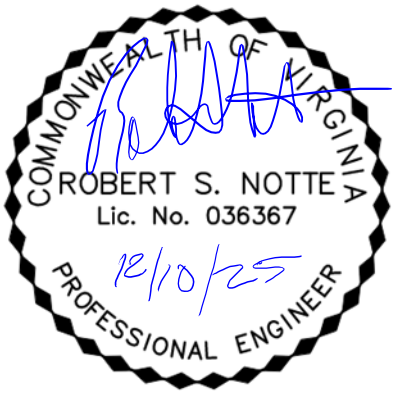
RADFORD UNIVERSITY
ALLEN BUILDING ELECTRICAL REPLACEMENT
PROJECT NUMBER 217-B5217-004

ADDENDUM NO. 3
DECEMBER 10, 2025



General:

1. Bids are due **prior to 2:00pm on January 6, 2026,** at the Facilities Planning & Construction Office, Armstrong Complex, 501 Stockton Street, Radford, VA 24142
2. Bids will be publicly opened and read aloud starting at **2:00pm on January 7, 2026,** at the same location.

Plan Sheets:

1. **REPLACEMENT:** Replace plan sheet T1.01 “Cover Sheet” with the attached T1.01 “Cover Sheet.”
2. **REPLACEMENT:** Replace plan sheet A2.02 “Elevations, Details, Partition Types” with the attached A2.02 “Elevations, Details, Partition Types.”
3. **REPLACEMENT:** Replace plan sheet C0.01 “General Notes” with the attached C0.01 “General Notes.”
4. **REPLACEMENT:** Replace plan sheet C2.01 “Erosion & Sediment Control & Demolition Plan” with the attached C2.01 “Erosion & Sediment Control & Demolition Plan.”
5. **REPLACEMENT:** Replace plan sheet C3.01 “Site Plan” with the attached C3.01 “Site Plan.”
6. **REPLACEMENT:** Replace plan sheet C5.01 “Details” with the attached C5.01 “Details.”
7. **REPLACEMENT:** Replace plan sheet M0.01 “Mechanical Symbols & Abbreviations” with the attached M0.01 “Mechanical Symbols & Abbreviations.”
8. **REPLACEMENT:** Replace plan sheet M0.02 “Mechanical Notes” with the attached M0.02 “Mechanical Notes.”
9. **REPLACEMENT:** Replace plan sheet M0.03 “Mechanical Notes” with the attached M0.03 “Mechanical Notes.”
10. **REPLACEMENT:** Replace plan sheet MD1.11 “Ground Floor Mechanical Demolition Plan” with the attached MD1.11 “Ground Floor Mechanical Demolition Plan.”
11. **REPLACEMENT:** Replace plan sheet MD1.21 “First Floor Mechanical Demolition Plan” with the attached MD1.21 “First Floor Mechanical Demolition Plan.”
12. **REPLACEMENT:** Replace plan sheet MD1.31 “Roof Mechanical Demolition Plan” with the attached MD1.31 “Roof Mechanical Demolition Plan.”
13. **REPLACEMENT:** Replace plan sheet M1.11 “Ground Floor Mechanical Plan” with the attached M1.11 “Ground Floor Mechanical Plan.”
14. **REPLACEMENT:** Replace plan sheet M1.12 “Ground Floor Mechanical Plan” with the attached M1.12 “Ground Floor Mechanical Plan.”
15. **REPLACEMENT:** Replace plan sheet M1.21 “First Floor Mechanical Plan” with the attached M1.21 “First Floor Mechanical Plan.”
16. **REPLACEMENT:** Replace plan sheet M1.31 “Roof Mechanical Plan” with the attached M1.31 “Roof Mechanical Plan.”
17. **REPLACEMENT:** Replace plan sheet M5.05 “Details” with the attached M5.05 “Details.”
18. **DELETION:** Delete plan sheet M5.06 “Details.”
19. **DELETION:** Delete plan sheet M5.07 “Details.”
20. **DELETION:** Delete plan sheet M5.08 “Details.”
21. **REPLACEMENT:** Replace plan sheet M7.01 “Mechanical Controls” with the attached M7.01 “Mechanical Controls.”
22. **REPLACEMENT:** Replace plan sheet E0.01 “Electrical Symbols & Abbreviations” with the attached E0.01 “Electrical Symbols & Abbreviations.”
23. **REPLACEMENT:** Replace plan sheet E1.11 “Ground Power Plan” with the attached E1.11 “Ground Power Plan.”

24. **REPLACEMENT:** Replace plan sheet E1.12 “Ground Lighting Plan” with the attached E1.12 “Ground Lighting Plan,”
25. **REPLACEMENT:** Replace plan sheet E1.21 “First Floor Power Plan” with the attached E1.21 “First Floor Power Plan.”
26. **REPLACEMENT:** Replace plan sheet E1.22 “First Floor Lighting Plan” with the attached E1.22 “First Foor Lighting Plan.”
27. **REPLACEMENT:** Replace plan sheet E4.01 “Ground Floor Electrical Plan” with the attached E4.01 “Ground Floor Electrical Plan.”
28. **REPLACEMENT:** Replace plan sheet E4.02 “Ground Floor Electrical Room Plans” with the attached E4.02 “Ground Floor Electrical Room Plans.”
29. **REPLACEMENT:** Replace plan sheet E5.01 “Electrical Details” with the attached E5.01 “Electrical Details.”
30. **REPLACEMENT:** Replace plan sheet E5.02 “Electrical Details” with the attached E5.02 “Electrical Details.”
31. **DELETION:** Delete plan sheet E5.03 “Electrical Details.”
32. **REPLACEMENT:** Replace plan sheet E6.01 “Schedules and Diagrams” with the attached E6.01 “Schedules and Diagrams.”
33. **REPLACEMENT:** Replace plan sheet E9.01 “Riser Diagrams” with the attached E9.01 “Riser Diagrams.”

Specifications:

1. **REPLACEMENT:** Replace specification section 00 01 02 “Table of Contents” with the attached 00 01 02 “Table of Contents.”
2. **REPLACEMENT:** Replace the “Invitation for Bids” in the contract documents with the attached “Invitation for Bids”.
3. **REPLACEMENT:** Replace specification section 00 01 07 “Seals Page” with the attached 00 01 07 “Seals Page.”
4. **DELETION:** Delete specification section 23 05 00 “HVAC Firestopping.”
5. REPLACEMENT: Replace specification section 23 05 48 “HVAC Seismic, Wind and Vibration Controls” with the attached 23 05 48 “HVAC Seismic, Wind and Vibration Controls.”
6. **REPLACEMENT:** Replace specification section 26 05 26 “Grounding and Bonding” with the attached 26 05 26 “Grounding and Bonding.”
7. **ADDITION:** Add three (3) UL details (C-AJ-5061, W-L-1164, and W-L-5064) to the project manual.

Pre-Bid Questions:

1. Specification Section 26 27 26, Page 707, Paragraph D – This section says “replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete. Does this only relate to the exit sign and light fixtures or does any material/equipment that appears old or damaged need to be replaced?

Answer: This specification section is in regards to any temporary items installed by the Contractor to perform the work (i.e. any temp power, temp receptacles to power tools, temp lighting to perform work, etc.). It includes anything the Contractor installs in order to perform the work and that isn’t on the plans. This section does not apply to the temporary devices called out on the plans. The Contractor is not expected to replace all old/deteriorated devices or equipment in the building that are outside of the scope of this project.

2. Drawing Sheet E1.21 - Notes 2&4 describe a junction box for a future duct detector for AHU-1. Note 2 has this Junction box on the roof and note 4 has the junction box above the ceiling. Which location requires the j box or does this AHU-1 require 2 boxes, 1 above the ceiling with the other j boxes on the plan, 1 on the roof.

Answer: The junction box shall be installed above the first floor accessible ceiling, just below the roof at the future AHU-1 location. The junction box is not at the rooftop. Note #2 will be modified for clarity in Addendum 3.

3. I would like to know the peak electrical demand on the current electrical service feeding the building now.

Answer: Existing peak 12-month demand load is 46kW according to the information provided by Radford University. This information is located on sheet E6.01, under the "Building Load Summary" table.

4. Is seismic performance and compliance with ASCE/SEI 7 required on this project as listed in 236426 Air Cooled Chillers specification section 1.2.A?

Answer: Seismic performance in compliance with ASCE/SEI 7-22 is required for centrifugal chillers only. However, section 236426 requires a scroll-type chiller, so this requirement does not apply unless a manufacturer were to submit a substitution request for a centrifugal-style chiller.

Robert S. Notte, PE, LEED AP
Project Manager | Vice President
Dewberry Engineers Inc.

Attachments:
T1.01 "Cover Sheet" (1 Page)
A2.02 "Elevations, Details, Partition Types" (1 Page)
C0.01 "General Notes" (1 Page)
C2.01 "Erosion & Sediment Control & Demolition Plan" (1 Page)
C3.01 "Site Plan" (1 Page)
C5.01 "Details" (1 Page)
M0.01 "Mechanical Symbols & Abbreviations" (1 Page)
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E4.02 "Ground Floor Electrical Room Plans" (1 Page)
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E5.02 "Electrical Details" (1 Page)
E6.01 "Schedules and Diagrams" (1 Page)
E9.01 "Riser Diagrams" (1 Page)
00 01 02 "Table of Contents" (4 Pages)
00100 "Invitation for Bids" (1 Page)
00 01 07 "Seals Page" (4 Pages)
23 05 48 "HVAC Seismic, Wind and Vibration Controls." (11 Pages)
26 05 26 "Grounding and Bonding" (4 Pages)
UL details (C-AJ-5061, W-L-1164, and W-L-5064) (6 Pages)

P:\50158550\Constr\Constr Contract\Electrical Bid\Electrical Addendum 3\2025.12.10_Addendum 3_FINAL.docx

END OF ADDENDUM 3

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DRAWING INDEX

GENERAL
T1.01 COVER SHEET
G1.01 FIRE RATING PLANS
G1.02 EGRESS PLAN

ARCHITECTURAL
AD1.11 GROUND FLOOR DEMOLITION PLAN
AD1.13 GROUND FLOOR DEMOLITION RCP
A1.11 GROUND FLOOR ANNOTATION & DIMENSION PLAN
A1.13 GROUND FLOOR REFLECTED CEILING PLAN
A2.02 ELEVATIONS, DETAILS, PARTITION TYPES

CIVIL
C0.01 GENERAL NOTES
C1.01 EXISTING CONDITIONS
C2.01 EROSION & SEDIMENT CONTROL & DEMOLITION PLAN
C3.01 SITE PLAN
C4.01 PROFILE
C5.01 DETAILS

MECHANICAL
M0.01 MECHANICAL SYMBOLS & ABBREVIATIONS
M0.02 MECHANICAL NOTES
M0.03 MECHANICAL NOTES
MD1.11 GROUND FLOOR MECHANICAL DEMOLITION PLAN
MD1.21 FIRST FLOOR MECHANICAL DEMOLITION PLAN
MD1.31 ROOF MECHANICAL DEMOLITION PLAN
M1.11 GROUND FLOOR MECHANICAL PLAN
M1.12 GROUND FLOOR MECHANICAL PLAN
M1.21 FIRST FLOOR MECHANICAL PLAN
M1.31 ROOF MECHANICAL PLAN
M5.01 DETAILS
M5.02 DETAILS
M5.03 DETAILS
M5.04 DETAILS
M5.05 DETAILS
M6.01 MECHANICAL SCHEDULES
M6.02 MECHANICAL SCHEDULES
M7.01 MECHANICAL CONTROLS
M7.02 MECHANICAL CONTROLS
M7.03 MECHANICAL CONTROLS
M9.01 ISOMETRICS, PERSPECTIVES

ELECTRICAL
E0.01 ELECTRICAL SYMBOLS & ABBREVIATIONS
ED1.11 GROUND ELECTRICAL DEMOLITION PLAN
ED1.12 GROUND LIGHTING DEMOLITION PLAN
ED1.21 FIRST FLOOR ELECTRICAL DEMOLITION PLAN
E1.11 GROUND POWER PLAN
E1.12 GROUND LIGHTING PLAN
E1.21 FIRST FLOOR POWER PLAN
E1.22 FIRST FLOOR LIGHTING PLAN
E3.01 GROUND LIGHTING EMERGENCY LIGHTING CALCS
E4.01 GROUND FLOOR ELECTRICAL PLAN
E4.02 GROUND FLOOR ELECTRICAL ROOM PLANS
E5.01 ELECTRICAL DETAILS
E5.02 ELECTRICAL DETAILS
E6.01 SCHEDULES AND DIAGRAMS
E6.02 SCHEDULES AND DIAGRAMS
E9.01 RISER DIAGRAMS

STRUCTURAL
S0.01 STRUCTURAL GENERAL NOTES, ABBREVIATIONS, AND SCHEDULES
S5.01 STRUCTURAL DETAILS

LIGHTNING PROTECTION SYSTEM (LPS) RISK FACTORS

Nd = .260
Nc = .0003
Nd > Nc – LPS RISK ASSESSMENT IS RECOMMENDED PER NFPA 780. HOWEVER, OWNER HAS CHOSEN NOT TO INSTALL AN LPS ON THE EXISTING BUILDING DUE TO CURRENT BUDGET AND SCOPE OF PROJECT.

NOTES:

AN ASBESTOS INSPECTION WAS PERFORMED AND NO ACM WAS FOUND. THE ASBESTOS INSPECTION REPORT IS INCLUDED AS AN APPENDIX TO THE PROJECT SPECIFICATIONS.

AN INSPECTION TO IDENTIFY LEAD CONTAINING OR COATED BUILDING COMPONENTS HAS BEEN CONDUCTED AND CAN BE FOUND IN THE PROJECT SPECIFICATIONS. THIS REPORT IS PROVIDED FOR THE CONTRACTOR'S USE AND MAY NOT BE ALL INCLUSIVE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH ALL VIRGINIA OCCUPATIONAL SAFETY AND HEALTH (VOSH) REGULATIONS AS THEY PERTAIN TO EMPLOYEE EXPOSURES TO LEAD. ALL LEAD AND LEAD-COATED BUILDING COMPONENTS SHALL BE RECYCLED TO THE EXTENT POSSIBLE.

CONTACT VIRGINIA 811 AT 811, 1-800-552-7001, OR HTTPS://WWW.VA811.COM NO LESS THAN 72 HOURS PRIOR TO EXCAVATION AND DO NOT DISTURB THE SOIL UNTIL DIG TICKET HAS BEEN PROCESSED.

PROJECT / BUILDING INFORMATION:

SCOPE OF WORK:	ELECTRICAL IMPROVEMENTS	NATURE OF OCCUPANCY:	POLICE STATION
OCCUPANT LOAD:	85	SEPARATED MIXED USE:	N/A
CONSTRUCTION TYPE:	IIIB	GROSS BUILDING AREA:	12,998 SF
FLOOR AREA:	6,721 SF	WORK AREA:	6,835 SF
FIRE SUPPRESSION:	N/A	FIRE ALARMS:	EXISTING
BUILDING OCCUPANCY USE GROUP: 2 STORY, BUSINESS		WORK TO BE PERFORMED:	LEVEL 2 ALTERATION

CODE REFERENCES

VIRGINIA UNIFORM STATEWIDE BUILDING CODE (VUSBC) – 2021
2021 VIRGINIA EXISTING BUILDING CODE (VEBC) – VUSBC PART II – ALTERATION LEVEL 2
RADFORD UNIVERSITY DESIGN AND CONSTRUCTION STANDARDS – 2019
RADFORD UNIVERSITY ANNUAL STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT – REVISION 6 – FEBRUARY 16, 2021
MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES (ASCE 7-22)
BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318-19)
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY – EROSION AND SEDIMENT CONTROL REGULATIONS
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY – STORMWATER MANAGEMENT REGULATIONS
TITLE II, AMERICANS WITH DISABILITIES ACT OF 1990
CONSTRUCTION AND PROFESSIONAL SERVICES MANUAL, 2025 CPSM, REV. 0, ISSUED 03/17/25
VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD & BRIDGE SPECIFICATIONS – 2020
2020 NATIONAL ELECTRICAL CODE

Radford University

ALLEN BUILDING ELECTRICAL REPLACEMENT

100% CONSTRUCTION DOCUMENTS
RADFORD, VIRGINIA
RADFORD UNIVERSITY PROJECT NUMBER 217-B5217-004

ENERGY COMPLIANCE STATEMENTS

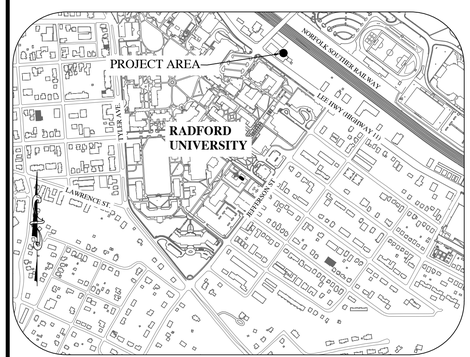
HBPA COMPLIANCE STATEMENT: IN ACCORD WITH THE HIGH-PERFORMANCE BUILDINGS ACT, THE BUILDING IS EXEMPT FROM COMPLIANCE BECAUSE OF THE COST OF THE RENOVATIONS DOES NOT EXCEED 50% OF THE VALUE OF THE BUILDING.

VECC COMPLIANCE STATEMENT: IN ACCORD WITH THE VIRGINIA ENERGY CONSERVATION CODE (VECC), THE BUILDING SHALL COMPLY WITH VECC SECTIONS C402 THROUGH C405 AND C408.

DELEGATED DESIGN LIST

AVAILABLE FAULT CURRENT STUDY (PER SPECIFICATION 260571)
DESIGN OF EXCAVATION SUPPORT AND PROTECTIVE SYSTEMS (PER SPECIFICATION 230300)
DESIGN OF TRAPEZE PIPE HANGERS AND EQUIPMENT SUPPORTS (PER SPECIFICATION 230529)
SEISMIC BRACING DESIGN (PER SPECIFICATION 230548)
WIND RESTRAINT DESIGN (PER SPECIFICATION 230548)
FLUSHING AND TESTING PLAN (PER SPECIFICATION 230555)
HYDRONIC PIPING EXPANSION ANCHOR DESIGN (PER SPECIFICATION 232113)
DUCT CONSTRUCTION AND SUPPORT DESIGN (PER SPECIFICATION 230548)

LOCATION MAP
SCALE: NTS



CONTACTS

OWNER:
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W. L. Ferguson
Project Manager
501 Stockton Street
Radford, Virginia 24142
PH. (540) 831-7781
wlferguso@radford.edu

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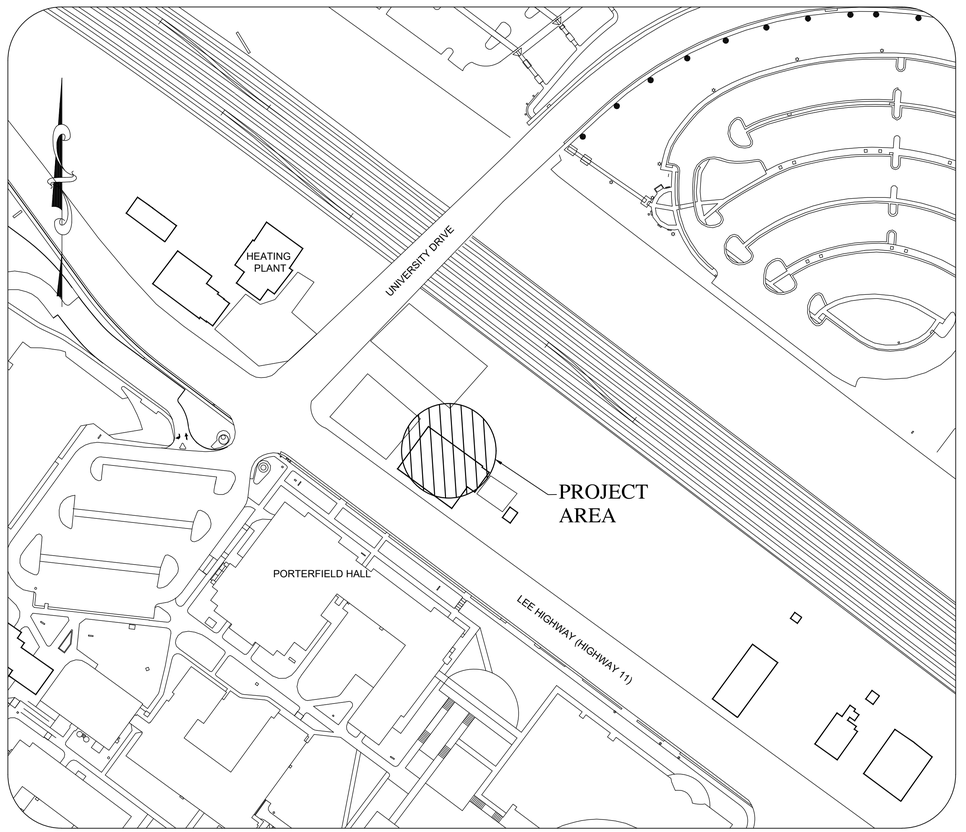
Robert S. Notte, P.E., LEED AP
9300 Harris Corners Pkwy, Suite 220
Charlotte, NC 28269
PH. (704) 625-5088
FAX (704) 509-9937
snotte@dewberry.com

SUBMITTAL		SET NUMBER
☐ PRELIMINARY	☐ CONSTRUCTION	
■ APPROVAL	☐ REVISION	
☐ BIDDING	☐ RECORD	

VICINITY MAP
SCALE: 1" = 100'



STATE BUILDING OFFICIAL

Dewberry
Dewberry Engineers Inc.
9300 Harris Corners Pkwy - Suite 220
Charlotte, NC 28269
Phone: 704.509.9918
Fax: 704.509.9937
www.dewberry.com

DEB APPROVAL

Signed by: Scott Davis
SCOTT W. DAVIS
Lic. No. 062725
COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER
12/5/2025
MECHANICAL

Signed by: Tyler Winokur
TYLER WINOKUR
Lic. No. 065927
COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER
12/5/2025
ELECTRICAL

Signed by: Larry W. Hasson, Jr.
Larry W. Hasson, Jr.
Lic. No. 010298
COMMONWEALTH OF VIRGINIA
ARCHITECT
12/5/2025
ARCHITECTURAL

SEAL
Signed by: Robert S. Notte
ROBERT S. NOTTE
Lic. No. 036367
COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER
12/5/2025
CIVIL

SEAL
Signed by: William James Hamilton
WILLIAM JAMES HAMILTON
Lic. No. 0402059615
COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER
12/5/2025
STRUCTURAL

REVISIONS

No.	DATE	BY	Description
2	12/05/2025	RAL	DEB CMTS/ADD 3
1	10/24/2025	RAL	DEB COMMENTS

Radford University
ALLEN BUILDING ELECTRICAL REPLACEMENT
100% CONSTRUCTION DOCUMENTS
RADFORD, VIRGINIA

DRAWN BY RAL
APPROVED BY RSN
CHECKED BY RSN
DATE JULY 25, 2025

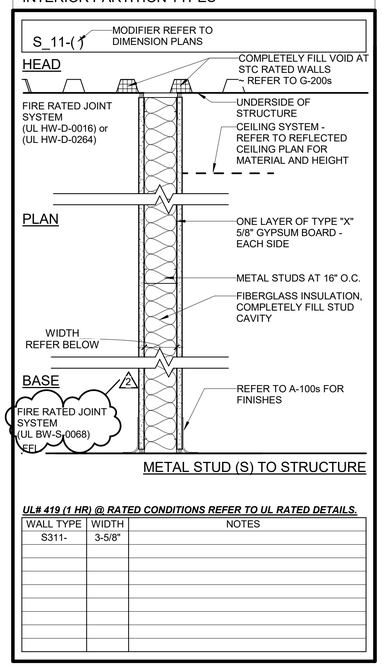
TITLE
COVER SHEET

DEI PROJECT NO: 50188025
RADFORD UNIVERSITY PROJECT NO: 217-B5217-004

SHEET NO.
T1.01

Docusign Envelope ID: 6A420090-FC13-49FC-A63C-8D42CD4A18A6

INTERIOR PARTITION TYPES

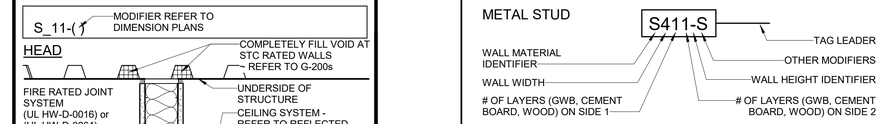


UL# 419 (1 HR) @ RATED CONDITIONS REFER TO UL RATED DETAILS.

WALL TYPE	WIDTH	NOTES
S311-	3-5/8"	

INTERIOR PARTITION LEGEND

METAL STUD



WALL MATERIAL IDENTIFIER & WIDTH:

S = METAL STUD C = C-H STUD

SHOWS A ROUNDED VALUE FOR THE WIDTH OF THE STRUCTURAL PORTION OF THE WALL.

S3: 3 5/8" METAL STUD C4: 4" C-H STUD
S8: 8" METAL STUD

OF GYP. WALL BD. LAYERS ON SIDE 1 & 2: (METAL STUD WALL ONLY)

SHOWS A VALUE FOR THE NUMBER OF LAYERS OF GWB ON EACH SIDE OF THE STUD. A '0' INDICATES ZERO LAYERS OF GWB. WHERE A WALL ONLY HAS GWB ON ONE SIDE, IT IS ALWAYS ON THE EXPOSED SIDE.

WALL HEIGHT IDENTIFIER:

- (DASH) = TO STRUCTURE
A = TO 6" ABOVE CEILING OR ONE FULL COURSE ABOVE CEILING (CMU)

OTHER MODIFIERS:

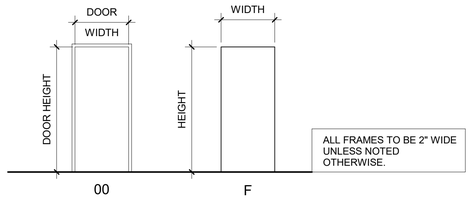
F = FIRE RATED WALL (COORDINATE WITH CODE COMPLIANCE PLAN FOR RATING AND UL DESIGNATION)

GENERAL NOTES:

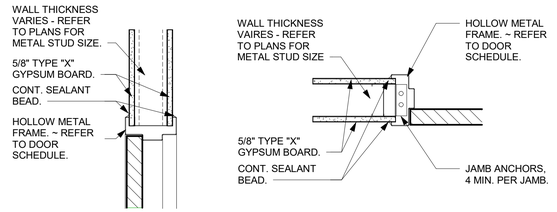
1. ALL METAL STUD & FURRED PARTITIONS TO RECEIVE SOUND ATTENUATION BLANKET FULL WIDTH OF STUD AND FULL HEIGHT OF WALL TO UNDERSIDE OF STRUCTURE/DECK, U.N.O. IN FIRE-RATED PARTITIONS, USE SOUND ATTENUATION FIRE BLANKET.
2. SEE PLANS AND DETAIL PLANS FOR CHASE DIMENSIONS. WITHIN CHASE WALLS, USE 4" C-H STUDS MIN.
3. INTERIOR DIMENSIONS ARE TO FACE OF METAL STUD, U.N.O.
4. REFER TO DETAIL DRAWINGS AND SPECIFICATION FOR LOCATIONS AND INFORMATION ON THE VARIOUS TYPES OF GYPSUM BOARD.
5. FINAL WALL PREP REQUIREMENTS BASED ON FINISH SHOWN IN THE ROOM FINISH SCHEDULE AND WITH THE SPECIFICATIONS.
6. REFER TO DETAIL PLANS AND SECTIONS FOR FURTHER DESCRIPTION OF INTERIOR PARTITIONS.
7. REFER TO FINISH DRAWINGS AND SCHEDULES FOR WALL MATERIAL AND FINISHES.
8. LABEL ALL NEW FIRE RATED WALLS IN ACCORDANCE WITH VCC SECTION 703.7.
9. REFER TO ***M6.01 AND E5.01*** LIFE-SAFETY PENETRATION SCHEDULES ***AND SPEC SEC. 078413*** FOR FIRE STOPPING SYSTEMS.

DOOR SCHEDULE

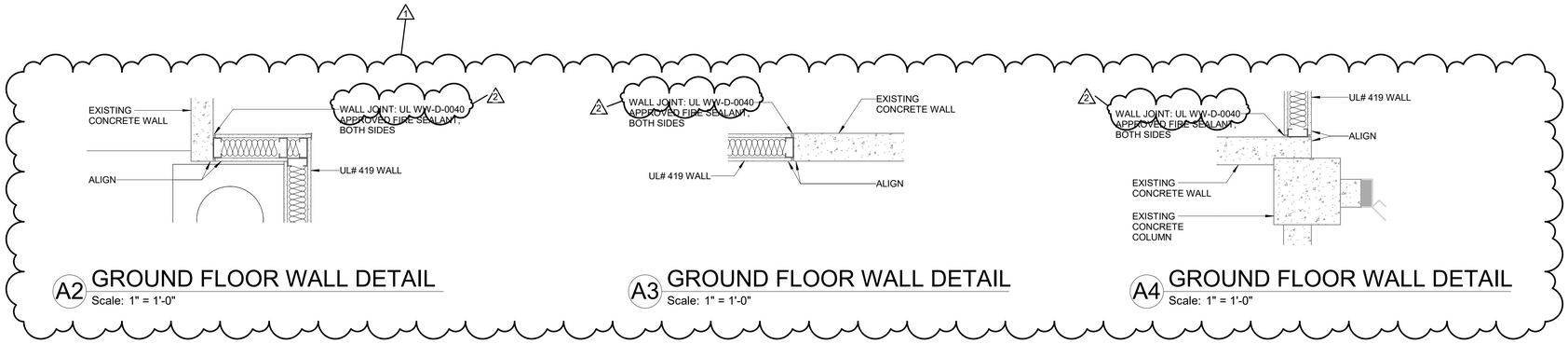
DOOR NUMBER	LEAF QTY	DOOR SIZE WIDTH	DOOR SIZE HEIGHT	DOOR SIZE THICKNESS	DOOR TYPE	DOOR MATERIAL	FRAME TYPE	FRAME MATERIAL	DETAILS HEAD	DETAILS JAMB	DETAILS SILL	FIRE LABEL	HARDWARE	REMARKS	DOOR NUMBER
002	1	3' - 6"	7' - 0"	1 3/4"	F	HM	00	HM	C6	C6		45 MIN	1		002



C3 DOOR AND FRAME TYPES
Scale: 1/4" = 1'-0"



C4 DOOR HEAD AND JAMB
Scale: 1 1/2" = 1'-0"



A2 GROUND FLOOR WALL DETAIL
Scale: 1" = 1'-0"

A3 GROUND FLOOR WALL DETAIL
Scale: 1" = 1'-0"

A4 GROUND FLOOR WALL DETAIL
Scale: 1" = 1'-0"

STATE BUILDING OFFICAL

Dewberry

Dewberry Engineers Inc.
8300 Harris Corners Pkwy - Suite 220
Charlotte, NC 28269
Phone: 704.509.9918
Fax: 704.509.9937
www.dewberry.com

DEB APPROVAL

Radford UNIVERSITY

ALLEN BUILDING ELECTRICAL REPLACEMENT
100% CONSTRUCTION DOCUMENTS
RADFORD, VIRGINIA

SEAL

Signed by: Larry W. Hasson, Jr.
42F4BFE44B6446...
Larry W. Hasson, Jr.
Lic. No. 010298
COMMONWEALTH OF VIRGINIA
ARCHITECT
12/5/2025

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/25		DEB CMTS/ADD 3
1	10/24/25		DEB COMMENTS

DRAWN BY JP
APPROVED BY PR
CHECKED BY BK
DATE JULY 25, 2025

TITLE

ELEVATIONS, DETAILS, PARTITION TYPES

DEI PROJECT NO: 50188025
RADFORD UNIVERSITY PROJECT NO: 217-B5217-004

SHEET NO.

A2.02

GENERAL NOTES

1. THE INFORMATION AND DATA SHOWN OR INDICATED WITH RESPECT TO EXISTING UNDERGROUND FACILITIES AT, OR CONTIGUOUS TO, THE SITE IS APPROXIMATE. THE OWNER AND ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ANY SUCH INFORMATION OR DATA. THE CONTRACTOR SHALL HAVE FULL RESPONSIBILITY FOR REVIEWING AND CHECKING ALL SUCH INFORMATION AND DATA (PRIOR TO CONSTRUCTION) FOR LOCATING ALL UNDERGROUND FACILITIES SHOWN OR INDICATED; FOR COORDINATION OF THE WORK WITH THE OWNERS OF SUCH UNDERGROUND FACILITIES DURING CONSTRUCTION; AND FOR THE SAFETY AND PROTECTION THEREOF RESULTING FROM THE WORK; ALL OF WHICH WILL BE AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL CONTACT "MISS UTILITY" OF VIRGINIA AT 1-800-552-7001 72 HOURS PRIOR TO THE START OF CONSTRUCTION. WORK SHALL BE SUBJECT TO INSPECTION BY RADFORD UNIVERSITY.
2. BASE MAP INFORMATION IS BASED FIELD SURVEY PROVIDED BY DEWBERRY ENGINEERS INC. DATED JULY 11, 2023.
3. WHEN WORKING ADJACENT TO EXISTING STRUCTURES, POLES, FENCES, ETC., THE CONTRACTOR SHALL USE WHATEVER METHODS THAT ARE NECESSARY TO PROTECT STRUCTURES FROM DAMAGE. THE CONTRACTOR SHALL HAND EXCAVATE WITHIN 5' OF ALL BUILDINGS, WALLS, AND STRUCTURES. REPLACEMENT OF DAMAGED STRUCTURES SHALL BE AT THE CONTRACTOR'S EXPENSE.
4. CONTRACTOR SHALL IMMEDIATELY REPORT ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND CONTRACT DOCUMENTS TO THE ENGINEER.
5. THE LOCATION OF ALL EXISTING UTILITIES ACROSS THE LINES OF THE PROPOSED WORK ARE NOT NECESSARILY SHOWN ON THE PLANS, AND WHERE SHOWN ARE ONLY APPROXIMATE. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND LINES AND STRUCTURES AS NECESSARY.
6. ALL MATERIALS AND CONSTRUCTION SHALL COMPLY WITH THE CONSTRUCTION DOCUMENTS AND RADFORD UNIVERSITY CONSTRUCTION STANDARDS.
7. ANY ALTERATIONS AND CONNECTIONS TO ANY UTILITY MUST BE COORDINATED THROUGH RADFORD UNIVERSITY.
8. CONTRACTOR WORK DAYS AND HOURS SHALL BE MONDAY THROUGH FRIDAY 7 AM TO 7 PM. ANY DEVIATION FROM THIS SCHEDULE SHALL BE APPROVED, IN ADVANCE, BY RADFORD UNIVERSITY. ANY SERVICE SUPPLY SHUTDOWNS WILL BE PERFORMED AT NIGHT AND/OR DURING WEEKENDS WITH 10 DAYS WRITTEN NOTICE AND WRITTEN APPROVAL OF RADFORD UNIVERSITY.
9. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL VERIFY DEPTHS OF ALL UTILITY CROSSINGS.
10. CONTRACTOR SHALL PROVIDE ALL CONSTRUCTION SIGNS.
11. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY ELEVATIONS OF ALL POINTS OF CONNECTION OR PROPOSED WORK TO EXISTING CURBS, SIDEWALKS, ETC.
12. CONTRACTOR SHALL UTILIZE RADFORD UNIVERSITY APPROVED CONSTRUCTION SAFETY FENCING FOR PROTECTION OF WORK AREAS, UNLESS OTHERWISE NOTED ON DRAWINGS. PRIOR TO CONSTRUCTION, THE LIMITS OF DISTURBANCE SHALL BE COORDINATED WITH RADFORD UNIVERSITY.
13. ALL VEHICULAR, BICYCLE, AND PEDESTRIAN TRAFFIC SHALL BE MAINTAINED THROUGHOUT THE PROJECT.
14. CONTRACTOR SHALL OBTAIN COMPACTION AT 95% MAXIMUM DRY DENSITY STANDARD PROCTOR PER ASTM D-968, METHOD D. CONTRACTOR SHALL PLACE BACKFILL AND FILL MATERIALS IN LAYERS NOT MORE THAN 8 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HEAVY COMPACTION EQUIPMENT, AND NOT MORE THAN 4 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND-OPERATED TAMPERS.
15. OWNER SHALL EMPLOY A QUALIFIED INDEPENDENT GEOTECHNICAL ENGINEERING TESTING AGENCY TO PERFORM REQUIRED FIELD AND LABORATORY TESTING.
16. MATERIAL LAYDOWN AND STORAGE SHALL BE WITHIN THE PROJECT AREA.

PLANT PROTECTION

TREES AND VEGETATION ADJACENT TO THE ACTUAL WORK AREA OR BORROW AREA ARE TO BE PROTECTED WITH TEMPORARY FENCING (CHAIN LINK FENCE FOR TREES; CONSTRUCTION SAFETY FENCE FOR VEGETATION) TO PRESERVE EXISTING ITEMS THAT ARE INDICATED TO REMAIN AND TO PREVENT DAMAGE TO PROPERTY.

UNDERGROUND UTILITIES SHALL BE LOCATED SO THAT CONSTRUCTION WILL NOT DAMAGE OR DESTROY THE PLANTS TO REMAIN. UTILITY TRENCHING SHALL NOT BE LOCATED CLOSER THAN 1'-0" FOR EACH 1" IN DIAMETER, UP TO A MAXIMUM OF 20'-0", FOR TREES TO REMAIN. DAMAGED TREES AND PLANTS SHALL BE RESTORED TO THE SATISFACTION OF RADFORD UNIVERSITY.

THE PARKING OF VEHICLES AND STORAGE OF ANY CONSTRUCTION EQUIPMENT OR MATERIALS SHALL NOT OCCUR UNDER THE DRIP LINE OF TREES TO BE PROTECTED.

GENERAL DEMOLITION NOTES

1. ALL PRIMARY UTILITIES DISCOVERED DURING DEMOLITION OPERATIONS THAT SERVE ACTIVITIES OTHER THAN THE SITE SHALL BE PROPERLY PRESERVED AND PROTECTED.
2. THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE OWNER ANY UNFORESEEN OR ADVERSE CONDITIONS DISCOVERED DURING DEMOLITION OPERATIONS.
3. DURING CONSTRUCTION, CONTRACTOR SHALL PROTECT EXISTING PLANT MATERIAL NOT DESIGNATED FOR REMOVAL OR RELOCATION FROM DAMAGE.
4. CONTRACTOR SHALL KEEP ALL SURROUNDING PUBLIC ROADWAYS AND DRAINAGE SYSTEMS FREE FROM DIRT, MUD, AND CONSTRUCTION DEBRIS AT ALL TIMES.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY ITEMS DAMAGED DURING THE CONSTRUCTION.
6. DISPOSAL OF DEMOLISHED DEBRIS FROM RADFORD UNIVERSITY PROPERTY MUST BE COMPLETED LEGALLY.
7. SAW CUT AND REMOVE ALL ASPHALT AND CONCRETE TO LIMITS REQUIRED FOR PROPOSED WORK. SAW CUTS FOR CONCRETE SHALL OCCUR AT NEAREST CONTROL JOINT OR EXPANSION JOINT. SAW CUTS BETWEEN CONTROL JOINTS ARE NOT ACCEPTABLE. ALL DECORATIVE SCORING PATTERNS SHALL BE REPLACED TO THE OWNER'S SATISFACTION. CONTRACTOR SHALL DOCUMENT AND PHOTOGRAPH ALL DECORATIVE SCORING PATTERNS PRIOR TO DEMOLITION.

EROSION AND SEDIMENT CONTROL NOTES

1. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME. AT THE END OF EACH WORK DAY, ALL EXCAVATION SHALL BE FILLED OR PLATED.
2. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES. CONTRACTOR SHALL PROVIDE APPROPRIATE PROTECTION TO CONTROL SEDIMENT WASHING INTO THE TRENCH.
3. ALL EROSION CONTROL DEVICES SHALL BE IN PLACE AND FUNCTIONAL AT ALL TIMES, AND IF REMOVED FOR CONSTRUCTION PROGRESS, SHALL BE REPLACED BY THE CLOSE OF EACH WORKDAY.
4. FINAL REMOVAL OF EROSION CONTROL DEVICES SHALL NOT OCCUR UNTIL THE OWNER OR HIS DESIGNATED AGENT DEEMS THE SITE STABILIZED AND REMOVAL IS AUTHORIZED BY THE REGULATORY AUTHORITY.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SATISFYING ANY AND ALL EROSION CONTROL (EC) AND STORM WATER MANAGEMENT (SWM) REQUIREMENTS FOR ANY LAND DISTURBING ACTIVITIES, INCLUDING BUT NOT LIMITED TO ON-SITE OR OFF-SITE BORROW, ON-SITE OR OFF-SITE STOCKPILING, OR DISPOSAL OF WASTE MATERIALS IN ACCORDANCE WITH VIRGINIA E&SC HANDBOOK. BEFORE UNDERTAKING ANY LAND EROSION CONTROL AND STORM WATER MANAGEMENT, THE CONTRACTOR SHALL CONTACT RADFORD UNIVERSITY TO DETERMINE WHAT EC AND SWM MEASURES ARE NECESSARY. BEFORE IMPLEMENTATION, ALL EC AND SWM MEASURES MUST BE APPROVED BY RADFORD UNIVERSITY. HE CONTRACTOR SHALL COMPLETELY SATISFY ALL REQUIREMENTS OF RADFORD UNIVERSITY BEFORE CONTINUING WITH THE CONCERNED ACTIVITY.
6. CONCRETE WASHOUT SHALL BE COMPLETED AT AN APPROVED CONCRETE WASHOUT FACILITY ONLY.
7. SLOPES SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION.
8. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE REGULATORY AUTHORITY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.

MINIMUM STANDARDS

1. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE, BUT WILL REMAIN DORMANT FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR. SPECIFIC FERTILIZER, NUTRIENT, AND SEED APPLICATION MUST MEET E.S.C. TECHNICAL BULLETIN NO. 4 - NUTRIENT MANAGEMENT FOR DEVELOPMENT PROJECTS. DOWNLOAD AT http://www.dcr.virginia.gov/soil_&_water/documents/esnutan.pdf. MULCHING REQUIREMENTS MUST MEET VESC HANDBOOK MULCHING TABLE 3.35A.

   SATISFIED BY: EROSION AND SEDIMENT CONTROL NOTES, THIS SHEET.
2. DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES AND BORROW AREAS SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE APPLICANT IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS BORROW AREAS AND SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE. ANY BORROW, FILL OR WASTE, SUCH AS DEMOLITION MATERIAL, MUST BE PROVIDED FROM OR HAULED TO A PERMITTED/APPROVED SUPPLY OR WASTE AREA. OFFSITE ACTIVITY IS NOT PART OF THIS PERMIT/PLAN SET.

   SATISFIED BY: MATERIAL LAYDOWN AND STORAGE STATED IN GENERAL NOTE 16, THIS SHEET.
3. A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT IS UNIFORM, MATURE ENOUGH TO SURVIVE, AND WILL INHIBIT EROSION.

   SATISFIED BY: EROSION AND SEDIMENT CONTROL NOTES, THIS SHEET.
4. SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS, AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND-DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.

   SATISFIED BY: NOTES ON SHEET C2.01
5. STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES, AND DIVERSIONS, IMMEDIATELY AFTER INSTALLATION.

   SATISFIED BY: NOT APPLICABLE
6. SEDIMENT TRAPS AND SEDIMENT BASINS SHALL BE DESIGNED AND CONSTRUCTED BASED UPON THE TOTAL DRAINAGE AREA TO BE SERVED BY THE TRAP OR BASIN.
   A. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT TRAP SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA AND THE TRAP SHALL ONLY CONTROL DRAINAGE AREAS LESS THAN THREE ACRES.
   B. SURFACE RUNOFF FROM DISTURBED AREAS THAT IS COMPRISED OF FLOW FROM DRAINAGE AREAS GREATER THAN OR EQUAL TO THREE ACRES SHALL BE CONTROLLED BY A SEDIMENT BASIN. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT BASIN SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA. THE OUTFALL SYSTEM SHALL, AT A MINIMUM, MAINTAIN THE STRUCTURAL INTEGRITY OF THE BASIN DURING A 25-YEAR STORM OF 24-HOUR DURATION. RUNOFF COEFFICIENTS USED IN RUNOFF CALCULATIONS SHALL CORRESPOND TO A BARE EARTH CONDITION, OR THOSE CONDITIONS EXPECTED TO EXIST WHILE THE SEDIMENT BASIN IS UTILIZED.

   SATISFIED BY: NOT APPLICABLE
7. CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED.

   SATISFIED BY: EROSION AND SEDIMENT CONTROL NOTES, THIS SHEET.
8. CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME, OR SLOPE DRAIN STRUCTURE.

   SATISFIED BY: NOT APPLICABLE
9. WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.

   SATISFIED BY: NOT APPLICABLE
10. ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.

    SATISFIED BY: INLET PROTECTION(S) ON SHEET C2.01 AND C5.01
11. BEFORE NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS OR PIPES ARE MADE OPERATIONAL, ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.

    SATISFIED BY: NOT APPLICABLE
12. WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED, PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENCROACHMENT, CONTROL SEDIMENT TRANSPORT, AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. NONERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES, IF ARMORED BY NONERODIBLE COVER MATERIALS.

    SATISFIED BY: NOT APPLICABLE
13. WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ANY SIX-MONTH PERIOD, A TEMPORARY VEHICULAR STREAM CROSSING, CONSTRUCTED OF NONERODIBLE MATERIAL, SHALL BE PROVIDED.

    SATISFIED BY: NOT APPLICABLE
14. ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET.

    SATISFIED BY: NOT APPLICABLE
15. THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.

    SATISFIED BY: NOT APPLICABLE
16. UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:
    F. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME.
    G. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
    H. EFFLUENT FROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF-SITE PROPERTY.
    I. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.
    J. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE REGULATIONS.
    K. COMPLIANCE WITH APPLICABLE SAFETY REGULATIONS IS REQUIRED.

    SATISFIED BY: SEE EROSION AND SEDIMENT CONTROL NOTES, THIS SHEET.
17. WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED OR PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PAVED OR PUBLIC ROAD SURFACE, THE ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER. THIS PROVISION SHALL APPLY TO INDIVIDUAL DEVELOPMENT LOTS AS WELL AS TO LARGER LAND-DISTURBING ACTIVITIES.

    SATISFIED BY: SEE GENERAL DEMOLITION NOTE 4, THIS SHEET.
18. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE REGULATORY AUTHORITY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.

    SATISFIED BY: SEE EROSION AND SEDIMENT CONTROL NOTES, THIS SHEET.
19. PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION AND DAMAGE DUE TO INCREASES IN VOLUME, VELOCITY AND PEAK FLOW RATE OF STORMWATER RUNOFF FOR THE STATED FREQUENCY STORM OF 24-HOUR DURATION IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND CRITERIA:
    A. CONCENTRATED STORMWATER RUNOFF LEAVING A DEVELOPMENT SITE SHALL BE DISCHARGED DIRECTLY INTO AN ADEQUATE NATURAL OR MAN-MADE RECEIVING CHANNEL, PIPE OR STORM SEWER SYSTEM. FOR THOSE SITES WHERE RUNOFF IS DISCHARGED INTO A PIPE OR PIPE SYSTEM, DOWNSTREAM STABILITY ANALYSES AT THE OUTFALL OF THE PIPE OR PIPE SYSTEM SHALL BE PERFORMED.
    B. ADEQUACY OF ALL CHANNELS AND PIPES SHALL BE VERIFIED IN THE FOLLOWING MANNER:
       1. THE APPLICANT SHALL DEMONSTRATE THAT THE TOTAL DRAINAGE AREA TO THE POINT OF ANALYSIS WITHIN THE CHANNEL IS ONE HUNDRED TIMES GREATER THAN THE CONTRIBUTING DRAINAGE AREA OF THE PROJECT IN QUESTION; OR
          A. NATURAL CHANNELS SHALL BE ANALYZED BY THE USE OF A TWO-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP CHANNEL BANKS NOR CAUSE EROSION OF CHANNEL BED OR BANKS; AND
          B. ALL PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS SHALL BE ANALYZED BY THE USE OF A TEN-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP ITS BANKS AND BY THE USE OF A TWO-YEAR STORM TO DEMONSTRATE THAT STORM WATER WILL NOT CAUSE EROSION OF CHANNELBED OR BANKS; AND
          C. PIPES AND STORM SEWER SYSTEMS SHALL BE ANALYZED BY THE USE OF A TEN-YEAR STORM TO VERIFY THAT STORMWATER WILL BE CONTAINED WITHIN THE PIPE OR SYSTEM.
    C. IF EXISTING NATURAL RECEIVING CHANNELS OR PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS OR PIPES ARE NOT ADEQUATE, THE APPLICANT SHALL:
       1. IMPROVE THE CHANNEL TO A CONDITION WHERE A TEN-YEAR STORM WILL NOT OVERTOP THE BANKS AND A TWO-YEAR STORM WILL NOT CAUSE EROSION TO THE CHANNEL BED OR BANKS; OR
       2. IMPROVE THE PIPE OR PIPE SYSTEM TO A CONDITION WHERE THE TEN-YEAR STORM IS CONTAINED WITHIN THE APPURTENANCES; OR
       3. DEVELOP A SITE DESIGN THAT WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A TWO-YEAR STORM TO INCREASE WHEN RUNOFF OUT FALLS INTO A NATURAL CHANNEL OR WILL NOT CAUSE THE PRE-DEVELOPMENT PEAK RUNOFF RATE FROM A TEN YEAR STORM TO INCREASE WHEN RUNOFF OUT FALLS INTO A MAN-MADE CHANNEL; OR
       4. PROVIDE A COMBINATION OF CHANNEL IMPROVEMENT, STORMWATER DETENTION OR OTHER MEASURES WHICH IS SATISFACTORY TO THE PLAN-APPROVING AUTHORITY TO PREVENT DOWNSTREAM EROSION.
    D. THE APPLICANT SHALL PROVIDE EVIDENCE OF PERMISSION TO MAKE THE IMPROVEMENTS.
    E. ALL HYDROLOGIC ANALYSES SHALL BE BASED ON THE EXISTING WATERSHED CHARACTERISTICS AND THE ULTIMATE DEVELOPMENT OF THE SUBJECT PROJECT.
    F. IF THE APPLICANT CHOOSES AN OPTION THAT INCLUDES STORMWATER DETENTION HE SHALL OBTAIN APPROVAL FROM THE LOCALITY OF A PLAN FOR MAINTENANCE OF THE DETENTION FACILITIES. THE PLAN SHALL SET FORTH THE MAINTENANCE REQUIREMENTS OF THE FACILITY AND THE PERSON RESPONSIBLE FOR PERFORMING THE MAINTENANCE.
    G. OUTFALL FROM A DETENTION FACILITY SHALL BE DISCHARGED TO A RECEIVING CHANNEL, AND ENERGY DISSIPATERS SHALL BE PLACED AT THE OUTFALL OF ALL DETENTION FACILITIES AS NECESSARY TO PROVIDE A STABILIZED TRANSITION FROM THE FACILITY TO THE RECEIVING CHANNEL.
    H. ALL ON-SITE CHANNELS MUST BE VERIFIED TO BE ADEQUATE.
    I. INCREASED VOLUMES OF SHEET FLOWS THAT MAY CAUSE EROSION OR SEDIMENTATION ON ADJACENT PROPERTY SHALL BE DIVERTED TO A STABLE OUTLET, ADEQUATE CHANNEL, PIPE OR PIPE SYSTEM, OR TO A DETENTION FACILITY.
    J. IN APPLYING THESE STORMWATER RUNOFF CRITERIA, INDIVIDUAL LOTS OR PARCELS IN A RESIDENTIAL, COMMERCIAL OR INDUSTRIAL DEVELOPMENT SHALL NOT BE CONSIDERED TO BE SEPARATE DEVELOPMENT PROJECTS. INSTEAD, THE DEVELOPMENT, AS A WHOLE, SHALL BE CONSIDERED TO BE A SINGLE DEVELOPMENT PROJECT. HYDROLOGIC PARAMETERS THAT REFLECT THE ULTIMATE DEVELOPMENT CONDITION SHALL BE USED IN ALL ENGINEERING CALCULATIONS.
    K. ALL MEASURES USED TO PROTECT PROPERTIES AND WATERWAYS SHALL BE EMPLOYED IN A MANNER WHICH MINIMIZES IMPACTS ON THE PHYSICAL, CHEMICAL AND BIOLOGICAL INTEGRITY OF RIVERS, STREAMS AND OTHER WATERS OF THE STATE.

    SATISFIED BY: NOT APPLICABLE.

LEGEND

EXISTING

Symbol	Description	Line	Description
	SET GPS GRID TIE		TIE LINE
(E)	UTILITY MANHOLE		PAVEMENT
	GRATE		BACK OF CURB
	BOLLARD	2075	MAJOR CONTOUR
	UTILITY POLE	2076	MINOR CONTOUR
(S)	SANITARY SEWER MANHOLE		CONCRETE WALK
(SD)	STORM DRAIN MANHOLE	OHE	OVERHEAD ELECTRIC LINE
CONC.	CONCRETE	SD	STORM DRAINAGE LINE
HVAC	HEATING, VENTILATION, AIR CONDITIONING		BUILDING
(TYP)	TYPICAL		CHAIN LINK FENCE
FF	FINISHED FLOOR	UGG	UNDERGROUND GAS LINE
INV	INVERT	UGS	UNDERGROUND STEAM LINE
			TREE LINE/VEGETATION

PROPOSED

Symbol	Description
SAF	PROPOSED CONSTRUCTION SAFETY FENCE
SAF	PROPOSED CONSTRUCTION FENCE
IP	PROPOSED INLET PROTECTION
SF	PROPOSED TEMPORARY SILT FENCE-3.05
UGG	PROPOSED UNDERGROUND GAS SERVICE
UC	PROPOSED UNDERGROUND CONDUIT
UGE	PROPOSED UNDERGROUND ELECTRIC LINE
CW	PROPOSED CHILLED WATER
	PROPOSED DEMOLITION OF CONCRETE/ASPHALT
XXXXXXXXXX	PROPOSED UTILITY DEMOLITION
	PROPOSED CONCRETE BOLLARD
	PROPOSED TANK
	PROPOSED LIMITS OF DISTURBANCE
1851	PROPOSED MINOR CONTOUR
1850	PROPOSED MAJOR CONTOUR
	CLEAR AND GRUB VEGETATION
	PROPOSED CONCRETE
	PROPOSED FULL DEPTH ASPHALT PAVEMENT
TS	PROPOSED TEMPORARY SEEDING-3.31
SO	SODDING-3.33
MU	PROPOSED MULCH-3.35
N: XXXX.XX E: XXXX.XX	PROPOSED NORTHING/EASTING
	PROPOSED FLOW DIRECTION ARROW

STATE BUILDING OFFICIAL

Dewberry

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DEB APPROVAL

Radford UNIVERSITY

ALLEN BUILDING ELECTRICAL REPLACEMENT
100% CONSTRUCTION DOCUMENTS
RADFORD, VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
ROBERT S. NOTTE
Lic. No. 036367
PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE: N/A

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/2025	RAL	DEB CMTS/ADD 3
1	10/24/2025	RAL	DEB COMMENTS

DRAWN BY JP
APPROVED BY PR
CHECKED BY BK
DATE JULY 25, 2025

TITLE

GENERAL NOTES

DEI PROJECT NO: 50188025
RADFORD UNIVERSITY PROJECT NO: 217-B5217-004

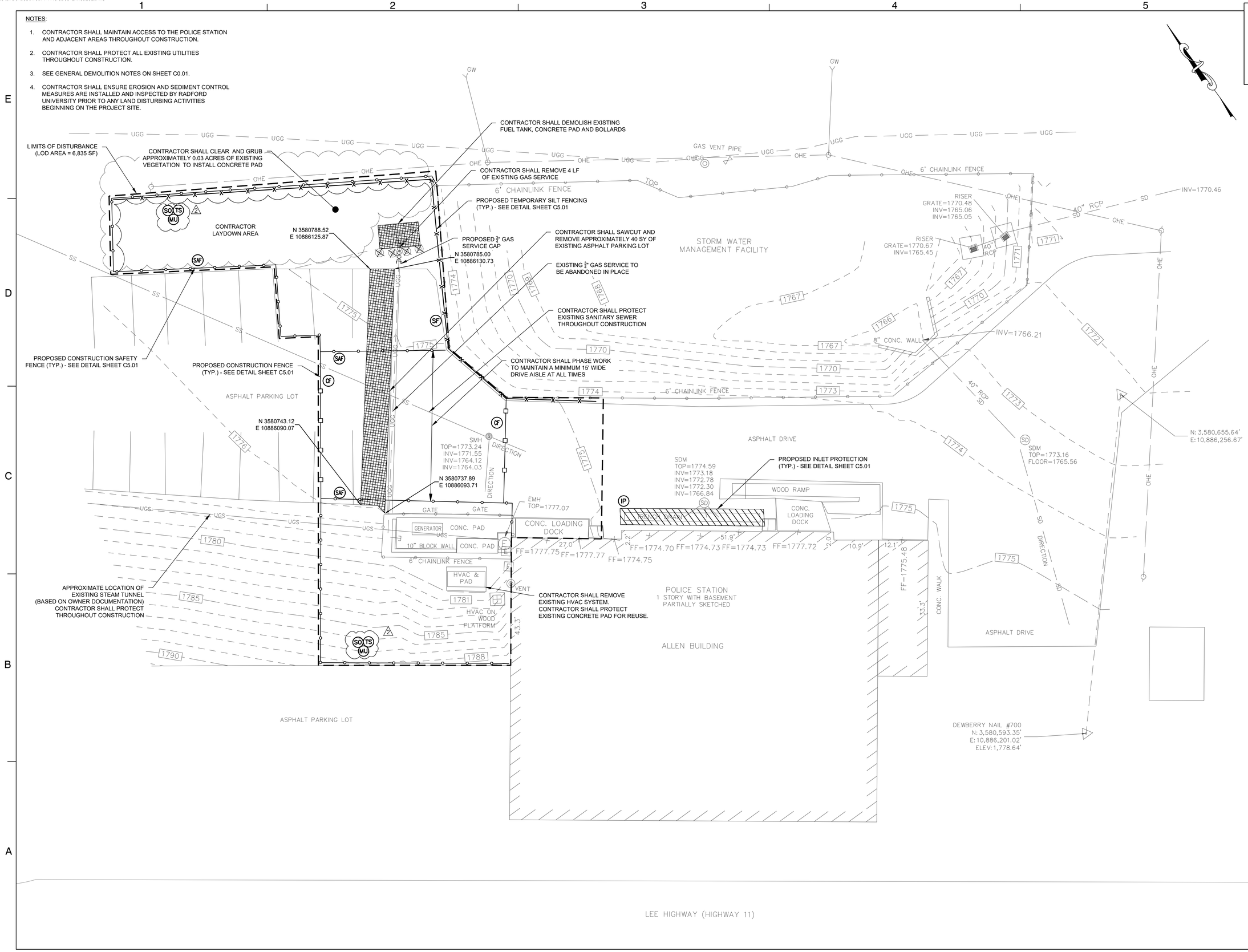
SHEET NO.

C0.01

Docusign Envelope ID: D0A99B04-0574-4110-9D3D-E1A09E0E0A4C

NOTES:

1. CONTRACTOR SHALL MAINTAIN ACCESS TO THE POLICE STATION AND ADJACENT AREAS THROUGHOUT CONSTRUCTION.
2. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES THROUGHOUT CONSTRUCTION.
3. SEE GENERAL DEMOLITION NOTES ON SHEET C0.01.
4. CONTRACTOR SHALL ENSURE EROSION AND SEDIMENT CONTROL MEASURES ARE INSTALLED AND INSPECTED BY RADFORD UNIVERSITY PRIOR TO ANY LAND DISTURBING ACTIVITIES BEGINNING ON THE PROJECT SITE.



STATE BUILDING OFFICIAL

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DEB APPROVAL

Radford University

ALLEN BUILDING ELECTRICAL REPLACEMENT

100% CONSTRUCTION DOCUMENTS

RADFORD, VIRGINIA

SEAL

Signed by: Robert S. Notte
COMMONWEALTH OF VIRGINIA
ROBERT S. NOTTE
Lic. No. 036367
PROFESSIONAL ENGINEER

12/5/2025

KEY PLAN:

SCALE: 1" = 10'

0' 10' 20'

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/2025	RAL	DEB CMTS/ADD 3
1	10/24/2025	RAL	DEB COMMENTS

DRAWN BY JP
APPROVED BY PR
CHECKED BY BK
DATE JULY 25, 2025

TITLE

EROSION & SEDIMENT CONTROL & DEMOLITION PLAN

DEI PROJECT NO: 50188025
RADFORD UNIVERSITY PROJECT NO: 217-BS217-004

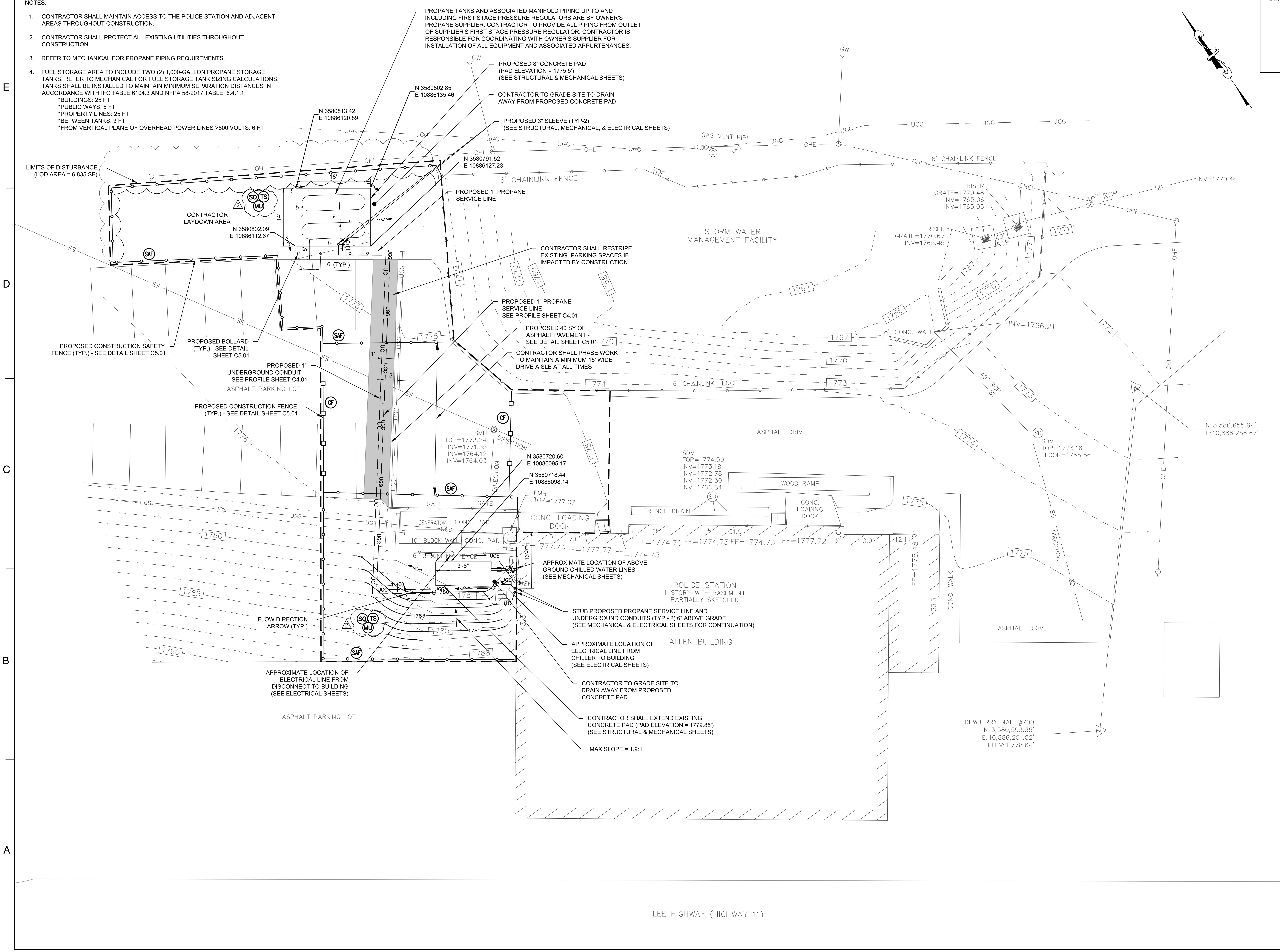
SHEET NO.

C2.01

Docusign Envelope ID: D0A99B04-0574-4110-9D3D-E1A09E0E0A4C

NOTES:

1. CONTRACTOR SHALL MAINTAIN ACCESS TO THE POLICE STATION AND ADJACENT AREAS THROUGHOUT CONSTRUCTION.
2. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES THROUGHOUT CONSTRUCTION.
3. REFER TO MECHANICAL FOR PROPANE PIPING REQUIREMENTS.
4. FUEL STORAGE AREA TO INCLUDE TWO (2) 1,000-GALLON PROPANE STORAGE TANKS. REFER TO MECHANICAL FOR FUEL STORAGE TANK SIZING CALCULATIONS. TANKS SHALL BE INSTALLED TO MAINTAIN MINIMUM SEPARATION DISTANCES IN ACCORDANCE WITH IFC TABLE 6104.3 AND NFPA 58-2017 TABLE 6.4.1.1:
   - *BUILDINGS: 25 FT
   - *PUBLIC WAYS: 5 FT
   - *PROPERTY LINES: 25 FT
   - *BETWEEN TANKS: 3 FT
   - *FROM VERTICAL PLANE OF OVERHEAD POWER LINES >600 VOLTS: 6 FT



PROPANE TANKS AND ASSOCIATED MANIFOLD PIPING UP TO AND INCLUDING FIRST STAGE PRESSURE REGULATORS ARE BY OWNER'S PROPANE SUPPLIER. CONTRACTOR TO PROVIDE ALL PIPING FROM OUTLET OF SUPPLIER'S FIRST STAGE PRESSURE REGULATOR. CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH OWNER'S SUPPLIER FOR INSTALLATION OF ALL EQUIPMENT AND ASSOCIATED APPURTENANCES.
PROPOSED 8" CONCRETE PAD (PAD ELEVATION = 1775.5') (SEE STRUCTURAL & MECHANICAL SHEETS)
N 3580802.85 E 10886135.46
CONTRACTOR TO GRADE SITE TO DRAIN AWAY FROM PROPOSED CONCRETE PAD
N 3580813.42 E 10886120.89
PROPOSED 3" SLEEVE (TYP-2) (SEE STRUCTURAL, MECHANICAL, & ELECTRICAL SHEETS)
N 3580791.52 E 10886127.23
LIMITS OF DISTURBANCE (LOD AREA = 6,835 SF)
PROPOSED 1" PROPANE SERVICE LINE
CONTRACTOR LAYDOWN AREA
N 3580802.09 E 10886112.67
6' (TYP.)
CONTRACTOR SHALL RESTRIPE EXISTING PARKING SPACES IF IMPACTED BY CONSTRUCTION
PROPOSED 1" PROPANE SERVICE LINE - SEE PROFILE SHEET C4.01
PROPOSED 40 SY OF ASPHALT PAVEMENT - SEE DETAIL SHEET C5.01
CONTRACTOR SHALL PHASE WORK TO MAINTAIN A MINIMUM 15' WIDE DRIVE AISLE AT ALL TIMES
PROPOSED CONSTRUCTION SAFETY FENCE (TYP.) - SEE DETAIL SHEET C5.01
PROPOSED BOLLARD (TYP.) - SEE DETAIL SHEET C5.01
PROPOSED 1" UNDERGROUND CONDUIT - SEE PROFILE SHEET C4.01
ASPHALT PARKING LOT
PROPOSED CONSTRUCTION FENCE (TYP.) - SEE DETAIL SHEET C5.01
SMH TOP=1773.24 INV=1771.55 INV=1764.12 INV=1764.03
N 3580720.60 E 10886095.17
N 3580718.44 E 10886098.14
EMH TOP=1777.07
GENERATOR
CONC. PAD
10" BLOCK WALL
CONC. LOADING DOCK
APPROXIMATE LOCATION OF ABOVE GROUND CHILLED WATER LINES (SEE MECHANICAL SHEETS)
STUB PROPOSED PROPANE SERVICE LINE AND UNDERGROUND CONDUITS (TYP - 2) 6" ABOVE GRADE. (SEE MECHANICAL & ELECTRICAL SHEETS FOR CONTINUATION)
FLOW DIRECTION ARROW (TYP.)
APPROXIMATE LOCATION OF ELECTRICAL LINE FROM CHILLER TO BUILDING (SEE ELECTRICAL SHEETS)
APPROXIMATE LOCATION OF ELECTRICAL LINE FROM DISCONNECT TO BUILDING (SEE ELECTRICAL SHEETS)
CONTRACTOR TO GRADE SITE TO DRAIN AWAY FROM PROPOSED CONCRETE PAD
CONTRACTOR SHALL EXTEND EXISTING CONCRETE PAD (PAD ELEVATION = 1779.85') (SEE STRUCTURAL & MECHANICAL SHEETS)
MAX SLOPE = 1.9:1
ASPHALT PARKING LOT
STORM WATER MANAGEMENT FACILITY
6' CHAINLINK FENCE
GAS VENT PIPE
RISER GRATE=1770.48 INV=1765.06 INV=1765.05
RISER GRATE=1770.67 INV=1765.45
40" RCP
INV=1770.46
8" CONC. WALL
INV=1766.21
ASPHALT DRIVE
SDM TOP=1774.59 INV=1773.18 INV=1772.78 INV=1772.30 INV=1766.84
SDM TOP=1773.16 FLOOR=1765.56
N: 3,580,655.64' E: 10,886,256.67'
WOOD RAMP
TRENCH DRAIN
CONC. LOADING DOCK
FF=1777.75 FF=1777.77 FF=1774.75 FF=1774.70 FF=1774.73 FF=1774.73 FF=1777.72 FF=1775.48
POLICE STATION 1 STORY WITH BASEMENT PARTIALLY SKETCHED
ALLEN BUILDING
CONC. WALK
ASPHALT DRIVE
DEWBERRY NAIL #700 N: 3,580,593.35' E: 10,886,201.02' ELEV: 1,778.64'
LEE HIGHWAY (HIGHWAY 11)

STATE BUILDING OFFICIAL

Dewberry

Dewberry Engineers Inc.
9300 Harris Corners Pkwy - Suite 220
Charlotte, NC 28269
Phone: 704.509.9918
Fax: 704.509.9937
www.dewberry.com

DEB APPROVAL

Radford UNIVERSITY

ALLEN BUILDING ELECTRICAL REPLACEMENT
100% CONSTRUCTION DOCUMENTS
RADFORD, VIRGINIA

SEAL
Signed by: Robert S. Notte
COMMONWEALTH OF VIRGINIA
ROBERT S. NOTTE
Lic. No. 036367
PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE: 1" = 10'

0' 10' 20'

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/2025	RAL	DEB CMTS/ADD 3
1	10/24/2025	RAL	DEB COMMENTS

DRAWN BY: JP
APPROVED BY: PR
CHECKED BY: BK
DATE: JULY 25, 2025

TITLE

SITE PLAN

DEI PROJECT NO: 50188025
RADFORD UNIVERSITY PROJECT NO: 217-B5217-004

SHEET NO.

C3.01

Docusign Envelope ID: D0A99B04-0574-4110-9D3D-E1A09E0E0A4C

1992 3.33

TABLE 3.33-A

TYPE OF SOD AVAILABLE IN VIRGINIA AND RECOMMENDED USES

Kentucky Bluegrass: Adapted to the Northern Piedmont and Mountain Regions. Individual varieties selected must make up not less than 10%, nor more than 35% of the total mixture on a weight basis. All varieties must be certified. Selections can be made from Category I alone or various combinations of Categories I, II and III, as noted.

Category I - Recommended Kentucky Bluegrass Varieties

65% - 100% A-34, Abbey, Aspen, Asset, Baron, Blacksburg, Bristol, Cheri, Chateau, Classic, Coventry, Georgetown, Glade, Haga, Julia, Liberty, Loft's 1757, Merit, Midnight, Monopoly, Plush, Princeton 104, Rugby, Suffolk, Victa

Category II - Special use varieties. If used, must contain at least 65% Category I varieties

Shade Tolerant

10-35% Bristol, Columbia, Georgetown, Glade, Midnight

Low-Maintenance Tolerant

10-35% Columbia, Georgetown, Monopoly, Ram I, Touchdown, Victa

Category III - Promising Kentucky Bluegrass - Limited performance data or seed availability

10-35% Dawn, Estate, Freedom, Kelly

(continued)

III - 337 SO

1992 3.33

TABLE 3.33-A (CONTINUED)

TYPE OF SOD AVAILABLE IN VIRGINIA AND RECOMMENDED USES

Tall Fescue: Adapted to the entire state.

Recommended Tall Fescue Varieties:

90-100% Amigo, Apache, Bonanza, Chieftain, Finelawn 5GL, Mesa, Rebel II, Shenandoah, Tribute

Promising Tall Fescues

Certified Arriba, Austin, Avanti, Aztec, Cochise, Crossfire, Eldorado, Hubbard 87, Jaguar II, Maverick II, Monarch, Olympic II, Phoenix, Safari, Shortstop, Sundance, Taurus, Thoroughbred, Titan, Tradition, Vegas, Winchester, Wrangler

0-10% Kentucky bluegrass: Baron, Cheri, Columbia, Monopoly, Nassau, Ram I, Victa

Bermudagrass: Tufcote is adapted to the Richmond-Danville-Newport News triangle. Midiron may be used east of Roanoke and south of Charlottesville. Tifgreen and Tifway may be used to the east and south of Richmond. Vamont may be used east of Roanoke and at lower elevations in southwestern Virginia.

Certified Midiron, Tifgreen#, Tifway, Tifway II, Tufcote and Vamont

Zoysiagrass: This sod performs best in southeastern Virginia.

Meyer, Emerald#

Note: Common Bermudagrass is not recommended for sod production.

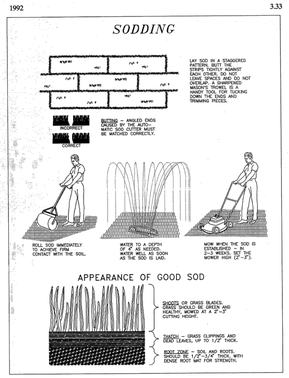
Only recommended in southeastern Virginia.

Source: 1991 Virginia Turfgrass Variety Recommendations, Virginia Crop Improvement Association

III - 338 SO

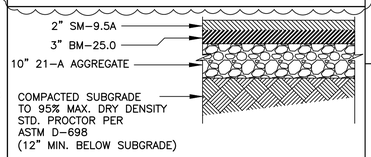
1992 3.33

SODDING



Source: Va. DSWC Plate 3.33-1

III - 339 SO



TYPICAL PAVEMENT SECTION
N.T.S.

SEED		
APPLICATION DATES	SPECIES	APPLICATION RATES
SEPT. 1 – FEB. 15	50/50 MIX OF ANNUAL RYEGRASS (LOLIUM MULTI–FLORUM) & CEREAL (WINTER) RYE (SECALE CEREALE)	50–100 (lbs./acre)
FEB. 16 – APR. 30	ANNUAL RYEGRASS (LOLIUM MULTI–FLORUM)	60–100 (lbs./acre)
MAY 1 – AUG. 31	GERMAN MILLET	50 (lbs./acre)

FERTILIZER & LIME

- APPLY 10–10–10 FERTILIZER AT A RATE OF 450 lbs./acre (OR 10 lbs./1,000 sq. ft.)
- APPLY PULVERIZED AGRICULTURAL LIMESTONE AT A RATE OF 2 TONS/ACRE (OR 90 LBS./1,000 SQ. FT.)

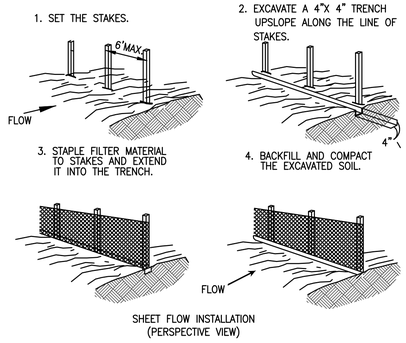
NOTE:
1. A SOIL TEST IS NECESSARY TO DETERMINE THE ACTUAL AMOUNT OF LIME REQUIRED TO ADJUST THE SOIL pH OF SITE.
2. INCORPORATE THE LIME AND FERTILIZER INTO THE TOP 4–6 INCHES OF THE SOIL BY DISKING OR BY OTHER MEANS.
3. WHEN APPLYING SLOWLY AVAILABLE NITROGEN USE RATES AVAILABLE IN EROSION & SEDIMENT CONTROL TECHNICAL BULLETIN #4, 2003 NUTRIENT MANAGEMENT FOR DEVELOPMENT SITES AT: http://ww.dcr.state.va.us/sw/e&s.htm#pubs

TEMPORARY SEEDING SPECIFICATIONS
QUICK REFERENCE FOR ALL REGIONS
TS
TABLE 3.31–B
(REVISED JUNE 2003)

MULCHES	RATES		NOTES
	PER ACRE	PER 1,000 sq. ft.	
STRAW	2.5 TONS	2 BALES	• CLEAN OAT OR WHEAT STRAW WELL SEASONED BEFORE BAILING. • FREE FROM MATURE SEED–BEARING STALKS OR PROHIBITED NOXIOUS WEEDS.

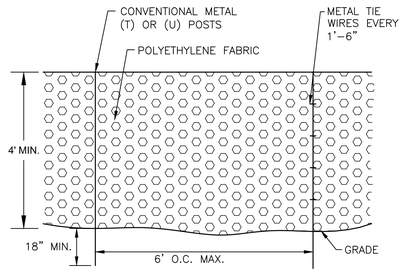
NOTES:
1. STRAW SHALL BE PLACED ON SEEDED AREAS WITHIN 24 HOURS OF SEEDING.
2. PLACE STRAW MULCH UNIFORMLY IN A CONTINUOUS BLANKET (CONTRACTOR WILL BE ASKED TO REMOVE ANY STRAW CLUMPS LEFT ON THE SEEDED AREA).
3. A MECHANICAL BLOWER MY BE USED FOR STRAW MULCH APPLICATION WHEN ACCEPTABLE TO THE OWNER'S REPRESENTATIVE.
4. STRAW MULCH SHALL BE TACKED DOWN BY APPLYING A LIGHT COATING OF HYDROMULCH.

MU ORGANIC MULCH MATERIALS AND APPLICATION RATES

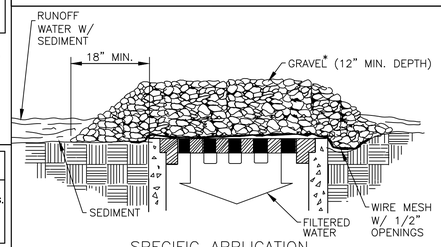


SF SILT FENCE
N.T.S.

CONSTRUCTION OF A SILT FENCE



CF CONSTRUCTION FENCE
N.T.S.



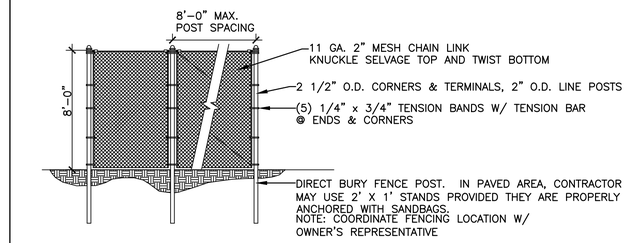
SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY CONCENTRATED FLOWS ARE EXPECTED BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

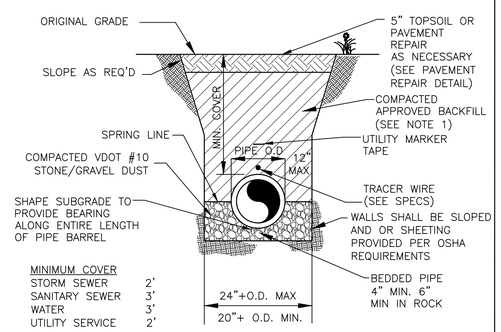
IF STONE FILTER BECOMES CLOGGED, CONTRACTOR SHALL PULL AWAY STONES FROM THE INLET CLEAN THEM AND/OR REPLACE THEM PER VESCH REQUIREMENTS.

* GRAVEL SHALL BE VDOT #3, #357 OR #5 COARSE AGGREGATE.

IP INLET PROTECTION



SAF TEMPORARY CONSTRUCTION SAFETY FENCING

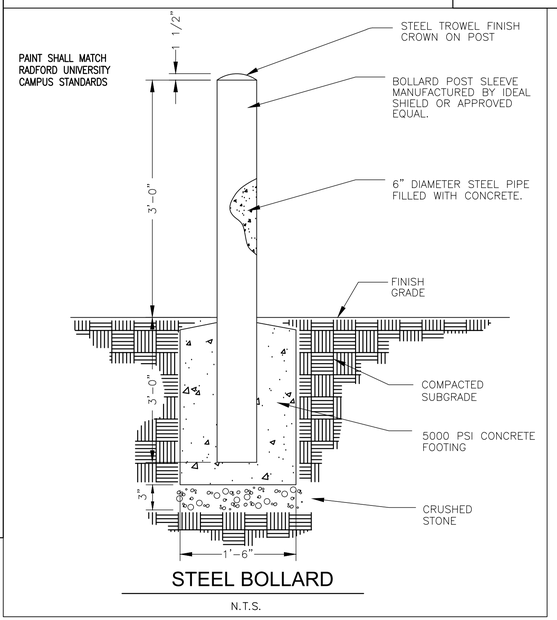


MINIMUM COVER

STORM SEWER	2'
SANITARY SEWER	3'
WATER	3'
UTILITY SERVICE	2'

NOTES :
1. ALL BACKFILL IN TRENCHES WHICH ARE LOCATED WITHIN PAVED STREETS & ROADS, SHALL BE VDOT NO. 21–A STONE FROM SPRING LINE TO BOTTOM OF PAVEMENT.
2. INSTALL UNDERGROUND UTILITY MARKER PER SPECIFICATIONS.

PIPE LAYING CONDITION
N.T.S.



STEEL BOLLARD
N.T.S.

STATE BUILDING OFFICIAL

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www.dewberry.com

DEB APPROVAL

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ALLEN BUILDING ELECTRICAL REPLACEMENT
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RADFORD, VIRGINIA

SEAL
Signature
Robert S. Notte
COMMONWEALTH OF VIRGINIA
ROBERT S. NOTTE
Lic. No. 036367
PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE: 1" = 10'

0' 10' 20'

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/2025	RAL	DEB CMTS/ADD 3
1	10/24/2025	RAL	DEB COMMENTS

DRAWN BY JP
APPROVED BY PR
CHECKED BY BK
DATE JULY 25, 2025

TITLE

DETAILS

DEI PROJECT NO: 50188025
RADFORD UNIVERSITY PROJECT NO: 217-B5217-004

SHEET NO.

C5.01

Docusign Envelope ID: 6A420090-FC13-49FC-A63C-8D42CD4A18A6

STANDARD DETAILING SYMBOLS

NUMBER INDICATES "SECTION"
LETTER INDICATES "ELEVATION" OR "DETAIL"

SHEET NUMBER WHERE SECTION ELEVATION OR DETAIL IS TAKEN — A1.11,A1.12

SHEET NUMBER WHERE SECTION ELEVATION OR DETAIL IS DRAWN

ADDITIONAL SHEET REFERENCES

LEVEL NAME — FIRST FLOOR; LEVEL ELEVATION — 100' - 0" — LEVEL LINE

GRID NUMBER OR LETTER — A — GRID LINE

INDICATES PLAN NORTH / INDICATES TRUE NORTH — NORTH INDICATOR

ROOM NUMBER — Room Name 101 — ROOM TAG

REVISION NUMBER — 1 — REVISION TAG

REVISION CLOUD

PER SHEET KEYNOTE NUMBER — 1 — KEYNOTE TAG

ELEVATION AT POINT INDICATED — 1' - 0" — SPOT ELEVATION SYMBOL

CONNECT NEW TO EXISTING

POINT OF DISCONNECTION

LINE TYPE INDICATES EXISTING

LINE TYPE INDICATES DEMOLITION

LINE TYPE INDICATES NEW/FUTURE

LINE TYPE INDICATES HIDDEN/UNDER OBSTRUCTION

HVAC SYMBOLS

SYMBOL	DESCRIPTION
GRILLES	
CEILING MTD / WALL MTD	
	SUPPLY AIR DEVICE
	RETURN AIR DEVICE
	EXHAUST AIR DEVICE
X / 500	AIR DEVICE TAG "TYPE" / "CFM" (SEE SCHEDULE)
	ECCENTRIC TRANSITION
	CONCENTRIC TRANSITION
	RADIUS OFFSET (IN THE VERTICAL)
	MITERED OFFSET (IN THE VERTICAL)
	RADIUS ELBOW
	MITERED ELBOW WITH TURNING VANES
RISE / DROP	SUPPLY DUCT
RISE / DROP	RETURN AIR DUCT
RISE / DROP	EXHAUST AIR DUCT
	FLEX DUCT
	DEMOLITION DUCTWORK OR EQUIPMENT.
	EXISTING DUCTWORK OR EQUIPMENT.
24"x24"	NEW OR FUTURE DUCTWORK OR EQUIPMENT
24"ø	ROUND DUCT RISE/DROP
	RECTANGULAR TAKE-OFF
	ROUND TAKE-OFF
BOTTOM / TOP / SIDE	ACCESS DOORS

HVAC SYMBOLS CONTINUED

SYMBOL	DESCRIPTION
DAMPERS	
AD	DAMPER
FD OR	FIRE DAMPER
	MANUAL DAMPER
	GRAVITY BACKDRAFT DAMPER
	MOTORIZED PARALLEL BLADE DAMPER
	MOTORIZED OPPOSED BLADE DAMPER
CONTROLS	
T	TEMPERATURE SENSOR
H	HUMIDITY SENSOR
CO	CARBON MONOXIDE SENSOR
CD	CARBON DIOXIDE SENSOR
	DUCT MOUNTED SMOKE DETECTOR
	EMERGENCY POWER OFF SWITCH (E-STOP)
$M	MANUAL MOTOR STARTER, FRACTIONAL HORSEPOWER

ABBREVIATIONS
"AD" = AUTOMATIC/MOTORIZED
"FD" = FIRE

MECHANICAL PIPING SYMBOLS

SYMBOL	DESCRIPTION
	BALL VALVE
	STOP VALVE (HANDLE OPTIONAL)
	3-WAY VALVE
AB	BALANCING VALVE AUTOMATIC
MB	BALANCING VALVE MANUAL
	BUTTERFLY VALVE
	CHECK VALVE
	CONTROL VALVE
	3-WAY CONTROL VALVE
	GATE VALVE
	GLOBE VALVE
RPZ	REDUCED PRESSURE ZONE
	PRESSURE REGULATING VALVE
	PIPE TURN UP
	PIPE TURN DOWN
	PIPE BOTTOM TAKE OFF
	PIPE TOP TAKE OFF
	PIPE CAP OR PLUG
	PIPE UNION
	WYE STRAINER
	PIPE ANCHOR
	PIPE ALIGNMENT GUIDE

MECHANICAL PIPING SYSTEMS

SYMBOL	
CD	CONDENSATE DRAIN
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
D	DRAIN
HPC	HIGH PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
MU	MAKEUP WATER
PG	PROPANE GAS
RF	REFRIGERANT

ABBREVIATIONS -...

%	PERCENT
(D)	DEMOLISH
(E)	EXISTING
AC	AIR CONDITIONING
ADJ	ADJUSTABLE
AF	AIRFLOW
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT
AO	ANALOG OUTPUT
ARCH	ARCHITECTURAL
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING, AND AIR-CONDITIONING ENGINEERS
ATC	AUTOMATIC TEMPERATURE CONTROL
ATV	ATMOSPHERIC VENT
B	BOILER
BAS	BUILDING AUTOMATION SYSTEM
BHP	BRAKE HORSEPOWER
BI	BINARY INPUT
BMS	BUILDING MANAGEMENT SYSTEM
BO	BINARY OUTPUT
BT	BUFFER TANK
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHWP	CHILLED WATER PUMP
CO	CARBON MONOXIDE
CO2	CARBON DIOXIDE
CONT	CONTROLS, CONTINUED
CP	CONDENSATE PUMP
CU	CONDENSING UNIT
Cv	VALVE COEFFICIENT
DB	DRY BULB
DEG	DEGREE
DI	DIGITAL INPUT
DIA	DIAMETER
DMSS	DUCTLESS MINI-SPLIT SYSTEM

ABBREVIATIONS -...

DN	DOWN
DO	DIGITAL OUTPUT
DP	DIFFERENTIAL PRESSURE (SENSOR)
DWG	DRAWING
DX	DIRECT EXPANSION
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
ECM	ELECTRONICALLY COMMUTATED MOTOR
EF	EXHAUST FAN
EHC	ELECTRIC HEATING COIL
ELEC	ELECTRICAL
EMCS	ENERGY MANAGEMENT CONTROL SYSTEM
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
F	DEGREES FAHRENHEIT
FD	FIRE DAMPER OR FLOOR DRAIN
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FPM	FEET PER MINUTE
FS	FLOW SWITCH
FT	FOOT/FEET
GA	GAUGE
GAL	GALLONS
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
H	HUMIDIFIER OR HEIGHT
H2O	WATER
HD	HEAD
HP	HORSEPOWER
HVAC	HEATING, VENTILATION, AND AIR-CONDITIONING
HWT	HEATING WATER TEMPERATURE
IN	INCH
KW	KILOWATT
L	LOUVER
LAT	LEAVING AIR TEMPERATURE

ABBREVIATIONS -...

LBS	POUNDS
LF	LINEAR FEET
LIN	LINEAR
LWT	LEAVING WATER TEMPERATURE
M	MOTOR OR MOTORIZED DAMPER OR METER
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAU	MAKEUP AIR UNIT
MBH	1,000 BRITISH THERMAL UNITS PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MERV	MINIMUM EFFICIENCY REPORTING VALUE
MFG	MANUFACTURER
MOCP	MAXIMUM OVERCURRENT PROTECTION
MS/D	COMBO MOTOR STARTER/DISCONNECT
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTDOOR AIR
OAT	OUTDOOR AIR TEMPERATURE
OD	OUTSIDE DIAMETER
P	PRESSURE OR PRESSURE SENSOR
PD	PRESSURE DROP
PH	PHASE
PHC	PREHEAT COIL
PPM	PARTS PER MILLION
PRV	PRESSURE REDUCING VALVE
QTY	QUANTITY
R	RADIUS, RISE, OR REMOVE
RA	RETURN AIR
RAT	RETURN AIR TEMPERATURE
RCP	REFLECTED CEILING PLAN
RH	RELATIVE HUMIDITY, REHEAT
RHC	REHEAT COIL
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SAT	SUPPLY AIR TEMPERATURE
SCH	SCHEDULE
SEC	SECONDS
SF	SUPPLY FAN OR SQUARE FOOT

ABBREVIATIONS -...

SP	STATIC PRESSURE
SS	SPLIT SYSTEM OR STAINLESS STEEL
T&P	TEMPERATURE AND PRESSURE
T, TEMP	TEMPERATURE
T-STAT	THERMOSTAT
TON	COOLING TONS (12,000 BTUH)
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UH	UNIT HEATER
UPS	UNINTERRUPTIBLE POWER SUPPLY
V, VOLT	VOLTAGE
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
W	WIDTH OR WATTS
W/	WITH
WB	WET BULB
WC	WATER COLUMN
WG	WATER GAUGE
WPD	WATER PRESSURE DROP
XT	EXPANSION TANK

DRAWING LIST - MECHANICAL

M0.01	MECHANICAL SYMBOLS & ABBREVIATIONS
M0.02	MECHANICAL NOTES
M0.03	MECHANICAL NOTES
MD1.11	GROUND FLOOR MECHANICAL DEMOLITION PLAN
MD1.21	FIRST FLOOR MECHANICAL DEMOLITION PLAN
MD1.31	ROOF MECHANICAL DEMOLITION PLAN
M1.11	GROUND FLOOR MECHANICAL PLAN
M1.12	GROUND FLOOR MECHANICAL PLAN
M1.21	FIRST FLOOR MECHANICAL PLAN
M1.31	ROOF MECHANICAL PLAN
M5.01	DETAILS
M5.02	DETAILS
M5.03	DETAILS
M5.04	DETAILS
M5.05	DETAILS
M6.01	MECHANICAL SCHEDULES
M6.02	MECHANICAL SCHEDULES
M7.01	MECHANICAL CONTROLS
M7.02	MECHANICAL CONTROLS
M7.03	MECHANICAL CONTROLS
M9.01	ISOMETRICS, PERSPECTIVES
TOTAL: 21	

2

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DEB APROVAL

Radford UNIVERSITY
ALLEN BUILDING ELECTRICAL REPLACEMENT
100% CONSTRUCTION DOCUMENTS
RADFORD, VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
SCOTT W. DAVIS
Lic. No. 062725
PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE:

REVISIONS

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MECHANICAL GENERAL NEW WORK NOTES

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE STATE CODES AND REGULATIONS. MECHANICAL EQUIPMENT SHALL BE SELECTED TO MEET OR EXCEED THE REQUIREMENTS OF THE STATE ENERGY CONSERVATION CODE. MECHANICAL WORK SHALL COMPLY WITH PROJECT SPECIFICATIONS.
2. FURNISH AND INSTALL ALL INCIDENTAL ACCESSORIES REQUIRED TO MAKE THE MECHANICAL WORK COMPLETE AND OPERATIONAL.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR INSPECTING, TESTING AND VERIFYING CONTROL SEQUENCES, LINE BY LINE, AND VERIFYING OPERATION OF THE EQUIPMENT. ALL EQUIPMENT, VALVES, DAMPERS ACTUATORS, ETC. SHALL BE FUNCTIONAL PRIOR TO FINAL COMMISSIONING. COORDINATE WITH ELECTRICAL AND TAB CONTRACTORS. REFER TO SECTION 239000 FOR MORE DETAIL.
4. THESE DRAWINGS ARE DIAGRAMMATIC. EXACT EQUIPMENT LOCATIONS AND DUCT AND PIPING ROUTING SHALL BE COORDINATED WITH THE BUILDING AND SITE CONDITIONS. THE ACTUAL EQUIPMENT AND MINIMUM CLEARANCE DIMENSIONS SHALL BE VERIFIED WITH THE SUPPLIERS. FITTINGS NOT SHOWN ON THE DRAWINGS MIGHT BE REQUIRED.
5. EQUIPMENT, DUCTWORK, PIPING AND CONDUIT LAYOUT SHALL BE COORDINATED WITH BUILDING COMPONENTS AND OTHER TRADES PRIOR TO INSTALLATION. THE SYSTEM SHALL BE NEATLY ARRANGED TO MAXIMIZE SPACE ABOVE CEILINGS AND WITHIN CHASES. MAINTAIN MINIMUM EQUIPMENT AND DEVICE MAINTENANCE CLEARANCES. DEVICES SHALL BE READILY MAINTAINABLE. METERS AND GAGES SHALL BE ORIENTED FOR BEST VIEW. INSTALLED MATERIALS NOT COORDINATED SHALL BE REMOVED AND REINSTALLED AT NO ADDITIONAL COST.
6. DUCT OFFSETS SHALL BE MADE AT 15 OR 30-DEGREE ANGLES WHERE POSSIBLE BUT AT NEVER MORE THAN 45-DEGREES.
7. WALL-MOUNTED CONTROL SENSORS SHALL BE INSTALLED AT 48-INCHES ABOVE THE FLOOR TO THE TOP OF SENSOR. COORDINATE EXACT LOCATIONS WITH LIGHT SWITCHES. WHEN BOTH ARE INDICATED ADJACENT TO A DOOR, LOCATE THE SWITCH CLOSEST TO THE DOOR AND THE SENSOR WITHIN 12-INCHES OF THE SWITCH.
8. CONTROL AND ALARM DEVICES SHALL BE INSTALLED IN BACK-BOXES WITHIN NEW AND EXISTING WALLS. SURFACE-MOUNTED CONDUIT AND RACEWAY WILL NOT BE ACCEPTED EXCEPT FOR EXISTING SOLID CONCRETE WALLS. DEVICE BACK-BOXES IN FIRE-RATED WALLS SHALL HAVE FIRESTOP PUTTY PADS OR EQUIVALENT UL-LISTED INSTALLATION.
9. PROVIDE APPROVED UL-LISTED FIRESTOP SYSTEMS AT PENETRATIONS OF LIFE-SAFETY RATED ASSEMBLIES AS REQUIRED FOR THE WORK. REFERENCE SECTION 078413 "THROUGH PENETRATION FIRESTOP SYSTEMS" FOR REQUIREMENTS AND THE UL DESIGN APPENDIX IN THE PROJECT MANUAL FOR FIRESTOP SYSTEM DETAILS.
10. INSTALL LIFE-SAFETY (FIRE, SMOKE AND COMBINATION FIRE AND SMOKE) DAMPERS IN RATED ASSEMBLIES PER UL-LISTED DETAIL IN ACCORDANCE WITH THE BUILDING CODE AND MANUFACTURER'S LISTING REQUIREMENTS.
11. PROVIDE A DUCT ACCESS DOOR FOR EACH DUCT-MOUNTED DEVICE REQUIRING MAINTENANCE OR INSPECTION. REFER TO SECTION 23 33 00 FOR DOOR SIZING REQUIREMENTS. COORDINATE CEILING AND WALL ACCESS DOORS WITH DUCT ACCESS DOORS.
12. HVAC PIPING SHALL BE NO LESS THAN 3/4-INCH, EXCEPT REFRIGERANT PIPING.
13. ALL MOTORIZED EQUIPMENT SHALL BE CONNECTED TO DUCTWORK OR PIPING WITH FLEXIBLE CONNECTIONS.
14. ROOF MODIFICATIONS AND REPAIRS SHALL MEET THE REQUIREMENTS OF THE ROOF WARRANTY.
15. EXTEND POWER CONDUIT AND WIRING FROM DEDICATED POWER SOURCES TO CONTROL EQUIPMENT AND DEVICES. COORDINATE POWER SOURCES WITH ELECTRICAL CONTRACTOR.
16. PIPING BRANCHES FROM MAINS TO HEATING AND COOLING COILS SHALL MATCH SCHEDULED SIZES UNLESS OTHERWISE NOTED.
17. MAINTAIN MINIMUM 36-INCH CLEARANCE FOR 120/208V POWER OR 42-INCH CLEARANCE FOR 277/480V POWER AS REQUIRED BY THE NATIONAL ELECTRIC CODE FOR ELECTRICAL EQUIPMENT AND TO PROVIDE MAINTENANCE ACCESS.
18. FIELD VERIFY EXACT PIPING SIZES AND FLOW DIRECTIONS PRIOR TO CONNECTING TO PIPING SYSTEM.
19. EXPOSED DUCT, PIPING AND CONDUIT SHALL BE PRIMED AND PAINTED TO MATCH ADJACENT SURFACES. REFER TO SPECIFICATIONS FOR DETAILED REQUIREMENTS.
20. SCHEDULE ALL SERVICE DISRUPTIONS AND SHUTDOWNS WITH THE OWNER NO LESS THAN 2 WEEKS PRIOR.
21. AIR HANDLING UNIT INTAKES SHALL BE SEPARATED BY MINIMUM 10 FEET FROM EXHAUST FANS, EXHAUST VENTS, FLUES, PLUMBING VENTS, ETC.
22. EXISTING DUCTWORK AND PIPING SHOWN ARE BASED ON AS-BUILT DRAWINGS AND EXISTING CONDITIONS NOTED TO THE BEST OF ENGINEER'S ABILITY DURING DESIGN. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-VERIFYING ALL EXISTING MECHANICAL ITEMS SHOWN PRIOR TO COMMENCING WORK.

MECHANICAL GENERAL DEMOLITION WORK NOTES

1. VERIFY PROJECT SITE EXISTING CONDITIONS PRIOR TO BID. EXISTING CONDITIONS INDICATED IN THESE DOCUMENTS ARE APPROXIMATE AND DO NOT INCLUDE EVERY COMPONENT.
2. RECORD EXISTING CONDITIONS PRIOR TO THE START OF WORK. REPAIR DAMAGES RESULTING FROM PROJECT WORK.
3. COORDINATE MATERIALS TO BE RETAINED BY THE OWNER PRIOR TO THE START OF DEMOLITION WORK. RETAINED MATERIALS SHALL BE DELIVERED TO A POINT DESIGNATED BY THE OWNER WITHIN A 10-MILE RADIUS OF THE PROJECT SITE. PROPERLY DISPOSE OF ALL REMAINING DEMOLITION MATERIALS. COMPLY WITH MATERIAL RECYCLING REQUIREMENTS. DO NOT ABANDON IN PLACE ANY ITEMS IDENTIFIED TO BE REMOVED UNLESS OTHERWISE NOTED.
4. THE SCOPE OF DEMOLITION FOR ITEMS TO BE REMOVED INCLUDES ASSOCIATED SUPPORTS, POWER CONNECTIONS, CONTROLS, CONDUIT, ETC.
5. PERFORM ALL DEMOLITION INDICATED INCLUDING THAT REQUIRED TO INSTALL NEW WORK. REMOVE AND REINSTALL MATERIALS TO REMAIN AS NEEDED WHERE REQUIRED TO PERFORM DEMOLITION OR TO INSTALL NEW WORK. REPAIR DAMAGED SURFACES TO MATCH EXISTING ADJACENT SURFACES.
6. REMOVE DUCT, PIPING AND CONDUIT BACK TO POINTS INDICATED. PREPARE OPEN ENDS FOR CONNECTION TO NEW WORK INDICATED OR CAP.
7. REPAIR DAMAGE TO ANY OPENINGS IN LIFE-SAFETY RATED ASSEMBLIES CREATED BY THE DEMOLITION WORK PER APPROVED UL-LISTED DETAIL IN ACCORDANCE WITH THE BUILDING CODE.
8. PIPING AND CONDUIT TO BE REMOVED THAT IS LOCATED BELOW CONCRETE SLAB-ON-GRADE FLOORS OR WITHIN CONCRETE SOLID OR BLOCK WALLS MAY BE ABANDONED IN PLACE UNLESS NECESSARY TO INSTALL NEW WORK OR NOTED OTHERWISE. WHEN ABANDONING CUT PIPING OR CONDUIT BACK AT LEAST 1-INCH BEHIND THE SURFACE, PLUG THE ENDS AND PATCH THE SURFACE WITH SIMILAR MATERIAL.
9. CAPTURE AND RECYCLE REFRIGERANT FROM HVAC EQUIPMENT. COMPLY WITH THE EPA REFRIGERANT RECYCLING REQUIREMENTS.
10. REMOVE AND REINSTALL LAY-IN CEILING TILES AND GRID AS NEEDED TO PERFORM CONTRACT WORK. STORE CEILING MATERIALS IN A CLEAN DRY PLACE. REPLACE DAMAGED TILES WITH NEW TO MATCH. SELECT ONE ROOM TO INSTALL ALL NEW TILE AND GRID TO PROVIDE THE TILES NEEDED TO REPLACE DAMAGED TILES IN OTHER SPACES.
11. DURING RENOVATION, MAINTAIN OPERATION OF EXISTING CONTROL SYSTEMS AND COMPONENTS OUTLINED ON CONTROLS DRAWINGS AND IN THE SEQUENCE OF CONSTRUCTION NOTES ON THIS DRAWING. AT EACH PHASE RE-VERIFY OPERATION OF REMAINING CONTROLLED DEVICES AFTER REMOVAL WORK IS COMPLETE.
12. EXISTING SYSTEMS SERVING AREAS OCCUPIED DURING CONSTRUCTION AND SYSTEMS EXPLICITLY INDICATED SHALL BE KEPT IN OPERATION BY TEMPORARY MEANS. TEMPORARY MEANS INCLUDES TEMPORARY BYPASSES OR CONNECTIONS TO BUILDING SYSTEMS AND / OR CONNECTIONS TO TEMPORARY EQUIPMENT. ALL TEMPORARY MEANS, MATERIALS AND EQUIPMENT SHALL BE INCLUDED IN THE CONTRACT UNLESS OTHERWISE NOTED.
13. CONTRACTOR SHALL PERFORM PRE-READ TAB AND SUBMIT TAB REPORT TO ENGINEER PRIOR TO COMMENCING DEMOLITION. THIS IS A CRITICAL, NON-NEGOTIABLE STEP OF THE WORK SCOPE THAT SHALL NOT BE OVERLOOKED. REFER TO TEST AND BALANCE (TAB) DESCRIPTION ON M0.03 AND SECTION 230593 "TESTING ADJUSTING AND BALANCING".

HAZARDOUS MATERIAL NOTES

1. HAZARDOUS MATERIALS WARNING: HAZARDOUS MATERIALS ARE ANTICIPATED TO BE ON SITE. REFER TO THE HAZARDOUS MATERIALS TESTING REPORT PROVIDED BY THE OWNER PRIOR TO THE START OF WORK. IF UNCOVERED MATERIALS ARE SUSPECTED OF CONTAINING ASBESTOS, LEAD-BASED PAINT, PCB'S OR ANY OTHER HAZARDOUS MATERIAL, STOP WORK IN THAT AREA AND REPORT THE CONCERN TO THE CONSTRUCTION MANAGER, OWNER, ARCHITECT AND ENGINEER IMMEDIATELY.

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DEB APROVAL

Radford UNIVERSITY
ALLEN BUILDING
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100% CONSTRUCTION DOCUMENTS
RADFORD, VIRGINIA

SEAL

Signed by: SCOTT DAVIS
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COMMONWEALTH OF VIRGINIA
SCOTT W. DAVIS
Lic. No. 062725
PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
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APPROVED BY	SWD
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GENERAL PROJECT INFORMATION AND CRITICAL SYSTEMS REQUIREMENTS

GENERAL

RADFORD UNIVERSITY PLANS TO FULLY RENOVATE THE ALLEN BUILDING HVAC SYSTEMS. THIS WORK WILL BE PERFORMED IN TWO CONSECUTIVE PROJECT PHASES UNDER SEPARATE CONTRACTS. THIS PROJECT, THE "ALLEN BUILDING ELECTRICAL IMPROVEMENTS" IS THE FIRST PROJECT PHASE AND CONSISTS OF UPGRADES TO THE BUILDING ELECTRICAL SYSTEMS TO SUPPORT THE HVAC RENOVATION, AND THE DEMOLITION AND REPLACEMENT OF THE CENTRAL CHILLED WATER AND HEATING HOT WATER SYSTEMS AND ASSOCIATED EQUIPMENT AND CONTROLS. PHASE 1 PROJECT SCOPE IS GENERALLY LOCATED IN GROUND FLOOR MECHANICAL ROOM 002 AND ON THE BUILDING EXTERIOR.

THE SECOND PHASE RENOVATION PROJECT WILL BE PERFORMED BY OTHERS IN THE FUTURE, UNDER A SEPARATE CONTRACT. FUTURE PHASE 2 PROJECT SCOPE WILL INCLUDE DEMOLITION AND REPLACEMENT OF THE REMAINING BUILDING HVAC SYSTEMS NOT INCLUDED UNDER THIS PHASE 1 PROJECT.

CRITICAL SYSTEMS REQUIREMENTS

THE ALLEN BUILDING IS A FULL-SERVICE EMERGENCY FIRST-RESPONSE POLICE DEPARTMENT SERVING THE RADFORD UNIVERSITY COMMUNITY. AS SUCH, PORTIONS OF THE BUILDING AND ASSOCIATED SYSTEMS MUST REMAIN OPERATIONAL AT ALL TIMES. THIS INCLUDES THE FOLLOWING:

1. EMERGENCY COMMUNICATIONS ROOM 132: THIS DISPATCH ROOM WILL BE OCCUPIED AT ALL TIMES DURING CONSTRUCTION. ROOM CONTAINS CRITICAL EMERGENCY COMMUNICATION, FIRE, DATA, AND SECURITY EQUIPMENT WHICH REQUIRES CONTINUOUS POWER AND HVAC. CONTINUOUS HVAC TO THE ROOM SHALL BE MAINTAINED VIA EXISTING FAN COIL UNIT FC2215 AND DUCTLESS MINI-SPLIT SYSTEM DMSS-2(E)/CU-2(E).
2. RADIO ROOM 016: RADIO ROOM CONTAINS CRITICAL EMERGENCY COMMUNICATION, FIRE, DATA, AND SECURITY EQUIPMENT WHICH REQUIRES CONTINUOUS POWER AND HVAC. CONTINUOUS HVAC TO THE ROOM SHALL BE MAINTAINED BY EXISTING DUCTLESS MINI-SPLIT SYSTEM, DMSS-1(E)/CU-1(E).
3. BUILDING AUTOMATION SYSTEM (BAS): EXISTING BAS FUNCTIONALITY FOR CONTROL AND MONITORING OF EQUIPMENT AND DEVICES UNRELATED TO THE HVAC REPLACEMENT WORK SCOPE SHALL BE KEPT IN CONTINUOUS OPERATION BY TEMPORARY MEANS. ALL TEMPORARY MEANS, MATERIALS AND EQUIPMENT SHALL BE INCLUDED IN THE CONTRACT UNLESS OTHERWISE NOTED.
4. BAS CONNECTION TO CAMPUS SERVER: THE EXISTING NETWORK INTERFACE BETWEEN THE BUILDING AUTOMATION SYSTEM AND THE CAMPUS SUPERVISORY SERVER SYSTEM SHALL BE MAINTAINED TO SUPPORT CRITICAL COMMUNICATIONS UNTIL WORK IS COMPLETE AND ALL COMMUNICATIONS HAVE BEEN RELOCATED TO THE NEW BUILDING AUTOMATION SYSTEM/HEAD END. REFER TO KEYNOTE 4 ON THIS DRAWING FOR EXISTING SUPERVISORY NETWORK INTERFACE LOCATION IN MECHANICAL ROOM 002.
5. EMERGENCY OUTDOOR AIR ISOLATION SWITCH: BAS INTERFACE AND FUNCTIONALITY OF THE CAMPUS-WIDE EMERGENCY OUTDOOR AIR INTAKE ISOLATION SWITCH LOCATED IN EMERGENCY COMMUNICATIONS 132 SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION. REFER TO KEYNOTE 2 ON M1.21 FOR OA SHUTDOWN SWITCH LOCATION.
6. CAMPUS ELECTRIC METER INTERFACE: THE CAMPUS-WIDE ELECTRIC SERVICE UTILITY METER IS LOCATED IN THE RADFORD CITY ELECTRIC SUBSTATION, DIRECTLY ADJACENT TO THE ALLEN BUILDING. EXISTING ELECTRIC METER CONNECTIONS TO THE SUBSTATION MUST BE MAINTAINED. THIS IS WHAT CONTROLS THE ENERGY SAVINGS/DEMAND LIMITING CONTROLS ON CAMPUS. THE EXISTING CONNECTION TO THE DEMAND RESPONSE VENDOR (CURRENTLY VOLTUS ENERGY) MUST ALSO BE MAINTAINED. THIS IS HOW RADFORD UNIVERSITY PROVIDES DATA FOR DEMAND RESPONSE PARTICIPATION IN THE VIRGINIA ENERGY DEPARTMENT PROGRAM. REFER TO KEYNOTES 3 AND 10 ON THIS SHEET FOR ADDITIONAL INFORMATION.
7. BUILDING ELECTRIC METER INTERFACE: ALLEN BUILDING ELECTRIC METER INTERFACE FROM PANEL MDP TO BAS MUST BE MAINTAINED. REFER TO KEYNOTE 12 ON THIS SHEET.
8. OWNER COORDINATION: CONTRACTOR SHALL COORDINATE THE SEQUENCE OF ALL WORK WITH THE OWNER/OCCUPANTS TO MINIMIZE DISRUPTION. REFER TO GENERAL MECHANICAL NOTES ON M0.02 FOR ADDITIONAL REQUIREMENTS.

PIPING SYSTEM FLUSHING NOTES

THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR CHILLED WATER AND HOT WATER HYDRONIC PIPING SYSTEMS FLUSHING AND TESTING, SUBJECT TO THE CRITERIA OUTLINED HEREIN AND THE REQUIREMENTS OF SECTION "230555 - HVAC PIPING SYSTEMS FLUSHING AND TESTING."

EACH BUILDING HYDRONIC SYSTEM LOOP PIPING SHALL BE CLEANED AND FLUSHED PRIOR TO STARTING WORK ON THE RESPECTIVE SYSTEM. REFER TO SEQUENCE OF CONSTRUCTION NOTES ON THIS DRAWING FOR FLUSHING PROCEDURE CONSTRUCTION SEQUENCE. CONTRACTOR SHALL SUBMIT A DELEGATED-DESIGN SUBMITTAL WITH DETAILED FLUSHING AND TESTING PLAN FOR REVIEW AND APPROVAL OF THE ENGINEER AND OWNER.

GENERAL PROCEDURES FOR PRELIMINARY AND FINAL FLUSHING SHALL INCLUDE AN INITIAL SYSTEM CLEANING PERIOD, OPERATING THE SYSTEM PUMPS WITH A PRE-CLEANING CHEMICAL AGENT TO REMOVE SYSTEM DEPOSITS, AND CONCURRENT BLOWDOWN OF ALL SYSTEM AND EQUIPMENT STRAINERS. FOLLOWING CLEANING AND BLOWDOWN, THE SYSTEM SHALL BE DRAINED, REFILLED, AND RE-FLUSHED UNTIL WATER IS WITHIN TOLERANCES SPECIFIED IN SECTION 230555.

THE FOLLOWING CRITERIA SHALL APPLY:

1. THE PROCESS OF CLEANING SHALL BE PERFORMED AND MONITORED BY A QUALIFIED COMMERCIAL WATER TREATMENT COMPANY. A FULL REPORT OF CLEANING WITH ANALYSIS SHALL BE SUBMITTED.
2. EXISTING BASE MOUNTED CONSTANT VOLUME PUMPS SERVING THE HYDRONIC SYSTEMS MAY BE USED FOR CLEANING AND FLUSHING.
3. STRAINER BLOW-DOWN PROCESS SHALL INCLUDE STRAINERS AT ALL FAN COIL UNITS, OUTDOOR AIR UNIT OAU-1, SYSTEM PUMPS, CHILLER, AND HW HEAT EXCHANGER. FINE MESH STRAINERS SHALL BE INSTALLED AT THE SYSTEM PUMP SUCTION DIFFUSERS FOR THE DURATION OF THE FLUSHING PROCESS.
4. ALL EXISTING EQUIPMENT COILS ARE EQUIPPED WITH A 3-WAY CONTROL VALVE. CONTROL VALVES SHALL BE MODULATED TO FULLY BYPASS THE COIL FOR THE DURATION OF THE FLUSHING PROCESS.
5. ALL SYSTEM WATER AND CHEMICAL CLEANERS SHALL BE DRAINED TO THE SANITARY SEWER SYSTEM.
6. ALL CHEMICALS SHALL BE APPROVED BY THE OWNER IN WRITING PRIOR TO USE AND SHALL BE COMPATIBLE WITH OWNER'S PRESENT PROGRAM AND WITH EXISTING SYSTEM PIPING, EQUIPMENT, SENSORS, AND OTHER COMPONENTS.
7. NO HAZARDOUS CHEMICALS SHALL BE USED. MSDS FOR ALL CHEMICALS TO BE USED SHALL BE SUBMITTED FOR REVIEW AND APPROVAL, PRIOR TO DELIVERY OF CHEMICALS TO SITE.
8. ALL EMPTY CHEMICAL DRUMS, TEMPORARY EQUIPMENT, AND ASSOCIATED DEBRIS SHALL BE REMOVED AT COMPLETION OF JOB.

CENTRAL PLANT REPLACEMENT - SEQUENCE OF CONSTRUCTION

THE ALLEN BUILDING WILL REMAIN OCCUPIED DURING CONSTRUCTION. THE BUILDING'S CENTRAL HEATING AND COOLING SYSTEMS WILL BE CONSECUTIVELY REPLACED IN THE RESPECTIVE SUMMER AND WINTER PERIODS WHEN EACH SYSTEM IS NOT REQUIRED FOR OCCUPANT COMFORT.

PLEASE NOTE THAT THE FOLLOWING SEQUENCE IS NOT MEANT TO SERVE AS STEP-BY-STEP INSTRUCTIONS FOR THE CONTRACTOR. INSTEAD, IT IS MEANT TO SERVE AS A GENERAL GUIDE FOR THE CONTRACTOR'S USE IN MAINTAINING CONTINUOUS HEATING AND COOLING TO THE BUILDING AS SEASONALLY REQUIRED THROUGHOUT THE DURATION OF THE CONSTRUCTION PROCESS.

CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE MECHANICAL WORK WITH THE ELECTRICAL WORK. ANY REQUIRED SHUTDOWN WORK SHALL BE COORDINATED WITH THE OWNER A MINIMUM OF 2-WEEKS PRIOR TO THE PLANNED SHUTDOWN.

HEATING PLANT REPLACEMENT – SUMMER 2026

1. PERFORM AIR AND WATER SYSTEM PRE-TAB OF EXISTING HEATING WATER SYSTEM EQUIPMENT AND COILS TO ESTABLISH BASELINE PERFORMANCE OF EXISTING HW SYSTEMS PRIOR TO START OF WORK.
2. ENLARGE MECHANICAL ROOM 002 SPACE INTO SAFETY STORAGE ROOM 001 AS INDICATED ON ARCHITECTURAL DRAWINGS. DEMOLISH EXISTING PARTITION WALL AND INSTALL NEW FIRE-RATED PARTITION WALL. UPGRADE EXISTING MECHANICAL ROOM 002 WALLS TO FIRE-RATED CONSTRUCTION.
3. IN THE SPRING, WHEN BUILDING HEATING IS NO LONGER REQUIRED:
   - A. FLUSH EXISTING BUILDING HW PIPING SYSTEMS. REFER TO PIPING SYSTEMS FLUSHING NOTES ON THIS DRAWING AND SPECIFICATION SECTION "230555 - HVAC SYSTEMS FLUSHING AND TESTING" FOR REQUIREMENTS.
   - B. TAKE STEAM AND HEATING WATER SYSTEMS OFFLINE, DISCONNECT BUILDING HW PIPING SERVICE MAINS AT MECHANICAL ROOM 002 WALL AND DEMOLISH ALL HOT WATER PIPING AND ASSOCIATED EQUIPMENT IN MECHANICAL ROOM 002 UP TO THE POINTS OF DISCONNECTION AT THE ROOM WALL.
   - C. DISCONNECT BUILDING STEAM AND STEAM CONDENSATE SERVICE PIPING AT ISOLATION VALVES LOCATED AT THE CENTRAL PLANT, AND DEMOLISH ALL ABOVE GROUND STEAM AND STEAM CONDENSATE SYSTEMS THROUGHOUT THE ALLEN BUILDING, COMPLETE WITH STEAM TO HW EXCHANGER, HOT WATER PUMPS, CONDENSATE PUMPS, UNIT HEATERS, MAKEUP AIR UNIT STEAM COIL, AND ALL ASSOCIATED PIPING AND CONTROLS. RETURN STEAM PRV AND STEAM METER TO OWNER FOR REUSE.
   - D. INFILL BELOW GROUND CONDENSATE BASIN IN MECH RM 002 AS INDICATED ON STRUCTURAL DRAWINGS.
4. INSTALL TEMPORARY ELECTRIC HEATERS (UH-A TO UH-E AND RHC-1) TO REPLACE DEMOLISHED STEAM HEATERS. TEMPORARY HEATERS TO REMAIN IN SERVICE UNTIL CONSTRUCTION OF FUTURE PHASE 2 PROJECT (BY OTHERS).
5. INSTALL NEW HW PLANT, COMPLETE WITH BOILER(S), PROPANE STORAGE AND SUPPLY PIPING, PRIMARY AND SECONDARY PUMPS, EXPANSION TANK, PIPING, UNIT HEATERS, AND CONTROLS. CONNECT PLANT PIPING TO EXISTING BUILDING HW SERVICE MAINS, FLUSH NEW PIPING, START PLANT, AND TAB NEW AND EXISTING SYSTEM EQUIPMENT AND COILS.

COOLING PLANT REPLACEMENT- WINTER '26-'27

1. PERFORM AIR AND WATER SYSTEMS PRE-TAB OF EXISTING CHILLED WATER SYSTEM EQUIPMENT AND COILS TO ESTABLISH BASELINE PERFORMANCE OF EXISTING CHW SYSTEMS PRIOR TO START OF WORK.
2. IN THE FALL, WHEN BUILDING COOLING IS NO LONGER REQUIRED:
   - A. FLUSH EXISTING BUILDING CHW PIPING SYSTEMS. REFER TO PIPING SYSTEMS FLUSHING NOTES ON THIS DRAWING AND SPECIFICATION SECTION "230555 - HVAC SYSTEMS FLUSHING AND TESTING" FOR REQUIREMENTS.
   - B. TAKE CHILLED WATER PLANT OFFLINE, DISCONNECT BUILDING CHW PIPING SERVICE MAINS AT MECHANICAL ROOM 002 WALL AND DEMOLISH ALL CHILLED WATER PIPING AND ASSOCIATED EQUIPMENT AND CONTROLS IN MECHANICAL ROOM 002 AND OUTSIDE, UP TO THE POINTS OF DISCONNECTION AT THE MECHANICAL ROOM WALL.
3. INSTALL NEW CHW PLANT, COMPLETE WITH CHILLER, PUMPS, BUFFER TANK, PIPING, AND CONTROLS. CONNECT PLANT PIPING TO BUILDING CHW SERVICE MAINS, FLUSH NEW PIPING, START PLANT, AND TAB NEW AND EXISTING EQUIPMENT AND COILS.

TEST AND BALANCE (TAB) DESCRIPTION

PRE-CONSTRUCTION TAB:

- PRE-READ TAB OF THE EXISTING CHILLED WATER AND HOT WATER SYSTEMS SHALL BE PERFORMED PRIOR TO THE START OF CONSTRUCTION TO ESTABLISH BASELINE PERFORMANCE. THIS INCLUDES READING CHW AND HW FLOWRATES AT ALL EXISTING FAN COIL UNITS, AIR HANDLING UNITS, OUTDOOR AIR UNIT OAU-1, HW/CHW PUMPS, HW HEAT EXCHANGER, AND CHILLER.
- PRE-READ TAB OF ALL EXISTING AIR SYSTEMS SHALL BE PERFORMED PRIOR TO START OF CONSTRUCTION TO ESTABLISH BASELINE PERFORMANCE. THIS INCLUDES READING OUTLET AND EQUIPMENT AIRFLOWS AT ALL EXISTING FAN COIL UNITS, AIR HANDLING UNITS, EXHAUST FANS, AND OUTDOOR AIR UNIT OAU-1.
- CONTRACTOR SHALL SUBMIT PRE-READ TAB REPORTS FOR ENGINEER APPROVAL PRIOR TO COMMENCING DEMOLITION.

FINAL TAB OF ALL HYDRONIC AND AIR SYSTEMS SHALL BE PERFORMED AT THE END OF CONSTRUCTION TO CONFIRM CENTRAL PLANT PERFORMANCE AND TO VERIFY BASELINE PERFORMANCE HAS BEEN RESTORED TO THE EXISTING SYSTEMS AND EQUIPMENT.

REFER TO SECTION 230593 "TESTING ADJUSTING AND BALANCING" FOR DETAILED REQUIREMENTS.

BULDING STEAM SERVICE DISCONNECTION SCOPE

ALL EXISTING STEAM AND CONDENSATE SYSTEM EQUIPMENT, PIPING AND COMPONENTS IN THE ALLEN BUILDING WILL BE DEMOLISHED. BUILDING STEAM SERVICE PIPING AND AND STEAM TUNNEL BETWEEN THE CAMPUS BOILER PLANT AND ALLEN BUILDING WILL BE ABANDONED IN PLACE.

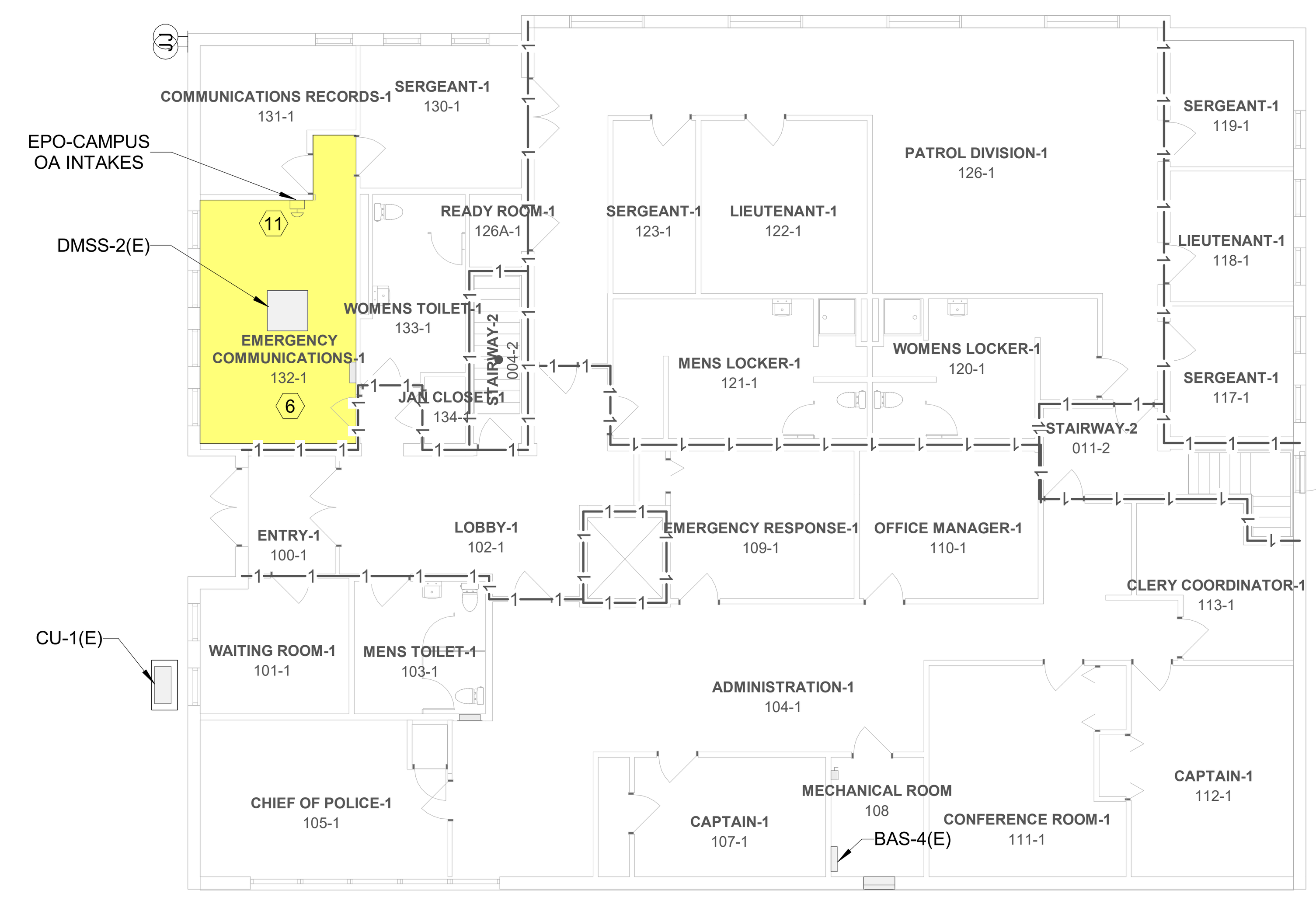
ALLEN BUILDING STEAM AND PUMPED CONDENSATE RETURN SERVICE PIPING IS ROUTED IN A BELOW-GROUND STEAM TUNNEL WITH CRAWL ACCESS FROM THE CAMPUS BOILER PLANT TO THE ALLEN BUILDING. THE BOILER PLANT IS LOCATED APPROXIMATELY 350 FEET WEST OF THE ALLEN BUILDING AT THE WEST END OF EAST MAIN STREET ACCESS ROAD. THE STEAM TUNNEL IS ROUTED BELOW THE ACCESS ROAD FROM THE BOILER PLANT TO THE ALLEN BUILDING SERVICE ENTRANCE LOCATED IN SAFETY STORAGE ROOM 001. EACH SERVICE LINE IS EQUIPPED WITH AN ISOLATION VALVE AT THE STEAM TUNNEL ENTRANCE IN THE BOILER HOUSE.

PRIOR TO DEMOLITION OF THE ALLEN BUILDING STEAM SYSTEMS, THE EXISTING HIGH PRESSURE STEAM AND PUMPED CONDENSATE RETURN SERVICE LINES SHALL BE DISCONNECTED FROM THE PLANT MAINS AT THEIR RESPECTIVE BRANCH ISOLATION VALVES AT THE BOILER PLANT SERVICE TUNNEL ENTRANCE. CONTRACTOR SHALL PERMANENTLY CAP EACH ISOLATION VALVE AFTER DISCONNECTING THE BUILDING SERVICE LINES.

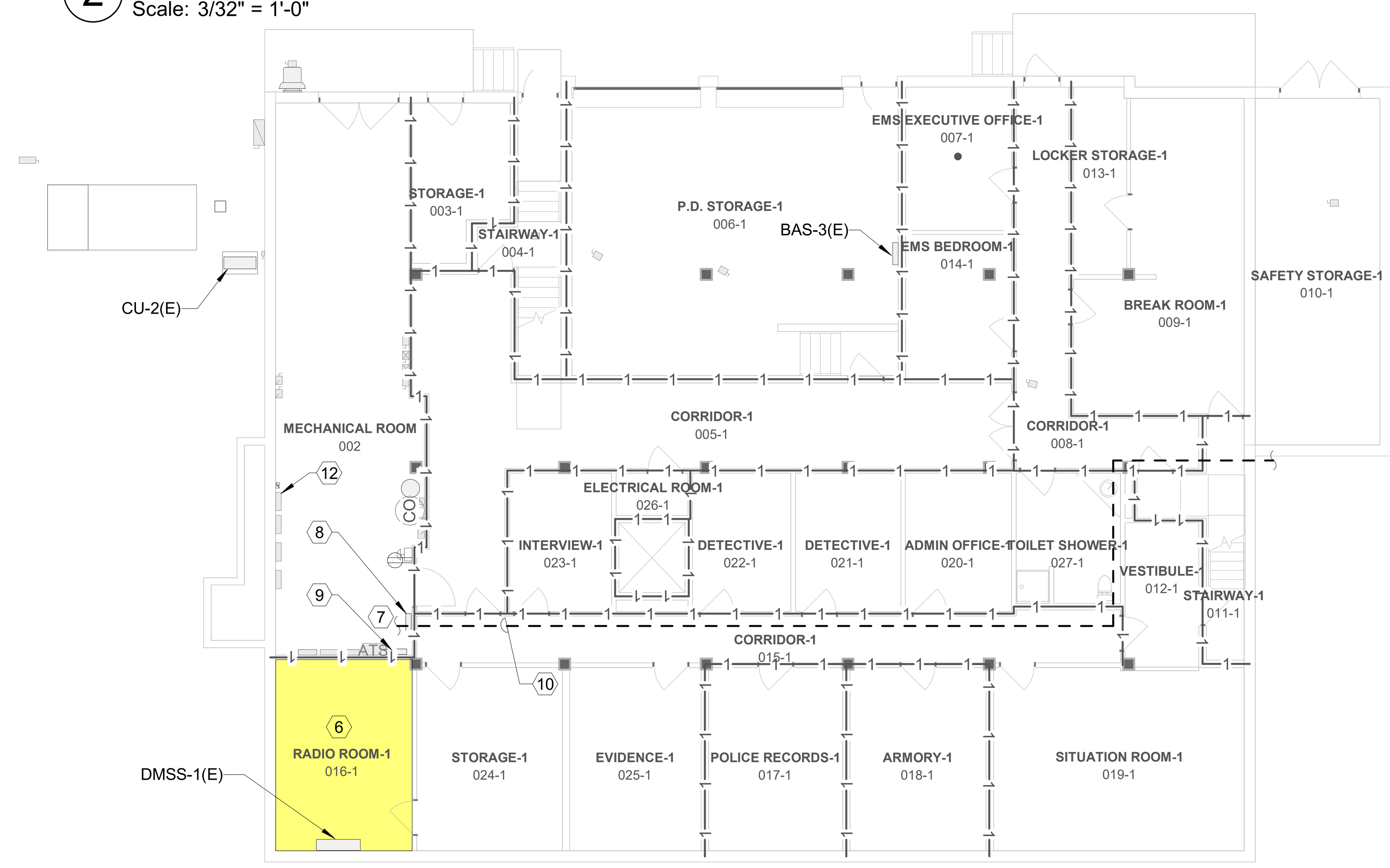
CONTRACTOR IS ADVISED THAT ACCESS TO THE ISOLATION VALVES IN THE PLANT TUNNEL ENTRANCE IS LIMITED AND WORK SCOPE ASSOCIATED WITH DISCONNECTION AND CAPPING OF THE BUILDING BRANCH LINES REQUIRES CONFINED SPACE WORK. ALL PERSONNEL SHALL BE PROPERLY TRAINED FOR CONFINED SPACE WORK AND CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A "CONFINED SPACE ENTRY PERMIT" FROM THE UNIVERSITY PRIOR TO COMMENCING THE WORK.

2 FOLLOWING SERVICE LINE ISOLATION AND CAPPING AT THE BOILER HOUSE, CONTRACTOR SHALL DISCONNECT AND CAP THE LINES IN THE STEAM TUNNEL BELOW THE EXTERIOR MANHOLE AT THE NORTHWEST CORNER OF THE ALLEN BUILDING WHERE INDICATED ON DRAWING B/M1.12. ALL STEAM AND STEAM CONDENSATE PIPING FROM THE MANHOLE TO THE BUILDING AND WITHIN THE BUILDING SHALL THEN BE DEMOLISHED TO THE POINTS OF DISCONNECTION AS INDICATED ON THE DRAWINGS.

1 CRITICAL COMPONENTS IN MECHANICAL ROOM 002
Scale: N.T.S.



2 FIRST FLOOR CRITICAL SYSTEMS
Scale: 3/32" = 1'-0"



3 GROUND FLOOR CRITICAL SYSTEMS
Scale: 3/32" = 1'-0"

KEY NOTES

#	KEY NOTES
1	EXISTING BAS PANELS TO REMAIN. CONTRACTOR TO PROTECT PANEL AND MAINTAIN POWER AND CRITICAL DATA CONNECTIONS THROUGHOUT CONSTRUCTION.
2	EXISTING BAS UPS PANEL TO BE RELOCATED. CONTRACTOR TO PROTECT PANEL AND MAINTAIN POWER AND DATA CONNECTIONS THROUGHOUT CONSTRUCTION. EXTEND CONDUIT AND WIRING AND MOUNT UPS PANEL ON WALL BELOW EXISTING BAS PANEL NOTED IN KEYNOTE #1 ON THIS SHEET. CONTRACTOR TO TEST UPS BATTERY AND REPLACE OR UPGRADE UPS AS REQUIRED TO MAINTAIN POWER TO BAS EQUIPMENT FOR A POWER LOSS DURATION OF 30 MINUTES OR GREATER.
3	EXISTING CAMPUS-WIDE ELECTRIC UTILITY DEMAND RESPONSE CONTROL PANEL TO REMAIN ("VOLTUS" IS THE CURRENT CAMPUS DEMAND RESPONSE VENDOR). CONTRACTOR TO PROTECT PANEL AND MAINTAIN POWER AND DATA CONNECTIONS THROUGHOUT CONSTRUCTION. FIELD-VERIFY DATA CABLE ROUTING PRIOR TO START OF CONSTRUCTION. REFER TO "CRITICAL SYSTEMS REQUIREMENTS" NOTES ON THIS SHEET FOR ADDITIONAL INFORMATION.
4	EXISTING SSI NETWORK INTERFACE PANEL TO CAMPUS SUPERVISORY SERVER. CONTRACTOR TO PROTECT PANEL AND MAINTAIN POWER AND DATA CONNECTIONS THROUGHOUT CONSTRUCTION. DISCONNECT POWER AND DEMOLISH FOLLOWING INSTALLATION AND FINAL COMMISSIONING OF NEW BUILDING AUTOMATION SYSTEM AND NETWORK INTERFACE TO CAMPUS SUPERVISORY SERVER. COORDINATE DEMOLITION WITH WORK SEQUENCE.
5	EXISTING EXTERIOR LIGHTING RELAY PANEL 'FC' TO REMAIN. CONTRACTOR TO PROTECT PANEL AND MAINTAIN POWER AND CONTROL CONNECTIONS THROUGHOUT CONSTRUCTION. COORDINATE RECONNECTION OF EXISTING CONTROL POINTS TO NEW BAS WITH CONSTRUCTION SEQUENCE. REFER TO M7.03.
6	THIS ROOM TO REMAIN FULLY OPERATIONAL AT ALL TIMES DURING CONSTRUCTION. REFER TO "CRITICAL SYSTEMS REQUIREMENTS" NOTES ON THIS SHEET FOR ADDITIONAL INFORMATION.
7	REFER TO PHOTOGRAPH 1 ON THIS SHEET FOR EXISTING CRITICAL COMPONENTS IN THIS CORNER OF MECHANICAL ROOM 002 THAT REQUIRE PROTECTION AND CONTINUOUS POWER AND DATA CONNECTIONS THROUGHOUT CONSTRUCTION.
8	EXISTING BAS PANEL.
9	NEW BAS PANEL.
10	APPROXIMATE ROUTING OF EXISTING ELECTRIC METER CONNECTION TO THE RADFORD CITY ELECTRIC SUBSTATION. CONTRACTOR TO VERIFY EXACT LOCATION WITH OWNER PRIOR TO STARTING DEMOLITION AND PROTECT ROUTING AND CONNECTIVITY THROUGHOUT CONSTRUCTION. REFER TO "CRITICAL SYSTEMS REQUIREMENTS" NOTES ON THIS SHEET FOR ADDITIONAL INFORMATION.
11	CAMPUS OA INTAKE EMERGENCY CLOSURE/RESET SWITCH. CONTRACTOR TO PROTECT SWITCH PRIOR TO STARTING DEMOLITION AND MAINTAIN SWITCH ACCESS, FUNCTIONALITY AND BAS INTERFACE THROUGHOUT CONSTRUCTION.
12	ALLEN BUILDING ELECTRIC METER IN EXISTING PANEL MDP.

WALL RATING LEGEND

—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

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ALLEN BUILDING ELECTRICAL REPLACEMENT
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COMMONWEATH OF VIRGINIA
SCOTT W. DAVIS
Lic. No. 062725
PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/25	SWD	DEB CMNTS/ADD 3
1	10/24/25	SWD	DEB COMMENTS

DRAWN BY	SMF
APPROVED BY	SWD
CHECKED BY	JMT
DATE	JULY 25, 2025

TITLE
MECHANICAL NOTES

DEI PROJECT NO: 50188025
RADFORD PROJECT NO: 217-B5217-004

SHEET NO.
M0.03

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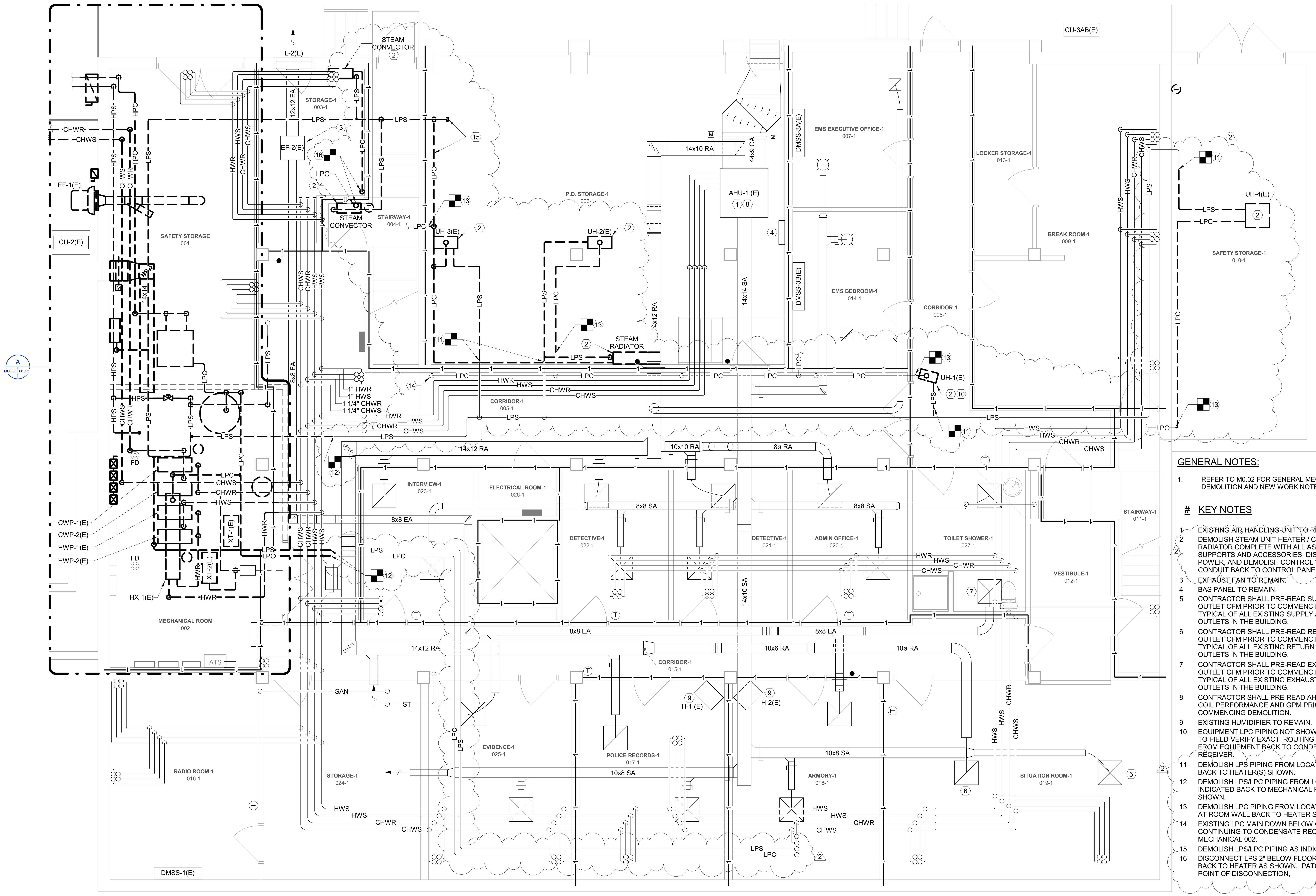

1 GROUND MECHANICAL DEMOLITION PLAN
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.

KEY NOTES

1 EXISTING AIR HANDLING UNIT TO REMAIN.
2 DEMOLISH STEAM UNIT HEATER / CONVECTOR / RADIATOR COMPLETE WITH ALL ASSOCIATED SUPPORTS AND ACCESSORIES. DISCONNECT POWER, AND DEMOLISH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL.
3 EXHAUST FAN TO REMAIN.
4 BAS PANEL TO REMAIN.
5 CONTRACTOR SHALL PRE-READ SUPPLY AIR OUTLET CFM PRIOR TO COMMENCING DEMOLITION. TYPICAL OF ALL EXISTING SUPPLY AIR SYSTEM OUTLETS IN THE BUILDING.
6 CONTRACTOR SHALL PRE-READ RETURN AIR OUTLET CFM PRIOR TO COMMENCING DEMOLITION. TYPICAL OF ALL EXISTING RETURN AIR SYSTEM OUTLETS IN THE BUILDING.
7 CONTRACTOR SHALL PRE-READ EXHAUST AIR OUTLET CFM PRIOR TO COMMENCING DEMOLITION. TYPICAL OF ALL EXISTING EXHAUST AIR SYSTEM OUTLETS IN THE BUILDING.
8 CONTRACTOR SHALL PRE-READ AHU-1 HW AND CHW COIL PERFORMANCE AND GPM PRIOR TO COMMENCING DEMOLITION.
9 EXISTING HUMIDIFIER TO REMAIN.
10 EQUIPMENT LPC PIPING NOT SHOWN. CONTRACTOR TO FIELD-VERIFY EXACT ROUTING AND DEMOLISH FROM EQUIPMENT BACK TO CONDENSATE RECEIVER.
11 DEMOLISH LPS PIPING FROM LOCATION INDICATED BACK TO HEATER(S) SHOWN.
12 DEMOLISH LPS/LPC PIPING FROM LOCATION INDICATED BACK TO MECHANICAL ROOM 002 AS SHOWN.
13 DEMOLISH LPC PIPING FROM LOCATION INDICATED AT ROOM WALL BACK TO HEATER SHOWN.
14 EXISTING LPC MAIN DOWN BELOW GROUND CONTINUING TO CONDENSATE RECIEVER IN MECHANICAL 002.
15 DEMOLISH LPS/LPC PIPING AS INDICATED.
16 DISCONNECT LPS 2" BELOW FLOOR AND DEMOLISH BACK TO HEATER AS SHOWN. PATCH FLOOR AT POINT OF DISCONNECTION,

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KEY PLAN:

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DRAWN BY SMF
APPROVED BY SWD
CHECKED BY JMT
DATE JULY 25, 2025

TITLE
GROUND FLOOR MECHANICAL DEMOLITION PLAN

DEI PROJECT NO: 50188025
RADFORD PROJECT NO: 217-B5217-004

SHEET NO.
MD1.11

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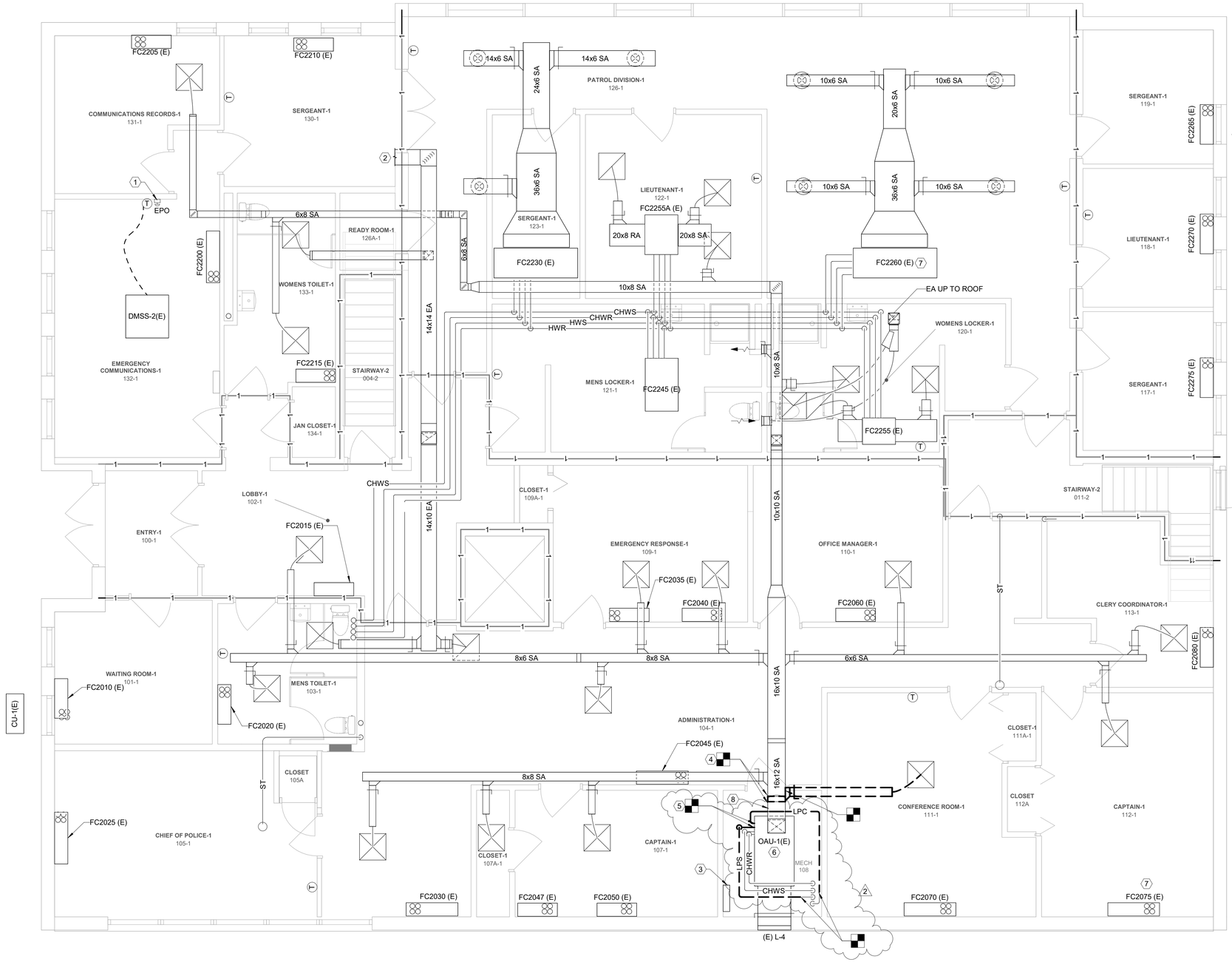

1 FIRST FLOOR MECHANICAL DEMOLITION PLAN

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

0' 2' 4' 8'

GENERAL NOTES:

1. REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.

KEY NOTES

1 CAMPUS OA INTAKE EMERGENCY CLOSURE/RESET SWITCH TO REMAIN FUNCTIONAL WITH BAS INTERFACE AT ALL TIMES. REFER TO CONTROLS. COORDINATE WITH OWNER.

2 REFER TO ROOF PLAN FOR EA DUCT CONNECTION TO FAN.

3 BAS PANEL TO REMAIN.

4 DEMOLISH SECTION OF SA DUCT IN PREPARATION FOR INSTALLATION OF ELECTRIC HEAT COIL.

5 DISCONNECT LPS AND LPC PIPING FROM UNIT AND DEMOLISH PIPING BACK TO POINT OF DISCONNECTION INDICATED. PREPARE FOR CAPPING.

6 CONTRACTOR SHALL PRE-READ OAU-1 CHW COIL PERFORMANCE AND GPM PRIOR TO COMMENCING DEMOLITION.

7 CONTRACTOR SHALL PRE-READ FAN COIL UNIT HW AND CHW COIL PERFORMANCE AND GPM PRIOR TO COMMENCING DEMOLITION. TYPICAL AT ALL FAN COIL UNITS IN THE BUILDING.

8 CAREFULLY REMOVE DISCHARGE AIR TEMPERATURE SENSOR, PATCH DUCT, AND PREPARE SENSOR FOR RELOCATION SHOWN ON NEW WORK PLAN.

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CHECKED BY	JMT
DATE	JULY 25, 2025

TITLE

FIRST FLOOR MECHANICAL DEMOLITION PLAN

DEI PROJECT NO: 50188025
RADFORD PROJECT NO: 217-B5217-004

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MD1.21

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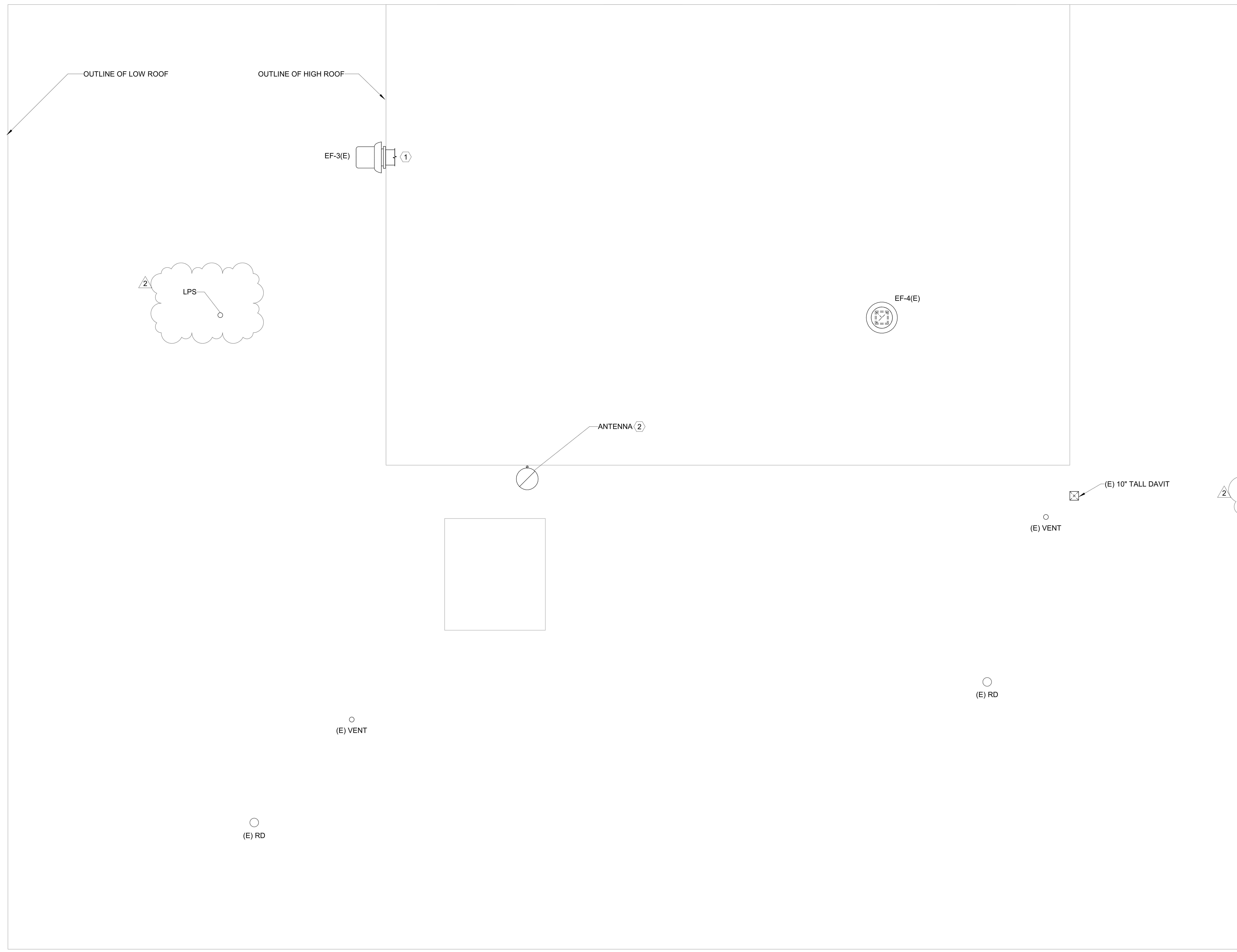
GENERAL NOTES:

1. REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.



KEY NOTES

#	
1	REFER TO MD1.21 FOR EA DUCT CONTINUATION.
2	EXISTING COMMUNICATION ANTENNA TO REMAIN.

1 ROOF MECHANICAL DEMOLITION PLAN

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

0' 2' 4' 8'

WALL RATING LEGEND

—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

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KEY PLAN:

SCALE:

REVISIONS

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1	10/24/25	SWD	DEB COMMENTS

DRAWN BY	SMF
APPROVED BY	SWD
CHECKED BY	JMT
DATE	JULY 25, 2025

TITLE

ROOF MECHANICAL DEMOLITION PLAN

DEI PROJECT NO:	50188025
RADFORD PROJECT NO:	217-B5217-004

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MD1.31

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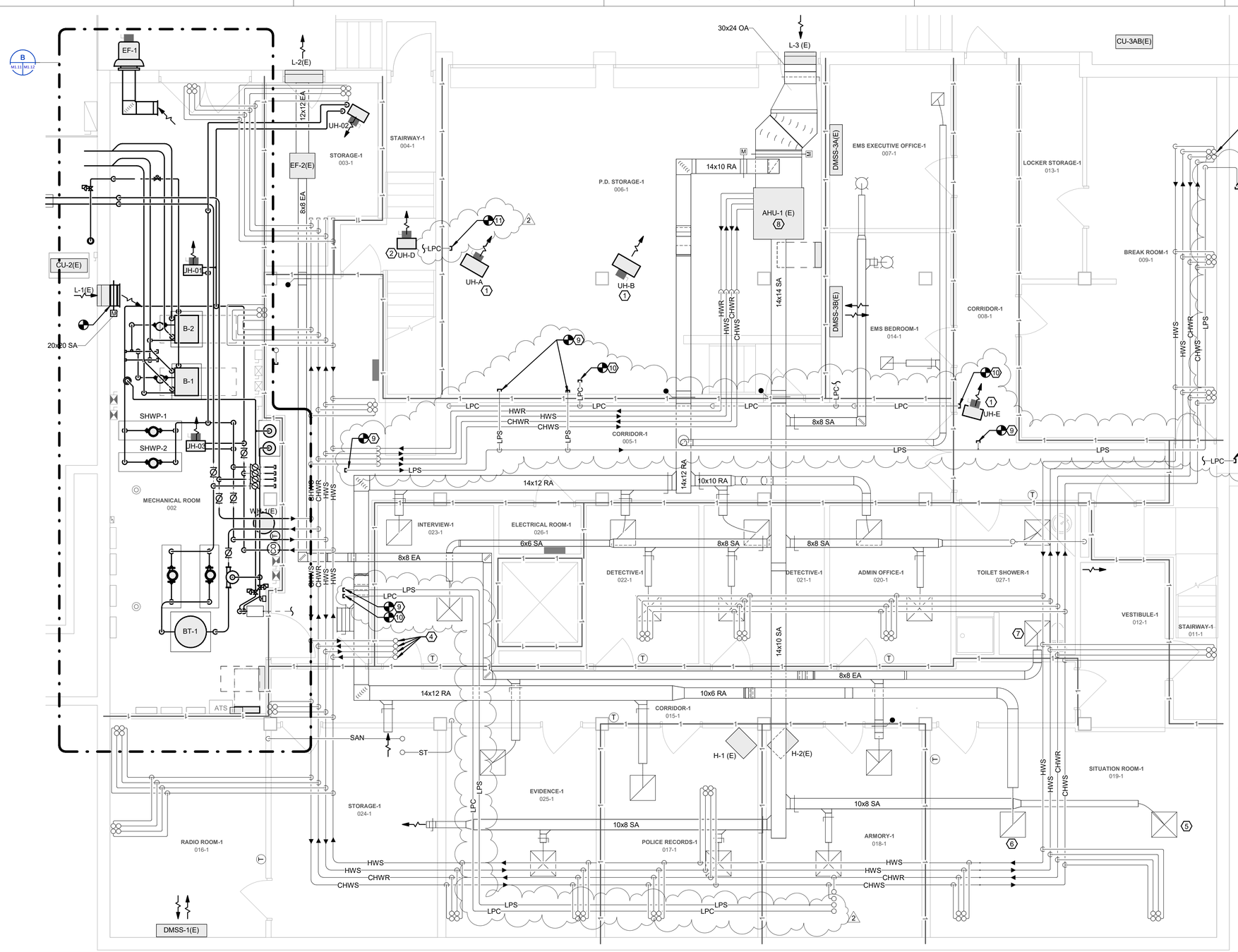

1 GROUND MECHANICAL PLAN

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

0' 2' 4' 8'

GENERAL NOTES:

1. REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.
2. REFER TO UNIT HEATER SCHEDULE FOR HOT WATER BRANCH PIPE SIZING.
3. REFER TO DETAILS FOR PROPANE PIPE SIZING AND ISOMETRIC VIEW.

KEY NOTES

1 INSTALL ELECTRIC UNIT HEATER IN SAME LOCATION AS FORMER STEAM UNIT HEATER.
2 HANG ELECTRIC UNIT HEATER ABOVE STAIR LANDING.
3 EXISTING CHWS/R AND HWS/R BRANCH PIPING UP TO FIRST FLOOR. (TYPICAL)
4 EXISTING CHWS/R AND HWS/R MAINS UP TO FIRST FLOOR FAN COILS.
5 CONTRACTOR SHALL BALANCE SUPPLY AIR OUTLET CFM TO THE AIRFLOW MEASURED DURING PRE-READ TAB. TYPICAL OF ALL EXISTING SUPPLY AIR SYSTEM OUTLETS IN THE BUILDING.
6 CONTRACTOR SHALL BALANCE RETURN AIR OUTLET CFM TO THE AIRFLOW MEASURED DURING PRE-READ TAB. TYPICAL OF ALL EXISTING RETURN AIR SYSTEM OUTLETS IN THE BUILDING.
7 CONTRACTOR SHALL BALANCE EXHAUST AIR OUTLET CFM TO THE AIRFLOW MEASURED DURING PRE-READ TAB. TYPICAL OF ALL EXISTING EXHAUST AIR SYSTEM OUTLETS IN THE BUILDING.
8 CONTRACTOR SHALL BALANCE AHU-1 HW AND CHW COIL FLOWRATES TO GPM MEASURED DURING PRE-READ TAB.
9 CAP LPS.
10 CAP LPC.
11 LPC THROUGH WALL TO BELOW GROUND UNDER STAIR, CONTINUING TO CONDENSATE RECEIVER IN MECH 002. ABANDON BELOW GROUND PIPING AND INSTALL CAP AT WALL.

WALL RATING LEGEND	
—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

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12/5/2025

KEY PLAN:

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DRAWN BY	SMF
APPROVED BY	SWD
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DATE	JULY 25, 2025

TITLE
GROUND FLOOR MECHANICAL PLAN

DEI PROJECT NO:	50188025
RADFORD PROJECT NO:	217-B5217-004

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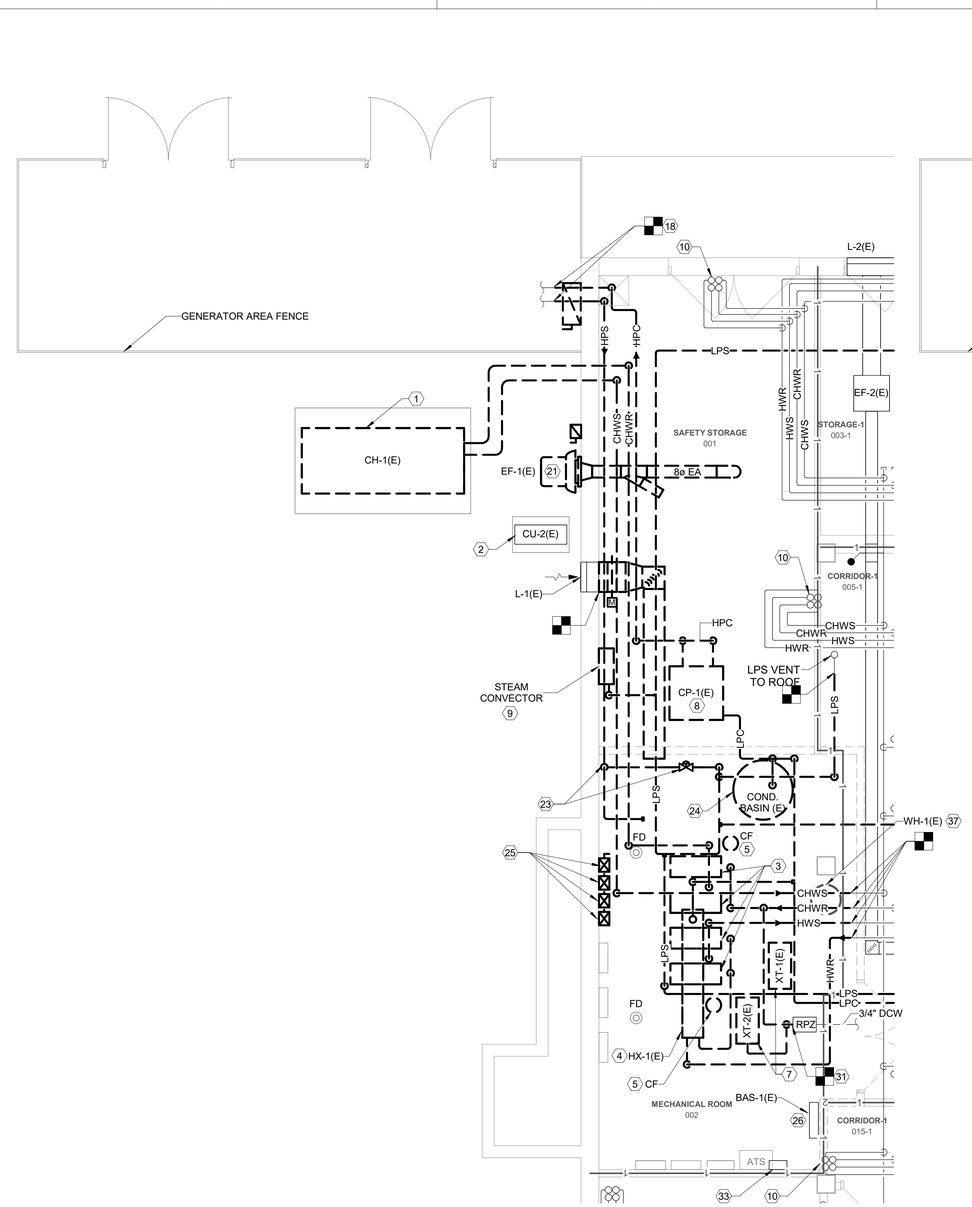
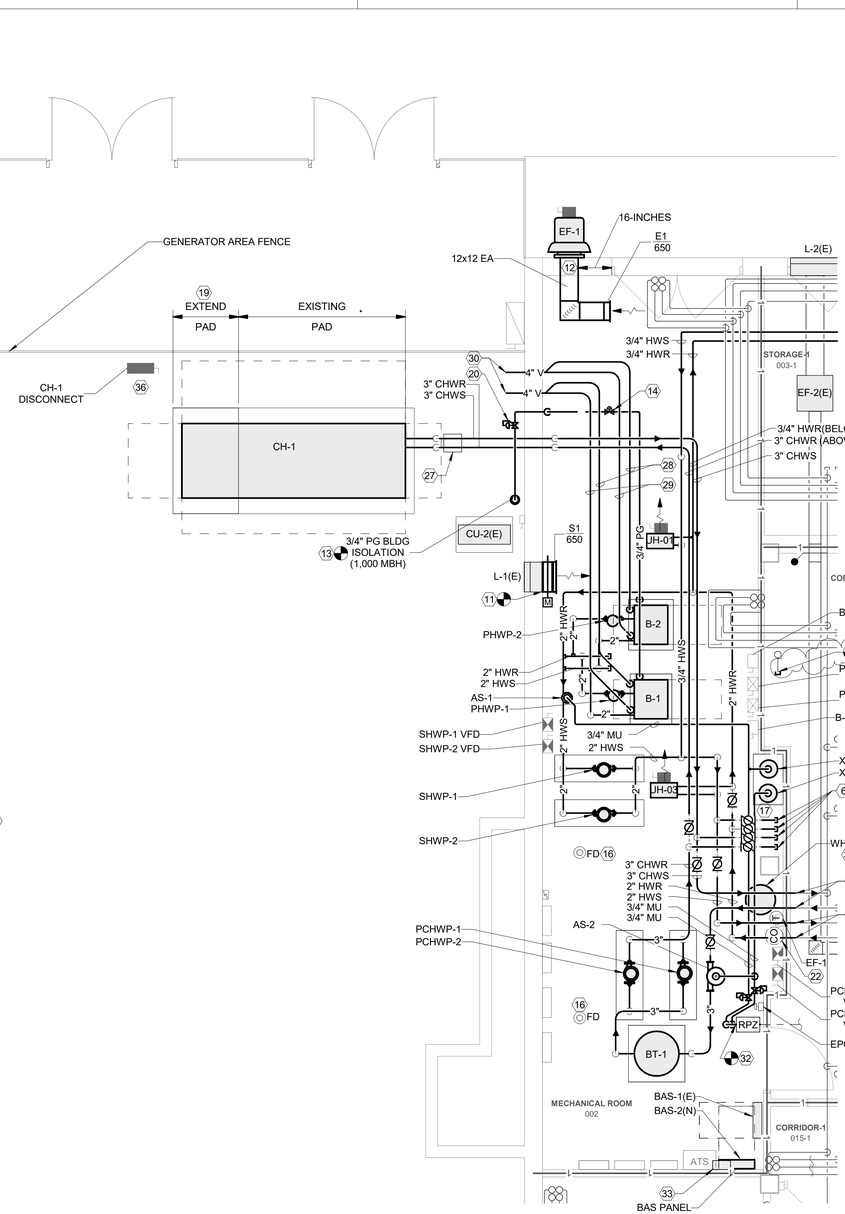


GROUND FLOOR MECHANICAL DEMOLITION PLAN AT CHILLER / BOILER AREA

A M01.11 M1.12 Scale: 1/4" = 1'-0"

0' 2' 4' 8'



GROUND FLOOR MECHANICAL PLAN AT CHILLER / BOILER AREA

B M1.11 M1.12 Scale: 1/4" = 1'-0"

0' 2' 4' 8'

GENERAL NOTES:

1. REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES, AND SEQUENCE OF CONSTRUCTION REQUIREMENTS.
2. REFER TO DETAILS FOR PROPANE PIPE SIZING AND ISOMETRIC VIEW.

KEY NOTES

1 DEMOLISH CHILLER COMPLETE WITH ALL ASSOCIATED PIPING AND ACCESSORIES. DISCONNECT POWER, AND DEMOLISH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL. PREPARE CONCRETE PAD FOR EXPANSION AS SHOWN ON NEW WORK PLAN ON THIS DRAWING.

2 EXISTING CONDENSING UNIT TO REMAIN.

3 DEMOLISH HW AND CHW PUMPS. DISCONNECT ALL ASSOCIATED PIPING AND ACCESSORIES. DISCONNECT POWER, AND DEMOLISH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL.

4 DEMOLISH HEAT EXCHANGER. DISCONNECT ALL ASSOCIATED PIPING AND ACCESSORIES. DISCONNECT POWER, AND DEMOLISH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL.

5 DEMOLISH CHEMICAL POT FEEDER COMPLETE WITH ALL PIPING AND SUPPORTS.

6 2" HWS/R AND 3" CHWS/R VALVED AND CAPPED PIPING STUBS. LOCATE WHERE SHOWN FOR FUTURE CONNECTION.

7 DEMOLISH EXPANSION TANK COMPLETE WITH ALL ASSOCIATED PIPING SUPPORTS AND ACCESSORIES.

8 DEMOLISH CONDENSATE PUMP COMPLETE WITH ALL ASSOCIATED PIPING AND ACCESSORIES. DISCONNECT POWER AND DEMOLISH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL.

9 DEMOLISH STEAM UNIT HEATER / CONVECTOR / RADIATOR COMPLETE WITH ALL ASSOCIATED PIPING, SUPPORTS AND ACCESSORIES. DISCONNECT POWER, AND DEMOLISH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL.

10 CHWS/R AND HWS/R PIPING UP TO FLOOR ABOVE TO REMAIN.

11 CONNECT TO EXISTING LOUVER. FIELD VERIFY EXACT SIZE (APPROXIMATELY 20X20). PROVIDE MOTORIZED ISOLATION DAMPER IN INTAKE DUCT AND INTERLOCK WITH EF-1 OPERATION. REFER TO CONTROLS.

12 PROVIDE 14X14 OPENING IN WALL. LOCATE EDGE OF OPENING 16-INCHES FROM DOOR OPENING AS INDICATED. LOCATE TOP OF OPENING 2-INCHES BELOW BOTTOM OF 1ST FLR SLAB. COORDINATE EXACT DUCT ROUTING WITH EXISTING CONDUIT IN ROOM.

13 3/4" PROPANE GAS BUILDING SERVICE LINE DN BELOW GRADE WITH BUILDING ISOLATION VALVE. REFER TO MECHANICAL DETAILS AND CIVIL DRAWINGS FOR CONTINUATION.

14 INSTALL EMERGENCY SHUTOFF VALVE IN PROPANE GAS SUPPLY MAIN AND WIRE TO EPO SWITCH IN BOILER ROOM. REFER TO CONTROL DRAWINGS.

15 INSTALL EMERGENCY SHUT OFF SWITCH HARD-WIRED TO FUEL SHUT OFF VALVE AND BOILER, B-1 AND B-2 SHUTDOWN. REFER TO CONTROL DRAWINGS.

16 CLEAN ALL BELOW GROUND MECHANICAL ROOM DRAIN PIPING FROM FLOOR DRAINS TO BUILDING SERVICE MAIN WITH WATER JET AND AUGER AS REQUIRED TO RESTORE FLOW.

17 APPROXIMATE LOCATION OF EXISTING BUILDING DOMESTIC WATER METER. RECONNECT TO NEW BAS. REFER TO CONTROL DRAWINGS.

18 2" HPS & 2" HPC BUILDING STEAM SERVICE PIPING IN STEAM TUNNEL BELOW GROUND. DISCONNECT AND CAP SERVICE LINES AT POINT INDICATED BELOW EXTERIOR MANHOLE. ABANDON SERVICE PIPING IN TUNNEL. DEMOLISH ALL STEAM AND STEAM CONDENSATE PIPING FROM THE MANHOLE TO THE BUILDING AND WITHIN THE BUILDING TO THE POINTS OF DISCONNECTION AS INDICATED. REFER TO "BUILDING STEAM SERVICE DISCONNECTION SCOPE" ON DRAWING M0.03 FOR ADDITIONAL INFORMATION.

19 EXTEND CHILLER PAD AS SHOWN. REFER TO STRUCTURAL AND CIVIL DRAWINGS.

20 SECOND STAGE BUILDING PRESSURE REGULATOR. PIPE RELIEF TO SAFE LOCATION AT BUILDING EXTERIOR. REFER TO MECHANICAL DETAILS.

21 DEMOLISH EXHAUST FAN WITH DUCTWORK AND SUPPORTS. DISCONNECT POWER, AND DEMOLISH CONTROL WIRING AND CONDUIT BACK TO CONTROL PANEL. PREPARE WALL OPENING FOR NEW FAN.

22 PROVIDE CARBON MONOXIDE DETECTOR WITH AUDIBLE/VISUAL ALARM. REFER TO CONTROLS DRAWINGS.

23 CAREFULLY REMOVE BUILDING STEAM SERVICE FLOW METER AND PRV AND RETURN TO OWNER FOR REUSE.

24 DEMOLISH CONDENSATE BASIN ACCESSORIES, INFILL HOLE, AND PATCH SLAB. REFER TO STRUCTURAL.

25 DEMOLISH EXISTING PUMP MOTOR STARTERS.

26 EXISTING BAS PANEL TO REMAIN. REFER TO M0.02 FOR ADDITIONAL INFORMATION.

27 PROVIDE PIPE SUPPORT STAND. REFER TO STRUCTURAL DETAIL ON S5.01.

28 4" DIAMETER COMBUSTION INTAKE.

29 4" DIAMETER STAINLESS STEEL VENT.

30 TERMINATE COMBUSTION AIR INTAKE AND STAINLESS STEEL VENT WITH CONCENTRIC VENT TERMINAL IN ACCORDANCE WITH BOILER MANUFACTURER'S INSTRUCTIONS. DO NOT TERMINATE VENT VERTICALLY ABOVE ELECTRICAL EQUIPMENT. COORDINATE EXACT LOCATION WITH DIV 26 CONTRACTOR.

31 RPZ TO REMAIN. DISCONNECT MAKEUP WATER PIPING FROM RPZ OUTLET & DEMOLISH BACK TO HW & CHW SYSTEMS INCLUDING PRV'S.

32 CONNECT 3/4" MU TO RPZ OUTLET AND EXTEND TO HW AND CHW SYSTEMS AS SHOWN. PROVIDE SEPARATE PRV FOR EACH SYSTEM. REFER TO AIR SEPARATOR/EXPANSION TANK DETAIL FOR MU PIPING REQUIREMENTS.

33 EXISTING EXTERIOR LIGHTING RELAY PANEL 'FC' TO REMAIN. CONTRACTOR TO PROTECT PANEL AND MAINTAIN POWER AND CONTROL CONNECTIONS THROUGHOUT CONSTRUCTION. COORDINATE RECONNECTION OF EXISTING CONTROL POINTS TO NEW BAS WITH CONSTRUCTION SEQUENCE. REFER TO 1/M0.03 AND M7.01.

34 CONNECT 3" CHWS/R TO EXISTING 2-1/2" CHWS/R. PATCH INSULATION AND JACKET.

35 CONNECT 2" HWS/R TO EXISTING 2" HWS/R. PATCH INSULATION AND JACKET.

36 PROVIDE UNISTRUT SUPPORT RACK. REFER TO DETAIL 1/M5.05.

37 DISCONNECT DCW & DHW AT WATER HEATER AND PREPARE WH FOR RELOCATION.

38 RELOCATE ELECTRIC WATER HEATER TO NEW LOCATION SHOWN ON EXISTING SUPPORTS AND RECONNECT TO DCW AND DHW SERVICE LINES. INSULATE NEW PIPING FROM WH TO POINTS OF CONNECTION. COORDINATE BRANCH CIRCUIT WIRE/CONDUIT EXTENSION REQUIREMENTS WITH ELECTRICAL CONTRACTOR.

2 39 CAP LPS.

WALL RATING LEGEND

—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

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KEY PLAN:

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1	10/24/25	SWD	DEB COMMENTS

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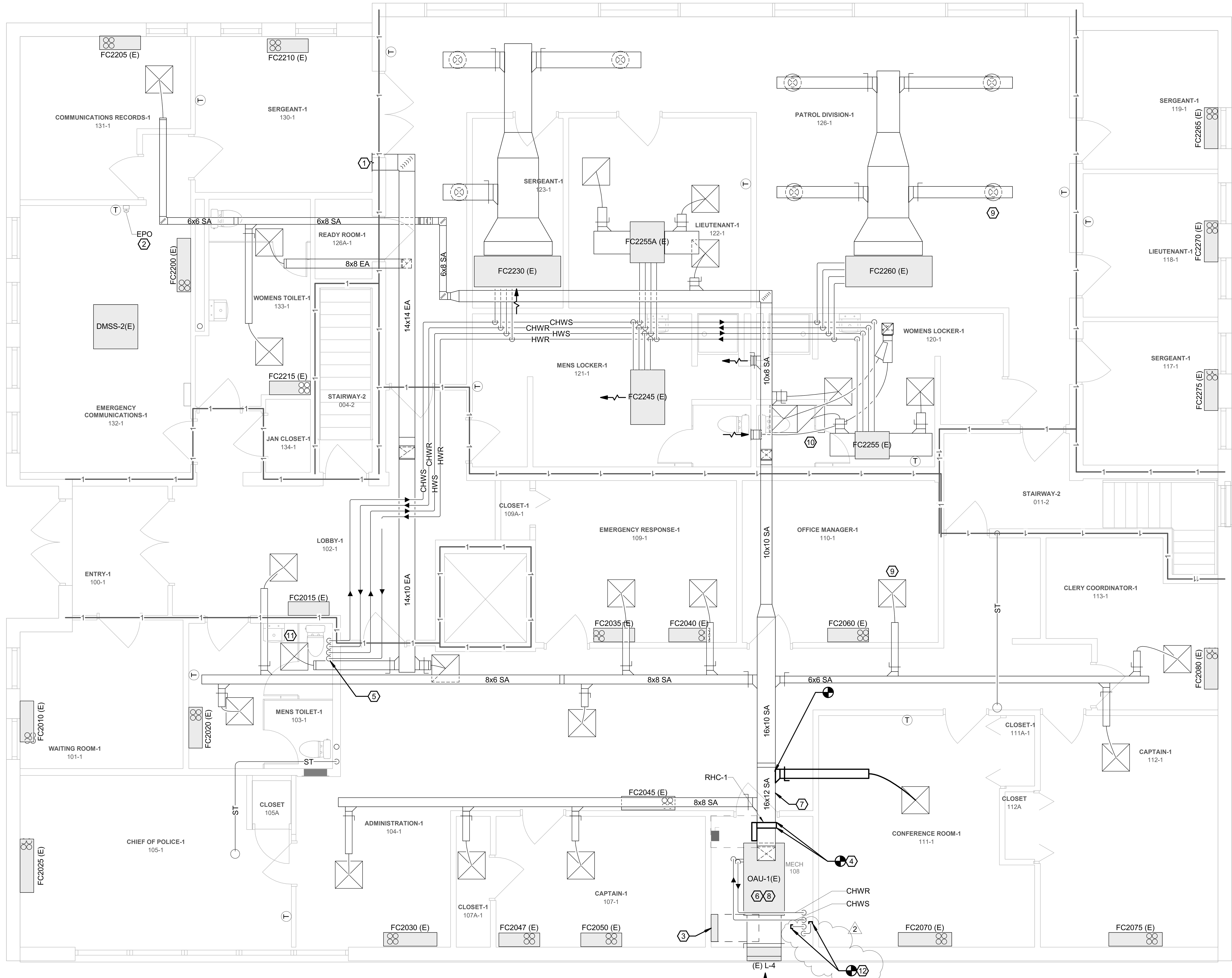

1 FIRST FLOOR MECHANICAL PLAN
Scale: 1/4" = 1'-0"

0' 2' 4' 8'

GENERAL NOTES:

1. REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.

KEY NOTES

1 REFER TO ROOF PLAN FOR EA DUCT CONNECTION TO FAN.
2 CAMPUS OA INTAKE EMERGENCY CLOSURE/RESET SWITCH. PROTECT COMMUNICATION CABLE INTERFACE WITH SWITCH PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SWITCH FUNCTIONALITY AND BAS INTERFACE AT ALL TIMES.
3 EXISTING BAS PANEL.
4 INSTALL DUCT HEATER IN EXISTING DUCT. MAINTAIN MIN 3 FT CLEARANCE FROM CONTROL PANEL AS SHOWN.
5 EXISITING CHWS/R AND HWS/R DN TO GROUND FLOOR.
6 CONTRACTOR SHALL BALANCE OAU-1 CHW COIL FLOWRATE TO GPM MEASURED DURING PRE-READ TAB.
7 REINSTALL OAU-1 DISCHARGE AIR TEMPERATURE SENSOR IN DUCT AT LOCATION SHOWN AND RECONNECT TO BAS.
8 OAU-1 WILL BE TEMPORARILY OPERATED WITH WITHOUT A STEAM PREHEAT COIL UNTIL PHASE 2 ALLEN BUILDING RENOVATION PROJECT IS COMPLETED. TO AVOID FREEZING THE CHILLED WATER COIL, CONTRACTOR SHALL BE REPONSIBLE FOR THE SEASONAL WINTER DRAINDOWN OF THE COIL.
9 CONTRACTOR SHALL BALANCE SUPPLY AIR OUTLET CFM TO THE AIRFLOW MEASURED DURING PRE-READ TAB. TYPICAL OF ALL EXISTING SUPPLY AIR SYSTEM OUTLETS IN THE BUILDING.
10 CONTRACTOR SHALL BALANCE RETURN AIR OUTLET CFM TO THE AIRFLOW MEASURED DURING PRE-READ TAB. TYPICAL OF ALL EXISTING RETURN AIR SYSTEM OUTLETS IN THE BUILDING.
11 CONTRACTOR SHALL BALANCE EXHAUST AIR OUTLET CFM TO THE AIRFLOW MEASURED DURING PRE-READ TAB. TYPICAL OF ALL EXISTING EXHAUST AIR SYSTEM OUTLETS IN THE BUILDING.
2 12 CAP LPS AND LPC.

WALL RATING LEGEND	
—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

STATE BUILDING OFFICIAL

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Radford UNIVERSITY
ALLEN BUILDING ELECTRICAL REPLACEMENT
100% CONSTRUCTION DOCUMENTS
RADFORD, VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
SCOTT W. DAVIS
Lic. No. 062725
PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/25	SWD	DEB CMNTS/ADD 3
1	10/24/25	SWD	DEB COMMENTS

DRAWN BY	SMF
APPROVED BY	SWD
CHECKED BY	JMT
DATE	JULY 25, 2025

TITLE
FIRST FLOOR MECHANICAL PLAN

DEI PROJECT NO:	50188025
RADFORD PROJECT NO:	217-B5217-004

SHEET NO.
M1.21

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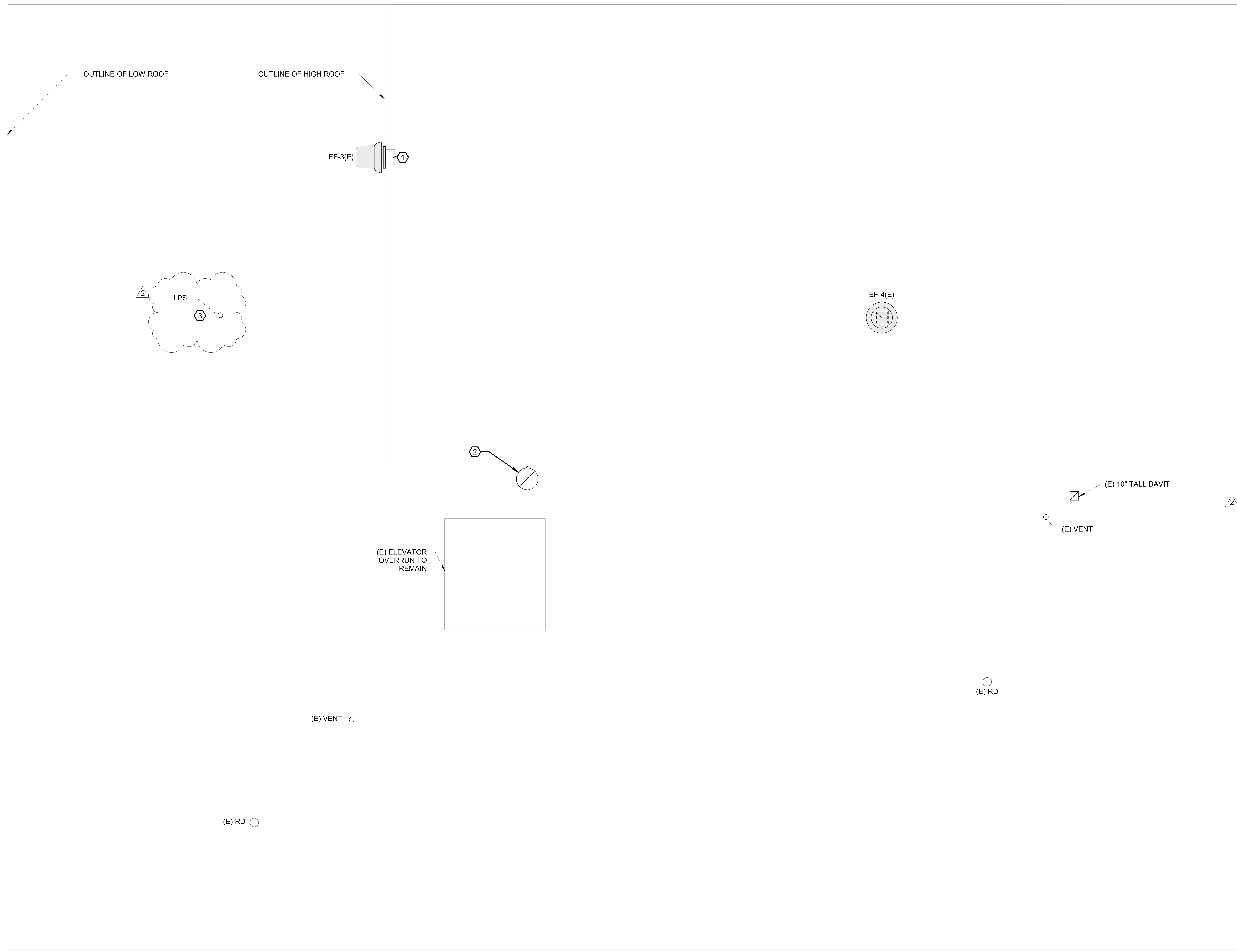
GENERAL NOTES:

1. REFER TO M0.02 FOR GENERAL MECHANICAL DEMOLITION AND NEW WORK NOTES.



1 ROOF MECHANICAL PLAN
Scale: 1/4" = 1'-0"

0' 2' 4' 8'

KEY NOTES

1. REFER TO M1.21 FOR EA DUCT CONTINUATION.
2. EXISTING COMMUNICATION ANTENNA.
3. CAP LPS ABOVE ROOF. (2)

WALL RATING LEGEND	
—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

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RADFORD, VIRGINIA

SEAL
Signed by: Scott W. Davis
SCOTT W. DAVIS
Lic. No. 062725
COMMONWEALTH OF VIRGINIA PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/25	SWD	DEB CMNTS/ADD 3
1	10/24/25	SWD	DEB COMMENTS

DRAWN BY SMF
APPROVED BY SWD
CHECKED BY JMT
DATE JULY 25, 2025

TITLE
ROOF MECHANICAL PLAN

DEI PROJECT NO: 50188025
RADFORD PROJECT NO: 217-B5217-004

SHEET NO.
M1.31

E D C B A

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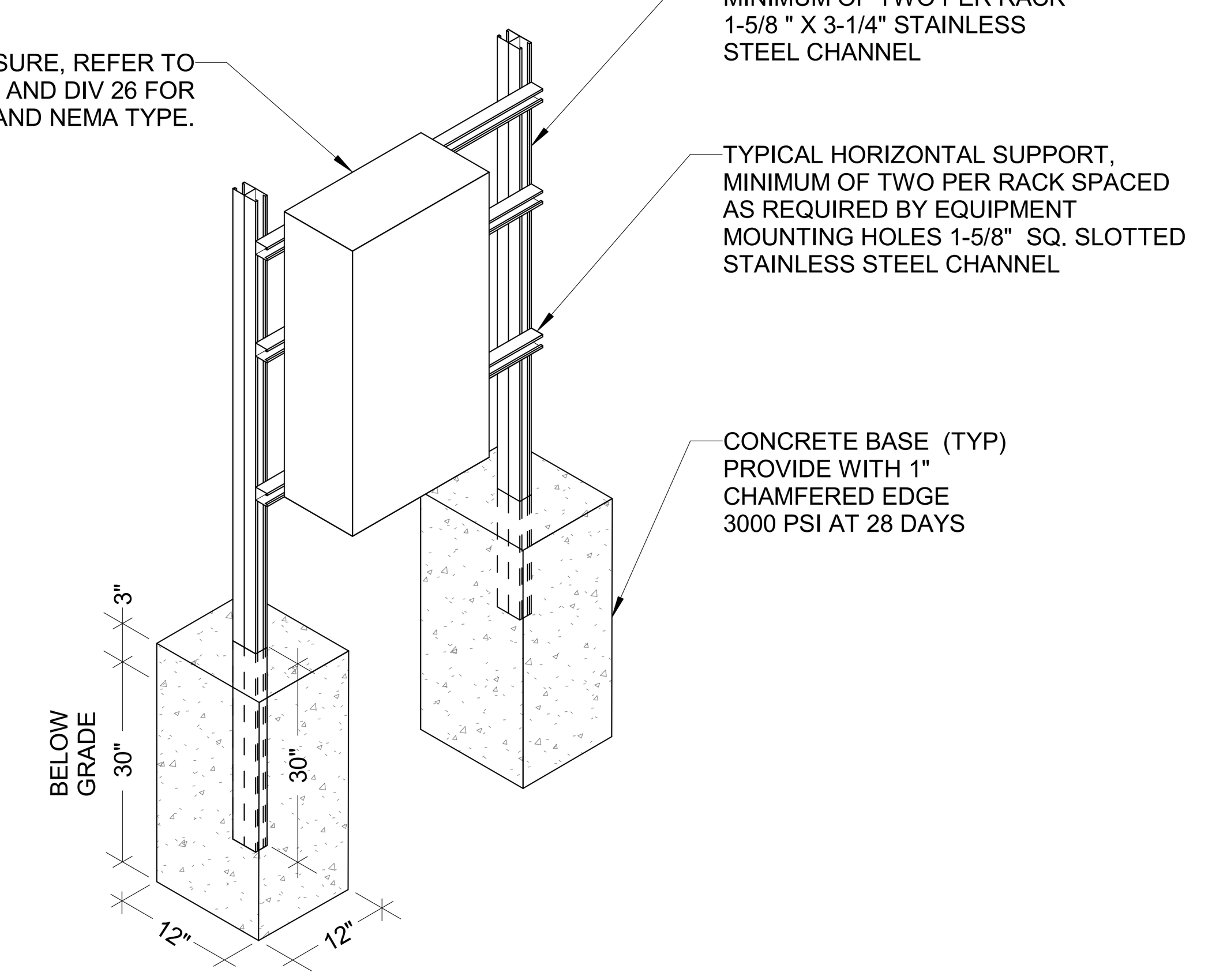
NOTES:

1. CHANNEL CONNECTIONS, NUTS, AND HARDWARE SHALL BE MADE BY CHANNEL MANUFACTURER.



1 CHILLER DISCONNECT SUPPORT RACK

Scale: N.T.S.

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RADFORD, VIRGINIA

SEAL

Signed by: Scott Davis
BC4DAD4049234A8...

COMMONWEALTH OF VIRGINIA
SCOTT W. DAVIS
Lic. No. 062725
PROFESSIONAL ENGINEER

12/5/2025

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/25	SWD	DEB CMNTS/ADD 3
1	10/24/25	SWD	DEB COMMENTS

DRAWN BY	SMF
APPROVED BY	SWD
CHECKED BY	JMT
DATE	JULY 25, 2025

TITLE

DETAILS

2

DEI PROJECT NO:	50188025
RADFORD PROJECT NO:	217-B5217-004

SHEET NO.

M5.05

12/3/2025 4:25:30 PM

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CONTROLS LEGEND

- AI = ANALOG INPUT
- AO = ANALOG OUTPUT
- DI = DIGITAL INPUT
- DO = DIGITAL OUTPUT
- N = NETWORK CONNECTION
- AC = ACTUATOR CONTROL
- AF = AIR FLOW SWITCH
- CO = CARBON MONOXIDE SENSOR
- CO2 = CARBON DIOXIDE SENSOR
- CS = CURRENT SENSING RELAY
- DP = DIFFERENTIAL PRESSURE SENSOR
- EM = ENERGY METER
- FM = FLOW METER
- FS = FLOAT SWITCH OR FLOW SWITCH
- HL = HUMIDITY HIGH LIMIT SWITCH
- HS = HUMIDITY SENSOR
- OS = OCCUPANCY SENSOR
- PS = PRESSURE SENSOR
- R = RELAY
- ES = END SWITCH
- SD = DUCT SMOKE DETECTOR
- SCR = SILICON CONTROLLED RECTIFIER
- STR = STARTER
- TS = TEMPERATURE SENSOR
- VF = VARIABLE FLOW VALVE OR DAMPER
- VS = VELOCITY SENSOR
- VFD = VARIABLE SPEED DRIVE
- $ = OVERRIDE SWITCH
- FA = FIRE ALARM CONTACT
- FO = FAIL OPEN
- FC = FAIL CLOSED
- = THREE WAY CONTROL VALVE
- = TWO WAY CONTROL VALVE
- M = MOTOR
- AFMS = AIR FLOW MONITORING STATION
- = DAMPER
- = COOLING OR HEATING COIL
- TS = FREEZE STAT
- = FILTER
- = FAN
- = FAN
- = PUMP

CONTROLS SCOPE:

1. GENERAL PROJECT DESCRIPTION:

   A. THIS PROJECT CONSISTS OF A FULL REPLACEMENT OF THE ALLEN BUILDING CENTRAL HEATING AND COOLING PLANT LOCATED IN AND DIRECTLY OUTSIDE OF MECHANICAL ROOM 002 LOCATED ON THE GROUND FLOOR OF THE BUILDING. EXISTING HOT WATER AND CHILLED WATER PIPING MAINS FROM THE PLANT WILL BE DISCONNECTED FROM BUILDING DISTRIBUTION MAINS AT MECHANICAL ROOM 002 WALL. HEATING AND COOLING SYSTEM EQUIPMENT AND PIPING WITHIN MECHANICAL ROOM 002 WILL BE FULLY DEMOLISHED, INCLUDING STEAM TO HOT WATER EXCHANGER, DUPLEX STEAM CONDENSATE PUMP, CHILLED AND HOT WATER PUMPS, ASSOCIATED PIPING ACCESSORIES, AND AIR-COOLED CHILLER LOCATED OUTSIDE.

   B. EXISTING STEAM AND STEAM CONDENSATE SYSTEMS WILL BE DEMOLISHED THROUGHOUT THE ENTIRE BUILDING, COMPLETE WITH ASSOCIATED EQUIPMENT, PIPING AND ACCESSORIES.

   C. ALL EXISTING HVAC SYSTEMS IN THE BUILDING THAT ARE LOCATED OUTSIDE OF MECHANICAL ROOM 002 WILL REMAIN FOR CONTINUED SERVICE WITH THE EXCEPTION OF THE EXISTING STEAM SYSTEMS AND ITEMS SPECIFICALLY NOTED ON THE DEMOLITION DRAWINGS.

   D. NEW CHILLED WATER AND HEATING HOT WATER EQUIPMENT AND RELATED COMPONENTS WILL BE INSTALLED IN AND DIRECTLY OUTSIDE OF MECHANICAL ROOM 002. THE NEW CHW PLANT WILL CONSIST OF ONE AIR-COOLED CHILLER, TWO CHILLED WATER PUMPS, PIPING, ACCESSORIES, AND CONTROLS. THE NEW HW PLANT WILL CONSIST OF TWO GAS-FIRED BOILERS, PROPANE STORAGE SYSTEM WITH FUEL SUPPLY PIPING, TWO PRIMARY AND TWO SECONDARY PUMPS, PIPING, HYRDONIC ACCESSORIES, THREE HW UNIT HEATERS, AND HEATING SYSTEM CONTROLS. SUPPLY AND RETURN PIPING FROM THE NEW HOT AND CHILLED WATER SYSTEMS WILL BE CONNECTED TO THE EXISTING BUILDING CHILLED AND HOT WATER DISTRIBUTION MAINS IN THE CORRIDOR DIRECTLY OUTSIDE MECHANICAL ROOM 002.

   E. STEAM SYSTEM HEATING EQUIPMENT THAT WAS DEMOLISHED WILL BE REPLACED WITH TEMPORARY ELECTRIC HEATERS. THIS INCLUDES FIVE UNIT HEATERS AND ONE HEATING COIL LOCATED IN EXISTING OUTDOOR AIR UNIT, OAU-1. ELECTRIC HEATERS WILL BE REPLACED BY OTHERS AS PART OF THE FUTURE, PHASE 2 BUILDING RENOVATION PROJECT.

2. EXISTING BUILDING CONTROLS CONSIST OF OLDER GENERATION JCI METASYS COMPONENTS. FIELD LEVEL CONTROLLERS ARE LOCATED THROUGHOUT THE BUILDING, INCLUDING THE FOLLOWING:

   MECHANICAL ROOM 002 (METASYS DX-9100; SERVES CENTRAL PLANT)
   P.D. STORAGE 006 (METASYS DX-9100; SERVES EXISTING AHU-1), AND
   MECH RM 108 (METASYS FEC-2611; SERVES EXISTING OAU-1).

   EXISTING FIELD CONTROLLERS ARE INTEGRATED WITH THE CENTRAL CAMPUS JCI SYSTEM VIA A SUPERVISORY CONTROLLER (METASYS SNE10501) LOCATED IN MECHANICAL ROOM 002.

3. CONTROLS SERVING EXISTING-TO-REMAIN EQUIPMENT AND SYSTEMS SHALL REMAIN IN SERVICE. REFER TO M0.03 FOR CRITICAL SYSTEMS AND COMPONENTS REQUIRING CONTINUOUS OPERATION AT ALL TIMES.

4. A NEW BAS SYSTEM COMPLYING WITH SECTION 239000 REQUIREMENTS SHALL BE PROVIDED TO SERVE THE NEW CENTRAL PLANT SYSTEMS AND EQUIPMENT. THE NEW SYSTEM SHALL INCLUDE A NEW SUPERVISORY LEVEL NETWORK CONTROLLER TO REPLACE THE EXISTING SNE10501 CONTROLLER. ALL EXISTING BUILDING CONTROLS, INCLUDING FIELD CONTROLLERS, DEVICES, AND SENSORS SHALL BE RECONNECTED AND FULLY INTEGRATED WITH THE EXISTING CAMPUS NETWORK. THE BAS SHALL INCLUDE ALL REQUIRED SENSORS, DEVICES, FIELD CONTROLLERS AND PANELS, NETWORK CONTROLLERS AND SERVERS, INTEGRATION WITH ALL EXISTING BUILDING SENSORS, DEVICES, AND FIELD CONTROLLERS, INTEGRATION WITH THE CAMPUS FRONT END OPERATOR INTERFACE, SOFTWARE AND ANY OTHER HARDWARE OR SOFTWARE COMPONENTS FOR A FULLY FUNCTIONING BAS SYSTEM.

5. ALL COMMISSIONING AND FUNCTIONAL TESTING WITH THE UNIVERSITY COMMISSIONING TEAM SHALL BE INCLUDED IN THIS CONTRACT AND CONSIST OF ALL PROCEDURES OUTLINED IN THE COMMISSIONING PROCEDURES.

BAS CONTROL SYSTEM GENERAL NOTES

DESCRIPTION: OPEN ARCHITECTURE SYSTEM SHALL VIEW, MONITOR AND CONTROL BACNET PROTOCOL DEVICES OVER ETHERNET OR IP. REFER TO SECTION 239000 SPECIFICATIONS FOR DETAILED INFORMATION.

SET POINTS: ALL SET POINTS AND NUMERIC VALUES SHALL BE ADJUSTABLE.

TIME DELAYS: TIME DELAYS NOTED IN THE SEQUENCES OF OPERATION ARE INTENDED TO ALLOW FOR OTHER DEVICES TO ACT IN ADVANCE. FOR EXAMPLE, A FAN NOTED TO START ON A TIME DELAY IS WAITING FOR AN ASSOCIATED DAMPER TO OPEN. TIME DELAY DURATIONS SHALL BE DETERMINED WITH THE ENGINEER ONCE THE ACTUATORS HAVE BEEN SELECTED.

VARIABLE SPEED DRIVE OPERATION: WHEN A FAN OR PUMP IS STARTED, THE VARIABLE FREQUENCY DRIVE SHALL START AT MINIMUM SPEED AND SLOWLY INCREASE UNTIL REACHING THE REQUIRED SPEED TO SATISFY THE REFERENCE SIGNAL. STARTING AT FULL SPEED AND SLOWING TO MEET SET POINT IS NOT ACCEPTABLE.

EQUIPMENT WITH PACKAGED CONTROLS: HVAC EQUIPMENT THAT COMES EQUIPPED WITH FACTORY-INSTALLED PACKAGED CONTROLS SHALL COME WITH BACNET INTERFACE CARDS THAT ALLOW FULL VISIBILITY OF INTERNAL CONTROL AND MONITORING POINTS. THIS REQUIREMENT SHALL INCLUDE CHILLERS AND BOILERS. ELECTRICAL OR INDUSTRIAL EQUIPMENT THAT IS NOT AVAILABLE WITH A DIRECT BACNET INTERFACE SHALL BE MODBUS.

REGAIN POWER CONTROL: ENABLE CHILLER AND BOILER AUTOMATIC RESTART 5 MINUTES (ADJ.) AFTER RESUMPTION OF POWER FROM AN OUTAGE. AUTOMATICALLY RESTART ALL OTHER EQUIPMENT BASED ON THE OCCUPANCY SCHEDULE.

POWER SUPPLY: POWER TO THE BAS SYSTEM SHALL BE MAINTAINED BY UPS FOR A POWER LOSS DURATION OF UP TO 30 MINUTES.

SCHEDULING FUNCTIONS: PROVIDE A REAL TIME CLOCK AND SCHEDULE CONTROLLER WITH SUFFICIENT SCHEDULING CAPABILITY TO SCHEDULE ALL REQUIRED CONTROLLERS AND SEQUENCES. SET UP INITIAL OCCUPANCY AND SYSTEM CONTROL SCHEDULES IN COORDINATION WITH THE OWNER.

OCCUPANCY SCHEDULE: EACH TEMPERATURE CONTROL ZONE SHALL REFERENCE A USER-DEFINED AND USER-ADJUSTABLE SCHEDULE. MINIMUM OF 10 SCHEDULES SHALL BE AVAILABLE FOR CURRENT AND FUTURE USE. UNLESS OTHERWISE DIRECTED BY THE OWNER / ENGINEER, USE THE FOLLOWING PRELIMINARY SCHEDULE:

OCCUPIED:
MON. – SUN. 12:00 AM – 12:00 AM

SPACE SENSORS: ALL SPACE SENSORS SHALL BE COMBINATION TEMPERATURE / HUMIDITY SENSORS. ALL SPACE SENSORS SHALL BE EQUIPPED WITH SETPOINT ADJUSTMENT AND OVERRIDE PUSH BUTTON (ASSOCIATED SYSTEM SHALL OPERATE FOR 90 MINUTE PERIOD (ADJ.)). REFER TO PLANS FOR LOCATIONS OF STAINLESS STEEL FLAT PLATE SENSORS AND FLAT PLATE SENSORS WITH OVERRIDE.

AMBIENT CARBON DIOXIDE	CO2	AI	AMBIENT CARBON DIOXIDE (GLOBAL POINT)
OUTSIDE AIR TEMPERATURE	TS	AI	OA TEMPERATURE (GLOBAL POINT)
OUTSIDE AIR HUMIDITY	HS	AI	OA HUMIDITY (GLOBAL POINT)
LIGHTING CONTROL ZONES (RECONNECT TO EXISTING)	R	DO	ON/OFF (SCHEDULE/MONTH)
FIRE ALARM RELAY	R	DI	ALARM
PROPANE STORAGE TANK FILL LEVEL	R	AI	MONITOR AND ALARM
WATER METER (RECONNECT TO EXISTING METER)	R	DI	PULSE METER
ALLEN BLDG ELECTRIC METER CONNECTIONS (CONFIRM WITH OWNER AND RECONNECT ALL TO EXISTING)	R	-	ELECTRIC METER
CAMPUS SUBSTATION ELECTRIC METER INTERFACE (CONFIRM WITH OWNER AND RECONNECT ALL TO EXISTING)	R	-	ELECTRIC METER
DEMAND RESPONSE VENDOR ELECTRIC METER INTERFACE (CONFIRM WITH OWNER AND RECONNECT ALL TO EXISTING)	R	-	ELECTRIC METER
HEAT TRACE CURRENT FLOWING	R	DI	MONITOR
HEAT TRACE POWER ON	R	DI	ENABLE/DISABLE
HEAT TRACE FAULT	R	DI	ALARM
CAMPUS EMERGENCY OA INTAKE - CLOSE (RECONNECT TO EXISTING)	R	DO	ALARM
CAMPUS EMERGENCY OA INTAKE - RESET (RECONNECT TO EXISTING)	R	DO	ALARM

2

MISCELLANEOUS CONTROL POINTS

OA TEMPERATURE, HUMIDITY & CARBON DIOXIDE: PROVIDE BUILDING OUTDOOR AMBIENT REFERENCE SENSORS FOR TEMPERATURE, HUMIDITY AND CARBON DIOXIDE TO BE USED BY ALL HVAC BUILDING CONTROLLERS TO DETERMINE OUTSIDE AIR TEMPERATURE, HUMIDITY AND CARBON DIOXIDE LEVEL. COORDINATE SENSOR LOCATION WITH OWNER.

LIGHTING CONTROLS: RECONNECT ANY EXISTING LIGHTING CONTROL ZONES AND RELAYS. REFER TO 1/M0.03 FOR REQUIREMENTS FOR EXTERIOR LIGHTING RELAY PANEL 'FC'. CONFIRM DETAILED REQUIREMENTS WITH OWNER.

FIRE ALARM SYSTEM: BAS SHALL SEND THE APPROPRIATE HVAC SHUTDOWN SIGNALS IN THE EVENT THE FIRE ALARM PANEL IS IN ALARM.

PROPANE STORAGE TANK FILL LEVEL: PROVIDE PROPANE STORAGE TANK LEVEL SENSOR AT A MINIMUM OF ONE PROPANE TANK. COORDINATE INSTALLTION WITH OWNERS TANK SUPPLIER. MONITOR FILL LEVEL ON 15 MIN. (ADJ) INTERVALS AND ALARM BAS WHEN WHEN TANK LEVEL FALLS BELOW 25%. REFER TO CIVIL DRAWINGS FOR TANK FARM LOCATION.

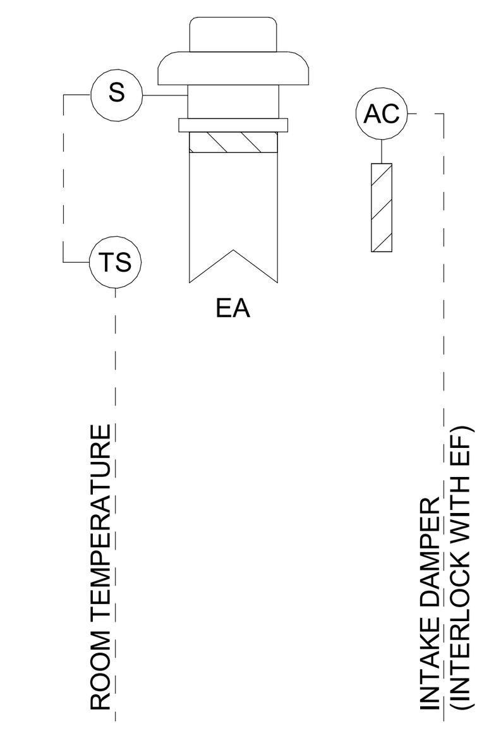
EXISTING DOMESTIC WATER METER: RECONNECT EXISTING DOMESTIC WATER METER IN MECHANICAL ROOM 002 TO THE BAS. REFER TO B/M1.12 FOR APPROXIMATE METER LOCATION.

EXISTING ELECTRIC METER DEMAND & CONSUMPTION: CONNECTIONS TO THE EXISTING ELECTRIC METER MUST BE MAINTAINED DURING CONSTRUCTION AND TRANSFERRED TO THE NEW BAS PRIOR TO PROJECT COMPLETION. THIS INCLUDES MONITORING AND CONTROL CONNECTIONS TO RADFORD CITY ELECTRIC SUBSTATION AS REQUIRED FOR THE ENERGY SAVINGS/DEMAND LIMITING CONTROLS ON CAMPUS. THE EXISTING CONNECTION TO THE DEMAND RESPONSE VENDOR (VOLTUS ENERGY) MUST ALSO BE MAINTAINED. THIS IS USED TO PROVIDE RADFORD UNIVERSITY DATA FOR DEMAND RESPONSE PARTICIPATION IN THE VIRGINIA ENERGY DEPARTMENT PROGRAM. FIELD VERIFY CONNECTION REQUIREMENTS SHOWN WITH OWNER. REFER TO CRITICAL SYSTEM NOTES AND PHOTOGRAPH ON DRAWING M0.03 FOR ADDITIONAL INFORMATION.

HEAT TRACE CONTROLS: BAS SHALL ALARM ON HEAT TRACE SYSTEM FAULT OR WHEN SYSTEM POWER IS TURNED OFF AND OUTSIDE AIR TEMPERATURE FALLS BELOW 45 DEF. F. HEAT TRACE OPERATION SHALL BE LOCKED OUT WHEN OUTDOOR AIR TEMPERATURE RISES ABOVE 40°F. REFER TO MECHANICAL DETAILS AND HEAT TRACING SPECIFICATION 230533.

CAMPUS OA INTAKE EMERGENCY CLOSURE/RESET SWITCH: BAS INTERFACE AND FUNCTIONALITY OF THE EMERGENCY OUTDOOR AIR INTAKE SHUTDOWN SWITCH LOCATED IN EMERGENCY COMMUNICATIONS 132 SHALL BE MAINTAINED DURING CONSTRUCTION AND TRANSFERRED TO THE NEW BAS PRIOR TO PROJECT COMPLETION. FIELD VERIFY CONNECTION REQUIREMENTS SHOWN WITH OWNER. REFER TO CRTICAL SYSTEMS REQUIREMENTS ON M0.03 FOR ADDITIONAL INFORMATION.

TREND LOGS: PROVIDE TREND LOGS FOR BOILER OPERATION, CHILLER OPERATION, PUMP OPERATION, AIR HANDLING UNIT OPERATION AND ENERGY RECOVERY UNIT OPERATION AT OWNER'S DISCRETION. COORDINATE WITH OWNER FOR EXACT REQUIREMENTS OF TREND LOG REQUIREMENTS.



THERMOSTAT OPERATION - NO BAS
(EF-1)

EXHAUST FAN CONTROL DIAGRAM

EXHAUST FAN CONTROL

THERMOSTAT FAN CONTROL: OPEN MOTOR-OPERATED INTAKE DAMPER (WHERE APPLICABLE) AND START FAN (TIME DELAY) BASED ON A RISE IN SPACE TEMPERATURE ABOVE THE SPACE TEMPERATURE SET POINT. STOP FAN AND CLOSE MOTOR-OPERATED INTAKE DAMPER (WHERE APPLICABLE) (TIME DELAY) WHEN SPACE TEMPERATURE DROPS 1F BELOW SET POINT.

SPACE SET POINTS:
MECHANICAL/ELECTRICAL ROOMS = 85F

HW UNIT HEATER CONTROL

GENERAL: PROVIDE UNIT-MOUNTED ADJUSTABLE THERMOSTAT. CYCLE FAN ON AND OPEN HW CONTROL VALVE TO MAINTAIN SETPOINT AS TEMPERATURE DROPS BELOW THERMOSTAT SETPOINT. PROVIDE AQUASTAT TO PREVENT FAN OPERATION IF HOT WATER SUPPLY DROPS BELOW 90F. DEENERGIZE FAN AND CLOSE HW VALVE WHEN OUTSIDE AIR TEMP RISES ABOVE 60F ADJUSTABLE

SPACE SET POINTS:
MECHANICAL/ELECTRICAL ROOMS = 60F
STAIRWELLS = 60F
STORAGE ROOMS = 60F

MONITOR AND TREND: SPACE TEMPERATURE (15 MINUTE INTERVALS)

ALARM BAS: SPACE TEMPERATURE FALLS 10F (ADJ.) BELOW SETPOINT.

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DEB APROVAL

Radford UNIVERSITY

ALLEN BUILDING ELECTRICAL REPLACEMENT

100% CONSTRUCTION DOCUMENTS

RADFORD, VIRGINA

SEAL

Signed by: Scott Davis
EC4DAD4049234A8...
COMMONWEALTH OF VIRGINIA
SCOTT W. DAVIS
Lic. No. 062725
PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/25	SWD	DEB CMNTS/ADD 3
1	10/24/25	SWD	DEB COMMENTS

DRAWN BY SMF
APPROVED BY SWD
CHECKED BY JMT
DATE JULY 25, 2025

TITLE
MECHANICAL CONTROLS

DEI PROJECT NO: 50188025
RADFORD PROJECT NO: 217-B5217-004

SHEET NO.
M7.01

12/3/2025 4:25:31 PM

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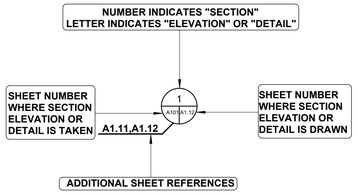
STANDARD DETAILING SYMBOLS



LEVEL NAME — FIRST FLOOR
LEVEL ELEVATION — 100' - 0"
LEVEL LINE

GRID NUMBER OR LETTER — A
GRID LINE

INDICATES PLAN NORTH
INDICATES TRUE NORTH
NORTH INDICATOR

ROOM NUMBER — Room Name 101
ROOM TAG

REVISION NUMBER — 1
REVISION TAG

REVISION CLOUD

PER SHEET KEYNOTE NUMBER — 1
KEYNOTE TAG

ELEVATION AT POINT INDICATED — 1' - 0"
SPOT ELEVATION SYMBOL

CONNECT NEW TO EXISTING

POINT OF DISCONNECTION

LINE TYPE INDICATES EXISTING

LINE TYPE INDICATES DEMOLITION

LINE TYPE INDICATES NEW/FUTURE

LINE TYPE INDICATES HIDDEN/UNDER OBSTRUCTION

DRAWING LIST - ELECTRICAL

DELEGATED DESIGN LIST:
AVAILABLE FAULT CURRENT STUDY (SPECIFCATION 260571)

POWER SYMBOLS

SYMBOL (CEILING MTD / NORMAL WALL MTD / EMERGENCY/CRITICAL / STUB UP / FLOOR MTD)	DESCRIPTION
	DUPLEX OUTLETS — SUBSCRIPTS: "AC" = ABOVE COUNTER; "G" = GROUND FAULT BREAKER; "GF" = GROUND FAULT; "WP" = WEATHERPROOF BOX; "WR" = WEATHER RESISTANT
J	JUNCTION BOX — SUBSCRIPTS: "P" = FURNITURE POWER CONNECTION; "T" = FURNITURE TELECOM CONNECTION
e	EQUIPMENT CONNECTION
$M	MANUAL MOTOR STARTER, FRACTIONAL HORSEPOWER (SEE STARTER SCHEDULE FOR SIZE, ETC.)
	NON-FUSIBLE SAFETY SWITCH (SEE DISCONNECT SCHEDULE FOR SIZE, ETC.)
	FUSIBLE SAFETY SWITCH (SEE DISCONNECT SCHEDULE FOR SIZE, ETC.)
	COMBINATION MOTOR STARTER/SAFETY SWITCH, ENCLOSED CIRCUIT BREAKER (SEE APPLICABLE SCHEDULES FOR SIZE, ETC.)
	VARIABLE FREQUENCY DRIVE (VFD) (SEE APPLICABLE SCHEDULE FOR SIZE, ETC.)
	DISCONNECT SWITCH (FURNISHED BY OTHERS)
	SURGE SUPPRESSOR
	GROUND BAR
POWER DISTRIBUTION	
	WALL MOUNTED PANEL
	UTILITY METER

CIRCUIT SYMBOLS

WIRES	DESCRIPTION
LC-1-1	HOME RUN. NUMERALS INDICATE PANELBOARD AND CIRCUIT NUMBERS.
	HOME RUN. MULTIPLE ARROWS INIDCATES NUMBER OF CIRCUITS INCLUDED IN CONDUIT (1, 2 OR 3).
	UNCONTROLLED/UNSWITCHED CIRCUIT
	INDICATES CIRCUIT CONTINUATION
	STUB INTO ACCESSIBLE CORRIDOR CEILING SPACE UNO
	CAP END OF CONDUIT
	INDICATES CONDUIT RISER UP
	INDICATES CONDUIT RISER DOWN
	CONDUIT SLEEVE

GENERAL NOTES - ELECTRICAL

GENERAL:

1. ELECTRICAL PLANS ARE GENERALLY DIAGRAMMATIC IN NATURE AND DO NOT CONVEY ALL DETAILS REQUIRED FOR A COMPLETE INSTALLATION. HOWEVER, THESE PLANS SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE FOR GENERAL ARRANGEMENT AND LOCATION OF EQUIPMENT. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS, DIMENSIONS AND MOUNTING METHODS. CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO COMMENCING WORK. CONTRACTOR SHALL VERIFY STRUCTURAL AND FINISH CONDITIONS PRIOR TO COMMENCING WORK. CONTRACTOR SHALL ARRANGE WORK TO MEET THESE CONDITIONS AND PROVIDE SUCH EQUIPMENT AND ACCESSORIES AS MAY BE REQUIRED. IN THE EVENT OF A CONFLICT, DEVIATION OR DISCREPENCY FOUND WITHIN THE PLANS OR SPECIFICATIONS, CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO ENGINEER OF RECORD FOR CLARIFICATION PRIOR TO COMMENCING WORK.
2. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, MANUFACTURERS' RECOMMENDED INSTALLATION PROCEDURES, THE AMERICANS WITH DISABILITIES ACT, ANSI A117.1, THE 2020 NATIONAL ELECTRICAL CODE, THE 2021 NATIONAL FIRE ALARM AND SIGNALING CODE, THE 2021 VIRGINIA UNIFORM STATEWIDE BUILDING CODE, THE 2019 RADFORD UNIVERSITY DESIGN AND CONSTRUCTION STANDARDS, AND THE CONSTRUCTION AND PROFESSIONAL SERVICES MANUAL, REV. 0 (03/17/2025).
3. AN ELECTRICAL FOREMAN SHALL BE ON-SITE, SUPERVISING ALL WORK PERFORMED.
4. CONTRACTOR SHALL COORDINATE WITH OWNER FOR ACCESS TO AREA OF WORK AND FOLLOW ALL OWNER ENVIRONMENTAL, HEALTH, SAFETY AND SECURITY PROTOCOLS.
5. ALL WORK SHALL BE PHASED IN ACCORDANCE WITH CONTRACT PLANS, SPECIFICATIONS AND OWNER'S REQUIREMENTS.
6. ALL MATERIALS AND EQUIPMENT FURNISHED FOR THIS PROJECT SHALL BE NEW AND SHALL BE LISTED AND LABELED BY A THIRD PARTY NATIONALLY RECOGNIZED TESTING LABORATORY AS REQUIRED AND PERMITTED BY AUTHORITIES HAVING JURISDICTION. WHERE MULTIPLE PIECES OF EQUIPMENT AND/OR A COMPONENTS ARE INSTALLED IN A COMMON ENCLOSURE, THE ENTIRE ASSEMBLY SHALL BE LISTED AND LABELED AS AN ASSEMBLY. MODIFICATIONS OR ADDITIONS TO EXISTING EQUIPMENT SHALL MATCH EXISTING TO MAINTAIN ANY ASSEMBLY LISTING.
7. CONTRACTOR SHALL COORDINATE LOCATIONS OF ALL FIRE AND/OR SMOKE RATED WALLS, BARRIERS, CEILINGS, FLOORS, PARTITIONS, AND ROOFS PRIOR TO AND DURING CONSTRUCTION.
8. CONTRACTOR SHALL PROVIDE NATIONALLY RECOGNIZED TESTING LABORATORY LISTED THROUGH-PENETRATION DRAFT, FIRE AND SMOKE STOP SYSTEMS FOR ALL NEW FIRE AND/OR SMOKE-RATED WALL, BARRIER, CEILING, FLOOR AND ROOF PENETRATIONS WITHIN THE AREA OF WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE, NATIONALLY RECOGNIZED TESTING LABORATORY LISTED REQUIREMENTS AND APPLICABLE BUILDING CODES. PROVIDE PENETRATION ASSEMBLIES SUITABLE FOR PARTICULAR CONSTRUCTION.
9. CONTRACTOR SHALL MAINTAIN INTEGRITY OF VAPOR BARRIER AND INSULATION FOR ALL ELECTRICAL WORK AND DEVICES ON EXTERIOR AND PERIMETER WALLS.
10. CONTRACTOR SHALL COORDINATE ELECTRICAL WORK WITH ALL OTHER TRADES PRIOR TO COMMENCING WORK TO ENSURE ELECTRICAL WORK DOES NOT INTERFERE WITH OTHER TRADES. LINES AND SYSTEMS THAT REQUIRE SLOPE SHALL TAKE PRECEDENCE OVER ELECTRICAL WORK.

LIGHTING SYMBOLS

SYMBOL	DESCRIPTION
NORMAL	T (BRACKET INDICATES WALL MOUNTED TYP.)
	SURFACE/RECESSED TROFFER LUMINAIRE
	DIRECT/INDIRECT PENDANT LUMINAIRE
	LINEAR WALL MOUNTED LUMINAIRE
	STRIP LUMINAIRE - SIZE AND TYPE AS SHOWN
	WALL SCONCE LUMINAIRE
	CEILING MOUNTED EXIT SIGN FACES AND CHEVRONS AS SHOWN
	CEILING MOUNTED COMBINATION EXIT SIGN AND EMERGENCY LIGHT - FACES AND CHEVRONS AS SHOWN
	WALL MOUNTED EXIT SIGNS FACES AND CHEVRONS AS SHOWN
	WALL MOUNTED COMBINATION EXIT SIGN AND EMERGENCY LIGHT - FACES AND CHEVRONS AS SHOWN
	WALL MOUNTED EMERGENCY LUMINARE
$	SWITCH — SUBSCRIPTS: "a" = SWITCHED CIRCUIT; "2" = 2 POLE; "3" = 3-WAY; "4" = 4-WAY; "D" = DIMMER; "E" = UL924 DEVICE; "K" = KEY OPERATED; "LV" = LOW VOLTAGE; "OS" = OCCUPANCY SENSOR, SINGLE RELAY; "OS2" = OCCUPANCY SENSOR, DUAL RELAY; "OSD" = OCCUPANCY SENSOR, DIMMER; "P" = PILOT LIGHT; "PH" = PHOTOCELL; "RO" = RELAY OVERRIDE; "T" = TIMER; "VS" = VACANCY SENSOR, SINGLE RELAY; "VS2" = VACANCY SENSOR, DUAL RELAY; "VSD" = VACANCY SENSOR, DIMMER; "WP" = WEATHERPROOF
	OCCUPANCY SENSORS
	OCCUPANCY SENSORS (LONG RANGE)
	DAYLIGHT SENSORS
	PHOTOCELL
LC-1	LIGHTING CONTROL PANEL, SURFACE - TYPE (CONTACTOR, RELAY, ROOM CONTROLLER, ETC.) AS SHOWN
LC-1	LIGHTING CONTROL PANEL, RECESSED - TYPE (CONTACTOR, RELAY, ROOM CONTROLLER, ETC.) AS SHOWN

GENERAL NOTES - ELECTRICAL

GENERAL CONTINUED:

11. CONTRACTOR SHALL REFER TO MECHANICAL FOR LOCATIONS OF MECHANICAL EQUIPMENT. CONTRACTOR SHALL REFER TO DRAWINGS OF OTHER TRADES FOR LOCATIONS OF THEIR EQUIPMENT. CONTRACTOR SHALL COORDINATE AND VERIFY ELECTRICAL REQUIREMENTS WITH OTHER TRADES PRIOR TO COMMENCING WORK.
12. PRIOR TO EQUIPMENT INSTALLATION, CONTRACTOR SHALL CONDUCT FIELD MEASUREMENTS TO ENSURE ALL ELECTRICAL EQUIPMENT AND ACCESSORIES WILL FIT INTO LOCATION(S) AS INDICATED ON PLANS. IN THE EVENT OF A CONFLICT, DEVIATION OR DISCREPENCY, CONTRACTOR SHALL PROVIDE A PROPOSED SKETCH OF REVISED ARRANGEMENT TO ENGINEER OF RECORD FOR ACCEPTANCE PRIOR TO COMMENCING WORK.
13. PROPERLY SUPPORT ALL WORK AND EQUIPMENT INSTALLED UNDER THIS CONTRACT PLUMB AND PARALLEL WITH BUILDING LINES. STUDY ALL GENERAL, STRUCTURAL, PLUMBING, HVAC, AND ELECTRICAL DRAWINGS, SHOP DRAWINGS, AND CATALOG DATA TO DETERMINE HOW EQUIPMENT, ACCESSORIES, PIPING, FIXTURES, AND RELATED ITEMS ARE TO BE SUPPORTED, MOUNTED, OR SUSPENDED. PROVIDE ALL BOLTS, INSERTS, PIPE STANDS, BRACKETS, STRUCTURAL SUPPORTS, AND ACCESSORIES FOR PROPER SUPPORT OF EQUIPMENT FURNISHED UNDER THIS CONTRACT.
14. CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORT FOR DEVICE BACK BOXES, EQUIPMENT, LUMINAIRES AND RACEWAY WHERE BUILDING CONSTRUCTION IS NOT SUITABLE FOR DIRECT MOUNTING.
15. CONTRACTOR SHALL VERIFY CEILING SYSTEMS AND PROVIDE MOUNTING ACCESSORIES, TRIMS AND ALL REQUIRED MOUNTING HARDWARE TO SUIT THE PARTICULAR INSTALLATION.
16. CONTRACTOR SHALL NOT BACKFILL EXCAVATIONS, INSTALL COVERPLATES AND ENCLOSURES OR GENERALLY SEAL OR OBSCURE ELECTRICAL INSTALLATIONS PRIOR TO INSPECTION AND ACCEPTANCE BY VIRGINIA DIVISION OF ENGINEERING & BUILDINGS (DEB).
17. CONTRACTOR SHALL REMOVE ALL DIRT AND DEBRIS FROM ALL ELECTRICAL ENCLOSURES AND DEVICE, JUNCTION AND PULL BOXES PRIOR TO INSTALLATION OF DEVICES, COVERPLATES AND LIDS.
18. CONTRACTOR SHALL LABEL ALL COVERPLATES, EQUIPMENT, JUNCTION BOXES, AND PULL BOXES WITH CIRCUIT AND PANEL DESIGNATIONS. REFER TO DETAILS AND SPECIFICATIONS FOR SPECIFIC LABEL AND IDENTIFICATION REQUIREMENTS.
19. CONTRACTOR SHALL PROVIDE NEW, TWO COLUMN, TYPED, COMPLETED AND REMOVABLE DIRECTORIES INDICATING CIRCUIT DESCRIPTIONS AND ROOM NUMBERS (AS INDICATED BY FINAL ROOM SIGNAGE), FOR ALL AFFECTED CIRCUITS WITHIN ELECTRICAL DISTRIBUTION EQUIPMENT. ALL SPACES SHALL BE INDICATED AS SUCH. ALL SPARES SHALL BE INDICATED AS SUCH AND PLACED IN THE "OFF" POSITION.
20. MINIMUM RACEWAY SIZE OF 3/4", UNLESS NOTED OTHERWISE.
21. ALL RACEWAYS SHALL BE INSTALLED CONCEALED ABOVE CEILINGS, WITHIN WALLS OR BELOW FLOORS EXCEPT WITHIN UNFINISHED SPACES AND ON CEILINGS OF AREAS WITH EXPOSED STRUCTURE. WITHIN PUBLIC SPACES, EXPOSED CONDUIT SHALL BE FACTORY OR FIELD PAINTED TO MATCH ADJACENT STRUCTURE. ALL CONDUITS SHALL BE ROUTED PARALLEL OR PERPENDICULAR TO BUILDING STRUCTURE. ALL CONDUITS ROUTED IN PARALLEL SHALL UTILIZE CONCENTRIC BEND RADII FOR ALL TURNS.
22. ALL EMPTY RACEWAYS SHALL BE PROVIDED WITH PULL STRINGS INSTALLED PER SPECIFICATIONS.
23. ALL EXPOSED RACEWAY ENDS SHALL BE PROVIDED WITH PLASTIC BUSHINGS.
24. ALL ELECTRICAL CONDUCTORS, EQUIPMENT AND TERMINALS SHALL BE 75°C RATED UNLESS NOTED OTHERWISE.
25. MINIMUM CONDUCTOR SIZE OF #12AWG, COPPER, THHN/THWN, FOR BRANCH CIRCUITS, UNLESS NOTED OTHERWISE.
26. BRANCH CIRCUIT WIRE AND CONDUIT SIZES CAN BE FOUND IN THE PANEL SCHEDULES. BRANCH CIRCUITS SHALL BE 2#12 & 1#12G IN 3/4"C UNLESS NOTED OTHERWISE.
27. ALL BRANCH AND FEEDER CIRCUITS SHALL ORIGINATE FROM PANELS AND SERVE DEVICES AND EQUIPMENT AS INDICATED ON PLANS AND SCHEDULES. IN THE EVENT OF A CONFLICT, DEVIATION OR DISCREPENCY, CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO ENGINEER OF RECORD FOR CLARIFICATION PRIOR TO COMMENCING WORK.
28. ALL BRANCH CIRCUITS SHALL HAVE A DEDICATED NEUTRAL CONDUCTOR, UNLESS NOTED OTHERWISE. THE USE OF A COMMON NEUTRAL FOR MULTIPLE BRANCH CIRCUITS IS STRICTLY PROHIBITED.
29. ALL RACEWAYS CONTAINING A FEEDER OR BRANCH CIRCUIT SHALL BE PROVIDED WITH AN INSULATED EQUIPMENT GROUNDING CONDUCTOR. FOR RACEWAYS CONTAINING MORE THAN ONE BRANCH CIRCUIT, SIZE OF EQUIPMENT GROUNDING CONDUCTOR SHALL BE BASED ON THE LARGEST CIRCUIT'S OVERCURRENT PROTECTIVE DEVICE.
30. ALL DEVICE BACK BOXES SHALL BE RECESSED WITHIN WALLS, FURRING, OR CASEWORK, UNLESS NOTED OTHERWISE. USE OF EXPOSED SURFACE MOUNTED DEVICE BACK BOXES IS PROHIBITED EXCEPT WITHIN UNFINISHED SPACES AND ON CEILINGS OF AREAS WITH EXPOSED STRUCTURE. WITHIN PUBLIC SPACES, EXPOSED DEVICE BACK BOXES SHALL BE FACTORY OR FIELD PAINTED TO MATCH ADJACENT STRUCTURE.
31. DEVICE BACK BOXES INDICATED ON PLANS AS ADJACENT TO ONE ANOTHER SHALL BE MOUNTED 8" APART, CENTER-TO-CENTER, UNLESS NOTED OTHERWISE.
32. DEVICE BACK BOXES LOCATED ON OPPOSITE SIDES OF FIRE OR SMOKE RATED PARTITIONS SHALL NOT BE MOUNTED WITHIN THE SAME WALL CAVITY. WALL PENETRATIONS SHALL BE SEPARATED BY MOUNTING BOXES ON OPPOSITE SIDES OF WALL STUDS OR OTHER VERTICAL STRUCTURAL MEMBER INSIDE THE WALL.
33. NOT USED.
34. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL DEVICE BACK BOX AND EQUIPMENT LOCATIONS WITH OTHER TRADES PRIOR TO INSTALLATION. IN THE EVENT OF A CONFLICT, DEVIATION OR DISCREPENCY, CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO ENGINEER OF RECORD FOR CLARIFICATION PRIOR TO COMMENCING WORK. MINOR ADJUSTMENTS IN ANY DIRECTION FOR DEVICE LOCATION, I.E. 5'-0" OR LESS, SHALL BE MADE AT NO ADDITIONAL COST TO THE OWNER.
35. NOT USED.
36. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLANS FOR THE EXACT LOCATION OF ALL CEILING MOUNTED LUMINAIRES AND DEVICES.
37. EXACT HEIGHTS AND LOCATIONS OF LUMINAIRES WITHIN UNFINISHED SPACES SHALL BE COORDINATED AND DETERMINED IN THE FIELD. LUMINAIRES SHALL NOT BE SUPPORTED FROM DUCTWORK OR PIPING. CHAIN OR TRAPEZE-TYPE HANGERS SHALL BE PROVIDED WHERE LUMINAIRES CAN NOT BE MOUNTED DIRECTLY TO STRUCTURE OR CEILING. LUMINAIRES SHALL BE LOCATED TO MAXIMIZE ACCESSIBILITY AND ILLUMINATION.
38. ORIENT VERTICALLY MOUNTED RECEPTACLES WITH GROUND PIN UP. ORIENT HORIZONTALLY MOUNTED RECEPTACLES WITH GROUND PIN TO LEFT (NEUTRAL UP).
39. NOT USED.

GENERAL NOTES - ELECTRICAL

DEMOLITION:

1. DEMOLITION WORK SHOWN BOLD AND DASHED. EXISTING TO REMAIN WORK SHOWN LIGHT AND CONTINUOUS.
2. ALL ELECTRICAL DEVICES AND CIRCUITS SCHEDULED FOR DEMOLITION, INCLUDING ALL ASSOCIATED CONDUIT, WIRING, SUPPORTS AND OTHER HARDWARE, SHALL BE REMOVED BACK TO SOURCE, UNLESS NOTED OTHERWISE.
3. CONTRACTOR SHALL PROTECT, PRESERVE AND MAINTAIN ANY DEVICES TO BE REUSED OR RELOCATED AND SHALL REINSTALL WHERE INDICATED ON PLANS.
4. EXCEPT WHERE NOTED OTHERWISE, ALL REMOVED ELECTRICAL EQUIPMENT, DEVICES, CONDUIT, CONDUCTORS, BOXES, LUMINAIRES AND ASSOCIATED ITEMS SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE CODES AND REGULATIONS.
5. CONTRACTOR SHALL DISCONNECT AND REMOVE ALL ELECTRICAL CONNECTIONS TO EQUIPMENT FROM OTHER TRADES BEING REMOVED WITHIN AREA OF WORK. COORDINATE WITH OTHER TRADE CONTRACTORS PRIOR TO DEMOLITION.
6. PRIOR TO REMOVAL OF CIRCUIT FROM A PANEL, CONTRACTOR SHALL VERIFY NO OTHER DEVICES EXIST ON THE CIRCUIT. IN THE EVENT OF A CONFLICT, DEVIATION OR DISCREPENCY, CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO ENGINEER OF RECORD FOR CLARIFICATION PRIOR TO REMOVAL.
7. ONCE A CIRCUIT HAS BEEN REMOVED, THE REMAINING BREAKER SHALL BE LABELED SPARE, TURNED OFF, AND MADE READY FOR USE UNDER NEW WORK.
8. RADFORD UNIVERSITY SHALL HAVE THE FIRST RIGHTS OF SALVAGE FOR ALL DEMOLISHED EQUIPMENT. COORDINATE WITH RADFORD PLANNING AND CONSTRUCTION PRIOR TO ANY EQUIPMENT DISPOSAL.

GENERAL NOTES - ELECTRICAL

RENOVATION:

1. NEW WORK SHOWN BOLD AND CONTINUOUS. EXISTING TO REMAIN WORK SHOWN LIGHT AND CONTINUOUS.
2. NOT ALL ELECTRICAL DEVICES AND EQUIPMENT ARE SHOWN. LOCATIONS AND ASSOCIATED CIRCUITS OF EXISTING DEVICES AND EQUIPMENT SHOWN ARE BASED IN PART UPON PREVIOUS DRAWINGS, FIELD OBSERVATIONS AND INFORMATION FURNISHED BY OTHERS AND SHALL BE CONSIDERED APPROXIMATE. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
3. ALL EXISTING DEVICES AND EQUIPMENT SHALL REMAIN IN PLACE AND OPERATIONAL UNLESS NOTED OTHERWISE.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUITY OF ALL EXISTING CIRCUITS AND SYSTEMS TO REMAINING DEVICES AND EQUIPMENT WHICH MAY BE AFFECTED BY AREA OF WORK. MATCH AND EXTEND CONDUIT, CONDUCTORS, CABLES, ETC. AS NECESSARY TO MAINTAIN CIRCUIT INTEGRITY.
5. ALL EXISTING RACEWAY AND WIRING THAT ARE TO REMAIN IN THE AREA OF WORK SHALL BE RELOCATED AS REQUIRED TO PROVIDE OR MAINTAIN ACCESSIBILITY AND TO ACCOMMODATE THE PROPOSED CONSTRUCTION. CONTRACTOR SHALL FIELD VERIFY ALL RACEWAY AND WIRING TO REMAIN PRIOR TO COMMENCING WORK. ALL RELOCATION SHALL BE COORDINATED WITH THE OWNER OR OWNER'S REPRESENTATIVE. PROVIDE TEMPORARY CONNECTIONS TO EQUIPMENT AND DEVICES TO MAINTAIN EQUIPMENT AND SYSTEMS IN SERVICE. ALL DOWNTIME REQUIRED FOR INSTALLATION OF TEMPORARY CONNECTIONS SHALL BE COORDINATED WITH THE OWNER OR OWNER'S REPRESENTATIVE.
6. IN AREAS WHERE EXISTING CEILINGS ARE NOT SLATED TO BE REPLACED, CONTRACTOR SHALL WORK THROUGH EXISTING CEILINGS. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR AREA OF WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING AND REPLACING CEILING SYSTEM DAMAGED AS A RESULT OF THEIR WORK.
7. CONTRACTOR SHALL COORDINATE POWER SHUTDOWN REQUIREMENTS WITH OWNER OR OWNER'S REPRESENTATIVE AT LEAST 14 DAYS IN ADVANCE OF DEMOLITION AND/OR TIE-IN WORK. SHUTDOWN WORK SHALL BE MINIMIZED TO AVOID INTERFERENCE WITH OWNER'S NORMAL OPERATING SCHEDULE.
8. CONTRACTOR SHALL VERIFY NO DEVICES OR EQUIPMENT ARE SERVED BY BREAKERS CURRENTLY LABELED "SPARE" TO BE UTILIZED FOR NEW WORK WITHIN AFFECTED ELECTRICAL DISTRIBUTION EQUIPMENT. IN THE EVENT OF A CONFLICT, DEVIATION OR DISCREPANCY, CONTRACTOR SHALL TRACE AND IDENTIFY SUSPECT LOAD(S) AND PROVIDE WRITTEN NOTIFICATION TO ENGINEER OF RECORD FOR CLARIFICATION PRIOR TO COMMENCING WORK.

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DEB APROVAL

Radford University
ALLEN BUILDING
ELECTRICAL
REPLACEMENT
100% CONSTRUCTION DOCUMENTS
RADFORD, VIRGINIA

SEAL

Signed by: Tyler Winokur
TYLER WINOKUR
Lic. No. 065927
PROFESSIONAL ENGINEER
COMMONWEALTH OF VIRGINIA
12/5/2025

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/25		DEB CMNTS/ADD 3
1	10/24/25		DEB COMMENTS

DRAWN BY	TLW
APPROVED BY	TLW
CHECKED BY	POA
DATE	JULY 25, 2025

TITLE
ELECTRICAL SYMBOLS & ABBREVIATIONS

DEI PROJECT NO:	50188025
RADFORD PROJECT NO:	217-B5217-004

SHEET NO.
E0.01

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(1) GROUND POWER PLAN

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

0' 2' 4' 8'

KEY NOTES

GENERAL NOTES:

1. REFER TO E0.01 FOR ADDITIONAL NOTES.
2. COORDINATE CONNECTION OF ALL MECHANICAL EQUIPMENT WITH DIVISION 23 CONTRACTOR.
3. REFER TO MECHANICAL SHEET M0.03 FOR PHOTO OF EXISITNG CONDITIONS OF PLAN SOUTHEAST CORNER IN MECHANICAL ROOM 003 FOR CLARITY. EQUIPMENT IN THIS LOCATION IS "STACKED" WITH RELAY PANEL 'FC' BEING LOCATED HIGH AT THE CEILING.
4. (2) PROVIDE LISTED FIRESTOP SYSTEMS AT PENETRATIONS FO LIFE-SAFETY RATED ASSEMBLIES REQUIRED FOR THE WORK. REFERENCE SECTION 078413 "THROUGH PENETRATION FIRESTOP SYSTEMS" FOR REQUIREMENTS AND THE UL DESIGN APPENDIX IN THE PROJECT MANUAL FOR FIRESTOP SYSTEM DETAILS.

WALL RATING LEGEND	
—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

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ALLEN BUILDING ELECTRICAL REPLACEMENT

100% CONSTRUCTION DOCUMENTS

RADFORD, VIRGINA

SEAL

Signed by: Tyler Winokur D0B46442625D42E...
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TYLER WINOKUR
Lic. No. 065927
PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE:

REVISIONS

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1	10/24/25		DEB COMMENTS

DRAWN BY	TLW
APPROVED BY	TLW
CHECKED BY	POA
DATE	JULY 25, 2025

TITLE
GROUND POWER PLAN

DEI PROJECT NO: 50188025
RADFORD PROJECT NO: 217-B5217-004

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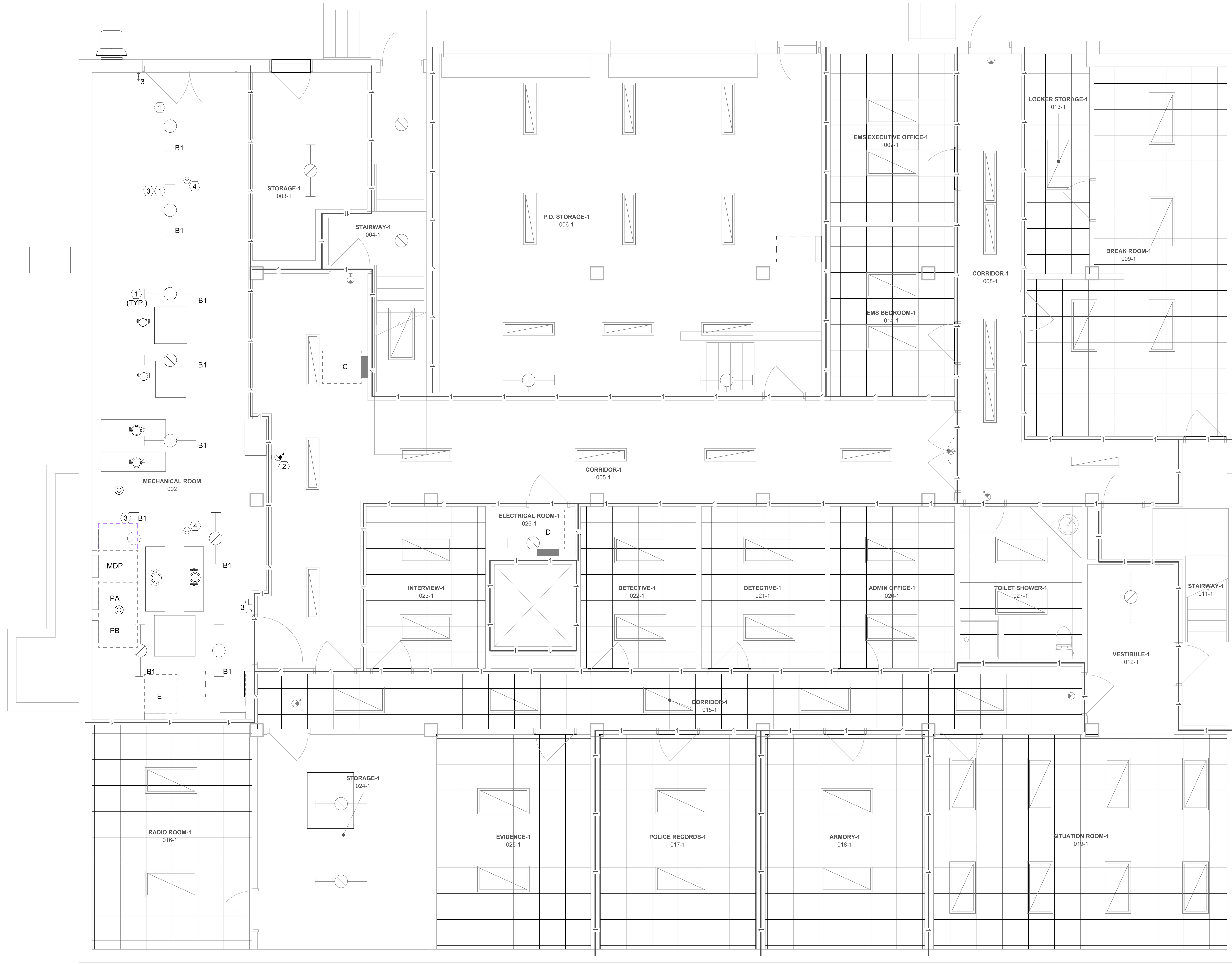

1 GROUND LIGHTING PLAN

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

0' 2' 4' 8'

GENERAL NOTES:

1. REFER TO E0.01 FOR ADDITIONAL NOTES.
2. ~~REFER TO FIXTURE SCHEDULE FOR FURTHER INFORMATION.~~
3. PROVIDE LISTED FIRESTOP SYSTEMS AT PENETRATIONS FOR LIFE-SAFETY RATED ASSEMBLIES REQUIRED FOR THE WORK. REFERENCE SECTION 078413 "THROUGH PENETRATION FIRESTOP SYSTEMS" FOR REQUIREMENTS AND THE UL DESIGN APPENDIX IN THE PROJECT MANUAL FOR FIRESTOP SYSTEM DETAILS. (2)

KEY NOTES

1. CONTRACTOR SHALL PROVIDE NEW FIXTURE AS SHOWN. MODIFY AND EXTEND SWITCHED CIRCUIT RETAINED DURING DEMOLITION TO NEW FIXUTRE. CONNECT TO EXISTING BRANCH CIRCUIT SERVING THIS AREA.
2. CONTRACTOR SHALL REINSTALL DEVICE RETAINED DURING DEMOLITION. MODIFY AND EXTEND CIRCUIT AS REQUIRED FOR NEW LOCATION. PRIOR TO RE-INSTALLATION, CONTRACTOR SHALL WIPE DOWN AND CLEAN DEVICE.
3. FIXTURE TO BE WIRED AS NIGHT LIGHT. CONTRACTOR SHALL CONNECT FIXTURE AHEAD OF SWITCHED LEG.
4. CONTRACTOR SHALL PROVIDE OCCUPANCY SENSOR AS SHOWN. OCCUPANCY SENSOR SHALL CONTROL NIGHT LIGHT FIXTURES IN THIS SPACE. FIXTURES SHALL TURN OFF IF SPACE IS EMPTY AND NO MOTION IS DETECTED AFTER A PERIOD OF 30 MINUTES. UPON DETECTION OF MOTION OCCUPANCY SENSOR SHALL BRING NIGHT LIGHT FIXTURE TO FULL BRIGHTNESS.

WALL RATING LEGEND	
—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

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RADFORD, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TYLER WINOKUR
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PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/25		DEB CMNTS/ADD 3
1	10/24/25		DEB COMMENTS

DRAWN BY	TLW
APPROVED BY	TLW
CHECKED BY	POA
DATE	JULY 25, 2025

TITLE

GROUND LIGHTING PLAN

DEI PROJECT NO: 50188025
RADFORD PROJECT NO: 217-B5217-004

SHEET NO.

E1.12

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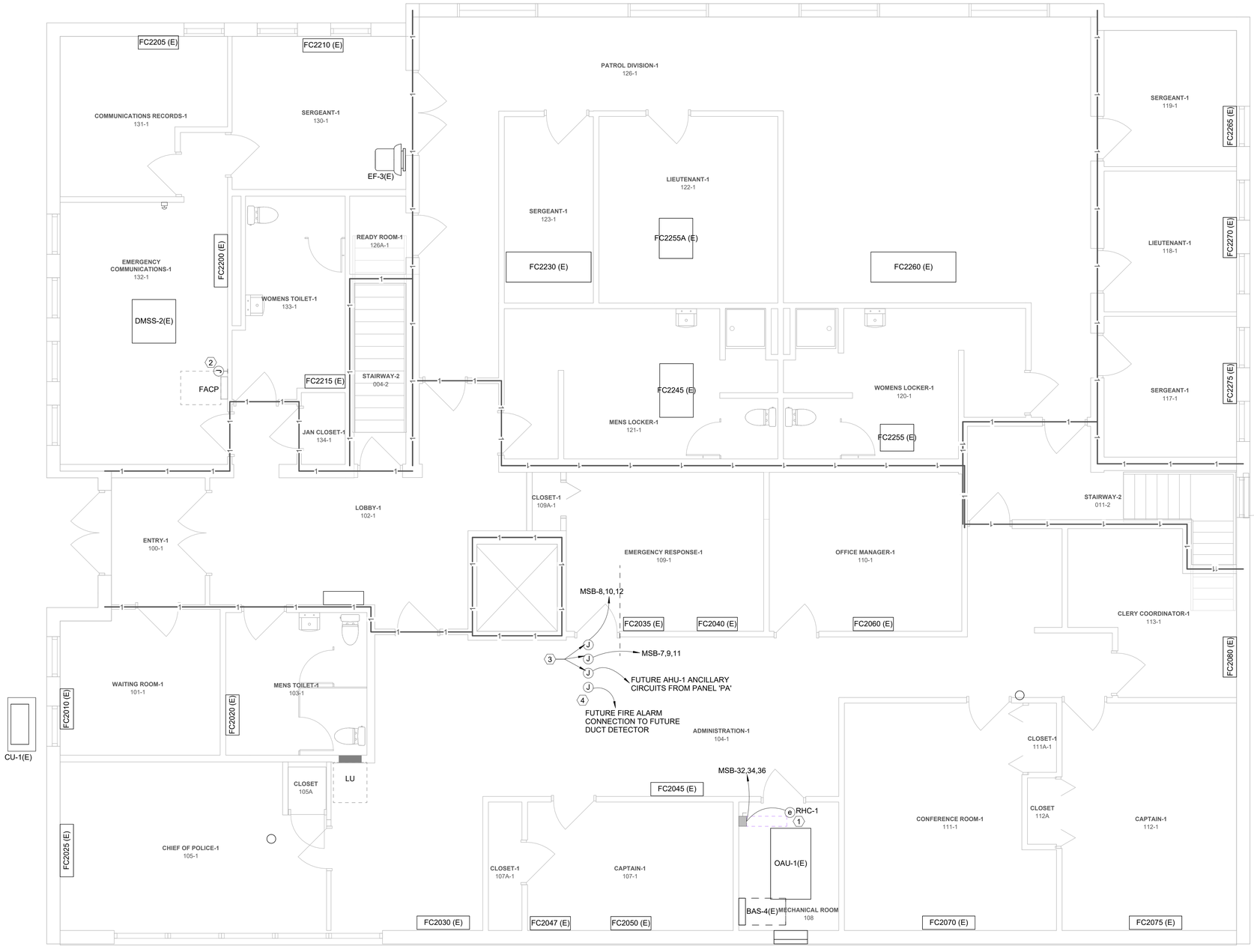

1 FIRST FLOOR POWER PLAN

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

0' 2' 4' 8'

GENERAL NOTES:

1. REFER TO E0.01 FOR ADDITIONAL NOTES.
2. COORDINATE CONNECTION OF ALL MECHANICAL EQUIPMENT WITH DIVISION 23 CONTRACTOR.
3. PROVIDE LISTED FIRESTOP SYSTEMS AT PENETRATIONS FOR LIFE-SAFETY RATED ASSEMBLIES REQUIRED FOR THE WORK. REFERENCE SECTION 07843 "THROUGH-PENETRATION FIRESTOP SYSTEMS" FOR REQUIREMENTS AND THE UL DESIGN APPENDIX IN THE PROJECT MANUAL FOR FIRESTOP SYSTEM DETAILS.

KEY NOTES

1 CONTRACTOR SHALL COORDINATE RHC-1 ELECTRICAL CONNECTION WITH DIVISION 23 CONTRACTOR. REFER TO PANEL SCHEDULE FOR FURTHER INFORMATION. REFER TO MECHANICAL FIRST FLOOR NEW WORK PLAN AND MECHANICAL SCHEDULE FOR FURTHER INFORMATION.

2 CONTRACTOR SHALL PROVIDE JUNCTION BOX ABOVE CEILING ADJACENT TO FACP FOR FUTURE AHU-1 DUCT DETECTOR CONNECTION.

3 CONTRACTOR SHALL PROVIDE JUNCTION BOX ABOVE CEILING TO STUB FUTURE AHU-1 FEEDER CONDUIT INTO. CLEARLY LABEL JUNCTION BOXES FOR FUTURE AHU-1 USE. REFER TO RISER DIAGRAM FOR FURTHER DETAILS.

4 CONTRACTOR SHALL PROVIDE NEW FIRE ALARM WIRING AND CONDUIT FROM NEW JUNCTION BOX ADJACENT TO EXISTING FACP TO NEW JUNCTION BOX ABOVE CEILING FOR FUTURE AHU-1 DUCT DETECTOR. FACP IS LOCATED ON FIRST FLOOR ROOM 132. CLEARLY LABEL JUNCTION BOX AS FUTURE AHU-1 FIRE ALARM.

WALL RATING LEGEND

—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

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SEAL

Signed by: Tyler Winokur
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PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
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1	10/24/25		DEB COMMENTS

DRAWN BY	TLW
APPROVED BY	TLW
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TITLE
FIRST FLOOR POWER PLAN

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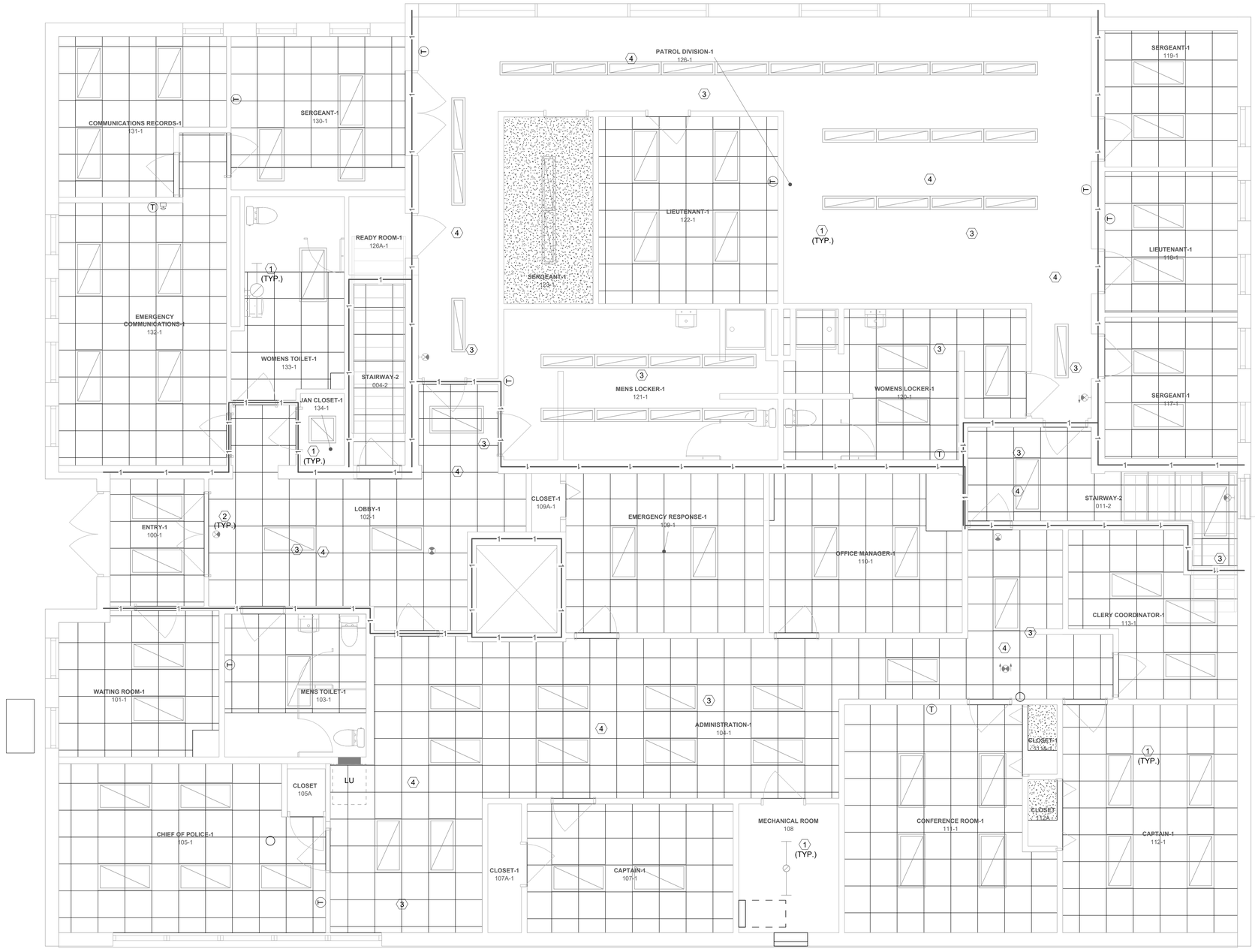

1 FIRST FLOOR LIGHTING PLAN

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

0' 2' 4' 8'

GENERAL NOTES:

1. REFER TO E-001 FOR ADDITIONAL NOTES.
2. REFER TO FIXTURE SCHEDULE FOR FURTHER INFORMATION.
3. PROVIDE LISTED FIRESTOP SYSTEMS AT PENETRATIONS FOR LIFE-SAFETY RATED ASSEMBLIES REQUIRED FOR THE WORK. REFERENCE SECTION 078413 "THROUGH PENETRATION FIRESTOP SYSTEMS" FOR REQUIREMENTS AND THE UL DESIGN APPENDIX IN THE PROJECT MANUAL FOR FIRESTOP SYSTEM DETAILS.

KEY NOTES

1 CONTRACTOR SHALL PROVIDE NEW FIXTURE AS SHOWN. MODIFY AND EXTEND SWITCHED CIRCUIT RETAINED DURING DEMOLITION TO NEW FIXTURE. CONNECT TO EXISTING BRANCH CIRCUIT SERVING THIS AREA.

2 CONTRACTOR SHALL PROVIDE NEW EXIT SIGN AS SHOWN. MODIFY AND EXTEND BRANCH CIRCUIT WIRING AND CONDUIT RETAINED DURING DEMOLITION TO NEW EXIT SIGN.

3 FIXTURE TO BE WIRED AS NIGHT LIGHT. CONTRACTOR SHALL CONNECT FIXTURE AHEAD OF SWITCHED LEG.

4 CONTRACTOR SHALL PROVIDE OCCUPANCY SENSOR AS SHOWN. OCCUPANCY SENSOR SHALL CONTROL NIGHT LIGHT FIXTURES IN THIS SPACE. FIXTURES SHALL TURN OFF IF SPACE IS EMPTY AND NO MOTION IS DETECTED AFTER A PERIOD OF 30 MINUTES. UPON DETECTION OF MOTION OCCUPANCY SENSOR SHALL BRING NIGHT LIGHT FIXTURE TO FULL BRIGHTNESS.

WALL RATING LEGEND	
—1—1—	1-HR FIRE RATED WALL
—2—2—	2-HR FIRE WALL
—SB—SB—	SMOKE PARTITIONS

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SEAL

Signed by: COMMONWEALTH OF VIRGINIA
Tyler Winokur
TYLER WINOKUR
Lic. No. 065927
PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/25		DEB CMNTS/ADD 3
1	10/24/25		DEB COMMENTS

DRAWN BY	TLW
APPROVED BY	TLW
CHECKED BY	POA
DATE	JULY 25, 2025

TITLE
FIRST FLOOR LIGHTING PLAN

DEI PROJECT NO:	50188025
RADFORD PROJECT NO:	217-B5217-004

SHEET NO.
E1.22

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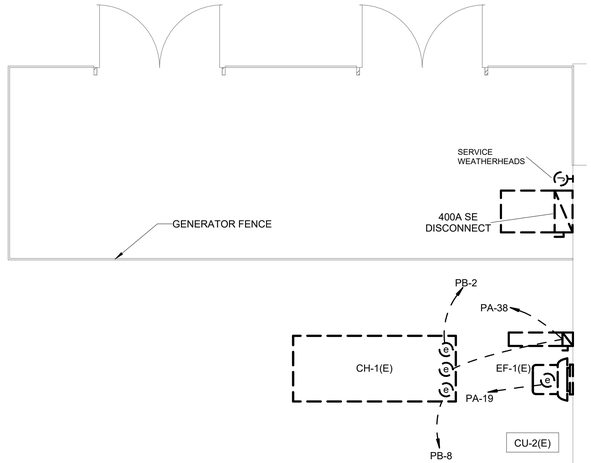
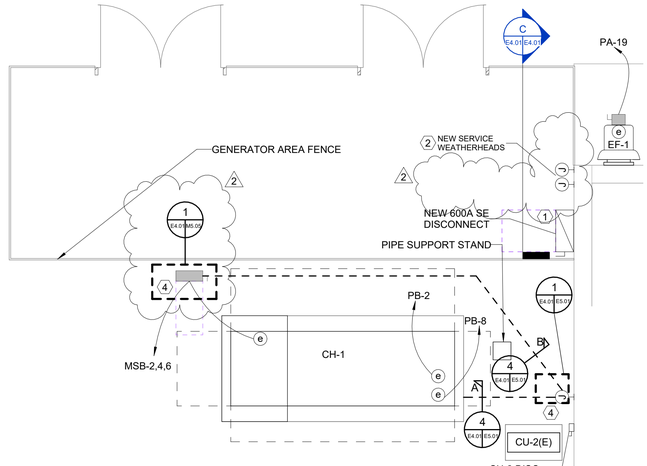
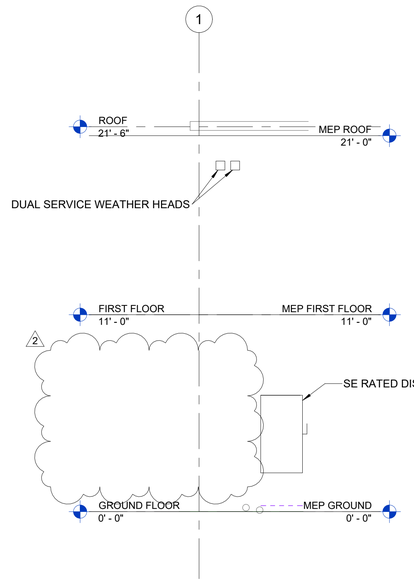


A ELECTRICAL DEMOLITION PLAN AT CHILLER AREA
Scale: 1/4" = 1'-0"
0' 2' 4' 8'



B ELECTRICAL PLAN AT CHILLER AREA
Scale: 1/4" = 1'-0"
0' 2' 4' 8'



C E4.01 E4.01 ELECTRICAL SERVICE EQUIPMENT ELEVATION VIEW
Scale: 1/4" = 1'-0"
0' 2' 4' 8'

KEY NOTES

1 CONTRACTOR SHALL PROVIDE NEW 600A SE RATED, NEMA 3R, HD, FUSED DISCONNECT AS SHOWN. REFER TO RISER DIAGRAM FOR FURTHER DETAILS.

2 CONTRACTOR SHALL PROVIDE (2) NEW SERVICE WEATHERHEADS FOR NEW ELECTRICAL SERVICE. NEW WEATHERHEADS SHALL BE MINIMUM 12' AFG AND MAXIMUM 22' AFG. COORDINATE FINAL MOUNTING HEIGHT WITH UTILITY COMPANY PRIOR TO ROUGH IN.

4 CONTRACTOR SHALL STUB CHILLER FEEDER CONDUIT DOWN AT BUILDING EXTERIOR AND ROUTE TO BELOW GRADE TO NEW DISCONNECT MOUNTED ON NEW UNISTRUT FRAME. NEW UNISTRUT FRAME SHALL BE PROVIDED BY DIVISON 23 CONTRACTOR. PROVIDE A NEMA 3R RATED JUNCTION BOX AT EXTERIOR OF BUILDING TO MAKE TRANSITION.

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SCALE:

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DRAWN BY	TLW
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CHECKED BY	POA
DATE	JULY 25, 2025

TITLE
GROUND FLOOR ELECTRICAL PLAN

DEI PROJECT NO: 50188025
RADFORD PROJECT NO: 217-B5217-004

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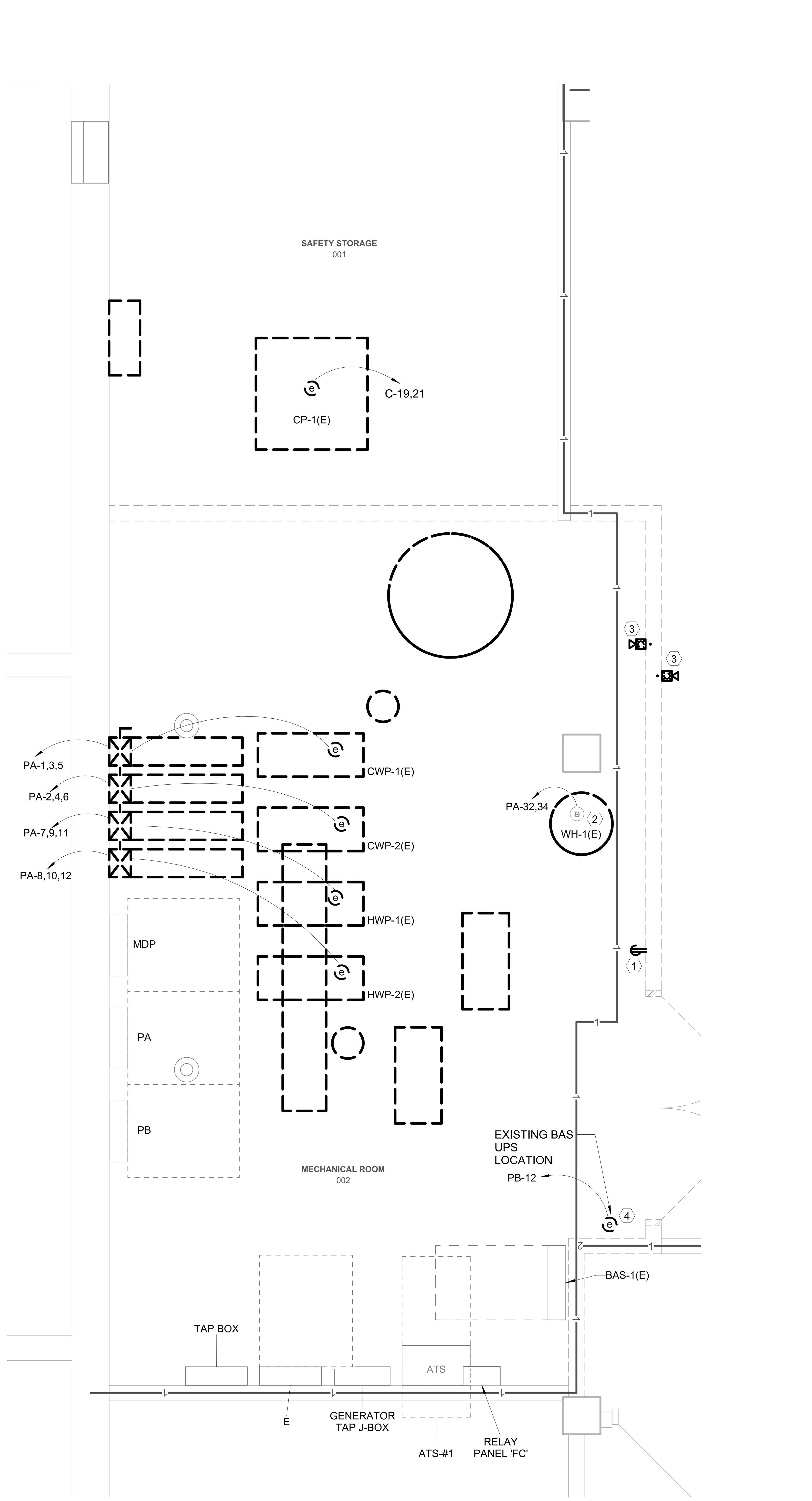
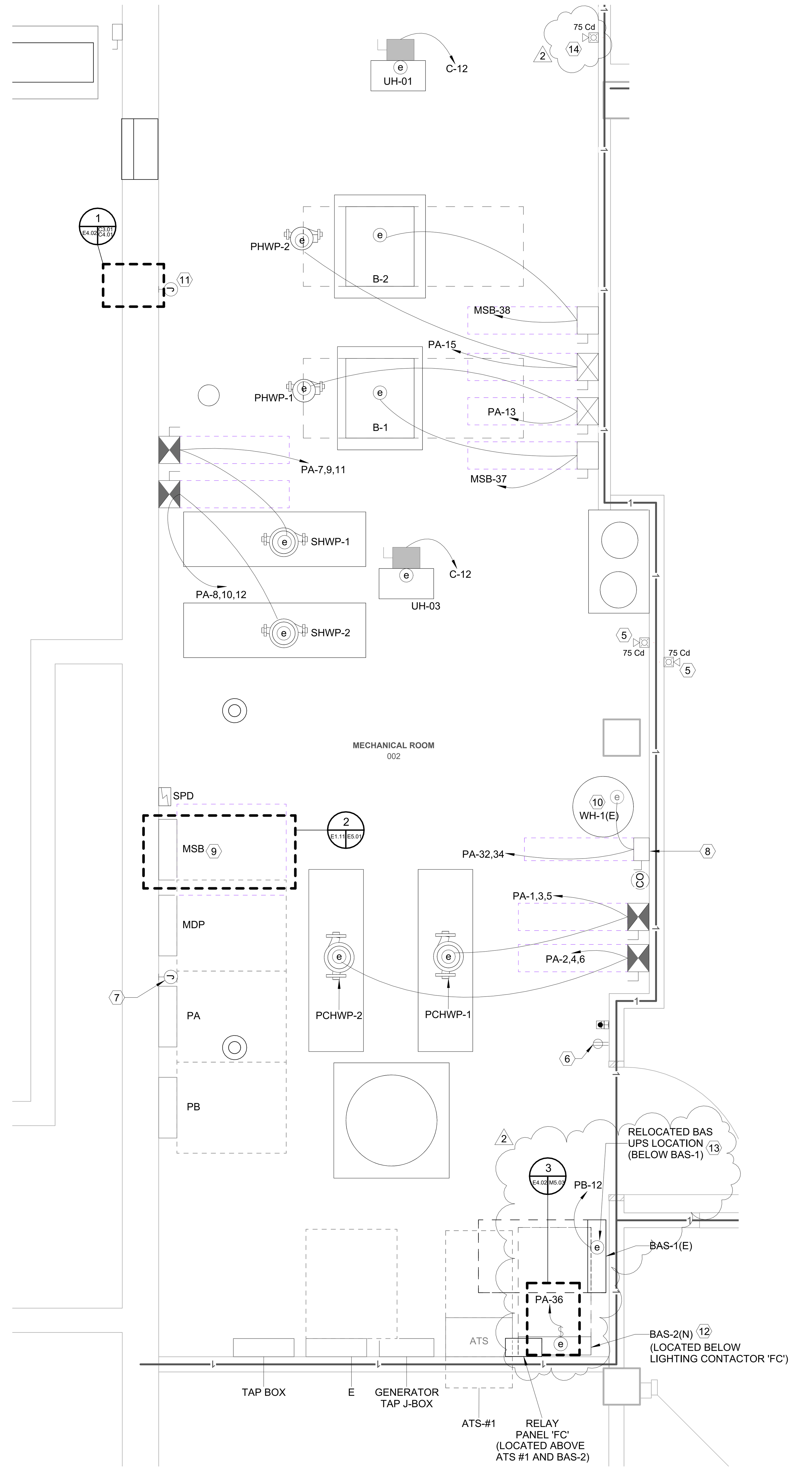


A GROUND ENLARGED ELECTRICAL DEMOLITION PLAN
Scale: 1/2" = 1'-0"



B GROUND ENLARGED ELECTRICAL NEW WORK PLAN
Scale: 1/2" = 1'-0"

KEY NOTES

1. CONTRACTOR SHALL REMOVE AND RETAIN EXISTING DEVICE FOR RELOCATION DURING NEW WORK. PULL BACK AND RETAIN CIRCUIT TO NEAREST UPSTREAM JUNCTION BOX.
2. CONTRACTOR SHALL DISCONNECT WATER HEATER BRANCH CIRCUIT IN PREPERATION FOR WATER HEATER RELOCATION. COORDINATE RELOCATION WITH DIVISION 23 CONTRACTOR.
3. CONTRACTOR SHALL REMOVE FIRE ALARM DEVICE AND RETAIN FOR RE-INSTALLATION DURING NEW WORK. MAINTAIN CONTINUITY OF SLC CIRCUIT DURING WALL DEMOLITION.
4. CONTRACTOR SHALL CAP AND SEAL EXISITNG KNOCKOUT ON EXISTING BAS UPS ENCLOSURE. BAS UPS AND ENCLOSURE SHALL BE RELOCATED BY DIVISION 23 CONTRACTOR. MODIFY AND EXTEND EXISITNG BRANCH CIRCUIT TO NEW LOCATION BELOW EXISTING BAS PANEL. COORDINATE RELOCATION WITH DIVISION 23 CONTRACTOR.

KEY NOTES

5. CONTRACTOR SHALL REINSTALL FIRE ALARM DEVICE RETAINED DURING DEMOLITION. RECONNECT DEVICE TO EXISTING SLC LOOP.
6. CONTRACTOR SHALL REINSTALL DEVICE RETAINED DURING DEMOLITION. MODIFY AND EXTEND CIRCUIT AS REQUIRED FOR NEW LOCATION.
7. CONTRACTOR SHALL PROVIDE JUNCTION BOX ABOVE PANEL PA FUTURE AHU-1 ANCILLARY CIRCUITS. PROVIDE WIRE AND CONDUIT FROM NEW JUNCTION BOX TO ROOFTOP. CLEARLY LABEL JUNCTION BOX AS FUTURE USE FOR AHU-1 ANCILLARY CIRCUITS. MINIMUM JUNCTION BOX SIZE SHALL BE 4"Dx4"Hx12"W. REFER TO ROOF PLAN AND RISER DIAGRAM FOR FURTHER INFORMATION.
8. CONTRACTOR SHALL PROVIDE HEAVY DUTY, NEMA 1, 30AF, NF DISCONNECT FOR WH-1.
9. CONTRACTOR SHALL PROVIDE NEW PANELBOARD AS SHOWN. REFER TO RISER DIAGRAM AND PANEL SCHEDULES FOR FURTHER INFORMATION.
10. CONTRACTOR SHALL MODIFY AND EXTEND BRANCH CIRCUIT WIRE AND CONDUIT TO ACCOMODATE RELOCATION OF EXISTING WATER HEATER. TERMINATE EXISTING BRANCH CIRCUIT RETAINED DURING DEMOLITION ON NEW DISCONNECT. PROVIDE NEW WIRE AND CONDUIT (2#10 & 1#10G IN 3/4"C) BETWEEN NEW DISCONNECT AND EXISTING WH-1. COORDINATE RELOCATION WITH DIVISION 23 CONTRACTOR.
11. CONTRACTOR SHALL PROVIDE (1) 1"C WITH PULLSTRING TO NEW PROPANE TANK FOR PROPANE TANK FILL LEVEL ALARM. REFER TO CIVIL PLANS AND PROFILE FOR EXACT LOCATION, UNDERGROUND ROUTING, AND BURIAL DEPTH. TURN UNDERGROUND CONDUIT UP AT WALL AND STUB INTO MECHANICAL ROOM. ROUTE CONDUITS INTO NEW JUNCTION BOX INSIDE MECHANICAL ROOM. ROUTE INTERIOR CONDUIT FROM NEW JUNCTION BOX TO NEW BAS PANEL LOCATED IN MECHANICAL ROOM 002. COORDINATE TERMINATION AT NEW BAS PANEL WITH DIVISION 23 CONTRACTOR. CLEARLY LABEL JUNCTION BOX TO SHOW CONDUIT IS ROUTED TO NEW PROPANE TANK.
12. CONTRACTOR SHALL PROVIDE NEW BRANCH CIRCUIT (2#12 & 1#12G IN 3/4"C) TO NEW BAS PANEL AS SHOWN. COORDINATE CONNECTION WITH DIVISION 23 CONTRACTOR.
13. CONTRACTOR SHALL MODIFY AND EXTEND BRANCH CIRCUIT WIRING AND CONDUIT (2#12, 1#12G IN 3/4"C) SERVING THE BAS UPS PANEL TO NEW LOCATION BELOW BAS-1 AS SHOWN. COORDINATE RELOCATION WITH DIVISION 23 CONTRACTOR.
14. CONTRACTOR SHALL PROVIDE NEW FIRE ALARM DEVICE AS SHOWN. CONNECT DEVICE TO EXISTING SLC LOOP.

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TYLER WINOKUR
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12/5/2025

KEY PLAN:

SCALE:

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DRAWN BY	TLW
APPROVED BY	TLW
CHECKED BY	POA
DATE	JULY 25, 2025

TITLE

GROUND FLOOR ELECTRICAL ROOM PLANS

DEI PROJECT NO: 50188025
RADFORD PROJECT NO: 217-B5217-004

SHEET NO.

E4.02

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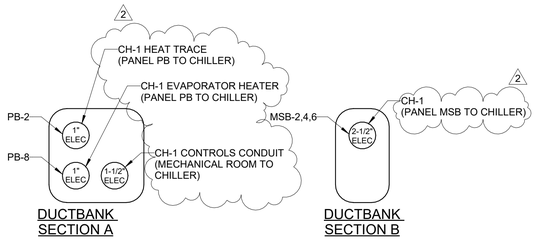


NOTE: REFER TO DETAIL #3 THIS SHEET FOR FURTHER DUCT BANK DETAILS.

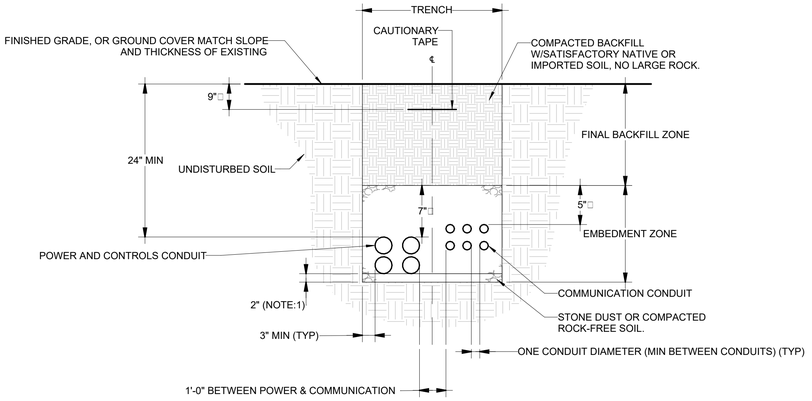
4 DIRECT BURIED DUCT BANK SECTION

4 (E4.01 | E5.01)

Scale: N.T.S.

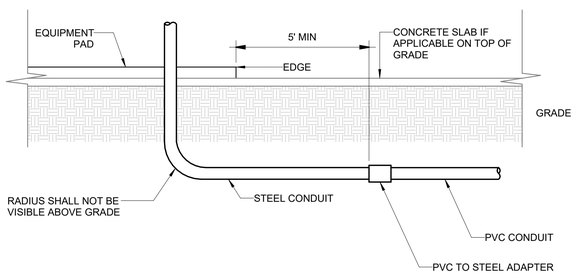
NOTE:

1. THE BOTTOM OF THE TRENCH MUST BE FREE OF ROCK, CINDERS OR SHARP OBJECTS.
2. THE BACKFILLED TRENCH SHALL BE FREE OF PEAT, MARL, HIGHLY PLASTIC CLAY, OR OTHER UNSUITABLE MATERIAL SUCH AS TRASH, DEBRIS, BRUSH, FROZEN MATERIAL OR ICE.
3. PLACE EMBEDMENT ZONE MATERIAL IN 3 OR MORE LIFTS AS SHOWN AND TAMP TO ELIMINATE VOIDS AND ASSURE FULL CONTACT WITH THE CONDUIT PERIMETER.
4. PLACE FINAL BACKFILL ZONE MATERIAL IN 6-INCH LIFTS AND COMPACT WITH MULTIPLE PASSES OF A MACHINE TAMPER, ROLLER, OR VIBRATORY EQUIPMENT (FOR USE ON SAND AND GRAVEL ONLY) THAT IS SPECIFICALLY DESIGNED FOR SOIL COMPACTION. COMPACT UNTIL VOIDS ARE ELIMINATED AND THE COMPACTED SURFACE NO LONGER VISIBLY YIELDS BENEATH THE COMPACTION EQUIPMENT.
5. NUMBER OF CONDUIT VARIES. REFER TO DIRECT BURIED DUCT BANK SECTION DETAIL #4 THIS SHEET.



3 TYPICAL DIRECT BURIED CONDUIT INSTALLATION

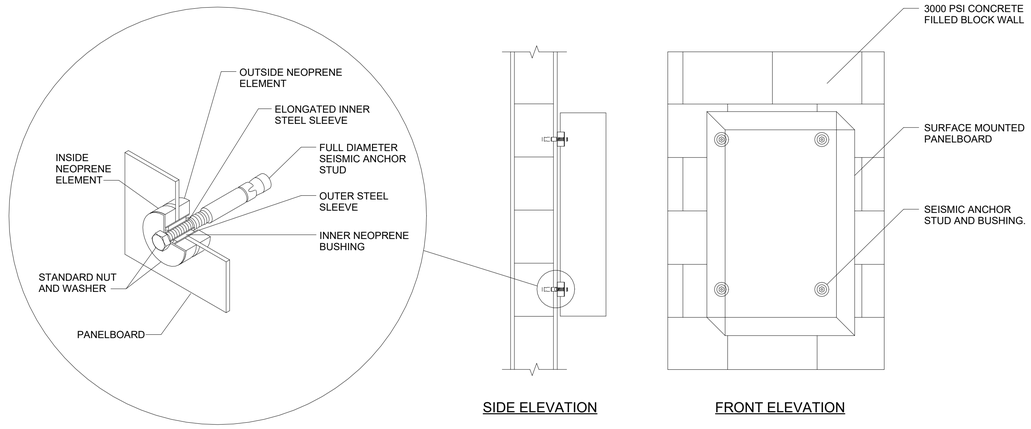
Scale: N.T.S.



1 CONDUIT DIRECT BURIED GRS-PVC TRANSITION

1 (E4.01 | E5.01)

Scale: N.T.S.



SEISMIC CATEGORY 'C'
TYPICAL PANELBOARD MOUNTING DETAIL

NOTES:

1. PROVIDE CERTIFICATION THAT PANELBOARDS, OVERCURRENT PROTECTION DEVICES, ACCESSORIES AND COMPONENTS MEET THE SEISMIC REQUIREMENTS OF VCC 2015, CATEGORY 'C'.
2. PROVIDE SHAKE TABLE TEST RESULTS CERTIFIED BY A THIRD PARTY TO THE AUTHORITIES HAVING JURISDICTION PRIOR TO INSPECTION.

2 SEISMIC PANELBOARD SUPPORT

Scale: N.T.S.

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12/5/2025

KEY PLAN:

SCALE:

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NO.	DATE	BY	DESCRIPTION
2	12/05/25		DEB CMNTS/ADD 3
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DRAWN BY	TLW
APPROVED BY	TLW
CHECKED BY	POA
DATE	JULY 25, 2025

TITLE
ELECTRICAL
DETAILS

DEI PROJECT NO: 50188025
RADFORD PROJECT NO: 217-B5217-004

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E5.01

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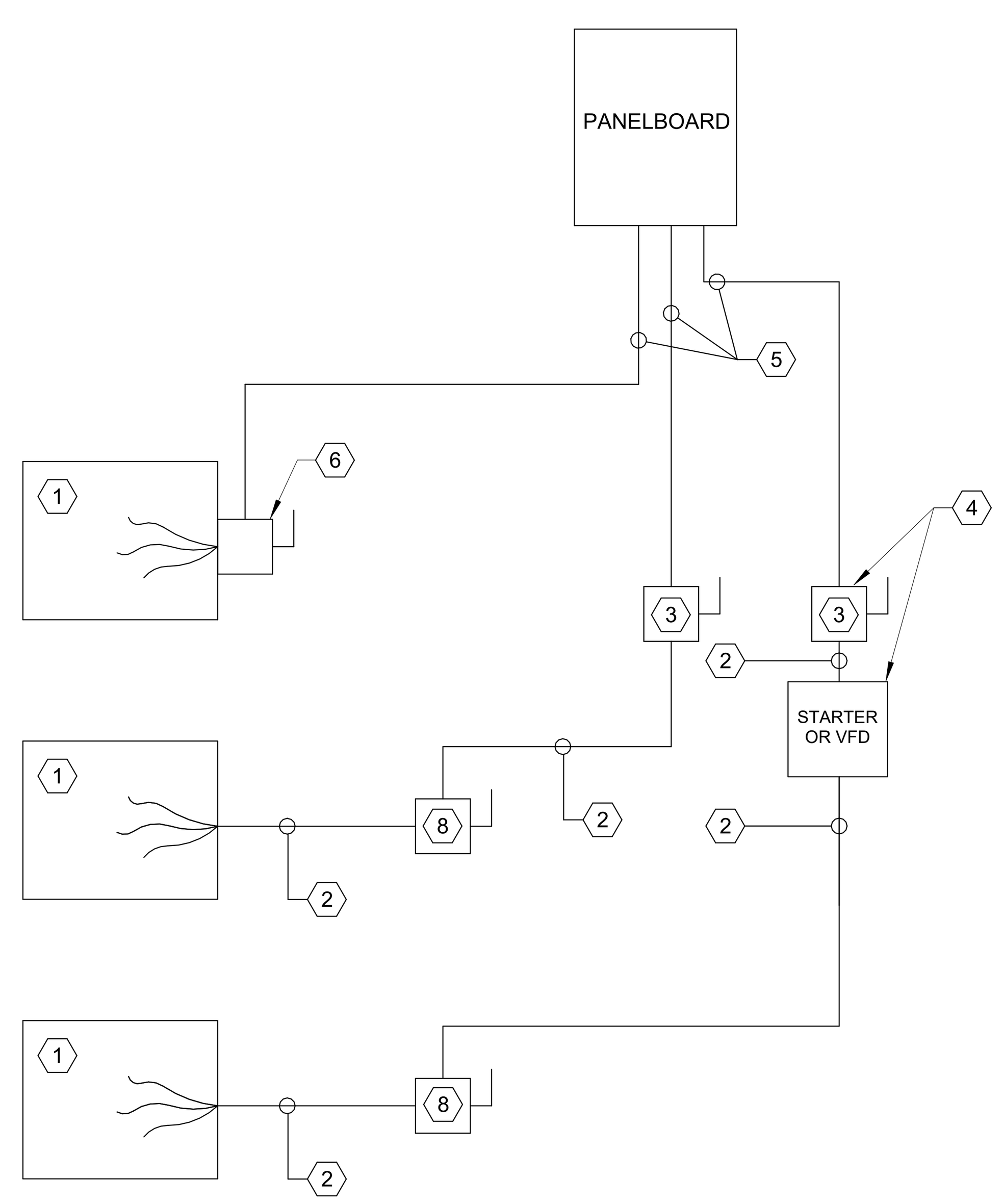
DETAIL KEY NOTES:

1. EQUIPMENT BY MECHANICAL CONTRACTOR.
2. CONDUIT & WIRING BY ELECTRICAL CONTRACTOR.
3. DISCONNECT SWITCH FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR.
4. A COMBINATION STARTER OR VFD MAY BE USED IN LIEU OF A SEPARATE DISCONNECT SWITCH AND STARTER / VFD. DISCONNECT SWITCH AND STARTER/VFD FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR. LOCATE DISCONNECT SWITCH ADJACENT TO VFD.
5. FEEDER CIRCUIT WIRING AND CONDUIT IN ELECTRICAL WORK. SEE PANELBOARD SCHEDULE FOR BREAKER SIZES AND BRANCH OR FEEDER SCHEDULES FOR WIRE/CONDUIT SIZES.
6. EQUIPMENT PROVIDED BY MECHANICAL CONTRACTOR, WITH INTEGRAL DISCONNECTING MEANS.
7. MECHANICAL CONTRACTOR SUPPLYING THE EQUIPMENT SHALL MAKE FINAL CONNECTIONS, START UP, AND TEST EQUIPMENT.
8. IF AN ADDITIONAL DISCONNECT IS REQUIRED BY NEC IT SHALL BE FURNISHED BY MECHANICAL CONTRACTOR AND INSTALLED BY ELECTRICAL CONTRACTOR.



2 ELECTRICAL TO MECHANICAL EQUIPMENT

Scale: N.T.S.

NOTE: DETAIL IS ALSO SHOWN ON MECHANICAL DRAWINGS. DETAIL IS DUPLICATED FOR EASE OF REFERENCE FOR EACH RESPECTIVE CONTRACTOR.

NOTE:

1. THIS FIGURE ILLUSTRATES THE WORKING SPACE IN FRONT OF THE ELECTRICALEQUIPMENT REQUIRED BY SECTION 110.26(A) AND 110.26(F) OF THE NATIONAL ELECTRICAL CODE.
2. DOORS TO ELECTRICAL ROOMS SHALL BE PROVIDED WITH PERMANENT SIGNAGE READING "NO STORAGE" IN LETTERS NOT LESS THAN THE ROOM IDENTIFICATION OR THE WORKING SPACE AS DEFINED BY NEC SHALL BE MARKED BY A 2 WIDE YELLOW LINE AND STENCILED "NO STORAGE – ELECTRICAL WORKING SPACE" IN 2" HIGH YELLOW LETTERS IN MECHANICAL ROOMS, ELECTRICAL ROOMS, AND SERVICE AREAS.

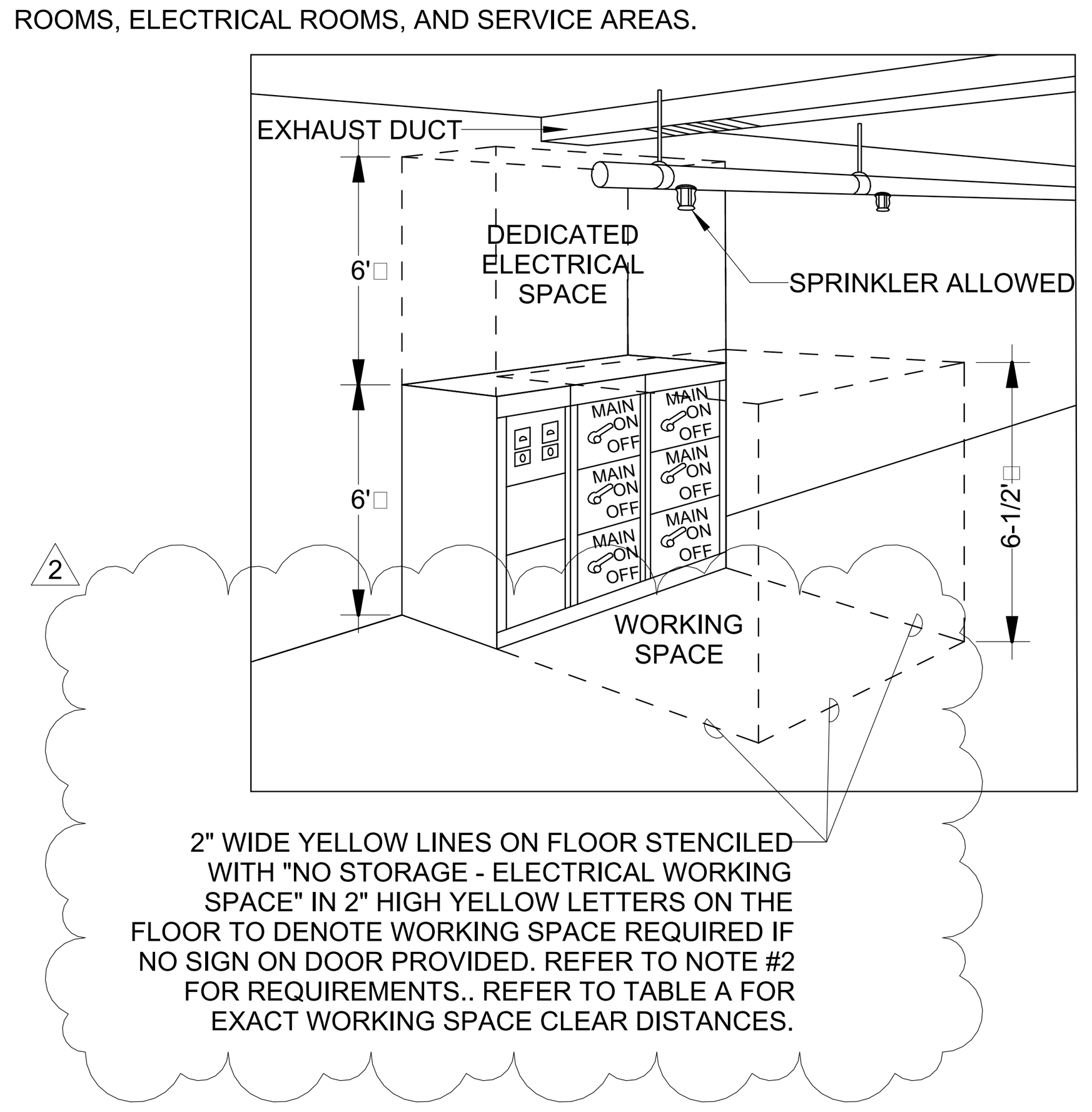
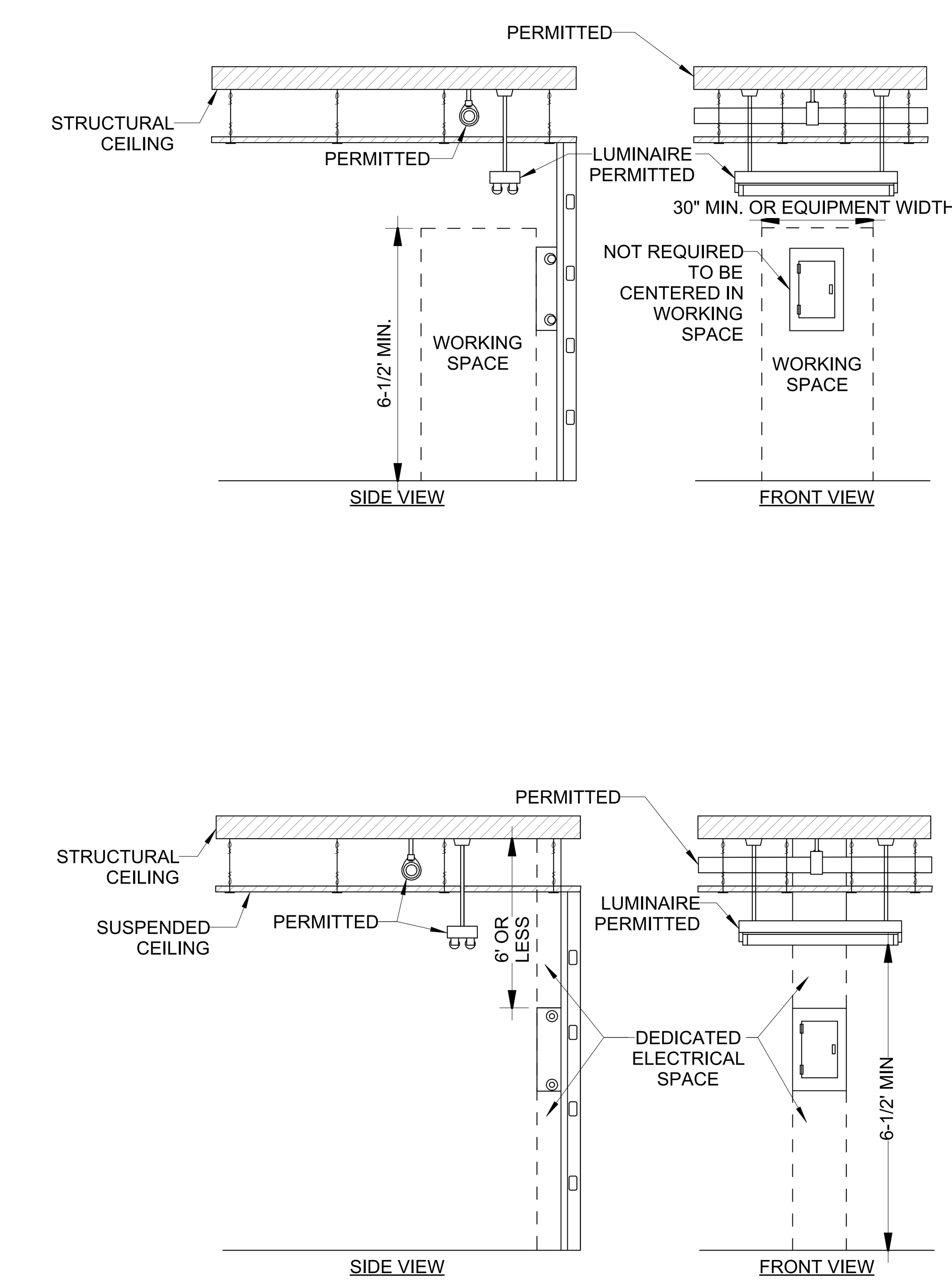


TABLE A - WORKING SPACES

VOLTAGE TO GROUND NOMINAL	CONDITION:	MINIMUM CLEAR DISTANCE FEET 1	2	3
0-150		3	3	3
151-600		3	3-1/2	4

WHERE THE "CONDITIONS" ARE AS FOLLOWS

1. EXPOSED LIVE PARTS ON ONE SIDE AND NO LIVE OR GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE, OR EXPOSED LIVE PARTS ON BOTH SIDES EFFECTIVELY GUARDED BY SUITABLE WOOD OR OTHER INSULATING MATERIALS. INSULATED WIRE OR INSULATED BUSBARS OPERATING AT NOT OVER 300V TO GROUND SHALL NOT BE CONSIDERED LIVE PARTS.
2. EXPOSED LIVE PARTS ON ONE SIDE AND GROUNDED PARTS ON THE OTHER SIDE. (CONCRETE BRICK OR TILE WALLS SHALL BE CONSIDERED AS GROUNDED.)
3. EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORK SPACE (NOT GUARDED AS PROVIDED IN CONDITION 1) WITH THE OPERATOR BETWEEN.



1 WORKING CLEARANCE FOR ELECTRICAL EQUIPMENT

Scale: N.T.S.

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TITLE

ELECTRICAL DETAILS

DEI PROJECT NO:	50188025
RADFORD PROJECT NO:	217-B5217-004

SHEET NO.

E5.02

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EXISTING PANEL: PA — NEW WORK

LOCATION: MECHANICAL... **VOLTS:** 120/208 Wye **MAINS TYPE:** MLO
SUPPLY FROM: MDP **PHASES:** 3 **BUS RATING:** 225 A
MOUNTING: Surface **WIRES:** 4 **NEUTRAL RATING:** 100.00%
ENCLOSURE: Type 1 **SE RATED:** NO **MINIMUM KAIC:** 10
MANUFACTURER/MODEL: **CALCULATED Isc:**

CKT	LOAD SERVED	CB	P	*	A		B		C		*	P	CB	LOAD SERVED	CKT
1					1272	0									2
3	**PCHWP-1 (3HP) (3#12 & 1#12G IN 3/4"C)** (1)	20 A	3	11			1272	0			11	3	20 A	**PCHWP-2 (3HP) (3#12 & 1#12G IN 3/4"C)** (1)	4
5									1272	0					6
7					792	0									8
9	**SHWP-1 (1.5HP) (3#12 & 1#12G IN 3/4"C)** (1)	15 A	3	11			792	0			11	3	15 A	**SHWP-2 (1.5HP) (3#12 & 1#12G IN 3/4"C)** (1)	10
11									792	0					12
13	**PHWP-1 (1/3HP)**	**20 A**	**1**	**10**	864	0									14
15	**PHWP-2 (1/3HP)**	**20 A**	**1**	**10**			864	0			--	3	20 A	OAU-1	16
17	**SPARE**	**20 A**	**1**	**10**					0	0					18
19	**EF-1 (1/4HP)**	15 A	1	11	696	0					--	1	20 A	REC. EMS DAY RM.	20
21	EF-3	20 A	1	--			0	0			--	1	20 A	REC. EMS BED RM.	22
23									0	0	--	2	20 A	AIR COND OUTSIDE	24
25	KW METER	20 A	3	--	0	0									26
27							0	0			--	1	20 A	LTS - AMMO/RECORD RM.	28
29	AC UNIT RADIO ROOM	20 A	2	--					0	0	--	1	20 A	EQUIP RM RECT & VOLTUS...	30
31					0	500						2	20 A	WATER HEATER	32
33	RECORD ROOM REC	20 A	1	--			0	0							34
35	AMMO ROOM REC	20 A	1	--					0	500	10	1	20 A	BAS-2	36
37					0	0									38
39	FUTURE ELEVATOR	125 A	3	--			0	0			--	3	150 A	**SPARE**	40
41									0	0					42
				CONNECTED LOAD:	4124 VA		2928 VA		2564 VA						
				CONNECTED AMPS:	35 A		25 A		21 A						
				DEMAND AMPS:	35 A		25 A		21 A						

BREAKER NOTES:
* INDICATES BREAKER TYPE: 1 =GFCI (6mA), 2= GECB (30mA/100mA), 3=SHUNT TRIP, 4=AFCI, 5=SUBFEED BREAKER, 6=LI, 7=LSI, 8=LSIG, 9= LOCKING DEVICE, 10=NEW BREAKER IN EXISTING, 11=EXISTING BREAKER.

PANEL NOTES:

LOAD CLASSIFICATION	CONNECTED LOAD	Demand Factor	ESTIMATED DEMAND	PANEL TOTALS	
Default	9616 VA	100.00%	9616 VA	**TOTAL LOAD:**	9616 VA
				DEMAND FACTOR:	100.00%
				DEMAND LOAD:	9616 VA
				DEMAND AMPS:	27 A

PANEL PA
LOAD REMOVED: 29,780VA
LOAD ADDED: 9,616VA
NET LOAD: -20,164VA

PANEL: PB BRANCH: WORK

LOCATION: MECHANICAL... **VOLTS:** 120/208 Wye **MAINS TYPE:** MLO
SUPPLY FROM: MDP **PHASES:** 3 **BUS RATING:** 125 A
MOUNTING: Surface **WIRES:** 4 **NEUTRAL RATING:** 100.00%
ENCLOSURE: Type 1 **SE RATED:** NO **MINIMUM KAIC:** 10
MANUFACTURER/MODEL: **CALCULATED Isc:**

CKT	LOAD SERVED	CB	P	*	A		B		C		*	P	CB	LOAD SERVED	CKT
1	CARD READER	20 A	1	--	0	1000					10,2	**1**	**20 A**	**CHILLER HEAT TRACE**	2
3	OAU + VALVES	20 A	1	--			0	0			--	1	20 A	FC 2005,2010,2015,2020,2025,2030,2035	4
5	FC 2040,2045,2047,2050,2060,2070,2075,2080	20 A	1	--					0	0	--	1	20 A	FC 2200,2205,2210,2215,2230	6
7	FC 2245,2255,2260,2265,2270,2275	20 A	1	--	0	1000					11	1	20 A	**CHILLER EVAPORATOR HEATER**	8
9	NIGHT LIGHTS	20 A	1	--			0	0			--	1	20 A	EMERGENCY LIGHTS	10
11	EXTERIOR LIGHTS	20 A	1	--					0	25		1	20 A	Default MECHANICAL ROOM 002	12
13	COMPUTER INTERFACE	20 A	1	--	0	0					--	1	20 A	TELEPHONE SYSTEM	14
15	MISC. EMS CIRCUITS	20 A	1	--			0	0			--	1	20 A	MISC. RECEPT. GRD. FLOOR	16
17	CARD READERS	20 A	1	--					0	0	--	2	25 A	DMSS-3A, 3B & CU-3AB	18
19	A&B EVAP UNITS	15 A	1	--	0	0									20
21	CARD READER	20 A	1	--			0	0			--	1	20 A	D.C. MARQUE LIGHTS	22
23	NETWORK SYCS. RECEPT	20 A	1	--					0	0	--	2	20 A	EAST AN WEST MARQUE	24
25	LIGHTS IN GARAGE	20 A	1	--	0	0									26
27	RECEPTS IN GARAGE	20 A	1	--			0	0			--	1	20 A	EXISTING	28
29	GEN. BATT. CHARGER	20 A	1	--					0	0	--	1	20 A	MAIN FIRE ALARM PANEL	30
				CONNECTED LOAD:	2000 VA		0 VA		25 VA						
				CONNECTED AMPS:	17 A		0 A		0 A						
				DEMAND AMPS:	17 A		0 A		0 A						

BREAKER NOTES:
* INDICATES BREAKER TYPE: 1 =GFCI (6mA), 2= GECB (30mA/100mA), 3=SHUNT TRIP, 4=AFCI, 5=SUBFEED BREAKER, 6=LI, 7=LSI, 8=LSIG, 9= LOCKING DEVICE, 10=NEW BREAKER IN EXISTING, 11=EXISTING BREAKER.

PANEL NOTES:

LOAD CLASSIFICATION	CONNECTED LOAD	Demand Factor	ESTIMATED DEMAND	PANEL TOTALS	
Default	2025 VA	100.00%	2025 VA	**TOTAL LOAD:**	2025 VA
				DEMAND FACTOR:	100.00%
				DEMAND LOAD:	2025 VA
				DEMAND AMPS:	6 A

PANEL PB
LOAD REMOVED: 2,200VA
LOAD ADDED: 2,000VA
NET LOAD: -200VA

PANEL: C BRANCH: WORK

LOCATION: CORRIDOR-1 005-1 **VOLTS:** 120/208 Wye **MAINS TYPE:** M.L.O.
SUPPLY FROM: MDP **PHASES:** 3 **BUS RATING:** 100 A
MOUNTING: Surface **WIRES:** 4 **NEUTRAL RATING:** 100.00%
ENCLOSURE: Type 1 **SE RATED:** NO **MINIMUM KAIC:** 10
MANUFACTURER/MODEL: **CALCULATED Isc:**

CKT	LOAD SERVED	CB	P	*	A		B		C		*	P	CB	LOAD SERVED	CKT
1	LIGHTS - STAIRWAYS	20 A	1	--	0	0					--	1	20 A	LIGHTS - AUTO SHOP	2
3	LIGHTS - PLUMBING SHOP	20 A	1	--			0	0			--	1	20 A	LIGHTS - STORAGE REAR	4
5	EXIST	20 A	1	--					0	0	--	1	20 A	LIGHTS - STORAGE CENTER	6
7	EXIST	20 A	1	--	0	0					--	1	20 A	LIGHTS - EMS	8
9	EMS BEDROOM	20 A	1	--			0	0			--	1	20 A	LIGHTS - STORAGE ENTRANCE	10
11	REC - SAND BLASTER	20 A	1	--					0	57	11	1	15 A	**UH-01, UH-02, UH-03**	12
13	REC. OUTSIDE EMS PARKING	20 A	1	--	0	0					--	1	20 A	EMS BEDROOM	14
15	EQUIP ROOM EXHAUST FAN	20 A	1	--			0	0			--	1	20 A	JUDYS RECPS	16
17	OUTLETS - PLUMBING SHOP	20 A	1	--					0	0	--	1	20 A	EMS LOUNGE	18
19	**SPARE**	20 A	2	--	0	0					--	1	20 A	DISC. JIM MELTON	20
21							0	0			--	1	20 A	AIR PRINT OFFICER FLOOR REC	22
23	EXIST	60 A	2	--					0	0	--	1	20 A	AIR PRINT OFFICER FLOOR REC	24
25					0	0									26
27	EXIST	20 A	1	--			0	0			--	3	20 A	EXIST	28
29	EXIST	20 A	1	--					0	0					30
				CONNECTED LOAD:	0 VA		0 VA		57 VA						
				CONNECTED AMPS:	0 A		0 A		0 A						
				DEMAND AMPS:	0 A		0 A		0 A						

BREAKER NOTES:
* INDICATES BREAKER TYPE: 1 =GFCI (6mA), 2= GECB (30mA/100mA), 3=SHUNT TRIP, 4=AFCI, 5=SUBFEED BREAKER, 6=LI, 7=LSI, 8=LSIG, 9= LOCKING DEVICE, 10=NEW BREAKER IN EXISTING, 11=EXISTING BREAKER.

PANEL NOTES:

LOAD CLASSIFICATION	CONNECTED LOAD	Demand Factor	ESTIMATED DEMAND	PANEL TOTALS	
Default	57 VA	100.00%	57 VA	**TOTAL LOAD:**	57 VA
				DEMAND FACTOR:	100.00%
				DEMAND LOAD:	57 VA
				DEMAND AMPS:	0 A

PANEL C
LOAD REMOVED: 2,376VA
LOAD ADDED: 57VA
NET LOAD: -2,319VA

KEYED NOTES:

1. PUMPS ARE REDUNDANT AND WILL NOT OPERATE SIMULTANEOUSLY. BAS SYSTEM WILL HANDLE THE CONTROL AND LOCKOUT OF THE REDUNDANT SYSTEMS.

GENERAL NOTES: (2)

1. CONTRACTOR SHALL CIRCUIT TRACE THE ENTIRETY OF THE BUILDING PRIOR TO BEGINNING CONSTRUCTION IN ORDER TO PROVIDE DETAILED, ACCURATE PANEL DIRECTORIES FOR EVERY PANELBOARD IN THE BUILDING. PANEL DIRECTORIES SHALL INCLUDE ROOM NUMBERS, LOCATIONS (N/S/E/W/ETC.), EQUIPMENT ID, OR OTHER MEANS AS REQUIRED BY NEC 480.4 AND CPSM 5.8.6.5.1(C). CONTRACTOR SHALL SUBMIT CIRCUIT TRACING RESULTS AND UPDATED PANEL DIRECTORIES TO ENGINEER FOR APPROVAL.

PACKAGE 2 BUILDING LOAD SUMMARY: (2)

EXISTING PACKAGE 1 LOAD:	429.7A
@208V/3P	154.7KVA
TEMP EQUIPMENT LOAD REMOVED:	58.3KVA
FUTURE LOAD ADDED:	33.952KVA
NET LOAD ADDED:	-24.348KVA
TOTAL LOAD ON BUILDING (PACKAGE 2):	130.352KVA
@208V/3P:	362.09A
SERVICE SIZE:	600A, 208V/3P

*NOTE TO REVIEWER: THE LOAD SUMMARY ABOVE REFLECTS THE TEMPORARY MECHANICAL LOADS REMOVED AND FUTURE MECHANICAL LOADS ADDED FOR PACKAGE 2 THAT ARE SHOWN IN THIS PACKAGE 1. THE NET LOAD WILL REDUCE AND THE BUILDING SERVICE WILL HAVE CAPACITY TO HANDLE THE FUTURE EQUIPMENT.

BUILDING LOAD SUMMARY:

EXISTING PEAK DEMAND LOAD	46KW
@125% PER NEC	57.5KW
@.85pf	67.6KVA
LOAD REMOVED:	52.2KVA*
LOAD ADDED:	132.4KVA
TOTAL LOAD ON BUILDING:	154.7KVA
@208V/3P:	429.7A
NEW SERVICE SIZE:	600A, 208V/3P

*NOTE TO REVIEWER: THE LOAD REMOVED IS BASED ON MECHANICAL EQUIPMENT NAMEPLATE RATINGS, EXISTING BUILDING DRAWINGS, AND FIELD OBSERVATIONS. THIS AMOUNT EXCEEDS THE MAXIMUM HISTORICAL KW ON THE BUILDING BASED ON UTILITY DEMAND BILLING. TOTAL LOAD ON BUILDING WAS CALCULATED USING ALL NEW LOADS INSTALLED ON THIS PROJECT ADDED TO 33% OF THE HISTORICAL DEMAND TO ACCOUNT FOR EXISTING TO REMAIN EQUIPMENT, RECEPTACLES, ETC.

PANEL MDP
LOAD REMOVED: 34,356VA
LOAD ADDED: 11,673VA
NET LOAD: -22,683VA

PANEL: MDP BRANCH: WORK

LOCATION: MECHANICAL... **VOLTS:** 120/208 Wye **MAINS TYPE:** M.L.O.
SUPPLY FROM: MSB **PHASES:** 3 **BREAKER RATING:** 400 A
MOUNTING: Surface **WIRES:** 4 **BUS RATING:** 400 A
ENCLOSURE: Type 1 **SE RATED:** NO **NEUTRAL RATING:** 100.00%
MANUFACTURER/MODEL: **CALCULATED Isc:** **MINIMUM KAIC:**

CKT	LOAD SERVED	CB	P	*	A		B		C		*	P	CB	LOAD SERVED	CKT
1					2000	0									2
3	PB	100 A	3				0	0				3	100 A	C	4
5									25	57					6
7					0	4124									8
9	LU	250 A	3				0	2928				3	200 A	PA	10
11									0	2564					12
13	E	100 A	2		0	--					--	1	--	SPACE	14
15							0	--			--	1	--	SPACE	16
17	SPACE	--	1	--					--	--	--	1	--	SPACE	18
19	SPACE	--	1	--	--	0									20
21	SPACE	--	1	--			--	0				3	200 A	D	22
23										0					24
25															26
27															28
29															30
31															32
33															34
35															36
37															38
39															40
41															42
				CONNECTED LOAD:	6124 VA		2928 VA		2646 VA						
				CONNECTED AMPS:	51 A		25 A		22 A						
				DEMAND AMPS:	51 A		25 A		22 A						

BREAKER NOTES:
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PANEL NOTES:

LOAD CLASSIFICATION	CONNECTED LOAD	Demand Factor	ESTIMATED DEMAND	PANEL TOTALS	
Default	11698 VA	100.00%	11698 VA	**TOTAL LOAD:**	11698 VA
				DEMAND FACTOR:	100.00%
				DEMAND LOAD:	11698 VA
				DEMAND AMPS:	32 A

PANEL: MSB BRANCH: WORK

LOCATION: MECHANICAL... **VOLTS:** 120/208 Wye **MAINS TYPE:** MCB
SUPPLY FROM: **PHASES:** 3 **BREAKER RATING:** 600 A
MOUNTING: Surface **WIRES:** 4 **BUS RATING:** 600 A
ENCLOSURE: Type 1 **SE RATED:** NO **NEUTRAL RATING:**
MANUFACTURER/MODEL: **CALCULATED Isc:** 10KAIC **MINIMUM KAIC:**

CKT	LOAD SERVED	CB	P	*	A		B		C		*	P	CB	LOAD SERVED	CKT
1					6124	20040									2
3	PANEL MDP (2 SETS 4#3/0 & 1#3G IN 2"C EA. SET)	400 A	3				2928	20040				3	250 A	CH-1 (3#250KCMIL & 1#4G IN 2-1/2"C)	4
5									2646	20040					6
7					0	0									8
9	SPARE (FUTURE AHU-1 SUPPLY FAN)	100 A	3	--			0	0			--	3	60 A	SPARE (FUTURE AHU-1 RETURN FAN)	10
11									0	0					12
13					0	0									14
15	SPARE	100 A	3	--			0	0			--	3	60 A	SPD (3#6 & 1#10G IN 1"C)	16
17									0	0					18
19					2500	2500									20
21	TEMPORARY UH-B (3#10 & 1#10G IN 3/4"C)	30 A	3				2500	2500				3	30 A	TEMPORARY UH-A (3#10 & 1#10G IN 3/4"C)	22
23									2500	2500					24
25					1666	3333									26
27	TEMPORARY UH-D (3#12 & 1#12G IN 3/4"C)	20 A	3				1666	3333				3	40 A	TEMPORARY UH-C (3#8 & 1#10G IN 3/4"C)	28
29									1666	3333					30
31					1100	8333									32
33	TEMPORARY UH-E (3#12 & 1#12G IN 3/4"C)	15 A	3				1100	8333				3	90 A	TEMPORARY RHC-1 (3#3 & 1#8G IN 1-1/4"C)	34
35									1100	8333					36
37	B-1	20 A	1		1440	1440						1	20 A	B-2	38
39	SPARE	20 A	1	--			0	0			--	1	20 A	SPARE	40
41	SPARE	20 A	1	--					0	0	--	1	20 A	SPARE	42
				CONNECTED LOAD:	48476 VA		42400 VA		42118 VA						
				CONNECTED AMPS:	404 A		354 A		351 A						
				DEMAND AMPS:	404 A		354 A		351 A						

BREAKER NOTES:
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PANEL NOTES:

LOAD CLASSIFICATION	CONNECTED LOAD	Demand Factor	ESTIMATED DEMAND	PANEL TOTALS	
Default	132994 VA	100.00%	132994 VA	**TOTAL LOAD:**	132994 VA
				DEMAND FACTOR:	100.00%
				DEMAND LOAD:	132994 VA
				DEMAND AMPS:	369 A

STATE BUILDING OFFICIAL

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Radford UNIVERSITY
ALLEN BUILDING ELECTRICAL REPLACEMENT
100% CONSTRUCTION DOCUMENTS
RADFORD, VIRGINA

SEAL
Signed by: Tyler Winokur
D0B46442625D42E...
COMMONWEALTH OF VIRGINIA
TYLER WINOKUR
Lic. No. 065927
PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/25		DEB CMNTS/ADD 3
1	10/24/25		DEB COMMENTS

DRAWN BY TLW
APPROVED BY TLW
CHECKED BY POA
DATE JULY 25, 2025

TITLE
SCHEDULES AND DIAGRAMS

DEI PROJECT NO: 50188025
RADFORD PROJECT NO: 217-B5217-004

SHEET NO.
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GENERAL NOTES:

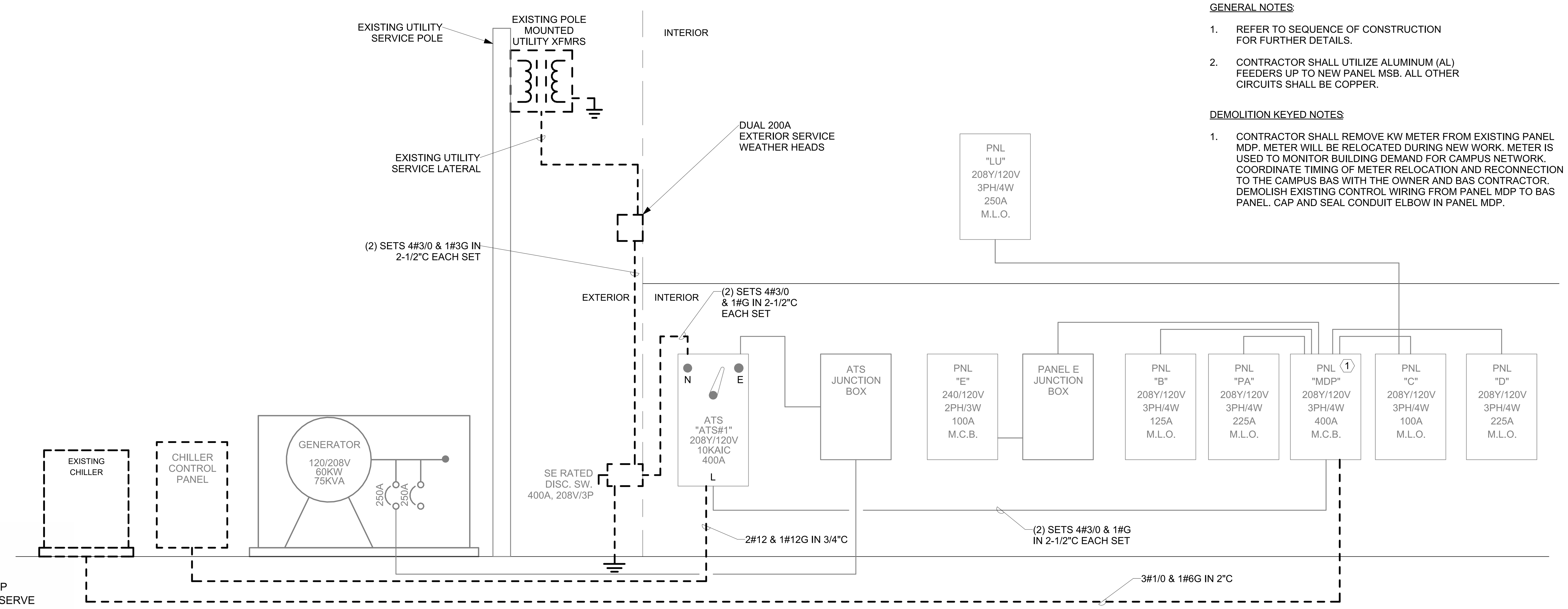
1. REFER TO SEQUENCE OF CONSTRUCTION FOR FURTHER DETAILS.
2. CONTRACTOR SHALL UTILIZE ALUMINUM (AL) FEEDERS UP TO NEW PANEL MSB. ALL OTHER CIRCUITS SHALL BE COPPER.

DEMOLITION KEYED NOTES:

1. CONTRACTOR SHALL REMOVE KW METER FROM EXISTING PANEL MDP. METER WILL BE RELOCATED DURING NEW WORK. METER IS USED TO MONITOR BUILDING DEMAND FOR CAMPUS NETWORK. COORDINATE TIMING OF METER RELOCATION AND RECONNECTION TO THE CAMPUS BAS WITH THE OWNER AND BAS CONTRACTOR. DEMOLISH EXISTING CONTROL WIRING FROM PANEL MDP TO BAS PANEL. CAP AND SEAL CONDUIT ELBOW IN PANEL MDP.

SEQUENCE OF CONSTRUCTION NOTES:

1. CONTRACTOR SHALL PROVIDE 150KW, DIESEL RENTAL GENERATOR AND TEMPORARY CABLING FOR THE DURATION OF THE ELECTRICAL INFRASTRUCTURE UPGRADES. IT IS CONTRACTORS RESPONSIBILITY TO INCLUDE RENTAL GENERATOR COSTS IN THEIR BID.
2. ANY SHUTDOWN EFFECTING CALL CENTER EQUIPMENT MUST BE SHORTER IN DURATION THAN THE UPS BATTERY RUN TIME (~30MINS) TO ENSURE CALL CENTER FUCNTIONALITY.
3. CONTRACTOR SHALL CONFIRM UPS LOADING, UPS CAPACITY, AND UPS RUNTIME FOR CALL CENTER UPS AND BAS PANEL UPS PRIOR TO ANY PLANNED BUILDING OUTAGE. IF IT IS DETERMINED THAT THE PLANNED OUTAGE WILL BE LONGER THAN UPS RUNTIME A TEMPORARY UPS MAY BE REQUIRED. NOTIFY ENGINEER IMMEDIATELY IF IT IS DETERMINED EITHER UPS HAS INSUFFICIENT RUNTIME FOR PLANNED OUTAGE.
4. ALL OUTAGES ARE TO OCCUR MONDAY-FRIDAY DURING TYPICAL BUSINESS HOURS.
5. CONTRACTOR SHALL PROVIDE ADEQUATE AMOUNT OF FUEL FOR GENERATOR DURING TIMES WHEN BUILDING IS ON GENERATOR POWER ONLY. CONTRACTOR SHALL MONITOR FUEL LEVELS AND REFILL THE FUEL TANK AS REQUIRED. ONCE SEQUENCE IS COMPLETE CONTRACTOR SHALL FILL GENERATOR FUEL TANK TO FULL LEVEL.



1 ELECTRICAL DEMOLITION POWER RISER DIAGRAM
Scale: N.T.S.

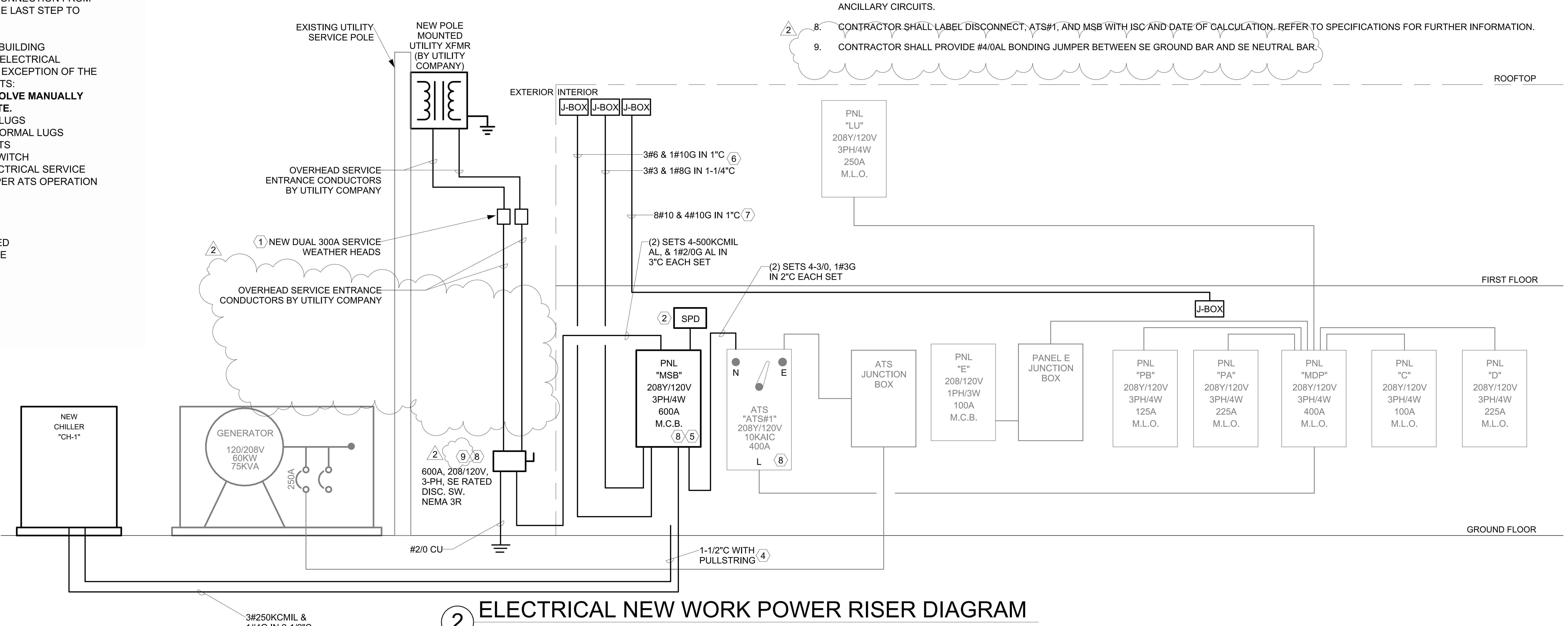
ELECTRICAL SERVICE REPLACEMENT – SEQUENCE OF CONSTRUCTION

PLEASE NOTE THAT THE FOLLOWING SEQUENCE IS NOT MEANT TO SERVE AS STEP-BY-STEP INSTRUCTIONS FOR THE CONTRACTOR DURING CONSTRUCTION. INSTEAD, IT IS MEANT TO SERVE AS A GENERAL GUIDE TO AID IN TRANSITIONING FROM DEMOLITION TO NEW WORK AND MINIMIZE DOWNTIME FOR THE BUILDING. CONTRACTOR TO COORDIANTE ANY SHUTDOWN WORK WITH THE OWNER A MINIMUM OF 2-WEEKS PRIOR TO PLANNED SHUTDOWN.

1. CONTRACTOR SHALL PROVIDE TEMPORARY, ROLL-UP, 150KW, DIESEL GENERATOR WITH ONBOARD BELLY TANK. PROVIDE DLO CABLING TO ROUTE FROM TEMPORARY GENERATOR TO EXISTING ATS INSIDE MECHANICAL ROOM 002. COORDINATE TEMPORARY CABLE ROUTING AND TEMPORARY GENERATOR LOCATION WITH OWNER.
2. **COORDINATE BUILDNG OUTAGE WITH OWNER**. DURING OUTAGE:
    a. DISCONNECT NORMAL FEEDERS FROM EXISTING ATS NORMAL LUGS
    b. TERMINATE TEMPORARY DLO FEEDERS FROM TEMPORARY GENERATOR ON NORMAL LUGS OF EXISTING ATS
    c. START-UP TEMPORARY GENERATOR AND ENSURE PROPER VOLTAGE, PHASE ROTATION, AND FEEDER CONNECTIONS
3. BUILDING IS NOW OPERATING ON TEMPORARY GENERATOR AS THE 'NOMRAL' ATS FEED AND THE EXISTING ON-SITE GENERATOR CONTINUING TO OPERATE AS THE EMERGENCY FEED. CONTRACTOR CAN NOW COORDINATE THE NEW UTILITY FEED TO THE BUILDING WITH THE UTILITY COMPANY, DEMOLISH THE NORMAL FEED INTO THE BUILDING, AND INSTALL THE NEW ELECTRICAL INFRASTRUCTURE WHILE THE BUILDING HAS (2) SOURCES OF POWER. REFER TO THE DEMOLITION AND NEW WORK RISER DIAGRAM FOR FURTHER DETAILS.
    a. CONTRACTOR SHALL ONLY ROUTE THE FEEDERS FROM NEW PANEL MSB TO THE EXISTING ATS. DO NOT TERMINATE THE FEEDERS ONTO THE ATS UNTIL ALL ELECTRICAL WORK IS COMPLETE. THE PERMANENT FEEDER CONNECTION FROM PANEL MSB TO THE EXISTING ATS NORMAL LUGS SHALL BE THE LAST STEP TO MINIMIZE DOWNTIMES AND OUTAGES.
    b. LOTO MSB BREAKER THAT SERVES THE ATS NORMAL LUGS
    c. LOTO NEW SE RATED DISCONNECT SWITCH ON EXTERIOR OF BUILDING
4. ONCE ALL ELECTRICAL INFRASTRUCTURE IS DEMOLISHED AND NEW ELECTRICAL INFRASTRUCUTRE IS INSTALLED PER THE RISER DIAGRAM WITH THE EXCEPTION OF THE PERMANENT NORMAL FEEDER FROM PANEL MSB TO THE EXISTING ATS:
    a. **COORDINATE BUILDING OUTAGE WITH OWNER. THIS WILL INVOLVE MANUALLY SHUTTING OFF AND DISENGAGING BOTH GENERATORS ON SITE.**
    b. DISCONNECT TEMPORARY DLO FEEDERS FROM ATS NORMAL LUGS
    c. TERMINATE PERMANENT FEEDER FROM PANEL MSB ON ATS NORMAL LUGS
    d. LOTO CAN BE REMOVED FROM MSB BREAKER SERVING THE ATS
    e. LOTO CAN BE REMOVED FROM THE SE RATED DISCONNECT SWITCH
    f. BUILDING IS NOW READY TO BE ENERGIZED VIA THE NEW ELECTRICAL SERVICE
    g. RE-ENGAGE EXISTING ON-SITE GENERATOR TO ENSURE PROPER ATS OPERATION
5. AT THIS POINT DURING THE SEQUENCE:
    a. NEW MSB INSTALLED AND ENERGIZED
    b. NEW UTILITY SERVICE ACTIVE AND ENERGIZED
    c. ATS NORMAL IS SERVED VIA THE NEW MSB
    d. TEMPORARY GENERATOR AND CABLING IS NO LONGER NEEDED
6. REMOVE TEMPORARY GENERATOR AND DLO CABLING FROM THE SITE

NEW WORK KEYED NOTES:

1. CONTRACTOR SHALL COORDINATE WEATHERHEAD LOCATION AND REQUIREMENTS WITH UTILITY PRIOR TO INSTALLATION.
2. CONTRACTOR SHALL PROVIDE SPD FOR NEW PANEL MSB. INSTALL SPD PER MANUFACTURER'S GUIDELINES. INSTALL SPD AS NEAR TO MSB AS PRACTICAL.
3. CONTRACTOR SHALL INSTALL NEW CT CABINET AND METERBASE. NEW CT CABINET AND METERBASE SHALL BE FURNISHED BY THE UTILITY COMPANY. COORDINATE CT CABINET AND METERBASE INSTALLATION WITH UTILITY COMPANY. UTILITY COMPANY TO PROVIDE SERVICE CONDUCTORS TO LINE SIDE OF CT CABINET. CONTRACTOR SHALL PROVIDE CONDUCTORS FROM LOAD SIDE OF CT CABINET TO SE RATED DISCONNECT.
4. CONTRACTOR SHALL PROVIDE 1-1/2" CONTROLS CONDUIT FOR CHILLER. COORDINATE HEAD END LOCATION IN MECHANICAL ROOM 002 WITH DIVISION 23 CONTRACTOR. PROVIDE CONDUIT WITH PULLSTRING.
5. CONTRACTOR SHALL INSTALL KW METER RETAINED DURING DEMOLITION IN NEW PANEL MSB. METER SHALL MONITOR AND REPORT BUILDING KW DEMAND. PROVIDE NEW CONTROL WIRING IN 1"C FROM NEW PANEL MSB TO NEW BAS PANEL. COORDINATE TIMING OF METER RELOCATION AND RECONNECTION OT THE CAMPUS BAS WITH THE OWNER AND BAS CONTRACTOR.
6. CONTRACTOR SHALL PROVIDE BRANCH CIRCUITS AS SHOWN FROM NEW PANEL MSB TO ROOF FOR FUTURE AHU-1 FANS. TERMINATE FEEDERS ABOVE FIRST FLOOR ACT CEILING IN NEW JUNCTION BOX. CLEARLY LABEL JUNCTION BOXES AS FUTURE USE FOR AHU-1.
7. CONTRACTOR SHALL PROVIDE BRANCH CIRCUITS AS SHOWN FROM NEW JUNCTION BOX ADJACENT TO EXISTING PANEL PA TO ABOVE FIRST FLOOR ACT CEILING FOR FUTURE AHU-1 ANCILLARY CIRCUITS. TERMINATE FEEDERS ON ROOF IN NEW JUNCTION BOX. CLEARLY LABEL JUNCTION BOX AS FUTURE USE FOR AHU-1 ANCILLARY CIRCUITS.
8. ~~CONTRACTOR SHALL LABEL DISCONNECT, ATS#1, AND MSB WITH ISC AND DATE OF CALCULATION.~~ REFER TO SPECIFICATIONS FOR FURTHER INFORMATION. (2)
9. CONTRACTOR SHALL PROVIDE #4/0AL BONDING JUMPER BETWEEN SE GROUND BAR AND SE NEUTRAL BAR.



2 ELECTRICAL NEW WORK POWER RISER DIAGRAM
Scale: N.T.S.

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SEAL

COMMONWEALTH OF VIRGINIA
TYLER WINOKUR
Lic. No. 065927
PROFESSIONAL ENGINEER
12/5/2025

KEY PLAN:

SCALE:

REVISIONS

NO.	DATE	BY	DESCRIPTION
2	12/05/25		DEB CMNTS/ADD 3
1	10/24/25		DEB COMMENTS

DRAWN BY	TLW
APPROVED BY	TLW
CHECKED BY	POA
DATE	JULY 25, 2025

TITLE
RISER DIAGRAMS

DEI PROJECT NO:	50188025
RADFORD PROJECT NO:	217-B5217-004

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RADFORD UNIVERSITY
ALLEN BUILDING ELECTRICAL REPLACEMENT

100% CONSTRUCTION DOCUMENTS
DATE – JULY 25, 2025
REVISED OCTOBER 24, 2025
REVISED DECEMBER 5, 2025

PROCUREMENT AND CONTRACT DOCUMENTS

** Please see https://dgs.virginia.gov/search/documents-and-forms/?filter=DEB

TECHNICAL SPECIFICATIONS

Division 01 – General Conditions

END OF SECTION 00 01 02

DGS-30-256
(Rev. 07/21)

NOTICE OF
INVITATION FOR BIDS (IFB)
Allen Building Electrical Replacement
Project Code 217-B5217-004

Sealed bids are invited for the construction of **Allen Building Electrical Replacement**, Project Code 217-B5217-004, on the campus of Radford University, Radford, Virginia. The project is generally described as: Electrical improvements to include but not limited to, replacement of electrical service to the building, upgrade of heating system and installation of propane tanks.

Sealed bids will be received at Facilities Planning & Construction Office, Armstrong Complex, 501 Stockton Street, Radford, VA 24142. **The deadline for submitting bids is 2:00 P.M. sharp**, **as determined by the Bid Officer, on January 6, 2026.** The bids will be opened publicly and read aloud **beginning** at **2:00 P.M.**, on **January 7, 2026**, at the same location.

A Bid Bond is required.

eVA Vendor Registration: The bidder or offeror shall be a registered vendor in eVA. See the attached **eVA Vendor Registration Requirements.**

Procedures for submitting a bid, claiming an error, withdrawal of bids and other pertinent information are contained in the Instructions to Bidders, which is part of the Invitation for Bids. Withdrawal due to error in bid shall be permitted in accord with Section 9 of the Instructions to Bidders and § 2.2-4330, Code of Virginia. The Owner reserves the right to reject any or all bids.

A pre-bid conference will be held at the Facilities Planning & Construction Office, Armstrong Complex, 501 Stockton Street, Radford, VA 24142 at 10:00 a.m. on November 14, 2025. Attendance shall be optional for those submitting a bid.

All attendees to the pre-bid conference will be required to comply with Radford University Parking Regulations found at this web address: https://www.radford.edu/parking/parking-information/index.html
Attendees requesting Parking validation must email wlferguso@radford.edu 24 hours prior to pre-bid conference.

The contract shall be awarded on a lump sum basis as follows: the Total Base Bid Amount including any properly submitted and received bid modifications, if the Owner in its discretion decides to award in the manner set forth in Paragraph 12 of the Instructions to Bidders. '**Notice of Award' or 'Notice of Intent to Award' will be posted on eVA, Virginia Department of General Services' central electronic procurement website, at https://eva.virginia.gov**.

Contractor registration is required in accordance with Section 54.1-1103 of the Code of Virginia. See the Invitation for Bids for additional qualification requirements.

All executive branch agencies are directed to advance Executive Order 35, dated July 3, 2019.

The Invitation for Bids for the above project, including the Drawings and the Specifications containing the information necessary for bidding, will be available for download from the eVA website at **https://eva.virginia.gov**.

Copies of the Invitation for Bids documents, including the plans and the specifications, will also be available for inspection at the following locations:

Facilities Planning & Construction Office: 501 Stockton St., Radford, VA 24142

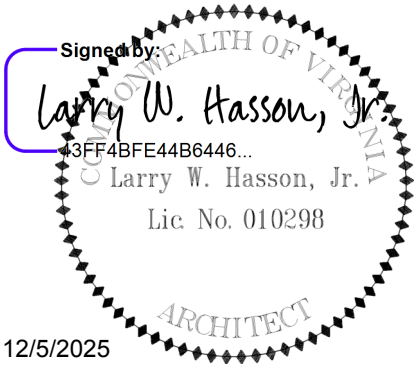
Attachment: eVA Vendor Registration Requirements

Docusign Envelope ID: 6A420090-FC13-49FC-A63C-8D42CD4A18A6

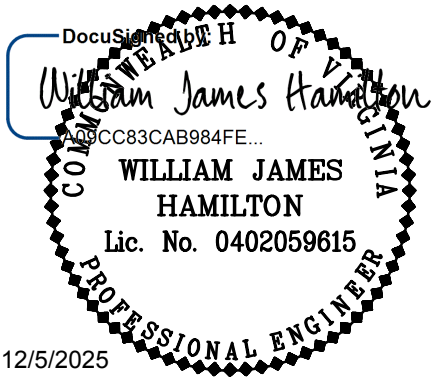
SECTION 00 01 07 – SEALS PAGE

1.1 DESIGN PROFESSIONALS OF RECORD

ARCHITECT **Larry W. Hasson, Jr.**
Virginia Architect License # 010298



STRUCTURAL ENGINEER **William James Hamilton**
Virginia Professional Engineer License # 0402059615



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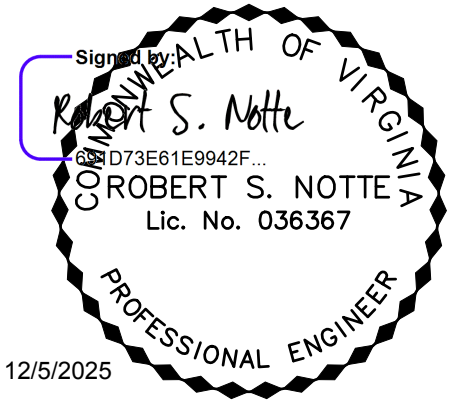
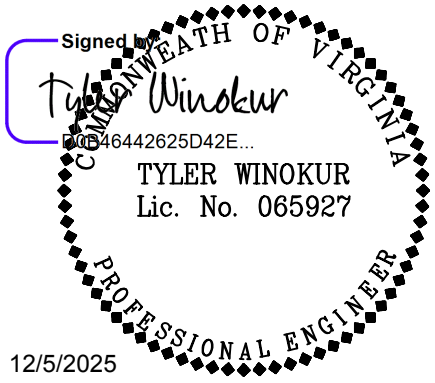
CIVIL ENGINEER — **Robert S. Notte**
Virginia Professional Engineer License # 036367



ELECTRICAL ENGINEER — **Tyler Winokur**
Virginia Professional Engineer License # 065927



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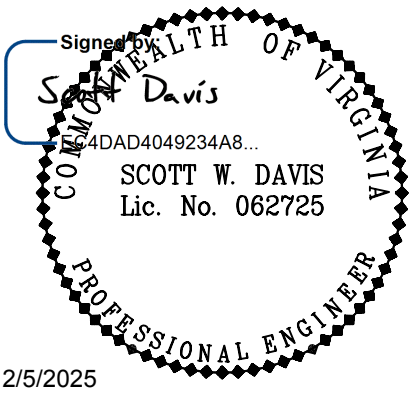
MECHANICAL ENGINEER	**Scott W. Davis** **Virginia Professional Engineer License # 062725**



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END OF SECTION 00 01 07

SECTION 23 05 48 – HVAC SEISMIC, WIND AND VIBRATION CONTROLS

PART 1 - GENERAL

1.1. SUMMARY

A. Section includes seismic, wind and vibration control devices and related materials, including isolators, mounts, guides and supports.

B. Description: Delegated design of all equipment and materials installed under Division 23.

1. Seismic Bracing: Applies to all HVAC equipment and materials based on the seismic criteria defined in this section.

2. Wind Restraints: Applies to all HVAC equipment and materials installed outdoors, above-grade.

3. Vibration Isolation: Applies to all HVAC equipment and materials.

1.2. SUBMITTALS

A. Delegated-Design Submittals: For each vibration isolation, wind restraint and seismic restraint device:

1. Include design calculations and details for selecting vibration isolators, wind restraints, seismic restraints, and vibration isolation bases complying with performance requirements, design criteria, and analysis data signed and sealed by the qualified professional engineer (registered in the state of the project's location) responsible for their preparation.

2. Design Calculations: Calculate static and dynamic loading due to equipment weight, operation, and seismic and wind forces required to select vibration isolators and seismic and wind restraints and for designing vibration isolation bases.

a. Coordinate design calculations with wind load calculations required for equipment mounted outdoors. Comply with requirements in other Sections for equipment mounted outdoors.

3. Riser Supports: Include riser diagrams and calculations showing anticipated expansion and contraction at each support point, initial and final loads on building structure, spring deflection changes, and seismic loads. Include certification that riser system was examined for excessive stress and that none exists.

4. Seismic and Wind Restraint Details:

a. Design Analysis: To support selection and arrangement of seismic and wind restraints. Include calculations of combined tensile and shear loads.

b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods and spacings. Identify components, list their strengths, and indicate directions and values

of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.

c. Coordinate seismic-restraint and vibration isolation details with wind-restraint details required for equipment mounted outdoors. Comply with requirements in other Sections for equipment mounted outdoors.

B. Product Submittals: For each type of product indicated.

1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.

2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of vibration isolation, wind restraint and seismic restraint device required.

1.3. QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7 and that is acceptable to authorities having jurisdiction.

B. Comply with seismic-restraint requirements in the Virginia Construction Code unless requirements in this Section are more stringent.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

D. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproval by an agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are unavailable, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide product by one of the following for spring and elastomeric isolators:

1. Mason Industries, Inc.

2. Kinetics Noise Control, Inc.

3. Vibration Eliminator Company, Inc.

4. Vibration Mounting & Controls (VMC) Group, Inc.

2.2. PERFORMANCE REQUIREMENTS

A. Wind-Restraint Loading:

1. Ultimate Wind Speed: 120 MPH.

2. Building Risk Category: IV.

3. Minimum 50 lb/sq. ft. multiplied by maximum area of HVAC component projected on vertical plane normal to wind direction, and 45 degrees either side of normal.

B. Seismic-Restraint Loading:

1. Site Class as Defined in the State Building Code: D (Assumed).

2. Seismic Design Category: C.

3. Assigned Risk Category as Defined in the State Building Code: IV.

a. Component Importance Factor of 1.5:

1) Smoke Control Systems including Make-Up Air Systems

2) Life-Safety Dampers

3) Natural Gas, Propane (LP) Gas, and Fuel Oil Piping Systems

4) Carbon Monoxide Detection and Alarm Systems

5) Fuel-Fired Equipment Chimneys and Breechings

6) HVAC Systems in First Responder Facilities (Law Enforcement, EMT, Fire, Rescue and 911 Emergency Call Centers)

b. Component Importance Factor of 1.0: All other systems and their components.

c. Component Response Modification Factor: Table 13.6-1, ~~***ASCE 7-16***~~ ***ASCE/SEI7-22*** - Chapter 13.

d. Component Amplification Factor: Table 13.6-1, ~~***ASCE 7-16***~~ ***ASCE/SEI 7-22*** - Chapter 13.

4. Design Spectral Response Acceleration at Short Periods (0.2 Second): 0.258.

5. Design Spectral Response Acceleration at 1.0-Second Period: 0.113.

6. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they are subjected.

C. Seismic Performance: HVAC equipment shall withstand the effects of earthquake motions determined according to ~~***ASCE/SEI-16***~~ ***ASCE/SEI-22***. The term "withstand" means the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified.

D. Critical Functions: In addition, the following equipment and systems shall be fully operational after the seismic event:

1. Computer room air-conditioners serving data centers and emergency communications equipment.

2.3. ELASTOMERIC ISOLATION PADS

A. Description: Elastomeric Isolation Pads.

1. Fabrication: Single or multiple layers of sufficient durometer stiffness for uniform loading over pad area.

2. Size: Factory or field cut to match requirements of supported equipment.

3. Pad Material: Oil and water resistant with elastomeric properties.

4. Surface Pattern: Waffle pattern.

5. Infused nonwoven cotton or synthetic fibers.

6. Load-bearing metal plates adhered to pads.

7. Sandwich-Core Material: Resilient and elastomeric.

a. Surface Pattern: Waffle pattern.

b. Infused nonwoven cotton or synthetic fibers.

2.4. ELASTOMERIC ISOLATION MOUNTS

A. Description: Double-Deflection, Elastomeric Isolation Mounts.

1. Mounting Plates:

a. Top Plate: Encapsulated steel load transfer top plates, factory drilled and threaded with threaded studs or bolts.

b. Baseplate: Encapsulated steel bottom plates with holes provided for anchoring to support structure.

2. Elastomeric Material: Molded, oil-resistant rubber, neoprene, or other elastomeric material.

2.5. RESTRAINED ELASTOMERIC ISOLATION MOUNTS

A. Description: All-directional isolator with seismic restraints containing two separate and opposing elastomeric elements that prevent central threaded element and attachment hardware from contacting the housing during normal operation.

1. Housing: Cast-ductile iron or welded steel.

2. Elastomeric Material: Molded, oil-resistant rubber, neoprene, or other elastomeric material.

2.6. OPEN SPRING ISOLATORS

A. Description: Freestanding, Laterally Stable, Open-Spring Isolators.

1. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.

2. Minimum Additional Travel: 50 percent of the required deflection at rated load.

3. Lateral Stiffness: More than 80 percent of rated vertical stiffness.

4. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

5. Baseplates: Factory-drilled steel plate for bolting to structure with an elastomeric isolator pad attached to the underside. Baseplates shall limit floor load to 500 psig.

6. Top Plate and Adjustment Bolt: Threaded top plate with adjustment bolt and cap screw to fasten and level equipment.

2.7. HOUSED SPRING ISOLATORS

A. Description: Freestanding, Laterally Stable, Open-Spring Isolators in Two-Part Telescoping Housing.

1. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.

2. Minimum Additional Travel: 50 percent of the required deflection at rated load.

3. Lateral Stiffness: More than 80 percent of rated vertical stiffness.

4. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

5. Two-Part Telescoping Housing: A steel top and bottom frame separated by an elastomeric material and enclosing the spring isolators.

a. Drilled base housing for bolting to structure with an elastomeric isolator pad attached to the underside. Bases shall limit floor load to 500 psig.

2.8. RESTRAINED SPRING ISOLATORS

A. Description: Freestanding, Laterally Stable, Open-Spring Isolators with Vertical-Limit Stop Restraint.

1. Housing: Steel housing with vertical-limit stops to prevent spring extension due to weight being removed.

a. Base with holes for bolting to structure with an elastomeric isolator pad attached to the underside. Bases shall limit floor load to 500 psig.

b. Top plate with threaded mounting holes or elastomeric pad.

c. Internal leveling bolt that acts as blocking during installation.

2. Restraint: Limit stop as required for equipment and authorities having jurisdiction.

3. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.

4. Minimum Additional Travel: 50 percent of the required deflection at rated load.

5. Lateral Stiffness: More than 80 percent of rated vertical stiffness.

6. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

2.9. HOUSED RESTRAINED SPRING ISOLATORS

A. Description: Freestanding, Steel, Open-Spring Isolators with Vertical-Limit Stop Restraint in Two-Part Telescoping Housing.

1. Two-Part Telescoping Housing: A steel top and bottom frame separated by an elastomeric material and enclosing the spring isolators. Housings are equipped with adjustable snubbers to limit vertical movement.

a. Drilled base housing for bolting to structure with an elastomeric isolator pad attached to the underside. Bases shall limit floor load to 500 psig.

b. Threaded top housing with adjustment bolt and cap screw to fasten and level equipment.

2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.

3. Minimum Additional Travel: 50 percent of the required deflection at rated load.

4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.

5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

2.10. PIPE RISER RESILIENT SUPPORTS

A. Description: All-directional, acoustical pipe anchor consisting of two steel tubes separated by a minimum 1/2-inch thick neoprene.

1. Vertical-Limit Stops: Steel and neoprene vertical-limit stops arranged to prevent vertical travel in both directions.

2. Maximum Load Per Support: 500 psig on isolation material providing equal isolation in all directions.

2.11. RESILIENT PIPE GUIDES

A. Description: Telescopic arrangement of two steel tubes or post and sleeve arrangement separated by a minimum 1/2-inch-thick neoprene.

1. Factory-Set Height Guide with Shear Pin: Shear pin shall be removable and re-insertable to allow for selection of pipe movement. Guides shall be capable of motion to meet location requirements.

2.12. ELASTOMERIC HANGERS

A. Description: Elastomeric Mount in a Steel Frame with Upper and Lower Steel Hanger Rods.

1. Frame: Steel, fabricated with a connection for an upper threaded hanger rod and an opening on the underside to allow for a maximum of 30 degrees of angular lower hanger-rod misalignment without binding or reducing isolation efficiency.

2. Dampening Element: Molded, oil-resistant rubber, neoprene, or other elastomeric material with a projecting bushing for the underside opening preventing steel to steel contact.

2.13. SPRING HANGERS

A. Description: Combination Coil-Spring and Elastomeric-Insert Hanger with Spring and Insert in Compression.

1. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.

2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.

3. Minimum Additional Travel: 50 percent of the required deflection at rated load.

4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.

5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

6. Elastomeric Element: Molded, oil-resistant rubber or neoprene. Steel-washer-reinforced cup to support spring and bushing projecting through bottom of frame.

7. Adjustable Vertical Stop: Steel washer with neoprene washer "up-stop" on lower threaded rod.

8. Self-centering hanger-rod cap to ensure concentricity between hanger rod and support spring coil.

2.14. SNUBBERS

A. Description: Factory fabricated using welded structural-steel shapes and plates, anchor bolts, and replaceable resilient isolation washers and bushings.

1. Anchor bolts for attaching to concrete shall be seismic-rated, drill-in, and stud-wedge or female-wedge type.

2. Resilient Isolation Washers and Bushings: Oil- and water-resistant neoprene.

3. Maximum 1/4-inch air gap, and minimum 1/4-inch-thick resilient cushion.

2.15. RESTRAINT CHANNEL BRACINGS

A. Description: MFMA-4, shop- or field-fabricated bracing assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; rated in tension, compression, and torsion forces.

2.16. RESTRAINT CABLES

A. Restraint Cables: ASTM A 492 stainless-steel cables. End connections made of steel assemblies with thimbles, brackets, swivel, and bolts designed for restraining cable service; with a minimum of two clamping bolts for cable engagement.

2.17. SEISMIC RESTRAINT ACCESSORIES

A. Hanger-Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod.

B. Hinged and Swivel Brace Attachments: Multifunctional steel connectors for attaching hangers to rigid channel bracings and restraint cables.

C. Bushings for Floor-Mounted Equipment Anchor Bolts: Neoprene bushings designed for rigid equipment mountings and matched to type and size of anchor bolts and studs.

D. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings and matched to type and size of attachment devices used.

E. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.

2.18. MECHANICAL ANCHOR BOLTS

A. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

2.19. ADHESIVE ANCHOR BOLTS

A. Adhesive Anchor Bolts: Drilled-in and capsule anchor system containing PVC or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

PART 3 - EXECUTION

3.1. EXAMINATION

A. Examine areas and equipment to receive vibration isolation and seismic and wind control devices for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2. APPLICATIONS

A. Multiple Pipe Supports: Secure pipes to trapeze member with clamps approved for application.

B. Hanger-Rod Stiffeners: Install hanger-rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.

C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength is adequate to carry present and future static and seismic loads within specified loading limits.

D. Vibration Isolation: In addition to vibration isolation devices indicated within the project documents, provide isolators per ASHRAE Handbook – "HVAC Applications", Chapter 49, Table 47 "Selection Guide for Vibration Isolation".

1. Install vibration isolators on all vibrating equipment.

2. Suspended Piping: Install vibration isolation hangers in all mechanical equipment rooms and on all piping within 50 feet of vibrating equipment connections.

a. Three hangers closest to each equipment connection shall be rated for deflection equal to the equipment isolator deflection.

b. The remaining hangers shall have a deflection of 3/4-inch.

c. Exceptions: Not required at terminal equipment connections where the equipment is isolated, such as terminal units, blower coil units, fan coil units and heaters.

3.3. CONTROL AND RESTRAINT DEVICE INSTALLATION

A. Coordinate the location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork.

B. Installation of vibration isolators must not cause any change of position of equipment, piping, or ductwork resulting in stresses or misalignment.

C. Equipment Restraints:

1. Install seismic snubbers on HVAC equipment mounted on vibration isolators. Locate snubbers as close as possible to vibration isolators and bolt to equipment base and supporting structure.

2. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.

3. Install seismic-restraint devices.

D. Piping Restraints:

1. Comply with requirements in MSS SP-127.

2. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.

3. Brace a change of direction longer than 12 feet.

E. Install cables so they do not bend across edges of adjacent equipment or building structure.

F. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.

G. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

H. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

I. Drilled-in Anchors:

1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid pre-stressed tendons, electrical and telecommunications conduit, and gas lines.

2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.

3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.

4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.

5. Set anchors to manufacturer's recommended torque, using a torque wrench.

6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.4. ACCOMODATION OF DIFFERENTIAL SEISMIC MOTION

A. Install flexible connections in piping where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one supporting the connections as they approach equipment. Comply with requirements in Section 232113 for piping flexible connections.

3.5. FIELD QUALITY CONTROL

A. Perform tests and inspections:

1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.

2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless post-connection testing has been approved), and with at least seven days' advance notice.

3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.

4. Test at least four of each type and size of installed anchors and fasteners selected by Engineer.

5. Test to 90 percent of rated proof load of device.

6. Measure isolator restraint clearance.

7. Measure isolator deflection.

8. Verify snubber minimum clearances.

B. Remove and replace malfunctioning units and retest as specified above.

C. Prepare test and inspection reports.

3.6. ADJUSTING

A. Adjust isolators after piping system is at operating weight.

B. Adjust limit stops on restrained-spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

END OF SECTION 230548

SECTION 260526 - GROUNDING AND BONDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes methods and materials for grounding systems and equipment.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field quality-control test reports.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Bonding Cable: stranded conductor sized per NEC 250 requirements.
4. Bonding Conductor: stranded conductor sized per NEC 250 requirements.
5. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; sized per NEC 250 requirements.

C. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 2 inches (6 by 50 mm) in cross section, unless otherwise indicated; with insulators and stand-off brackets.

2.2 CONNECTORS

A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.

1. Pipe Connectors: Clamp type, sized for pipe.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet (19 mm by 3 m) in diameter.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger, unless otherwise indicated.

B. Underground Grounding Conductors: Install bare copper conductor, No. 3/0 AWG minimum. Bury at least 24 inches (600 mm) below grade.

C. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors.
3. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits. The raceway shall not be relied on for ground continuity.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Rods: Drive rods until tops are 6 inches (50 mm) below finished floor or final grade, unless otherwise indicated.

1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.
2. Use exothermic welds for all below-grade connections.

C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
3. Provide exothermic-welded connection to building structural steel.
4. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

D. Grounding Bushings and Jumpers: Boxes provided with concentric, eccentric or over-sized knockouts shall be provided with bonding bushings and jumpers lugged to box.

3.4 FIELD QUALITY CONTROL

A. Perform the following tests and inspections and prepare test reports:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.

B. Testing Technician

1. The testing technicians shall be trained in all the methods of correctly and safely conducting the required test. The technician shall have regular experience conducting the required tests and they must have the knowledge to determine the serviceability of a specific piece of equipment.

C. Physical Inspection and Testing

1. Inspect grounding system to verify that it complies with the requirements in the drawings and specifications, as well as, NFPA 70 *National Electric Code Article 250*.
2. Inspect the physical and mechanical condition and verify that it complies with manufacturer's standards. All portions of the grounding system shall be free of corrosion.
3. Confirm bolted electrical connections are provided with low impedance using one of the following means:

a. Measure the resistance with a low-resistance ohmmeter. Bolted electrical connection resistances shall be compared to resistances measured on similar connections. Any similar resistance values that deviate more than 50 percent should be investigated.
b. Inspect the bolted connection and verify that it is at the manufacturer's rated torque using a calibrated torque wrench.

4. Verify that adequate anchorage is in place for the grounding system.

D. Electrical Inspection and Testing

1. Conduct tests for fall of potential as defined by ANSI/IEEE 81 on the grounding system.
2. Determine the resistance to ground throughout grounding system including equipment frames, systems neutral, and equipment grounding bars. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform ground resistance in all of, but not limited to, the areas listed below:

a. Main electrical distribution ground bar: 15 ohms
b. Main telecommunications ground bar: 15 ohms
c. Secondary telecommunications ground bars: 15 ohms
~~***d. Lightning protection path to ground: 5 ohms***~~

E. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance.

1. Retest required to show compliance with above value.

F. Remove and replace malfunctioning units and retest as specified above.

G. Test Reports: Prepare a written report to record the following:

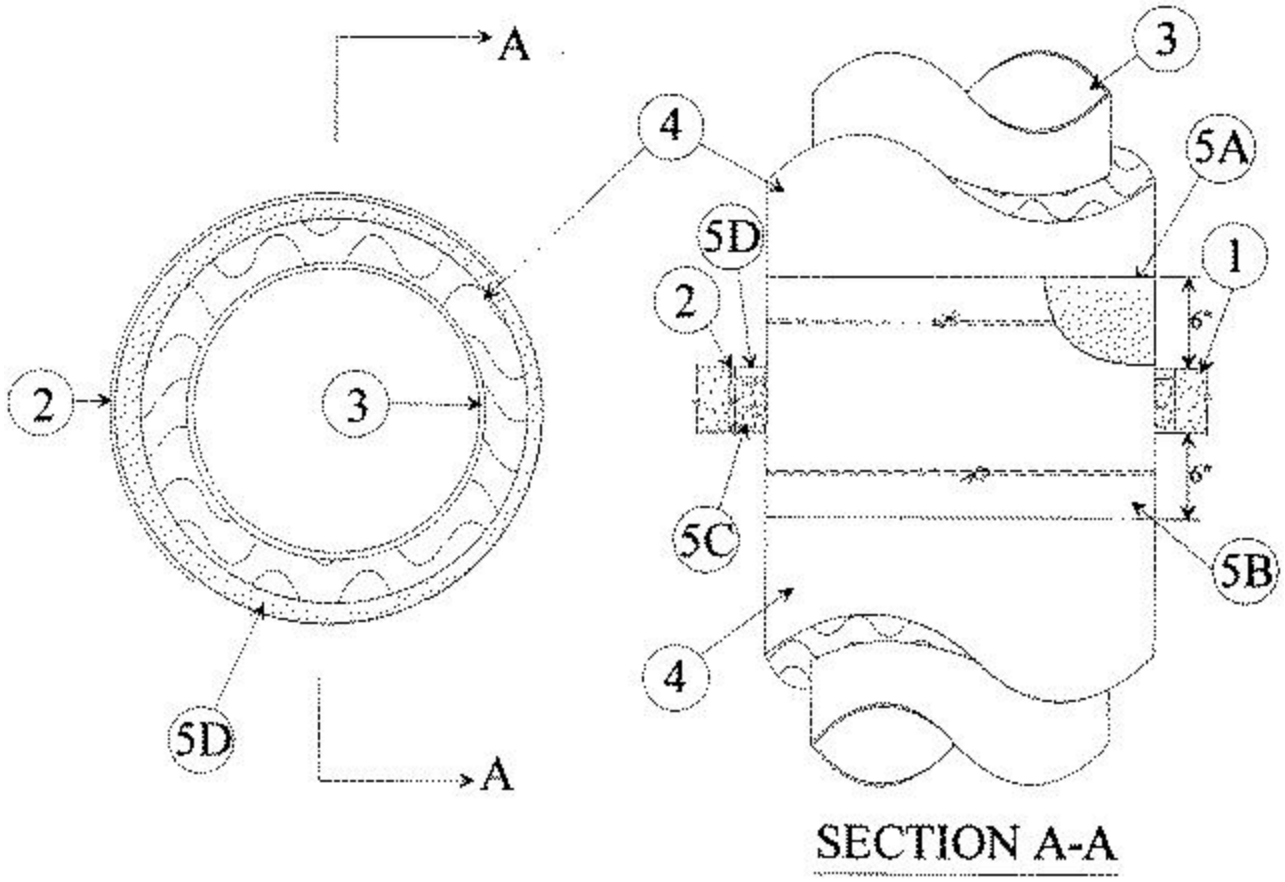
1. Test procedures used.
2. Test results that comply with requirements.
3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

END OF SECTION 260526

System No. C-AJ-5061

March 14, 2017

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 3 Hr	F Rating — 3 Hr
T Rating — 1/2Hr	FT Rating — 1/2 Hr
	FH Rating — 3 Hr
	FTH Rating — 1/2 Hr



1. **Floor or Wall Assembly —** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks*.** Max diam of opening is 30 in. (762 mm). See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. **Metallic Sleeve —** (Optional) — Nom 30 in. (762 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe, conduit or EMT cast or grouted into floor or wall assembly, flush with floor or wall surfaces.

3. **Through Penetrants —** One metallic pipe or tubing to be either concentrically or eccentrically within the firestop system. Pipe or tube to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes or tubing may be used:

A. **Steel Pipe —** Nom 20 in. (508 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.

B. **Iron Pipe —** Nom 20 in. (508 mm) diam (or smaller) cast or ductile iron pipe.

C. **Copper Tubing —** Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.

D. **Copper Pipe —** Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.

4. **Pipe Covering —** Max 3 in. (76 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 56 kg/m^3) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. Pipe covering to terminate 6 in. (152 mm)from each side of floor or wall assembly.
See **Pipe and Equipment Covering — Materials** (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

5. **Firestop System —** The firestop system shall consist of the following:

A. **Pipe Covering Materials* —** Nom 3 in. (76 mm) thick unfaced mineral fiber pipe insulation having a nom density of 5 pcf (80 kg/m^3) (or heavier) sized to the outside diam of pipe or tube and extending min 6 in. (152 mm) beyond each surface of floor or wall. Pipe insulation secured with min 18 AWG steel wire 3 in. (76 mm) beyond each surface of floor or wall. The annular space shall be min 1/4 in. (6 mm) to max of 3 in. (76 mm), or when steel sleeve is used, min 1 in. (25 mm) to max 2-1/4 in. (57 mm).
See **Pipe and Equipment Covering — Materials** (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specification and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

B. **Sheathing Material* —** All service jacket material shall be wrapped around the outer circumference of the pipe covering material (Item 5A) with kraft facing exposed. Longitudinal joints sealed with metal fasteners.
See **Sheathing Material** (BVDV) category in the Building Materials Directory for names of manufacturers. Any sheathing material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

C. **Packing Material —** Min 3 in. (76 mm) thickness of min 4 pcf (64 kg/m^3) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of fill material.

D. **Fill, Void or Cavity Material* — Sealant —** Min 3/4 in. (19 mm) thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant or FS-ONE MAX Intumescent Sealant

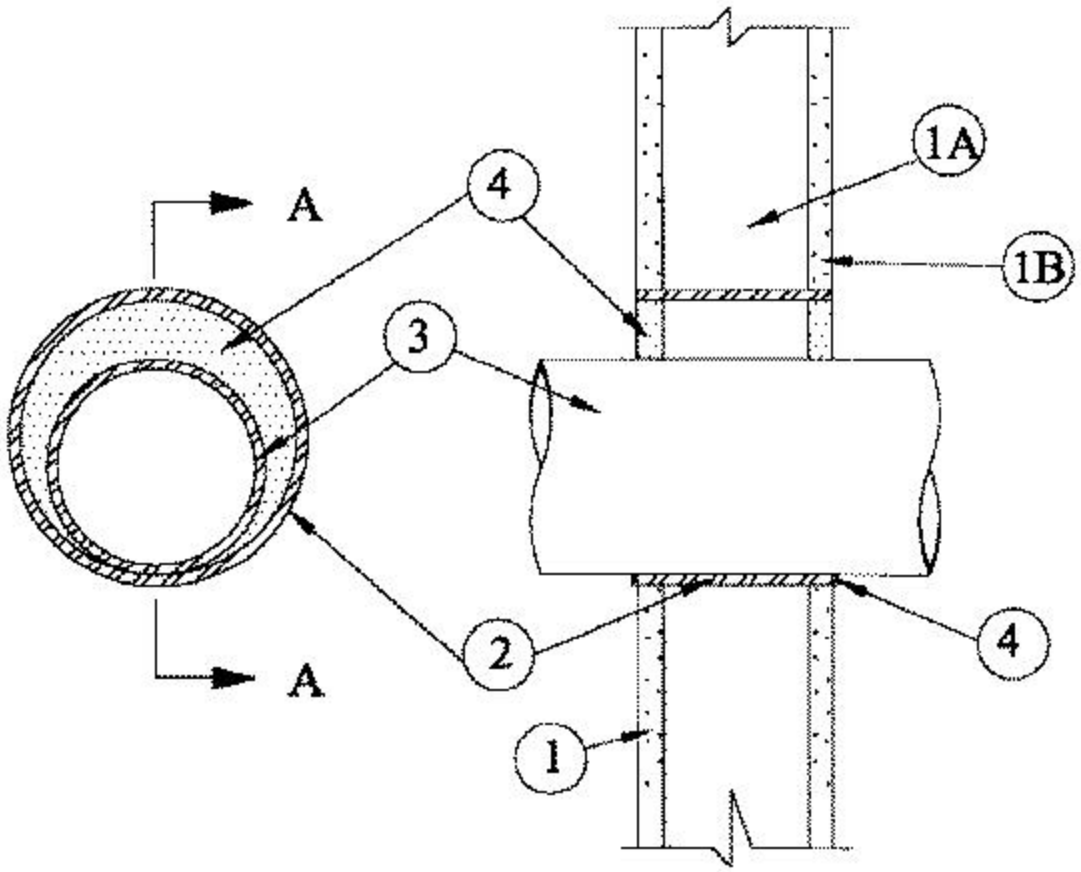
* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Last Updated on 2017-03-14

System No. W-L-1164

January 22, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings — 1 and 2 Hr (See Item 1and 4)	F Ratings — 1 and 2 Hr (See Items 1 and 4)
T Rating — 0 Hr	FT Rating — 0 Hr
	FH Ratings — 1 and 2 Hr (See Items 1 and 4)
	FTH Rating — 0 Hr



SECTION A-A

1. **Wall Assembly —** The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300, U400, V400 or W400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

A. **Studs —** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC. When steel studs are used and the diam of opening exceeds the width of stud cavity, the opening shall be framed on all sides using lengths of steel stud installed between the vertical studs and screw-attached to the steel studs at each end. The framed opening in the wall shall be 4 to 6 in. (102 to 152 mm) wider and 4 to 6 in. (102 to 152 mm) higher than the diam of the penetrating item such that, when the penetrating item is installed in the opening, a 2 to 3 in. (51 to 76 mm) clearance is present between the penetrating item and the framing on all four sides.

B. **Gypsum Board* —** The gypsum wallboard type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design. Max diam of opening in steel stud walls is 32 in. (813 mm). Max diam of openings in wood stud walls is 14-1/2 in. (368 mm).

The hourly F, FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Steel Sleeve —** Nom 32 in. (813 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe sleeve friction fit in nom 32 in. (813 mm) diam circular opening cut through gypsum board layers. Length of steel sleeve to be equal to thickness of wall.

3. **Through-Penetrant —** One metallic pipe, conduit or tubing installed either concentrically or eccentrically within the firestop system. The annular space between pipe, conduit or tubing and the steel sleeve shall be min of 0 in. (point contact) to max 1-7/8 in. (48 mm) Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:

A. **Steel Pipe —** Nom 30 in. (762 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.

B. **Iron Pipe —** Nom 30 in. (762 mm) diam (or smaller) service weight (or heavier) cast iron soil pipe or Class 50 (or heavier) ductile iron pressure pipe.

C. **Conduit —** Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing.

D. **Copper Tubing —** Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.

E. **Copper Pipe —** Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.

4. **Fill, Void or Cavity Material*-Sealant —** Min 5/8 in. (16 mm) and 1-1/4 in. (32 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly for 1 or 2 hr rated walls, respectively. Min 1/2 in. (13 mm) diam bead of caulk applied to the penetrant/gypsumboard interface at the point contact location on both sides of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

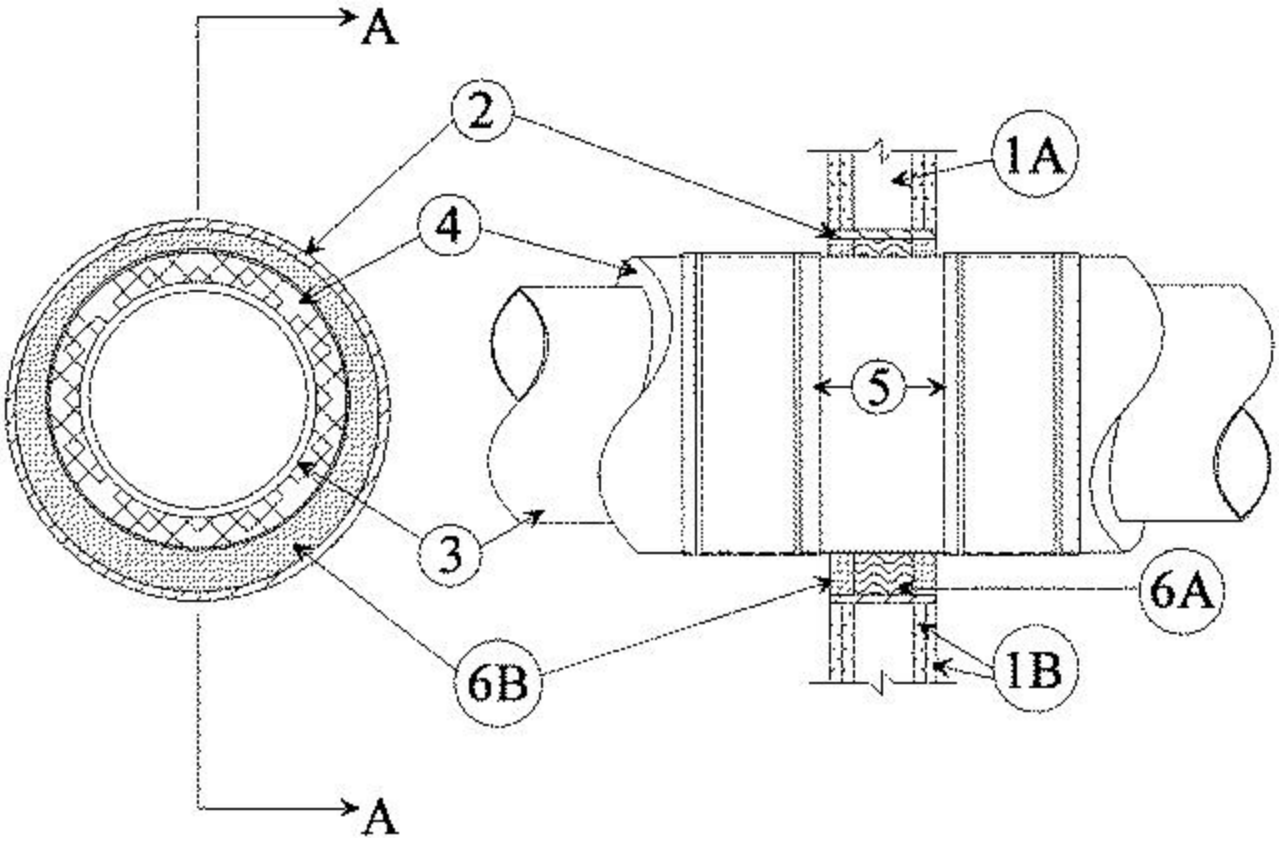
* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Last Updated on 2015-01-22

System No. W-L-5046

December 21, 2017

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 1 & 2 Hr (See Item 6)	F Rating — 1 & 2 Hr (See Item 6)
T Rating — 0 & 1 Hr (See Item 4)	FT Rating — 0 & 1 Hr (See Item 4)
	FH Rating — 1 & 2 Hr (See Item 6)
	FTH Rating — 0 & 1 Hr (See Item 4)



1. **Wall Assembly —** The fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. **Studs —** Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC.

B. **Gypsum Board* —** Nom 5/8 in. (16 mm) thick gypsum wallboard, as specified in the individual Wall and Partition Design. Max diam of opening is 14-1/2 in. (368 mm) for wood stud walls and 22 in. (559 mm) for steel stud walls.

2. **Metallic Sleeve —** Nom 22 in. (559 mm) diam (or smaller) Schedule 40 (or thinner) steel pipe cast into wall assembly with joint compound and installed flush with wall surfaces.

3. **Through Penetrants —** One metallic pipe or tubing to be positioned within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The annular space shall be min 3/4 in. (19 mm) to max 3 in. (76 mm). The following types and sizes of metallic pipes or tubing may be used:

A. **Steel Pipe —** Nom 12 in. (305 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe.

B. **Copper Tubing —** Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.

C. **Copper Pipe —** Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.

4. **Pipe Covering Materials* — Cellular Glass Insulation —** Nom 1-1/2 in. (38 mm) or 3 in. (76 mm) thick cellular glass pipe insulation sized to the outside diam of the steel pipe or tube and installed in accordance with the manufacturer's instructions. T Rating is 0 hr when nom 1-1/2 in. (38 mm) thick pipe insulation is used in 1 hr and 2 hr fire-rated wall assembly. T Rating is 0 hr when nom 3 in. (76 mm) thick pipe insulation is used in 1 hr fire-rated wall assembly. T Rating is 1 hr when nom 3 in. (76 mm) thick pipe insulation is used in 2 hr fire-rated wall assembly.

5. **Metal Jacket (Optional) —** Min 12 in. (305 mm) long jacket formed of min 0.010 in. (.254 mm) thick steel or aluminum sheet cut to wrap tightly around the pipe insulation with a min 2 in. (51 mm) lap. Jacket secured with min 1/2 in. (13 mm) wide stainless steel hose clamps or bands located within 2 in. (51 mm) of each end of the jacket and spaced a max of 10 in. (254 mm) OC. Jacket to be installed with abutting surface of sealant (Item 6B) on both surfaces of wall. Metal jacket to be used in addition to any other jacketing material which may be required or desired on the pipe insulation.

6. **Firestop System —** Installed symmetrically on both sides of the wall. **The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.**

A. **Packing Material —** Min 2-1/4 or 3-1/2 in. (57 to 89 mm) thickness of min 4.0 pcf (64 kg/m^3) mineral wool batt insulation firmly packed into opening as a permanent form for 1 or 2 hr walls, respectively. Packing material to be recessed from both surfaces of wall as required to accommodate the required thickness of fill material.

B. **Fill, Void or Cavity Material* — Sealant —** Min 3/4 in. (19 mm) thickness of fill material applied within the annulus, flush with both surfaces of the wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Last Updated on 2017-12-21