DCC TO28 BUILDING A CHILLER; COOLING TOWER REPLACEMENT

515 5th Street N.W. Washington, DC 20001

DC COURTS

515 5th Street N.W. Washington, DC 20001

SMITHGROUP

1700 NEW YORK AVENUE NW
SUITE 100
WASHINGTON, DC 20006
202.842.2100
smithgroup.com

DISTRICT OF COLUMBIA
JOHN G. CRUMP
ARC100840
LICENSED
ARCHITECT
4/2/2026

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PROPOSED SHAFT BASE DESIGN & DEDUCT ALTERNATE

a. **BASE DESIGN**
1. CONTRACTOR SHALL FIELD-VERIFY EXISTING FLOOR OPENING DIMENSIONS AT THE LOCATION OF THE FIRE-WRAPPED EMERGENCY REFRIGERANT EXHAUST DUCT RISER.
2. THE BASE DESIGN ASSUMES THAT REFLECTS ENLARGEMENT OF THE EXISTING STRUCTURAL FLOOR OPENING TO ACCOMMODATE THE FIRE-WRAPPED EMERGENCY REFRIGERANT EXHAUST DUCT RISER. ACCORDINGLY, THE BASE SCOPE INCLUDES ALL ARCHITECTURAL/STRUCTURAL DEMOLITION, REVISED OPENING CONSTRUCTION, AND ASSOCIATED WALL AND FLOOR FINISH WORK REQUIRED TO ENLARGE THE STRUCTURAL OPENING, INCLUDING BUT NOT LIMITED TO RESTROOM STALL MODIFICATIONS, WALL TILE, AND ADJACENT FINISHES. THE SHAFT REPLACEMENT AND RESTORATION SCOPE IS INCLUDED REGARDLESS OF OPENING SIZE FOR DUCT INSTALLATION AND INSULATION.
3. REFER TO MECHANICAL DRAWINGS FOR THE SCOPE OF WORK ASSOCIATED WITH ROUTING THE REFRIGERANT EXHAUST DUCT WITH FIRE WRAP.
4. REFER TO STRUCTURAL DRAWINGS FOR THE SCOPE OF WORK ASSOCIATED WITH REINFORCING THE ENLARGED OPENING.

B. **DEDUCT ALTERNATE**
1. CONTRACTOR SHALL FIELD-VERIFY EXISTING FLOOR OPENING DIMENSIONS AT THE LOCATION OF THE FIRE-WRAPPED EMERGENCY REFRIGERANT EXHAUST DUCT RISER.
2. IF THE EXISTING STRUCTURAL OPENING IS VERIFIED TO BE SUFFICIENT TO ACCOMMODATE THE INSTALLATION OF THE NEW FIRE-WRAPPED EMERGENCY REFRIGERANT EXHAUST DUCT RISER WITHOUT ENLARGEMENT, CONTRACTOR SHALL PROVIDE A CREDIT TO THE OWNER FOR ALL STRUCTURAL WORK ASSOCIATED WITH ENLARGING AND REINFORCING THE FLOOR OPENING THAT IS NO LONGER REQUIRED, AS WELL AS ANY ASSOCIATED ARCHITECTURAL DEMOLITION AND FINISH WORK THAT WOULD HAVE BEEN REQUIRED SOLELY DUE TO ENLARGEMENT OF THE OPENING.
3. SHAFT REPLACEMENT AND ASSOCIATED SHAFT FINISHES SHALL REMAIN INCLUDED IN THE BASE SCOPE REGARDLESS OF OPENING SIZE AND SHALL NOT BE SUBJECT TO CREDIT.

APPLICABLE CODES & STANDARDS

DISTRICT OF COLUMBIA BUILDING CODES (DC AMENDMENTS & ASSOCIATED MODEL CODES) (DCBC), 2017 ED.

BASED ON THE INTERNATIONAL CODE COUNCIL (ICC) STANDARDS, 2015 ED. AS AMENDED BY THE DISTRICT OF COLUMBIA DEPARTMENT OF BUILDINGS.

- INTERNATIONAL BUILDING CODE *(IBC)*
- INTERNATIONAL EXISTING BUILDING CODE *(IEBC)*
- INTERNATIONAL ELECTRICAL CODE *(IEC)*
- INTERNATIONAL ENERGY CONSERVATION CODE *(IECC) ASHRAE 90.1-2013 AND AMENDMENTS*
- INTERNATIONAL GREEN CONSTRUCTION CODE *(IGCC)*
- INTERNATIONAL FUEL GAS CODE *(IFGC)*
- INTERNATIONAL MECHANICAL CODE *(IMC)*
- INTERNATIONAL PLUMBING CODE *(IPC)*

ACCESSIBILITY GUIDELINES
- *ADA-2010,* STANDARDS FOR ACCESSIBLE DESIGN
- *ICC A117.1-2017,* ACCESSIBLE AND USABLE BLDGS AND FACILITIES
- *IBC CHAPTER 11*

PROJECT CODE SUMMARY
THE SCOPE OF WORK INVOLVES IN-KIND REPLACEMENT OF THE EXISTING COOLING PLANT (TWO CHILLERS, FOUR PUMPS, AND TWO COOLING TOWERS) IN THE BASEMENT LEVEL OF THE BUILDING. TO SUPPORT THIS WORK, THE PROJECT SCOPE INCLUDES RECONFIGURATION OF EXISTING MECHANICAL ROOMS, CONSTRUCTION OF A NEW SHAFT, INSTALLATION OF A NEW REFRIGERANT EXHAUST SYSTEM, AND NECESSARY ACCESSORIES, PIPING, AND CONTROLS.

THE WORK WILL NOT EXCEED 50 PERCENT OF THE BUILDING AREA AND AS SUCH IS CLASSIFIED AS A LEVEL 2 ALTERATION IN ACCORDANCE WITH THE DISTRICT OF COLUMBIA EXISTING BUILDING CODE. EXISTING MEANS OF EGRESS IN THE BASEMENT IS NOT BEING MODIFIED AS PART OF THIS SCOPE OF WORK.

PROJECT TEAM

OWNER / CLIENT:

DC COURTS
500 INDIANA AVE NW
WASHINGTON DC 20001
202 879 1010

CONTACT:
ENOR WILLIAMS
enor.williams@dcsc.gov

ARCHITECT / MEP ENGINEER:

SMITHGROUP
1700 NEW YORK AVE. NW
WASHINGTON / DC / 20006
202 842 2100
WWW.SMITHGROUP.COM

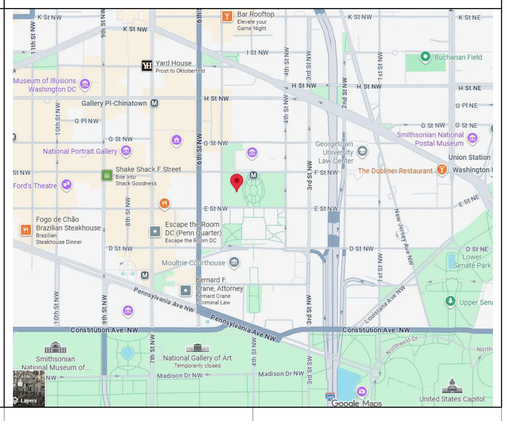
CONTACT
IONEL PETRUS
Ionel.Petrus@smithgroup.com
202 974 0856

STRUCTURAL ENGINEER:

TYIin
5301 SHAWNEE RD
SUITE 400
ALEXANDRIA, VA 22312
800 837 9779
www.tylin.com

CONTACT
MARGARET COWIE
margaret.cowie@tylin.com
202.333.6230

VICINITY MAP



PROJECT GENERAL NOTES

THE FOLLOWING PROJECT GENERAL NOTES APPLY TO THE ENTIRE DRAWING SET AND ARE NOT SPECIFIC TO ANY ONE DISCIPLINE, UNLESS OTHERWISE NOTED.

1. THE DRAWING SET AND SPECIFICATIONS (PROJECT MANUAL) ARE COMPLEMENTARY AND ESTABLISH DETAILED MINIMUM REQUIREMENTS FOR THE DESIGN AND CONSTRUCTION OF THE PROJECT.
2. THE DRAWING SET CONSISTS OF ALL SHEETS LISTED BY THE SHEET INDEX. THE WORK DESCRIBED BY THE DRAWINGS OF ANY ONE DISCIPLINE MAY BE AFFECTED BY THE WORK DESCRIBED ON DRAWINGS OF ANOTHER DISCIPLINE AND MAY REQUIRE REFERENCE TO DRAWINGS OF ANOTHER DISCIPLINE. AS SUCH, DO NOT DISTRIBUTE OR UTILIZE PARTIAL SETS OF DRAWINGS.
3. COLUMN GRID LINES IDENTIFIED BY A LETTER DESIGNATION ARE PARALLEL, UNLESS OTHERWISE NOTED. COLUMN GRID LINES IDENTIFIED BY A NUMBER DESIGNATION ARE PARALLEL AND ARE PERPENDICULAR TO THOSE WITH LETTER DESIGNATIONS, UNLESS OTHERWISE NOTED.
4. DISCIPLINE GENERAL NOTES, SYMBOLS AND DEFINITIONS APPLICABLE TO EACH DISCIPLINE'S DRAWINGS MAY BE FOUND AT THE FRONT OF EACH DISCIPLINE'S PORTION OF THE DRAWING SET AND ARE LISTED IN THE SHEET INDEX.
5. UNLESS INDICATED OTHERWISE, THE "ARCHITECTURAL" SERIES DRAWINGS TAKE PRECEDENCE FOR THE FINISHED APPEARANCE AND LOCATION OF ALL EXPOSED ELEMENTS OF THE WORK OF ALL TRADES, INCLUDING THAT WORK WHICH IS ILLUSTRATED PRIMARILY ON DRAWINGS OF OTHER DISCIPLINES.
6. THE DRAWINGS MAY MAKE REFERENCE TO OR ILLUSTRATE ITEMS WHICH ARE NOT PART OF THE WORK OF THE CONTRACT. THESE "NOT IN CONTRACT" ITEMS AS INDICATED ARE REFERENCED OR ILLUSTRATED FOR THE CONTRACTOR'S REFERENCE, INFORMATION AND COORDINATION ONLY.
7. EXISTING CONDITIONS, IF SHOWN, ARE FROM AVAILABLE RECORD DRAWINGS AND/OR VISUAL FIELD SURVEYS. VERIFY ACTUAL EXISTING CONDITIONS AT THE SITE PRIOR TO SUBMITTING A BID. NOTIFY THE ARCHITECT, IN WRITING AND PRIOR TO SUBMITTING A BID, OF ANY DISCREPANCIES.
8. TAKE PRECAUTIONS TO MAINTAIN AND PROTECT NEW WORK AS WELL AS EXISTING SYSTEMS AND ELEMENTS, IF ANY, WHICH ARE TO REMAIN OR BE SALVAGED. ANY DAMAGE TO SUCH SYSTEMS AND ELEMENTS SHALL BE IMMEDIATELY REPAIRED IN A MANNER ACCEPTABLE TO THE ARCHITECT. IF SATISFACTORY REPAIRS CANNOT BE MADE, REPLACE SYSTEMS AND ELEMENTS WITH "LIKE NEW" QUALITY ACCEPTABLE TO THE ARCHITECT, ALL AT NO ADDITIONAL COST.
9. ALL PARTS OF THE WORK, INCLUDING BUT NOT LIMITED TO MATERIALS, METHODS, OR ASSEMBLIES, MUST COMPLY WITH THE REQUIREMENTS OF THE GOVERNING CODES AND REGULATIONS OF ALL FEDERAL, STATE AND LOCAL AUTHORITIES HAVING JURISDICTION OVER THE PROJECT, AS WELL AS THOSE GREATER REQUIREMENTS INDICATED BY THE CONTRACT DOCUMENTS. NO PART OF THE CONTRACT DOCUMENTS MAY BE CONSTRUED TO REQUIRE OR ALLOW WORK CONTRARY TO A GOVERNING CODE OR REGULATION.
10. IDENTIFY AND NOTIFY THE ARCHITECT OF CONFLICTS BETWEEN THE WORK OF DIFFERENT PARTIES AT THE EARLIEST POSSIBLE DATE SO AS TO ALLOW REASONABLE AND ADEQUATE TIME FOR THE CONFLICT TO BE RESOLVED WITHOUT DELAYING THE WORK. ALL DEVIATIONS FROM THE CONTRACT DOCUMENTS MUST BE APPROVED IN ADVANCE BY THE ARCHITECT AND OWNER.
11. REVIEW AND COORDINATE THE WORK OF ALL OTHER PARTIES PERFORMING WORK AT THE PROJECT, INCLUDING BUT NOT LIMITED TO, DELEGATED DESIGN ENTITIES, TRADES AND SUPPLIERS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS BEFORE COMMENCING CONSTRUCTION, AND ASSURE THAT ALL PARTIES ARE AWARE OF ALL REQUIREMENTS, REGARDLESS OF WHERE THE REQUIREMENTS OCCUR IN THE CONTRACT DOCUMENTS, WHICH MIGHT AFFECT THE WORK OF THAT PARTY.
12. DO NOT SCALE THE DRAWINGS FOR DIMENSIONAL INFORMATION. NOTIFY THE ARCHITECT IN WRITING IMMEDIATELY IF DIMENSIONAL INFORMATION CANNOT BE DETERMINED FROM THE DRAWINGS OR IF DIMENSIONS ARE IN CONFLICT WITH OTHER DRAWINGS.

NOTE: COORDINATE ARCHITECTURAL AND PLUMBING DEMOLITION AND NEW WORK SCOPE WITH DC COURTS. DO NOT PLAN, SCHEDULE, OR PROCEED WITH ANY DEMOLITION OR NEW WORK WITHOUT PRIOR WRITTEN APPROVAL FROM DC COURTS.

DC Courts TO-28
Building a Chiller; Cooling Tower Replacement
515 5th Street N.W.
Washington, DC 20001

SMITHGROUP

1700 NEW YORK AVENUE NW
SUITE 100
WASHINGTON, DC 20006
202.842.2100
www.smithgroup.com

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100% Construction Documents		2/12/2026

SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
JOHN G. CRUMP
ARC100840
LICENSED
ARCHITECT
4/2/2026

SHEET TITLE
PROJECT SHEET INDEX AND BUILDING CODES

PROJECT NUMBER 00100451

SHEET NUMBER **G0.1**

START Sheet

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GENERAL NOTES

1. ALL STRUCTURAL WORK SHALL BE COORDINATED WITH ARCHITECTURAL AND MECHANICAL DRAWINGS AND SHALL CONFORM TO THE PROJECT SPECIFICATIONS, INCLUDING THE 2015 INTERNATIONAL BUILDING CODE AND 2015 INTERNATIONAL EXISTING BUILDING CODE AS AMENDED BY THE 2017 DCMR 12A AND 12B. THE FOLLOWING STANDARDS WERE USED AS SPECIFIED IN THE GOVERNING BUILDING CODE:
   a. ASCE 7-10 MINIMUM DESIGN LOADS (AND ASSOCIATED CRITERIA) FOR BUILDINGS AND OTHER STRUCTURES
   b. ACI 318-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
   c. AISC 360-10 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS
2. CONTRACTOR SHALL PROVIDE TEMPORARY SHORING, BRACING AND SHEETING AND SHALL MAKE SAFE ALL FLOORS, ROOFS, WALLS AND ADJACENT PROPERTY AS PROJECT CONDITIONS REQUIRE. SHORING AND SHEETING SHALL BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER LICENSED IN THE PROJECT JURISDICTION, HIRED BY THE CONTRACTOR, WHO SHALL SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR THE OWNER'S REVIEW.
3. DIMENSIONS AND ELEVATIONS OF EXISTING CONSTRUCTION GIVEN IN STRUCTURAL DRAWINGS ARE BASED ON INFORMATION CONTAINED IN VARIOUS ORIGINAL DESIGN AND CONSTRUCTION DOCUMENTS PROVIDED BY THE OWNER, AND LIMITED FIELD OBSERVATIONS AND MEASUREMENTS. THE ORIGINAL STRUCTURAL DRAWINGS HAVE NOT BEEN AVAILABLE TO THE TEAM, NOR HAVE ANY RENOVATION STRUCTURAL DRAWINGS. HOWEVER, BUILDING A IS A SISTER BUILDING TO BUILDING B, SO THE RENOVATION DRAWINGS FOR BUILDING B, WHICH USED THE ORIGINAL DRAWINGS AS BACKGROUNDS, PROVIDE AN ASSUMED BASIS FOR THE STRUCTURAL SYSTEMS. THE CONTRACTOR SHALL VERIFY ALL INFORMATION PERTAINING TO EXISTING CONDITIONS BY ACTUAL MEASUREMENT AND OBSERVATION AT THE SITE. ALL DISCREPANCIES BETWEEN ACTUAL CONDITIONS AND THOSE SHOWN IN THE CONTRACT DOCUMENTS SHALL BE REPORTED TO THE ENGINEER OF RECORD FOR EVALUATION BEFORE THE AFFECTED CONSTRUCTION IS PUT IN PLACE. HISTORIC DRAWINGS REFERENCED INCLUDE:
   A. INTERIOR IMPROVEMENTS TO DC SUPERIOR COURTS BUILDING 'B' BY LEO A DALY DATED 2003
   B. EVAPCO COOLING TOWER PRODUCT DATA DATED 2003
4. THE CONTRACT DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY. THESE NOTES HIGHLIGHT RATHER THAN REPLACE THE SPECIFICATIONS CONTAINED IN THE PROJECT MANUAL. CONTRACTOR SHALL NOTIFY THE ARCHITECT AND ENGINEER OF ANY CONFLICTS FOR GUIDANCE.

CONCRETE

1. ALL CONCRETE WORK SHALL CONFORM TO THE FOLLOWING GOVERNING STANDARDS:
   A. AMERICAN CONCRETE INSTITUTE (ACI) "BUILDING CODE REQUIREMENTS FOR CONCRETE" (ACI 318)
   B. ACI COLLECTION, LATEST EDITION
   C. CONCRETE REINFORCING STEEL INSTITUTE (CRSI) "MANUAL OF STANDARD PRACTICE"
2. ALL CONCRETE COMPOSITE ON METAL DECK SHALL BE LIGHT WEIGHT CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS, UNLESS OTHERWISE NOTED.
3. ALL OTHER CONCRETE SHALL BE NORMAL WEIGHT CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS, UNLESS OTHERWISE NOTED.
4. CONTRACTOR SHALL SUBMIT A PROJECT-SPECIFIC SIGNED AND SEALED CONCRETE MIX DESIGN FOR EACH CONCRETE TYPE SPECIFIED IN THE CONTRACT DOCUMENTS. WHERE 033000 SPECIFICATIONS HAVE BEEN INCLUDED IN THE CONTRACT DOCUMENTS, REFER TO THAT SPECIFICATION SECTION FOR BALANCE OF MIX DESIGN REQUIREMENTS (AGGREGATES, ADMIXTURES, W/C RATIO, AIR CONTENT, ETC.)
5. REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60 REINFORCING STEEL SHALL BE DETAILED ACCORDING TO THE ACI "DETAILS AND DETAILING OF REINFORCEMENT" (ACI 315).
6. WELDED WIRE REINFORCEMENT (W.W.R.) SHALL CONFORM TO ASTM A1064, WITH A MINIMUM YIELD STRENGTH OF 65,000 PSI.
7. COORDINATE SIZE AND LOCATION OF ALL OPENINGS AND PIPE SLEEVES WITH ALL OTHER DISCIPLINES. MINIMUM CONCRETE BETWEEN SLEEVES SHALL BE 6".
8. GENERAL CONTRACTOR SHALL PROVIDE COORDINATED MEP TRADE SUBMITTALS FOR DESIGN TEAM REVIEW OF PENETRATIONS. ALL TRADES SHALL BE OVERLAID INTO ONE SUBMITTAL TO CAPTURE AND EVALUATE ALL PENETRATIONS THROUGH SLABS AND WALLS TOGETHER.
9. ALL GROUT SHALL BE NONSHRINK WITH A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI.
10. MINIMUM CONCRETE COVER FOR REINFORCING STEEL IN CAST-IN-PLACE NON-PRESTRESSED MEMBERS SHALL BE AS FOLLOWS:
    A. NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:
       a. SLABS, JOISTS, AND WALLS:
          • 1-1/2" (#14 THROUGH #18 BARS)
          • 3/4" (#11 BAR AND SMALLER)
11. SHOP DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW AND APPROVAL. NO CONCRETE WORK SHALL COMMENCE WITHOUT APPROVED SHOP DRAWINGS.
12. CLEAN AND ROUGHEN TO 1/4" AMPLITUDE ALL EXISTING CONCRETE SURFACES TO RECEIVE NEW CONCRETE PRIOR TO PLACEMENT.
13. SEE OTHER DRAWINGS IN THIS PROJECT FOR SIZE AND LOCATIONS OF EQUIPMENT PADS, INSERTS, AND EMBED ITEMS.
14. REINFORCING DOWELS, WATER STOPS, AND OTHER EMBED ITEMS SHALL BE INSTALLED AND SECURED PRIOR TO CONCRETE PLACEMENT. "WET-SETTING" OF EMBEDDED ITEMS IS NOT PERMITTED.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL WORK SHALL CONFORM TO THE FOLLOWING GOVERNING STANDARDS:
   A. AISC 360 "SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS".
   B. AISC 303 "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES".
   C. AMERICAN WELDING SOCIETY (AWS D1.1) "STRUCTURAL WELDING CODE - STEEL".
   D. RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC) "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS".
2. ALL STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS:
   A. WIDE FLANGE BEAMS, COLUMNS, AND STRUCTURAL TEES: ASTM A992.
   B. CHANNELS, ANGLES, AND PLATES: ASTM A36 UNLESS OTHERWISE NOTED.
   C. STRUCTURAL STEEL PLATE SHALL BE ASTM A572 GRADE 50 HAVING A MINIMUM YIELD POINT OF 50,000 PSI. GRADE 42 HAVING A MINIMUM YIELD POINT OF 42,000 PSI FOR THICKNESS GREATER THAN 4".
   D. BOLTED CONNECTIONS SHALL BE PER ASTM F3125. GRADES ARE TO BE SELECTED AS FOLLOWS:
      a. STANDARD BEAM TO BEAM/GIRDER: ASTM F3125, GRADES A325, F1852, A490 OR F2280 BOLTS IN SNUG-TIGHTENED JOINTS (3/4" DIAMETER MINIMUM WITH HARDENED WASHERS).
      b. PER AISC 341, ALL BOLTS SHALL BE INSTALLED AS PRETENSIONED HIGH STRENGTH BOLTS AND MEET THE REQUIREMENTS FOR SURFACE PREPARATION FOR SLIP CRITICAL CONNECTIONS WITH CLASS A SLIP COEFFICIENT OR HIGHER. THE AVAILABLE SHEAR STRENGTH OF BOLTED JOINTS USING STANDARD HOLES SHALL BE CALCULATED AS THAT FOR BEARING TYPE JOINTS.
   E. ANCHOR RODS: ASTM F1554, GRADE 36.
3. MINIMUM WELD SIZE IS 1/4" FILLET UNLESS NOTED OTHERWISE.
4. ALL BEAMS EXCEPT CANTILEVER BEAMS SHALL BE FABRICATED AND INSTALLED WITH NATURAL CAMBER UP. CANTILEVER BEAMS SHALL BE FABRICATED AND INSTALLED SO THAT NATURAL CAMBER RAISES CANTILEVER END.
5. FIELD CUTTING OR BURNING OF STEEL IS PROHIBITED EXCEPT WITH THE EXPRESS WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD (IN WHICH CASE ALL BURNING OF STEEL MUST CONFORM TO THE THERMAL CUTTING REQUIREMENTS OF AISC AND AWS).
6. WELDING SHALL BE PERFORMED BY CERTIFIED, AWS-QUALIFIED WELDERS. WELDING ELECTRODES FOR CARBON STEEL SHALL BE AWS 5.1, CLASS E70XX. FOR ASTM A572 GRADE 50 KSI PLATE USE ELECTRODE E7018 OR APPROVED EQUAL.
7. SHOP PAINT EXPOSED STEEL MEMBERS, STEEL MEMBERS NOT ENCASED IN CONCRETE OR SPRAY FIREPROOFED, AND ALL STEEL MEMBERS AT THE EXTERIOR WALL WITH TNEMEC V10-99 OR APPROVED EQUAL EXCEPT FOR MEMBERS TO BE HOT DIPPED GALVANIZED.
8. LINTELS SHALL BE INSTALLED OVER ALL OPENINGS IN MASONRY WALLS AS FOLLOWS:

MASONRY OPENING	LINTEL
4' - 0" OR LESS	L4x3-1/2x5/16 LLV
4' - 1" TO 7' - 0"	L6x3-1/2x5/16 LLV

   A. 3-1/2" LEGS ARE HORIZONTAL.
   B. PROVIDE ONE ANGLE FOR EACH 4" OF WALL THICKNESS.
   C. PROVIDE L5x5x5/16 ANGLES FOR 6" THICK WALLS AND PARTITIONS WITH OPENINGS UP TO 6' - 0".
   D. PROVIDE MINIMUM 6" BEARING AT EACH END.
   E. LINTELS OVER 6' - 4" SHALL BE FIREPROOFED.
11. SHOP AND ERECTION DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW AND APPROVAL. NO FABRICATION OF STEEL SHALL COMMENCE WITHOUT APPROVED SHOP DRAWINGS.

POST-INSTALLED ADHESIVE AND MECHANICAL ANCHORS

1. POST INSTALLED ANCHORAGE SHALL BE INSTALLED BY QUALIFIED PERSONNEL PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII), AS INCLUDED IN THE ANCHOR PACKAGING, TO INTACT BASE MATERIAL. INSTALLATION OF ANCHORS SHALL BE CARRIED OUT BY AN INSTALLER TRAINED TO INSTALL THE SPECIFIED ANCHORS. NOTIFY ENGINEER OF RECORD PRIOR TO INSTALLATION IF BASE MATERIAL CONDITION DEVIATES FROM STRUCTURAL DRAWINGS OR ASSUMPTIONS AND CONDITIONS OF THE MPII. ALL HOLES SHALL BE DRY AND HAMMER DRILLED UNLESS OTHERWISE NOTED, AND ALL CONCRETE BASE MATERIAL TO RECEIVE ADHESIVE ANCHORS SHALL HAVE A MINIMUM AGE OF 21 DAYS.
2. INSTALLATION OF ADHESIVE ANCHORS IN A HORIZONTAL OR UPWARDLY INCLINED ORIENTATION AND SUPPORTING A SUSTAINED TENSION LOAD SHALL BE PERFORMED BY A CERTIFIED ADHESIVE ANCHOR INSTALLER. CERTIFICATION SHALL INCLUDE WRITTEN AND PERFORMANCE TESTS IN ACCORDANCE WITH THE ACI/CRSI ADHESIVE ANCHOR INSTALLER CERTIFICATION PROGRAM OR APPROVED EQUAL. PRIOR TO THE COMMENCEMENT OF INSTALLING ANCHORS PROVIDE OWNER AND ENGINEER OF RECORD WITH DOCUMENTED CONFIRMATION THAT ALL OF THE CONTRACTOR'S PERSONNEL WHO INSTALL HORIZONTAL OR UPWARDLY INCLINED ADHESIVE ANCHORS SUPPORTING SUSTAINED TENSION LOADS ARE TRAINED AND CERTIFIED.
   A. OVERHEAD ADHESIVE ANCHORS MUST BE INSTALLED USING THE PISTON PLUG SYSTEM SPECIFIED BY THE MPII AND PRODUCED BY THE CORRESPONDING MANUFACTURER FOR THE ANCHOR SYSTEM BEING INSTALLED.
3. EXISTING REINFORCING BARS IN THE STRUCTURE MAY CONFLICT WITH SPECIFIC ANCHOR LOCATIONS. REINFORCING BARS SHALL NOT BE CUT WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER OF RECORD. UNLESS NOTED ON THE DRAWINGS THAT THE EXISTING REBARS CAN BE CUT, THE CONTRACTOR SHALL REVIEW THE EXISTING STRUCTURAL DRAWINGS AND SHALL UNDERTAKE TO LOCATE THE POSITION OF THE REINFORCING BARS BY A MEANS APPROVED BY THE ENGINEER OF RECORD.
4. ANCHOR CAPACITY IS DEPENDENT UPON SPACING BETWEEN ADJACENT ANCHORS, PROXIMITY OF ANCHORS TO EDGE OF CONCRETE, AND EMBEDMENT DEPTH INTO THE SUBSTRATE. INSTALL ANCHORS IN ACCORDANCE WITH SPACING, EDGE CLEARANCES, AND EMBEDMENT DEPTHS INDICATED ON THE DRAWINGS.
5. UNLESS OTHERWISE INDICATED, POST INSTALLED ANCHORAGE SHALL BE ADHESIVE TYPE HILTI HIT-HY 200-R INTO CONCRETE OR HILTI HIT-HY 270 INTO BRICK MASONRY, GROUT FILLED CMU OR UNGROUTED CMU BASE MATERIAL. PROVIDE MESH SCREEN IN UNGROUTED CMU, UNREINFORCED MASONRY CONSTRUCTION, AND BRICK MASONRY WITH HOLES OR VOIDS.
6. SUBSTITUTION REQUESTS FOR ALTERNATE ANCHORAGE PRODUCTS SHALL BE SUBMITTED TO ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO USE. THIS SHALL INCLUDE MANUFACTURER PRODUCT DATA AND CALCULATIONS DEMONSTRATING THAT THE PROPOSED SUBSTITUTE CAN ACHIEVE THE PERFORMANCE VALUES OF THE SPECIFIED PRODUCT. ANCHOR CAPACITY USED IN DESIGN SHALL BE BASED ON THE TECHNICAL DATA PUBLISHED BY THE MANUFACTURER OR SUCH OTHER METHOD AS APPROVED BY THE ENGINEER OF RECORD. SUBSTITUTIONS WILL BE EVALUATED BY THEIR HAVING AN ICC-ES EVALUATION REPORT SHOWING COMPLIANCE WITH THE RELEVANT BUILDING CODE, SEISMIC USE, LOAD RESISTANCE, INSTALLATION CATEGORY, AND AVAILABILITY OF MPII. ADHESIVE ANCHOR EVALUATION WILL ALSO CONSIDER CREEP, IN-SERVICE TEMPERATURE AND INSTALLATION TEMPERATURE AND MUST PROVIDE INFORMATION ON THESE ITEMS. SUBSTITUTION REQUESTS FOR ALTERNATE PRODUCTS MUST BE APPROVED IN WRITING BY THE ENGINEER OF RECORD PRIOR TO USE.

Special Inspection Policy Manual

SCHEDULE OF SPECIAL INSPECTIONS

Address:

MATERIAL/ACTIVITY	TYPE OF INSPECTION	Y/N	C/P	EXTENT/REFERENCE (APPLICABLE TO THIS PROJECT)	AGENT	COMPLETED
GENERAL						
Pre-construction conference	Meeting with parties listed in Section 6 of DOB SIPM to discuss Special Inspection procedures	Y	P	Scheduled by DOB with the Contractor prior to commencement of work	SIER	
EARTHWORK						
Site preparation (building)	Field testing and inspection	N	P	Field Review; IBC 1705.6	SIER	
Fill material (building)	Review submittals, field testing and inspection	N	P	Field Review; IBC 1705.6	SIER	
Fill compaction (building)	In-place density tests, lift thickness	N	C	Field Review; IBC 1705.6	SIER	
Excavation	Field inspection and verification of proper depth	N	P	Field Review; IBC 1705.6	SIER	
Foundation sub-grade	Field inspection of foundation subgrade prior to placement of concrete	N	P	Field Review; IBC 1705.6	SIER	
Sheeting and shoring	H piles and lagging, tie backs,	N	C	IBC 1705.2,1705.7, 1705.8 T1705.7	SIER	
DEEP FOUNDATION ELEMENTS						
Materials	Review product, sizes, and lengths	N	C	Submittal and Field Review; IBC 1705.7, 1705.8, 1705.9	SIER	
Test piles	Monitor driving of test piles	N	C	Field Review; IBC 1705.8, .9 or .10	SIER	
Installation	Monitor drilling, placement, plumb, driving of piles, including recording blows per foot, cut off, and tip elevation	N	C	Field Review; IBC 1705.2, 1705.3, 1705.7	SIER	
Load test	Monitor pile load test	N	C	Field Review; IBC 1705.8, .9 or .10	SIER	
Helical Piles	Continuous special inspections shall be performed during installation of helical pile foundations	N	C	IBC 1705.9, 1810.3.1, 1810.4.11	SIER	
CONCRETE						
Materials	Review product supplied versus certificates of compliance and mix design	Y	P	Submittal & Field Review; IBC 1705.3; ACI 318:Ch. 4 and 5; IBC 1904.2, 1910.2, 1903.3	SIER	
Installation of reinforcing steel, including Pre-stressed tendons and anchor bolts as well as welding	Field inspection of placement	Y	P	Submittal and Field Review; ACI 318:3.5, 3.5.2, 3.8.6 & Ch. 7 8.1.3 and 21.2.8; AWS D1.4; IBC 1705.3, 1908.5, 1909.1, 1910.4	S	I
Formwork installation	Field inspection	N	P	Field Review; ACI 318: 6.1.1; IBC 1705.3	SIER	
Concreting operations and placement	Field inspection of placement/sampling	Y	C	Field Review; ACI 318: 5.6, 5.8, 5.9-10; ASTM C 172, C 31; IBC 1705.3, 1910.6, 1910.7, 1910.8, 1910.10	SIER	
Concrete curing	Field inspection of curing process	Y	P	Field Review; ACI 318: 5.11-13; IBC 1705.3, 1910.9	SIER	
Concrete strength	Evaluation of concrete strength	Y	P	Laboratory Testing; ACI 318: 6.2; IBC 1705.3	SIER	
Inspect anchors post-installed in hardened concrete members	IBC TABLE 1705.3	Y	C	ACI 318: 17.8.2.4	SIER	
PRECAST CONCRETE						
Verify fabrication/quality control procedures	In-plant inspection of fabrication/quality control procedures**	N	P	Submittal or Field Review; IBC 1705.3	SIER	
Erection and installation	Review submittals and as-built assemblies; Field inspection of in-place precast	N	P	Submittal and Field Review; ACI 318; Ch. 16; IBC Table 1705.3	SIER	
MASONRY (Level___; Building Risk Category__) TYPICAL FOR LEVEL B AND RISK CATEGORY I,II,III						
Materials	Review of products supplied versus certificate of compliance and material submitted	N	P	Submittal & Field Review; ACI 530/ASCE 5; ACI 530.1/ASCE 6; IBC 1705.4, 1708	SIER	
Strength	Testing/review of strength	N	C	Submittal & Field Review; ACI 530/ASCE 5; ACI 530.1/ASCE 6; IBC 1705.4, 2105.2.2, 2105.3	SIER	
Mortar and Grout	Inspection of proportioning and mixing. Placement of mortar only.	N	P	Field Review; IBC 1705.4; ACI 530/ASCE 5; ACI 530.1/ASCE 6	SIER	
Grout placement, including pre-stressing grout	Verification to ensure compliance	N	C	Field Review; IBC 1705.4; ACI 530/ASCE 5; ACI 530.1/ASCE 6	SIER	
Grout space	Verification to ensure compliance	N	P	Field Review; IBC 1705.4; ACI 530/ASCE 5; ACI 530.1/ASCE 6; TMS 602	SIER	
Mortar, grout, and prism specimens	Observe Preparation	N	C	Field Review; IBC 1704.5, ACI 530.1; ASCE 6	SIER	
Reinforcement, pre-stressing tendons, and connections	Inspect condition, size, location, and spacing	N	P	Field Review; IBC 1704.5; ACI 530/ASCE 5; ACI 530.1/ASCE 6	SIER	
Welding of reinforcing bars	Inspection and testing of welds	N	C	Field Review; IBC 1705.4; ACI 530/ASCE 5; ACI530.1/ ASCE 6	SIER	
Pre-stressing force	Verify application and measurement	N	C	Field Review; IBC 1705.4; ACI 530/ASCE 5; ACI530.1/ASCE 6	SIER	
Protection	Inspect procedures for protection during cold and hot weather	N	P	Field Review; IBC 1705.4; ACI 530/ASCE 5;ACI 530.1/ASCE 6	SIER	
Anchorage	Inspection of anchorages	N	P	Field Review; ACI 530.1/ASCE 6, ASCE 6; IBC1705.4; ACI 530/ASCE 5	SIER	
Masonry installation	Inspection of placement of masonry and joints (Periodic after the first 5000 SF.)	N	C	Field Review; ACI 530/ASCE 5; ACI 530.1/ASCE6; IBC 1705.4	SIER	
Grouting of pre-stressed tendons	Field inspection	N	C	Field Review; ACI 318: 18.18.4; IBC 1705.3	SIER	
Application of forces for pre-stressed concrete	Field inspection	N	C	Field Review; ACI 318: 18.20; IBC 1705.3	SIER	
STRUCTURAL STEEL		Y/N	C/P			
Verify fabrication/quality control procedures	In-plant inspection of fabrication/quality control procedures or submit Certificate of Compliance	Y	P	IBC 1704.2.5, IBC 1704.2.5.1, 1704.2.5.2, 1705.2	SIER	
Bolts, nuts, and washers – materials	Material identification markings. Review of Certificate of Compliance	Y	P	Submittal & Field Review; IBC 1705.2.1; IBC 1705.2.2; IBC 1706; ASTM; AISC 360, Section A3.3	SIER	
Bolts, nuts, washers – installation	Inspection of in-place high-strength bolts, snug- tight joints, pre-tensioned and bearing type, and slip critical connections	Y	C	Submittal & Field Review; IBC 1705.2.1, 1705.2.2, AISC 360 Section M2.5	SIER	
Structural steel – materials	Material identification markings and review of Certificate of Compliance	Y	P	Submittal & Field Review; IBC 705.2.1,1705.2.2, 1706; ASTM A6, A568	SIER	
Structural steel details – installation	Inspection of member locations, structural details for bracing, connections, stiffening	Y	P	Submittal & Field Review; IBC 1705.2.1,1705.2.2, AISC 360	SIER	
Weld filler materials and welder certification	Review of identification markings, Certificate of Compliance, and welder certifications	Y	P	Submittal & Field Review; ASTM AISC 360 A3.5	SIER	
Welds	Inspection and testing of welds	Y	C	Field Review; IBC 1705.2.2.1; AWS D1.1, D1.3	SIER	
Cold-formed metal deck – materials	Review of identification marking manufacturer's certified test results	N	P	Submittal and Field Review; IBC 1705.2.2; ASTM	SIER	
Cold-formed metal deck – installation	Review laps and welds	N	P	Submittal and Field Review; IBC 1705.2.2, AWS D1.3	SIER	
Cold-formed light frame construction – welds	Review welding operation	N	P	IBC 1705.11.2	SIER	
Cold form light frame construction wind resistance – screws	Review screw attachment bolting, anchoring hold downs, bracing, diaphragms, struts	N	P	Field Review; IBC 1705.11.2	SIER	
Cold-formed steel trusses spanning 60' or greater	Inspection of temporary and permanent restraints/bracing	N	C	Field review IBC 1705.2.4	SIER	
WOOD						
Verify fabrication/quality control procedures	In-plant inspection of fabrication/quality control procedures** or submit Certificate of Compliance	N	P	Submittal or Field Review; IBC 1704.2.5, 1705.5, 1705.5.2	SIER	
Metal plate connected wood/metal trusses spanning 60' or more	Review approved submittal and installation of restraint/bracing	N	P	Field Review; IBC 1704.2.5, 1705.5, 1705.2	SIER	
Joist Hangers – Materials/Installation	Review manufacturer's material and test standards	N	P	Field Review; IBC 1711, ASTM D 1761	SIER	
High-Load Diaphragms – Installation	Review submittal and as-built assemblies; inspection of sheathing, framing size, nail and staple diameter and length, number of fastener lines, and fastener spacing.	N	C	IBC 1705.5, 1705.5.1	S	I
Wood Shear Walls-installation	Review nailing, bolting, anchoring, fastening, Diaphragms, struts, braces, and hold downs when fasteners are ≤ 4" on center.	N	P	Field Review; IBC 1705.11.1	SIER	
MAIN WIND FORCE RESISTING SYSTEM		Y/N	C/P			
Wind requirements	Review of the system components and installation for wood construction, cold-formed steel light frame construction, components, and cladding	N	P	Submittal and Field Review; IBC 1609.1.2, 1704.5.2, 1705.111705, 1705.4, 1705.4.1, 1705.4.2, 1710	S	I
SEISMIC FORCE RESISTING SYSTEMS						
Seismic requirements	Review of the designated seismic systems and seismic force resistance systems	N	C	Submittal and Field Review; IBC 1613, 1704.5.1, 1705.11, 1705.12; ASCE 7	SIER	
SMOKE CONTROL						
Special Inspection of smoke control systems	Leakage testing and recording of device location. Pressure difference testing, flow measurement and detection, and control verification	N	P	Field Review; IBC ,1705.18 ,1705.18.1 1705.17.2 1705.16.2	S	I
SPRAYED FIRE RESISTIVE MATERIAL, FIRE RESISTANT PENETRATIONS; JOINTS, MASTIC AND INTUMESCENT FIRE RESISTANT COATING						
Structural member surface conditions	Field Review of surface conditions prior to application	N	P	AWCI 12-B; IBC 1705.14 1705.14.2	SIER	
Application/thickness/density/bond strength	Field review of application operations, thickness, and density	N	P	ASTM E605, AWCI 12-B; IBC 1705.14.3 1705.14.1, 1705.14.3, 1705.14.4IBC 1705.14.5 1705.14.6	SIER	
Mastic & Intumescent Fire Resistant Coating	Field review of application operations and thickness	N	P	AWCI 12-B; IBC 1705.15	SIER	
Fire-resistant penetrations and joints. In high-rise buildings or in buildings assigned to Risk Category III or IV.	Field inspection per design	N	P	IBC 1705.17.1, 1705.17.2, ASTM E2174.	SIER	
EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS)						
Application	Field Review of application/installation	N	P	ASTM E2570, IBC 1705.16	SIER	
SPECIAL CASES						
Alternative Materials and Systems	As requested by Chief Building Official, review system and installation	N	C/P	IBC 1705.1.1	SIER	

INSPECTION AGENTS	FIRM	ADDRESS	TELEPHONE
Special Inspections Engineer of Record			
Materials and Testing Laboratory			
Special Inspections Engineer of Record Smoke Control System			
Additional Agents			

Note: The Qualifications of the Special Inspections Engineer of Record and Testing Laboratories are subject to the Approval of the Chief Building Official The Schedule of Special Inspections includes certain Architectural, Mechanical, Electric components, Storage Racks and Isolation Systems specified in Section 1705.11 of the Construction Code.

PROPOSED BASE DESIGN AND DEDULT ALTERNATE

1. BASE DESIGN
   A. CONTRACTOR SHALL FIELD-VERIFY EXISTING FLOOR OPENING DIMENSIONS AT THE LOCATION OF THE FIRE-WRAPPED EMERGENCY REFRIGERANT EXHAUST DUCT RISER.
   B. THE BASE DESIGN ASSUMES THAT REFLECTS ENLARGEMENT OF THE EXISTING STRUCTURAL FLOOR OPENING TO ACCOMMODATE THE FIRE-WRAPPED EMERGENCY REFRIGERANT EXHAUST DUCT RISER. ACCORDINGLY, THE BASE SCOPE INCLUDES ALL ARCHITECTURAL/STRUCTURAL DEMOLITION, REVISED OPENING CONSTRUCTION, AND ASSOCIATED WALL AND FLOOR FINISH WORK REQUIRED TO ENLARGE THE STRUCTURAL OPENING, INCLUDING BUT NOT LIMITED TO RESTROOM STALL MODIFICATIONS, WALL TILE, AND ADJACENT FINISHES. THE SHAFT REPLACEMENT AND RESTORATION SCOPE IS INCLUDED REGARDLESS OF OPENING SIZE FOR DUCT INSTALLATION AND INSULATION.
   C. REFER TO MECHANICAL DRAWINGS FOR THE SCOPE OF WORK ASSOCIATED WITH ROUTING THE REFRIGERANT EXHAUST DUCT WITH FIRE WRAP.
   D. REFER TO ARCHITECTURAL DRAWINGS FOR DEMOLITION SCOPE, REVISED OPENING DIMENSIONS, SHAFT CONSTRUCTION, AND FINISH RESTORATION.
2. DEDUCT ALTERNATE
   A. CONTRACTOR SHALL FIELD-VERIFY EXISTING FLOOR OPENING DIMENSIONS AT THE LOCATION OF THE FIRE-WRAPPED EMERGENCY REFRIGERANT EXHAUST DUCT RISER.
   B. IF THE EXISTING STRUCTURAL OPENING IS VERIFIED TO BE SUFFICIENT TO ACCOMMODATE THE INSTALLATION OF THE NEW FIRE-WRAPPED EMERGENCY REFRIGERANT EXHAUST DUCT RISER WITHOUT ENLARGEMENT, CONTRACTOR SHALL PROVIDE A CREDIT TO THE OWNER FOR ALL STRUCTURAL WORK ASSOCIATED WITH ENLARGING AND REINFORCING THE FLOOR OPENING THAT IS NO LONGER REQUIRED, AS WELL AS ANY ASSOCIATED ARCHITECTURAL DEMOLITION AND FINISH WORK THAT WOULD HAVE BEEN REQUIRED SOLELY DUE TO ENLARGEMENT OF THE OPENING.
   C. SHAFT REPLACEMENT AND ASSOCIATED SHAFT FINISHES SHALL REMAIN INCLUDED IN THE BASE SCOPE REGARDLESS OF OPENING SIZE AND SHALL NOT BE SUBJECT TO CREDIT.

LEGEND

EXISTING CONCRETE FOOTING, GRADE BEAM, OR PILE CAP
EXISTING WALL, CONCRETE BEAM, OR PAN JOIST BELOW
BRICK MASONRY
CONCRETE MASONRY (CMU)
CONCRETE WALL
EXISTING WALL, BEAM FLOOR, OR FOUNDATION (SEE NOTES FOR MATERIAL)
EXISTING CONCRETE COLUMN
EXISTING ELEMENT TO BE DEMOLISHED
STEEL COLUMN
EXISTING STEEL COLUMN
COLUMN ABOVE / BELOW
HANGER COLUMN ABOVE / BELOW
EXISTING STEEL BEAM
STEEL BEAM
EXISTING BEAM TO BE DEMOLISHED
S-# — ONE WAY FLOOR SLAB OR DECK (SEE SCHEDULE), OPEN ARROW INDICATES SPAN DIRECTION
S-# — TWO WAY CONCRETE SLAB (SEE SCHEDULE)
S-# — CONCRETE ON METAL DECK (SEE SCHEDULE), OPEN ARROW INDICATES SPAN DIRECTION
(E) S.O.G. — EXISTING SLAB ON GRADE (SEE SCHEDULE)
STEP IN SLAB
SLAB SLOPE TRANSITION
#' - #" — TOP OF SLAB ELEVATION
#' - #" — SPOT ELEVATION
OPENING IN SLAB
EXISTING OPENING IN EXISTING SLAB

STANDARD ABBREVIATIONS

ADD'L	ADDITIONAL
ADJ.	ADJACENT
A/E	DESIGN TEAM OF RECORD
ALT.	ALTERNATE
ANCH.	ANCHOR
APPROX.	APPROXIMATE/APPROXIMATELY
ARCH.	ARCHITECT/ARCHITECTURAL
BLDG.	BUILDING
BM.	BEAM
B.O.	BOTTOM OF
BOT.	BOTTOM
BRG.	BEARING
BSMT.	BASEMENT
CANT.	CANTILEVER
CFS	COLD FORMED STEEL
C.I.P.	CAST IN PLACE
C.J.	CONTRACTION JOINT
CLG.	CEILING
CLR.	CLEAR
CMU	CONCRETE MASONRY UNIT
COL.	COLUMN
COMP.	COMPOSITE
CONC.	CONCRETE
CONST.	CONSTRUCTION
CONT.	CONTINUOUS
COORD.	COORDINATE/COORDINATION
CONTR.	CONTRACTOR
COTR	CONTRACT OFFICER'S TECHNICAL REPRESENTATIVE
CTR.	CENTER
DBL.	DOUBLE
DEMO	DEMOLITION/DEMOLISH
DIA.	DIAMETER
DIAG.	DIAGONAL
DIM.	DIMENSION
D.L.	DEAD LOAD
DN.	DOWN
DTL.	DETAIL
DWG(S)	DRAWING(S)
DWL.	DOWEL
EA.	EACH
E.F.	EACH FACE
E.J.	EXPANSION JOINT
EL.	ELEVATION
ELEC.	ELECTRICAL
ELEV.	ELEVATOR
EMBED.	EMBEDMENT
E.O.	EDGE OF
ENGR.	ENGINEER
E.O.R.	ENGINEER OF RECORD
EQ.	EQUAL
E.S.	EACH SIDE
E.W.	EACH WAY
EXP.	EXPANSION
EXT.	EXTERIOR
FDN.	FOUNDATION
FIN.	FINISH
FLR.	FLOOR
FRMG.	FRAMING
F.S.	FAR SIDE
FT.	FEET
FTG.	FOOTING
GA.	GAGE
GALV.	GALVANIZED
G.B.	GRADE BEAM
HDR.	HEADER
HGR.	HANGER
HORIZ.	HORIZONTAL
H.P.	HIGH POINT
HT.	HEIGHT
HVAC	HEATING, VENTILATION, & AIR CONDITIONING
I.D.	INSIDE DIAMETER
I.F.	INSIDE FACE
I.J.	ISOLATION JOINT
INFO	INFORMATION
INT.	INTERIOR
JT.	JOINT
K	KIP
LB.	POUND
L.L.	LIVE LOAD
LLBB	LONG LEGS BACK-TO-BACK
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
L.P.	LOW POINT
L.W.	LIGHTWEIGHT
L.W.	LONG WAY
MAS.	MASONRY
MAX.	MAXIMUM
MECH.	MECHANICAL
MEP	MECH., ELECT., PLUMBING, & FIRE PROTECTION
MFR.	MANUFACTURER
MIN.	MINIMUM
MISC.	MISCELLANEOUS
M.O.	MASONRY OPENING
MPII	MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS
N.F.	NEAR FACE
N.I.C.	NOT IN CONTRACT
NO.	NUMBER
N.S.	NEAR SIDE
N.T.S.	NOT TO SCALE
N.W.	NORMAL WEIGHT
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
O.F.	OUTSIDE FACE
OPNG.	OPENING
OPP.	OPPOSITE
PC.	PIECE
P/C	PRECAST
PED.	PEDESTAL
PERP.	PERPENDICULAR
PL.	PLATE
PLF	POUNDS PER LINEAR FOOT
PREFAB.	PREFABRICATED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
P-T	POST-TENSIONED
REINF.	REINFORCE(D)/REINFORCEMENT
REQ'D	REQUIRED
REV.	REVISION
SCHED.	SCHEDULE
SECT.	SECTION
S.I.F.	STEP IN FOOTING
SLBB	SHORT LEGS BACK-TO-BACK
SIM.	SIMILAR
S.O.G.	SLAB ON GRADE
SPEC.	SPECIFICATION
SQ.	SQUARE
S.S.	STAINLESS STEEL
STD.	STANDARD
STIFF.	STIFFENER
STL.	STEEL
S.W.	SHORT WAY
SYM.	SYMMETRIC
T & B	TOP & BOTTOM
TEMP.	TEMPORARY/TEMPERATURE
THK.	THICK(NESS)
T.O.	TOP OF
TR.	TRANSFER
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
VERT.	VERTICAL
W/	WITH
W.P	WORK POINT
W.W.R.	WELDED WIRE REINFORCEMENT
#	NUMBER/SIZE
Ø	DIAMETER

STANDARD ABBREVIATIONS FOR EXISTING STRUCTURES

(E)	EXISTING MEMBER OR DIMENSION
EXIST.	EXISTING
V.I.F.	VERIFY IN FIELD
PJ	PAN JOIST
CB	CONCRETE BEAM
SB	STEEL BEAM
SG	STEEL GIRDER

DESIGN PARAMETER TABLE

GOVERNING CODE:		IEBC 2015 WITH 2017 DCMR 12J AMENDMENTS
RISK CATEGORY:		III
LIVE LOAD		
20 PSF		ROOF
50 PSF		OFFICE AREA
100 PSF		ASSEMBLY AREAS
100 PSF		CORRIDORS (FIRST FLOOR)
80 PSF		CORRIDORS (OTHER FLOORS)
		OCCUPANCY TYPE AND LOADING OF THE BUILDING ARE NOT CHANGING. LIVE LOAD CRITERIA PROVIDED FOR REFENCE ONLY
SNOW LOAD:		
30 PSF	Pg	GROUND SNOW LOAD
1	Ce	SNOW EXPOSURE FACTOR
1.1	Is	SNOW LOAD IMPORTANCE FACTOR
1	Ct	THERMAL FACTOR
		SNOW LOADS NOT CONSIDERED IN THE DESIGN FOR THIS SCOPE OF WORK. SNOW CRITERIA IS PROVIDED FOR REFERENCE ONLY.
WIND LOAD:		
120 MPH	Vult	BASIC WIND SPEED
1	Vasd	WIND IMPORTANCE FACTOR
B		WIND EXPOSURE CATEGORY
0.18	GCPi	INTERNAL PRESSURE COEFFICIENT
		WIND LOADS NOT CONSIDERED IN THE DESIGN FOR THIS SCOPE OF WORK. WIND CRITERIA PROVIDED FOR REFERENCE ONLY.
SEISMIC DESIGN:		
1	I	SEISMIC IMPORTANCE FACTOR
0.118	Ss	SHORT PERIOD SPECTRAL RESPONSE ACCELERATION
0.051	S1	1-SECOND PERIOD SPECTRAL RESPONSE ACCELERATION
D		SITE CLASS (ASSUMED)
0.126	S(ds)	5-% DAMPED SPECTRAL RESPONSE COEFFICIENT AT SHORT PERIODS
0.081	S(d1)	5-% DAMPED SPECTRAL RESPONSE COEFFICIENT AT 1-SECOND PERIODS
B		SEISMIC DESIGN CATEGORY
EQUIVALENT STATIC FORCE		ANALYSIS PROCEDURE
		SEISMIC LOADS FOR BUILDING NOT CONSIDERED AS PART OF THIS RENOVATION. PER THE 2015 IEBC THE EXISTING LATERAL LOAD CARRYING SYSTEM IS ALLOWED TO REMAIN UNALTERED AT THE PROPOSED MODIFICATIONS WILL INCREASE THE DEMAND-CAPACITY RATIO FOR THE LATERAL SYSTEM BY FAR LESS THAN THE CODE'S 10 PERCENT THRESHOLD.

Building A Chilled Water Upgrade
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Washington, DC 20001

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TYLin | Silman Structural Solutions

ISSUED FOR	REV	DATE
PRICING AND PERMIT		04/02/2026
100% CONSTRUCTION DOCUMENTS		02/12/2026
50% CONSTRUCTION DOCUMENTS		10/09/2025

SEALS AND SIGNATURES

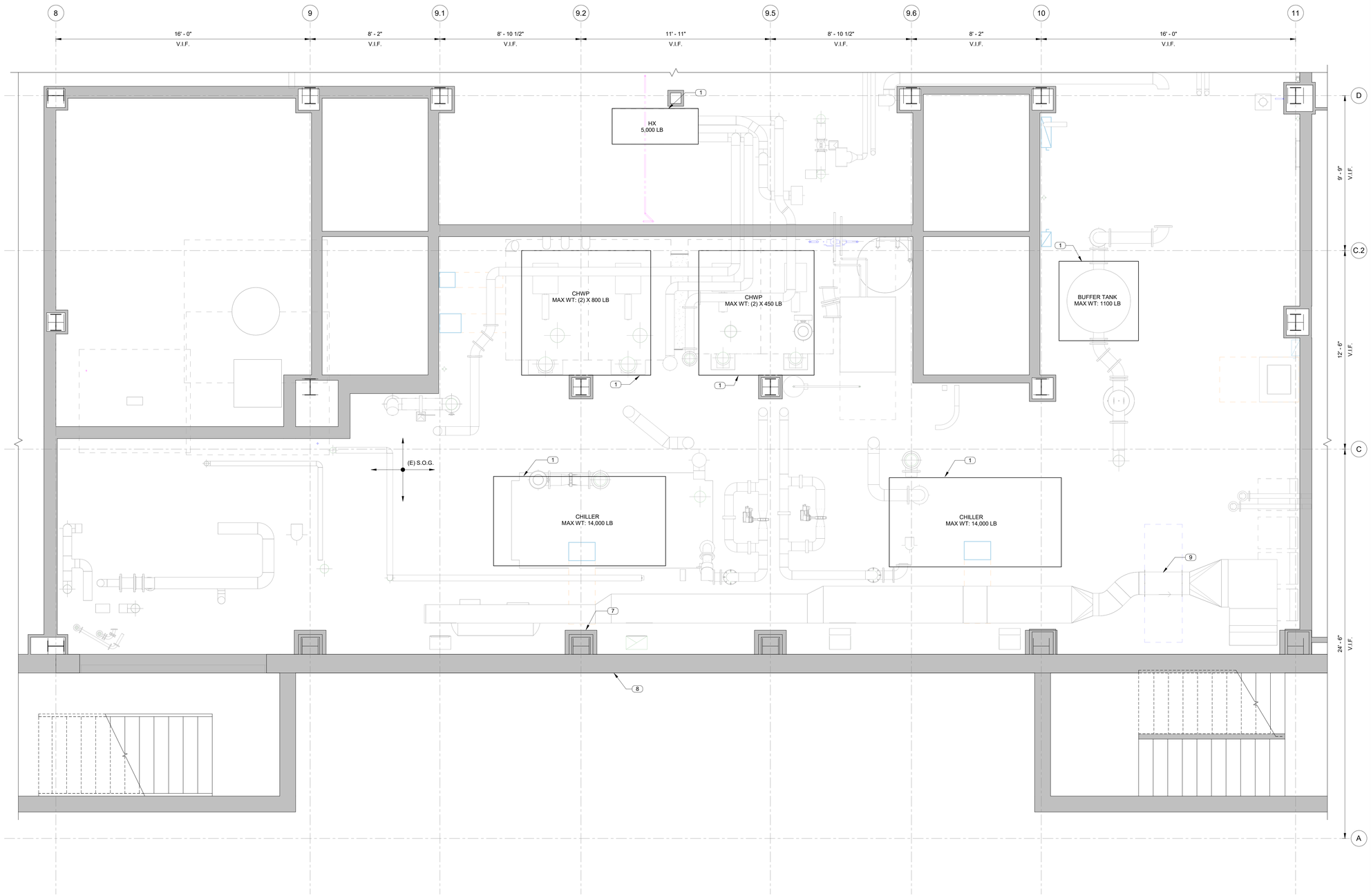
DISTRICT OF COLUMBIA
CHRISTOPHER K. RUIZ
No. PES40000232
STRUCTURAL
PROFESSIONAL ENGINEER
Christopher K Ruiz
04/01/2026

SHEET TITLE
STRUCTURAL GENERAL NOTES AND LEGENDS

3026.0030359
PROJECT NUMBER

S0.1
SHEET NUMBER

Plot Date: 4/1/2026 5:18:36 PM Author



1 S1.1 BASEMENT - PARTIAL PLAN

3/8" = 1'-0"

SHEET NOTES

1. ALL DEMOLITION, SHORING, BRACING, AND SEQUENCING IS THE RESPONSABILITY OF THE CONTRACTOR'S ENGINEER. TEMPORARY BRACING, IF NOTED ON STRUCTURAL DRAWINGS, IS INTENDED IN A QUALITATIVE, SCHEMATIC AND NON- COMPREHENSIVE MANNER FOR THE PURPOSES OF OF ASSISTANCE IN COORDINATION AND GENERAL SCOPE AND PRICING.
2. ALL DIMENSIONS OF EXISTING STRUCTURE SHALL BE FIELD VERIFIED BY THE CONTRACTOR. WHERE DIMENSIONS OF NEW ELEMENTS ARE DEPENDENT ON EXISTING GEOMETRY, THE CONTRACTOR SHALL PERFORM FIELD SURVEY FOR VERIFICATION PRIOR TO DEVELOPING SHOP DRAWINGS FOR NEW ELEMENTS.
3. COORDINATE ALL DIMENSIONS AND ELEVATIONS WITH ARCHITECT, MEP, AND ALL OTHER PRIME CONTRACTORS.
4. CONTRACTOR TO COORDINATE ALL EQUIPMENT PAD SIZES AND LOCATIONS WITH FINAL EQUIPMENT SELECTIONS AND LOCATIONS. SEE MEP FOR ALL EQUIPMENT BASIS OF DESIGN SIZES AND LOCATIONS

KEY NOTES

MARK	DESCRIPTION
1	NEW 4" THICK CONCRETE EQUIPMENT PAD AT MEP EQUIPMENT (6" THICK AT HX). SEE TYPICAL DETAIL ON S5.1 FOR REINFORCING AND MECHANICAL DRAWINGS FOR SIZE AND LOCATION. MAXIMUM EQUIPMENT WEIGHT NOTED ON PLAN.
7	EXISTING CONCRETE ENCASED STEEL COLUMN TYPICAL.
8	EXISTING FOUNDATION WALL TYPICAL.
9	NEW EXHAUST FAN, REFER TO S5.1 FOR ATTACHMENT DETAIL TO EXISTING CONCRETE PAN SLAB.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
CHRISTOPHER K. RUIZ
No. PES40000232
STRUCTURAL
PROFESSIONAL ENGINEER
4/10/2026

KEYPLAN

NORTH

SHEET TITLE

BASEMENT STRUCTURAL PLAN

3026.0030359

PROJECT NUMBER

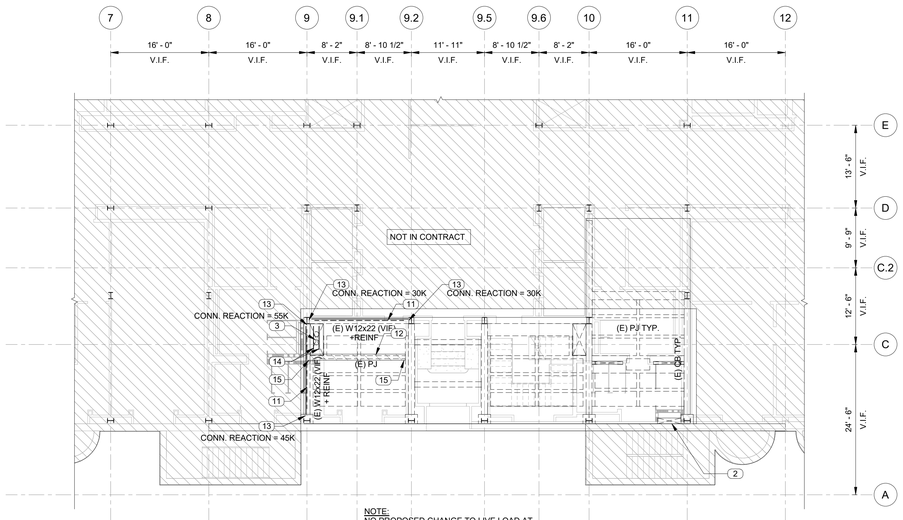
S1.1

SHEET NUMBER

Author

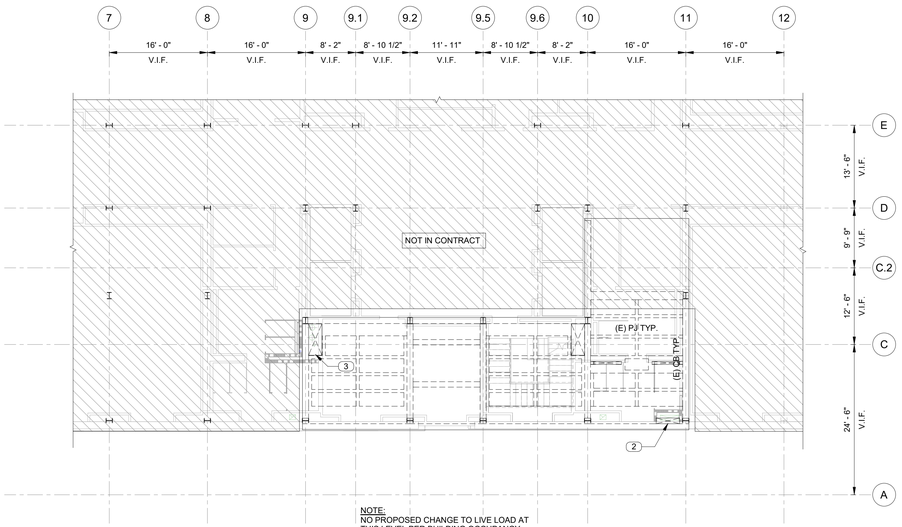
4/10/2026 5:19:05 PM

Plot Date:



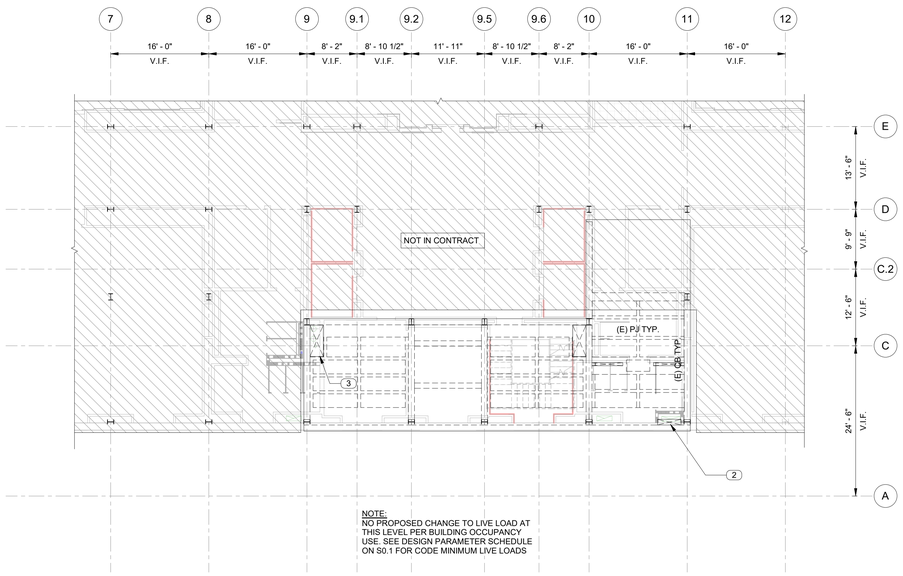
NOTE:
NO PROPOSED CHANGE TO LIVE LOAD AT THIS LEVEL PER BUILDING OCCUPANCY USE. SEE DESIGN PARAMETER SCHEDULE ON S0.1 FOR CODE MINIMUM LIVE LOADS

1 S1.2 LEVEL 1 - PARTIAL FRAMING PLAN
1" = 10'-0"



NOTE:
NO PROPOSED CHANGE TO LIVE LOAD AT THIS LEVEL PER BUILDING OCCUPANCY USE. SEE DESIGN PARAMETER SCHEDULE ON S0.1 FOR CODE MINIMUM LIVE LOADS

2 S1.2 LEVEL 2 - PARTIAL FRAMING PLAN
1" = 10'-0"



NOTE:
NO PROPOSED CHANGE TO LIVE LOAD AT THIS LEVEL PER BUILDING OCCUPANCY USE. SEE DESIGN PARAMETER SCHEDULE ON S0.1 FOR CODE MINIMUM LIVE LOADS

3 S1.2 LEVEL 3 - PARTIAL FRAMING PLAN
1" = 10'-0"

SHEET NOTES

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2. ALL DIMENSIONS OF EXISTING STRUCTURE SHALL BE FIELD VERIFIED BY THE CONTRACTOR. WHERE DIMENSIONS OF NEW ELEMENTS ARE DEPENDENT ON EXISTING GEOMETRY, THE CONTRACTOR SHALL PERFORM FIELD SURVEY FOR VERIFICATION PRIOR TO DEVELOPING SHOP DRAWINGS FOR NEW ELEMENTS.
3. COORDINATE ALL DIMENSIONS AND ELEVATIONS WITH ARCHITECT, MEP, AND ALL OTHER PRIME CONTRACTORS.
4. CONTRACTOR TO COORDINATE ALL EQUIPMENT PAD SIZES AND LOCATIONS WITH FINAL EQUIPMENT SELECTIONS AND LOCATIONS. SEE MEP FOR ALL EQUIPMENT BASIS OF DESIGN SIZES AND LOCATIONS

KEY NOTES

MARK	DESCRIPTION
2	NEW REFRIGERANT EXHAUST DUCT. ASSUME NO EXISTING OPENING IS FOUND IN THIS LOCATION OR EXISTING OPENING SIZE NEEDS TO BE INCREASED. GPR SCAN TO LOCATE EXISTING REINFORCEMENT AND ASSUME NEW STEEL CHANNEL FRAMED SLAB OPENING PER DETAIL ON S5.1. IF AN EXISTING SHAFT IS FOUND IN THIS LOCATION, RE-USE EXISTING OPENING FOR NEW EXHAUST DUCT AS PART OF THE DEDUCT ALTERNATE. REFER TO GENERAL NOTES FOR MORE INFORMATION ON BASE DESIGN AND DEDUCT ALTERNATE SCOPE.
3	NEW CONDENSER WATER PIPING TO BE LOCATED AT EXISTING OPENING. MAX VERTICAL REACTION OF 10.1 KIP PER PIPE. EXISTING OPENING ASSUMED BASED ON 2003 STRUCTURAL DRAWINGS FOR BUILDING B. SEE GENERAL NOTE 3 ON S0.1 FOR ASSUMPTIONS ON SIMILARITIES BETWEEN BUILDING A AND BUILDING B AND LIMITED AVAILABLE DOCUMENTATION. CONTRACTOR TO VERIFY LOCATION OF OPENING. DO NOT CUT OR DAMAGE EXISTING STRUCTURE.
11	EXISTING BEAM TO BE REINFORCED. CONTRACTOR TO PERFORM NDE SCANNING AND SELECTIVE PROBES ON EXISTING BEAMS AND NOTIFY EOR OF EXISTING STRUCTURAL FRAMING. IT IS ASSUMED THAT BEAM IS STEEL AND SIZE NEEDS TO BE CONFIRMED. ASSUME 40 LB/FT STEEL REINFORCING FOR PRICING. IF BEAMS ARE CONCRETE, ALTERNATIVE REINFORCEMENT DETAIL WILL BE PROVIDED.
12	EXISTING PAN JOIST TO BE REINFORCED. REFER TO DETAIL ON S5.1. VERIFY IN FIELD EXISTING CONCRETE PAN JOIST CONDITION.
13	EXPOSE EXISTING CONNECTION BETWEEN STEEL BEAM/GIRDER AND COLUMN. PROVIDE DOCUMENTATION OF CONNECTION TO EOR FOR EVALUATION. CONTRACTOR TO PROVIDE DELEGATED DESIGN OF CONNECTION REINFORCING FOR REQUIRED SHEAR LOADING. ASSUME EXISTING BOLTED SHEAR CONNECTION TO BE FULLY WELDED.
14	CONDENSER WATER PIPING SUPPORT BEAMS TO BE PROVIDED BY OTHER TRADE/SUBCONTRACTOR.
15	AS NOTED IN KEYNOTE 11, VERIFY EXISTING BEAM IS CONCRETE ENCASED STEEL BEAM AND CONFIRM CLEAR COVER TO ENCASEMENT TIES. AT JOIST END, LOCALLY CHIP OUT WIDTH AND HEIGHT OF ENCASEMENT AT GIRDER TO PROVIDE SEAT FOR NEW REINFORCED JOIST. DEPTH OF SEAT TO BE CONFIRMED IN FIELD TO MATCH COVER OF ENCASEMENT TIES. PROVIDE MIN 1" TO 2" MAX SEAT. PROVIDE POST INSTALLED DOWELS AT TOP AND BOTTOM CORNER BARS (4 TOTAL), MIN EMBED 3 1/2" AND LAP WITH JOIST REINFORCEMENT.

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SEALS AND SIGNATURES

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KEYPLAN

NORTH

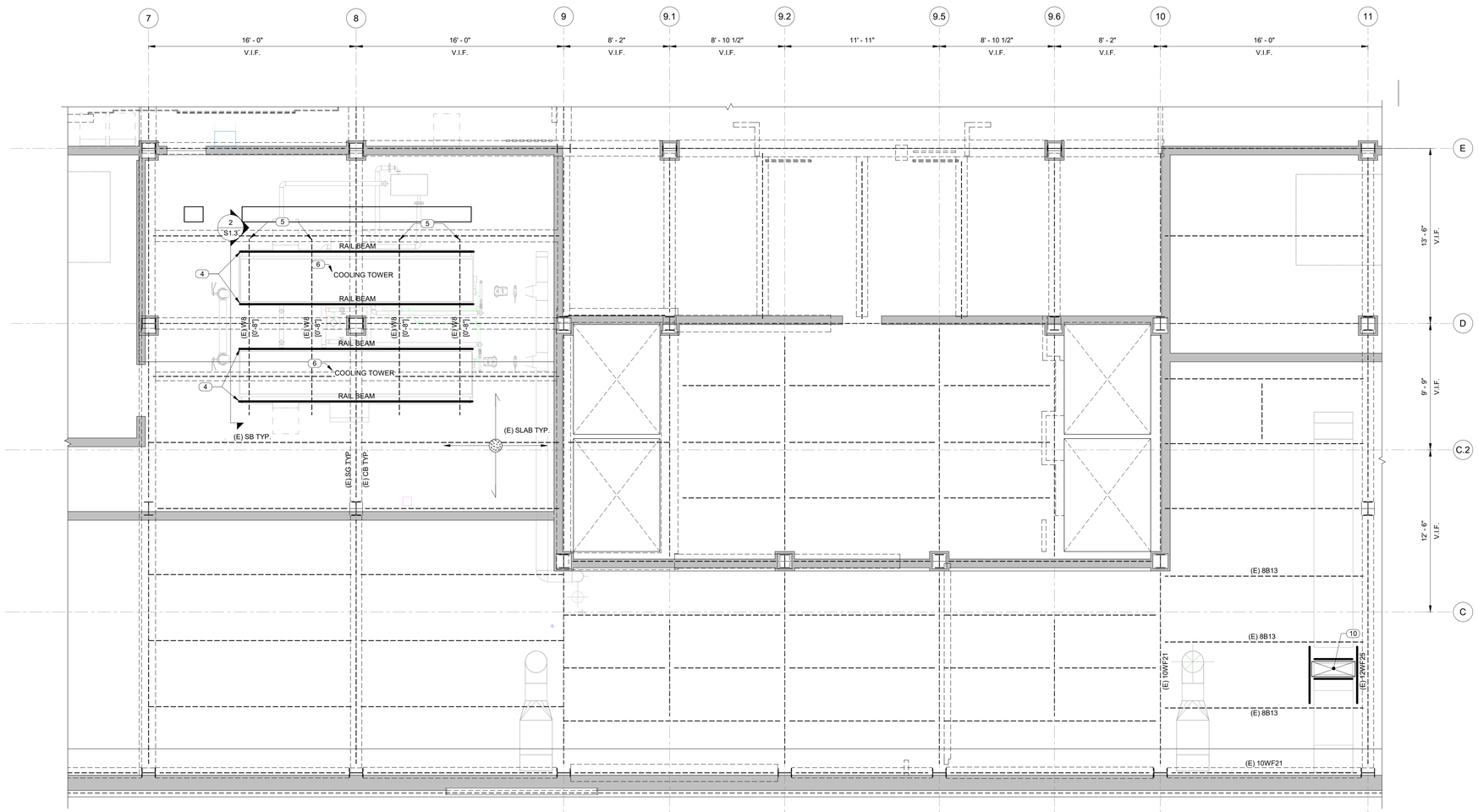
SHEET TITLE
1ST THROUGH 3RD FLOOR FRAMING PART PLANS

3026.0030359
PROJECT NUMBER

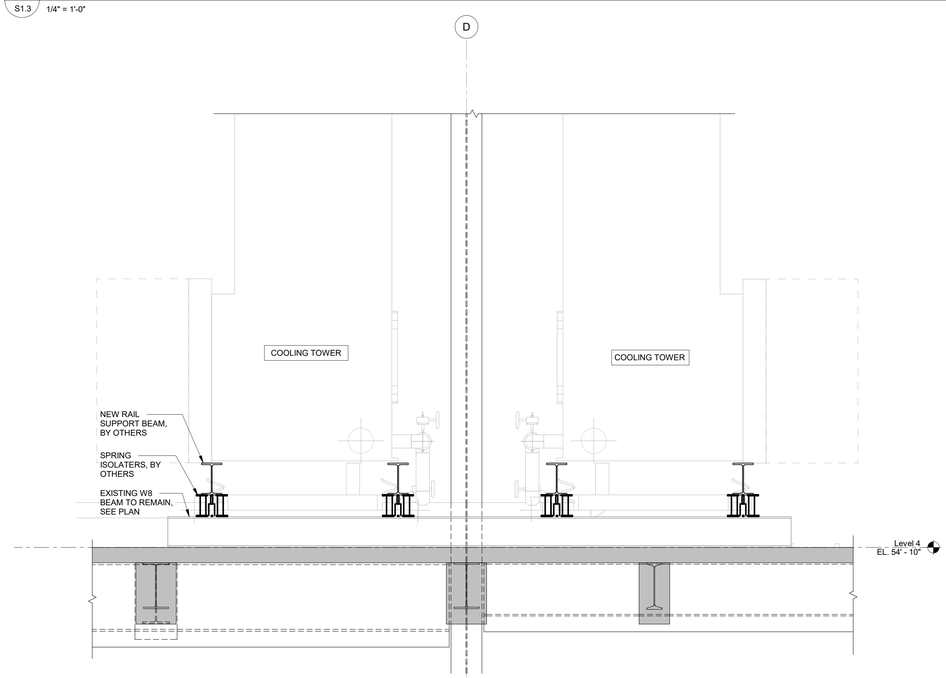
S1.2
SHEET NUMBER

Author

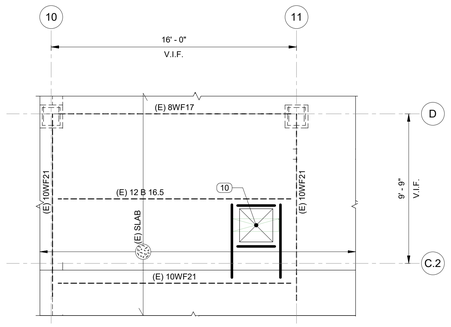
Plot Date: 4/1/2026 5:18:37 PM



1 S1.3 LEVEL 4 - PARTIAL FRAMING PLAN
1/4" = 1'-0"



2 S1.3 SECTION AT LEVEL 4 COOLING TOWER
3/4" = 1'-0"



3 S1.3 ROOF - PARTIAL FRAMING PLAN
1/4" = 1'-0"

SHEET NOTES

1. TOP OF STEEL ELEVATION INDICATED [X'-XX"] RELATIVE TO TOP OF SLAB.
2. ALL DEMOLITION, SHORING, BRACING, AND SEQUENCING IS THE RESPONSABILITY OF THE CONTRACTOR'S ENGINEER. TEMPORARY BRACING, IF NOTED ON STRUCTURAL DRAWINGS, IS INTENDED IN A QUALITATIVE, SCHEMATIC AND NON- COMPREHENSIVE MANNER FOR THE PURPOSES OF OF ASSISTANCE IN COORDINATION AND GENERAL SCOPE AND PRICING.
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4. COORDINATE ALL DIMENSIONS AND ELEVATIONS WITH ARCHITECT, MEP, AND ALL OTHER PRIME CONTRACTORS.
5. FOR ALL PIPE PENETRATIONS THROUGH MASONRY WALLS REFER TO TYPICAL PIPE PENETRATION DETAIL ON S5.1

KEY NOTES

MARK	DESCRIPTION
4	EXISTING COOLING TOWER RAIL BEAM TO BE REMOVED AND REPLACED. DESIGN OF NEW SUPPORT BEAM IS A DELEGATED DESIGN ITEM. REFER TO DIVISION 23 FOR ADDITIONAL INFORMATION.
5	EXISTING COOLING TOWER SUPPORT BEAM IN GENERALLY GOOD CONDITION. BEAMS TO BE RE-USED PENDING CONTRACTOR CONFIRMATION OF CONDITION. DUE TO THE EXISTING COATING AND IN-PLACE COOLING TOWER, A FULL ASSESSMENT OF THE BEAMS WILL NOT BE POSSIBLE UNTIL THE PROJECT IS IN CONSTRUCTION AND THE CONTRACTOR IS ABLE TO ACCESS THESE BEAMS. STEEL PLATING MAY BE REQUIRED. REMOVE ALL EXISTING COATINGS, SCALING, AND RUST FROM EXISTING STEEL GRILLAGE BEAMS. AT MINIMUM, RUST SCALE SHALL BE REMOVED PER SSPC SP-3 "POWER TOOL CLEAN" AND GREASE OR OIL SHALL BE REMOVED PER SSPC SP-1 "SOLVENT CLEAN". EXPOSED STEEL SHALL BE REVIEWED FOR STRUCTURAL ADEQUACY BY EOR. CONTRACTOR TO IDENTIFY ANY MEMBERS WITH SECTION LOSS GREATER THAN 5% FOR REVIEW BY EOR AND DETERMINATION IF STEEL REINFORCING IS REQUIRED. AFTER COMPLETION OF ALL REMEDIAL WORK, PREPARE AND PAINT EXPOSED STEEL SURFACES PER SPECIFICATIONS.
6	ORIGINAL BUILDING LOADING / CAPACITY IS UNKNOWN. IN 2003 RENOVATION, UNIT WAS INSTALLED THAT WEIGHS 6740 LB (MODEL # LSTA 4-182). PROPOSED REPLACEMENT UNIT TO BE IN SAME LOCATION AND WEIGHS 6630 LB (MODEL # LSTE-4318) REPLACEMENT UNIT WEIGHT MUST BE EQUAL TO OR LESS THAN THE UNIT BEING REPLACED. THE NEW UNIT WILL HAVE THE OVERALL DIMENSIONS (WXLXH): 4'-5/8"X18'-0"X9'-10 3/8".
10	NEW ROOF PENETRATION FOR EXHAUST DUCT. REFER TO S5.1 FOR DETAIL AND INFILL FRAMING SIZES AT NEW OPENING IN EXISTING CONCRETE SLAB. COORDINATE FINAL SIZE AND LOCATION WITH EXISTING STEEL. SEE ARCH FOR ROOFING AND FLASHING REPAIRS AT NEW OPENING. SEE ARCH AND MEP FOR ADDITIONAL INFORMATION

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CHRISTOPHER K. RUIZ
No. PES40000232
STRUCTURAL
PROFESSIONAL ENGINEER
4/10/2026

KEYPLAN

NORTH

SHEET TITLE
4TH FLOOR AND ROOF FRAMING PART PLANS

3026.0030359
PROJECT NUMBER

S1.3
SHEET NUMBER

Author

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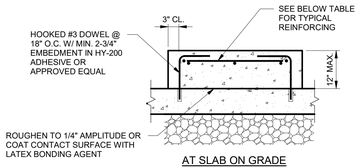
Plot Date:



AT SLAB ON GRADE

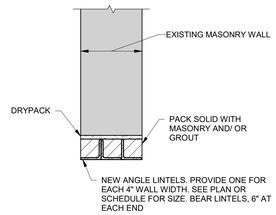
EQUIPMENT PAD TEMPERATURE AND SHRINKAGE REINFORCING	
PAD THICKNESS	REINFORCING
4"-5"	#3 @ 12" O.C. EACH WAY
6"-9"	#4 @ 12" O.C. EACH WAY
10"-12"	#5 @ 12" O.C. EACH WAY

NOTES:

1. FOR SIZE AND LOCATION SEE ARCHITECTURAL AND MECHANICAL DRAWINGS.
2. CONCRETE FOR PADS SHALL BE NORMAL WEIGHT WITH f'c = 4,000 PSI.

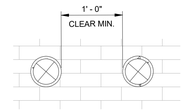
TYPICAL EQUIPMENT PAD

N.T.S.



TYPICAL ANGLE LINTEL IN EXISTING MASONRY WALL

N.T.S.

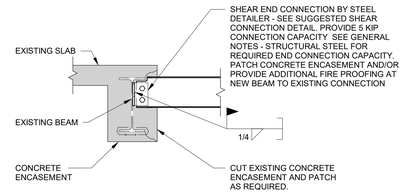


NOTES:

1. SINGLE PIPE PENETRATIONS SHALL MEET THE LOCATION AND SPACING REQUIREMENTS OF TYP. DETAILS ON THIS SHEET.
2. SINGLE PENETRATIONS SHALL BE 1'-4" FROM ANY OTHER NEW OR EXISTING PENETRATION.
3. THE MODEL AND ELEVATIONS MAY IDEALIZE INDIVIDUAL PIPE LOCATIONS. THE COORDINATED SHOP DRAWINGS SHALL REFLECT FINAL LOCATIONS MEETING THESE RULES.
4. PENETRATIONS FOR ROUND PIPE TO BE CORE DRILLED.
5. PIPES 2" DIAMETER AND SMALLER DO NOT NEED A SLEEVE
6. DRYPACK SLEEVE TIGHT OR NON-SHRINK GROUT- MIN. 1"
7. PIPE SLEEVE TO BE MIN. SCHEDULE 40 PIPE

PIPE PENETRATIONS IN LOAD BEARING MASONRY WALLS

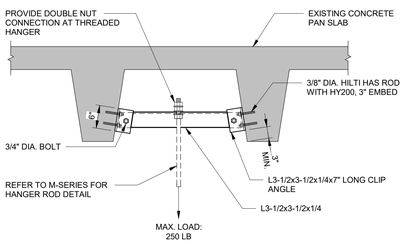
N.T.S.



NOTE: IF EXISTING CONNECTIONS INTERFERE WITH THIS DETAIL, CONTRACTOR SHALL SUBMIT ALTERNATE DETAIL FOR REVIEW.

TYPICAL CONNECTION OF NEW BEAM TO EXISTING BEAM

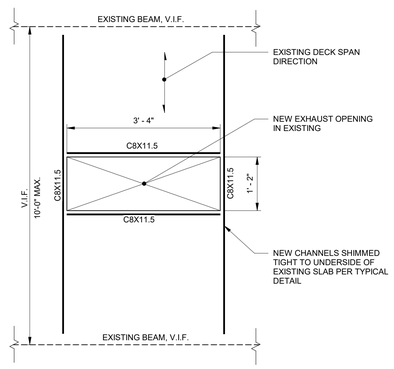
N.T.S.



NOTE: DO NOT CUT EXISTING REBAR. CONTRACTOR SHALL SCAN FOR EXISTING REBAR LOCATIONS, AND SHALL LOCATE ANCHORS TO AVOID CUTTING EXISTING REBAR. CONTRACTOR MUST COORDINATE BETWEEN TRADES TO ACHIEVE THIS REQUIREMENT, INCLUDING BUT NOT LIMITED TO, DRILLING THE HOLES IN STEEL PLATES AFTER FIELD SURVEY WITH REBAR SCAN.

ATTACHMENT DETAIL AT CONCRETE PAN SLAB JOISTS

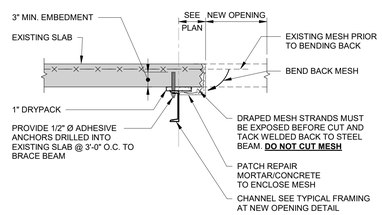
N.T.S.



NOTE: COORDINATE REQUIRED MECHANICAL OPENING PENETRATIONS WITH MEP AND ARCHITECTURAL DRAWINGS

DETAIL FRAMING OUT NEW EXHAUST DUCT OPENING IN EXISTING ROOF SLAB

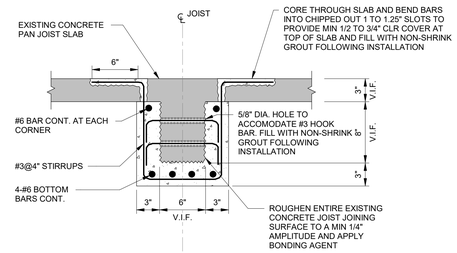
N.T.S.



NOTE: CONTRACTOR TO V.I.F. EXISTING SLAB REINFORCING. IF BAR REINFORCING IS PRESENT INSTEAD OF DRAPED MESH, TACK WELDING OF REINFORCING IS NOT REQUIRED AND BARS MAY BE CUT AT OPENING EDGE.

TYPICAL DETAIL OF BEAM DRYPACKED BELOW EXISTING SLAB AT NEW OPENING

N.T.S.



TYPICAL CONCRETE JOIST REINFORCEMENT DETAIL

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SHEET TITLE
STRUCTURAL TYPICAL DETAILS

3026.0030359
PROJECT NUMBER

S5.1
SHEET NUMBER

Author
Plot Date: 4/1/2026 5:18:38 PM

ARCHITECTURAL ABBREVIATIONS

A	AB	ANCHOR BOLT
	ACP	ACOUSTICAL CEILING PANEL
	ACS PNL	ACCESS PANEL
	ACT	ACOUSTICAL CEILING TILE
	AD	AREA DRAIN
	ADDL	ADDITIONAL
	ADH	ADHESIVE
	ADJ	ADJUSTABLE
	ADJ	ADJACENT
	AFF	ABOVE FINISH FLOOR
	AFG	ABOVE FINISH GRADE
	AFS	ABOVE FINISH SLAB
	AGGR	AGGREGATE
	ALT	ALTERNATE
	ALUM	ALUMINIM
	ANOD	ANODIZED
	APPROX	APPROXIMATE(LY)
	ARCH	ARCHITECT(URAL)
	AS	ADJUSTABLE SHELF
	ASPH	ASPHALT
	AVG	AVERAGE
	AWF	ACOUSTICAL WALL FABRIC
	AWP	ACOUSTICAL WALL PANEL
B	B	BASE
	BB	BULLETIN BOARD
	BD	BOARD
	BFC	BAFFLE CEILING
	BITUM	BITUMINOUS
	BLDG	BUILDING
	BM	BENCHMARK
	BOS	BOTTOM OF STEEL
	BOT	BOTTOM
	BRG	BEARING
	BSMT	BASEMENT
	BTWN	BETWEEN
	BUR	BUILT UP ROOFING SYSTEM
C	CAB	CABINET
	CB	CATCH BASIN
	CCR	CARD CONTROL READER
	CCT	CUBICLE CURTAIN TRACK
	CCTV	CLOSED CIRUIT TELEVISION
	CEM	CEMENT, CEMENTITOUS
	CER	CERAMIC
	CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
	CG	CORNER GUARD
	CI	CAST IRON
	CJ	CONTROL JOINT
	CL	CENTER LINE
	CLG	CEILING
	CLR	CLEAR
	CMU	CONCRETE MASONRY
	CNTR	COUNTER
	COL	COLUMN
	CONC	CONCRETE
	CONF	CONFERENCE
	CONN	CONNECTION
	CONSTR	CONSTRUCTION
	CONT	CONTINUOUS
	CONTR	CONTRACTOR
	CORR	CORRUGATED
	CPT	CARPET
	CRK	CORK
	CSK	COUNTERSUNK
	CSP	COMBINATION STANDPIPE
	CSWK	CASEWORK
	CU	CUBIC
D	D	DEPTH
	DBL	DOUBLE
	DBL ACT	DOUBLE ACTING
	DEG	DEGREE
	DEMO	DEMOLISH
	DEPT	DEPARTMENT
	DET	DETAIL
	DF	DRINKING FOUNTAIN
	DIA	DIAMETER
	DIAG	DIAGONAL
	DIFF	DIFFUSER
	DIM	DIMENSION
	DIM PT	DIMENSION POINT
	DISP	DISPENSER
	DIST	DISTANCE
	DN	DOWN
	DR	DRAIN
	DS	DOWNSPOUT
	DSP	DRY STANDPIPE
	DW	DISHWASHER
	DWG	DRAWING
	DWGS	DRAWINGS
E	(E)	EXISTING
	EA	EACH
	EDR	EQUPMENT DRAWING
	EG	EDGE GUARD
	EIFS	EXTERIOR INSULATION FINISH SYSTEM
	EL	ELEVATION
	ELAST	ELASTOMERIC
	ELEC	ELECTRICAL
	ELEV	ELEVATOR
	EMER	EMERGENCY
	ENCL	ENCLOSURE
	ENGR	ENGINEER
	EOS	EDGE OF SLAB
	EP	ELECTRICAL PANEL
	EPB	ELECTRICAL PANEL BOARD
	EPD	ENVIRONMENTAL PRODUCT DECLARATION
	EPDM	ETHYLENE PROPYLENE DIENE MONOMER
	EPX	EPOXY
	EQ	EQUAL
	EQL SO	EQUALLY SPACED
	EQUIP	EQUIPMENT
	EQUIV	EQUIVALENT
	ER	EPOXY RESIN
	ESCAL	ESCALATOR
	EST	ESTIMATE(D)
	ETR	EXISTING TO REMAIN
	EWC	ELECTRIC WATER COOLER
	EXC	EXCAVATED
	EXH	EXHAUST
	EXP	EXPANSION
	EXP JT	EXPANSION JOINT
	EXT	EXTERIOR
F	F/F	FACE TO FACE
	FA	FIRE ALARM
	FACP	FIRE ALARM CONTROL PANEL
	FAS	FIRE SLARM STATION
	FB	FLAT BAR
	FCU	FAN COIL UNIT
	FD	FLOOR DRAIN
	FDC	FIRE DEPARTMENT CONNECTION
	FDN	FOUNDATION
	FE	FIRE EXTINGUISHER
	FEC	FIRE EXTINGUISHER CABINET
	FF	FINISH FACE
	FF&E	FURNITURE FIXTURES AND EQUIPMENT
	FH/FEC	FIRE HOSE/FIRE EXTINGUISHER CABINET
	FHC	FIRE HOSE CABINET
	FHMS	FLAT HEAD MACHINE SCREW
	FHWS	FLAT HEAD WOOD SCREW
	FHY	FIRE HYDRANT
	FLAM	FLAMMABLE
	FLASH	FLASHING
	FLEX	FLEXIBLE
	FLUOR	FLUORESCENT
	FO	FACE OF
	FRP	FIBERGLASS REINFORCED PLASTIC
	FSB	FOLDING SHOWER BENCH
	FSTNR	FASTNER
	FT	FOOT, FEET
	FTG	FOOTING
	FURN	FURNITURE
	FXTR	FIXTURE
G	G	GAS
	GA	GAUGE, GAGE
	GAL	GALLON
	GALV	GALVANIZED
	GB	GRAB BAR
	GC	GENERAL CONTRACTOR
	GFRC	GLASS FIBER REINFORCED CONCRETE
	GFRG	GLASS FIBER REINFORCED GYPSUM
	GL	GLASS
	GLU LAM	GLUE LAMINATED
	GLZ	GLAZING
	GR	GRADE OR GRADING
	GVL	GRAVEL
	GYP	GYPSUM
	GYP BD	GYPSUM BOARD
	GYP PLAS	GYPSUM PLASTER
H	H	HIGH
	HB	HOSE BIBB
	HC	HOLLOW CORE
	HD	HEAD
	HDBD	HARDBOARD
	HDW	HARDWARE
	HDWD	HARDWOOD
	HGT	HEIGHT
	HM	HOLLOW METAL
	HNDRL	HANDRAIL
	HORIZ	HORIZONTAL
	HPC	HIGH PERFORMANCE COATING
	HPD	HEALTH PRODUCT DECLARATION
	HPT	HIGH POINT
	HR	HOUR
	HVAC	HEATING-VENTILATION-AIR CONDITIONING
I	ICE	ICE MACHINE
	ID	INSIDE DIAMETER
	IN	INCH
	INCAND	INCANDESCENT
	INCL	INCLUDE, INCLUDING
	INFO	INFORMATION
	INSUL	INSULATION
	INTR	INTERIOR
	INV	INVERT
	IVT	INTRAVENOUS TRACK
J	JAN	JANITOR
	JST	JOIST
	JT	JOINT
K	KG	KILOGRAM
	KIT	KITCHEN
	KPL	KICK PLATE
	KS	KNEE SPACE
L	L	LENGTH, LONG
	LAB	LABORATORY
	LAM	LAMINATE, LAMINATION
	LAV	LAVATORY
	LB	POUND
	LED	LIGHT EMITTING DIODE
	LF	LINEAR FOOT
	LG	LENGTH
	LIN	LINEAR
	LL	LEAD LINED
	LPT	LOW POINT
	LT	LIGHT
	LT WT	LIGHT WEIGHT
	LTG	LIGHTING
	LVR	LOUVER
M	M	METERS
	MACH	MACHINE
	MATL	MATERIAL
	MATV	MASTER ANTENNA TELEVISION SYSTEM
	MAX	MAXIMUM
	MB	MACHINE BOLT
	MC	MEDICINE CABINET
	MDO	MEDIUM DENSITY OVERLAY
	MECH	MECHANICAL
	MED	MEDIUM
	MEMB	SYMMETRICAL
	MFR	MANUFACTURER
	MH	MANHOLD
	MICRO	MICROWAVE
	MIN	MINIMUM
	MISC	MISCELLANEOUS
	MKB	MARKERBOARD
	MLDG	MOLDING
	MM	MILLIMETERS
	MO	MASONRY OPENING
	MOD	MODULE, MODULAR
	MTD	MOUNTED
	MTG	MOUNTING
	MTL	METAL
	MTLB	METAL BASE
	MULL	MULLION
	MVBL	MOVABLE
N	NA	NOT APPLICABLE
	NAT	NATURAL
	NE	NORTHEAST
	NIC	NOT IN CONTRACT
	NO	NUMBER
	NOM	NOMINAL
	NRC	NOISE REDUCTION COEFFICIENT
	NTS	NOT TO SCALE
	NW	NORTHWEST
O	OA	OVERALL
	OC	ON CENTER
	OD	OUTSIDE DIAMETER
	OFCI	OWNER FURNISHED- CONTRACTOR INSTALLED
	OFOI	OWNER FURNISHED- OWNER INSTALLED
	OPP	OPPOSITE
	ORD	OVERFLOW ROOF DRAIN
	OVHD	OVERHEAD
	OZ	OUNCE
P	P	PAINT
	PA	PUBLIC ADDRESS
	PART	PARTIAL
	PBD	PARTICLEBOARD
	PBX	PRIVATE TELEPHONE EXCHANGE
	PC	PRIVACY CURTAIN
	PCF	POUNDS PER CUBIC FOOT
	PCI	POUNDS PER CUBIC INCH
	PERF	PERFORATED
	PERIM	PERIMETER
	PERM	PERMANENT
	PERP	PERPENDICULAR
	PI	POINT OF INTERSECTION
	PL	PLATE
	PLAM	PLASTIC LAMINATE
	PLAS	PLASTER
	PLBG	PLUMBING
	PLF	POUNDS PER LINEAR FOOT
	PLYWD	PLYWOOD
	PNEU	PENUMATIC
	PNL	PANEL
	PNL BD	PANEL BOARD
	PORT	PORTABLE
	PP	PUSH PLATE
	PPM	PARTS PER MILLION
	PPR	PAPER DISPENSER
	PR	PAIR
	PRCST	PRECAST
	PREFAB	PREFABRICATION
	PREFIN	PREFINISHED
	PREP	PREPARATION
	PRKG	PARKING
	PROJ	PROJECT
	PROP	PROPERTY
	PSF	POUNDS PER SQUARE FOOT
	PSI	POUNDS PER SQUARE INCH
	PT	POINT
	PTN	PARTITION
	PTX	PNEUMATIC TUBE STATION
	PVC	POLYVINYL CHLORIDE
	PVG	PAVING
	PVMT	PAVEMENT
	PWR	POWER
Q	QTR	QUARTER
	QTY	QUANTITY
R	R	RISER
	R/O	REVERSE OSMOSIS WATER
	RA	RETURN AIR
	RAD	RADIUS
	RB	RESILIENT BASE
	RCP	REFLECTED CEILING PLAN
	RCPT	RECEPTACLE
	RD	ROOF DRAIN
	RE	REFERENCE
	RECT	RECTANGULAR
	REF	REFRIGERATOR
	REG	REGISTER
	REINF	REINFORCE (D) (ING) (MENT)
	REQD	REQUIRED
	REQT	REQUIREMENT
	RET	RETURN AIR
	REV	REVISION
	RF	RESILIENT FLOORING
	RH	RIGHT HAND
	RHMS	ROUND HEAD MACHINE
	RHWS	ROUND HEAD WOOD SCREW
	RM	ROOM
	RND	ROUND
	RO	ROUGH OPENING
	ROW	RIGHT OF WAY
	RS	RESINOUS FLOOR
	RSN	RESIN PANEL
	RWL	RAIN WATER LEADER
S	S	SOUTH
	SA	SUPPLY AIR
	SB	SPLASH BLOCK
	SC	SOLID CORE
	SCHED	SCHEDULE
	SCRN	SCREEN
	SD	STORM DRAIN
	SE	SOUTHEAST
	SECT	SECTION
	SEG	SEGMENT
	SEP	SEPARATION OR SEPARATE
	SEP JT	SEPARATION JOINT
	SHT	SHEET, SHEETING
	SHV	SHELVES, SHELVING
	SHWR	SHOWER
	SIM	SIMILAR
	SK	SINK
	SKLR	SPRINKLER
	SMS	SHEET METAL SCREW
	SOG	SLAB ON GRADE
	SP	SPACE, SPACED, SPACING
	SPC	SPECIALTY APPLICATION
	SPD	SOAP DISPENSER
	SPEC	SPECIFICATION
	SPKR	SPEAKER
	SQ	SQUARE
	SS	SANITARY SEWER
	SSK	SERVICE SINK
	SSM	SOLID SURFACE MATERIAL
	SST	STAINLESS STEEL
	ST	STREET
	STA	STATION
	STAG	STAGGERED
	STC	SOUND TRANSMISSION COEFFICIENT
	STD	STANDARD
	STL	STEEL
	STN	STONE
	STNB	STONE BASE
	STOR	STORAGE
	STRUCT	STRUCTURAL
	STS	SELF-TAPPING STEEL
	SUSP	SUPSENDED
	SVCE	SERVICE
	SW	SOUTHWEST
	SYMM	SYMMETRICAL
	SYST	SYSTEM
T	T	TREAD
	T&B	TOP AND BOTTOM
	T&G	TONGUE AND GROOVE
	TBD	TO BE DETERMINED
	TC	TOP OF CONCRETE, TOP OF CURB
	TD	TRENCH DRAIN
	TEL	TELEPHONE
	TEMP	TEMPORARY
	THERM	THERMAL
	THK	THICK, THICKNESS
	THRES	THRESHOLD
	THRU	THROUGH
	TL	TILE
	TLB	TILE BASE
	TMPD GL	TEMPERED GLASS
	TO	TOP OF
	TOR	TOP OF RAILING
	TOS	TOP OF STEEL
	TOT	TOTAL
	TOW	TOP OF WALL
	TP	TOP OF PAVEMENT
	TPT	TOILET PARTITION
	TRC	TRASH RECEPTACLE
	TRZ	TERAZZO
	TTB	TELEPHONE TERMINAL BOARD
	TV	TELEVISION
	TYP	TYPICAL
U	UC	UNDER COUNTER
	UL	UNDERWRITER'S LABORATORIES
	UON	UNLESS OTHERWISE NOTED
	UPH	UPHOLSTERY
	UPS	UNINTERRUPTABLE POWER SUPPLY
	UTIL	UTILITY
V	VAC	VACUUM
	VB	VALVE BOX
	VCT	VINYL COMPOSITION TILE
	VERT	VERTICAL
	VEST	VESTIBULE
	VIF	VERIFY IN FIELD
	VIT	VITREOUS
	VOL	VOLUME
	VP	VENT PIPE
W	W	WEST
	W/	WITH
	W/D	WASHER/DRYER
	W/O	WITHOUT
	W/W	WALL TO WALL
	WC	WATER CLOSET
	WCHR	WHEELCHAIR
	WCV	WALLCOVERING
	WD	WOOD
	WDB	WOOD BASE
	WDF	WOOD FLOORING
	WDV	WOOD VENEER
	WDW	WINDOW
	WF	WINDOW FILM
	WGL	WIRE GLASS
	WH	WHITEBOARD
	WM	WIRE MESH
	WO	WHERE OCCURS
	WOM	WALK OFF MAT
	WP	WALL PROTECTION
	WPT	WORKING POINT
	WR	WATER RESISTANT
	WSCT	WAINSCOT
	WSP	WET STANDPIPE
	WT	WEIGHT
	WTHPRF	WEATHERPROOF
	WTR	WINDOW TREATMENT
	WTRPRF	WATERPROOF
	WWF	WELDED WIRE FABRIC
	WWM	WELDED WIRE MESH
X	XFMR	TRANSFORMER
Y	YD	YARD

ARCHITECTURAL FLOOR PLAN SYMBOLS

DIMENSION SYMBOLS

10' - 0" — DIMENSION SHOWN TO:
- STRUCTURAL GRID
- LAYOUT GRID
- CENTERLINE OF ASSEMBLY
- CENTER OF OPENING
- CENTER OF EQUIP/ FURN

GRID OR CENTER LINE TYPICAL

10' - 0" — DIMENSION SHOWN TO:
- PARTITION ASSEMBLY
- EDGE OF DOOR OPENING
- OTHER BUILDING ELEMENT
- WORKING POINT INDICATED ON DETAIL

PARTITION SYMBOLS

PARTITION

EXISTING PARTITION

GENERAL SYMBOLS

BASE CABINETS

BASE AND WALL CABINETS

WALL CABINETS

TOILET PARTITION AND DOOR

HANDRAIL

BUMPER GUARD

CG CG — CORNER GUARD

EG — EDGE GUARD

OVERHEAD ITEMS

UNDER-COUNTER ITEMS

NIC — NOT-IN-CONTRACT ITEMS

FIRE EXTINGUISHER SYMBOLS

FEXT — FIRE EXTINGUISHER BRACKET MOUNTED

FEC — FIRE EXTINGUISHER SURFACE MOUNTED

FEC — FIRE EXTINGUISHER CABINET SEMI-RECESSED

FEC — FIRE EXTINGUISHER CABINET RECESSED

PLUMBING SYMBOLS

TOILET - WALL HUNG

URINAL - FLOOR/WALL HUNG

LAVATORY - COUNTERTOP

LAVATORY - PEDESTAL/WALL HUNG

UTILITY SINK

DRINKING FOUNTAIN / EWC

JANITOR'S RECEPTOR

BATHTUB

SHOWER

FD — FLOOR DRAIN IN SLOPING FLOOR

ARCHITECTURAL DEMOLITION SYMBOLS

EXISTING PARTITION TO REMAIN

EXISTING PARTITION TO BE REMOVED

NO OPENING MARK AT EXISTING DOORS WITH NO WORK - TYP

EXISTING DOOR TO REMAIN

EXISTING DOOR AND FRAME TO BE REMOVED

EXISTING WINDOW TO REMAIN

EXISTING WINDOW TO BE REMOVED

EXISTING LAY-IN CEILING TO REMAIN

EXISTING LAY-IN CEILING TO BE REMOVED

DOOR AND INTERIOR OPENING SYMBOLS

DOOR OPENING MARK - TYP

122 — SINGLE OPENING DOOR

122 — DOUBLE ACTING DOOR

122 — PAIR DOORS - EQUAL SIZES

122 — PAIR DOORS - UNEQUAL SIZES

122 — PAIR DOORS - DOUBLE EGRESS

122 — 2 PANEL BI-FOLD DOOR

122 — PAIR - BI FOLD DOOR

122 — OVERHEAD ROLLING DOOR

122 — INTERIOR GLAZED WINDOW

122 — DOOR WITH SIDE LIGHT

122 — SLIDING DOOR - BETWEEN JAMBS

122 — SLIDING POCKET DOOR

ARCH REFLECTED CEILING PLAN SYMBOLS

ARCHITECTURAL

2'X4' LAY IN ACOUSTIC TILE CEILING

2'X2' LAY IN ACOUSTIC TILE CEILING

GYPSUM BOARD

AP — ACCESS PANEL

MECHANICAL

SUPPLY GRILLE

RETURN GRILLE

EXHAUST GRILLE

LINEAR DIFFUSER

SPRINKLER HEAD - CLG MOUNT SPECIAL AREAS - REFER TO FIRE PROTECTION DWGS FOR SPECIFIC TYPE

ELECTRICAL

2'X4' LIGHTING FIXTURE

2'X2' LIGHTING FIXTURE

1'X4' LIGHTING FIXTURE

LIGHTING STRIP FIXTURE

RECESSED DOWN LIGHT

WALL WASH

TRACK LIGHTING

EXIT SIGN, SINGLE-SIDED

EXIT SIGN, DOUBLE-SIDED

F — FIRE ALARM

S — SPEAKER

P — SMOKE DETECTOR

W — WIRELESS INTERNET

MISCELLANEOUS

+12'-8" — HEIGHT OF CEILING FINISH ABOVE FINISH FLOOR

ARCHITECTURAL REFERENCE SYMBOLS

BUILDING SECTION

1 SIM A101 — WALL SECTION NUMBER; DIRECTION OF VIEW; SHEET WHERE DRAWN

WALL SECTION

1 SIM A101 — WALL SECTION NUMBER; SHEET WHERE DRAWN; DIRECTION OF VIEW

EXTERIOR ELEVATION

AX.X.X X — ELEVATION NUMBER AND DIRECTION; SHEET WHERE DRAWN

DETAIL REFERENCE

SIM A101 — DETAIL NUMBER; SHEET WHERE DRAWN, HYPHEN INDICATES DETAIL ON SAME SHEET.

SECTION DETAIL REFERENCE

1 SIM A101 — ELEVATION NUMBER AND DIRECTION; SHEET WHERE DRAWN

INTERIOR ELEVATION REFERENCE

1 2 A102 2 1 — ELEVATION NUMBER AND DIRECTION OF VIEW; SHEET WHERE DRAWN

ROOM NAME AND NUMBER

Room Name 101

WINDOW AND LOUVER TYPE MARK

W-X — SEE CORRESPONDING NUMBER ON SCHEDULE

M-X — SEE ASSEMBLY TYPE FOR DETAILS.

LEVEL LINE

SECOND LEVEL +12'-0" — NAME OF LEVEL; INDICATES HEIGHT ABOVE PROJECT DATUM

REVISION EXTENT

EXTENT OF CURRENT REVISION

SHEET KEYNOTE MARK

A502 — SEE CORRESPONDING NUMBERED KEYNOTE ON SHEET WHERE REFERENCE OCCURS

REFERENCE KEYNOTE MARK

088000.A03 — THE FIRST SIX DIGITS REPRESENT THE SPECIFICATION SECTION; EXAMPLE 1: THE CHARACTERS FOLLOWING THE PERIOD REPRESENT PARTICULAR ITEMS OF THE SPECIFIED SYSTEM

061600 5/8" PLYWOOD — EXAMPLE 2: THE TEXT IS THE PRODUCT DESCRIPTION

MATCH LINE REFERENCES

MATCH LINE SHEET A2.1.1 — REFER TO THE SHEET WHERE CONTINUATION IS FOUND

OR

SHEET A2.1.2 SHEET A2.1.1 — REFER TO THE SHEETS EITHER SIDE OF THE MATCH LINE

DRAWING TITLE SYMBOLS

1 View Name SCALE: 1/8" = 1'-0" — BASIC DRAWING TITLE

1 View Name SCALE: 1/8" = 1'-0" — BASIC DRAWING TITLE WITH LINE

View Name SCALE: 1/8" = 1'-0" — DRAWING TITLE WHEN ONLY ONE PLAN EXISTS ON THE DRAWING

LAYOUT GRID LINES

A B 90.00° 1 — NEW GRID IDENTIFICATION; EXISTING GRID IDENTIFICATION

NORTH ARROW REFERENCES

NORTH OR PROJECT NORTH OR TRUE NORTH

ARCHITECTURAL MATERIAL INDICATIONS

PLAN AND SECTION

EARTH

AGGREGATE BASE COURSE

CONCRETE

CONCRETE MASONRY UNIT

BRICK MASONRY

PRECAST CONCRETE

LIMESTONE, SANDSTONE, GRANITE

MARBLE

STEEL, STAINLESS STEEL (LARGE SCALE)

ALUMINUM (LARGE SCALE)

OTHER METALS (LARGE SCALE)

WOOD FRAMING / BLOCKING - CONTINUOUS (LARGE SCALE)

WOOD FRAMING / BLOCKING - DISCONTINUOUS (LARGE SCALE)

GYPSUM SHEATHING (LARGE SCALE)

PLYWOOD (LARGE SCALE)

FINISH WOOD (LARGE SCALE)

COMPOSITE BOARD (LARGE SCALE)

ORIENTED STRAND BOARD (OSB) (LARGE SCALE)

EIFS INSULATION BOARD (LARGE SCALE)

SEMI-RIGID INSULATION (LARGE SCALE)

BATT INSULATION (LARGE SCALE)

MORTAR, SAND, FIREPROOFING, STUCCO, GYPSUM BOARD

ACOUSTIC TILE (LARGE SCALE)

PROTECTION BOARD (LARGE SCALE)

CERAMIC TILE (LARGE SCALE)

GLASS (LARGE SCALE)

TERRAZZO (LARGE SCALE)

ELEVATION

PLASTER CONCRETE

MASONRY, METAL SIDING (HORIZONTAL)

GLASS BLOCK, CERAMIC TILE

METAL SIDING (VERTICAL)

GLASS

ARCHITECTURAL GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY TO ALL ARCHITECTURAL SERIES SHEETS. FOR GENERAL NOTES APPLICABLE TO ALL SHEETS REFER TO THE "PROJECT GENERAL NOTES".

A. THE ARCHITECTURAL SERIES SHEETS ARE PART OF A COMPLETE SET OF CONSTRUCTION DOCUMENTS DESCRIBING THE WORK FOR THIS PROJECT. USERS OF THESE DOCUMENTS ARE RESPONSIBLE TO REVIEW ALL CONSTRUCTION DOCUMENTS TO UNDERSTAND AND COORDINATE THE GRAPHIC AND ANNOTATED INFORMATION PROVIDED IN THESE ARCHITECTURAL SERIES SHEETS.

B. DO NOT SCALE THE DRAWINGS FOR DIMENSIONAL INFORMATION. NOTIFY THE ARCHITECT IN WRITING IMMEDIATELY IF DIMENSIONAL INFORMATION CANNOT BE DETERMINED FROM THE DRAWINGS OR IF DIMENSIONS ARE IN CONFLICT WITH OTHER DRAWINGS.

C. ALL VISUALLY EXPOSED STRUCTURAL, MECHANICAL AND ELECTRICAL ELEMENTS, INCLUDING EXPOSED METAL FLOOR AND ROOF DECK, ARE TO BE PAINTED UNLESS OTHERWISE NOTED. THIS INCLUDES ELEMENTS THAT MAY BE VISIBLE THROUGH GRILLES, LOUVERS OR CEILINGS. COLORS AND PAINT MATERIALS ARE DEFINED IN THE FINISH SCHEDULE, THE SPECIFICATIONS, AND THE DRAWINGS AS APPLICABLE TO THE CONSTRUCTION DOCUMENTS.

REFERENCE ELEVATION DEFINITIONS

A. THE TERM "REFERENCE" ELEVATION OR DIMENSIONS REFERS TO A NOMINAL WORK POINT. THE ACTUAL ELEVATION MAY VARY FROM THE REFERENCE POINT. REFER TO APPLICABLE DETAIL TO DETERMINE THE RELATIONSHIP BETWEEN THE ACTUAL ELEVATION OR DIMENSION AND THE STATED REFERENCE POINT."

B. THE DESIGN REFERENCE ELEVATION +0'-0" SHOWN ON THE ARCHITECTURAL DRAWINGS CORRESPONDS TO THE FINISH FLOOR ELEVATION OF THE GROUND FLOOR. ESTABLISH THE ACTUAL ELEVATION WITH RESPECT TO SITE-SPECIFIC BENCHMARKS AND CONTROL POINTS AS DEFINED IN THE CIVIL DRAWINGS.

C. "FINISH FLOOR" ELEVATIONS ARE MEASURED AT THE TOP OF THE CONCRETE FLOOR SLAB UNLESS OTHERWISE NOTED. APPLIED FINISHES SUCH AS RESILIENT FLOORING OR CARPET MAY RAISE THE ACTUAL FINISH SURFACE ABOVE THE REFERENCE ELEVATION PROVIDED FOR THE FINISH FLOOR.

D. WHERE CONCRETE FLOOR SLAB IS DEPRESSED TO ACCOMMODATE MORTAR BEDS, SETTING BEDS, RAISED ACCESS FLOORS, AND OTHER SIMILAR FLOOR ASSEMBLIES, "FINISHED FLOOR" ELEVATIONS ARE MEASURED AS IF CONCRETE DEPRESSION DOES NOT OCCUR.

E. CEILING HEIGHT ELEVATIONS ARE MEASURED TO BOTTOM OF FINISH SURFACES AND STATED IN RELATION TO DISTANCE ABOVE THE REFERENCE ELEVATION FOR THE FINISH FLOOR UNLESS OTHERWISE NOTED.

F. ROOF ELEVATIONS ARE MEASURED TO TOP OF SURFACES AND STATED IN RELATION TO DISTANCE ABOVE THE REFERENCE ELEVATION PROVIDED FOR THE UPPERMOST FINISH FLOOR UNLESS OTHERWISE NOTED. ELEVATIONS GIVEN ARE TO TOP OF STEEL (TOS), TOP OF DECK (TOD), OR TOP OF TAPERED INSULATION (TOT) UNLESS OTHERWISE NOTED.

ARCHITECTURAL ASSEMBLY SYSTEM TAGS

TYPICAL ARCHITECTURAL ASSEMBLY IDENTIFICATION MARK

A000X — PLAN

A000X — SECTION

FOR THE ASSEMBLY TYPES LISTED, SEE THE FOLLOWING SHEETS FOR SYSTEM DETAILS AND DESCRIPTIONS:

TYPE **A** = EXTERIOR WALLS - ABOVE GRADE - SHEET A5.0.X
TYPE **B** = VERTICAL BELOW GRADE - SHEET A5.0.X
TYPE **H** = HORIZONTAL BELOW GRADE - SHEET A5.0.X
TYPE **R** = ROOFING SYSTEMS - SHEET A5.0.X
TYPE **S** = EXTERIOR SOFFITS - SHEET A5.0.X

TYPE **U** = EXTERIOR ALL GLASS FENESTRATION SYSTEMS - SHEET A5.0.X
TYPE **V** = EXTERIOR STOREFRONT FENESTRATION SYSTEMS - SHEET A5.0.X
TYPE **W** = EXTERIOR PUNCHED WINDOW FENESTRATION SYSTEMS - SHEET A5.0.X
TYPE **X** = EXTERIOR CURTAIN WALL FENESTRATION SYSTEMS - SHEET A5.0.X
TYPE **Z** = EXTERIOR SKYLIGHT FENESTRATION SYSTEMS - SHEET A5.0.X

TYPE **P** = INTERIOR WALL PARTITIONS - SHEET A9.2.X

TYPE **Y** = INTERIOR FENESTRATION SYSTEMS - SHEET A9.3.X

A000X
- ASSEMBLY TYPE
- ASSEMBLY NAME REPRESENTING: -MAJOR GROUP -FINISH SYSTEM -SUBSTRATE CONFIGURATION
- ASSEMBLY VARIABLE (NOT ALWAYS PRESENT)

ASSEMBLY TAG DESIGNATION

FIRE RESISTIVE RATING INDICATION

- 0 HOUR SMOKE PARTITION
- 0 HOUR EXISTING SMOKE PARTITION
- 1 HOUR FIRE RESISTANCE RATING
- 1 HOUR EXISTING FIRE RESISTANCE RATING
- 2 HOUR FIRE RESISTANCE RATING
- 2 HOUR EXISTING FIRE RESISTANCE RATING
- 3 HOUR FIRE RESISTANCE RATING
- 3 HOUR EXISTING FIRE RESISTANCE RATING
- 4 HOUR FIRE RESISTANCE RATING
- 4 HOUR EXISITNG FIRE RESISTANCE RATING

ARCHITECTURAL SYMBOL NOTES

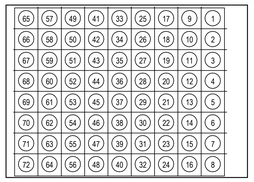
A. THE PURPOSE OF THIS SHEET IS TO ILLUSTRATE AND DEFINE TYPICAL GRAPHIC SYMBOLS WHICH MAY TYPICALLY OCCUR ON THE ARCHITECTURAL DRAWINGS.

B. THIS SHEET MAY ILLUSTRATE ABBREVIATIONS, SYMBOLS AND LEGENDS WHICH DO NOT OCCUR AS PART OF THIS PROJECT. REFER TO THE DRAWINGS TO DETERMINE WHICH ITEMS APPLY TO THE WORK OF THIS PROJECT.

C. ADDITIONAL SYMBOLS NOT SHOWN OR DEFINED ON THIS SHEET MAY BE USED ON THE ARCHITECTURAL DRAWINGS AND ARE TYPICALLY DEFINED ON OTHER SHEETS.

D. SYMBOLS ARE NOT DRAWN TO SCALE. TO DETERMINE THE ACTUAL SIZES OF ELEMENTS REPRESENTED BY SYMBOLS, REFER TO THE SPECIFICATIONS AND OTHER SHEETS, AS MAY APPLY.

MODULAR LAYOUT / DETAIL NUMBER

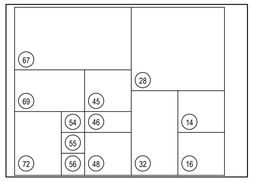


DETAIL MODULE LAYOUT

DETAILS ARE NUMBERED ACCORDING TO THEIR LOCATION ON EACH SHEET AND ARE NOT NUMBERED CONSECUTIVELY. EACH MODULE MAINTAINS THE NUMBER ASSOCIATED WITH IT

THIS SYSTEM CAN BE APPLIED TO ANY SHEET THAT CONTAINS MULTIPLE IMAGES. THE IMAGES ARE NUMBERED ACCORDING TO THE MODULE SYSTEM SHOWN ILLUSTRATED TO THE LEFT

EACH DETAIL MAY OCCUPY ONE OR MORE WHOLE MODULES. THE DETAIL MODULE IS USED TO ESTABLISH THE IDENTIFYING LABEL FOR EACH DETAIL, NOT TO LIMIT THE SIZE OF THE DETAIL



DETAIL NUMBERING EXAMPLE

THE NUMBER OF THE MODULE WHICH OCCURS IN THE LOWER LEFT CORNER OF A SINGLE MODULE OR SEVERAL MODULES GROUPED TOGETHER WILL DEFINE THE FINAL DETAIL NUMBER AS SHOWN IN THE ILLUSTRATION TO THE LEFT. ALTHOUGH THE MODULE NUMBERS OCCUR IN CONSECUTIVE ORDER, NOT ALL NUMBERS ARE NECESSARILY USED ON EACH SHEET

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA JOHN G. CRUMP ARC100840 LICENSED ARCHITECT
4/2/2026

SHEET TITLE
ARCHITECTURAL ABBREVIATIONS AND SYMBOLS

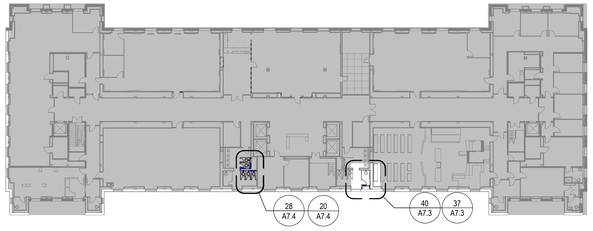
PROJECT NUMBER 00100451

SHEET NUMBER A0.1

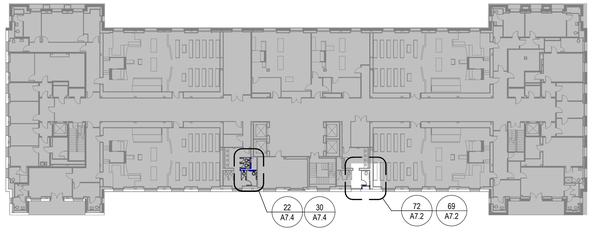
Author

4/13/2026 3:16:34 PM

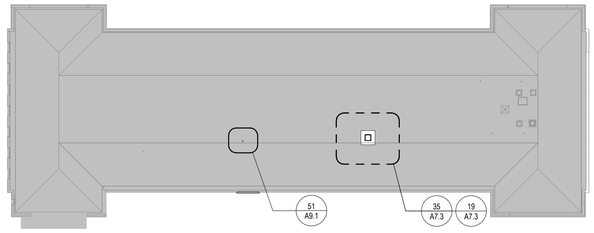
Plot Date:



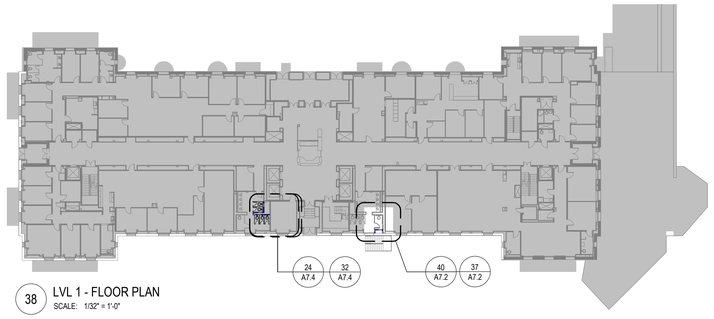
34 LVL 3 - FLOOR PLAN
SCALE: 1/32" = 1'-0"



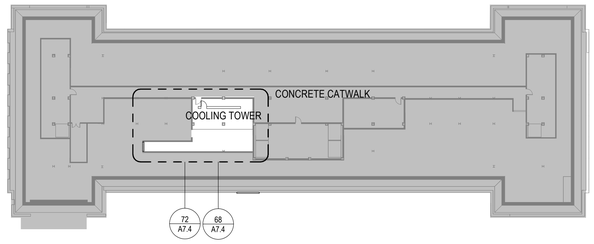
36 LVL 2 - FLOOR PLAN
SCALE: 1/32" = 1'-0"



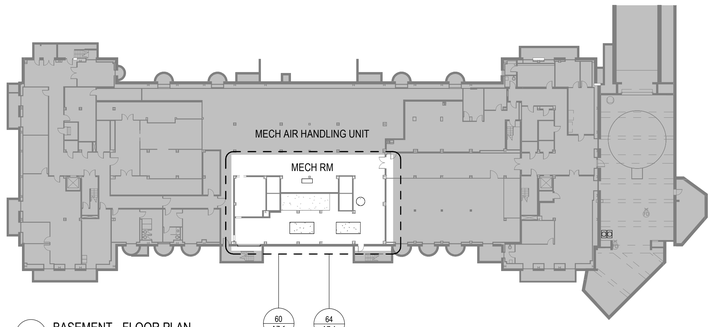
70 ROOF PLAN
SCALE: 1/32" = 1'-0"



38 LVL 1 - FLOOR PLAN
SCALE: 1/32" = 1'-0"



72 LVL 4 - FLOOR PLAN
SCALE: 1/32" = 1'-0"



40 BASEMENT - FLOOR PLAN
SCALE: 1/32" = 1'-0"

GENERAL SHEET NOTES

A. REFER TO THE A0.X SERIES SHEETS FOR ARCHITECTURAL GENERAL NOTES, DRAWING, REFERENCE AND MATERIAL SYMBOLS, ABBREVIATIONS, AS WELL AS DIMENSIONING CONVENTIONS USED ON THIS SHEET.

B. REFER TO AND COORDINATE WITH STRUCTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION NOT SHOWN ON THIS SHEET.

SHEET KEYNOTES

DC Courts TO-28
Building a Chiller; Cooling Tower Replacement
515 5th Street N.W.
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SEALS AND SIGNATURES

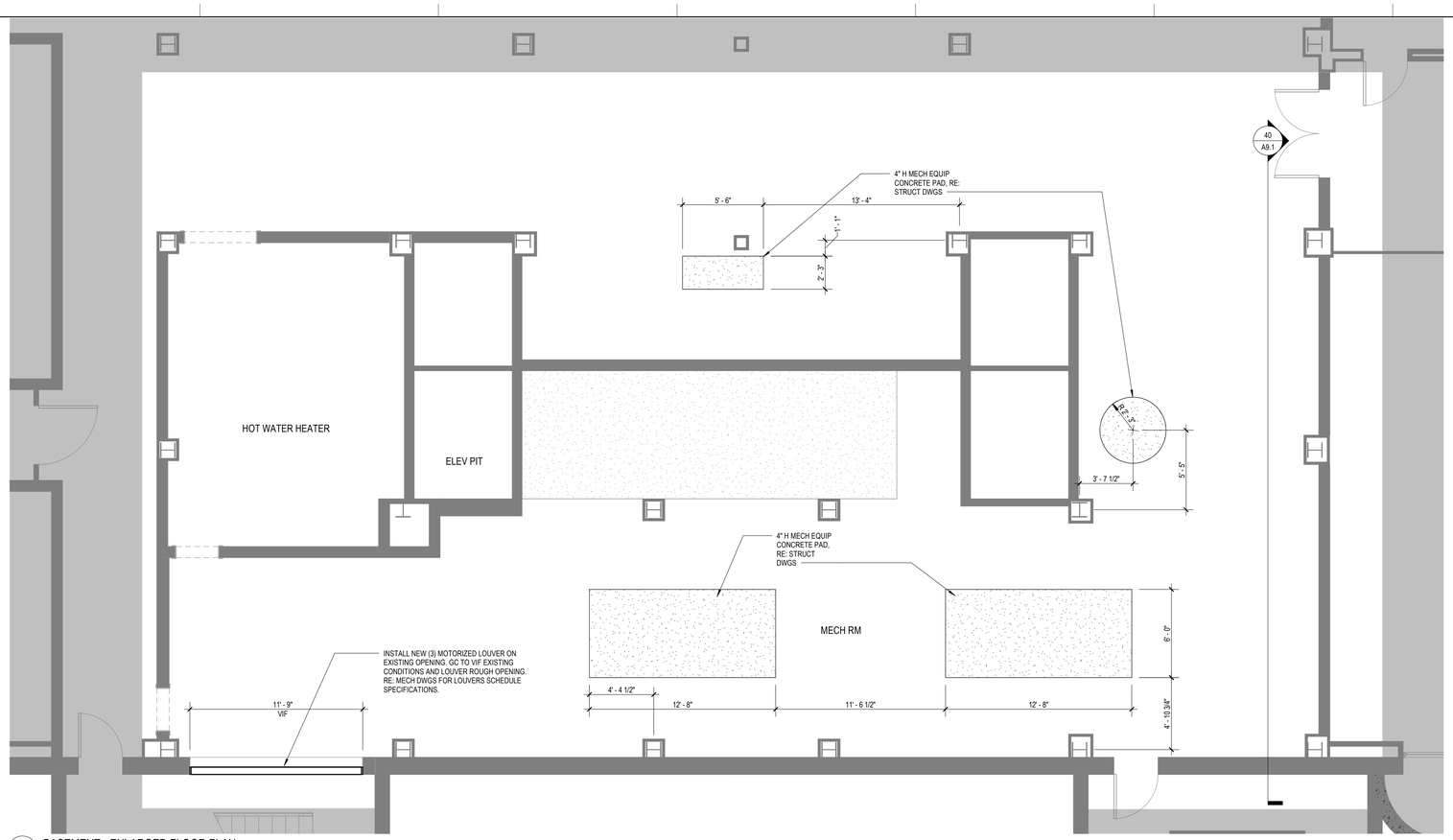
DISTRICT OF COLUMBIA
JOHN G. CRUMP
ARC100840
LICENSED
ARCHITECT
4/2/2026

SHEET TITLE
OVERALL FLOOR PLANS

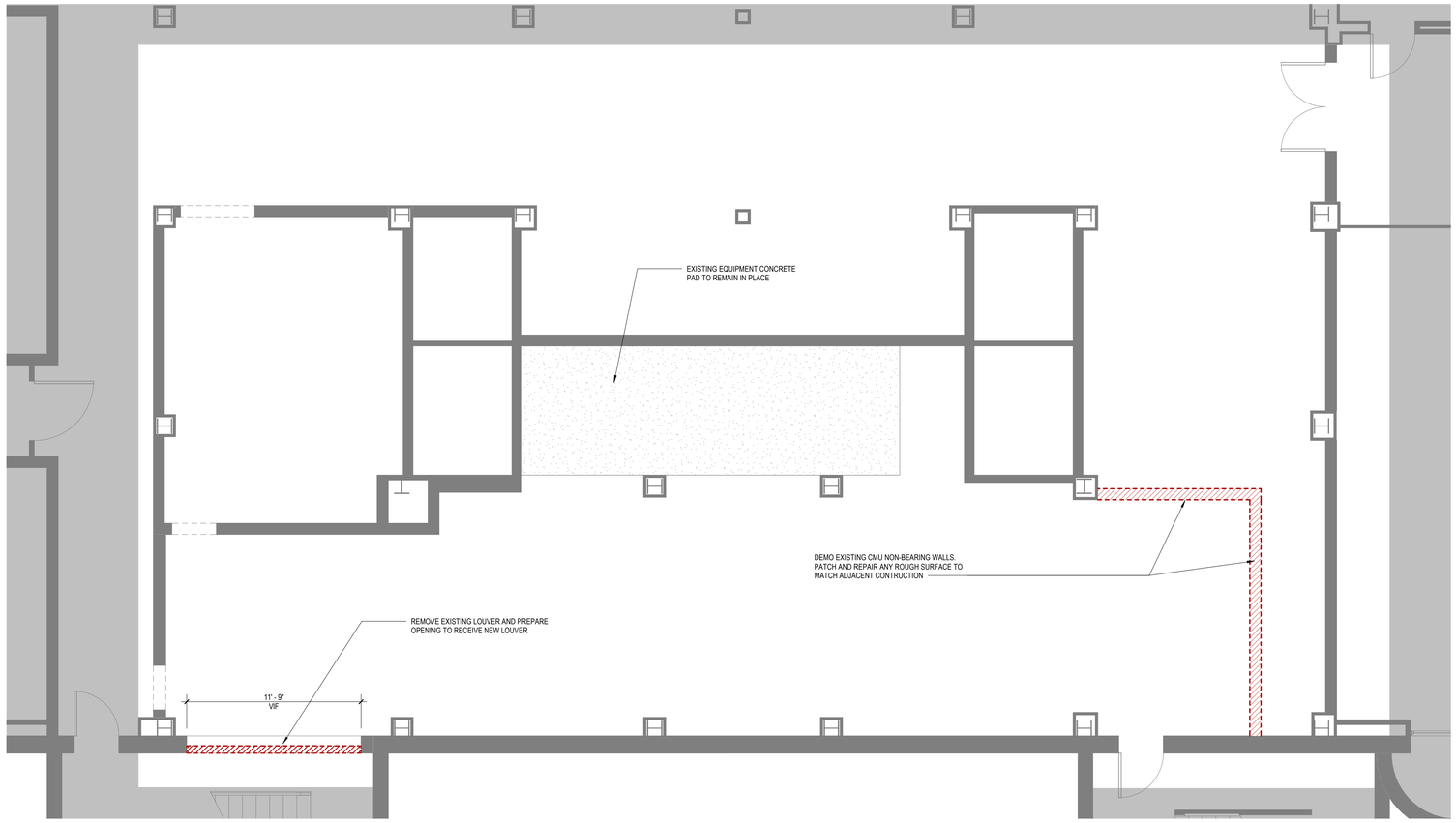
PROJECT NUMBER
00100451

SHEET NUMBER
A2.1

Plot Date: 4/13/2026 3:16:39 PM
Author



64 BASEMENT - ENLARGED FLOOR PLAN
SCALE: 1/4" = 1'-0"



60 BASEMENT - ENLARGED DEMO PLAN
SCALE: 1/4" = 1'-0"

DEMO GENERAL NOTES

A. REFER TO THE PROJECT GENERAL NOTES IN THE G0.1 FOR INFORMATION REGARDING VERIFICATION AND PROTECTION OF EXISTING CONDITIONS.

B. REFER TO THE A0.1 SHEET FOR ARCHITECTURAL GENERAL NOTES, DRAWING, REFERENCE AND MATERIAL SYMBOLS, ABBREVIATIONS, AS WELL AS DIMENSIONING CONVENTIONS USED ON THIS DRAWING.

C. REFER TO AND COORDINATE WITH STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION INFORMATION NOT SHOWN ON THIS DRAWING.

D. DEMOLITION WORK SHALL BE DONE IN A MANNER WHICH WILL NOT CAUSE UNNECESSARY INCONVENIENCE OR DANGER TO USERS OF THE PREMISES AND ADJACENT SITE AND NOT INTERFERE WITH ITS OPERATION. ANY DEMOLITION WORK TO BE PERFORMED MUST BE PLANNED IN ADVANCE AND APPROVED BY THE OWNER.

E. ALL MATERIALS INDICATED TO BE REMOVED SHALL BE DISPOSED OF PROPERLY AND REMOVED FROM THE SITE.

F. ALL REMOVED MATERIALS AND EQUIPMENT WHICH IS CLASSIFIED AS "SALVAGE FOR OWNER" SHALL REMAIN THE PROPERTY OF THE OWNER. DELIVER SUCH MATERIALS AND EQUIPMENT ON THE PREMISES AS DIRECTED BY THE OWNER AND NEATLY STORE AND PROTECT FROM DAMAGE.

G. ALL REMOVED MATERIALS AND EQUIPMENT WHICH IS CLASSIFIED "SALVAGE FOR RELOCATION" SHALL REMAIN THE PROPERTY OF THE OWNER. THE CONTRACTOR IS RESPONSIBLE FOR PLACING ITEMS IN STORAGE ON SITE AND FOR THE PROTECTION OF THOSE ITEMS. THESE ITEMS WILL BE RELOCATED. REFER TO THE FLOOR PLANS FOR NEW LOCATIONS.

H. PATCH AND REPAIR ALL ELEMENTS THAT ARE TO REMAIN WHICH ARE DAMAGED FROM THE DEMOLITION WORK WITH CONSTRUCTION TO MATCH EXISTING CONDITIONS.

GENERAL SHEET NOTES

A. REFER TO THE A0.1 FOR ARCHITECTURAL GENERAL NOTES, DRAWING, REFERENCE AND MATERIAL SYMBOLS, ABBREVIATIONS, AS WELL AS DIMENSIONING CONVENTIONS USED ON THIS SHEET.

B. REFER TO THE A9.1 SHEET FOR PARTITION SYSTEMS TYPES AND DETAILS.

C. REFER TO SHEET G0.1 FOR INFORMATION ASSOCIATED WITH THE SHAFT EXHAUST DUCT BASE DESIGN AND DEDUCT ALTERNATE.

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SEALS AND SIGNATURES

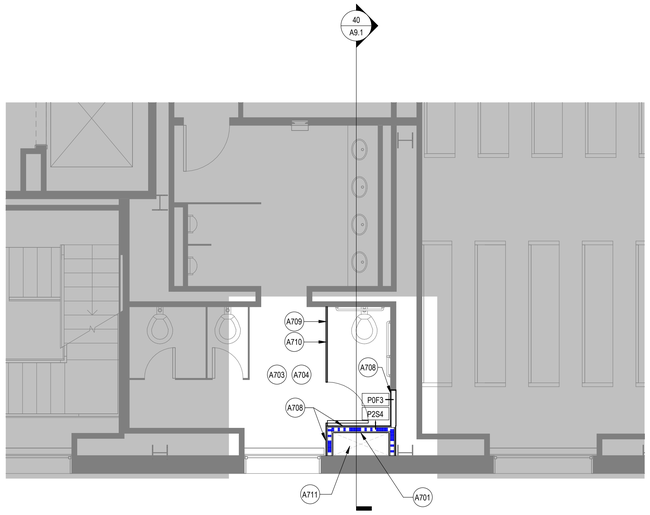
DISTRICT OF COLUMBIA JOHN G. CRUMP ARC100840 LICENSED ARCHITECT
4/2/2026

SHEET TITLE
BASEMENT - ENLARGED DEMO & FLOOR PLANS

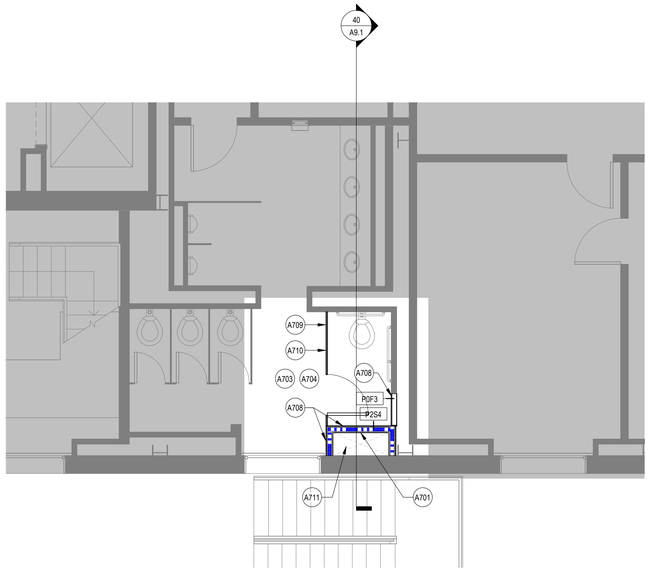
PROJECT NUMBER 00100451

SHEET NUMBER A7.1

Author
4/13/2026 3:16:39 PM
Plot Date:



72 LEVEL 2 - ENLARGED FLOOR PLAN
SCALE: 1/4" = 1'-0"



37 LEVEL 1 - ENLARGED FLOOR PLAN
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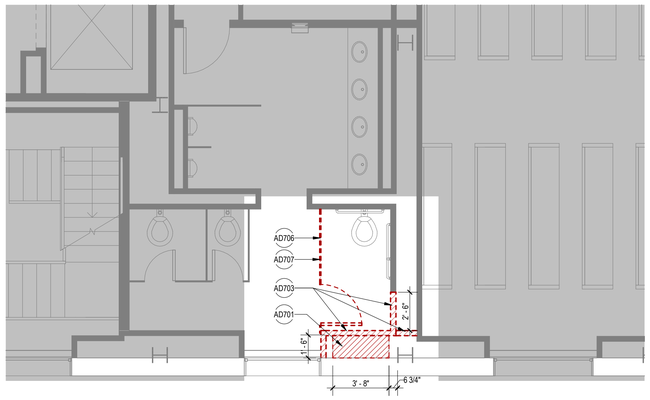
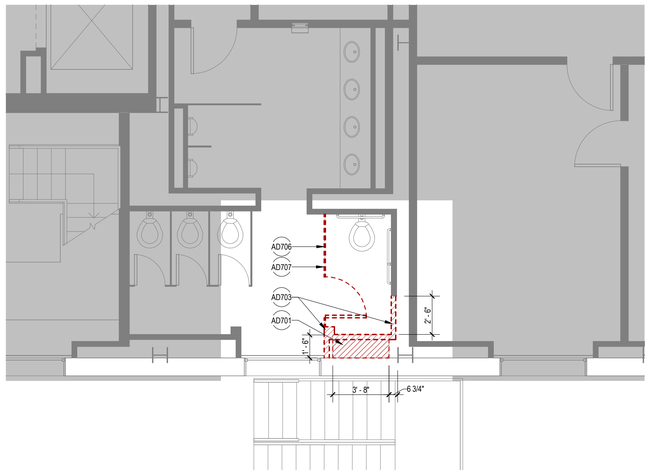


69 LEVEL 2 - ENLARGED DEMO PLAN
SCALE: 1/4" = 1'-0"



40 LEVEL 1 - ENLARGED DEMO PLAN
SCALE: 1/4" = 1'-0"

DEMO GENERAL NOTES

A. REFER TO THE PROJECT GENERAL NOTES IN THE G0.1 FOR INFORMATION REGARDING VERIFICATION AND PROTECTION OF EXISTING CONDITIONS.

B. REFER TO THE A0.1 SHEET FOR ARCHITECTURAL GENERAL NOTES, DRAWING, REFERENCE AND MATERIAL SYMBOLS, ABBREVIATIONS, AS WELL AS DIMENSIONING CONVENTIONS USED ON THIS DRAWING.

C. REFER TO AND COORDINATE WITH STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION INFORMATION NOT SHOWN ON THIS DRAWING.

D. DEMOLITION WORK SHALL BE DONE IN A MANNER WHICH WILL NOT CAUSE UNNECESSARY INCONVENIENCE OR DANGER TO USERS OF THE PREMISES AND ADJACENT SITE AND NOT INTERFERE WITH ITS OPERATION. ANY DEMOLITION WORK TO BE PERFORMED MUST BE PLANNED IN ADVANCE AND APPROVED BY THE OWNER.

E. ALL MATERIALS INDICATED TO BE REMOVED SHALL BE DISPOSED OF PROPERLY AND REMOVED FROM THE SITE.

F. ALL REMOVED MATERIALS AND EQUIPMENT WHICH IS CLASSIFIED AS "SALVAGE FOR OWNER" SHALL REMAIN THE PROPERTY OF THE OWNER. DELIVER SUCH MATERIALS AND EQUIPMENT ON THE PREMISES AS DIRECTED BY THE OWNER AND NEATLY STORE AND PROTECT FROM DAMAGE.

G. ALL REMOVED MATERIALS AND EQUIPMENT WHICH IS CLASSIFIED "SALVAGE FOR RELOCATION" SHALL REMAIN THE PROPERTY OF THE OWNER. THE CONTRACTOR IS RESPONSIBLE FOR PLACING ITEMS IN STORAGE ON SITE AND FOR THE PROTECTION OF THOSE ITEMS. THESE ITEMS WILL BE RELOCATED. REFER TO THE FLOOR PLANS FOR NEW LOCATIONS.

H. PATCH AND REPAIR ALL ELEMENTS THAT ARE TO REMAIN WHICH ARE DAMAGED FROM THE DEMOLITION WORK WITH CONSTRUCTION TO MATCH EXISTING CONDITIONS.

GENERAL SHEET NOTES

A. REFER TO THE A0.1 FOR ARCHITECTURAL GENERAL NOTES, DRAWING, REFERENCE AND MATERIAL SYMBOLS, ABBREVIATIONS, AS WELL AS DIMENSIONING CONVENTIONS USED ON THIS SHEET.

B. REFER TO THE A9.1 SHEET FOR PARTITION SYSTEMS TYPES AND DETAILS.

C. REFER TO SHEET G0.1 FOR INFORMATION ASSOCIATED WITH THE SHAFT EXHAUST DUCT BASE DESIGN AND DEDUCT ALTERNATE.

SHEET KEYNOTES

A701	NEW 2HR SHAFT WALL TO BE TIGHT TO THE NEW EXHAUST DUCT SLAB OPENING. SHAFT WALL CAN'T OBSTRUCT EXISTING WINDOW OPENING.
A703	PATCH AND REPAIR FLOORING TO MATCH EXISTING CONDITIONS
A704	EXISTING CEILING TO BE MODIFIED/REPAIRED TO MATCH EXISTING CONDITIONS
A708	WALL TO BE FINISHED TO MATCH EXISTING 4 1/4"X 4 1/4" WHITE CERAMIC GLAZED TILE (FULL HEIGHT TILE). INSTALL BLACK CERAMIC GLAZED COVE BASE TILE GROUTED TO THE FLOOR TILE TO MATCH EXISTING.
A709	BASE DESIGN: IF THE SHAFT NEEDS TO BE EXPANDED IN THE NORTH/SOUTH DIRECTION AND REDUCING THE SIZE OF THE TOILET STALL. GC TO INSTALL NEW TOILET PARTITION AND DOOR TO MATCH EXISTING.
A710	ALTERNATE DEDUCT: IF THE NEW SHAFT WALL CAN REMAIN THE SAME DEPTH AS THE EXISTING WALL, INSTALL SALVAGED TOILET PARTITION AT THE SAME PLACE.
A711	ALTERNATE DEDUCT: ELIMINATE ANY ENLARGEMENT OF THE SLAB CUT FOR THE DUCT IF A SLAB OPENING IS FOUND AFTER DEMOLITION WORK.
AD701	DEMO EXISTING SLAB FOR MECH EXHAUST DUCT, RE: MEP
AD703	DEMO EXISTING WALL.
AD706	BASE DESIGN: DEMO EXISTING TOILET PARTITION
AD707	ALTERNATE-DEDUCT: REMOVE AND SALVAGE EXISTING TOILET PARTITION. TOILET PARTITION TO BE RE-USED IF NEW SHAFT WALL REMAIN AT THE SAME DEPTH AS THE EXISTING WALL

NOTE: COORDINATE ARCHITECTURAL AND PLUMBING DEMOLITION AND NEW WORK SCOPE WITH DC COURTS. DO NOT PLAN, SCHEDULE, OR PROCEED WITH ANY DEMOLITION OR NEW WORK WITHOUT PRIOR WRITTEN APPROVAL FROM DC COURTS.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
JOHN G. CRUMP
ARC100840
LICENSED
ARCHITECT
4/2/2026

SHEET TITLE
LEVEL 1 & 2 - ENLARGED DEMO & FLOOR PLANS

PROJECT NUMBER 00100451

SHEET NUMBER A7.2

Author

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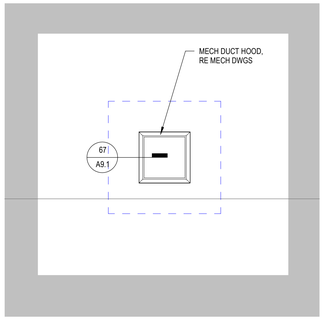
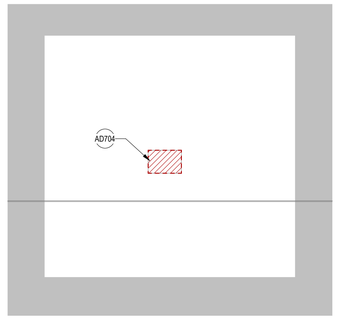
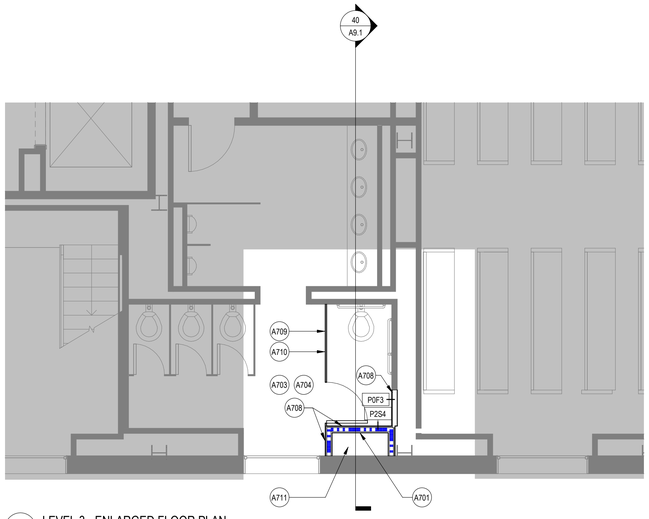


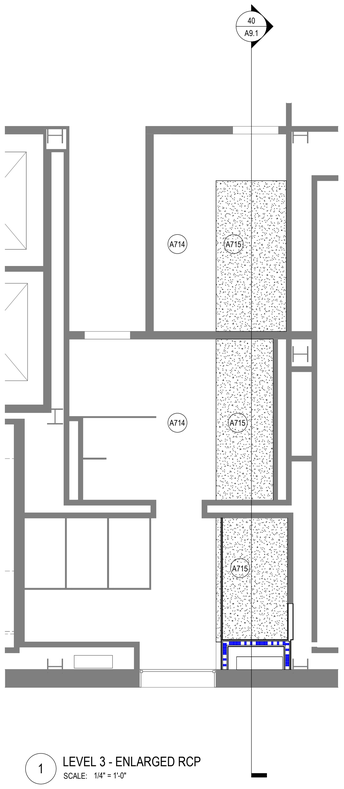
35 ENLARGED ROOF PLAN
SCALE: 1/4" = 1'-0"



19 ENLARGED DEMO ROOF PLAN
SCALE: 1/4" = 1'-0"



37 LEVEL 3 - ENLARGED FLOOR PLAN
SCALE: 1/4" = 1'-0"



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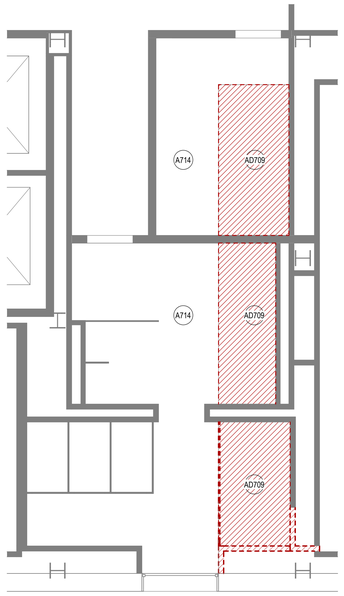
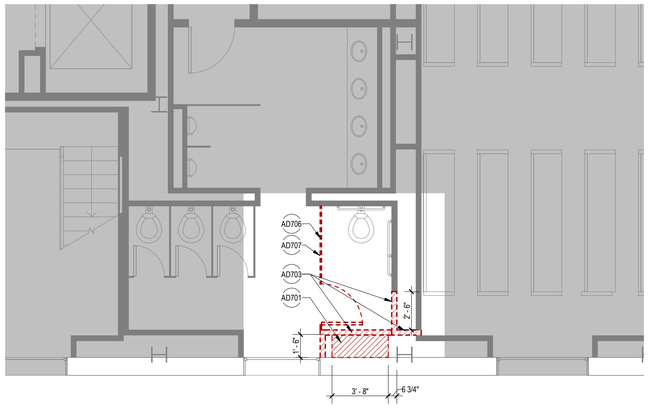
SCALE: 1/4" = 1'-0"



2 LEVEL 3 - ENLARGED DEMO RCP
SCALE: 1/4" = 1'-0"



40 LEVEL 3 - ENLARGED DEMO PLAN
SCALE: 1/4" = 1'-0"

DEMO GENERAL NOTES

A. REFER TO THE PROJECT GENERAL NOTES IN THE G0.1 FOR INFORMATION REGARDING VERIFICATION AND PROTECTION OF EXISTING CONDITIONS.

B. REFER TO THE A0.1 SHEET FOR ARCHITECTURAL GENERAL NOTES, DRAWING, REFERENCE AND MATERIAL SYMBOLS, ABBREVIATIONS, AS WELL AS DIMENSIONING CONVENTIONS USED ON THIS DRAWING.

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E. ALL MATERIALS INDICATED TO BE REMOVED SHALL BE DISPOSED OF PROPERLY AND REMOVED FROM THE SITE.

F. ALL REMOVED MATERIALS AND EQUIPMENT WHICH IS CLASSIFIED AS "SALVAGE FOR OWNER" SHALL REMAIN THE PROPERTY OF THE OWNER. DELIVER SUCH MATERIALS AND EQUIPMENT ON THE PREMISES AS DIRECTED BY THE OWNER AND NEATLY STORE AND PROTECT FROM DAMAGE.

G. ALL REMOVED MATERIALS AND EQUIPMENT WHICH IS CLASSIFIED "SALVAGE FOR RELOCATION" SHALL REMAIN THE PROPERTY OF THE OWNER. THE CONTRACTOR IS RESPONSIBLE FOR PLACING ITEMS IN STORAGE ON SITE AND FOR THE PROTECTION OF THOSE ITEMS. THESE ITEMS WILL BE RELOCATED. REFER TO THE FLOOR PLANS FOR NEW LOCATIONS.

H. PATCH AND REPAIR ALL ELEMENTS THAT ARE TO REMAIN WHICH ARE DAMAGED FROM THE DEMOLITION WORK WITH CONSTRUCTION TO MATCH EXISTING CONDITIONS.

GENERAL SHEET NOTES

A. REFER TO THE A0.1 FOR ARCHITECTURAL GENERAL NOTES, DRAWING, REFERENCE AND MATERIAL SYMBOLS, ABBREVIATIONS, AS WELL AS DIMENSIONING CONVENTIONS USED ON THIS SHEET.

B. REFER TO THE A9.1 SHEET FOR PARTITION SYSTEMS TYPES AND DETAILS.

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SHEET KEYNOTES

A701	NEW 2HR SHAFT WALL TO BE TIGHT TO THE NEW EXHAUST DUCT SLAB OPENING. SHAFT WALL CAN'T OBSTRUCT EXISTING WINDOW OPENING.
A703	PATCH AND REPAIR FLOORING TO MATCH EXISTING CONDITIONS
A704	EXISTING CEILING TO BE MODIFIED/REPAIRED TO MATCH EXISTING CONDITIONS
A708	WALL TO BE FINISHED TO MATCH EXISTING 4 1/4"X 4 1/4" WHITE CERAMIC GLAZED TILE (FULL HEIGHT TILE). INSTALL BLACK CERAMIC GLAZED COVE BASE TILE GROUTED TO THE FLOOR TILE TO MATCH EXISTING.
A709	BASE DESIGN: IF THE SHAFT NEEDS TO BE EXPANDED IN THE NORTH/SOUTH DIRECTION AND REDUCING THE SIZE OF THE TOILET STALL. GC TO INSTALL NEW TOILET PARTITION AND DOOR TO MATCH EXISTING.
A710	ALTERNATE DEDUCT: IF THE NEW SHAFT WALL CAN REMAIN THE SAME DEPTH AS THE EXISTING WALL, INSTALL SALVAGED TOILET PARTITION AT THE SAME PLACE.
A711	ALTERNATE DEDUCT: ELIMINATE ANY ENLARGEMENT OF THE SLAB CUT FOR THE DUCT IF A SLAB OPENING IS FOUND AFTER DEMOLITION WORK.
A714	EXISTING CEILING TO REMAIN
A715	NEW CEILING TO MATCH EXISTING FINISH AND ELEVATION. REINSTALL ALL MECHANICAL AND ELECTRICAL FIXTURES REMOVED FROM EXISTING CEILING.
AD701	DEMO EXISTING SLAB FOR MECH EXHAUST DUCT, RE: MEP
AD703	DEMO EXISTING WALL.
AD704	DEMO ROOF OPENING FOR MECH EXHAUST DUCT, GC TO COORD OPENING SIZE AND LOCATION WITH MEP DRAWINGS.
AD706	BASE DESIGN: DEMO EXISTING TOILET PARTITION
AD707	ALTERNATE-DEDUCT: REMOVE AND SALVAGE EXISTING TOILET PARTITION. TOILET PARTITION TO BE RE-USED IF NEW SHAFT WALL REMAIN AT THE SAME DEPTH AS THE EXISTING WALL
AD709	REMOVE EXISTING CEILING AS REQUIRED FOR MECHANICAL EXHAUST DUCT INSTALLATION. GC TO CONFIRM LIMITS OF IMPACTED AREAS BEFORE DEMOLITION BEGINS.

NOTE: COORDINATE ARCHITECTURAL AND PLUMBING DEMOLITION AND NEW WORK SCOPE WITH DC COURTS. DO NOT PLAN, SCHEDULE, OR PROCEED WITH ANY DEMOLITION OR NEW WORK WITHOUT PRIOR WRITTEN APPROVAL FROM DC COURTS.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
JOHN G. CRUMP
ARC100840
LICENSED
ARCHITECT
4/2/2026

SHEET TITLE
LEVEL 3, 4 & ROOF - ENLARGED DEMO & FLOOR PLANS

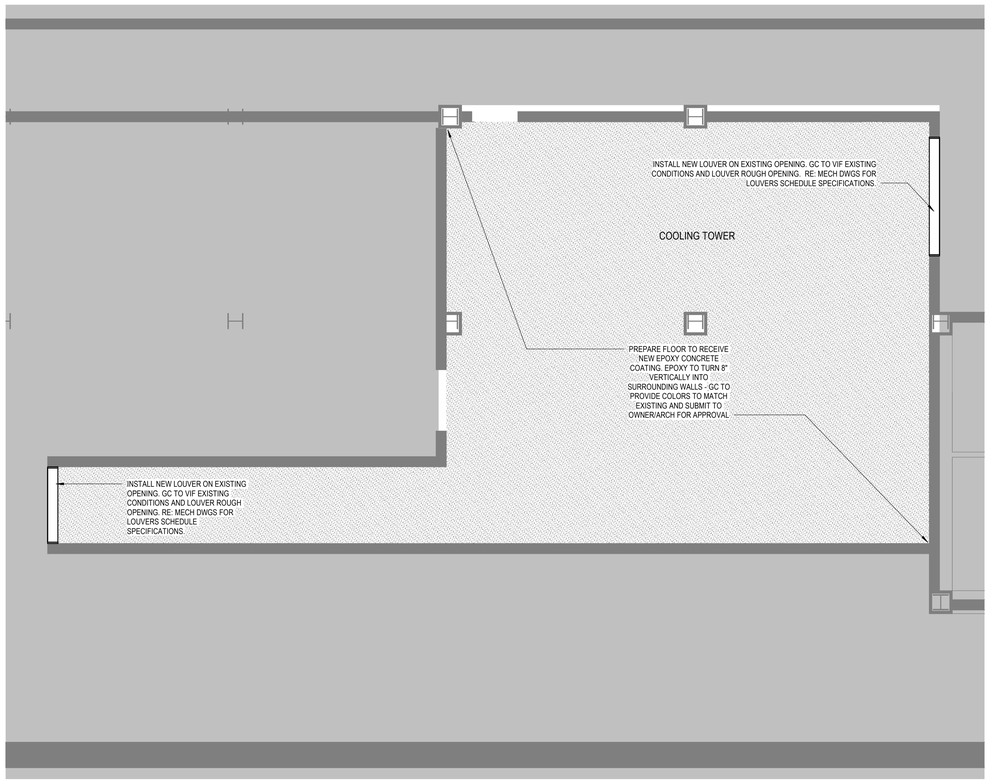
PROJECT NUMBER 00100451

SHEET NUMBER A7.3

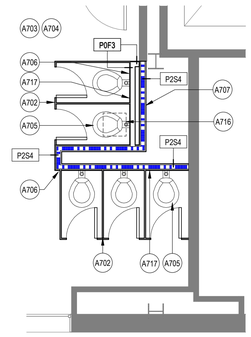
Author

4/13/2026 3:16:41 PM

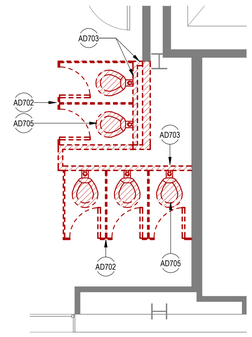
Plot Date:



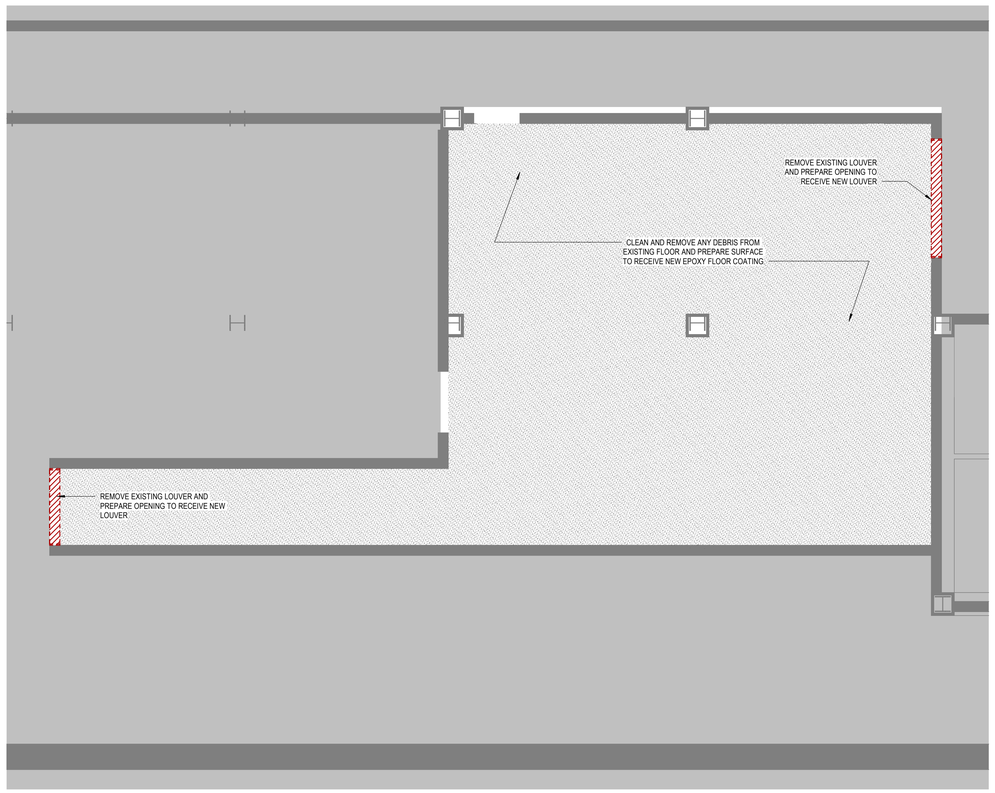
68 LEVEL 4 - ENLARGED FLOOR PLAN
SCALE: 1/4" = 1'-0"



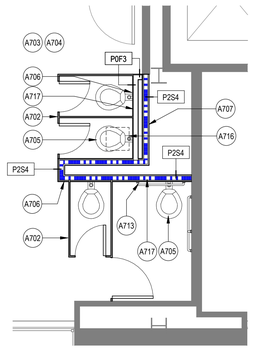
28 LEVEL 3 - ENLARGED PLAN - CWP
SCALE: 1/4" = 1'-0"



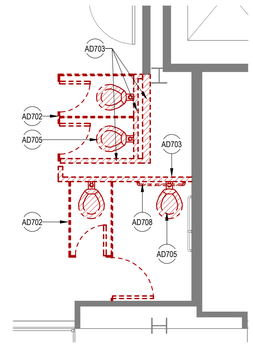
20 LEVEL 3 - ENLARGED DEMO PLAN - CWP
SCALE: 1/4" = 1'-0"



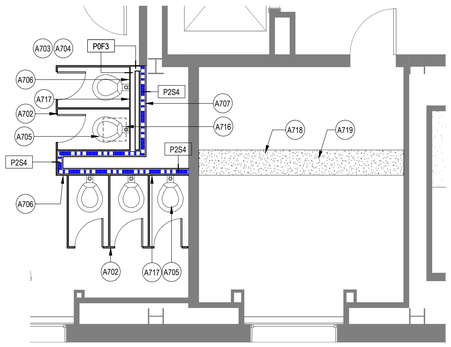
72 LEVEL 4 - ENLARGED DEMO PLAN
SCALE: 1/4" = 1'-0"



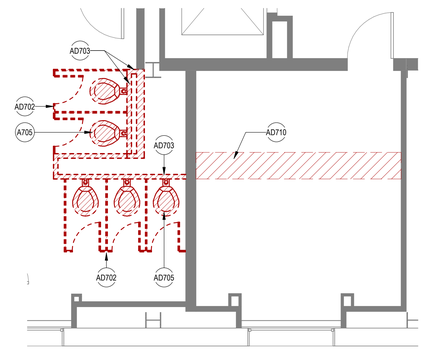
30 LEVEL 2 - ENLARGED PLAN - CWP
SCALE: 1/4" = 1'-0"



22 LEVEL 2 - ENLARGED DEMO PLAN - CWP
SCALE: 1/4" = 1'-0"



32 LEVEL 1 - ENLARGED PLAN - CWP
SCALE: 1/4" = 1'-0"



24 LEVEL 1 - ENLARGED DEMO PLAN - CWP
SCALE: 1/4" = 1'-0"

DEMO GENERAL NOTES

A. REFER TO THE PROJECT GENERAL NOTES IN THE G0.1 FOR INFORMATION REGARDING VERIFICATION AND PROTECTION OF EXISTING CONDITIONS.

B. REFER TO THE A0.1 SHEET FOR ARCHITECTURAL GENERAL NOTES, DRAWING, REFERENCE AND MATERIAL SYMBOLS, ABBREVIATIONS, AS WELL AS DIMENSIONING CONVENTIONS USED ON THIS DRAWING.

C. REFER TO AND COORDINATE WITH STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION INFORMATION NOT SHOWN ON THIS DRAWING.

D. DEMOLITION WORK SHALL BE DONE IN A MANNER WHICH WILL NOT CAUSE UNNECESSARY INCONVENIENCE OR DANGER TO USERS OF THE PREMISES AND ADJACENT SITE AND NOT INTERFERE WITH ITS OPERATION. ANY DEMOLITION WORK TO BE PERFORMED MUST BE PLANNED IN ADVANCE AND APPROVED BY THE OWNER.

E. ALL MATERIALS INDICATED TO BE REMOVED SHALL BE DISPOSED OF PROPERLY AND REMOVED FROM THE SITE.

F. ALL REMOVED MATERIALS AND EQUIPMENT WHICH IS CLASSIFIED AS "SALVAGE FOR OWNER" SHALL REMAIN THE PROPERTY OF THE OWNER. DELIVER SUCH MATERIALS AND EQUIPMENT ON THE PREMISES AS DIRECTED BY THE OWNER AND NEATLY STORE AND PROTECT FROM DAMAGE.

G. ALL REMOVED MATERIALS AND EQUIPMENT WHICH IS CLASSIFIED "SALVAGE FOR RELOCATION" SHALL REMAIN THE PROPERTY OF THE OWNER. THE CONTRACTOR IS RESPONSIBLE FOR PLACING ITEMS IN STORAGE ON SITE AND FOR THE PROTECTION OF THOSE ITEMS. THESE ITEMS WILL BE RELOCATED. REFER TO THE FLOOR PLANS FOR NEW LOCATIONS.

H. PATCH AND REPAIR ALL ELEMENTS THAT ARE TO REMAIN WHICH ARE DAMAGED FROM THE DEMOLITION WORK WITH CONSTRUCTION TO MATCH EXISTING CONDITIONS.

GENERAL SHEET NOTES

A. REFER TO THE A0.1 FOR ARCHITECTURAL GENERAL NOTES, DRAWING, REFERENCE AND MATERIAL SYMBOLS, ABBREVIATIONS, AS WELL AS DIMENSIONING CONVENTIONS USED ON THIS SHEET.

B. REFER TO THE A9.1 SHEET FOR PARTITION SYSTEMS TYPES AND DETAILS.

C. REFER TO SHEET G0.1 FOR INFORMATION ASSOCIATED WITH THE SHAFT EXHAUST DUCT BASE DESIGN AND DEDUCT ALTERNATE.

SHEET KEYNOTES

A702	RE-INSTALL SALVAGED TOILET PARTITION
A703	PATCH AND REPAIR FLOORING TO MATCH EXISTING CONDITIONS
A704	EXISTING CEILING TO BE MODIFIED/REPAIRED TO MATCH EXISTING CONDITIONS
A705	RE-INSTALL SALVAGED TOILET FIXTURE AND ASSOCIATED PLUMBING
A706	WALL TO BE FINISHED TO MATCH EXISTING 4 1/4"X 4 1/4" WHITE CERAMIC GLAZED TILE (FULL HEIGHT TILE). INSTALL GREY CERAMIC GLAZED COVE BASE TILE GROUTED TO THE FLOOR TILE TO MATCH EXISTING.
A707	2HR FIRE RATED SHAFT WALL. ALL PLUMBING PIPES PENETRATING THE WALL, MUST BE PROTECTED WITH TESTED FIRESTOP SYSTEM.
A713	RE-INSTALL SALVAGED TOILET GRAB BAR
A716	PROVIDE A 18"X18" ACCESS PANEL ON EXISTING GWB SEE MEP DWGS FOR EXACT LOCATION. ACCESS PANEL TO BE: BAUCO PLUS II. PATCH, REPAIR AND REFINISH ANY AFFECTED ADJACENT CEILING CONSTRUCTION.
A717	PROVIDE A 10"X10" ACCESS PANEL ON THE WALL FOR WATER HAMMER ARRESTOR ACCESS. COORDINATE EXACT LOCATION WITH PLUMB DWGS.
A718	INFILL EXISTING CHIPPED OUT CONC SLAB, SEE STRUCT DWGS. FOR DETAILS.
A719	REFINISH EXISTING FLOORING TO MATCH EXISTING. GC TO SUBMIT FINISHES FOR OWNER & ARCHITECT APPROVAL.
AD702	REMOVE AND SALVAGE EXISTING TOILET PARTITION. TOILET PARTITION TO BE RE-INSTALLED DURING NEW CONSTRUCTION PHASE.
AD703	DEMO EXISTING WALL.
AD705	REMOVE AND SALVAGE EXISTING FLOOR MOUNTED TOILET AND ASSOCIATED PLUMBING. TOILET FIXTURE TO BE RE-INSTALLED DURING NEW CONSTRUCTION PHASE.
AD708	REMOVE AND SALVAGE EXISTING TOILET GRAB BAR
AD710	CHIP OUT EXISTING CONCRETE SLAB FOR BEAM REINFORCEMENT WORK. SEE STRUCTURAL DWGS FOR DETAIL.

NOTE: COORDINATE ARCHITECTURAL AND PLUMBING DEMOLITION AND NEW WORK SCOPE WITH DC COURTS. DO NOT PLAN, SCHEDULE, OR PROCEED WITH ANY DEMOLITION OR NEW WORK WITHOUT PRIOR WRITTEN APPROVAL FROM DC COURTS.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
JOHN G. CRUMP
ARC100840
LICENSED ARCHITECT
4/2/2026

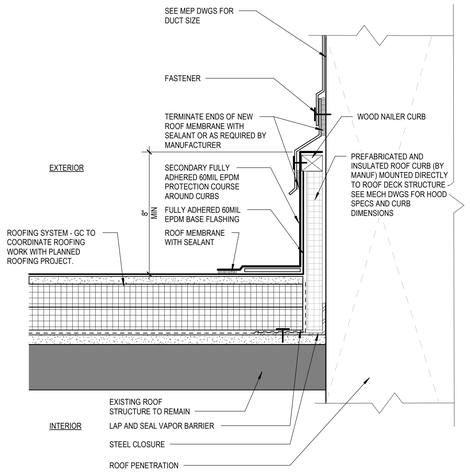
SHEET TITLE
CONDENSER WATER PIPES - ENLARGED DEMO & FLOOR PLANS

PROJECT NUMBER
00100451

SHEET NUMBER
A7.4

Author

Plot Date: 4/13/2026 3:16:42 PM

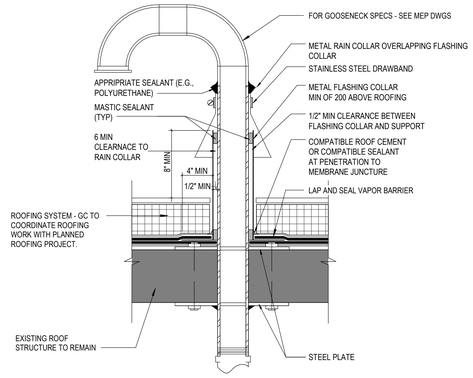


NOTES:
1. CONTRACTOR TO FIELD VERIFY EXISTING ROOF COMPONENTS.

4. PATCH AND REPAIR OF EXISTING ROOF MEMBRANE IS NOT TO IMPEDE EXISTING ROOF DRAINAGE.

5. IF EXISTING ROOF SYSTEM DOES NOT INCLUDE AIR/VAPOR RETARDER LAYER, PROVIDE SELF-ADHERED SHEET. AIR/VAPOR RETARDER AND TERMINATE AIR/VAPOR RETARDER TO TOP OF INSULATION BELOW COVER BOARD.

67 ROOF PENETRATION DETAIL AT MECH EXHAUST DUCT
SCALE: 3" = 1'-0"



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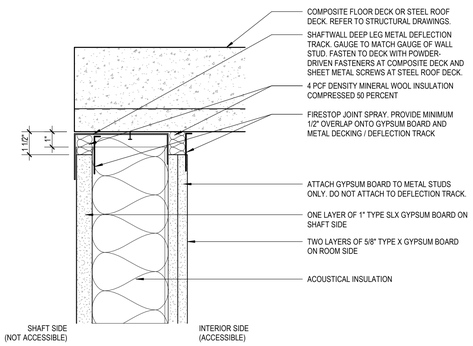
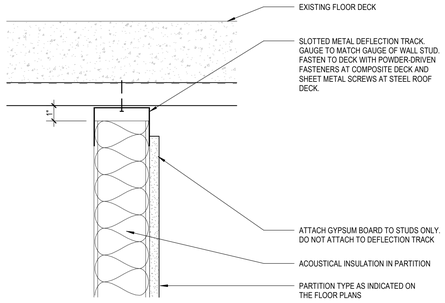
51 GOOSENECK ROOF DETAIL
SCALE: 1 1/2" = 1'-0"



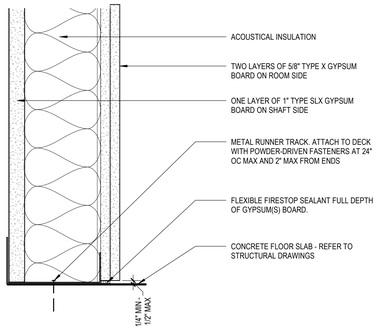
A PERPENDICULAR TO METAL DECK FLUTES: AT BOTTOM OF FLUTES AT METAL STUD SHAFTWALL AND STEEL DECK - UL DESIGNS (HW-D-0548, HW-D-0570)

70 FIRE-RATED SHAFTWALL HEAD DETAIL (METAL STUD) - 2 HOUR RATED
SCALE: 3" = 1'-0"



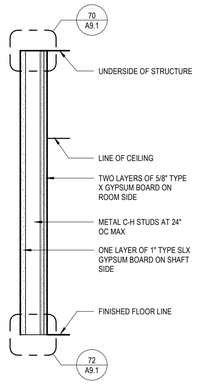
A PERPENDICULAR TO STEEL DECK FLUTES: AT BOTTOM OF FLUTES AT METAL STUD WALL AND STEEL DECK W/O ACOUSTICAL INSULATION

54 NON-FIRE-RATED PARTITION HEAD DETAIL (METAL STUD)
SCALE: 3" = 1'-0"

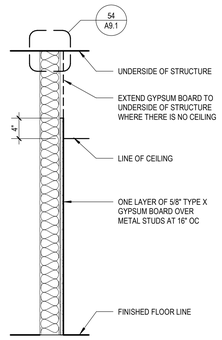


AT METAL STUD SHAFTWALL UL DESIGNS (BW-S-0037, BW-S-0070)

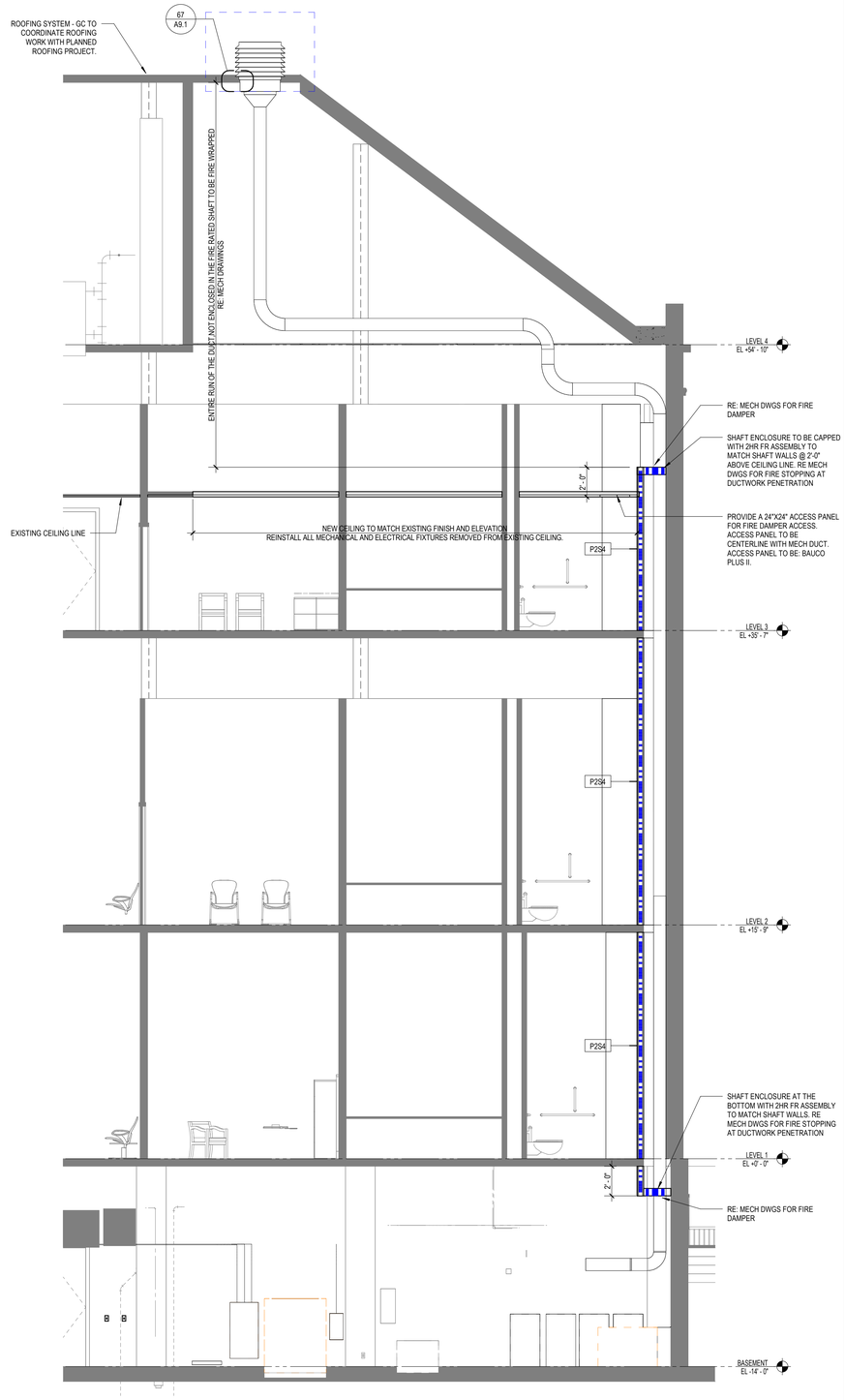
72 FIRE-RATED SHAFTWALL BASE DETAIL (METAL STUD) - 2 HOUR RATED
SCALE: 3" = 1'-0"



P2S SHAFT WALL ASSEMBLY
2 HOUR RATED (UL- U438)
SCALE: NTS



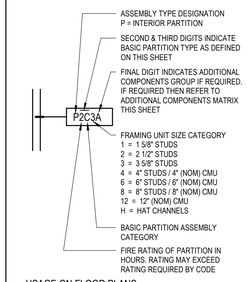
P0F ONE SIDED ASSEMBLY
NON-COMBUSTIBLE
SCALE: NTS



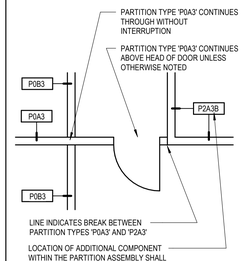
40 EXHAUST DUCT
SCALE: 1/4" = 1'-0"

PARTITION TYPE SYMBOL

SYMBOL DEFINITION



USAGE ON FLOOR PLANS



FRAMING NOTES

A. ALL INTERIOR NON-LOAD-BEARING METAL WALL FRAMING EXCEEDING 6 FEET IN HEIGHT SHALL RESIST A HORIZONTAL LOAD OF NOT LESS THAN 5 PSF, UNLESS OTHERWISE NOTED OR REQUIRED BY THE SPECIFICATIONS.

B. GAUGE THICKNESS DESIGNATION IS BASED ON THE FOLLOWING MIL THICKNESS FOR INTERIOR NON-LOAD BEARING PARTITION FRAMING, ALL 33 ksi, PER THE STEEL STUD MANUFACTURERS ASSOCIATION (SSMA):

18 MIL = 0.0179 INCHES = 25 GAUGE
25 MIL = 0.0250 INCHES = 20 GAUGE (DIMPLED)
30 MIL = 0.0269 INCHES = 20 GAUGE (STANDARD)
33 MIL = 0.0329 INCHES = 20 GAUGE (STRUCTURAL)
43 MIL = 0.0428 INCHES = 18 GAUGE
54 MIL = 0.0538 INCHES = 16 GAUGE

C. ALL INTERIOR NON-LOAD-BEARING METAL WALL FRAMING SHALL BE 25 GAUGE INSTALLED AT 16" O.C. UNLESS OTHERWISE NOTED.

D. ALL INTERIOR NON-LOAD-BEARING METAL WALL FRAMING SHALL BE INSTALLED WITH A DEFLECTION CRITERIA OF L/240 , UNLESS OTHERWISE NOTED OR REQUIRED BY THE SPECIFICATIONS.

E. WHERE AN ADDITIONAL INTERIOR WALL FINISH IS APPLIED TO THE BASE PARTITION SUCH AS TILE, VENEERS, WOOD PANELING, OR SIMILAR; ALL INTERIOR NON-LOAD-BEARING METAL WALL FRAMING SHALL BE INSTALLED WITH A DEFLECTION CRITERIA OF L/360, UNLESS OTHERWISE NOTED OR REQUIRED BY THE SPECIFICATIONS.

F. LIMITING HEIGHTS OF INTERIOR NON-LOAD-BEARING FRAMING SHALL BE PER THE MANUFACTURERS SPAN TABLES BASED ON THE FOLLOWING CRITERIA OUTLINED IN THIS SET OF DRAWINGS AND THE PROJECT MANUAL: HORIZONTAL LOADING, STUD DEPTH, STUD SPACING, AND DEFLECTION CRITERIA.

G. PROVIDE 20 GAUGE (OR GREATER AS REQUIRED) METAL WALL FRAMING AT THE FOLLOWING LOCATIONS:

1. DOUBLE STUD JAMB ASSEMBLIES AT OPENINGS
2. FIRST STUD IN THE PARTITION BEYOND THE DOUBLE STUD JAMB ASSEMBLY. LOCATE STUD 6" FROM DOUBLE STUD ASSEMBLY.
3. STUDS TO WHICH GLASS-MAT BACKER WATER-RESISTANT BACKER BOARD, SPECIFIED IN SECTION 093000, ARE INSTALLED FOR WET AREAS
4. STUDS TO WHICH ABUSE-RESISTANT AND HIGH-IMPACT GYPSUM WALL PANELS ARE ATTACHED
5. STUDS TO WHICH WALL MOUNTED EQUIPMENT, INCLUDING OWNER FURNISHED EQUIPMENT, IS FASTENED
6. STUD INFILL AND SILL TRACK BELOW WINDOW OPENINGS
7. STUDS INSTALLED FOR OPENING HEADS BETWEEN DOUBLE STUD JAMB ASSEMBLIES

H. PROVIDE DEFLECTION TRACKS AT TOP OF ALL FULL HEIGHT PARTITIONS THAT ATTACHED TO STRUCTURE ABOVE

PARTITION NOTES

A. PARTITIONS AND FURRING ARE DIMENSIONED TO THE FACE OF PARTITION ASSEMBLY (NOT TO THE FACE OF APPLIED FINISH OR FACE OF STUD), UNLESS OTHERWISE NOTED

B. PARTITION TYPE INDICATIONS ARE INDEPENDENT OF APPLIED FINISHES. SEE FINISH SCHEDULE AND/OR THE DESIGNATIONS ON THE PLANS FOR ADDITIONAL INFORMATION REGARDING APPLIED FINISHES

C. THE MINIMUM REQUIREMENTS FOR CONSTRUCTION OF EACH PARTITION TYPE AS EXPRESSED BY THE INDICATED FIRE RATING REFERENCE ARE INCORPORATED BY REFERENCE AND ARE APPLICABLE TO THE WORK OF THIS PROJECT. HOWEVER, ADDITIONAL AND/OR MORE RESTRICTIVE REQUIREMENTS MAY BE INDICATED BY THE SPECIFICATIONS AND DRAWINGS. SUCH REQUIREMENTS ALSO APPLY AND SHALL GOVERN. SUCH REQUIREMENTS INCLUDE BUT ARE NOT LIMITED TO:

1. USE 5/8 THICK GYPSUM BOARD THROUGHOUT - TYPE X IS THE DEFAULT STANDARD UON.
2. USE 16 OC MAX STUD SPACING UNLESS OTHERWISE NOTED. THE SPACING STATED BY THE REFERENCED APPROVAL OR TEST REPORT IS THE MAX SPACING
3. USE STUDS OF GAUGE INDICATED ON THE DRAWINGS OR IN THE SPECIFICATIONS. THE GAUGE STATED BY THE REFERENCED APPROVAL OR TEST REPORT IS THE MINIMUM GAUGE
4. USE STUDS OF DEPTH INDICATED BY THE DRAWINGS. THE DEPTH STATED BY THE REFERENCED APPROVAL OR TEST REPORT IS THE MINIMUM DEPTH

D. SEAL ALL PIPE, CONDUIT, AND DUCTWORK PENETRATIONS IN FULL HEIGHT NON-RATED PARTITIONS SHALL INCLUDE A MINIMUM 1/2 INCH ANNULAR SPACE FILLED WITH MINERAL FIBER/FIBER-GLASS/BACKER ROD AND SHALL BE SEALED WITH NON-HARDING LATEX SEALANT UNLESS OTHERWISE NOTED IN THE ADDITIONAL PARTITION COMPONENTS MATRIX.

E. ALL PARTIAL HEIGHT, NON-RATED, PARTITIONS OR SOFFIT / HEADERS SHALL BE ISOLATED FROM PIPE AND DUCTWORK PENETRATIONS. PENETRATIONS SHALL INCLUDED A MINIMUM 1/2 INCH ANNULAR SPACE FILLED WITH MINERAL FIBER/FIBER-GLASS/BACKER ROD AND SHALL BE SEALED WITH NON-HARDING LATEX SEALANT UNLESS OTHERWISE NOTED IN THE ADDITIONAL PARTITION COMPONENTS MATRIX.

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ARCHITECT
4/2/2026

SHEET TITLE
SECTIONS AND DETAILS

PROJECT NUMBER 00100451

SHEET NUMBER A9.1

Author

4/13/2026 3:16:44 PM

Plot Date:

PLUMBING ABBREVIATIONS

ABBR	ABBREVIATION
ADA	AMERICANS WITH DISABILITIES ACT
AFF	ABOVE FINISHED FLOOR
AG	ABOVE GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AMB	AMBIENT
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
AP	ACCESS PANEL
APPROX	APPROXIMATE
BFP	BACKFLOW PREVENTOR (TYPE AS INDICATED)
BFV	BUTTERFLY VALVE
BHP	BRAKE HORSEPOWER
BLV	BALANCING VALVE
BTU/H	BRITISH THERMAL UNIT PER HOUR
BV	BALL VALVE
CA	UTILITY COMPRESSED AIR (PRESSURE AS INDICATED)
CAP	CAPACITY
CFM	CUBIC FEET PER MINUTE
CI	CAST IRON
CO	CLEANOUT
COMP	COMPRESSOR
COND	CONDENSATE
CONT	CONTINUATION
CV	CHECK VALVE
CW	DOMESTIC COLD WATER
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DN	DOWN
DOM	DOMESTIC
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DWR	DRINKING WATER RETURN
DWS	DRINKING WATER SUPPLY
(E)	EXISTING MATERIAL OR EQUIPMENT
EA	EACH
ECO	EXTERIOR CLEANOUT
EEW	EMERGENCY EYE WASH
EFF	EFFICIENCY
EFW	EMERGENCY FACE WASH
EL	ELEVATION
EQ	EQUIVALENT
ESH	EMERGENCY SHOWER
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXP	EXPANSION
EXT	EXTERNAL
F	DEGREES FAHRENHEIT
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FL	FLOOR
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FS	FLOOR SINK
FT	FEET OR FOOT
FTD	FOOTER DRAINAGE
G	NATURAL GAS (PRESSURE AS INDICATED)
GAL	GALLON
GC	GAS COCK
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GV	GATE VALVE
GW	GREASE WASTE
HB	HOSE BIBB
HG	MERCURY
HGT	HEIGHT
HP	HORSE POWER
HPS	HIGH PRESSURE STEAM
HR	HOUR
HW	DOMESTIC HOT WATER
HWR	DOMESTIC HOT WATER RETURN
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN.	INCHES
KW	KILOWATTS
LAV	LAVATORY
LGT	LENGTH
LPG	LIQUID PETROLEUM GAS
LPS	LOW PRESSURE STEAM
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	1000 BTU/HR
MCA	MINIMUM CURRENT AMPACITY
MIN	MINIMUM
MISC	MISCELLANEOUS
MOCP	MINIMUM OVER CURRENT PROTECTION
MPS	MEDIUM PRESSURE STEAM
MTG	MOUNTING
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN/ NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OD	OUTSIDE DIAMETER
OD	OVERFLOW ROOF DRAIN
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFL	OVERFLOW
OFOI	OWNER FURNISHED OWNER INSTALLED
OSD	OPEN SITE DRAIN
P	PUMP
PC	PUMPED CONDENSATE
PD	PUMPED DISCHARGE (TYPE AS INDICATED)
PDI	PLUMBING DRAINAGE INSTITUTE
PH	PHASE (ELECTRICAL)
PPM	PARTS PER MILLION
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH - GAUGE
PV	PLUG VALVE
PW	PROCESS WATER
RD	ROOF DRAIN
REF	REFERENCE
RL	RELOCATED MATERIAL OR EQUIPMENT
RPM	REVOLUTIONS PER MINUTE
RV	PRESSURE RELIEF VALVE
SAN	SANITARY OR WASTE
SCFM	STANDARD CUBIC FEET PER MINUTE
SCW	SOFTENED COLD WATER
SE	SEWAGE EJECTOR
SG	SPECIFIC GRAVITY
SP	SUMP PUMP
SPEC	SPECIFICATION
SQ. FT.	SQUARE FEET
SS	STAINLESS STEEL
SSD	SUB-SOIL DRAINAGE
ST	STORM (RAINWATER)
STD	STANDARD
STM	STEAM
SV	SOLENOID VALVE
TEMP	TEMPERATURE
TP	TRAP PRIMER
TPU	TRAP PRIMER UNIT
TPV	TEMPERATURE AND PRESSURE RELIEF VALVE
TW	TEMPERED WATER
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLTAGE/VENT
VAC	VACUUM
VEL	VELOCITY
VTR	VENT THRU ROOF
W/	WITH
W/O	WITHOUT
WC	WATER CLOSET
WCO	WALL CLEAN OUT
WG	WATER GAUGE
WH	WALL HYDRANT
WHA	WATER HAMMER ARRESTOR
WM	WATER METER
YD	YARD

PIPING SYMBOLS

- ISOLATION VALVE
- BALANCING VALVE
- ANGLE VALVE
- CHECK VALVE
- SOLENOID VALVE
- BUTTERFLY VALVE
- BALL VALVE
- PLUG VALVE or GAS COCK
- PRESSURE REGULATOR VALVE FLANGED
- PRESSURE REGULATOR VALVE THREADED
- FLOW INDICATING BALANCE VALVE
- PRESSURE RELIEF VALVE or TEMP PRESSURE RELIEF VALVE
- STRAINER
- MECHANICAL EXPANSION JOINT
- FLEXIBLE CONNECTION
- CLEANOUT
- FLOOR CLEANOUT or EXTERIOR CLEANOUT
- FLOOR DRAIN/SINK
- MATERIAL OR EQUIPMENT TO BE DEMOLISHED
- MATERIAL OR EQUIPMENT EXISTING TO REMAIN
- REDUCER - CONCENTRIC
- REDUCER - ECCENTRIC
- PIPE UNION
- PIPE ANCHOR
- PIPE ALIGNMENT GUIDE/ PIPE SLEEVE
- PRESSURE GAUGE WITH COCK
- THERMOMETER
- QUICK COUPLING
- CAP OR PLUG
- PIPE UP
- PIPE DOWN
- TEE OUTLET - DOWN
- BRANCH TOP CONNECTION
- DIRECTION OF FLOW
- FLOW METER
- AIR VENT WITH VALVE
- WATER HAMMER ARRESTOR
- HOSE BIBB
- WALL HYDRANT
- POINT OF CONNECTION
- POINT OF DISCONNECT

PIPING LEGEND

DCW	DOMESTIC COLD WATER	V	SANITARY VENT
DHW	DOMESTIC HOT WATER	SAN	SANITARY DRAIN
DHWR	DOMESTIC HOT WATER RETURN	SAN	UNDER SLAB SANITARY DRAIN
TW(0F)	TEMPERED WATER (TEMP AS INDICATED)	ST	STORM (RAINWATER) DRAIN
NPW	NON-POTABLE WATER	OD	OVERFLOW ROOF DRAIN
PD	PUMP DISCHARGE (TYPE AS INDICATED)	ST	UNDER SLAB STORM DRAIN
W	WASTE	SYS(E)	SYSTEM(EXISTING TO REMAIN)
		SYS(E)	SYSTEM(EXISTING TO BE DEMOLISHED)

PLUMBING GENERAL NOTES

1. INSTALL PLUMBING IN ACCORDANCE WITH THE INTERNATIONAL PLUMBING CODE 2017 AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION.
2. OBTAIN COMPLETE CONSTRUCTION DOCUMENTS WHICH INCLUDE BUT ARE NOT LIMITED TO ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, ELECTRICAL, AND FIRE PROTECTION DRAWINGS. ALSO OBTAIN A COMPLETE SET OF SPECIFICATIONS.
3. DURING THE COORDINATION PROCESS BRING TO THE ATTENTION OF THE ARCHITECT AND ENGINEER(S) ANY CONFLICTS. THE CONTRACTOR SHALL NOT PROCEED WITH ANY INSTALLATION EXCEPT AT HIS OWN RISK UNTIL ALL CONFLICTS ARE RESOLVED AND THE CLARIFYING INFORMATION ISSUED TO THE CONTRACTOR BY THE ARCHITECT.
4. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE LOCATION OF ALL STRUCTURAL MEMBERS FOR CONFLICTS WITH PIPING. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IMMEDIATELY IF A CONFLICT IS DETERMINED.
5. PROVIDE CLEANOUTS WHERE INDICATED ON DRAWINGS AND WHERE REQUIRED BY THE APPLICABLE CODES.
6. FIRE STOP ALL OPENINGS IN COMPLIANCE WITH THE U.L. LISTING OF THE METHOD USED TO MAINTAIN THE APPROPRIATE FIRE RATING AS REQUIRED BY CODE.
7. COORDINATE ALL PIPING INSTALLED WITH ALL OTHER TRADES (I.E. STRUCTURAL, MECHANICAL, ELECTRICAL, AND FIRE PROTECTION) TO ENSURE THAT ALL SYSTEMS ARE INSTALLED ABOVE THE CEILING OR IN A CONCEALED LOCATION. ALL CEILING HEIGHTS ARE INDICATED ON THE ARCHITECTURAL AND/OR INTERIOR DESIGN DRAWINGS. MAINTAIN MINIMUM CLEARANCES REQUIRED BY THE APPLICABLE CODES THROUGHOUT OUT THE BUILDING.
8. EACH FIXTURE TRAP SHALL HAVE A LIQUID TRAP SEAL, AS REQUIRED BY CODE. LIQUID TRAP SEALS SHALL BE MAINTAINED WITH A TRAP PRIMER, WHERE REQUIRED.
9. PROVIDE WATER HAMMER ARRESTORS WHERE QUICK CLOSING VALVES ARE UTILIZED. LOCATE ARRESTORS PER MANUFACTURER'S INSTRUCTIONS. ARRESTOR SHALL BE ACCESSIBLE.
10. INSULATE ALL STORM DRAIN BODIES AND HORIZONTAL PIPING. THE HORIZONTAL STORM PIPING SHALL BE INSULATED AT THE UPPER MOST LEVEL.
11. INSULATE ALL DRAINAGE PIPING RECEIVING CONDENSATE.
12. INSULATE ALL DRAINAGE AND WATER PIPING IN COMPLIANCE WITH ANSI 117.1, LOCAL CODES AND SPECIFICATIONS.
13. INSTALL VALVES AND OR ACCESSORIES SERVING EQUIPMENT TO ALLOW FOR THE REMOVAL OR SERVICING OF THE VALVES, ACCESSORIES AND EQUIPMENT.
14. WHEN PROVIDING UNIONS, VACUUM BREAKERS, STRAINERS, ETC. AS INDICATED ON DRAWINGS AND ALL EQUIPMENT, PROVIDE FOR MAINTENANCE CLEARANCE AS REQUIRED BY CODE.
15. REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF ALL PLUMBING FIXTURES.
16. SEE THE PLUMBING FIXTURE CONNECTION SCHEDULE FOR CONNECTION SIZES.
17. ALL ABOVE CEILING WATER/LIQUID 1/4 TURN VALVES SHALL BE HORIZONTAL WITH THEIR VALVE HANDLE PULL DOWN TOWARDS OPERATOR FOR SHUTOFF.
18. DO NOT SCALE THE DRAWINGS FOR DIMENSIONAL INFORMATION. NOTIFY THE ARCHITECT IN WRITING IMMEDIATELY IF DIMENSIONAL INFORMATION CANNOT BE DETERMINED FROM THE DRAWINGS OR IF DIMENSIONS ARE IN CONFLICT WITH OTHER DRAWINGS.

DEMOLITION GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS DURING THE CONTRACTOR'S PRE-BID SITE VISIT(S) AND BRING TO THE ATTENTION OF THE ARCHITECT/ENGINEER ANY DISCREPANCIES BETWEEN THE CONTRACT DOCUMENTS AND THE ACTUAL SITE CONDITIONS PRIOR TO BID FOR CLARIFICATION VIA PRE-BID RFI.
2. THE REQUIRED DEMOLITION IS NOT LIMITED TO THAT PORTION INDICATED ON THE PLANS ALONE, BUT SHALL INCLUDE ALL NECESSARY WORK INDICATED ELSEWHERE IN THE SPECIFICATIONS WHICH ARE NECESSARY TO COMPLETE THE INTENT OF THE CONTRACT DOCUMENTS.
3. THE CONTRACTOR SHALL NOT VIOLATE THE PHYSICAL SECURITY OF THE BUILDING DURING DEMOLITION OR ASSOCIATED OPERATIONS. COORDINATE DEMOLITION WITH OWNER/AGENT.
4. THE CONTRACTOR SHALL SCHEDULE WITH THE OWNER/AGENT ANY INTERRUPTIONS OF EXISTING UTILITIES. PRIOR TO STARTING WORK THE CONTRACTOR SHALL HAVE OBTAINED WRITTEN PERMISSION TO PROCEED. THE CONTRACTOR SHALL ASSUME THE BUILDING IS OCCUPIED AND OPERATIONAL AT ALL TIMES.
5. THE CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES.
6. IT IS UNDERSTOOD THAT WORK UNDER THESE CONTRACT DOCUMENTS MAY EXTEND PAST THE LIMITS OF WORK. THE OWNER SHALL BE NOTIFIED PRIOR TO WORK STARTING IN THESE AREAS AND PROVIDE A SCHEDULE.
7. ALL FIXTURES AND EQUIPMENT INDICATED TO BE REMOVED SHALL HAVE ALL ASSOCIATED PIPING REMOVED BACK TO THE NEAREST BRANCH, MAIN, RISER AND CAPPED IN A CONCEALED LOCATION.
8. "CONCEALED LOCATION" IS DEFINED AS BEING ABOVE, BELOW OR BEHIND A FINISHED PLANE.
9. ALL FIXTURES, EQUIPMENT, PIPING AND APPURTENANCES SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED IN A TIMELY MANNER. THE SALVAGE VALUE SHALL APPEAR AS A CREDIT IN THE BID.
10. ANY PIPE SHALL BE CAPPED USING A COMMERCIALLY PURCHASED CAP. A VALVE OR CRIMPING SHALL NOT CONSTITUTE A CAP AND IS UNACCEPTABLE.

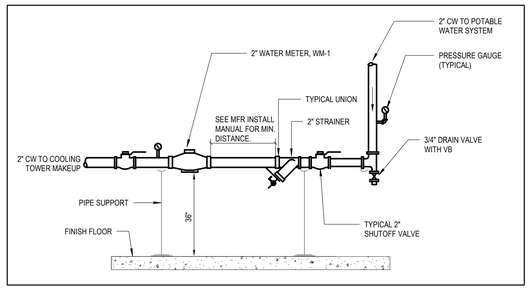
PE - WATER METER SCHEDULE

TAG	DESCRIPTION	SIZE	MANUFACTURER	MODEL	REMARKS
WM-1	MAKEUP WATER WATER METER	2"	MUELLER SYSTEMS	572IIS	
WM-2	BLOWDOWN DRAIN WATER METER	2"	MUELLER SYSTEMS	572IIS	

WATER HAMMER ARRESTER SCHEDULE

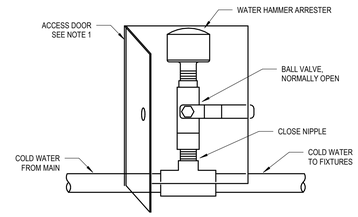
P.D.I. SYMBOL	FIXTURE UNIT RATING	SIZE	REMARKS
A	1 - 11	3/4"	1, 2
B	12 - 32	1"	1, 2
C	33 - 60	1"	1, 2
D	61 - 113	1"	1, 2
E	114 - 154	1"	1, 2

REMARKS:
1. LOCATE AT THE END OF THE BRANCH LINE BETWEEN THE LAST FIXTURES AND ANOTHER BRANCHES OVER 20 FT IN LENGTH.
2. PROVIDE WALL ACCESS PANEL.



1 WATER METER DIAGRAM
SCALE: N.T.S.

NOTES:
1. ACCESS DOOR SHALL BE 10" WIDE x 10" HIGH MINIMUM. MATCH ACCESS DOOR FIRE RATING TO FIRE RATING OF WALL.
2. THIS DETAIL APPLIES TO ALL WATER CLOSETS
3. LOCATION OF ACCESS PANELS AND WATER HAMMER ARRESTER LOCATIONS SHALL BE SUBMITTED FOR ARCHITECTURE APPROVAL PRIOR TO INSTALLATION.
4. OTHER THAN THE FITTING REQUIRED BY THE ASSEMBLY SHOWN, WATER HAMMER ARRESTER SHALL BE LOCATED AS CLOSE TO MAIN AS POSSIBLE.



2 WATER HAMMER ARRESTOR INSTALLATION
SCALE: N.T.S.

SYMBOL SHEET NOTES

A. THE PURPOSE OF THIS SHEET IS TO ILLUSTRATE AND DEFINE TYPICAL GRAPHIC SYMBOLS WHICH MAY TYPICALLY OCCUR ON THE PLUMBING DRAWINGS.

B. THIS SHEET MAY ILLUSTRATE ABBREVIATIONS, SYMBOLS AND LEGENDS WHICH DO NOT OCCUR AS PART OF THIS PROJECT. REFER TO THE DRAWINGS TO DETERMINE WHICH ITEMS APPLY TO THE WORK OF THIS PROJECT.

C. ADDITIONAL SYMBOLS NOT SHOWN OR DEFINED ON THIS SHEET MAY BE USED ON THE PLUMBING DRAWINGS AND ARE TYPICALLY DEFINED ON OTHER SHEETS.

D. SYMBOLS ARE NOT DRAWN TO SCALE. TO DETERMINE THE ACTUAL SIZES OF ELEMENTS REPRESENTED BY SYMBOLS, REFER TO THE SPECIFICATIONS AND OTHER SHEETS, AS MAY APPLY.

REFERENCE SYMBOLS

- SECTION NUMBER (1 / SIM)
- DRAWING NUMBER WHERE DRAWN (P0.1)
- DETAIL NUMBER (1)
- DRAWING NUMBER WHERE DRAWN (---)
- RISER DESIGNATION (TYPE AS INDICATED) (HHWS / 4)
- KEYNOTE (MXXX)
- DEMO KEYNOTE (4)

Author

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Plot Date:

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Building A Chilled Water Upgrade
515 5th Street N.W.
Washington, DC 20001

SMITHGROUP
1700 NEW YORK AVENUE NW
SUITE 100
WASHINGTON, DC 20006
202.842.2100
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50% CONSTRUCTION DOCUMENTS		10/09/2025

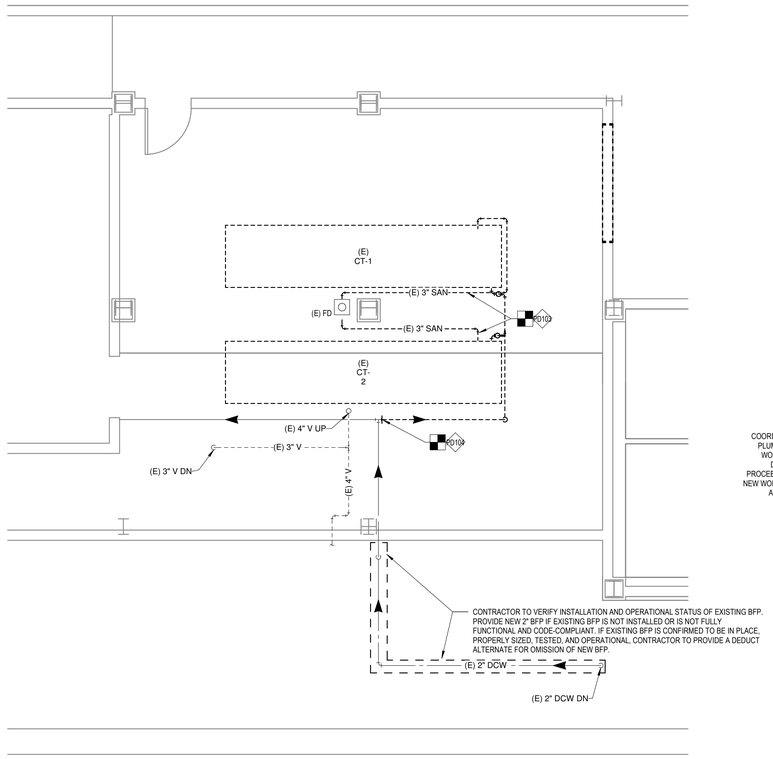
SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
ATILER GURSOY
No. PE40003050
LICENSED
PROFESSIONAL ENGINEER

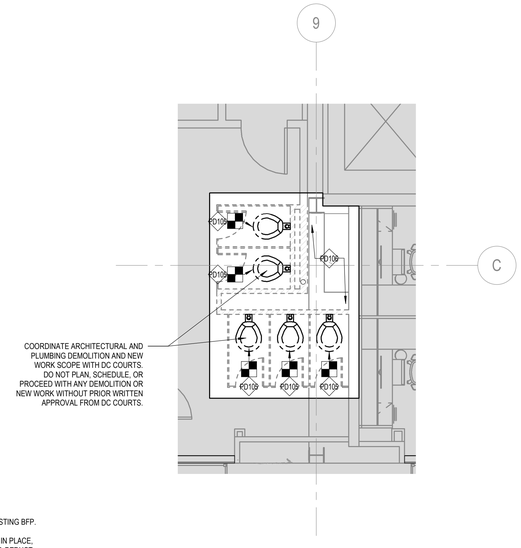
SHEET TITLE
PLUMBING ABBREVIATIONS /SYMBOLS/GENERAL NOTES/DETAILS

PROJECT NUMBER
00100451

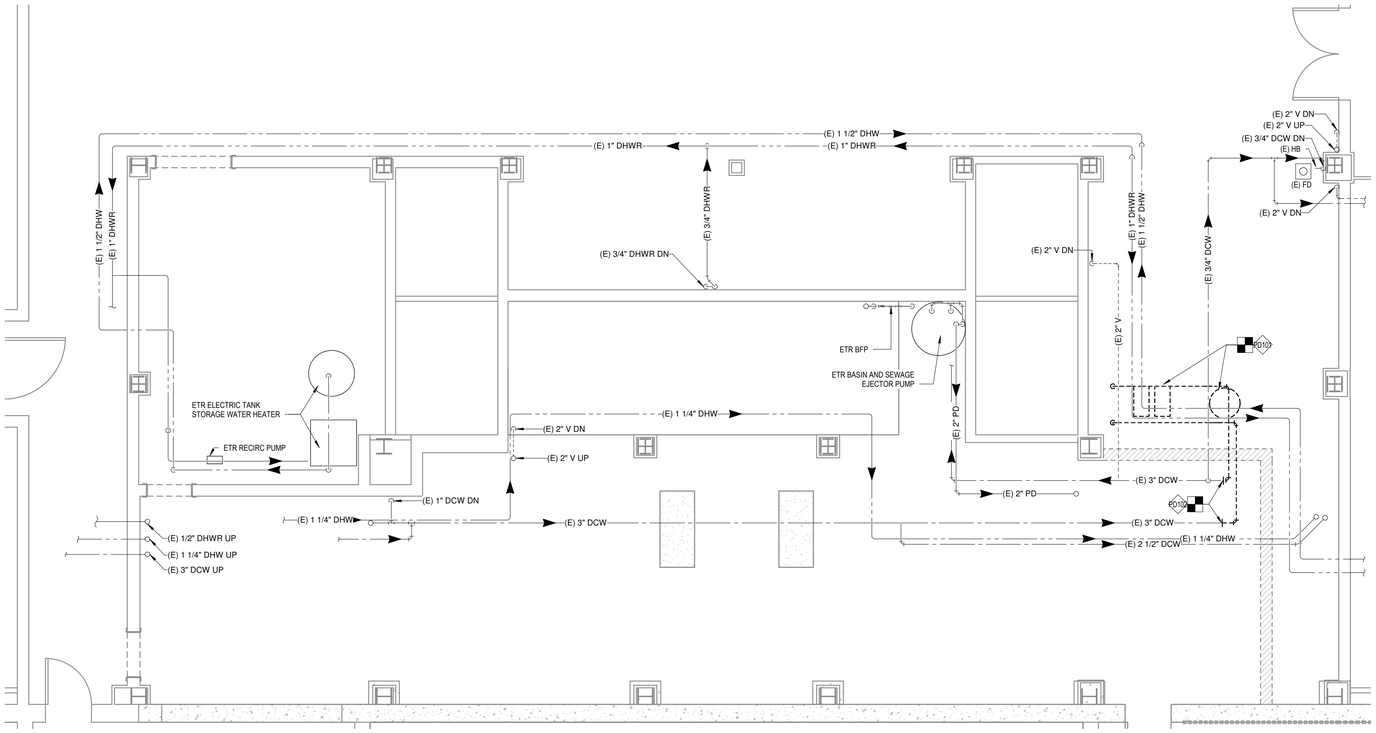
SHEET NUMBER
P0.1



1 COOLING TOWER ROOM - PLUMBING DEMOLITION FLOOR PLAN
SCALE: 1/4" = 1'-0"



3 TYPICAL LEVELS 1-3 - RESTROOM PLUMBING DEMOLITION PLAN
SCALE: 1/4" = 1'-0"



2 BASEMENT LEVEL - PLUMBING DEMOLITION PLAN
SCALE: 1/4" = 1'-0"

ROOM LEGEND

GENERAL SHEET NOTES

A. SEE P0.1 FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS.

SHEET KEYNOTES

PD101	DISCONNECT AND REMOVE EXISTING OFFLINE BOOSTER PUMP AND HYDROCUMULATOR TANK.
PD102	DISCONNECT AND REMOVE EXISTING DCW PIPING. CAP PIPE FOR REROUTING IN NEW WORK.
PD103	DISCONNECT AND REMOVE EXISTING COOLING TOWER BLOWDOWN PIPING.
PD104	DISCONNECT AND REMOVE EXISTING MAKEUP WATER PIPING TO COOLING TOWER(S).
PD105	DISCONNECT, REMOVE AND SALVAGE EXISTING FIXTURES FOR REINSTALLATION. CUT AND CAP EXISTING DCW, SAN, AND VENT PIPING FROM WALL CHASE TO ALLOW ACCESS TO EXISTING SHAFT FOR NEW MECHANICAL PIPING INSTALL. REINSTALL EXISTING FIXTURES AND RECONNECT TO EXISTING DCW, SAN, AND VENT PIPING AFTER INSTALLATION OF NEW MECHANICAL PIPING. SEE MECH DRAWINGS FOR MORE INFO.
PD106	REMOVE ALL EXISTING PLUMBING PIPING AND PROVIDE NEW VENT PIPING TO MATCH EXISTING MATERIAL AND SIZE IF NEEDED TO FACILITATE ACCESS.

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1700 NEW YORK AVENUE NW
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SEALS AND SIGNATURES

SHEET TITLE
PLUMBING DEMOLITION PLANS

PROJECT NUMBER
00100451

SHEET NUMBER
PD2.1

Author

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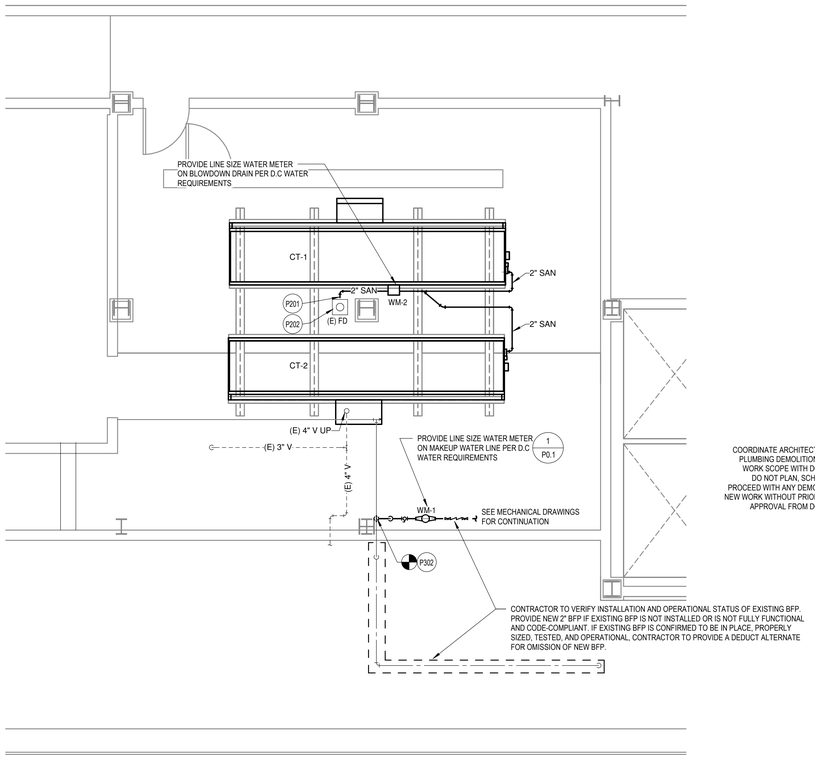
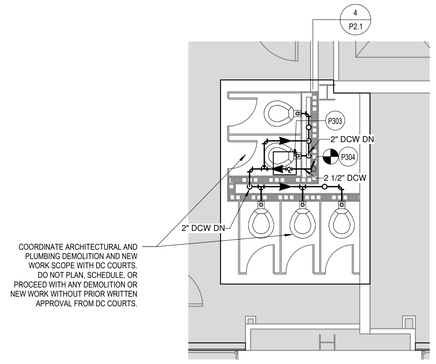
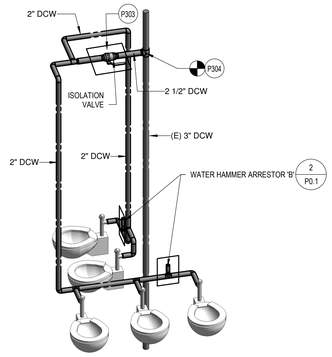


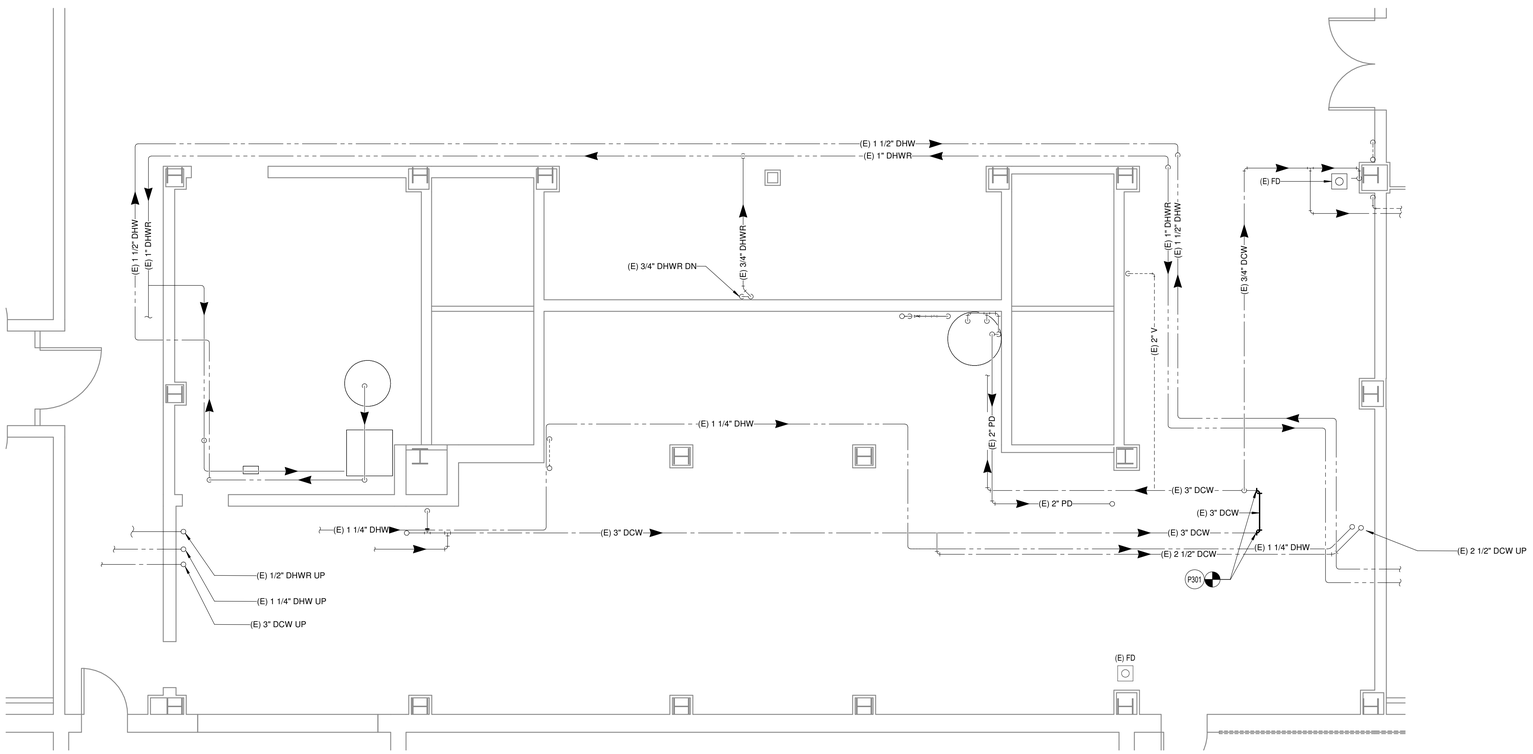
1 COOLING TOWER ROOM - PLUMBING FLOOR PLAN
SCALE: 1/4" = 1'-0"



3 TYPICAL LEVELS 1-3 - RESTROOM PLUMBING NEW WORK
SCALE: 1/4" = 1'-0"



4 TYPICAL LEVELS - RESTROOM WATER PIPING INSTALLATION
SCALE: NOT TO SCALE



2 BASEMENT LEVEL - PLUMBING FLOOR PLAN
SCALE: 1/4" = 1'-0"

ROOM LEGEND

GENERAL SHEET NOTES

A. SEE P0.1 FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS.

SHEET KEYNOTES

P201	EXTEND BLOWDOWN DRAIN AND TERMINATE INTO EXISTING FLOOR DRAIN WITH INDIRECT CONNECTION.
P202	TEST FLOOR DRAIN BETWEEN COOLING TOWERS FOR PROPER AND LEAK FREE OPERATION.
P301	CONNECT NEW 3" DCW TO EXISTING 3" DCW.
P302	CONNECT NEW 1-1/2" DCW TO EXISTING 1-1/2" DCW.
P303	PROVIDE 18" X 18" ACCESS PANEL ON EACH FLOOR WITH LINE SIZE BALL VALVES ON DCW TO BE ABLE TO ISOLATE DCW SUPPLY AT EACH FLOOR. EXTEND AND OFFSET DCW TO BALL VALVES. PIPING MATERIAL AND SIZE TO MATCH EXISTING.
P304	CONNECT NEW 2-1/2" DCW TO EXISTING 3" DCW RISER.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
TYLER GURSKY
No. PE40003050
LICENSED
PROFESSIONAL ENGINEER

SHEET TITLE
PLUMBING FLOOR PLANS

PROJECT NUMBER
00100451

SHEET NUMBER
P2.1

Author

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MECHANICAL ABBREVIATIONS

A	A	AC	AIR CONDITIONING
	A	ACC	AIR COOLED CHILLER
	A	ACCU	AIR COOLED CONDENSING UNIT
	A	ACFM	ABSOLUTE CUBIC FEET PER MINUTE
	A	ACU	AIR CONDITIONING UNIT
	A	AD	ACCESS DOOR
	A	AFF	ABOVE FINISHED FLOOR
	A	AFM	AIRFLOW MEASURING DEVICE
	A	AFMS	AIRFLOW MEASURING STATION
	A	AHU	AIR HANDLING UNIT
	A	AMB	AMBIENT
	A	AP	ACCESS PANEL
	A	APPROX	APPROXIMATE
	A	AS	AIR SEPARATOR
	A	ASHRAE	AMERICAN SOCIETY OF HEATING REFRIGERATION AND AIR CONDITIONING ENGINEERS
B	B	B	BOILER
	B	BAS	BUILDING AUTOMATION SYSTEM
	B	BHP	BRAKE HORSEPOWER
	B	BOD	BOTTOM OF DUCT
	B	BOP	BOTTOM OF PIPE
	B	BS	BASIN SWEEPER
	B	BTU(H)	BRITISH THERMAL UNIT (PER HOUR)
C	C	CAP	CAPACITY
	C	CC	COOLING COIL
	C	CDSR	CONDENSER
	C	CFH	CUBIC FEET PER HOUR
	C	CFM	CUBIC FEET PER MINUTE
	C	CH	CHILLER
	C	CI	CAST IRON
	C	COMP	COMPRESSOR
	C	COND	CONDENSATE
	C	CONT	CONTINUATION
	C	CP	CONDENSATE PUMP
	C	CS	CLEAN STEAM
	C	CT	COOLING TOWER
	C	CUH	CABINET UNIT HEATER
	C	CV	CONSTANT VOLUME/CONTROL VALVE
	C	CW	COLD WATER
D	D	D&T	DRIP & TRAP
	D	DB	DECIBELS
	D	DBA	DECIBELS (A-WEIGHTED SCALE)
	D	DBT	DRY BULB TEMPERATURE °F
	D	DDC	DIRECT DIGITAL CONTROL
	D	DIA	DIAMETER
	D	DN	DOWN
	D	DP	DIFFERENTIAL PRESSURE
	D	DPS	DIFFERENTIAL PRESSURE SENSOR
	D	DPT	DEW POINT TEMPERATURE °F
	D	DWG	DRAWING
	D	DX	DIRECT EXPANSION
E	E	(E)	EXISTING
	E	EA	EACH/EXHAUST AIR
	E	EAT	ENTERING AIR TEMPERATURE
	E	EER	ENERGY EFFICIENCY RATIO
	E	EF	EXHAUST FAN
	E	EFF	EFFICIENCY
	E	EG	ETHYLENE GLYCOL WATER SOLUTION
	E	EL	ELEVATION
	E	ELEC	ELECTRICAL
	E	ENT	ENTERING
	E	EQ	EQUIVALENT
	E	ERU	ENERGY RECOVERY UNIT
	E	ESP	EXTERNAL STATIC PRESSURE
	E	ET	EXPANSION TANK
	E	EV	EXHAUST VALVE
	E	EWC	ELECTRIC WATER COOLER
	E	EWT	ENTERING WATER TEMPERATURE
	E	EXH	EXHAUST
	E	EXP	EXPANSION
	E	EXT	EXTERAL
F	F	F	FAHRENHEIT
	F	FCU	FAN COIL UNIT
	F	FD	FIRE DAMPER
	F	FLA	FULL LOAD AMPERES
	F	FLEX	FLEXIBLE CONNECTION
	F	FLR	FLOOR
	F	FM	FLOW METER
	F	FPM	FEET PER MINUTE
	F	FS	FLOW SWITCH
	F	FSD	FIRE & SMOKE DAMPER
	F	FT	FEET or FOOT
	F	ftH2O	FEET OR FOOT OF WATER COLUMN
	F	FTR	FIN TUBE RADIATION
G	G	G	GLYCOL
	G	GAL	GALLONS
	G	GPH	GALLONS PER HOUR
	G	GPM	GALLONS PER MINUTE
	G	GR	GRAINS
H	H	H	HEIGHT
	H	HB	HOSE BIBB
	H	HC	HEATING COIL
	H	HEX	HEAT EXCHANGER
	H	HG	MERCURY
	H	HO	HUB OUTLET
	H	HP	HORSE POWER
	H	HR	HOUR
	H	HUM	HUMIDIFEIR
	H	HZ	HERTZ
I	I	ID	INSIDE DIAMETER
	I	IE	INVERT ELEVATION
	I	IFB	INTEGRAL FACE AND BY-PASS
	I	IFC	INTERNATIONAL FIRE CODE
	I	IMC	INTERNATIONAL MECHANICAL CODE
	I	IN	INCHES
	I	IPLV	INTEGRATED PART LOAD VALUE
K	K	kW	KILOWATTS
	K	KWH	KILOWATT HOURS
L	L	L	LENGTH
	L	LAT	LEAVING AIR TEMPERATURE
	L	LBS	POUNDS
	L	LBS/HR	POUNDS PER HOUR
	L	LEF	LAB EXHAUST FAN
	L	LP	LOW POINT
	L	LRA	LOCKED ROTOR AMPERES
	L	LVG	LEAVING
	L	LWT	LEAVING WATER TEMPERATURE
M	M	MAX	MAXIMUM
	M	MBH	1000 BTU/HR
	M	MCA	MAXIMUM CURRENT AMPACITY
	M	MCC	MOTOR CONTROL CENTER
	M	MD	MOTORIZED DAMPER
	M	MECH	MECHANICAL
	M	MER	MECHANICAL EQUIPMENT ROOM
	M	MIN	MINIMUM
	M	MISC	MISCELLANEOUS
	M	MND	MANUAL DAMPER
	M	MOCP	MAXIMUM OVER CURRENT PROTECTION
	M	MTG	MOUNTING
	M	MW	MAKE-UP WATER
N	N	(NRL)	NEW LOCATION OF RELOCATED MATERIAL OR EQUIPMENT
	N	N.C	NORMALLY CLOSED
	N	N.O.	NORMALLY OPEN
	N	NC	NOISE CRITERIA
	N	NIC	NOT IN CONTRACT
	N	NO.	NUMBER
	N	NOM	NOMINAL
	N	NPLV	NON STANDARD PART LOAD VALUE
	N	NPSH	NET POSITIVE SUCTION HEAD
	N	NTS	NOT TO SCALE
O	O	OA	OUTSIDE AIR
	O	OAD	OUTSIDE AIR DAMPER
	O	OD	OUTSIDE DIAMETER
	O	OPR	OPERATING
	O	OV	OUTLET VELOCITY
P	P	P	PUMP
	P	PCB	PASSIVE CHILLED BEAM
	P	PD	PRESSURE DROP (FEET OF WATER)
	P	PG	PROPYLENE GLYCOL WATER SOLUTION
	P	PH	PHASE
	P	PRESS	PRESSURE
	P	PRV	PRESSURE REGULATING VALVE
	P	PSI	POUNDS PER SQUARE INCH
	P	PSIG	POUNDS PER SQUARE INCH - GAUGE
Q	Q	QTY	QUANTITY
R	R	(RL)	RELOCATED MATERIAL OR EQUIPMENT
	R	RA	RETURN/RELIEF AIR
	R	RC	ROOF CONDUCTOR
	R	RE	REFERENCE
	R	REF	REFRIGERANT EXHAUST FAN
	R	RET	RETURN
	R	RF	RETURN FAN
	R	RH	RELATIVE HUMIDITY
	R	RHC	REHEAT COIL
	R	RLA	RUNNING LOAD AMPS
	R	RPM	REVOLUTIONS PER MINUTE
	R	RTU	ROOFTOP UNIT
S	S	SA	SUPPLY AIR
	S	SA	SHOCK ABSORBER
	S	SA	SOUND ATTENUATOR
	S	SAN	SANITARY WASTE
	S	SCFM	STANDARD CUBIC FEET PER MINUTE
	S	SD	SMOKE DAMPER/SMOKE DETECTOR
	S	SD	SMOKE DAMPER
	S	SEER	SEASONAL ENERGY EFFICIENCY RATIO
	S	SENS	SENSIBLE
	S	SF	SQUARE FEET
	S	SG	SPECIFIC GRAVITY
	S	SL	SOUND LINING
	S	SP	STATIC PRESSUR (INCHES OF WATER)
	S	SPD	SPEED
	S	SPL	SOUND POWER LEVEL
	S	SPS	STATIC PRESSURE SENSOR
	S	SS	STAINLESS STEEL
	S	STM	STEAM
	S	SV	SUPPLY VALVE
T	T	T	TEMPERATURE
	T	TAB	TESTING, ADJUSTING AND BALANCING
	T	TOD	TOP OF DUCT
	T	TOP	TOP OF PIPE
	T	TP	TOTAL PRESSURE
	T	TSP	TOTAL STATIC PRESSURE
	T	TYP	TYPICAL
U	U	UH	UNIT HEATER
	U	UON	UNLESS OTHERWISE NOTED
V	V	V	VOLTAGE/VENT
	V	VAC	VACUUM
	V	VAV	VARIABLE AIR VOLUME
	V	VEL	VELOCITY
	V	VFD	VARIABLE FREQUENCY DRIVE
	V	VIFB	VERTICAL INTEGRAL FACE AND BYPASS
	V	VTR	VENT THRU ROOF
W	W	W	WATTS/WIDTH
	W	W/	WITH
	W	W/O	WITHOUT
	W	WB	WET BULB TEMPERATURE
	W	WG	WATER GAUGE
	W	WMS	WIRE MESH SCREEN

SYMBOL SHEET NOTES

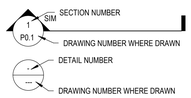
A. THE PURPOSE OF THIS SHEET IS TO ILLUSTRATE AND DEFINE TYPICAL GRAPHIC SYMBOLS WHICH MAY TYPICALLY OCCUR ON THE MECHANICAL DRAWINGS.

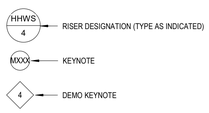
B. THIS SHEET MAY ILLUSTRATE ABBREVIATIONS, SYMBOLS AND LEGENDS WHICH DO NOT OCCUR AS PART OF THIS PROJECT. REFER TO THE DRAWINGS TO DETERMINE WHICH ITEMS APPLY TO THE WORK OF THIS PROJECT.

C. ADDITIONAL SYMBOLS NOT SHOWN OR DEFINED ON THIS SHEET MAY BE USED ON THE MECHANICAL DRAWINGS AND ARE TYPICALLY DEFINED ON OTHER SHEETS.

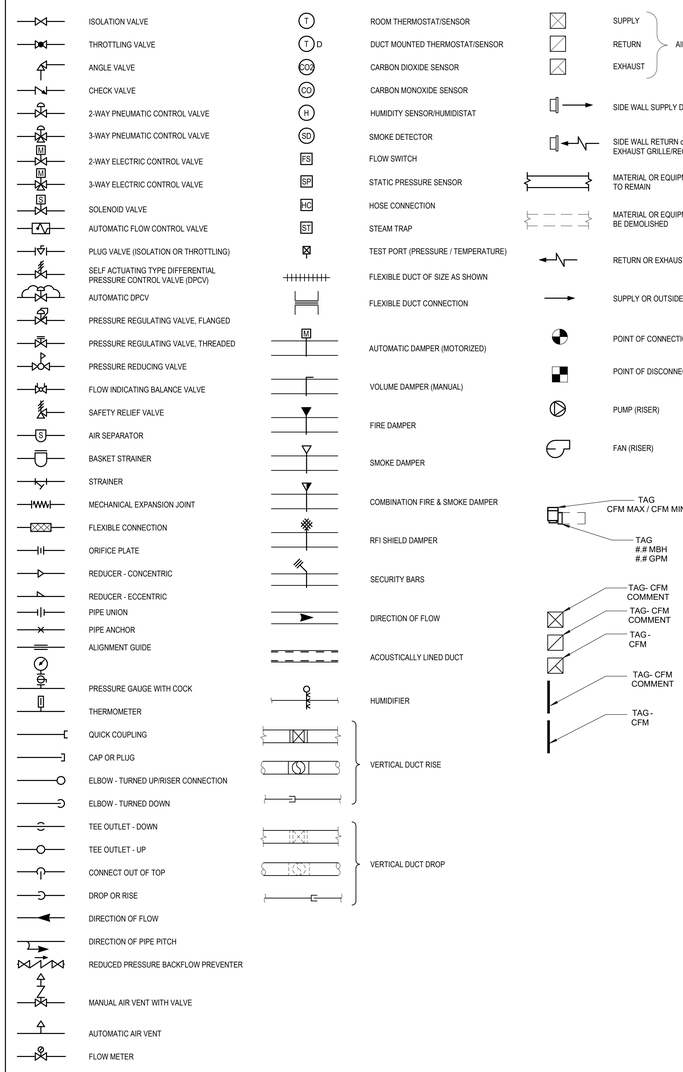
D. SYMBOLS ARE NOT DRAWN TO SCALE. TO DETERMINE THE ACTUAL SIZES OF ELEMENTS REPRESENTED BY SYMBOLS, REFER TO THE SPECIFICATIONS AND OTHER SHEETS, AS MAY APPLY.

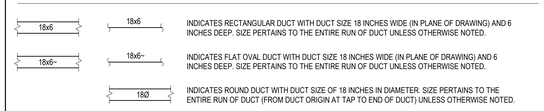
REFERENCE SYMBOLS





MECHANICAL SYMBOLS





MECHANICAL DUCTWORK AND PIPING LEGEND

CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
HHWR	HEATING HOT WATER RETURN
STEAM(PSIG)	STEAM
D	CONDENSATE DRAIN
BS	BASIN SWEEPER
SA	SUPPLY AIR
RA	RETURN AIR
EA	GENERAL EXHAUST AIR

MECHANICAL GENERAL NOTES

1. **HAZARDOUS MATERIAL, INCLUDING BUT NOT LIMITED TO ASBESTOS, MAY BE ENCOUNTERED IN EXISTING PIPING, DUCTWORK, AND INSULATION. ENSURE ADEQUATE PROTOCOLS AND PROCEDURES ARE IN PLACE FOR LIFE SAFETY OR PERSONNEL BEFORE COMMENCING ANY WORK.**
2. INSTALL ALL WORK IN ACCORDANCE WITH THE 2015 INTERNATIONAL MECHANICAL CODE, 2015 INTERNATIONAL ENERGY CONSERVATION CODE AND THE REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION.
3. TO OBTAIN ALL CONSTRUCTION INFORMATION, ALL SPECIFICATION AND DRAWINGS (E.G. ARCHITECTURAL, STRUCTURAL, CIVIL, MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION) MUST BE USED.
4. BRING TO THE ATTENTION OF THE ARCHITECT/ENGINEER ANY INFORMATIONAL CONFLICTS WITHIN THE SPECIFICATIONS AND DRAWINGS. THE CONTRACTOR(S) SHALL NOT PROCEED WITH ANY WORK, EXCEPT AT ITS OWN RISK, UNTIL ALL CONFLICTS ARE RESOLVED AND THE CLARIFYING INFORMATION IS ISSUED TO THE CONTRACTOR(S) BY THE ARCHITECT/ENGINEER.
5. PROVIDE OFFSETS AND TRANSITIONS IN DUCTWORK AND PIPING AS REQUIRED TO AVOID INTERFERENCE AT NO ADDITIONAL COST TO THE OWNER. THOUGH SOME OFFSETS & TRANSITIONS ARE SHOWN IN PIPING & SHEET METAL TO HELP INDICATE THE PHYSICAL RELATIONSHIP BETWEEN THEM, IT IS NOT THE INTENT OF THE DRAWINGS TO SHOW ALL PIPING & SHEET METAL OFFSETS & TRANSITIONS REQUIRED. THE CONTRACTOR SHALL FULLY COORDINATE THE MECHANICAL WORK WITHIN ITSELF & WITH THE WORK OF ALL TRADES TO PROVIDE COMPLETE & OPERABLE SYSTEMS WITHOUT INTERFERENCES.
6. INSTALL ALL EQUIPMENT LEVEL AND PLUMB. PROVIDE BLOCKING AND HARDWARE AS REQUIRED.
7. VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATION OF WORK. PROVIDE TRANSITIONS AND MAKE FINAL CONNECTIONS TO EQUIPMENT, UNLESS OTHERWISE INDICATED.
8. INSTALL ALL EQUIPMENT REQUIRING PERIODIC SERVICE NOT LESS THAN 10 FEET FROM ROOF EDGE OR OPENING, UNLESS PROTECTIVE RAILING OR PARAPET OF 42 INCHES AFF. HAS BEEN PROVIDED. VERIFY WITH OTHER TRADES TO CONFIRM IF PROTECTIVE RAILING OR PARAPET OF 42 INCHES AFF IS PROVIDED.
9. CONCENTRATE LOADS AT JOIST AND/OR BEAM LOCATIONS. WHERE CONCENTRATED LOADS DUE TO EQUIPMENT, RISERS, OR SPECIAL DUCT CONSTRUCTION OCCUR AT OTHER LOCATIONS, PROVIDE ADDITIONAL SUPPORT FRAMING AND/OR ANGLE BRACING.
10. DUCT CONSTRUCTION SHALL COMPLY WITH THE LATEST VERSION OF SMACNA CONSTRUCTION STANDARDS FOR THE SPECIFIC PRESSURE CLASSIFICATIONS INDICATED BELOW. ALL 90 DEGREE ELBOWS SHALL BE LONG RADIUS TYPE UNLESS SPACE IS LIMITED. SHORT RADIUS AND RECTANGULAR ELBOWS SHALL HAVE TURNING VANES. UNLESS OTHERWISE NOTED FOR BRANCH CONNECTIONS, PROVIDE CONICAL TAPS FOR ROUND DUCTS AND 45 DEGREE TAPS FOR RECTANGULAR DUCTS.
11. FLEXIBLE DUCTWORK SHALL NOT BE USED IN RETURN OR EXHAUST DUCT SYSTEM. FLEXIBLE DUCTWORK MAY BE USED IN THE SUPPLY SYSTEM PROVIDED THE LENGTH IS LIMITED TO A TOTAL LENGTH OF FIVE (5) FEET.
12. INSTALL DUCTWORK AS CLOSE AS POSSIBLE TO UNDERSIDE OF BEAMS AND/OR JOISTS.
13. ALL DUCTWORK SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS.
14. PROVIDE DUCTWORK TO TERMINAL AIR DEVICES AT SCHEDULED INLET SIZE UNLESS OTHERWISE INDICATED.
15. PROVIDE DUCTWORK FROM TERMINAL AIR BOXES AT MANUFACTURER'S OUTLET DIMENSION SIZE UNLESS OTHERWISE INDICATED. PROVIDE TRANSITIONS AS REQUIRED.
16. PROVIDE FIRE AND SMOKE DAMPERS AT DUCTWORK PENETRATIONS OF ALL FIRE RATED AND SMOKE RESISTIVE CONSTRUCTION. COORDINATE WITH LIFE SAFETY PLANS FOR LOCATIONS. PENETRATION ASSEMBLY TO BE U.L. LISTED.
17. PAINT FLAT BLACK THE INSIDE OF ALL DUCTWORK VISIBLE THROUGH DIFFUSERS, GRILLES AND REGISTERS.
18. PROVIDE OPEN END DUCTWORK (OED) WITH 2X2 MESH (1/2"X 1/2") ALUMINUM SCREEN WITH REMOVABLE FRAMES.
19. FURNISH AND INSTALL ALL MANUALLY OPERATED VOLUME CONTROL (BALANCING) DAMPERS NECESSARY TO PERFORM THE BALANCING WORK, AT EACH BRANCH TAKEOFF. AT EACH AIR TERMINAL DEVICE AND WHERE INDICATED.
20. DUCT SYSTEMS SHALL BE BALANCED TO AIRFLOWS INDICATED ON DRAWINGS. FANS SHALL BE FIELD TESTED TO ENSURE COMPLIANCE WITH SCHEDULED FAN PERFORMANCE AND SCHEDULED AIRFLOW AT THE DESIGN STATIC PRESSURES LISTED.
21. PROVIDE FLEXIBLE CONNECTIONS BETWEEN DUCTWORK AND ALL FANS AND ALL AIR HANDLING EQUIPMENT.
22. COORDINATE EXACT LOCATION OF DIFFUSERS, GRILLES AND REGISTERS WITH THE REFLECTED CEILING PLANS BEFORE INSTALLATION. PROVIDE SYMMETRY WITH THE ROOM LIGHTING SYSTEMS.
23. VERIFY DIFFUSER, GRILLE AND REGISTER MOUNTING FRAME TYPES WITH THE CEILING TYPES. PROVIDE FRAME TYPE THAT MATCHES CEILING CONFIGURATION.
24. PROVIDE CONCRETE HOUSEKEEPING PADS FOR FLOOR MOUNTED MECHANICAL EQUIPMENT. COORDINATE SIZE AND LOCATION WITH ALL TRADES.
25. PROVIDE ACCESS DOORS AND/OR PANELS FOR DUCT MOUNTED FIRE, SMOKE, AND FIRE/SMOKE DAMPERS AND SMOKE DETECTORS.
26. PROVIDE ACCESS DOORS AND/OR PANELS IN HARD CEILINGS AND WALLS TO PERMIT SERVICE TO DAMPERS, VALVES, AND CONCEALED EQUIPMENT.
27. REFER TO ARCHITECTURAL GENERAL INFORMATION SHEETS FOR MOUNTING HEIGHTS OF DEVICES. WHERE THIS INFORMATION IS NOT PROVIDED, MOUNT ROOM THERMOSTAT CENTERLINE AT 42 INCHES AFF AND OCCUPANCY SENSORS AT 84 INCHES AFF UNLESS OTHERWISE INDICATED.
28. COORDINATE ALL WALL MOUNTED DEVICES SUCH AS THERMOSTATS AND CONTROL PANELS WITH EQUIPMENT DRAWINGS (AS APPLICABLE) AND ARCHITECTURAL DRAWINGS.
29. COORDINATE ALL DOOR UNDER CUTS INDICATED AND AS REQUIRED WHERE RETURN/TRANSFER OPENS ARE NOT PROVIDED.
30. WHERE SIZE OF MOTORIZED DAMPER EXCEEDS THE LIMITS OF A SINGLE OPERATOR, PROVIDE MULTIPLE OPERATORS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
31. PROVIDE RUNOUT PIPING AS SCHEDULED OR AS OTHERWISE INDICATED.
32. ALL ABOVE CEILING WATER/LIQUID 1/4 TURN VALVES SHALL BE LOCATED IN THE HORIZONTAL WITH THEIR VALVE HANDLE WITH PULL DOWN TOWARDS OPERATOR FOR SHUTOFF SERVICE. COORDINATE VALVE HEIGHTS SO THAT VALVE HANDLE OPERATION DOES NOT CONFLICT WITH CEILING.
33. DUCTWORK, PIPING, AND OTHER PENETRATIONS OF ALL NON FIRE RATED FULL HEIGHT PARTITIONS SHALL NOT BE IN CONTACT WITH THE PARTITION. LEAVE A MINIMUM 1/2" ANNULAR SPACE, FILL SPACE WITH MINERAL FIBER/FIBERGLASS, AND SEAL PENETRATION WITH ACOUSTICAL SEALANT.
34. PRIOR TO DEMOLISHING ANY PIPING, ENSURE ALL PIPING SYSTEMS ARE FULLY DRAINED OF WATER. PIPING SYSTEMS SHALL NOT HAVE STANDING WATER DURING DEMOLITION AND NEW CONSTRUCTION.
35. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN, COORDINATE WITH THE OWNER 21 DAYS PRIOR TO SHUT DOWN. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. SEE DIVISION 01 DOCUMENTS FOR ADDITIONAL INFORMATION.
36. DO NOT SCALE THE DRAWINGS FOR DIMENSIONAL INFORMATION. NOTIFY THE ARCHITECT IN WRITING IMMEDIATELY IF DIMENSIONAL INFORMATION CANNOT BE DETERMINED FROM THE DRAWINGS OR IF DIMENSIONS ARE IN CONFLICT WITH OTHER DRAWINGS.

STATIC PRESSURE CLASSIFICATION FOR DUCT CONSTRUCTION

DUCT SYSTEM	LOCATION		PRESSURE CLASSIFICATION (INCH WATER GAUGE)	DUCTWORK SEAL/LEAKAGE CLASS	REMARKS
	FROM	TO			
REFRIGERANT EMERGENCY EXHAUST AIR	GRILLE	FAN INLET	-3	A	
REFRIGERANT EMERGENCY EXHAUST AIR	FAN OUTLET	ROOF	+4	A	

NOTES:

A. ALL DUCTWORK WITH PRESSURE CLASSIFICATIONS IN EXCESS OF NEGATIVE 3 INCH WATER GAUGE (I.E. -4,-5,-6, -10 ETC) SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SMACNA INDUSTRIAL DUCT STANDARDS (ROUND & RECTANGULAR)
B. ALL EXHAUST DUCTWORK NOT INDICATED ABOVE SHALL BE NEGATIVE 3 INCH WATER GAUGE CONSTRUCTION.
C. WRAP THE EMERGENCY REFRIGERANT DUCTWORK WITH DUCT FIRE WRAP. FIRE WRAP TO PROVIDE AT LEAST 2 HOUR OF FIRE RESISTANCE.
   a. WRAP THE DUCT IN THE SHAFT, OVER THE CEILING OF LEVEL 3 AND ATTIC.
   b. BASIS OF DESIGN: 3M FIRE BARRIER DUCT WRAP 615.

PROPOSED BASE DESIGN AND DEDUCT ALTERNATE

BASE DESIGN

A. CONTRACTOR SHALL FIELD-VERIFY EXISTING FLOOR OPENING DIMENSIONS AT THE LOCATION OF THE FIRE-WRAPPED EMERGENCY REFRIGERANT EXHAUST DUCT RISER.
B. THE BASE DESIGN ASSUMES THAT REFLECTS ENLARGEMENT OF THE EXISTING STRUCTURAL FLOOR OPENING TO ACCOMMODATE THE FIRE-WRAPPED EMERGENCY REFRIGERANT EXHAUST DUCT RISER. ACCORDINGLY, THE BASE SCOPE INCLUDES ALL ARCHITECTURAL/STRUCTURAL DEMOLITION, REVISED OPENING CONSTRUCTION, AND ASSOCIATED WALL AND FLOOR FINISH WORK REQUIRED TO ENLARGE THE STRUCTURAL OPENING, INCLUDING BUT NOT LIMITED TO RESTROOM STALL MODIFICATIONS, WALL TILE, AND ADJACENT FINISHES. THE SHAFT REPLACEMENT AND RESTORATION SCOPE IS INCLUDED REGARDLESS OF OPENING SIZE FOR DUCT INSTALLATION AND INSULATION.
C. REFER TO STRUCTURAL DRAWINGS FOR THE SCOPE OF WORK ASSOCIATED WITH REINFORCING THE ENLARGED OPENING.
D. REFER TO ARCHITECTURAL DRAWINGS FOR DEMOLITION SCOPE, REVISED OPENING DIMENSIONS, SHAFT CONSTRUCTION, AND FINISH RESTORATION.

DEDUCT ALTERNATE

A. CONTRACTOR SHALL FIELD-VERIFY EXISTING FLOOR OPENING DIMENSIONS AT THE LOCATION OF THE FIRE-WRAPPED EMERGENCY REFRIGERANT EXHAUST DUCT RISER.
B. IF THE EXISTING STRUCTURAL OPENING IS VERIFIED TO BE SUFFICIENT TO ACCOMMODATE THE INSTALLATION OF THE NEW FIRE-WRAPPED EMERGENCY REFRIGERANT EXHAUST DUCT RISER WITHOUT ENLARGEMENT, CONTRACTOR SHALL PROVIDE A CREDIT TO THE OWNER FOR ALL STRUCTURAL WORK ASSOCIATED WITH ENLARGING AND REINFORCING THE FLOOR OPENING THAT IS NO LONGER REQUIRED, AS WELL AS ANY ASSOCIATED ARCHITECTURAL DEMOLITION AND FINISH WORK THAT WOULD HAVE BEEN REQUIRED SOLELY DUE TO ENLARGEMENT OF THE OPENING.
C. SHAFT REPLACEMENT AND ASSOCIATED SHAFT FINISHES SHALL REMAIN INCLUDED IN THE BASE SCOPE REGARDLESS OF OPENING SIZE AND SHALL NOT BE SUBJECT TO CREDIT.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IONEL PETRIS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER

04/02/2026

SHEET TITLE

MECHANICAL ABBREVIATIONS AND SYMBOLS

00100451

PROJECT NUMBER

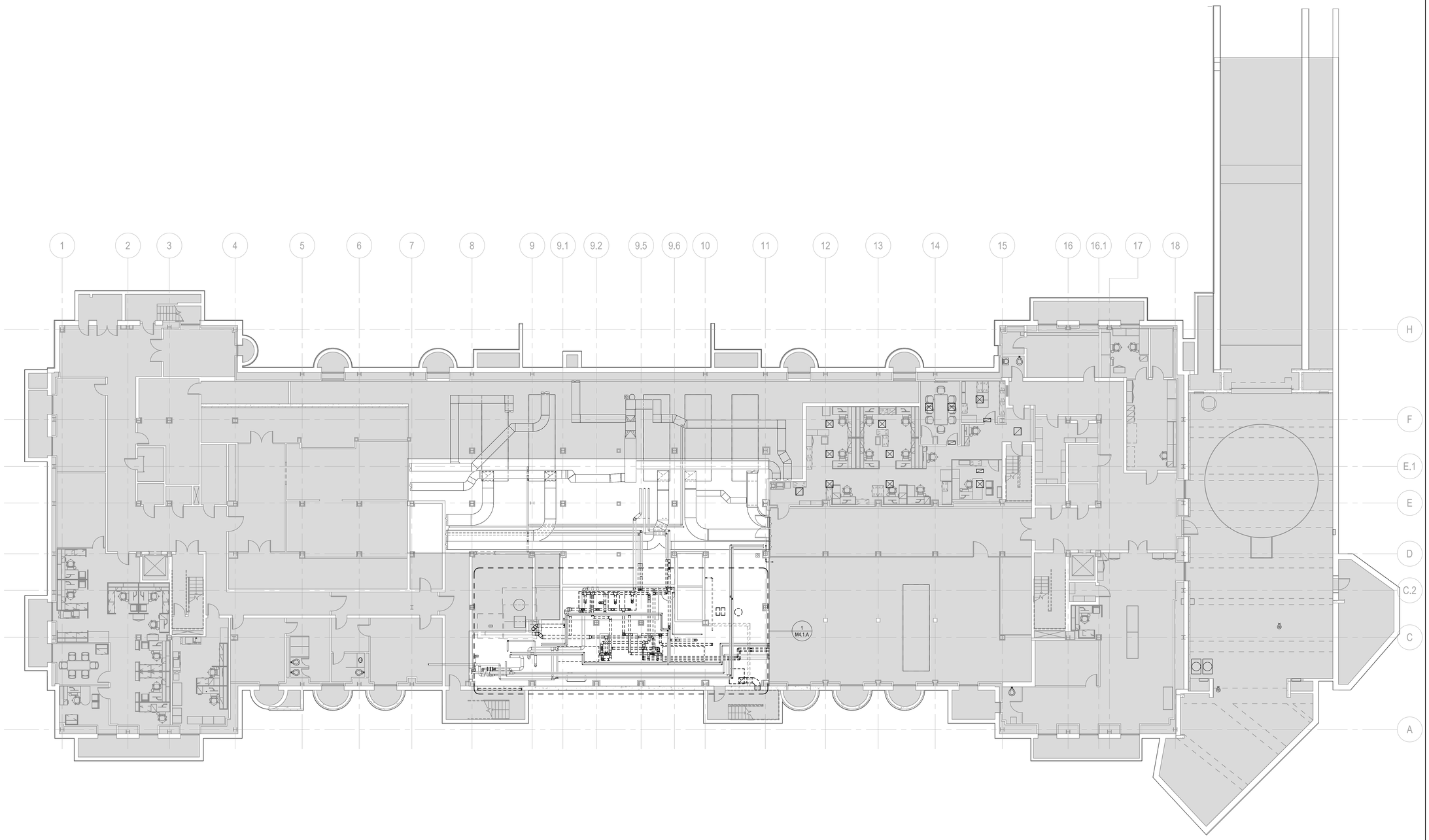
M0.1

SHEET NUMBER

Author

4/13/2026 4:09:59 PM

Plot Date:



1 BASEMENT - MECHANICAL DEMOLITION PLAN
SCALE: 3/32" = 1'-0"

GENERAL SHEET NOTES

A. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
B. **HAZARDOUS MATERIAL, INCLUDING BUT NOT LIMITED TO ASBESTOS, MAY BE ENCOUNTERED IN EXISTING PIPING, DUCTWORK AND INSULATION. ENSURE ADEQUATE PROTOCOLS AND PROCEDURES ARE IN PLACE FOR LIFE SAFETY OF PERSONNEL BEFORE COMMENCING ANY WORK.**
C. SYSTEMS WITH AN 'IE)' SUBSCRIPT AND NON-DASHED LINETYPE ARE EXISTING TO REMAIN. MAINTAIN ALL PIPES, DUCTS, AIR TERMINALS, FITTINGS AND ACCESSORIES FOR CONTINUITY. PROTECT FROM DAMAGE DURING CONSTRUCTION.
D. SYSTEMS WITH AN '(D)' SUBSCRIPT ARE TO BE DISCONNECTED AND REMOVED. MAINTAIN ALL EXISTING TO REMAIN PIPES, DUCTS, AIR TERMINALS, FITTINGS AND ACCESSORIES FOR CONTINUITY.
E. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN, COORDINATE WITH THE OWNER 21 DAYS PRIOR TO SHUT DOWN. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. SEE DIVISION 01 DOCUMENTS FOR ADDITIONAL INFORMATION.
F. FOR ALL WORK ON OR WITHIN EXISTING EQUIPMENT, CONTRACTOR TO COORDINATE WITH EQUIPMENT MANUFACTURER TO MAINTAIN WARRANTIES AND UL LISTINGS OF EQUIPMENT AND SYSTEMS.
G. ISOLATION VALVES ARE NORMALLY OPEN (N.O.) UNLESS SPECIFIED TO BE NORMALLY CLOSED (N.C.)
H. PRIOR TO ANY DEMOLITION AND NEW WORK, PERFORM TESTING AND BALANCING OF THE EXISTING CHILLED WATER PUMPING SYSTEMS SERVING THE BUILDING A. MEASURE PUMP FLOW, PUMP SUCTION PRESSURE, PUMP DISCHARGE PRESSURE, AND TOTAL SYSTEM FLOW AT EXISTING OPERATING PUMP SPEED. SUBMIT TAB REPORT TO OWNER AND EOR FOR REVIEW. DO NOT PROCEED WITH ANY WORK WITHOUT PRIOR TO FORMAL DIRECTION FROM THE OWNER.
I. ENGAGE A CERTIFIED PROFESSIONAL TO DISCONNECT, REMOVE AND DISCARD REFRIGERANT CHARGE FROM THE SYSTEM. COORDINATE WITH BUILDING OWNER ON SAFETY PROCEDURES.
J. PRIOR TO DEMOLISHING ANY PIPING, ENSURE ALL PIPING SYSTEMS ARE FULLY DRAINED OF WATER. PIPING SYSTEMS SHALL NOT HAVE STANDING WATER DURING DEMOLITION AND NEW CONSTRUCTION.

Author

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IONEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER

04/02/2026

KEYPLAN

NORTH

SHEET TITLE

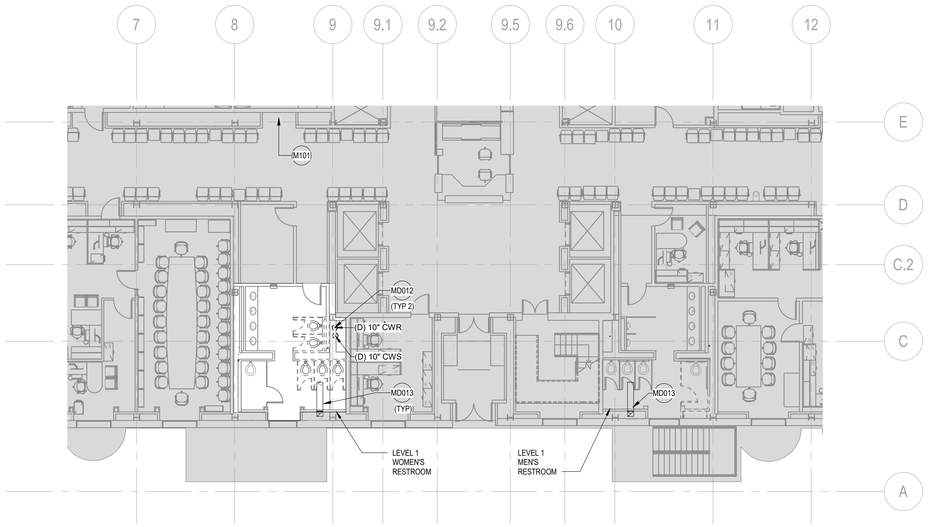
BASEMENT MECHANICAL DEMOLITION PLAN

00100451

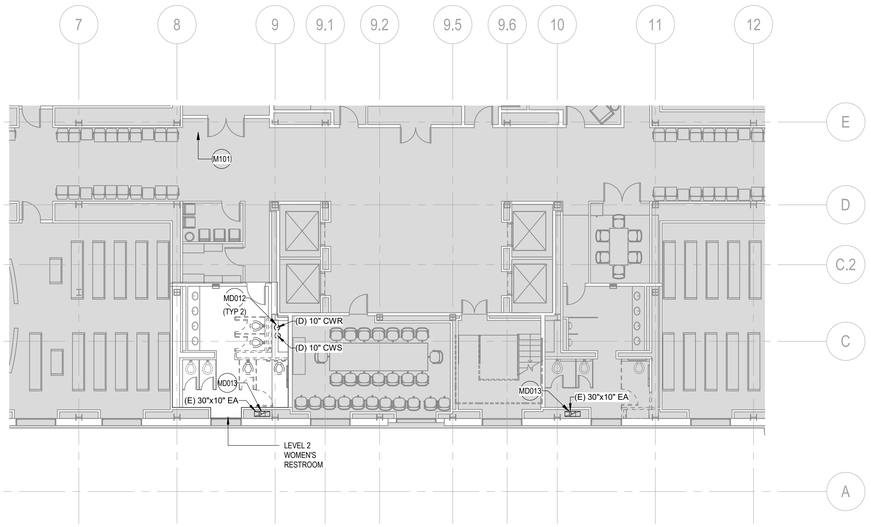
PROJECT NUMBER

MD2.1

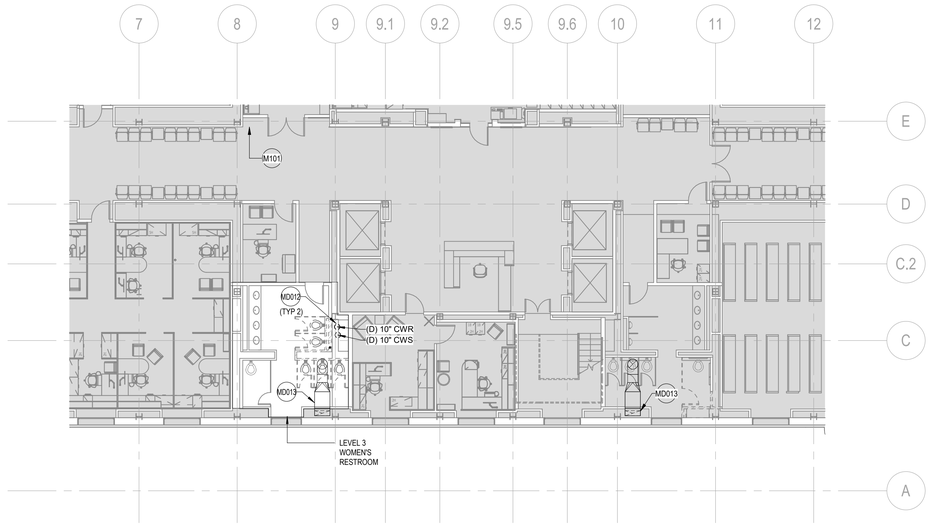
SHEET NUMBER



1 LEVEL 1 - MECHANICAL DEMOLITION PLAN
SCALE: 1" = 10'-0"



2 LEVEL 2 - MECHANICAL DEMOLITION PLAN
SCALE: 1" = 10'-0"



3 LEVEL 3 - MECHANICAL DEMOLITION PLAN
SCALE: 1" = 10'-0"

GENERAL SHEET NOTES

A. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
B. **HAZARDOUS MATERIAL, INCLUDING BUT NOT LIMITED TO ASBESTOS, MAY BE ENCOUNTERED IN EXISTING PIPING, DUCTWORK AND INSULATION. ENSURE ADEQUATE PROTOCOLS AND PROCEDURES ARE IN PLACE FOR LIFE SAFETY OF PERSONNEL BEFORE COMMENCING ANY WORK.**
C. SYSTEMS WITH AN '(E)' SUBSCRIPT AND NON-DASHED LINETYPE ARE EXISTING TO REMAIN. MAINTAIN ALL PIPES, DUCTS, AIR TERMINALS, FITTINGS AND ACCESSORIES FOR CONTINUITY. PROTECT FROM DAMAGE DURING CONSTRUCTION.
D. SYSTEMS WITH AN '(D)' SUBSCRIPT ARE TO BE DISCONNECTED AND REMOVED. MAINTAIN ALL PIPES, DUCTS, AIR TERMINALS, FITTINGS AND ACCESSORIES FOR CONTINUITY. PROTECT FROM DAMAGE DURING CONSTRUCTION.
E. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN, COORDINATE WITH THE OWNER 21 DAYS PRIOR TO SHUT DOWN. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. SEE DIVISION 01 DOCUMENTS FOR ADDITIONAL INFORMATION.
F. FOR ALL WORK ON OR WITHIN EXISTING EQUIPMENT, CONTRACTOR TO COORDINATE WITH EQUIPMENT MANUFACTURER TO MAINTAIN WARRANTIES AND UL LISTINGS OF EQUIPMENT AND SYSTEMS.
G. ISOLATION VALVES ARE NORMALLY OPEN (N.O.) UNLESS SPECIFIED TO BE NORMALLY CLOSED (N.C.)
H. PRIOR TO ANY DEMOLITION AND NEW WORK, PERFORM TESTING AND BALANCING OF THE EXISTING CHILLED WATER PUMPING SYSTEMS SERVING THE BUILDING A. MEASURE PUMP FLOW, PUMP SUCTION PRESSURE, PUMP DISCHARGE PRESSURE, AND TOTAL SYSTEM FLOW AT EXISTING OPERATING PUMP SPEED. SUBMIT TAB REPORT TO OWNER AND EOR FOR REVIEW. DO NOT PROCEED WITH ANY WORK WITHOUT PRIOR TO FORMAL DIRECTION FROM THE OWNER.
I. PRIOR TO DEMOLISHING ANY PIPING, ENSURE ALL PIPING SYSTEMS ARE FULLY DRAINED OF WATER. PIPING SYSTEMS SHALL NOT HAVE STANDING WATER DURING DEMOLITION AND NEW CONSTRUCTION.
J. ENGAGE A CERTIFIED PROFESSIONAL TO DISCONNECT, REMOVE AND DISCARD REFRIGERANT CHARGE FROM THE SYSTEM. COORDINATE WITH BUILDING OWNER ON SAFETY PROCEDURES.

SHEET KEYNOTES

M101	SHADED AREA NOT IN SCOPE OF WORK FOR DIVISION 23. TYP.
MD012	DISCONNECT AND REMOVE EXISTING CWS AND CWR PIPING RISER IN ITS ENTIRETY. SEE ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
MD013	EXISTING RESTROOM EXHAUST DUCT SHOWN FOR REFERENCE ONLY.

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SEALS AND SIGNATURES

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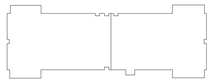
KEYPLAN

NORTH



SHEET TITLE

TYPICAL LEVELS - MECHANICAL DEMOLITION PLAN

PROJECT NUMBER
00100451

SHEET NUMBER
MD2.2

Author

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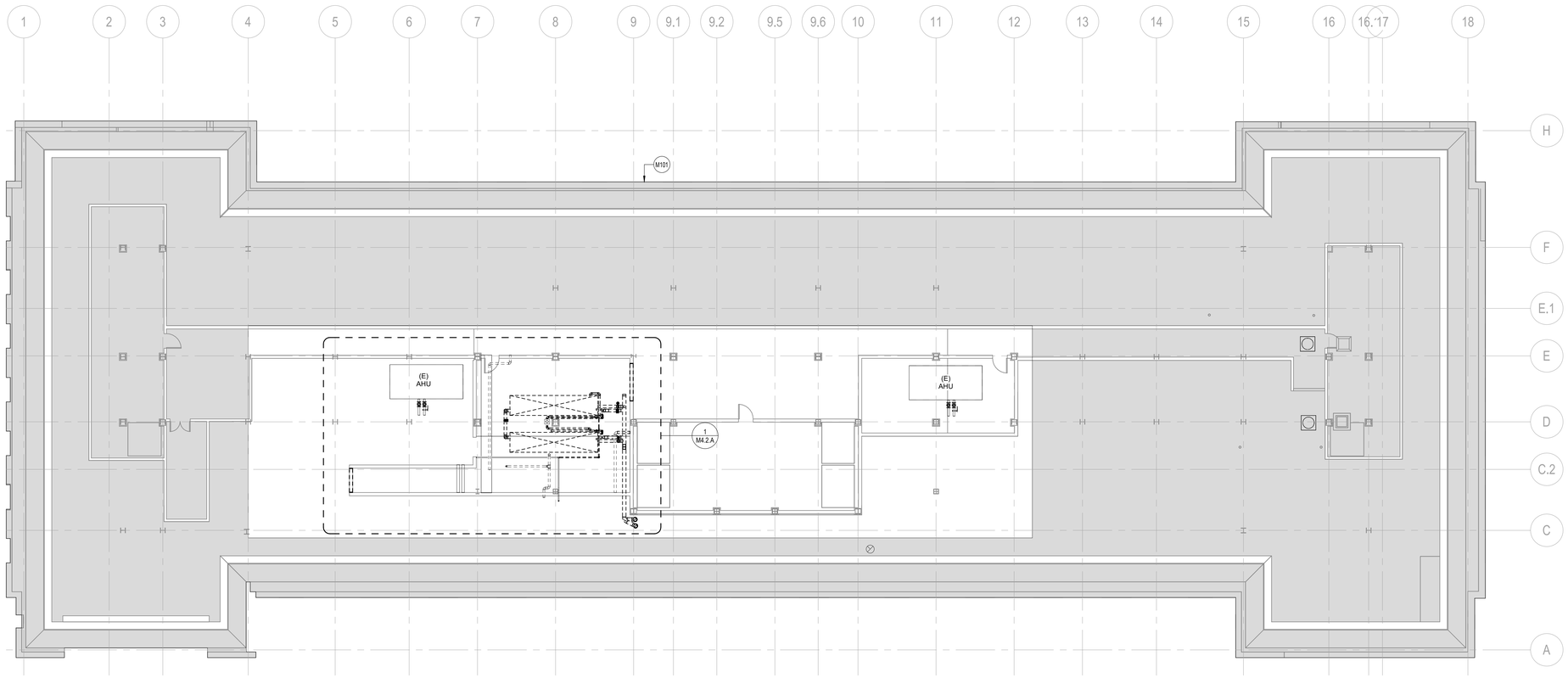

1 LEVEL 4 - MECHANICAL DEMOLITION PLAN
SCALE: 3/32" = 1'-0"

GENERAL SHEET NOTES

A. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
B. **HAZARDOUS MATERIAL, INCLUDING BUT NOT LIMITED TO ASBESTOS, MAY BE ENCOUNTERED IN EXISTING PIPING, DUCTWORK AND INSULATION. ENSURE ADEQUATE PROTOCOLS AND PROCEDURES ARE IN PLACE FOR LIFE SAFETY OF PERSONNEL BEFORE COMMENCING ANY WORK.**
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E. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN, COORDINATE WITH THE OWNER 21 DAYS PRIOR TO SHUT DOWN. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. SEE DIVISION 01 DOCUMENTS FOR ADDITIONAL INFORMATION.
F. FOR ALL WORK ON OR WITHIN EXISTING EQUIPMENT, CONTRACTOR TO COORDINATE WITH EQUIPMENT MANUFACTURER TO MAINTAIN WARRANTIES AND UL LISTINGS OF EQUIPMENT AND SYSTEMS.
G. ISOLATION VALVES ARE NORMALLY OPEN (N.O.) UNLESS SPECIFIED TO BE NORMALLY CLOSED (N.C.)
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I. PRIOR TO DEMOLISHING ANY PIPING, ENSURE ALL PIPING SYSTEMS ARE FULLY DRAINED OF WATER. PIPING SYSTEMS SHALL NOT HAVE STANDING WATER DURING DEMOLITION AND NEW CONSTRUCTION.
J. ENGAGE A CERTIFIED PROFESSIONAL TO DISCONNECT, REMOVE AND DISCARD REFRIGERANT CHARGE FROM THE SYSTEM. COORDINATE WITH BUILDING OWNER ON SAFETY PROCEDURES.

SHEET KEYNOTES

M101 SHADED AREA NOT IN SCOPE OF WORK FOR DIVISION 23. TYP.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IONEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER

04/02/2026

KEYPLAN

NORTH

SHEET TITLE

LEVEL 4 MECHANICAL DEMOLITION PLAN

00100451

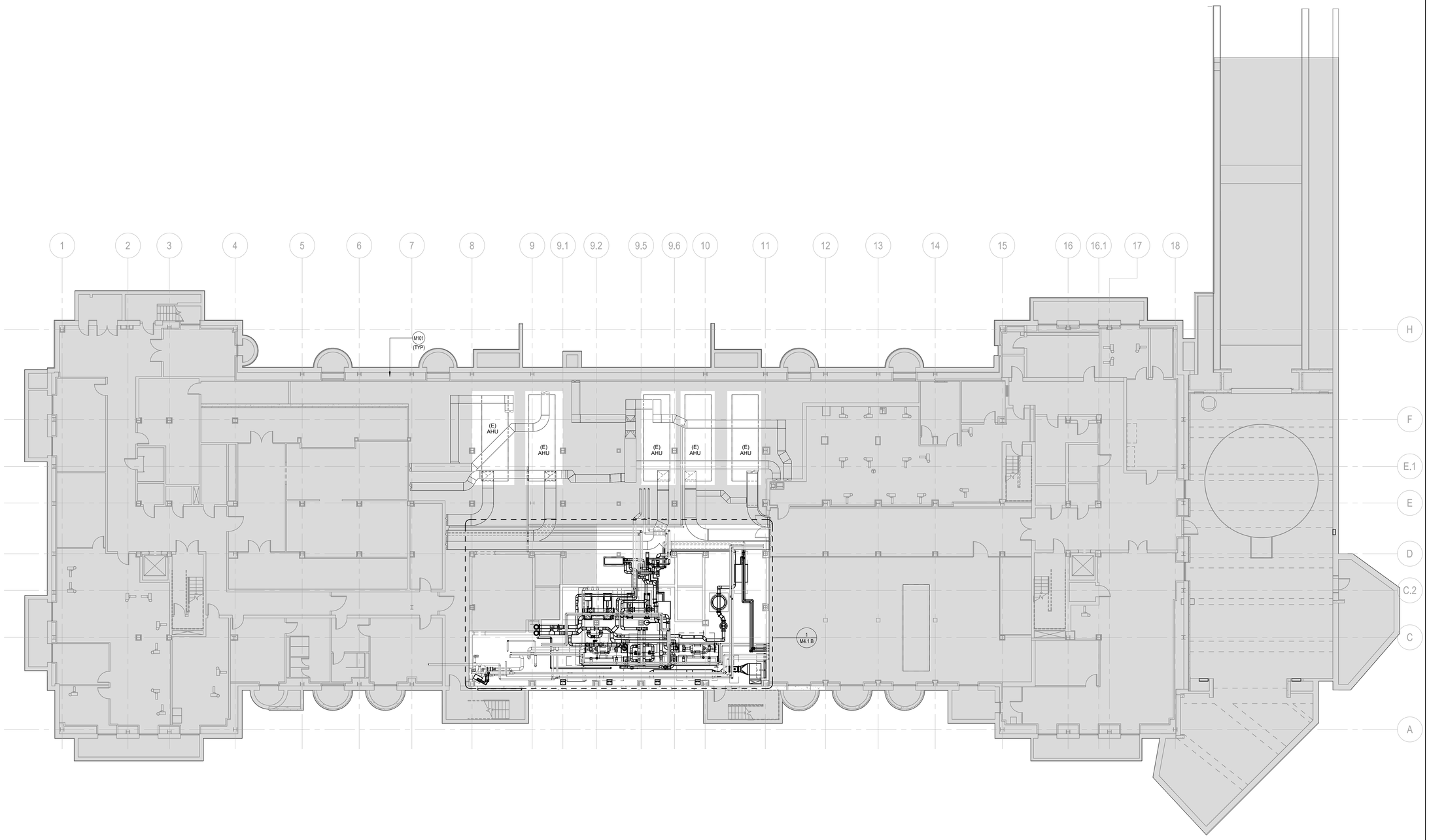
PROJECT NUMBER

MD2.3

SHEET NUMBER

Author

Plot Date: 4/13/2026 4:10:25 PM



1 BASEMENT - MECHANICAL FLOOR PLAN
SCALE: 3/32" = 1'-0"

GENERAL SHEET NOTES

A. **HAZARDOUS MATERIAL, INCLUDING BUT NOT LIMITED TO ASBESTOS, MAY BE ENCOUNTERED IN EXISTING PIPING, DUCTWORK, AND INSULATION. ENSURE ADEQUATE PROTOCOLS AND PROCEDURES ARE IN PLACE FOR LIFE SAFETY OR PERSONNEL BEFORE COMMENCING ANY WORK.**
B. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
C. SYSTEMS WITH AN '(E)' SUBSCRIPT ARE EXISTING TO REMAIN. MAINTAIN ALL PIPING, DUCTWORK, SUPPORTS AND ACCESSORIES. PROTECT FROM DAMAGE DURING CONSTRUCTION.
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SHEET KEYNOTES

M101 SHADED AREA NOT IN SCOPE OF WORK FOR DIVISION 23. TYP.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IONEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER
04/02/2026

KEYPLAN

NORTH

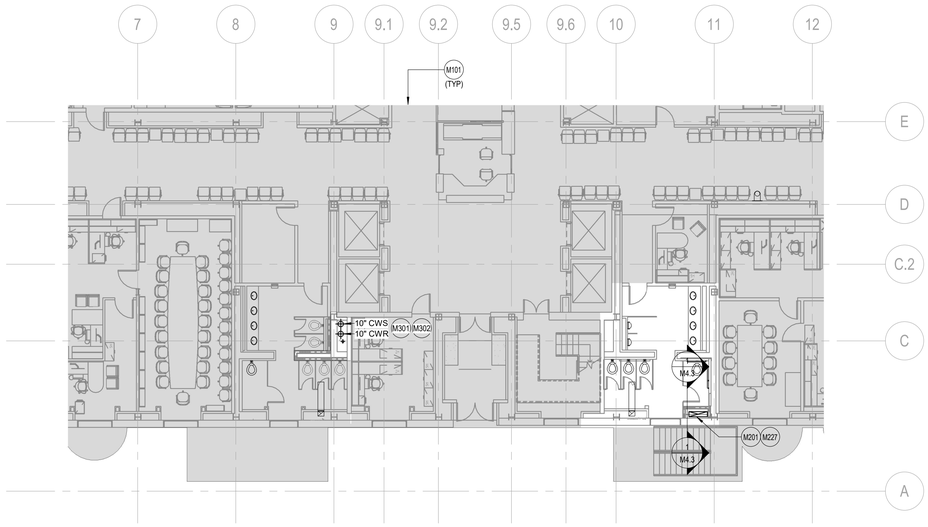
SHEET TITLE
BASEMENT MECHANICAL NEW WORK PLAN

PROJECT NUMBER
00100451

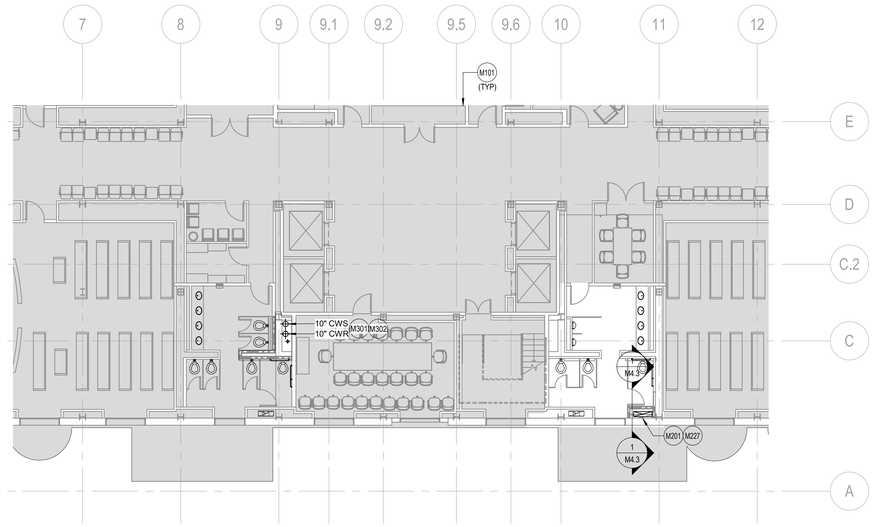
SHEET NUMBER
M2.1

Author

Plot Date: 4/13/2026 4:10:36 PM



2 LEVEL 1 - MECHANICAL NEW WORK FLOOR PLAN
SCALE: 1" = 10'-0"



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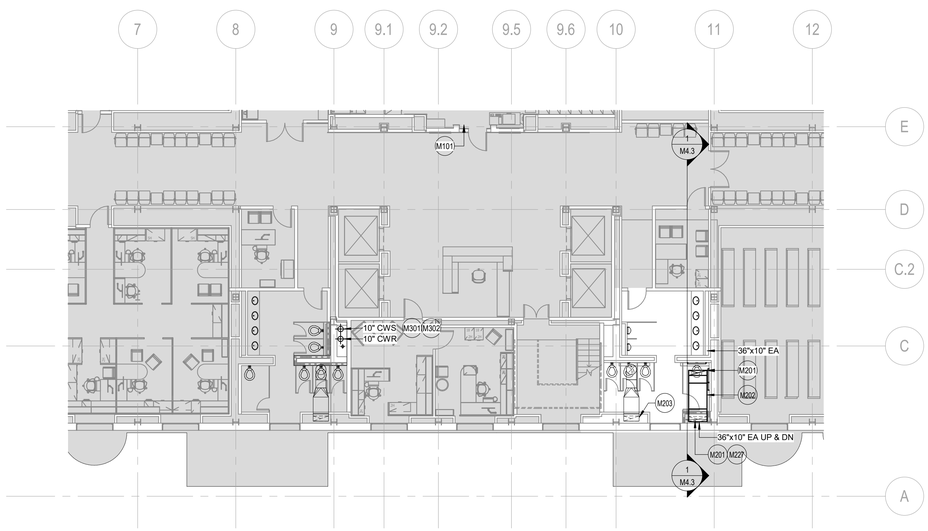
SCALE: 1" = 10'-0"



1 LEVEL 3 - MECHANICAL FLOOR PLAN
SCALE: 1" = 10'-0"

GENERAL SHEET NOTES

A. HAZARDOUS MATERIAL, INCLUDING BUT NOT LIMITED TO ASBESTOS, MAY BE ENCOUNTERED IN EXISTING PIPING, DUCTWORK, AND INSULATION. ENSURE ADEQUATE PROTOCOLS AND PROCEDURES ARE IN PLACE FOR LIFE SAFETY OR PERSONNEL BEFORE COMMENCING ANY WORK.
B. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
C. SYSTEMS WITH AN '(E)' SUBSCRIPT ARE EXISTING TO REMAIN. MAINTAIN ALL PIPING, DUCTWORK, SUPPORTS AND ACCESSORIES. PROTECT FROM DAMAGE DURING CONSTRUCTION.
D. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN, COORDINATE WITH THE OWNER 21 DAYS PRIOR TO SHUT DOWN. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. SEE DIVISION 01 DOCUMENTS FOR ADDITIONAL INFORMATION.
E. FOR ALL WORK ON OR WITHIN EXISTING EQUIPMENT, CONTRACTOR TO COORDINATE WITH EQUIPMENT MANUFACTURER TO MAINTAIN WARRANTIES AND UL LISTINGS OF EQUIPMENT AND SYSTEMS.
F. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION OF EQUIPMENT, PANELS, AND CONTROLLERS WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
G. ISOLATION VALVES ARE NORMALLY OPEN (N.O.) UNLESS SPECIFIED TO BE NORMALLY CLOSED (N.C.)
H. PRIOR TO ANY DEMOLITION AND NEW WORK, PERFORM TESTING AND BALANCING OF THE EXISTING CHILLED WATER PUMPING SYSTEMS SERVING THE BUILDING A. MEASURE PUMP FLOW, PUMP SUCTION PRESSURE, PUMP DISCHARGE PRESSURE, AND TOTAL SYSTEM FLOW AT EXISTING OPERATING PUMP SPEED. SUBMIT TAB REPORT TO OWNER AND EOR FOR REVIEW. DO NOT PROCEED WITH ANY WORK WITHOUT PRIOR TO FORMAL DIRECTION FROM THE OWNER.
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SHEET KEYNOTES

M101 SHADED AREA NOT IN SCOPE OF WORK FOR DIVISION 23. TYP.

M201 EMERGENCY REFRIGERANT EXHAUST DUCT (36 INCHES X 10INCHES) ROUTED THROUGH FIRE RATED SHAFT. WRAP THE ENTIRE EMERGENCY REFRIGERANT DUCTWORK WITH 2-HOUR RATED DUCT FIRE WRAP; BASIS OF DESIGN: 3M FIRE BARRIER DUCT WRAP 615. EXHAUST DUCT UP TO PENTHOUSE ROOF. EXHAUST DUCT DOWN TO CHILLER MECHANICAL ROOM. SEE M2.1/M4.1.B FOR PLAN/SECTION VIEW.

M202 TYP. EMERGENCY REFRIGERANT EXHAUST DUCT. ROUTE THE FIRE-WRAPPED DUCT ABOVE THE CEILING OF LEVEL 3. THE DUCT FIRE WRAP SHALL PROVIDE FIRE RESISTANCE FOR AT LEAST 2 HOURS. BASIS OF DESIGN: 3M FIRE BARRIER DUCT WRAP 615. ANY HANGER OR SUPPORT FOR THIS DUCT SHALL BE COATED WITH FIRE RESISTANT COATING/PAINT THAT PROVIDES AT LEAST 2 HOURS OF FIRE RESISTANCE.

M203 EXISTING TOILET EXHAUST DUCT (TO REMAIN) SHOWN FOR REFERENCE. NEW REFRIGERANT RELIEF EXHAUST DUCT SHALL BE ROUTED SIMILARLY; THROUGH THE WALL CAVITY.

M227 SEE M0.1 FOR INFORMATION SPECIFIC TO BASE DESIGN AND DEDUCT ALTERNATE ASSOCIATED WITH THE SHAFT FOR REFRIGERANT EXHAUST DUCT.

M301 DELEGATED DESIGN; PROVIDE VICTAULIC FLEX COUPLINGS AND/OR VICTAULIC EXPANSION JOINTS AS REQUIRED TO ACCOUNT FOR THERMAL EXPANSION OF PIPING SYSTEMS AND FOR SELECTING/DESIGNING EXPANSION JOINTS, LOOPS, AND SWING CONNECTIONS. PROVIDE A DELEGATED DESIGN SUBMITTAL STAMPED BY A LICENSED PROFESSIONAL FOR REVIEW AND APPROVAL BY EOR. REFER TO SPECIFICATION 230516 - "EXPANSION FITTINGS AND LOOPS FOR HVAC PIPING" AND SECTION 013573 "DELEGATED DESIGN REQUIREMENTS AND PROCEDURES".

M302 NEW CONDENSER WATER SUPPLY AND RETURN SERVICE TO/FROM THE COOLING TOWER ROOM AND CHILLED WATER ROOM. SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION.

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SEALS AND SIGNATURES

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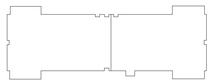
PROFESSIONAL ENGINEER

04/02/2026

KEYPLAN

NORTH



SHEET TITLE

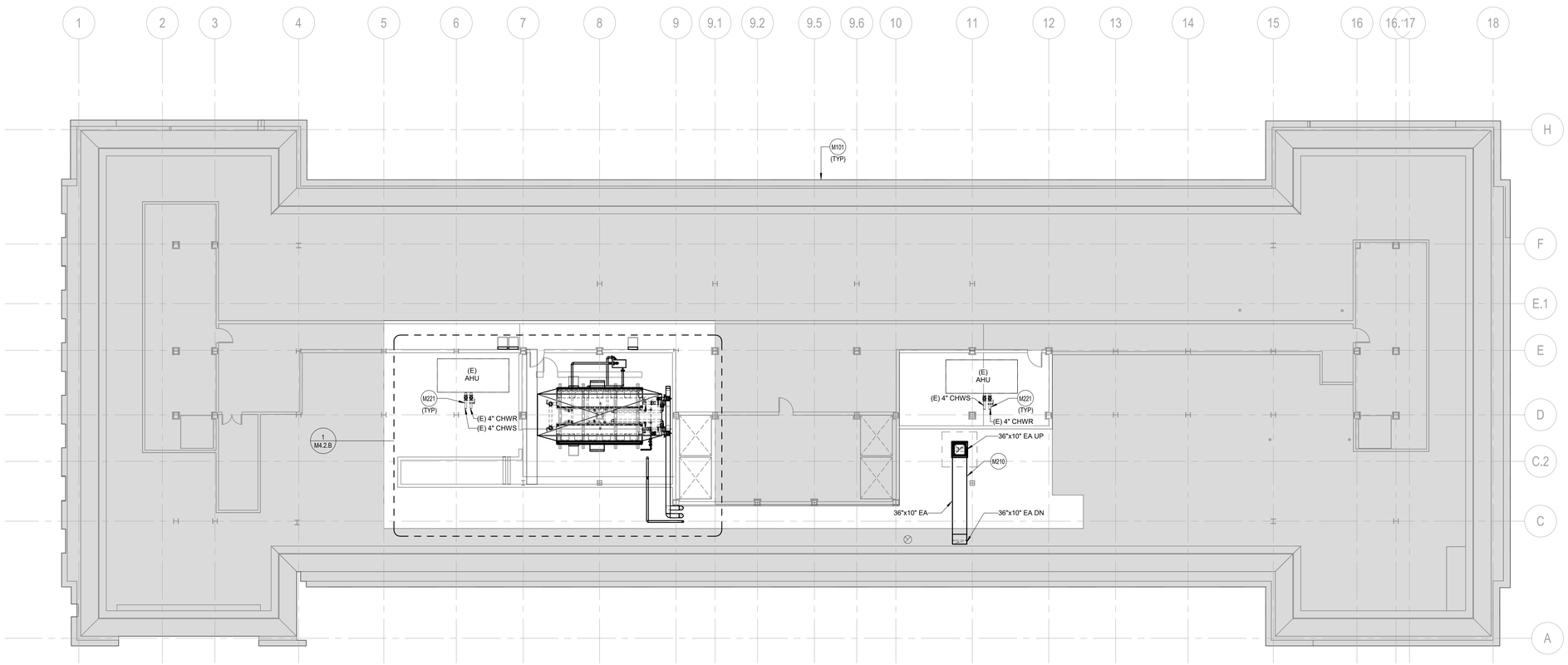
TYPICAL LEVELS
MECHANICAL NEW WORK

PROJECT NUMBER
00100451

SHEET NUMBER
M2.2

Author

Plot Date: 4/13/2026 4:10:45 PM



1 LEVEL 4 - MECHANICAL FLOOR PLAN
SCALE: 3/32" = 1'-0"

GENERAL SHEET NOTES

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B. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
C. SYSTEMS WITH AN '(E)' SUBSCRIPT ARE EXISTING TO REMAIN. MAINTAIN ALL PIPING, DUCTWORK, SUPPORTS AND ACCESSORIES. PROTECT FROM DAMAGE DURING CONSTRUCTION.
D. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN, COORDINATE WITH THE OWNER 21 DAYS PRIOR TO SHUT DOWN. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. SEE DIVISION 01 DOCUMENTS FOR ADDITIONAL INFORMATION.
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G. ISOLATION VALVES ARE NORMALLY OPEN (N.O.) UNLESS SPECIFIED TO BE NORMALLY CLOSED (N.C.)
H. PRIOR TO ANY DEMOLITION AND NEW WORK, PERFORM TESTING AND BALANCING OF THE EXISTING CHILLED WATER PUMPING SYSTEMS SERVING THE BUILDING A. MEASURE PUMP FLOW, PUMP SUCTION PRESSURE, PUMP DISCHARGE PRESSURE, AND TOTAL SYSTEM FLOW AT EXISTING OPERATING PUMP SPEED. SUBMIT TAB REPORT TO OWNER AND EOR FOR REVIEW. DO NOT PROCEED WITH ANY WORK WITHOUT PRIOR TO FORMAL DIRECTION FROM THE OWNER.
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SHEET KEYNOTES

M101	SHADED AREA NOT IN SCOPE OF WORK FOR DIVISION 23. TYP.
M210	REFRIGERANT RELIEF DUCT FROM CHILLER MECHANICAL ROOM TO PENTHOUSE ROOF. SEE M4.1, M4.2, M4.3 SHEET SERIES FOR ADDITIONAL INFORMATION.
M221	REFER TO M7.1, M8.1.A, M8.1.B AND M8.1.C FOR CONTROL LOGIC REQUIREMENTS.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IONEL PETRIS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER
04/02/2026

KEYPLAN

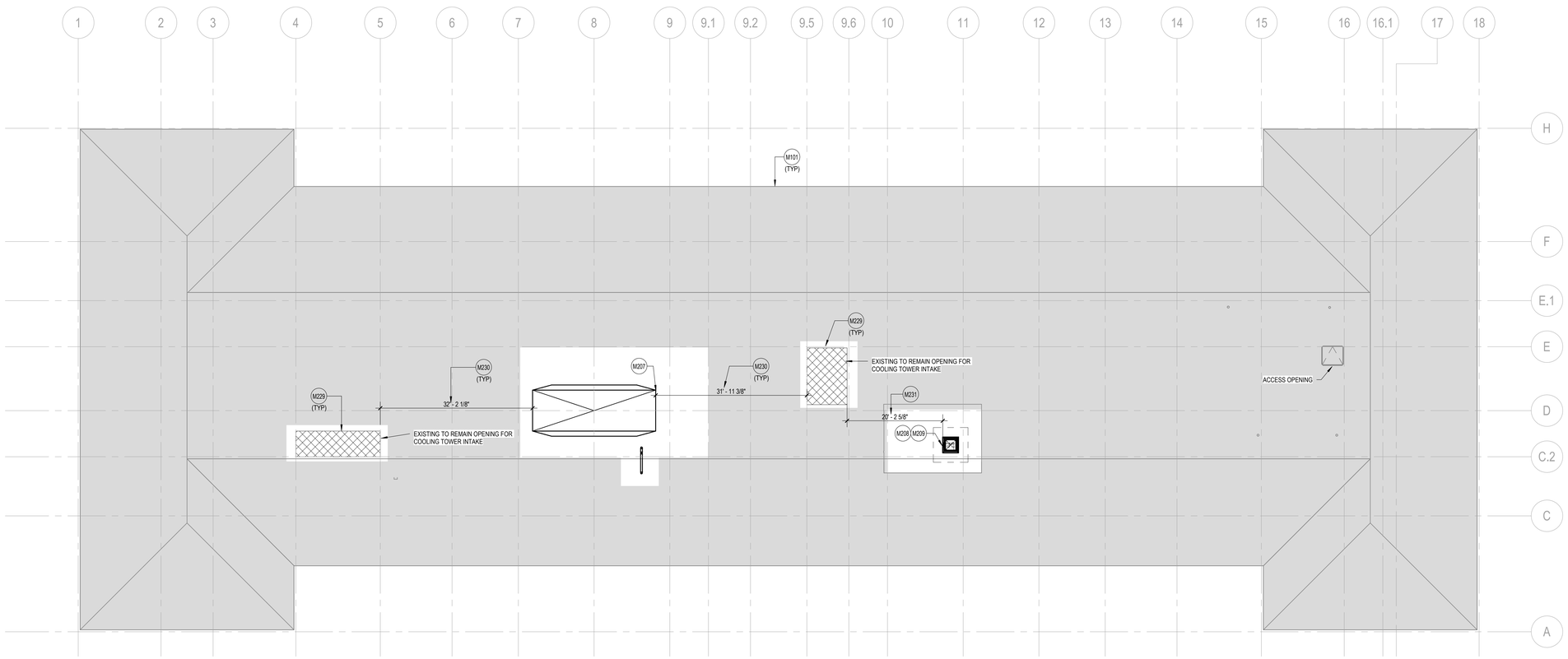
NORTH

SHEET TITLE
LEVEL 4 MECHANICAL
NEW WORK

00100451
PROJECT NUMBER

M2.3
SHEET NUMBER

Author
4/13/2026 4:10:49 PM
Plot Date:



1 ROOF LEVEL - MECHANICAL FLOOR PLAN
SCALE: 3/32" = 1'-0"

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SHEET KEYNOTES

M101 SHADED AREA NOT IN SCOPE OF WORK FOR DIVISION 23. TYP.

M207 NEW COOLING TOWER DISCHARGE DUCTWORK THROUGH THE EXISTING OPENING (FOR THIS PROJECT). COORDINATE WITH DC COURTS ON ROOFING PROJECT, AND EXPECTED LOCATION/DIMENSIONS OF OPENING. BASED ON THIS COORDINATION CONFIRM FINAL DIMENSION/LOCATION OF NEW EXHAUST DUCT WITH EOR OF THIS PROJECT BEFORE INSTALLATION.

M208 COORDINATE ROOF INSULATION AND CURB WITH EXISTING CONDITIONS. AT A MINIMUM, THE CURB SHALL BE EQUAL TO THICKNESS OF ROOF INSULATION. SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION.

M209 RELIEF HOOD FROM REFRIGERANT EXHAUST SYSTEM. REFER TO M4.1, M4.2, AND M4.3 FOR ADDITIONAL INFORMATION.

M229 KEYNOTE FOR OWNER INFORMATION FOR NEW ROOFING PROJECT - COOLING TOWER INTAKE OPENING. EXISTING TO REMAIN FOR THIS PROJECT (TASK ORDER 28). FOR THE NEW ROOFING PROJECT, PLEASE ENSURE THAT THE TOTAL OPENING AREA (TWO OPENINGS IN TOTAL) IS SIZED FOR A PRESSURE DROP OF NO MORE THAN 0.07 IN W.G. FOR TOTAL AIRFLOW OF 85,000 CFM ACROSS ALL OBSTRUCTIONS ALONG AIR PATH. MAINTAIN AIR INTAKE VELOCITY OF 450FPM OR LOWER.

M230 KEYNOTE FOR OWNER INFORMATION FOR NEW ROOFING PROJECT - SHOWN DIMENSION IS INTENDED TO CONVEY THE EXISTING SEPARATION BETWEEN COOLING TOWER AIR INTAKE AND AIR EXHAUST ONLY.

M231 CONTRACTOR TO FIELD COORDINATE THE EXHAUST LOCATION OF NEW OPENING WITH DC COURTS AND EOR. COORDINATE WITH DC COURTS ON THE NEW ROOFING PROJECT TO IDENTIFY POTENTIAL LOCATION OF COOLING TOWER AIR INTAKE. THE REFRIGERANT EXHAUST OPENING SHALL BE AT LEAST 15FT OFFSET FROM THIS COOLING TOWER INTAKE.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IONEL PETRIE
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER

04/02/2026

KEYPLAN

NORTH

SHEET TITLE
ROOF LEVEL MECHANICAL NEW WORK PLAN

00100451
PROJECT NUMBER

M2.4
SHEET NUMBER

Author

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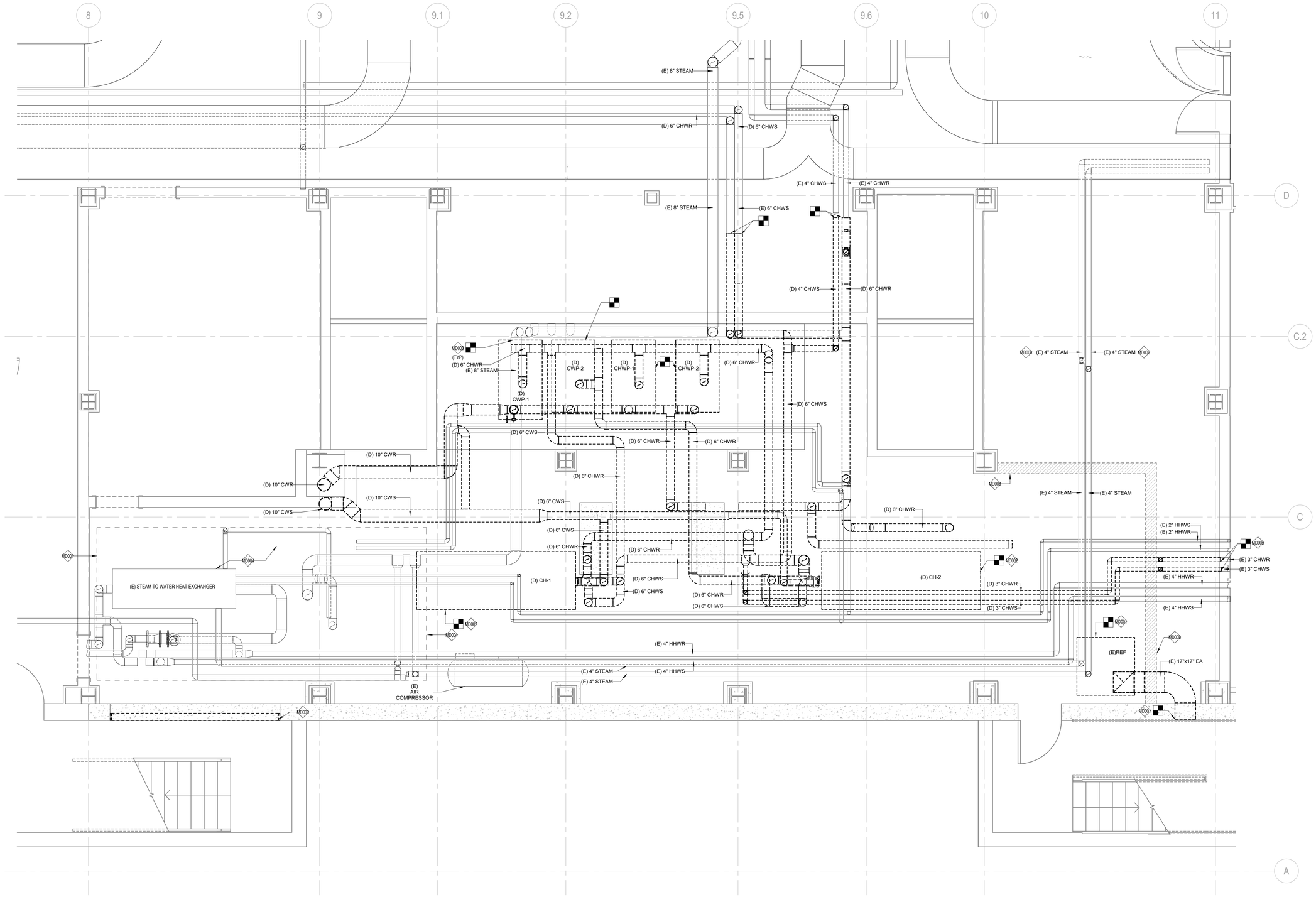
Plot Date:



1 BASEMENT - DEMOLITION WORK
SCALE: 3/8" = 1'-0"

GENERAL SHEET NOTES

A. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
B. **HAZARDOUS MATERIAL, INCLUDING BUT NOT LIMITED TO ASBESTOS, MAY BE ENCOUNTERED IN EXISTING PIPING, DUCTWORK AND INSULATION. ENSURE ADEQUATE PROTOCOLS AND PROCEDURES ARE IN PLACE FOR LIFE SAFETY OF PERSONNEL BEFORE COMMENCING ANY WORK.**
C. SYSTEMS WITH AN '(E)' SUBSCRIPT AND NON-DASHED LINETYPE ARE EXISTING TO REMAIN. MAINTAIN ALL PIPES, DUCTS, AIR TERMINALS, FITTINGS AND ACCESSORIES FOR CONTINUITY. PROTECT FROM DAMAGE DURING CONSTRUCTION.
D. SYSTEMS WITH AN '(D)' SUBSCRIPT ARE TO BE DISCONNECTED AND REMOVED. MAINTAIN ALL EXISTING TO REMAIN PIPES, DUCTS, AIR TERMINALS, FITTINGS AND ACCESSORIES FOR CONTINUITY.
E. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN, COORDINATE WITH THE OWNER 21 DAYS PRIOR TO SHUT DOWN. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. SEE DIVISION 01 DOCUMENTS FOR ADDITIONAL INFORMATION.
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J. PRIOR TO DEMOLISHING ANY PIPING, ENSURE ALL PIPING SYSTEMS ARE FULLY DRAINED OF WATER. PIPING SYSTEMS SHALL NOT HAVE STANDING WATER DURING DEMOLITION AND NEW CONSTRUCTION.

SHEET KEYNOTES

MD001	DISCONNECT AND REMOVE EXISTING EXHAUST FAN AND ASSOCIATED DUCTWORK AS SHOWN. REMOVE DUCT DANGERS AND SUPPORTS. SEAL ALL OPENINGS AFTER CONSTRUCTION.
MD002	DISCONNECT AND REMOVE EXISTING CHILLER. REMOVE AND DISCARD ALL GAUGES, SENSORS, VALVES, AND ALL PIPING AS SHOWN. ENGAGE A CERTIFIED PARTY TO REMOVE REFRIGERANT CHARGE FROM THE SYSTEM.
MD003	DISCONNECT AND REMOVE EXISTING CHWP-1, CHWP-2, CWP-1 AND CWP-2 PUMPS. REMOVE ALL PIPING, VALVES, SENSORS AND SUPPORTS.
MD004	EXISTING HEATING PLANT TO REMAIN. COORDINATE DEMOLITION AND NEW WORK SCOPE AROUND EXISTING STEAM AND HEATING HOT WATER SERVICE IN THE ROOM.
MD005	DISCONNECT EXISTING CHILLED WATER SUPPLY/RETURN SERVICE AT SHOWN POINT OF DISCONNECTION. REMOVE ALL SUPPORTS, ACCESSORIES AND INSULATION UP UNTIL SHOWN POINT.
MD006	EXISTING STEAM SERVICE TO REMAIN.
MD008	SEE ARCHITECTURAL DRAWINGS FOR DEMOLITION SCOPE PERTAINING THE WALL.
MD009	SEE ARCHITECTURAL DRAWINGS FOR DEMOLITION SCOPE PERTAINING GRAVITY MAKEUP AIR LOUVER.

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PRICING AND PERMIT		04/02/2026
100% CONSTRUCTION DOCUMENTS		02/12/2026
50% CONSTRUCTION DOCUMENTS		10/09/2025

SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IGNEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER
04/02/2026

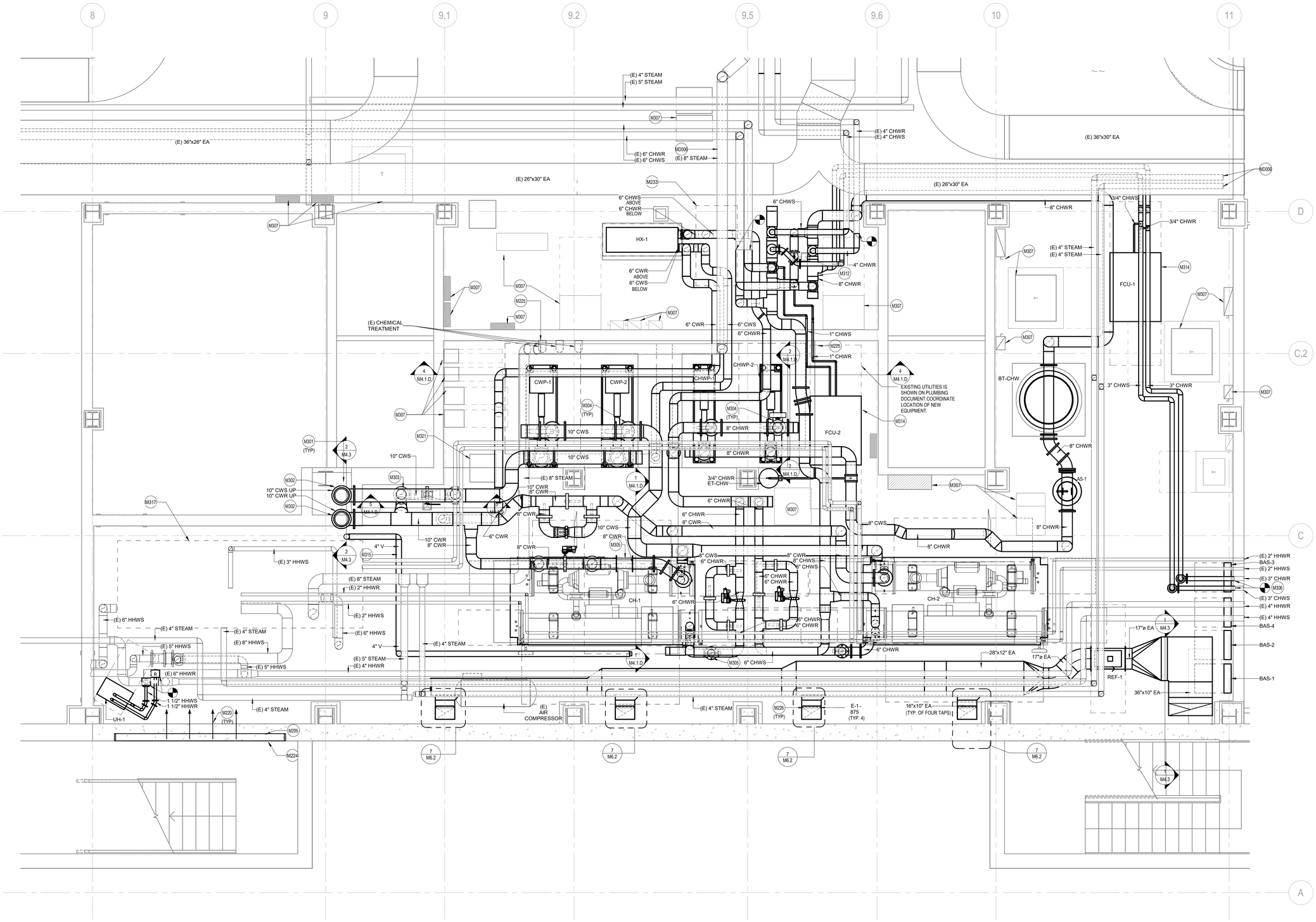
SHEET TITLE
ENLARGED DEMOLITION - BASEMENT MECHANICAL ROOM

00100451
PROJECT NUMBER

M4.1.A
SHEET NUMBER

Author

4/13/2026 4:10:55 PM
Plot Date:



1 BASEMENT - NEW WORK
SCALE: 3/8" = 1'-0"

GENERAL SHEET NOTES

A. **HAZARDOUS MATERIAL, INCLUDING BUT NOT LIMITED TO ASBBESTOS, MAY BE ENCOUNTERED IN EXISTING PIPING, DUCTWORK, AND INSULATION. ENSURE ADEQUATE PROTOCOLS AND PROCEDURES ARE IN PLACE FOR LIFE SAFETY OR PERSONNEL BEFORE COMMENCING ANY WORK.**
B. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
C. SYSTEMS WITH AN 'E)' SUBSCRIPT ARE EXISTING TO REMAIN. MAINTAIN ALL PIPING, DUCTWORK, SUPPORTS AND ACCESSORIES. PROTECT FROM DAMAGE DURING CONSTRUCTION.
D. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN, COORDINATE WITH THE OWNER 21 DAYS PRIOR TO SHUT DOWN. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. SEE DIVISION 01 DOCUMENTS FOR ADDITIONAL INFORMATION.
E. FOR ALL WORK ON OR WITHIN EXISTING EQUIPMENT, CONTRACTOR TO COORDINATE WITH EQUIPMENT MANUFACTURER TO MAINTAIN WARRANTIES AND UL LISTINGS OF EQUIPMENT AND SYSTEMS.
F. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION OF EQUIPMENT, PANELS, AND CONTROLLERS WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
G. ISOLATION VALVES ARE NORMALLY OPEN (N.O.) UNLESS SPECIFIED TO BE NORMALLY CLOSED (N.C.)
H. PRIOR TO ANY DEMOLITION AND NEW WORK, PERFORM TESTING AND BALANCING OF THE EXISTING CHILLED WATER PUMPING SYSTEMS SERVING THE BUILDING A. MEASURE PUMP FLOW, PUMP SUCTION PRESSURE, PUMP DISCHARGE PRESSURE. AND TOTAL SYSTEM FLOW AT EXISTING OPERATING PUMP SPEED. SUBMIT TAB REPORT TO OWNER AND EOR FOR REVIEW. DO NOT PROCEED WITH ANY WORK WITHOUT PRIOR TO FORMAL DIRECTION FROM THE OWNER.
I. PRIOR TO DEMOLISHING ANY PIPING, ENSURE ALL PIPING SYSTEMS ARE FULLY DRAINED OF WATER. PIPING SYSTEMS SHALL NOT HAVE STANDING WATER DURING DEMOLITION AND NEW CONSTRUCTION.

SHEET KEYNOTES

M205	SEE ARCHITECTURAL PLANS FOR SCOPE ASSOCIATED WITH MAKEUP AIR LOUVER FOR REFRIGERANT EXHAUST SYSTEM. PROVIDE MOTORIZED ACTUATOR TIED WITH BAS.
M220	ARROW INDICATE OUTSIDE AIRFLOW PATH THROUGH THE NEW LOUVERS INTO THE BASEMENT MECHANICAL ROOM.
M224	SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION. SEE MECHANICAL CONTROLS FOR ADDITIONAL INFORMATION. PROVIDE ATLEAST 50% FREE AREA ON ALL NEW MOTORIZED LOUVERS.
M225	ENGAGE THE CURRENT CHEMICAL TREATMENT CONTRACTOR FOR THIS BUILDING THROUGH OWNER. PROVIDE NEW CHEMICAL TREATMENT ONLY IF REQUIREMENTS OF 232513 AND 232516 CANNOT BE MET. USE EXISTING CHEMICAL TREATMENT FOR THE CHILLED WATER AND EXISTING CHEMICAL TREATMENT FOR CONDENSER WATER SYSTEM OTHERWISE.
M226	SEE SHEET M6.2 FOR MORE INFORMATION.
M233	DASHED LINE BOUNDARY INDICATE EXISTING TO REMAIN UNDERFLOOR ACCESS PANEL. MAINTAIN CLEARANCE ABOVE THE ACCESS DOOR.
M301	DELEGATED DESIGN: PROVIDE VICTAULIC FLEX COUPLINGS AND/OR VICTAULIC EXPANSION JOINTS AS REQUIRED TO ACCOUNT FOR THERMAL EXPANSION OF PIPING SYSTEMS AND FOR SELECTING/DESIGNING EXPANSION JOINTS, LOOPS, AND SWING CONNECTIONS. PROVIDE A DELEGATED DESIGN SUBMITTAL STAMPED BY A LICENSED PROFESSIONAL FOR REVIEW AND APPROVAL BY EOR. REFER TO SPECIFICATION 230516 - "EXPANSION FITTINGS AND LOOPS FOR HVAC PIPING" AND SECTION 013573 "DELEGATED DESIGN REQUIREMENTS AND PROCEDURES".
M302	NEW CONDENSER WATER SUPPLY AND RETURN SERVICE TO/FROM THE COOLING TOWER ROOM AND CHILLED WATER ROOM. SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION.
M303	CONDENSER LOOP BYPASS VALVE. SEE M4.1.D FOR SECTION AND 3D VIEW. SEE M5.2 FOR SYSTEM DIAGRAM. SEE MECHANICAL SCHEDULES FOR BYPASS VALVE SIZING.
M304	HYDRONIC PIPING TO PUMP SUCTION/DISCHARGE. PROVIDE SUCTION DIFFUSER ON IMPELLER INLET. MOUNT PUMP AND SUCTION DIFFUSER ON VIBRATION ISOLATION PADS.
M305	RECOMMENDED LOCATION FOR FLOW METER.
M306	CONNECT NEW CHILLED WATER SUPPLY AND RETURN PIPING AS SHOWN, AT POINT OF CONNECTION.
M307	ELECTRICAL EQUIPMENT/FIXTURES SHOWN ONLY FOR COORDINATION.
M312	SEE THE 3D VIEW FOR THIS SECTION OF PIPING ON SHEET M4.1.E.
M314	ROUTE CONDENSATE PIPING TO NEAREST DRAIN. HORIZONTAL RUN OF PIPING SHALL HAVE A SLOP NO LESS THAN 1%. ANY ELBOWS WITHIN THE CONDENSATE DRAIN PIPING SHALL BE 45 DEGREE.
M315	4IN NPS VENT PIPING ROUTED TO THE ROOF FOR CHILLER CH-1 AND CH-2. COORDINATE EXACT LOCATION OF VENT CONNECTIONS WITH PURCHASED PRODUCT, AND PER MANUFACTURER RECOMMENDATION.
M317	EXISTING HEAT EXCHANGER TO REMAIN.
M321	SEE ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION. NO PIPING SHALL BE ROUTED UNDER THE CLEARANCE FOR THE PULL BOX.
MD006	EXISTING STEAM SERVICE TO REMAIN.

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DISTRICT OF COLUMBIA
LIONEL PETRUE
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER
04/02/2026

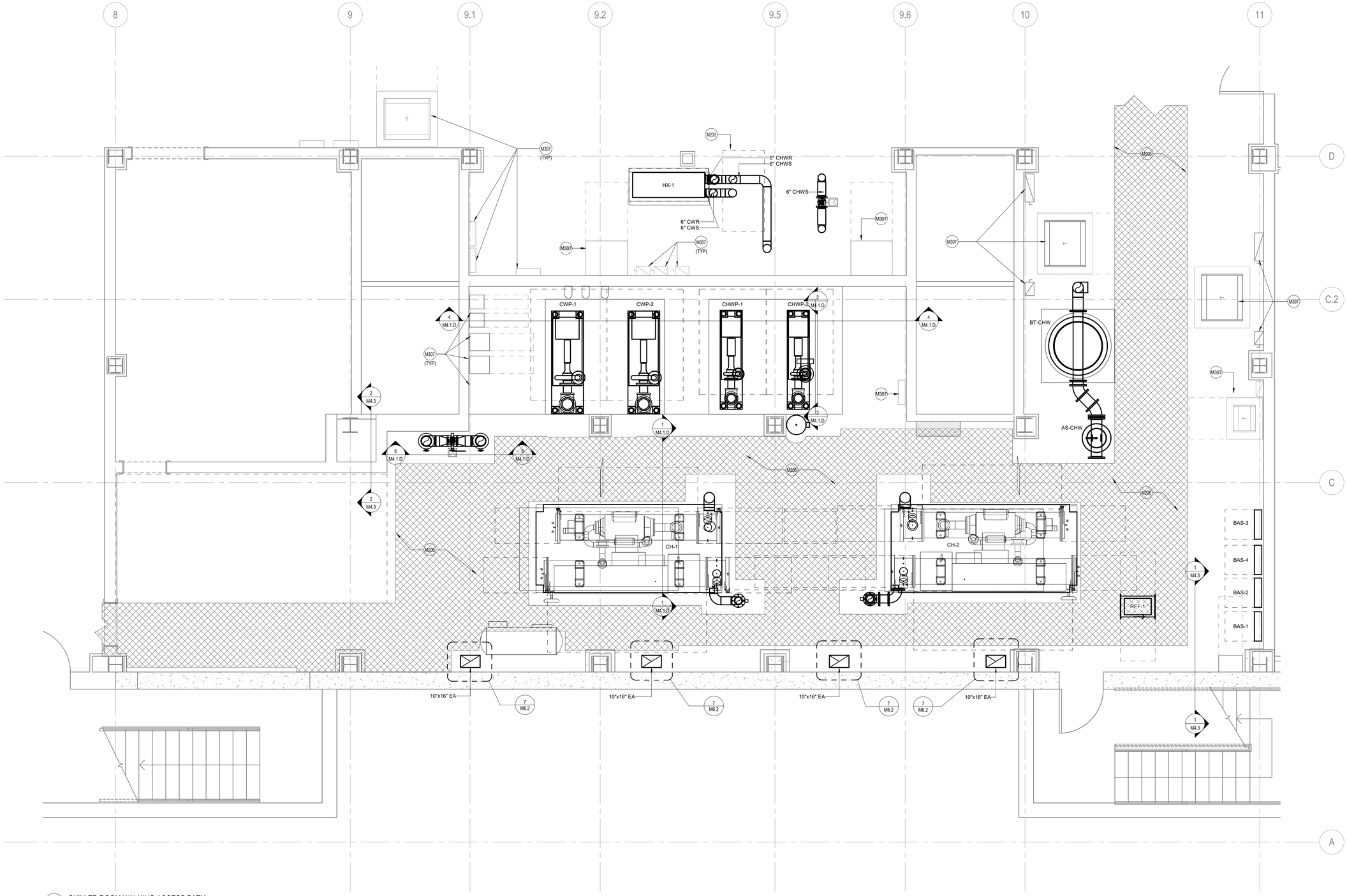
SHEET TITLE
ENLARGED NEW WORK - BASEMENT MECHANICAL ROOM

PROJECT NUMBER
00100451

SHEET NUMBER
M4.1.B

Author

Plot Date: 4/13/2026 4:29:03 PM



1 CHILLER ROOM WALKING ACCESS PATH
SCALE: 3/8" = 1'-0"

GENERAL SHEET NOTES

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B. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
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G. ISOLATION VALVES ARE NORMALLY OPEN (N.O.) UNLESS SPECIFIED TO BE NORMALLY CLOSED (N.C.)

H. PRIOR TO ANY DEMOLITION AND NEW WORK, PERFORM TESTING AND BALANCING OF THE EXISTING CHILLED WATER PUMPING SYSTEMS SERVING THE BUILDING A. MEASURE PUMP FLOW, PUMP SUCTION PRESSURE, PUMP DISCHARGE PRESSURE. AND TOTAL SYSTEM FLOW AT EXISTING OPERATING PUMP SPEED. SUBMIT TAB REPORT TO OWNER AND EOR FOR REVIEW. DO NOT PROCEED WITH ANY WORK WITHOUT PRIOR TO FORMAL DIRECTION FROM THE OWNER.
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SHEET KEYNOTES

M206 HATCHED REGION IS MEANT TO CONVEY THE WALKING PATH THROUGH THE SPACE.
M233 DASHED LINE BOUNDARY INDICATE EXISTING TO REMAIN UNDERFLOOR ACCESS PANEL. MAINTAIN CLEARANCE ABOVE THE ACCESS DOOR.
M307 ELECTRICAL EQUIPMENT/FIXTURES SHOWN ONLY FOR COORDINATION.

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IONEL PETRIS
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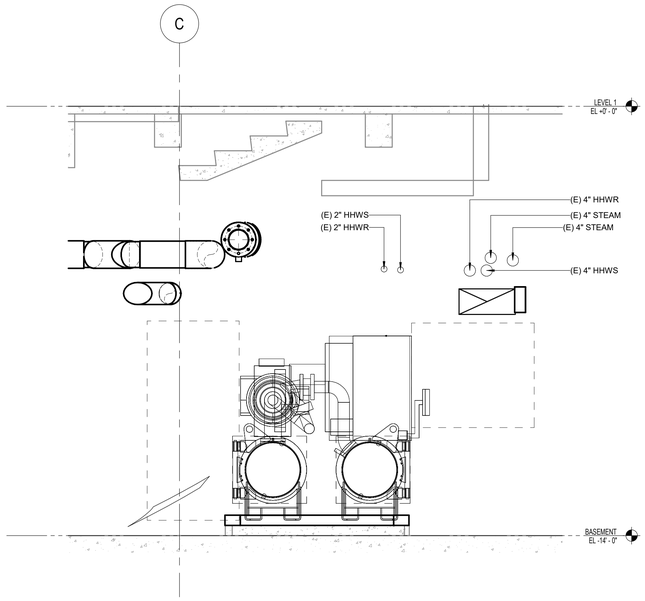
04/02/2026

SHEET TITLE
ENLARGED NEW WORK - BASEMENT MECHANICAL ROOM ACCESS AND CONTROLS

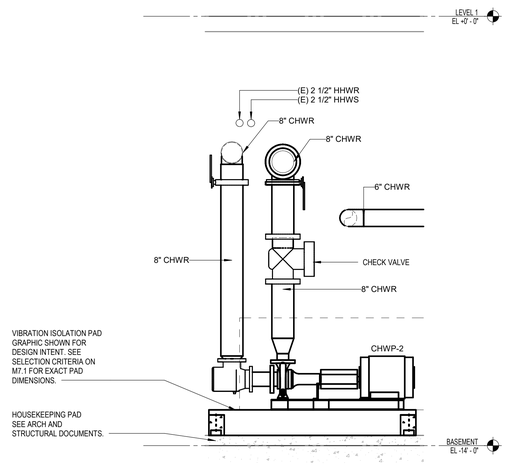
PROJECT NUMBER
00100451

SHEET NUMBER
M4.1.C

Author
Plot Date: 4/13/2026 4:11:06 PM



1 TYPICAL CHILLER MARINE BOX CONNECTIONS
SCALE: 1/2" = 1'-0"



2 TYPICAL PUMP SECTION
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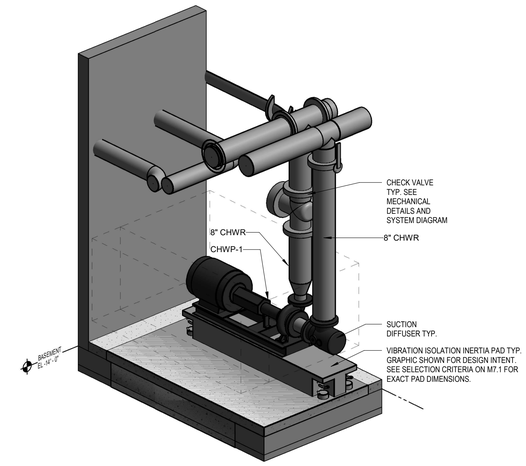

3 TYPICAL PUMP 3D SECTION - CHWP-2
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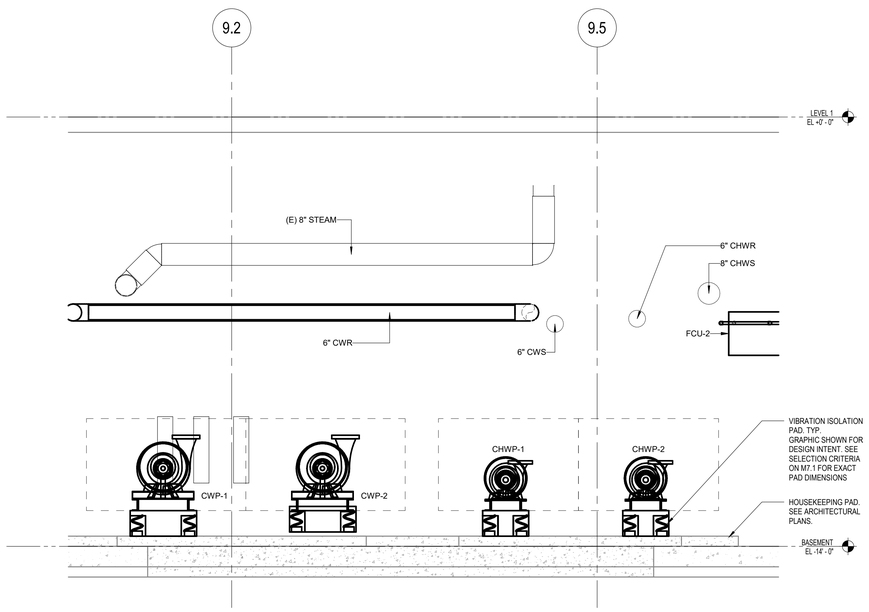
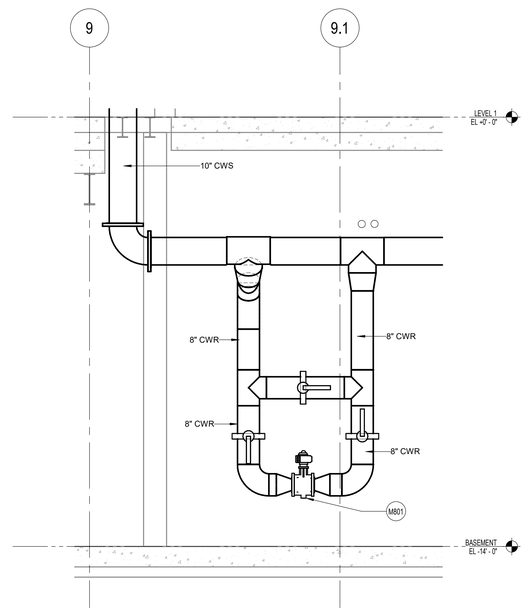
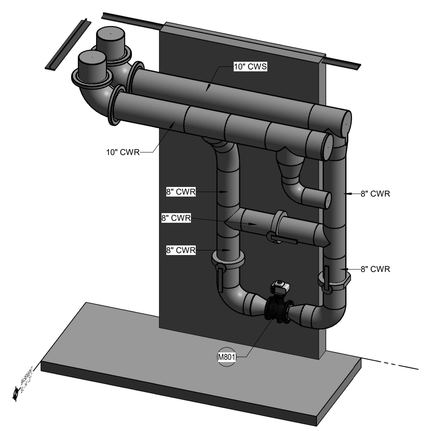


4 CH-2 ISOLATION VALVE SECTION
SCALE: 1/2" = 1'-0"



5 CONDENSER SYSTEM BYPASS VALVE
SCALE: 1/2" = 1'-0"



6 CONDENSER SYSTEM BYPASS VALVE - 3D
SCALE: NOT TO SCALE

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IONEL PETRUS
No. PE907217
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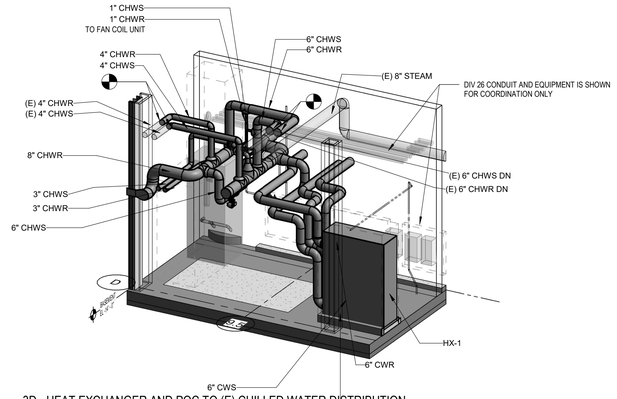
04/02/2026

SHEET TITLE
MECHANICAL SECTIONS - BASEMENT MECHANICAL ROOM

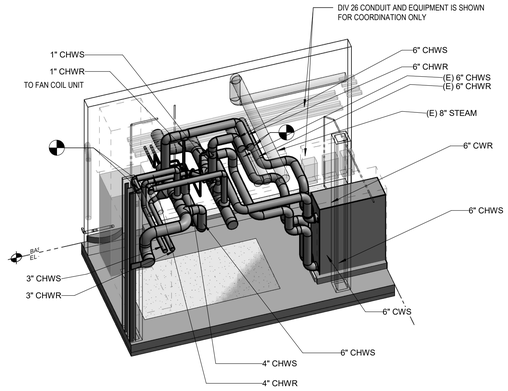
00100451
PROJECT NUMBER

M4.1.D
SHEET NUMBER

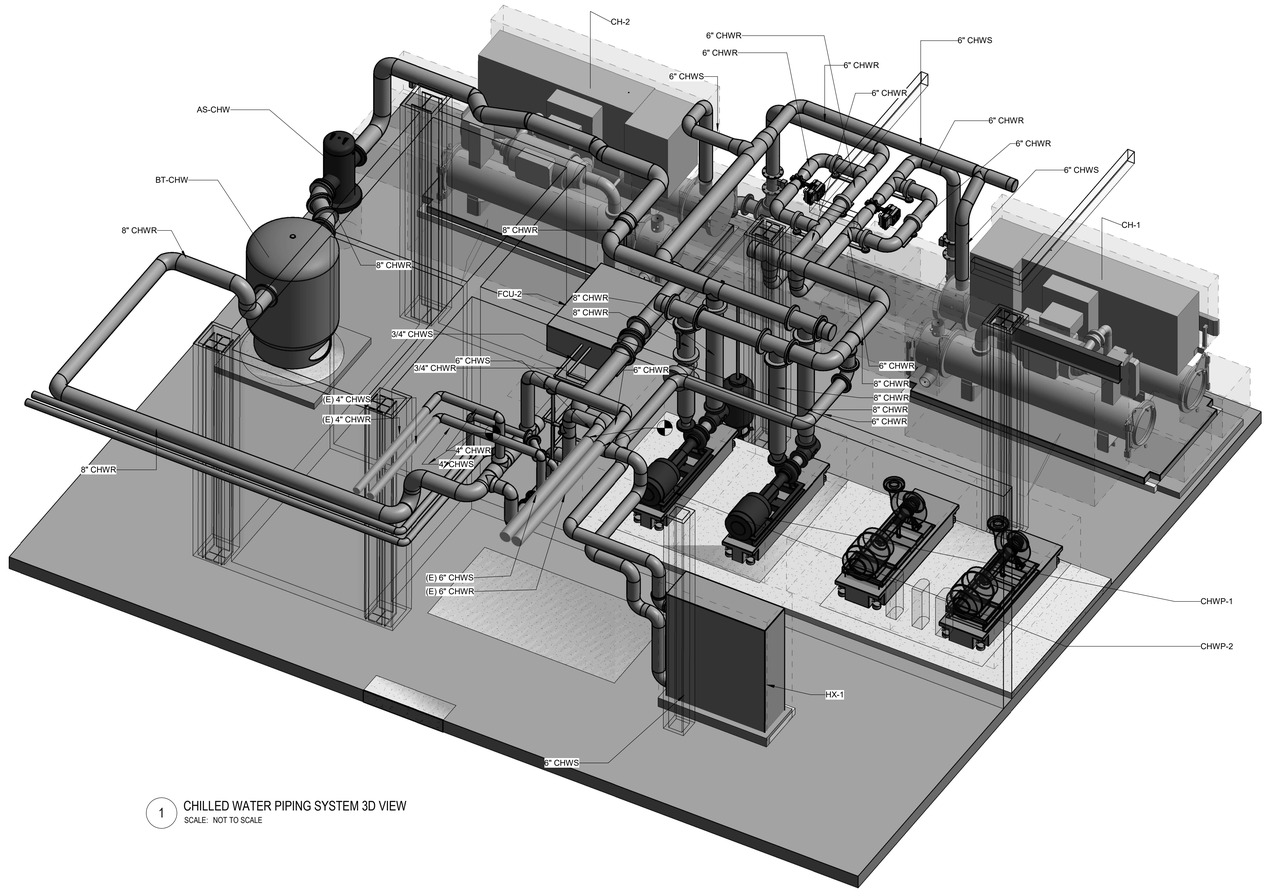
Author
Plot Date: 4/13/2026 4:11:13 PM



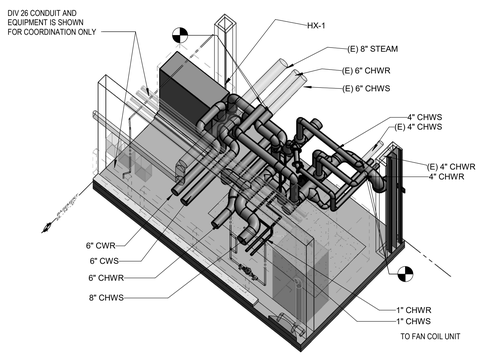
3 3D - HEAT EXCHANGER AND POC TO (E) CHILLED WATER DISTRIBUTION - PERSPECTIVE A
SCALE: NOT TO SCALE



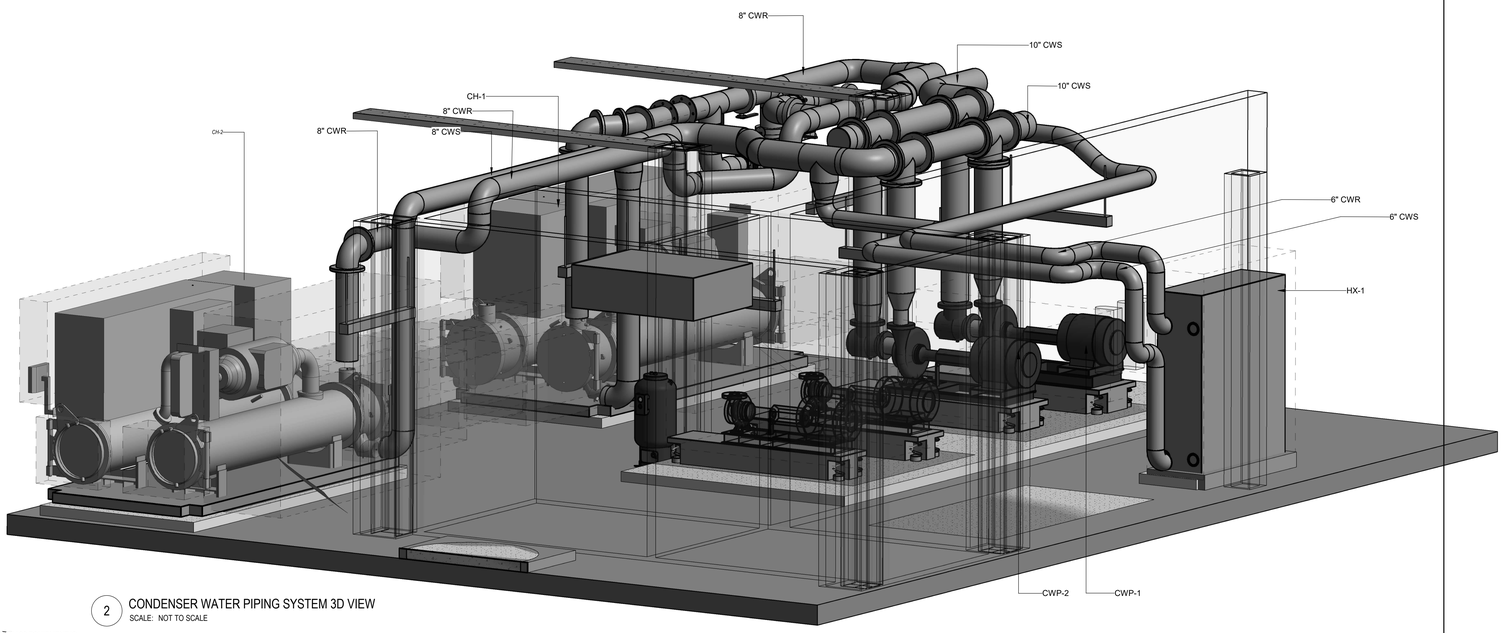
4 3D - HEAT EXCHANGER AND POC TO (E) CHILLED WATER DISTRIBUTION - PERSPECTIVE B
SCALE: NOT TO SCALE



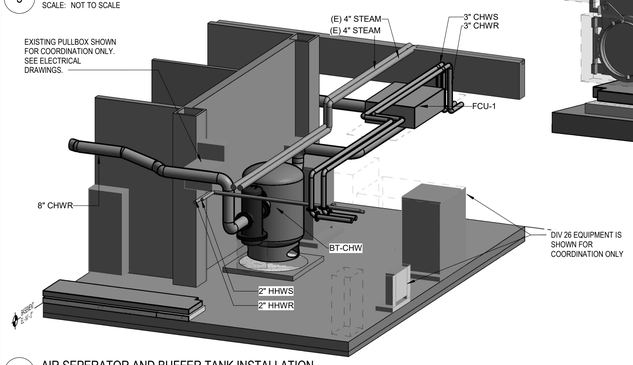
1 CHILLED WATER PIPING SYSTEM 3D VIEW
SCALE: NOT TO SCALE



5 3D - HEAT EXCHANGER AND POC TO (E) CHILLED WATER DISTRIBUTION - PERSPECTIVE C
SCALE: NOT TO SCALE



2 CONDENSER WATER PIPING SYSTEM 3D VIEW
SCALE: NOT TO SCALE



6 AIR SEPERATOR AND BUFFER TANK INSTALLATION
SCALE: NOT TO SCALE

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3D NEW WORK - BASEMENT MECHANICAL VIEW

PROJECT NUMBER
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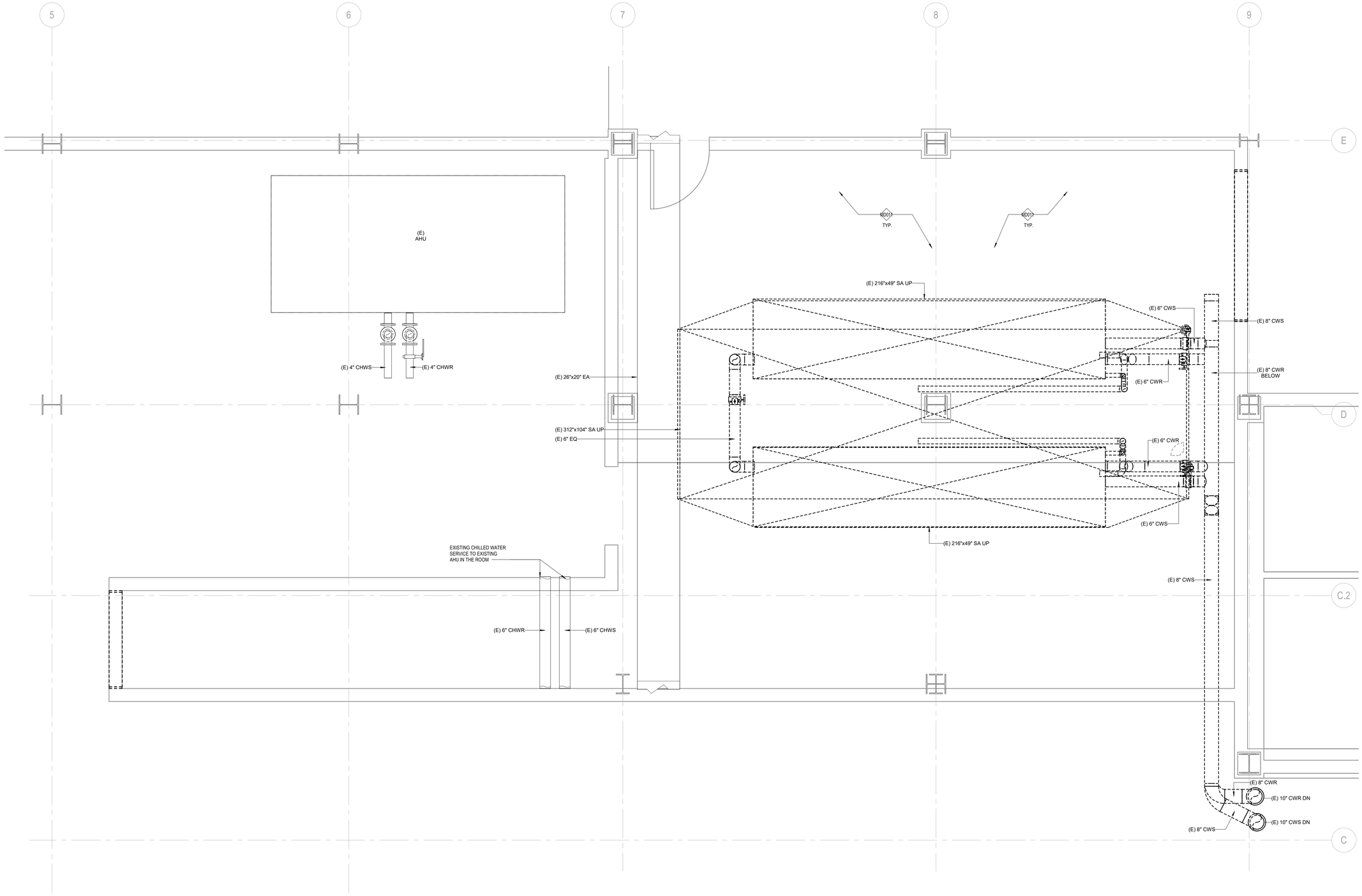

1 LEVEL 4 - DEMOLITION WORK
SCALE: 1/2" = 1'-0"

GENERAL SHEET NOTES

A. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
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C. SYSTEMS WITH AN '(E)' SUBSCRIPT AND NON-DASHED LINETYPE ARE EXISTING TO REMAIN. MAINTAIN ALL PIPES, DUCTS, AIR TERMINALS, FITTINGS AND ACCESSORIES FOR CONTINUITY. PROTECT FROM DAMAGE DURING CONSTRUCTION.
D. SYSTEMS WITH AN '(D)' SUBSCRIPT ARE TO BE DISCONNECTED AND REMOVED. MAINTAIN ALL EXISTING TO REMAIN PIPES, DUCTS, AIR TERMINALS, FITTINGS AND ACCESSORIES FOR CONTINUITY.
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H. PRIOR TO ANY DEMOLITION AND NEW WORK, PERFORM TESTING AND BALANCING OF THE EXISTING CHILLED WATER PUMPING SYSTEMS SERVING THE BUILDING A. MEASURE PUMP FLOW, PUMP SUCTION PRESSURE, PUMP DISCHARGE PRESSURE, AND TOTAL SYSTEM FLOW AT EXISTING OPERATING PUMP SPEED. SUBMIT TAB REPORT TO OWNER AND EOR FOR REVIEW. DO NOT PROCEED WITH ANY WORK WITHOUT PRIOR TO FORMAL DIRECTION FROM THE OWNER.
I. ENGAGE A CERTIFIED PROFESSIONAL TO DISCONNECT, REMOVE AND DISCARD REFRIGERANT CHARGE FROM THE SYSTEM. COORDINATE WITH BUILDING OWNER ON SAFETY PROCEDURES.
J. PRIOR TO DEMOLISHING ANY PIPING, ENSURE ALL PIPING SYSTEMS ARE FULLY DRAINED OF WATER. PIPING SYSTEMS SHALL NOT HAVE STANDING WATER DURING DEMOLITION AND NEW CONSTRUCTION.

◯ SHEET KEYNOTES

MD011	DISCONNECT AND REMOVE COOLING TOWER, ALL PIPING, COOLING TOWER SUPPORTS, AND ACCESSORIES IN ITS ENTIRETY. SEE DRAWINGS FROM OTHER TRADES.

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50% CONSTRUCTION DOCUMENTS		10/09/2025

SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IONEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER
04/02/2026

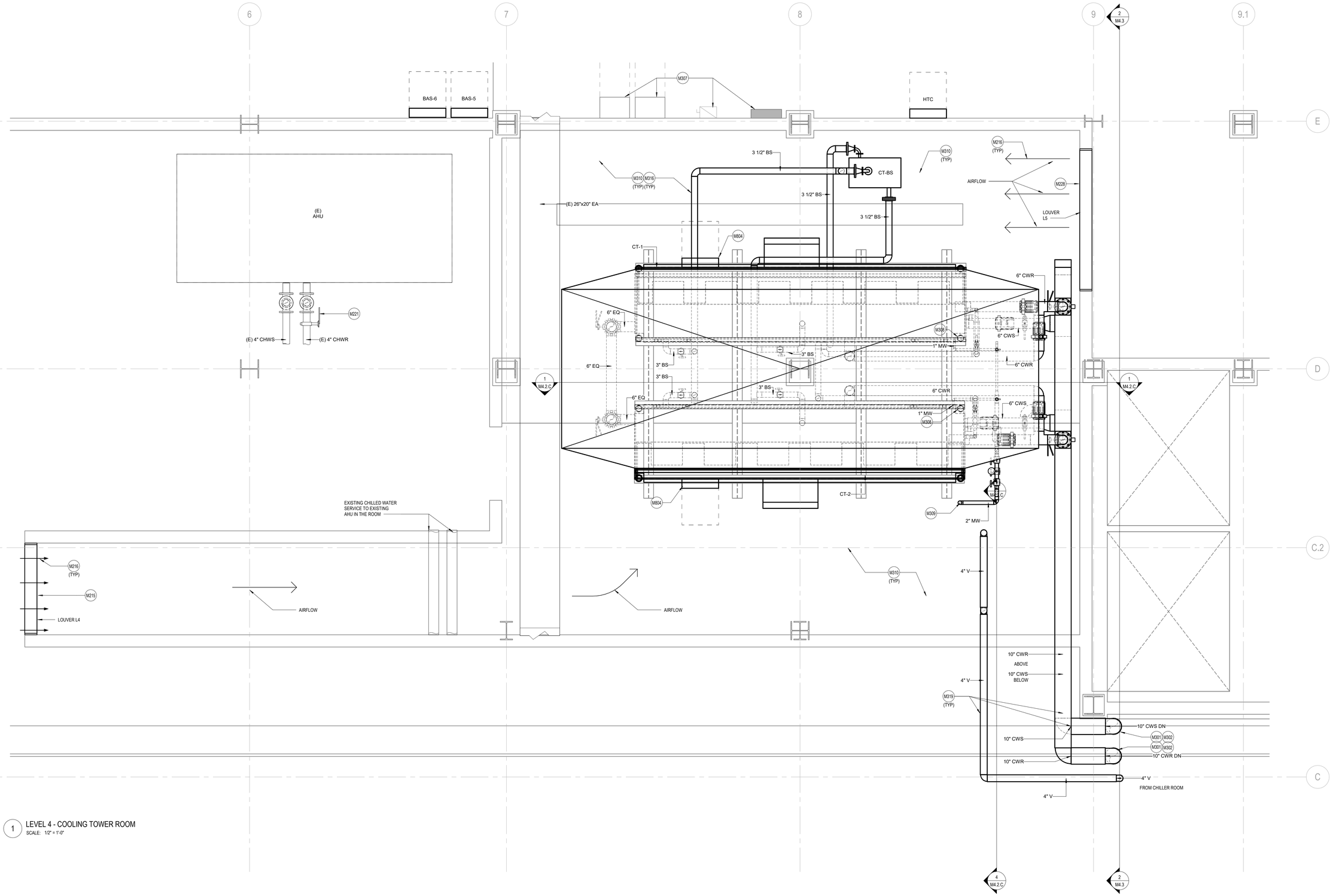
SHEET TITLE
ENLARGED DEMOLITION - COOLING TOWER ROOM

PROJECT NUMBER
00100451

SHEET NUMBER
M4.2.A

Author

Plot Date: 4/13/2026 4:11:30 PM



1 LEVEL 4 - COOLING TOWER ROOM
SCALE: 1/2" = 1'-0"

GENERAL SHEET NOTES

A. **HAZARDOUS MATERIAL, INCLUDING BUT NOT LIMITED TO ASBESTOS, MAY BE ENCOUNTERED IN EXISTING PIPING, DUCTWORK, AND INSULATION. ENSURE ADEQUATE PROTOCOLS AND PROCEDURES ARE IN PLACE FOR LIFE SAFETY OR PERSONNEL BEFORE COMMENCING ANY WORK.**
B. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
C. SYSTEMS WITH AN '(E)' SUBSCRIPT ARE EXISTING TO REMAIN. MAINTAIN ALL PIPING, DUCTWORK, SUPPORTS AND ACCESSORIES. PROTECT FROM DAMAGE DURING CONSTRUCTION.
D. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN, COORDINATE WITH THE OWNER 21 DAYS PRIOR TO SHUT DOWN. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. SEE DIVISION 01 DOCUMENTS FOR ADDITIONAL INFORMATION.
E. FOR ALL WORK ON OR WITHIN EXISTING EQUIPMENT, CONTRACTOR TO COORDINATE WITH EQUIPMENT MANUFACTURER TO MAINTAIN WARRANTIES AND UL LISTINGS OF EQUIPMENT AND SYSTEMS.
F. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION OF EQUIPMENT, PANELS, AND CONTROLLERS WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
G. ISOLATION VALVES ARE NORMALLY OPEN (N.O.) UNLESS SPECIFIED TO BE NORMALLY CLOSED (N.C.)
H. PRIOR TO ANY DEMOLITION AND NEW WORK, PERFORM TESTING AND BALANCING OF THE EXISTING CHILLED WATER PUMPING SYSTEMS SERVING THE BUILDING A. MEASURE PUMP FLOW, PUMP SUCTION PRESSURE, PUMP DISCHARGE PRESSURE, AND TOTAL SYSTEM FLOW AT EXISTING OPERATING PUMP SPEED. SUBMIT TAB REPORT TO OWNER AND EOR FOR REVIEW. DO NOT PROCEED WITH ANY WORK WITHOUT PRIOR TO FORMAL DIRECTION FROM THE OWNER.
I. PRIOR TO DEMOLISHING ANY PIPING, ENSURE ALL PIPING SYSTEMS ARE FULLY DRAINED OF WATER. PIPING SYSTEMS SHALL NOT HAVE STANDING WATER DURING DEMOLITION AND NEW CONSTRUCTION.

SHEET KEYNOTES

M215 NEW COOLING TOWER AIR INTAKE LOUVER. SEE M7.1 FOR ADDITIONAL INFORMATION. ALSO SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.
M216 ARROW INDICATE OUTSIDE AIRFLOW PATH THROUGH THE LOUVER INTO THE COOLING TOWER ROOM.
M221 REFER TO M7.1, M8.1.A, M8.1.B AND M8.1.C FOR CONTROL LOGIC REQUIREMENTS.
M228 NEW COOLING TOWER AIR INTAKE LOUVER CONNECTED TO EXISTING TO REMAIN INTAKE DUCT. SEE M7.1 FOR ADDITIONAL INFORMATION. ALSO SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.
M301 DELEGATED DESIGN; PROVIDE VICTAULIC FLEX COUPLINGS AND/OR VICTAULIC EXPANSION JOINTS AS REQUIRED TO ACCOUNT FOR THERMAL EXPANSION OF PIPING SYSTEMS AND FOR SELECTING/DESIGNING EXPANSION JOINTS, LOOPS, AND SWING CONNECTIONS. PROVIDE A DELEGATED DESIGN SUBMITTAL STAMPED BY A LICENSED PROFESSIONAL FOR REVIEW AND APPROVAL BY EOR. REFER TO SPECIFICATION 230516 - "EXPANSION FITTINGS AND LOOPS FOR HVAC PIPING" AND SECTION 013573 "DELEGATED DESIGN REQUIREMENTS AND PROCEDURES".
M302 NEW CONDENSER WATER SUPPLY AND RETURN SERVICE TO/FROM THE COOLING TOWER ROOM AND CHILLED WATER ROOM. SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION.
M307 ELECTRICAL EQUIPMENT/FIXTURES SHOWN ONLY FOR COORDINATION.
M308 COOLING TOWER MAKEUP WATER TYP. MAKEUP WATER VALVE SHALL BE INTERLOCKED WITH WATER LEVEL SENSOR. PROVIDE 20 GPM OF MAKEUP WATER AT 30 PSI AT THIS POINT. COORDINATE WITH PLUMBING SYSTEM.
M309 MAKEUP WATER CONNECTION TO EXISTING BUILDING PLUMBING MAKEUP SYSTEM. SEE PLUMBING DOCUMENTS FOR ADDITIONAL INFORMATION.
M310 HEAT TRACE ALL NEW PIPING (HVAC AND PLUMBING). PROVIDE HEAT TRACE ON CONTROL VALVES, FITTINGS AND ACCESSORIES.
M316 SHOWN PIPING FOR THE COOLING TOWER REPRESENTS POINTS OF CONNECTION TO THE BASIS OF DESIGN EQUIPMENT. CONTRACTOR SHALL COORDINATE THE PIPING AND PHYSICAL LOCATION OF CONNECTIONS WITH PURCHASED EQUIPMENT. SEE SHEET M5.2 FOR ADDITIONAL INFORMATION.
M319 SEE DETAIL 8 ON M6.2 FOR ADDITIONAL INFORMATION SPECIFIC TO HANGERS AND SUPPORTS.
M804 PROVIDE A MANUFACTURER FURNISHED MANUFACTURER INSTALLED COOLING TOWER PANEL, INSTALLED AT ACCESSIBLE HEIGHT ON THE TOWER. HARDWIRE ALL MANUFACTURER PROVIDED POINTS TO THIS CENTRALIZED PANEL FOR EASIER BAS INTEGRATION BY TCC. PROVIDE ANY/ALL ACCESSORIES NEEDED TO INTEGRATE WITH PURCHASED COMMUNICATION PROTOCOL.

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SEALS AND SIGNATURES

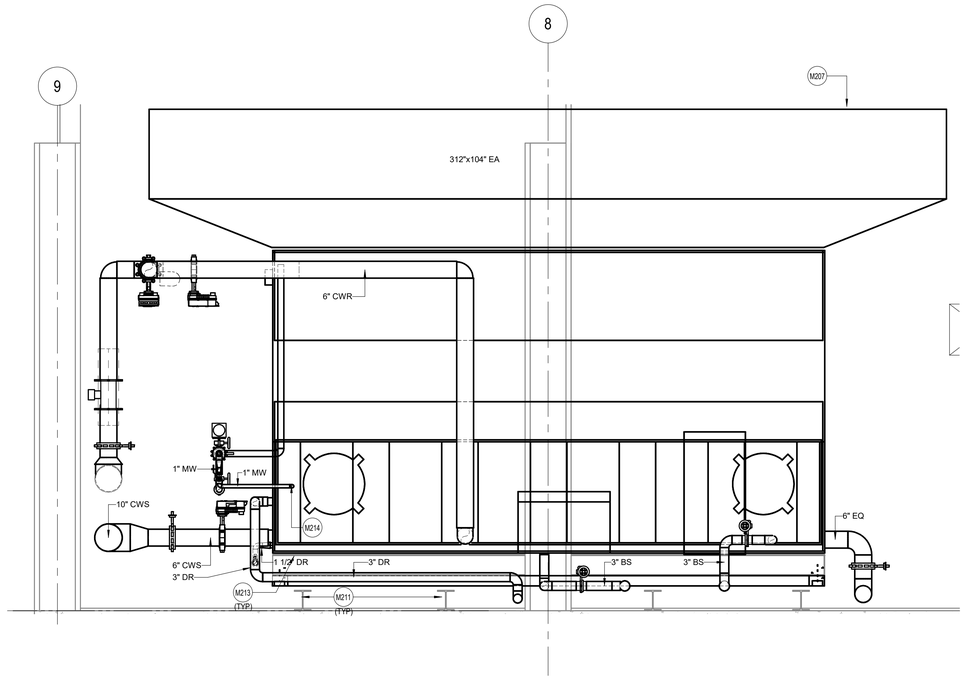
DISTRICT OF COLUMBIA
IONEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER
04/02/2026

SHEET TITLE
ENLARGED NEW WORK - COOLING TOWER ROOM

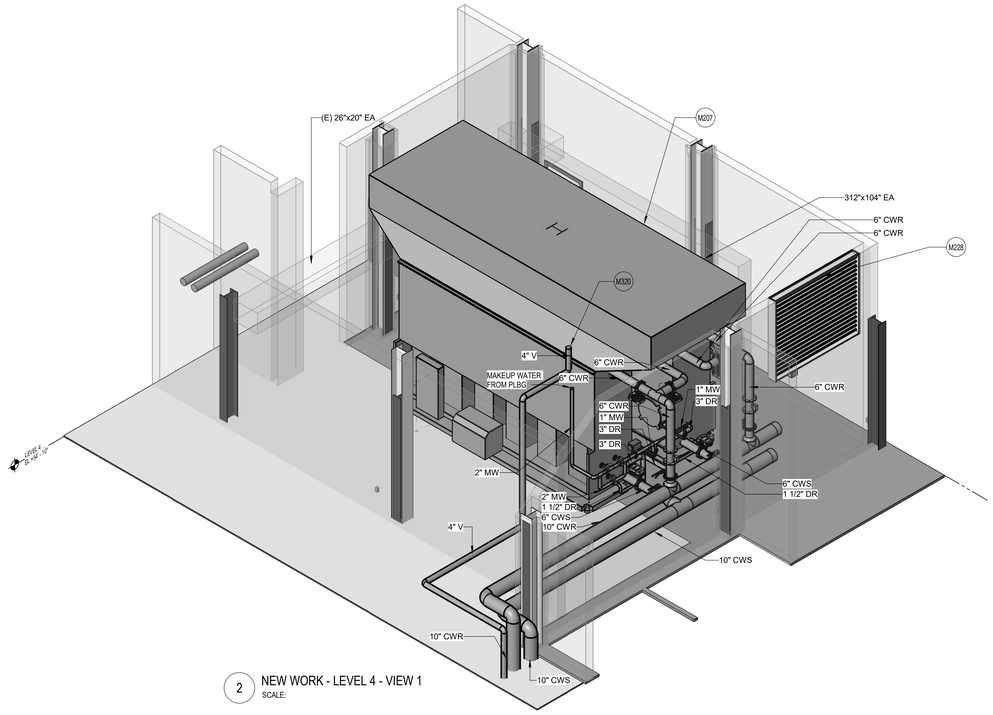
PROJECT NUMBER
00100451

SHEET NUMBER
M4.2.B

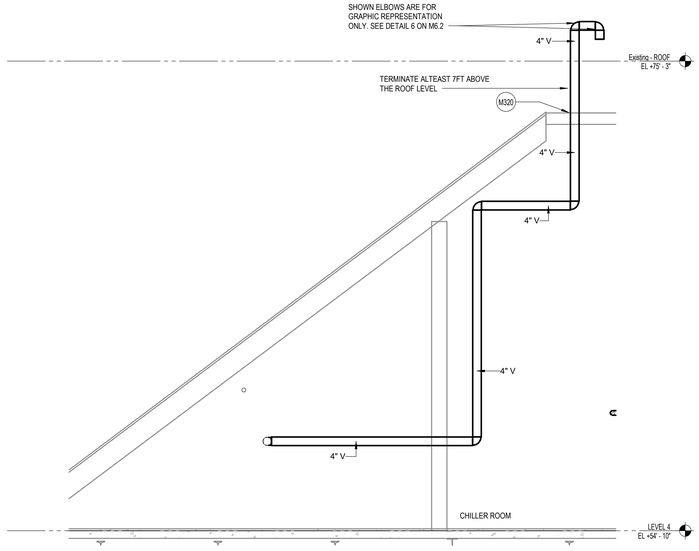
Author
Plot Date: 4/13/2026 4:11:34 PM



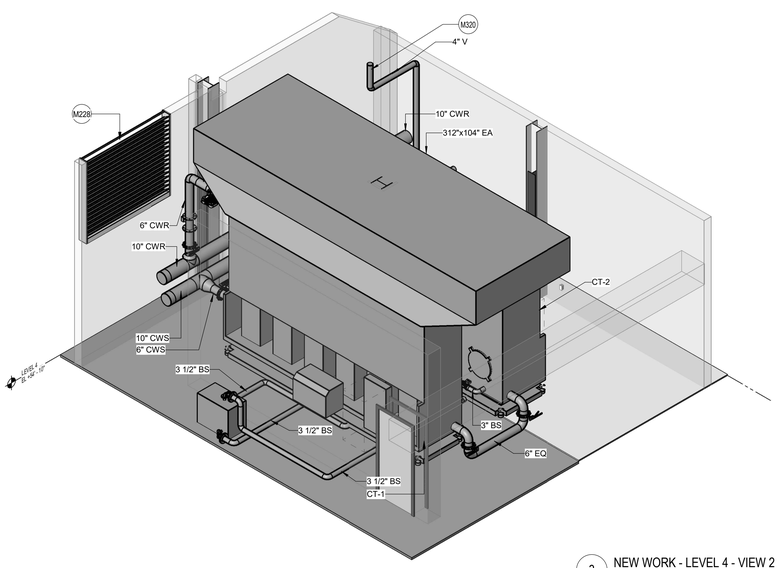
1 COOLING TOWER TOP SECTION VIEW
SCALE: 1/2" = 1'-0"



2 NEW WORK - LEVEL 4 - VIEW 1
SCALE:



4 CHILLER REFRIGERANT VENT SECTION VIEW
SCALE: 3/8" = 1'-0"



3 NEW WORK - LEVEL 4 - VIEW 2
SCALE:

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IONEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER

04/02/2026

GENERAL SHEET NOTES

A. **HAZARDOUS MATERIAL, INCLUDING BUT NOT LIMITED TO ASBESTOS, MAY BE ENCOUNTERED IN EXISTING PIPING, DUCTWORK, AND INSULATION. ENSURE ADEQUATE PROTOCOLS AND PROCEDURES ARE IN PLACE FOR LIFE SAFETY OR PERSONNEL BEFORE COMMENCING ANY WORK.**
B. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
C. SYSTEMS WITH AN '(E)' SUBSCRIPT ARE EXISTING TO REMAIN. MAINTAIN ALL PIPING, DUCTWORK, SUPPORTS AND ACCESSORIES. PROTECT FROM DAMAGE DURING CONSTRUCTION.
D. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN, COORDINATE WITH THE OWNER 21 DAYS PRIOR TO SHUT DOWN. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. SEE DIVISION 01 DOCUMENTS FOR ADDITIONAL INFORMATION.
E. FOR ALL WORK ON OR WITHIN EXISTING EQUIPMENT, CONTRACTOR TO COORDINATE WITH EQUIPMENT MANUFACTURER TO MAINTAIN WARRANTIES AND UL LISTINGS OF EQUIPMENT AND SYSTEMS.
F. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION OF EQUIPMENT, PANELS, AND CONTROLLERS WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
G. ISOLATION VALVES ARE NORMALLY OPEN (N.O.) UNLESS SPECIFIED TO BE NORMALLY CLOSED (N.C.)

H. PRIOR TO ANY DEMOLITION AND NEW WORK, PERFORM TESTING AND BALANCING OF THE EXISTING CHILLED WATER PUMPING SYSTEMS SERVING THE BUILDING A. MEASURE PUMP FLOW, PUMP SUCTION PRESSURE, PUMP DISCHARGE PRESSURE, AND TOTAL SYSTEM FLOW AT EXISTING OPERATING PUMP SPEED. SUBMIT TAB REPORT TO OWNER AND EOR FOR REVIEW. DO NOT PROCEED WITH ANY WORK WITHOUT PRIOR TO FORMAL DIRECTION FROM THE OWNER.
I. PRIOR TO DEMOLISHING ANY PIPING, ENSURE ALL PIPING SYSTEMS ARE FULLY DRAINED OF WATER. PIPING SYSTEMS SHALL NOT HAVE STANDING WATER DURING DEMOLITION AND NEW CONSTRUCTION.

SHEET KEYNOTES

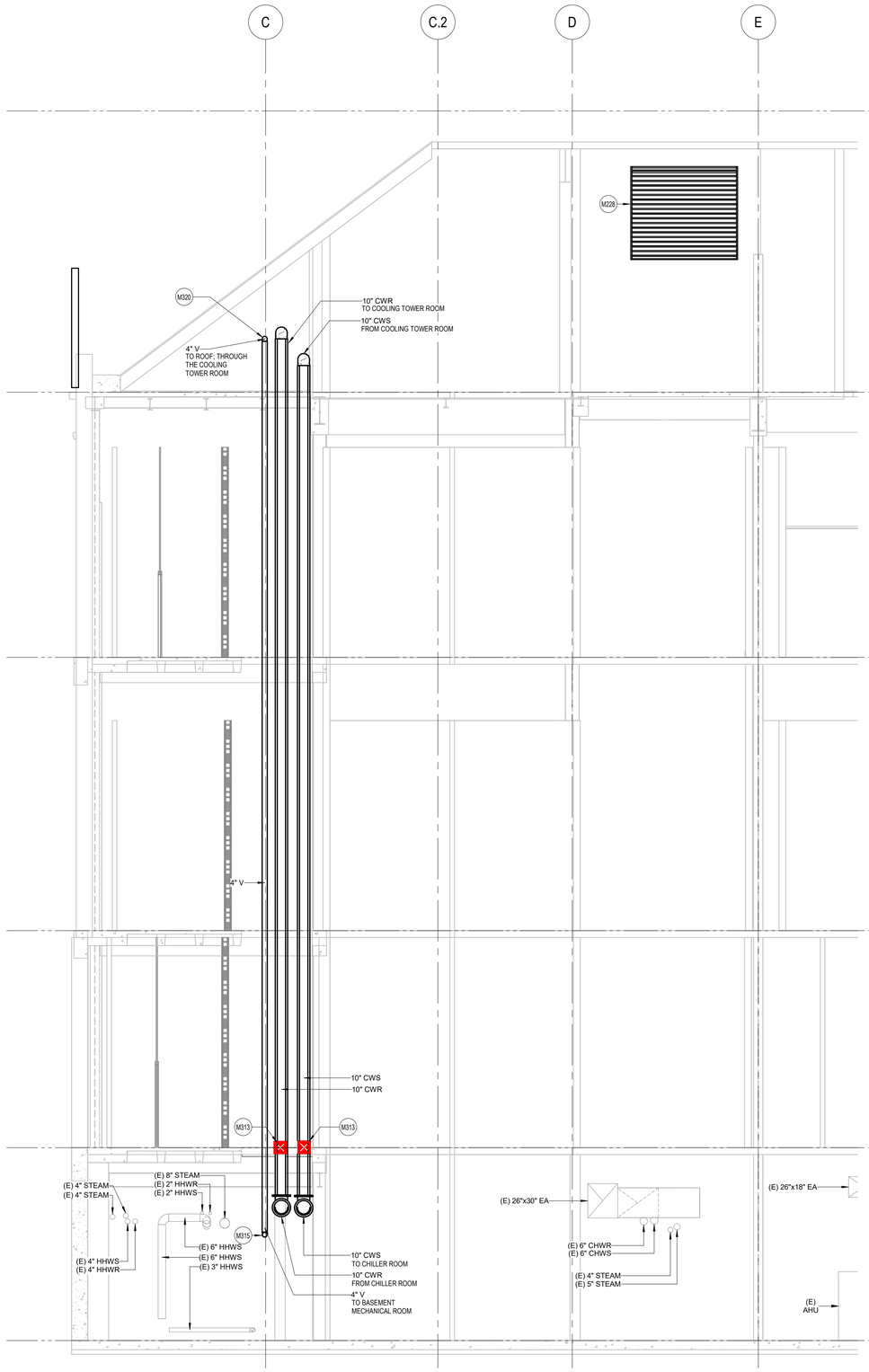
M207	NEW COOLING TOWER DISCHARGE DUCTWORK THROUGH THE EXISTING OPENING (FOR THIS PROJECT). COORDINATE WITH DC COURTS ON ROOFING PROJECT, AND EXPECTED LOCATION/DIMENSIONS OF OPENING. BASED ON THIS COORDINATION CONFIRM FINAL DIMENSION/LOCATION OF NEW EXHAUST DUCT WITH EOR OF THIS PROJECT BEFORE INSTALLATION.
M211	EXISTING COOLING TOWER SUPPORT STRUCTURE. SEE STRUCTURAL DOCUMENTS FOR ADDITIONAL INFORMATION.
M213	DELEGATED DESIGN. EQUIPMENT MANUFACTURER TO SIZE AND PROVIDE NEW STRUCTURAL SUPPORTS TO COOLING TOWER. SEE 235513 AND STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
M214	PROVIDE MAKEUP WATER AS SHOWN ON M5.2. SEE PLUMBING DOCUMENTS FOR ADDITIONAL INFORMATION.
M228	NEW COOLING TOWER AIR INTAKE LOUVER CONNECTED TO EXISTING TO REMAIN INTAKE DUCT. SEE M7.1 FOR ADDITIONAL INFORMATION. ALSO SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.
M320	SEE DETAIL 6 ON M6.2 ALONGSIDE ARCHITECTURAL DRAWINGS FOR INFORMATION ON VENT PIPING.

SHEET TITLE
MECHANICAL SECTIONS - COOLING TOWER ROOM

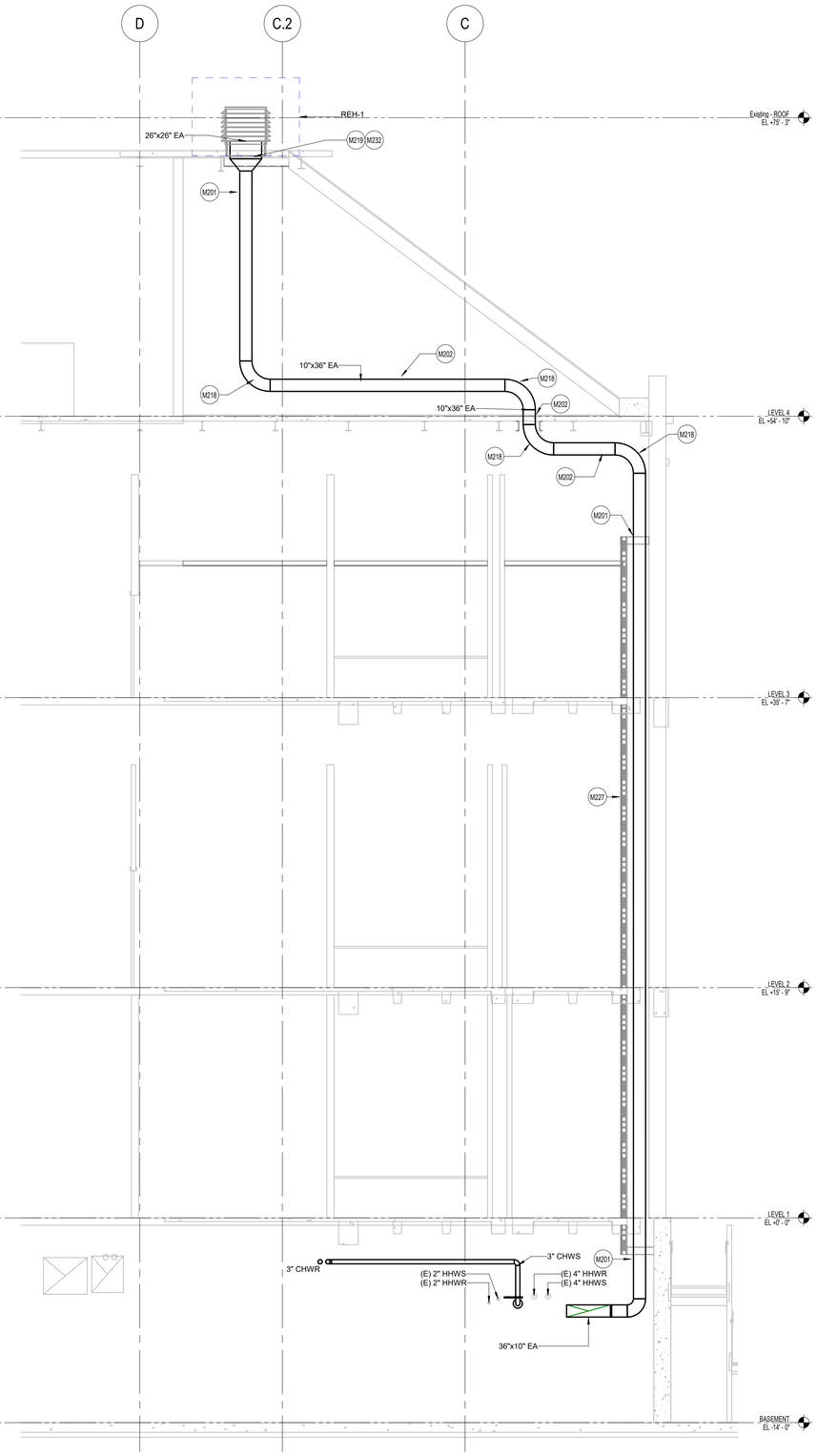
PROJECT NUMBER
00100451

SHEET NUMBER
M4.2.C

Author
Plot Date: 4/13/2026 4:11:43 PM



2 CONDENSER SYSTEM RISERS
SCALE: 1/4" = 1'-0"



1 EMERGENCY REFRIGERANT EXHAUST DUCT RISER
SCALE: 1/4" = 1'-0"

GENERAL SHEET NOTES

A. HAZARDOUS MATERIAL, INCLUDING BUT NOT LIMITED TO ASBESTOS, MAY BE ENCOUNTERED IN EXISTING PIPING, DUCTWORK, AND INSULATION. ENSURE ADEQUATE PROTOCOLS AND PROCEDURES ARE IN PLACE FOR LIFE SAFETY OR PERSONNEL BEFORE COMMENCING ANY WORK.
B. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
C. SYSTEMS WITH AN '(E)' SUBSCRIPT ARE EXISTING TO REMAIN. MAINTAIN ALL PIPING, DUCTWORK, SUPPORTS AND ACCESSORIES. PROTECT FROM DAMAGE DURING CONSTRUCTION.
D. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN, COORDINATE WITH THE OWNER 21 DAYS PRIOR TO SHUT DOWN. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. SEE DIVISION 01 DOCUMENTS FOR ADDITIONAL INFORMATION.
E. FOR ALL WORK ON OR WITHIN EXISTING EQUIPMENT, CONTRACTOR TO COORDINATE WITH EQUIPMENT MANUFACTURER TO MAINTAIN WARRANTIES AND UL LISTINGS OF EQUIPMENT AND SYSTEMS.
F. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION OF EQUIPMENT, PANELS, AND CONTROLLERS WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
G. ISOLATION VALVES ARE NORMALLY OPEN (N.O.) UNLESS SPECIFIED TO BE NORMALLY CLOSED (N.C.)
H. PRIOR TO ANY DEMOLITION AND NEW WORK, PERFORM TESTING AND BALANCING OF THE EXISTING CHILLED WATER PUMPING SYSTEMS SERVING THE BUILDING A. MEASURE PUMP FLOW, PUMP SUCTION PRESSURE, PUMP DISCHARGE PRESSURE, AND TOTAL SYSTEM FLOW AT EXISTING OPERATING PUMP SPEED. SUBMIT TAB REPORT TO OWNER AND EOR FOR REVIEW. DO NOT PROCEED WITH ANY WORK WITHOUT PRIOR TO FORMAL DIRECTION FROM THE OWNER.
I. PRIOR TO DEMOLISHING ANY PIPING, ENSURE ALL PIPING SYSTEMS ARE FULLY DRAINED OF WATER. PIPING SYSTEMS SHALL NOT HAVE STANDING WATER DURING DEMOLITION AND NEW CONSTRUCTION.

SHEET KEYNOTES

M201	EMERGENCY REFRIGERANT EXHAUST DUCT (36 INCHES X 10INCHES) ROUTED THROUGH FIRE RATED SHAFT. WRAP THE ENTIRE EMERGENCY REFRIGERANT DUCTWORK WITH 2-HOUR RATED DUCT FIRE WRAP. BASIS OF DESIGN: 3M FIRE BARRIER DUCT WRAP 615. EXHAUST DUCT UP TO PENTHOUSE ROOF. EXHAUST DUCT DOWN TO CHILLER MECHANICAL ROOM. SEE M2.1/M4.1.B FOR PLAN/SECTION VIEW.
M202	TYP. EMERGENCY REFRIGERANT EXHAUST DUCT. ROUTE THE FIRE-WRAPPED DUCT ABOVE THE CEILING OF LEVEL 3. THE DUCT FIRE WRAP SHALL PROVIDE FIRE RESISTANCE FOR AT LEAST 2 HOURS. BASIS OF DESIGN: 3M FIRE BARRIER DUCT WRAP 615. ANY HANGER OR SUPPORT FOR THIS DUCT SHALL BE COATED WITH FIRE RESISTANT COATING/PAINT THAT PROVIDES AT LEAST 2 HOURS OF FIRE RESISTANCE.
M218	TYP. PROVIDE RADIUS ELBOW FITTING WITH RADIUS TO WIDTH RATIO OF TWO (2).
M219	PRIOR TO ORDERING THE EXHAUST HOOD OR CREATING THE OPENING FOR THE DUCT, PERFORM ALL FOLLOWING COORDINATIONS. COORDINATE EXACT LOCATION OF OPENING WITH STRUCTURAL DRAWINGS. COORDINATE ROOF CURB AND INSULATION WITH ARCHITECTURAL FLOOR PLAN AND DETAIL. COORDINATE WITH BUILDING OWNER ABOUT THE ROOFING PROJECT ASSOCIATED WITH THIS BUILDING.
M227	SEE M0.1 FOR INFORMATION SPECIFIC TO BASE DESIGN AND DEDUCT ALTERNATE ASSOCIATED WITH THE SHAFT FOR REFRIGERANT EXHAUST DUCT.
M228	NEW COOLING TOWER AIR INTAKE LOUVER CONNECTED TO EXISTING TO REMAIN INTAKE DUCT. SEE M7.1 FOR ADDITIONAL INFORMATION. ALSO SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.
M232	SEE M6.1 ALONG WITH ARCHITECTURAL DRAWINGS.
M313	PROVIDE PIPE ANCHOR AT SHOWN LOCATION. CONTRACTOR SHALL PROVIDE DETAILS, CALCULATIONS AS REQUIRED BY 230516 - "EXPANSION FITTINGS AND LOOPS FOR HVAC PIPING" AND SECTION 013573 "DELEGATED DESIGN REQUIREMENTS AND PROCEDURES".
M315	4IN NPS VENT PIPING ROUTED TO THE ROOF FOR CHILLER CH-1 AND CH-2. COORDINATE EXACT LOCATION OF VENT CONNECTIONS WITH PURCHASED PRODUCT, AND PER MANUFACTURER RECOMMENDATION.
M320	SEE DETAIL 6 ON M6.2 ALONGSIDE ARCHITECTURAL DRAWINGS FOR INFORMATION ON VENT PIPING.

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SEALS AND SIGNATURES

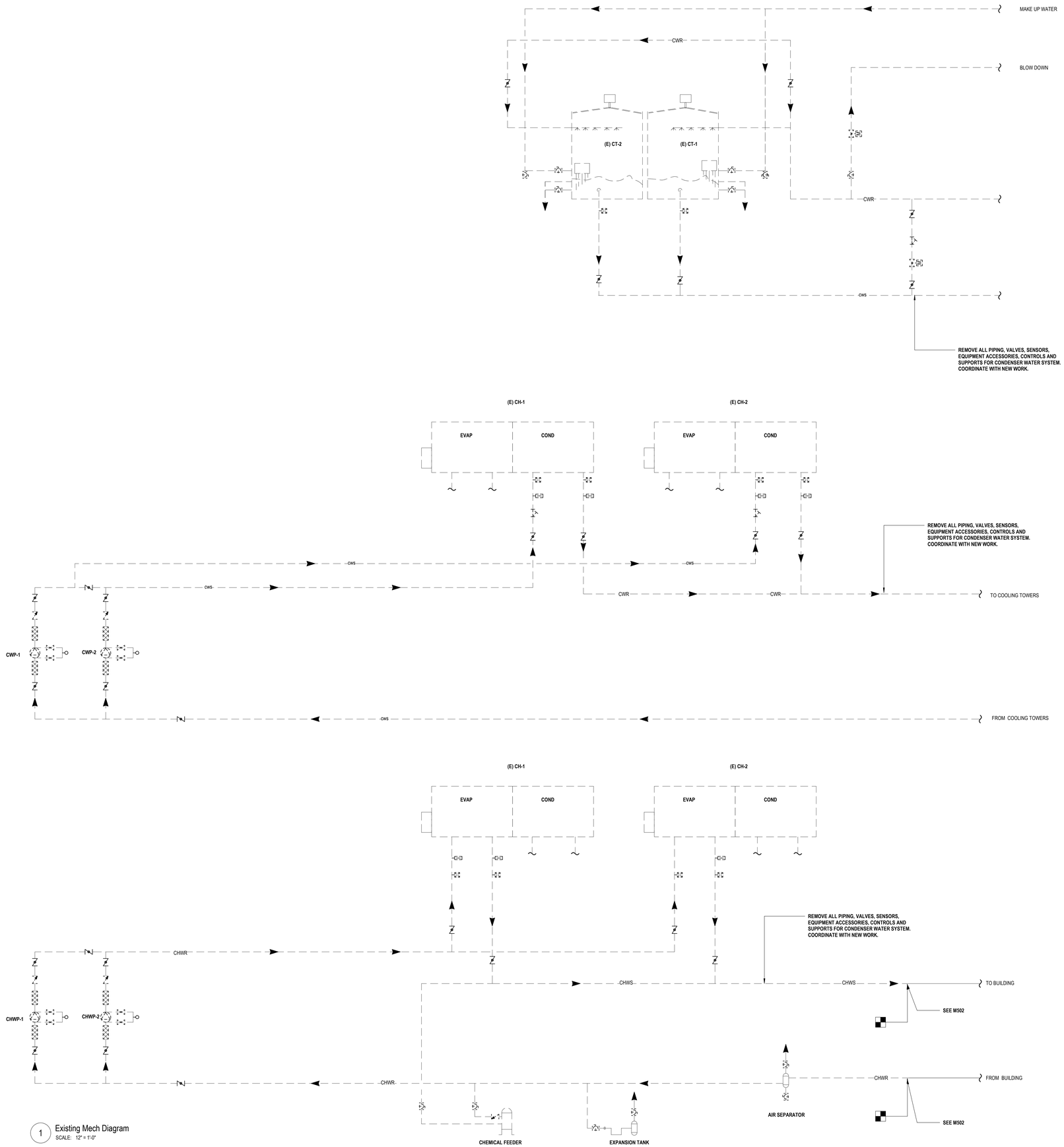
DISTRICT OF COLUMBIA
IONEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER
04/02/2026

SHEET TITLE
MECHANICAL SECTIONS - REFRIGERANT RELIEF SYSTEM AND CONDENSER RISERS

00100451
PROJECT NUMBER

M4.3
SHEET NUMBER

Author
Plot Date: 4/13/2026 3:56:32 PM



1 Existing Mech Diagram
SCALE: 12" = 1'-0"

GENERAL SHEET NOTES

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SHEET KEYNOTES

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IONEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER

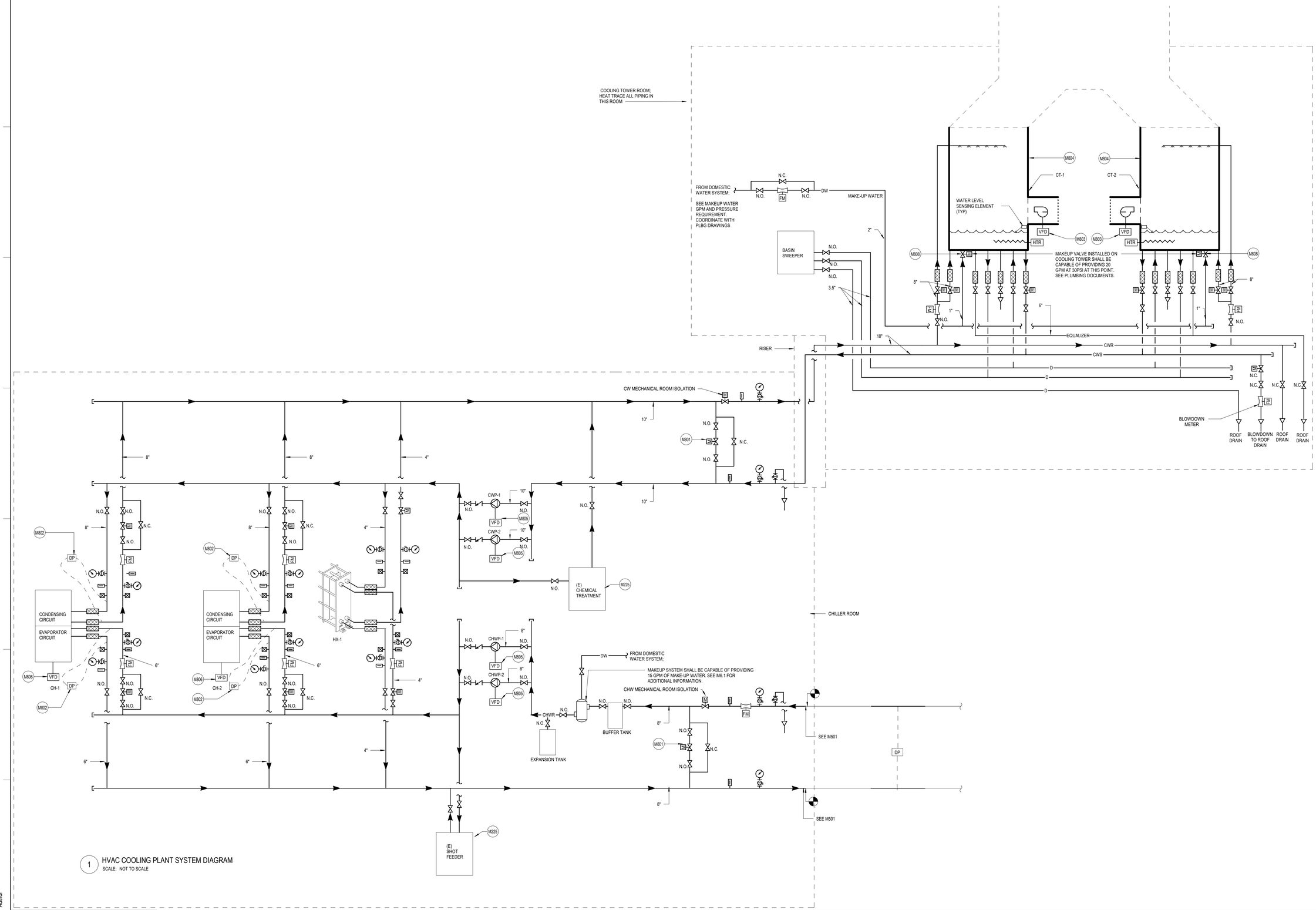
04/02/2026

SHEET TITLE
MECHANICAL DIAGRAMS
EXISTING COOLING PLANT

PROJECT NUMBER
00100451

SHEET NUMBER
M5.1

Author
4/13/2026 4:11:47 PM
Plot Date:



1 HVAC COOLING PLANT SYSTEM DIAGRAM
SCALE: NOT TO SCALE

GENERAL SHEET NOTES

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G. ISOLATION VALVES ARE NORMALLY OPEN (N.O.) UNLESS SPECIFIED TO BE NORMALLY CLOSED (N.C.)
H. PRIOR TO ANY DEMOLITION AND NEW WORK, PERFORM TESTING AND BALANCING OF THE EXISTING CHILLED WATER PUMPING SYSTEMS SERVING THE BUILDING A. MEASURE PUMP FLOW, PUMP SUCTION PRESSURE, PUMP DISCHARGE PRESSURE, AND TOTAL SYSTEM FLOW AT EXISTING OPERATING PUMP SPEED. SUBMIT TAB REPORT TO OWNER AND EOR FOR REVIEW. DO NOT PROCEED WITH ANY WORK WITHOUT PRIOR TO FORMAL DIRECTION FROM THE OWNER.
I. PRIOR TO DEMOLISHING ANY PIPING, ENSURE ALL PIPING SYSTEMS ARE FULLY DRAINED OF WATER. PIPING SYSTEMS SHALL NOT HAVE STANDING WATER DURING DEMOLITION AND NEW CONSTRUCTION.

SHEET KEYNOTES

M225	ENGAGE THE CURRENT CHEMICAL TREATMENT CONTRACTOR FOR THIS BUILDING THROUGH OWNER. PROVIDE NEW CHEMICAL TREATMENT ONLY IF REQUIREMENTS OF 232513 AND 232516 CANNOT BE MET. USE EXISTING CHEMICAL TREATMENT FOR THE CHILLED WATER AND EXISTING CHEMICAL TREATMENT FOR CONDENSER WATER SYSTEM OTHERWISE.
M801	PROVIDE HIGH PERFORMANCE SEGMENTED BALL VALVE WITH A TURNDOWN RATIO OF 300:1; BASIS OF DESIGN: VSI, SERIES V. PROVIDE VALVE WITH AN ELECTRIC ACTUATOR WITH A RESOLUTION OF 200 STEPS, 0.04VDC/0.5 DEGREES. BASIS OF DESIGN: VSI, SERIES 1000-X. SEE MECHANICAL SCHEDULES AND SPECIFICATIONS FOR SIZING CRITERIA.
M802	PROVIDE FIVE VALVE MANIFOLD ASSEMBLY DIFFERENTIAL PRESSURE SENSOR-TRANSDUCER, BIDIRECTIONAL DP SENSING RANGE SHALL BE ATLEAST+/-50PSID, ACCURACY OF READING WITHIN 0.25%. BASIS OF DESIGN : SETRA MODEL 230 - FIVE VALVE MANIFOLD.
M803	ONE VARIABLE FREQUENCY DRIVE PER COOLING TOWER. ALL FANS SHALL BE DRIVEN BY SINGULAR SIGNAL FROM THIS VFD. VARIABLE FREQUENCY DRIVE SHALL BE PROVIDED BY DIVISION 26. SEE TYPICAL VARIABLE FREQUENCY DRIVE MOTOR DIAGRAM ON M801.
M804	PROVIDE A MANUFACTURER FURNISHED MANUFACTURER INSTALLED COOLING TOWER PANEL. INSTALLED AT ACCESSIBLE HEIGHT ON THE TOWER. HARDWIRE ALL MANUFACTURER PROVIDED POINTS TO THIS CENTRALIZED PANEL FOR EASIER BAS INTEGRATION BY TCC. PROVIDE ANY/ALL ACCESSORIES NEEDED TO INTEGRATE WITH PURCHASED COMMUNICATION PROTOCOL.
M805	ONE VARIABLE FREQUENCY DRIVE PER PUMP. VARIABLE SPEED DRIVE SHALL BE PROVIDED BY DIVISION 26. SEE TYPICAL VARIABLE FREQUENCY DRIVE MOTOR DIAGRAM ON M801.
M806	MANUFACTURER FURNISHED MANUFACTURER INSTALLED VARIABLE FREQUENCY DRIVE FOR CHILLER COMPRESSORS. PROVIDE THE POINTS SPECIFIED ON CHILLER CONTROL PANEL THROUGH NETWORK INTEGRATION.
M808	VALVE PROVIDED BY COOLING TOWER MANUFACTURER. TIE MAKEUP WATER VALVE CONTROL WITH WATER LEVEL SENSING ELEMENT.

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Washington, DC 20001

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WASHINGTON, DC 20006
202.842.2100
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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IGNEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER
04/02/2026

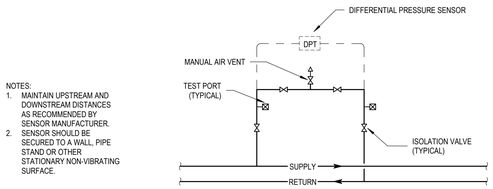
SHEET TITLE
MECHANICAL DIAGRAMS
CHILLED WATER PLANT

PROJECT NUMBER
00100451

SHEET NUMBER
M5.2

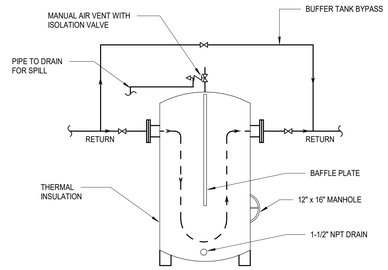
Author

Plot Date: 4/13/2026 4:11:50 PM

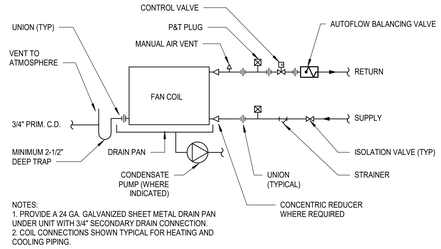


NOTES:
1. MAINTAIN UPSTREAM AND DOWNSTREAM DISTANCES AS RECOMMENDED BY SENSOR MANUFACTURER.
2. SENSOR SHOULD BE SECURED TO A WALL, PIPE STAND OR OTHER STATIONARY NON-VIBRATING SURFACE.

1 DIFFERENTIAL PRESSURE SENSOR
SCALE: NOT TO SCALE

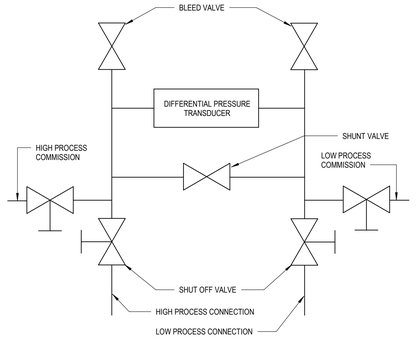


2 BUFFER TANK
SCALE: NOT TO SCALE

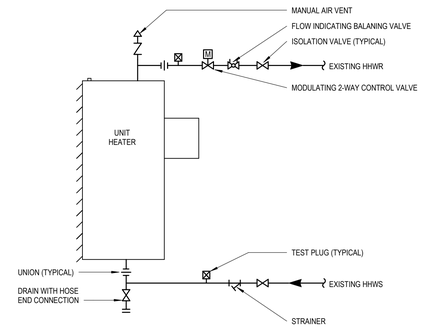


NOTES:
1. PROVIDE A 24 GA. GALVANIZED SHEET METAL DRAIN PAN UNDER UNIT WITH 3/4" SECONDARY DRAIN CONNECTION.
2. COIL CONNECTIONS SHOWN TYPICAL FOR HEATING AND COOLING PIPING.

3 FAN COIL PIPING
SCALE: NOT TO SCALE

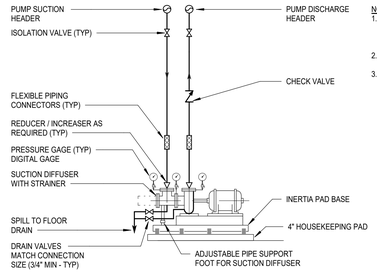


4 FIVE VALVE DP MANIFOLD TYPICAL INTERNAL COMPOENTS
SCALE: NOT TO SCALE



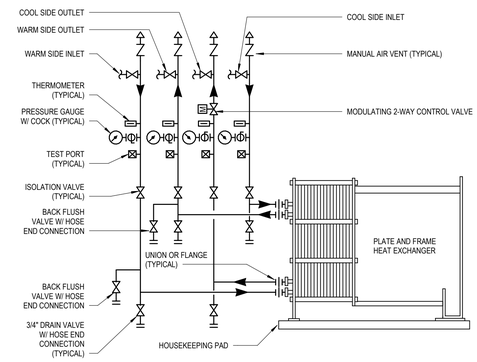
NOTE:
1. UNIT MOUNTING SHALL BE COORDINATED BY CONTRACTOR.

5 HORIZONTAL HOT WATER UNIT HEATER
SCALE: NOT TO SCALE

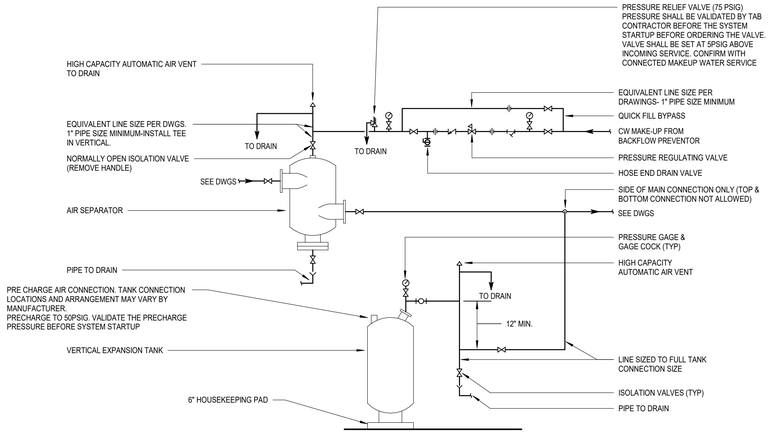


NOTES:
1. INSTALL DIGITAL PRESSURE GAGES AS SHOWN OR INSTALL SINGLE DIGITAL GAGE WITH MULTIPLE INPUT SELECTOR VALVE.
2. REFER TO CONTROLS SCHEMATIC FOR CONTROLS INSTRUMENTATION.
3. HOUSE KEEPING PAD TO BE EPOXY DOWELLED TO FLOOR, REINFORCED WITH WELDED WIRE MESH OR REBAR, AND CHAMFERED TO 1" AT 45 DEGREES ON ALL CORNERS.

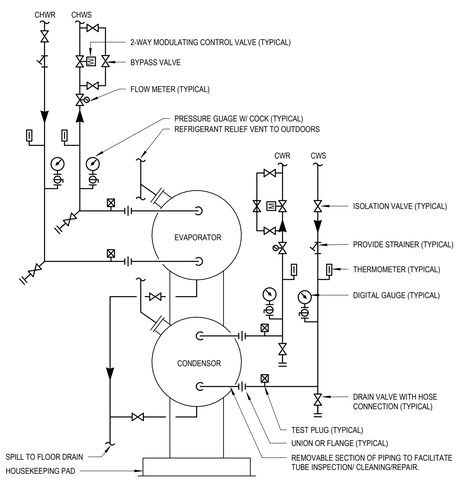
6 END SUCTION PUMP
SCALE: NOT TO SCALE



7 PLATE AND FRAME HEAT EXCHANGER
SCALE: NOT TO SCALE

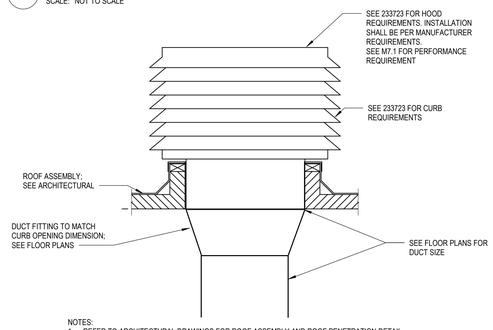


9 VERTICAL EXPANSION TANK AND AIR SEPARATOR
SCALE: NOT TO SCALE



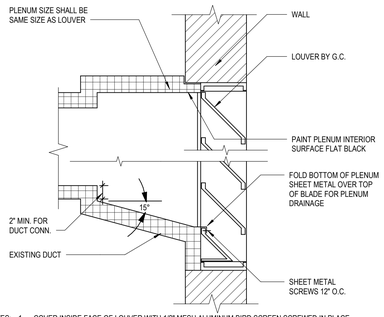
NOTES:
1. DRAIN ALL LOW POINTS OF SYSTEMS TO NEAREST FLOOR DRAIN.
2. COLLECT VENT PIPES FROM ALL REFRIGERANT SAFETY RELIEF DEVICES AND EXTEND TO EXTERIOR OF BUILDING IN ACCORDANCE WITH ASHRAE 15. HEADER SIZE TO EQUAL OR EXCEED TOTAL AREA OF DEVICES CONNECTED TO THE HEADER.
3. REFER TO CONTROLS SCHEMATIC FOR CONTROLS INSTRUMENTATION.
4. DETAIL ILLUSTRATES SAME SIDE PIPING CONNECTIONS. PIPING CONNECTIONS BASED ON CHILLER SELECTION AND PIPING CONNECTION LOCATIONS.

8 CONNECTION TO CHILLER CONDENSER AND EVAPORATOR
SCALE: NOT TO SCALE



NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS FOR ROOF ASSEMBLY AND ROOF PENETRATION DETAIL.
2. REFER TO STRUCTURAL DRAWINGS FOR OPENING SUPPORT.

10 ROOF EXHAUST HOOD
SCALE: NOT TO SCALE



NOTES:
1. COVER INSIDE FACE OF LOUVER WITH 1/2" MESH ALUMINUM BIRD SCREEN SCREWED IN PLACE.
2. INSULATE UNUSED PORTION OF LOUVER WITH 1 1/2" GLASS FIBER INSULATING BOARD.
3. SEAL ALL PLENUM SEAMS WATERTIGHT WITH SILICONE SEALANT.
4. TYPICAL FOR SUPPLY AND EXHAUST PLENUMS.
5. PROVIDE ACCESS PANEL/DOOR IN PLENUM. PANEL/DOOR SHALL BE FIELD COORDINATED FOR ACCESS. PANEL/DOOR SIZE SHALL BE 36" HIGH X 18" WIDE. REFER TO SPEC FOR DOOR CONSTRUCTION.

11 INTAKE AND EXHAUST LOUVER INSTALLATION
SCALE: NOT TO SCALE

GENERAL SHEET NOTES

A. HAZARDOUS MATERIAL, INCLUDING BUT NOT LIMITED TO ASBESTOS, MAY BE ENCOUNTERED IN EXISTING PIPING, DUCTWORK, AND INSULATION. ENSURE ADEQUATE PROTOCOLS AND PROCEDURES ARE IN PLACE FOR LIFE SAFETY OR PERSONNEL BEFORE COMMENCING ANY WORK.
B. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
C. SYSTEMS WITH AN '(E)' SUBSCRIPT ARE EXISTING TO REMAIN. MAINTAIN ALL PIPING, DUCTWORK, SUPPORTS AND ACCESSORIES. PROTECT FROM DAMAGE DURING CONSTRUCTION.
D. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN, COORDINATE WITH THE OWNER 21 DAYS PRIOR TO SHUT DOWN. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. SEE DIVISION 01 DOCUMENTS FOR ADDITIONAL INFORMATION.
E. FOR ALL WORK ON OR WITHIN EXISTING EQUIPMENT, CONTRACTOR TO COORDINATE WITH EQUIPMENT MANUFACTURER TO MAINTAIN WARRANTIES AND UL LISTINGS OF EQUIPMENT AND SYSTEMS.
F. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION OF EQUIPMENT, PANELS, AND CONTROLLERS WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
G. ISOLATION VALVES ARE NORMALLY OPEN (N.O.) UNLESS SPECIFIED TO BE NORMALLY CLOSED (N.C.)
H. PRIOR TO ANY DEMOLITION AND NEW WORK, PERFORM TESTING AND BALANCING OF THE EXISTING CHILLED WATER PUMPING SYSTEMS SERVING THE BUILDING A. MEASURE PUMP FLOW, PUMP SUCTION PRESSURE, PUMP DISCHARGE PRESSURE, AND TOTAL SYSTEM FLOW AT EXISTING OPERATING PUMP SPEED. SUBMIT TAB REPORT TO OWNER AND EOR FOR REVIEW. DO NOT PROCEED WITH ANY WORK WITHOUT PRIOR TO FORMAL DIRECTION FROM THE OWNER.
I. PRIOR TO DEMOLISHING ANY PIPING, ENSURE ALL PIPING SYSTEMS ARE FULLY DRAINED OF WATER. PIPING SYSTEMS SHALL NOT HAVE STANDING WATER DURING DEMOLITION AND NEW CONSTRUCTION.

SHEET KEYNOTES

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202.842.2100
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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
LIONEL PETRIE
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER
04/02/2026

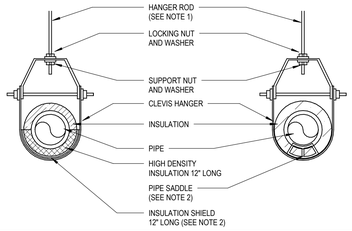
SHEET TITLE
MECHANICAL DETAILS

PROJECT NUMBER
00100451

SHEET NUMBER
M6.1

Author

Plot Date: 4/13/2026 4:11:51 PM

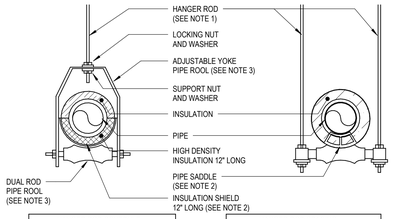


HANGER ROD SCHEDULE	
PIPE SIZE	ROD SIZE
UP TO 2"	3/8" DIA.
2 1/2" THRU 3"	1/2" DIA.

HANGER ROD SPACING	
PIPE SIZE	MAX. ALLOWABLE SPACING
1"	7'
1 1/4"	8'
1 1/2"	9'
2"	10'
2 1/2"	10'
3"	10'

NOTES:
1. REFER TO "TYPICAL METHOD OF SECURING HANGER RODS DETAIL" FOR ATTACHING HANGERS TO THE STRUCTURE.
2. PROVIDE INSULATION SHIELD OR PIPE SADDLE BASED ON THE PIPING SYSTEM AND PIPE SIZE AS INDICATED IN THE SPECIFICATIONS.
3. CLEVIS TYPE PIPE HANGER SHALL BE USED ON ALL PIPING 3" AND SMALLER.

1 CLEVIS TYPE PIPE HANGER INSTALLATION DETAIL
SCALE: NOT TO SCALE

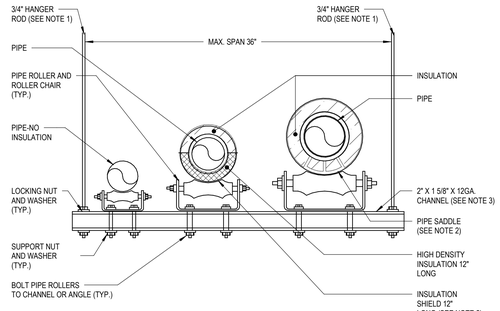


HANGER ROD SCHEDULE	
PIPE SIZE	ROD SIZE
4"	5/8" DIA.
5"	5/8" DIA.
6"	3/4" DIA.
8"	7/8" DIA.
10"	7/8" DIA.
12"	7/8" DIA.

HANGER ROD SPACING	
PIPE SIZE	MAX. ALLOWABLE SPACING
4"	10'
5"	10'
6"	10'
8"	10'
10"	10'
12"	10'

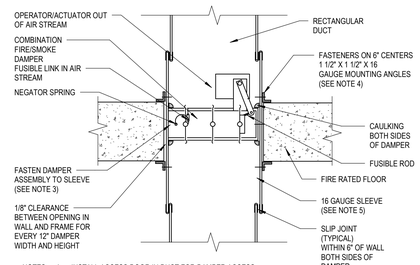
NOTES:
1. REFER TO "TYPICAL METHOD OF SECURING HANGER RODS DETAIL" FOR ATTACHING HANGERS TO THE STRUCTURE.
2. PROVIDE INSULATION SHIELD OR PIPE SADDLE BASED ON THE PIPING SYSTEM AND PIPE SIZE AS INDICATED IN THE SPECIFICATIONS.
3. ADJUSTABLE YOKE PIPE ROLL SHALL BE USED ON 4" AND 5" PIPING. ON ALL PIPING 6" AND LARGER USE DUAL ROD PIPE ROLL.

2 PIPE ROLL TYPE PIPE HANGER INSTALLATION DETAIL
SCALE: NOT TO SCALE



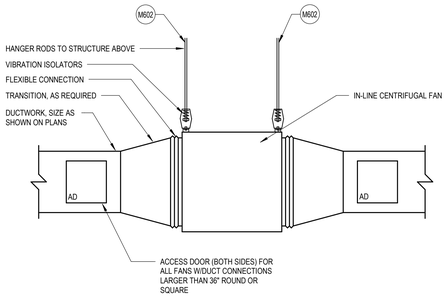
NOTES:
1. REFER TO "TYPICAL METHOD OF SECURING HANGER RODS DETAIL" FOR ATTACHING HANGERS TO THE STRUCTURE.
2. PROVIDE INSULATION SHIELD OR PIPE SADDLE BASED ON THE PIPING SYSTEM AND PIPE SIZE AS INDICATED IN THE SPECIFICATIONS.
3. TRAPEZE TYPE HANGER SHALL BE USED FOR A MAXIMUM 1000 LB. UNIFORM LOAD.

3 TRAPEZE TYPE PIPE HANGER INSTALLATION DETAIL
SCALE: NOT TO SCALE

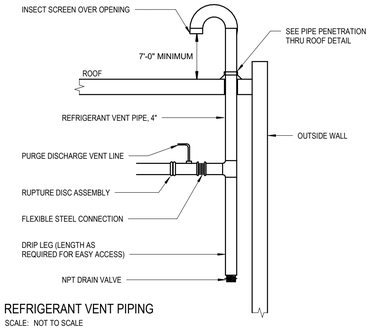


NOTES:
1. INSTALL ACCESS DOOR IN DUCT FOR DAMPER ACCESS.
2. INSTALL IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS AND NFPA-90A.
3. REFER TO SMACNA-"FIRE, SMOKE AND RADIATION DAMPER INSTALLATION GUIDE FOR HVAC SYSTEMS" FOR FIRE DAMPER INSTALLATION DETAILS.
4. MOUNTING ANGLES SHALL BE 2" X 2" X 16 GAUGE FOR DAMPERS 48" OR LARGER IN WIDTH OR HEIGHT.
5. SLEEVE THICKNESS SHALL NOT BE LESS THAN THE GAUGE OF THE DUCT.
6. FIRE DAMPER MODE: HIGH TEMPERATURE MELTS FUSIBLE LINK, CLOSING FIRE DAMPER.
7. SMOKE DAMPER MODE: SMOKE DETECTOR UPON SENSING HEAT/SMOKE ACTUATED DAMPER MOTOR TO CLOSE DAMPER.

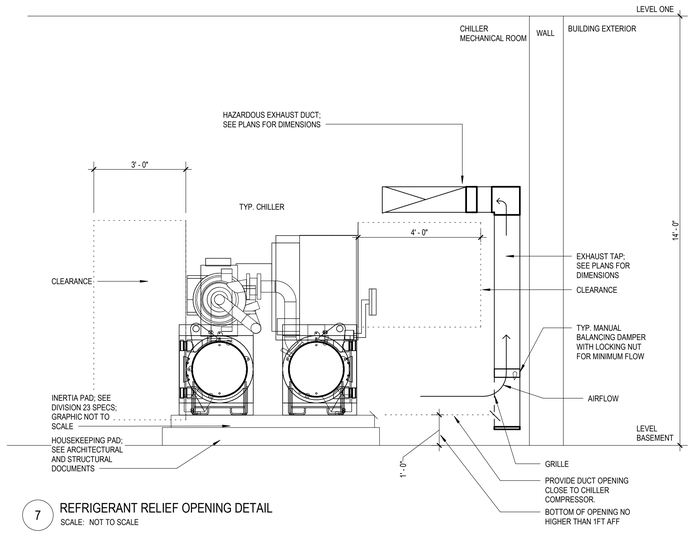
4 HORIZONTAL COMBINATION FIRE - SMOKE DAMPER INSTALLATION
SCALE: NOT TO SCALE



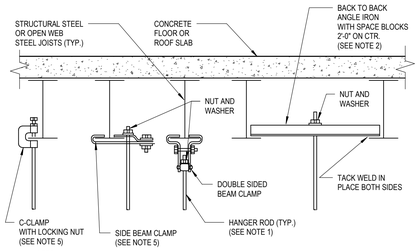
5 IN-LINE FAN DETAIL
SCALE: NOT TO SCALE



6 REFRIGERANT VENT PIPING
SCALE: NOT TO SCALE



7 REFRIGERANT RELIEF OPENING DETAIL
SCALE: NOT TO SCALE



NOTES:
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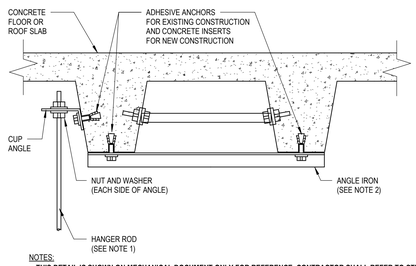
REFER TO PIPE HANGER DETAIL FOR HANGER ROD SIZE FOR CEILING SUSPENDED EQUIPMENT PROVIDE MIN. 3/8" DIA. HANGER ROD (REFER TO MANUFACTUERS INSTALLATION INSTRUCTIONS).
1. FOR PIPES UNDER 2" USE A SINGLE 1-1/2" X 1-1/2" X 1/4" ANGLE IRON WITH C-CLAMP FOR PIPES 2-1/2" AND LARGER USE 3" X 3" X 1/4" ANGLE IRON BACK TO BACK AS SHOWN.
2. REFER TO "TYPICAL METHOD OF SECURING HANGER RODS TO CONCRETE DECK DETAIL" FOR ATTACHING HANGER RODS TO CONCRETE DECK.
3. REPAIR OF FIREPROOFING IN ORDER TO FACILLITATE THE INSTALLATION OF HANGER RODS IN EXISTING CONSTRUCTION SHALL BE BY THE G.C.
4. USE OF C-CLAMPS AND SIDE BEAM CLAMPS IS LIMITED TO PIPING 2-1/2" AND UNDER.

8 TYPICAL METHODS OF SECURING HANGER RODS TO STRUCTURAL STEEL DETAIL
SCALE: NOT TO SCALE



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1. FOR PIPES UNDER 2" USE 1-1/2" X 1-1/2" X 1/4" ANGLE IRON. FOR PIPES 2" AND LARGER USE 3" X 3" X 1/4" ANGLE IRON.
2. EXPANSION SHIELDS SHALL BE ONLY USED IN SLABS OR BEAMS OF 4" MIN. DEPTH.

9 TYPICAL METHOD OF SECURING HANGER RODS TO CONCRETE DECK DETAIL
SCALE: NOT TO SCALE

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F. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION OF EQUIPMENT, PANELS, AND CONTROLLERS WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
G. ISOLATION VALVES ARE NORMALLY OPEN (N.O.) UNLESS SPECIFIED TO BE NORMALLY CLOSED (N.C.)
H. PRIOR TO ANY DEMOLITION AND NEW WORK, PERFORM TESTING AND BALANCING OF THE EXISTING CHILLED WATER PUMPING SYSTEMS SERVING THE BUILDING A. MEASURE PUMP FLOW, PUMP SUCTION PRESSURE, PUMP DISCHARGE PRESSURE, AND TOTAL SYSTEM FLOW AT EXISTING OPERATING PUMP SPEED. SUBMIT TAB REPORT TO OWNER AND EOR FOR REVIEW. DO NOT PROCEED WITH ANY WORK WITHOUT PRIOR TO FORMAL DIRECTION FROM THE OWNER.
I. PRIOR TO DEMOLISHING ANY PIPING, ENSURE ALL PIPING SYSTEMS ARE FULLY DRAINED OF WATER. PIPING SYSTEMS SHALL NOT HAVE STANDING WATER DURING DEMOLITION AND NEW CONSTRUCTION.

SHEET KEYNOTES

M602 IN-LINE CENTRIFUGAL EXHAUST FAN WILL BE SUPPORTED BY THE EXISTING STRUCTURE. SEE DETAIL 4 FOR INSTALLATION DETAIL.

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Building A Chilled Water Upgrade
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1700 NEW YORK AVENUE NW
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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
LIONEL PETRIE
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER
04/02/2026

SHEET TITLE
MECHANICAL DETAILS

PROJECT NUMBER
00100451

SHEET NUMBER
M6.2

Author
Plot Date: 4/13/2026 4:11:54 PM

BUILDING AUTOMATION SYSTEM PANEL...

TAG	SYSTEM	LOCATION	VOLTAGE	PHASE	REMARKS
BAS-1	CH-1 CONTROLS	BASEMENT CHILLER MER	120 V	1	
BAS-2	CH-2 CONTROLS	BASEMENT CHILLER MER	120 V	1	
BAS-3	MISC CONTROLS	BASEMENT CHILLER MER	120 V	1	
BAS-4	EMERGENCY REFRIGERANT LEAK PANEL	BASEMENT CHILLER MER	120 V	1	
BAS-5	CT-1 SYSTEM	COOLING TOWER MER	120 V	1	
BAS-6	CT-2 SYSTEM	COOLING TOWER MER	120 V	1	

GENERAL NOTES -
1. REFER TO SPECIFICATION SECTION 230900 FOR ADDITIONAL INFORMATION.
2. PROVIDE A DIVISION 23 CONTROL POWER TRANSFORMER AS REQUIRED TO POWER LOW VOLTAGE EQUIPMENT.
3. PROVIDE DIVISION 23 UNINTERRUPTABLE POWER SUPPLY (UPS) FOR ALL SHOWN PANELS. SIZE THE UPS AS SPECIFIED UNDER 230900.
4. SHOWN LOCATIONS ON FLOOR PLANS ARE RECOMMENDATIONS ONLY. CONTROLS CONTRACTOR TO FIELD COORDINATE DESIRED LOCATION WITH OWNER AND OTHER TRADES AND DOCUMENT EXACT LOCATION IN SHOP DRAWINGS.
5. PANELS ARE INTENDED TO :
   A. PROVIDE POWER TO MOTORIZED VALVES, DAMPERS AND ACTUATORS/RELAYS.
   B. PROVIDE CENTRALIZED LOCATION TO HOUSE THE BAS CONTROLLER ASSOCIATED WITH SYSTEM. ALL POINTS SHOWN ON M8 SHALL BE INTEGRATED ON CONTROLLER(S) HOUSED IN THESE PANELS.
   C. PANELS AND CONTROLLERS MUST BE SIZED SUCH THAT THE WORST CASE CONDITION OF THE FOLLOWING IS SATISFIED :
      a. PROVIDE SPACE ON PANELS/CONTROLLERS FOR ADDITIONAL 20% CONNECTIONS OF EACH TYPE (POINTS, RELAYS) FOR FUTURE.
      b. PROVIDE SPACE FOR ONE (1) ADDITIONAL CONTROLLER OF SIMILAR SIZE FOR FUTURE.

CHILLER SCHEDULE (WATER-COOLED)

TAG	SYSTEM	LOCATION	COMPRESSOR TYPE	REFRIGERANT	NOMINAL CAPACITY TONS	EVAPORATOR SIDE DATA						CONDENSER SIDE DATA						KW/TON		ELECTRICAL DATA			OPERATING WEIGHT	BASIS OF DESIGN		REMARKS
						EWT	LWT	FLOW	NUMBER OF PASSES	SCALE FACTOR	MAX PD	EWT	LWT	FLOW	NUMBER OF PASSES	SCALE FACTOR	MAX PD	RATED NPLV	FULL LOAD COOLING EFFICIENCY	VOLTAGE	PHASE	STARTER TYPE		MANUFACTURER	MODEL	
CH-1	CHILLED WATER (CHW)	BUILDING A CHILLER MER	MAGNETIC BEARING CENTRIFUGAL	R-513A	188	55 °F	44 °F	400 GPM	2	0.0001	6.8 ft#2O	85 °F	94 °F	600 GPM	2	0.00025	10.3 ft#2O	0.38	0.6443	460 V	3	VFD	13568.00 lb	TRANE	HDWA 200	
CH-2	CHILLED WATER (CHW)	BUILDING A CHILLER MER	MAGNETIC BEARING CENTRIFUGAL	R-513A	188	55 °F	44 °F	400 GPM	2	0.0001	6.8 ft#2O	85 °F	94 °F	600 GPM	2	0.00025	10.3 ft#2O	0.38	0.6443	460 V	3	VFD	13568.00 lb	TRANE	HDWA 200	

NOTES-
1. ONE CHILLER NOMINAL TON = 12,000 BTU/HR.
2. PROVIDE HARMONIC FILTER.
3. MANUFACTURED FURNISHED MANUFACTURER INSTALLED VARIABLE SPEED DRIVE. VARIABLE SPEED DRIVE SHALL COMPLY WITH DIVISION 23 SPECIFICATIONS.
4. EACH CHILLER IS SIZED FOR 50% OF DESIGN LOAD. NO CHILLER IS REDUNDANT.

COOLING TOWER SCHEDULE

TAG	SYSTEM	LOCATION	TYPE	CELL QUANTITY	DESIGN					WATERSIDE ECONOMIZER MODE				FAN MOTOR DATA						ELECTRIC BASIN HEATER			SOUND RATING DBA AT 50 FT	MAXIMUM WEIGHT	BASIS OF DESIGN		REMARKS
					NOMINAL TONS EACH	EAT WB	FLOW PER TOWER	EWT	LWT	NOMINAL TONS EACH	EAT WB	FLOW PER TOWER	LWT	QTY OF FANS	BHP	HP	VOLTAGE	PHASE	TYPE OF CONTROL	kW	VOLTAGE	PHASE			MANUFACTURER	MODEL	
CT-1	CONDENSER WATER	ATTIC	INDUCED DRAFT; COUNTERFLOW OPEN CIRCUIT	1	188.98	78 °F	600 GPM	94 °F	85 °F	120	34 °F	220 GPM	42 °F	6	25	25	208 V	3	VFD	5 kW	208 V	3	97	6630.00 lb	EVAPCO	LSTE-4318	
CT-2	CONDENSER WATER	ATTIC	INDUCED DRAFT; COUNTERFLOW OPEN CIRCUIT	1	188.98	78 °F	600 GPM	94 °F	85 °F	120	34 °F	220 GPM	42 °F	6	25	25	208 V	3	VFD	5 kW	208 V	3	97	6630.00 lb	EVAPCO	LSTE-4318	

NOTES-
1. ONE COOLING TOWER NOMINAL TON = 15,000 BTU/HR.
2. ONE VFD PER ENTIRE FAN ARRAY. SEE DIVISION 26 DOCUMENTS.
3. PROVIDE BASIN SWEEPER PIPING.
4. TOWERS SHALL BE SUPPORTED ON SPRING ISOLATORS WITH INTERMEDIARY SUPPORT BEAM.
5. COLD WATER BASIN SHALL ONLY BE OF STAINLESS STEEL CONSTRUCTION.
6. EACH COOLING TOWER IS SIZED FOR 50% OF DESIGN LOAD. NO COOLING TOWER IS REDUNDANT.

GRILLE SCHEDULE

TAG	SYSTEM CLASSIFICATION	LOCATION	DESIGN CFM	SIZE	MAX AIR PD	BASIS OF DESIGN		REMARKS
						MANUFACTURER	MODEL	
E-1	EXHAUST AIR	BASEMENT MECHANICAL	875 CFM	14"x14"	0.1"	TITUS	350RS-SS	
E-1	EXHAUST AIR	BASEMENT MECHANICAL	875 CFM	14"x14"	0.1"	TITUS	350RS-SS	
E-1	EXHAUST AIR	BASEMENT MECHANICAL	875 CFM	14"x14"	0.1"	TITUS	350RS-SS	
E-1	EXHAUST AIR	BASEMENT MECHANICAL	875 CFM	14"x14"	0.1"	TITUS	350RS-SS	

NOTES-
1. PURCHASED PRODUCT MUST BE SUITABLE FOR EXHAUST APPLICATION.
2. PROVIDE MANUAL BALANCING DAMPERS WITH MINIMUM FLOW LOCKING NUT FOR ALL GRILLES.
3. SEE SPECIFICATIONS FOR MORE INFORMATION.

BASIN SWEEPER SKID SCHEDULE

TAG	SYSTEM	LOCATION	TYPE	FLUID	TEMPERATURE	DUTY POINT		MOTOR DATA			OPERATING WEIGHT	BASIS OF DESIGN		REMARKS
						FLOW	MINIMUM DISCHARGE HEAD	HP	VOLTAGE	PHASE		MANUFACTURER	MODEL	
CT-BS	COOLING TOWER SWEEPER SKID	COOLING TOWER MER	CENTIFUGAL	100% WATER	80 °F	80 GPM	30.0 psi	3	208 V	3	350 lb	PUROFLUX	PF-64-015-AP	

PLATE & FRAME HEAT EXCHANGER SCHEDULE (WATER TO WATER)

TAG	SYSTEM	LOCATION	TYPE	CAPACITY (MBH)	BOD EFFECTIVE HEATING SURFACE	MINIMUM EXCESS SURFACE (%)	HOT SIDE DATA				COLD SIDE DATA				DESIGN/FUTURE CAPACITY		OPERATING WEIGHT	BASIS OF DESIGN		REMARKS
							EWT	LWT	FLOW	MAX PD	EWT	LWT	FLOW	MAX PD	NUMBER OF PLATES	TOTAL PLATE CAPACITY		MANUFACTURER	MODEL	
HX-1	BUILDING A COOLING PLANT	BUILDING A CHILLER MER	GASKETED PLATE AND FRAME TYPE	2,642	999 SF	25	62 °F	46 °F	440 GPM	7.5 psi	42 °F	54 °F	440 GPM	7.5 psi	184	273	3,000.00 lb	BELL & GOSSETT	AP47	

NOTES:
1. PROVIDE GASKETED CONNECTIONS.
2. ECONOMIZER IS SIZED FOR 58.6% OF TOTAL DESIGN CAPACITY. BASIS OF DESIGN COOLING TOWER IS RATED FOR SCHEDULED FLOW RATE AND CONDENSER WATER SUPPLY TEMPERATURE ASSOCIATED WITH OUTSIDE AIR CONDITION OF 34F WET BULB TEMPERATURE.

LOUVER SCHEDULE

TAG	AIRFLOW (cfm)	MINIMUM FREE AREA (sq.ft.)	WIDTH (in.)	HEIGHT (in.)	MAXIMUM PERMISSIBLE AIR PD (in.w.g.)	MANUFACUTURER	MODEL	REMARKS
L1	1,000	3.9	48	24	0.1	GREENHECK	EAD	
L2	2,500	7.7	93	24	0.1	GREENHECK	EAD	
L3		47.5	141	80		GREENHECK	EAD	
L4	45,000	38.9	154	60	0.2	GREENHECK	ESD	
L5	39,000	33.5	93	81	0.2	GREENHECK	ESD	

NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICIATIONS FOR MORE INFORMATION.
2. CONTRACTOR SHALL FIELD VERIFY EXACT DIMENSIONS BEFORE ORDDERING THE PRODUCT.
3. SEE M8.3 FOR CONTROLS SPECIFIC TO LOUVERS L1, L2 AND L3.
4. PRODUCT SUBMITTAL MUST INCLUDE AIR PRESSURE DROP AND FREE AREA. CONTRACTOR MAY SELECT A PRODUCT OF SIMILAR DIMENSION WITH HIGHER FREE AREA (SQ.FT.).

HVAC PUMP SCHEDULE

TAG	SYSTEM	LOCATION	TYPE	FLUID	TEMPERATURE	DUTY POINT				PHYSICAL CONSTRUCTION			MOTOR DATA				OPERATING WEIGHT	BASIS OF DESIGN		REMARKS
						FLOW	DYNAMIC HEAD	BHP	MINIMUM EFFICIENCY AT DUTY POINT	MINIMUM NPSH REQ'D (FEET)	SUCTION	DISCHARGE	HP	RPM	VOLTAGE	PHASE		MANUFACTURER	MODEL	
CHWP-1	BUILDING A CHILLED WATER	BASEMENT CHILLER MER	BASE MOUNTED END SUCTION CENTRIFUGAL	100% WATER	56 °F	800 GPM	125 ft#2O	31.4	80	19.20	5"	4"	40	3600	208 V	3	360 lb	BELL & GOSSETT	e-1510	
CHWP-2	BUILDING A CHILLED WATER	BASEMENT CHILLER MER	BASE MOUNTED END SUCTION CENTRIFUGAL	100% WATER	56 °F	800 GPM	125 ft#2O	31.4	80	19.20	5"	4"	40	3600	208 V	3	360 lb	BELL & GOSSETT	e-1510	NOTE 1
CWP-1	BUILDING A CONDENSER WATER	BASEMENT CHILLER MER	BASE MOUNTED END SUCTION CENTRIFUGAL	100% WATER	85 °F	1200 GPM	150 ft#2O	54	84	9.70	6"	5"	60	1800	208 V	3	800 lb	BELL & GOSSETT	e-1510	
CWP-2	BUILDING A CONDENSER WATER	BASEMENT CHILLER MER	BASE MOUNTED END SUCTION CENTRIFUGAL	100% WATER	85 °F	1200 GPM	150 ft#2O	54	84	9.70	6"	5"	60	1800	208 V	3	800 lb	BELL & GOSSETT	e-1510	NOTE 1

GENERAL NOTES:
1. PROVIDE SUCTION DIFFUSER FOR ALL PUMPS.
2. ALL PUMPS DRIVEN BY VFD PROVIDED BY DIVISION 26.
3. SEE VIBRATION ISOLATION SCHEDULE. PROVIDE INERIA BASE FOR ALL PUMPS; SUCTION DIFFUSER SHALL ALSO BE SUPPORTED USING THIS INERTIA BASE.

NOTES -
1. REDUNDANT PUMP. PUMP OPERATES AS A STANDBY EQUIPMENT IN CONTROL LOGIC.

VIBRATION ISOLATION EQUIPMENT SCHEDULE

EQUIPMENT TAG	EQUIPMENT TYPE	ISOLATOR TYPE	BASE TYPE	MINIMUM DEFLECTION PERFORMANCE	MANUFACTURER - MODEL	REMARKS
CH-1, CH-2	CENTRIFUGAL CHILLER	OPEN-SPRING ISOLATORS	-	0.25 in	MASON KSL	
CHWP-1, CHWP-2, CWP-1, CWP-2	CENTRIFUGAL PUMP	OPEN-SPRING ISOLATORS	CONCRETE INERTIA	1.00 in	MASON KSL	
CT-1, CT-2	COOLING TOWER	HOUSED-RESTRAINED SPRING ISOLATORS	-	2.00 in	MASON SLRSW	
REF-1	FAN	SPRING HANGERS	-	1.00 in	MASON KSL	
FCU-1, FCU-2	HORIZONTAL FAN COIL UNIT	ELASTOMERIC HANGERS	-	0.25 in	MASON KSL	

REFRIGERANT EXHAUST FAN SCHEDULE

TAG	SYSTEM	LOCATION	TYPE	MINIMUM AIRFLOW	OPERATING POINT					MOTOR DATA					OPERATING WEIGHT	BASIS OF DESIGN		REMARKS
					DESIGN	STATIC PRESSURE TSP	STATIC PRESSURE ESP	FAN RPM	BHP	VOLUME CONTROL	HP	MAX RPM	VOLTAGE	PHASE		MANUFACTURER	MODEL	
REF-1	REFRIGERANT EXHAUST	BUILDING A CHILLER MER	INLINE; BELT DRIVE	1000 CFM	3500 CFM	3.5 in-wg	3.5 in-wg	3451	3.3	VFD	5	3600	208 V	3	250.00 lb	GREENHECK	QEI-12	

NOTES-
1. MOTOR SHALL BE CERTIFIED FOR SPARK RESISTANCE B.
2. MOTOR SHALL BE OUTSIDE THE AIRSTREAM.
3. PROVIDE BACKDRAFT DAMPER

UNIT HEATER SCHEDULE (HOT WATER)

TAG	SYSTEM	LOCATION	TYPE	AIRSIDE DATA				HEATING DATA					MOTOR DATA				MAX MOUNTING HEIGHT	OPERATING WEIGHT	BASIS OF DESIGN		REMARKS
				AIRFLOW	EAT	LAT	THROW	DESIGN CAPACITY	EWT	LWT	FLOW	MAX PD	HP	RPM	VOLTAGE	PHASE			MANUFACTURER	MODEL	
UH-1	HEATING HOT WATER	BASEMENT	HORIZONTAL	1000 CFM	0 °F	60 °F	26' - 0"	73800 Btu/h	150 °F	180 °F	5 GPM	0.5 psi	0.125	875	208 V	1	17' - 0"	77.00 lb	DAIKIN	UH-121	

EXPANSION TANK SCHEDULE

TAG	SYSTEM	LOCATION	TYPE	TEMPERATURE		SYSTEM VOLUME	TANK VOLUME	MIN ACCEPTANCE VOLUME	AIR CHARGE PRESSURE	RELIEF VALVE	OPERATING WEIGHT	BASIS OF DESIGN		REMARKS
				MIN	MAX							MANUFACTURER	MODEL	
ET-CHW	BUILDING A CHILLED WATER	BASEMENT CHILLER MER	VERTICAL BLADDER	44 °F	57 °F	1350.0 gal	23.0 gal	8.0 gal	40.0 psi	140.0 psi	273.00 lb	BELL & GOSSETT	B85	

NOTES-
1. BEFORE SYSTEM STARTUP, PRECHARGE THE EXPANSION TANK TO A PRESSURE DETERMINED BY TAB EXERCISE. THE TAB EXERCISE SHALL VALIDATE THE OPERATING TOTAL PRESSURE OF THE SYSTEM AT PUMP SUCTION INLET. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

CONTROL VALVE SCHEDULE

TAG	TYPE	PHYSICAL CONSTRUCTION	SERVICE	LINE SIZE	DESIGN FLOW RATE	DESIGN PRESSURE DROP	VOLTAGE	PHASE	MANUFACTURER	REMARKS
CV-1A	MODULATING	BUTTERFLY	CH-1 CHILLED WATER ISOLATION	6"	400 GPM	5.0 psi	120 V	1	BELIMO	
CV-1B	MODULATING	BUTTERFLY	CH-1 CONDENSER WATER ISOLATION	8"	600 GPM	5.0 psi	120 V	1	BELIMO	
CV-2A	MODULATING	BUTTERFLY	CH-2 CHILLED WATER ISOLATION	6"	400 GPM	5.0 psi	120 V	1	BELIMO	
CV-2B	MODULATING	BUTTERFLY	CH-2 CONDENSER WATER ISOLATION	8"	600 GPM	5.0 psi	120 V	1	BELIMO	
CV-3A	MODULATING	BUTTERFLY	CT-1 RETURN WATER ISOLATION	8"	600 GPM	5.0 psi	120 V	1	BELIMO	
CV-3B	MODULATING	BUTTERFLY	CT-1 SUPPLY WATER ISOLATION	8"	600 GPM	5.0 psi	120 V	1	BELIMO	
CV-3C	MODULATING	BUTTERFLY	CT-1 SUPPLY WATER BYPASS ISOLATION	8"	600 GPM	5.0 psi	120 V	1	BELIMO	
CV-4A	MODULATING	BUTTERFLY	CT-2 RETURN WATER ISOLATION	8"	600 GPM	5.0 psi	120 V	1	BELIMO	
CV-4B	MODULATING	BUTTERFLY	CT-2 SUPPLY WATER ISOLATION	8"	600 GPM	5.0 psi	120 V	1	BELIMO	
CV-4C	MODULATING	BUTTERFLY	CT-2 SUPPLY WATER BYPASS ISOLATION	8"	600 GPM	5.0 psi	120 V	1	BELIMO	
CV-CHW	MODULATING; HIGH TURNDOWN	BALL	CHILLER MINIMUM FLOW - CHILLED WATER BYPASS	6"	800 GPM	4.0 psi	120 V	1	VSI-V	NOTE 1
CV-CW	MODULATING; HIGH TURNDOWN	BALL	CHILLER MINIMUM FLOW - CONDENSER BYPASS	6"	800 GPM	4.0 psi	120 V	1	VSI-V	NOTE 1
CV-U1	MODULATING	BUTTERFLY	USER 1 - BASEMENT AHU	0"	0 GPM	0.0 psi	120 V	1	BELIMO	NOTE 2
CV-U2	MODULATING	BUTTERFLY	USER 2 - BASEMENT AHU	0"	0 GPM	0.0 psi	120 V	1	BELIMO	NOTE 2
CV-U3	MODULATING	BUTTERFLY	USER 3 - BASEMENT AHU	0"	0 GPM	0.0 psi	120 V	1	BELIMO	NOTE 2
CV-U4	MODULATING	BUTTERFLY	USER 4 - BASEMENT AHU	0"	0 GPM	0.0 psi	120 V	1	BELIMO	NOTE 2
CV-U5	MODULATING	BUTTERFLY	USER 5 - BASEMENT AHU	0"	0 GPM	0.0 psi	120 V	1	BELIMO	NOTE 2
CV-U6	MODULATING	BUTTERFLY	USER 6 - BASEMENT AHU	0"	0 GPM	0.0 psi	120 V	1	BELIMO	NOTE 2
CV-U7	MODULATING	BUTTERFLY	USER 7 - BASEMENT AHU	0"	0 GPM	0.0 psi	120 V	1	BELIMO	NOTE 2

GENERAL NOTES -
1. PROVIDE ELECTRIC ACTUATOR FOR ALL VALVES.
2. REFER TO SPECIFICATION SECTION 230900 FOR ADDITIONAL INFORMATION.
3. FAIL SAFE POSITION SHALL BE PER M8.1.A, 8.1.B AND M8.1.C.

NOTES
1. PROVIDE A HIGH PERFORMANCE SEGMENTED BALL VALVE WITH A TURNDOWN RATIO OF 300:1. PROVIDE VALVE WITH AN ELECTRIC ACTUATOR WITH A RESOLUTION OF 200 STEPS, 0.04VDC/0.5 DEGREES. BASIS OF DESIGN: VSI, SERIES 1000-X
2. VALVE SIZE SHALL CONFORM TO LINE SIZE. PROVIDE ACTUATOR WITH FEEDBACK FUNCTIONALITY FOR ALL CONTROL VALVES TAGGED WITH A USER. PROVIDE OWNER CREDIT IF EXISTING VALVE CAN MEET REQUIREMENTS OF M8.1.A, M8.1.B AND M8.1.C.

BUFFER TANK SCHEDULE

TAG	SYSTEM	LOCATION	TYPE	MIN TANK VOLUME	CONNECTION SIZE	DIAMETER	TANK HEIGHT	OPERATING WEIGHT	BASIS OF DESIGN		REMARKS
									MANUFACTURER	MODEL	
BT-CHW	CHILLED WATER SYSTEM	BUILDING A CHILLER MER	VERTICAL	400.0 gal	8"	48 in	65 in	1,010.00 lb	TACO	BTH0400F	

NOTES-
1. ASME CONSTRUCTION.
2. PROVIDE FLANGED CONNECTION FOR ALL ASSOCIATED PIPE CONNECTIONS.
3. PROVIDE WITH A HAND HOLE ON TANK FOR CLEANING.
4. PROVIDE WITH INTERNAL BAFFLES, LEGS FOR VERTICAL INSTALLATION, AIR VENT AND FACTOR INSTALLED ELASTOMERIC INSULATION (WITH REMOVABLE PORTION AT HAND HOLE).

AIR SEPARATOR SCHEDULE

TAG	SYSTEM	LOCATION	TYPE	CONNECTION SIZE	DESIGN FLOW	MAX WATER PD	OPERATING WEIGHT	MANUFACTURER	MODEL	REMARKS
AS-CHW	CHILLED WATER	BASEMENT	COALESCING	8"	800 GPM	1.0 psi	888.00 lb	BELL & GOSSETT	CRS-8F Mag	

NOTES-
1. PROVIDE FLANGED CONNECTION FOR ALL ASSOCIATED PIPE CONNECTIONS.
2. PROVIDE PLUMBING MAKEUP WATER CONNECTION.
3. PROVIDE SERVICABLE MAGNETIC INSERT ACCESSORY.

HEAT TRACE SCHEDULE

TAG	SYSTEM	LOCATION	TYPE	WATTS PER LINEAR FOOT	VOLTAGE	PHASE	INPUT POWER	MANUFACTURER	MODEL	REMARKS
HTC	COOLING TOWER HYDRONIC PIPING	COOLING TOWER MER	PARALLEL SELF REGULATING	10 VA	208 V	3	5000 VA	CHROMALOX	SRL	

NOTES-
1. REFER TO PIPING INSULATION SPECIFICATION FOR CONDENSER WATER SYSTEM AND FLOOR PLANS. HEAT TRACE ELEMENT SHALL BE COMPATIBLE WITH THE PURCHASED INSULATION. VALIDATE PRODUCT SELECTION WITH ELECTRICAL DOCUMENTS.
2. BAS SHALL BE FULLY CAPABLE OF STARTING/STOPPING ANY/ALL HEAT TRACE CIRCUIT.
3. SEE MECHANICAL CONTROLS FOR ADDITIONAL INFORMATION. PROVIDE A DISTRIBUTION BOX ACCESSORY (BOD - MARSHALL BOX CHROMALOX) TO PROVIDE FOUR (4) LOADSIDE CIRCUITS.
4. PROVIDE ANY/ALL ACCESSORIES NEEDED TO TIE THE HEAT TRACE PANEL TO THE BAS.
5. PROVIDE HEAT TRACING ON ALL VALVES, AND PIPE ELBOWS. INSTALL HEATING ELEMENT AS RECOMMENDED BY HEAT TRACE MANUFACTURER.

REFRIGERANT EXHAUST HOOD SCHEDULE

TAG	SYSTEM	LOCATION	AIRFLOW	MAXIMUM PERMISSIBLE AIR PRESSURE DROP	BASIS OF DESIGN HOOD SIZE			OPERATING WEIGHT	BASIS OF DESIGN		REMARKS
					LENGTH	WIDTH	HEIGHT		MANUFACTURER	MODEL	
REH-1	EMERGENCY REFRIGERANT EXHAUST SYSTEM	BUILDING A ROOF	3500 CFM	0.1 in-wg	2' - 10"	2' - 10"	2' - 4"	100.00 lb	GREENHECK	WRH	

NOTES -
1. PRIOR TO ORDERING THE HOOD, COORDINATE WITH BUILDING OWNER ON A SPERATE ROOF PROJECT ASSOCIATED WITH THIS BUILDING.
2. CONTRACTOR SHALL COORDINATE ROOF OPENING SIZE WITH STRUCTURAL, ARCHITECTURAL AND MECHANICAL DRAWINGS, AND THE SEPERATE ROOFING PROJECT.
3. COORDINATE ROOF CURB AND INSULATION WITH ARCHITECTURAL DETAIL AND THE SEPERATE ROOFING PROJECT.

FAN COIL UNIT SCHEDULE (COOLING ONLY)

TAG	SYSTEM	LOCATION	TYPE	AIRSIDE DATA		MOTOR DATA			COOLING COIL DATA									OPERATING WEIGHT	BASIS OF DESIGN		REMARKS
				AIRFLOW	ESP	HP	VOLTAGE	PHASE	TOTAL CAPACITY	SENSIBLE CAPACITY	EAT DB	EAT WB	LAT DB	LAT WB	EWT	LWT	FLOW	MAX PD		MANUFACTURER	MODEL	
FCU-1	BUILDING A CHILLED WATER	BASEMENT CHILLER MER	CEILING MOUNTED; NON-DUCTED	875 CFM	0.1 in-wg	1	208 V	3	39820 Btu/h	30810 Btu/h	75 °F	63 °F	51 °F	50 °F	44 °F	56 °F	7 GPM	5.0 psi	243.30 lb	TRANE	BCHE036	
FCU-2	BUILDING A CHILLED WATER	BASEMENT CHILLER MER	CEILING MOUNTED; NON-DUCTED	1150 CFM	0.1 in-wg	0.5	208 V	3	52180 Btu/h	26340 Btu/h	75 °F	68 °F	48 °F	48 °F	44 °F	56 °F	9 GPM	5.0 psi	254.00 lb	TRANE	BCHE036	

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
ISRAEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER

04/02/2026

SHEET TITLE
MECHANICAL SCHEDULES

PROJECT NUMBER
00100451

SHEET NUMBER
M7.1

Author

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Plot Date:

CONTROL ABBREVIATIONS

#

2-D	TWO-DIMENSIONAL
3-D	THREE-DIMENSIONAL

A

AAC	ADVANCED APPLICATION CONTROLLER
AFMS	AIRFLOW MEASURING STATION
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT
ALT	ALTERNATOR
AO	ANALOG OUTPUT
ASC	APPLICATION SPECIFIC CONTROLLER
AX	AUXILIARY CONTACT

B

B	BOILER
BC	BUILDING CONTROLLER
BD	BACKDRAFT DAMPER
BMS	BUILDING MANAGEMENT SYSTEM

C

CB	CHILLED BEAM
CBCHW	CHILLED BEAM CHILLED WATER
CBHW	CHILLED BEAM HOT WATER
CC	COOLING COIL
CCDT	COOLING COIL DISCHARGE TEMPERATURE
CH	CHILLER
CHW	CHILLED WATER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CI	CURRENT INPUT
CM	CONTROL MODULE
CO	CARBON MONOXIDE
CO2	CARBON DIOXIDE
CSR	CURRENT SWITCH OR CURRENT SENSING RELAY
CR	CONTROL RELAY
CT	COOLING TOWER
CW	CONDENSER WATER
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY

D

D	DAMPER
DDC	DIRECT DIGITAL CONTROL
DF	DIESEL FUEL
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
DP	PRESSURE DIFFERENCE
DPS	DIFFERENTIAL PRESSURE SWITCH
DPT	DIFFERENTIAL PRESSURE SENSOR
DX	DIRECT EXPANSION

E

EA	EXHAUST AIR
ED	ENABLE / DISABLE
EF	EXHAUST FAN
EP	ELECTRIC / PNEUMATIC RELAY
ES	END SWITCH

F

F	DEGREES FAHRENHEIT
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FD	FIRE DAMPER
FDAT	FAN DISCHARGE AIR TEMPERATURE
FD/SD	COMBINATION FIRE AND SMOKE DAMPER
FM	FLOW METER
FR	FIELD RELAY
FS	FLOW SWITCH
FZ	FREEZESTAT

G

GCF	GARAGE CIRCULATION FAN
GEF	GARAGE EXHAUST FAN
GIF	GARAGE INTAKE FAN

H

H	HUMIDITY
HC	HEATING COIL
HHW	HEATING HOT WATER
HHWR	HEATING HOT WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
HI	HIGH
HL	HIGH LEVEL
HX	HEAT EXCHANGER

K

KW	KILOWATTS

L

LO	LOW
LL	LOW LEVEL
LV	LEVEL

M

MAX	MAXIMUM
MAT	MIXED AIR TEMPERATURE
MIN	MINIMUM
MS	MOTOR STARTER

N

N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN

O

OA	OUTDOOR AIR
OAH	OUTDOOR AIR HUMIDITY
OAT	OUTDOOR AIR TEMPERATURE
OWS	OPERATOR WORK STATION

P

P	PUMP
PH	PENTHOUSE
PHDT	PREHEAT DISCHARGE TEMPERATURE
PMCS	POWER MONITORING & CONTROL SYSTEM
PPM	PARTS PER MILLION
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH

R

RA	RETURN AIR; REFRIGERANT ALARM
RAH	RETURN AIR HUMIDITY
RAT	RETURN AIR TEMPERATURE
RET	RETURN
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RLMS	REFRIGERANT LEAK MONITORING SYSTEM
RLF	RELIEF
ROT	ROTATION MONITORING SENSOR

S

S	SOLENOID
SA	SUPPLY AIR
SC	SELF CONTAINED UNIT
SD	SMOKE DAMPER; SMOKE DETECTOR
SF	SUPPLY FAN
SP	STATIC PRESSURE
SS	START / STOP
SV	SOLENOID VALVE
SW	SWITCH

T

T	TEMPERATURE SENSOR
TEF	TOILET EXHAUST FAN
TH	THERMOSTAT

V

V	VALVE
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE
VO	VOLTAGE OUTPUT
VS	VIBRATION SWITCH

W

WC	WATER COLUMN

SEE CONTROL SYMBOLS, LEGENDS AND EQUIPMENT SCHEDULES FOR ADDITIONAL ABBREVIATIONS. ALL ABBREVIATIONS, SYMBOLS, AND LEGENDS SHOWN ON THIS DRAWINGS ARE NOT NECESSARILY USED.

CONTROL SYMBOLS

SENSING COMPONENTS

- AIR FLOW MEASURING STATION (DUCT)
- FAN INLET BELL HOUSING AIR FLOW MEASURING STATION
- T — TEMPERATURE SENSOR
- T — TEMPERATURE SENSOR (AVERAGING)
- PS — PRESSURE SWITCH
- P — PRESSURE SENSOR OR PRESSURESTAT
- FS — FLOW SWITCH
- SD — SMOKE DETECTOR (DUCT)
- FM — FLOW METER
- L — LEVEL SENSOR
- R — REFRIGERANT LEAK SENSING POINT
- SP — STATIC PRESSURE SENSOR
- DPS — DIFFERENTIAL PRESSURE SWITCH
- DPT — DIFFERENTIAL PRESSURE SENSOR
- S — SPACE TEMPERATURE SENSOR
- T — THERMOSTAT
- H — SPACE HUMIDITY SENSOR
- H — HUMIDISTAT

CONTROL COMPONENTS

- M — 2-WAY ELECTRIC CONTROL VALVE
- M — 3-WAY ELECTRIC CONTROL VALVE
- M — BUTTERFLY VALVE ELECTRIC ACTUATOR
- M — SEGMENTED BALL VALVE ELECTRIC ACTUATOR
- 2-WAY PNEUMATIC CONTROL VALVE
- 3-WAY PNEUMATIC CONTROL VALVE
- BUTTERFLY VALVE PNEUMATIC ACTUATOR
- SEGMENTED BALL VALVE PNEUMATIC ACTUATOR
- S — 2-WAY SOLENOID VALVE
- S — 3-WAY SOLENOID VALVE
- M — PARALLEL BLADE DAMPER - ELECTRIC ACTUATOR
- M — PARALLEL BLADE DAMPER WITH END SWITCH - ELECTRIC ACTUATOR
- PARALLEL BLADE DAMPER - PNEUMATIC ACTUATOR
- PARALLEL BLADE DAMPER WITH END SWITCH - PNEUMATIC ACTUATOR
- DPT — DIFFERENTIAL PRESSURE SENSOR, SWITCH, ETC. INSTALLED IN A THERMOWELL BY DIV.23
- P — PRESSURE SENSOR, SWITCH, ETC. INSTALLED IN A THERMOWELL BY DIV.23
- T — TEMPERATURE SENSOR, SWITCH, ETC. INSTALLED IN A THERMOWELL BY DIV.23
- M — INTEGRAL FACE & BYPASS STEAM HEATING COIL
- H / C — HOT WATER OR STEAM HEATING COIL
- C / C — CHILLED WATER COOLING COIL
- E / C — WATERSIDE ECONOMIZER COOLING COIL
- FAN OR FAN ARRAY
- FAN WITH PNEUMATIC VARIABLE INLET VANES
- PROPELLER TYPE FAN
- M — ROOF MOUNTED EXHAUST FAN (SINGLE PHASE)
- M — ROOF MOUNTED EXHAUST FAN (3 PHASE)
- PLATE AND FRAME HEAT EXCHANGER
- SHELL AND TUBE HEAT EXCHANGER

CONTROL ELECTRICAL COMPONENTS

- AX — AUXILIARY CONTACT
- CI — CURRENT INPUT
- CSR — CURRENT SENSING RELAY
- CT — CURRENT TRANSDUCER
- EN — ENABLE / DISABLE
- SP — SET POINT
- SS — START / STOP
- VI — VOLTAGE INPUT
- VO — VOLTAGE OUTPUT
- VS — VIBRATION SWITCH
- CS — CURRENT SWITCH
- CM — CONTROL MODULE
- TDR — TIME DELAY RELAY
- MS — MOTOR STARTER
- FA — FIRE ALARM INTERFACE
- VFD — VARIABLE FREQUENCY DRIVE
- ECM — ELECTRONICALLY COMMUTATED MOTOR
- EPS — ELECTRIC TO PNEUMATIC SWITCH
- EPV — ELECTRIC TO PNEUMATIC VALVE
- ROT — ROTATION MONITORING SENSOR
- UMCP — UNIT MANUFACTURER'S CONTROL PANEL
- RLMS — REFRIGERANT LEAK MONITORING SYSTEM
- FACP — FIRE ALARM CONTROL PANEL
- EPB — EMERGENCY PUSH BUTTON
- SW — WALL MOUNTED SWITCH
- OR — OCCUPANCY OVER RIDE SWITCH
- OS — OCCUPANCY SENSOR
- R — REFRIGERANT LEAK MONITORING SYSTEM COMBINATION HORN/STROBE THREE COLORED STROBE.
- HORN OR SIREN
- BELL
- ALT — ALTERNATOR
- R — RELAY
- T-1 — POINT NAME'S INDENIFICATION (CORRESPONDS TO CONTROL ABBREVIATIONS)
- POINT NAME'S NUMBER (CONSECUTIVELY COUNTED IN RESPECT TO CONTROL ABBREVIATIONS)
- 1 — POINT NUMBER (CONSECUTIVELY COUNTED)

BMS POINT FUNCTION DESCRIPTIONS

HVAC CONTROLS - BMS POINT FUNCTION SCHEDULE

	1 HARDWARE		2 FAIL MODE			3 SOFTWARE														4 ALARM LIMITS		
POINT NAME	TAG	POINT TYPE	FAIL ON (OPEN)	FAIL OFF (CLOSED)	LAST COMMANDED STATE	LOCAL DEFAULT	NETWORK POINT	CALCULATED POINT	MAINTENANCE ALARM	CRITICAL ALARM	24 HOUR OPERATION	PROGRAM START/STOP	OPTIMUM START	MORNING WARM/COOL	UNOCCUPIED SET POINT	DEMAND LIMIT	DIRECT DIGITAL CONTROL	SET POINT ADJUSTMENT	TOTALIZER	RUN TIME	ALARM INSTRUCTIONS	MAINTENANCE WORK ORDER	ALARM LIMITS	SOFTWARE INTERLOCKS	TREND	LOW LIMIT	HIGH LIMIT	NOTES

POINT NAME: UNIQUE MORE DISCRIPTIVE VERSION OF TAG (POINT TAG).

1 HARDWARE

TAG (POINT TAG): UNIQUE SENSOR/DEVICE IDENTIFICATION DESIGNATION.

POINT TYPE: TYPE OF INPUT OR OUTPUT CONNECTED TO A BMS CONTROL PANEL. EACH OF THE 4 TYPES (AI, AO, DI, DO) ARE DISCRIPBED BELOW:

AI (ANALOG INPUT): A SIGNAL INPUT TO THE BUILDING MANAGEMENT SYSTEM WHICH HAS A VARIABLE RANGE OF VALUES. ANALOG INPUTS PROVIDE NUMERIC DATA RATHER THAN SIMPLE "ON/OFF" STATES. EXAMPLES OF ANALOG INPUTS FROM SENSORS INCLUDE TEMPERATURE, PRESSURE, HUMIDITY, AND CHEMICAL CONCENTRATION.

AO (ANALOG OUTPUT): A SIGNAL OUTPUT FROM THE BUILDING MANAGEMENT SYSTEM WHICH HAS A VARIABLE RANGE OF VALUES. ANALOG OUTPUTS PROVIDE PROPORTIONAL CONTROL COMMANDS TO EQUIPMENT. EXAMPLES OF ANALOG OUTPUTS INCLUDE SET POINT ADJUSTMENT AND MOTOR SPEED.

DI (DIGITAL INPUT): A SIGNAL INPUT TO THE BUILDING MANAGEMENT SYSTEM WHICH HAS A BINARY (1 OR 0) VALUE. DIGITAL INPUTS PROVIDE DATA ABOUT THE STATUS OF A SPACE OR EQUIPMENT. EXAMPLES OF DIGITAL INPUTS INCLUDE MOTOR STATUS ("ON/OFF"), VALVE POSITION ("OPEN/CLOSED"), OCCUPANCY ("OCCUPIED/UNOCCUPIED"), OR LIMIT ALARMS SUCH AS HIGH VOLTAGE OR LOW FUEL.

DO (DIGITAL OUTPUT): A SIGNAL OUTPUT FROM THE BUILDING MANAGEMENT SYSTEM WHICH HAS A BINARY (1 OR 0) VALUE. THESE OUTPUTS CONTROL EQUIPMENT WHICH OPERATES IN TWO MAIN STATES (SUCH AS "ON" AND "OFF"). EXAMPLES OF THESE OUTPUTS INCLUDE MOTOR START/STOP AND DAMPER OR VALVE POSITION CONTROL ("OPEN/CLOSE").

2 FAIL MODE

FAIL ON (OPEN): CONTROLLED DEVICE REVERTS TO THE OPEN POSITION OR THE ENGAGED STATE WHEN POWER OR CONTROL SIGNAL IS LOST.

FAIL OFF (CLOSED): CONTROLLED DEVICE REVERTS TO THE CLOSED POSITION OR THE DISENGAGED STATE WHEN POWER OR CONTROL SIGNAL IS LOST.

LAST COMMANDED STATE: CONTROLLED DEVICE REMAINS IN THE SAME POSITION OR STATE, WHEN POWER OR CONTROL SIGNAL IS LOST.

3 SOFTWARE

NETWORK POINT: POINT IS EITHER DIRECTLY OR INDIRECTLY CONNECTED TO THE BMS. IT IS COMMUNICATED TO THE BMS THROUGH A COMMUNICATION GATEWAY FROM ANOTHER INTELLIGENT PIECE OF EQUIPMENT OR PROVIDED BY A COMMUNICATION PROTOCOL (I.E. BACNET, LONWORKS, OR MODBUS).

CALCULATED POINT: A POINT NOT CONNECTED DIRECTLY TO THE BMS, BUT ITS VALUE IS CALCULATED BY THE DDC USING INPUT DATA. DEFINED IN POINT SCHEDULE WHEN SPECIAL CALCULATED VALUES ARE REQUIRED BY SYSTEM DESIGN.

MAINTENANCE ALARM: NOTIFIES PERSONNEL OF REQUIRED MAINTENANCE.

CRITICAL ALARM: ALARM FOR FAILURES WHICH WOULD PROVE PARTICULARLY DAMAGING TO SYSTEMS OR ARCHITECTURE.

24 HOUR OPERATION: SPECIFIES PROCEDURE FOR RUNNING SYSTEM AT ALL HOURS OF DAY AND NIGHT.

PROGRAM START/STOP: BEGINS/ENDS SYSTEM CONTROL PROGRAM.

OPTIMUM START: USES PAST HISTORY TO DETERMINE ENERGY EFFICIENT TIMES TO ACTIVATE EQUIPMENT.

MORNING WARM/COOL: PROCEDURE FOR BRINGING SPACE TO OCCUPIED SET POINTS FROM UNOCCUPIED SET POINTS.

UNOCCUPIED SET POINT: SET POINT WHICH ALLOWS SYSTEM TO SAVE ENERGY BY DRIFTING FROM NORMAL TARGETS WHILE SPACE IS UNOCCUPIED.

DEMAND LIMIT: ELECTRICAL ENERGY CONSERVATION STRATEGY WHICH REDUCES kW DEMAND DURING PEAK UTILITY RATE PERIODS.

DIRECT DIGITAL CONTROL: MICRO PROCESSOR BASED DIGITAL CONTROLLER.

CONTROL POINT ADJUSTMENT: MODIFIES SET POINT.

TOTALIZER: PERFORMS A SUMMATION OF AN ANALOG INPUT.

RUN TIME: MONITORS HOW LONG A DIGITAL INPUT OR 2-STATE DIGITAL OUTPUT HAS REGISTERED A SPECIFIC STATE.

ALARM INSTRUCTIONS: PROVIDES INSTRUCTIONS FOR RESPONSE TO A GIVEN ALARM CONDITION.

MAINTENANCE WORK ORDER: CREATES WORK ORDER FOR USE BY MAINTENANCE PERSONNEL OR CONTRACTOR.

ALARM LIMITS: DETERMINES AT WHAT POINTS THE SYSTEM MUST REACH BEFORE ALARM IS INDICATED.

SOFTWARE INTERLOCKS: TRIGGERS AN EVENT TO TAKE PLACE IN THE SYSTEM.

TREND: TRACKS AND DISPLAYS POINT VALUES (ANALOG OR DIGITAL) OVER TIME.

4 ALARM LIMITS

LOW LIMIT: USER DEFINED MINIMUM VALUE BEFORE ALARMING.

HIGH LIMIT: USER DEFINED MAXIMUM .

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04/02/2026

SHEET TITLE

MECHANICAL CONTROLS - GENERAL INFORMATION PAGE 1 OF 2

PROJECT NUMBER 00100451

SHEET NUMBER M8.0.A

Author

Plot Date: 4/13/2026 4:12:03 PM

FOR ALL CONTROL SCOPE INCLUDED IN THIS PROJECT -
THE SYSTEM SHALL BE FULLY COMPATIBLE WITH THE EXISTING AUTOMATED LOGIC SYSTEM. PROVIDE ALL NECESSARY UPGRADES TO THE EXISTING SYSTEM TO ACCOMODATE THE INTEGRATION OF THE NEW EQUIPMENT.

TRIM & RESPOND SETPOINT RESET LOGIC (GL36 SECTION 5.1.14)

A. TRIM & RESPOND SETPOINT RESET LOGIC AND ZONE/SYSTEM RESET REQUESTS WHERE REFERENCED IN SEQUENCES SHALL BE IMPLEMENTED AS DESCRIBED BELOW.
B. A "REQUEST" IS A CALL TO RESET A STATIC/DIFFERENTIAL PRESSURE OR TEMPERATURE SETPOINT, GENERATED BY DOWNSTREAM ZONES OR AIR HANDLING SYSTEMS. THESE REQUESTS ARE SENT UPSTREAM TO THE PLANT OR SYSTEM THAT SERVES THE ZONE OR AIR HANDLER WHICH GENERATED THE REQUEST.
   1. FOR EACH DOWNSTREAM ZONE OR SYSTEM, AND FOR EACH TYPE OF SETPOINT RESET REQUEST LISTED FOR THE ZONE/SYSTEM, PROVIDE THE FOLLOWING SOFTWARE POINTS:
      a. IMPORTANCE MULTIPLIER (DEFAULT = 1)
      b. REQUEST-HOURS ACCUMULATOR. PROVIDED SYSTEM-OK IS TRUE FOR THE ZONE/SYSTEM, EVERY X MINUTES (DEFAULT 5 MINUTES), ADD X DIVIDED BY 60 TIMES THE CURRENT NUMBER OF REQUESTS TO THIS REQUEST-HOURS ACCUMULATOR POINT
      c. SYSTEM RUN-HOURS TOTAL. THIS IS THE NUMBER OF HOURS THE ZONE/SYSTEM HAS BEEN OPERATING IN ANY MODE OTHER THAN UNOCCUPIED MODE.
      d. CUMULATIVE%-REQUEST-HOURS. THIS IS THE ZONE/SYSTEM REQUEST-HOURS DIVIDED BY THE ZONE/SYSTEM RUN-HOURS (THE HOURS IN ANY MODE OTHER THAN UNOCCUPIED MODE) SINCE THE LAST RESET, EXPRESSED AS A PERCENTAGE.
      e. THE REQUEST-HOURS ACCUMULATOR AND SYSTEM RUN-HOURS TOTAL ARE RESET TO ZERO AS FOLLOWS:
         - RESET AUTOMATICALLY FOR AN INDIVIDUAL ZONE/SYSTEM WHEN THE SYSTEM RUN-HOURS TOTAL EXCEEDS 400 HOURS.
         - RESET MANUALLY BY A GLOBAL OPERATOR COMMAND. THIS COMMAND WILL SIMULTANEOUSLY RESET THE REQUEST-HOURS POINT FOR ALL ZONES SERVED BY THE SYSTEM.
      f. A LEVEL 4 ALARM IS GENERATED IF THE ZONE IMPORTANCE MULTIPLIER IS GREATER THAN ZERO, THE ZONE/SYSTEM CUMULATIVE%-REQUEST-HOURS EXCEEDS 70%, AND THE TOTAL NUMBER OF ZONE/SYSTEM RUN-HOURS EXCEEDS 40.
      g. SEE ZONE AND AIR HANDLING SYSTEM CONTROL SEQUENCES FOR LOGIC TO GENERATE REQUESTS.
      h. MULTIPLY THE NUMBER OF REQUESTS DETERMINED FROM ZONE/SYSTEM LOGIC TIMES THE IMPORTANCE MULTIPLIER AND SEND TO THE SYSTEM/PLANT THAT SERVES THE ZONE/SYSTEM. SEE SYSTEM/PLANT LOGIC TO SEE HOW REQUESTS ARE USED IN TRIM & RESPOND LOGIC.

FOR EACH UPSTREAM SYSTEM OR PLANT SETPOINT BEING CONTROLLED BY A T&R LOOP, DEFINE THE FOLLOWING VARIABLES. ALL VARIABLES BELOW SHALL BE ADJUSTABLE FROM A RESET GRAPHIC ACCESSIBLE FROM A HYPERLINK ON THE ASSOCIATED SYSTEM/PLANT GRAPHIC. INITIAL VALUES ARE DEFINED IN SYSTEM/PLANT SEQUENCES BELOW. VALUES FOR TRIM, RESPOND, TIME STEP, ETC. SHALL BE TUNED TO PROVIDE STABLE CONTROL.

TABLE B.1.C - TRIM AND RESPOND VARIABLES AND SETTINGS

VARIABLE	DEFINITION
SP_0	INITIAL SETPOINT
SP_{min}	MINIMUM SETPOINT
SP_{max}	MAXIMUM SETPOINT
T_d	DELAY TIMER
T	TIME STEP
I	NUMBER OF IGNORED REQUESTS
R	NUMBER OF REQUESTS FROM ZONES/SYSTEMS
SP_{trim}	TRIM AMOUNT
SP_{res}	RESPOND AMOUNT (MUST BE OPPOSITE IN SIGN TO SP_{trim} AND SHOULD GENERALLY BE HIGHER)
$SP_{res\text{-}max}$	MAXIMUM RESPONSE PER TIME INTERVAL (MUST BE SAME SIGN AS SP_{res})

A. TRIM & RESPOND LOGIC SHALL RESET SETPOINT WITHIN THE RANGE SPMIN TO SPMAX. WHEN THE ASSOCIATED DEVICE (E.G. FAN, PUMP) IS OFF, THE SETPOINT SHALL BE SP_0. THE RESET LOGIC SHALL BE ACTIVE WHILE THE ASSOCIATED DEVICE IS PROVEN ON, STARTING T_d AFTER INITIAL DEVICE START COMMAND. WHEN ACTIVE, EVERY TIME STEP T, TRIM THE SETPOINT BY SP_{trim}. IF THERE ARE MORE THAN I REQUESTS, RESPOND BY CHANGING THE SETPOINT BY SP_{res} * (R-I), (I.E. THE NUMBER OF REQUESTS MINUS THE NUMBER OF IGNORED REQUESTS), BUT NO MORE THAN $SP_{res\text{-}max}$. IN OTHER WORDS, EVERY TIME STEP T:

CHANGE SETPOINT BY SP_{TRIM}
IF R>I, ALSO CHANGE SETPOINT BY $(R\text{-}I)*SP_{res}$ BUT NO LARGER THAN $SP_{res\text{-}max}$

A. FOR EACH TRIM AND RESPOND LOOP, GENERATE A GRAPHIC SIMILAR TO THE SAMPLE FIGURE. THE GRAPHIC DOES NOT NEED TO BE CUSTOMIZED TO MATCH THE FIGURE IN TERMS OF AESTHETICS; HOWEVER, IT MUST CONTAIN ALL OF THE INFORMATION AND FUNCTIONALITY SHOWN IN THE FIGURE. SUBMIT A SAMPLE OF THE INTENDED GRAPHIC FOR APPROVAL. THE FIGURE MUST BE CONSISTENT FOR EACH TRIM & RESPOND LOOP IN THE PROJECT.

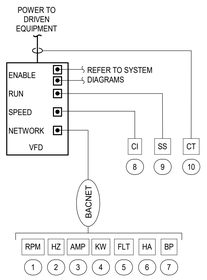
EQUIPMENT STAGING AND ROTATION (GL36 SECTION 5.1.15)

A. PARALLEL EQUIPMENT SHALL BE LEAD/STANDBY ROTATED TO MAINTAIN EVEN WEAR.
B. TWO RUNTIME POINTS SHALL BE DEFINED FOR EACH EQUIPMENT:
   1. LIFETIME RUNTIME: THE CUMULATIVE RUNTIME OF THE EQUIPMENT SINCE EQUIPMENT START-UP. THIS PIONT SHALL NOT BE READILY RESETTABLE BY OPERATORS.
   2. STAGING RUNTIME: AN OPERATOR RESETTABLE RUNTIME POINT THAT STORES CUMULATIVE RUNTIME SINCE THE LAST OPERATOR RESET.
C. LEAD/LAG EQUIPMENT:
   1. UNLESS OTHERWISE NOTED, PARALLEL STAGED DEVICES (SUCH AS PUMPS, TOWERS) THAT ARE NOT REDUNDANT SHALL BE LEAD/LAG ALTERNATED WHEN MORE THAN ONE IS OFF OR MORE THAN ONE IS ON SO THAT THE EQUIPMENT WITH THE MOST OPERATING HOURS AS DETERMINED BY STAGING RUNTIME IS MADE THE LAST STAGE EQUIPMENT AND THE ONE WITH THE LEAST NUMBER OF HOURS IS MADE THE LEAD STAGE EQUIPMENT.
D. LEAD/STANDBY EQUIPMENT:
   1. UNLESS EQUIPMENT RUNS CONTINUOUSLY, PARALLEL EQUIPMENT THAT ARE 100% REDUNDANT SHALL BE LEAD/STANDBY ALTERNATED WHEN MORE THAN ONE OF THE EQUIPMENT IS OFF SO THAT THE EQUIPMENT WITH THE MOST OPERATING HOURS AS DETERMINED BY STAGING RUNTIME IS MADE THE LAST STAGE EQUIPMENT AND THE ONE WITH THE LEAST NUMBER OF HOURS IS MADE THE EARLIER STAGE EQUIPMENT.
   2. IF EQUIPMENT RUNS CONTINUOUSLY, LEAD/STANDBY POSITIONS SHALL SWITCH AT AN ADJUSTABLE DAY OF THE WEEK AND TIME (E.G. TUESDAY AT 10:00AM) BASED ON STAGING RUNTIME; STANDBY EQUIPMENT SHALL FIRST BE STARTED AND PROVEN ON BEFORE FORMER LEAD EQUIPMENT IS CHANGED TO STANDBY AND SHUT OFF.
      a. VARIABLE SPEED FANS AND PUMPS SHALL HAVE A DECELERATION RATE OF 1 HZ/SECOND OR SLOWER SET IN BAS LOGIC WHEN DISABLED TO PREVENT NUESANCE TRIPS OF OPERATING EQUIPMENT (E.G. CHILLERS).
E. EXCEPTIONS TO LEAD/LAG AND LEAD/STANDBY ROTATION
   1. OPERATORS WITH APPROPRIATE ACCESS LEVEL SHALL BE ABLE TO MANUALLY COMMAND STAGING ORDER VIA SOFTWARE POINTS, BUT NOT OVERRIDING THE IN-ALARM OR HAND-OPERATION LOGIC IN THE FOLLOWING SUBSECTIONS.
      a. STAGING ORDER CHANGES INITIATED VIA OPERATOR OVERRIDE SHALL BE INSTITUTED AS PART OF NORMAL STAGING EVENTS.
      b. STAGING ORDER SHALL REMAIN OVERRIDEN UNTIL RELEASED BY OPERATORS.
   2. FAULTED EQUIPMENT:
      a. A FAULTED EQUIPMENT IS ANY EQUIPMENT COMMANDED TO RUN THAT IS EITHER NOT RUNNING OR UNABLE TO PERFORM ITS REQUIRED DUTY. IF AN OPERATING EQUIPMENT HAS ANY FAULT CONDITION DESCRIBED SUBSEQUENTLY, A LEVEL 2 ALARM SHALL BE GENERATED AND A RESPONSE SHALL BE TRIGGERED AS DEFINED BELOW.
      b. FANS AND PUMPS
         - STATUS POINT NOT MATCHING ITS ON/OFF POINT FOR 3 SECONDS AFTER A TIME DELAY OF 15 SECONDS WHILE THE EQUIPMENT IS COMMANDED ON.
      c. WATER-SOURCE CHILLER-HEATERS
         - SAFETY SHUTDOWN ALARM CONDITIONS EITHER THROUGH NETWORK OR HARDWIRED ALARM CONTACT.
         - CHILLER-HEATER IS MANUALLY SHUT OFF AS INDICATED BY THE STATUS OF THE LOCAL/AUTO SWITCH FROM CHILLER GATEWAY, OR
         - CHILLER-HEATER STATUS REMAINS OFF 5 MINUTES AFTER COMMAND TO START (NOTE: THIS CONDITION ONLY APPLIES WHEN A CHILLER-HEATER FIRST STARTS, I.E., ONCE STATUS IS PROVEN, THEN STATUS IS NO LONGER USED AS A FAULT CONDITION BECAUSE STATUS WILL COME AND GO IF CHILLER-HEATER CYCLES ON LOW LOAD), OR
         - CHW AND/OR CW ISOLATION VALVE FEEDBACK INDICATES A MISMATCH WITH THE COMMAND SIGNAL 90 SECONDS AFTER THE VALVE IS COMMANDED TO OPEN/CLOSE OR
         - FOR 10 MINUTES, CHILLED WATER RETURN TEMPERATURE HAS BEEN AT LEAST 5°F ABOVE THE CHWST SETPOINT, AND DELTA-T ACROSS THE CHILLER, AS DETERMINED BASED ON THE DIFFERENCE BETWEEN CHILLED WATER RETURN TEMPERATURE AND CHILLED WATER SUPPLY TEMPERATURE MEASURED AT THE CHILLER (I.E. NOT COMMON CHWST), HAS BEEN LESS THAN 3°F.
      d. BOILERS
         - SAFETY SHUTDOWN ALARM CONDITION EITHER THROUGH NETWORK OR HARDWIRED ALARM CONTACT, OR
         - HHW ISOLATION VALLVE FEEDBACK INDICATES VALVE IS NOT OPEN 90 SECONDS AFTER VALVE IS COMMANDED OPEN, OR
         - IF BOILER LEAVING WATER TEMPERATURE REMAINS 15°F BELOW SETPOINT FOR 15 MINUTES AND DELTA-T ACROSS THE BOILER, AS DETERMINED BASED ON THE DIFFERENCE BETWEEN HEATING HOT WATER SUPPLY TEMPERATURE AND HEATING HOT WATER RETURN TEMPERATURE MEASURED AT THE BOILER (IE., NOT COMMON HHWST), HAS BEEN LESS THAN 10°F.
      e. COOLING TOWERS
         - TOWER FAN HAS FAILED AS DEFINED ABOVE, OR
         - INLET/OUTLET END SWITCH (WHERE APPLICABLE) INDICATES A MISMATCH BETWEEN VALVE POSITION AND VALVE COMMAND 90 SECONDS AFTER THE VALVE COMMAND HAS BEEN ISSUED.
   3. UPON IDENTIFICATION OF A FAULT CONDITION:
      a. FOR FANS, PUMPS, AND COOLING TOWERS:
         - THE NEXT COMMANDED OFF EQUIPMENT IN THE STAGING ORDER, EQUIPMENT "B", SHALL BE COMMANDED ON WHILE ALARMING EQUIPMENT "A" REMAINS COMMANDED ON.
         - IF EQUIPMENT "B" FAILS TO PROVE STATUS (I.E. IT ALSO GOES INTO ALARM), IT SHALL REMAIN COMMANDED ON AND THE PRECEEDING STEP SHALL BE REPEATED UNTIL THE QUANTITY OF EQUIPMENT CALLED FOR BY THE CURRENT STAGE HAS PROVEN ON, OR THERE ARE NO MORE AVAILABLE EQUIPMENT.
         - SET ALARMING EQUIPMENT TO THE LAST POSITIONS IN THE LEAD/LAG OR LEAD/STANDBY STAGING ORDER SEQUENCED REVERSE CHRONOLOGICALLY (I.E., THE EQUIPMENT THAT ALARMED MOST RECENTLY IS SENT TO LAST POSITION).
         - STAGING ORDER OF NON-ALARMING EQUIPMENT SHALL FOLLOW THE EVEN WEAR LOGIC. EQUIPMENT IN ALARM CAN ONLY AUTOMATICALLY MOVE UP ON THE STAGING ORDER IF ANOTHER EQUIPMENT GOES INTO ALARM.
         - EQUIPMENT IN ALARM SHALL RUN IF SO CALLED FOR BY THE LEAD/LAG OR LEAD/STANDBY STAGING ORDER AND PRESENT STAGE.
      b. FOR CHILLER-HEATERS AND BOILERS:
         - THE NEXT COMMANDED OFF EQUIPMENT IN THE STAGING ORDER, EQUIPMENT "B", SHALL BE COMMANDED ON WHILE ALARMING EQUIPMENT "A" IS COMMANDED OFF AND SET TO THE LAST POSITION IN THE LEAD/LAG STAGING ORDER
         - IF EQUIPMENT B FAILS TO PROVE STATUS (I.E., IT ALSO GOES INTO ALARM), REPEAT THE PRECEDING STEP UNTIL THE QUANTITY OF EQUIPMENT CALLED FOR BY THE LEAD/LAG LOGIC HAVE PROVEN ON OR UNTIL ALL EQUIPMENT HAS BEEN TRIED.
         - IF ALL EQUIPMENT HAS BEEN TRIED AND THE QUANTITY OF NON-ALARMING EQUIPMENT IS LESS THAN CALLED FOR THEN THE MOST RECENTLY ALARMED EQUIPMENT WILL REMAIN COMMANDED ON.
         - STAGING ORDER OF NON-ALARMING EQUIPMENT SHALL FOLLOW THE EVEN WEAR LOGIC. EQUIPMENT IN ALARM CAN ONLY AUTOMATICALLY MOVE UP IN THE STAGING ORDER IF ANOTHER EQUIPMENT GOES INTO ALARM.
         - EQUIPMENT IN ALARM SHALL RUN IF SO CALLED FOR BY THE LEAD/LAG STAGING ORDER AND PRESENT STAGE.
      c. HAND OPERATION. IF A PIECE OF EQUIPMENT IS ON-IN-HAND (E.G., VIA AN HOA SWITCH OR LOCAL CONTROL OF VFD), THE EQUIPMENT SHALL BE SET TO THE LEAD DEVICE, AND A LEVEL 4 ALARM SHALL BE GENERATED. THE EQUIPMENT WILL REMAIN AS LEAD UNTIL HAND OPERATION IS NO LONGER DETECTED. HAND OPERATION IS DETERMINED BY THE FOLLOWING:
         - WHERE PROVIDED - HAND MODE STATUS POINT INDICATES THE DEVICE IS IN HAND MODE OR;
         - FANS AND PUMPS: STATUS POINT NOT MATCHING ITS ON/OFF POINT FOR 15 SECONDS AFTER A TIME DELAY OF 60 SECONDS WHEN THE EQUIPMENT IS COMMANDED OFF.

HIERARCHICAL ALARM SUPPRESSION (GL36 SECTION 5.1.19)

A. FOR EACH PIECE OF EQUIPMENT OR SPACE CONTROLLED BY THE BAS, DEFINE ITS RELATIONSHIP (IF ANY) TO OTHER EQUIPMENT IN TERMS OF "SOURCE", "LOAD", OR "SYSTEM."
   1. A COMPONENT IS A "SOURCE" IF IT PROVIDES RESOURCES TO A DOWNSTREAM COMPONENT, SUCH AS A CHILLER PROVIDING CHILLED WATER (CHW) TO AN AHU.
   2. A COMPONENT IS A "LOAD" IF IT RECEIVES RESOURCES FROM AN UPSTREAM COMPONENT, SUCH AS AN AHU THAT RECEIVES CHW FROM A CHILLER.
   3. THE SAME COMPONENT MAY BE BOTH A LOAD (RECEIVING RESOURCES FROM AN UPSTREAM SOURCE) AND A SOURCE (PROVIDING RESOURCES TO A DOWNSTREAM LOAD).
   4. A SET OF COMPONENTS IS A "SYSTEM" IF THEY SHARE A LOAD IN COMMON (I.E., COLLECTIVELY ACT AS A SOURCE TO DOWNSTREAM EQUIPMENT, SUCH AS A SET OF CHILLERS IN A LEAD/LAG RELATIONSHIP SERVING AIR HANDLERS).
      a. IF A SINGLE COMPONENT ACTS AS A SOURCE FOR DOWNSTREAM LOADS (E.G., AN AHU AS A SOURCE FOR ITS VAV BOXES), THEN THAT SINGLE-SOURCE COMPONENT SHALL BE DEFINED AS A "SYSTEM" OF ONE ELEMENT.
      b. FOR EQUIPMENT WITH ASSOCIATED PUMPS (CHILLERS, BOILERS, COOLING TOWERS):
         - IF THE PUMPS ARE IN A ONE-TO-ONE RELATIONSHIP WITH EQUIPMENT THEY SERVE, THE PUMPS SHALL BE TREATED AS PART OF THE SYSTEM TO WHICH THEY ARE ASSOCIATED (I.E. THEY ARE NOT CONSIDERED LOADS), AS A PUMP FAILURE WILL NECESSARILY DISABLE ITS ASSOCIATED EQUIPMENT.
         - IF THE PUMPS ARE HEADERED TO THE EQUIPMENT THEY SERVE, THEN THE PUMPS MAY BE TREATED AS A SYSTEM WHICH IS A LOAD RELATIVE TO THE UPSTREAM EQUIPMENT (E.G. CHILLERS) AND A SOURCE RELATIVE TO DOWNSTREAM EQUIPMENT (E.G., AIR HANDLERS).
B. FOR EACH SYSTEM, THERE SHALL BE A SystemOK FLAG, WHICH IS EITHER TRUE OR FALSE.
C. SystemOK SHALL BE TRUE WHEN ALL OF THE FOLLOWING ARE TRUE:
   1. THE SYSTEM IS PROVEN ON
   2. THE SYSTEM IS ACHIEVING ITS TEMPERATURE AND/OR PRESSURE SETPOINT(S) FOR AT LEAST 5 MINUTES.
   3. THE SYSTEM IS READY AND ABLE TO SERVE ITS LOAD.
D. SystemOK SHALL BE FALSE WHEN THE SYSTEM IS STARTING UP (I.E., BEFORE REACHING SETPOINT) OR WHEN ENOUGH OF THE SYSTEM'S COMPONENTS ARE UNAVAILABLE (IN ALARM, DISABLED, OR TURNED OFF) TO DISRUPT THE ABILITY OF THE SYSTEM TO SERVE ITS LOAD.
   1. BY DEFAULT, LEVEL 1 THROUGH LEVEL 3 COMPONENT ALARMS (INDICATING EQUIPMENT FAILURE) SHALL INHIBIT SystemOK. LEVEL 4 COMPONENT ALARMS (MAINTENANCE AND ENERGY EFFICIENCY ALARMS) SHALL NOT AFFECT SystemOK.
E. THE BAS SHALL SELECTIVELY SUPPRESS (I.E., FAIL TO ANNOUNCE; ALARMS MAY STILL BE LOGGED TO A DATABASE) ALARMS FOR LOAD COMPONENTS IF SystemOK IS FALSE FOR THE SOURCE SYSTEM THAT SERVES THAT LOAD.
   1. IF SystemOK IS FALSE FOR A COOLING WATER SYSTEM (I.E., CHILLER, COOLING TOWER, OR ASSOCIATED PUMP), THEN ONLY HIGH-TEMPERATURE ALARMS FROM THE LOADS SHALL BE SUPPRESSED.
   2. IF SystemOK IS FALSE FOR A HEATING WATER SYSTEM (I.E., BOILER OR ASSOCIATED PUMP), THEN ONLY LOW TEMPERATURE ALARMS FROM THE LOADS SHALL BE SUPPRESSED.
   3. IF SystemOK IS FALSE FOR AN AIR-SIDE SYSTEM (AIR HANDLER, FAN COIL, VAV BOX, ETC.), THEN ALL ALARMS FROM THE LOADS SHALL BE SUPPRESSED.
F. THIS HIERARCHICAL SUPPRESSION SHALL CASCADE THROUGH MULTIPLE LEVELS OF LOAD-SOURCE RELATIONSHIPS SUCH THAT ALARMS AT DOWNSTREAM LOADS SHALL ALSO BE SUPPRESSED. REFER TO GL36 FOR ADDITIONAL EXAMPLES OF THESE RELATIONSHIPS AND LOGIC.
G. THE FOLLOWING ALARMS WILL NEVER BE SUPPRESSED BY THIS LOGIC:
   1. LIFE/SAFETY AND LEVEL 1 ALARMS
   2. FAILURE TO START ALARMS (I.E., EQUIPMENT IS COMMANDED ON, BUT STATUS POINT SHOWS EQUIPMENT TO BE OFF)
   3. FAILURE-TO-STOP/HAND ALARMS (I.E., EQUIPMENT IS COMMANDED OFF, BUT STATUS POINTS SHOWS EQUIPMENT TO BE ON)
H. TIME BASED SUPPRESSION
   1. CALCULATE A TIME-DELAY PERIOD AFTER ANY CHANGE IN SETPOINT BASED ON THE DIFFERENCE BETWEEN THE CONTROLLED VARIABLE (E.G., ZONE TEMPERATURE) AT THE TIME OF THE CHANGE AND THE NEW SETPOINT. THE DEFAULT TIME DELAY PERIOD SHALL BE AS FOLLOWS:
      a. FOR THERMAL ZONE TEMPERATURE ALARMS: 10 MINUTES PER °F OF DIFFERENCE.
      b. FOR THERMAL ZONE TEMPERATURE COOLING REQUESTS: 5 MINUTES PER °F OF DIFFERENCE BUT NO LONGER THAN 30 MINUTES.

FOR THERMAL ZONE TEMPERATURE HEATING REQUESTS: 5 MINUTES PER °F OF DIFFERENCE BUT NO LONGER THAN 30 MINUTES.



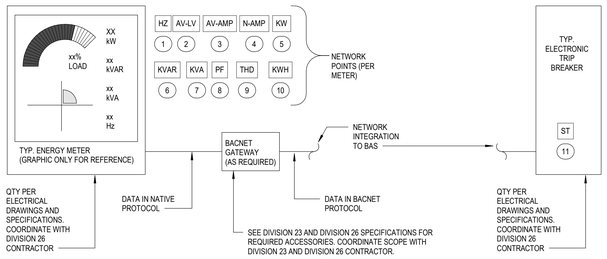
1 TYPICAL MOTOR/DRIVE POINTS
SCALE: NA

VFD NOTES

A. **THE SYSTEM SHALL BE FULLY COMPATIBLE WITH THE EXISTING AUTOMATED LOGIC SYSTEM. PROVIDE ALL NECESSARY UPGRADES TO THE EXISTING SYSTEM TO ACCOMODATE THE INTEGRATION OF THE NEW EQUIPMENT.**
B. UNLESS OTHERWISE NOTED, THIS DIAGRAM SHALL APPLY TO VFDs ON THE ENTIRE PROJECT SERVING PUMPS AND FANS WITH THE EXCEPTION OF VFDs THAT ARE INTEGRAL TO A PIECE OF EQUIPMENT SUCH AS A CHILLER COMPRESSOR VARIABLE SPEED DRIVE.
C. PROVIDE INTEGRATION VIA BACNET IP. INTEGRATION VIA BACNET MS/TP SHALL ONLY BE ACCEPTABLE IF BACNET IP IS NOT AN OPTION FOR THE SELECTED VFD MANUFACTURER.
D. ALL VFDs ON THE ENTIRE PROJECT SHALL BE PROVIDED BY A SINGLE MANUFACTURER UNLESS OTHERWISE INDICATED.
E. REFER TO SPECIFIC DIAGRAMS FOR SAFETY AND RUN-ONLY REQUIREMENTS FOR EACH VFD.
F. PROVIDE A CURRENT TRANSDUCER TO MEASURE ACTUAL AMPERAGE (POINT 7). CREATE AND MAP A DIGITAL POINT TO THE INPUT OF THE CT FOR USE IN PROVE-ON/PROVE-OFF ALARM LOGIC. I.E. IF AMERAGE GREATER THAN x, THE DIGITAL POINT SHALL READ: ON = TRUE, AND VICE VERSA IF AMERAGE IS LESS THAN x. THE AMPERAGE VALUE "x" SHALL BE USER ADJUSTABLE AND DETERMINED DURING THE TESTING AND BALANCING PROCESS IN CONJUNCTION WITH THE DETERMINATION OF THE MINIMUM VFD SPEED. THE VALUE "x" SHALL BE SET TO A VALUE SLIGHTLY BELOW THE MEASURED AMPERAGE AT THE MINIMUM VFD SPEED. REFER TO TAB SPECIFICATION FOR ADDITIONAL INFORMATION.
G. VFD SPEED POINTS
   1. THE SPEED AO SENT TO VFDs SHALL BE CONFIGURED SUCH THAT 0% SPEED CORRESPONDS TO 0 HZ, AND 100% SPEED CORRESPONDS TO MAXIMUM SPEED CONFIGURED IN THE VFD.
   2. FOR EACH PIECE OF EQUIPMENT, THE MINIMUM SPEED SHALL BE STORED IN A SINGLE SOFTWARE POINT; IN THE CASE OF A HARD-WIRED VFD INTERFACE, THE MINIMUM SPEED SHALL BE THE LOWEST SPEED COMMAND SENT TO THE DRIVE BY THE BAS. THE ACTIVE MINIMUM SPEED PARAMETER SHALL BE READ EVERY 60 MINUTES VIA THE DRIVE'S NETWORK INTERFACE. WHEN A MISMATCH BETWEEN THE DRIVE'S ACTIVE MINIMUM SPEED AND THE MINIMUM SPEED STORED IN THE SOFTWARE POINT IS DETECTED, THE MINIMUM SPEED STORED IN THE SOFTWARE POINT SHALL BE WRITTEN TO THE VFD VIA THE NETWORK INTERFACE TO RESTORE THE ACTIVE MINIMUM SPEED PARAMETER TO ITS DEFAULT VALUE, AND GENERATE A LEVEL 4 ALARM.
H. HAND-OFF-AUTO (HOA) OPERATION
   1. PROVIDE HOA SETTINGS AS PART OF THE VARIABLE FREQUENCY DRIVE (VFD) THROUGH THE DRIVES KEYPAD FOR THE SUPPLY FAN.
   2. WHEN IN HAND MODE, THE MOTOR CONTROLLED BY THE VFD WILL START.
   3. WHEN IN OFF MODE, THE MOTOR CONTROLLED BY THE VFD WILL BE OFF.
   4. WHEN IN AUTO MODE, THE MOTOR CONTROLLED BY THE VFD WILL BE STARTED AND STOPPED THROUGH THE BAS.
   5. UPON ACTIVATION, SAFTIES WILL STOP THE MOTOR IN AUTO OR HAND MODES.
I. LOCAL-REMOTE SPEED CONTROL
   1. LOCAL-REMOTE SETTINGS WILL BE PROVIDED AS PART OF THE VFD THROUGH THE DRIVES KEYPAD.
   2. IN LOCAL MODE THE MOTOR SPEED WILL BE CONTROLLED THROUGH A MANUAL SPEED CONTROL LOCATED AT THE DRIVES CONTROL PANEL.
   3. IN REMOTE MODE, THE MOTOR SPEED WILL BE CONTROLLED BY THE BAS.

HVAC CONTROLS - BMS POINT FUNCTION SCHEDULE - GENERAL

	POINT NAME	HARDWARE TAG	POINT TYPE	FAIL MODE: FAIL ON (OPEN)	FAIL MODE: FAIL OFF (CLOSED)	FAIL MODE: LAST COMMANDED STATE	NOTES
VFD							
1	MOTOR SPEED (RPM)	RPM	AI				
2	OUTPUT FREQUENCY (HZ)	HZ	AI				
3	OUTPUT CURRENT (AMPS)	AMP	AI				
4	OUTPUT POWER (KW)	KW	AI				
5	FAULT ALARM	FLT	DI				
6	HAND MODE STATUS	HA	DI				
7	BYPASS MODE STATUS	BP	DI				
8	SPEED CONTROL	CI	AO			■	
9	START/STOP	SS	DO				
10	RUN STATUS	CT	AI				



THE SYSTEM SHALL BE FULLY COMPATIBLE WITH THE EXISTING AUTOMATED LOGIC SYSTEM. PROVIDE ALL NECESSARY UPGRADES TO THE EXISTING SYSTEM TO ACCOMODATE THE INTEGRATION OF THE NEW EQUIPMENT.

SEQUENCE OF OPERATIONS (INTEGRATION INTO ENERGY MONITORING DASHBOARD) -

1. PROVIDE DISPLAY OF SHOWN NEW ELECTRICAL SYSTEM IN ENERGY MONITORING DASHBOARD.
2. PROVIDE BUILDING ENERGY MONITORING DISPLAY OF TOTAL BUILDING INSTANTANEOUS KW.
3. TREND DATA EVERY 15 MINUTES (ADJ.).
4. REPORT kBTU/SF AND KWH DAILY, MONTHLY AND ANNUALLY.
5. REPORT PEAK AND AVERAGES OF ALL SHOWN ENERGY METER POINTS DAILY, MONTHLY AND ANNUALLY.
6. STORE DATA AS EXTERNAL FILES FOR A MINIMUM OF 36 MONTHS (ADJ.) ON THE SERVER, ACCESSIBLE TO BUILDING ENGINEER AND OWNER.
7. COORDINATE STORAGE LOCATION WITH BUILDING ENGINEER AND OWNER.

2 ELECTRICAL INTEGRATION
SCALE: NOT TO SCALE

BAS POINT FUNCTION SCHEDULE - ELECTRICAL INTEGRATION

	POINT NAME	NETWORK TAG	POINT TYPE	SOFTWARE: TOTALIZER	SOFTWARE: RUN TIME	SOFTWARE: TREND	GRAPHICS: 2-D- GRAPHICS	NOTES
ENERGY METER								
1	FREQUENCY	HZ	AI		■	■	■	
2	AVERAGE LINE VOLTAGE	AV-LV	AI		■	■	■	
3	AVERAGE CURRENT	AV-AMP	AI		■	■	■	
4	NEUTRAL CURRENT	N-AMP	AI		■	■	■	
5	TOTAL ACTIVE POWER	KW	AI		■	■	■	
6	TOTAL REACTIVE POWER	KVAR	AI		■	■	■	
7	TOTAL APPARENT POWER	KVA	AI		■	■	■	
8	TOTAL POWER FACTOR	PF	AI		■	■	■	
9	AVERAGE CURRENT THD	THD	AI		■	■	■	
10	TOTAL ENERGY USE	KWH	AI	■	■	■	■	
TRIP BREAKER								
11	STATUS	ST	DI		■		■	

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IONEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER
04/02/2026

SHEET TITLE
MECHANICAL CONTROLS - GENERAL INFORMATION PAGE 2 OF 2

00100451
PROJECT NUMBER

M8.0.B
SHEET NUMBER

Author
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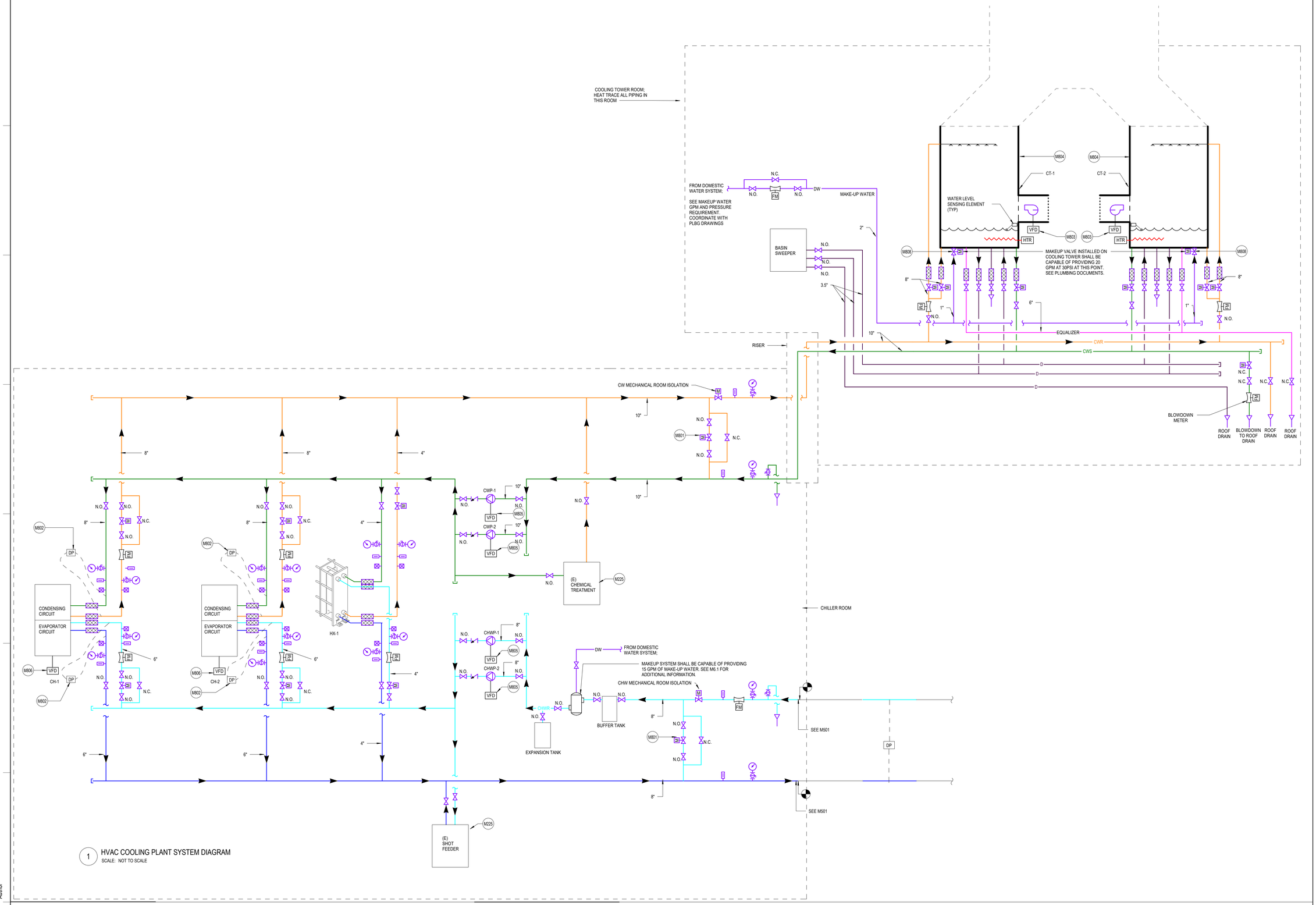

1 HVAC COOLING PLANT SYSTEM DIAGRAM
SCALE: NOT TO SCALE

GENERAL SHEET NOTES

A. **HAZARDOUS MATERIAL, INCLUDING BUT NOT LIMITED TO ASBESTOS, MAY BE ENCOUNTERED IN EXISTING PIPING, DUCTWORK, AND INSULATION. ENSURE ADEQUATE PROTOCOLS AND PROCEDURES ARE IN PLACE FOR LIFE SAFETY OR PERSONNEL BEFORE COMMENCING ANY WORK.**
B. SEE DRAWING M0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
C. SYSTEMS WITH AN \(E)/ SUBSCRIPT ARE EXISTING TO REMAIN. MAINTAIN ALL PIPING, DUCTWORK, SUPPORTS AND ACCESSORIES. PROTECT FROM DAMAGE DURING CONSTRUCTION.
D. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN, COORDINATE WITH THE OWNER 21 DAYS PRIOR TO SHUT DOWN. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. SEE DIVISION 01 DOCUMENTS FOR ADDITIONAL INFORMATION.
E. FOR ALL WORK ON OR WITHIN EXISTING EQUIPMENT, CONTRACTOR TO COORDINATE WITH EQUIPMENT MANUFACTURER TO MAINTAIN WARRANTIES AND UL LISTINGS OF EQUIPMENT AND SYSTEMS.
F. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION OF EQUIPMENT, PANELS, AND CONTROLLERS WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
G. ISOLATION VALVES ARE NORMALLY OPEN (N.O.) UNLESS SPECIFIED TO BE NORMALLY CLOSED (N.C.)
H. PRIOR TO ANY DEMOLITION AND NEW WORK, PERFORM TESTING AND BALANCING OF THE EXISTING CHILLED WATER PUMPING SYSTEMS SERVING THE BUILDING A. MEASURE PUMP FLOW, PUMP SUCTION PRESSURE, PUMP DISCHARGE PRESSURE, AND TOTAL SYSTEM FLOW AT EXISTING OPERATING PUMP SPEED. SUBMIT TAB REPORT TO OWNER AND EOR FOR REVIEW. DO NOT PROCEED WITH ANY WORK WITHOUT PRIOR TO FORMAL DIRECTION FROM THE OWNER.
I. PRIOR TO DEMOLISHING ANY PIPING, ENSURE ALL PIPING SYSTEMS ARE FULLY DRAINED OF WATER. PIPING SYSTEMS SHALL NOT HAVE STANDING WATER DURING DEMOLITION AND NEW CONSTRUCTION.

SHEET KEYNOTES

M225	ENGAGE THE CURRENT CHEMICAL TREATMENT CONTRACTOR FOR THIS BUILDING THROUGH OWNER. PROVIDE NEW CHEMICAL TREATMENT ONLY IF REQUIREMENTS OF 232513 AND 232516 CANNOT BE MET. USE EXISTING CHEMICAL TREATMENT FOR THE CHILLED WATER AND EXISTING CHEMICAL TREATMENT FOR CONDENSER WATER SYSTEM OTHERWISE.
M801	PROVIDE HIGH PERFORMANCE SEGMENTED BALL VALVE WITH A TURNDOWN RATIO OF 300:1; BASIS OF DESIGN: VSI, SERIES V. PROVIDE VALVE WITH AN ELECTRIC ACTUATOR WITH A RESOLUTION OF 200 STEPS, 0.04VDC/0.5 DEGREES. BASIS OF DESIGN: VSI, SERIES 1000-X. SEE MECHANICAL SCHEDULES AND SPECIFICATIONS FOR SIZING CRITERIA.
M802	PROVIDE FIVE VALVE MANIFOLD ASSEMBLY DIFFERENTIAL PRESSURE SENSOR-TRANSDUCER. BIDIRECTIONAL DP SENSING RANGE SHALL BE ATLEAST+/-50PSID, ACCURACY OF READING WITHIN 0.25%. BASIS OF DESIGN : SETRA MODEL 230 - FIVE VALVE MANIFOLD.
M803	ONE VARIABLE FREQUENCY DRIVE PER COOLING TOWER. ALL FANS SHALL BE DRIVEN BY SINGULAR SIGNAL FROM THIS VFD. VARIABLE FREQUENCY DRIVE SHALL BE PROVIDED BY DIVISION 26. SEE TYPICAL VARIABLE FREQUENCY DRIVE MOTOR DIAGRAM ON M801.
M804	PROVIDE A MANUFACTURER FURNISHED MANUFACTURER INSTALLED COOLING TOWER PANEL. INSTALLED AT ACCESSIBLE HEIGHT ON THE TOWER. HARDWIRE ALL MANUFACTURER PROVIDED POINTS TO THIS CENTRALIZED PANEL FOR EASIER BAS INTEGRATION BY TCC. PROVIDE ANY/ALL ACCESSORIES NEEDED TO INTEGRATE WITH PURCHASED COMMUNICATION PROTOCOL.
M805	ONE VARIABLE FREQUENCY DRIVE PER PUMP. VARIABLE SPEED DRIVE SHALL BE PROVIDED BY DIVISION 26. SEE TYPICAL VARIABLE FREQUENCY DRIVE MOTOR DIAGRAM ON M801.
M806	MANUFACTURER FURNISHED MANUFACTURER INSTALLED VARIABLE FREQUENCY DRIVE FOR CHILLER COMPRESSORS. PROVIDE THE POINTS SPECIFIED ON CHILLER CONTROL PANEL THROUGH NETWORK INTEGRATION.
M808	VALVE PROVIDED BY COOLING TOWER MANUFACTURER. TIE MAKEUP WATER VALVE CONTROL WITH WATER LEVEL SENSING ELEMENT.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IGNEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER
04/02/2026

SHEET TITLE
MECHANICAL DIAGRAMS
CHILLED WATER PLANT

PROJECT NUMBER
00100451

SHEET NUMBER
M5.2

Author

Plot Date: 4/13/2026 3:56:35 PM

BAS POINT FUNCTION SCHEDULE - COOLING PLANT

	POINT NAME	TAG	POINT TYPE	HARDWARE FAIL MODE: FAIL ON (OPEN)	HARDWARE FAIL MODE: FAIL OFF (CLOSED)	HARDWARE FAIL MODE: LAST COMMANDED STATE	HARDWARE FAIL MODE: LOCAL DEFAULT	SOFTWARE: NETWORK POINT	SOFTWARE: CALCULATED POINT	NOTES
1. WEATHER STATION										
1	OUTSIDE AIR DRY BULB TEMPERATURE	T	AI							
2	OUTSIDE AIR RELATIVE HUMIDITY %	H	AI							
2. CHILLER-1										
3	CONDENSER WATER RETURN TEMPERATURE	T	AI							
4	CONDENSER WATER SUPPLY TEMPERATURE	T	AI							
5	CONDENSER WATER VALVE CONTROL	VC	AO							
6	CONDENSER WATER VALVE POSITION	VP	AI	■						
7	DP CONDENSER MINIMUM FLOW	DP	AI							
8	CONDENSER WATER FLOW RATE	FL	AI							
9	EVAPORATOR CHILLED WATER RETURN TEMPERATURE	T	AI							
10	EVAPORATOR CHILLED WATER SUPPLY TEMPERATURE	T	AI							
11	CHILLED WATER VALVE CONTROL	VC	AO							
12	CHILLED WATER VALVE POSITION	VP	AI	■						
13	DP EVAPORATOR MINIMUM FLOW	DP	AI							
14	CHILLED WATER FLOW RATE	FL	AI							
2. CHILLER-1 HARDWIRE										
15	CHILLER DEMAND LIMIT	DL	AO							
16	CHILLER ENABLE/DISABLE	ED	DO							
17	CHILLER SETPOINT ADJUSTMENT	SPT-ADJ	DI							
2. CHILLER-1 NETWORK										
18	CHILLER ALARM STATUS	AL-ST	DI					■		
19	CHILLER STATUS	ST	DI					■		
20	CHILLER FAULT CODE	FC	AI					■		
21	CHILLER HEAD PRESSURE CONTROL	HPC	AI					■		
22	CHILLER HAND MODE STATUS	HM	DI					■		
23	CHILLER EVAPORATOR REFRIGERANT TEMPERATURE	REFT-EV	AI					■		
24	CHILLER EVAPORATOR REFRIGERANT TEMPERATURE	REFT-CN	AI					■		
25	CHILLER CONDENSER CW DIFFERENTIAL PRESSURE	DP	AI					■		
26	CHILLER EVAPORATOR CHW DIFFERENTIAL PRESSURE	DP	AI					■		
27	CONTROL PANEL CHILLED WATER RETURN TEMPERATURE	CP-CHWRT	AI					■		
28	CONTROL PANEL CHILLED WATER SUPPLY TEMPERATURE	CP-CHWST	AI					■		
3. CHILLER-2										
29	CONDENSER WATER RETURN TEMPERATURE	T	AI							
30	CONDENSER WATER SUPPLY TEMPERATURE	T	AI							
31	CONDENSER WATER VALVE CONTROL	VC	AO							
32	CONDENSER WATER VALVE POSITION	VP	AI	■						
33	DP CONDENSER MINIMUM FLOW	DP	AI							
34	CONDENSER WATER FLOW RATE	FL	AI							
35	EVAPORATOR CHILLED WATER SUPPLY TEMPERATURE	T	AI							
36	EVAPORATOR CHILLED RETURN TEMPERATURE	T	AI							
37	CHILLED WATER VALVE POSITION	VP	AI	■						
38	CHILLED WATER VALVE CONTROL	VC	AO							
39	CHILLED WATER FLOW RATE	FL	AI							
40	DP EVAPORATOR MINIMUM FLOW	DP	AI							
3. CHILLER-2 HARDWIRE										
41	CHILLER DEMAND LIMIT	DL	AO							
42	CHILLER ENABLE/DISABLE	ED	DO							
43	CHILLER SETPOINT ADJUSTMENT	SPT-ADJ	DI							
3. CHILLER-2 NETWORK										
44	CHILLER ALARM STATUS	AL-ST	DI					■		
45	CHILLER STATUS	ST	DI					■		
46	CHILLER FAULT CODE	FC	AI					■		
47	CHILLER HEAD PRESSURE CONTROL	HPC	AI					■		
48	CHILLER HAND MODE STATUS	HM	DI					■		
49	CHILLER EVAPORATOR REFRIGERANT TEMPERATURE	REFT-EV	AI					■		
50	CHILLER EVAPORATOR REFRIGERANT TEMPERATURE	REFT-CN	AI					■		
51	CHILLER CONDENSER CW DIFFERENTIAL PRESSURE	DP	AI					■		
52	CHILLER EVAPORATOR CHW DIFFERENTIAL PRESSURE	DP	AI					■		
53	CONTROL PANEL CHILLED WATER RETURN TEMPERATURE	CP-CHWRT	AI					■		
54	CONTROL PANEL CHILLED WATER SUPPLY TEMPERATURE	CP-CHWST	AI					■		
4. COOLING TOWER 1										
55	PRIMARY VALVE CONTROL	VC	AO							
56	PRIMARY VALVE POSITION	VP	AI			■				
57	BYPASS VALVE CONTROL	VC	AO							
58	BYPASS VALVE CONTROL	VP	AI	■						
59	CONDENSER WATER SUPPLY VALVE CONTROL	VC	AO							
60	CONDENSER WATER SUPPLY VALVE POSITION	VP	AI			■				
61	CONDENSER WATER FLOW RATE	FL	AI							
62	TOWER 1 CONDENSER SUPPLY TEMPERATURE	T	AI							
4. COOLING TOWER 1 CONTROL PANEL										
63	BASIN TEMPERATURE SENSOR	T	AI							
64	FREEZE PROTECTION ELECTRIC HEATER START STOP	BH	DO							
65	FREEZE PROTECTION ELECTRIC HEATER STATUS	BH-ST	DO							
66	VIBRATION SWITCH	VS	DI							
67	HIGH WATER LEVEL ALARM	HL	DI							
68	LOW WATER LEVEL ALARM	LL	DI							
69	COOLING TOWER LOEW LEVEL CUTOFF	CUT	DI							
70	COOLING TOWER WATER LEVEL ALARM STATUS	WL-AL	DI							
71	MAKEUP WATER VALVE POSITION	VP	AI		■					
72	MAKEUP WATER VALVE CONTROL	VC	AO							
73	MAKEUP WATER VALVE POSITION	VP	AI		■					
74	MAKEUP WATER VALVE CONTROL	VC	AO							

BAS POINT FUNCTION SCHEDULE - COOLING PLANT

	POINT NAME	TAG	POINT TYPE	HARDWARE FAIL MODE: FAIL ON (OPEN)	HARDWARE FAIL MODE: FAIL OFF (CLOSED)	HARDWARE FAIL MODE: LAST COMMANDED STATE	HARDWARE FAIL MODE: LOCAL DEFAULT	SOFTWARE: NETWORK POINT	SOFTWARE: CALCULATED POINT	NOTES
5. COOLING TOWER 2										
75	PRIMARY VALVE CONTROL	VC	AO							
76	PRIMARY VALVE POSITION	VP	AI			■				
77	BYPASS VALVE CONTROL	VC	AO							
78	BYPASS VALVE POSITION	VP	AI	■						
79	CONDENSER WATER SUPPLY VALVE CONTROL	VC	AO							
80	CONDENSER WATER SUPPLY VALVE POSITION	VP	AI			■				
81	CONDENSER WATER FLOW RATE	FL	AI							
82	TOWER 2 CONDENSER SUPPLY TEMPERATURE	T	AI							
5. COOLING TOWER 2 CONTROL PANEL										
83	BASIN TEMPERATURE SENSOR	T	AI							
84	FREEZE PROTECTION ELECTRIC HEATER START STOP	BH	DO							
85	FREEZE PROTECTION ELECTRIC HEATER STATUS	BH-ST	DO							
86	VIBRATION SWITCH	VS	DI							
87	HIGH WATER LEVEL ALARM	HL	DI							
88	LOW WATER LEVEL ALARM	LL	DI							
89	COOLING TOWER LOW LEVEL CUTOFF	CUT	DI							
90	COOLING TOWER WATER LEVEL ALARM STATUS	WL-AL	DI							
7. PLUMBING										
91	MAKEUP WATER FLOW	FL	AI							
92	BLOWDOWN VALVE CONTROL	VC	AO							
93	BLOWDOWN VALVE POSITION	VP	AI		■					
94	BLOWDOWN METER	FL	AI							
8. BASIN SWEEPING SKID										
95	BASIN SWEEPER PUMP START STOP	SS	DO							
96	BASIN SWEEPER SOLIDS RECOVERY VESSEL PRESSURE SWITCH STATUS	SRS	DI							
97	BASIN SWEEPER CARTRIDGE FILTER PRESSURE SWITCH STATUS	CFS	DI							
8. CONDENSER WATER SYSTEM										
98	CONDENSER WATER RETURN TEMPERATURE	T	AI							
99	CONDENSER WATER SUPPLY TEMPERATURE	T	AI							
100	CONDENSER WATER FLOW RATE	FL	AI							
101	CHILLER MIN FLOW VALVE CONTROL	VC	AO	■						
102	CHILLER MIN FLOW VALVE POSITION	VP	AI							
103	AVAILABLE NPSH	P	AI					■		
104	LOW NPSHA ALARM	AL	DI							
9. CHILLED WATER SYSTEM										
105	CHILLED WATER SUPPLY TEMPERATURE	T	AI							
106	CHILLED WATER RETURN TEMPERATURE	T	AI							
107	CHILLER MIN FLOW VALVE CONTROL	VC	AO							
108	CHILLER MIN FLOW VALVE POSITION	VP	AI	■						
109	CHILLED WATER FLOW RATE	FL	AI							
110	CHILLED WATER PUMP DP	DP	AI							
10. WATERSIDE ECONOMIZER										
111	CONDENSER WATER RETURN TEMPERATURE	T	AI							
112	CONDENSER WATER SUPPLY TEMPERATURE	T	AI							
113	HEAT EXCHANGER CONDENSER SIDE DP	DP	AI							
114	HEAT EXCHANGER EVAPORATOR SIDE DP	DP	AI							
115	CONDENSER WATER FLOW RATE	FL	AI							
116	CONDENSER WATER VALVE POSITION	VP	AI			■				
117	CONDENSER WATER VALVE CONTROL	VC	AO							
118	CHILLED WATER SUPPLY TEMPERATURE	T	AI							
119	CHILLED WATER RETURN TEMPERATURE	T	AI							
120	CHILLED WATER FLOW RATE	FL	AI							
121	CHILLED WATER VALVE POSITION	VP	AI			■				
122	CHILLED WATER VALVE CONTROL	VC	AO							
11. USER FEEDBACK										
123	USER 1	VP	AI	■						
124	USER 2	VP	AI	■						
125	USER 3	VP	AI	■						
126	USER 4	VP	AI	■						
127	USER 5	VP	AI	■						
128	USER 6	VP	AI	■						
129	USER 7	VP	AI	■						
12. ENERGY MONITORING										
130	CHILLER 1 EVAPORATOR	BTU-1	AI						■	
131	CHILLER 1 CONDENSER	BTU-2	AI						■	
132	CHILLER 2 EVAPORATOR	BTU-3	AI						■	
133	CHILLER 2 CONDENSER	BTU-4	AI						■	
134	WATERSIDE ECONOMIZER HEAT REJECTION	BTU-5	AI						■	
135	COOLING TOWER 1 HEAT REJECTION	BTU-6	AI						■	
136	COOLING TOWER 2 HEAT REJECTION	BTU-7	AI						■	
137	CHW SYSTEM PUMP HEAT GAIN	BTU-8	AI						■	
138	CW SYSTEM PUMP HEAT GAIN	BTU-9	AI						■	
MECHANICAL ROOM ISOLATION										
139	CONDENSER SYSTEM ISOLATION VALVE CONTROL	VC	AO	■						
140	CHW SYSTEM ISOLATION VALVE CONTROL	VC	AO	■						
141	CONDENSER SYSTEM ISOLATION VALVE POSITION	VP	AI							
142	CHW SYSTEM ISOLATION VALVE POSITION	VP	AI							

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IONEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER

04/02/2026

SHEET TITLE

MECHANICAL CONTROLS - COOLING PLANT BAS POINT TABLE

PROJECT NUMBER 00100451

SHEET NUMBER M8.1.B

Author

Plot Date: 4/13/2026 4:12:11 PM

SETPOINTS (GL 36 SECTION 3.1.7)

A. THE SYSTEM SHALL BE FULLY COMPATIBLE WITH THE EXISTING AUTOMATED LOGIC SYSTEM. PROVIDE ALL NECESSARY UPGRADES TO THE EXISTING SYSTEM TO ACCOMODATE THE INTEGRATION OF THE NEW EQUIPMENT.
B. TEMPERATURE SETPOINTS
 1. CHWSTmin, THE LOWEST CHILLED WATER SUPPLY TEMPERATURE SETPOINT FOR CHILLER: **44 °F**
 2. CHWSTmin WSE MODE, THE LOWEST CHILLED WATER SUPPLY TEMPERATURE SETPOINT WHEN THE PLANT IS OPERATING IN WSE MODE: **46 °F**
 3. CHWSTmax, THE MAXIMUM CHILLED WATER SUPPLY TEMPERATURE SETPOINT USED IN PLANT RESET LOGIC: **50°F**
 4. CWRTdes, THE CONDENSER WATER RETURN (CHILLER CONDENSER LEAVING) TEMPERATURE AT CHILLER SELECTION CONDITIONS FOR CHILLER: **95 °F**
 5. CWSTdes, THE CONDENSER WATER SUPPLY (CHILLER CONDENSER ENTERING) TEMPERATURE AT CHILLER SELECTION CONDITIONS FOR CHILLER: **85 °F**
 6. CH-LOT, THE OUTDOOR AIR LOCKOUT TEMPERATURE BELOW WHICH THE CHILLER PLANT IS PREVENTED FROM OPERATING: **40 °F**
C. DIFFERENTIAL PRESSURE SETPOINTS
 1. CHW-DPmin, THE MINIMUM DIFFERENTIAL PRESSURE SETPOINT USED IN PLANT RESET LOGIC: **5 PSI.**
  a. CHW-DPmin SHALL BE SUFFICIENTLY HIGH AS TO ENSURE CHW-MinFlowX IS MAINTAINED THROUGH THE LARGEST CHILLER. THE FINAL VALUE SHALL BE DETERMINED BY THE TAB CONTRACTOR.
D. CHILLER FLOW SETPOINTS
 1. UPDATE AND VALIDATE THIS SECTION AFTER FINAL PRODUCT IS PURCHASED. THE VALUES APPLY TO BASIS OF DESIGN PRODUCT.
 2. CHW-MinFlow, THE MINIMUM CHILLER CHILLED WATER FLOWRATE PER MANUFACTURER'S RECOMMENDATIONS FOR CHILLER: **260 GPM**
 3. CHW-DesFlow, THE DESIGN CHILLER CHILLED WATER FLOWRATE FOR CHILLER, IN GPM: **400 GPM**
 4. CW-DesFlow, THE DESIGN CHILLER CONDENSER WATER FLOWRATE FOR CHILLER, IN GPM: **600 GPM**
E. CHILLER LIFT SETPOINTS
 1. LIFTmin, THE MINIMUM ALLOWABLE LIFT AT MINIMUM LOAD FOR CHILLER, AS DETERMINED FROM THE MANUFACTURER'S RECOMMENDATIONS, WHERE LIFT IS THE DIFFERENCE BETWEEN CONDENSER WATER RETURN TEMPERATURE AND CHILLED WATER SUPPLY TEMPERATURE: **4 °F**
 2. LIFTmax, DESIGN LIFT AT DESIGN LOAD FOR CHILLER, AS DETERMINED BY SUBTRACTING CHWSTmin FROM CWRTdes.
F. CAPACITY
 1. Qch, DESIGN CAPACITY OF CHILLER : **188 TONS**
 2. CHWFdesign, DESIGN LOOP FLOW: **400 GPM**
G. WATERSIDE ECONOMIZER DESIGN INFORMATION
 1. DA_{HX}, DESIGN HEAT EXCHANGER APPROACH: **4 °F**
 2. DT_{WB}, DESIGN COOLING TOWER WETBULB TEMPERATURE: **78 °F**
 3. DA_{CT}, DESIGN COOLING TOWER APPROACH: **8 °F**
 4. HXFdesign, DESIGN WATERSIDE ECONOMIZER CHILLED WATER FLOW: **440 GPM**
 5. $HX_{DP\text{-}Design}$, DESIGN WATERSIDE ECONOMIZER CHILLED WATER PRESSURE DROP: **25 FT. OF WATER**
 6. HXCWFdesign, DESIGN WATERSIDE ECONOMIZER CONDENSER WATER FLOW: **440 GPM**
H. COOLING TOWER LEVEL CONTROL
 1. T-level-high-alarm, MAXIMUM LEVEL JUST BELOW OVERFLOW
 2. T-level-low-alarm, MINIMUM LEVEL
 3. T-level-min-fill, LOWEST NORMAL OPERATING LEVEL
 4. T-level-max-fill, HIGHEST NORMAL OPERATING LEVEL
I. HEADERED PUMP DESIGN QUANTITIES
 1. N-CHWP, THE NUMBER OF PRIMARY CHILLED WATER PUMPS THAT OPERATE AT DESIGN CONDITIONS: **QTY = ONE (1).**
J. SETPOINTS TO BE PROVIDED BY TAB CONTRACTOR:
 1. CHW-DPmax, THE MAXIMUM CHILLED WATER DIFFERENTIAL PRESSURE SETPOINT, IN PSI
 2. LocalCHW-DPmax, THE MAXIMUM CHILLED WATER DIFFERENTIAL PRESSURE SETPOINT LOCAL TO THE PLANT, IN PSI
 3. Cw-DesPumpSpdStage, THE CONDENSER WATER PUMP SPEED THAT DELIVERS DESIGN CONDENSER WATER FLOW THROUGH THE CHILLERS AND WATERSIDE HEAT EXCHANGERS, CW-DesFlow and HXCWFdesign, OPERATING IN A CHILLER STAGE.
 4. MinCWPspeed, THE MINIMUM CONDENSER WATER PUMP SPEED.
 5. MINIMUM SPEEDS: WHERE MINIMUM SPEEDS ARE NOT REQUIRED FOR FLOW CONTROL PER OTHER BALANCER-PROVIDED SETPOINTS ABOVE, MINIMUM SPEED SETPOINTS FOR ALL VFD-DRIVEN PUMPS AND FANS SHALL BE DETERMINED FOR THE FOLLOWING:
  a. COOLING TOWER FANS
  b. CONDENSER WATER PUMPS
  c. CHILLED WATER PUMPS
K. $NPSH_R$ FOR PUMP ALARMS -
 1. CHWP PUMPS - SEE M7.1 FOR BASIS OF DESIGN NPSHR. CONTRACTOR TO VALIDATE WITH PURCHASED EQUIPMENT.
 2. CWP PUMPS - SEE M7.1 FOR BASIS OF DESIGN NPSHR. CONTRACTOR TO VALIDATE WITH PURCHASED EQUIPMENT.

PLANT ENABLE/DISABLE WITH ECONOMIZER (GL36 SECTION 5.20.2)

A. THE CHILLER PLANT SHALL INCLUDE AN ENABLING SCHEDULE THAT ALLOWS OPERATORS TO LOCK OUT THE PLANT DURING OFF-HOURS, HOLIDAYS, OR ANY OTHER SCHEDULED EVENT, E.G., TO ALLOW OFF-HOUR OPERATION OF HVAC SYSTEMS EXCEPT THE CHILLER PLANT. THE DEFAULT SCHEDULE SHALL BE 24/7 (ADJUSTABLE).
B. ENABLE THE PLANT IN THE LOWEST STAGE WHEN THE PLANT HAS BEEN DISABLED FOR AT LEAST 15 MINUTES AND:
 1. NUMBER OF CHILLER PLANT REQUESTS > I (I = IGNORES SHALL DEFAULT TO 0, ADJUSTABLE), AND
 2. OAT > CH-LOT, AND
 3. THE CHILLER PLANT ENABLE SCHEDULE IS ACTIVE.
C. DISABLE THE PLANT WHEN IT HAS BEEN ENABLED FOR AT LEAST 15 MINUTES AND:
 1. NUMBER OF CHILLER PLANT REQUESTS ≤ I FOR 3 MINUTES, OR
 2. OAT < CH-LOT - 1°F, OR
 3. THE CHILLER PLANT ENABLE SCHEDULE IS INACTIVE.
D. WHEN THE PLANT IS ENABLED:
 1. IF THE PLANT IS ENABLED IN WSE MODE:
  a. OPEN THE CW ISOLATION VALVE OF THE WATERSIDE ECONOMIZER.
  b. STAGE ON LEAD PRIMARY CHW PUMP, CW PUMP, AND COOLING TOWER(S).
 2. IF THE PLANT IS ENABLED IN CHILLER MODE:
  A. OPEN THE CHW ISOLATION VALVE OF THE LEAD CHILLER.
  B. OPEN THE CW ISOLATION VALVE OF THE LEAD CHILLER.
  C. STAGE ON LEAD PRIMARY CHW PUMP, CW PUMP, AND COOLING TOWER(S).
  D. ONCE THE LEAD PUMPS ARE PROVEN ON, ENABLE THE LEAD CHILLER.
E. WHEN THE PLANT IS DISABLED:
 1. SHUT OFF ALL ENABLED CHILLERS, IF ANY.
 2. FOR EACH ENABLED CHILLER, CLOSE THE CHW ISOLATION VALVE AFTER 3 MINUTES OR THE CHILLER IS NOT REQUESTING CHW FLOW.
 3. FOR EACH ENABLED CHILLER, CLOSE THE CW ISOLATION VALVE AFTER 3 MINUTES OR THE CHILLER IS NOT REQUESTING CW FLOW.
 4. DISABLE THE OPERATING PRIMARY CHW PUMP(S), CW PUMP(S), AND COOLING TOWER(S).

CHILLER STAGING (GL36 SECTION 5.20.4)

A. CHILLER STAGES SHALL BE DEFINED AS FOLLOWS:

CHILLER STAGE	ENABLED CHILLERS	WATERSIDE ECONOMIZER STATUS
0	NONE	OFF
0+WSE	NONE	ON
1	CH-1 OR CH-2	OFF
2	CH-1 AND CH-2	OFF

B. INTERCHANGEABLE CHILLERS INDICATED WITH "OR" IN THE TABLE ABOVE SHALL BE LEAD/LAG CONTROLLED PER GENERAL CONTROLS SHEETS. IF A CHILLER IS IN ALARM, ITS CHW AND CW ISOLATION VALVES SHALL BE CLOSED.
C. CHILLERS ARE STAGED IN PART BASED ON REQUIRED CAPACITY, $Q_{required}$, RELATIVE TO DESIGN CAPACITY OF A GIVEN STAGE, WHICH IS THE SUM OF THE DESIGN CAPACITY OF EACH CHILLER ACTIVE IN EACH STAGE. THIS RATIO IS THE OPERATIVE PART LOAD RATIO, OPLR.
D. $Q_{required}$ IS CALCULATED BASED ON CHILLED WATER RETURN TEMPERATURE (CHWRT) ENTERING THE CHILLERS, ACTIVE CHILLED WATER SUPPLY TEMPERATURE SETPOINT ($CHWST_{SP}$), AND MEASURED FLOW THROUGH THE PRIMARY CIRCUIT FLOW METER ($FLOW_P$), AS SHOWN IN THE EQUATION BELOW. $Q_{required}$ USED IN LOGIC SHALL BE A 5-MINUTE ROLLING AVERAGE OF INSTANTANEOUS VALUES SAMPLED AT A MINIMUM OF EVERY 30 SECONDS.

$$Q_{required} = \frac{FLOW_P(CHWRT - CHWST_{SP})}{24}\ [tons]$$

E. WHEN A STAGE UP OR STAGE DOWN TRANSITION IS INITIATED, HOLD $Q_{required}$ FIXED AT ITS LAST VALUE UNTIL THE LONGER OF THE SUCCESSFUL COMPLETION OF THE STAGE CHANGE (E.G., LAG CHILLER PROVEN ON) AND 15 MINUTES.
F. OPLR SHALL BE CALCULATED AS FOLLOWS:

$$OPLR = \frac{Q_{required}[tons]}{Sum\ of\ QchX\ for\ Chillers\ in\ stage}$$

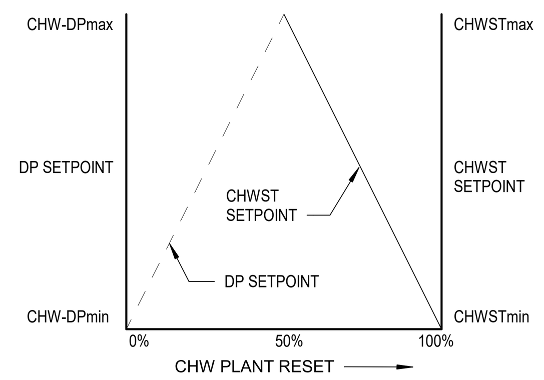
G. MINIMUM CYCLING PART LOAD RATIO, $OPLR_{MIN}$, SHALL BE CALCULATED AS:

$$OPLR_{MIN,stage} = \frac{Sum\ of\ MinUnloadTonsX\ for\ Chillers\ in\ stage}{Sum\ of\ QchX\ for\ Chillers\ in\ stage}$$

H. STAGE UP EVENTS ARE INITIATED IN PART BASED ON CURRENT STAGE *OPLR* EXCEEDING A STAGE UP PART LOAD RATIO, $SPLR_{UP}$; STAGE DOWN EVENTS ARE INITIATED IN PART BASED ON *OPLR* FOR THE NEXT LOWER STAGE FALLING BELOW A STAGE DOWN PART LOAD RATIO, $SPLR_{DN}$.
I. STAGING EVENTS REQUIRE THAT A CHILLER STAGE BE AVAILABLE. A STAGE SHALL BE DEEMED *UNAVAILABLE* IF THE STAGE CANNOT BE ACHIEVED BECAUSE A CHILLER REQUIRED TO OPERATE IN THE STAGE IS FAULTED OR A CHILLED WATER OR CONDENSER WATER PUMP DEDICATED TO THAT CHILLER IS FAULTED. OTHERWISE, THE STAGE SHALL BE DEEMED AVAILABLE.
J. $SPLR_{UP}$ and $SPLR_{DN}$ RESET BASED ON THE TYPES OF CHILLERS OPERATING IN THE CURRENT STAGE AND THE TYPES OF CHILLERS OPERATING IN THE NEXT HIGHER AND LOWER *AVAILABLE* STAGES PER THE SUBSEQUENT LOGIC. THE RULES BELOW ARE ORGANIZED IN ORDER OF PRECEDENCE FROM MOST IMPORTANT TO LEAST IMPORTANT; MORE IMPORTANT RULES SUPERSEDE LESS IMPORTANT RULES.
 1. SET $SPLR_{UP}$ AS FOLLOWS:
  a. WHEN ANY CHILLERS IN THE CURRENT OPERATING STAGE ARE VARIABLE SPEED CENTRIFUGAL, $SPLR_{UP}$ SHALL BE CALCULATED AS THE 5 MINUTE ROLLING AVERAGE OF THE FOLLOWING EQUATION SAMPLED AT LEAST EVERY 30 SECONDS:
   - $SPLR_{UP}$ = Min (Max (0.45 , E * LIFT + F) , 0.9)
   - LIFT = CWRT - $CHWST_{SP}$
   - E = 0.9 / ($LIFT_{MAX}$ - $LIFT_{MIN}$)
   - F = E * (0.4 * $LIFT_{MAX}$ - 1.4 * $LIFT_{MIN}$)
  b. $LIFT_{MIN}$ AND $LIFT_{MAX}$ SHALL BE CALCULATED AS THE AVERAGES OF $LIFT_{MIN}X$ AND $LIFT_{MAX}X$ FOR ALL VARIABLE SPEED CENTRIFUGAL CHILLERS OPERATING IN THE CURRENT STAGE RESPECTIVELY.
 2. SET $SPLR_{DN}$ AS FOLLOWS:
  a. WHEN A VARIABLE SPEED CENTRIFUGAL CHILLER OPERATES IN THE NEXT LOWER STAGE, $SPLR_{DN}$ SHALL BE CALCULATED AS THE 5 MINUTE ROLLING AVERAGE OF THE FOLLOWING EQUATION SAMPLED AT LEAST EVERY 30 SECONDS:
   - $SPLR_{DN}$= Min (Max (0.45 , E * LIFT + F) , 0.9)
   - LIFT = CWRT - $CHWST_{SP}$
   - E = 0.9 / ($LIFT_{MAX}$ - $LIFT_{MIN}$)
   - F = E * (0.4 * $LIFT_{MAX}$ - 1.4 * $LIFT_{MIN}$)
  b. $LIFT_{MIN}$ AND $LIFT_{MAX}$ SHALL BE FOR VARIABLE SPEED CENTRIFUGAL CHILLERS OPERATING IN THE NEXT LOWER STAGE RESPECTIVELY.
K. STAGING SHALL BE EXECUTED PER THE CONDITIONS BELOW SUBJECT TO THE FOLLOWING REQUIREMENTS.
 1. EACH STAGE SHALL HAVE A MINIMUM RUNTIME OF 15 MINUTES.
 2. TIMES SHALL RESET TO ZERO AT THE COMPLETION OF EVERY STAGE CHANGE.
 3. ANY UNAVAILABLE STAGE SHALL BE SKIPPED DURING STAGING EVENTS, BUT STAGING CONDITIONALS IN THE CURRENT STAGE SHALL BE EVALUATED AS PER USUAL.
  a. EXCEPTION: IF STAGE 1 IS UNAVAILABLE, THEN THE STAGE DOWN CONDITIONALS USED WHILE THE NEXT HIGHER AVAILABLE STAGE IS OPERATING SHALL BE THOSE NORMALLY APPLIED TO STAGE 1.
 4. CHILLED WATER SUPPLY AND RETURN TEMPERATURES USED IN STAGING LOGIC SHALL BE THOSE LOCATED IN COMMON SUPPLY AND RETURN MAINS, HARDWIRED TO PLANT CONTROLLERS.
 5. WHEN ENABLING THE PLANT, SKIP THE WATERSIDE ECONOMIZER ONLY STAGE (LOWEST STAGE) IF PHXLWT (DEFINED IN WSE LOGIC) WITH PLR_{HX} SET EQUAL TO 1 IS NOT 1°F < CHWST SETPOINT.
 6. WHEN ONLY THE WATERSIDE ECONOMIZER IS ENABLED, STAGE UP IF EITHER OF THE FOLLOWING IS TRUE:
  a. CHW SUPPLY TEMPERATURE IS 2°F > SETPOINT FOR 20 MINUTES.
  b. CHW SUPPLY TEMPERATURE IS 4°F > SETPOINT FOR 10 MINUTES.
 7. IN ALL OTHER STAGES, STAGE UP IF ANY OF THE FOLLOWING IS TRUE:
  a. AVAILABILITY CONDITION: THE EQUIPMENT NECESSARY TO OPERATE THE CURRENT STAGE ARE UNAVAILABLE. THE AVAILABILITY CONDITION IS NOT SUBJECT TO THE MINIMUM STAGE RUNTIME REQUIREMENT; OR
  b. EFFICIENCY CONDITION: CURRENT STAGE OPLR > $SPLR_{UP}$ FOR 15 MINUTES AND CURRENT STAGE OPLR IS NOT DECREASING AT A RATE GREATER THAN 2.5% PER MINUTE AVERAGED OVER 5 MINUTES; OR
  c. FAILSAFE CONDITION:
   - CHW DP IS 2 PSI < SETPOINT FOR 15 MINUTES; OR
   - CHW SUPPLY TEMPERATURE IS 2°F > SETPOINT FOR 15 MINUTES.
 8. REFER TO WATERSIDE ECONOMIZER CONTROL.
 9. IN ALL OTHER STAGES, STAGE DOWN IF BOTH OF THE FOLLOWING ARE TRUE:
  a. NEXT AVAILABLE LOWER STAGE OPLR < $SPLR_{DN}$ FOR 15 MINUTES AND NEXT LOWER STAGE OPLR IS NOT INCREASING AT A RATE GREATER THAN 2.5% PER MINUTE AVERAGED OVER 5 MINUTES; AND
  b. THE FAILSAFE STAGE UP CONDITION IS NOT TRUE.
L. WHENEVER THERE IS A STAGE-UP COMMAND:
 1. COMMAND OPERATING CHILLERS TO REDUCE DEMAND TO 75% OF THEIR CURRENT LOAD. WAIT UNTIL ACTUAL DEMAND <80% OF CURRENT LOAD UP TO A MAXIMUM OF 5 MINUTES BEFORE PROCEEDING.
 2. RESET THE MINIMUM FLOW BYPASS SETPOINT TO THAT APPROPRIATE FOR THE NEW STAGE. AFTER NEW SETPOINT IS ACHIEVED, WAIT 1 MINUTE TO ALLOW LOOP TO STABILIZE.
 3. START THE NEXT CW PUMP AND/OR CHANGE CW PUMP SPEED TO THAT REQUIRED OF THE NEW STAGE AND AFTER 10 SECONDS ENABLE HEAD PRESSURE CONTROL FOR THE CHILLER BEING ENABLED. WAIT 30 SECONDS.
 4. SLOWLY OPEN CHW ISOLATION VALVE OF THE CHILLER BEING ENABLED. DETERMINE VALVE TIMING IN THE FIELD AS THAT REQUIRED TO PREVENT NUISANCE TRIPS.
 5. START THE NEXT STAGE CHILLER AFTER THE CHW ISOLATION VALVE IS FULLY OPEN (AS DETERMINED BY END SWITCH STATUS, OR NOMINAL VALVE TIMING IF END SWITCHES ARE NOT PROVIDED).
 6. RELEASE THE DEMAND LIMIT.
M. WHENEVER THERE IS A STAGE-DOWN COMMAND:
 1. SHUT OFF THE LAST STAGE CHILLER.
 2. WHEN THE CONTROLLER OF THE CHILLER BEING SHUT OFF INDICATES NO REQUEST FOR CHILLED WATER FLOW OR 3 MINUTES HAS ELAPSED, SLOWLY CLOSE THE CHILLER'S CHW ISOLATION VALVE TO AVOID A SUDDEN CHANGE IN FLOW THROUGH OTHER OPERATING CHILLERS.
 3. WHEN THE CONTROLLER OF THE CHILLER BEING SHUT OFF INDICATES NO REQUEST FOR CONDENSER WATER FLOW OR 3 MINUTES HAS ELAPSED, DISABLE THE CHILLER'S HEAD PRESSURE CONTROL LOOP. WHEN THE CW ISOLATION/HEAD PRESSURE CONTROL VALVE IS FULLY CLOSED (AS DETERMINED BY END SWITCH STATUS, OR NOMINAL VALVE TIMING IF END SWITCHES ARE NOT PROVIDED), SHUT OFF THE LAST LAG CW PUMP AND/OR CHANGE CW PUMP SPEED TO THAT REQUIRED OF THE NEW STAGE.
 4. CHANGE THE CHILLED WATER MINIMUM FLOW BYPASS CONTROL SETPOINT TO THAT APPROPRIATE FOR THE NEW STAGE.

CHILLED WATER PLANT RESET (GL 36 SECTION 5.20.5)

A. CHWSTmin IN THE FOLLOWING LOGIC SHALL BE THE LOWEST IN THE PLANT.
B. DIFFERENTIAL PRESSURE CONTROLLED LOOPS: CHILLED WATER SUPPLY TEMPERATURE SETPOINT CHWSTsp AND PUMP DIFFERENTIAL PRESSURE SETPOINT CHW-DPsp SHALL BE RESET BASED ON THE CURRENT VALUE OF THE LOGIC VARIABLE CALLED "CHW PLANT RESET" AS SHOWN BELOW AND DESCRIBED SUBSEQUENTLY



C. FROM 0% LOOP OUTPUT TO 50% LOOP OUTPUT, RESET DP SETPOINT FROM CHW-DPmin TO CHWP-DPmax.
D. FROM 50% LOOP OUTPUT TO 100% LOOP OUTPUT, RESET CHWST SETPOINT FROM CHWSTmax TO CHWSTmin.
E. CHW PLANT RESET VARIABLE SHALL BE RESET USING TRIM & RESPOND LOGIC WITH THE FOLLOWING PARAMETERS:

VARIABLE	DEFINITION	VALUE
DEVICE	ASSOCIATED DEVICE (E.G., FAN, PUMP)	ANY CHW PUMP DISTRIBUTION LOOP
SP_0	INITIAL SETPOINT	100%
SP_{min}	MINIMUM SETPOINT	0%
SP_{max}	MAXIMUM SETPOINT	100%
T_d	DELAY TIMER	15 MINUTES
T	TIME STEP	5 MINUTES
I	NUMBER OF IGNORED REQUESTS	2 REQUESTS
R	NUMBER OF REQUESTS FROM ZONES/SYSTEMS	COOLING CHWST RESET REQUESTS
SP_{trim}	TRIM AMOUNT	-2%
SP_{res}	RESPOND AMOUNT (MUST BE OPPOSITE IN SIGN TO SP_{trim} AND SHOULD GENERALLY BE HIGHER)	+3%
$SP_{res\text{-}max}$	MAXIMUM RESPONSE PER TIME INTERVAL (MUST BE SAME SIGN AS SP_{res})	+7%

F. CHWST PLANT RESET LOOP SHALL BE ENABLED WHEN THE PLANT IS ENABLED AND DISABLED WHEN THE PLANT IS DISABLED.
G. WHEN A PLANT STAGE CHANGE IS INITIATED, CHW PLANT RESET LOGIC SHALL BE DISABLED AND VALUE FIXED AT ITS LAST VALUE FOR THE LONGER OF 15 MINUTES AND THE TIME IT TAKES FOR THE PLANT TO SUCCESSFULLY STAGE.

PRIMARY CHILLED WATER PUMPS

A. PRIMARY PUMPS SHALL BE PRIMARY/STANDBY CONTROLLED PER THE GENERAL CONTROLS SHEETS.
B. ENABLE PRIMARY CHW PUMP WHEN ANY CHILLER CHW ISOLATION VALVE IS COMMANED OPEN OR WSE IS ENABLED. DISABLE THE LEAD PRIMARY CHW PUMP WHEN ALL CHILLER CHW ISOLATION VALVES ARE COMMANDED CLOSED AND WSE IS DISABLED.
C. WHEN ANY PUMP IS PROVEN ON, PUMP SPEED WILL BE CONTROLLED BY A REVERSE ACTING PID LOOP MAINTAINING THE DIFFERENTIAL PRESSURE SIGNAL AT A SETPOINT CHW-DPsp DETERMINED BY THE RESET SCHEME DESCRIBED HEREIN (REFER TO CHILLED WATER PLANT RESET ABOVE). ALL PUMPS RECEIVE THE SAME SPEED SIGNAL.
D. WHERE MULTIPLE DP SENSORS EXIST, A PID LOOP SHALL RUN FOR EACH SENSOR. CHW PUMPS SHALL BE CONTROLLED TO THE HIGH SIGNAL OUTPUT OF ALL DP SENSOR LOOPS.

CHILLED WATER MINIMUM FLOW BYPASS VALVE (GL 36 SECTION 5.20.8)

A. BYPASS VALVE SHALL MODULATE TO MAINTAIN MINIMUM FLOW AS MEASURED BY THE CHILLED WATER FLOW METER AT A SETPOINT THAT PROVIDES MINIMUM FLOW THROUGH ALL OPERATING CHILLERS, DETERMINED AS FOLLOWS:
 1. FOR THE CHILLERS OPERATING IN THE STAGE, IDENTIFY THE MINIMUM FLOW RATIO, MinFlowRatio DEFINED AS CHW-MinFlow TO CHW-DesFlow.
 2. CALCULATE THE MINIMUM FLOW SETPOINT AS MinFlowRatio MULTIPLIED BY THE SUM OF CHW-DesFlowX FOR THE OPERATING CHILLERS.
B. WHEN ANY CHW PUMP IS PROVEN ON, THE BYPASS VALVE PID LOOP SHALL BE ENABLED. THE VALVE SHALL BE OPENED 100% OTHERWISE. WHEN ENABLED, THE BYPASS VALVE LOOP SHALL BE BIASED TO START WITH THE VALVE 100% OPEN.

CONDENSER WATER PUMPS

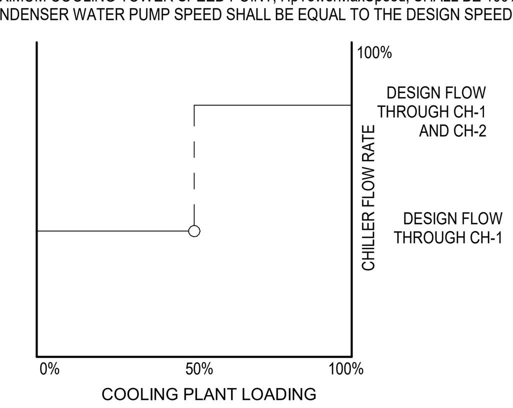
A. CONDENSER WATER PUMPS SHALL BE PRIMARY/STANDBY CONTROLLED PER THE GENERAL CONTROLS SHEETS.
B. ENABLE CW PUMP WHEN ANY CHILLER OR WSE CW ISOLATION VALVE IS COMMANDED OPEN.
C. DISABLE THE CW PUMP WHEN ALL CHILLERS AND WSE CW ISOLATION VALVES ARE COMMANDED CLOSED.
D. THE NUMBER OF OPERATING CONDENSER WATER PUMPS AND DESIGN CONDENSER WATER PUMP SPEED FOR THE STAGE, CW-DESPUMPSPDSTAGE, SHALL BE SET PER BELOW.

PLANT STAGE	CWPs ON	Cw-DesPumpSpdStage
0	0	N/A, OFF
0+WSE	1	PER TAB TO PROVIDE DESIGN FLOW THROUGH HX
1	1	PER TAB TO PROVIDE DESIGN FLOW THROUGH ONE CHILLER
2	1	PER TAB TO PROVIDE AT LEAST DESIGN FLOW THROUGH BOTH CHILLERS

D. CONDENSER WATER PUMP SPEED SETPOINT FOR A GIVEN STAGE SHALL BE Cw-DesPumpSpdStage.

CONSTANT FLOW CONDENSER WATER SYSTEM

A. ENABLE PRIMARY CW PUMP WHEN ANY CHILLER CW ISOLATION VALVE IS COMMANED OPEN OR WSE IS ENABLED.
B. DISABLE THE PRIMARY CW PUMP WHEN ALL CHILLER CW ISOLATION VALVES ARE COMMANDED CLOSED AND WSE IS DISABLED.
C. MAINTAIN CONSTANT DESIGN FLOW THROUGH THE CHILLER WHEN COMMANDED ON, VALIDATED BY THE CONDENSER WATER FLOW METER.
D. RECORD THE DIFFERENTIAL PRESSURE ASSOCIATED WITH THE DESIGN FLOW THROUGH THE CHILLER(S) AS READ BY FIVE VALVE MANIFOLD DIFFENTIAL PRESSURE SENSOR.
E. THE PUMPS SHALL BE CONTROLLED TO MAINTAIN THE DIFFERENTIAL PRESSURE ASSOCIATE WITH DESIGN FLOW.
F. CONTINUOS CALIBRATION -
 a. THE CHILLER(S) SHALL UPDATE THE DIFFERENTIAL PRESSURE ASSOCIATED WITH THEIR DESIGN FLOW DYNAMICALLY.
 b. UPDATE Cw-DesPumpSpdStage FROM THE VALUE READ BY THE FIVE VALVE MANIFOLD DIFFENTIAL PRESSURE SENSOR, TO MAINTAIN DESIGN FLOW RATE THROUGH THE CHILLER.
G. WHEN THE WSE IS ENABLED, MAP LOOP OUTPUTS AS FOLLOWS:
 1. MAXIMUM COOLING TOWER SPEED POINT, HpTowerMaxSpeed, SHALL BE 100% IRRESPECTIVE OF LOOP OUTPUT.
 2. CONDENSER WATER PUMP SPEED SHALL BE EQUAL TO THE DESIGN SPEED FOR THE STAGE IRRESPECTIVE OF THE LOOP OUTPUT.



WATER TREATMENT OVERRIDE (GL 36 SECTION 5.20.11)

A. EVERY NIGHT AT 1:00 AM, IF ALL CONDENSER WATER PUMPS ARE OFF AND THE CONDENSER WATER PUMPS HAVE NOT ACCUMULATED AT LEAST 20 MINUTES OF RUNTIME IN THE LAST 36 HOURS THEN:
 1. OPEN ALL CHILLER CONDENSER ISOLATION VALVES.
 2. OPEN ALL TOWER ISOLATION VALVES.
 3. START LEAD CONDENSER WATER PUMP.
 4. AFTER 20 MINUTES, OR IF THE PLANT IS ENABLED, RELEASE BACK TO NORMAL CONTROL.

COOLING TOWERS (GL 36 SECTION 5.20.12)

A. TOWER STAGING
 1. TOWERS SHALL BE LEAD/LAG CONTROLLED PER THE GENERAL CONTROLS SHEETS.
 2. THE QUANTITY OF ENABLED COOLING TOWERS SHALL MAP TO PLANT STAGE PER BELOW.

PLANT STAGE	ENABLED TOWERs
0	0
0+WSE	2
1	2
2	2

 3. LEAD TOWER(S) SHALL BE ENABLED WHEN THE CW PUMP IS ENABLED. LEAD TOWER(S) SHALL BE DISABLED WHEN ALL CW PUMPS ARE PROVEN OFF.
 4. TOWER STAGE CHANGES SHALL BE INITIATED CONCURRENTLY WITH CONDENSER WATER PUMP STAGE AND/OR CONDENSER WATER PUMP SPEED CHANGES PER PLANT STAGING LOGIC.
 5. WHEN ENABLING A TOWER, OPEN ITS SUPPLY ISOLATION VALVE, AND OUTLET ISOLATION VALVE IF PROVIDED. ONCE PROVEN OPEN AS DETERMINED BY END SWITCH STATUS, OR NOMINAL VALVE TIMING IF END SWITCHES ARE NOT PROVIDED, ENABLE TOWER FAN.
 6. WHEN DISABLING A TOWER, COMMAND THE FAN OFF AND SHUT ITS SUPPLY ISOLATION VALVE, AND OUTLET ISOLATION VALVES IF PROVIDED.

B. FAN CONTROL
 1. CONDENSER WATER RETURN TEMPERATURE (CWRT) CONTROL
  a. TOWER FAN CONTROL IS IN PART DICTATED BY PLANT PART LOAD RATIO, PLR_{plant}, WHICH IS THE RATIO OF CURRENT PLANT REQUIRED CAPACITY, $Q_{required}$, TO PLANT DESIGN CAPACITY:
   - PLR_{plant} = Qrequired / Qdesign
  b. CWRTdes IN THE SUBSEQUENT LOGIC SHALL BE THE LOWEST OF ALL CHILLERS.
  c. WHEN ANY CHILLERS ARE ENABLED AND THE WSE IS DISABLED, THE FOLLOWING LOGIC SHALL APPLY.
  d. MAXIMUM TOWER SPEED SHALL BE LIMITED BASED ON OPLR. RESET THE VARIABLE PlrTowerMaxSpd LINEARLY FROM 100% AT 50% OPLR DOWN TO 70% AT 0% OPLR.
  e. CWRT SETPOINT, CWRTsp, SHALL BE THE OUTPUT OF THE FOLLOWING EQUATION.
   - CWRTsp = CHWSTsp + LIFTtarget
   - LIFTtarget = Max (LIFTmin , Min (LIFTmax , A * PLR_Plant + B))
   - A = 1.1 * (LIFTmax - LIFTmin)
   - B = LIFTmax - A
   - WHERE CHILLERS HAVE DIFFERENT LIFTminX VALUES, LIFTmin IN THE ABOVE EQUATION SHALL RESET DYNAMICALLY TO EQUAL THE HIGHEST LIFTminX OF ENABLED CHILLERS.
   - WHERE CHILLERS HAVE DIFFERENT LIFTmaxX VALUES, LIFTmax IN THE ABOVE EQUATIONS SHALL RESET DYNAMICALLY TO EQUAL THE LOWEST LIFTmaxX OF ENABLED CHILLERS.
  f. WHEN ANY CONDENSER WATER PUMP IS PROVEN ON, CWRT SHALL BE CONTROLLED TO CWRTsp BY SETTING CWST SETPOINT, CWSTsp, EQUAL TO CWRTsp MINUS CWdt, WHERE CWdt IS THE 5 MINUTE ROLLING AVERAGE OF COMMON CONDENSER WATER RETURN TEMPERATURE LESS CONDENSER WATER SUPPLY TEMPERATURE, SAMPLED AT MINIMUM ONCE EVERY 30 SECONDS. WHEN THE PLANT IS FIRST ENABLED CWdt SHALL BE HELD FIXED EQUAL TO 50% OF CWRTdesX LESS CWSTdesX OF THE ENABLED CHILLER FOR 5 MINUTES TO POPULATE THE ROLLING AVERAGE QUEUE BEFORE POPULATING WITH ACTUAL DATA.
  g. WHEN ANY CONDENSER WATER PUMP IS PROVEN ON, CWST SHALL BE MAINTAINED AT SETPOINT BY A DIRECT ACTING PID LOOP. THE LOOP OUTPUT SHALL BE MAPPED TO THE VARIABLE CWSTTowerSpd. RESET CWSTTowerSpd FROM MINIMUM TOWER SPEED AT 0% LOOP OUTPUT TO 100% SPEED AT 100% LOOP OUTPUT.
  h. TOWER SPEED COMMAND SIGNAL SHALL BE THE LOWEST VALUE OF CWSTTowerSpd, HpTowerMaxSpd FROM EACH CHILLER HEAD PRESSURE CONTROL LOOP, AND PlrTowerMaxSpd. ALL OPERATING FANS SHALL RECEIVE THE SAME SPEED SIGNAL
  i. DISABLE THE TOWER FANS IF EITHER
   - ANY ENABLED CHILLER'S HpTowerMaxSpd HAS EQUALED TOWER MINIMUM SPEED FOR 5 MINUTES, OR
   - TOWER FANS HAVE BEEN AT MINIMUM SPEED FOR 5 MINUTES AND CWST DROPS BELOW SETPOINT MINUS 1°F.
  j. ENABLE THE TOWER FANS IF
   - THEY HAVE BEEN OFF FOR AT LEAST 1 MINUTE, AND
   - CWST RISES ABOVE SETPOINT BY 1°F, AND
   - ALL ENABLED CHILLERS' HpTowerMaxSpd ARE GREATER THAN TOWER MINIMUM SPEED.
  k. WHEN ALL CONDENSER WATER PUMPS ARE COMMANDED OFF, DISABLE THE PID LOOP AND STOP ALL TOWER FANS.
  l. UPON PLANT STARTUP, HOLD CWRTsp AT 10°F DEGREES LESS THAN CWRTdes FOR 10 MINUTES BEFORE RAMPING THE SETPOINT TO THE CALCULATED VALUE ABOVE OVER 10 MINUTES.
C. WSE MODE
 1. WHEN THE WSE IS RUNNING ALONE:
  a. FAN SPEED SHALL BE MODULATED TO MAINTAIN CHWST AT SETPOINT BY A DIRECT ACTING PID LOOP THAT RESETS FAN SPEED FROM MINIMUM AT 0% LOOP OUTPUT TO MAXIMUM AT 100% LOOP OUTPUT.
  b. IF CHWST DROPS BELOW SETPOINT AND FANS HAVE BEEN AT MINIMUM FAN SPEED FOR 5 MINUTES, FANS SHALL CYCLE OFF FOR AT LEAST 3 MINUTES AND UNTIL CHWST RISES ABOVE SETPOINT BY 1°F.
D. COOLING TOWER BYPASS VALVES
 1. IF ANY CONDENSER WATER PUMP IS ON, ALL TOWER FANS ARE OFF, AND CWST FROM THE TOWER FALLS BELOW 40°F FOR 5 MINUTES, FULLY OPEN THE TOWER BYPASS VALVE TO THE TOWER BASINS. FULLY CLOSE THE PRIMARY SUPPLY VALVE TO COOLING TOWER.
 2. CLOSE THE VALVE TO THE TOWER BASINS WHEN ANY OF THE FOLLOWING ARE TRUE:
  a. THE WSE IS DISABLED, THE VALVE HAS BEEN OPEN FOR AT LEAST 5 MINUTES, AND CWST RISES LIFTminX – 2°F ABOVE CHWST SETPOINT. WHERE CHILLERS HAVE DIFFERENT LIFTminX VALUES, LIFTminX IN THE ABOVE EQUATION SHALL RESET DYNAMICALLY TO EQUAL THE HIGHEST LIFTminX OF ENABLED CHILLERS.
  b. THE WSE IS ENABLED, THE VALVE HAS BEEN OPEN FOR AT LEAST 5 MINUTES, AND CHWST RISES TO WITHIN 1°F OF CHWST SETPOINT.
  c. TOWER FANS ARE COMMANDED ON (VALVE SHALL NEVER BE OPEN WHEN FANS ARE ON).
E. TOWER MAKE-UP WATER
 1. MAKE-UP WATER VALVE SHALL CYCLE BASED ON TOWER WATER FILL LEVEL SENSOR. THE VALVE SHALL OPEN WHEN WATER LEVEL IN ANY TOWER FALLS BELOW T-level-min-fill FOR MORE THAN 5 MINUTES. IT SHALL CLOSE WHEN THE WATER LEVEL IN THE ALARMING TOWER GOES ABOVE T-level-max-fill FOR MORE THAN 5 MINUTES.
F. EMERGENCY CHILLER OFF
 1. CHILLERS SHALL BE LOCKED OFF (START/STOP POINTS OVERRIDDEN TO OFF AT HIGHEST PROTOCOL PRIORITY) UPON CLOSING OF EMERGENCY CHILLER OFF SWITCH LOCATED AT CHILLER ROOM ENTRY. REMAINING EQUIPMENT SHALL REMAIN ENABLED AND BE INDEXED TO STAGE 0+WSE UNTIL THE PLANT IS EITHER DISABLED OR THE EMERGENCY POWER OFF SWITCH IS RELEASED, AT WHICH POINT STAGING SHALL RESUME FROM STAGE 0+WSE.
G. FREEZE PROTECTION
 1. TOWER BASIN HEATERS
  a. ENABLE BASIN HEATER WHENEVER BASIN TEMPERATURE DROPS BELOW 38°F FOR MORE THAN 5 MINUTES.
  b. DISABLE BASIN HEATER WHENEVER BASIN TEMPERAURE RISES ABOVE 40°F FOR MORE THAN 5 MINUTES.
 2. PIPING HEAT TRACE
  a. SEE M8.4.

WATERSIDE ECONOMIZER CONTROL (GL36 SECTION 5.20.3)

A. ENABLE WATERSIDE ECONOMIZER IF IT HAS BEEN DISABLED FOR AT LEAST 20 MINUTES AND CHWRT UPSTREAM OF HX IS GREATER THAN THE PREDICTED HEAT EXCHANGER LEAVING WATER TEMPERATURE (PHXLWT) + 2°F. PHXLWT SHALL BE THE OUTPUT OF THE FOLLOWING EQUATIONS.
 1. PHXLWT = T_{WB} + PA_{HX} + PA_{CT}
 2. PREDICTED HEAT EXCHANGER APPROACH PA_{HX} = DA_{HX} * PLR_{HX}
 3. PREDICTED COOLING TOWER APPROACH PA_{CT} = m * (DT_{WB} - T_{WB}) + DA_{CT}
 4. HEAT EXCHANGER PART LOAD RATIO PLR_{HX} = MIN(1, $FLOW_p$ / HXFdesign)
 5. PLR_{HX} = THE LESSER OF 1 AND PREDICTED HEAT EXCHANGER PART LOAD RATIO (CURRENT CHILLED WATER FLOW RATE DIVIDED BY DESIGN HX CHILLED WATER FLOW RATE)
 6. CURRENT WET-BULB TEMPERATURE T_{WB} SHALL BE CALCULATED FROM THE TEMPERATURE AND HUMIDITY SENSOR MEASUREMENTS AT THE WEATHER STATION.
B. DISABLE WSE WHEN IT HAS RUN FOR AT LEAST 20 MINUTES AND CHWRT DOWNSTREAM OF HX IS GREATER THAN CHWRT UPSTREAM OF HX LESS 1°F FOR 2 MINUTES (I.E., IF THE HX IS NOT REDUCING THE CHWR TEMP BY AT LEAST 1°F).
C. PHXLWT TUNING
 a. DECREASE m BY 0.02 WHEN THE ECONOMIZER IS DISABLED IF THE ECONOMIZER REMAINED ENABLED FOR GREATER THAN 60 MINUTES.
 b. INCREASE m BY 0.02 WHEN THE ECONOMIZER IS DISABLED IF THE ECONOMIZER REMAINED ENABLED FOR LESS THAN 30 MINUTES AND WseTower-MaxSpeed DID NOT DECREASE BELOW 100% SPEED WHILE THE WSE WAS ENABLED.
 c. m SHALL BE LIMITED TO THE RANGE OF -0.2 TO 0.5.
 d. m SHALL INITIALIZE AT 0 UPON FIRST PLANT START UP AND SHALL NOT BE REINITIALIZED EVERY TIME THE PLANT IS DISABLED/ENABLED. RATHER, m HOLDS ITS VALUE WHEN THE PLANT IS DISABLED AND TUNING RESUMES FROM THAT VALUE WHEN THE PLANT IS RE-ENABLED.
D. WHEN ECONOMIZER IS ENABLED:
 1. START CW PUMP AND/OR ADJUST CW PUMP SPEED PER CW PUMP LOGIC.
 2. OPEN THE HX CW ISOLATION VALVE.
E. WHEN THE WSE CHW ISOLATION VALVE IS ENABLED, IT SHALL BE MODULATED BY A DIRECT-ACTING PID LOOP TO MAINTAIN THE DP ACROSS THE CHW SIDE OF THE HX AT $HX_{DP\text{-}Design}$. MAP THE LOOP OUTPUT FROM 0% OPEN AT 0% OUTPUT TO 100% OPEN AT 100% OUTPUT. BIAS THE LOOP TO LAUNCH FROM 100% OUTPUT. THE VALVE SHALL BE FULLY OPEN WHEN LOOP IS DISABLED.
F. WHEN ECONOMIZER IS DISABLED:
 1. FULLY CLOSE THE HX CW ISOLATION VALVE.
 2. DISABLE THE LAG CW PUMP AND/OR ADJUST CW PUMP SPEED PER CW PUMP LOGIC.
G. CLOSE ECONOMIZER ISOLATION VALVE WHEN ANY CHILLER ISOLATION VALVE IS COMMANDED OPEN AND EXCEEDS 25% OPEN (AS DETERMINED BY VALVE POSITION).

PERFORMANCE MONITORING (GL 36 SECTION 5.20.16)

A. ALL CALCULATIONS LISTED BELOW SHALL BE PERFORMED AT LEAST ONCE EVERY 30 SECONDS. TIME AVERAGED VALUES SHALL BE RECORDED AT LEAST ONCE EVERY 5 MINUTES. THE AVERAGING PERIOD SHALL EQUAL THE TRENDING INTERVAL.
B. TOTAL PLANT POWER. CALCULATE TOTAL PLANT POWER AS THE SUM OF CHILLER POWER, PUMP POWER, AND COOLING TOWER FAN POWER. FOR MOTORS WITH VFDS, POWER SHALL BE ACTUAL POWER AS READ THROUGH THE VFD NETWORK INTERFACE. FOR FIXED SPEED MOTORS (E.G., CW PUMPS WITHOUT VFDS), POWER SHALL BE ASSUMED TO BE FIXED AT BHP (FROM EQUIPMENT SCHEDULE) * 0.746 / 0.93 (APPROXIMATE MOTOR EFFICIENCY).
C. TOTAL PLANT LOAD. CALCULATE PLANT LOAD USING FLOWRATE THROUGH THE PRIMARY CIRCUIT, $FLOW_P$; CHILLED WATER RETURN TEMPERATURE UPSTREAM OF THE FIRST HX OR CHILLER, CHWRT; AND PRIMARY LOOP CHILLED WATER SUPPLY TEMPERATURE LEAVING THE PLANT, CHWST. WHERE A BTU METER IS PROVIDED, THE USE OF ITS INPUT IS ACCEPTABLE IN LIEU OF THE BELOW EQUATION PROVIDED THAT ITS LOAD INPUT IS REPORTED AND TRENDED IN TONS.
 1. Q_{PLANT} [TONS] = FLOWp * (CHWRT - CHWST) / 24
D. EQUIPMENT LOAD. CALCULATE LOAD FOR EACH OPERATING CHILLER AND WSE HEAT EXCHANGER (AS APPLICABLE) USING FLOWRATE THROUGH THE EQUIPMENT, $FLOW_D$; CHILLED WATER RETURN TEMPERATURE ENTERING THE EQUIPMENT, $CHWRT_D$; AND CHILLED WATER SUPPLY TEMPERATURE LEAVING THE EQUIPMENT, $CHWST_D$. INPUTS TO THE BELOW EQUATION SHALL BE DETERMINED PER THE FOLLOWING RULES.
 1. Q_D [TONS] = $FLOW_D$ ($CHWRT_D$ - $CHWST_D$) / 24
  a. WHERE FLOW THROUGH EACH CHILLER IS INDIVIDUALLY MEASURED USING A FLOW METER, $FLOW_D$ SHALL BE THE FLOW MEASURED BY THE CHILLER'S ASSOCIATED FLOW METER.
  a. $CHWRT_D$ SHALL BE THE RETURN TEMPERATURE ENTERING THE EQUIPMENT AS READ BY A HARDWIRED SENSOR IF AVAILABLE. IF A HARDWIRED SENSOR IS UNAVAILABLE FOR A CHILLER, TEMPERATURE SHALL BE READ FROM A SENSOR INTERNAL TO THE CHILLER THROUGH ITS NETWORK INTERFACE.
  b. $CHWST_D$ SHALL BE A HARDWIRED TEMPERATURE SENSOR AT THE OUTLET OF THE EQUIPMENT IF AVAILABLE. IF A HARDWIRED SENSOR IS UNAVAILABLE FOR A CHILLER, TEMPERATURE SHALL BE READ FROM A SENSOR INTERNAL TO THE CHILLER THROUGH ITS NETWORK INTERFACE. ONLY IF NEITHER OF THE ABOVE IS AVAILABLE SHALL A COMMON SUPPLY TEMPERATURE SENSOR (I.E., ONE MEASURING THE OUTPUT FROM MULTIPLE CHILLERS), BE USED.
E. CALCULATE PLANT EFFICIENCY AS TOTAL PLANT POWER DIVIDED BY PLANT LOAD. CALCULATE EFFICIENCY FOR EACH CHILLER AS CHILLER POWER DIVIDED BY CHILLER LOAD.
F. SUMMARY DATA. FOR EACH CHILLER, AND FOR THE TOTAL PLANT, STATISTICS SHALL BE CALCULATED FOR RUNTIME, KWH, AVERAGE ACTUAL EFFICIENCY (KW/TON), PEAK DEMAND (TONS), AVERAGE DEMAND (TONS) AND AVERAGE LOAD (TON-HOURS), ALL ON AN INSTANTANEOUS, YEAR-TO-DATE, AND PREVIOUS-YEAR BASIS.

CHILLED WATER SERVICE USERS

A. THE EXISTING SEVEN AIR HANDLING UNITS WITHIN THE BUILDING SHALL BE REFERRED TO AS CHILLED WATER USERS OR "USERS" THROUGHOUT THE DOCUMENT.
B. THE USERS SHALL BE CAPABLE OF SENDING REQUESTS TO RESET THE CHILLED WATER PLANT (BAS).
C. IMPLEMENT THE FOLLOWING LOGIC FOR THE USERS -
 a. CHILLED-WATER RESET REQUESTS
  - IF THE SUPPLY AIR TEMPERATURE EXCEEDS THE SUPPLY AIR TEMPERATURE SETPOINT BY 5°F FOR 2 MINUTES, SEND 3 REQUESTS.
  - ELSE IF THE SUPPLY AIR TEMPERATURE EXCEEDS THE SUPPLY AIR TEMPERATURE SETPOINT BY 3°F FOR 2 MINUTES, SEND 2 REQUESTS.
  - ELSE IF THE CHW VALVE POSITION IS GREATER THAN 95%, SEND 1 REQUEST UNTIL THE CHW VALVE POSITION IS LESS THAN 85%.
  - ELSE IF THE CHW VALVE POSITION IS LESS THAN 95%, SEND 0 REQUESTS.
 b. CHILLER PLANT REQUESTS. SEND THE CHILLER PLANT REQUEST AS FOLLOWS:
  - IF THE CHW VALVE POSITION IS GREATER THAN 95%, SEND 1 REQUEST UNTIL THE CHW VALVE POSITION IS LESS THAN 10%.
  - ELSE IF THE CHW VALVE POSITION IS LESS THAN 95%, SEND 0 REQUESTS.
D. SEE TRIM AND RESPOND LOGIC ON M8.0.B.
E. SEE CHILLED WATER PLANT RESET LOGIC ON THIS SHEET.

ALARMS (GL 36 SECTION 5.20.17)

A. MAINTENANCE INTERVAL ALARM WHEN PUMP HAS OPERATED FOR MORE THAN 3000 HOURS AS INDICATED BY THE STAGING RUNTIME: LEVEL 4. RESET THE STAGING RUNTIME INTERVAL COUNTER WHEN ALARM IS ACKNOWLEDGED.
B. MAINTENANCE INTERVAL ALARM WHEN CHILLER HAS OPERATED FOR MORE THAN 1000 HOURS AS INDICATED BY THE STAGING RUNTIME: LEVEL 4. RESET THE STAGING RUNTIME INTERVAL COUNTER WHEN ALARM IS ACKNOWLEDGED.
C. CHILLER ALARM: LEVEL 2
D. EMERGENCY OFF SWITCH: LEVEL 1
E. TOWER LEVEL
 1. IF TOWER WATER LEVEL SENSOR INDICATES WATER LEVEL BELOW T-LEVEL-LOW-ALARM, GENERATE A LEVEL 2 ALARM.
 2. IF TOWER WATER LEVEL SENSOR INDICATES WATER LEVEL ABOVE T-LEVEL-HIGH-ALARM, GENERATE A LEVEL 3 ALARM.
F. PUMP OR TOWER FAN ALARM IS INDICATED BY THE STATUS INPUT BEING DIFFERENT FROM THE OUTPUT COMMAND FOR 15 SECONDS.
 1. COMMANDED ON, STATUS OFF: LEVEL 2. DO NOT EVALUATE ALARM UNTIL THE EQUIPMENT HAS BEEN COMMANDED ON FOR 15 SECONDS.
 2. COMMANDED OFF, STATUS ON: LEVEL 4. DO NOT EVALUATE THE ALARM UNTIL THE EQUIPMENT HAS BEEN COMMANDED OFF FOR 60 SECONDS.
G. TOWER BASIN HEATER ALARM IS INDICATED BY THE STATUS BEING DIFFERENT FROM THE OUTPUT COMMAND FOR 15 SECONDS.
 1. COMMANDED ON, STATUS OFF: LEVEL 2. DO NOT EVALUATE ALARM UNTIL THE EQUIPMENT HAS BEEN COMMANDED ON FOR 15 SECONDS.
 2. COMMANDED OFF, STATUS ON: LEVEL 4. DO NOT EVALUATE ALARM UNTIL THE EQUIPMENT HAS BEEN COMMANDED OFF FOR 15 SECONDS.
H. PIPING HEAT TRACE ALARM INDICATED BY THE STATUS BEING DIFFERENT FROM THE OUTPUT COMMAND FOR 15 SECONDS.
 1. COMMANDED ON, STATUS OFF: LEVEL 2. DO NOT EVALUATE ALARM UNTIL THE EQUIPMENT HAS BEEN COMMANDED ON FOR 15 SECONDS.
 2. COMMANDED OFF, STATUS ON: LEVEL 4. DO NOT EVALUATE ALARM UNTIL THE EQUIPMENT HAS BEEN COMMANDED OFF FOR 15 SECONDS.
I. FOR TWO-POSITION VALVES, VALVE ALARM IS INDICATED BY THE END SWITCH STATUS BEING DIFFERENT FROM THE OUTPUT COMMAND FOR 90 SECONDS.
 1. COMMANDED OPEN, STATUS NOT OPEN: LEVEL 2. DO NOT EVALUATE ALARM UNTIL THE EQUIPMENT HAS BEEN COMMANDED OPEN FOR 90 SECONDS.
 2. COMMANDED CLOSED, STATUS NOT CLOSED: LEVEL 4. DO NOT EVALUATE ALARM UNTIL THE EQUIPMENT HAS BEEN COMMANDED CLOSED FOR 90 SECONDS.
J. FOR MODULATING VALVES, VALVE ALARM IS INDICATED BY THE ANALOG POSITION FEEDBACK BEING DIFFERENT FROM THE OUTPUT COMMAND BY MORE THAN 10% FOR 90 SECONDS: LEVEL 2.
K. TOWER BASIN TEMPERATURE ALARM
 1. BASIN TEMPERATURE IS BELOW 38°F FOR 5 MINUTES CONTINUOUSLY: LEVEL 3
 2. BASIN TEMPERATURE IS BELOW 36°F FOR 5 MINUTES CONTINUOUSLY: LEVEL 2
L. SENSOR FAILURE
 1. SENSOR SHALL BE DEEMED OUTSIDE OF ITS WIDEST POSSIBLE OPERATING RANGE IF ANY OF THE FOLLOWING ARE TRUE:
  a. FEEDBACK LESS THAN 2 MA FROM ANY 4 TO 20 MA TRANSDUCER; OR
  b. TEMPERATURE READING LESS THAN 0°F FROM ANY TEMPERATURE SENSOR.
 2. ANY SENSOR THAT GOES OUTSIDE OF ITS WIDEST POSSIBLE OPERATING RANGE.
  a. IF THE SENSOR IS USED FOR MONITORING ONLY: LEVEL 3
  b. IF THE SENSOR IS USED FOR CONTROL: LEVEL 2
M. TOTAL PRESSURE READ BY 'AVAILABLE NPSH' POINT BELOW THE SETPOINT $NPSH_R$ VALUE WHEN ANY CONDENSER WATER PUMP IS ENERGIZED.

AUTOMATED FAULT DETECTION AND DIAGNOSTICS (GL 36 SECTION 5.20.18)

A. PROVIDE AUTOMATIC FAULT DETECTION AND DIAGNOSTICS (AFDD) FUNCTIONALITY IN ACCORDANCE WITH ASHRAE GUIDELINE 36 - 2021 SECTION 5.20.18.
B. AFDD CONDITIONS ARE EVALUATED CONTINUOUSLY FOR THE PLANT. THE POTENTIAL FAULT CONDITIONS ARE DEPENDENT ON THE PLANT OPERATING STATE (OS) AS WELL AS VARIOUS MEASURED AND CALCULATED VARIABLES. REFER TO GL 36 SECTION 5.20.18 FOR FULL DESCRIPTION OF VARIABLES.
C. PROVIDE THE FOLLOWING LIST OF POTENTIAL FAULT CONDITION MONITORING, AS APPLICABLE TO THIS SYSTEM, ACCORDING TO GL 36 TABLE 5.20.18.6.
 1. CHILLER FLOW LOWER THAN THE SCHEDULED MINIMUM FLOW. FLOW TO BE VALIDATED BY INLINE FLOW METERS.
 2. DIFFERENTIAL PRESSURE IS TOO HIGH WITH THE CHILLED WATER PUMPS OFF.
 3. PRIMARY CHILLED WATER FLOW IS TOO HIGH WITH THE CHILLED WATER PUMPS OFF.
 4. CHILLED WATER LOOP DIFFERENTIAL PRESSURE IS TOO LOW WITH CHILLED WATER PUMP(S) AT FULL SPEED.
 5. PRIMARY CHILLED WATER FLOW IS TOO LOW WITH THE MINIMUM FLOW BYPASS VALVE FULLY OPEN.
 6. CHILLED WATER SUPPLY TEMPERATURE IS TOO HIGH.
 7. CONDENSER WATER SUPPLY TEMPERATURE IS TOO HIGH WITH COOLING TOWERS AT FULL SPEED.
 8. DEVIATION BETWEEN THE ACTIVE WATERSIDE ECONOMIZER CONDENSER WATER RETURN TEMPERATURE AND THE COMMON CONDENSER WATER RETURN TEMPERATURE IS TOO HIGH.
 9. HEAT EXCHANGER APPROACH IS HIGH.
 10. DEVIATION BETWEEN CHILLED WATER RETURN TEMPERATURE BEFORE AND AFTER THE WATERSIDE ECONOMIZER IS TOO HIGH.
 11. TOO MANY CHANGES IN OPERATING STATE.
 12. TOO MANY CHILLER STARTS.
 13. TOO MANY CHILLED WATER PLANT STAGE CHANGES.

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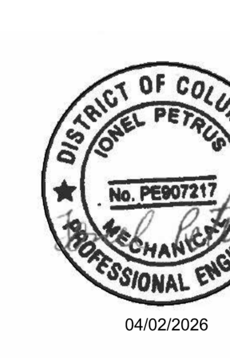
100% CONSTRUCTION DOCUMENTS		02/12/2026
50% CONSTRUCTION DOCUMENTS		10/09/2025

SEALS AND SIGNATURES



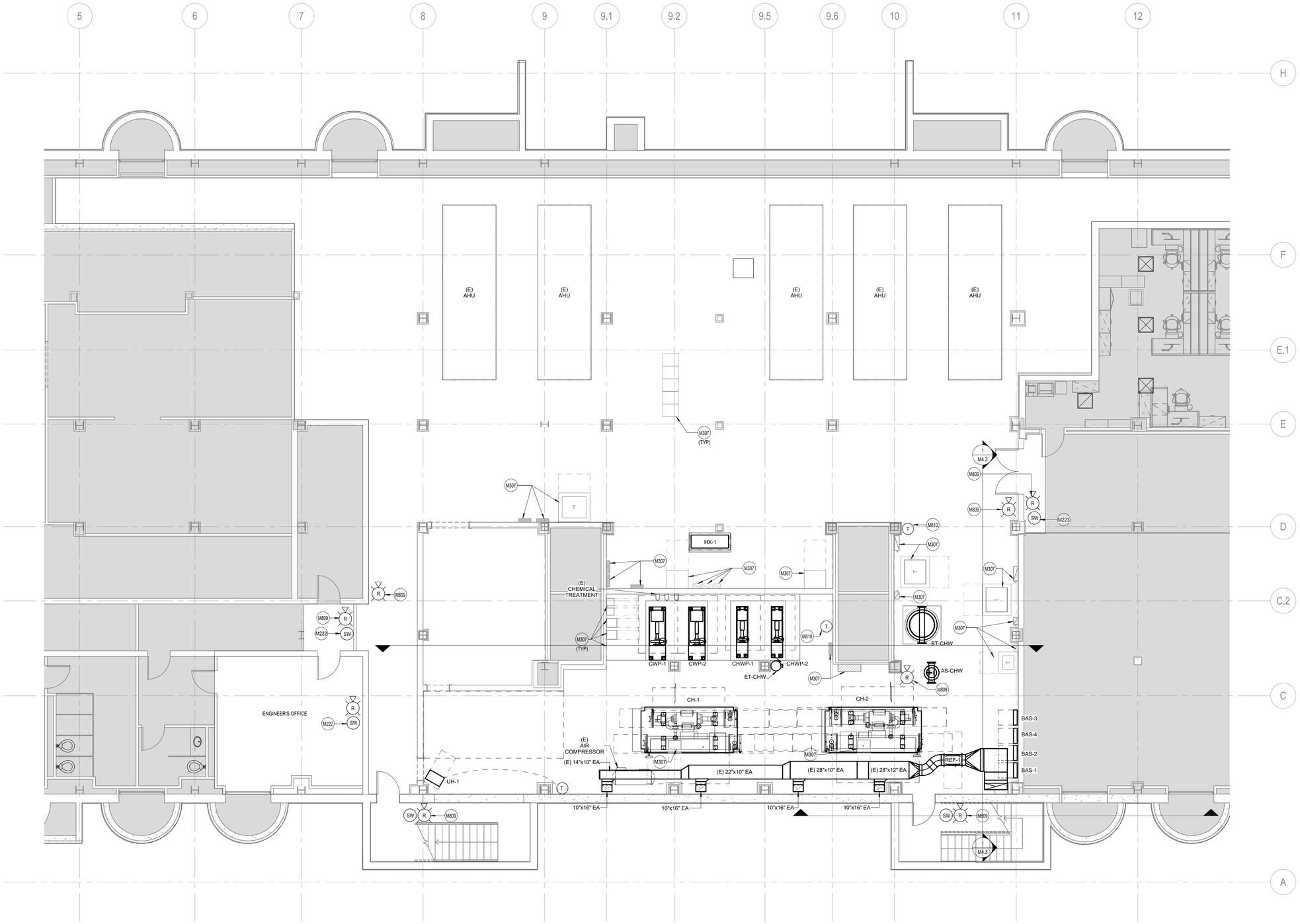
04/02/2026

SHEET TITLE
MECHANICAL CONTROLS - BUILDING A COOLING PLANT SEQUENCE OF OPERATIONS

00100451
PROJECT NUMBER

M8.1.C
SHEET NUMBER

Plot Date: 4/13/2026 4:12:14 PM Author



1 BASEMENT MECHANICAL CONTROLS
SCALE: 3/16" = 1'-0"

GENERAL SHEET NOTES

A. **THE SYSTEM SHALL BE FULLY COMPATIBLE WITH THE EXISTING AUTOMATED LOGIC SYSTEM. PROVIDE ALL NECESSARY UPGRADES TO THE EXISTING SYSTEM TO ACCOMODATE THE INTEGRATION OF THE NEW EQUIPMENT.**
B. SEE DRAWING M0.1 ALONG WITH M8.0.A FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES.
C. SYSTEMS WITH AN '(E)' SUBSCRIPT ARE EXISTING TO REMAIN. MAINTAIN ALL PIPING, DUCTWORK, SUPPORTS AND ACCESSORIES. PROTECT FROM DAMAGE DURING CONSTRUCTION .
D. FOR ALL WORK ON OR WITHIN EXISTING EQUIPMENT, CONTRACTOR TO COORDINATE WITH EQUIPMENT MANUFACTURER TO MAINTAIN WARRANTIES AND UL LISTINGS OF EQUIPMENT AND SYSTEMS.
E. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION OF SENSORS, EQUIPMENT, PANELS, AND CONTROLLERS WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
F. UNLESS EXPLICITLY STATED, ALL POINTS ASSOCIATED WITH REFRIGERANT EXHAUST SYSTEM SHALL BE HARD-WIRED BACK TO THE CONTROLLER.

SHEET KEYNOTES

M222	COORDINATE WITH BUILDING ENGINEER THE FINAL LOCATION OF A/V DEVICE AND SWITCH.
M223	SEE SHEET M8.3 FOR ADDITIONAL INFORMATION.
M307	ELECTRICAL EQUIPMENT/FIXTURES SHOWN ONLY FOR COORDINATION.
M809	CONTRACTOR SHALL VERIFY AND COORDINATE THE EXACT INSTALLATION LOCATION IN THE FIELD. THE VISUAL INDICATOR DEVICE SHALL BE POSITIONED TO ENSURE THAT ANY REFRIGERANT LEAK INDICATION IS CLEARLY VISIBLE AND EASILY IDENTIFIABLE BY ALL PERSONNEL WITHIN THE AREA. REFER TO THE M8 SERIES DOCUMENTATION FOR ADDITIONAL REQUIREMENTS AND GUIDANCE.
M810	THERMOSTAT FOR FCU CONTROL.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
LIONEL PETRIE
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER

04/02/2026

SHEET TITLE
MECHANICAL CONTROLS - FLOOR PLAN BASEMENT MECHANICAL ROOM

PROJECT NUMBER
00100451

SHEET NUMBER
M8.2

Author

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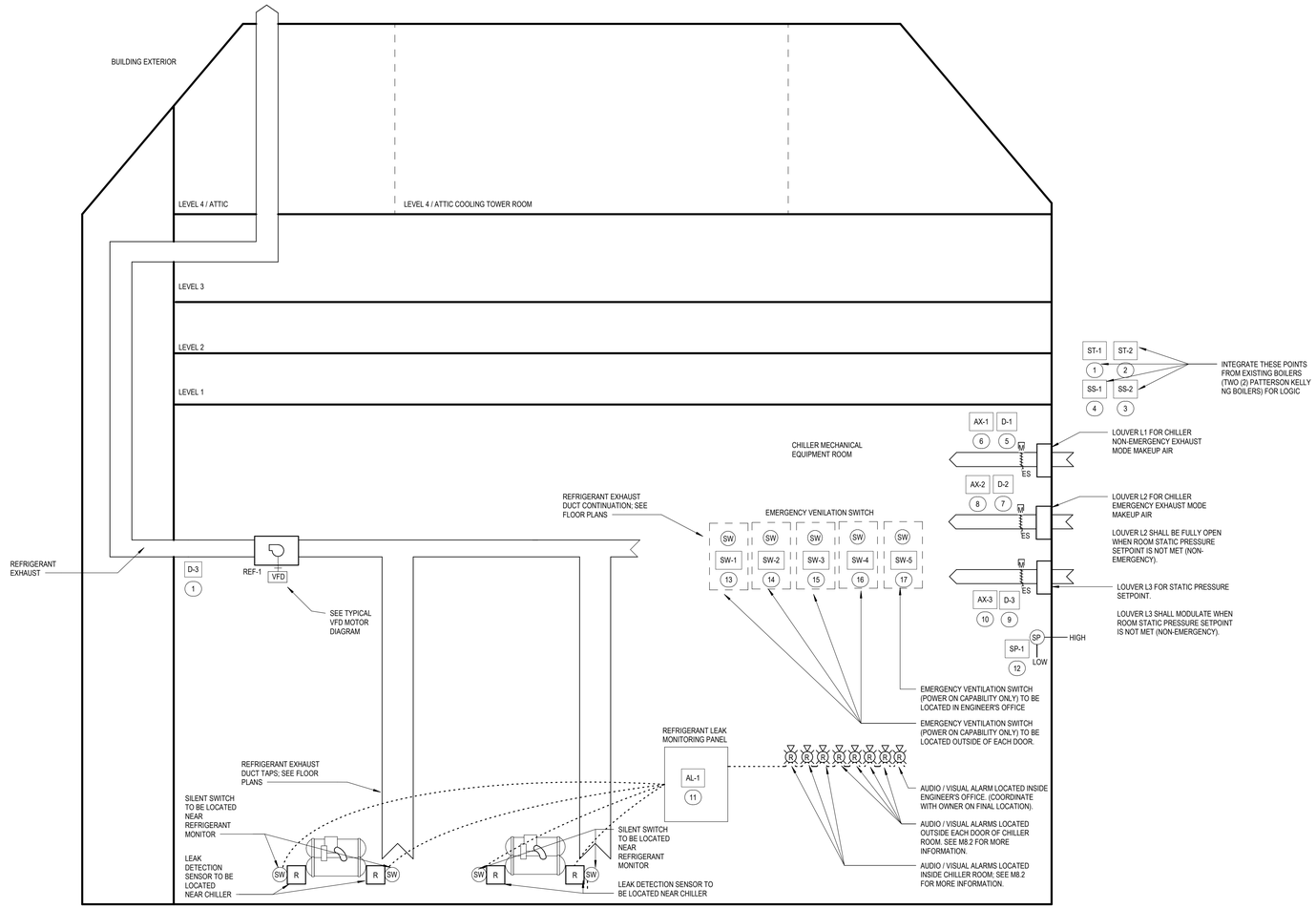

1 CHILLER ROOM REFRIGERANT PURGE
SCALE: NONE

HVAC CONTROLS - EMERGENCY EXHAUST

	POINT NAME	POINT TYPE	FAIL MODE: FAIL ON (OPEN)	FAIL MODE: FAIL OFF (CLOSED)	FAIL MODE: LAST COMMANDED STATE	NETWORK POINT	NOTES
EXISTING BOILER RUN STATUS							
1	BOILER 1	DI					
2	BOILER 2	DI					
3	BOILER 2 OVERRIDE STOP	DI					
4	BOILER 1 OVERRIDE STOP	DO					
MAKEUP AIR							
5	LOUVER L1 DAMPER	AO					
6	LOUVER L1 END SWITCH	AI					
7	LOUVER L2 DAMPER	AO					
8	LOUVER L2 END SWITCH	AI					
9	LOUVER L3 DAMPER	AO					
10	LOUVER L3 END SWITCH	AI					
RLMP							
11	REFRIGERANT LEAK MONITORING SYSTEM ALARM STATUS	AI					
PRESSURIZATION							
12	CURRENT ROOM STATIC PRESSURE	AI					
DOOR SWITCHES							
13	DOOR SWITCH 1	AI					
14	DOOR SWITCH 2	AI					
15	DOOR SWITCH 3	AI					
16	DOOR SWITCH 4	AI					
17	DOOR SWITCH 5	AI					

SEQUENCE OF OPERATIONS

THE SYSTEM SHALL BE FULLY COMPATIBLE WITH THE EXISTING AUTOMATED LOGIC SYSTEM. PROVIDE ALL NECESSARY UPGRADES TO THE EXISTING SYSTEM TO ACCOMODATE THE INTEGRATION OF THE NEW EQUIPMENT.

REFRIGERANT EXHAUST

1. SETPOINTS
   - A. EMERGENCY REFRIGERANT EXHAUST FAN AIRFLOW = 3,500 CFM (ADJ.).
   - B. NON-EMERGENCY REFRIGERANT EXHAUST FAN AIRFLOW = 1,000 CFM (ADJ.).
   - C. EMERGENCY STATIC PRESSURE SETPOINT = NEGATIVE 0.02 IN. W.G. (ADJ.).
   - D. NON-EMERGENCY STATIC PRESSURE SETPOINT = 0.00 IN. W.G. (ADJ.).
2. FAN CONTROL
   - A. HAND-OFF-AUTO (HOA) OPERATION
     - a. HOA SETTINGS SHALL BE PROVIDED AS PART OF THE VARIABLE FREQUENCY DRIVE THROUGH THE DRIVE'S KEYPAD FOR THE EXHAUST FAN.
     - b. WHEN IN HAND MODE, THE FAN CONTROLLED BY THE VFD WILL START.
     - c. WHEN IN OFF MODE, THE FAN CONTROLLED BY THE VFD WILL BE OFF.
     - d. IN THE AUTO MODE, THE FAN CONTROLLED BY THE VFD SHALL BE STARTED AND STOPPED THROUGH THE BAS.
     - e. AFTER A POWER FAILURE, THE BMS WILL INITIATE AN ORDERLY GLOBAL RESTART OF ALL EQUIPMENT TO PREVENT CREATING A SPIKE IN THE FACILITY ELECTRICAL DEMAND.
     - f. UPON ACTIVATION, SAFETIES SHALL STOP THE FAN IN THE AUTO AND HAND MODES.
   - B. LOCAL-REMOTE SPEED CONTROL
     - a. LOCAL-REMOTE SETTINGS SHALL BE PROVIDED AS PART OF THE VARIABLE FREQUENCY DRIVE (VFD) THROUGH THE DRIVE'S KEYPAD.
     - b. IN THE LOCAL MODE THE FAN SPEED SHALL BE CONTROLLED THROUGH A MANUAL SPEED CONTROL LOCATED AT THE DRIVE CONTROL PANEL.
     - c. IN THE REMOTE MODE, THE FAN SPEED SHALL BE CONTROLLED BY THE BAS.
3. REFRIGERANT EXHAUST FAN
   - A. THE EXHAUST FAN OPERATION MODE SHALL BE DRIVEN BY A SIGNAL FROM THE REFRIGERANT LEAK MONITORING SYSTEM OR A MANUAL INITIATION VIA THE EMERGENCY VENT SWITCH AT EACH ENTRANCE TO THE MECHANICAL ROOM.
   - B. WHEN REFRIGERNAT LEAK MONITORING SYSTEM IS NOT ALARMED,
     - a. THE REFRIGERANT EXHAUST FAN SHALL EXHAUST THE MECHANICAL ROOM AT "NON-EMERGENCY OPERATION" SETPOINT.
   - C. THE FAN SHALL NOT BE STARTED UNTIL THE EXHAUST ISOLATION DAMPER HAVE BEEN PROVEN OPEN BY ITS ASSOCIATED END SWITCH.
   - D. WHEN REFRIGERNAT LEAK MONITORING SYSTEM IS ALARMED,
     - a. THE REFRIGERANT EXHAUST FAN SHALL EXHAUST THE MECHANICAL ROOM AT "EMERGENCY OPERATION" SETPOINT.
   - E. THE FAN SHALL NOT BE STARTED UNTIL THE EXHAUST ISOLATION DAMPER HAVE BEEN PROVEN OPEN BY ITS ASSOCIATED END SWITCH.
   - F. UPON RECIEVEING A LEAK SIGNAL FROM THE REFRIGERANT LEAK MONITORING SYSTEM, THE FOLLOWING SHALL OCCUR:
     - a. EXHAUST DAMPER AND INTAKE DAMPER SHALL BE COMMANDED FULLY OPEN.
     - b. INITIATE REF-1.
     - c. CHILLERS SHALL BE SHUT DOWN.
4. OUTSIDE (MAKEUP) AIR LOUVER
   - A. DESIGN INTENT FOR MOTORIZED LOUVERS ARE PROVIDED -
     - a. LOUVER L1 = MAKE UP AIR FOR NON-EMERGENCY EXHAUST MODE.
     - b. LOUVER L2 = MAKE UP AIR FOR EMERGENCY EXHAUST MODE, <u>OR</u> STATIC PRESSURE SETPOINT.
     - c. LOUVER L3 = NON-EMERGENCY STATIC PRESSURE SETPOINT.
   - B. IF THE REFRIGERANT EXHAUST FAN IS IN EMERGENCY MODE,
     - a. BOILERS SHALL BE OVERRIDEN AND SHUT OFF.
     - b. LOUVER L1 AND LOUVER L2 SHALL MODULATE TO MAINTAIN EMERGENCY STATIC PRESSURE SETPOINT.
     - c. THE MOTORIZED LOUVER SHALL OPEN.
     - d. THE BASEMENT MECHANICAL ROOM SHALL BE NEGATIVELY PRESSURIZED WITH RESPECT TO THE OUTDOORS, TO FACILITATE REFRIGERANT REMOVAL.
   - C. IF THE REFRIGERANT EXHAUST FAN IS IN NON-EMERGENCY MODE,
     - a. LOUVER L1 SHALL MODULATE TO MAINTAIN NON-EMERGENCY MODE STATIC PRESSURE SETPOINT.
     - b. LOUVER L2 AND L3 SHALL MODULATE OPEN, WHEN <u>NON-EMERGENCY</u> STATIC PRESSURE SETPOINT IS NOT MET.
5. ALARMS & SYSTEM DIAGNOSTICS:
   - A. THE BAS SHALL VERIFY THE FAN STATUS EVERY FIVE MINUTES. THE BAS SHALL GENERATE AN ALARM INDICATING FAILURE OF REFRIGERANT EXHAUST FAN. IF THE FAN STATUS IS NOT OPERATIONAL.
   - B. SYSTEM DIAGNOSTIC REPORT:
     - a. INCLUDE FOLLOWING INFORMATION IN BAS INTERFACE FOR REFRIGERANT LEAK SYSTEM. FOLLOWING INFORMATION SHALL BE NON-EDITABLE, UNLESS OVERRIDEN BY BUILDING OWNER. WHEN OVERRIDEN, RECORD THE DATE AND TIME OF OVERRIDE.
       - CHILLER CH-1 TOTAL CHARGE IN POUNDS = CONTRACTOR SHALL OBTAIN THIS INFORMATION FROM PURCHASED AND APPROVED CHILLER SUBMITTAL.
       - CHILLER CH-2 TOTAL CHARGE IN POUNDS = CONTRACTOR SHALL OBTAIN THIS INFORMATION FROM PURCHASED AND APPROVED CHILLER SUBMITTAL.
       - CHILLER CH- 1 REFRIGERANT NAME AND ASHRAE 34 (2022) REFRIGERANT CLASS = CONTRACTOR SHALL OBTAIN THIS INFORMATION FROM PURCHASED AND APPROVED CHILLER SUBMITTAL.
       - CHILLER CH-2 REFRIGERANT NAME AND ASHRAE 34 (2022) REFRIGERANT CLASS = CONTRACTOR SHALL OBTAIN THIS INFORMATION FROM PURCHASED AND APPROVED CHILLER SUBMITTAL.
     - b. THE INFORMATION SHALL BE AVAILABLE TO PRINT/TRANSMIT VIA SMTP EMAIL.
   - C. SAFETY SHUTDOWNS:
     - a. EMERGENCY SHUTDOWN: UPON ACTIVATION OF EITHER ONE OF THE EMERGENCY SHUT DOWN SWITCHES AND IF NOT ALREADY SHUT DOWN BY THE EMERGENCY REFRIGERANT EXHAUST CONTROLS SYSTEMS, THE BAS SHALL AUTOMATICALLY SHUTDOWN THE CHILLERS.
     - b. ISOLATION DAMPER END SWITCH: THE BAS WILL MONITOR THE END SWITCH AND GENERATE AN ALARM IF THE DAMPER IS NOT PROVEN OPEN AFTER THE FAN IS COMMANDED TO START.
     - c. FAN STATUS MONITORING AND ALARMS SHALL BE PROVIDED AS FOLLOWS:
       - FAN FAILURE: COMMANDED ON BUT THE STATUS IS OFF.
       - FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
       - FAN VFD FAULT
6. REFRIGERANT LEAK NOTIFICATION (INTERNATIONAL FIRE CODE 2015- §606, INTERNATIONAL MECHANICAL CODE 2015- §1101.9)
   - A. SEE SPECIFICATION 230900 FOR ADDITIONAL INFORMATION. THE BAS SHALL BE CAPABLE OF SENDING AN SMTP EMAIL ALERT ALONG WITH A TEXT ALERT (PROVIDE GATEWAY/ACCESSORIES AS REQUIRED), WHEN REFRIGERANT LEAK SYSTEM IS ACTIVATED.
   - B. PERSUANT TO INTERNATIONAL FIRE CODE 2015 - §606.8 AND §606.14, DC FIRE CODE OFFICIAL (OFFICE OF FIRE MARSHALL), BUILDING ENGINEER AND BUILDING OWNER SHALL BE IMMEDIATELY NOTIFIED (WITHIN 5 MINUTES OR LESS) WHEN REFRIGERANT LEAK IS DETECTED <u>BY ANY DETECTOR/SENSOR</u>.
   - C. BUILDING ENGINEER SHALL HAVE THE ABILITY TO CUSTOMIZE ANY/ALL CONTENT/TEXT WITHIN THE ALERT. MESSAGE CUSTOMIZATION OPTION SHALL BE VISIBLE IN THE REFRIGERANT EXHAUST SECTION IN THE BAS GRAPHIC.
   - D. BUILDING ENGINEER AND OWNER SHALL HAVE THE ABILITY TO ADD/REMOVE RECIPIENTS OF THE ALERT.
   - E. THE ALERT MUST INCLUDE FOLLOWING AT THE MINIMUM -
     - a. ISSUE = REFRIGERANT LEAK.
     - b. PROPERTY OWNER NAME/CONTACT NUMBER = COORDINATE WITH OWNER.
     - c. PROPERTY ADDRESS = 515 FIFTH STREET NORTH WEST, WASHINGTON DC, 20001.
     - d. REFRIGERANT NAME AND ASHRAE 34 (2022) REFRIGERANT CLASS = CONTRACTOR SHALL OBTAIN THIS INFORMATION FROM PURCHASED AND APPROVED CHILLER SUBMITTAL.
     - e. LOCATION OF EQUIPMENT = BASEMENT MECHANICAL ROOM.
     - f. GLOBAL COORDINATES = 38.8966 DEGREE NORTH, -77.0181 DEGREE WEST.
     - g. STATUS OF REFRIGERANT EXHAUST FAN = ON/OFF.
     - h. STATUS OF REFRIGERANT MONITOR PANEL ALARM = ON/OFF.
7. OWNER REFERENCE -
   - A. FOR THE PROPOSED BASIS OF DESIGN EQUIPMENT,
     - a. ASHRAE 34-2022 REFRIGERANT NAME = R513A.
     - b. ASHRAE 34-2022 REFRIGERANT CLASS = A1, NON TOXIC, NON FLAMMABLE.
     - c. REFRIGERANT OCCUPATIONAL EXPOSURE LIMIT (OEL) = 650 PPM VOL/VOL
     - d. REFRIGERANT CONCENTRATION LIMIT (RCL) = 20 LB/1000FT^3
     - e. REFRIGERANT LOWER FLAMMABILITY LIMIT = DOES NOT APPLY FOR A1 REFRIGERANT.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
IONEL PETRUS
No. PE907217
MECHANICAL
PROFESSIONAL ENGINEER
04/02/2026

SHEET TITLE
MECHANICAL CONTROLS - EMERGENCY REFRIGERANT EXHAUST

PROJECT NUMBER
00100451

SHEET NUMBER
M8.3

Author

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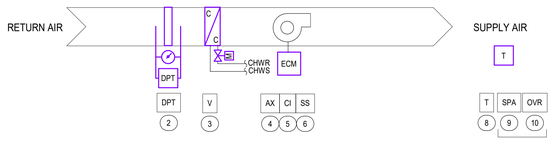
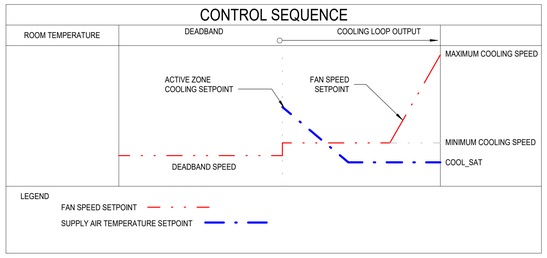




SEQUENCE OF OPERATIONS
THE SYSTEM SHALL BE FULLY COMPATIBLE WITH THE EXISTING AUTOMATED LOGIC SYSTEM. PROVIDE ALL NECESSARY UPGRADES TO THE EXISTING SYSTEM TO ACCOMODATE THE INTEGRATION OF THE NEW EQUIPMENT.
SETPOINTS
A. COOL_SAT, LOWEST COOLING SUPPLY AIR TEMPERATURE SETPOINT: DESIGN COOLING COIL LEAVING AIR TEMPERATURE PER MECHANICAL SCHEDULES.
B. DP_{100}, FILTER HIGH LIMIT DIFFERENTIAL PRESSURE AT DESIGN AIRFLOW: PER FINAL APPROVED SUBMITTAL.

SUPPLY FAN SPEED AND SUPPLY AIR TEMPERATURE CONTROL
A. THE SUPPLY FAN SHALL RUN WHENEVER THE UNIT IS IN ANY MODE OTHER THAN UNOCCUPIED MODE.
B. PROVIDE A RAMP FUNCTION TO PREVENT CHANGES IN FAN SPEED OF MORE THAN 10% PER MINUTE.
C. WHEN THE SUPPLY FAN IS PROVEN ON, FAN SPEED AND SUPPLY AIR TEMPERATURE SETPOINTS ARE CONTROLLED AS SHOWN IN THE CONTROL SEQUENCE DIAGRAM AND FOLLOWING SECTION.
  1. WHEN ZONE STATE IS DEADBAND
    a. FAN SPEED SETPOINT SHALL BE DEADBAND SPEED. IF DEADBANDSPEED IS ZERO, SHUT THE FAN OFF.
    b. COOLING COIL OFF
  2. WHEN ZONE STATE IS COOLING
    a. FOR A COOLING-LOOP SIGNAL OF 0% TO 50%, FAN SPEED SETPOINT IS MINIMUM COOLING SPEED.
    b. FOR A COOLING-LOOP SIGNAL OF 50% TO 100%, FAN SPEED SETPOINT IS RESET FROM MINIMUM COOLING SPEED TO MAXIMUM COOLING SPEED.
    c. FOR A COOLING-LOOP SIGNAL OF 0% TO 50%, SAT SETPOINT IS RESET FROM THE ACTIVE ZONE COOLING SETPOINT TO COOL_SAT.
    d. FOR A COOLING-LOOP SIGNAL OF 50% TO 100%, SAT SETPOINT IS COOL_SAT.
    e. THE COOLING COIL SHALL BE MODULATED WITH A PID LOOP TO MAINTAIN THE DISCHARGE TEMPERATURE AT SAT SETPOINT.

ALARMS
A. MAINTENANCE INTERVAL ALARM WHEN FAN HAS OPERATED FOR MORE THAN 1500 HOURS: LEVEL 4. RESET INTERVAL COUNTER WHEN ALARM IS ACKNOWLEDGED.
B. FAN ALARM IS INDICATED BY THE STATUS INPUT BEING DIFFERENT FROM THE OUTPUT COMMAND FOR 15 SECONDS.
  1. COMMANDED ON, STATUS OFF: LEVEL 2. DO NOT EVALUATE THE ALARM UNTIL THE EQUIPMENT HAS BEEN COMMANDED ON FOR 15 SECONDS.
  2. COMMANDED OFF, STATUS ON: LEVEL 4. DO NOT EVALUATE THE ALARM UNTIL THE EQUIPMENT HAS BEEN COMMANDED OFF FOR 60 SECONDS.
C. FILTER PRESSURE DROP EXCEEDS THE LARGER OF THE ALARM LIMIT OR 12.5 PA (0.05") FOR 10 MINUTES WHEN FAN SPEED EXCEEDS 20% OF MAXIMUM COOLING SPEED: LEVEL 4. THE ALARM LIMIT SHALL VARY WITH FAN SPEED AS FOLLOWS:
  1. $DP_X=DP_{100}(X)^{1.4}$, WHERE:
    a. DP_{100} IS THE HIGH LIMIT PRESSURE DROP AT DESIGN AIRFLOW.
    b. DP_X IS THE HIGH LIMIT AT THE CURRENT FAN SPEED X.

AUTOMATIC FAULT DETECTION AND DIAGNOSTICS
A. PROVIDE AUTOMATIC FAULT DETECTION AND DIAGNOSTICS (AFDD) FUNCTIONALITY IN ACCORDANCE WITH ASHRAE GUIDELINE 36 - 2021 SECTION 5.22.6.
B. AFDD CONDITIONS ARE EVALUATED CONTINUOUSLY FOR THE FCU. THE POTENTIAL FAULT CONDITIONS ARE DEPENDENT ON THE FCU OPERATING STATE (OS) AS WELL AS VARIOUS MEASURED AND CALCULATED VARIABLES. REFER TO GL 36 SECTION 5.22.6 FOR FULL DESCRIPTION VARIABLES.
C. THE FOLLOWING POTENTIAL FAULT CONDITIONS SHALL BE EVALUATED ACCORDING TO GL 36 TABLE 5.22.6.6.
  1. TOO MANY CHANGES IN OPERATING STATE
  2. SAT TOO HIGH IN FULL COOLING

TESTING/COMMISSIONING OVERIDES
A. PROVIDE SOFTWARE SWITCHES THAT INTERLOCK TO A CHW AND HOT-WATER PLANT LEVEL TO:
  1. FORCE CHW VALVE FULL OPEN
  2. FORCE CHW VALVE FULL CLOSED

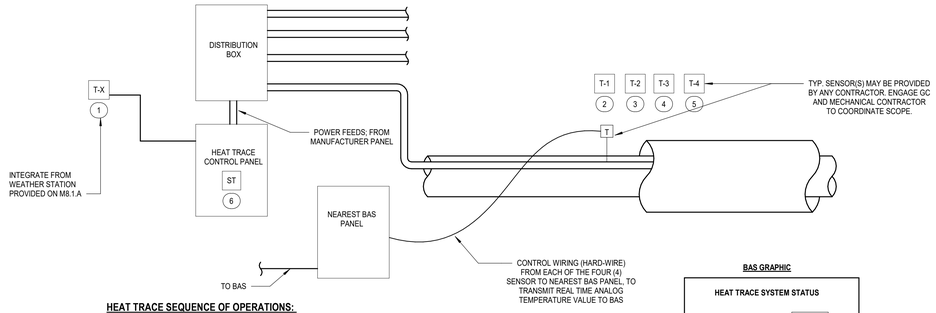
PLANT REQUESTS
A. CHILLED-WATER RESET REQUESTS
  1. ALL REQUESTS SHALL BE SUPPRESSED (SEND 0 REQUESTS) IF FAN IS NOT AT MAXIMUM COOLING SPEED.
  2. IF THE CHW VALVE POSITION IS GREATER THAN 95% AND THE SUPPLY AIR TEMPERATURE IS 10°F GREATER THAN SETPOINT FOR 5 MINUTES, SEND 3 REQUESTS,
  3. ELSE IF THE CHW VALVE POSITION IS GREATER THAN 95% AND THE SUPPLY AIR TEMPERATURE IS 5°F GREATER THAN SETPOINT FOR 5 MINUTES, SEND 2 REQUESTS,
  4. ELSE IF THE CHW VALVE POSITION IS GREATER THAN 95%, SEND 1 REQUEST UNTIL THE CHW VALVE POSITION IS LESS THAN 85%.
  5. ELSE IF THE CHW VALVE POSITION IS LESS THAN 95%, SEND 0 REQUESTS.
B. CHILLER PLANT REQUESTS.
  1. IF THE CHW VALVE POSITION IS GREATER THAN 95%, SEND 1 REQUEST UNTIL THE CHW VALVE POSITION IS LESS THAN 10%.
  2. ELSE IF THE CHW VALVE POSITION IS LESS THAN 95%, SEND 0 REQUESTS.

INFORMATION PROVIDED BY TAB CONTRACTOR
A. THE FOLLOWING INFORMATION SHALL BE PROVIDED BY (OR IN CONJUNCTION WITH) TESTING, ADJUSTING, AND BALANCING CONTRACTOR:
  1. MINCOOLSPEED: THE SPEED THAT PROVIDES SUPPLY AIRFLOW EQUAL TO THE DESIGN COOLING MINIMUM AIRFLOW SCHEDULED ON PLANS. IF NO MINIMUM AIRFLOW IS PROVIDED ON PLANS, DEFAULT TO 20% OF THE MAXIMUM COOLING SPEED.
  2. DEADBANDSPEED: IF THE FAN IS DESIRED TO OPERATE WHEN THE ZONE IS IN DEADBAND, SET THIS VALUE TO LESS THAN OR EQUAL TO MINSPEED. IF THE FAN IS TO SHUT OFF WHEN THE ZONE IS IN DEADBAND, SET THIS VALUE TO 0.
  3. MAXCOOLSPEED: THE SPEED THAT PROVIDES SUPPLY AIRFLOW EQUAL TO THE DESIGN COOLING AIRFLOW SCHEDULED ON PLANS.

1 FAN COIL UNIT COOLING
SCALE: NOT TO SCALE

HVAC CONTROLS - BMS POINT FUNCTION SCHEDULE M8.4.12 FCU COOLING

	POINT NAME	POINT TYPE	FAIL MODE: FAIL ON (OPEN)	FAIL MODE: FAIL OFF (CLOSED)	FAIL MODE: LAST COMMANDED STATE	NETWORK POINT	NOTES
FAN COIL UNIT COOLING ONLY							
2	FILTER DIFFERENTIAL PRESSURE	AI					
3	VALVE CONTROL	AO			■		
4	SUPPLY FAN STATUS	DI					CONNECT TO VFD STATUS OR ECM STATUS OR TO CURRENT SWITCH IF STATUS CONTACT IS NOT AVAILABLE THROUGH DRIVE
5	SUPPLY FAN SPEED	AO			■		
6	SUPPLY FAN START	DO	■				
8	ZONE TEMPERATURE	AI					
9	ZONE TEMPERATURE SETPOINT ADJUSTMENT	AI					
10	LOCAL OVERRIDE	DI					



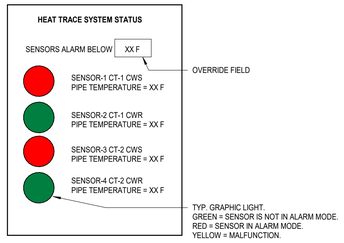
HEAT TRACE SEQUENCE OF OPERATIONS:
THE SYSTEM SHALL BE FULLY COMPATIBLE WITH THE EXISTING AUTOMATED LOGIC SYSTEM. PROVIDE ALL NECESSARY UPGRADES TO THE EXISTING SYSTEM TO ACCOMODATE THE INTEGRATION OF THE NEW EQUIPMENT.
NOTE: PROVIDE FOUR (4) TEMPERATURE SENSORS TO BE MOUNTED ON PIPING.
MOUNTING INSTRUCTION - MOUNT A SENSOR AT AN ACCESSIBLE HEIGHT ON THE FOLLOWING PIPES
1. COOLING TOWER 1 = CONDENSER WATER SUPPLY
2. COOLING TOWER 1 = CONDENSER WATER RETURN
3. COOLING TOWER 2 = CONDENSER WATER SUPPLY
4. COOLING TOWER 2 = CONDENSER WATER RETURN

SEQUENCE OF OPERATIONS:
1. ALL SETPOINTS ARE USER ADJUSTABLE. SEE M8.1.C.
2. ACTIVATION SETPOINT = 40°F (ADJ.)
3. HEAT TRACE SHALL BE ACTIVATED WHEN OUTDOOR AIR TEMPERATURE IS AT ACTIVATION SETPOINT OR BELOW.

ALARMS:
1. AN ALARM SHALL BE SENT TO THE BAS IF ANY OF THE TEMPERATURE SENSORS MOUNTED ON THE PIPE SENSE A TEMPERATURE LESS THAN 34°F DEG (ADJ) FOR MORE THAN 5 MINUTES.
2. AN ALARM SHALL BE SENT TO THE BAS WHEN AN OUTDOOR AIR TEMPERATURE DROPS BELOW 34°F DEG (ADJ) FOR MORE THAN 5 MINUTES AND HEAT TRACE PANEL IS NOT ON.
3. AN ALARM SHALL BE SENT TO THE BAS WHEN THE OUTDOOR AIR TEMPERATURE IS AT ACTIVATION SETPOINT OR BELOW AND THE RUN STATUS OF THE HEAT TRACE IS OFF.

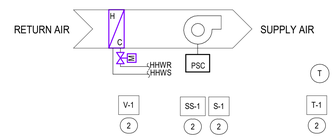
2 HEAT TRACE CONTROL SYSTEM
SCALE: NOT TO SCALE

BAS GRAPHIC



HVAC CONTROLS - HEAT TRACING

	POINT NAME	POINT TYPE	FAIL MODE: FAIL ON (OPEN)	FAIL MODE: FAIL OFF (CLOSED)	FAIL MODE: LAST COMMANDED STATE	NETWORK POINT	NOTES
RUN STATUS							
6	HEAT TRACE RUN STATUS	DI					
SENSORS							
1	WEATHER STATION TEMPERATURE SENSOR	AI					THIS SENSOR IS PROVIDED ON CHILLED WATER PLANT. DO NOT DUPLICATE.
2	SENSOR 1 CT-1 CONDENSER WATER SUPPLY PIPE SURFACE TEMPERATURE	AI					
3	SENSOR 2 CT-1 CONDENSER WATER RETURN PIPE SURFACE TEMPERATURE	AI					
4	SENSOR 3 CT-2 CONDENSER WATER SUPPLY PIPE SURFACE TEMPERATURE	AI					
5	SENSOR 4 CT-2 CONDENSER WATER RETURN PIPE SURFACE TEMPERATURE	AI					
UNIT HEATER							
2	TEMPERATURE SENSOR	AI					
2	UNIT HEATER STATUS	AI					
2	UNIT START / STOP	DO					
2	VALVE	AO					



SEQUENCE OF OPERATIONS
THE SYSTEM SHALL BE FULLY COMPATIBLE WITH THE EXISTING AUTOMATED LOGIC SYSTEM. PROVIDE ALL NECESSARY UPGRADES TO THE EXISTING SYSTEM TO ACCOMODATE THE INTEGRATION OF THE NEW EQUIPMENT....
GENERAL
A. UNIT HEATERS SHALL BE PROVIDED WITH STANDALONE CONTROLLERS FROM THE MANUFACTURER.
B. PROVIDE WALL MOUNTED FAN SPEED DIAL AND THERMOSTAT.

SUPPLY FAN SPEED AND SUPPLY AIR TEMPERATURE CONTROL
A. THE SUPPLY FAN SHALL RUN WHENEVER THE THERMOSTAT DROPS BELOW TEMPERATURE SETPOINT.
B. THE SUPPLY FAN SPEED SHALL BE CONSTANT SPEED AND CONTROLLED BY A MANUAL FAN SPEED DIAL.
C. THE HEATING COIL SHALL BE MODULATED WITH A PID LOOP TO MAINTAIN THE SPACE TEMPERATURE SETPOINT.

ALARMS
A. TEMPERATURE ALARM IS PROVIDED AT THE BAS WHEN THE SPACE TEMPERATURE IS BELOW SETPOINT FOR 15 MINUTES (ADJ).

3 HORIZONTAL HOT WATER UNIT HEATER
SCALE: NOT TO SCALE

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Washington, DC 20001

SMITHGROUP
1700 NEW YORK AVENUE NW
SUITE 100
WASHINGTON, DC 20006
202.842.2100
www.smithgroup.com

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SEALS AND SIGNATURES

04/02/2026

SHEET TITLE
MECHANICAL CONTROLS - MISC

PROJECT NUMBER
00100451

SHEET NUMBER
M8.4

Author
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ELECTRICAL ABBREVIATIONS

A	A	AMPERES
	AC	ALTERNATING CURRENT
	AF	AMPERE FRAME (BREAKER RATING)
	AFC	ABOVE FINISHED COUNTER
	AFF	ABOVE FINISHED FLOOR
	AFG	ABOVE FINISHED GRADE
	AHU	AIR HANDLING UNIT
	AIC	AMPERE INTERRUPTING CAPACITY
	ALT	ALTERNATE
	ARCH	ARCHITECT
	AT	AMPERES TRIP
	ATS	AUTOMATIC TRANSFER SWITCH
	AUX	AUXILIARY
	AWG	AMERICAN WIRE GAUGE
B	BAS/BMS	BUILDING AUTOMATION SYSTEM
	BLDG	BUILDING
	BRKR, BKR	BREAKER
C	C	CONDUIT
	CB	CIRCUIT BREAKER
	CKT	CIRCUIT
	CLG	CEILING
	CP	CONTROL PANEL
	CT	CURRENT TRANSFORMER
	CU	COPPER
D	(D)	EXISTING TO BE DEMOLISHED BACK TO SOURCE
	DC	DIRECT CURRENT
	DIST	DISTRIBUTION
	DIV	DIVISION
	DP	DISTRIBUTION PANEL
	DS	DISCONNECT
	DWG	DRAWING
E	(E)	EXISTING TO REMAIN
	EG	EQUIPMENT GROUND
	ELEC	ELECTRIC, ELECTRICAL
	EM. EMEG	EMERGENCY
	EMT	ELECTRIC METALLIC CONDUIT
	ENCL	ENCLOSURE
	EQ, EQIP	EQUIPMENT
	EWH	ELECTRIC WATER HEATER
F	F	FUSE
	FC	FOOT CANDLE
	FDR	FEEDER
	FL, FLR	FLOOR
	FLA	FULL LOAD AMPS
	FT	FOOT / FEET (')
G	G, GND, GRD	GROUND
	GEN	GENERATOR
	GFCI	GROUND FAULT INTERRUPTER
H	H	HORIZONTAL MOUNTING
	HP	HORSEPOWER
	HR	HOUR
	HTC	HEAT TRACE CONTROL
	HVAC	HEATING VENTILATION AND AIR CONDITIONING
	HZ	HERTZ
I	IG	ISOLATED GROUND
	IN	INCH / INCHES (")
J	JB, JBOX	JUNCTION BOX
K	K	KEY INTERLOCK
	Kcmil	1000 CIRCULAR mils
	KV	KILOVOLTS (THOUSAND VOLTS)
	KVA	KILOVOLTS-AMPERES (THOUSAND VOLT-AMPS)
	KW	KILOWATTS (THOUSAND WATTS)
	KWH	KILOWATT-HOURS
L	LA	LIGHTNING ARRESTOR
	LC, LCP	LIGHTING CONTROL PANEL
	LP	LIGHTING PANEL
	LSI	LONG-TIME, SHORT-TIME, INSTANTANEOUS
	LSIA	LONG-TIME, SHORT-TIME, INSTANTANEOUS,GROUND-FAULT ALARM ONLY
	LSIG	LONG-TIME, SHORT-TIME, INSTANTANEOUS,GROUND-FAULT
	LTG	LIGHTING
	LV	LOW VOLTAGE (BELOW 50 VOLTS)
M	MCA	MINIMUM CIRCUIT AMPACITY
	MCB	MAIN CIRCUIT BREAKER
	MCC	MOTOR CONTROL CENTER
	MECH	MECHANICAL
	MFR	MANUFACTURER
	MIN	MINIMUM
	MISC	MISCELLANEOUS
	MLO	MAIN LUGS ONLY
	MOCP	MAXIMUM OVERCURRENT PROTECTION
	MTD	MOUNTED
	MTG	MOUNTING
	MV	MEDIUM VOLTAGE (OVER 600V LESS THAN 35KV)
N	N	NEUTRAL
	NEC	NATIONAL ELECTRICAL CODE
	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
	NIC	NOT IN CONTRACT
	NO., NUM. #	NUMBER
	NTS	NOT TO SCALE
O	OC	ON CENTER
	OCPD	OVERCURRENT PROTECTION DEVICE
	OH	OVERHEAD
	OHD	OVERHEAD DOOR
P	P	POLE
	PB	PULL BOX
	PF	POWER FACTOR
	PH, Ø	PHASE
	PNL	PANEL
	PRI	PRIMARY
	PVC	POLYVINYL CHLORIDE
	PWR	POWER
Q	QTY	QUANTITY
R	(R)	EXISTING TO BE RELOCATED
	RCPT	RECEPTACLE
	RLA	RATED (RUNNING) LOAD AMPS
	RM	ROOM
	RP	RECEPTACLE PANELBOARD
	RSC	RIGID STEEL CONDUIT
S	SCH, SCHED	SCHEDULE
	SEC	SECONDARY
	SF	SQUARE FOOT
	SPD	SURGE PROTECTIVE DEVICE
	SPEC(S)	SPECIFICATION(S)
	STD	STANDARD
	SWBD	SWITCHBOARD
	SWGR	SWITCHGEAR
	SYM	SYMMETRICAL
T	TV	TELEVISION
	TYP	TYPICAL
U	UG	UNDERGROUND
	UL	UNDERWRITER'S LABORATORY
	UON	UNLESS OTHERWISE NOTED
	UPS	UNINTERRUPTIBLE POWER SUPPLY
V	V	VOLTS
	VA	VOLT-AMPERES
	VFD	VARIABLE FREQUENCY DRIVE/ VARIABLE FREQUENCY MOTOR CONTROLLER
W	W	WIRE
	W/	WITH
	W/O	WITHOUT
	WP	WEATHERPROOF
X	XFMR	TRANSFORMER
Z	%Z	PERCENT IMPEDANCE

ELECTRICAL LIGHTING SYMBOLS

WALL MOUNTED LIGHTING FIXTURE- TYPE AS INDICATED

a — LIGHTING FIXTURE - TYPE AS INDICATED (SUBSCRIPT INDICATES SWITCH CONTROL)

LIGHTING FIXTURE - TYPE AS INDICATED

EM EM — HALF SHADING INDICATES FIXTURE CONNECTED TO GENERATOR CIRCUIT (SWITCHED)

NL NL — SHADING INDICATES FIXTURE CONNECTED TO LIFE SAFETY BRANCH (UNSWITCHED)

EXIT LIGHT - WALL/CEILING MOUNTED - DIRECTIONAL ARROWS AS INDICATED SHADING INDICATES ILLUMINATED FACE

XX — LIGHTING FIXTURE TYPE DESIGNATION - "XX" INDICATES SPECIFIC TYPE REFER TO LIGHT FIXTURE SCHEDULE

$a — SINGLE POLE SWITCH (SUBSCRIPT INDICATES FIXTURES CONTROLLED)

$3 — THREE-WAY SWITCH (S3P-THREE-WAY SWITCH WITH PILOT LIGHT)

$4 — FOUR - WAY SWITCH

$P — SINGLE POLE SWITCH WITH PILOT LIGHT

DISTRIBUTION AND DIAGRAM SYMBOLS

T — TRANSFORMER - TYPE AND RATING AS INDICATED

GROUND

M EMU — ELECTRONIC METERING UNIT

SPD — SURGE PROTECTIVE DEVICE

DISTRIBUTION PANELBOARD

PANELBOARD - (FLUSH/SURFACE)

UPS — UNINTERRUPTIBLE POWER SUPPLY

RB5-X — SYMBOL INDICATES TO WHICH PANELBOARD AND CIRCUIT NUMBER (SEPARATED BY THE "-") THAT DEVICES IN THE SPACE ARE CIRCUITED TO. NOTE: SEE EQUIPMENT SCHEDULE FOR EQUIPMENT CIRCUITING INFORMATION.

RB5 — STANDALONE NUMBERS DIRECTLY ADJACENT TO A DEVICE INDICATE A SPECIFIC CIRCUIT NUMBER IF MULTIPLE CIRCUITS FROM THE SAME PANELBOARD ARE IN THE SPACE.

RB5 RTGEL-1 — PANELBOARD NAME AND CIRCUIT NUMBER (SEPARATED BY THE "-") WITHOUT THE HEXAGONAL BORDER WILL BE UTILIZED DIRECTLY ADJACENT TO A DEVICE IF THE PANELBOARD THE DEVICE IS BEING CIRCUITED TO DIFFERS FROM THE PANELBOARD (IN THE HEXAGON) THE SPACE IS BEING CIRCUITED TO.

ELECTRICAL WIRING SYMBOLS

DEMOLITION WORK (ON DEMOLITION DRAWINGS)

CONDUIT TURNED UP

CONDUIT TURNED DOWN

ELECTRICAL POWER SYMBOLS

SINGLE RECEPTACLE, NEMA 5-20R (SLASH INDICATES MOUNTING ABOVE FINISH COUNTER)

DUPLEX RECEPTACLE, NEMA 5-20R (SLASH INDICATES MOUNTING ABOVE FINISH COUNTER)

GFI, DUPLEX RECEPTACLE, NEMA 5-20R (SLASH INDICATES MOUNTING ABOVE FINISH COUNTER)

QUADRUPLEX RECEPTACLE, (2) NEMA 5-20R, DUPLEX RECEPTACLES WITH A COMMON FACEPLATE. (SLASH INDICATES MOUNTING ABOVE FINISH COUNTER)

GFI, QUADRUPLEX RECEPTACLE, (2) NEMA 5-20R, DUPLEX RECEPTACLES WITH A COMMON FACEPLATE. (SLASH INDICATES MOUNTING ABOVE FINISH COUNTER)

WP — GFCI, WEATHER-RESISTANT, DUPLEX RECEPTACLE, 20A, 125V, 2P, 3W, WITH DECORATOR-STYLE DEVICE AND FACEPLATE. RECEPTACLE TO BE IN RECESSED DIE-CAST ALUMINUM BOX WITH A HEAVY CAST ALUMINUM CONSTRUCTION. CORROSION-RESISTANT, WHILE-IN-USE COVER WITH NEMA 3R AND UL RATING, WET LOCATION APPROVAL, EXTRA DUTY RATING, LOCKABLE, AND FACTORY INSTALLED CORD FLAP GASKETS. COVER TO MOUNT WITH A GASKET AND STAINLESS STEEL SCREWS. B.O.D.: PASS & SEYMOUR WP833 + WIUCAST1 OR EQUAL.

EMERGENCY DUPLEX RECEPTACLE, NEMA 5-20R (SHADING INDICATING EMERGENCY RECEPTACLE TYPICAL FOR ALL OTHER RECEPTACLE TYPES)

J J J — JUNCTION BOX (CEILING, FLOOR OR WALL MOUNTED) INDICATED IN POWER, LIGHTING & FIRE ALARM SYSTEMS PLANS.

ELECTRICAL EQUIPMENT SYMBOLS

MOTOR AND CONNECTION

DISCONNECT SWITCH, NON-FUSED
PROVIDE SWITCH AMPACITY EQUAL TO OR GREATER THAN FEEDER AMPACITY, UON

DISCONNECT SWITCH, FUSED
PROVIDE SWITCH AMPACITY EQUAL TO OR GREATER THAN FEEDER AMPACITY, UON
FUSE AMPACITY AS INDICATED AND NO LESS THAN REQUIRED BY EQUIPMENT NAMEPLATE.

CB — CIRCUIT BREAKER IN NEMA 1 ENCLOSURE (FLUSH/SURFACE)

COMBINATION MOTOR STARTER WITH DISCONNECT SWITCH.
PROVIDE SWITCH AMPACITY EQUAL TO OR GREATER THAN FEEDER AMPACITY, UON
FUSE AMPACITY AS INDICATED AND NO LESS THAN REQUIRED BY EQUIPMENT NAMEPLATE.

$M — MANUAL MOTOR STARTER WITH PILOT LIGHT AS INDICATED.

VFD — VARIABLE FREQUENCY DRIVE/VARIABLE FREQUENCY MOTOR CONTROLLER

EMERGENCY POWER OFF

EGB — GROUNDING BUS BAR

REFERENCE SYMBOLS

1 / E0.1 — SECTION NUMBER / SIM / DRAWING NUMBER WHERE DRAWN

DETAIL NUMBER / DRAWING NUMBER WHERE DRAWN

EXXX — KEYNOTE

EDXX — DEMO KEYNOTE

XXX — ELECTICAL FEEDER KEYNOTE

GENERAL NOTES

A. PROVIDE 1#12 + 1#12N + 1#12G FOR 20A BRANCH CIRCUITING, UON; MAXIMUM OF THREE CIRCUITS PER CONDUIT; MINIMUM CONDUIT SIZE OF 3/4" C, UON.

B. PROVIDE A DEDICATED NEUTRAL WIRE FOR EACH BRANCH CIRCUIT.

C. COORDINATE DEVICE LOCATIONS AND MOUNTING HEIGHTS WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH-IN.

D. PROVIDE FIRE STOPPING FOR CONDUITS AND ELECTRICAL EQUIPMENT FOR FLOOR SLABS, WALLS AND CEILINGS TO MAINTAIN FIRE RATING.

E. INSTALL ELECTRICAL WORK IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL BUILDING AND FIRE CODES, IN A NEAT AND WORKMANLIKE MANNER.

F. LIMIT VOLTAGE DROP TO 2% FOR FEEDERS AND 3% FOR BRANCH CIRCUITS. INCLUDE DERATING FACTOR FOR ROOF-MOUNTED CONDUITS.

G. WHERE MULTIPLE SWITCHES, RECEPTACLES, AND OTHER OUTLETS (EXCEPT WALL PHONES) ARE INDICATED PROVIDE MULTI-GANG BACK BOXES WITH GANG BARRIERS AND A COMMON FACEPLATE.

H. WHERE DIFFERENT RECESSED DEVICES WITH THE SAME MOUNTING HEIGHTS ARE INDICATED SIDE-BY-SIDE, MOUNT THE DEVICES SO THAT THERE IS FOUR INCHES BETWEEN ADJACENT VERTICAL EDGES OF THE FACEPLATES, UON.

I. WHERE ELECTRICAL DEVICES WITH DIFFERENT MOUNTING HEIGHTS ARE LOCATED IN THE SAME AREA ALIGN DEVICES VERTICALLY THROUGH THEIR CENTERLINES, UON.

J. PROVIDE FEEDERS AND BRANCH CIRCUITS WHICH HAVE AN AMPACITY EQUAL TO OR GREATER THAN THE CIRCUIT OVERCURRENT PROTECTIVE DEVICE RATING, U.O.N.

K. MOUNT DEVICES FLUSH WITH CONCEALED CONDUIT, EXCEPT AS NOTED ON THE DRAWINGS AND IN MECHANICAL AND ELECTRICAL EQUIPMENT ROOMS.

L. THE DRAWINGS REPRESENT ELECTRICAL DESIGN INTENT. THEY ARE DIAGRAMMATIC. PROVIDE ALL COMPONENTS NECESSARY FOR COMPLETE OPERATING ELECTRICAL SYSTEMS.

M. CONDUIT, AND OTHER PENETRATIONS OF ALL NON FIRE RATED FULL HEIGHT PARTITIONS SHALL NOT BE IN CONTACT WITH THE PARTITION. LEAVE A MINIMUM 1/2" ANNULAR SPACE, FILL SPACE WITH MINERAL FIBER/FIBERGLASS, AND SEAL PENETRATION WITH ACOUSTICAL SEALANT.

N. DO NOT SCALE THE DRAWINGS FOR DIMENSIONAL INFORMATION. NOTIFY THE ARCHITECT IN WRITING IMMEDIATELY IF DIMENSIONAL INFORMATION CANNOT BE DETERMINED FROM THE DRAWINGS OR IF DIMENSIONS ARE IN CONFLICT WITH OTHER DRAWINGS.

O. WHERE THE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN, COORDINATE WITH THE OWNER 14 DAYS PRIOR TO SHUT DOWN. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS.

MOUNTING HEIGHTS

DISCONNECT SWITCHES	5'-6" AFF
INDIVIDUAL CIRCUIT BREAKERS	5'-6" AFF
MOTOR STARTERS	5'-6" AFF
PANELBOARDS & CABINETS	6'-0" AFF TO TOP
PUSHBUTTONS	3'-6" AFF
RECEPTACLES	1'-6" AFF
WALL SWITCHES	3'-6" AFF

MOUNTING HEIGHT NOTES:

1. ALL ELEVATIONS ARE TO CENTER LINE OF DEVICE, UNLESS OTHERWISE NOTED.
2. MOUNT MANUAL MOTOR STARTER ADJACENT TO OR ON UNIT.
3. REFER TO ARCHITECTURAL A0 SERIES FOR ADDITIONAL ELECTRICAL DEVICE MOUNTING HEIGHTS AND DEVICE ALIGNMENT RULES.

SYMBOL SHEET NOTES

A. THE PURPOSE OF THIS SHEET IS TO ILLUSTRATE AND DEFINE TYPICAL GRAPHIC SYMBOLS WHICH MAY TYPICALLY OCCUR ON THE ELECTRICAL DRAWINGS.

B. THIS SHEET MAY ILLUSTRATE ABBREVIATIONS, SYMBOLS AND LEGENDS WHICH DO NOT OCCUR AS PART OF THIS PROJECT. REFER TO THE DRAWINGS TO DETERMINE WHICH ITEMS APPLY TO THE WORK OF THIS PROJECT.

C. ADDITIONAL SYMBOLS NOT SHOWN OR DEFINED ON THIS SHEET MAY BE USED ON THE ELECTRICAL DRAWINGS AND ARE TYPICALLY DEFINED ON OTHER SHEETS.

D. SYMBOLS ARE NOT DRAWN TO SCALE. TO DETERMINE THE ACTUAL SIZES OF ELEMENTS REPRESENTED BY SYMBOLS, REFER TO THE SPECIFICATIONS AND OTHER SHEETS, AS MAY APPLY.

DC Courts TO-28
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515 5th Street N.W.
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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
KENZ MELIANI
No. PE 40001940
ELECTRICAL
PROFESSIONAL ENGINEER

04/02/2026

SHEET TITLE

ELECTRICAL ABBREVIATIONS AND SYMBOLS

PROJECT NUMBER 00100451

SHEET NUMBER E0.1

Author

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FEEDER & BRANCH CIRCUIT SIZING SCHEDULE - GENERAL PURPOSE

(NOTES 1 & 2)

OVERCURRENT DEVICE RATING (AMPERES)	WIRE SIZE - AWG OR KCMIL		CONDUIT SIZE			NOTE
	PHASE & NEUTRAL	E.G.	2 WIRE	3 WIRE	4 WIRE	
15-20	12	12	3/4"	3/4"	3/4"	
25-30	10	10	3/4"	3/4"	3/4"	
35-40	8	10	3/4"	3/4"	3/4"	
45-50	8(6)	10	3/4"	3/4"	3/4"(1")	
60	6(4)	10	3/4"(1")	3/4"(1")	1"(1 1/4")	
70	6(4)	8	3/4"(1")	3/4"(1")	1"(1 1/4")	
80-90	4(2)	8	1"	1"(1 1/4")	1 1/4"	
100	3(2)	8	1"(1 1/4")	1 1/4"	1 1/4"	
110	2(1)	6	1 1/4"	1 1/4"(1 1/2")	1 1/4"(1 1/2")	
125	1(1/0)	6	1 1/4"	1 1/2"	1 1/2"(2")	
150	1/0	6	1 1/4"	1 1/2"	2"	
175	2/0	6	1 1/2"	2"	2"	
200	3/0	6	1 1/2"	2"	2"	
225	4/0	4	2"	2"	2 1/2"	
250	250	4	2"	2 1/2"	2 1/2"	
300	350	4	2 1/2"	3"	3"	
350	500	3	3"	3"	3 1/2"	
400	2-3/0	2-3	2-2"	2-2"	2-2"	
450	2-4/0	2-2	2-2"	2-2"	2-2 1/2"	
500	2-250	2-2	2-2"	2-2 1/2"	2-2 1/2"	
600	2-350	2-1	2-2 1/2"	2-3"	2-3"	
700	2-500	2-1/0	2-3"	2-3"	2-3 1/2"	
800	3-300	3-1/0	3-2 1/2"	3-3"	3-3"	
1000	3-400	3-2/0	3-2 1/2"	3-3"	3-3"	
1200	4-350	4-3/0	4-2 1/2"	4-3"	4-3"	
1600	5-400	5-4/0	5-2 1/2"	5-3"	5-3"	
2000	6-400	6-250	6-2 1/2"	6-3"	6-3"	

CIRCUIT SIZING SCHEDULES NOTES:

1. BASED ON THHN/THWN, 90°C, 600V, INSULATED, COPPER WIRE APPLIED AT 75°C FOR TERMINATIONS RATED AT 60°C/75°C AND 75°C. FOR TERMINATIONS RATED AT 60°C PROVIDE WIRE AND CONDUIT SIZES INDICATED IN PARENTHESIS.
2. BASED ON WIRE OUTSIDE DIAMETERS AND RIGID METALLIC CONDUIT INSIDE DIAMETERS AS PROVIDED IN THE NEC. DO NOT REDUCE CONDUIT SIZE FOR NON-RIGID METALLIC APPLICATION. REFER TO NEC FOR CONDUIT TYPES MORE RESTRICTIVE THAN RIGID METALLIC.
3. BASED ON MOTOR FULL LOAD AMPERES AS PROVIDED BY THE NEC.
4. BASED ON MOTOR RUNNING OVERLOAD PROTECTION PROVIDED BY THERMAL OVERLOAD RELAYS.
5. MOTOR STARTING TYPE BASED ON 460V, 3 PHASE, FULL VOLTAGE NON-REVERSING EXCEPT FOR MOTORS SIZED 75HP OR GREATER WHICH ARE BASED ON 460V, 3 PHASE, PART WINDING REDUCED VOLTAGE STARTING.
6. TRANSFORMER CIRCUITS BASED ON 480V TO 208/120V, 3 PHASE, 4 WIRE,DRY TYPE.

480V., THREE PHASE CIRCUIT LENGTH TABLE

BREAKER AMPACITY (AMPS)	MAX. CIRCUIT LOAD (AMPS)	MAXIMUM LENGTH IN FEET																								
		NO.12	NO.10	NO.8	NO.6	NO.4	NO.3	NO.2	NO.1	1/0	2/0	3/0	4/0	250	350	500	2-3/0	2-4/0	2-250	2-350	2-500	3-300	3-400	4-350	5-400	6-400	6-500
20	16	253	403	642	1019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	24	169	269	428	679	1079	1364	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	32	-	201	321	509	809	1034	1293	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	40	-	-	257	408	648	818	1034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	48	-	-	-	340	540	682	862	1083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	56	-	-	-	291	462	584	739	928	1169	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	64	-	-	-	-	405	511	646	812	1023	1286	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	72	-	-	-	-	360	455	574	722	909	1143	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	80	-	-	-	-	-	409	517	650	818	1029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
125	100	-	-	-	-	-	-	414	520	655	823	1043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150	120	-	-	-	-	-	-	-	-	546	689	869	1107	-	-	-	-	-	-	-	-	-	-	-	-	-	-
175	140	-	-	-	-	-	-	-	-	-	588	745	949	1110	-	-	-	-	-	-	-	-	-	-	-	-	-
200	160	-	-	-	-	-	-	-	-	-	-	652	830	971	1360	-	-	-	-	-	-	-	-	-	-	-	-
225	180	-	-	-	-	-	-	-	-	-	-	-	738	863	1209	1743	-	-	-	-	-	-	-	-	-	-	-
250	200	-	-	-	-	-	-	-	-	-	-	-	-	777	1088	1569	1043	-	-	-	-	-	-	-	-	-	-
300	240	-	-	-	-	-	-	-	-	-	-	-	-	-	907	1307	869	1107	-	-	-	-	-	-	-	-	-
350	280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1120	745	949	1110	-	-	-	-	-	-	-	-
400	320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	652	830	971	1360	-	-	-	-	-	-	-
450	360	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	738	863	1209	-	-	-	-	-	-	-
500	400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	777	1088	1569	-	-	-	-	-	-
600	480	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	907	1307	1165	-	-	-	-	-
700	560	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1120	999	1346	-	-	-	-
800	640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	874	1177	1360	-	-	-
1000	800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	942	1088	1569	-	-
1200	960	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	907	1307	-	-
1600	1200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	980	1226	1307
1800	1440	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1089	1177
2000	1600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	980	1137

MOTOR CIRCUIT SIZING SCHEDULE

(FOR 460V, 3 PHASE MOTORS) (NOTES 3,4,5)

MOTOR HP	SWITCH/FUSE	CIRCUIT BREAKER	STARTER	CONDUIT & WIRE		
			SIZE/TYPE	PHASE	E.G.	CONDUIT
1/2	30/3A.	15A	1	12	12	3/4"
3/4	30/3A.	15A	1	12	12	3/4"
1	30/6A.	15A	1	12	12	3/4"
1 1/2	30/6A.	15A	1	12	12	3/4"
2	30/6A.	15A	1	12	12	3/4"
3	30/10A.	15A	1	12	12	3/4"
5	30/15A.	20A	1	12	12	3/4"
7 1/2	30/20A.	25A	1	12	12	3/4"
10	30/25A.	35A	1	12	12	3/4"
15	60/40A.	50A	2	10	10	3/4"
20	60/50A.	60A	2	8	10	3/4"
25	60/60A.	80A	2	6	8	3/4"
30	100/70A.	100A	3	6	8	3/4"
40	100/100A.	125A	3	4	6	1"
50	200/125A.	150A	3	3	6	1 1/4"
60	200/150A.	175A	4	1	6	1 1/4"
75	200/175A.	225A	4	1/0	4	1 1/2"
100	400/225A.	300A	4	2/0	4	2"
125	400/300A.	350A	5	3/0	3	2"
150	400/350A.	450A	5	4/0	2	2"
200	600/450A.	600A	5	350	1	2 1/2"

MOTOR CIRCUIT SIZING SCHEDULE

(FOR 208V, 3 PHASE MOTORS NOTES 3,4,5)

MOTOR HP	SWITCH/FUSE	CIRCUIT BREAKER	STARTER	CONDUIT & WIRE		
			SIZE/TYPE	PHASE	E.G.	CONDUIT
1/2	30/4A.	15A	1	12	12	3/4"
3/4	30/6.25A.	15A	1	12	12	3/4"
1	30/8A.	15A	1	12	12	3/4"
1 1/2	30/15A.	20A	1	12	12	3/4"
2	30/15A.	20A	1	12	12	3/4"
3	30/20A.	25A	1	12	12	3/4"
5	30/30A.	40A	1	10	10	3/4"
7 1/2	60/45A.	60A	1	8	10	3/4"
10	60/60A.	70A	2	8	8	3/4"
15	100/90A.	110A	3	4	6	1"
20	200/110A.	125A	3	3	6	1 1/4"
25	200/150A.	175A	3	2	6	1 1/4"
30	200/175A.	200A	4	1	6	1 1/4"
40	200/200A.	250A	4	1/0	4	1 1/2"
50	400/250A.	350A	5	3/0	3	2"
60	400/300A.	400A	5	4/0	3	2"
75	400/400A.	500A	5	300	2	2 1/2"
100	600/500A.	600A	6	500	1	3"
125	800/700A.	800A	6	2-4/0	2-1/0	2-2"
150	800/700A.	800A	6	2-250	2-1/0	2-2"
200	1200/1000A	1200A	7	2-400	2-3/0	2-2 1/2"

TRANSFORMER CIRCUIT SIZING SCHEDULE - GENERAL PURPOSE TYPE

(NOTE 6)

TRANSF. KVA	PRIMARY CIRCUIT (480V.)		SECONDARY CIRCUIT (208/120V.)		
	SWITCH/FUSE OR CIRCUIT BREAKER	PRIMARY FEEDER	SWITCH/FUSE OR CIRCUIT BREAKER	SYSTEM/EQUIPMENT BONDING JUMPER (GROUND WIRE)	SECONDARY FEEDER
9	30/20A.	20A., 3W.	30/30A.	#8	30A., 4W.
15	30/25A.	25A., 3W.	60/60A.	#8	60A., 4W.
30	60/45A.	45A., 3W.	100/100A.	#8	100A., 4W.
45	100/70A.	70A., 3W.	200/175A.	#4	175A., 4W.
75	200/125A.	125A., 3W.	400/300A.	#2	300A., 4W.
112 1/2	200/175A.	175A., 3W.	400/400A.	#1/0	400A., 4W.
150	400/225A.	225A., 3W.	600/600A.	#2/0	600A., 4W.
225	400/350A.	350A., 3W.	800/800A.	#3/0	800A., 4W.
300	600/500A.	500A., 3W.	1200/1000A.	#3/0	1000A., 4W.

120V. SINGLE PHASE CIRCUIT LENGTH TABLE

BREAKER AMPACITY (AMPS)	MAX. CIRCUIT CURRENT (AMPS)	MAX. CIRCUIT LOAD (VA)	MAXIMUM LENGTH IN FEET				
			NO.12	NO.10	NO.8	NO.6	NO.4
20	4	480	220	349	556	882	-
	8	960	110	174	278	441	701
	12	1440	73	116	185	294	467
	16	1920	55	87	139	221	350
30	24	2880	-	58	93	147	234
40	32	3840	-	-	70	110	175
50	40	4800	-	-	-	88	140
60	48	5760	-	-	-	-	117

208V. SINGLE PHASE CIRCUIT LENGTH TABLE

BREAKER AMPACITY (AMPS)	MAX. CIRCUIT CURRENT (AMPS)	MAX. CIRCUIT LOAD (VA)	MAXIMUM LENGTH IN FEET				
			NO.12	NO.10	NO.8	NO.6	NO.4
20	4	832	380	605	964	-	-
	8	1664	190	302	482	765	-
	12	2496	127	202	321	510	810
	16	3328	95	151	241	382	607
30	24	4992	-	101	161	255	405
40	32	6656	-	-	121	191	304
50	40	8320	-	-	-	153	243
60	48	9984	-	-	-	-	202

208V. THREE PHASE CIRCUIT LENGTH TABLE

BREAKER AMPACITY (AMPS)	MAX. CIRCUIT CURRENT (AMPS)	MAX. CIRCUIT LOAD (VA)	MAXIMUM LENGTH IN FEET				
			NO.12	NO.10	NO.8	NO.6	NO.4
20	4	1440	439	698	1113	-	-
	8	2880	220	349	557	883	-
	12	4320	127	233	371	589	935
	16	5760	95	175	278	442	701
30	24	8640	-	116	186	294	468
40	32	11520	-	-	139	221	351
50	40	14400	-	-	-	177	281
60	48	17280	-	-	-	-	234

277V. SINGLE PHASE CIRCUIT LENGTH TABLE

BREAKER AMPACITY (AMPS)	MAXIMUM LENGTH IN FEET		
	NO.12	NO.10	
20	200	300	

CIRCUIT MAXIMUM DISTANCE TABLE NOTES:

CIRCUIT MAXIMUM DISTANCE IS BASED ON NEC CHAPTER 9, TABLE 8 CONDUCTOR PROPERTIES FOR COATED COPPER CONDUCTORS AT 75 DEGREES CELSIUS.

MINIMUM WIRE SIZE BASED ON NEC TABLE 310.15 (B)(16) FOR COPPER THHN/THWN, AT 90 DEGREES CELSIUS.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
KENZ MELIANI
No. PE 40001940
ELECTRICAL
PROFESSIONAL ENGINEER

04/02/2026

SHEET TITLE

ELECTRICAL SCHEDULES

00100451

PROJECT NUMBER

E0.2

SHEET NUMBER

Author

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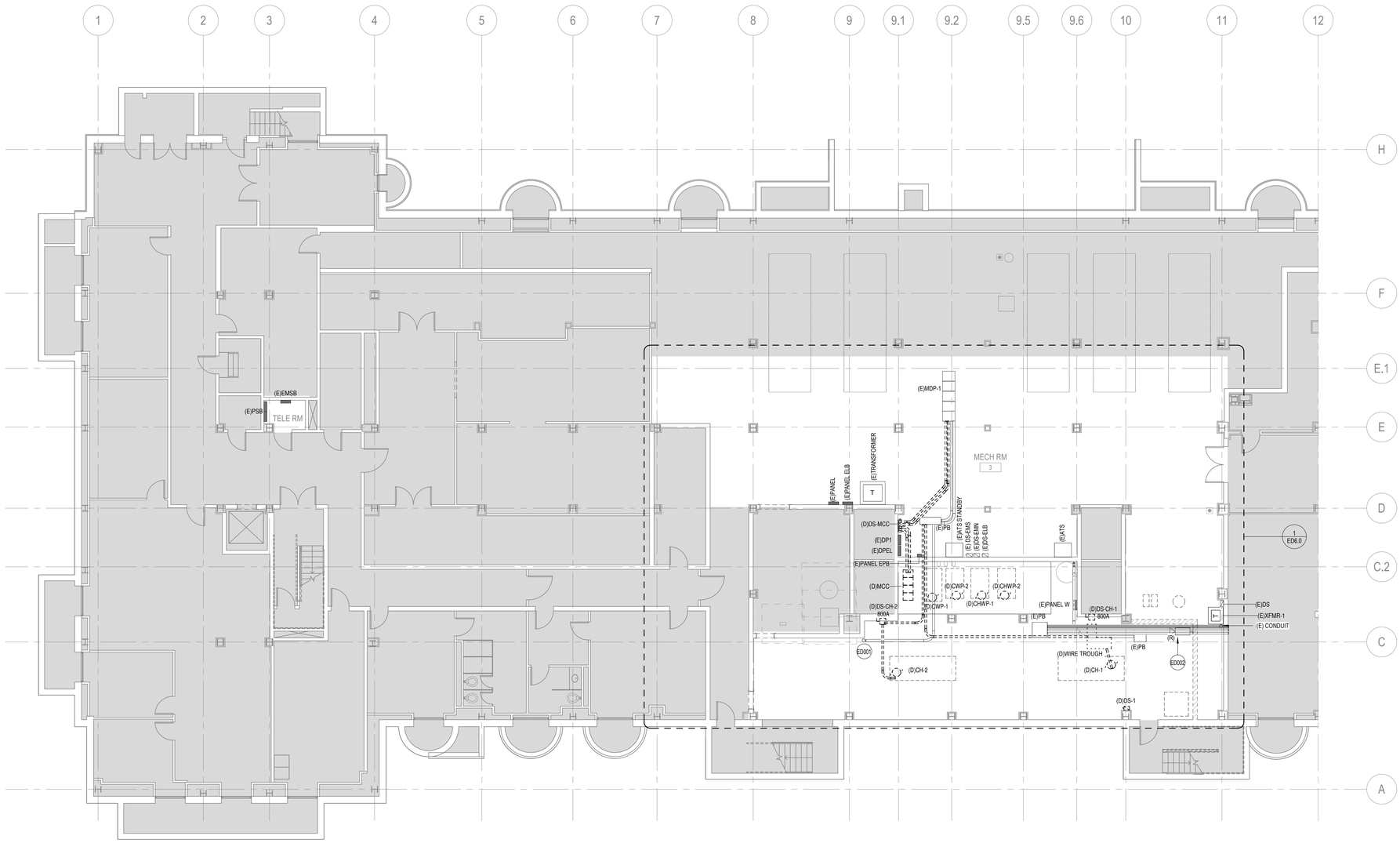

1 BASEMENT ELECTRICAL DEMOLITION POWER PLAN
SCALE: 1/8" = 1'-0"

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
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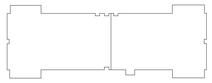
PROFESSIONAL ENGINEER

04/02/2026

KEYPLAN

NORTH



GENERAL SHEET NOTES

A. SEE DRAWING E0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES AND DEVICE MOUNTING HEIGHT OF WALL MOUNTED DEVICES, UON.
B. SEE DRAWING ED5.1 FOR ELECTRICAL DEMOLITION PARTIAL RISER DIAGRAM.
C. REMOVE EXISTING ELECTRICAL DEVICES, EQUIPMENT, BRANCH CIRCUITS AND FEEDERS IN THEIR ENTIRETY BACK TO THEIR POINT OF ORIGIN UNLESS OTHERWISE INDICATED. TURN OFF AND LABEL CIRCUIT BREAKERS AS SPARES FOR NEW WORK.
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E. PROTECT EXISTING-TO-REMAIN FLOORS, WALLS, CEILINGS, ELECTRICAL EQUIPMENT, ELECTRICAL DEVICES, LIGHTING FIXTURES, LIGHTING DEVICES, RACEWAYS AND BOXES, AND HANGERS AND SUPPORTS.
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SHEET KEYNOTES

ED001 (E)4" CONDUIT UP TO LEVEL 4 CONCRETE CATWALK. CONTRACTOR TO CONFIRM EXACT ROUTING UP TO LEVEL 4 AND PRESERVE EXISTING CONDUIT. REMOVE ALL EXISTING FEEDER CONDUCTORS WITHIN EXISTING CONDUIT.

ED002 REMOVE CAMERA FOR REUSE FROM WALL TO BE DEMOLISHED. PRESERVE EXISTING CONDUIT AND WIRING.

SHEET TITLE

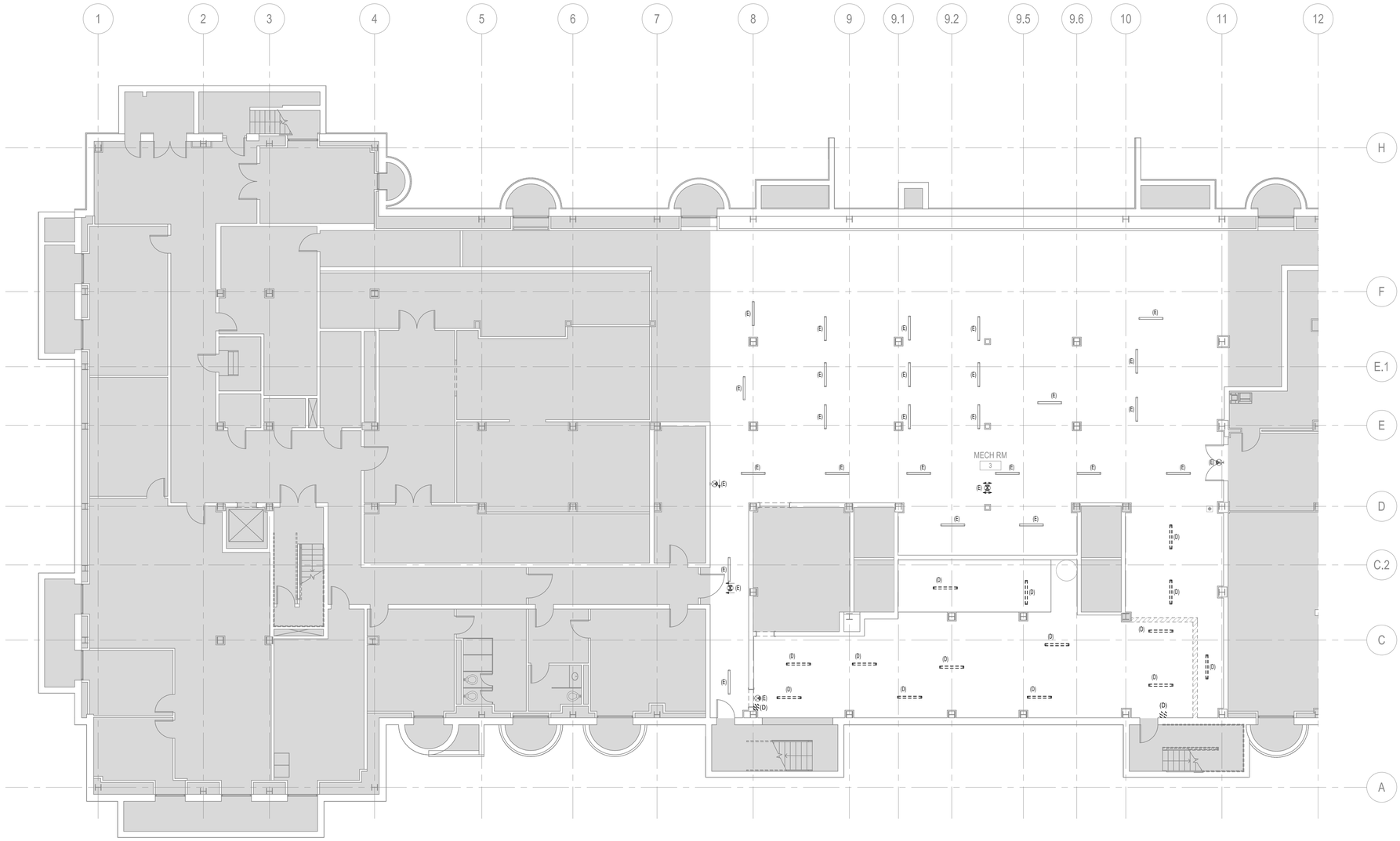
BASEMENT ELECTRICAL DEMOLITION POWER PLAN

PROJECT NUMBER 00100451

SHEET NUMBER **ED2.0**

Author

Plot Date: 4/13/2026 4:17:44 PM



1 BASEMENT ELECTRICAL DEMOLITION LIGHTING PLAN
SCALE: 1/8" = 1'-0"

GENERAL SHEET NOTES

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SHEET KEYNOTES

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KENZ. MELIANI
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04/02/2026

KEYPLAN

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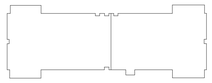
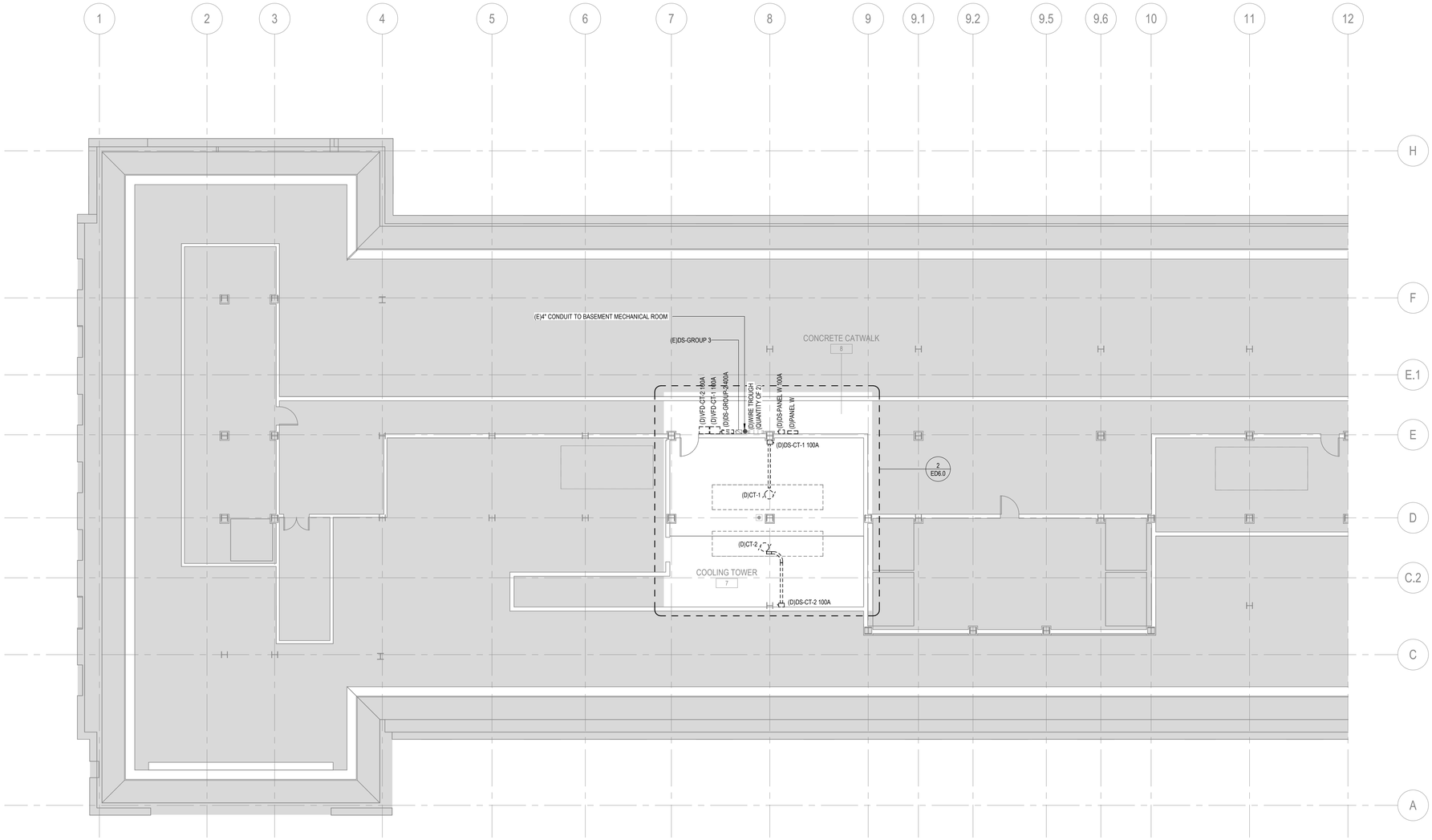


SHEET TITLE
BASEMENT ELECTRICAL DEMOLITION LIGHTING PLAN

00100451
PROJECT NUMBER

ED2.1
SHEET NUMBER

Author
Plot Date: 4/13/2026 4:17:46 PM



1 LEVEL 4 ELECTRICAL DEMOLITION POWER PLAN
SCALE: 1/8" = 1'-0"

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
KENZ MELIANI
No. PE 40001940
ELECTRICAL
PROFESSIONAL ENGINEER

04/02/2026

KEYPLAN

NORTH

SHEET TITLE
LEVEL 4 ELECTRICAL DEMOLITION POWER PLAN

00100451
PROJECT NUMBER

ED2.4
SHEET NUMBER

Author

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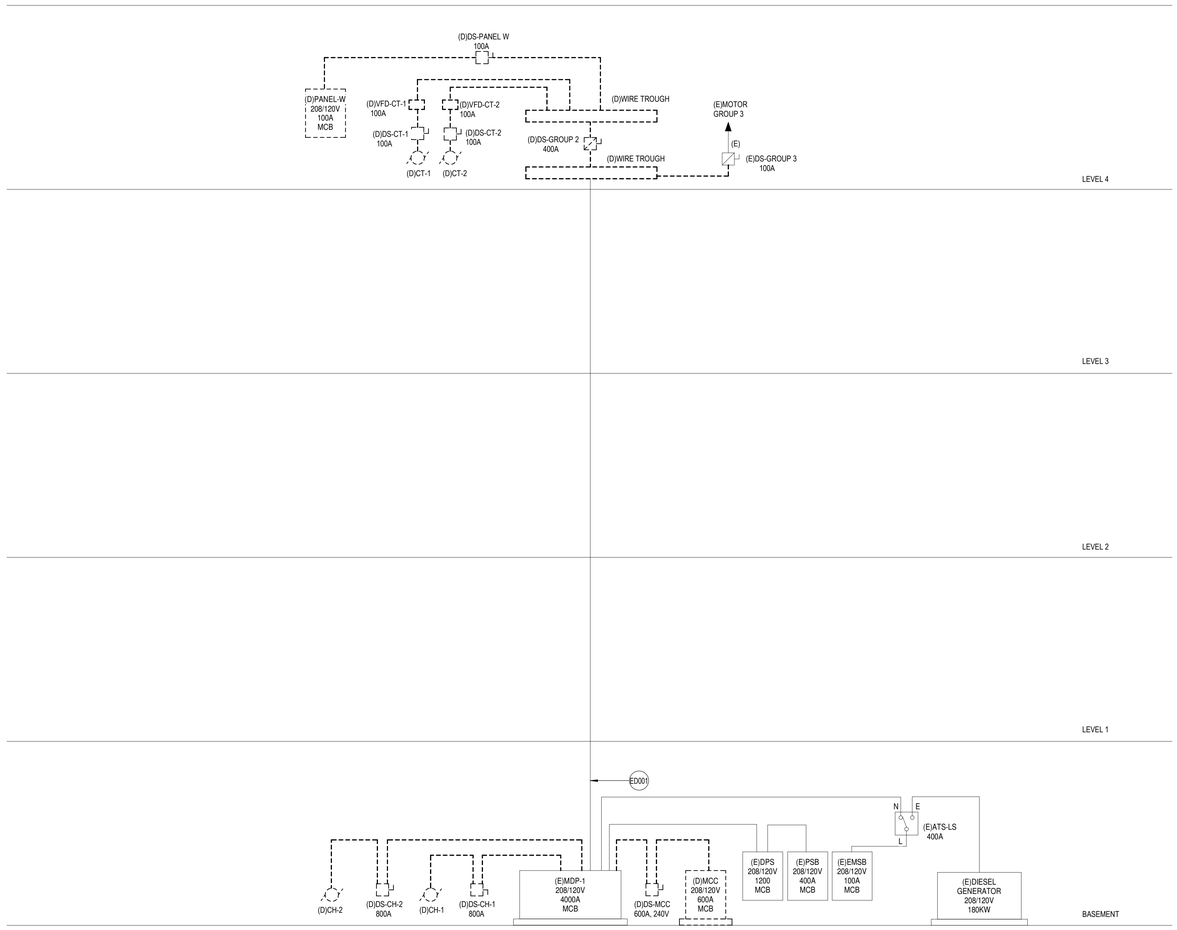

1 ELECTRICAL DEMOLITION PARTIAL RISER DIAGRAM
SCALE: NOT TO SCALE

GENERAL SHEET NOTES

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F. SELECT DEMOLITION MAY BE REQUIRED FOR NEW CONSTRUCTION AND MAY NOT BE DELINEATED ON THIS DRAWING. CAREFULLY COORDINATE DEMOLITION WITH NEW CONSTRUCTION (PARTITION AND REFLECTED CEILING) PLANS TO VERIFY ACTUAL EXTENT OF DEMOLITION.
G. EXAMINE THE DRAWINGS OF OTHER TRADES AND BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES. PERFORM INCIDENTAL ELECTRICAL DEMOLITION WORK AND/OR RELOCATION REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES, WHETHER OR NOT SPECIFICALLY INDICATED.
H. THOROUGHLY SURVEY THE EXISTING BUILDING AND SYSTEMS PRIOR TO SUBMITTING THE BID PRICE. INCLUDE A REMOVAL OF ALL ASSOCIATED COMPONENTS OF SYSTEMS INDICATED TO BE REMOVED. DEMOLISHED ELECTRICAL COMPONENTS SHALL NOT BE ABANDONED IN PLACE.
I. WHERE EQUIPMENT AND DEVICES ARE BEING DEMOLISHED BACK TO SOURCE IN EXISTING TO REMAIN SURFACES (CEILING, FLOOR, WALL) SURFACE IS TO BE PATCHED AND PAINTED.
J. PROVIDE NEW TYPED DIRECTORIES FOR EXISTING TO REMAIN ELECTRICAL EQUIPMENT AFFECTED BY THIS ALTERATION. SEE DIVISION 26 SPECIFICATIONS FOR DIRECTORY REQUIREMENTS.
K. FOR ALL EXISTING TO REMAIN MECHANICAL EQUIPMENT SHOWN ON THE MECHANICAL DRAWINGS, MAINTAIN ALL ASSOCIATED ELECTRICAL DEVICES AND CIRCUIT CONTINUITY. COORDINATE ALL MECHANICAL CONNECTIONS TO BE DEMOLISHED WITH THE MECHANICAL DRAWINGS.
L. RECYCLE OR DISPOSE MATERIALS OFF SITE AND INCLUDE ALL COSTS IN BID. HANDLE ALL MATERIALS IN ACCORDANCE WITH LEED REQUIREMENTS, ALL FEDERAL, AND LOCAL REGULATIONS.
M. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN COORDINATE WITH THE OWNER'S REPRESENTATIVE. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. COORDINATE ELECTRICAL SHUT DOWNS WITH THE OWNER ONE WEEK PRIOR TO SHUT DOWN.
N. PROVIDE CODE-COMPLIANT SUPPORT TO EXISTING-TO REMAIN UNSUPPORTED CONDUITS AND BOXES WHERE CEILINGS ARE TO BE REMOVED. RE-ROUTE BRANCH CIRCUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.
O. MAINTAIN ELECTRICAL SERVICE TO LIGHTING FIXTURES AND DEVICES THAT ARE TO REMAIN. EXTEND CONDUIT AND WIRE AS REQUIRED WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM DEVICES THAT ARE TO REMAIN.

SHEET KEYNOTES

ED001 (E)4" CONDUIT UP TO LEVEL 4 CONCRETE CATWALK. CONTRACTOR TO CONFIRM EXACT ROUTING UP TO LEVEL 4 AND PRESERVE EXISTING CONDUIT. REMOVE ALL EXISTING FEEDER CONDUCTORS WITHIN EXISTING CONDUIT.

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
KENZ MELIANI
No. PE 40001940
ELECTRICAL
PROFESSIONAL ENGINEER

04/02/2026

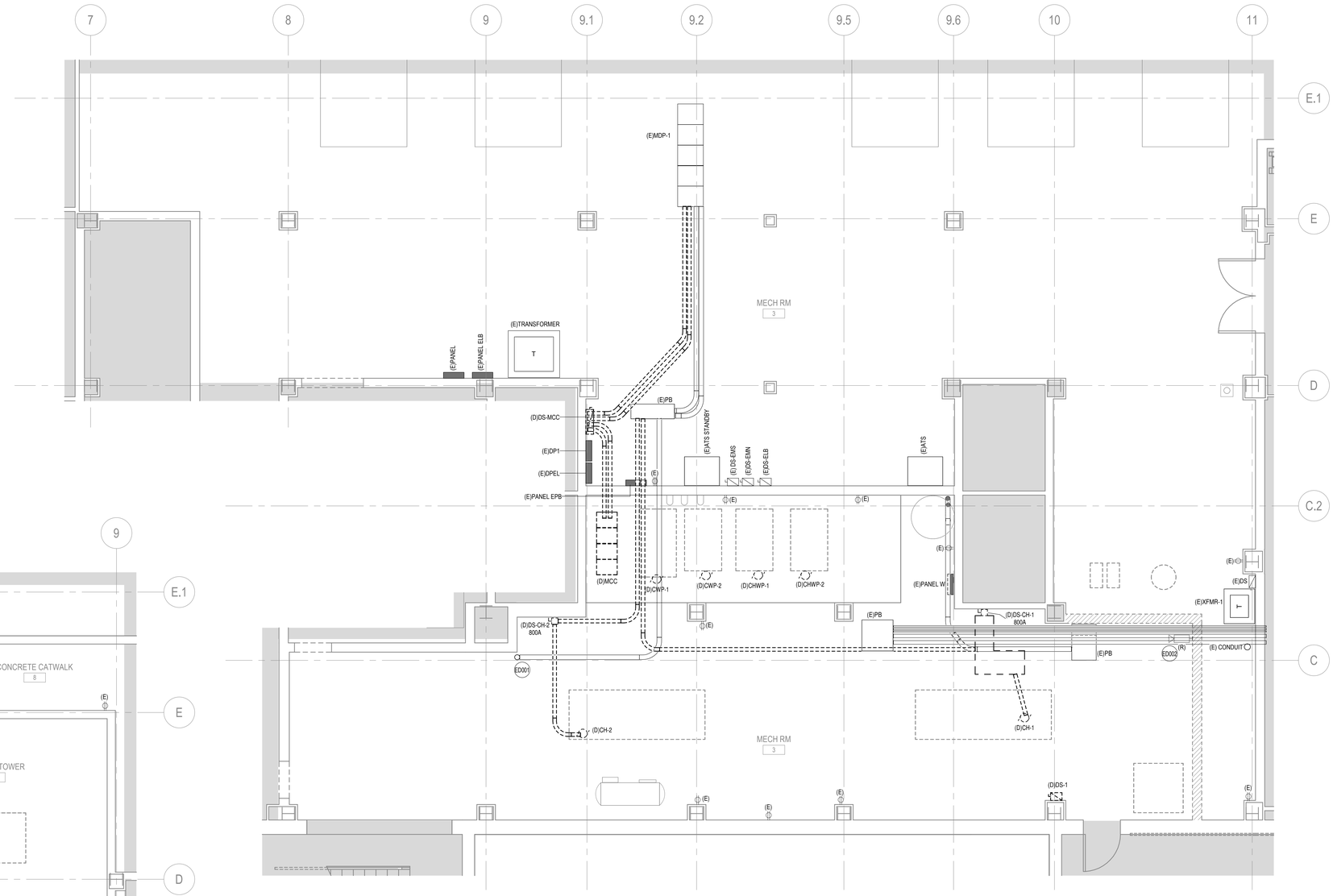
SHEET TITLE
ELECTRICAL DEMOLITION PARTIAL RISER DIAGRAM

PROJECT NUMBER
00100451

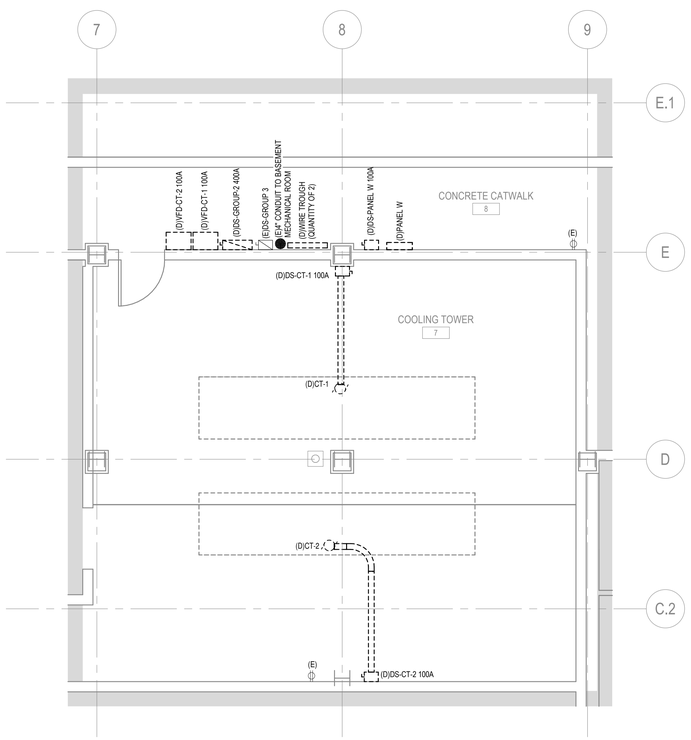
SHEET NUMBER
ED5.1

Author

Plot Date: 4/13/2026 4:17:48 PM



1 ENLARGED BASEMENT LEVEL ELECTRICAL DEMOLITION PLAN - MECHANICAL ROOMS
SCALE: 1/4" = 1'-0"



2 ENLARGED LEVEL 4 ELECTRICAL DEMOLITION PLAN - COOLING TOWER
SCALE: 1/4" = 1'-0"

GENERAL SHEET NOTES

A. SEE DRAWING E0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES AND DEVICE MOUNTING HEIGHT OF WALL MOUNTED DEVICES, UON.
B. SEE DRAWING ED5.1 FOR ELECTRICAL DEMOLITION PARTIAL RISER DIAGRAM.
C. REMOVE EXISTING ELECTRICAL DEVICES, EQUIPMENT, BRANCH CIRCUITS AND FEEDERS IN THEIR ENTIRETY BACK TO THEIR POINT OF ORIGIN UNLESS OTHERWISE INDICATED. TURN OFF AND LABEL CIRCUIT BREAKERS AS SPARES FOR NEW WORK.
D. QUANTITY AND LOCATION OF DEVICES SHOWN ON PLANS ARE APPROXIMATE. FIELD VERIFY DEVICES AND LOCATIONS.
E. PROTECT EXISTING-TO-REMAIN FLOORS, WALLS, CEILINGS, ELECTRICAL EQUIPMENT, ELECTRICAL DEVICES, LIGHTING FIXTURES, LIGHTING DEVICES, RACEWAYS AND BOXES, AND HANGERS AND SUPPORTS.
F. SELECT DEMOLITION MAY BE REQUIRED FOR NEW CONSTRUCTION AND MAY NOT BE DELINEATED ON THIS DRAWING. CAREFULLY COORDINATE DEMOLITION WITH NEW CONSTRUCTION (PARTITION AND REFLECTED CEILING) PLANS TO VERIFY ACTUAL EXTENT OF DEMOLITION.
G. EXAMINE THE DRAWINGS OF OTHER TRADES AND BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES. PERFORM INCIDENTAL ELECTRICAL DEMOLITION WORK AND/OR RELOCATION REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES, WHETHER OR NOT SPECIFICALLY INDICATED.
H. THOROUGHLY SURVEY THE EXISTING BUILDING AND SYSTEMS PRIOR TO SUBMITTING THE BID PRICE. INCLUDE A REMOVAL OF ALL ASSOCIATED COMPONENTS OF SYSTEMS INDICATED TO BE REMOVED. DEMOLISHED ELECTRICAL COMPONENTS SHALL NOT BE ABANDONED IN PLACE.
I. WHERE EQUIPMENT AND DEVICES ARE BEING DEMOLISHED BACK TO SOURCE IN EXISTING TO REMAIN SURFACES (CEILING, FLOOR, WALL) SURFACE IS TO BE PATCHED AND PAINTED.
J. PROVIDE NEW TYPED DIRECTORIES FOR EXISTING TO REMAIN ELECTRICAL EQUIPMENT AFFECTED BY THIS ALTERATION. SEE DIVISION 26 SPECIFICATIONS FOR DIRECTORY REQUIREMENTS.
K. FOR ALL EXISTING TO REMAIN MECHANICAL EQUIPMENT SHOWN ON THE MECHANICAL DRAWINGS, MAINTAIN ALL ASSOCIATED ELECTRICAL DEVICES AND CIRCUIT CONTINUITY. COORDINATE ALL MECHANICAL CONNECTIONS TO BE DEMOLISHED WITH THE MECHANICAL DRAWINGS.
L. RECYCLE OR DISPOSE MATERIALS OFF SITE AND INCLUDE ALL COSTS IN BID. HANDLE ALL MATERIALS IN ACCORDANCE WITH LEED REQUIREMENTS, ALL FEDERAL, AND LOCAL REGULATIONS.
M. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN. COORDINATE WITH THE OWNER'S REPRESENTATIVE. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. COORDINATE ELECTRICAL SHUT DOWNS WITH THE OWNER ONE WEEK PRIOR TO SHUT DOWN.
N. PROVIDE CODE-COMPLIANT SUPPORT TO EXISTING-TO REMAIN UNSUPPORTED CONDUITS AND BOXES WHERE WALLS ARE TO BE REMOVED. RE-ROUTE BRANCH CIRCUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.
O. MAINTAIN ELECTRICAL SERVICE TO LIGHTING FIXTURES AND DEVICES THAT ARE TO REMAIN. EXTEND CONDUIT AND WIRE AS REQUIRED WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM DEVICES THAT ARE TO REMAIN.
P. SEE ARCHITECTURAL AND NON-POWER/LIGHTING MEP DRAWINGS FOR ALL NON-POWER/LIGHTING DEMOLITION WORK.

SHEET KEYNOTES

ED001 (E)4" CONDUIT UP TO LEVEL 4 CONCRETE CATWALK. CONTRACTOR TO CONFIRM EXACT ROUTING UP TO LEVEL 4 AND PRESERVE EXISTING CONDUIT. REMOVE ALL EXISTING FEEDER CONDUCTORS WITHIN EXISTING CONDUIT.
ED002 REMOVE CAMERA FOR RELISE FROM WALL TO BE DEMOLISHED. PRESERVE EXISTING CONDUIT AND WIRING.

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SEALS AND SIGNATURES

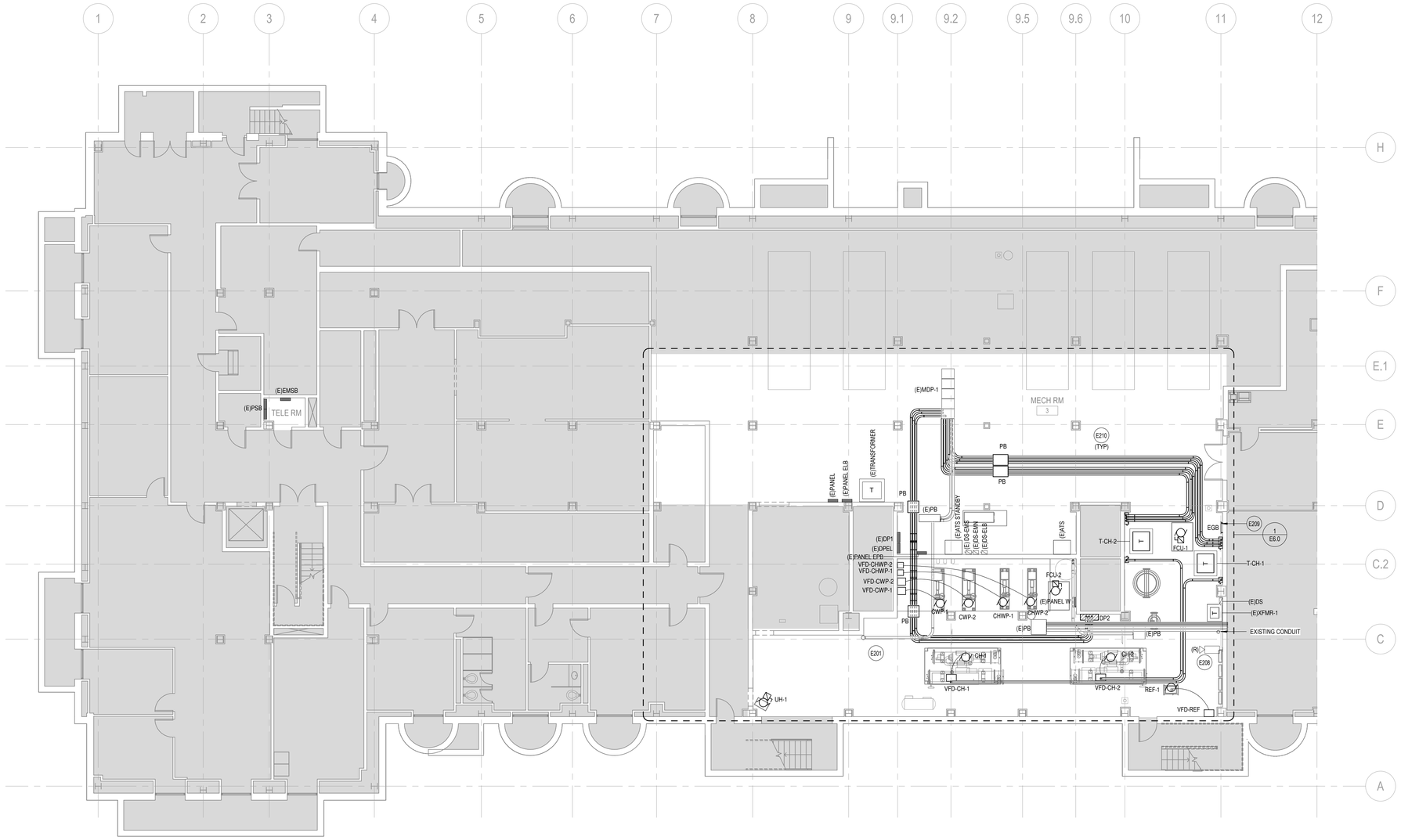
DISTRICT OF COLUMBIA
KENZ MELIANI
No. PE 40001940
ELECTRICAL
PROFESSIONAL ENGINEER
04/02/2026

SHEET TITLE
ENLARGED ELECTRICAL DEMOLITION PLANS

PROJECT NUMBER
00100451

SHEET NUMBER
ED6.0

Author
Plot Date: 4/13/2026 4:17:49 PM



1 BASEMENT POWER PLAN
SCALE: 1/8" = 1'-0"

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
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No. PE 40001940
ELECTRICAL
PROFESSIONAL ENGINEER

04/02/2026

KEYPLAN

NORTH

GENERAL SHEET NOTES

A. SEE DRAWING E0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES AND DEVICE MOUNTING HEIGHT OF WALL MOUNTED DEVICES, UON.
B. COORDINATE ALL DEVICE LOCATIONS AND MOUNTING HEIGHTS WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH-IN.
C. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION OF EQUIPMENT POWER CONNECTIONS WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
D. SEE MECHANICAL EQUIPMENT SCHEDULE FOR ASSOCIATED OVERCURRENT DEVICES, DISCONNECT SWITCHES, STARTERS AND WIRES.
E. X-RAY EXISTING FLOORS TO COORDINATE ALL WIRING DEVICE AND CORE DRILL LOCATIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH IN. LOCATION TO BE DETERMINED IN CONJUNCTION WITH FURNITURE SELECTION.
F. CONTRACTOR SHALL COORDINATE AND FIELD VERIFY REQUIREMENT OF NEUTRAL CONDUCTOR FOR ALL EQUIPMENT AND PROVIDE NEUTRAL CONDUCTOR AS NECESSARY.
G. TRIPPING OF GFCI RECEPTACLES SHALL NOT AFFECT THE DOWNSTREAM RECEPTACLES.
H. NO MORE THAN 3 CIRCUITS MAY SHARE A HOMERUN.
I. FOR ALL MECHANICAL EQUIPMENT, PROVIDE ADDITIONAL 120V CONNECTIONS REQUIRED BY MANUFACTURER.
J. PROVIDE 120V CIRCUITS FOR CONTROL PANELS AS REQUIRED BY CONTROL VENDOR. CIRCUIT TO NEAREST ADJACENT PANELBOARD.
K. COORDINATE FINAL LOCATION OF MECHANICAL AND PLUMBING EQUIPMENT AND ASSOCIATED DISCONNECT SWITCHES, STARTERS, VFDS, CONTROL POWER AND OTHER POWER REQUIREMENTS WITH DIV 22 AND 23.
L. CONTRACTOR IS RESPONSIBLE FOR ALL WIRING FROM VFDs AND DISCONNECTS SHOWN IN DRAWINGS TO THE EQUIPMENT AND IS TO COORDINATE WITH EQUIPMENT MANUFACTURER AND INSTALLATION INSTRUCTIONS.
M. CONTRACTOR SHALL SIZE PULL BOXES BASED ON NEC ARTICLE 314.
N. PROVIDE UNISTRUT MOUNTING FRAMES AS REQUIRED FOR ANY ELECTRICAL EQUIPMENT AND DEVICES NOT LOCATED ON A FULL WALL.
O. FINAL INSTALLATION SHALL HAVE NO WATER PIPING DIRECTLY ABOVE ELECTRICAL EQUIPMENT. PIPING SHALL BE REROUTED AS REQUIRED.
P. PROVIDE CODE-COMPLIANT SUPPORT TO EXISTING-TO REMAIN UNSUPPORTED CONDUITS AND BOXES WHERE WALLS ARE TO BE REMOVED. RE-ROUTE BRANCH CIRCUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.

SHEET KEYNOTES

E201 (E)4" CONDUIT UP TO LEVEL 4 CONCRETE CATWALK. CONTRACTOR TO CONFIRM EXACT ROUTING UP TO LEVEL 4 AND PRESERVE EXISTING CONDUIT. REMOVE ALL EXISTING FEEDER WIRING WITHIN EXISTING CONDUIT.

E208 REMOVE CAMERA FOR REUSE FROM WALL TO BE DEMOLISHED. PRESERVE EXISTING CONDUIT AND WIRING. EXTEND CONDUIT TO NEW LOCATION AS REQUIRED.

E209 PROVIDE NEW #4/0 COPPER GROUNDING CONDUCTOR FROM NEW TRANSFORMERS T-CH-1 AND T-CH-2 TO NEW GROUNDING BUS BAR, AND NEW GROUNDING BUS BAR TO (E)MDP-1 SO NEW ELECTRICAL EQUIPMENT IS TIED INTO THE EXISTING GROUNDING SYSTEM. CONTRACTOR TO CONFIRM MAIN GROUND BAR FOR BUILDING IS WITHIN (E)MDP-1 PRIOR TO ROUTING NEW CONDUCTORS. MAIN GROUND BAR DID NOT APPEAR EXTERNAL TO (E)MDP-1 AND IS NOT FOUND ON EXISTING DRAWINGS. THE NEW GROUNDING BUS BAR TO BE PLACED 4'-0" AFF.

E210 MINIMUM CONDUIT HEIGHT SHALL BE 6'-0" AFF MINIMUM.

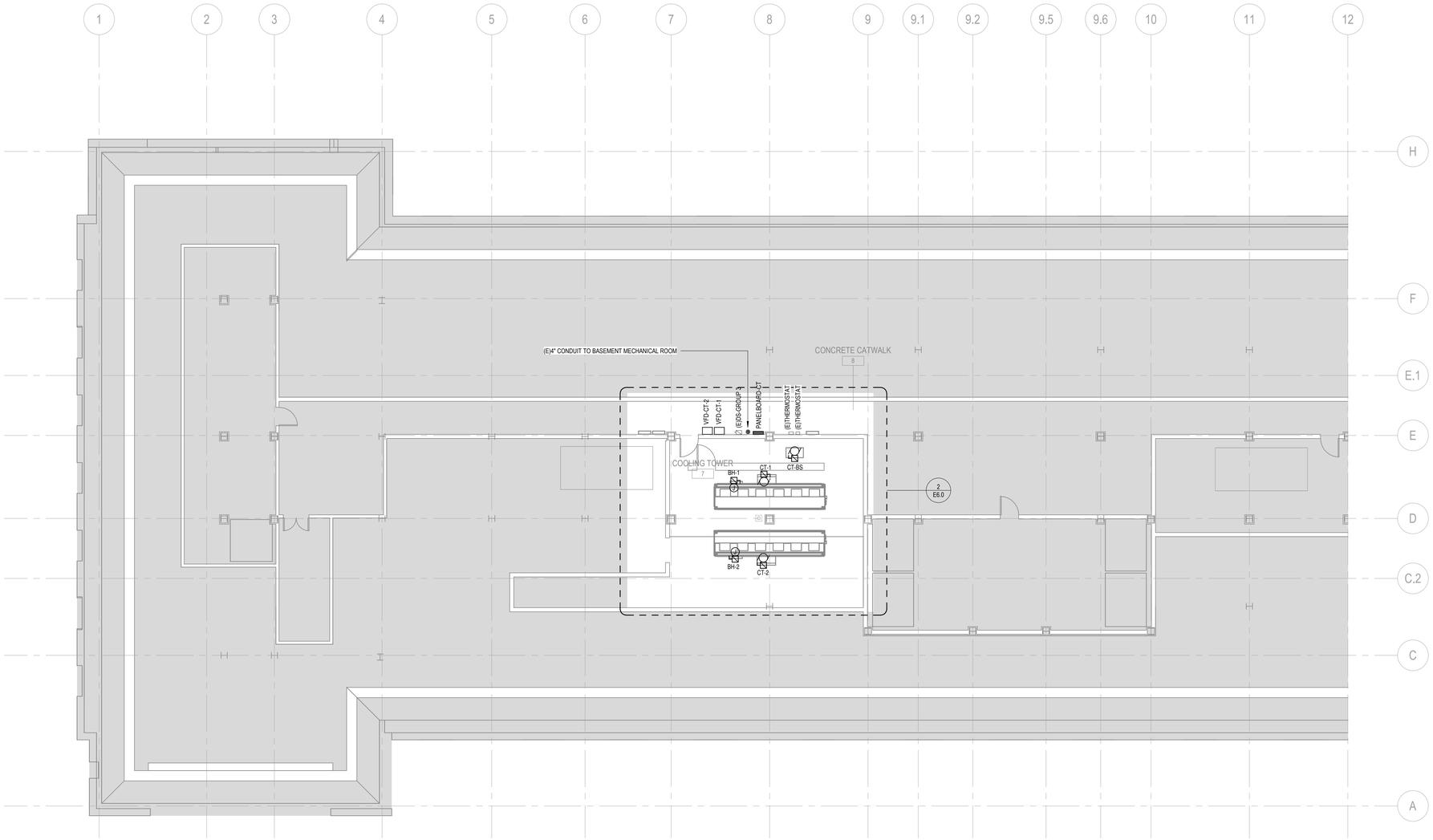
SHEET TITLE
BASEMENT POWER PLAN

PROJECT NUMBER
00100451

SHEET NUMBER
E2.0

Author

Plot Date: 4/13/2026 4:17:53 PM



1 LEVEL 4 POWER PLAN
SCALE: 1/8" = 1'-0"

GENERAL SHEET NOTES

A. SEE DRAWING E0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES AND DEVICE MOUNTING HEIGHT OF WALL MOUNTED DEVICES, UON.
B. COORDINATE ALL DEVICE LOCATIONS AND MOUNTING HEIGHTS WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH-IN.
C. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION OF EQUIPMENT POWER CONNECTIONS WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
D. SEE MECHANICAL EQUIPMENT SCHEDULE FOR ASSOCIATED OVERCURRENT DEVICES, DISCONNECT SWITCHES, STARTERS AND WIRES.
E. X-RAY EXISTING FLOORS TO COORDINATE ALL WIRING DEVICE AND CORE DRILL LOCATIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH IN. LOCATION TO BE DETERMINED IN CONJUNCTION WITH FURNITURE SELECTION.
F. CONTRACTOR SHALL COORDINATE AND FIELD VERIFY REQUIREMENT OF NEUTRAL CONDUCTOR FOR ALL EQUIPMENT AND PROVIDE NEUTRAL CONDUCTOR AS NECESSARY.
G. TRIPPING OF GFCI RECEPTACLES SHALL NOT AFFECT THE DOWNSTREAM RECEPTACLES.
H. NO MORE THAN 3 CIRCUITS MAY SHARE A HOMERUN.
I. FOR ALL MECHANICAL EQUIPMENT, PROVIDE ADDITIONAL 120V CONNECTIONS REQUIRED BY MANUFACTURER.
J. PROVIDE 120V CIRCUITS FOR CONTROL PANELS AS REQUIRED BY CONTROL VENDOR. CIRCUIT TO NEAREST ADJACENT PANELBOARD.
K. COORDINATE FINAL LOCATION OF MECHANICAL AND PLUMBING EQUIPMENT AND ASSOCIATED DISCONNECT SWITCHES, STARTERS, VFDS, CONTROL POWER AND OTHER POWER REQUIREMENTS WITH DIV 22 AND 23.
L. CONTRACTOR IS RESPONSIBLE FOR ALL WIRING FROM VFDs AND DISCONNECTS SHOWN IN DRAWINGS TO THE EQUIPMENT AND IS TO COORDINATE WITH EQUIPMENT MANUFACTURER AND INSTALLATION INSTRUCTIONS.
M. CONTRACTOR SHALL SIZE PULL BOXES BASED ON NEC ARTICLE 314.
N. PROVIDE UNISTRUT MOUNTING FRAMES AS REQUIRED FOR ANY ELECTRICAL EQUIPMENT AND DEVICES NOT LOCATED ON A FULL WALL.
O. FINAL INSTALLATION SHALL HAVE NO WATER PIPING DIRECTLY ABOVE ELECTRICAL EQUIPMENT. PIPING SHALL BE REROUTED AS REQUIRED.
P. PROVIDE CODE-COMPLIANT SUPPORT TO EXISTING-TO REMAIN UNSUPPORTED CONDUITS AND BOXES WHERE WALLS ARE TO BE REMOVED. RE-ROUTE BRANCH CIRCUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.

SHEET KEYNOTES

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
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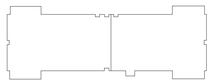
No. PE 40001940
ELECTRICAL
PROFESSIONAL ENGINEER

04/02/2026

KEYPLAN

NORTH



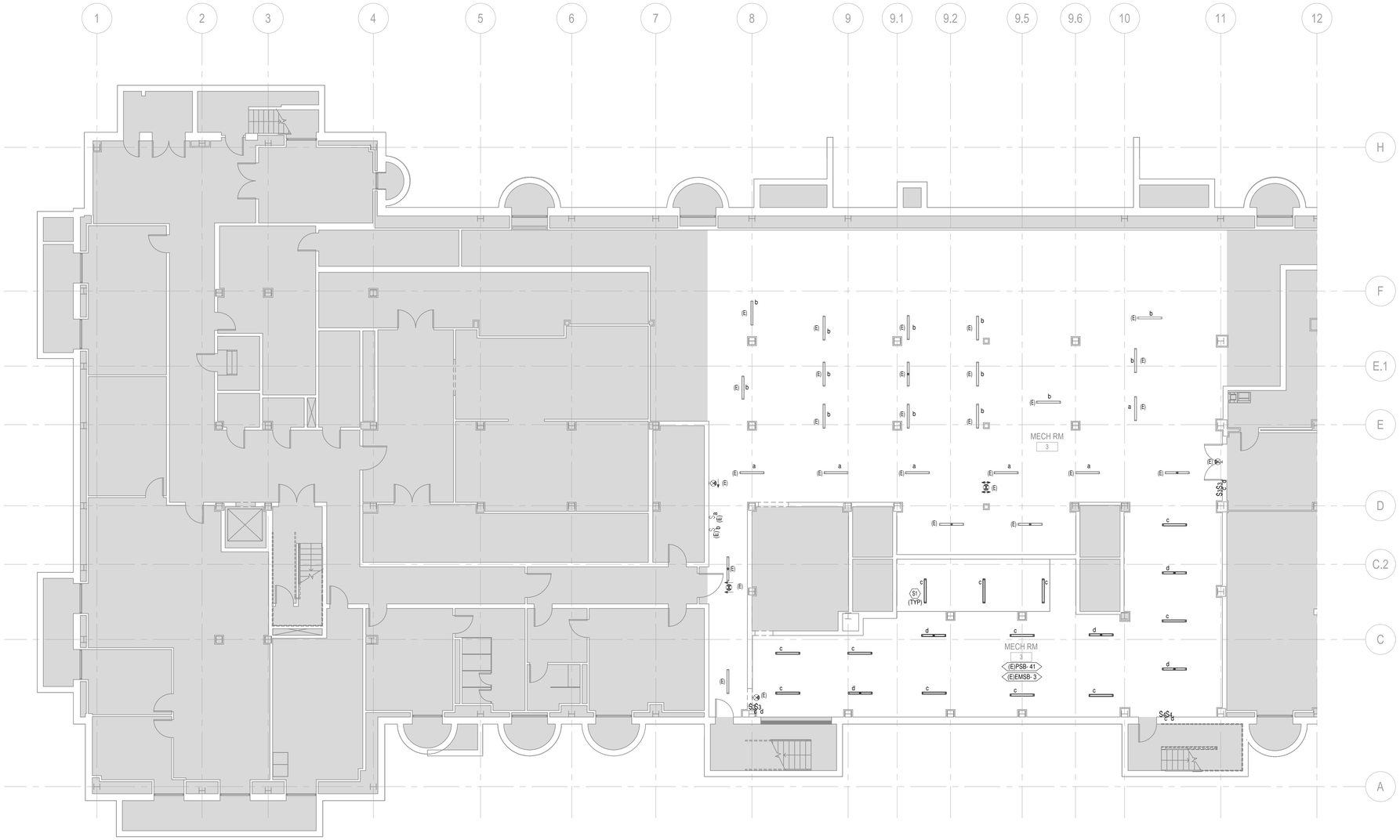
SHEET TITLE
LEVEL 4 POWER PLAN

PROJECT NUMBER
00100451

SHEET NUMBER
E2.4

Author

Plot Date: 4/13/2026 4:17:55 PM



1 BASEMENT LIGHTING PLAN
SCALE: 1/8" = 1'-0"

GENERAL SHEET NOTES

A. SEE DRAWING E0.1 FOR ABBREVIATIONS, SYMBOLS, AND GENERAL NOTES.
B. COORDINATE ALL DEVICE LOCATIONS AND MOUNTING HEIGHTS WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH-IN.
C. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF LIGHT FIXTURES AND OTHER CEILING MOUNTED DEVICES.
D. ALL LIGHTING BRANCH CIRCUIT WIRING SHALL BE A MINIMUM SIZE OF #10 AWG. COORDINATE FINAL WIRE SIZE REQUIRED WITH SCHEDULES ON SHEET E0.2.
E. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PROPER WIRE TYPE AND QUANTITY WITH MANUFACTURER.
F. LOWERCASE ALPHABETICAL SUBSCRIPT ON FIXTURES/DEVICES INDICATES SWITCHING ZONE WITHIN SPACE.
H. WHERE MORE THAN ONE SWITCH IS SHOWN AT ANY ONE LOCATION, GANG ALL SWITCHES UNDER ONE PLATE. PROVIDE BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT CIRCUITS. WHERE MORE THAN ONE DIMMER IS SHOWN AT ANY ONE LOCATION, MOUNT IN A MANNER TO GIVE THE APPEARANCE OF GANG MOUNTED UNDER ONE PLATE. FOLLOW MANUFACTURERS INSTRUCTIONS FOR DISTANCES AND DERATING.
I. COORDINATE ALL WALL MOUNTED WIRING DEVICE LOCATIONS WITH ARCHITECTURAL ELEVATIONS AND LIGHTING FIXTURE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLAN ON SHEET. REFER TO ARCH. REFLECTED CEILING PLANS FOR EXACT LOCATION OF LIGHT FIXTURES AND OTHER CEILING MOUNTED DEVICES.
J. COORDINATE FIXTURES WITH ARCHITECTURAL CEILING AND WALL TYPES.
K. THE LIGHTING CIRCUITING IS DIAGRAMMATIC. PROVIDE SWITCH LEGS, UNSWITCHED PHASE WIRES AND TRAVELLERS AS NECESSARY.
L. FIELD COORDINATE LIGHT FIXTURE LOCATIONS IN ELECTRICAL, MECHANICAL AND TELECOM ROOMS WITH EQUIPMENT, DUCTS, PIPING, TELECOM, SECURITY, AND ALL UTILITIES IN SPACE.
M. EXIT SIGNS ARE REQUIRED TO BE READILY VISIBLE. ENSURE THE EXIT SIGNS ARE NOT OBSTRUCTED.

SHEET KEYNOTES

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
KENZ MELIANI
No. PE 40001940
ELECTRICAL
PROFESSIONAL ENGINEER

04/02/2026

KEYPLAN

NORTH

SHEET TITLE
BASEMENT LIGHTING PLAN

00100451
PROJECT NUMBER

E3.0
SHEET NUMBER

Author

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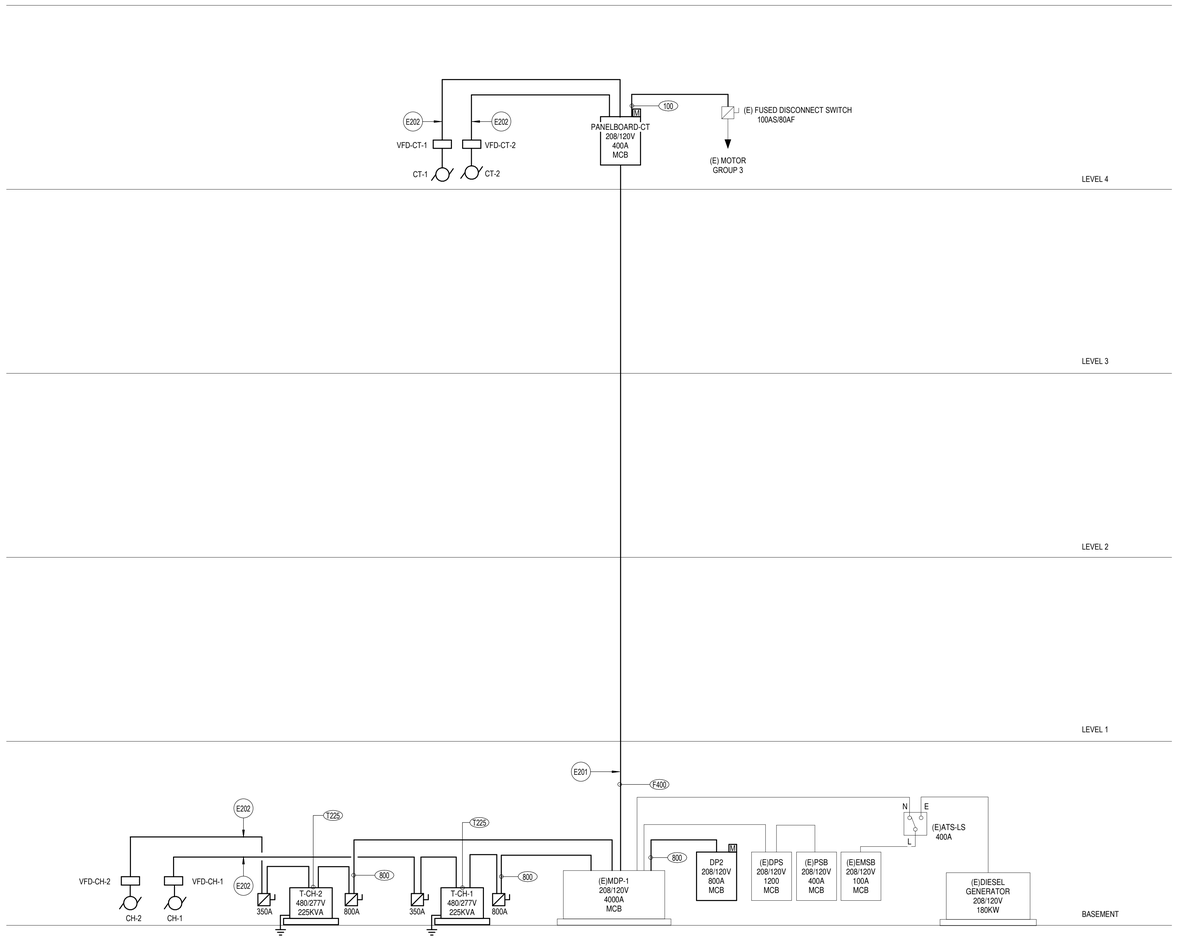

1 ELECTRICAL PARTIAL RISER DIAGRAM
SCALE: NOT TO SCALE

GENERAL SHEET NOTES

A. SEE DRAWING E0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES AND DEVICE MOUNTING HEIGHT OF WALL MOUNTED DEVICES, UON.
B. SEE DRAWING ED5.1 FOR ELECTRICAL DEMOLITION PARTIAL RISER DIAGRAM.
C. REMOVE EXISTING ELECTRICAL DEVICES, EQUIPMENT, BRANCH CIRCUITS AND FEEDERS IN THEIR ENTIRETY BACK TO THEIR POINT OF ORIGIN UNLESS OTHERWISE INDICATED. TURN OFF AND LABEL CIRCUIT BREAKERS AS SPARES FOR NEW WORK.
D. QUANTITY AND LOCATION OF DEVICES SHOWN ON PLANS ARE APPROXIMATE. FIELD VERIFY DEVICES AND LOCATIONS.
E. PROTECT EXISTING-TO-REMAIN FLOORS, WALLS, CEILINGS, ELECTRICAL EQUIPMENT, ELECTRICAL DEVICES, LIGHTING FIXTURES, LIGHTING DEVICES, RACEWAYS AND BOXES, AND HANGERS AND SUPPORTS.
F. SELECT DEMOLITION MAY BE REQUIRED FOR NEW CONSTRUCTION AND MAY NOT BE DELINEATED ON THIS DRAWING. CAREFULLY COORDINATE DEMOLITION WITH NEW CONSTRUCTION (PARTITION AND REFLECTED CEILING) PLANS TO VERIFY ACTUAL EXTENT OF DEMOLITION.
G. EXAMINE THE DRAWINGS OF OTHER TRADES AND BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES. PERFORM INCIDENTAL ELECTRICAL DEMOLITION WORK AND/OR RELOCATION REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES, WHETHER OR NOT SPECIFICALLY INDICATED.
H. THOROUGHLY SURVEY THE EXISTING BUILDING AND SYSTEMS PRIOR TO SUBMITTING THE BID PRICE. INCLUDE A REMOVAL OF ALL ASSOCIATED COMPONENTS OF SYSTEMS INDICATED TO BE REMOVED. DEMOLISHED ELECTRICAL COMPONENTS SHALL NOT BE ABANDONED IN PLACE.
I. WHERE EQUIPMENT AND DEVICES ARE BEING DEMOLISHED BACK TO SOURCE IN EXISTING TO REMAIN SURFACES (CEILING, FLOOR, WALL) SURFACE IS TO BE PATCHED AND PAINTED.
J. PROVIDE NEW TYPED DIRECTORIES FOR EXISTING TO REMAIN ELECTRICAL EQUIPMENT AFFECTED BY THIS ALTERATION. SEE DIVISION 26 SPECIFICATIONS FOR DIRECTORY REQUIREMENTS.
K. FOR ALL EXISTING TO REMAIN MECHANICAL EQUIPMENT SHOWN ON THE MECHANICAL DRAWINGS, MAINTAIN ALL ASSOCIATED ELECTRICAL DEVICES AND CIRCUIT CONTINUITY. COORDINATE ALL MECHANICAL CONNECTIONS TO BE DEMOLISHED WITH THE MECHANICAL DRAWINGS.
L. RECYCLE OR DISPOSE MATERIALS OFF SITE AND INCLUDE ALL COSTS IN BID. HANDLE ALL MATERIALS IN ACCORDANCE WITH LEED REQUIREMENTS, ALL FEDERAL, AND LOCAL REGULATIONS.
M. WHERE EXISTING BUILDING SERVICES AND/OR EQUIPMENT THAT IS TO REMAIN IN USE ARE REQUIRED TO BE SHUT DOWN COORDINATE WITH THE OWNER'S REPRESENTATIVE. INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWN MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. COORDINATE ELECTRICAL SHUT DOWNS WITH THE OWNER ONE WEEK PRIOR TO SHUT DOWN.
N. PROVIDE CODE-COMPLIANT SUPPORT TO EXISTING-TO REMAIN UNSUPPORTED CONDUITS AND BOXES WHERE CEILINGS ARE TO BE REMOVED. RE-ROUTE BRANCH CIRCUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.
O. MAINTAIN ELECTRICAL SERVICE TO LIGHTING FIXTURES AND DEVICES THAT ARE TO REMAIN. EXTEND CONDUIT AND WIRE AS REQUIRED WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM DEVICES THAT ARE TO REMAIN.

SHEET KEYNOTES

E201	(E)4" CONDUIT UP TO LEVEL 4 CONCRETE CATWALK. CONTRACTOR TO CONFIRM EXACT ROUTING UP TO LEVEL 4 AND PRESERVE EXISTING CONDUIT. REMOVE ALL EXISTING FEEDER WIRING WITHIN EXISTING CONDUIT.
E202	REFER TO E7 MECHANICAL EQUIPMENT SCHEDULE FOR ADDITIONAL INFORMATION.

FEEDER SCHEDULE

100	4#1 + 1#8 G, 1 1/2" C
800	3 SETS OF 4#300KCMIL + 1#1/0 G, (3) 3" C
F400	4#500 KCMIL+ 1#2 G, UTILIZE EXISTING (1) 4" CONDUIT.
T225	225KVA TRANSFORMER, 480-208Y/120V, 3PH PRIMARY FEEDER: 3#500KCMIL + 1#3 G, 3" C SECONDARY FEEDER: 3 SETS OF 4#300KCMIL + 1#3/0 G, (3) 3" C BONDING JUMPERS & GROUNDING ELECTRODE CONDUCTOR: #3/0

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
KENZ MELIANI
No. PE 40001940
ELECTRICAL
PROFESSIONAL ENGINEER

04/02/2026

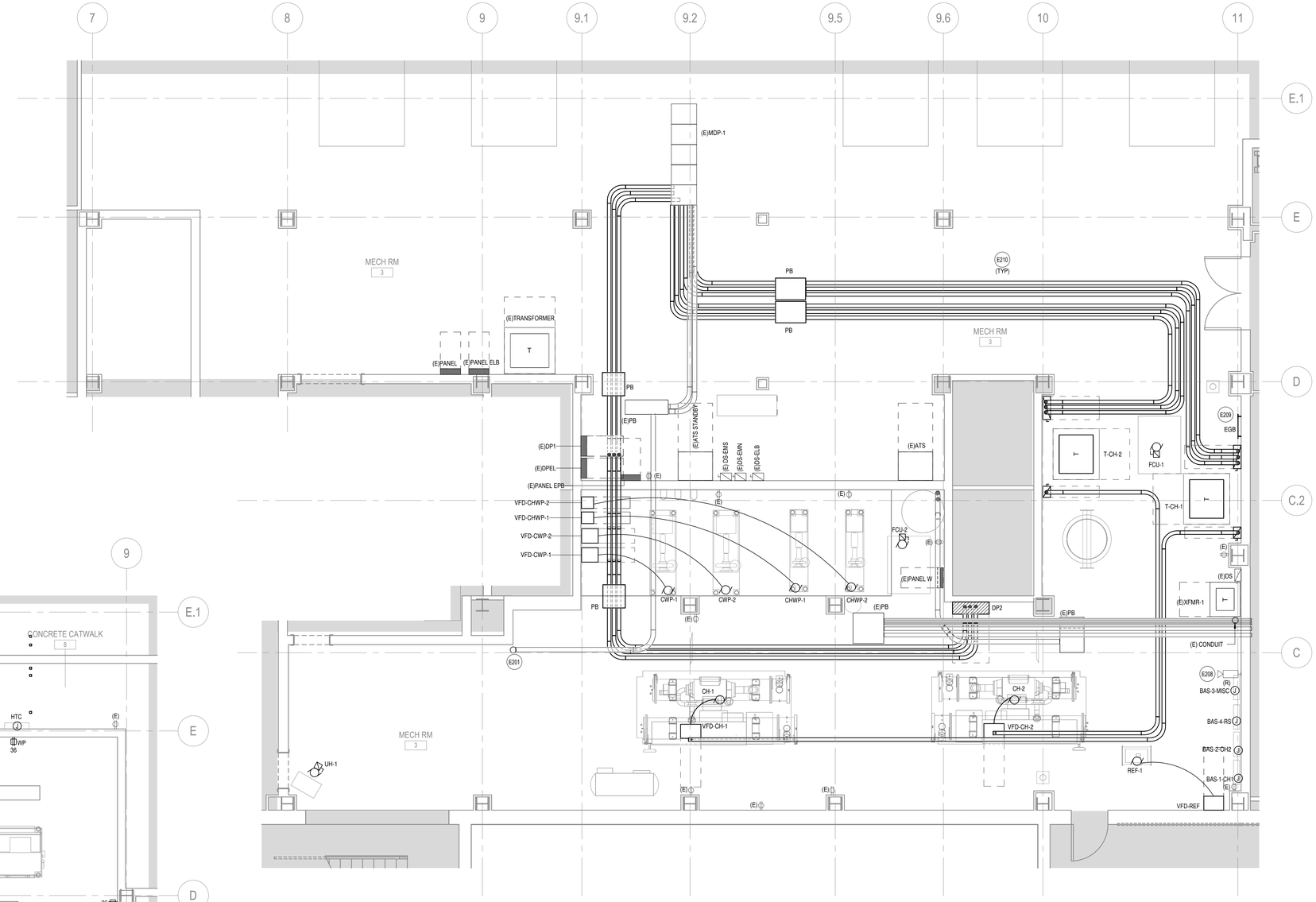
SHEET TITLE
ELECTRICAL PARTIAL RISER DIAGRAM

PROJECT NUMBER
00100451

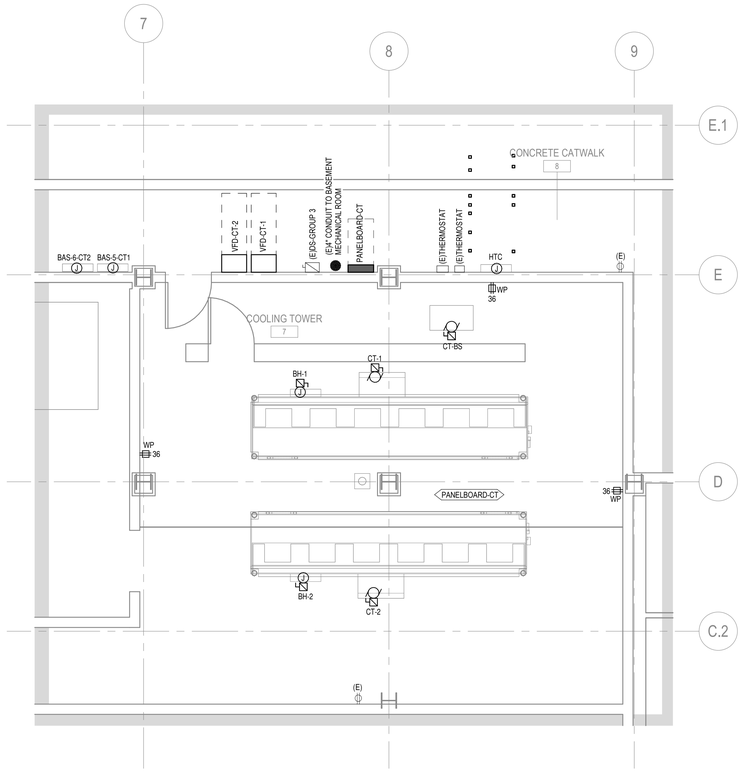
SHEET NUMBER
E5.0

Author

Plot Date: 4/13/2026 4:18:01 PM



1 ENLARGED PLAN - BASEMENT - MECHANICAL ROOM
SCALE: 1/4" = 1'-0"



2 ENLARGED PLAN - LEVEL 4 - COOLING TOWER
SCALE: 1/4" = 1'-0"

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04/02/2026

GENERAL SHEET NOTES

A. SEE DRAWING E0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES AND DEVICE MOUNTING HEIGHT OF WALL MOUNTED DEVICES, UON.
B. COORDINATE ALL DEVICE LOCATIONS AND MOUNTING HEIGHTS WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH-IN.
C. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION OF EQUIPMENT POWER CONNECTIONS WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
D. SEE MECHANICAL EQUIPMENT SCHEDULE FOR ASSOCIATED OVERCURRENT DEVICES, DISCONNECT SWITCHES, STARTERS AND WIRES.
E. X-RAY EXISTING FLOORS TO COORDINATE ALL WIRING DEVICE AND CORE DRILL LOCATIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH IN. LOCATION TO BE DETERMINED IN CONJUNCTION WITH FURNITURE SELECTION.
F. CONTRACTOR SHALL COORDINATE AND FIELD VERIFY REQUIREMENT OF NEUTRAL CONDUCTOR FOR ALL EQUIPMENT AND PROVIDE NEUTRAL CONDUCTOR AS NECESSARY.
G. TRIPPING OF GFCI RECEPTACLES SHALL NOT AFFECT THE DOWNSTREAM RECEPTACLES.
H. NO MORE THAN 3 CIRCUITS MAY SHARE A HOMERUN.
I. FOR ALL MECHANICAL EQUIPMENT, PROVIDE ADDITIONAL 120V CONNECTIONS REQUIRED BY MANUFACTURER.
J. PROVIDE 120V CIRCUITS FOR CONTROL PANELS AS REQUIRED BY CONTROL VENDOR. CIRCUIT TO NEAREST ADJACENT PANELBOARD.
K. COORDINATE FINAL LOCATION OF MECHANICAL AND PLUMBING EQUIPMENT AND ASSOCIATED DISCONNECT SWITCHES, STARTERS, VFDS, CONTROL POWER AND OTHER POWER REQUIREMENTS WITH DIV 22 AND 23.
L. CONTRACTOR IS RESPONSIBLE FOR ALL WIRING FROM VFDs AND DISCONNECTS SHOWN IN DRAWINGS TO THE EQUIPMENT AND IS TO COORDINATE WITH EQUIPMENT MANUFACTURER AND INSTALLATION INSTRUCTIONS.
M. CONTRACTOR SHALL SIZE PULL BOXES BASED ON NEC ARTICLE 314.
N. PROVIDE UNISTRUT MOUNTING FRAMES AS REQUIRED FOR ANY ELECTRICAL EQUIPMENT AND DEVICES NOT LOCATED ON A FULL WALL.
O. FINAL INSTALLATION SHALL HAVE NO WATER PIPING DIRECTLY ABOVE ELECTRICAL EQUIPMENT. PIPING SHALL BE REROUTED AS REQUIRED.
P. PROVIDE CODE-COMPLIANT SUPPORT TO EXISTING-TO REMAIN UNSUPPORTED CONDUITS AND BOXES WHERE WALLS ARE TO BE REMOVED. RE-ROUTE BRANCH CIRCUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.

SHEET KEYNOTES

E201 (E)4" CONDUIT UP TO LEVEL 4 CONCRETE CATWALK. CONTRACTOR TO CONFIRM EXACT ROUTING UP TO LEVEL 4 AND PRESERVE EXISTING CONDUIT. REMOVE ALL EXISTING FEEDER WIRING WITHIN EXISTING CONDUIT.

E208 REMOVE CAMERA FOR REUSE FROM WALL TO BE DEMOLISHED. PRESERVE EXISTING CONDUIT AND WIRING. EXTEND CONDUIT TO NEW LOCATION AS REQUIRED.

E209 PROVIDE NEW #4/0 COPPER GROUNDING CONDUCTOR FROM NEW TRANSFORMERS T-CH-1 AND T-CH-2 TO NEW GROUNDING BUS BAR, AND NEW GROUNDING BUS BAR TO (E)MDP-1 SO NEW ELECTRICAL EQUIPMENT IS TIED INTO THE EXISTING GROUNDING SYSTEM. CONTRACTOR TO CONFIRM MAIN GROUND BAR FOR BUILDING IS WITHIN (E)MDP-1 PRIOR TO ROUTING NEW CONDUCTORS. MAIN GROUND BAR DID NOT APPEAR EXTERNAL TO (E)MDP-1 AND IS NOT FOUND ON EXISTING DRAWINGS. THE NEW GROUNDING BUS BAR TO BE PLACED 4'-0" AFF.

E210 MINIMUM CONDUIT HEIGHT SHALL BE 6'-0" AFF MINIMUM.

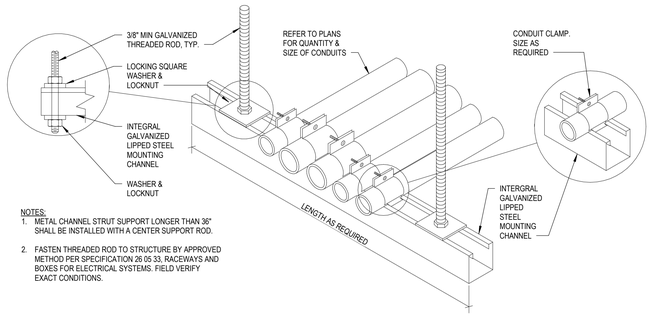
SHEET TITLE
ELECTRICAL ENLARGED PLANS

PROJECT NUMBER
00100451

SHEET NUMBER
E6.0

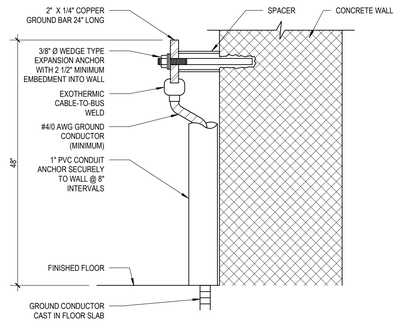
Author

Plot Date: 4/13/2026 4:16:04 PM



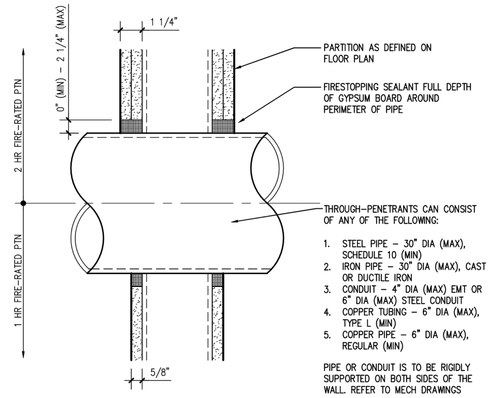
NOTES:
1. METAL CHANNEL STRUT SUPPORT LONGER THAN 36" SHALL BE INSTALLED WITH A CENTER SUPPORT ROD.
2. FASTEN THREADED ROD TO STRUCTURE BY APPROVED METHOD PER SPECIFICATION 26 05 33, RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS. FIELD VERIFY EXACT CONDITIONS.

1 CONDUIT TRAPEZE MOUNTING DETAIL
SCALE: NOT TO SCALE

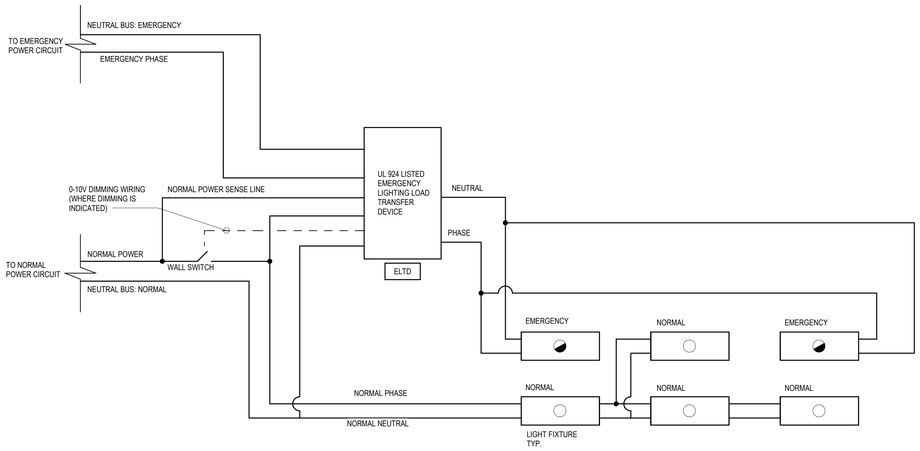


NOTES:
1. COPPER GROUND BAR SHALL BE ANCHORED TO THE WALL WITHIN 6" OF EACH END.
2. PROVIDE GROUND BUS WHERE INDICATED ON DRAWINGS AND IN SPECIFICATIONS.

2 GROUND BAR MOUNTING DETAIL
SCALE: NOT TO SCALE



3 FIRE-RATED WALL PENETRATION METAL PIPE OR CONDUIT DETAIL
SCALE: NOT TO SCALE



4 EMERGENCY LIGHTING LOAD TRANSFER DEVICE WIRING DIAGRAM
SCALE: NONE

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SEALS AND SIGNATURES

04/02/2026

SHEET TITLE
ELECTRICAL DETAILS

PROJECT NUMBER
00100451

SHEET NUMBER
E6.2

Author
4/13/2026 4:18:05 PM
Plot Date:

MECHANICAL EQUIPMENT SCHEDULE

TAG	PANEL	CIRCUIT NUMBER	INPUT POWER	MOTOR HP1	MOTOR HP2	MOTOR HP3	MOTOR HP4	VOLTAGE	PHASE	TOTAL POWER LOAD	MOTOR RATED SWITCH	COMBINATION STARTER NEMA SIZE	ECM	VFD	VFD DRIVE TYPE	DISC. SWITCH AMPS	DISC. SWITCH POLES	DISC. SWITCH FUSED	PHASE & NEUTRAL SETS	PHASE & NEUTRAL NO. OF WIRES	PHASE & NEUTRAL AWG	GROUND NO. OF WIRES	GROUND AWG	CONDUIT SETS	CONDUIT SIZE	COMMENTS
BAS-1-CH1	DP2	9	750 VA					120 V	1	750 VA	No		No	No					1	2	#12	1	#12	1	3/4"	
BAS-2-CH2	DP2	10	750 VA					120 V	1	750 VA	No		No	No					1	2	#12	1	#12	1	3/4"	
BAS-3-MISC	DP2	11	750 VA					120 V	1	750 VA	No		No	No					1	2	#12	1	#12	1	3/4"	
BAS-4-RS	DP2	8	750 VA					120 V	1	750 VA	No		No	No					1	2	#12	1	#12	1	3/4"	
BAS-5-CT1	PANELBOARD-CT	31,33,35	750 VA					208 V	3	750 VA	No		No	No					1	3	#12	1	#12	1	3/4"	
BAS-6-CT2	PANELBOARD-CT	19,21,23	750 VA					208 V	3	750 VA	No		No	No					1	3	#12	1	#12	1	3/4"	
BH-1	PANELBOARD-CT	12,14,16	5000 VA					208 V	3	5000 VA	No		No	No		30 A	3	20 A	1	3	#12	1	#12	1	3/4"	
BH-2	PANELBOARD-CT	18,20,22	5000 VA					208 V	3	5000 VA	No		No	No		30 A	3	20 A	1	3	#12	1	#12	1	3/4"	
CH-1	T-CH-1	1	0 VA					480 V	3	133791 VA	No		No	Yes	6-PULSE WITH 5% IMPEDANCE IP54 / UL TYPE 12				1	3	#4/0	1	#4	1	2"	VFD WITH INTEGRAL DISCONNECT SWITCH PROVIDED BY CHILLER MANUFACTURER
CH-2	T-CH-2	1	0 VA					480 V	3	133791 VA	No		No	Yes	6-PULSE WITH 5% IMPEDANCE IP54 / UL TYPE 12				1	3	#4/0	1	#4	1	2"	VFD WITH INTEGRAL DISCONNECT SWITCH PROVIDED BY CHILLER MANUFACTURER
CHWP-1	DP2	3	0 VA	40				208 V	3	41040 VA	No		No	Yes	6-PULSE WITH 5% IMPEDANCE IP54 / UL TYPE 12				1	3	#1/0	1	#4	1	1 1/2"	
CHWP-2	DP2	4	0 VA	40				208 V	3	41040 VA	No		No	Yes	6-PULSE WITH 5% IMPEDANCE IP54 / UL TYPE 12				1	3	#1/0	1	#4	1	1 1/2"	N+1 REDUNDANDY
CT-1	PANELBOARD-CT	24,26,28	0 VA	25				208 V	3	26928 VA	No		No	Yes	6-PULSE WITH 5% IMPEDANCE IP54 / UL TYPE 12	200 A	3	150 A	1	3	#2	1	#6	1	1 1/4"	
CT-2	PANELBOARD-CT	30,32,34	0 VA	25				208 V	3	26928 VA	No		No	Yes	6-PULSE WITH 5% IMPEDANCE IP54 / UL TYPE 12	200 A	3	150 A	1	3	#2	1	#6	1	1 1/4"	
CT-BS	PANELBOARD-CT	37,39,41	0 VA	3				208 V	3	3816 VA	No		No	No		30 A	3	20 A	1	3	#12	1	#10	1	3/4"	
CWP-1	DP2	1	0 VA	60				208 V	3	60840 VA	No		No	Yes	6-PULSE WITH 5% IMPEDANCE IP54 / UL TYPE 12				1	3	#4/0	1	#3	1	2"	
CWP-2	DP2	2	0 VA	60				208 V	3	60840 VA	No		No	Yes	6-PULSE WITH 5% IMPEDANCE IP54 / UL TYPE 12				1	3	#4/0	1	#3	1	2"	N+1 REDUNDANDY
FCU-1	DP2	6	0 VA	1				208 V	3	1656 VA	No		No	No		30 A	3	10 A	1	3	#12	1	#12	1	3/4"	
FCU-2	DP2	7	0 VA	1/2				208 V	3	864 VA	No		No	No		30 A	3	6 A	1	3	#12	1	#12	1	3/4"	
HTC	PANELBOARD-CT	25,27,29	5000 VA					208 V	3	5000 VA	No		No	No					1	3	#12	1	#12	1	3/4"	
REF-1	DP2	5	0 VA	5				208 V	3	6012 VA	No		No	Yes	6-PULSE WITH 5% IMPEDANCE IP54 / UL TYPE 12				1	3	#10	1	#10	1	3/4"	
UH-1	DP2	12	0 VA	1/8				120 V	1	420 VA	No		No	No		30 A	2	10 A	1	2	#12	1	#12	1	3/4"	

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER	MODEL	LAMP	VOLTAGE	MOUNTING	COMMENTS	TYPE
S1	4'L X 7"W X 5"H LED ENCLOSED AND GASKETED INDUSTRIAL STRIP FIXTURE WITH DUAL PENDANT MOUNT BRACKETS FOR SUSPENSION MOUNT WITH 3/8" THREADED ROD, NEMA TYPE 4X RATING, IP65 RATING, AND WET LOCATION FITTINGS.	LITHONIA	FEM-L48-4000LM-I-MAFL-MD-M VOLT-GZ10-35K-80CRI	24W,5000LM, 80CRI, 3500K, CCT LED	120 V	PENDANT	FIXTURE MUST BE MOUNTED BELOW ALL OTHER TRADES.	S1

GENERAL SHEET NOTES

A. COORDINATE ALL FINAL LOCATIONS, LOADS, AND CONNECTION REQUIREMENTS WITH MECHANICAL DRAWINGS AND FINAL EQUIPMENT SELECTION.
B. CONTRACTOR TO VERIFY THAT LUGS ON ALL MECHANICAL AND ELECTRICAL EQUIPMENT CAN ACCEPT THE WIRE SIZES INDICATED ON SCHEDULE AND PLANS.
C. CONTRACTOR TO VERIFY WIRE SIZES WITH FINAL EQUIPMENT LOCATIONS TO ACCOUNT FOR VOLTAGE DROP ON ALL MECHANICAL EQUIPMENT.
D. FOR ALL MECHANICAL EQUIPMENT, PROVIDE ADDITIONAL 120V CONNECTIONS AS REQUIRED BY MANUFACTURER.
E. COORDINATE ALL MECHANICAL DISCONNECT, VFD, STARTER AND CONTROLLER REQUIREMENTS WITH MANUFACTURER.

SHEET KEYNOTES

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
KENZ MELIANI
No. PE 40001940
ELECTRICAL
PROFESSIONAL ENGINEER

04/02/2026

SHEET TITLE

EQUIPMENT AND LIGHTING FIXTURES SCHEDULES

PROJECT NUMBER 00100451

SHEET NUMBER E7.0

Author

Plot Date: 4/13/2026 4:18:06 PM

COM*check* Software Version COMcheckWeb

Interior Lighting Compliance Certificate

Project Information

Energy Code: 2017 DC Energy Code
Project Title: DCC TO-28
Project Type: Alteration

Construction Site: Owner/Agent: Designer/Contractor:

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts
1-MECHANICAL ROOM (Common Space Types:Electrical/Mechanical)	1825	0.42	766
		Total Allowed Watts =	766

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Fixture Watt.	E (C X D)
MECHANICAL ROOM (Common Space Types: Electrical/Mechanical, 1825 sq.ft.)				
LED: Other:	1	17	24	408
			Total Proposed Watts =	408

Interior Lighting PASSES

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2017 DC Energy Code requirements in COM*check* Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Tarik Aitouali — Name - Title
Tarik Aitouali — Signature
04.02.2026 — Date

COM*check* Software Version COMcheckWeb

Inspection Checklist

Energy Code: 2017 DC Energy Code

Requirements: 0.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
8.4.3 [PR15][2]	All forms of energy delivered to, produced by, and/or reclaimed by the building or building site are metered and all energy load types measured in accordance with Section 8.4.3.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
4.2.2, 8.4.1.1, 8.4.1.2, 8.7 [PR6][2]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the electrical systems and equipment and document where exceptions are claimed. Feeder connectors sized in accordance with approved plans and branch circuits sized for maximum drop of 3%.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
4.2.2, 9.4.3, 9.7 [PR4][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
8.4.2 [EL10][2]	One 125-volt 15- and 20- amp duplex receptacle is in each private office and individual workstations located at the desk area and at least 50% of all 125 volt 15- and 20-Amp receptacles and 25% of the circuits feeding each base feed point of modular furniture (min 1 circuit) are controlled by an automatic control device.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
9.4.1.1 [EL1][2]	Automatic control requirements prescribed in Table 9.6.1, for the appropriate space type, are installed. Mandatory lighting controls (labeled as 'R(E0') and optional choice controls (labeled as 'ADD1' and 'ADD2') are implemented.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
9.4.1.2 [EL11][2]	Parking garage lighting is equipped with required lighting controls and daylight transition zone lighting.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
9.4.1.1f [EL13][1]	Daylight areas under skylights and roof monitors that have more than 150 W combined input power for general lighting are controlled by photocontrols.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
9.5.2.1 [EL15][2]	Group R-1 occupancies >= 50 guest rooms automatically turn lights off 30 min. after occupants leave.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
9.5.2.2 [EL16][2]	Commerical and industrial storage stack areas dim >= 50% 20 min. after occupants leave.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
9.4.1.3 [EL4][1]	Separate lighting control devices for specific uses installed per approved lighting plans.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
9.6.2 [EL8][1]	Additional interior lighting power allowed for special functions per the approved lighting plans and is automatically controlled and separated from general lighting.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
8.5.1 [FI27][2]	Hotels and motels with >= 50 guest rooms have automatic controls for each guest room configured to manage lighting, switched outlets, and televisions in accordance with Section 8.5.1.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
8.7.1 [FI16][3]	Furnished as-built drawings for electric power systems within 30 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
8.7.2 [FI17][3]	Furnished O&M instructions for systems and equipment to the building owner or designated representative.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
9.2.2.3 [FI18][2]	Interior installed lamp and fixture lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Interior Lighting fixture schedule for values.*

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
KENZ MELIANI
No. PE 40001940
ELECTRICAL
PROFESSIONAL ENGINEER

04/02/2026

SHEET TITLE

LIGHTING POWER DENSITY CALCULATIONS

PROJECT NUMBER 00100451

SHEET NUMBER E7.1

Plot Date: 4/13/2026 4:18:07 PM Author

Switchboard: (E)MDP-1

Location: MECH RM 3 **Volts:** 208Y/120 **A.I.C. Rating:** 100,000 A
Supply From: UTILITY **Phases:** 3 **Mains Type:** MCB
Mounting: PAD-MOUNTED **Wires:** 4 **Mains Rating:** 4000 A
Enclosure: TYP(E)UTILITY **MCB Rating:** 4000 A

(100% RATED)

CKT	Circuit Description	# of Poles	Frame Size	Trip Rating	Load	Remarks
1	(E)SPACE	3	--	--	--	
2	(E)SPACE	3	--	--	--	
3	(E)SPACE	3	--	--	--	
4	(E)SPACE	3	--	--	--	
5	(E)SPACE	3	--	--	--	
6	(E)SPACE	3	--	--	--	
7	(E)WATER HEATER	3	400 A	400 A	70000 VA	
8	(E)ATS-ELEVATOR 1-6 - CHILLER MECHANICAL ROOM	3	600 A	600 A	62900 VA	
9	**DISTRIBUTION BOARD DP2 - CHILLER MECHANICAL ROOM**	**3**	**800 A**	**800 A**	**215712 VA**	REPLACES EXISTING 600A "MCC".
10	(E)DISTRIBUTION BOARD DP1 - CHILLER MECHANICAL ROOM	3	600 A	600 A	46500 VA	
11	**PANELBOARD-CT - LEVEL 4 CONCRETE CATWALK**	**3**	**400 A**	**400 A**	**83462 VA**	REPLACE (4) EXISTING SPACES.
12	(E)UNKNOWN CIRCUIT	3	100 A	100 A	0 VA	
13	(E)SPACE	3	--	--	--	
14	(E)PANEL EPB + ATS-STANDBY	3	100 A	100 A	0 VA	
15	(E)PANEL W	3	100 A	100 A	500 VA	
16	(E)PANEL CVU	3	225 A	225 A	22500 VA	
17	(E)SPARE	3	225 A	225 A	0 VA	
18	(E)SPARE	3	225 A	225 A	0 VA	REPLABEL "PENTHOUSE" TO "SPARE".
19	(E)SPARE	3	225 A	225 A	0 VA	
20	**TRANSFORMER T-CH-1 - AIR HANDLING UNIT MECHANICAL ROOM**	3	800 A	800 A	133791 VA	UTILIZE (E)800A "CH-1" BREAKER.
21	**TRANSFORMER T-CH-2 - AIR HANDLING UNIT MECHANICAL ROOM**	3	800 A	800 A	133791 VA	UTILIZE (E)800A "CH-2" BREAKER.
22	(E)PANEL DPN	3	1200 A	1000 A	122300 VA	
23	(E)PANEL DPS	3	1200 A	1000 A	132000 VA	
				Total Conn. Load:	1023456 VA	
				Total Amps:	2841 A	

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Existing Load	465450 VA	100.00%	465450 VA		
Receptacle	540 VA	100.00%	540 VA	**Total Conn. Load:**	1023456 VA
Mechanical Equipment	353706 VA	100.00%	353706 VA	**Total Est. Demand:**	921576 VA
Mechanical Equipment (50%,N+1)	203760 VA	50.00%	101880 VA	**Total Conn.:**	2841 A
				Total Est. Demand:	2558 A

Notes:
PEAK METERING DATA COLLECTED ON JULY 22ND, 2025 INDICATED AN AVERAGE TOTAL AMPERAGE ON EXISTING MDP-1 OF 2,180A. THE EXISTING LOADS (VA) WERE ESTIMATED TO SUM UP TO THIS 2,180A VALUE IN THIS PANEL SCHEDULE.

Distributionboard: DP2

Location: MECH RM 3 **Volts:** 208Y/120 **A.I.C. Rating:** 65,000 A
Supply From: (E)MDP-1 **Phases:** 3 **Mains Type:** MCB
Mounting: Surface **Wires:** 4 **Mains Rating:** 800 A
Enclosure: Type 1 **MCB Rating:** 800 A

CKT	Circuit Description	# of Poles	Frame Size	Trip Rating	Load	Remarks
1	CWP-1 - MECH RM 3	3	400 A	400 A	60840 VA	NOTE 1.
2	CWP-2 - MECH RM 3	3	400 A	400 A	60840 VA	NOTE 1.
3	CHWP-1 - MECH RM 3	3	250 A	250 A	41040 VA	NOTE 1.
4	CHWP-2 - MECH RM 3	3	250 A	250 A	41040 VA	NOTE 1.
5	REF-1 - MECH RM 3	3	40 A	40 A	6012 VA	
6	FCU-1 - MECH RM 3	3	40 A	40 A	1656 VA	
7	FCU-2 - MECH RM 3	3	40 A	40 A	864 VA	
8	BAS-4-RS - MECH RM 3	1	20 A	20 A	750 VA	
9	BAS-1-CH1 - MECH RM 3	1	20 A	20 A	750 VA	
10	BAS-2-CH2 - MECH RM 3	1	20 A	20 A	750 VA	
11	BAS-3-MISC-MECH RM 3	1	20 A	20 A	750 VA	
12	UH-1 - MECH RM 3	1	20 A	20 A	420 VA	
13	SPARE	1	20 A	20 A	0 VA	
14	SPARE	3	40 A	40 A	0 VA	
15	SPARE	3	250 A	250 A	0 VA	
16	SPARE	3	400 A	400 A	0 VA	
17	INTEGRAL DISTRIBUTION BOARD DP2 ENERGY METER DISCONNECT	3	20 A	20 A	0 VA	
				Total Conn. Load:	215712 VA	
				Total Amps:	599 A	

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Mechanical Equipment	11952 VA	100.00%	11952 VA		
Mechanical Equipment (50%,N+1)	203760 VA	50.00%	101880 VA	**Total Conn. Load:**	215712 VA
				Total Est. Demand:	113832 VA
				Total Conn.:	599 A
				Total Est. Demand:	316 A

Notes:
(1) PUMPS RUN AND MANAGED IN N+1 CONFIGURATION. TOTAL CAPACITY IS N+1 REDUNDANT.

Panelboard: (E)EMSB

Location: TELE RM **Volts:** 208Y/120 **A.I.C. Rating:** EXISTING
Supply From: (E)MDP-1 **Phases:** 3 **Mains Type:** MCB
Mounting: Surface **Wires:** 4 **Mains Rating:** 100 A
Enclosure: Type 1

CKT	Circuit Description	Trip	Poles	A (VA)		B (VA)		C (VA)		Poles	Trip	Circuit Description	CKT
1	(E)FIRE/SMOKE DAMPER (BASEMENT SOUTH)	20 A	1	900	400					1	20 A	(E)LTG - EMERGENCY	2
3	**EMERGENCY LIGHTING - MECH RM 3**	**20 A**	**1**			**120**	700			1	20 A	(E)LTG - EMERGENCY	4
5	(E)SPACE	--	1					--	--	1	--	(E)SPACE	6
7	(E)SPACE	--	1	--	--					1	--	(E)SPACE	8
9	(E)SPACE	--	1			--	--			1	--	(E)SPACE	10
11	(E)SPACE	--	1					--	--	1	--	(E)SPACE	12
13	(E)SPACE	--	1	--	--					1	--	(E)SPACE	14
15	(E)SPACE	--	1			--	--			1	--	(E)SPACE	16
17	(E)SPACE	--	1					--	--	1	--	(E)SPACE	18
19	(E)SPACE	--	1	--	--					1	--	(E)SPACE	20
21	(E)SPACE	--	1			--	--			1	--	(E)SPACE	22
23	(E)SPACE	--	1					--	--	1	--	(E)SPACE	24
25	(E)SPACE	--	1	--	--					1	--	(E)SPACE	26
27	(E)SPACE	--	1			--	--			1	--	(E)SPACE	28
29	(E)SPACE	--	1					--	--	1	--	(E)SPACE	30
31	(E)SPACE	--	1	--	--					1	--	(E)SPACE	32
33	(E)SPACE	--	1			--	--			1	--	(E)SPACE	34
35	(E)SPACE	--	1					--	--	1	--	(E)SPACE	36
37	(E)SPACE	--	1	--	--					1	--	(E)SPACE	38
39	(E)SPACE	--	1			--	--			1	--	(E)SPACE	40
41	(E)SPACE	--	1					--	--	1	--	(E)SPACE	42
			Total Load:	1300 VA		820 VA		0 VA					
			Total Amps:	12 A		8 A		0 A					

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Existing Load	2000 VA	100.00%	2000 VA		
Lighting	120 VA	100.00%	120 VA	**Total Conn. Load:**	2120 VA
				Total Est. Demand:	2120 VA
				Total Conn.:	6 A
				Total Est. Demand:	6 A

Notes:

Panelboard: (E)PSB

Location: TELE RM **Volts:** 208Y/120 **A.I.C. Rating:** EXISTING
Supply From: (E)DPS **Phases:** 3 **Mains Type:** MCB
Mounting: Surface **Wires:** 4 **Bus Rating:** 400 A
Enclosure: Type 1 **MCB Rating:** 400 A

CKT	Circuit Description	Trip	Poles	A (VA)		B (VA)		C (VA)		Poles	Trip	Circuit Description	CKT
1	(E)SYS. FURN. COMP - RM B10A,B*	20 A	1	800	1200					1	20 A	(E)COPIER -RM B10*	2
3	(E)SYS. FURN. (RECP) - RM B10AB	20 A	1			1200	1200			1	20 A	(E)PRINTER/FAX - AM B10*	4
5	(E)SYS. FURN. (TASKLTG) - RM B10A,B	20 A	1					200	0	1	20 A	(E)SPARE	6
7	(E)SYS. FURN. COMP - RM B10 *	20 A	1	1200	0					1	20 A	(E)SPARE	8
9	(E)SYS. FURN. (RECP) - RM B10	20 A	1			1200	0			1	20 A	(E)SPARE	10
11	(E)SYS. FURN. (TASK LTG) - RM B10	20 A	1					300	0	1	20 A	(E)SPARE	12
13	(E)SYS. FURN. COMP - RM B10*	20 A	1	1200	800					1	20 A	(E)RECP - RM B10A, B10	14
15	(E)SYS. FURN. (RECP) - RM B10	20 A	1			1200	1000			1	20 A	(E)RECP - (MECH RM)	16
17	(E)SYS. FURN. (TASK LTG) - RM B10	20 A	1					300	1000	1	20 A	(E)RECP - (MECH RM)	18
19	(E)SYS. FURN. COMP - RM B10, B10A*	20 A	1	1200	200					1	15 A	(E)UH-1, UH-2 (TRASH, GENERATOR RM)	20
21	(E)SYS. FURN. (RECP) - RM B10, B10A	20 A	1			1200	1200			1	20 A	(E)FPI-3 (BASEMENT SOUTH)	22
23	(E)SYS. FURN. (TASK LTG) - RM B10, B10A	20 A	1					300	1700	1	25 A	(E)FPI-5 (RM B10)	24
25	(E)EXISTING LOADS	20 A	1	1200	1700					1	25 A	(E)FPI-2 (BASEMENT SOUTH)	26
27	(E)EXIST ING LOADS (EST IMATE)	20 A	1			1200	1700			1	25 A	(E)FPI-5 (BASEMENT SOUTH)	28
29	(E)LTG-STORAGE B11	20 A	1					1200	1200	1	20 A	(E)FPI-3 (RM B10)	30
31	(E)LTG-CONFR RM B10A	20 A	1	700	900								32
33	(E)LTG-OPEN OFFICE B10	20 A	1			1100	900			3	15 A	(E)SP-1 (BASEMENT TRACH/STOR)	34
35	(E)LTG-OPEN OFFICE B10,B10A,B10B	20 A	1					1500	900				36
37	(E)LTG-MECHANICAL RM	20 A	1	1600	3700								38
39	(E)LTG-MECHANICAL RM	20 A	1			700	3700			3	60 A	(E)BOOSTER PUMP (BASEMENT STOR)	40
41	**LIGHTING - MECH RM 3**	**20 A**	**1**					**288**	3700				42
43	(E)SPARE	20 A	1	0	0					1	20 A	(E)SPARE	44
45	(E)SPARE	20 A	1			0	0			1	20 A	(E)SPARE	46
47	(E)SPARE	20 A	1					0	0	1	20 A	(E)SPARE	48
49	(E)SPARE	20 A	1	0	0					1	20 A	(E)SPARE	50
51	(E)SPARE	20 A	1			0	0			1	20 A	(E)SPARE	52
53	(E)SPARE	20 A	1					0	0	1	20 A	(E)SPARE	54
55	(E)SPACE	--	1	--	--					1	--	(E)SPACE	56
57	(E)SPACE	--	1			--	--			1	--	(E)SPACE	58
59	(E)SPACE	--	1					--	--	1	--	(E)SPACE	60
61	(E)SPACE	--	1	--	--					1	--	(E)SPACE	62
63	(E)SPACE	--	1			--	--			1	--	(E)SPACE	64
65	(E)SPACE	--	1					--	--	1	--	(E)SPACE	66
67	(E)SPACE	--	1	--	--					1	--	(E)SPACE	68
69	(E)SPACE	--	1			--	--			1	--	(E)SPACE	70
71	(E)SPACE	--	1					--	--	1	--	(E)SPACE	72
73	(E)SPACE	--	1	--	--					1	--	(E)SPACE	74
75	(E)SPACE	--	1			--	--			1	--	(E)SPACE	76
77	(E)SPACE	--	1					--	--	1	--	(E)SPACE	78
79	(E)SPACE	--	1	--	--					1	--	(E)SPACE	80
81	(E)SPACE	--	1			--	--			1	--	(E)SPACE	82
83	(E)SPACE	--	1					--	--	1	--	(E)SPACE	84
			Total Load:	16400 VA		17500 VA		12588 VA					
			Total Amps:	142 A		151 A		105 A					

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting	288 VA	100.00%	288 VA		
Existing Load	46200 VA	100.00%	46200 VA	**Total Conn. Load:**	46488 VA
				Total Est. Demand:	46488 VA
				Total Conn.:	129 A
				Total Est. Demand:	129 A

Notes:

Panelboard: PANELBOARD-CT

Location: CONCRETE CATWALK 8 **Volts:** 208Y/120 **A.I.C. Rating:** 65,000 A
Supply From: (E)MDP-1 **Phases:** 3 **Mains Type:** MCB
Mounting: Surface **Wires:** 4 **Bus Rating:** 400 A
Enclosure: Type 1 **MCB Rating:** 400 A

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
1	(E)LIGHTING - MOTOR GROUP 1	15 A	1	500	500					1	15 A	(E)RECPECPTACLES - COOLING TOWER AREA	2
3	(E)LIGHTING - COOLING TOWER AREA	20 A	1			500	500			1	15 A	(E)RECEPTACLES; TEMP. CTRL - GROUP 1	4
5	(E)LIGHTING - MOTOR GROUP 3	20 A	1					500	500	1	20 A	(E)P. C. 10 PUMP	6
7	(E)RECEPTACLES; TEMP. CTRL - GROUP 3	20 A	1	500	500					1	20 A	(E)P. C. 11 PUMP	8
9	(E)UNIT HEATER - GROUP 3	20 A	1			500	250			1	20 A	(E)TEMP. CONTROL PANEL - GROUP 2	10
11	(E)HVAC ELEVATOR #6	20 A	2					1000	1667	3	20 A	BH-1 - COOLING TOWER 7	12
13				1000	1667								14
15	(E)HVAC ELEVATOR #5	20 A	2			1000	1667						16
17								1000	1667				18
19	BAS-6-CT2 - COOLING TOWER 7	20 A	3	250	1667					3	20 A	BH-2 - COOLING TOWER 7	20
21						250	1667						22
23								250	8976				24
25	HTC - COOLING TOWER 7 *	40 A	3	1667	8976					3	175 A	CT-1 - COOLING TOWER 7	26
27						1667	8976						28
29								1667	8976				30
31	BAS-5-CT1 - COOLING TOWER 7	20 A	3	250	8976					3	175 A	CT-2 - COOLING TOWER 7	32
33						250	8976						34
35								250	540	1	20 A	GENERAL PURP RECEP - COOLING TOWER 7	36
37	CT-BS - COOLING TOWER 7	25 A	3	1272	0					3	20 A	INTEGRAL PANELBOARD-CT ENERGY METER DISCONNECT	38
39						1272	0						40
41								1272	0				42
43	SPARE	20 A	1	0	0					1	20 A	SPARE	44
45	SPARE	20 A	1			0	0			1	20 A	SPARE	46
47	SPARE	20 A	1					0	0	1	20 A	SPARE	48
49	SPARE	20 A	1	0	0					1	20 A	SPARE	50
51	SPACE	--	1			--	--			1	--	SPACE	52
53	SPACE	--	1					--	--	1	--	SPACE	54
55	SPACE	--	1	--	--					1	--	SPACE	56
57	SPACE	--	1			--	--			1	--	SPACE	58
59	SPACE	--	1					--	--	1	--	SPACE	60
			Total Load:	27724 VA		27474 VA		28264 VA					
			Total Amps:	231 A		229 A		236 A					

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Existing Load	8750 VA	100.00%	8750 VA		
Receptacle	540 VA	100.00%	540 VA	**Total Conn. Load:**	83462 VA
Mechanical Equipment	74172 VA	100.00%	74172 VA	**Total Est. Demand:**	83462 VA
				Total Conn.:	232 A
				Total Est. Demand:	232 A

Notes:
* PROVIDE GFEP BREAKER.

GENERAL SHEET NOTES

A. SEE DRAWING E0.1 FOR ABBREVIATIONS, SYMBOLS, GENERAL NOTES AND DEVICE MOUNTING HEIGHT OF WALL MOUNTED DEVICES, UON.
B. SEE DRAWING SERIES E5 FOR POWER RISER DIAGRAM.
C. PROVIDE A MINIMUM OF 20% SPARE CIRCUIT BREAKERS ON EACH NEW PANEL.
D. CONTRACTOR TO VERIFY EXISTING AVAILABLE CIRCUITS. COORDINATE LOCATION OF AVAILABLE CIRCUITS WITH THOSE INDICATED IN PANEL SCHEDULES.
E. VERIFY EXISTING CIRCUIT BREAKERS FOR ADEQUACY TO REUSE FOR NEW LOADS WHEN "UTILIZE EXISTING BREAKER" IS INDICATED. REFER TO SPECIFICATIONS FOR MORE INFORMATION AND TESTING REQUIREMENTS. PROVIDE NEW BREAKERS IN EXISTING SPACES. COORDINATE NEW BREAKER TYPE WITH EXISTING TO REMAINING PANEL.
F. PROVIDE PERMANENT PANEL NAMEPLATES AND TYPED PANEL SCHEDULES AFTER ALL WORK IS COMPLETE. SCHEDULES AND NAMEPLATES MUST MATCH PANEL INFORMATION, CIRCUIT BREAKERS, AND CONNECTED LOADS.
G. CONTRACTOR TO PROVIDE 3 PHASE CIRCUIT FOR ALL NEW SURGE PROTECTION DEVICES. COORDINATE FINAL CIRCUIT BREAKER SIZE WITH DEVICE.
H. CONTRACTOR TO PROVIDE 3P, 15A BREAKER AS REQUIRED FOR ALL NEW METERS.
I. ALL FINAL PANEL LOADS SHALL BE BALANCED AMONG PHASES.
J. BOLD CIRCUIT DESCRIPTION INDICATES NEW CIRCUIT AND CIRCUIT BREAKER ON AN EXISTING PANELBOARD OR SWITCHBOARD. NEW CIRCUIT BREAKERS TO MATCH MODEL NUMBER AND AIC RATING OF EXISTING CIRCUIT BREAKERS TO ENSURE PANEL IS FULLY RATED. UTILIZE EXISTING SPARE BREAKERS FOR BOLD CIRCUITS IF TRIP RATINGS INDICATED MATCH EXISTING TRIP RATINGS IN-FIELD.

SHEET KEYNOTES

DC Courts TO-28
Building A Chilled Water Upgrade
515 5th Street N.W.
Washington, DC 20001

SMITHGROUP
1700 NEW YORK AVENUE NW
SUITE 100
WASHINGTON, DC 20006
202.842.2100
www.smithgroup.com

ISSUED FOR	REV	DATE
PRICING AND PERMIT		04/02/2026
100% CONSTRUCTION DOCUMENTS		02/12/2026
50% CONSTRUCTION DOCUMENTS		10/09/2025

SEALS AND SIGNATURES

DISTRICT OF COLUMBIA
KENZ MELIANI
No. PE 40001940
ELECTRICAL
PROFESSIONAL ENGINEER
04/02/2026

(E)MDP-1	(E)PSB
DP2	PANELBOARD-CT
(E)EMSB	

SHEET TITLE
PANELBOARD SCHEDULES

PROJECT NUMBER 00100451

SHEET NUMBER E7.2

Author
Plot Date: 4/13/2026 4:18:09 PM