORTH (IN.)	EAST (IN.)	PIPE OD (IN.)	INSULATION THICKNESS (IN.)
PS210	-0.113	0.035	3	1.5
PS211	-0.241	0.083	3	1.5
PS212	-0.403	0.082	3	1.5
PS213	-0.452	0.247	3	1.5
PS214	-0.062	0.186	3	1.5
PS215	0.135	0.217	3	1.5
PS216	0.395	0.002	3	1.5
PS217	0.368	-0.399	3	1.5
PS218	0.250	-0.395	3	1.5
PS219	0.399	-0.232	3	1.5
PS220	0.129	-0.098	3	1.5
PS221	0.024	-0.016	3	1.5
PS222	-0.033	0.005	3	1.5
PS223	-0.166	0.001	3	1.5
PS224	-0.299	-0.001	3	1.5
PS225	-0.432	0.000	3	1.5
PS226	-0.565	0.008	3	1.5
PS227	-0.698	0.026	3	1.5
PS228	-0.831	0.040	3	1.5
PS229	-1.097	-0.030	3	1.5
PS230	-0.683	0.273	3	1.5
PS231	-0.484	0.394	3	1.5
PS232	-0.256	0.279	3	1.5
PS233	0.133	0.027	3	1.5
PS234	-0.133	0.001	3	1.5
PS235	-0.266	0.094	3	1.5
PS236	-0.400	0.358	3	1.5

NOTES:

- REFER TO SHEET M141 FOR CONTINUATION OF THERMAL EXPANSION PLAN.
- AMBIENT TEMPERATURE USED WAS 55°F. OPERATING PRESSURE USED WAS 75 PSIG. OPERATING TEMPERATURE USED WAS 375°F ON MPS AND 200°F ON PC.
- CONTRACTOR TO CONFIRM DISTANCE BETWEEN PS136/PS236 AND THE NEAREST EXISTING PIPE SUPPORT IN THE TUNNEL. IF DISTANCE EXCEEDS 12' ADD ADDITIONAL PIPE SUPPORT IN THE TUNNEL.

LEGEND:



THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

ENGINEER / ARCHITECT OF RECORD:
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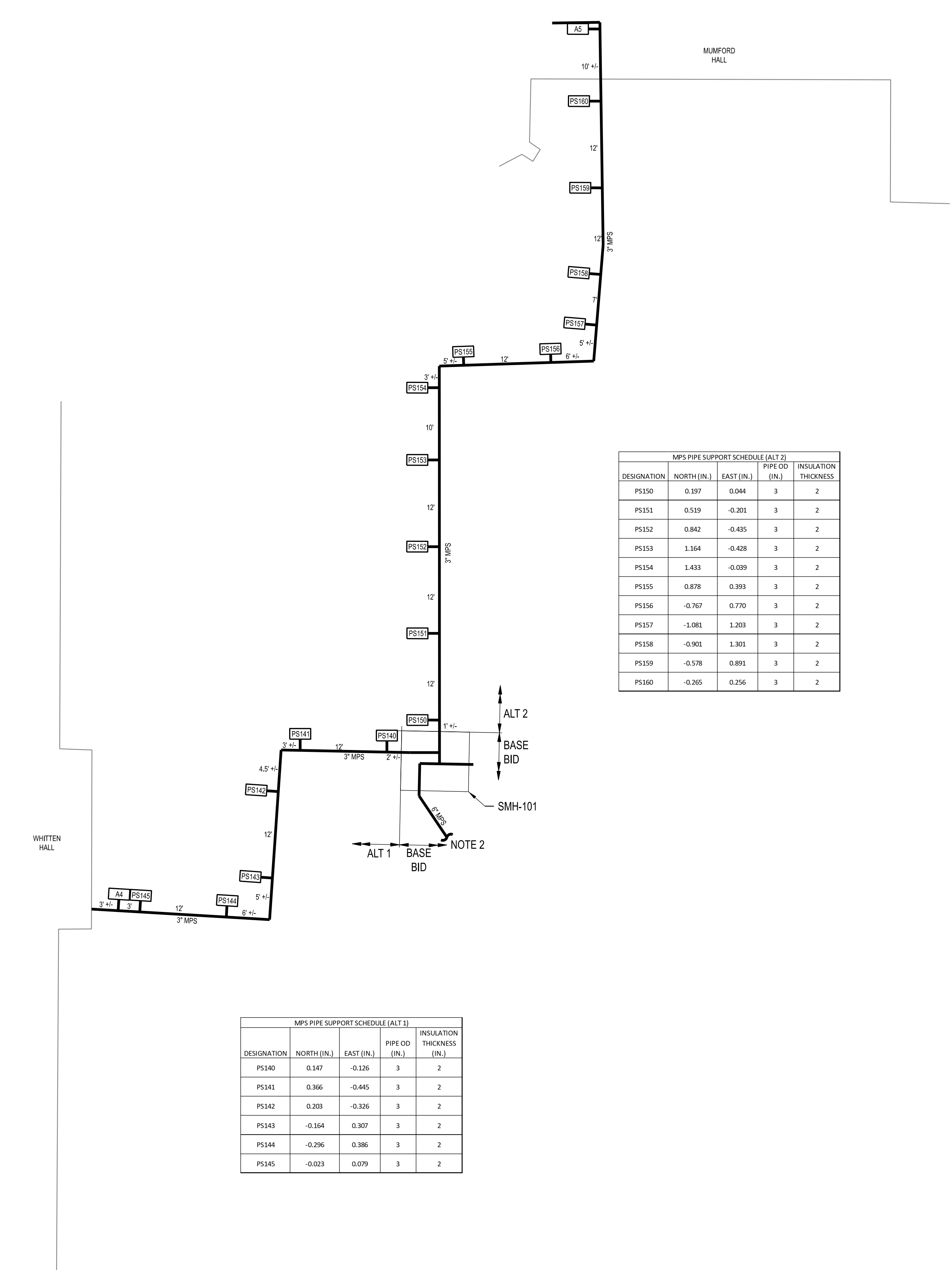
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MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
GENERAL SITE - REPLACE UTILITIES
NEAR MEMORIAL UNION
COLUMBIA, BOONE COUNTY, MISSOURI 65203
THERMAL EXPANSION PLAN - SHEET 1

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP230201
CONSULTANT
PROJECT NUMBER
24084
SHEET
M140

- NOTES:**
- REFER TO SHEET M140 FOR CONTINUATION OF THERMAL EXPANSION PLAN.
 - AMBIENT TEMPERATURE USED WAS 55°F. OPERATING PRESSURE USED WAS 75 PSIG. OPERATING TEMPERATURE USED WAS 375°F ON MPS AND 200°F ON PC.



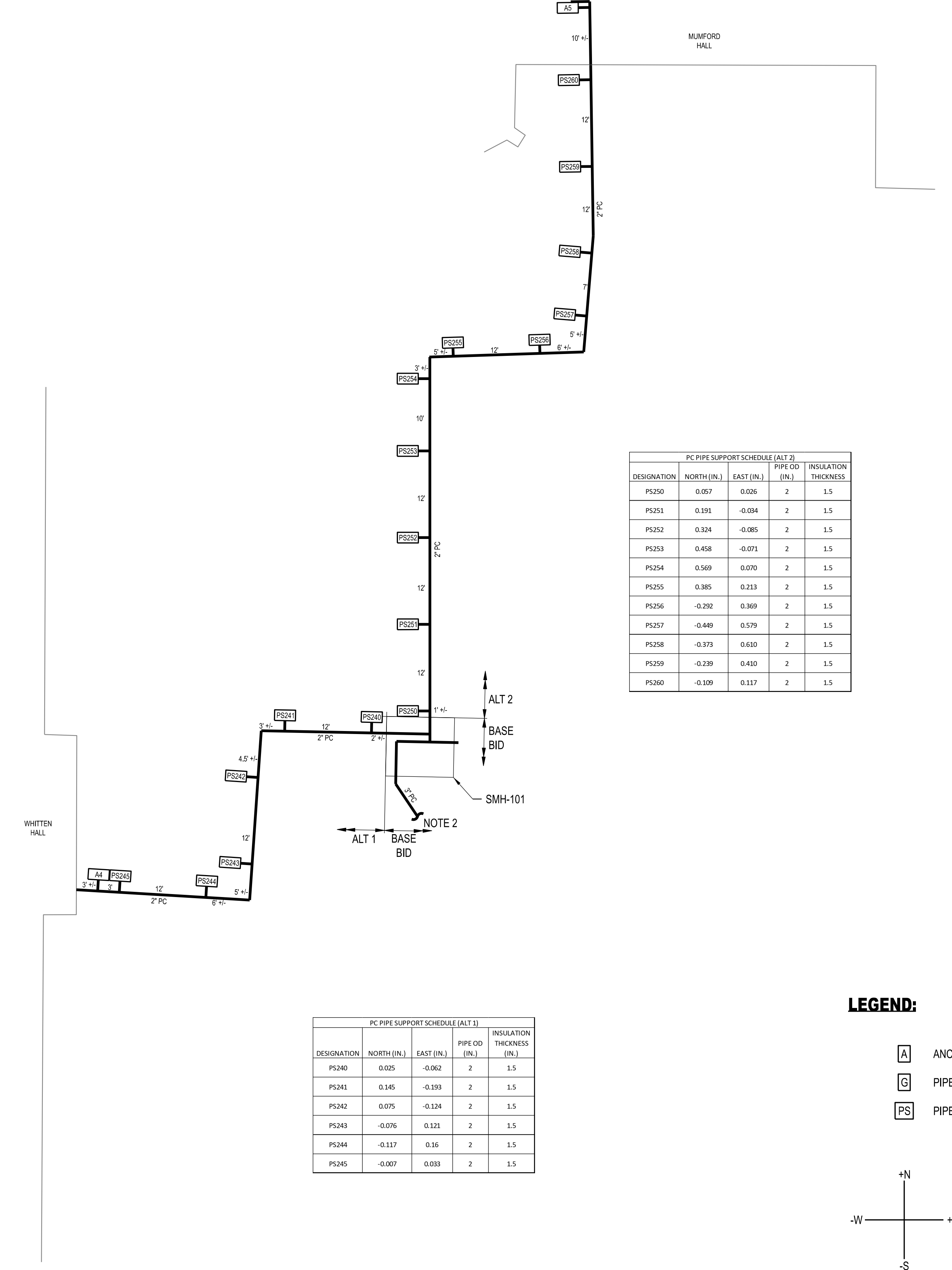
MPS PIPE SUPPORT SCHEDULE (ALT 2)

DESIGNATION	NORTH (IN.)	EAST (IN.)	PIPE OD (IN.)	INSULATION THICKNESS
PS150	0.197	0.044	3	2
PS151	0.519	-0.201	3	2
PS152	0.842	-0.435	3	2
PS153	1.164	-0.428	3	2
PS154	1.433	-0.039	3	2
PS155	0.878	0.393	3	2
PS156	-0.767	0.770	3	2
PS157	-1.081	1.203	3	2
PS158	-0.901	1.301	3	2
PS159	-0.578	0.891	3	2
PS160	-0.265	0.256	3	2

MPS PIPE SUPPORT SCHEDULE (ALT 1)

DESIGNATION	NORTH (IN.)	EAST (IN.)	PIPE OD (IN.)	INSULATION THICKNESS (IN.)
PS140	0.147	-0.126	3	2
PS141	0.366	-0.445	3	2
PS142	0.203	-0.326	3	2
PS143	-0.164	0.307	3	2
PS144	-0.296	0.386	3	2
PS145	-0.023	0.079	3	2

THERMAL EXPANSION PLAN - STEAM ALT 1 AND ALT 2
NO SCALE



PC PIPE SUPPORT SCHEDULE (ALT 2)

DESIGNATION	NORTH (IN.)	EAST (IN.)	PIPE OD (IN.)	INSULATION THICKNESS
PS250	0.057	0.026	2	1.5
PS251	0.191	-0.034	2	1.5
PS252	0.324	-0.085	2	1.5
PS253	0.458	-0.071	2	1.5
PS254	0.569	0.070	2	1.5
PS255	0.385	0.213	2	1.5
PS256	-0.292	0.369	2	1.5
PS257	-0.449	0.579	2	1.5
PS258	-0.373	0.610	2	1.5
PS259	-0.239	0.410	2	1.5
PS260	-0.109	0.117	2	1.5

PC PIPE SUPPORT SCHEDULE (ALT 1)

DESIGNATION	NORTH (IN.)	EAST (IN.)	PIPE OD (IN.)	INSULATION THICKNESS (IN.)
PS240	0.025	-0.062	2	1.5
PS241	0.145	-0.193	2	1.5
PS242	0.075	-0.124	2	1.5
PS243	-0.076	0.121	2	1.5
PS244	-0.117	0.16	2	1.5
PS245	-0.007	0.033	2	1.5

THERMAL EXPANSION PLAN - CONDENSATE ALT 1 AND ALT 2
NO SCALE

LEGEND:

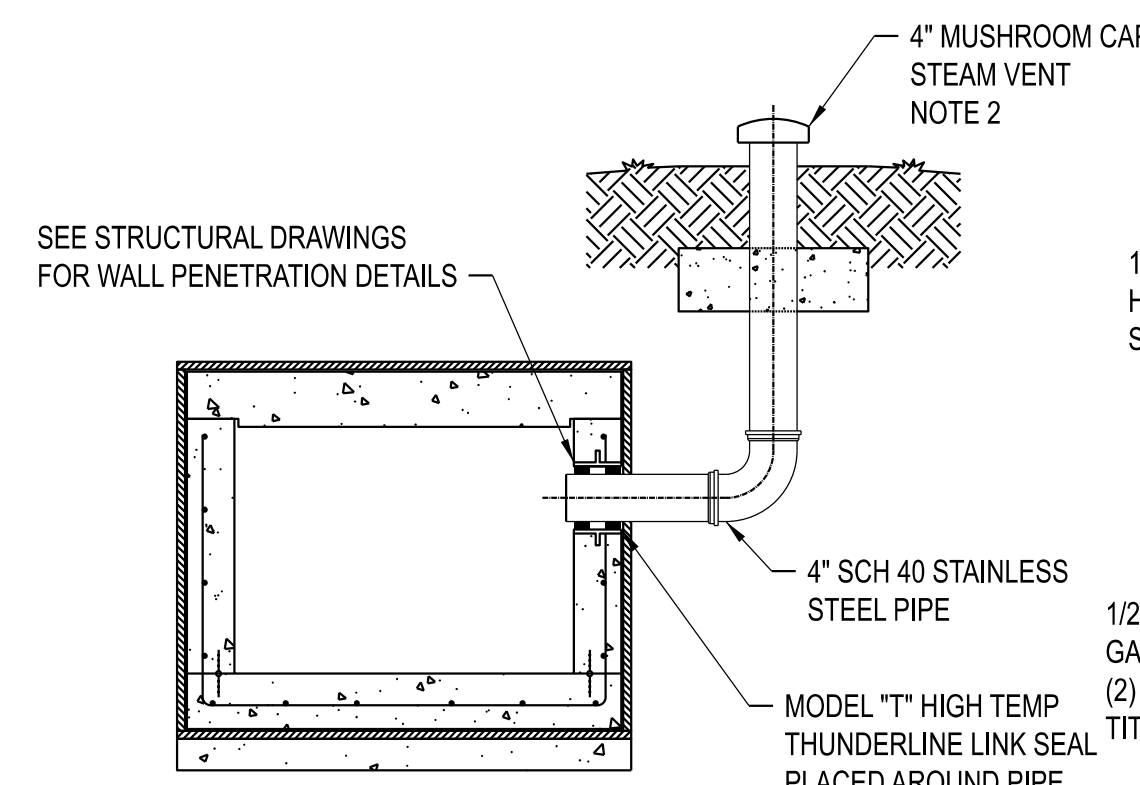
- A ANCHOR
- G PIPE GUIDE
- PS PIPE SUPPORT

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MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

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NEAR MEMORIAL UNION
COLUMBIA, BOONE COUNTY, MISSOURI 65203
THERMAL EXPANSION PLAN - SHEET 2

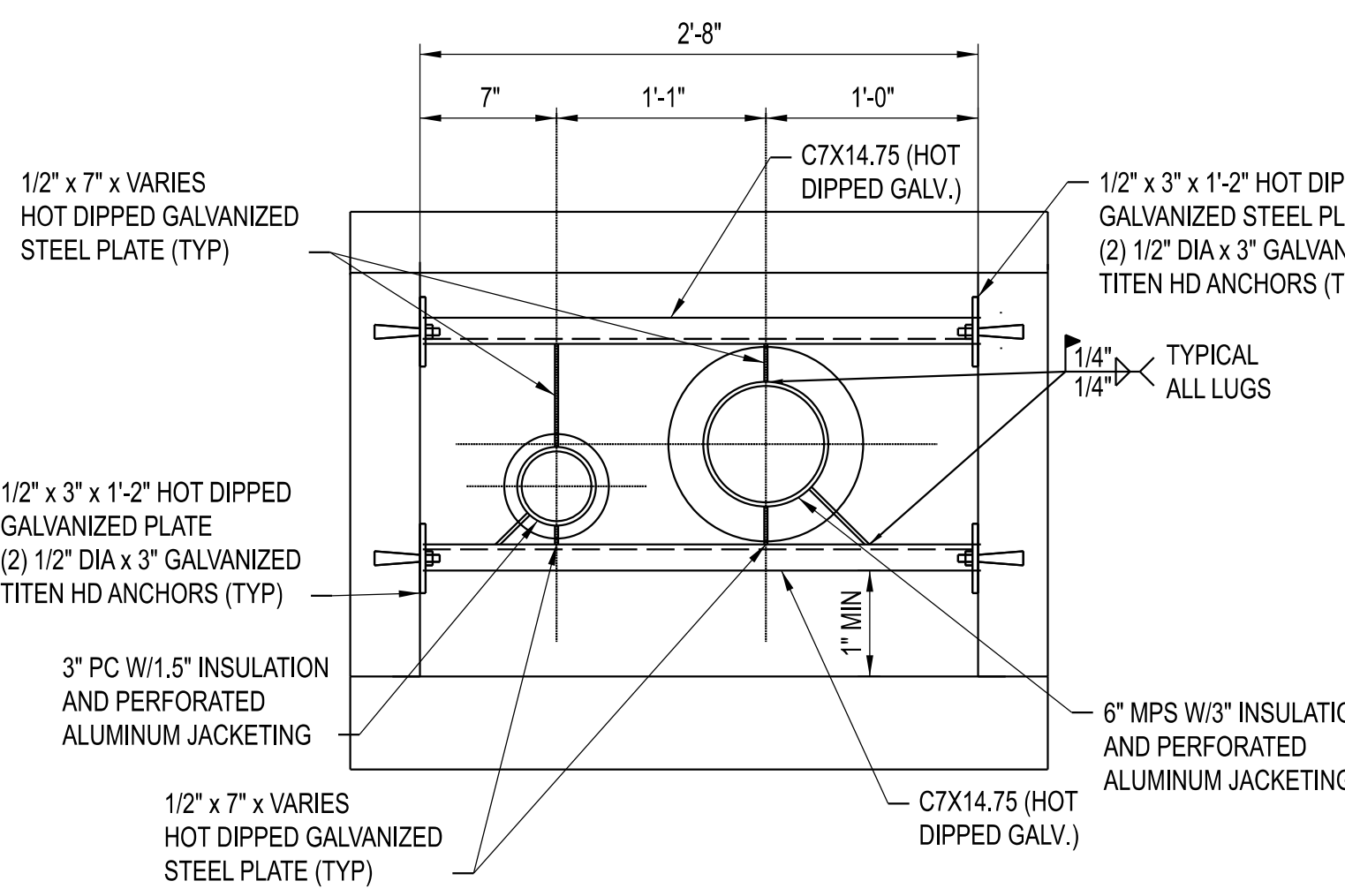
UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP230201
CONSULTANT
PROJECT NUMBER
24084
SHEET
M141

0	01/10/25	ISSUED FOR BID	CHECKED BY: J.J.N.
		DRAWN BY: M.A.O.	

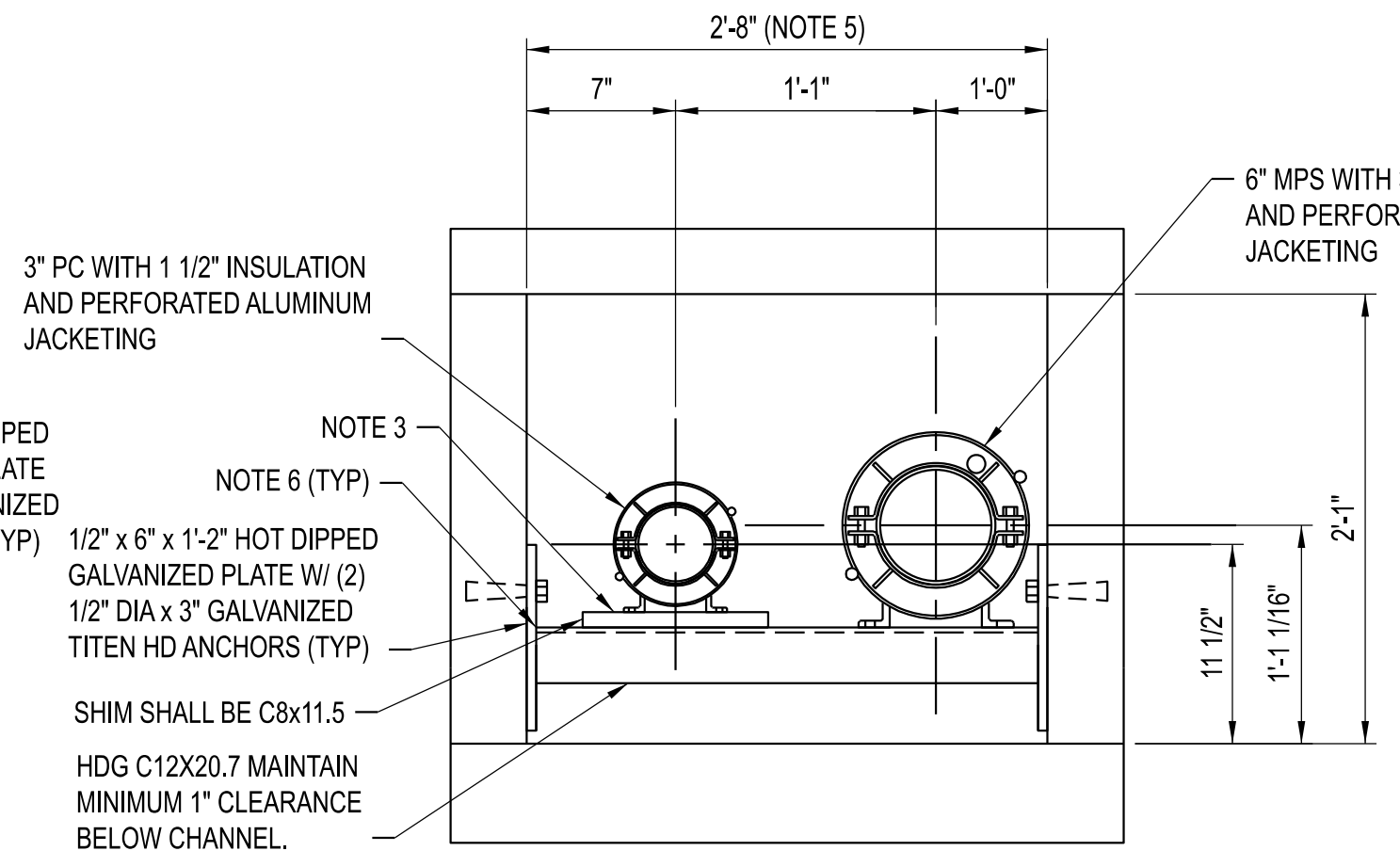


- NOTES:**
- PIPE VENT SHALL BE MUSHROOM TYPE WITH GALVANIZED CAST IRON BODY, 30 MESH STAINLESS STEEL SCREEN, POSITIVE STOP AND 4" NPT CONNECTION. OIL EQUIPMENT MANUFACTURING CORP. FIG NO. 4028 OR APPROVED EQUAL.
 - TERMINATE TOP OF VENT 1' ABOVE FINISHED GRADE.
 - PIPE VENT SHALL BE INSTALLED WITHIN 2' FROM THE BUILDING WALL.

TYPICAL CHASE VENT
SCALE: NONE

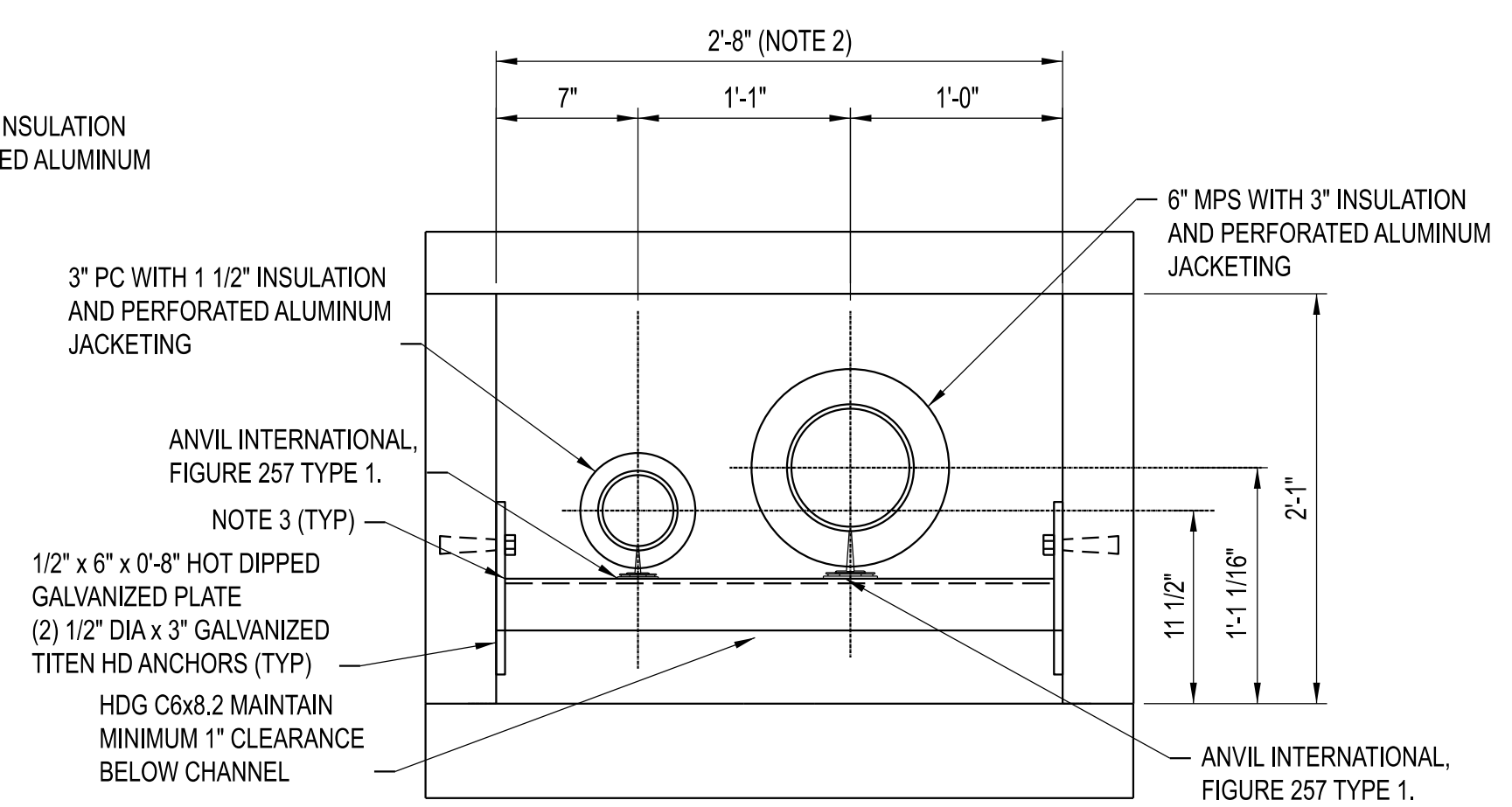


CHASE FROM SMH-101 TO UTILITY TUNNEL ANCHOR DETAIL
SCALE: NONE



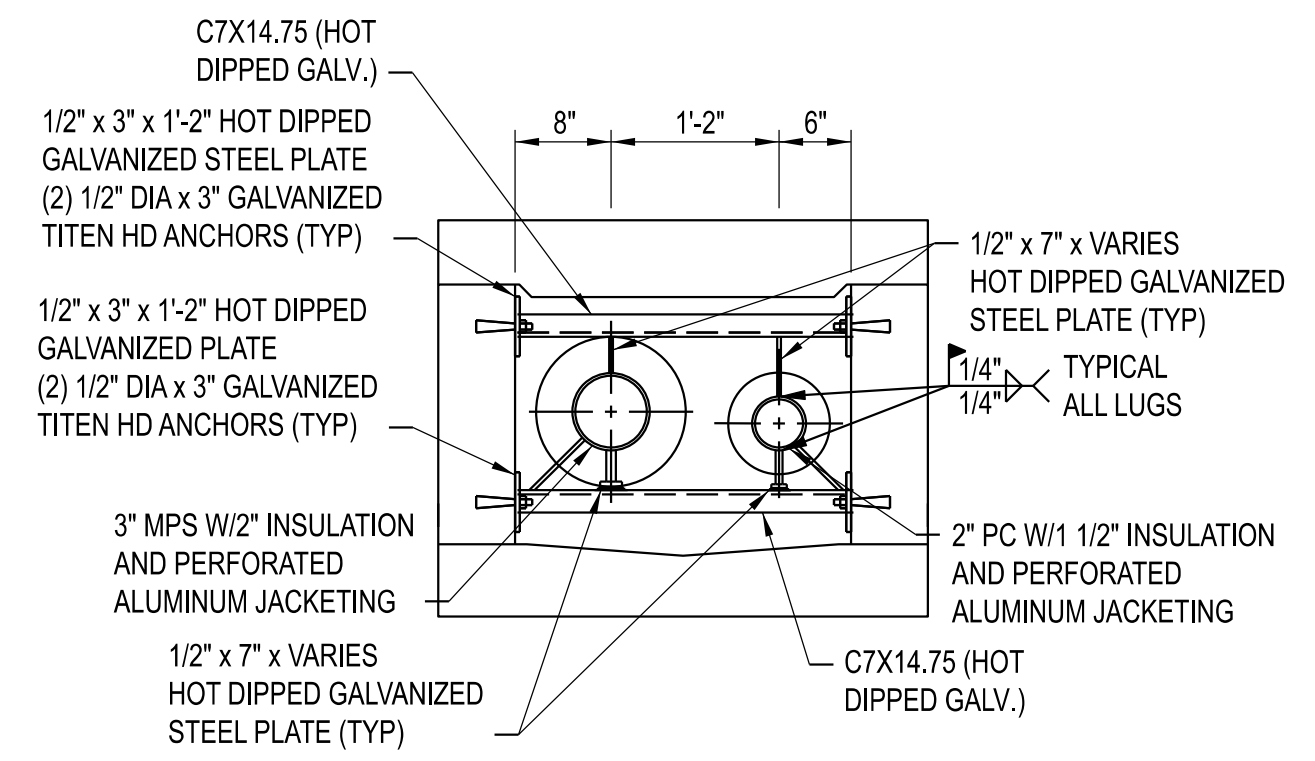
- NOTES:**
- GUIDE SPIDERS INSTALLED IN COLD CONDITION SHALL BE LOCATED OFF CENTER OPPOSITE THE DIRECTION OF EXPANSION SUCH THAT SPIDER BEARS ON HOUSING IN BOTH HOT AND COLD POSITIONS.
 - SEE SHEET M140 FOR LOCATIONS.
 - DIMENSIONS SHOWN ARE BASED ON ANVIL FIGURE 256. SIZES E AND B GUIDE. CONTRACTOR TO CHECK AND REVISE AS REQUIRED IF DIFFERENT GUIDE IS USED. PROVIDE HDG METAL SHIMS AS NEEDED TO MAINTAIN PIPE CENTERLINE.
 - IN THE EVENT EXISTING CONDITIONS DO NOT ALLOW FOR INSTALLATION AS DETAILED, CONSULT WITH OWNER'S REPRESENTATIVE.
 - CHASE WIDTH SHALL BE FIELD VERIFIED AFTER LID REMOVAL AND REPORTED TO MU REPRESENTATIVE AND ENGINEER. ENGINEER WILL UPDATE SPACING AS NECESSARY.
 - 5/16" FILLET WELD ON TOP AND SIDES. PERFORM HOT MELT STICK GALVANIZING REPAIRS. COLD GALVANIZING IS NOT ALLOWED.

CHASE FROM SMH-101 TO UTILITY TUNNEL PIPE GUIDE DETAIL
SCALE: NONE

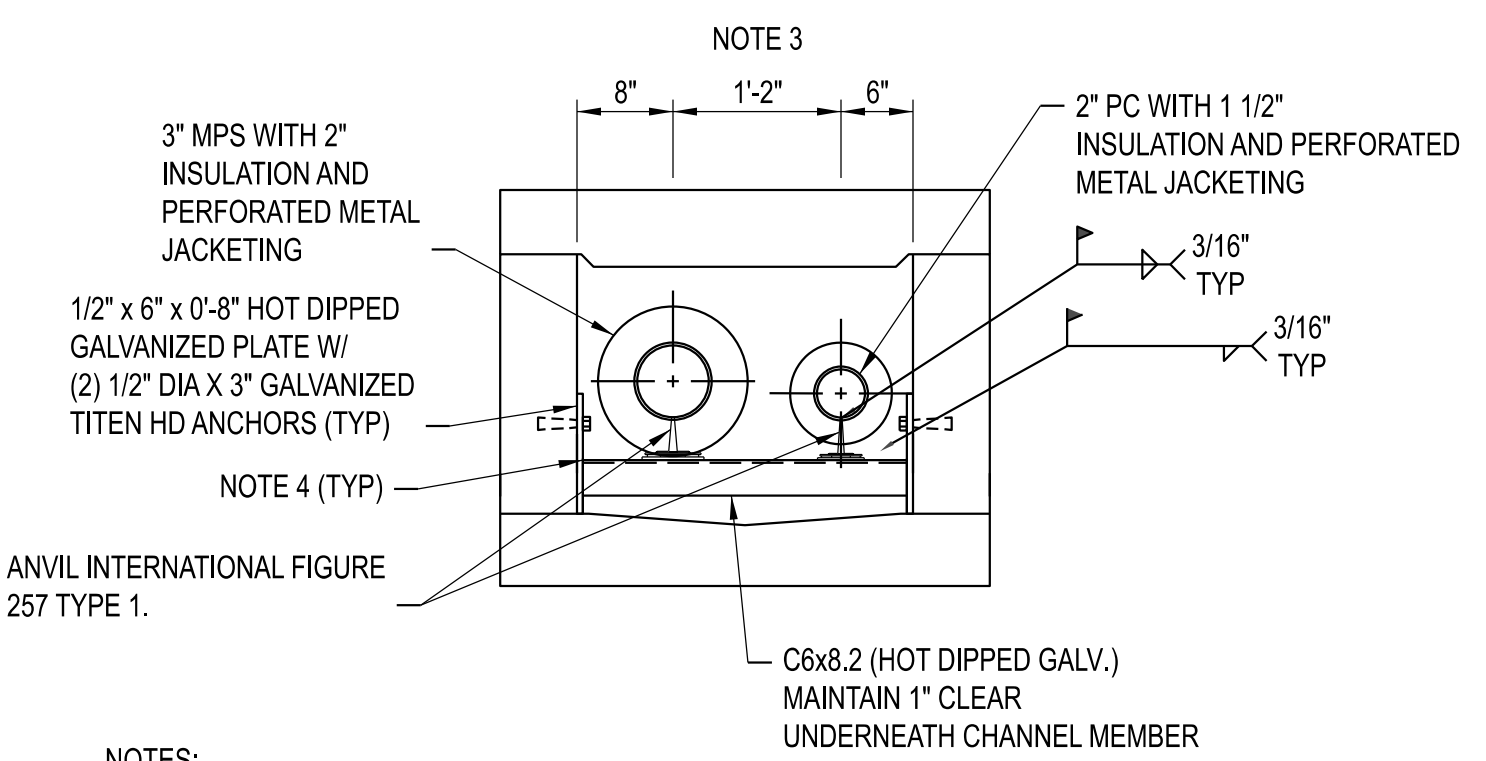


- NOTES:**
- PIPE SADDLES INSTALLATION IN COLD CONDITION SHALL BE LOCATED OFF CENTER OPPOSITE THE DIRECTION OF EXPANSION SUCH THAT SADDLE BEARS ON SUPPORT IN BOTH HOT AND COLD POSITIONS.
 - CHASE WIDTH SHALL BE FIELD VERIFIED AFTER LID REMOVAL AND REPORTED TO MU REPRESENTATIVE AND ENGINEER. ENGINEER WILL UPDATE SPACING AS NECESSARY.
 - 5/16" FILLET WELD ON TOP AND SIDES. PERFORM HOT MELT STICK GALVANIZING REPAIRS. COLD GALVANIZING IS NOT ALLOWED.

CHASE FROM SMH-101 TO UTILITY TUNNEL PIPE SUPPORT DETAIL
SCALE: NONE

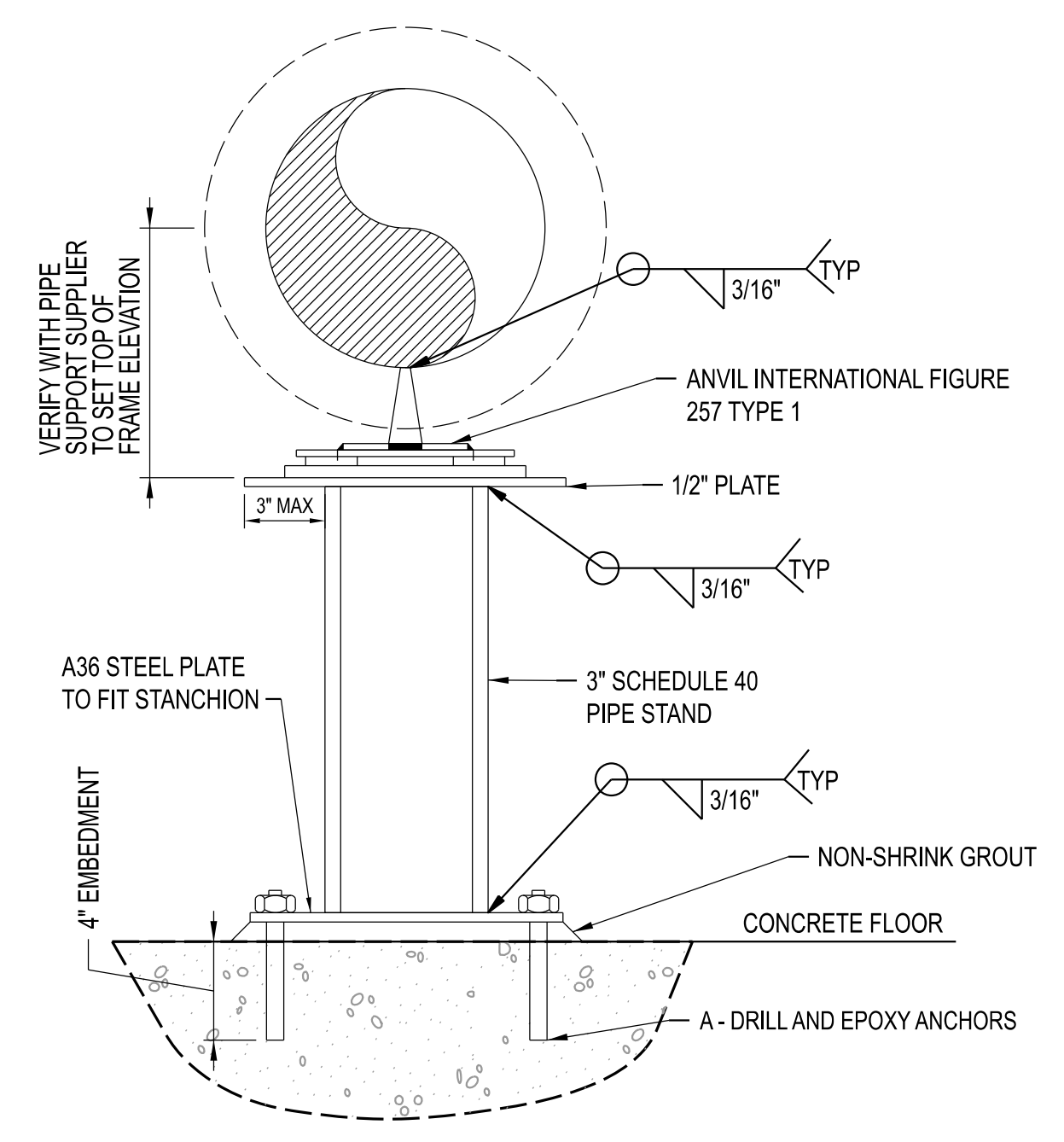


CHASE FROM SMH-101 TO WHITTEN HALL (ALT 1) AND MUMFORD HALL (ALT 2) ANCHOR DETAIL
SCALE: NONE



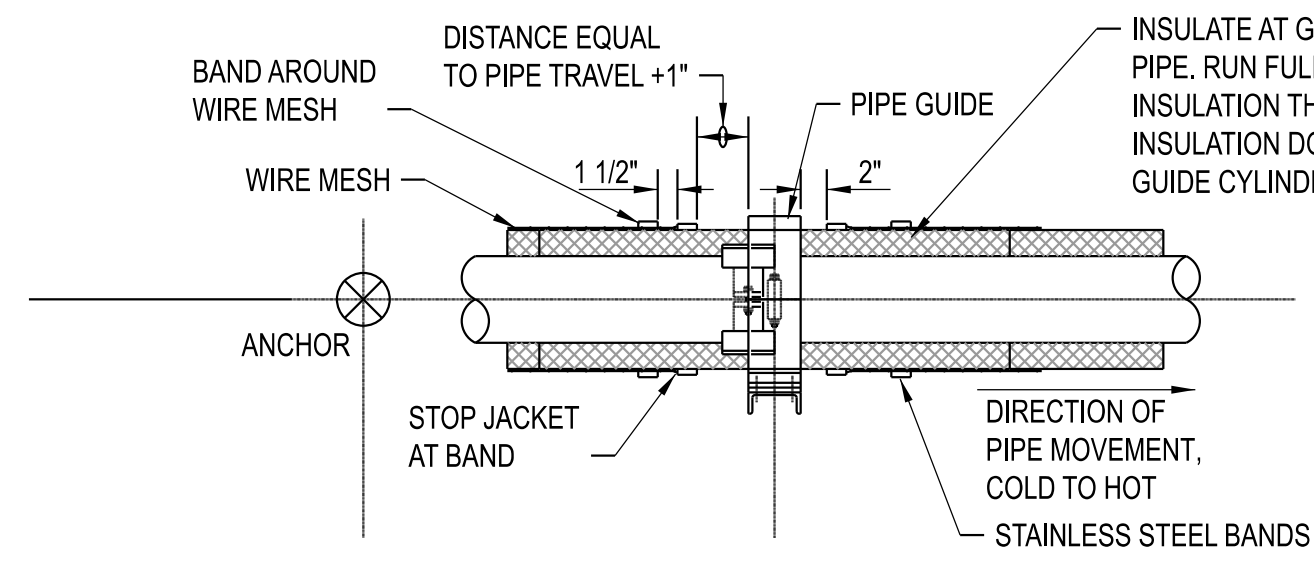
- NOTES:**
- PIPE SADDLES INSTALLATION IN COLD CONDITION SHALL BE LOCATED OFF CENTER OPPOSITE THE DIRECTION OF EXPANSION SUCH THAT SADDLE BEARS ON SUPPORT IN BOTH HOT AND COLD POSITIONS.
 - SEE SHEET M141 FOR LOCATIONS.
 - CHASE WIDTH SHALL BE FIELD VERIFIED AFTER LID REMOVAL AND REPORTED TO MU REPRESENTATIVE AND ENGINEER. ENGINEER WILL UPDATE SPACING AS NECESSARY.
 - 5/16" FILLET WELD ON TOP AND SIDES. PERFORM HOT MELT STICK GALVANIZING REPAIRS. COLD GALVANIZING IS NOT ALLOWED.

CHASE FROM SMH-101 TO WHITTEN HALL (ALT 1) AND MUMFORD HALL (ALT 2) PIPE SUPPORT DETAIL
SCALE: NONE

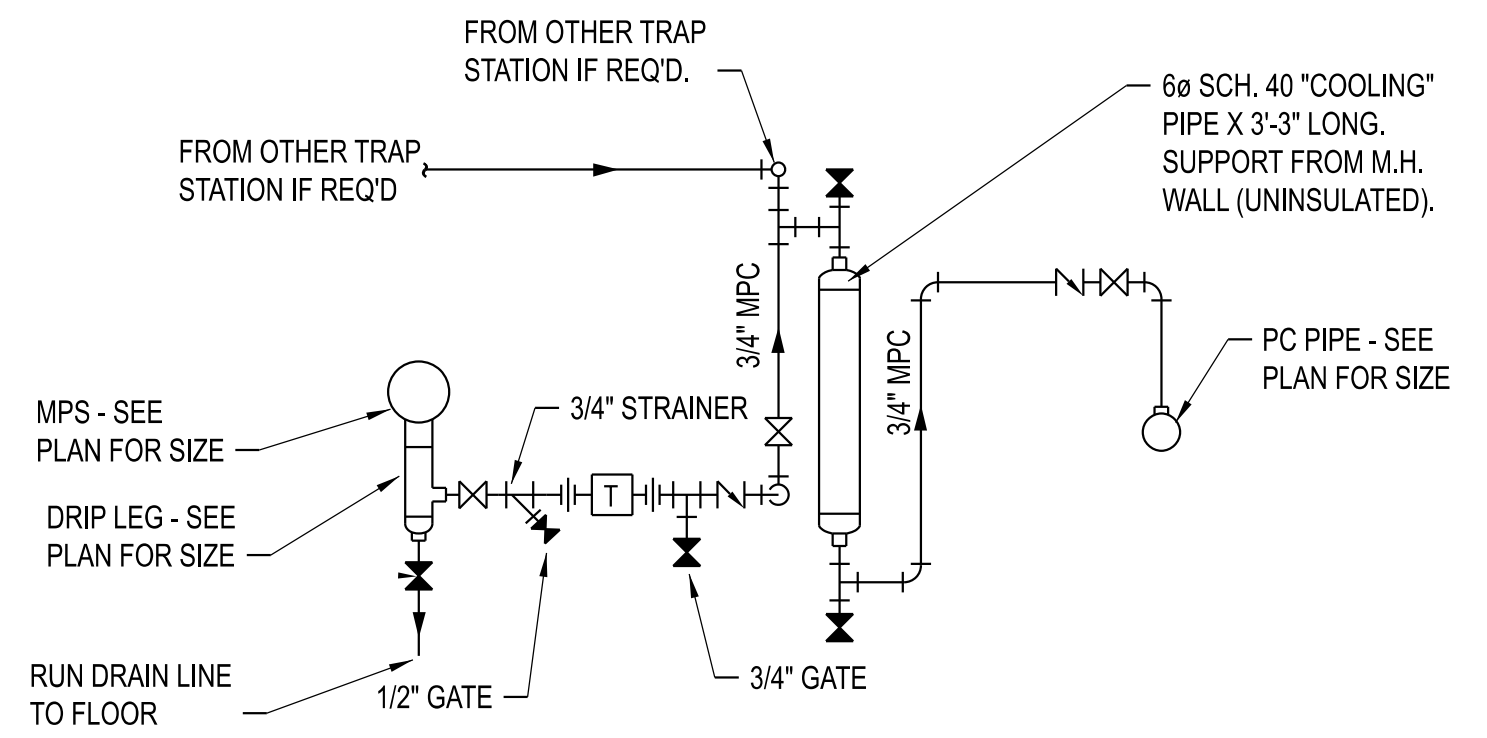


TYPE PH
SCALE: NONE

ITEM	FIGURE NO.	SIZE	MATERIAL	QUANTITY
A	HILTI HY-200 EPOXY	1/2" DIA	CARBON STEEL	4

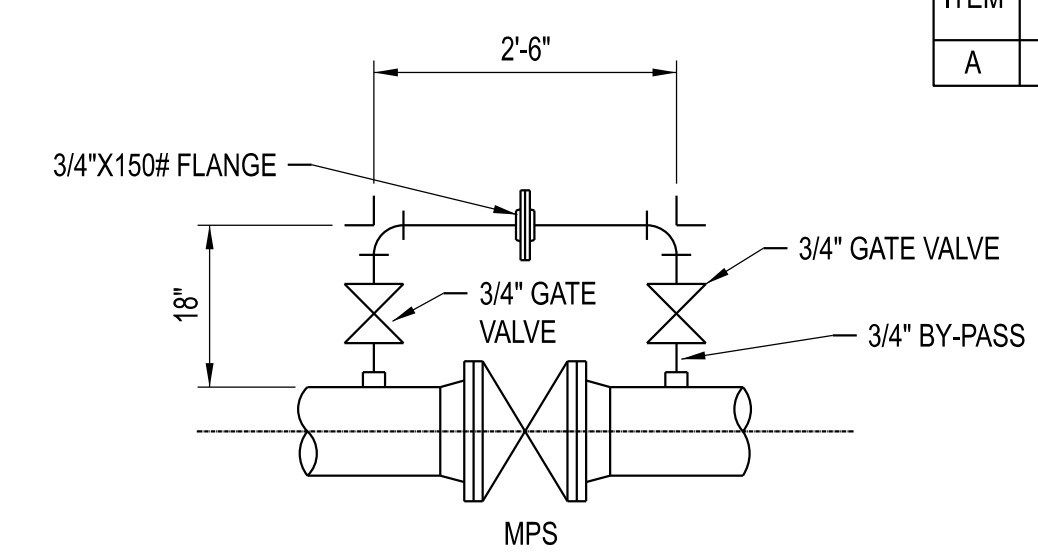


TYPICAL PIPE GUIDE INSULATION DETAIL
SCALE: NONE



- NOTES:**
- MOUNT COOLING PIPE FROM INSIDE WALL OF MANHOLE AS SHOWN IN PLAN VIEW.
 - TRAPS AND VALVING SHALL BE EASILY ACCESSIBLE FOR MAINTENANCE.
 - COOLING PIPE SHALL HAVE GALVANIZED EXPANDED METAL CAGE FOR PERSONNEL PROTECTION.

TYPICAL TRAP AND COOLING PIPE SCHEMATIC
SCALE: NONE



- PROVIDE 3/4" BY-PASS WITH GATE VALVES AROUND MPS VALVES 6" AND LARGER. FIELD LOCATE BY-PASS FOR GOOD ACCESS. USE SCHEDULE 40 PIPE AND 3000# FORGED STEEL SOCKET WELD FITTINGS.

TYPICAL VALVE BY-PASS
SCALE: NONE

CHECKED BY: J.J.N.
 ISSUED FOR BID
 01/10/25
 DRAWN BY: M.A.O.

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 MECHANICAL DETAILS

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP230201
 CONSULTANT
 PROJECT NUMBER
24084
 SHEET
M150

GENERAL NOTES

ELEVATION DATUM
SEE ARCHITECTURAL DRAWINGS OR SITE PLAN FOR FINISH FLOOR ELEVATIONS

DESIGN SPECIFICATIONS
2021 INTERNATIONAL BUILDING CODE

EARTHWORK
EARTHWORK OPERATIONS SHALL BE PERFORMED UNDER THE DIRECTION OF A PROFESSIONAL TESTING AGENCY TO ASSURE COMPLIANCE WITH THE RECOMMENDATIONS OF THE SOILS REPORT.

CONCRETE

CONCRETE WORK SHALL CONFORM TO ALL REQUIREMENTS OF THE CURRENT ACI 301, SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS, ACI 318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 305 SPECIFICATIONS FOR HOT WATER CONCRETE, AND ACI 306 SPECIFICATIONS FOR COLD WEATHER CONCRETE, WITH THE FOLLOWING ADDITIONAL REQUIREMENTS:

- CONCRETE SHALL DEVELOP THE FOLLOWING 28-DAY MINIMUM COMPRESSIVE STRENGTH:
FOUNDATIONS - 3,000 PSI
CAST-IN-PLACE WALLS - 4,500 PSI
FLOOR SLAB - 4,000 PSI
EXTERIOR SLABS, WALLS AND CURBS - 4,500 PSI
- ALL FOOTINGS SHALL BEAR ON UNDISTURBED SOIL OR ENGINEERED FILL.
- CHLORIDE-BASED ADMIXTURES ARE PROHIBITED IN ALL REINFORCED CONCRETE.
- REINFORCING STEEL SHALL CONFORM TO ASTM A615, A616, OR A617, GRADE 60.
- ALL CONTINUOUS REINFORCING STEEL THAT MEETS AT A CORNER SHALL BE TIED TOGETHER WITH A CORNER BAR THAT HAS SUFFICIENT LAP DISTANCE IN EACH DIRECTION.
- CONTINUOUS REINFORCING BARS LAP LENGTH SHALL BE A MINIMUM OF 48 BAR DIAMETERS UNLESS NOTED OTHERWISE.
- CONCRETE SLUMP SHALL BE A MAXIMUM OF 4" +/- 1" (ASTM C-143) AS DELIVERED IN THE FIELD. CONTRACTOR MAY USE CHEMICAL ADMIXTURES TO ATTAIN A MAXIMUM SLUMP OF 8" FOR WORKABILITY. NO WATER MAY BE ADDED TO THE CONCRETE MIX ON SITE UNLESS WATER IS WITHHELD AT THE BATCHING FACILITY. IF WATER IS WITHHELD AT THE BATCHING FACILITY IT SHOULD BE REFLECTED ON THE LOAD TICKET. THE TOTAL AMOUNT OF WATER IN THE MIX SHALL NOT EXCEED WHAT IS NOTED ON THE APPROVED MIXED. THIS SHALL BE NOTED IN THE SPECIAL INSPECTOR'S RECORDS.
- CONCRETE EXPOSED TO WEATHER, VEHICLES, AND/OR DEICING CHEMICALS SHALL BE AIR-ENTRAINED WITH 6% (+/-) 1.5% ENTRAINED AIR BY VOLUME AT POINT OF DISCHARGE. DO NOT ALLOW AIR CONTENT OF TROWELED FINISHED FLOORS TO EXCEED 3%.
- SUBMIT CONCRETE MIX PROPORTIONS PRIOR TO START OF WORK. DO NOT BEGIN CONCRETE PRODUCTION UNTIL MIXES HAVE BEEN REVIEWED AND ARE ACCEPTABLE TO THE ENGINEER.
- READY MIX CONCRETE SHALL COMPLY WITH REQUIREMENTS OF ASTM C94.
- CONCRETE WORK EXECUTION
 - CONSTRUCT FORMS TO CORRECT SIZE, SHAPE, ALIGNMENT, ELEVATION AND POSITION; AND TO SUPPORT VERTICAL AND LATERAL LOADS.
 - POSITION, SUPPORT, AND SECURE REINFORCEMENT AGAINST DISPLACEMENT. MINIMUM CONCRETE COVER FOR REINFORCEMENT SHALL BE, UNLESS NOTED OTHERWISE ON THE DRAWINGS:
CAST AGAINST AND EXPOSED TO EARTH.....3 INCHES
EXPOSED TO EARTH OR WEATHER.....2 INCHES
NOT EXPOSED TO WEATHER OR IN CONTACT WITH EARTH.....1 1/2 INCHES
 - PROVIDE CONTROL JOINTS IN SLABS-ON-GRADE AT NOT GREATER THAN 15 FEET ON CENTER IN EACH DIRECTION. SAW CUT CONTROL JOINTS MINIMUM 1/4" OF SLAB DEPTH, AS SOON AFTER SLAB FINISHING WITHOUT DISLODGING AGGREGATE.
 - STEEL TROWEL FINISH ALL INTERIOR CONCRETE SLABS, BROOM FINISH ALL EXTERIOR CONCRETE SLABS.
 - CURE ALL CONCRETE IN COMPLIANCE WITH ACI 301, USING A LIQUID TYPE MEMBRANE, NON-RESIDUAL, CURING COMPOUND COMPLYING WITH ASTM C309. ASSURE COMPATIBILITY WITH FINISH FLOOR COVERING.

SPECIAL INSPECTIONS

THE FOLLOWING ITEMS REQUIRE SPECIAL INSPECTION IN ACCORDANCE WITH CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE.

- CONCRETE GROUT DESIGN MIX (PERIODIC)
- PLACING OF CONCRETE AND REINFORCING STEEL (CONTINUOUS OF CONCRETE SAMPLING / PERIODIC OF REINFORCING)
- IN-SITU SOILS, EXCAVATIONS, FILLING & COMPACTION (PERIODIC)

THE CONTRACTOR SHALL REQUEST SPECIAL INSPECTION OF THE ITEMS LISTED ABOVE PRIOR TO THOSE ITEMS BECOMING INACCESSIBLE AND UNOBSERVABLE DUE TO PROGRESSION OF THE WORK.

DESIGN DATA

2021 INTERNATIONAL BUILDING CODE / ASCE 7-16

NEW STEAM MANHOLE LOAD DATA

LIVE LOAD	250
CONCRETE LID	100
MECHANICAL ALLOWANCE	15
TOTAL TO LID	365 lbs/sqft

WALL BELOW GRADE SOIL PARAMETERS

BEARING CAPACITY	1500 PSF (ASSUMED)
ACTIVE AT-REST EARTH PRESSURES (GRANULAR)	60 PCF

EARTHQUAKE DESIGN DATA

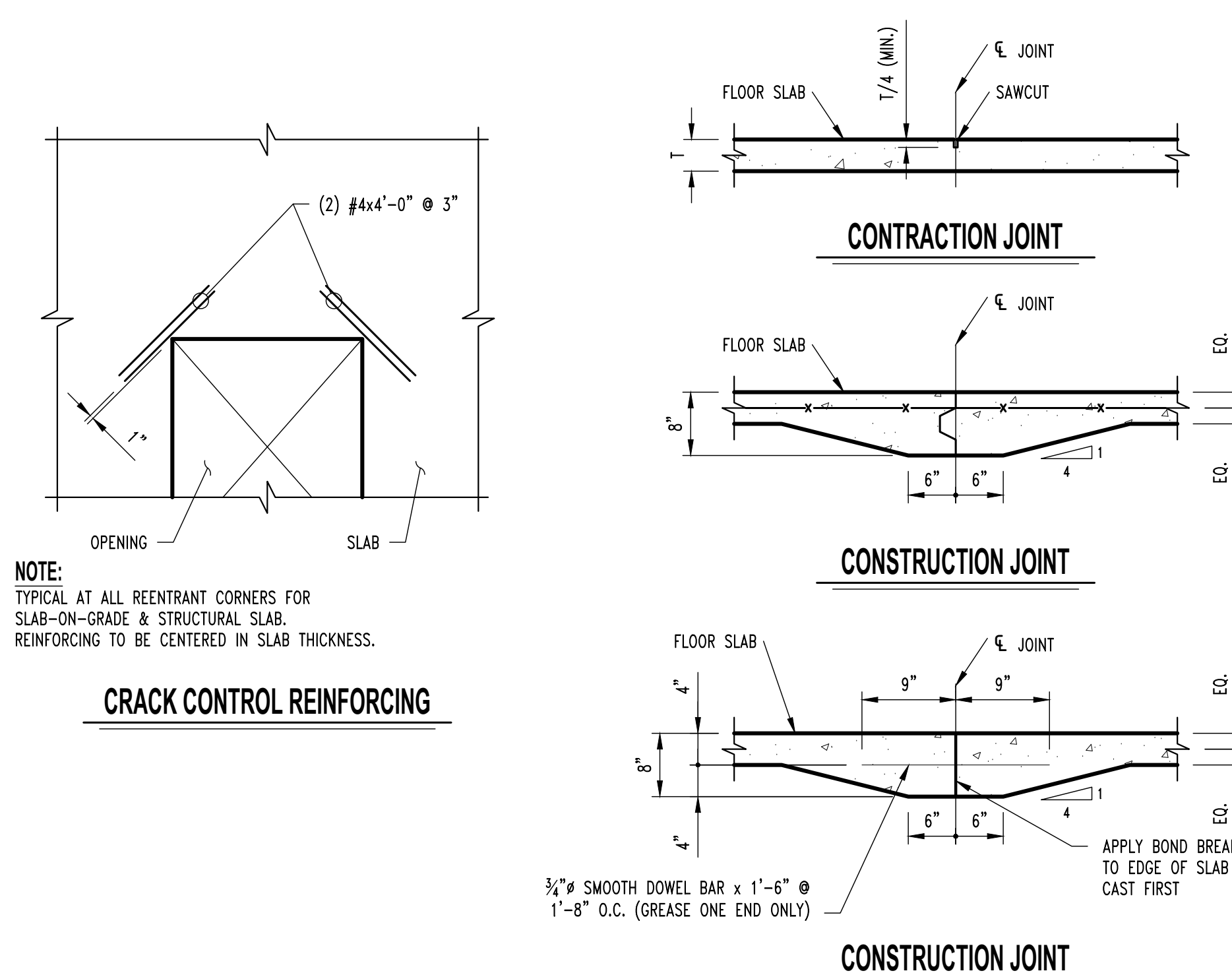
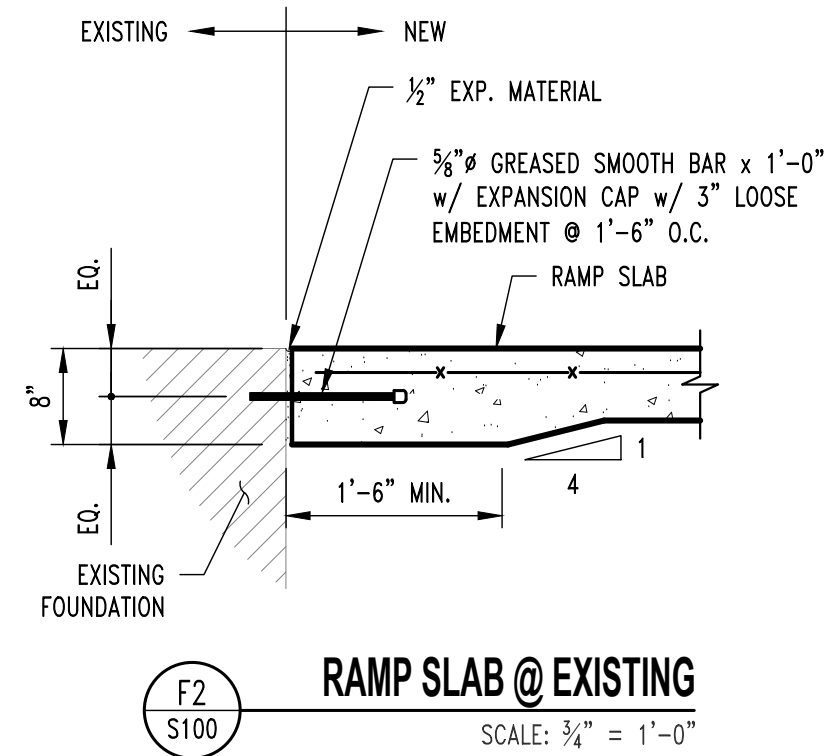
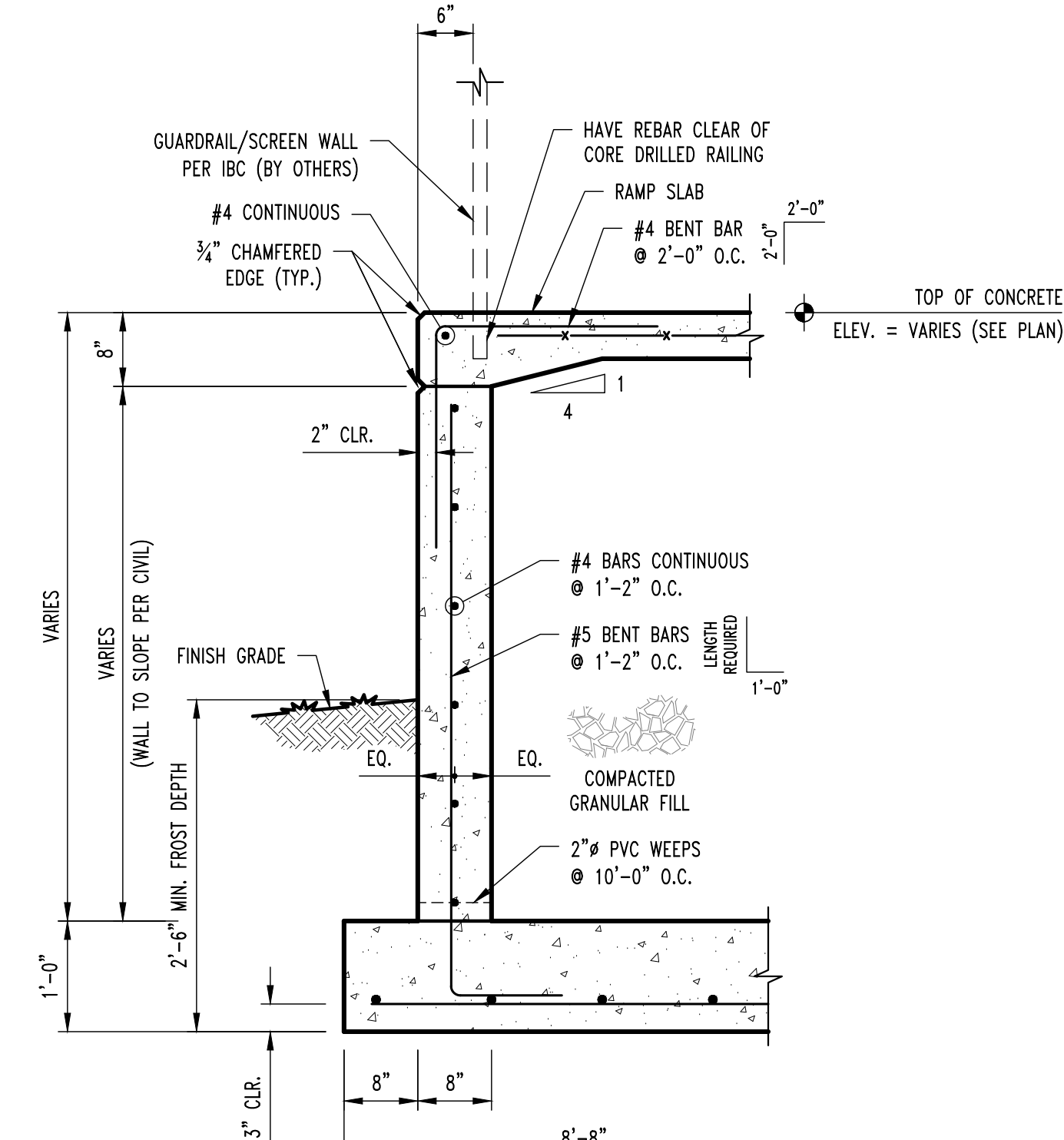
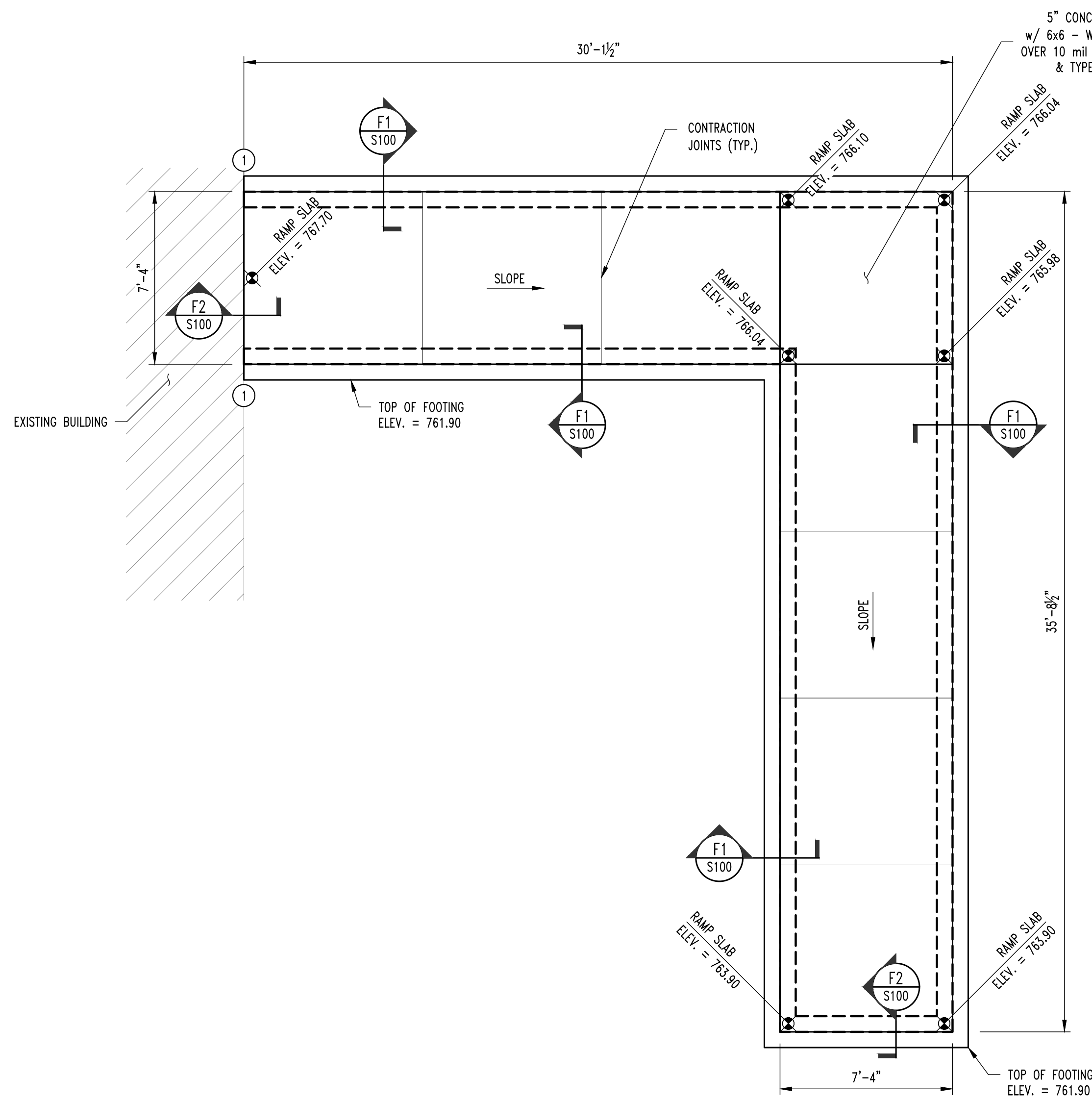
RISK CATEGORY	IV
I _e	1.5
S _s	0.161
S ₁	0.094
SITE CLASS	C
S _{DS}	0.14
S _{D1}	0.094
SEISMIC DESIGN CATEGORY	C

BASIC SEISMIC-FORCE-RESISTING SYSTEM -

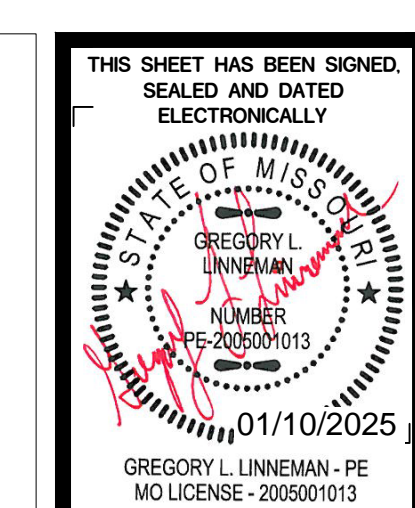
ORDINARY REINFORCED CONCRETE SHEAR WALLS

R	4.0
Ω _e	2.5
C _s	4.0

DESIGN BASE SHEAR
EQUIVALENT LATERAL FORCE PROCEDURE
V = 0.054W



- NOTES**
- DOWEL NEW TO EXISTING w/ 4" EPOXY EMBEDMENT @ FOOTING & WALL.
 - REINTRANT CORNER BARS, REFER TO TYPICAL CRACK CONTROL REINFORCING DETAIL S210.



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ENGINEERING CONSULTANTS

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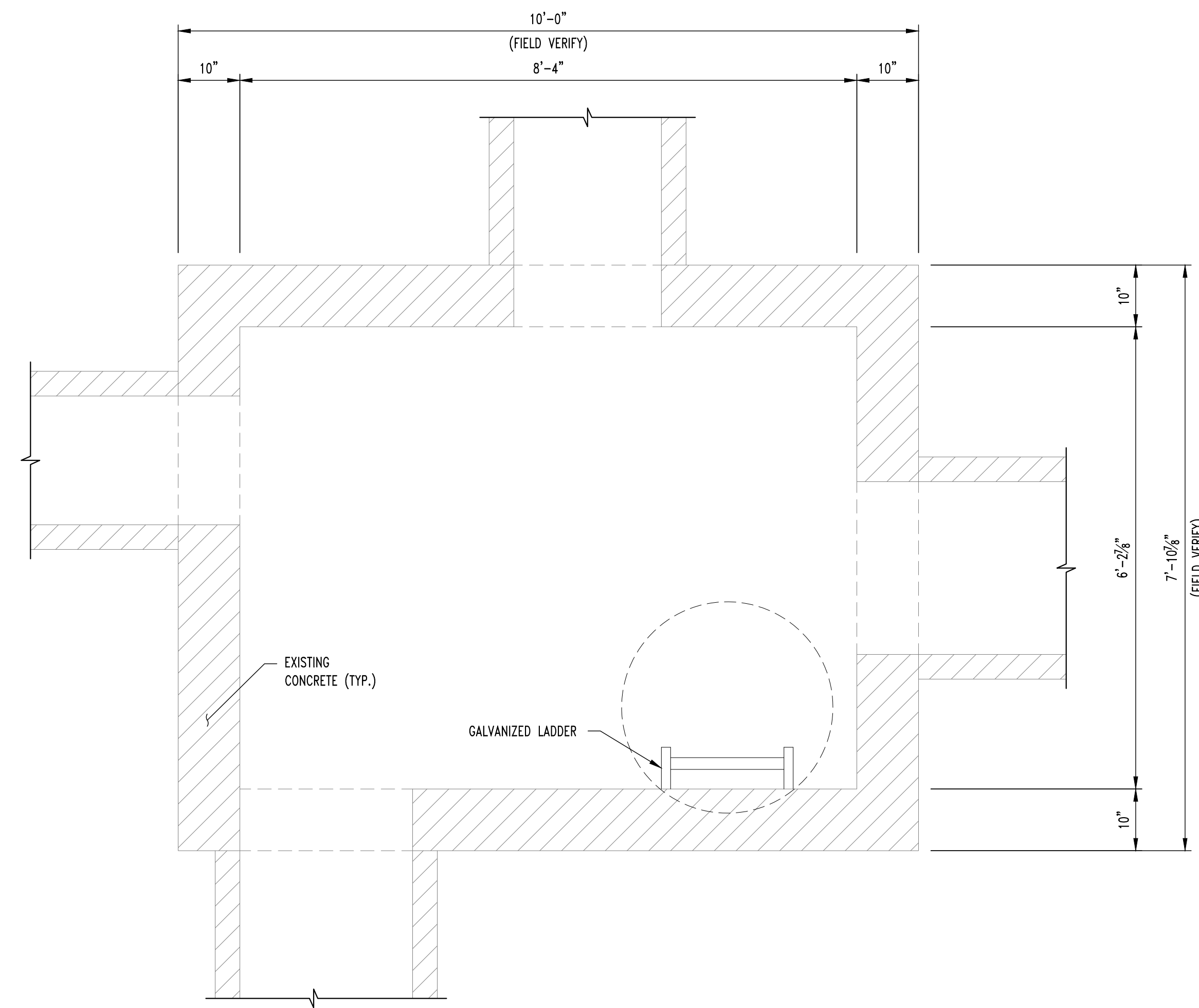
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RAMP FOUNDATION PLAN & DETAILS

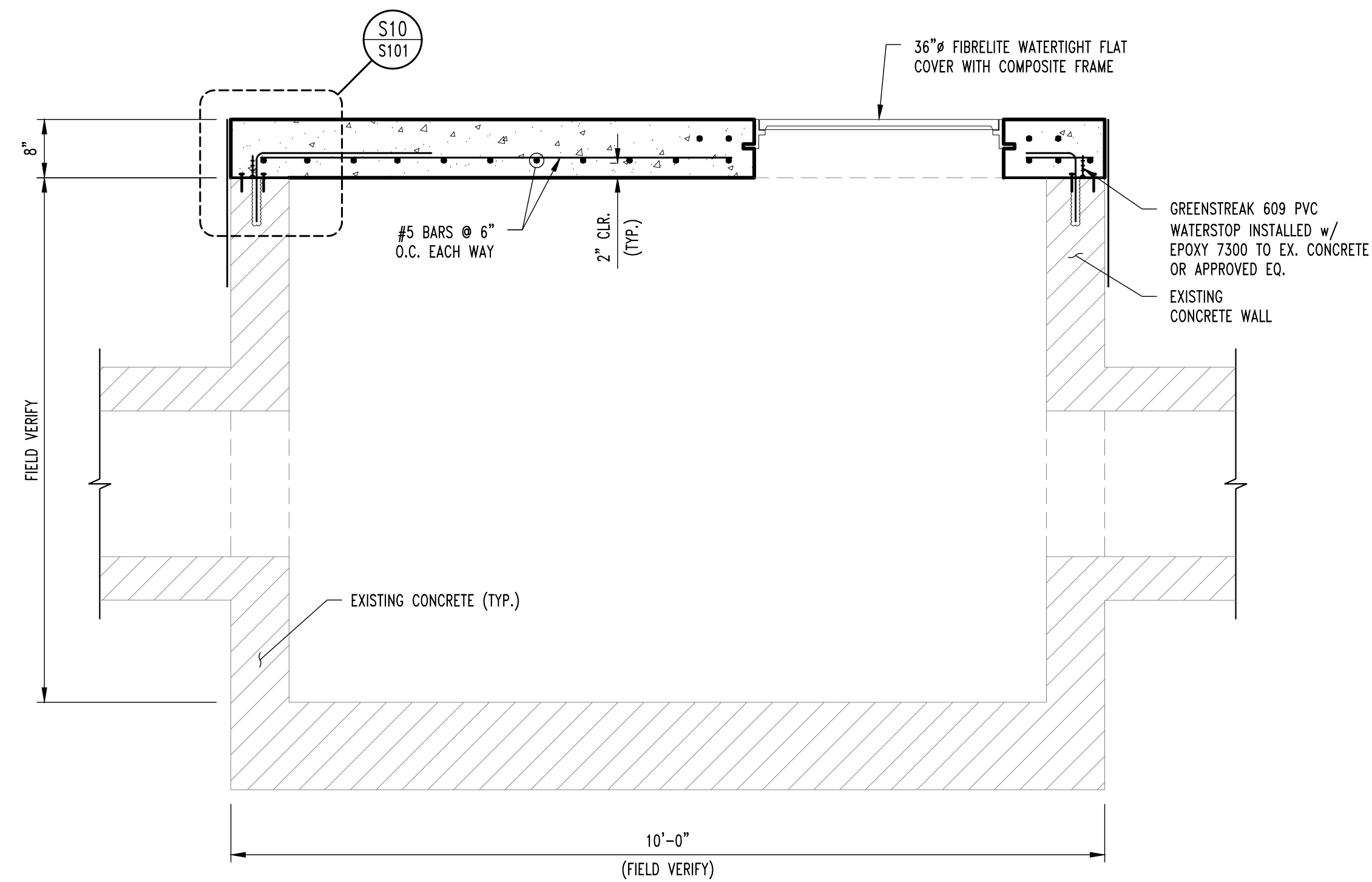
UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP230201
CONSULTANT
PROJECT NUMBER
220449
SHEET
S100

TYPICAL NOTES

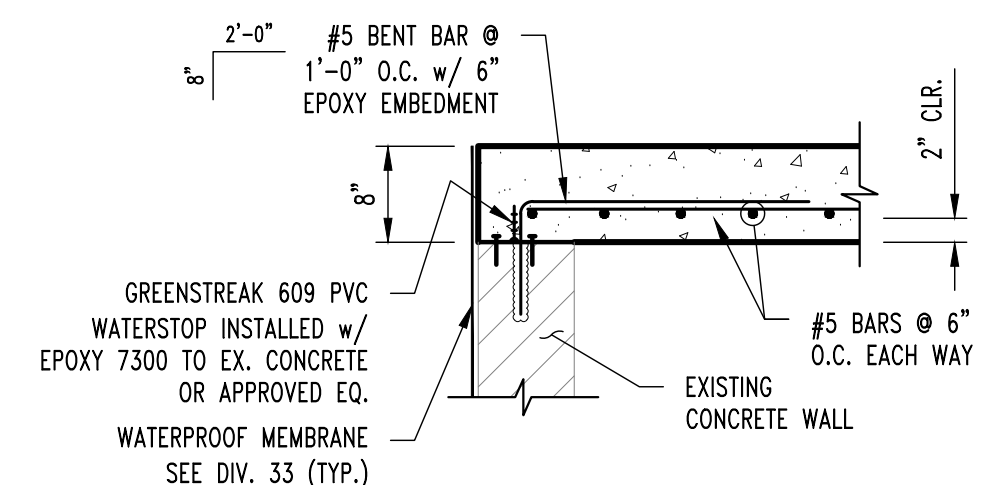
- ① CONCRETE MIX IS STEAM TUNNEL CONCRETE w/ INTEGRAL WATERPROOFING.
- ② REBAR REQUIRED IS MMFX STEEL, ASTM A1035.



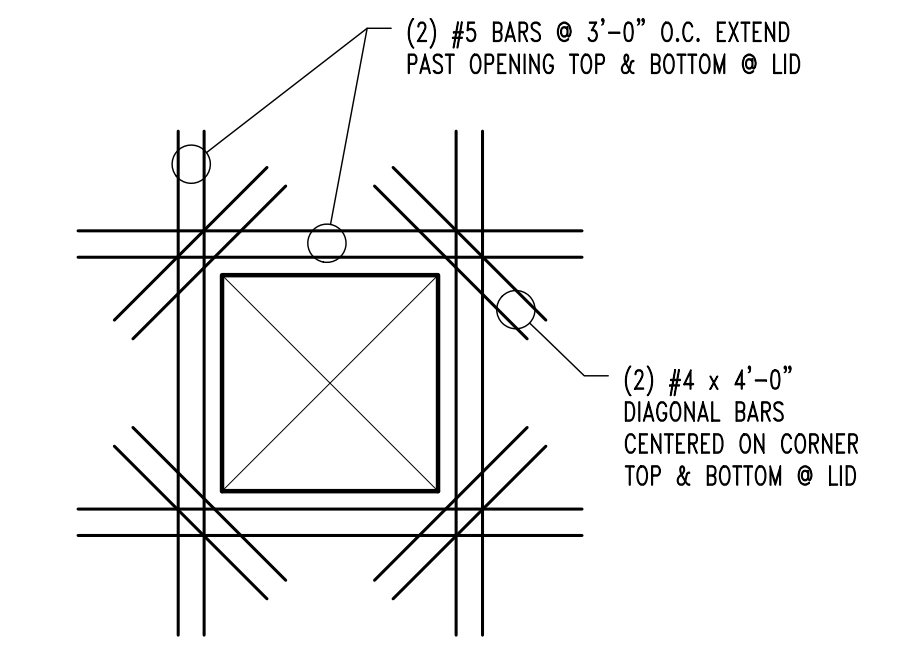
1
S101
SMH-101 PLAN
SCALE: 3/8" = 1'-0"
NOTE:
1. LID DESIGN FOR 250 PSF LIVE LOADING.
2. ADD XYPEX WATERPROOFING ADMIXTURE THIS CONCRETE LID.



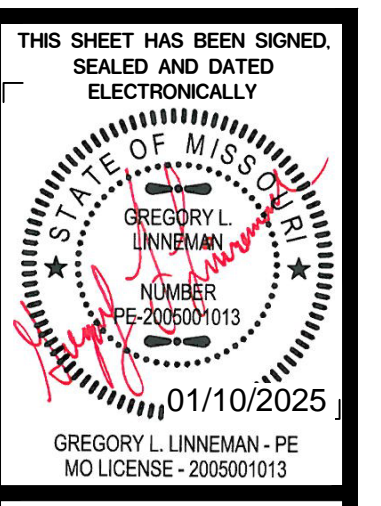
2
S101
ELEVATION
SCALE: 3/8" = 1'-0"



S101
DETAIL
SCALE: 3/8" = 1'-0"



TYPICAL LID OPENING REINFORCEMENT

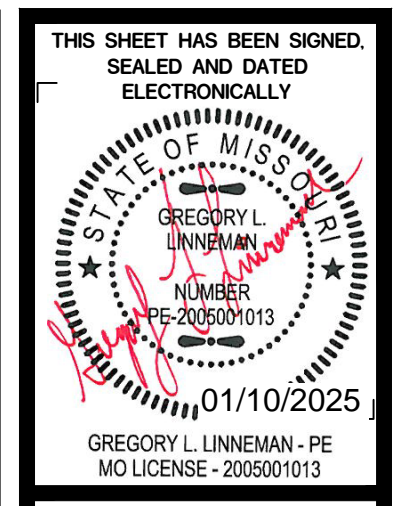


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		DRAWN BY: RCA

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SMH-101 PLAN & DETAILS

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S101



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TYPICAL REPAIR DETAILS & NOTES

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S110

TYPICAL WATERPROOFING NOTES

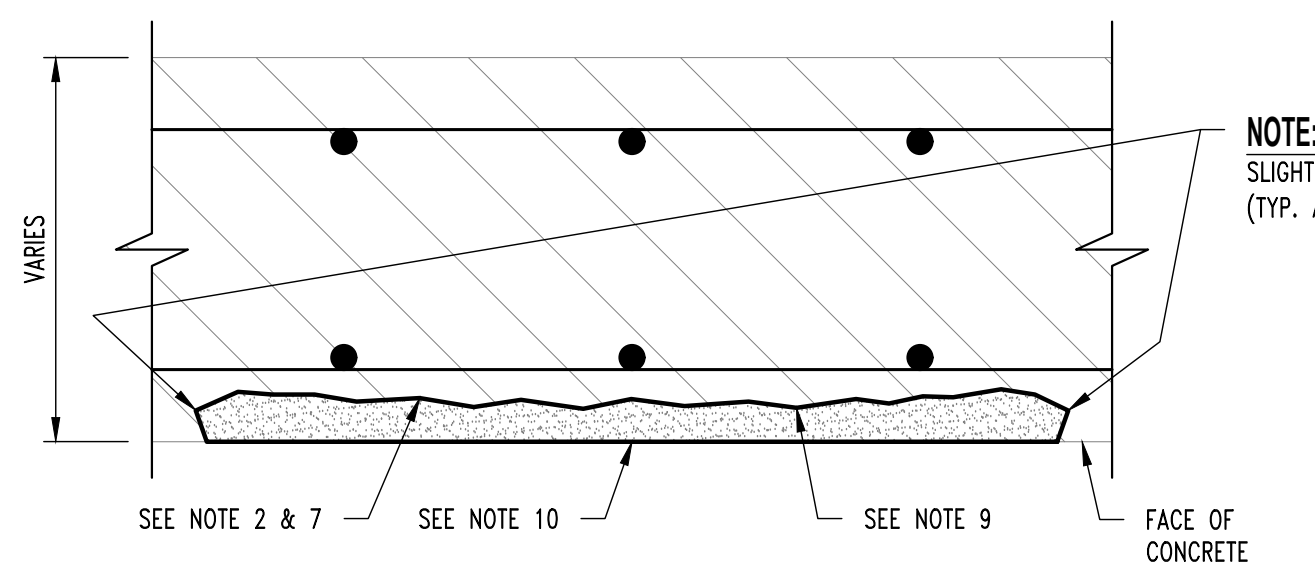
- OVERLAP HOT AND COLD APPLIED MEMBRANES PER MANUFACTURER'S REQUIREMENTS.
- CONTRACTOR SHALL PROTECT UNDER SLAB WATERPROOFING FROM HOT APPLIED WATERPROOFING.
- PREPARE ALL JOINTS IN ACCORDANCE w/ WATERPROOFING MANUFACTURER'S INSTRUCTIONS & DETAILS.
- CONTRACTOR SHALL PROPERLY PREPARE EXISTING CONCRETE SUBSTRATE & EXISTING WATERPROOFING TO PROPERLY INTERFACE w/ NEW WATERPROOFING SYSTEMS TO OBTAIN WATERPROOF JOINT. PROVIDE HOT TO EXISTING WATERPROOFING BARRIER AS REQUIRED. BUTT LIDS TIGHTLY TOGETHER @ PRE-CAST LIDS w/ 1/4" SHIM PLATE BETWEEN. REMOVE SHIM PLATES AFTER LIDS ARE IN FINAL POSITION & SEAL.
- ALL SEALANTS SHALL BE COMPATIBLE w/ WATERPROOFING SYSTEM.
- PREPARE ALL JOINTS IN ACCORDANCE w/ WATERPROOFING MANUFACTURER'S INSTRUCTIONS & DETAILS.

GENERAL NOTES

- ALL CONCRETE, REINFORCING, AND WATERPROOFING SHALL MEET THE SPECIFICATIONS IN DIVISION 33.
- WATERPROOFING SHOP DRAWINGS SHALL BE PROVIDED PER THE SPECIFICATIONS IN DIVISION 33.
- ALL UTILITIES IN AREA OF MANHOLE MAY BE ACTIVE DURING THE DURATION OF THE PROJECT INCLUDING THE STEAMLINES INSIDE THE MANHOLE. PIPING THAT WILL REMAIN NEEDS TO BE PROTECTED AS TO NOT DAMAGE DURING CONSTRUCTION. ANY DAMAGED MATERIALS WILL BE REPLACED AT THE CONTRACTOR'S EXPENSE. CONTRACTOR IS TO LIMIT WATER ENTRY INTO STEAM SYSTEM DURING CONSTRUCTION.
- ALL BACKFILL SHALL BE MODOT TYPE 1 OR 5 AND SHALL HAVE COMPACTION TESTS COMPLETED IN 8 INCH LIFTS PER SPECIFICATION.
- ALL WATERSTOPS SHALL BE SECURELY FASTENED INTO PLACE AND FULLY INSPECTED BY THE OWNER. CONCRETE CANNOT BE CAST AGAINST WATERSTOPS UNTIL APPROVED BY THE OWNER. OWNER SHALL RECEIVE 24 HOUR NOTICE OF INSPECTIONS BEING REQUIRED.
- ALL CONCRETE WATERPROOFING SHALL INSPECTED BY THE OWNER PRIOR TO PROCEEDING TO NEXT STEP OF INSTALLATION. OWNER SHALL RECEIVE 24 HOUR NOTICE OF INSPECTIONS BEING REQUIRED. THESE INSPECTIONS FOR APPROVAL INCLUDE:
 - SUBSTRATE CONDITIONS READY FOR WATERPROOFING
 - CRACK AND HOLE SURFACE PREPARATIONS COMPLETED
 - FLASHING INSTALLATION COMPLETE
 - MEMBRANE INSTALLATION COMPLETE
 - PROTECTION AND DRAINAGE INSTALLATION COMPLETE

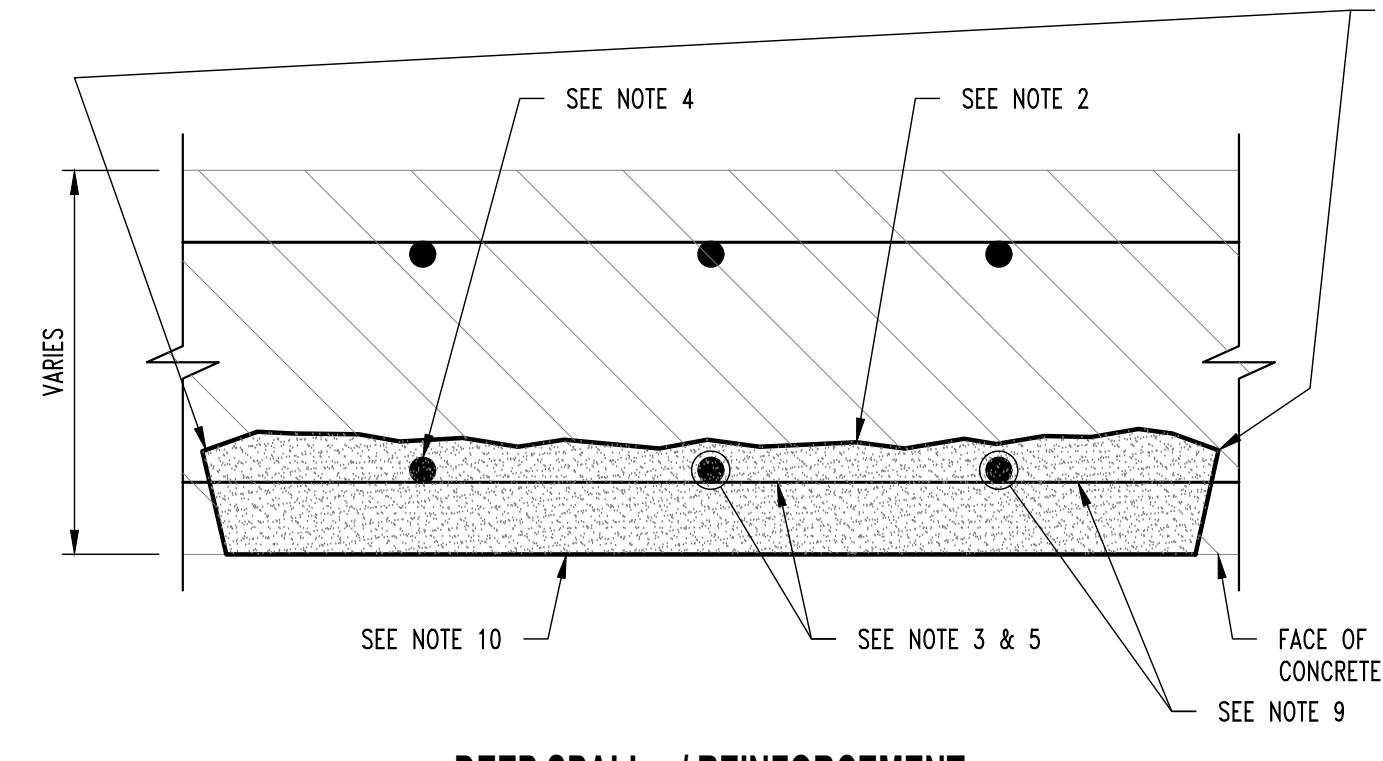
CONCRETE REPAIR NOTES

- PRIOR TO PERFORMING ANY CONCRETE REPAIRS, CONTRACTOR SHALL EXAMINE THE ENTIRE CONCRETE SURFACE BY SOUNDING TO DETECT ANY DEFICIENCIES NOT SHOWN ON THE CONTRACT DOCUMENTS. IF DEFICIENCIES ARE DETECTED, MARK OUTLINE ON CONCRETE SURFACE AND NOTIFY OWNER'S REPRESENTATIVE. PROVIDE OWNER'S REPRESENTATIVE WITH APPROXIMATE SIZE AND LOCATION OF EACH DEFICIENCY NOTED.
- REMOVE ALL LOOSE AND DETERIORATED CONCRETE. CHIP OUT AND PATCH AREA 1/2" MIN. BEYOND SPALLED SURFACE. AT BOUNDARIES OF DETERIORATED CONCRETE, SAWCUT BOUNDARY TO A MINIMUM DEPTH OF 3/4". DO NOT FEATHER EDGES.
- CARE SHOULD BE EXERCISED NOT TO DAMAGE EXISTING REINFORCING STEEL DURING CONCRETE REMOVAL. CONCRETE REMOVAL SHALL EXTEND TO WHERE BAR IS WELL BONDED TO SURROUNDING SOUND CONCRETE. CARE SHALL BE EXERCISED NOT TO DAMAGE THE BAR'S BOND TO SURROUNDING CONCRETE. IF BOND BETWEEN BAR AND CONCRETE IS BROKEN, UNDERCUTTING OF THE BAR IS REQUIRED AS SPECIFIED IN ITEM 4 BELOW.
- IF HALF OF THE THICKNESS OF THE REINFORCEMENT BAR OR MORE IS EXPOSED PROVIDE A MINIMUM OF 1/2" CLEARANCE BETWEEN EXPOSED REINFORCEMENT AND SURROUNDING CONCRETE FOR HAND APPLIED REPAIR MATERIALS AND A MINIMUM OF 1" CLEARANCE FOR SPRAY APPLIED REPAIR MATERIALS.
- MECHANICALLY CLEAN STEEL BY SANDBLASTING OR WIRE BRUSH TO WHITE METAL CONDITION TO REMOVE CORROSION. AFTER CLEANING REINFORCING STEEL, MEASURE DIAMETER AT NARROWEST POINT. IF SECTION LOSS IS GREATER THAN 25% (SEE "REINFORCING BAR DIAMETER TABLE" ON THIS SHEET) ADD NEW REINFORCING BAR MATCHING SIZE OF EXISTING. MAINTAIN A MINIMUM OF 1/2" CONCRETE COVER AT ALL NEW AND EXISTING REINFORCEMENT, ANY REINFORCEMENT TO BE DRILLED AND GROUDED INTO EXISTING CONCRETE SHALL USE HILTI HIT HY 200 MAX EPOXY ADHESIVE (OR APPROVED EQUAL).
- SCARIFY CONCRETE SURFACE TO OBTAIN CONCRETE SURFACE PROFILE ROUGHENED.
- MINIMUM DEPTH OF PATCH TO BE 3/8".
- SUBSTRATE SHOULD BE SATURATED SURFACE DRY (SSD) WITH NO STANDING WATER DURING APPLICATION.
- APPLY CONCRETE PRIMER TO SUBSTRATE PER MANUFACTURER'S SPECIFICATIONS. APPLY TWO COATS OF ANTI-CORROSION COATING PER MANUFACTURER'S SPECIFICATIONS TO ALL EXPOSED REINFORCEMENT ALLOWING TO PROPERLY DRY BETWEEN COATS. SIKAFERROGARD 901 OR APPROVED EQUAL.
- WHILE CONCRETE PRIMER IS STILL WET, APPLY PATCH MATERIAL PER MANUFACTURER'S SPECIFICATIONS. FOR APPLICATIONS GREATER THAN 1" IN DEPTH, APPLY PATCH MATERIAL IN LIFTS. SCORE THE TOP SURFACE OF EACH LIFT AND ALLOW EACH LIFT TO REACH FINAL SET THEN REPEAT FROM STEP 8.
- PROVIDE MECHANICAL SPLICE CAPABLE OF DEVELOPING 125% F_y. MAINTAIN A MINIMUM OF 1/2" CONCRETE COVER AT ALL NEW AND EXISTING REINFORCEMENT.
- CLEAN CRACK SURFACES AND REMOVE ANY FOREIGN MATTER AND DEPOSITS.
- INSTALL POLYMER MODIFIED CEMENTITIOUS PATCHING MATERIAL PER MANUFACTURER'S SPECIFICATION AND TOOL SURFACE TO MATCH SURROUNDING SURFACE. SIKATOP-123 OR APPROVED EQUAL.
- LID REPAIRS REQUIRE SHORING TO BE INSTALLED PRIOR TO DAMAGED CONCRETE BEING REMOVED. SHORING SHALL PROVIDE ADEQUATE SUPPORT TO STRUCTURE UNTIL PATCH IS INSTALLED AND CURED.



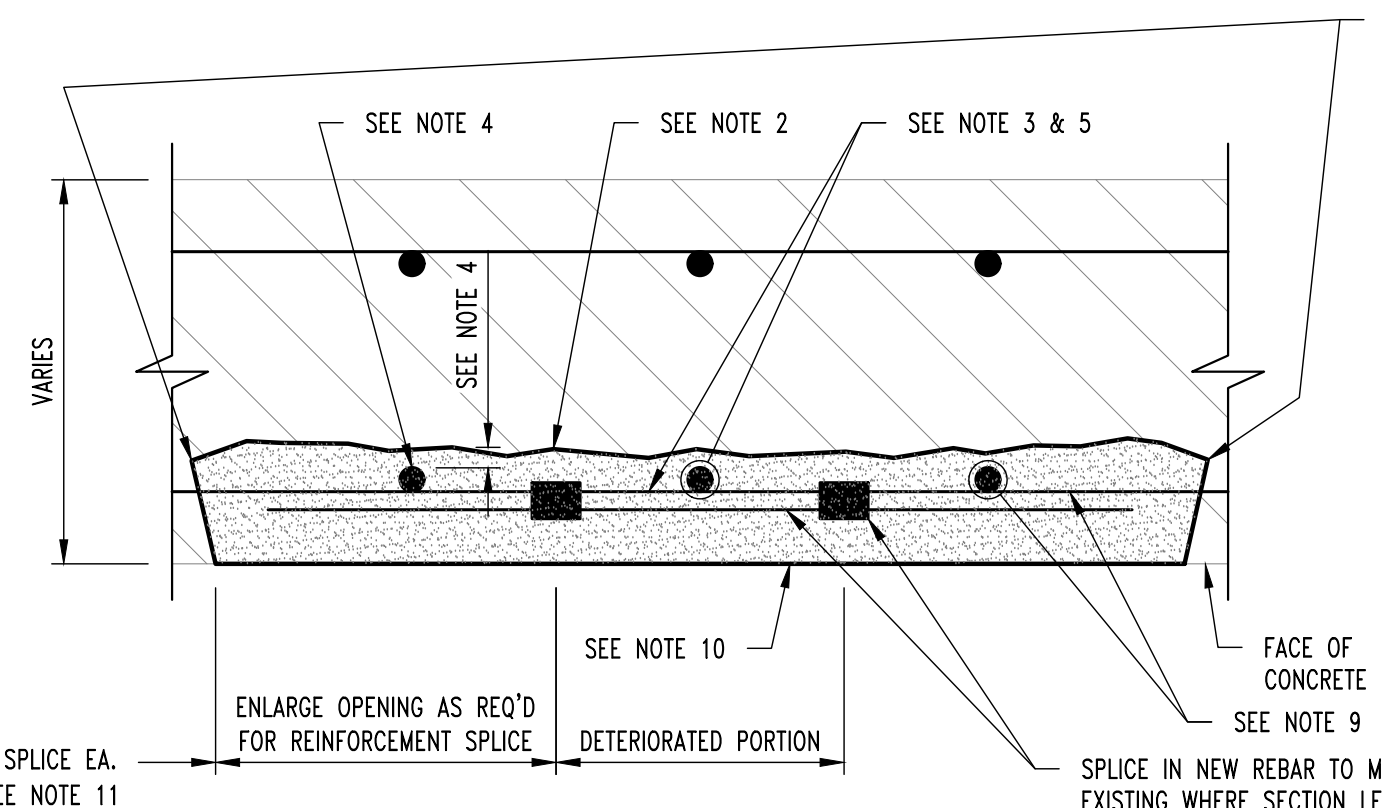
SURFACE SPALL REPAIR
REPAIR #1

NOTE:
DETAIL APPLIES TO SURFACE SPALLS WITH NO REINFORCEMENT EXPOSED.



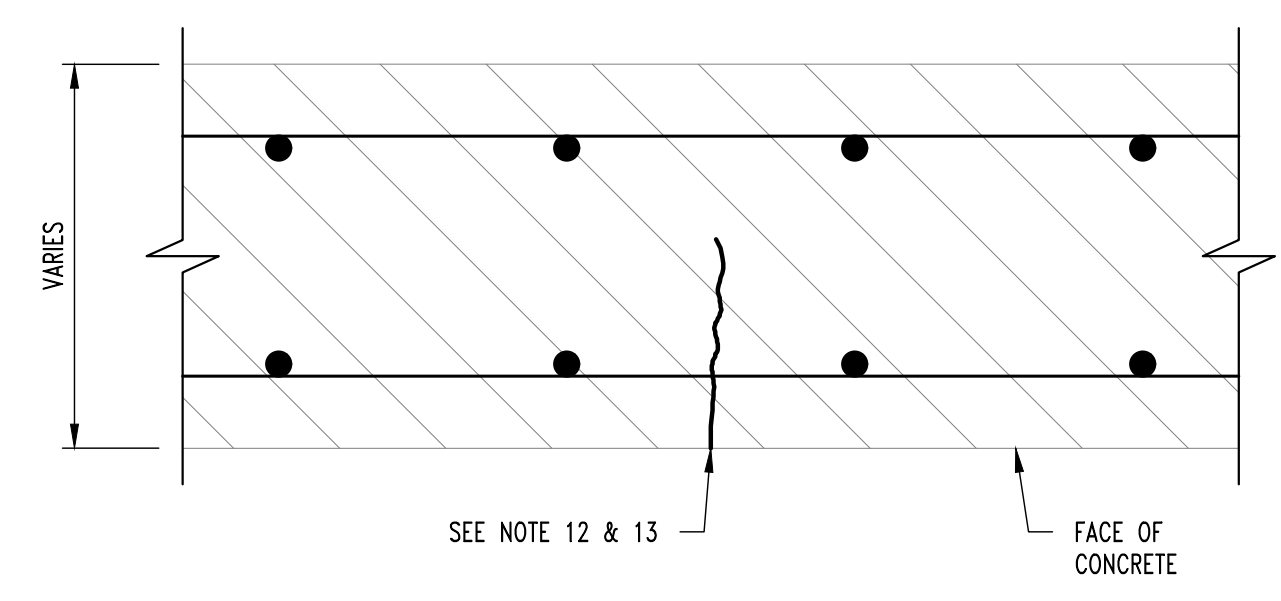
DEEP SPALL w/ REINFORCEMENT
SECTION LOSS LESS THAN OR EQUAL TO 25%

NOTE:
DETAIL APPLIES TO SURFACE SPALLS WITH REINFORCEMENT EXPOSED.



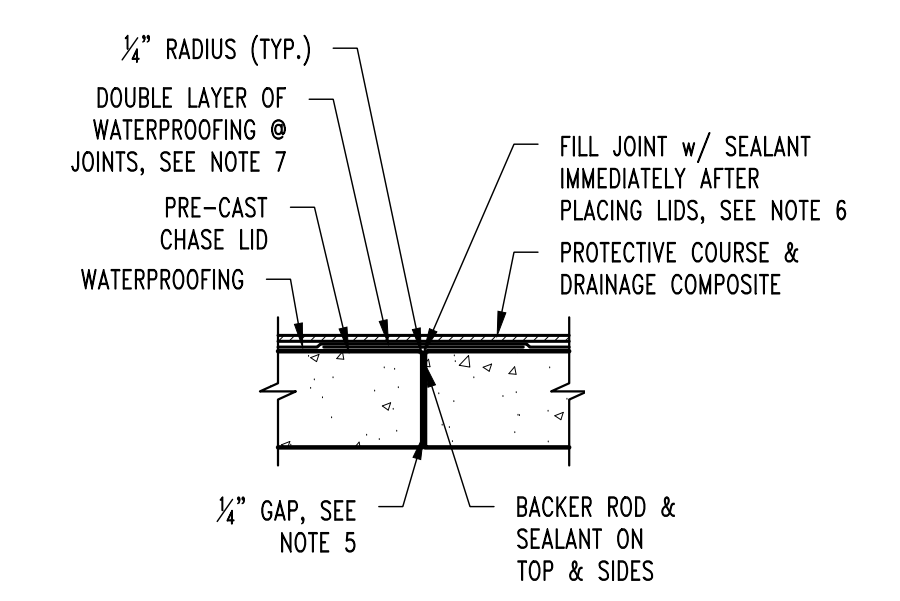
DEEP SPALL w/ REINFORCEMENT
SECTION LOSS GREATER THAN OR EQUAL TO 25%

NOTE:
DETAIL APPLIES TO SURFACE SPALLS WITH REINFORCEMENT EXPOSED.

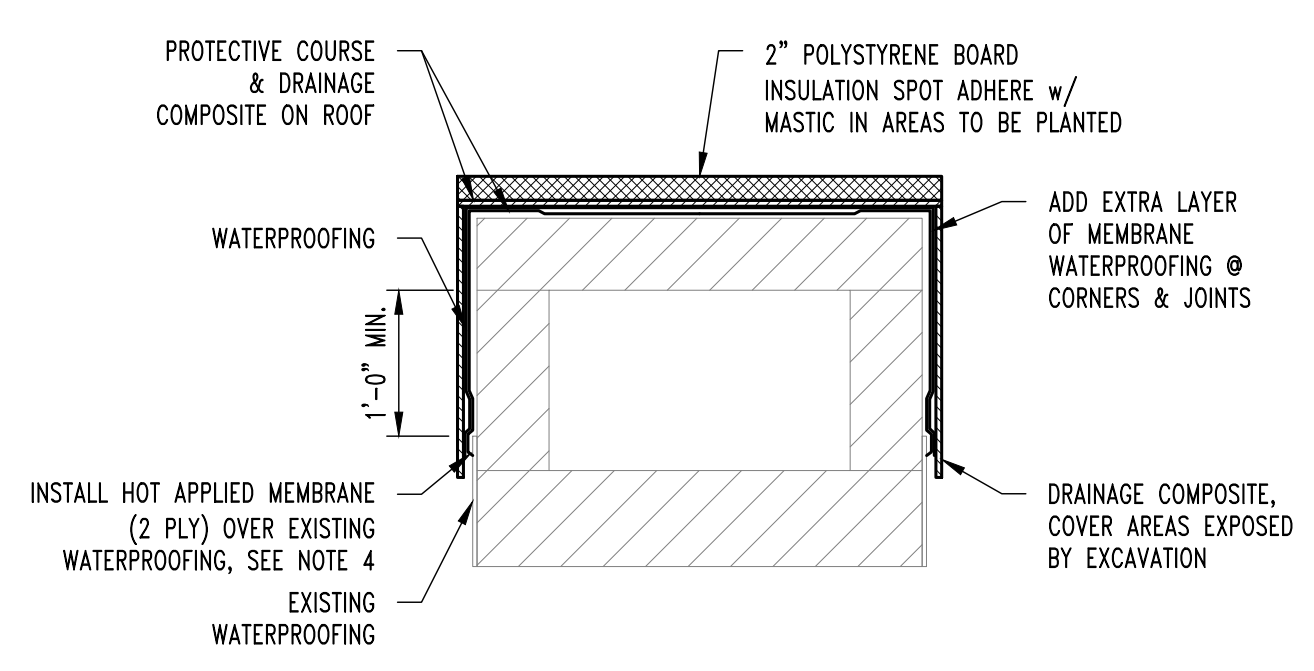


CRACK REPAIR
REPAIR #4

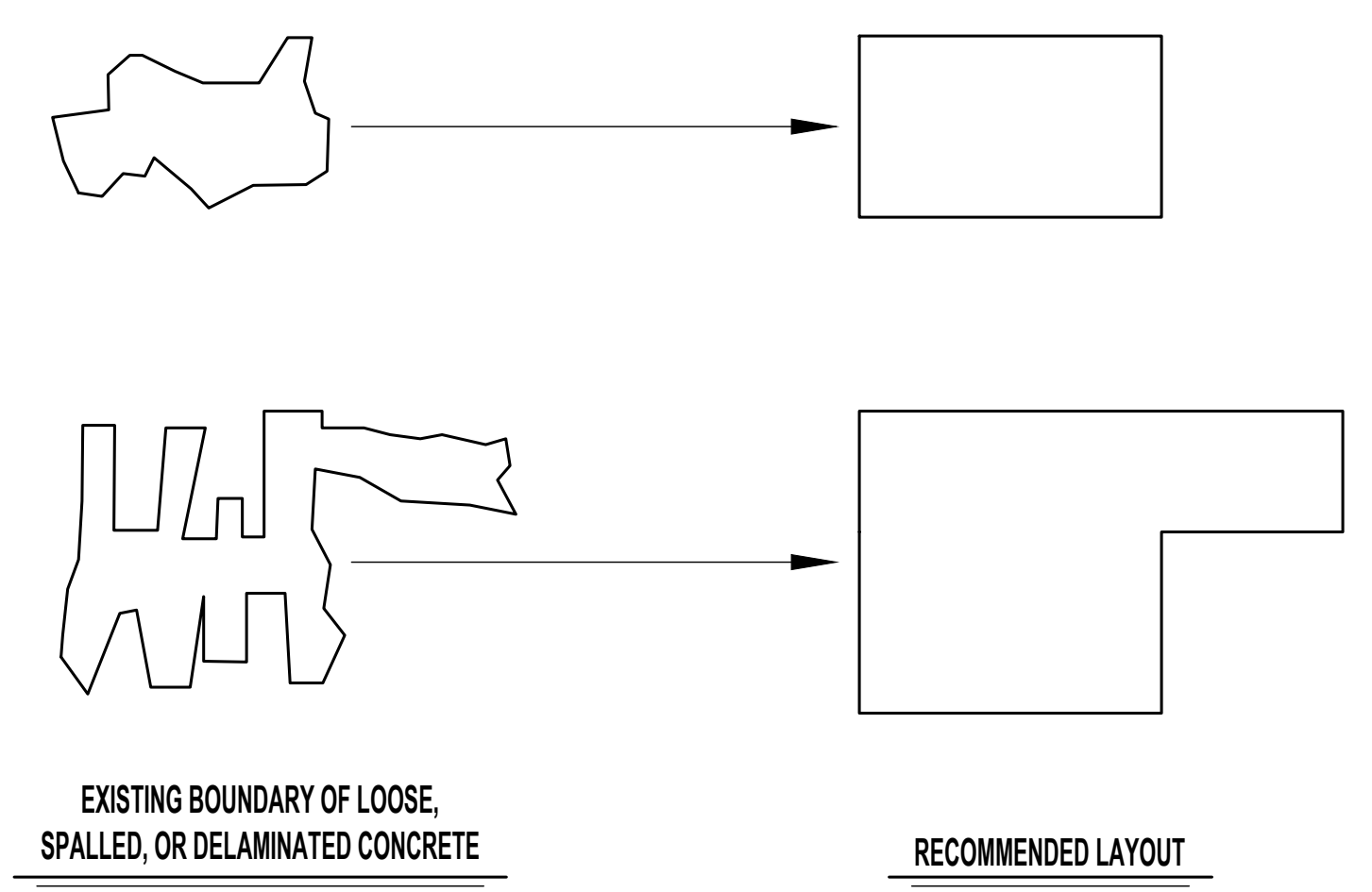
NOTE:
DETAIL APPLIES TO CRACKS LARGER THAN 0.03".



BELOW GRADE STEAM CHASE LID JOINT

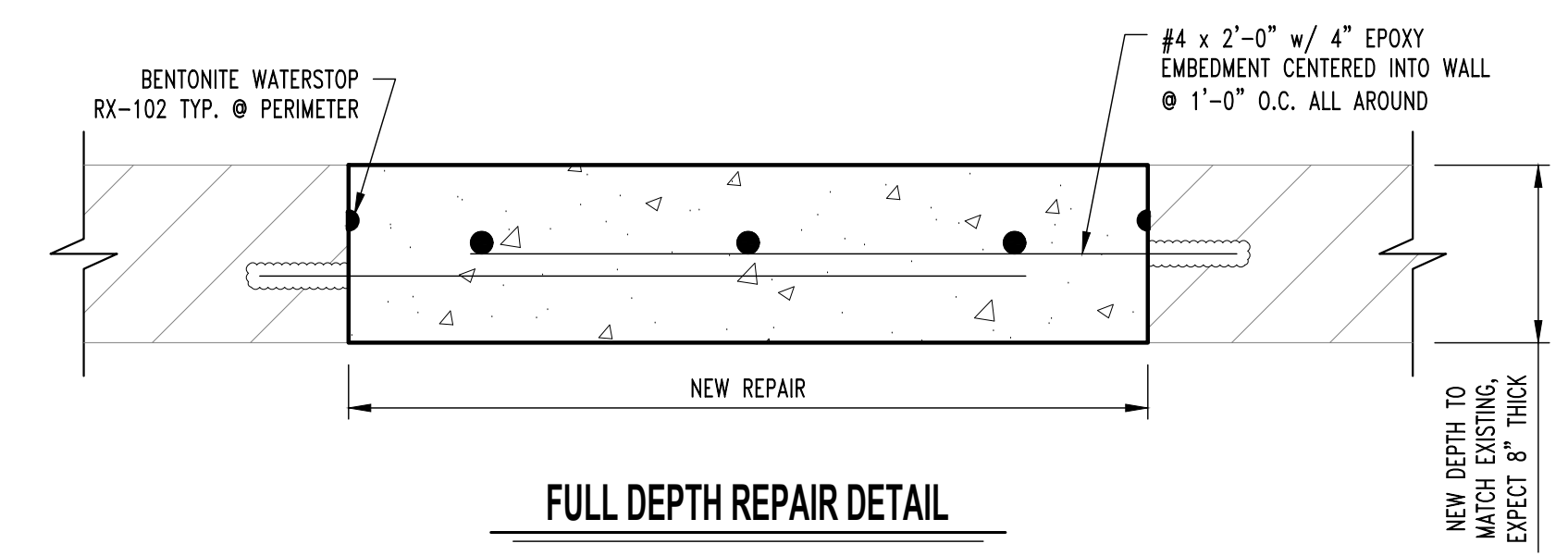


TYP. EXISTING STEAM CHASE WATERPROOFING DETAIL



DETERIORATED CONCRETE SURFACE REPAIR

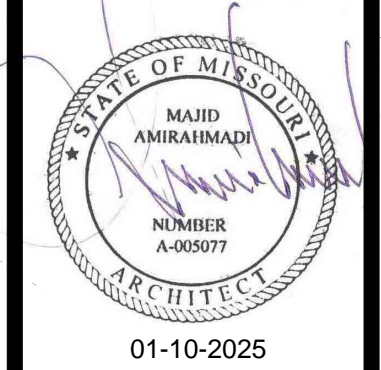
NOTE:
1. REPAIR CONFIGURATIONS TO BE KEPT AS SIMPLE AS POSSIBLE.
2. CORNERS MUST BE SQUARED TO AVOID FEATHERED EDGES.



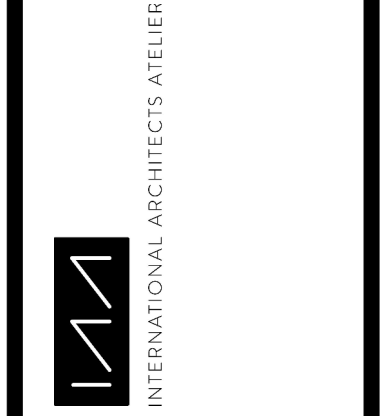
FULL DEPTH REPAIR DETAIL

BAR SIZE	NOMINAL DIAMETER (IN.)	MINIMUM ALLOWABLE DIAMETER (IN.)
#3	0.375	0.325
#4	0.500	0.433
#5	0.625	0.541
#6	0.750	0.650
#7	0.875	0.758
#8	1.000	0.866
#9	1.128	0.977
#10	1.270	1.100

REINFORCING BAR DIAMETER TABLE



MAJID AMIRAHMADI - ARCHITECT
MO# A-000977



ISSUE FOR BID
01/10/25
DRAWN BY: JL
CHECKED BY: MA

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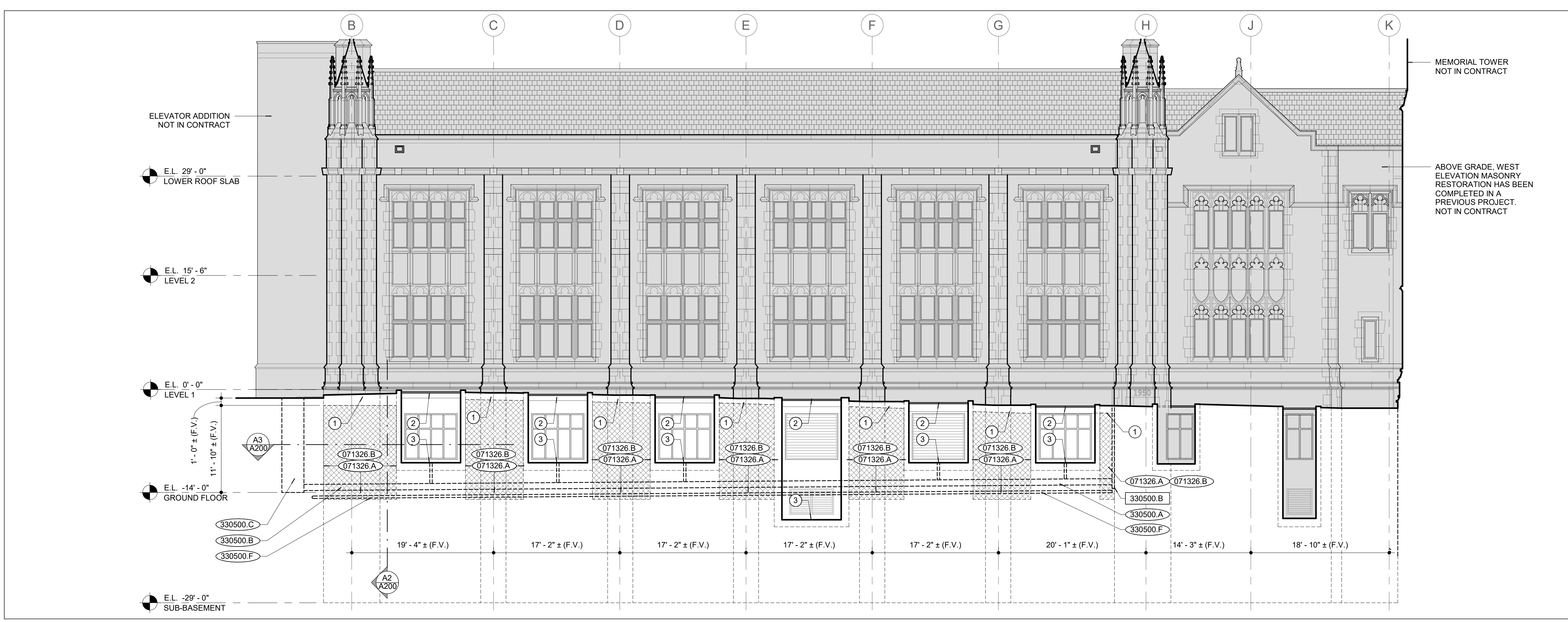


UNIVERSITY OF MISSOURI - COLUMBIA
GENERAL SITE - REPLACE UTILITIES
NEAR MEMORIAL UNION
COLUMBIA, BOONE COUNTY, MISSOURI 65203
EXTERIOR ELEVATIONS

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP230201
CONSULTANT
PROJECT NUMBER
241201

SHEET
A100

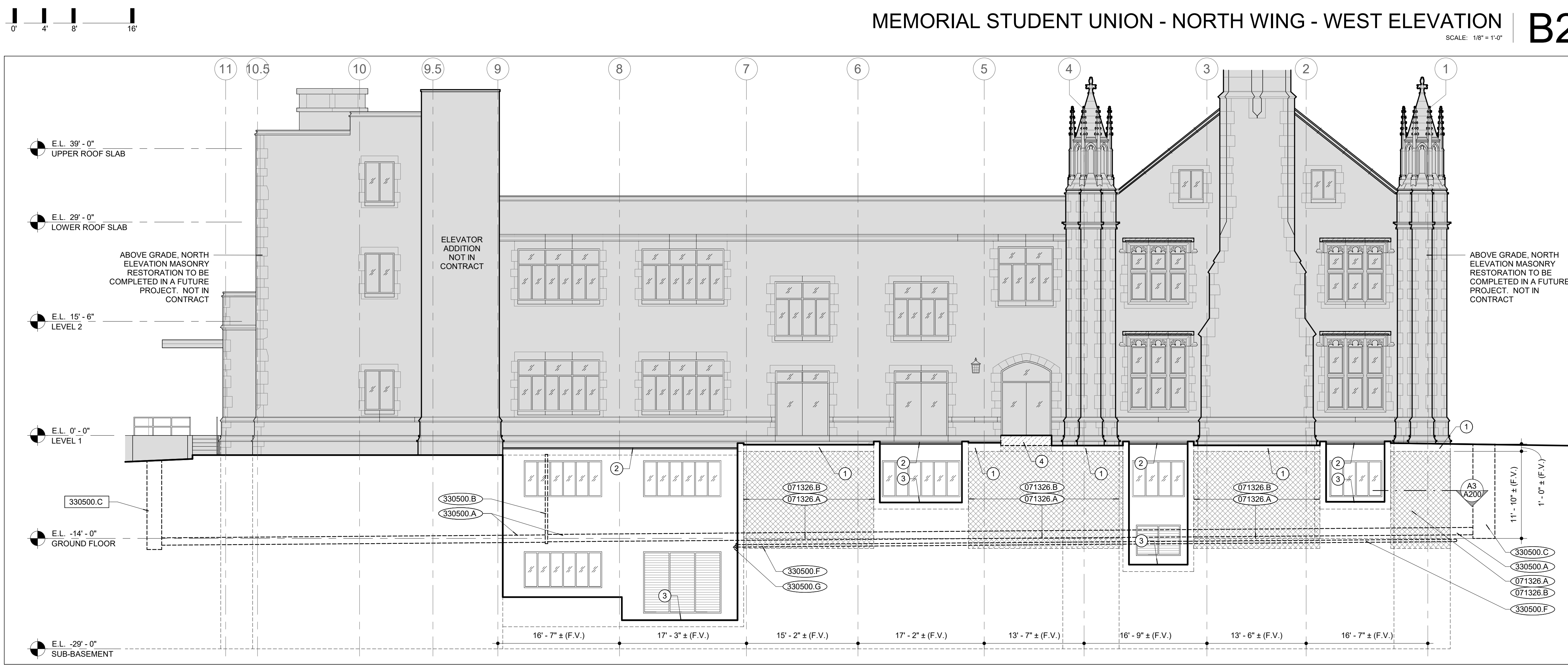
- GENERAL RESTORATION NOTES:**
- PROTECT ALL VEGETATION, GROUND COVER, TREES AND WINDOWS DURING CONSTRUCTION. RE: CIVIL FOR ADDITIONAL INFORMATION ON SITE ELEMENTS.
 - CONTRACTOR SHALL PROTECT ALL LIGHT FIXTURES, SECURITY CAMERAS, HOSE BIBBS, AND OTHER EXISTING ITEMS WITHIN LIMITS OF CONSTRUCTION TO REMAIN. ANY DAMAGED ITEMS SHALL BE REPAIRED OR REPLACED AT CONTRACTOR'S EXPENSE.
 - CONTRACTOR SHALL PROTECT ALL OPEN, RAKED JOINTS DURING ADVERSE WEATHER CONDITIONS IN WHICH RAINWATER COULD INFILTRATE THE JOINT. RAKED JOINTS MUST BE PROTECTED WITH BACKER ROD AND PLASTIC COVER.
 - TYPICAL REPOINTING:** CONTRACTOR SHALL 100% RAKE AND RE-POINT ALL UNCOVERED, BELOW GRADE STONE MASONRY JOINTS, UNLESS OTHERWISE NOTED, TO A MINIMUM OF 1" DEPTH OR 1.5 TIMES THE WIDTH OF THE MORTAR JOINT, WHICHEVER IS GREATER. FILL ANY VOIDS AND CAVITIES PRIOR TO TUCK POINTING THE JOINTS WITH HISTORIC MORTAR MIX.
 - REPOINTING AT VOIDS ≤ 2":** AT LOCATIONS WHERE VOIDS IN MORTAR JOINTS EXIST UP TO 2" FROM THE SURFACE OF MASONRY, POINT WITH HISTORIC POINTING MORTAR 1" FROM FACE OF MASONRY. POINT WITH PRE-MIXED MORTAR AN ADDITIONAL 1" BEYOND HISTORIC POINTING MORTAR.
 - GROUT INJECTION & POINTING AT VOIDS > 2":** AT LOCATIONS WHERE VOIDS IN MORTAR JOINTS EXIST GREATER THAN 2" FROM THE SURFACE OF THE MASONRY, INSERT VOID INJECTION GROUT UP TO 1" FROM THE SURFACE OF THE MASONRY. POINT WITH HISTORIC POINTING MORTAR FOR THE FINAL 1" TO THE SURFACE OF THE MASONRY.
- RESTORATION ELEVATION NOTES:**
- REMOVE EXISTING WATERPROOFING FROM EXISTING CONCRETE FOUNDATION WALLS. PREPARE EXISTING CONCRETE FOUNDATION WALLS TO RECEIVE NEW WATERPROOFING. RE: CIVIL FOR EXCAVATION EXTENTS AND REQUIREMENTS.
 - RAKE & TUCKPOINT ALL BELOW GRADE MASONRY JOINTS WITH HISTORIC POINTING MORTAR PRIOR TO INSTALLATION OF NEW WATERPROOFING.
 - REMOVE WINDOW WELL MESH COVER AND GRATE. SALVAGE FOR REINSTALLATION.
 - REMOVE ALL DEBRIS AND CLEAN WINDOW WELL AND DRAIN. RE: CIVIL FOR NEW AREA DRAIN STORM PIPING EXTENTS AND REQUIREMENTS.
 - REMOVE EXISTING CONCRETE PAVEMENT AND ASSOCIATED SNOW MELT SYSTEM FOR ACCESS TO BELOW GRADE UTILITY AND WATERPROOFING REPLACEMENT. RE: CIVIL FOR EXTENTS OF EXISTING CONCRETE AND SNOW MELT REMOVAL.



MEMORIAL STUDENT UNION - NORTH WING - WEST ELEVATION | **B2**
SCALE: 1/8" = 1'-0"

NOTES | **B1**

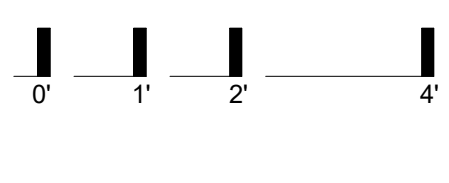
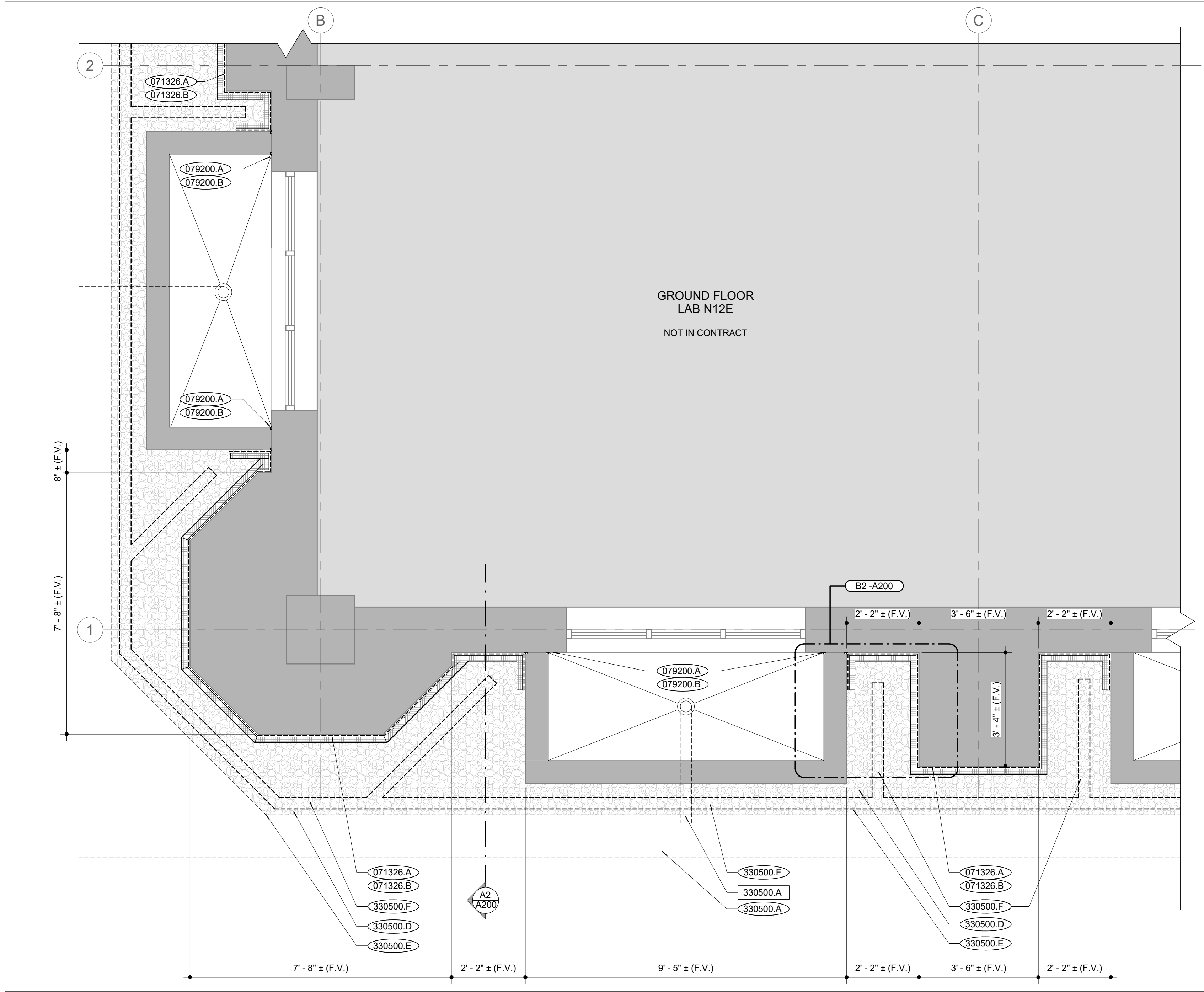
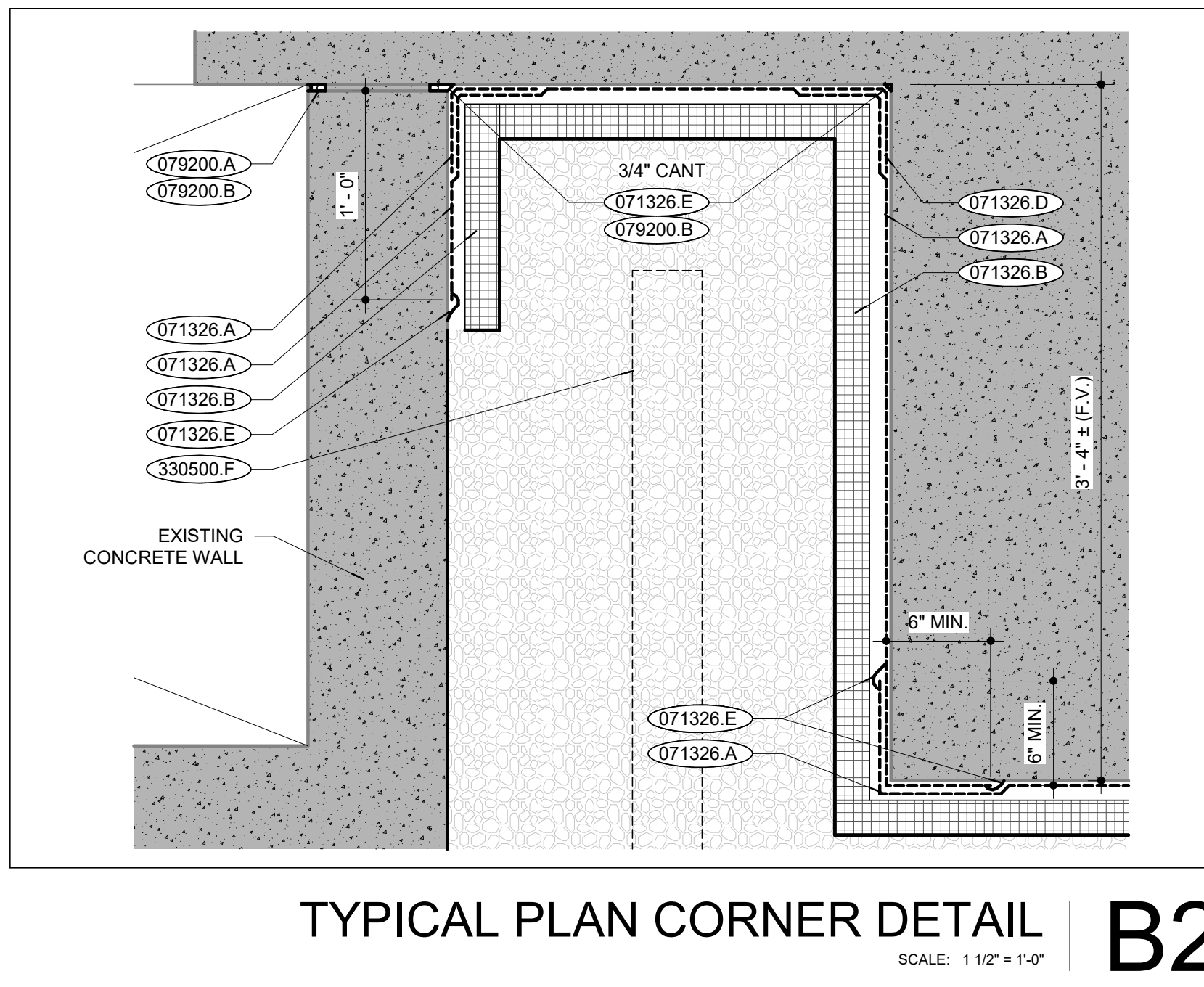
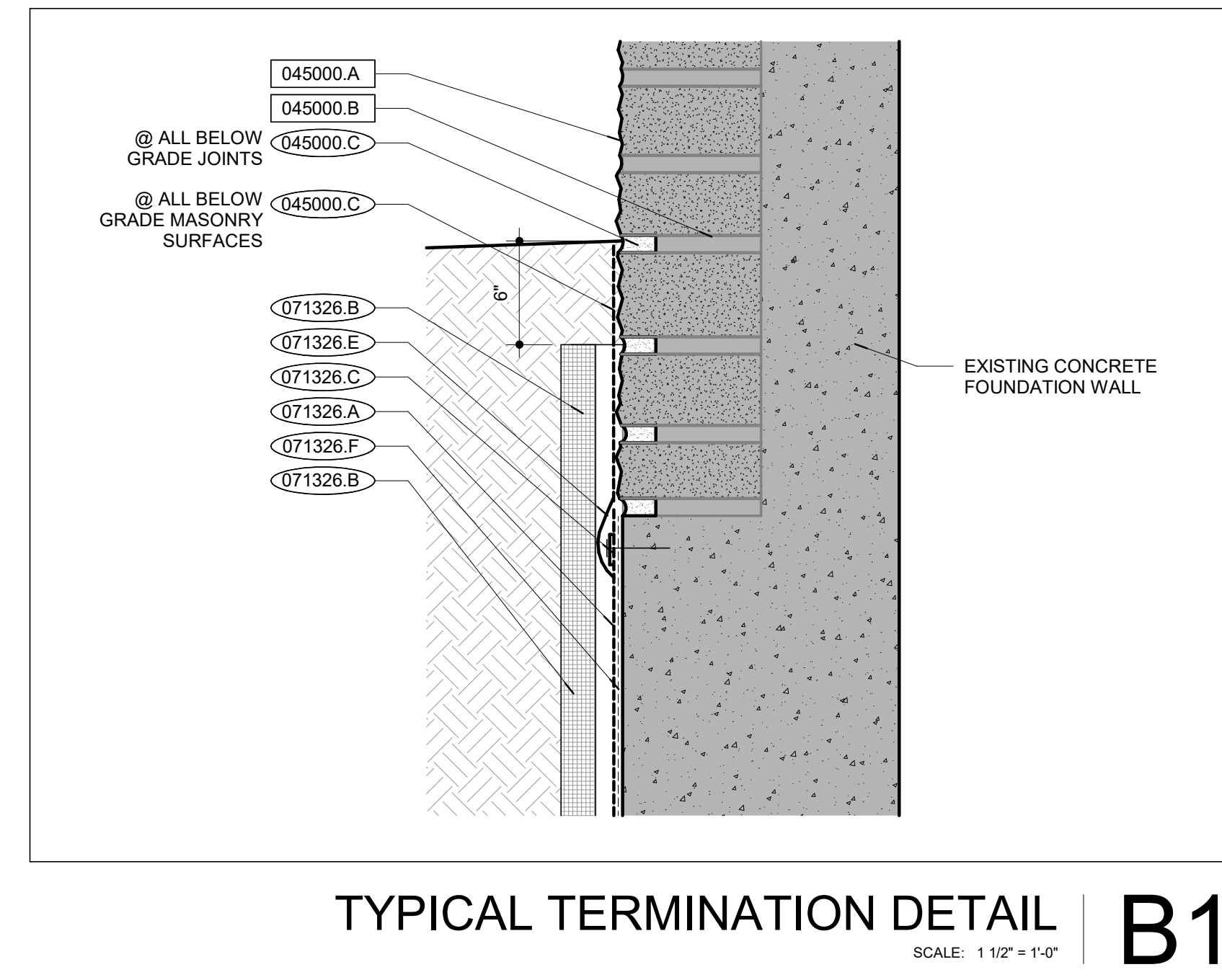
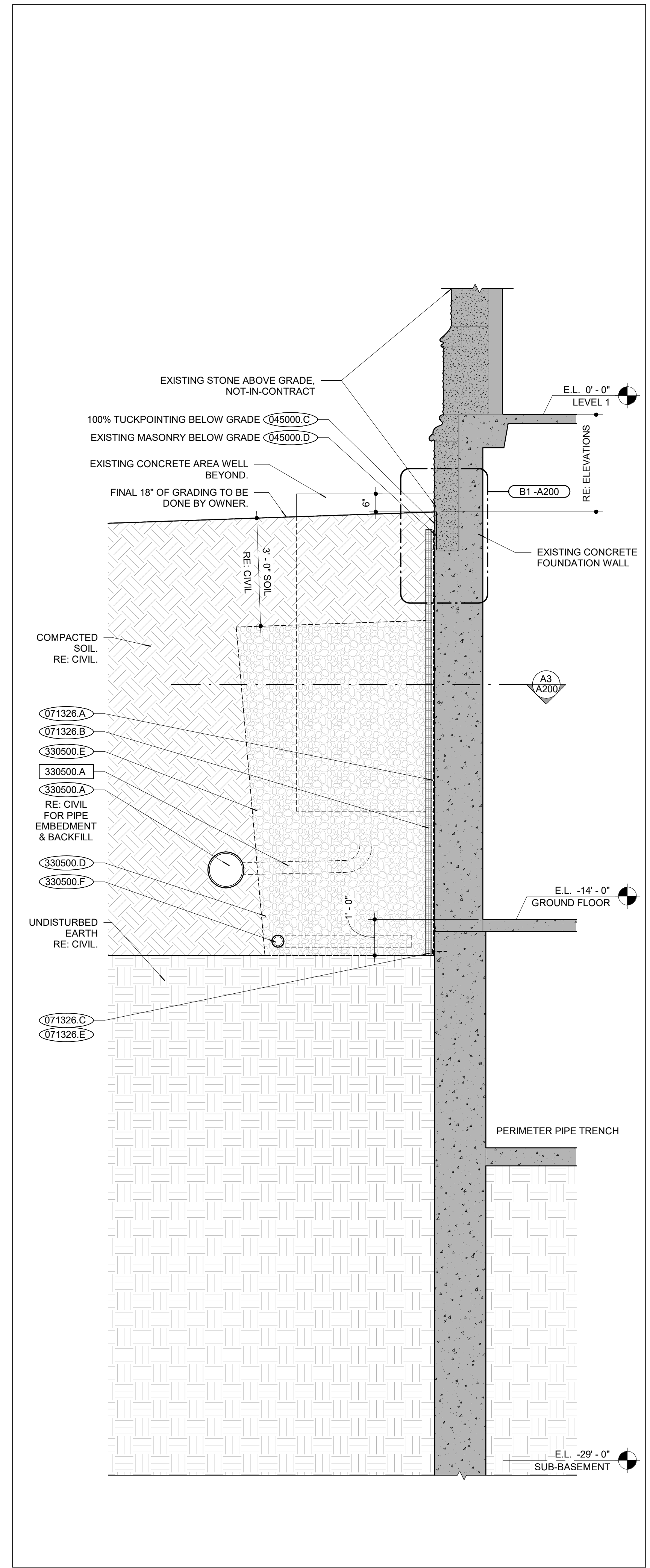
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NEW CONSTRUCTION	000000.X
DIVISION 03 CONCRETE	
DIVISION 04 MASONRY	
DIVISION 05 METALS	
DIVISION 06 WOOD, PLASTICS + COMPOSITES	
DIVISION 07 THERMAL + MOISTURE PROTECTION	071326.A SELF-ADHERING SHEET WATERPROOFING 071326.B PROTECTION BOARD
DIVISION 08 OPENINGS	
DIVISION 09 FINISHES	
DIVISION 10 SPECIALTIES	
DIVISION 11 EQUIPMENT	
DIVISION 12 FURNISHINGS	
DIVISION 14 CONVEYING EQUIPMENT	
DIVISION 22 PLUMBING	
DIVISION 23 HVAC	
DIVISION 26 ELECTRICAL	
DIVISION 31 EARTHWORK	
DIVISION 32 EXTERIOR IMPROVEMENTS	
DIVISION 33 UTILITIES	
330500.A	STORM PIPING (RE: CIVIL)
330500.B	STORM PIPING CLEANOUT (RE: CIVIL)
330500.C	STORM JUNCTION BOX (RE: CIVIL)
330500.F	PERFORATED FOUNDATION DRAIN (RE: CIVIL)
330500.G	LAMBS TONGUE NOZZLE (RE: CIVIL)



MEMORIAL STUDENT UNION - NORTH WING - NORTH ELEVATION | **A2**
SCALE: 1/8" = 1'-0"

KEYNOTES | **A1**

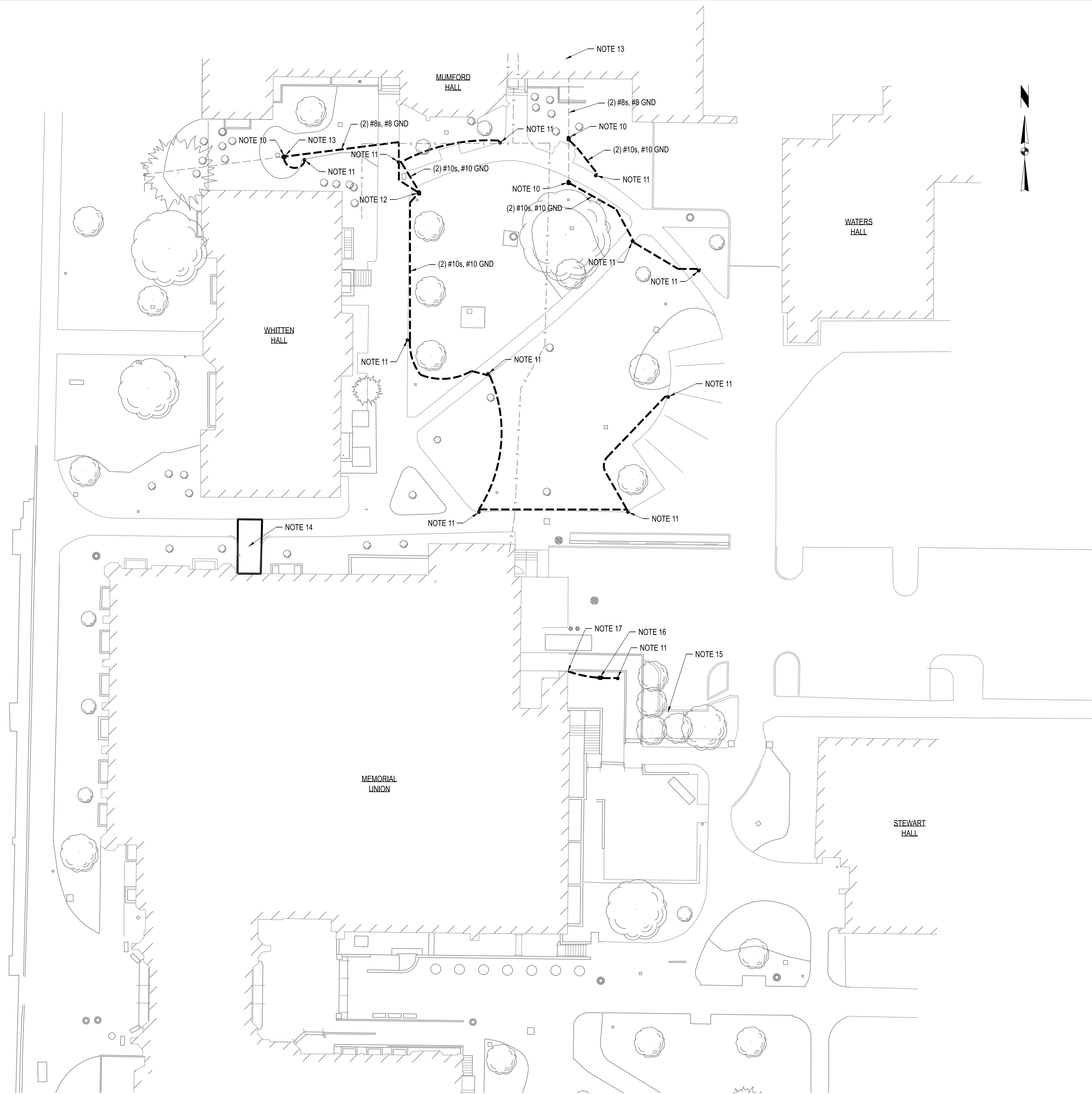
EXISTING CONSTRUCTION	000000.X
NEW CONSTRUCTION	000000.X
DIVISION 03 CONCRETE	
DIVISION 04 MASONRY	
045000.A	ASHLAR STONE
045000.B	SETTING MORTAR
045000.C	HISTORIC POINTING MORTAR
045000.D	DAMP-PROOFING
DIVISION 05 METALS	
DIVISION 06 WOOD, PLASTICS + COMPOSITES	
DIVISION 07 THERMAL + MOISTURE PROTECTION	
071326.A	SELF-ADHERING SHEET WATERPROOFING
071326.B	PROTECTION BOARD
071326.C	STAINLESS STEEL TERMINATION BAR
071326.D	CORNER SHEET WATERPROOFING FLASHING
071326.E	TERMINATION JOINT SEALANT
071326.F	CONTACT ADHESIVE
079200.A	JOINT SEALANT
079200.B	BACKER ROD
DIVISION 08 OPENINGS	
DIVISION 09 FINISHES	
DIVISION 10 SPECIALTIES	
DIVISION 11 EQUIPMENT	
DIVISION 12 FURNISHINGS	
DIVISION 14 CONVEYING EQUIPMENT	
DIVISION 22 PLUMBING	
DIVISION 23 HVAC	
DIVISION 26 ELECTRICAL	
DIVISION 31 EARTHWORK	
DIVISION 32 EXTERIOR IMPROVEMENTS	
DIVISION 33 UTILITIES	
330500.A	STORM PIPING (RE: CIVIL)
330500.D	GRANULAR FILL (RE: CIVIL)
330500.E	GEOTEXTILE FILTER FABRIC (RE: CIVIL)
330500.F	PERFORATED FOUNDATION DRAIN (RE: CIVIL)



WATERPROOFING PLAN DETAIL | **A3** SCALE: 1/2" = 1'-0"

BELOW GRADE WATERPROOFING SECTION | **A2** SCALE: 1/2" = 1'-0"

KEYNOTES | **A1**



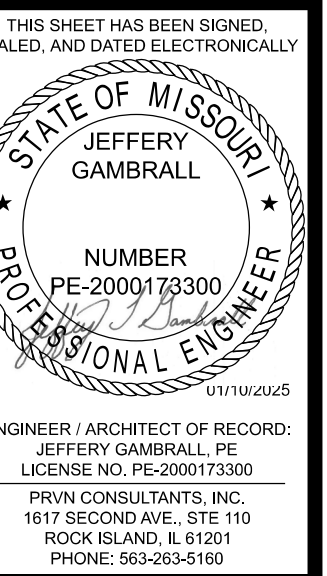
ELECTRICAL SITE PLAN

SCALE: 1"=20'-0"



NOTES:

1. LOCATE ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF NEW WORK SHOWN ON THIS PLAN. IMMEDIATELY REPAIR ANY DAMAGED UTILITIES TO THE SATISFACTION OF THE OWNER, IN COMPLIANCE WITH THE OWNER'S REQUIREMENTS.
2. COORDINATE ROUTING WITH ALL OTHER SITE UTILITIES (WATER, GAS, STORM, ETC).
3. UNDERGROUND CONDUITS SHALL BE A MINIMUM OF 1" AND CONDUCTORS SHALL BE #10 UNLESS NOTED OTHERWISE.
4. SEE SHEET E200 FOR ADDITIONAL INFORMATION.
5. "PUSH" NEW CONDUIT UNDER EXISTING SIDE WALKS. WHERE NOT POSSIBLE, REMOVE CONCRETE TO INSTALL CONDUIT AND REPLACE TO ADJACENT SURFACES.
6. COORDINATE WITH OWNER FOR CONDUIT ROUTING TO MINIMIZE DISRUPTION TO SIDEWALKS AND DAMAGE TO TREES.
7. SITE FIXTURES AND POLES ARE OWNER FURNISHED, CONTRACTOR INSTALLED. POLE BASE SHALL BE BY CONTRACTOR, SEE DETAIL SHEET E200. SITE FIXTURES ARE TYPE 2 DISTRIBUTION. DIRECTION OF FIXTURE SHOWN SHALL INDICATE ORIENTATION.
8. OWNER FURNISHED LIGHT FIXTURE IS: STERNBERG G18CALED/5PB05PTXRLLED-12L4ST5-MDL14/BK OWNER FURNISHED POLE IS: AMERON, CENTRECON SBQ-4.
9. INSTALLATION SEQUENCE:
 - 9.1. INSTALL HANDHOLES DENOTED BY KEYED NOTE 1. PROVIDE NEW CONDUIT AND CONDUCTORS BETWEEN NEW HANDHOLES.
 - 9.2. DISCONNECT AND REMOVE EXISTING LIGHTING CIRCUITING AS SHOWN ON D101.
 - 9.3. PROVIDE CONNECTION TO EXISTING LIGHTING CIRCUIT TO REMAIN SO THAT EXISTING SITE LIGHTING TO REMAIN IS CONTINUOUS.
 - 9.4. INSTALL NEW SITE LIGHTING FIXTURES AND BALANCE OF CONDUIT/CONDUCTOR.
10. INTERCEPT EXISTING CONDUIT AND SET 12X12 HANDHOLE.
11. NEW SITE FIXTURE LOCATION. CONTRACTOR SHALL FURNISH AND INSTALL BASE PER DETAIL ON SHEET E200. CONTRACTOR SHALL INSTALL POLE AND FIXTURE FURNISHED BY OWNER. INSTALL NEW LIGHTING CIRCUIT RACEWAYS AND CONDUCTORS. UTILIZE EXISTING TRENCH WHERE POSSIBLE.
12. UTILIZE EXISTING CONDUIT BETWEEN SITE BOXES SHOWN.
13. AT INTERIOR OF MUMFORD HALL IN RESEARCH 29 AND 29A, PROVIDE RELOCATION OF (2) DRYERS. FOR EACH DRYER ACCOUNT FOR (1) 20A, 120V FAN CKT AND (1) 30A, 208V HEATER CKT. PROVIDE FOR DISCONNECTION, RELOCATION, AND RE-INSTALLATION OF EACH DRYER. SEE SHEET M120 FOR MORE INFORMATION ON DRYER LOCATIONS.
14. PROVIDE AND INSTALL NEW RAYCHEM VIAGARD EM2-XR ICE MELT CABLE IN MEMORIAL UNION NORTH ADA RAMP. EXISTING CONTROLLER MAY BE REUSED. RECONNECT EXISTING POWER SUPPLY. PROVIDE NEW GROUND MOISTURE AND TEMPERATURE SENSOR AND KIT WITH RAYCHEM PART NUMBER VIA-DU-S20 AND CONNECT TO EXISTING CONTROLLER WHERE EXISTING SENSOR WAS DEMOLISHED.
15. DURING PERFORMANCE OF PHASE 2, PROTECT THE GOLF CART RECEPTACLE AND ASSOCIATED INFRASTRUCTURE.
16. INTERCEPT EXISTING LIGHTING CIRCUIT FOR DEMOLISHED RAMP LIGHT FIXTURES. PROVIDE NEW HANDHOLE PULLBOX PER DETAIL ON DRAWING E200 AND EXTEND CIRCUIT ROUTED IN CONDUITS TO TO NEW OWNER FURNISHED POLE AND FIXTURE.
17. INSTALL NEW LIGHTING CIRCUIT RACEWAY AND REUSE LIGHTING CIRCUIT WHICH WAS USED FOR THE DEMOLISHED CONCRETE-EMBEDDED FIXTURES THAT WERE FORMERLY MOUNTED IN THE DEMOLISHED CONCRETE RAMP RAILING. ROUTE THROUGH NEW HANDHOLE PULLBOX.



PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE 563.263.5160

0	01/10/25	ISSUED FOR BID	CHECKED BY: J.T.G.
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 MISSOURI CERTIFICATE OF
 AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
 GENERAL SITE - REPLACE UTILITIES
 NEAR MEMORIAL UNION
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 ELECTRICAL SITE PLAN

UNIVERSITY OF MISSOURI
 PROJECT NUMBER

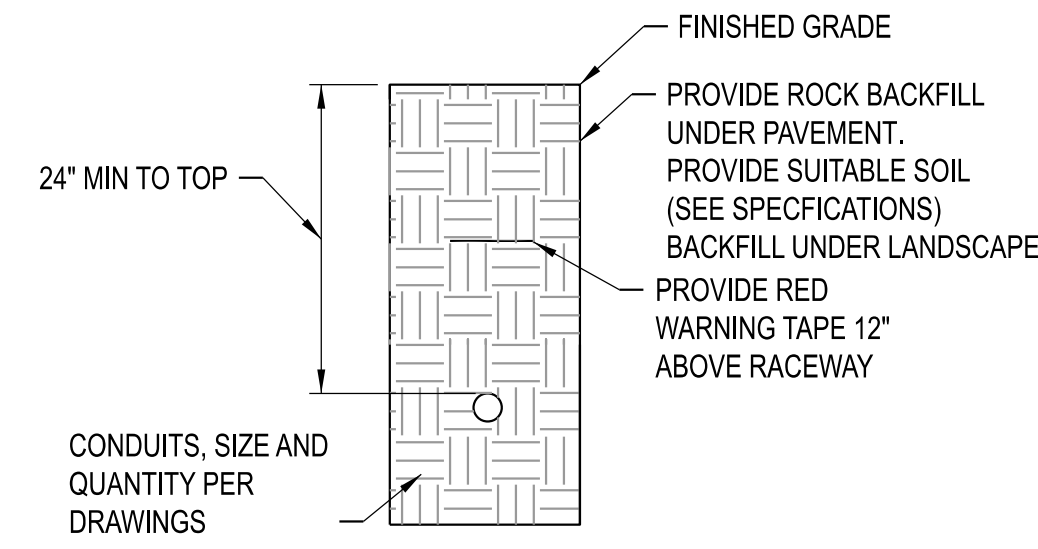
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CONSULTANT
 PROJECT NUMBER

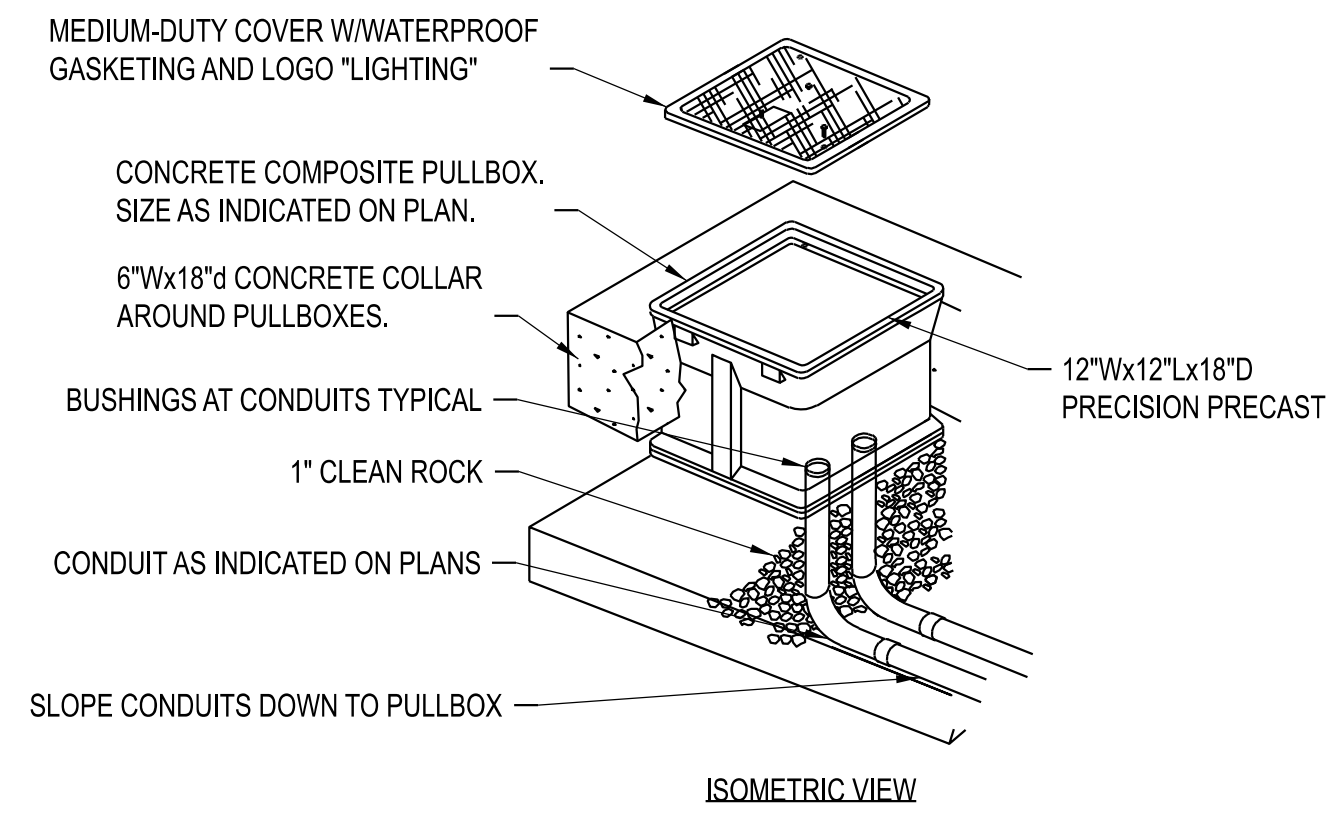
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SHEET

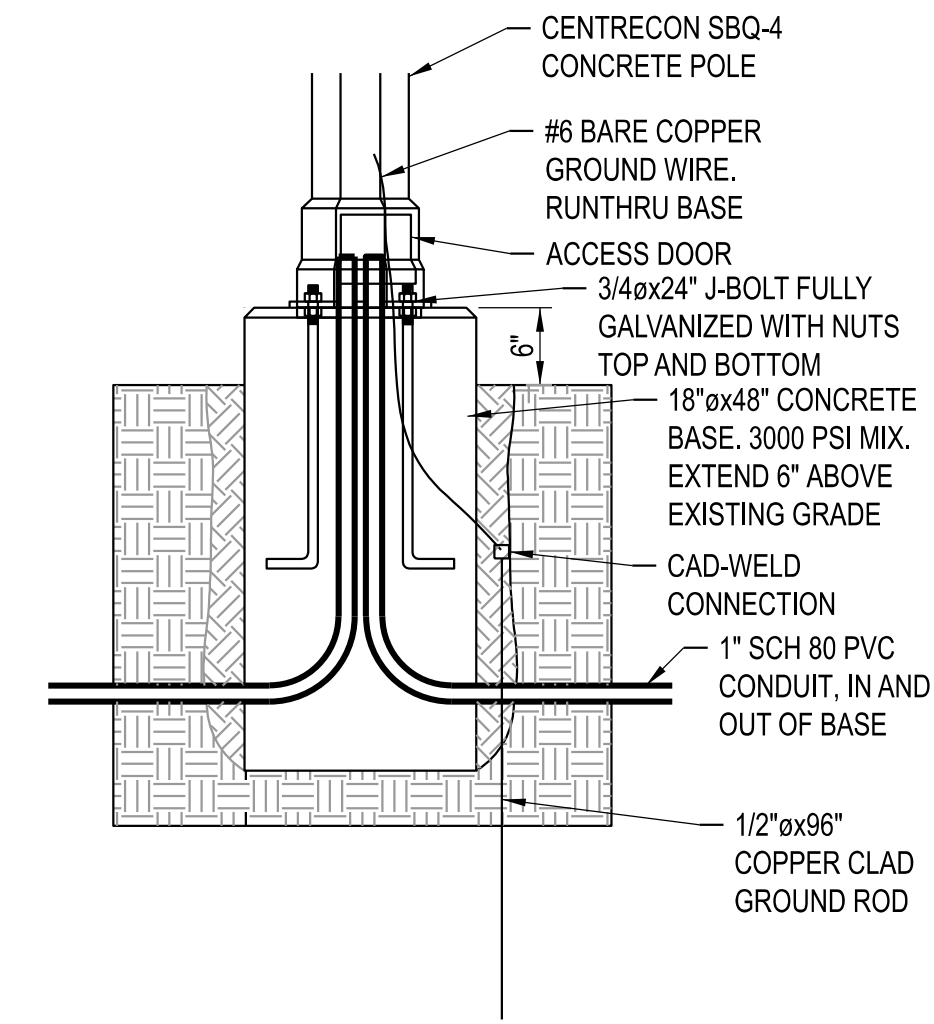
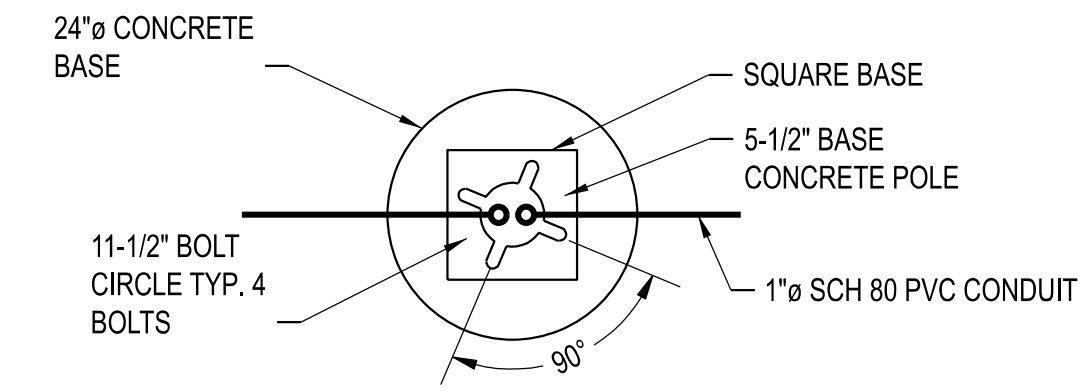
E101



TYPICAL TRENCHING DETAIL
SCALE: NONE



SITE PULLBOX DETAIL
SCALE: NONE



POLEBASE DETAIL
SCALE: NONE

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

STATE OF MISSOURI
JEFFERY GAMBELL
PROFESSIONAL ENGINEER
NUMBER PE-2000179300
11/10/2025

ENGINEER / ARCHITECT OF RECORD:
JEFFERY GAMBELL, PE
LICENSE NO. PE-2000179300

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		DRAWN BY: M.A.O.	

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UNIVERSITY OF MISSOURI - COLUMBIA
GENERAL SITE - REPLACE UTILITIES
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COLUMBIA, BOONE COUNTY, MISSOURI 65203
ELECTRICAL DETAILS

UNIVERSITY OF MISSOURI
PROJECT NUMBER

CP230201

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24084

SHEET

E200