

# University of Missouri - Columbia

For: The Curators of the University of Missouri

## ANIMAL SCIENCE RESEARCH CENTER

REPLACE ELECTRICAL SERVICE PANELS  
PROJECT NO.: CP221041

Bid Set Dated: JANUARY 04, 2024

I hereby certify that these Drawings and/or Specifications have been prepared by me, or under my supervision. I further certify that to the best of my knowledge these Drawings and/or Specifications are as required by and in compliance with the Building Codes of the University of Missouri.

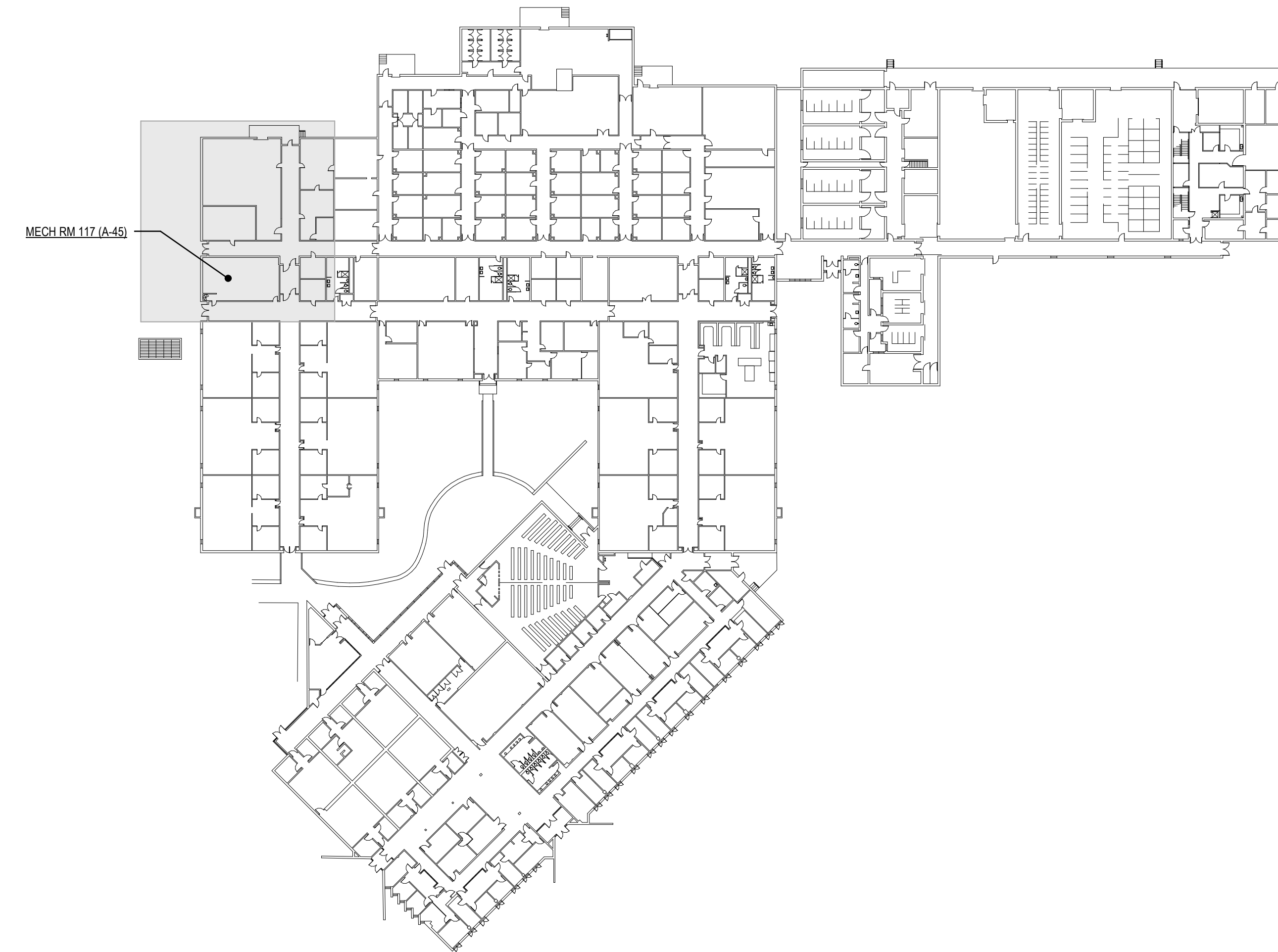
Signature: *Monica Santos*  
Monica Santos, MO License #E-200174546

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Kansas City, MO 64102  
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**ASRC KEY PLAN LEVEL 01**

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### ANIMAL SCIENCE RESEARCH CENTER - REPLACE ELECTRICAL SERVICE PANELS

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TITLE SHEET AND DRAWING INDEX

**G000**

**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 MOOR 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 10 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 ≈ 0.15 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.

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

**SPECIAL INSPECTIONS:**

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

1. PLACING OF CONCRETE AND REINFORCING STEEL (CONTINUOUS OF CONCRETE SAMPLING / PERIODIC OF REINFORCING)
2. IN-SITU SOILS, EXCAVATIONS, FILLING & COMPACTION (PERIODIC)
3. ALL UTILITY CONCRETE STRUCTURE 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. STEPS INCLUDE:
  - 3.1. SUBSTRATE CONDITIONS AND PREPARATIONS
  - 3.2. FLASHING INSTALLATION
  - 3.3. MEMBRANE INSTALLATION
  - 3.4. PROTECTION AND DRAINAGE INSTALLATION.

**DEFERRED SUBMITTALS:**

NONE

**CIVIL LEGEND OF SYMBOLS:**

---	EXISTING CURB	FF-XXXX	FINISH FLOOR OF STRUCTURE
- - - -	PROPOSED CURB	XXX.XX TD	PROPOSED TOP OF CURB ELEVATION
	RIP RAP	XXX.XX TP	PROPOSED TOP OF PAVEMENT ELEVATION
[ ]	EXISTING STRUCTURE	XXX.XX PD	PROPOSED FINISH GRADE ELEVATION
---	EXISTING TREETRINE	XXX.XX TW	PROPOSED TOP OF WALL
---	PROPOSED TREETRINE	XX	LOT NUMBER
---	EDGE OF WATERWAY	(X)	STORM SEWER STRUCTURE LABEL
---	EXISTING WATERLINE	(X)	SANITARY SEWER STRUCTURE LABEL
---	PROPOSED WATERLINE	HP.	HIGH POINT
---	EXISTING GAS LINE	LP.	LOW POINT
---	PROPOSED GAS LINE	⊕	EXISTING SIGNS
---	EXISTING UNDERGROUND TELEPHONE	⊕	EXISTING POWER POLE
---	EXISTING UNDERGROUND CABLE TELEVISION	⊕	EXISTING GAS VALVE
---	EXISTING HIGH VOLTAGE ELECTRIC	⊕	EXISTING WATER VALVE
---	EXISTING OVERHEAD ELECTRIC	⊕	EXISTING GAS METER
---	EXISTING UNDERGROUND ELECTRIC	⊕	EXISTING WATER METER
---	EXISTING OVERHEAD ELEC. & TV	⊕	EXISTING FIRE HYDRANT
---	EXISTING OVERHEAD ELEC., TV & TELE.	⊕	MANHOLE
---	EXISTING SANITARY SEWER	⊕	EXISTING SANITARY SEWER LATERAL
---	PROPOSED SANITARY SEWER	⊕	PROPOSED SANITARY SEWER LATERAL
---	EXISTING MINOR CONTOUR	⊕	PROPOSED TRACER WIRE TEST STATION BOX
---	EXISTING MAJOR CONTOUR	⊕	EXISTING AIR CONDITIONER
---	PROPOSED MINOR CONTOUR	⊕	EXISTING TELEPHONE PEDESTAL
---	PROPOSED MAJOR CONTOUR	⊕	EXISTING ELECTRICAL TRANSFORMER
---	100 YEAR FLOOD PLAIN	⊕	EXISTING ELECTRIC METER
---	FLOODWAY	⊕	EXISTING LIGHT POLE
---	ORDINARY HIGH WATER MARK	⊕	EXISTING GUY WIRE
---	STREAM SIDE BUFFER	⊕	CONSTRUCTION BARRIER FENCING
---	OUTER STREAM BUFFER	⊕	TREE PROTECTION FENCING
---	DEMOLITION LIMITS		
---	SILT FENCE		

**PROJECT BENCHMARK:**

TBM #1 - CHISELED SQUARE IN THE NORTHWEST CORNER OF THE HEADWALL OF THE STORM SEWER CULVERT, SOUTH OF THE DRIVE, LOCATED NORTHEAST OF THE PROJECT AREA. SEE PLAN FOR LOCATION. ELEVATION = 744.31'

**FLOOD PLAIN STATEMENT:**

NO PART OF THIS TRACT IS LOCATED WITHIN THE 100-YEAR FLOODPLAIN AS PER THE BOONE COUNTY FIRM MAP #290190280E DATED APRIL 19, 2017.

**UTILITY COMPANIES:**

**LOCATES:**  
MISSOURI ONE CALL INC.  
1022 B NORTHEAST DRIVE  
JEFFERSON CITY, MO 65109  
1-800-344-7463

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

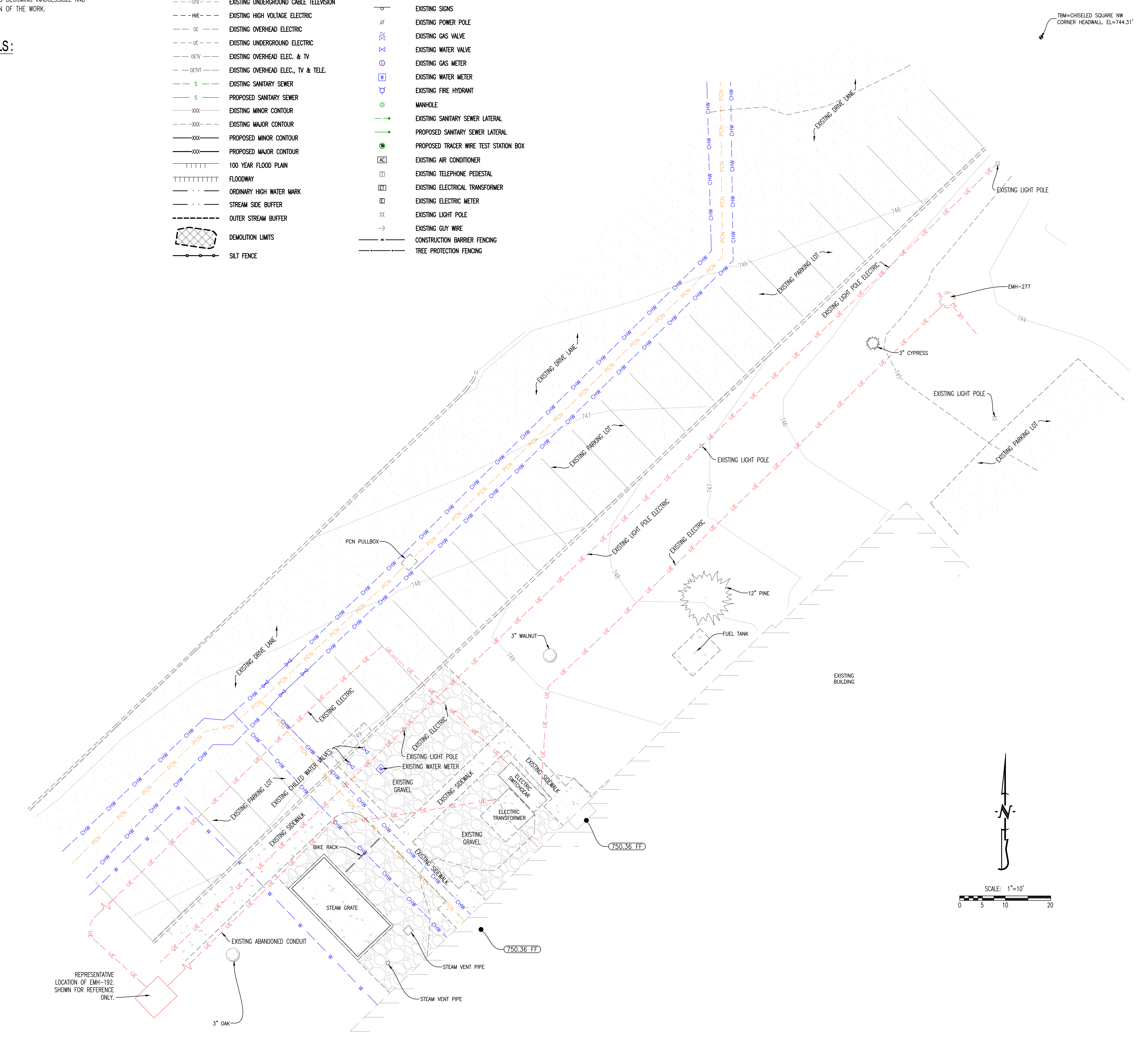
**TELEPHONE:**  
UNIVERSITY OF MISSOURI, DIVISION OF I.T.  
615 LOCUST ST.  
COLUMBIA, MO 65211  
573-882-5000

**STORM/SANITARY SEWER & SECONDARY ELECTRIC:**  
UNIVERSITY CAMPUS FACILITY OPERATIONS  
180 GENERAL SERVICES BUILDING  
COLUMBIA, MO 65211  
573-882-4211

**FIBER/CABLE TELEVISION:**  
CHARTER COMMUNICATIONS  
1510 CHARTER BLVD.  
INDUSTRIAL BOULEVARD  
COLUMBIA, MO 65202  
573-675-8875

**CABLE TELEVISION:**  
MEDIACOM  
1211 WILKES BLVD.  
COLUMBIA, MO 65201  
855-633-4226

**STEAM & MEDIUM VOLTAGE ELECTRIC:**  
ENERGY MANAGEMENT  
417 S. 5TH ST.  
COLUMBIA, MO 65211  
573-882-3094



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**ANIMAL SCIENCE RESEARCH CENTER - REPLACE ELECTRICAL SERVICE PANELS**

Antella Project No: CP221041

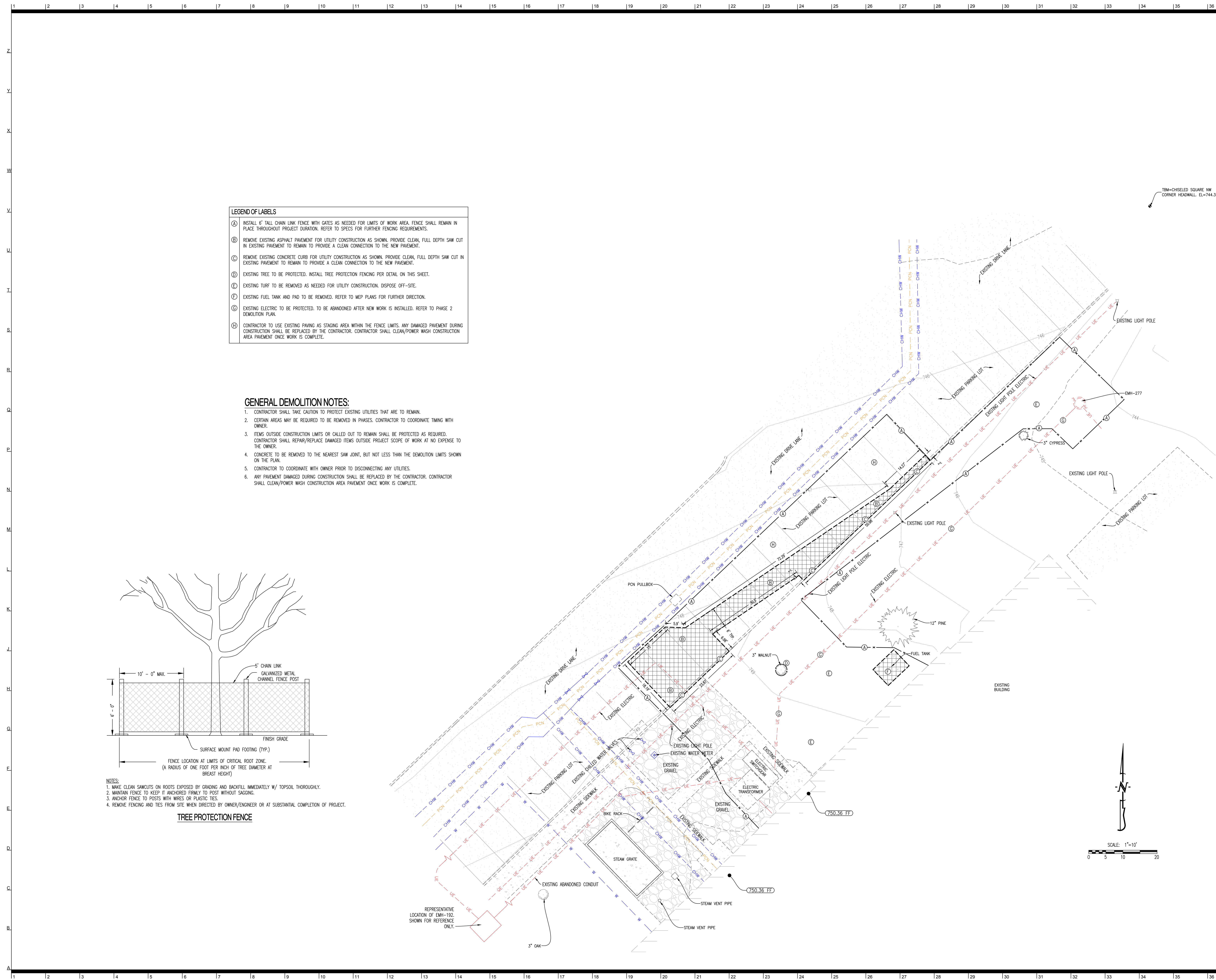
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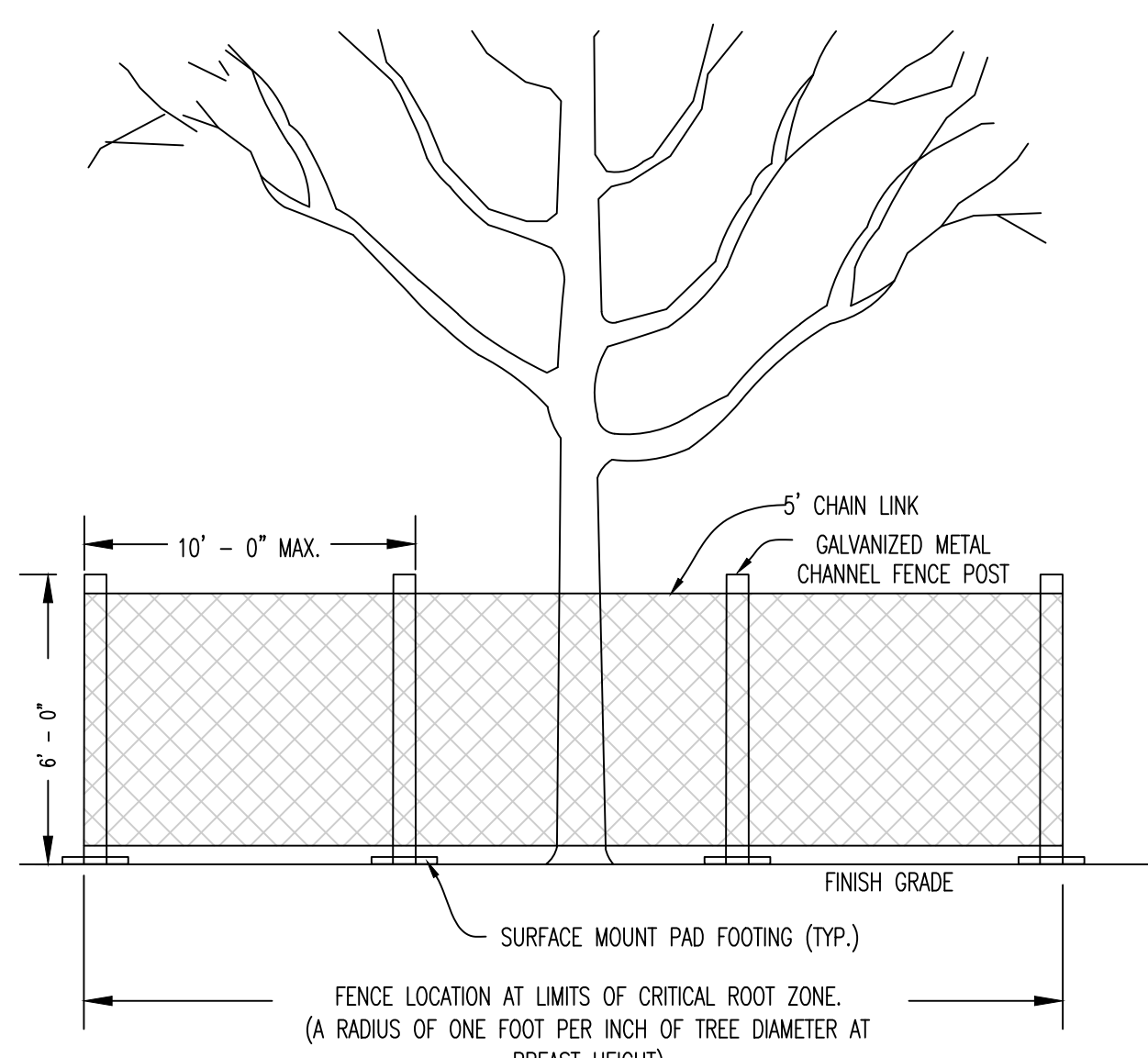
**CIVIL NOTES AND EXISTING CONDITIONS PLAN**





- LEGEND OF LABELS**
- (A) INSTALL 6" TALL CHAIN LINK FENCE WITH GATES AS NEEDED FOR LIMITS OF WORK AREA. FENCE SHALL REMAIN IN PLACE THROUGHOUT PROJECT DURATION. REFER TO SPECS FOR FURTHER FENCING REQUIREMENTS.
  - (B) REMOVE EXISTING ASPHALT PAVEMENT FOR UTILITY CONSTRUCTION AS SHOWN. PROVIDE CLEAN, FULL DEPTH SAW CUT IN EXISTING PAVEMENT TO REMAIN TO PROVIDE A CLEAN CONNECTION TO THE NEW PAVEMENT.
  - (C) REMOVE EXISTING CONCRETE CURBS FOR UTILITY CONSTRUCTION AS SHOWN. PROVIDE CLEAN, FULL DEPTH SAW CUT IN EXISTING PAVEMENT TO REMAIN TO PROVIDE A CLEAN CONNECTION TO THE NEW PAVEMENT.
  - (D) EXISTING TREE TO BE PROTECTED. INSTALL TREE PROTECTION FENCING PER DETAIL ON THIS SHEET.
  - (E) EXISTING TURF TO BE REMOVED AS NEEDED FOR UTILITY CONSTRUCTION. DISPOSE OFF-SITE.
  - (F) EXISTING FUEL TANK AND PAD TO BE REMOVED. REFER TO MEP PLANS FOR FURTHER DIRECTION.
  - (G) EXISTING ELECTRIC TO BE PROTECTED. TO BE ABANDONED AFTER NEW WORK IS INSTALLED. REFER TO PHASE 2 DEMOLITION PLAN.
  - (H) CONTRACTOR TO USE EXISTING PAVING AS STAGING AREA WITHIN THE FENCE LIMITS. ANY DAMAGED PAVEMENT DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR. CONTRACTOR SHALL CLEAN/POWER WASH CONSTRUCTION AREA PAVEMENT ONCE WORK IS COMPLETE.

- GENERAL DEMOLITION NOTES:**
- CONTRACTOR SHALL TAKE CAUTION TO PROTECT EXISTING UTILITIES THAT ARE TO REMAIN.
  - CERTAIN AREAS MAY BE REQUIRED TO BE REMOVED IN PHASES. CONTRACTOR TO COORDINATE TIMING WITH OWNER.
  - 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.
  - CONCRETE TO BE REMOVED TO THE NEAREST SAW JOINT, BUT NOT LESS THAN THE DEMOLITION LIMITS SHOWN ON THE PLAN.
  - CONTRACTOR TO COORDINATE WITH OWNER PRIOR TO DISCONNECTING ANY UTILITIES.
  - ANY PAVEMENT DAMAGED DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR. CONTRACTOR SHALL CLEAN/POWER WASH CONSTRUCTION AREA PAVEMENT ONCE WORK IS COMPLETE.



- NOTES:**
- MAKE CLEAN SINCUTS ON ROOTS EXPOSED BY GRADING AND BACKFILL IMMEDIATELY W/ TOPSOIL THOROUGHLY.
  - MAINTAIN FENCE TO KEEP IT ANCHORED FIRMLY TO POST WITHOUT SAGGING.
  - ANCHOR FENCING TO POSTS WITH WIRES OR PLASTIC TIES.
  - REMOVE FENCING AND TIES FROM SITE WHEN DIRECTED BY OWNER/ENGINEER OR AT SUBSTANTIAL COMPLETION OF PROJECT.
- TREE PROTECTION FENCE**



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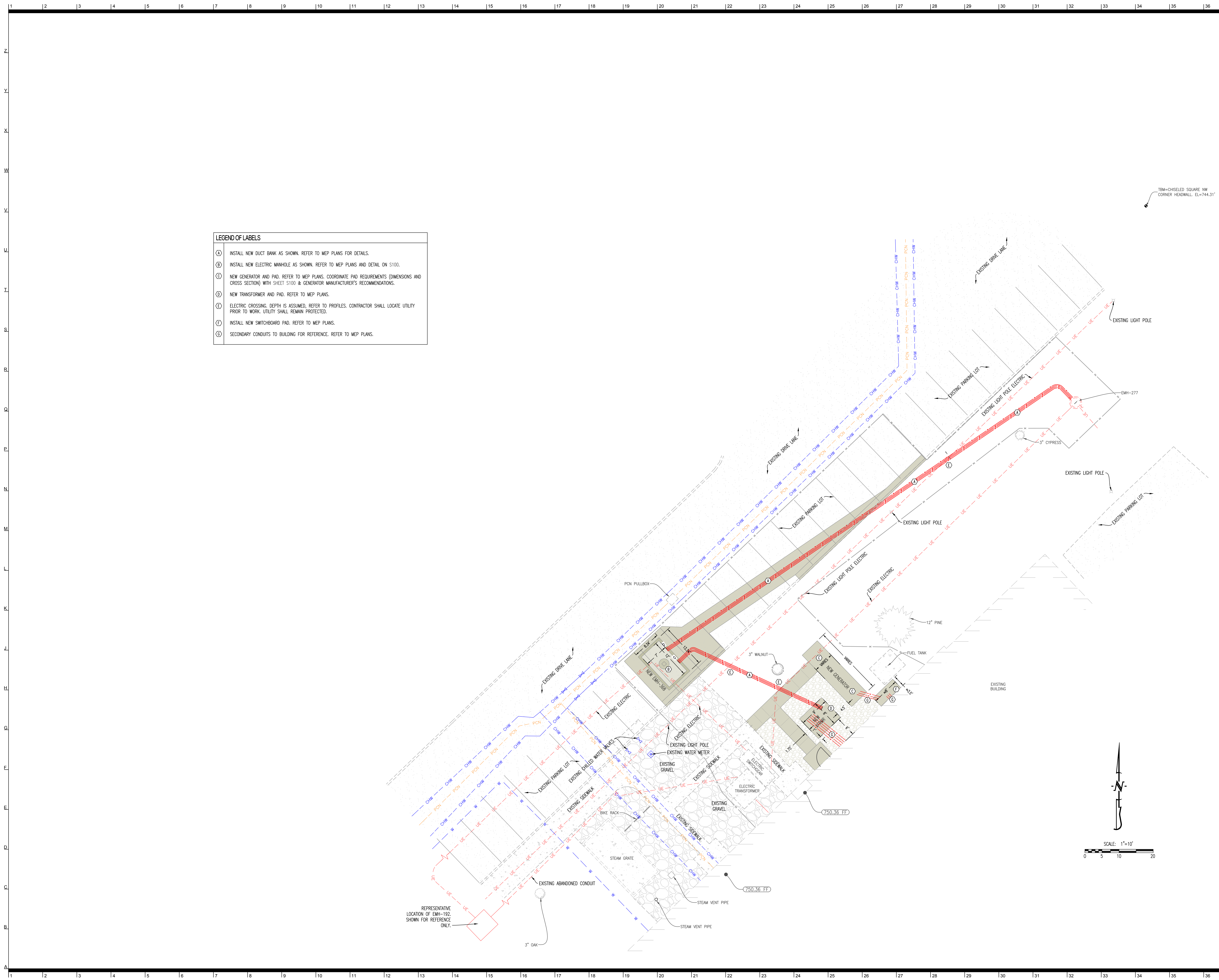
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**DEMOLITION & SITE FENCING  
 PLAN**

**CE 1**



**LEGEND OF LABELS**

(A)	INSTALL NEW DUCT BANK AS SHOWN. REFER TO MEP PLANS FOR DETAILS.
(B)	INSTALL NEW ELECTRIC MANHOLE AS SHOWN. REFER TO MEP PLANS AND DETAIL ON S100.
(C)	NEW GENERATOR AND PAD. REFER TO MEP PLANS. COORDINATE PAD REQUIREMENTS (DIMENSIONS AND CROSS SECTION) WITH SHEET S100 & GENERATOR MANUFACTURER'S RECOMMENDATIONS.
(D)	NEW TRANSFORMER AND PAD. REFER TO MEP PLANS.
(E)	ELECTRIC CROSSING. DEPTH IS ASSUMED. REFER TO PROFILES. CONTRACTOR SHALL LOCATE UTILITY PRIOR TO WORK. UTILITY SHALL REMAIN PROTECTED.
(F)	INSTALL NEW SWITCHBOARD PAD. REFER TO MEP PLANS.
(G)	SECONDARY CONDUITS TO BUILDING FOR REFERENCE. REFER TO MEP PLANS.

**The Curators of the University of Missouri**

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**UTILITY PLAN**



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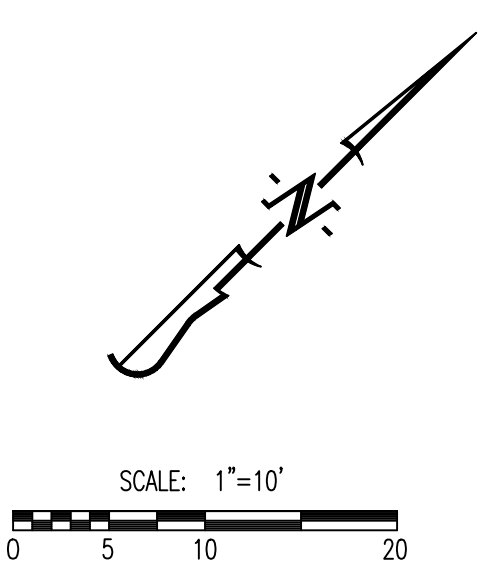
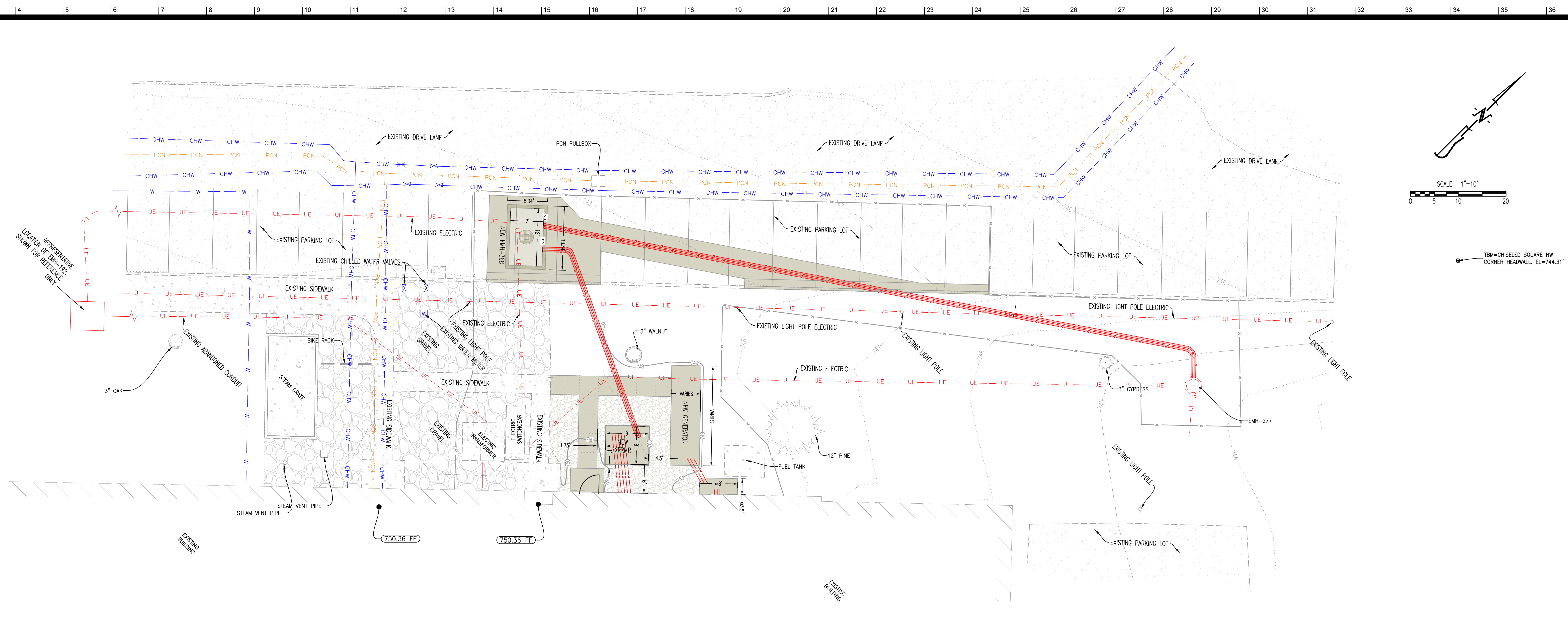
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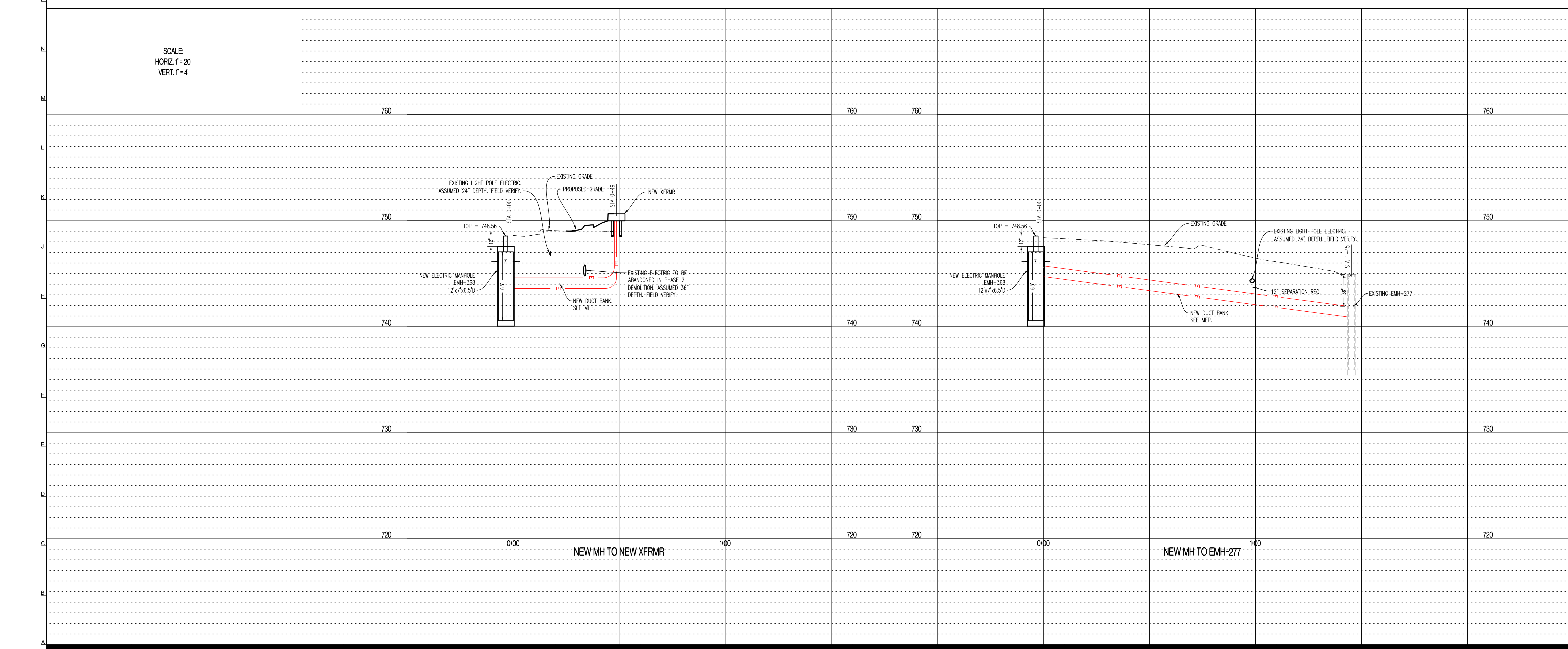
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DUCT BANK PROFILES

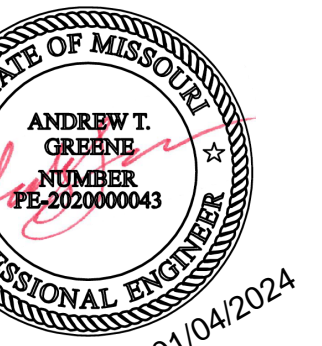
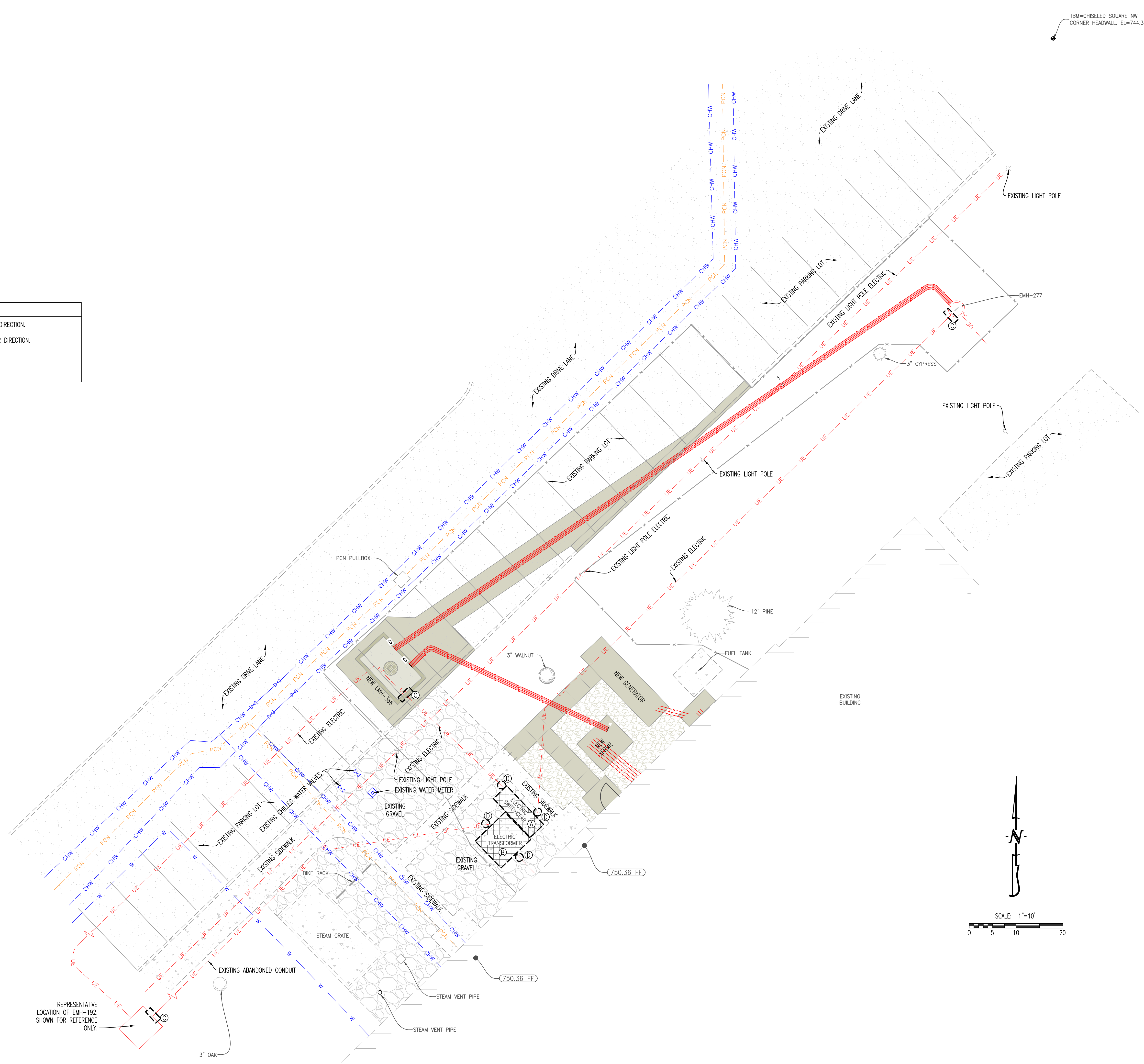
# CE 3



SCALE:  
HORIZ. 1" = 20'  
VERT. 1" = 4'



LEGEND OF LABELS	
Ⓐ	EXISTING SWITCHGEAR AND PAD TO BE REMOVED. REFER TO MEP PLANS FOR FURTHER DIRECTION.
Ⓑ	EXISTING TRANSFORMER AND PAD TO BE REMOVED. REFER TO MEP PLANS FOR FURTHER DIRECTION.
Ⓒ	CUT DUCT BANK BACK FROM STRUCTURE, FILL HOLE, AND WATERPROOF.
Ⓓ	CUT CONDUITS BACK TO BELOW GRADE AND PLUG.



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**PHASE 2 DEMOLITION PLAN**

**CE 4**



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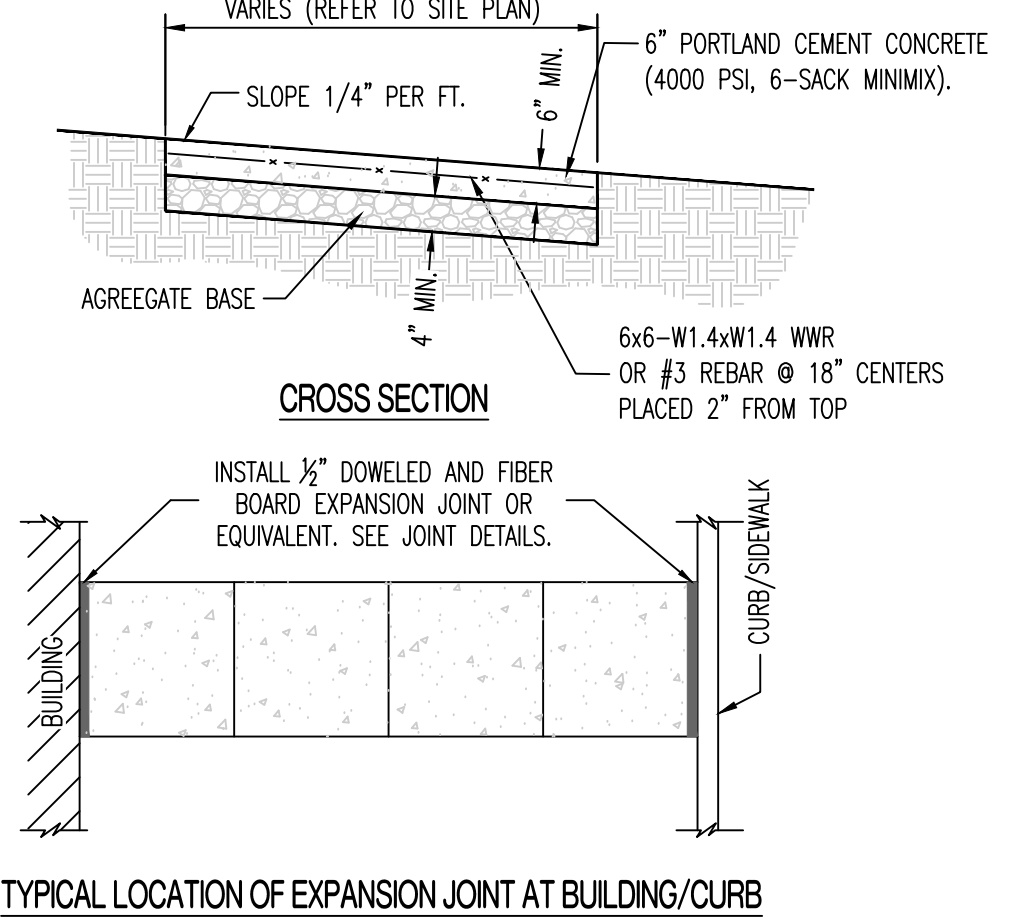
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SITE PLAN

**CE 5**

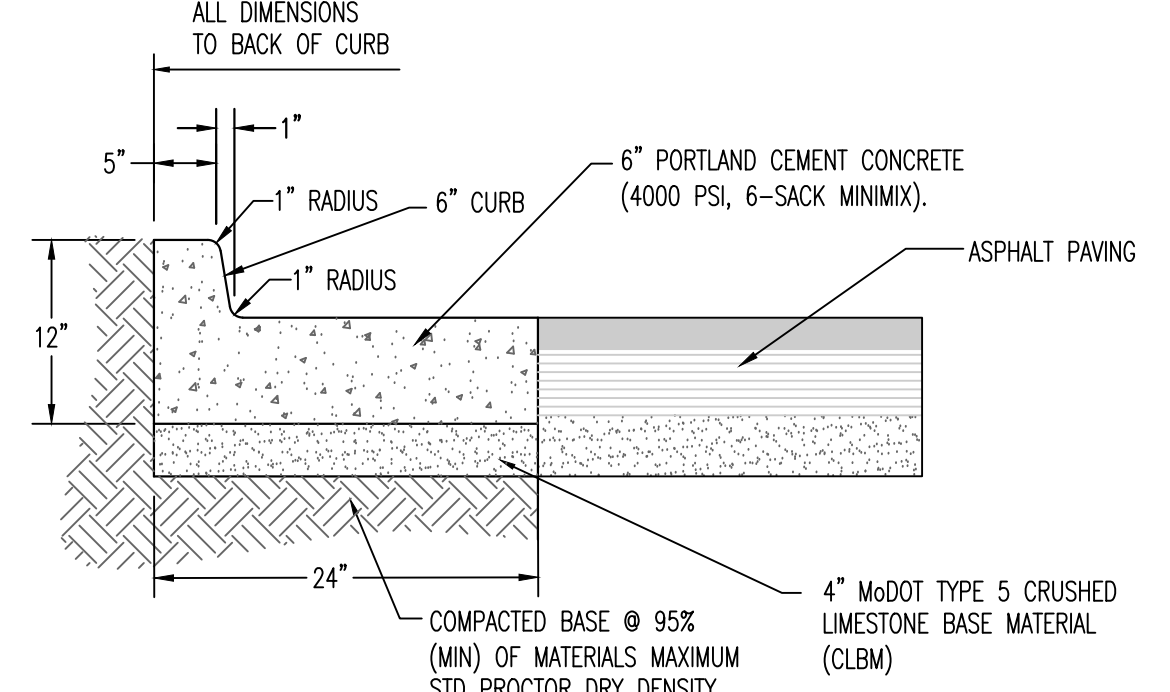
**LEGEND OF LABELS**

- ① PATCH ASPHALT PAVEMENT AS SHOWN, MATCH EXISTING GRADES, REFER TO DETAIL ON MEP DUCT BANK DETAIL.
- ② REPLACE CONCRETE CURB AND GUTTER SECTION AS SHOWN, MATCH EXISTING GRADES, REFER TO DETAIL ON THIS SHEET.
- ③ INSTALL TYPICAL CONCRETE SIDEWALK AS SHOWN, REFER TO DETAIL ON THIS SHEET.
- ④ PROPOSED GENERATOR PAD, COORDINATE PAD REQUIREMENTS (DIMENSIONS AND CROSS SECTION) WITH GENERATOR MANUFACTURER'S RECOMMENDATIONS.
- ⑤ PROPOSED TRANSFORMER PAD, REFER TO MEP PLANS.
- ⑥ INSTALL 1/2" EXPANSION JOINT BETWEEN PAVEMENT AND BUILDING, INSTALL 5/8" DIA. SMOOTH DOWEL W/ EXPANSION CAP, 6" LONG AT 18" CENTERS AT DOOR LOCATION IN BUILDING FOUNDATION/SLAB. INSTALL DOWEL AT EQUAL DISTANCE IN DEPTH OF NEW CONCRETE PAVEMENT.
- ⑦ INSTALL DOWELED CONSTRUCTION JOINT AT CONNECTION TO EXISTING PAVEMENT WITH SEALANT AS SHOWN, REFER TO DETAIL ON THIS SHEET.
- ⑧ INSTALL SAWED CONTROL JOINT WITH SEALANT AS SHOWN (TYPICAL), REFER TO JOINT DETAILS ON THIS SHEET.
- ⑨ REPAINT PARKING AREAS THAT FALL WITHIN THE PAVEMENT REPLACEMENT AREAS, TYPICAL ALL NEW PAVED AREAS.
- ⑩ INSTALL GRAVEL AS SHOWN, SECTION SHALL BE 6" OF COMPACTED M50 DOT TYPE 5 AGGREGATE OVER NON-WOVEN, POLYPROPYLENE FILTER FABRIC LINER OVER BASE MATERIAL COMPACTED TO 95% (MIN.) OF THE MATERIALS MAXIMUM STANDARD PROCTOR DRY DENSITY.
- ⑪ INSTALL NEW SWITCHBOARD PAD, REFER TO MEP PLANS.

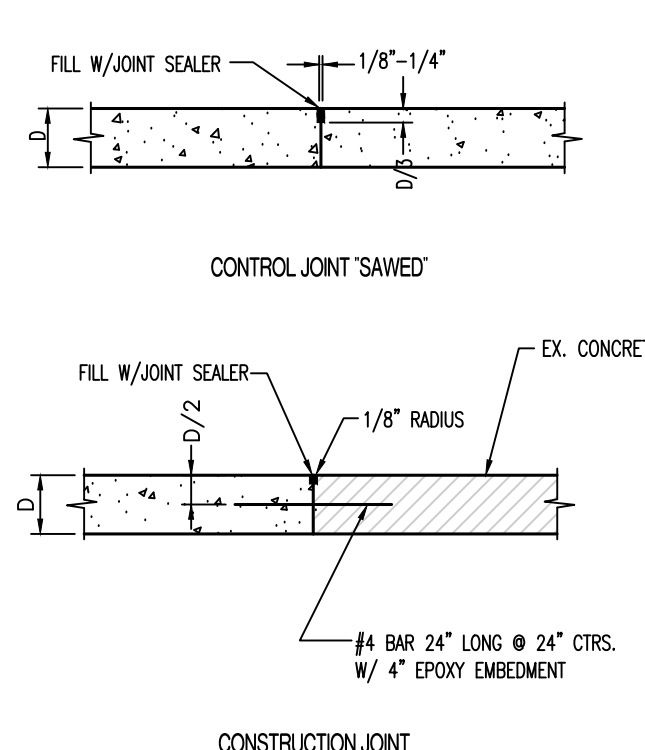


- NOTE:
- SIDEWALK SHALL BE 6" THICK CLASS A CONCRETE ON 4" AGGREGATE BASE.
  - INSTALL 1/2" DOWELED EXPANSION JOINTS AT INTERSECTIONS, RAMP, STRUCTURES, AND DRIVEWAY APPROACHES. MAX. EXPANSION JOINT SPACING = 150'
  - INSTALL TRANSVERSE SAW JOINTS AT SPACING = SIDEWALK WIDTH.

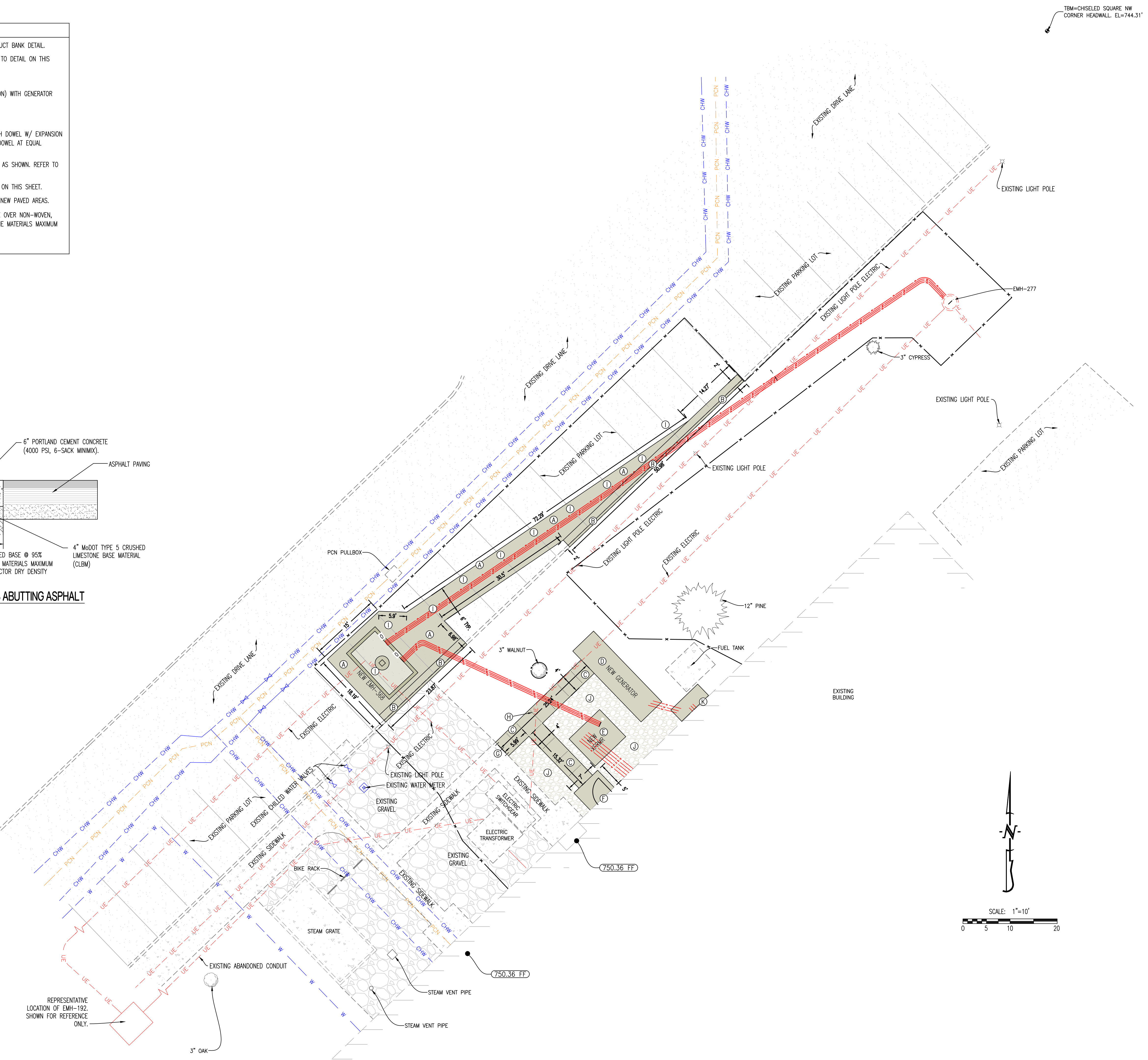
**TYPICAL PRIVATE SIDEWALK**



**6" TALL CURB ABUTTING ASPHALT**



**JOINT DETAILS (P.C. CONCRETE PAVEMENT)**



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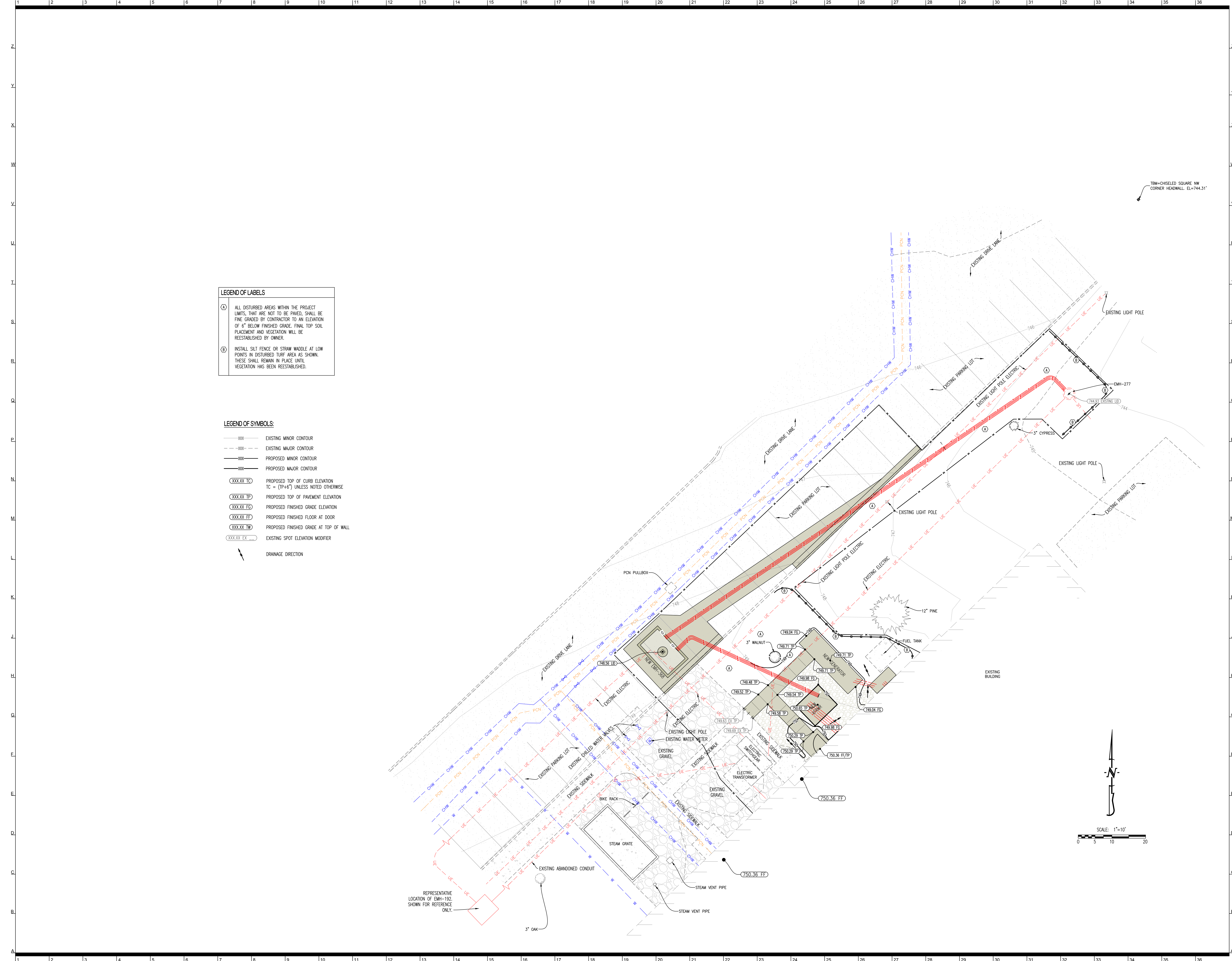
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Issued: 01/04/2024

Rev. #	Description	Date Issued

GRADING AND EROSION CONTROL PLAN

**CE 6**



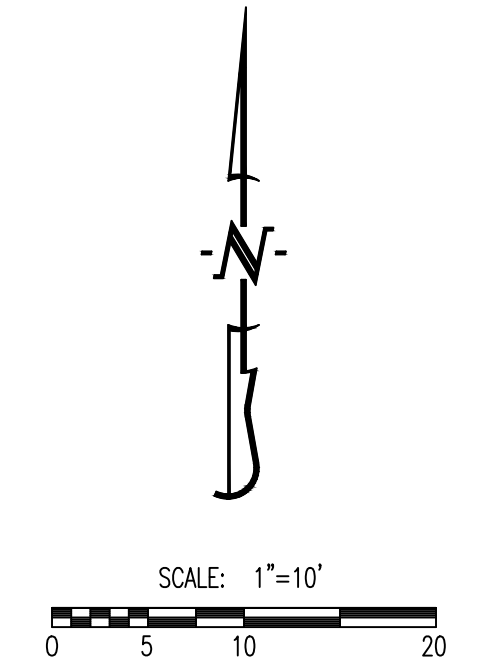
**LEGEND OF LABELS**

① 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 FINISHED GRADE. FINAL TOP SOIL PLACEMENT AND VEGETATION WILL BE REESTABLISHED BY OWNER.

② INSTALL SILT FENCE OR STRAW WADDE AT LOW POINTS IN DISTURBED TURF AREA AS SHOWN. THESE SHALL REMAIN IN PLACE UNTIL VEGETATION HAS BEEN REESTABLISHED.

**LEGEND OF SYMBOLS:**

- EXISTING MINOR CONTOUR
- - - EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- - - PROPOSED MAJOR CONTOUR
- xxx.xx TD PROPOSED TOP OF CURB ELEVATION TC = (TP+6") UNLESS NOTED OTHERWISE
- xxx.xx TP PROPOSED TOP OF PAVEMENT ELEVATION
- xxx.xx FD PROPOSED FINISHED GRADE ELEVATION
- xxx.xx FF PROPOSED FINISHED FLOOR AT DOOR
- xxx.xx TW PROPOSED FINISHED GRADE AT TOP OF WALL
- xxxxxx EX EXISTING SPOT ELEVATION MODIFIER
- DRAINAGE DIRECTION



REPRESENTATIVE LOCATION OF EMI-192. SHOWN FOR REFERENCE ONLY.



**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:
1. CONCRETE SHALL DEVELOP THE FOLLOWING 28-DAY MINIMUM COMPRESSIVE STRENGTH:  
CAST-IN-PLACE WALLS - 3500 PSI  
FLOOR SLAB - 4000 PSI
  2. ALL FOOTINGS SHALL BEAR ON UNDISTURBED SOIL OR ENGINEERED FILL.
  3. CHLORIDE-BASED ADMIXTURES ARE PROHIBITED IN ALL REINFORCED CONCRETE.
  4. REINFORCING STEEL SHALL CONFORM TO ASTM A615, A616, OR A617, GRADE 60.
  5. 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.
  6. CONTINUOUS REINFORCING BARS LAP LENGTH SHALL BE A MINIMUM OF 48 BAR DIAMETERS UNLESS NOTED OTHERWISE.
  7. 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.
  8. 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.
  9. READY MIX CONCRETE SHALL COMPLY WITH REQUIREMENTS OF ASTM C94.
  10. CONCRETE WORK EXECUTION
    - A. CONSTRUCT FORMS TO CORRECT SIZE, SHAPE, ALIGNMENT, ELEVATION AND POSITION; AND TO SUPPORT VERTICAL AND LATERAL LOADS.
    - B. 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 1/4 INCHES
    - C. 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**

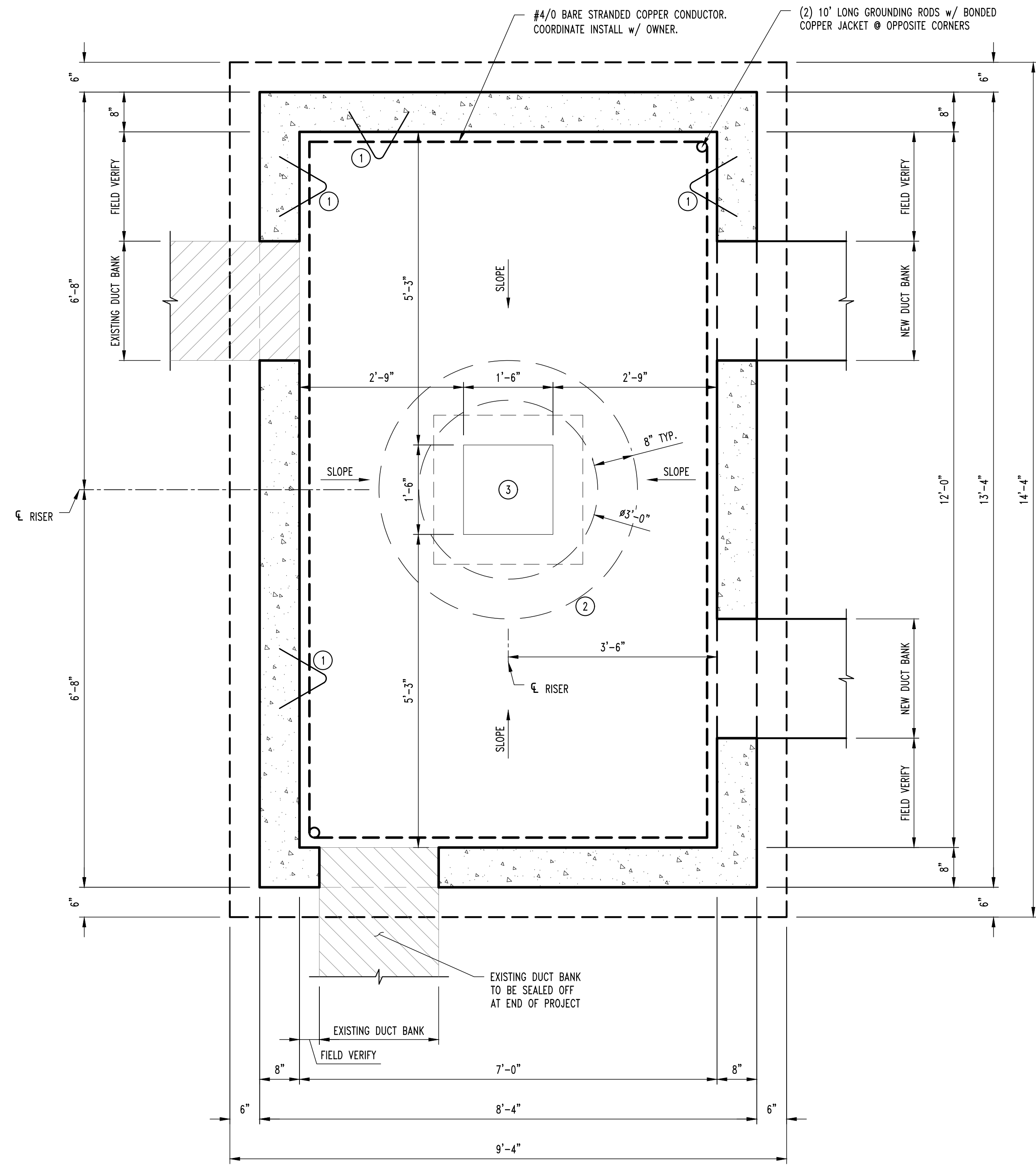
- THE FOLLOWING ITEMS REQUIRE SPECIAL INSPECTION IN ACCORDANCE WITH CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE.
- a. CONCRETE GROUT DESIGN MIX (PERIODIC)
  - b. PLACING OF CONCRETE AND REINFORCING STEEL (CONTINUOUS OF CONCRETE SAMPLING / PERIODIC OF REINFORCING)
  - c. BOLTS & ANCHORS EMBEDDED IN CONCRETE (PERIODIC)
  - d. POST INSTALLED ANCHORS IN CONCRETE (CONTINUOUS)
- 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.

**GENERAL NOTES**

1. ALL CONCRETE AND REINFORCING SHALL MEET THE SPECIFICATIONS IN DIVISION 33.
2. ALL BACKFILL SHALL BE MODOT TYPE 1 OR 5 AND SHALL HAVE COMPACTION TESTS COMPLETED IN 8 INCH LIFTS PER SPECIFICATION.
3. ALL NEW REINFORCING SHALL BE EPOXY COATED.

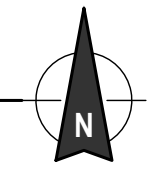
**FOUNDATION NOTES**

1. PROVIDE PULLING IRONS OPPOSITE OF EACH DUCT ENTRY. COORDINATE INSTALL W/ OWNER
2. CONCRETE RISER MAY BE 36" SQUARE OR 36" W/ INSIDE DIMENSION.
3. 18" x 18" SUMP PIT CENTERED INTO FLOOR. PROVIDE 1/2" TOTAL FLOOR SLOPE TO DRAIN.

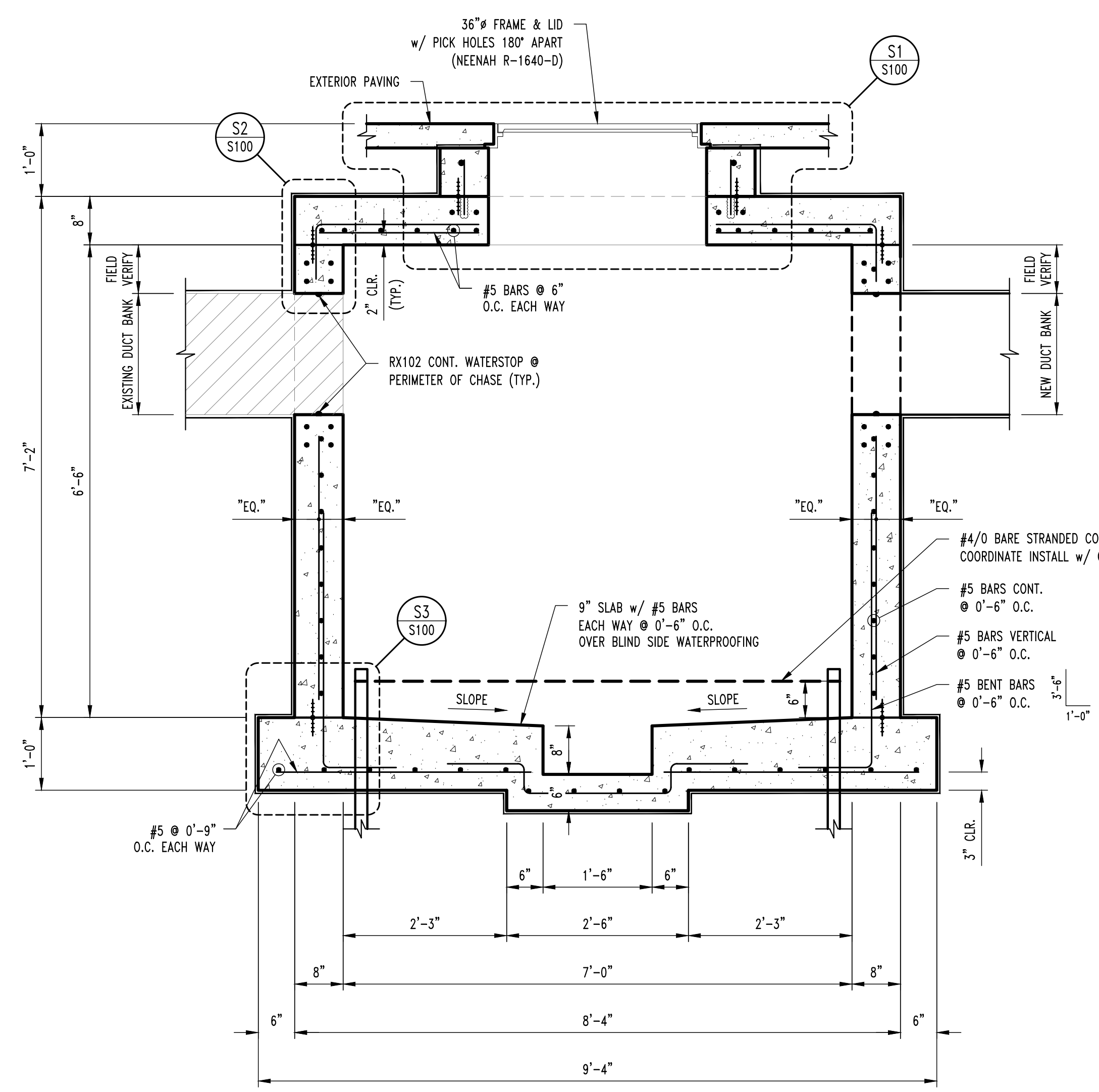


**EMH-368 MANHOLE PLAN**

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

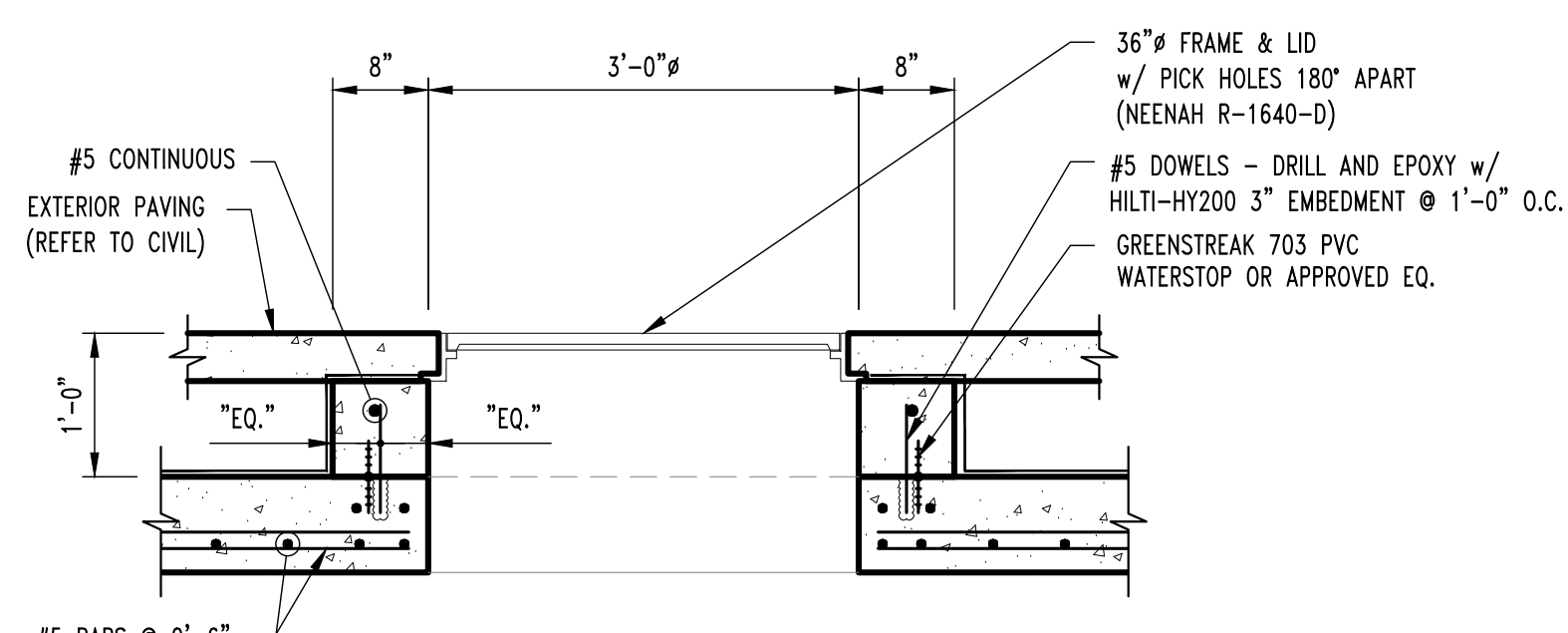


**NOTE:**  
LID DESIGN FOR 250 PSF LIVE LOADING & WALLS DESIGNED FOR 80 PCF ACTIVE PRESSURE.



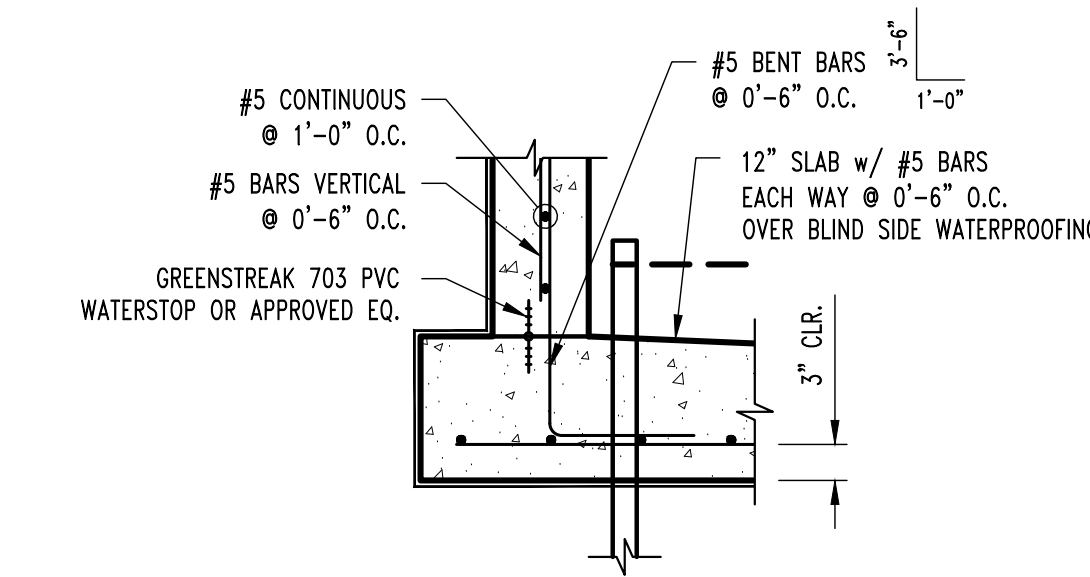
**ELEVATION**

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



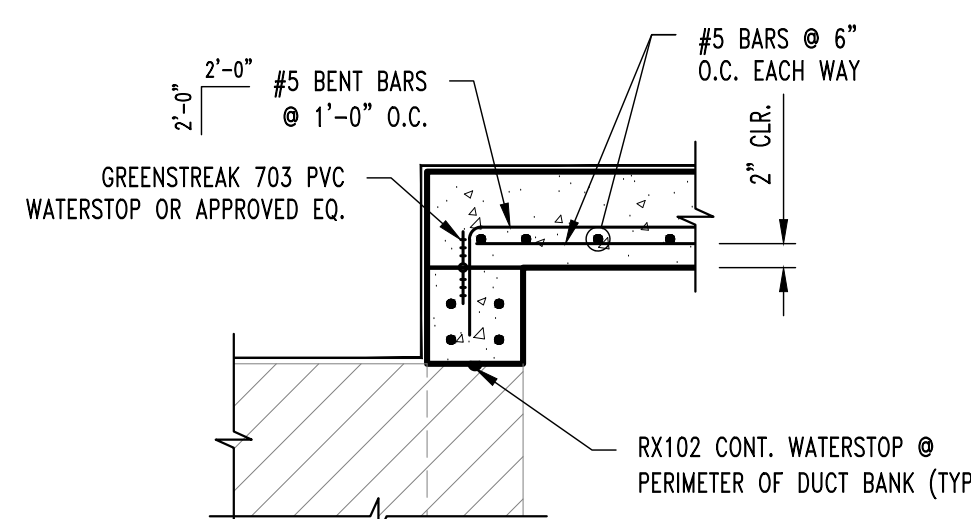
**DETAIL**

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

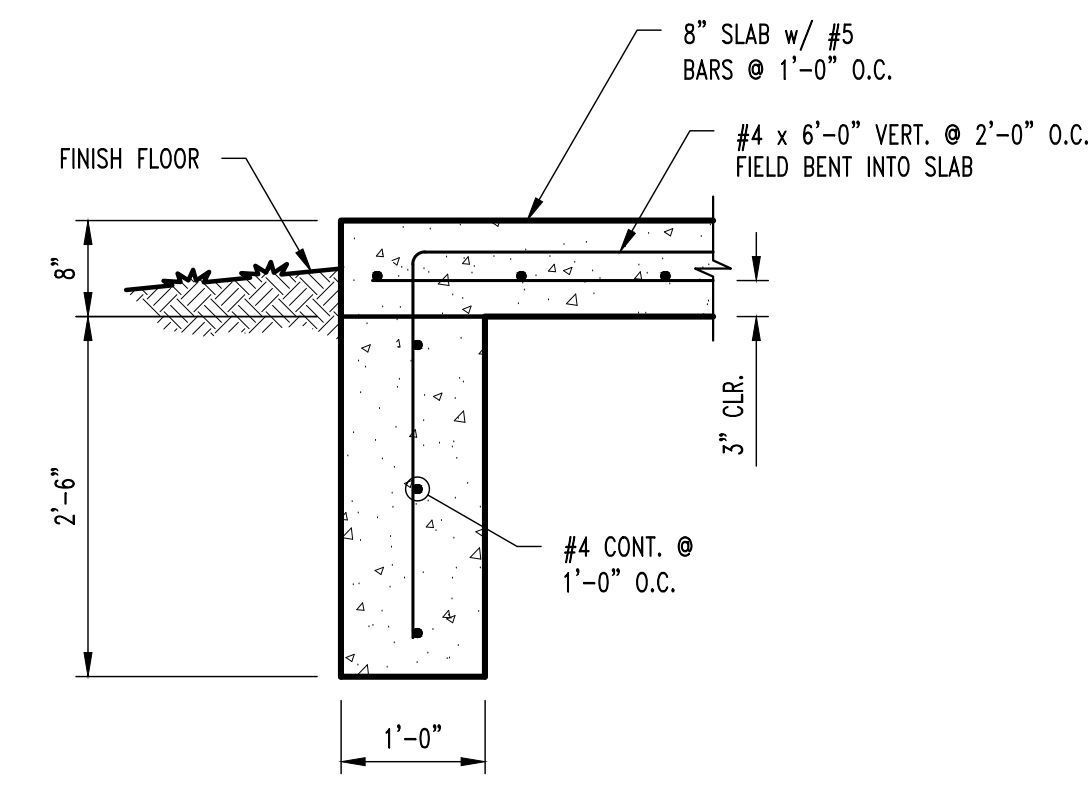


**DETAIL**

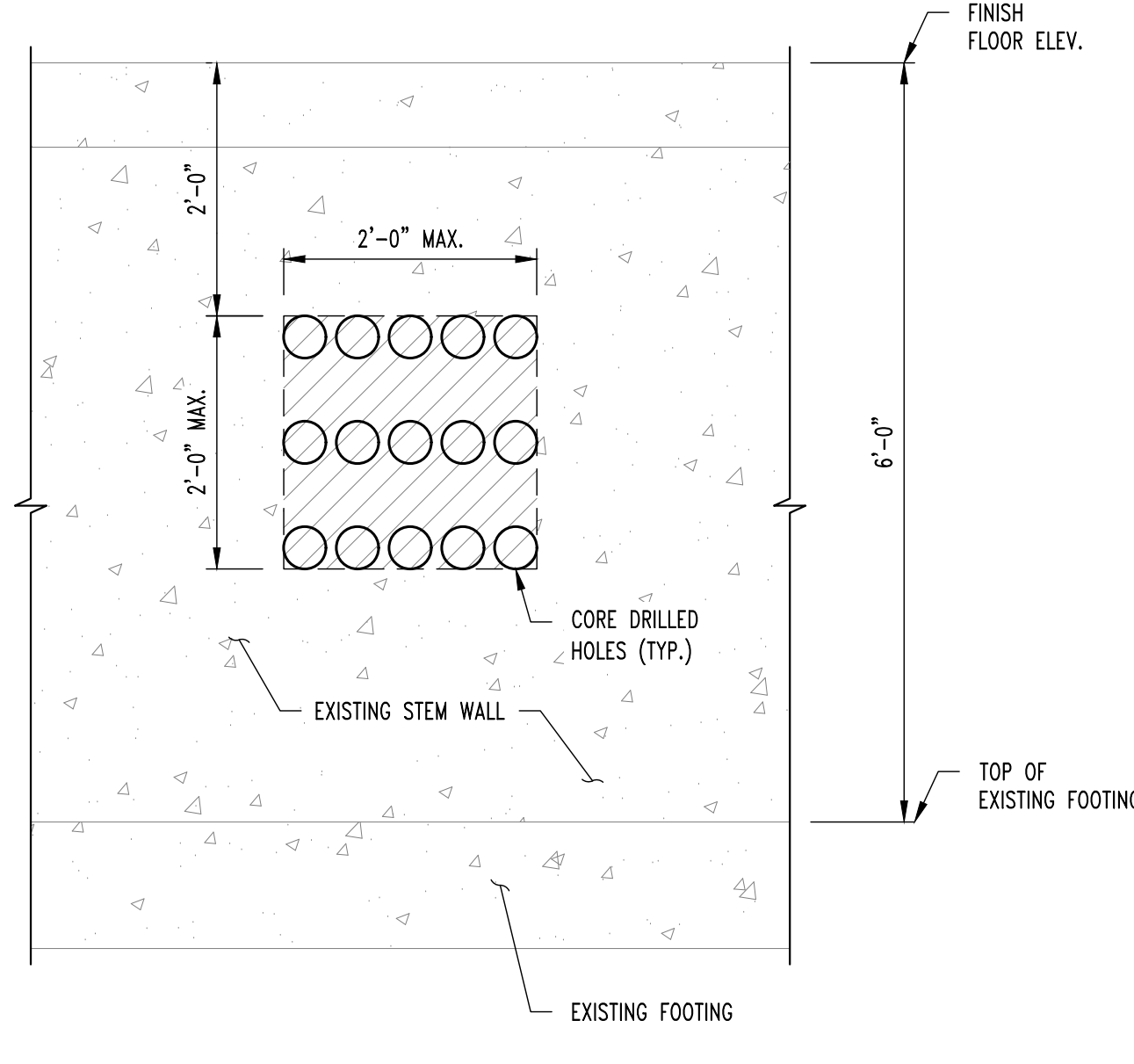
SCALE: 3/4" = 1'-0"



**TYPICAL WALL & LID OPENING REINFORCEMENT**



**TYPICAL GENERATOR PAD FOOTING SECTION**



**CONDUIT CORES THRU EXISTING STEM WALL @ EXISTING BUILDING**

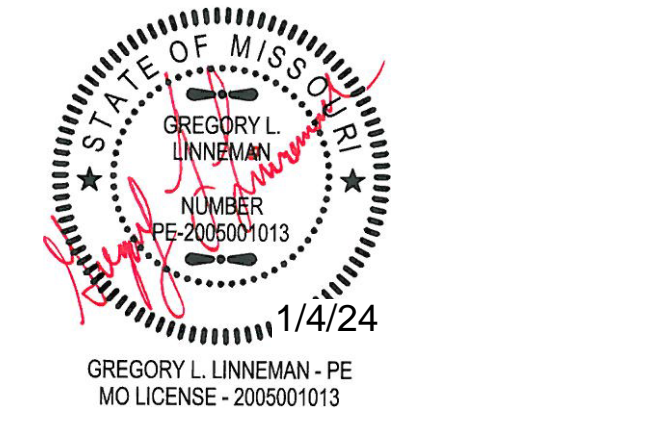
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**ANIMAL SCIENCE RESEARCH CENTER - REPLACE ELECTRICAL SERVICE PANELS**

Crockett Project No: 230426

**BID SET**

Issued: 01/04/2024

Rev. #	Description	Date Issued

**EMH-368 MANHOLE PLAN & DETAILS**

**S100**

# TYPICAL FIRESTOPPING DETAILS

**System No. W-L-5029**

ANSI/UL1474 (ASTM E814)	CANULC B115
F Rating - 1 and 2 hr (See Item 1, 3 and 4)	F Rating - 1 and 2 hr (See Item 1, 3 and 4)
1 Rating at Ambient - Less Than 1 CFM/sq ft	1 Rating at Ambient - Less Than 1 CFM/sq ft
1 Rating at 400 °F - Less Than 1 CFM/sq ft	1 Rating at 400 °F - Less Than 1 CFM/sq ft

**System No. W-L-5029**

3. Pipe Coating - Non-1, 1-1/2 or 2 in. (38 or 51 mm) thick hollow cylindrical heavy duty (min. 3.5 pcf or 56 kg/m³) glass fiber units... (text continues)

**System No. W-L-3065**

ANSI/UL1474 (ASTM E814)	CANULC B115
F Rating - 1 and 2 hr (See Item 1)	F Rating - 1 and 2 hr (See Item 1)
1 Rating at Ambient - Less Than 1 CFM/sq ft	1 Rating at Ambient - Less Than 1 CFM/sq ft
1 Rating at 400 °F - Less Than 1 CFM/sq ft	1 Rating at 400 °F - Less Than 1 CFM/sq ft

**System No. W-L-3065**

1. Wall Assembly - This 1 or 2 hr fire-stop gypsum wallboard wall assembly shall be constructed of the materials and in the manner specified in the individual ULS, ULQ, ULD or WBD Series Wall and Partition Details in the UL Fire Resistance Directory and shall include the following construction features: (text continues)

**System No. W-L-7155**

ANSI/UL1474 (ASTM E814)	CANULC B115
F Rating - 1 and 2 hr (See Item 1)	F Rating - 1 and 2 hr (See Item 1)
1 Rating at Ambient - Less Than 1 CFM/sq ft	1 Rating at Ambient - Less Than 1 CFM/sq ft
1 Rating at 400 °F - Less Than 1 CFM/sq ft	1 Rating at 400 °F - Less Than 1 CFM/sq ft

**System No. W-L-7155**

1. Wall Assembly - This 1 or 2 hr fire-stop gypsum wallboard wall assembly shall be constructed of the materials and in the manner specified in the individual ULS, ULQ, ULD or WBD Series Wall and Partition Details in the UL Fire Resistance Directory and shall include the following construction features: (text continues)

**System No. C-AJ-1226**

ANSI/UL1474 (ASTM E814)	CANULC B115
F Rating - 2 hr	F Rating - 2 hr
1 Rating at Ambient - Less Than 1 CFM/sq ft	1 Rating at Ambient - Less Than 1 CFM/sq ft
1 Rating at 400 °F - Less Than 1 CFM/sq ft	1 Rating at 400 °F - Less Than 1 CFM/sq ft

**System No. C-AJ-1226**

1. Floor or Wall Assembly - Min 4-1/2" (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2000 kg/m³) concrete wall... (text continues)

**System No. C-AJ-1149**

ANSI/UL1474 (ASTM E814)	CANULC B115
F Rating - 2 hr	F Rating - 2 hr
1 Rating at Ambient - Less Than 1 CFM/sq ft	1 Rating at Ambient - Less Than 1 CFM/sq ft
1 Rating at 400 °F - Less Than 1 CFM/sq ft	1 Rating at 400 °F - Less Than 1 CFM/sq ft

**System No. C-AJ-1149**

1. Floor or Wall Assembly - Min 4-1/2" (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2000 kg/m³) concrete wall... (text continues)

**UL/ULI SYSTEM NO. C-AJ-1138**

**BLANK OPENING THROUGH CONCRETE FLOOR/WALL OR BLOCK WALL ASSEMBLY**

F-RATING = 2-HR.  
T-RATING = 1-3/4-HR.

### CODE & ZONING INFORMATION

- APPLICABLE CODES:**
- 2021 INTERNATIONAL BUILDING CODE
  - 2021 INTERNATIONAL PLUMBING CODE
  - 2021 INTERNATIONAL MECHANICAL CODE
  - 2021 EXISTING BUILDING CODE
  - 2021 INTERNATIONAL FUEL GAS CODE
  - 2021 INTERNATIONAL FIRE CODE
  - 2021 INTERNATIONAL FUEL GAS CODE
  - 2017 ICC A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES (APPLICABLE SECTIONS PER CODE DETERMINATION 08)
  - 2012 NFPA 101, LIFE SAFETY CODE
  - 2012 NFPA 99 STANDARD FOR HEALTH CARE FACILITIES
  - 2019 ASHRAE 90.1 - ENERGY STANDARD FOR BUILDINGS
  - 2010 AMERICANS WITH DISABILITIES ACT - STANDARDS FOR ACCESSIBLE DESIGN
  - 2017 ASHRAE 170
  - 2020 NATIONAL ELECTRICAL CODE
  - 2019 NFPA 110 STANDARD FOR EMERGENCY & STANDBY POWER SYSTEMS
  - 2019 NFPA 72 NATIONAL FIRE ALARM CODE
  - 2018 NFPA 90A INSTALLATION OF AIR CONDITIONING & VENTILATING SYSTEMS
  - 2019 NFPA 20 STANDARD FOR THE INSTALLATION OF STATIONARY FIRE PUMPS FOR FIRE PROTECTION
  - 2019 NFPA 14 STANDARD FOR THE INSTALLATION OF STANDBY, PRIVATE HYDRANTS AND HOSE SYSTEMS
  - 2019 NFPA 13 INSTALLATION OF FIRE SPRINKLER SYSTEMS
- LOCAL FIRE DEPARTMENT: CITY OF COLUMBIA FIRE DEPARTMENT**
- LOCAL AGENCIES HAVING JURISDICTION: UM DIRECTOR OF FACILITIES PLANNING AND DEVELOPMENT, UNIVERSITY OF MISSOURI.**
- GENERAL INFORMATION:**
- USE GROUP - BUSINESS (B)
  - CONSTRUCTION TYPE - CONSISTENT WITH TYPE IIA OR IIB FLOOR AREAS
  - FIRST FLOOR: 125,899 SF
- HEIGHT: 23'
- EXISTING WALL CONDITIONS:**
- REFER TO TABLE 721.1.(2) 3-1.1-4 FOR MINIMUM THICKNESS 2.8" OF EXISTING CONCRETE MASONRY WALLS
- IBC 1016 EXIT TRAVEL DISTANCE:**
- MAXIMUM EXIT TRAVEL DISTANCE WITHOUT SPRINKLER SYSTEM IS 200'; CODE ALLOWS THIS TO INCREASE TO 300' IF SPRINKLERED
- IBC 1018 CORRIDORS:**
- CORRIDORS WITHOUT SPRINKLERS HAVE 1-HOUR REQUIRED FIRE-RESISTANCE RATING IF SERVING AN OCCUPANT LOAD GREATER THAN 30.
  - CORRIDORS WITH SPRINKLER HAVE 0-HOUR REQUIREMENT.
- SPECIAL INSPECTIONS (2021 IBC 107.1 & 107.4.3):** NOT APPLICABLE IF RISK CATEGORY II
- DEFERRED SUBMITTALS (2021 IBC 107.2.4.1):** NOT APPLICABLE
- BUILDING RISK CATEGORY (2021 IBC 1604.5):** RISK CATEGORY II (B USE GROUP < 5,000 OCCS)

### GENERAL NOTES: LIFE SAFETY PLAN

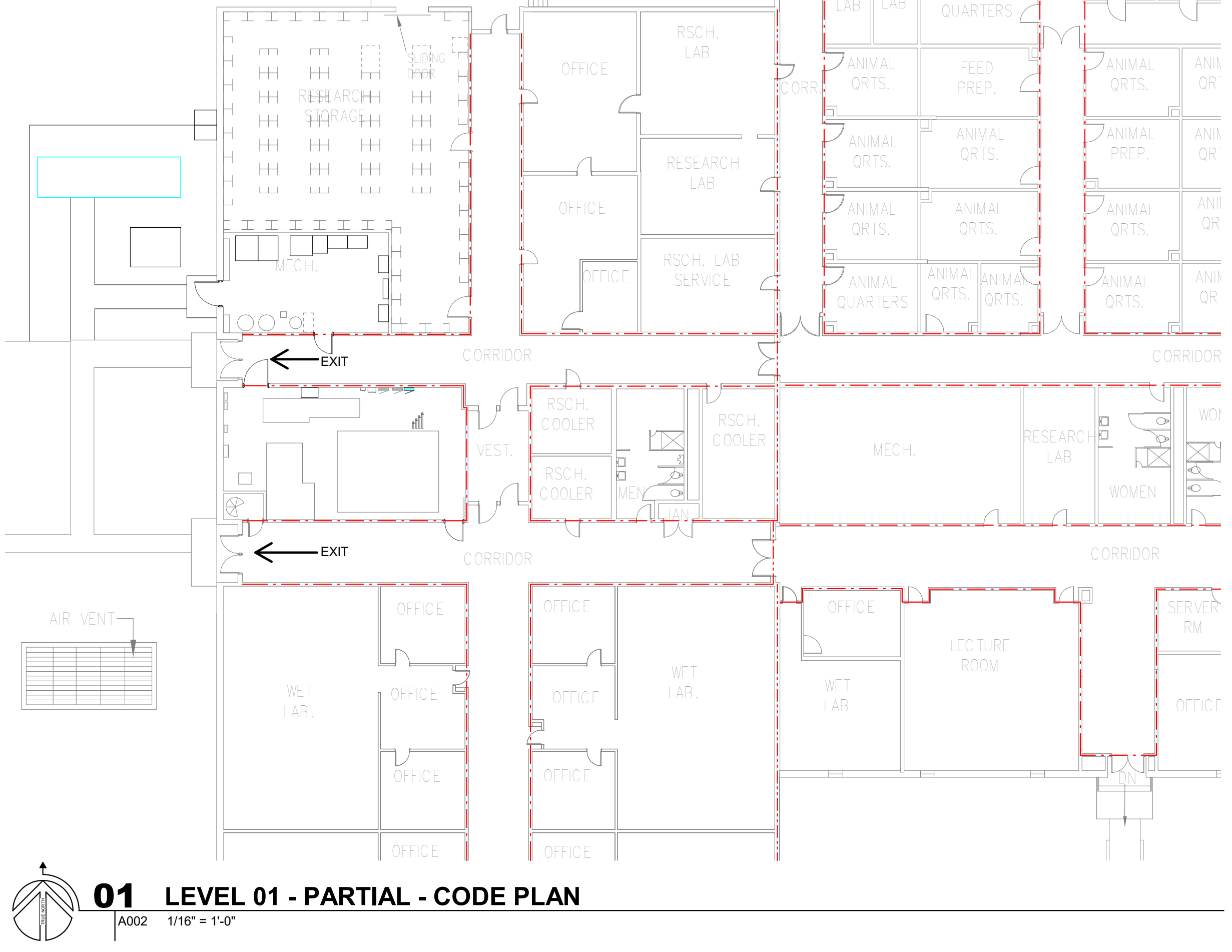
- ALL PENETRATIONS (NEW OR EXISTING) SHALL BE SEALED AT ALL TIMES, EXCEPT WHEN ACTIVELY WORKING WITH THE PENETRATION. EXISTING UNSEALED PENETRATIONS, ONCE ENCOUNTERED, SHALL BE SEALED IMMEDIATELY WITH THE APPROPRIATE FIRE/SMOKE STOPPING MATERIAL COORDINATE WITH OWNER'S REPRESENTATIVE, WHETHER TEMPORARY OR PERMANENT, WITH THE OWNER'S REPRESENTATIVE.
- EXISTING EXITS MUST REMAIN ACCESSIBLE. CLEAR PATHS OF TRAVEL TO EXITS MUST BE MAINTAINED WITHIN THE CONSTRUCTION LIMITS. CONTRACTOR IS TO COORDINATE WITH OWNER'S REPRESENTATIVE TO MAINTAIN PROPER EXIT SIGNAGE THROUGHOUT CONSTRUCTION.
- FIREWALLS, FIRE BARRIERS, FIRE PARTITIONS, SMOKE BARRIERS AND SMOKE PARTITIONS SHALL BE EFFECTIVELY IDENTIFIED WITH STENCILING IN CONCEALED SPACES. SUCH IDENTIFICATION SHALL:
  - BE LOCATED WITHIN 15' OF THE END OF EACH WALL AND AT INTERVALS NOT EXCEEDING 30' MEASURED HORIZONTAL LYING ALONG THE WALL PARTITION.
  - INCLUDE LETTERING NOT LESS THAN 3" IN HEIGHT WITH A MINIMUM 3/8" STROKE IN A CONTRASTING COLOR INCORPORATING WORDING IDENTIFYING THE BARRIER DESIGNATION AND FIRE RESISTANCE RATING.

**EXISTING FIRE RATED PARTITION KEY**

- 1/2-HOUR FIRE RATED PARTITION
- 1-HOUR FIRE RATED PARTITION
- 2-HOUR FIRE RATED PARTITION

**01 LEVEL 01 - PARTIAL - CODE PLAN**

**A002** 1/16" = 1'-0"



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Professional seal and signature area for project documentation.

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## ANIMAL SCIENCE RESEARCH CENTER - REPLACE ELECTRICAL SERVICE PANELS

Antella Project No: CP221041

**ISSUE FOR BID**

Issued: 01/04/2024

Rev. #	Description	Date Issued

## CODE SUMMARY AND FIRESTOPPING DETAILS

# A002

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**ANIMAL SCIENCE RESEARCH CENTER - REPLACE ELECTRICAL SERVICE PANELS**

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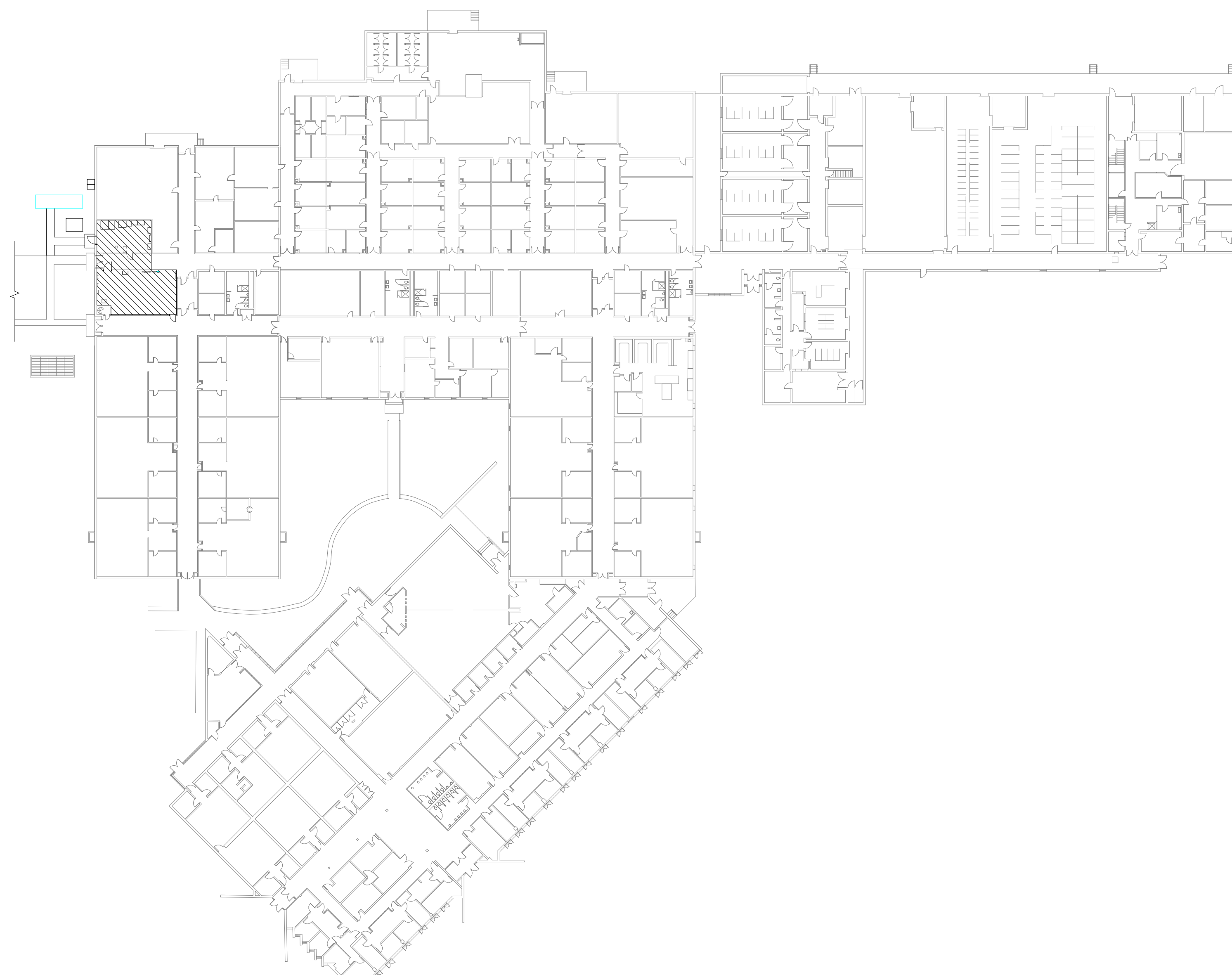
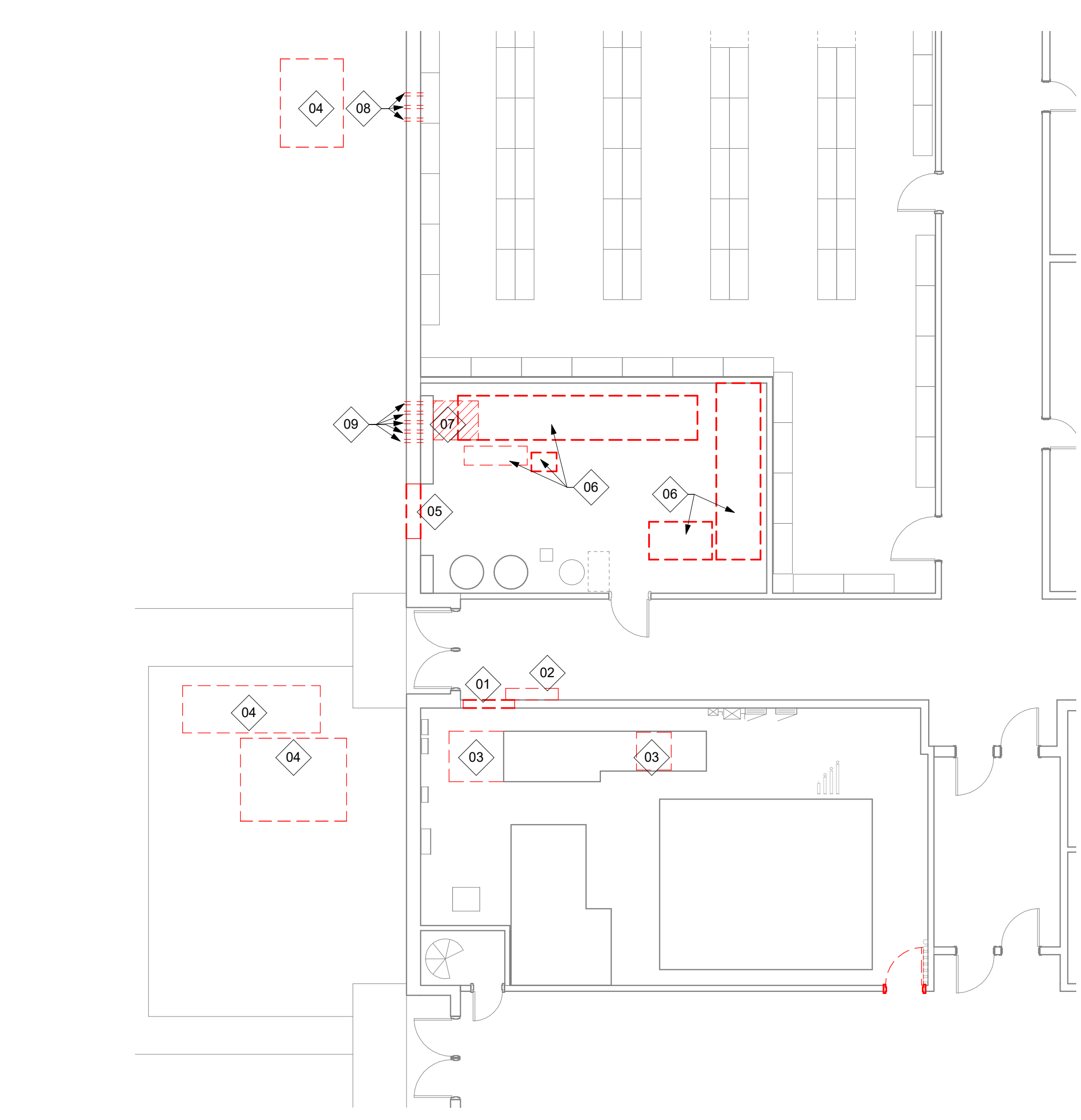
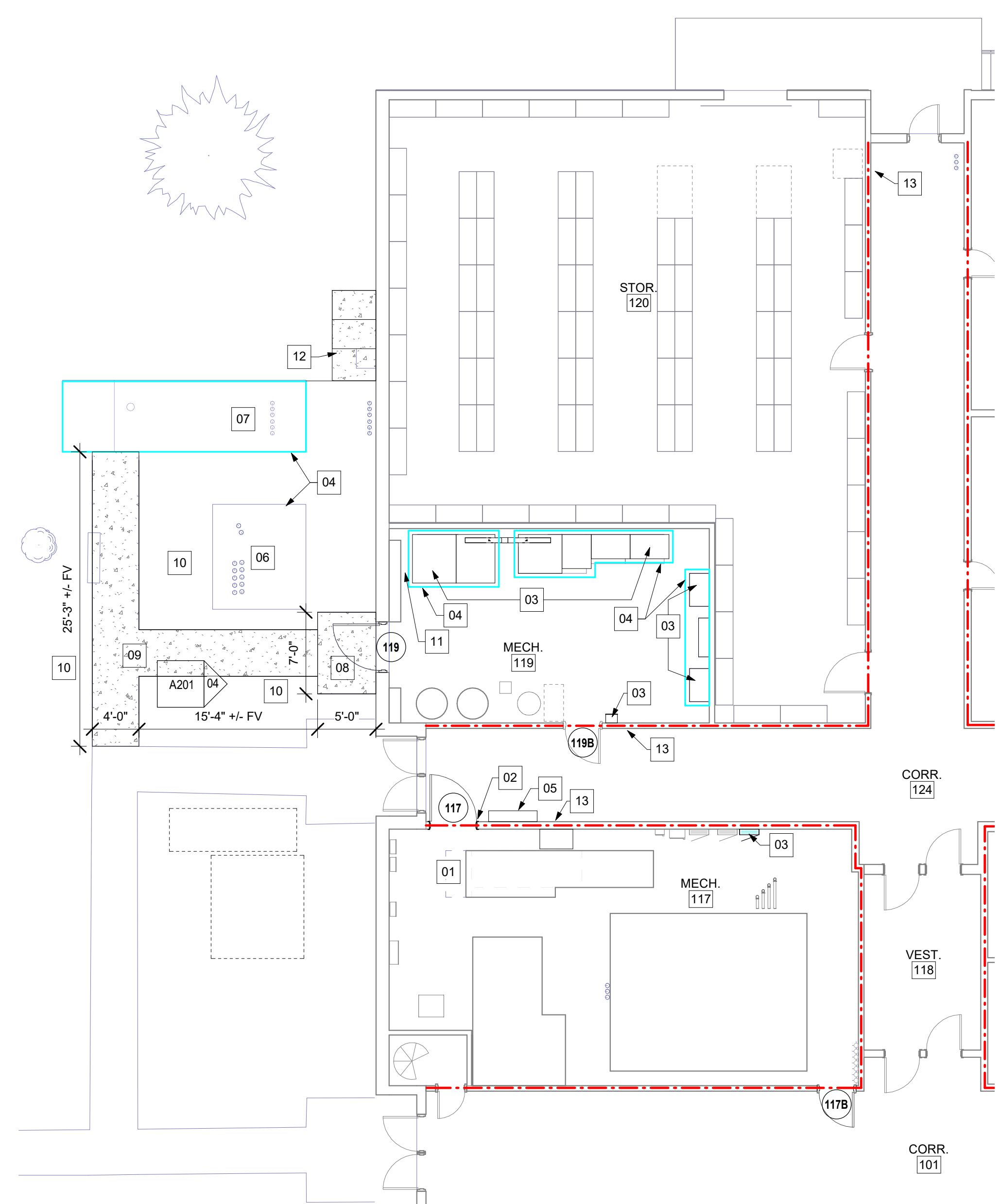
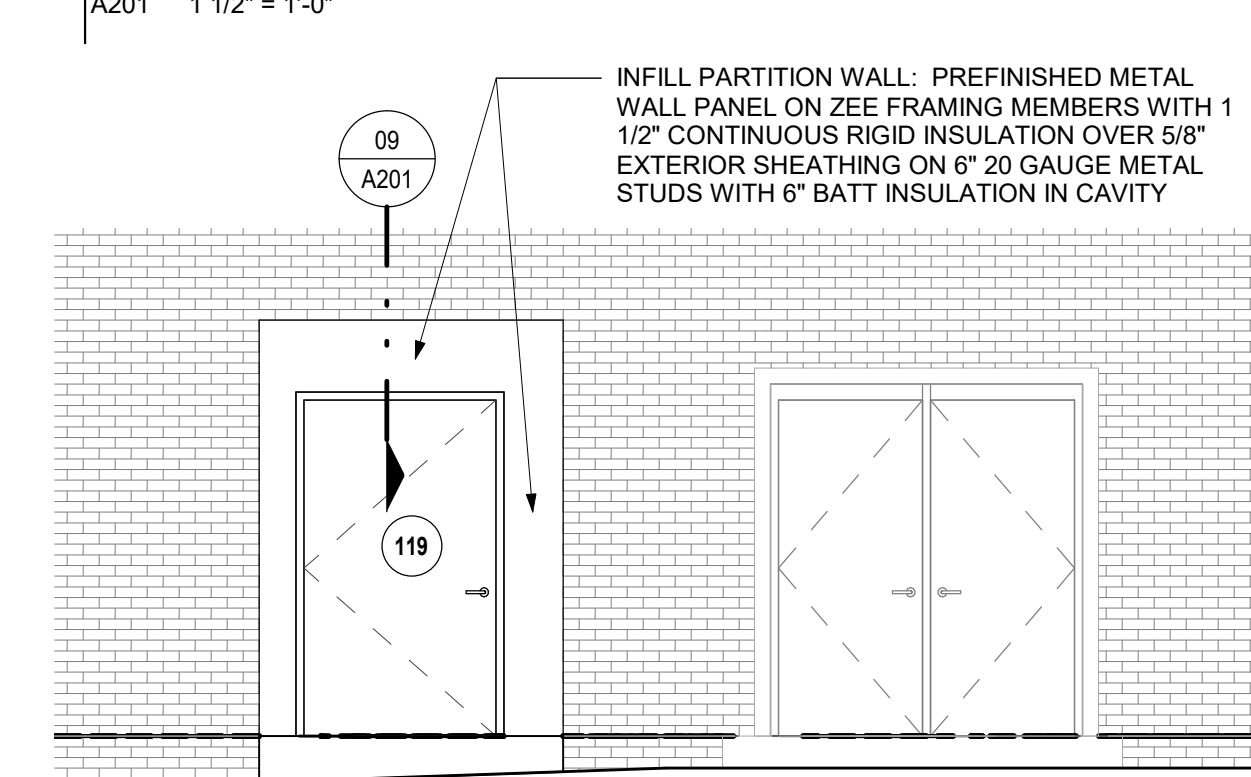
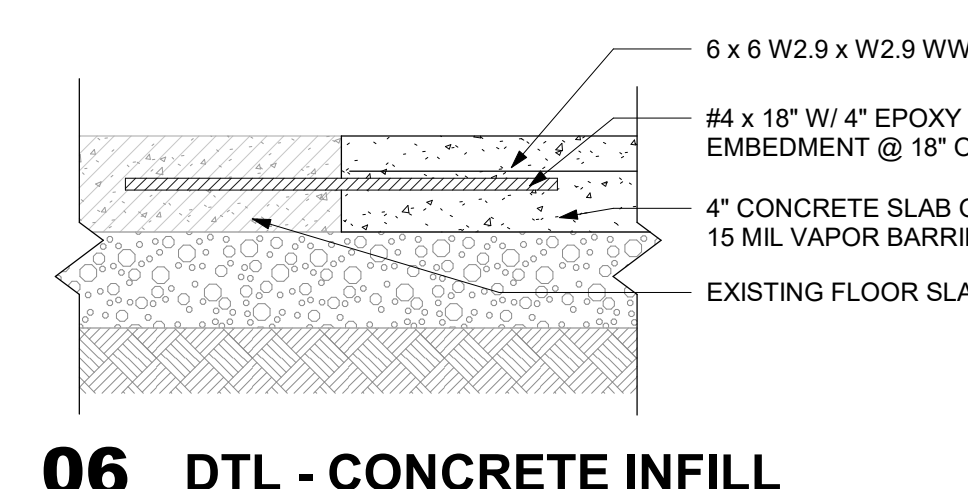
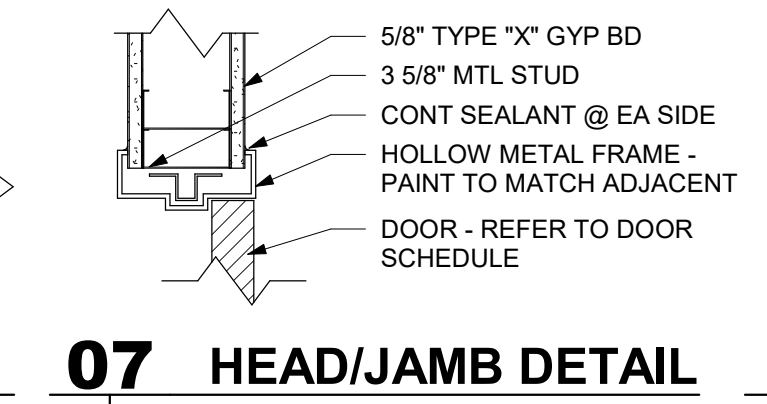
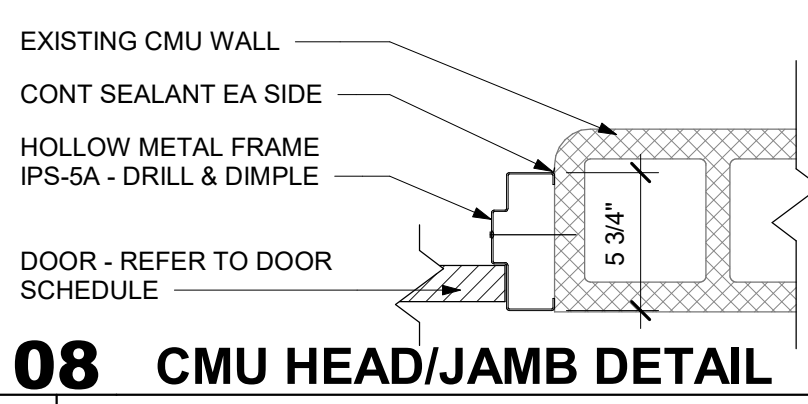
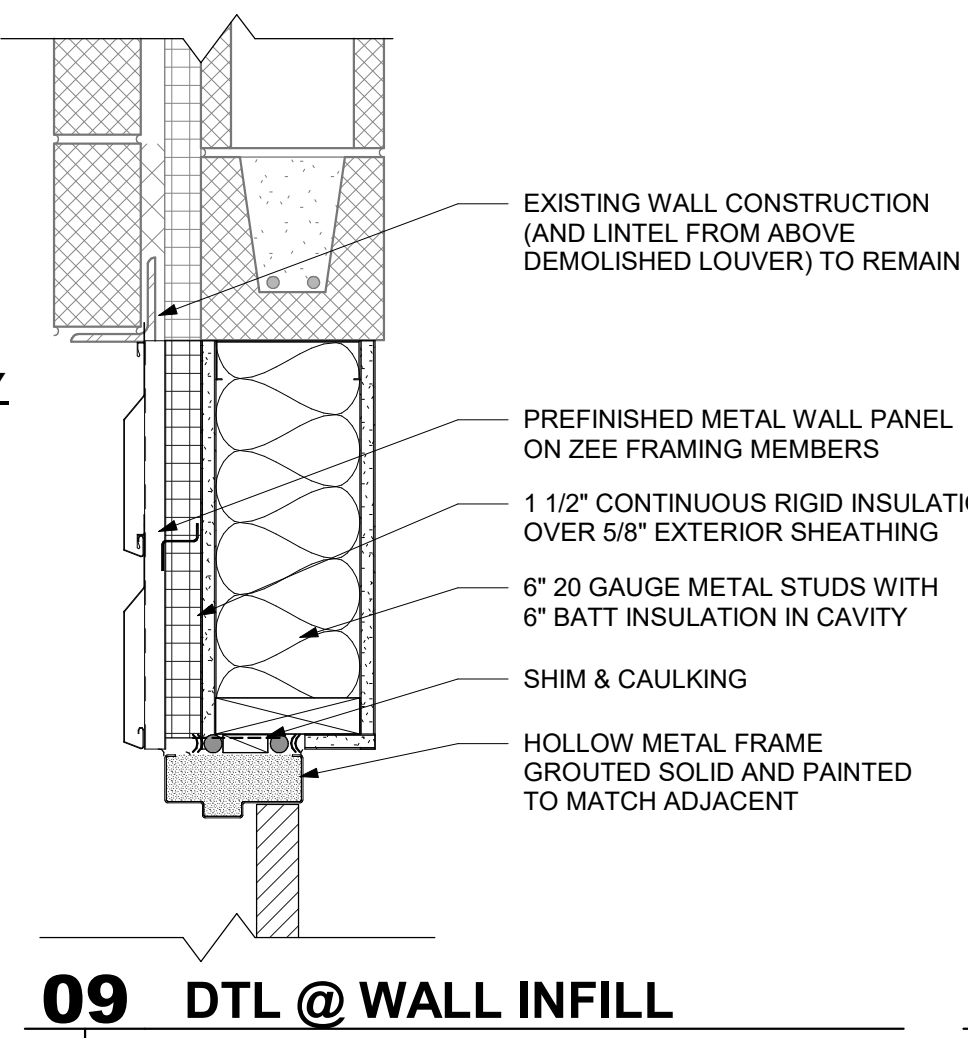
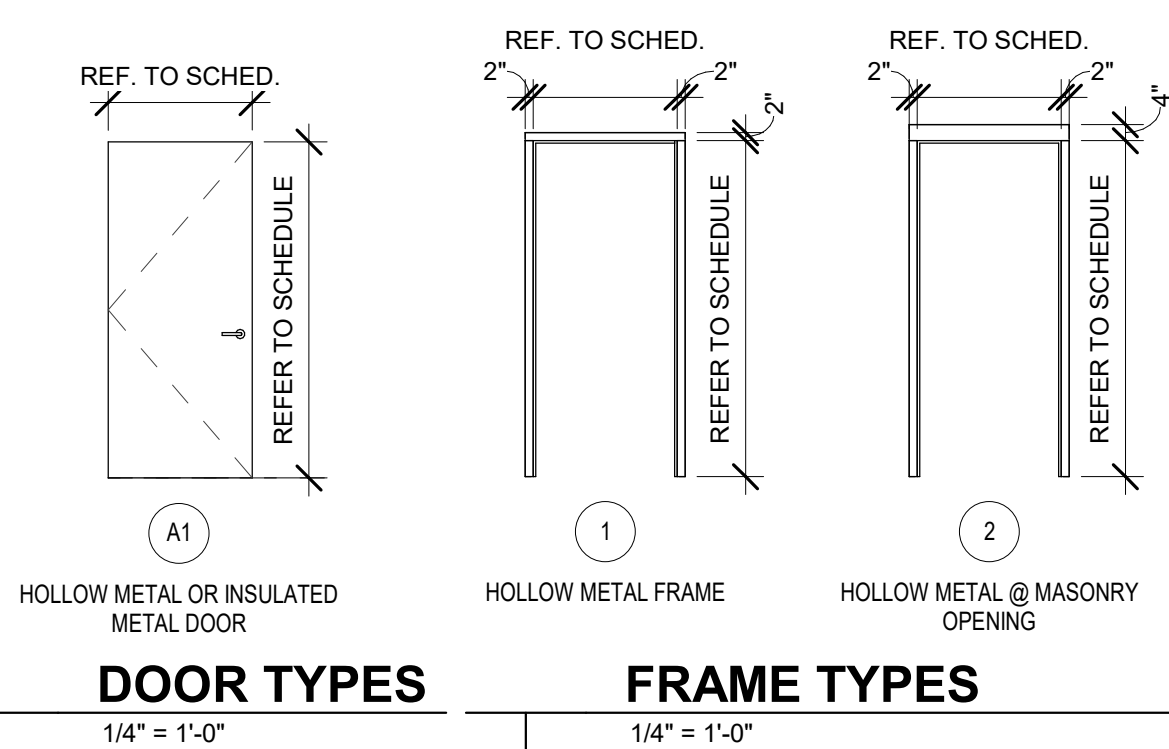
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**PLANS & ELEVATIONS**

**A201**

DOOR NO	DOOR					FRAME		FIRE RATING LABEL	HARDWARE SET NO	NOTES		
	SIZE	MATL	ELEV	MATL	ELEV	HEAD	JAMB					
LEVEL 01												
117	4'-0"	7'-0"	1 3/4"	HM	A1	HM	2	07/A201	07/A201	45 MIN	1	FIELD VERIFY OPENING SIZE
117B	3'-0"	7'-0"	1 3/4"	HM	A1	HM	1	08/A201	08/A201	45 MIN	1	FIELD VERIFY OPENING SIZE
119	4'-0"	7'-0"	1 3/4"	HM	A1	HM	1				2	INSULATED
119B	3'-0"	7'-0"	1 3/4"	EXIST	EXIST	EXIST	EXIST				3	



**EXISTING FIRE RATED PARTITION KEY**  
- - - 1/2-HOUR FIRE RATED PARTITION  
- - - 1-HOUR FIRE RATED PARTITION  
- - - 2-HOUR FIRE RATED PARTITION

**NEW WORK GENERAL NOTES**  
1. FIELD VERIFY ALL DIMENSIONS. IF DIMENSIONS VARY SIGNIFICANTLY NOTIFY THE ARCHITECT  
2. ALL DIMENSIONS TO CENTERLINE OF COLUMN, FACE OF STEEL STUD, OR MASONRY UNLESS NOTED OTHERWISE  
3. ALL NON STRUCTURAL METAL FRAMING (NSMF) 16" ON CENTER UNLESS NOTED OTHERWISE  
4. GRAY WALLS & DOORS ARE EXISTING TO REMAIN - PROTECT DURING CONSTRUCTION

**KEYNOTES - PLAN**  
01 PATCH FLOOR WHERE UNIT WAS REMOVED  
02 PATCH FLOOR & WALL WHERE HEATER WAS REMOVED - MATCH EXISTING ADJACENT FINISHES  
03 NEW ELECTRICAL EQUIPMENT - REFER ELECTRICAL  
04 4" CONCRETE SLAB / PAD FOR EQUIPMENT  
05 REINSTALLED HEATER - REFER MEP  
06 TRANSFORMER - REFER MEP  
07 NEW GENERATOR - REFER MEP  
08 CONCRETE STOOP - REFER TO CIVIL  
09 CONCRETE SIDEWALK - REFER TO CIVIL  
10 GRAVEL TO MATCH ADJACENT - REFER TO CIVIL  
11 CONCRETE INFILL PATCH - FLUSH WITH ADJACENT  
12 CONCRETE EQUIPMENT PAD  
13 SEAL AROUND CONDUIT - REFER FIRESTOP DETAILS ON A002

**GENERAL NOTES - DEMOLITION**  
1. REMOVE WALLS INDICATED BY THE FOLLOWING LINETYPE (UNLESS NOTED OTHERWISE):  
2. PROTECT EXISTING SURFACES & COMPONENTS SCHEDULED TO REMAIN  
3. REFER TO MEP DRAWINGS FOR ADDITIONAL DEMOLITION INFORMATION  
4. BEFORE DEMOLITION PHASE, COORDINATE WITH OWNER REPRESENTATIVE

**KEYNOTES - DEMOLITION PLAN**  
01 MASONRY WALL - REMOVE AS NEEDED FOR NEW DOORWAY  
02 HEATER - REMOVE & SALVAGE FOR REINSTALLATION - REFER MEP  
03 ELECTRICAL CABINET - REMOVE SECTION - REFER MEP DWGS  
04 EQUIPMENT - REMOVE AS INDICATED ON MEP DRAWINGS  
05 LOUVER & MASONRY WALL - REMOVE AS NEEDED FOR NEW DOORWAY  
06 HVAC EQUIPMENT AND CONCRETE HOUSEKEEPING PAD - REMOVE CONCRETE PAD AND DISPOSE OF DEMO MECHANICAL EQUIPMENT AS INDICATED ON MEP DWGS  
07 SAWCUT AND REMOVE CONCRETE SLAB AS REQUIRED FOR ELECTRICAL CONDUIT INSTALLATION  
08 CORE MASONRY EXTERIOR WALL ASSEMBLY AS REQUIRED FOR ELECTRICAL CONDUIT INSTALLATION - REFER TO ELECTRICAL  
09 CORE CONCRETE FOOTING AS REQUIRED FOR ELECTRICAL CONDUIT INSTALLATION - REFER TO STRUCTURAL AND ELECTRICAL

GENERAL NOTES: (TYPICAL ALL SHEETS)

- A) ALL WORK SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THE LATEST NATIONAL ELECTRICAL CODE... B) ALL JUNCTION BOXES FOR RECEPTACLES SHALL BE EVENLY SPACED... C) ELECTRICAL CONTRACTOR TO VERIFY EXACT PLACEMENT OF ALL DEVICES... D) ALL LIGHT FIXTURES SHALL BE SUPPORTED PER ASTM E580/E580M-06... E) EXIT AND EMERGENCY LIGHTS SHALL BE CONNECTED TO HOT LEG... F) ALL SINGLE PHASE, SINGLE POLE LOADS TO HAVE DEDICATED NEUTRALS... G) WHERE ELECTRICAL SITE WORK IS REQUIRED, CONTRACTOR SHALL RESTORE EXISTING SITE TO ITS ORIGINAL CONDITION... H) CONTRACTOR SHALL PROVIDE A MINIMUM OF 3/4" CONDUIT PER SPECIFICATIONS... I) USE OF 3M SCOTCHLOK CONNECTORS OR PUSH-IN WIRE CONNECTORS... J) IF CONTRACTOR CHOOSES TO GROUP CIRCUITS FOR HOME RUNS... K) ALL EMPTY CONDUITS SHALL BE PROVIDED WITH A PULL WIRE... L) ALL MATERIALS WITHIN A PLENUM SHALL BE NON-COMBUSTIBLE... M) CONTRACTOR SHALL COORDINATE INSTALLATION OF ELECTRICAL WORK ABOVE THE CEILING... N) ALL PANELBOARDS, SWITCHBOARDS AND LINE VOLTAGE CONTROL EQUIPMENT... O) BATTERY DISPOSAL: BATTERIES SHALL BE PROPERLY DISPOSED... P) PROPERLY DISPOSE OF FLUORESCENT LAMPS PER UNIVERSITY CAMPUS STANDARDS... Q) CONTRACTOR SHALL CONNECT EXISTING 120V LIGHTS AND RECEPTACLES... R) INSTALL BLANK COVER PLATE ON ALL OPEN OR ABANDONED DEVICE BOXES... S) ANY MATERIAL REMOVED THAT OWNER DOES NOT WISH TO RETAIN SHALL BE REMOVED FROM PROJECT SITE... T) UPDATED, TYPEWRITTEN PANELBOARD DIRECTORY SHALL BE PROVIDED... U) CONTRACTOR SHALL BE RESPONSIBLE TO REPAIR AND/OR REPLACE ANY DAMAGED CEILING TILE OR GRID... V) CONTRACTOR SHALL LOCATE ALL IN SLAB REBAR PRIOR TO CORE DRILLING...

GENERAL DEMO NOTES:

- A) REMOVE ALL WIRING (CONDUIT, CONDUCTORS, BOXES, ETC.), INCLUDING LOW-VOLTAGE AND TELECOM, ABANDONED AS PART OF THIS PROJECT... B) CONTRACTOR SHALL DISCONNECT AND REMOVE ALL CONDUCTORS, CONDUIT AND DEVICES ASSOCIATED WITH MECHANICAL EQUIPMENT... C) ANY EXISTING DEVICE AND/OR CIRCUIT SHOWN ARE INDICATED ONLY FOR INFORMATION PURPOSES... D) UNLESS NOTED OTHERWISE, THE ELECTRICAL CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH ALL WORK TO BE DONE BY OBSERVATION OF THE SITE... E) THE ELECTRICAL CONTRACTOR SHALL MAINTAIN ACCURATE RECORDS OF ANY MODIFICATIONS... F) WHERE FEEDERS OR OTHER CIRCUITS ARE ABANDONED AND ARE CONCEALED WITHIN WALLS OR FLOORS... G) WHERE NEW WORK INTERFERES WITH CIRCUITS IN ROOMS OTHERWISE UNDISTURBED... H) THE ELECTRICAL CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF ALL EXISTING UTILITIES... I) CIRCUIT ROUTINGS SHOWN IN REMODELED AREAS MAY BE MODIFIED TO SUIT FIELD CONDITIONS... J) WHERE EXISTING ELECTRICAL LIGHTING AND DISTRIBUTION PANELBOARDS ARE TO BE REMOVED... K) WHERE EQUIPMENT IS REMOVED FROM OR RELOCATED TO A LOCATION WHICH PENETRATES A FIRE RATED STRUCTURE... L) MAINTAIN CONTINUITY OF EXISTING CIRCUITS SERVING DEVICES... M) PROVIDE BLANK COVER PLATES ON ALL ABANDONED BOXES... N) EXISTING WIRING THAT MEETS INTENT OF NEW WORK AND IS IN GOOD CONDITION MAY REMAIN FOR REUSE.

ELECTRICAL SYMBOLS:

Diagrammatic list of electrical symbols including: BRANCH CIRCUIT CONCEALED IN CEILING OR WALL, PANEL - BREAKER NUMBER (IDENTIFICATION), HOME RUN INDICATED LIKE THIS INDICATED, CONDUIT CONCEALED IN CEILING OR WALL WITH THREE CONDUCTORS, EXIT SIGN - SINGLE FACED, EXIT SIGN - DOUBLE FACED, CEILING OR WALL MOUNTED EMERGENCY LIGHTING UNIT, STRIP FIXTURE, MOTOR, 208Y/120V OR 120/240V PANELBOARD, 480/277V PANELBOARD, DISTRIBUTION PANEL, SURFACE MOUNTED EQUIPMENT, FLUSH MOUNTED EQUIPMENT, CONDUIT UP, CONDUIT DOWN, CONDUIT STUBBED THRU WALL, EMPTY CONDUIT STUB-UP INSIDE WALL, GROUND, POWER CONNECTION POINT, DISCONNECT SWITCH, COMBINATION MAGNETIC MOTOR STARTER, SINGLE POLE SWITCH, THREE-WAY SWITCH, WALL MOUNTED OR CEILING MOUNTED JUNCTION BOX, CONTACTOR, RELAY, INDICATES DEVICE ABOVE RE: DRAWING, TOP OF OUTLET BOX ABOVE FINISHED FLOOR, FAN COIL UNIT AND NUMBER, EXHAUST FAN AND NUMBER, ABOVE FINISH FLOOR, EXISTING TO REMAIN, FIRE ALARM, EXISTING RELOCATED, FIRE ALARM ANNUNCIATOR PANEL, FIRE ALARM CONTROL PANEL, GFCI (GROUND FAULT CIRCUIT INTERRUPTER) PROTECTION, MECHANICAL EQUIPMENT CALL OUT BUBBLE.

DEFINITIONS

PROVIDE = FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE. FURNISH = SUPPLY AND DELIVER TO PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION AND SIMILAR OPERATIONS. INSTALL = OPERATIONS AT PROJECT SITE INCLUDING UNLOADING, TEMPORARILY STORING, UNPACKING, ASSEMBLING, ERECTING, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS.

PLAN NOTE LEGEND table with columns TAG VALUE and PLAN NOTE TEXT. Includes ED000 (ELECTRICAL DEMOLITION) and EP000 (POWER).

WIRING SCHEDULE-VOLTAGE DROP table with columns DISTANCE and CONDUCTOR SIZE. Shows voltage drop values for 120V-20A and 277V-20A branch circuits.

LUMINAIRE SCHEDULE table with columns TYPE, MOUNTING, LAMPS, LUMENS, COLOR TEMP., CRI, CONTROL TYPE, WATTS, VA, VOLTAGE, MANUFACTURER, DESCRIPTION, EQUALS, EQUALS 2, REVISION. Includes rows for A4 (LED strip) and X1 (surface emergency lighting).

LUMINAIRE SCHEDULE GENERAL NOTES: 1) PRE-APPROVAL FOR EQUALS MUST BE SUBMITTED PRIOR TO BIDS. SUBSTITUTIONS WILL NOT BE ENTERTAINED POST BIDS.

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Professional seal for Monica S Santos, Electrical Engineer, Missouri, License No. E-2000174546. Includes date 01/04/2024.

ANIMAL SCIENCE RESEARCH CENTER - REPLACE ELECTRICAL SERVICE PANELS

Antella Project No: CP221041

ISSUE FOR BID

Table with columns Rev. #, Description, Date Issued. Shows revision 01/04/2024.

GENERAL NOTES AND SYMBOLS LEGEND

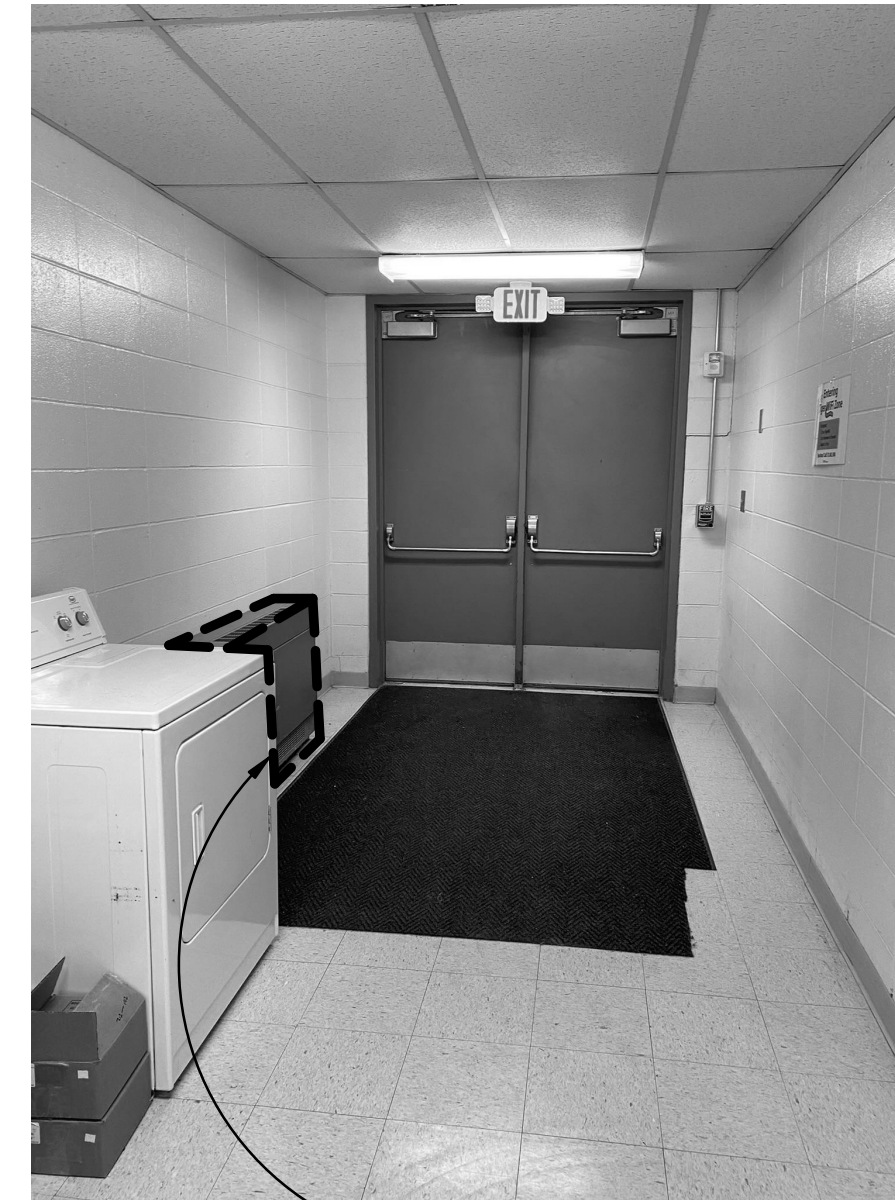
E001

### GENERAL DEMOLITION NOTES

- PRIOR TO DISCONNECTING OF ANY LOADS, TRACE FEEDER TO ENSURE LOAD AS LABELED IS CORRECT. PROVIDE RE-LINED AS-BUILT DOCUMENTS INDICATING EXISTING FEEDER CONDUCTOR SIZES IF DIFFERENT THAN NOTED. NOTIFY ENGINEER OF ANY DISCREPANCIES.
- CONTRACTOR IS LIMITED TO A MAXIMUM OF 4 HOUR OUTAGE AT A TIME. ANY AND ALL POWER OUTAGES TO BE CLOSELY COORDINATED WITH THE OWNER TO ENSURE THAT ALL AFFECTED LOADS SAFELY RE-ENERGIZE UPON RETURN OF POWER.
- CONTRACTOR TO PROVIDE OWNER DETAILED SEQUENCE OF DEMOLITION WORK TO ALLOW PROPER SCHEDULING OF POWER OUTAGES.
- PROTECT ALL EXISTING ELECTRICAL EQUIPMENT TO REMAIN OPERATION FROM CONSTRUCTION DEBRIS DURING DEMOLITION AND NEW CONSTRUCTION.

### DEMO PLAN NOTES

- ED001 EXISTING 550 GALLON FUEL OIL TANK TO BE EMPTIED AND REMOVED. CONTRACTOR SHALL REMOVE ALL ASSOCIATED FUEL LINES INTO THE BUILDING SERVING THE GENERATORS. PROPERLY DISPOSE OF TANK, LINES AND FUEL.
- ED002 REMOVE ROCK FILL AND RESTORE GROUND TO MATCH SURROUNDING AREA.
- ED003 DISCONNECT AND REMOVE GENERATOR. REMOVE ALL ASSOCIATED FUEL LINES, DAY TANKS, EXHAUST DUCTS, WIRING AND CONDUIT AND ASSOCIATED APPURTENANCES.
- ED004 DISCONNECT AND REMOVE TRANSFER SWITCHES AND ALL ASSOCIATED APPURTENANCES.
- ED005 EXISTING TRANSFORMER TO BE DISCONNECTED AND REMOVED. PULL ALL PRIMARY AND SECONDARY CABLES OUT AFTER NEW PAD MOUNTED TRANSFORMER HAS BEEN ENERGIZED AND ALL LOADS HAVE BEEN TRANSFERRED TO NEW SERVICE. REMOVE EXISTING EQUIPMENT PAD AND PULL CONDUIT BACK TO BELOW GRADE AND FILL.
- ED006 DISCONNECT AND SALVAGE EXISTING CABINET UNIT HEATER TO BE RE-INSTALLED ON OTHER SIDE OF CORRIDOR TO FACILITATE INSTALLATION OF NEW DOOR.
- ED007 CUT BACK EXHAUST FLUE THROUGH ROOF, CAP AND SEAL TIGHT.
- ED008 CUT BACK EXHAUST DUCT AT PENTHOUSE, CAP AT ROOF AND SEAL TIGHT.
- ED009 REMOVE EQUIPMENT PADS TO ALLOW FOR PLACEMENT OF NEW EQUIPMENT PADS. REFER TO NEW WORK FOR NEW EQUIPMENT PAD LOCATIONS.
- ED010 DISCONNECT AND REMOVE MAIN BREAKER SECTION. PROVIDE BLANK SIDE PLATES FOR SWITCHBOARD SECTIONS TO REMAIN.
- ED011 DISCONNECT AND REMOVE ASCO SWITCH SECTION. PROVIDE BLANK PLATES FOR SIDES OF SWITCHBOARD SECTIONS TO REMAIN.
- ED012 SECTION OF SWITCHBOARD TO REMAIN AS REQUIRED TO TIE INTO UNDERGROUND FEEDERS. REMOVE ALL BREAKERS AND PROVIDE BLANK COVERPLATES. PROVIDE LABEL ON SECTION TO INDICATE IT IS USED AS A JUNCTION BOX. PROVIDE LABELS ON EXTERIOR INDICATING WHICH CIRCUITS ARE SPICED IN EACH SECTION. IF SECTION IS NOT REQUIRED FOR UNDERGROUND FEEDERS, THEN REMOVE THAT SECTION. DO NOT LEAVE UN-USED SWITCHBOARD SECTIONS ABANDONED IN PLACE IF EMPTY.
- ED013 DISCONNECT AND REMOVE LIGHTING. MAINTAIN CIRCUIT FOR NEW LIGHTING.
- ED014 EXISTING SWITCH TO BE RE-USED FOR NEW LIGHTING CONTROL.
- ED015 ONCE NEW SERVICE IS FULLY ENERGIZED AND ALL EXISTING LOADS HAVE BEEN TRANSFERRED TO NEW SERVICE, EXISTING MEDIUM VOLTAGE SWITCHGEAR TO BE DISCONNECTED AND REMOVED. PULL ALL CABLES OUT AND CUT CONDUIT BACK TO BELOW GRADE AND FILL. REMOVE ALL EXISTING EQUIPMENT PADS.
- ED016 PULL BACK ALL CONDUIT MADE OBSOLETE BY REMOVAL OF EXISTING SERVICE TO BELOW GRADE AND FILL IF IT CANNOT BE COMPLETELY REMOVED.
- ED017 PULL BACK ALL CONDUIT MADE OBSOLETE BY REMOVAL OF EXISTING SERVICE FROM BUILDING, PATCH WALL PENETRATIONS AND WATERPROOF.

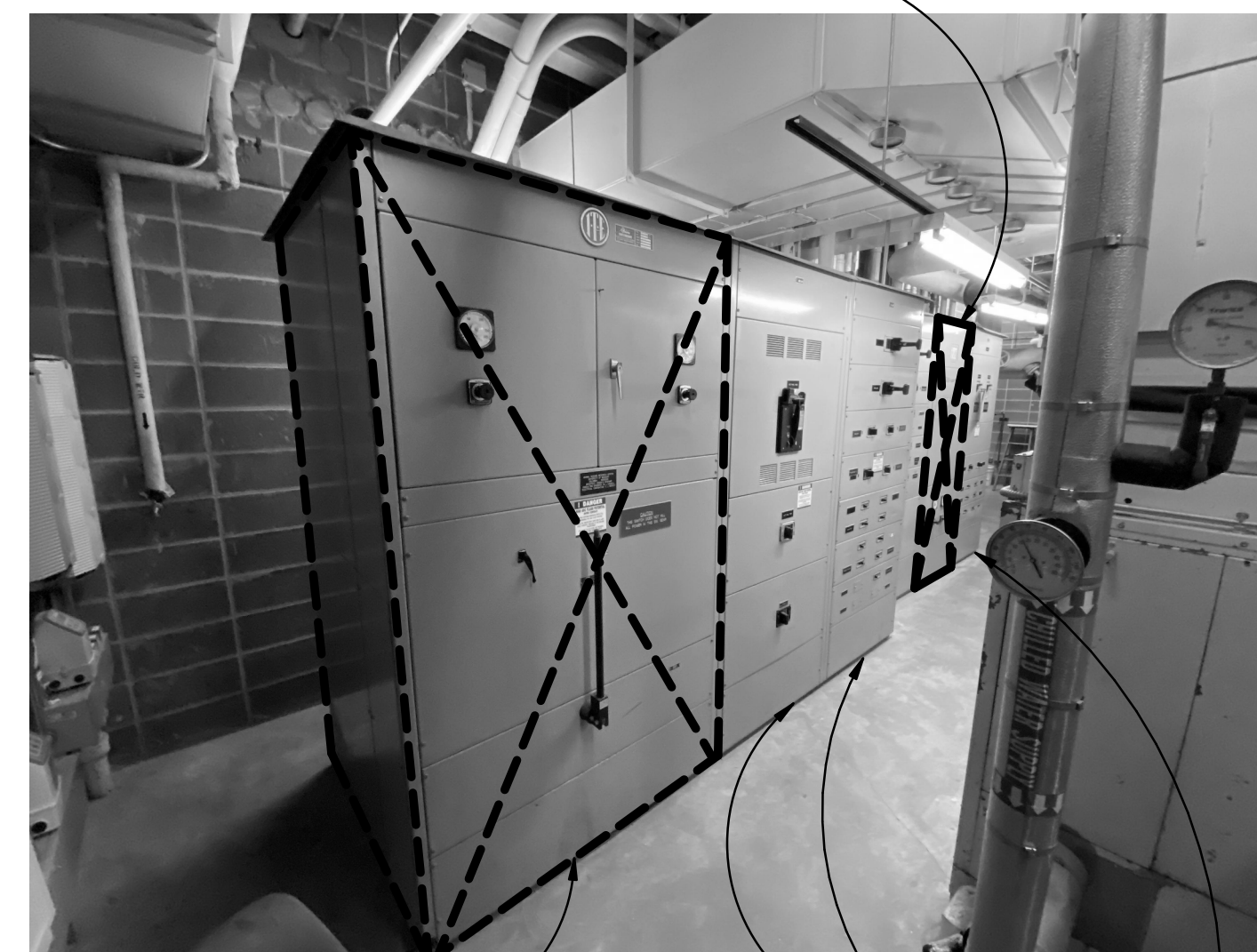


SALVAGE CABINET UNIT HEATER TO BE RE-INSTALLED ON OPPOSITE SIDE OF CORRIDOR. DISCONNECT AND CAP ALL ASSOCIATED PIPING AND APPURTENANCES TO BE EXTENDED TO NEW LOCATION. RE-CONNECT TO EXISTING POWER FEED.

DISCONNECT AND REMOVE GENERATORS INCLUDING ALL ASSOCIATED APPURTENANCES.  
DISCONNECT AND REMOVE TRANSFER SWITCHES.

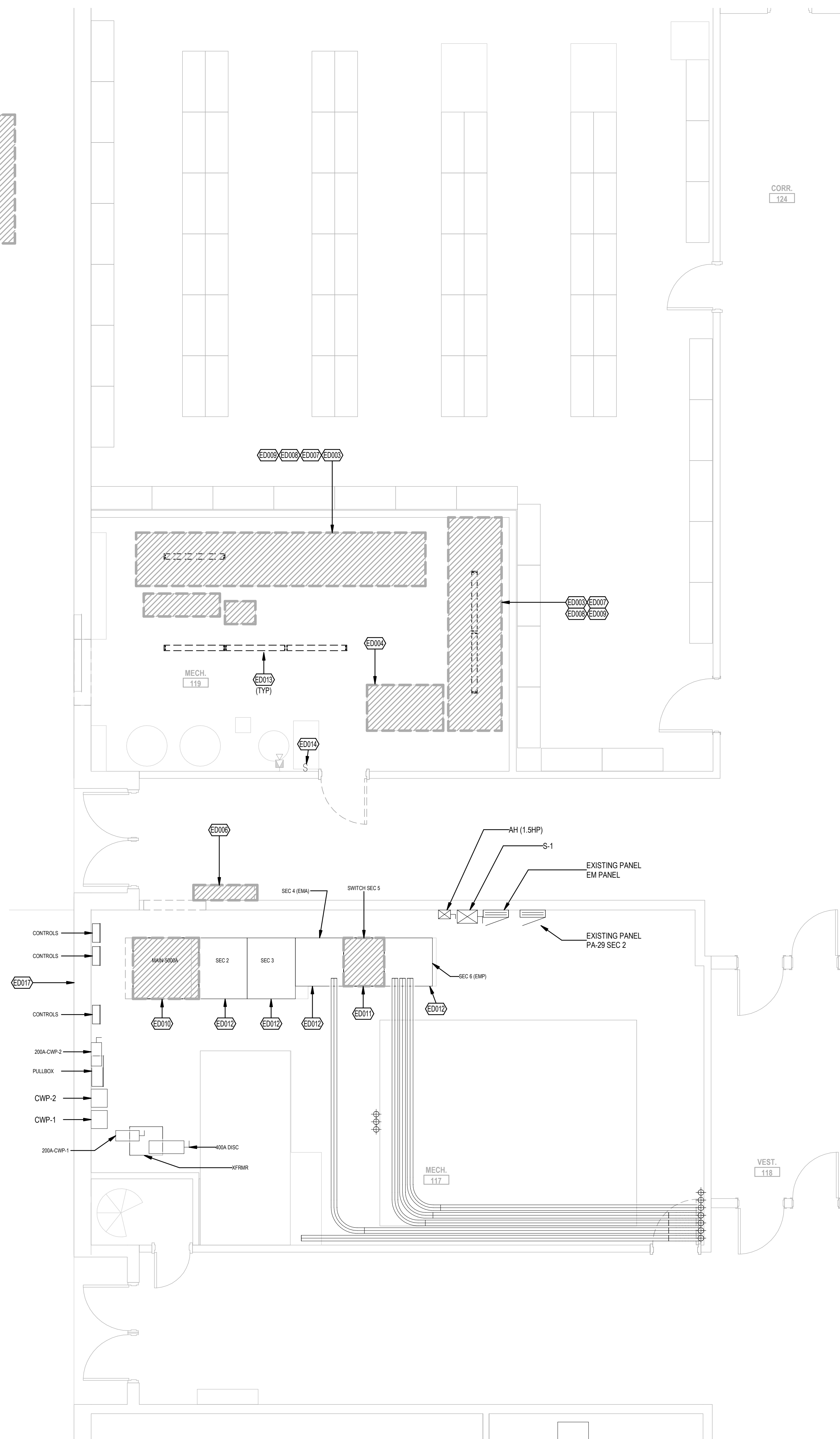
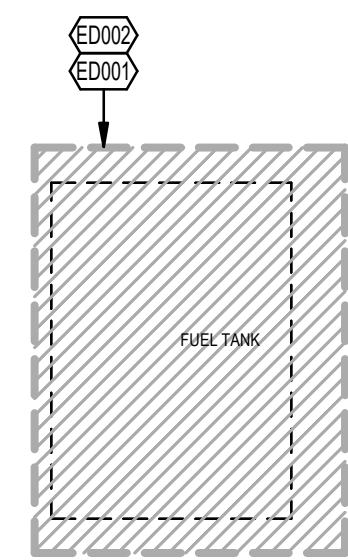


REMOVE THIS SECTION.



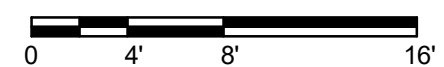
REMOVE THIS SECTION.

LEAVE THIS SECTION AND CONVERT TO PULLBOX TO PICKUP ANY UNDERGROUND FEEDS. PROVIDE BLANK COVERPLATES AND REMOVE ALL BREAKERS.



### LEVEL 01 POWER - DEMO

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



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### ELECTRICAL DEMO PLAN

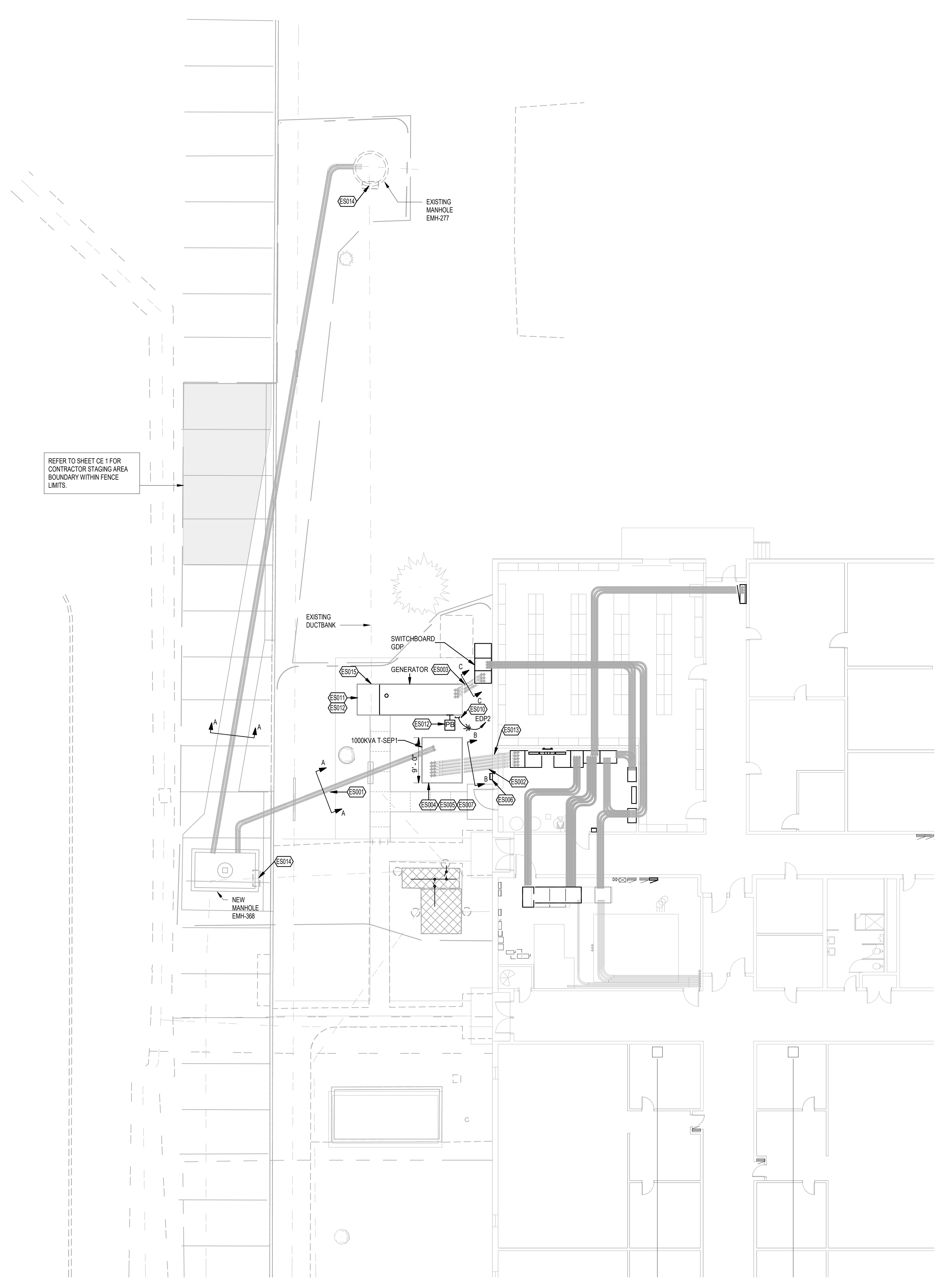
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ES001	PROVIDE TWO (2) 4" CONDUIT IN RED DUCTBANK. REFER TO DETAIL ON E601.
ES002	PROVIDE TEN (10) 4" CONDUIT IN GREY DUCTBANK. REFER TO DETAIL ON E601.
ES003	PROVIDE SIX (6) 3-1/2" CONDUIT IN GREY DUCTBANK. REFER TO DETAIL ON E601.
ES004	CONTRACTOR SHALL PROVIDE TRANSFORMER PAD. COORDINATE FINAL SIZE OF PAD WITH ACTUAL TRANSFORMER SUPPLIED. REFER TO DETAIL ON SHEET E601.
ES005	OWNER TO SUPPLY TRANSFORMER AND CONTRACTOR TO SET.
ES006	CONTRACTOR TO INSTALL OWNER SUPPLIED METER. REFER TO SHEET 601 FOR METER WIRING DETAIL.
ES007	CONTRACTOR TO TERMINATE ALL SECONDARY CABLES AT TRANSFORMER.
ES010	PROVIDE 2 POLE, 60 AMP FUSIBLE DISCONNECT IN NEMA 3R ENCLOSURE, FUSED AT 60 AMP. MAKE ALL FINAL CONNECTIONS TO GENERATOR SHORE POWER PER MANUFACTURER RECOMMENDATIONS. COORDINATE FINAL CIRCUIT CONFIGURATION WITH GENERATOR MANUFACTURER.
ES011	PROVIDE COMMUNICATION CABLING BETWEEN GENERATOR AND TRANSFER SWITCHES PER GENERATOR MANUFACTURER WIRING DIAGRAMS.
ES012	PROVIDE GENERATOR REMOTE EMERGENCY STOP SWITCH. PROVIDE WITH CLEAR COVER TO PREVENT ACCIDENTAL OPERATION. CLEARLY LABEL "GENERATOR EMERGENCY STOP" TOP OF BUTTON TO BE 6" AFF.
ES013	CORE DRILL THROUGH EXISTING STEM WALL. REFER TO SHEET S100 FOR CONDUIT CORE DETAIL FOR MAXIMUM SIZE AND DEPTH OF OPENING.
ES014	AT END OF PROJECT, OUTBACK FROM MANHOLE CONDUIT MADE OBSOLETE BY PROJECT. REFER TO CIVIL SHEET CE 4.
ES015	PROTECT EXISTING DUCTBANK FOR DURATION OF PROJECT UNTIL POWER TO EXISTING 750KVA TRANSFORMER HAS BEEN TRANSFERRED.



REFER TO SHEET CE 1 FOR CONTRACTOR STAGING AREA BOUNDARY WITHIN FENCE LIMITS.



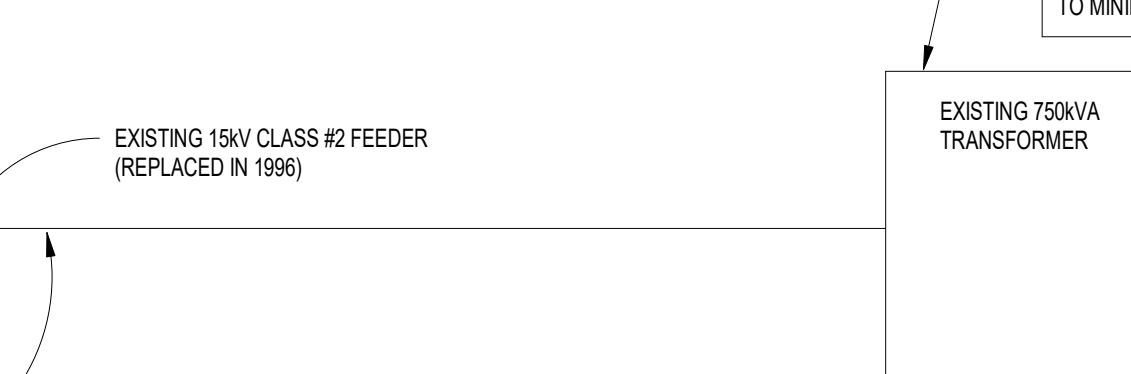
BY OWNER:  
OWNER TO REFEED THIS TRANSFORMER TOWARDS END OF PROJECT ONCE ALL WORK IS COMPLETE. AT THAT TIME, ACCOMMODATIONS ARE TO BE MADE TO MAINTAIN POWER TO EXISTING SERVICE FED FROM THIS TRANSFORMER WITH GENERATOR POWER TO MINIMIZE DOWNTIME.

**NEW DUCTBANK:**  
EXISTING MANHOLE EMH-277 IS 36" DIAMETER ROUND. CONTRACTOR TO ALIGN NEW DUCTBANK AT EMH-277 WITH THE EXISTING DUCTBANK FEEDING THE EXISTING 750KVA TRANSFORMER. COORDINATE PLACEMENT WITH OWNER PRIOR TO ENGAGING IN CONCRETE. PLACE 3" BELOW TOP EDGE OF MANHOLE. OWNER TO PULL NEW PRIMARY FEEDER STRAIGHT THROUGH TO MINIMIZE OUTAGE TIME. EXISTING MANHOLE NOT LARGE ENOUGH TO ALLOW FOR SPLINGING.

**TWO (2) APPROX 8 HOUR OUTAGES:**  
1ST 8 HR OUTAGE TO EXISTING 750KVA XFMR:  
• OWNER TO PULL NEW #2 CABLE FROM EMH-388 TO EMH-277 TO 750KVA XFMR.  
• OWNER TO PERFORM VLF HIPOT ACCEPTANCE TEST.  
2ND 8 HR OUTAGE TO EXISTING 750 KVA XFMR:  
• CUT INTO EXISTING DUCT IN NEW MANHOLE EMH-388 AND EXPOSE EXISTING #40 PRIMARY CABLE.  
• CUT EXISTING #40 CABLE AND SPLICE TO NEW #2 CABLE.  
• TERMINATE NEW #2 CABLE AT 750KVA TRANSFORMER.

**APPROX 4.5 HOUR OUTAGE:**  
AFTER MANHOLE IS BUILT, NEW DUCTBANK TO NEW TRANSFORMER IS BUILT AND NEW TRANSFORMER PLACED, CUT INTO EXISTING (1X2) DUCTBANK TO EXPOSE SPARE DUCT TO FEED NEW TRANSFORMER.  
• CONTRACTOR TO CUT SPARE CONDUIT BACK TO MANHOLE FACE TO ALLOW FOR ACCESS TO REROUTE NEW PRIMARY FEEDER.

BY OWNER:  
3 #2 AWG 15kV EPR PRIMARY CABLE AND 1 #2 600V GROUND, SPLICED IN NEW MANHOLE EMH-388 AND PULLED THROUGH EXISTING MANHOLE EMH-277 TO RE-FEED EXISTING 750KVA TRANSFORMER



BY CONTRACTOR:  
NEW MANHOLE: EMH-388

BY OWNER:  
3 #2 AWG 15kV EPR PRIMARY CABLE AND 1 #2 600V GROUND.

BY CONTRACTOR:  
EXISTING OUTDOOR PRIMARY SWITCHGEAR: END OF PROJECT. REMOVE INCLUDING ALL ASSOCIATED WIRING, CONDUIT AND PADS.

BY CONTRACTOR:  
AT END OF SERVICE TRANSFER, REMOVE CONDUIT BACK FROM MANHOLE, SEAL MANHOLE. REFER TO SITE PLAN.

BY OWNER:  
FROM #2 AWG 15W CABLE TO NEW 1000 KVA TRANSFORMER TO NEW 1000 KVA TRANSFORMER T-SEP1

BY CONTRACTOR:  
EXISTING 1000KVA TRANSFORMER: AT END OF PROJECT, REMOVE INCLUDING ALL ASSOCIATED WIRING, CONDUIT AND PADS.

**PROPOSED SEQUENCE OF CONSTRUCTION:**

- CONTRACTOR TO SET NEW MANHOLE OVER EXISTING DUCTBANKS
- CONTRACTOR TO PROVIDE NEW DUCTBANKS
- CONTRACTOR TO SET NEW TRANSFORMER  
a. TRANSFORMER SUPPLIED BY OWNER. CONTRACTOR TO PICK UP FROM THE MU POWER PLAN. (TRANSFORMER WILL BE AVAILABLE IN SPRING OF 2025)
- OWNER TO PULL NEW CABLES AND TERMINATE AT EACH MANHOLE  
a. OWNER TO PULL NEW CABLE FROM EXISTING SWITCHGEAR (EAST CAMPUS DRIVE) TO NEW TRANSFORMER.  
b. OWNER TO TERMINATE PRIMARY ON NEW TRANSFORMER.
- CONTRACTOR TO TERMINATE ALL SECONDARIES ON NEW TRANSFORMER.
- NEW TRANSFORMER TO BE ENERGIZED
- CONTRACTOR TO TRANSFER ALL LOADS ON TO NEW SERVICE  
a. CONTRACTOR TO WORK WITH OWNER TO MINIMIZE OUTAGE LENGTHS. PROVISIONS TO BE MADE TO MAINTAIN POWER TO ALL CRITICAL FREEZER/REFRIGERATOR LOADS SO NOT OFF FOR MORE THAN **4 HOURS**.
- AREA B:** MAXIMUM OUTAGE TIME OF 1 HOUR FOR VENTILATION SYSTEM. CONTRACTOR TO PROVIDE TEMPORARY BACKUP POWER TO VENTILATION SYSTEMS TO REMAIN OPERATIONAL DURING ALL OUTAGES.
- CONTRACTOR TO PROVIDE DETAILED SEQUENCE OF CONSTRUCTION TO FACILITATE COORDINATION WITH OWNER.
- REFER TO PLANS FOR AREAS THAT CANNOT SUSTAIN AN OUTAGE. CONTRACTOR TO MAKE PROVISIONS TO MAINTAIN POWER TO THOSE AREAS AS REQUIRED.
  - PRIOR TO ANY OUTAGES: WALK BUILDING WITH OWNER TO IDENTIFY FREEZER LOCATIONS. IF OUTAGE IS MORE THAN 4 HOURS, PROVISIONS TO PROVIDE BACKUP TO SHD FREEZERS SHALL BE MADE.
  - COORDINATE WITH END USER OUTAGE TIME AND UPON RESTORATION OF POWER, NOTIFY END USER, SO THAT THEY MAY CHECK ALL CRITICAL LOADS INCLUDING VENTILATION SYSTEMS AND FREEZERS TO ENSURE POWER HAS BEEN RESTORED.
- OWNER TO REFEED EXISTING 750kVA TRANSFORMER. (THIS WILL REQUIRE A PLANNED OUTAGE) AT THIS TIME, AREAS NOTED IN PLAN TO BE PROVIDED WITH BACK UP POWER IF NOT ALREADY ON THE GENERATOR.
- EXISTING SWITCHBOARD TO BE DISCONNECTED
- OWNER TO DE-ENERGIZE EXISTING OUTDOOR PRIMARY SWITCHGEAR FROM SOURCE. CONTRACTOR TO DISCONNECT AND DEMOLISH IN ITS ENTIRETY.
- OWNER TO DE-ENERGIZE EXISTING 1000kVA TRANSFORMER FROM SOURCE. CONTRACTOR TO DISCONNECT AND DEMOLISH IN ITS ENTIRETY.
- CONTRACTOR TO REMOVE EQUIPMENT PADS MADE OBSOLETE FROM REMOVAL OF EQUIPMENT.
- CONTRACTOR TO PULL DUCTBANKS MADE OBSOLETE FROM REMOVAL OF EXISTING EQUIPMENT BACK FROM MANHOLES EMH-388 & EMH-277. SEAL OPENINGS AND WATERPROOF.



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FIRST FLOOR - NEW WORK

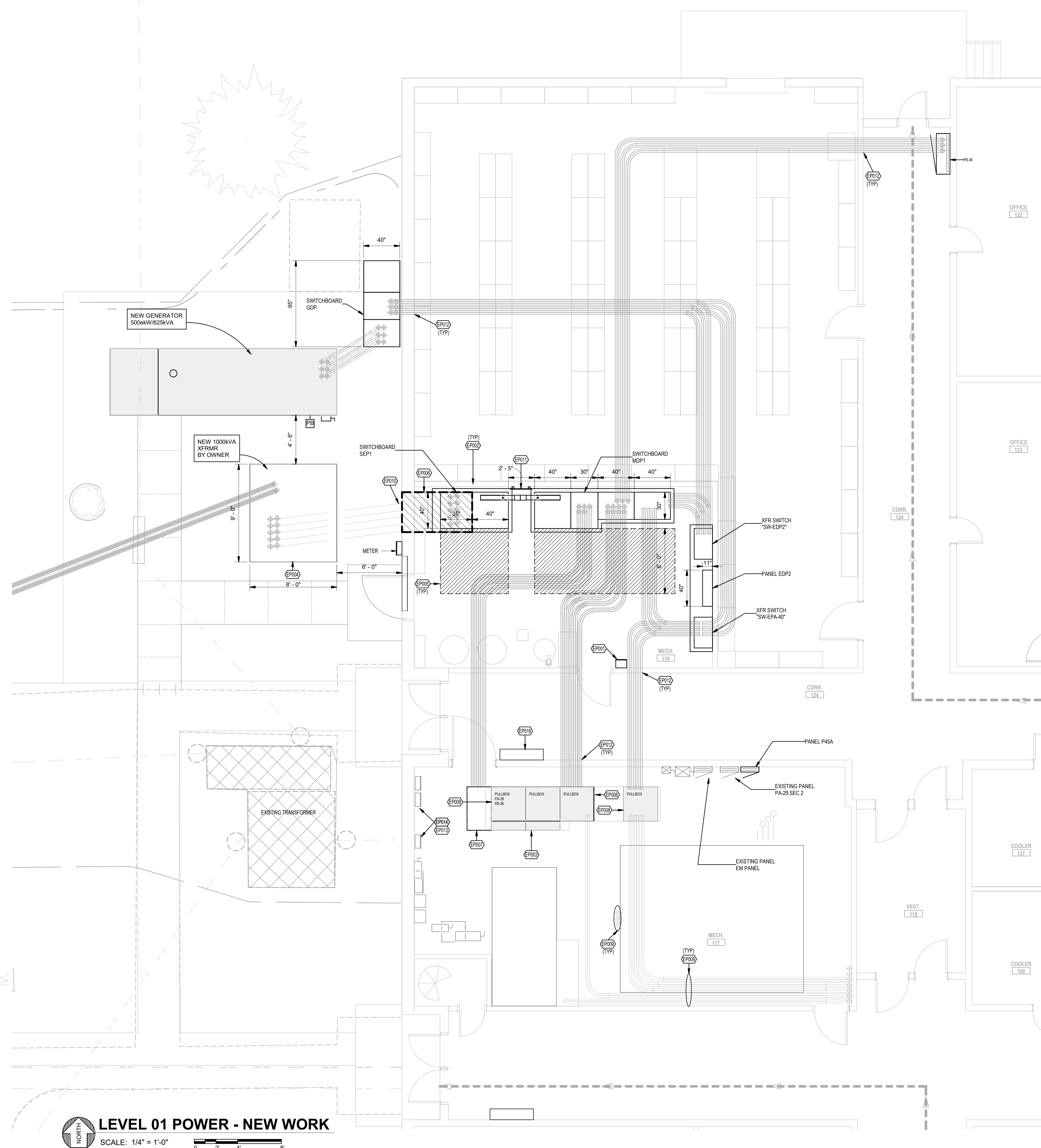
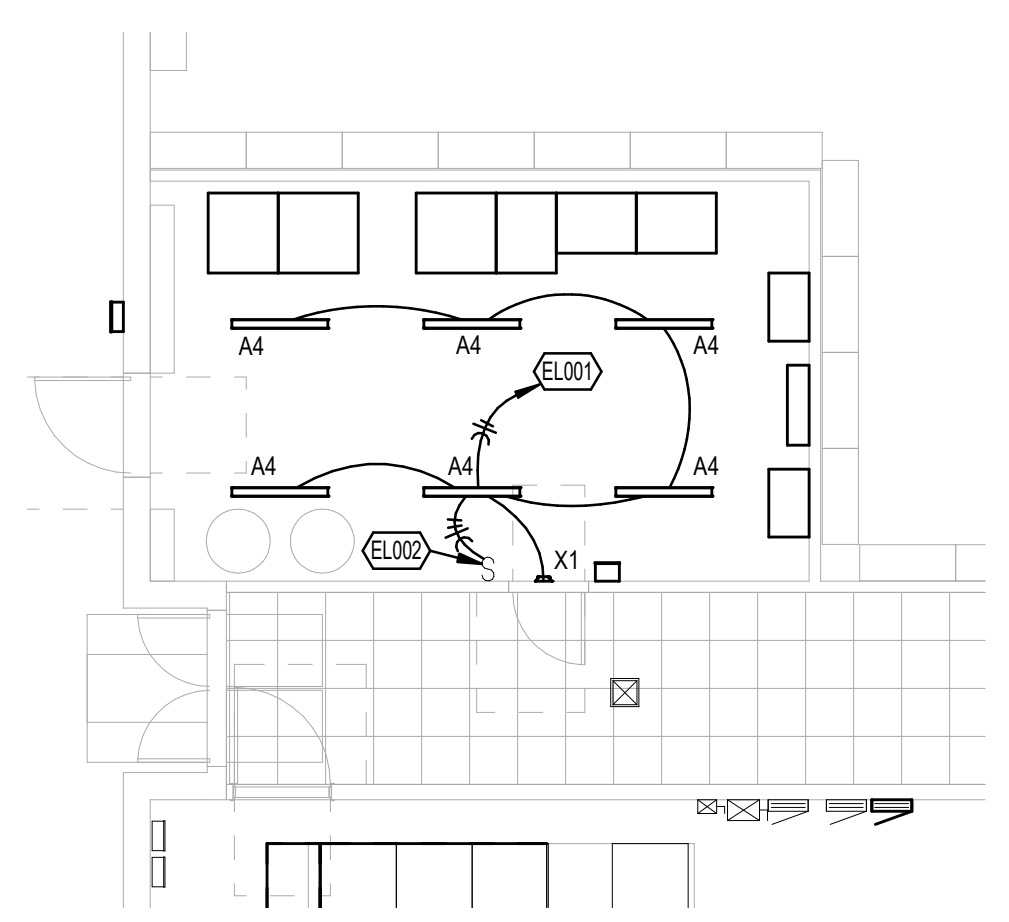
**E201**

### POWER PLAN NOTES

EP001	SEP1 ENCLOSED PUSHBUTTON CONTROL. PROVIDE LABEL ON COVER. "SEP1 MAIN BREAKER REMOTE OPERATION PUSHBUTTON"
EP002	PROVIDE HOUSEKEEPING PAD. PROVIDE A MINIMUM OF 4" BEYOND EQUIPMENT.
EP003	PROVIDE PULL BOX AS REQUIRED ABOVE GEAR TO ALLOW EXTENSION OF EXISTING FEEDERS TO NEW PANEL LOCATION.
EP004	PROVIDE NEW TRANSFORMER PAD. REFER TO DETAIL ON SHEET E601.
EP005	PAINT FLOOR WITH YELLOW STRIPES 6FT BEYOND GEAR. PROVIDE SIGNAGE TO MAINTAIN 6FT CLEAR IN FRONT OF DISTRIBUTION SWITCHBOARD AT ALL TIMES.
EP006	SAWCUT SLAB AND EXCAVATE AS REQUIRED FOR PLACEMENT OF NEW DUCTBANK FEEDER INTO THE SWITCHBOARD.
EP007	PROVIDE PULLBOX UP HIGH AS REQUIRED TO ALLOW EXTENSION OF FEEDERS DOWN INTO THE EXISTING SECTIONS TO REMAIN AS PULLBOXES.
EP008	PROVIDE BLANK PLATES ON SIDES OF SWITCHBOARD SECTIONS TO REMAIN. IF UNDERGROUND FEEDERS ARE NOT WITHIN A SECTION AND NOT REQUIRED FOR EXTENDING OF FEEDERS, THEN CONTRACTOR IS TO REMOVE THAT SECTION IN ADDITION TO THE ONES NOTED.
EP009	EXISTING CONDUIT SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL FIELD VERIFY AND IDENTIFY EACH EXISTING FEED TO TIE BACK INTO.
EP010	CORE DRILL CONDUIT PENETRATIONS THROUGH EXISTING STEM WALL. REFER TO SHEET S100 DETAIL INDICATING MAXIMUM OPENING SIZE AND LOCATION.
EP011	PROVIDE MAIN GROUNDING BUS BAR. REFER TO SHEET E602 FOR DETAIL.
EP012	FIRESTOP CONDUIT PENETRATIONS ALONG THIS WALL. REFER TO ARCHITECTURAL SHEET A602 FOR FIRE STOPPING DETAILS.
EP013	THE FOLLOWING POINTS ARE TO BE ADDED TO THE BUILDING AUTOMATION SYSTEM "BAS": GENERATOR RUNNING, GENERATOR TROUBLE, TRANSFER SWITCH "SW-EDP2" IN EMERGENCY, TRANSFER SWITCH "SW-EP-40" IN EMERGENCY, TRANSFER SWITCH "SW-EDP2" IN TROUBLE, TRANSFER SWITCH "SW-EP-40" IN TROUBLE.
EP014	COORDINATE WITH MU ENERGY MANAGEMENT WHERE TO LAND POINTS. CONTROLLERS LOCATED IN MECH ROOM 117.
EP018	RE-INSTALL EXISTING CABINET HEATER. RE-ROUTE ALL REQUIRED CONNECTIONS TO MAKE FULLY FUNCTIONAL.

### LIGHTING PLAN NOTES

EL001	RE-CONNECT TO CIRCUIT SERVING LIGHTING IN THIS ROOM.
EL002	RE-CONNECT TO EXISTING SWITCH.



**LEVEL 01 POWER - NEW WORK**  
SCALE: 1/4" = 1'-0"

**LEVEL 01 - LIGHTING - NEW WORK**  
SCALE: 1/8" = 1'-0"



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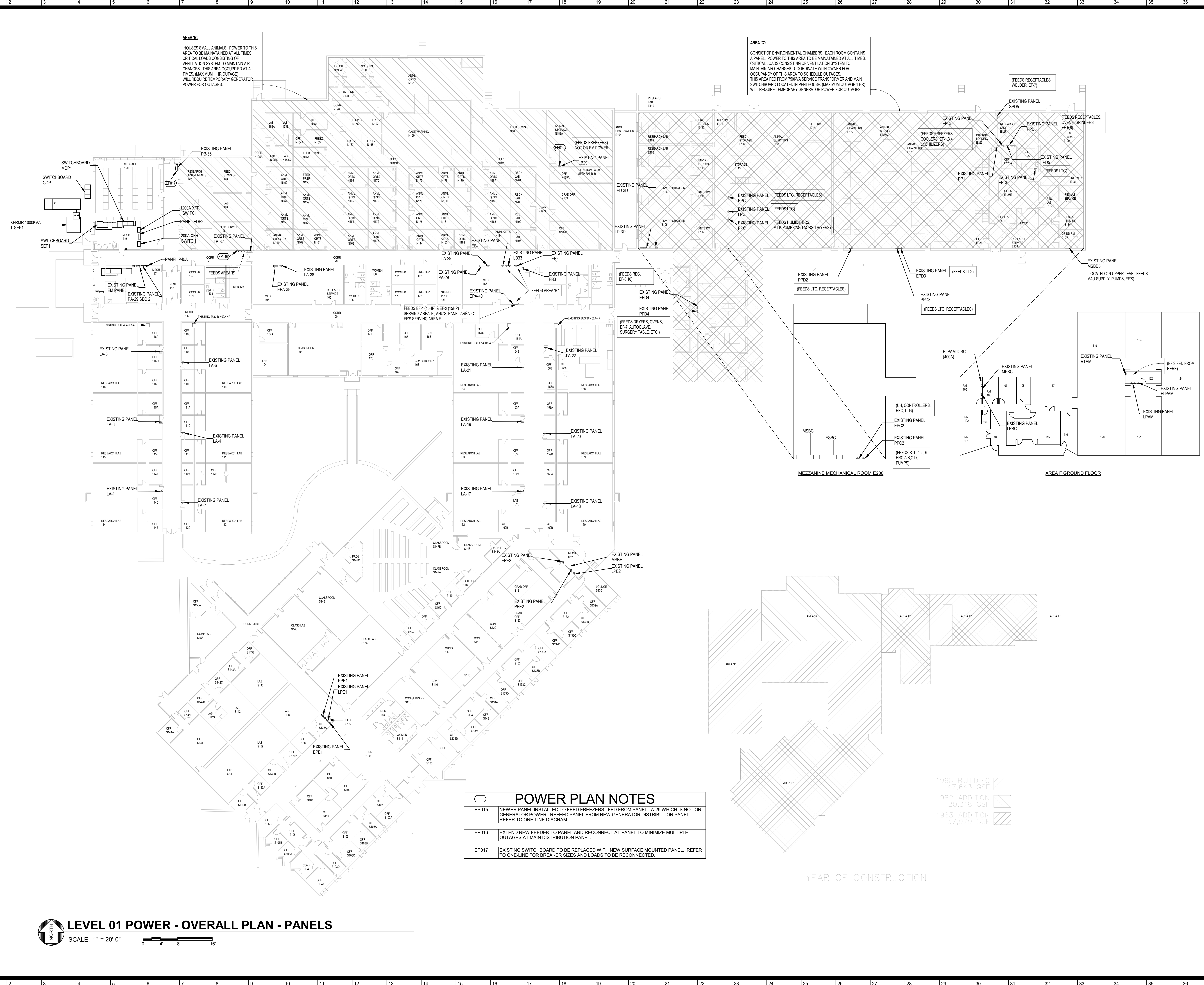
**ANIMAL SCIENCE  
RESEARCH CENTER -  
REPLACE ELECTRICAL  
SERVICE PANELS**

Antella Project No: CP221041

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**POWER PLAN NOTES**

EP015	NEWER PANEL INSTALLED TO FEED FREEZERS. FED FROM PANEL LA-29 WHICH IS NOT ON GENERATOR POWER. REFEED PANEL FROM NEW GENERATOR DISTRIBUTION PANEL. REFER TO ONE-LINE DIAGRAM.
EP016	EXTEND NEW FEEDER TO PANEL AND RECONNECT AT PANEL TO MINIMIZE MULTIPLE OUTAGES AT MAIN DISTRIBUTION PANEL.
EP017	EXISTING SWITCHBOARD TO BE REPLACED WITH NEW SURFACE MOUNTED PANEL. REFER TO ONE-LINE FOR BREAKER SIZES AND LOADS TO BE RECONNECTED.

1966 BUILDING 47,643 GSF  
1982 ADDITION 20,318 GSF  
1983 ADDITION 57,079 GSF

YEAR OF CONSTRUCTION

**LEVEL 01 POWER - OVERALL PLAN - PANELS**  
SCALE: 1" = 20'-0"

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

Z  
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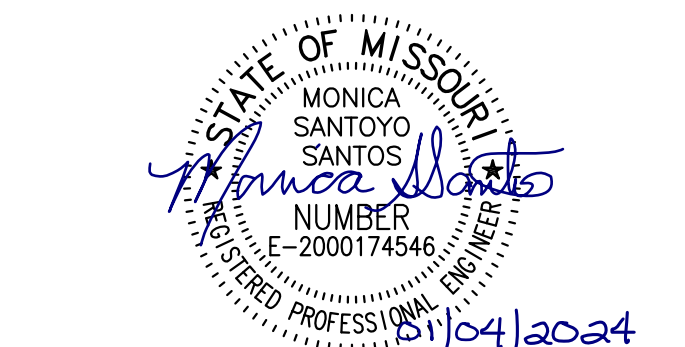


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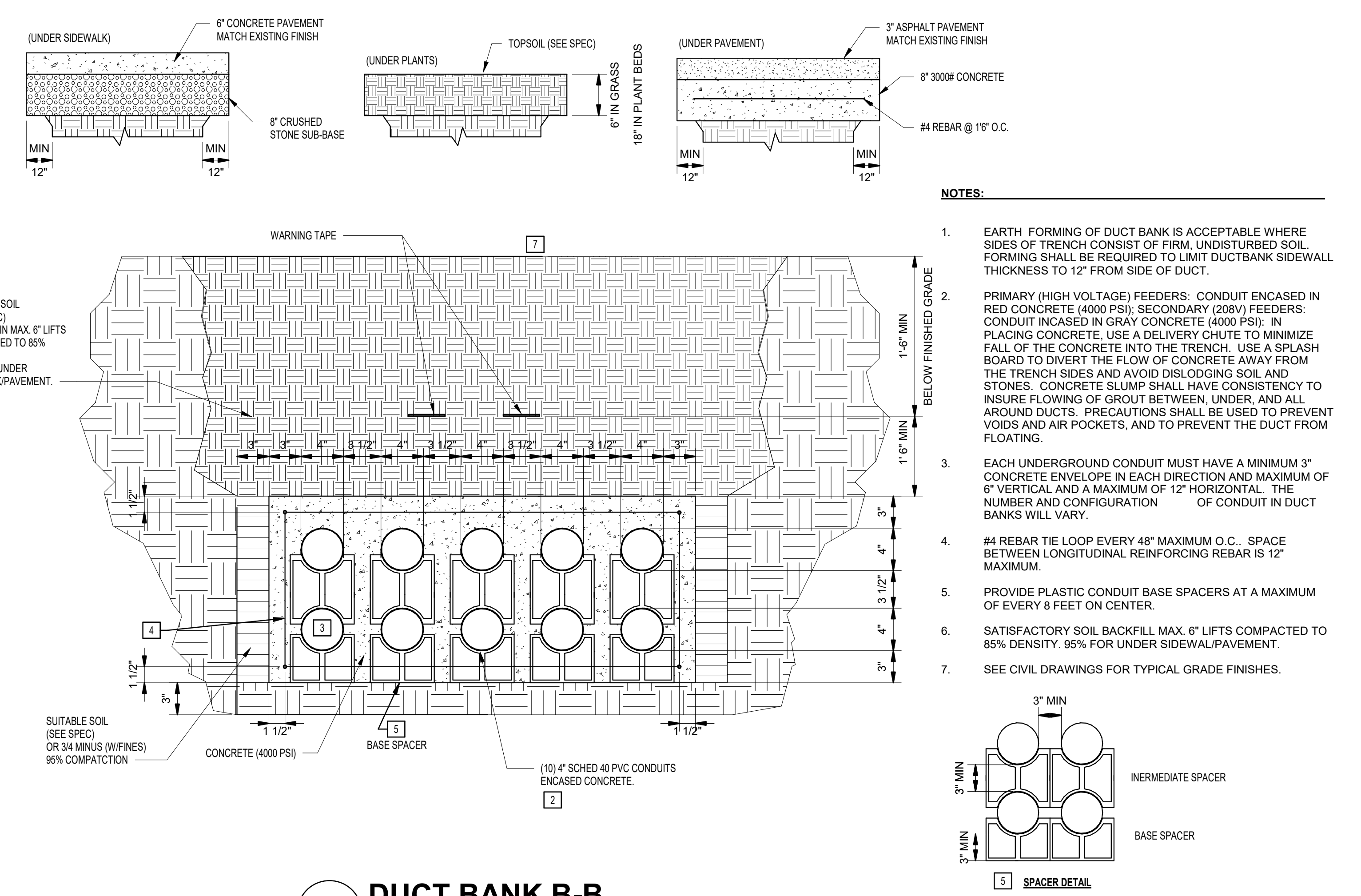
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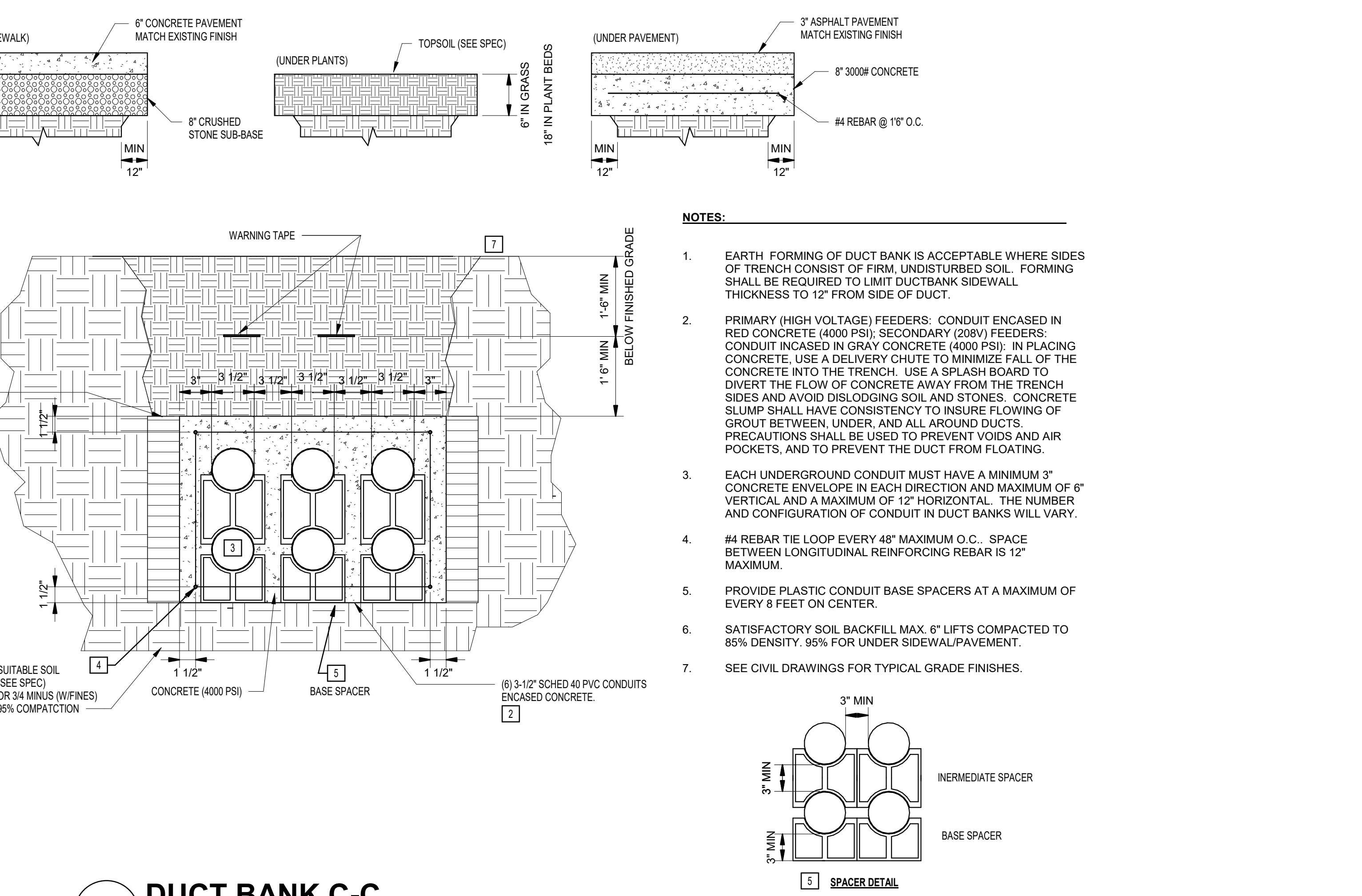
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ELECTRICAL DETAILS

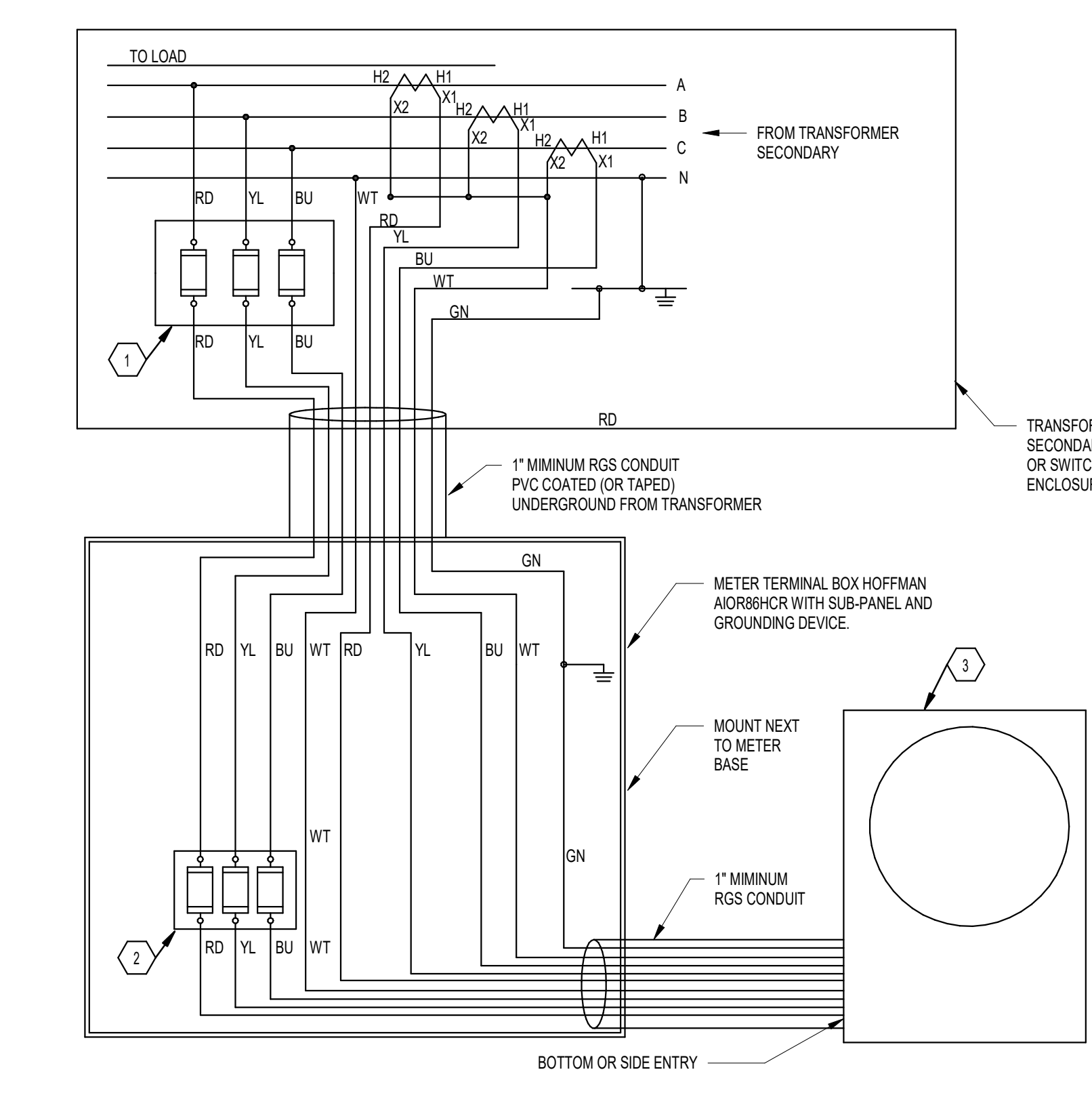
**E601**



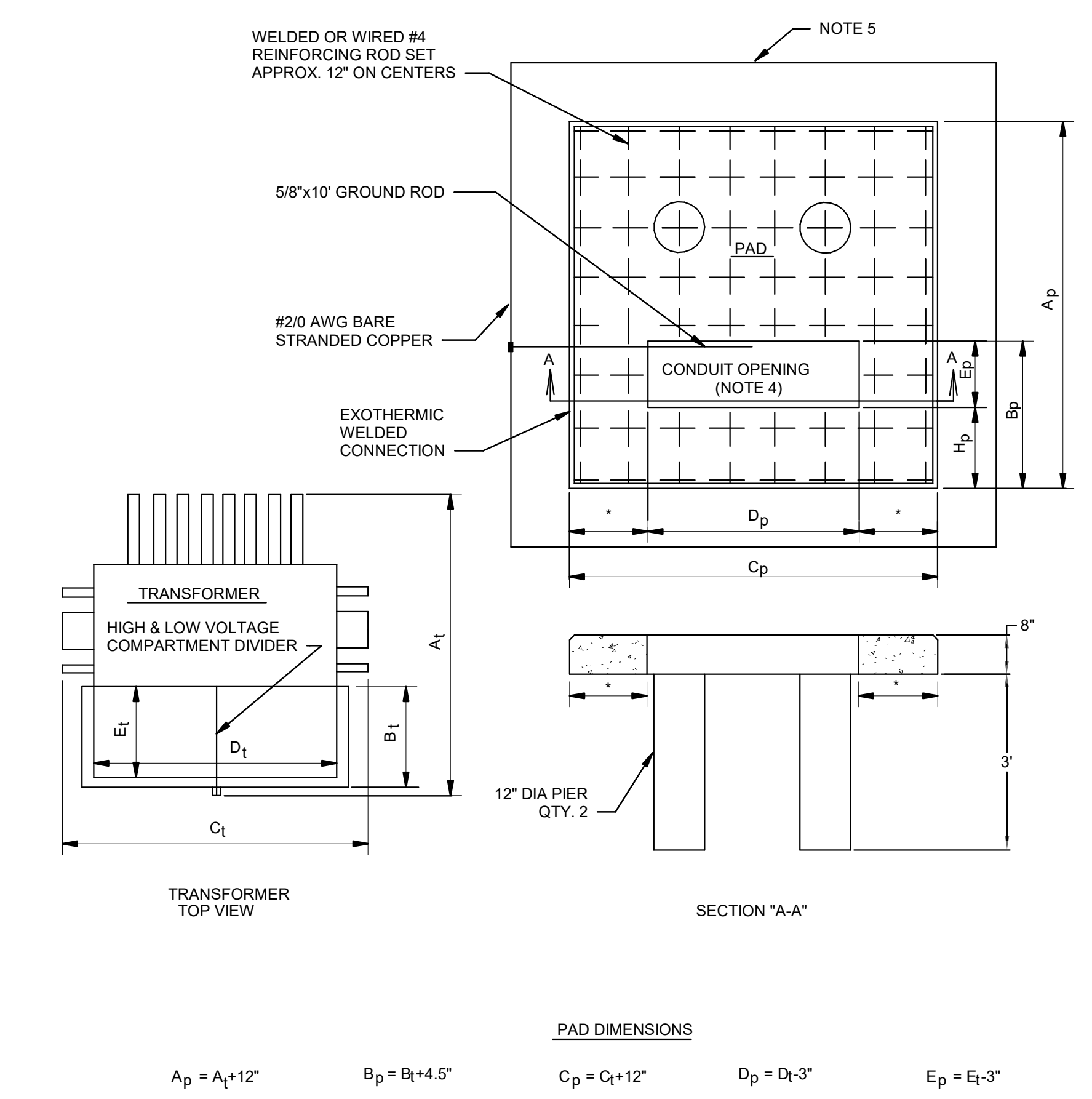
**4 DUCT BANK B-B**  
NO SCALE



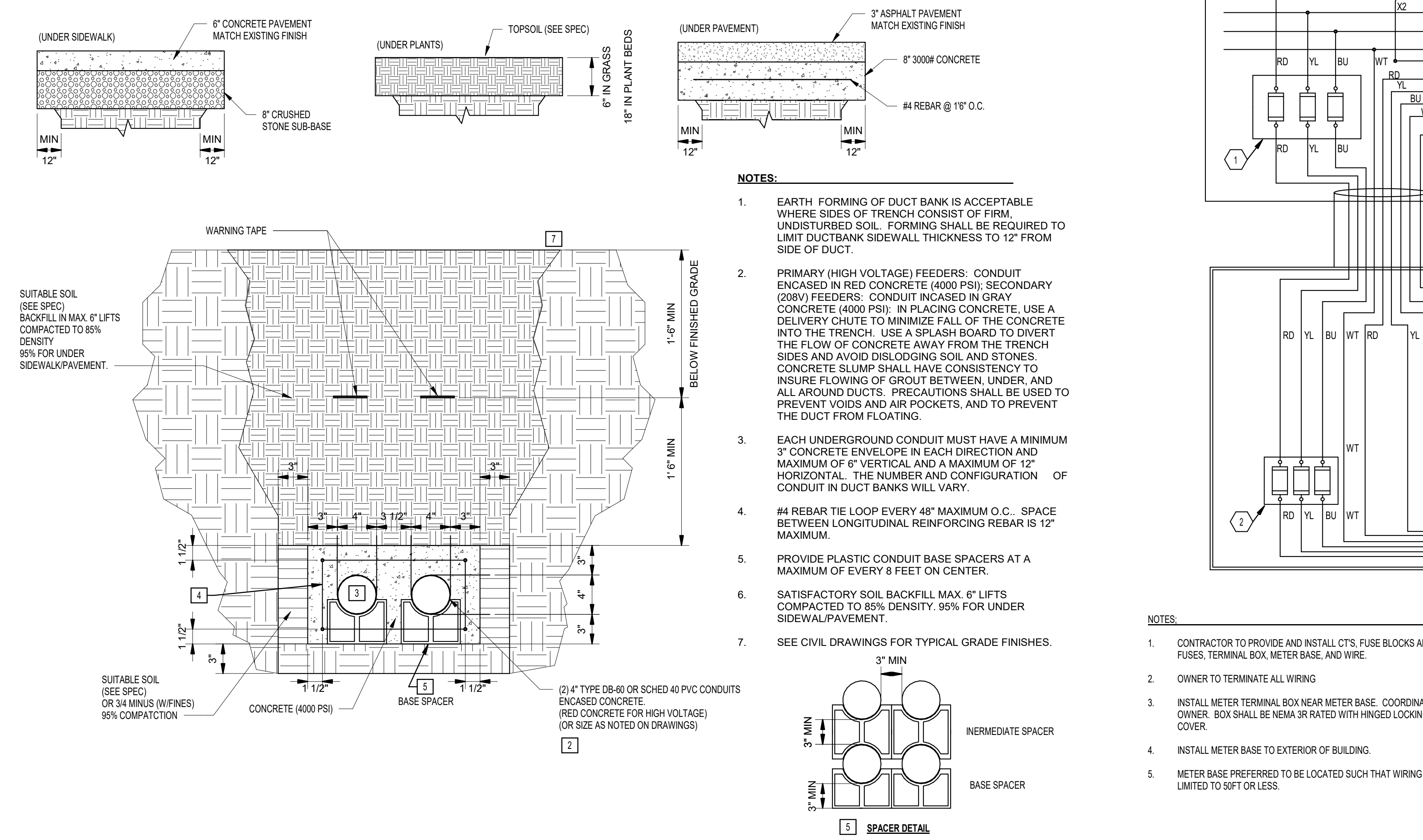
**5 DUCT BANK C-C**  
NO SCALE



**2 METERING DETAIL**  
NO SCALE



**1 UTILITY TRANSFORMER PAD DETAIL**  
NO SCALE



**3 DUCT BANK A-A**  
NO SCALE

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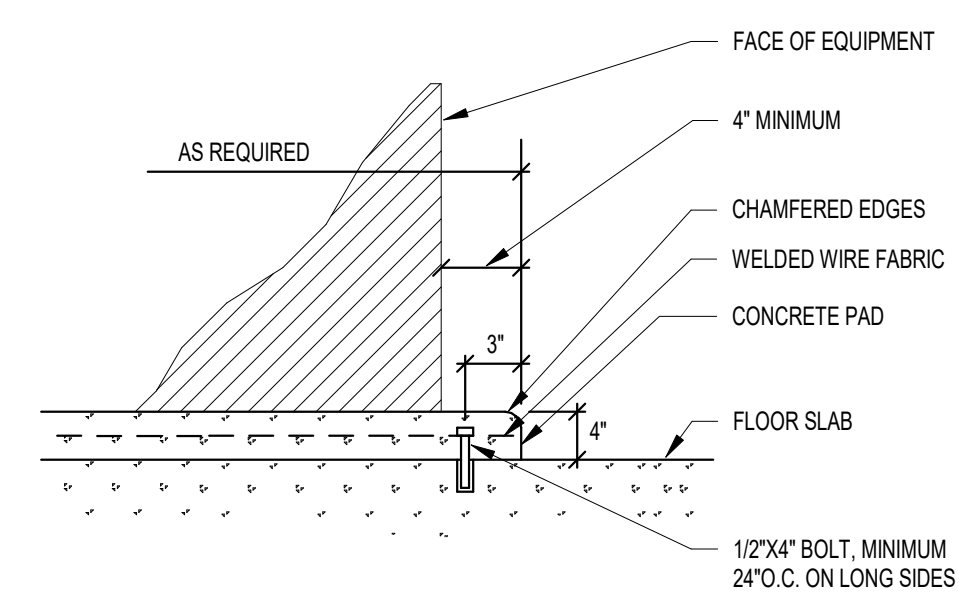
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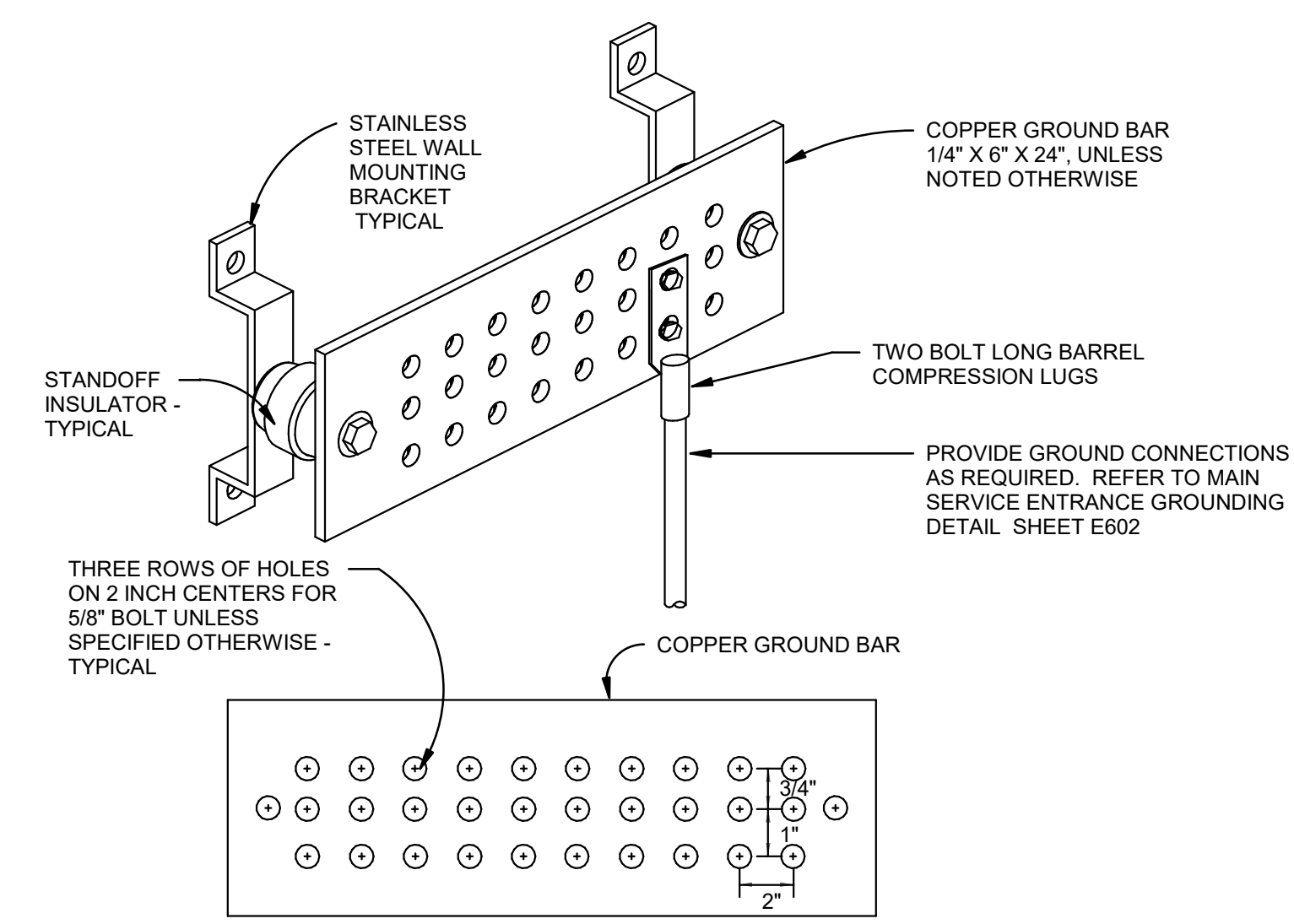
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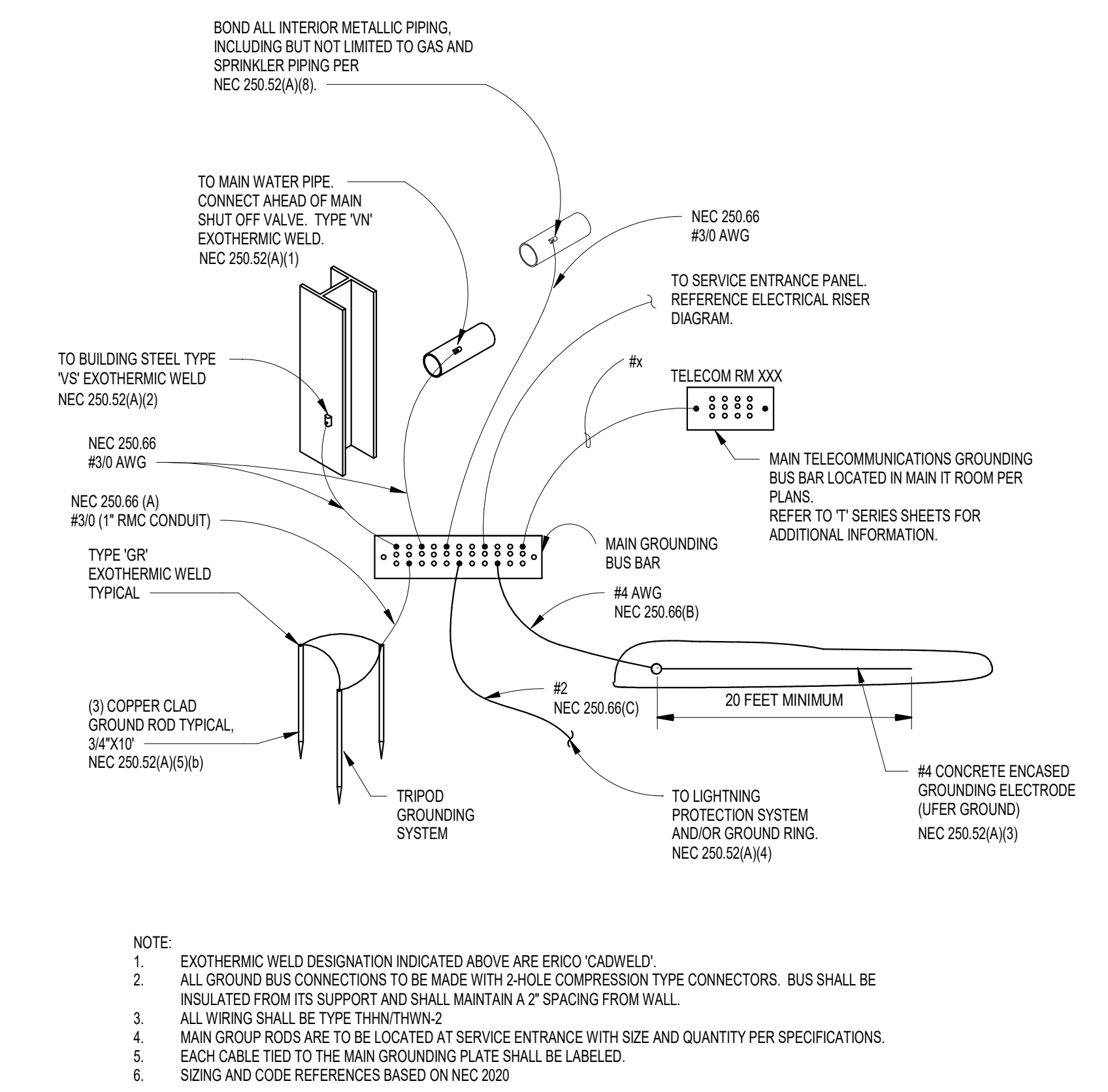
# E602



**5 HOUSEKEEPING PAD**  
NO SCALE



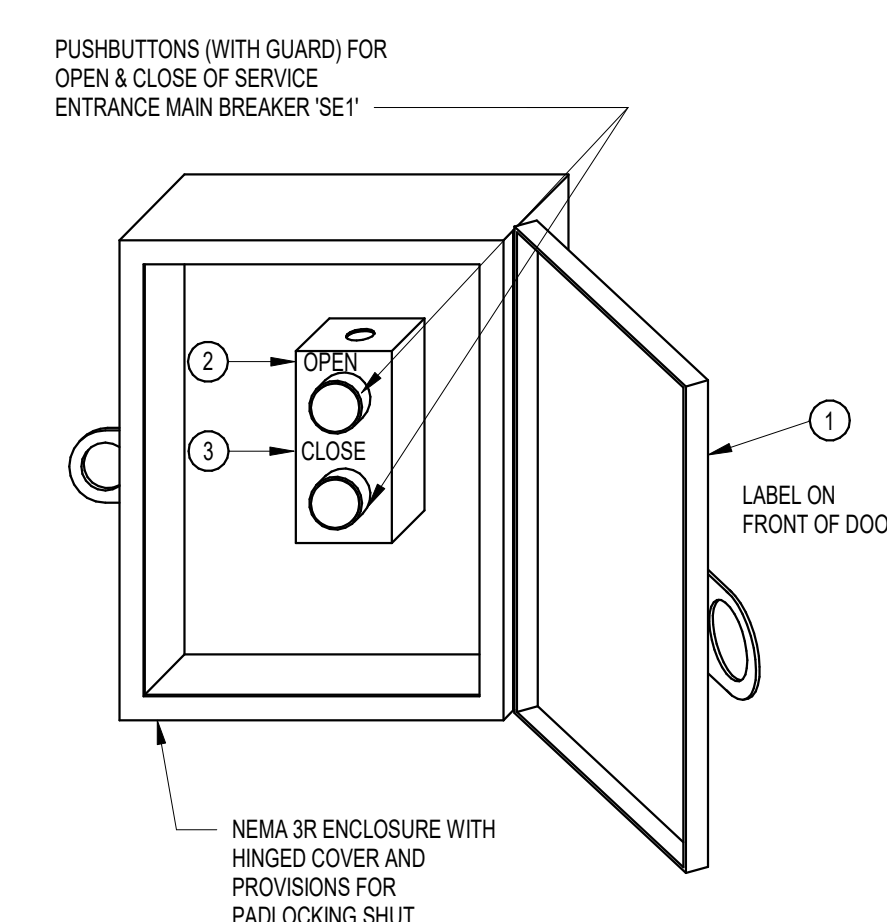
**4 MAIN SERVICE GROUND BAR**  
NO SCALE



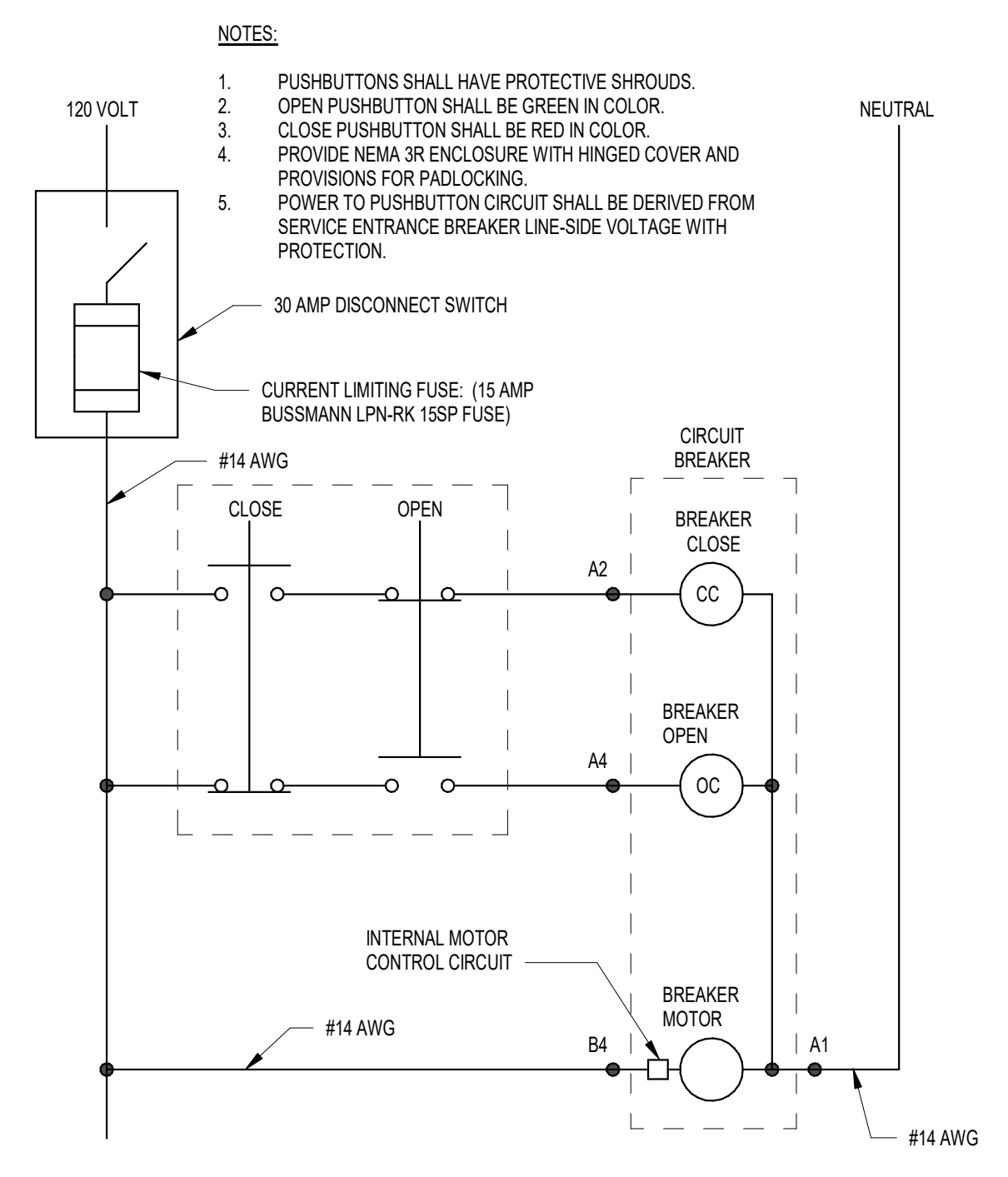
**3 MAIN SERVICE ENTRANCE GROUNDING**  
NO SCALE

- NOTES:
- PUSHBUTTONS TO BE HEAVY DUTY 30.5 MM MOUNTED IN DIE-CAST ZINC BOX WITH 3/4" NPT CONDUIT ENTRANCE.
  - PUSHBUTTON MODULE (SEE NOTE 1) TO BE MOUNTED IN THE BACK OF A 8"x10"x6" DEEP NEMA 3R ENCLOSURE.
  - INSTALL ENGRAVED NAMEPLATE AS SHOWN IN SCHEDULE FOR PUSHBUTTONS AND ON ENCLOSURE AT LOCATION INDICATED. NAMEPLATE TO BE 1/8" (MIN.) BLACK LETTERS ON WHITE BACKGROUND.
  - PUSHBUTTON TO BE INSTALLED OUTSIDE OF ARC FLASH BOUNDARY.

LOCATION ON PANEL	NAMEPLATE MESSAGE
1	BUILDING MAIN CIRCUIT BREAKER REMOTE OPERATION PUSHBUTTON STATION
2	OPEN
3	CLOSE

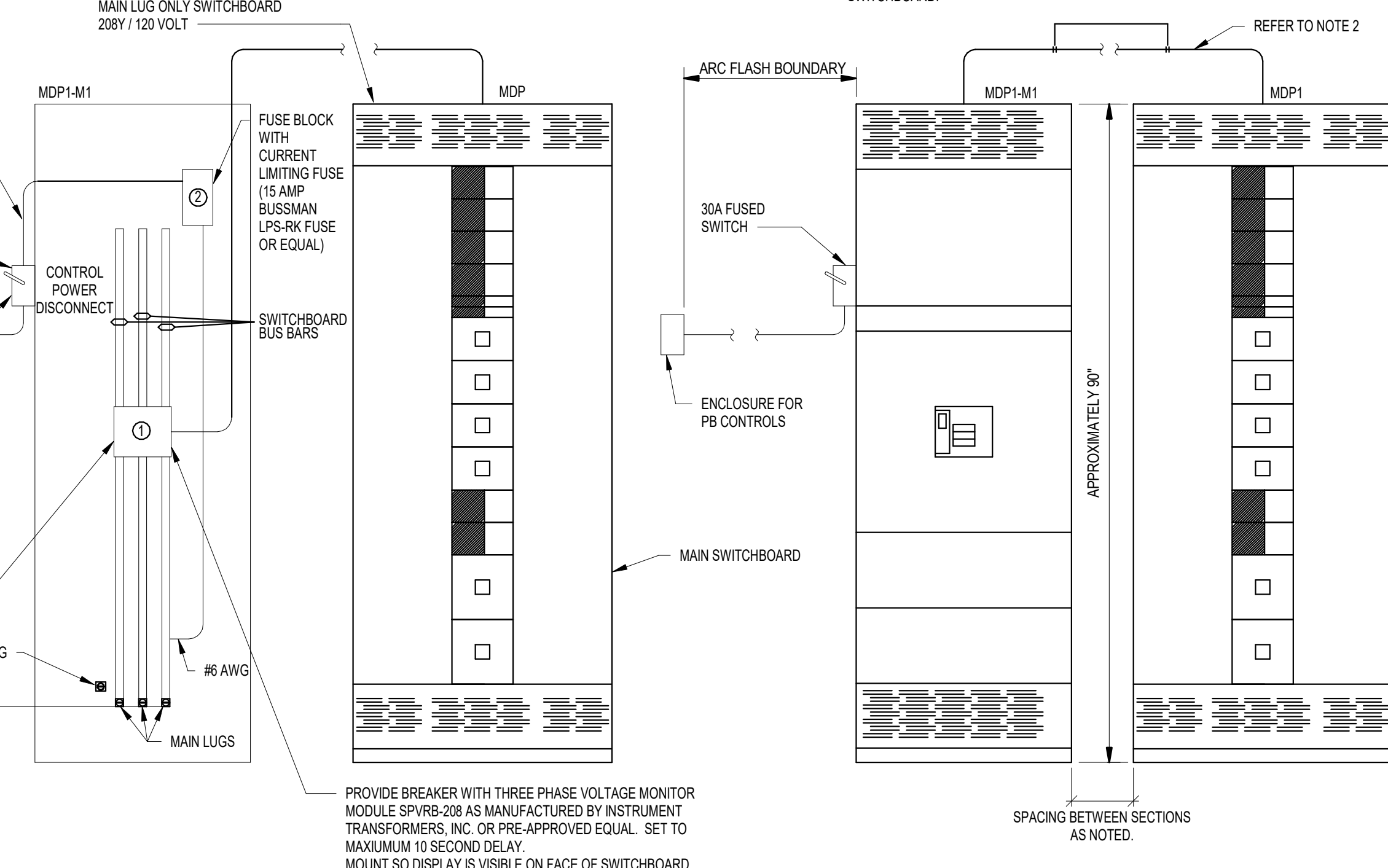


**2 MAIN BREAKER ENCLOSED PUSHBUTTON CONTROL**  
NO SCALE



**1 SERVICE ENTRANCE DETAIL**  
NO SCALE

LOCATION ON PANEL	NAMEPLATE MESSAGE
1	SERVICE ENTRANCE 1 OF 2 (MAIN)
2	SERVICE ENTRANCE 2 OF 2 (CONTROL POWER)
3	CONTROL POWER DISCONNECT



- NOTES:
- INSTALL ENGRAVED NAMEPLATE AS SHOWN IN SCHEDULE ONTO SERVICE ENTRANCE PANEL AT LOCATION INDICATED. NAMEPLATE TO BE 1/8" BLACK LETTERS ON WHITE BACKGROUND.
  - USE SANDWICH TYPE (TOTALLY ENCLOSED) BUSWAY, UNLESS CONDUIT IS PRE-APPROVED BY OWNER.

IF CONDUITS IS USED, PROVIDE 6 FEET MINIMUM CONDUIT LENGTH AND INSTALL O-2 GEDNEY CONDUIT SEALING BUSHINGS (TYPE CS80) IN ALL CONDUITS AT THE SERVICE ENTRANCE SWITCHBOARD.



**ANIMAL SCIENCE RESEARCH CENTER - REPLACE ELECTRICAL SERVICE PANELS**

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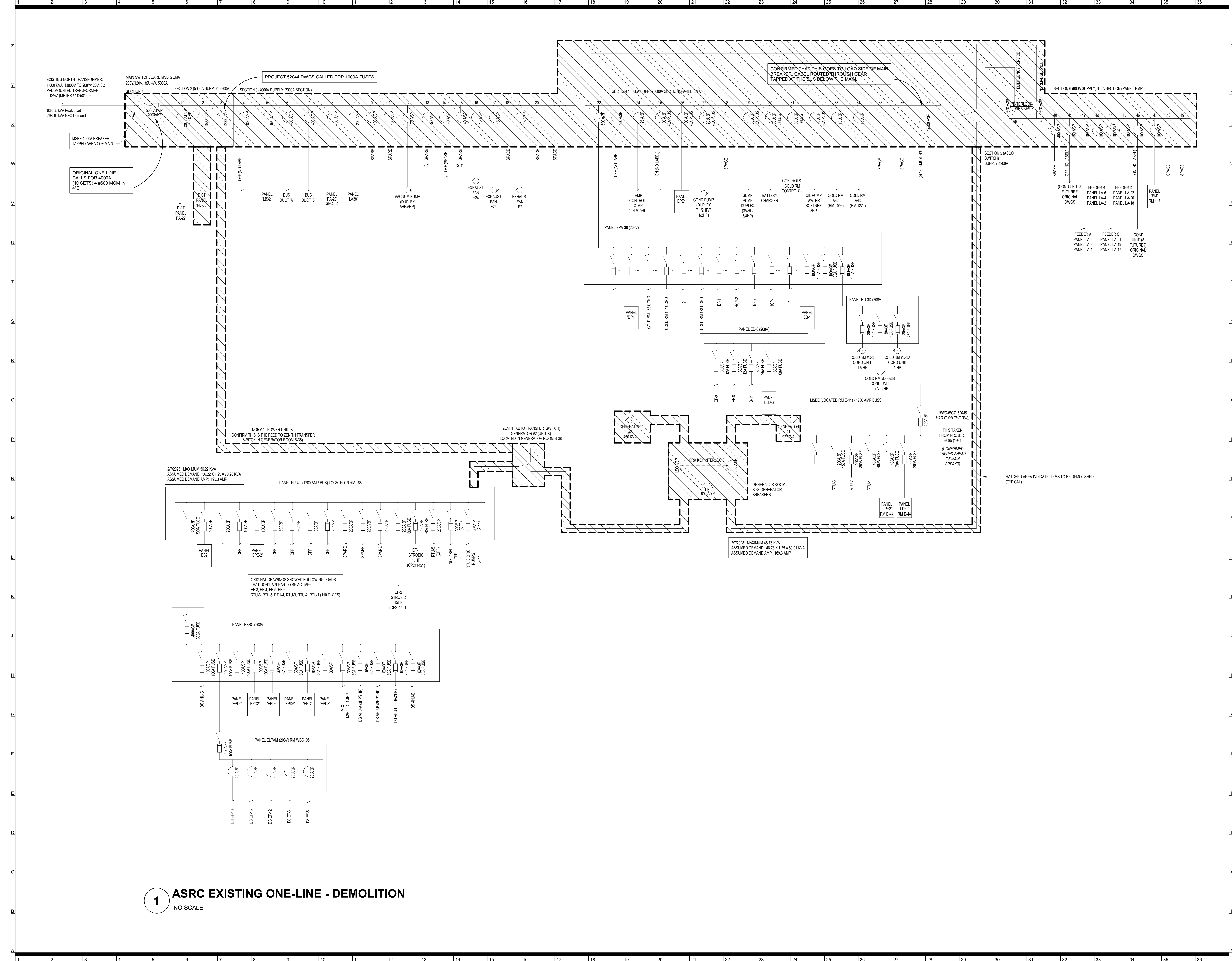
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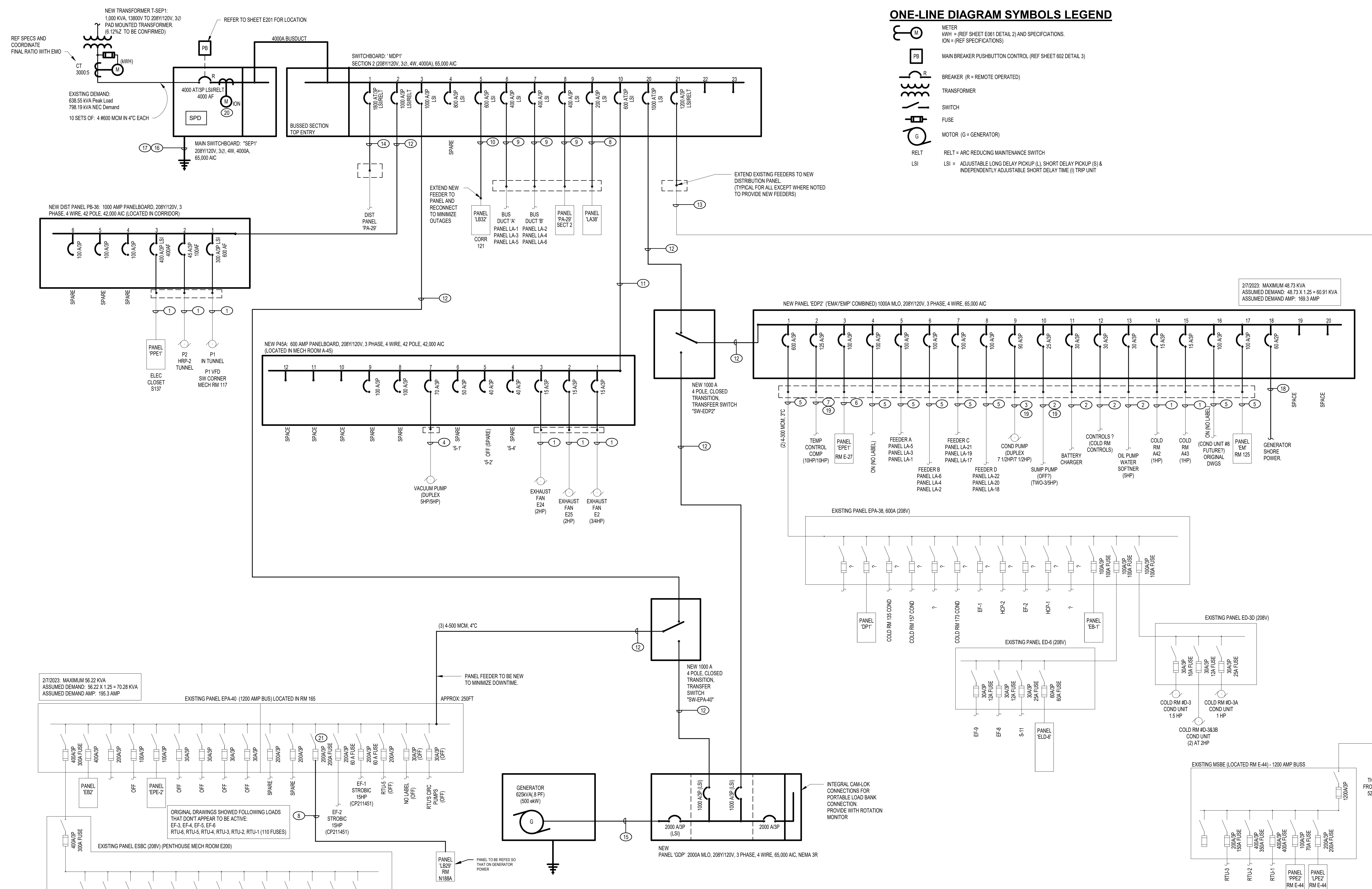
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ONE-LINE DIAGRAM - DEMOLITION

**E701**



**1 ASRC EXISTING ONE-LINE - DEMOLITION**  
NO SCALE



**ONE-LINE DIAGRAM SYMBOLS LEGEND**

- METER (WH = REF SHEET E081 DETAIL 2) AND SPECIFICATIONS (ON = REF SPECIFICATIONS)
- MAIN BREAKER PUSH-BUTTON CONTROL (REF SHEET E02 DETAIL 3)
- BREAKER (R = REMOTE OPERATED)
- TRANSFORMER
- SWITCH
- FUSE
- MOTOR (G = GENERATOR)
- RELT = ARC REDUCING MAINTENANCE SWITCH
- LSI = ADJUSTABLE LONG DELAY PICKUP (L), SHORT DELAY PICKUP (S) & INDEPENDENTLY ADJUSTABLE SHORT DELAY TIME (I) TRIP UNIT

**1 ASRC ONE-LINE DIAGRAM - NEW WORK**  
NO SCALE

**ELECTRICAL RISER FEEDER SCHEDULE**

SYMBOL #	AMPACITY	NUMBER OF RUNS	COPPER FEEDER SIZE/NOTES	TEMP RATING	NOTES
1	15A	1 SET	3 #12 AWG AND 1 #12 GROUND IN 3/4" CONDUIT	75 DEG C	SIZE TAKEN FROM EXISTING DRAWINGS. EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.
2	30A	1 SET	3 #10 AWG AND 1 #10 GROUND IN 3/4" CONDUIT	75 DEG C	SIZE TAKEN FROM EXISTING DRAWINGS. EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.
3	90A	1 SET	3 #2 AWG AND 1 #8 GROUND IN 1-1/4" CONDUIT	75 DEG C	SIZE TAKEN FROM EXISTING DRAWINGS. EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.
4	70A	1 SET	3 #6 AWG AND 1 #8 GROUND IN 3/4" CONDUIT	75 DEG C	MOTOR FEEDER. SIZE TAKEN FROM EXISTING DRAWINGS. EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.
5	100A	1 SET	4 #2 AWG AND 1 #8 GROUND IN 2" CONDUIT	90 DEG C	SIZE TAKEN FROM EXISTING DRAWINGS. EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.
6	100A*	1 SET	4 #20 AWG AND 1 #3 GROUND IN 2" CONDUIT	90 DEG C	SIZE TAKEN FROM EXISTING DRAWINGS (UPSIZED DUE TO VOLTAGE DROP). EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.
7	125A	1 SET	3 #1 AWG AND 1 #6 GROUND IN 1-1/4" CONDUIT	90 DEG C	SIZE TAKEN FROM EXISTING DRAWINGS. EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.
8	200A	1 SET	4 #250 MCM & 1 #3 GROUND IN 3" CONDUIT	90 DEG C	SIZE TAKEN FROM EXISTING DRAWINGS. EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.
9	400A	1 SET	4 #500 MCM & 1 #3 GROUND IN 3-1/2" CONDUIT	90 DEG C	SIZE TAKEN FROM EXISTING DRAWINGS. EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.
10	600A	2 SETS	4 #300 MCM & 1 #1 GROUND IN 3-1/2" CONDUIT	90 DEG C	SIZE TAKEN FROM EXISTING DRAWINGS. EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.
11	600A	2 SETS	4 #350 MCM AND 1 #1 GROUND IN 3" CONDUIT	90 DEG C	SIZE TAKEN FROM EXISTING DRAWINGS. EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.

**ELECTRICAL RISER FEEDER SCHEDULE**

SYMBOL #	AMPACITY	NUMBER OF RUNS	COPPER FEEDER SIZE/NOTES	TEMP RATING	NOTES
12	1000A	3 SETS	4 #500 MCM AND 1 #20 GROUND IN 3-1/2" CONDUIT	90 DEG C	SIZE TAKEN FROM EXISTING DRAWINGS (UPSIZED DUE TO VOLTAGE DROP). EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.
13	1200A*	5 SETS	4 #500 MCM AND 1 #250 GROUND IN 3-1/2" CONDUIT	90 DEG C	SIZE TAKEN FROM EXISTING DRAWINGS. EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.
14	1800A	5 SETS	4 #500 MCM AND 1 #250 GROUND IN 3-1/2" CONDUIT	90 DEG C	SIZE TAKEN FROM EXISTING DRAWINGS. EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.
15	2000A	6 SETS	4 #500 MCM AND 1 #250 GROUND IN 3-1/2" CONDUIT	90 DEG C	SIZE TAKEN FROM EXISTING DRAWINGS. EXTEND EXISTING FEEDERS TO NEW DISTRIBUTION PANEL. NOTIFY IF EXISTING CONDUCTORS ARE DIFFERENT THAN NOTED.
16			#30 GROUNDING CONDUCTOR		
17			GROUND PER NEC 250. BOND TO GROUND ROD, MAIN WATER PIPE AND BUILDING STEEL. REFER TO MAIN SERVICE ENTRANCE GROUNDING DETAIL ON SHEET E602.		
18	60A	1 SET	3 #4 AWG AND 1 #10 GROUND IN 1" CONDUIT	90 DEG C	MAKE ALL FINAL CONNECTIONS TO GENERATOR SHORE POWER. COORDINATE FINAL CIRCUIT CONFIGURATION WITH GENERATOR MANUFACTURER. FIELD VERIFY EXISTING WIRE SIZE. EXTEND SIZE NOTED AND SPLICE AS REQUIRED.
19			PROVIDE DIGITAL ELECTRIC POWER AND ENERGY METER WITH ALL ASSOCIATED METERING TRANSFORMERS TO BE INSTALLED INTEGRAL TO SWITCHBOARD. METER TO BE SOD POWER LOGIC ION SERIES OR EQUIVALENT AND VISIBLE FROM FRONT FACE OF SWITCHBOARD. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.		
20			EXISTING SWITCH. PROVIDE NEW FUSES SIZED AS NOTED. UPDATE LABEL ON SWITCH TO INDICATE LOAD BEING SERVED.		
21					

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**ONE-LINE DIAGRAM - NEW WORK**

**E702**