

UNIVERSITY OF COLORADO AT COLORADO SPRINGS CRAGMOR HALL CHILLER PLANT REPLACEMENT

PROJECT TEAM

OWNER

KENT W. MARSH, PE
ASSOCIATE VICE CHANCELLOR FOR CAMPUS PLANNING
AND FACILITIES MANAGEMENT
UNIVERSITY OF COLORADO COLORADO SPRINGS
FACILITIES SERVICES, CSB 212
1420 AUSTIN BLUFFS PARKWAY
COLORADO SPRINGS, CO 80918
(719) 255-3505
KMARSH2@UCCS.EDU

JEFF REED, CEFP
EXECUTIVE DIRECTOR FACILITIES SERVICES
UNIVERSITY OF COLORADO COLORADO SPRINGS
FACILITIES SERVICES, CSB 212
1420 AUSTIN BLUFFS PARKWAY
COLORADO SPRINGS, CO 80918
(719) 255-3547
JREED5@UCCS.EDU

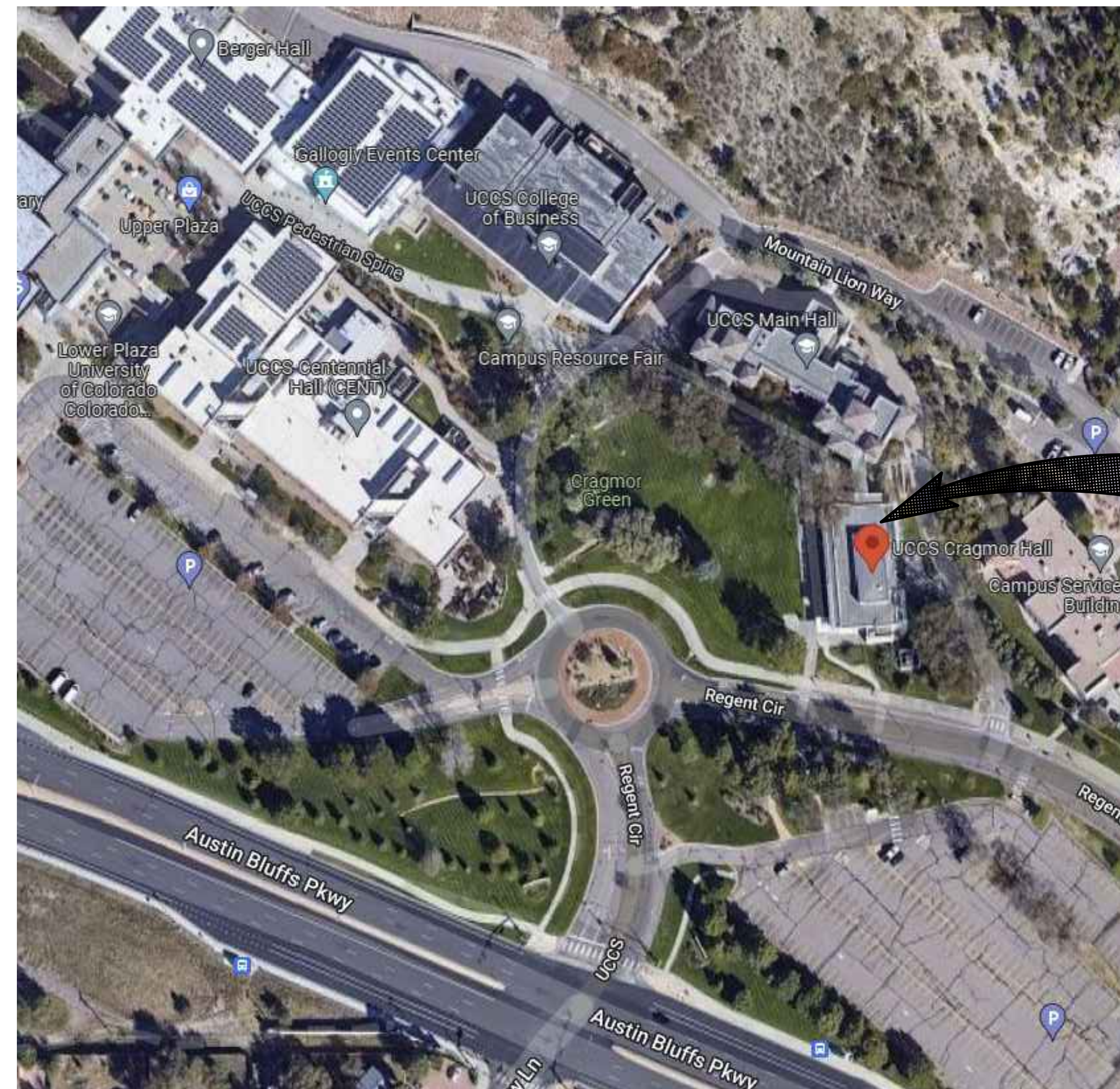
PRIME CONSULTANT

SCHENDT ENGINEERING CORPORATION
5145 CENTENNIAL BLVD, SUITE 200
COLORADO SPRINGS, CO 80919
(719) 637-8850

MECHANICAL ENGINEER
BRIAN BURESS, P.E.
SCHENDT ENGINEERING CORPORATION
5145 CENTENNIAL BLVD, SUITE 200
COLORADO SPRINGS, CO 80919
(719) 637-8850
BBURGESS@SECEENGR.COM

ELECTRICAL ENGINEER
STEVE PEAKE, P.E.
SCHENDT ENGINEERING CORPORATION
5145 CENTENNIAL BLVD, SUITE 200
COLORADO SPRINGS, CO 80919
(719) 637-8850
SPEAKE@SECEENGR.COM

STRUCTURAL ENGINEER
JEFF KOBRIGER, P.E.
HCDA ENGINEERING INC.
9 S WEBER ST
COLORADO SPRINGS, CO 80903
(719) 633-7784
JKOBRIGER@HCDAENGINEERING.COM

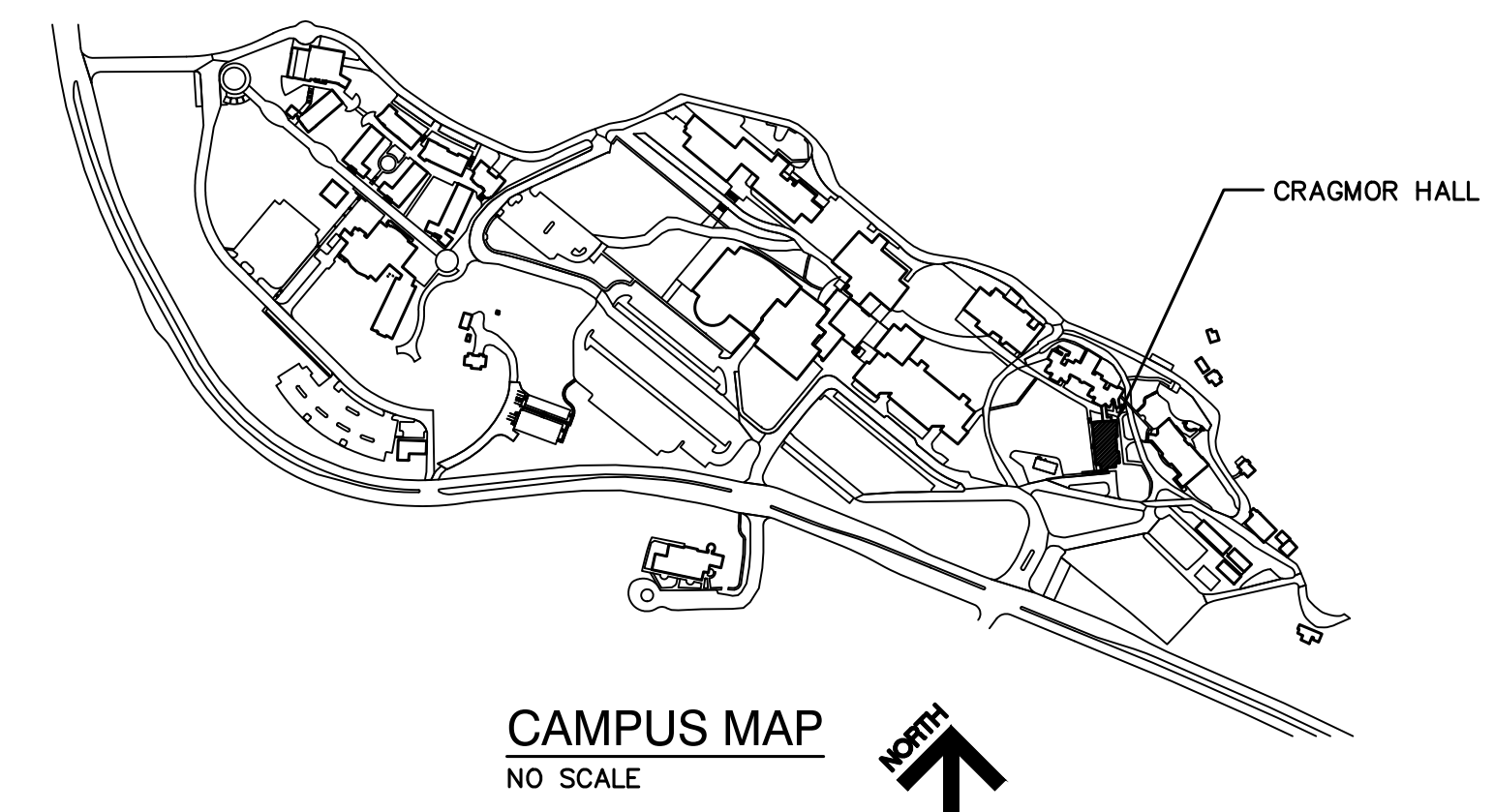


VICINITY MAP
NO SCALE



DRAWING NO.	DRAWING TITLE
G0.01	COVER SHEET
S1.01	FOUNDATION PLAN
M0.01	MECHANICAL LEGEND
M0.02	MECHANICAL GENERAL NOTES
M1.01	MECHANICAL PLAN - CRAWL AREA & CHILLER YARD
M3.01	MECHANICAL SECTIONS
M4.01	ENLARGED MECHANICAL PLAN - PENTHOUSE
M5.01	MECHANICAL DIAGRAMS
M6.01	MECHANICAL SCHEDULES
M7.01	MECHANICAL CONTROLS
M7.02	MECHANICAL CONTROLS
E0.01	ELECTRICAL LEGEND
E0.02	ELECTRICAL GENERAL NOTES
E4.01	ELECTRICAL PLAN - FIRST FLOOR
E4.02	ELECTRICAL PLAN - PENTHOUSE
E6.01	ONE LINE DIAGRAM

PROJECT
LOCATION



CAMPUS MAP
NO SCALE



SCHENDT
ENGINEERING
CORPORATION
CONSULTING ENGINEERS
5145 CENTENNIAL BLVD, SUITE 200
COLORADO SPRINGS, CO 80919
• PH: (719) 637-8850 • SEC@SECEENGR.COM



Digital Signature
Brian Buresse, PE
Date: 12/09/2022

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UCCS CRAGMOR HALL
CHILLER REPLACEMENT
1420 AUSTIN BLUFFS PARKWAY, COLORADO
SPRINGS, CO 80933

DESIGNED BY

BAB

DRAWN BY

KMM

PROJECT NO.

21142

DATE

12/09/2022

SHEET TITLE

COVER SHEET

SHEET

G0.01

SPECIAL INSPECTION GENERAL NOTES

- A statement of special inspections for structural items has been prepared by HCDA Engineering, Inc. for submittal to the Building Official. This is submitted as a condition for permit issuance in accordance with the Structural Testing and Special Inspection requirements of the International Building Code, 2021 Edition.
- The Structural Engineer will perform periodic observations of construction. These observations shall not replace required inspections by the Building Official. These observations also do not serve as "Special Inspections" as required by section 1704 of the International Building Code.
- Steel Fabricators shall be approved in accordance with IBC section 1704.2.5.1 of the International Building Code, 2021 Edition, or are required to have shop inspectors of the fabricated items for the project by the special inspector hired by the Owner as required by section 1704.2.5.
- Special Inspectors (not third party inspectors) shall be approved individually by the Building Official prior to the issuance of a permit. Please provide the list of specific special inspectors to determine if they have already been approved. Each Special Inspector not already approved by the Building Official must provide a resume and all supporting information related to their qualifications for the specific type of special inspections in accordance with IBC 1704.2.1.

Cast-in-Place Concrete

Item	Scope	Frequency	
		C = Continuous P = Periodic	P
1. Mix Design	Review concrete batch tickets and verify compliance with approved mix design. Verify that water added at the site does not exceed that allowed by the mix design.		X
2. Reinforcement Installation	Inspect size, spacing, cover, positioning and grade of reinforcing steel. Verify that reinforcing bars are free of form oil or other deleterious materials. Inspect bar laps and mechanical splices. Verify that bars are adequately tied and supported on chairs or bolsters.		X
3. Welding of Reinforcing	Visually inspect all reinforcing steel welds. Verify weldability of existing steel. Inspect preheating of steel when required. Welds > 5/16"		X
4. Cast in Anchors	Inspect size, positioning and embedment of anchor rods and embedded plates, inspect concrete placement and consolidation around anchors.		X
5. Concrete Placement	Inspect placement of concrete. Verify proper application techniques, concrete conveyance and depositing avoids segregation or contamination. Verify that concrete is properly consolidated.	X	
6. Sampling and Testing	Test concrete compressive strength (ASTM C13 & C39), slump (ASTM C143), air content (ASTM C231 or C173) and temperature (ASTM C1064). Fabricate specimens for strength tests.		X
7. Curing and Protection	Inspect curing, cold weather protection and hot weather protection procedures. Verify maintenance of specified curing temperature and techniques.		X
8. Post-installed Anchors	Inspect adhesive anchors installed horizontally or upwardly for anchor size, embedment, and installation technique. Inspect mechanical anchors for size and embedment.	X	
9. Formwork	Inspect formwork for shape, location and dimensions of the concrete member being formed.		X

Masonry Concrete

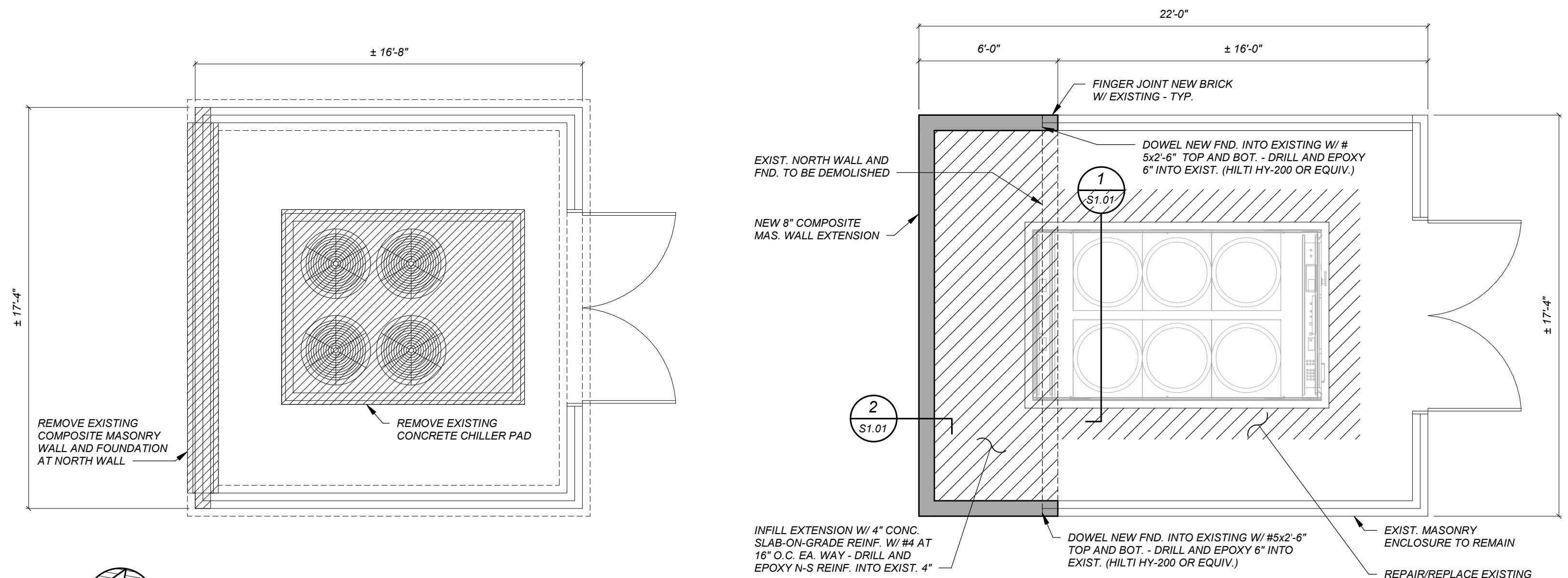
Item	Scope	Frequency	
		C = Continuous P = Periodic	P
1. Mixing of Mortar and Grout	Inspect proportioning, mixing and retempering of mortar and grout.		X
2. Installation of Masonry	Inspect size, layout, bonding and placement of masonry units.		X
3. Mortar Joints	Inspect construction of mortar joints including tooling and filling of head joints.		X
4. Reinforcement Installation	Inspect placement, positioning and lapping of reinforcing steel.		X
5. Grouting Operations	Inspect placement and consolidation of grout.	X	
6. Weather Protection	Inspect cold weather protection and hot weather protection procedures. Verify that wall cavities are protected against precipitation.		X
7. Evaluation of Masonry Strength	Inspect curing, cold weather protection and hot weather protection procedures. Verify maintenance of specified curing temperature and techniques.		X
8. Anchors, Ties and Embedded Items	Inspect size, location, spacing and embedment of dowels, anchors and ties.		X

DESIGN LOADS:

Wind Loads - Exposure C, 140 mph (V_{ult}) 3 second gust

Seismic Information

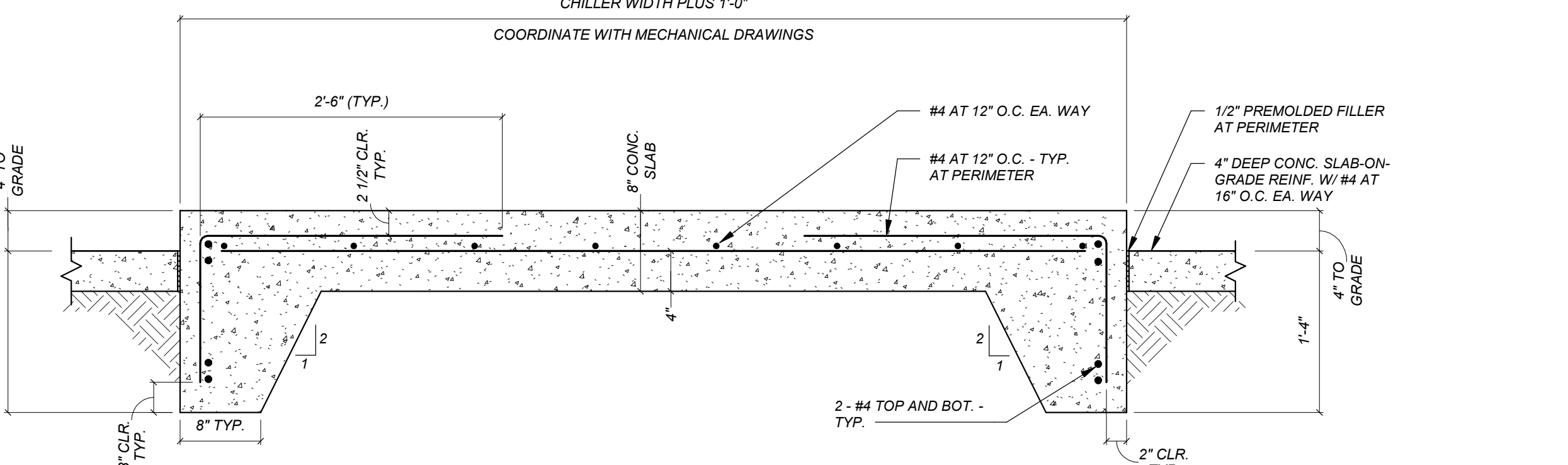
Importance Factor	I _e = 1.25
Building Occupancy Category	III
Mapped Spectral Accelerations	S _s = 0.185g S ₁ = 0.061g
Site Class	D
Design Spectral Accelerations	S _{DS} = 0.194g S _{D1} = 0.097g
Seismic Design Category	B



DEMOLITION PLAN - CHILLER YARD
 1/4"=1'-0"

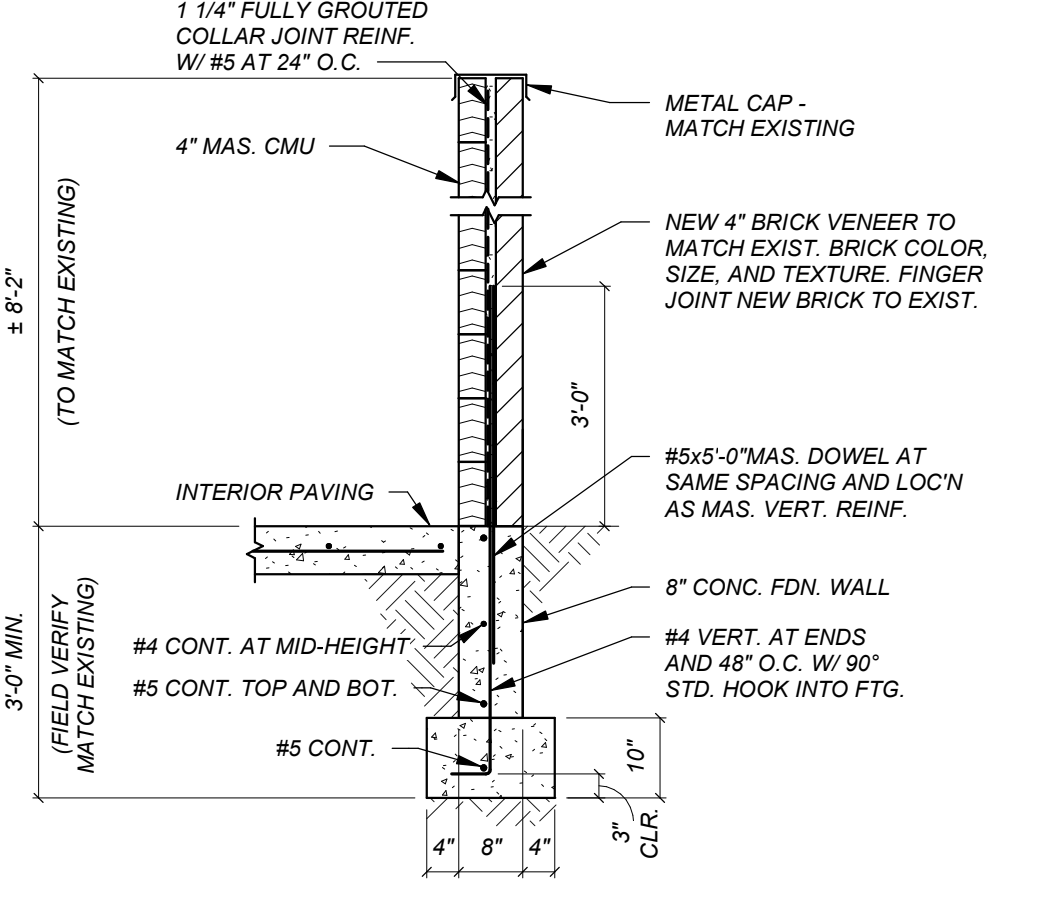
FOUNDATION PLAN - CHILLER YARD
 1/4"=1'-0"

- FIELD VERIFY ALL DIMENSIONS SHOWN.
- SEE MECHANICAL DRAWINGS FOR MODIFICATIONS TO EXISTING SPRINKLER SYSTEM.
- PAINT ENTIRE ENCLOSURE (NEW AND EXISTING) UPON COMPLETION OF EXTENSION TO MATCH ORIGINAL PAINT COLOR TO MATCH EXISTING.



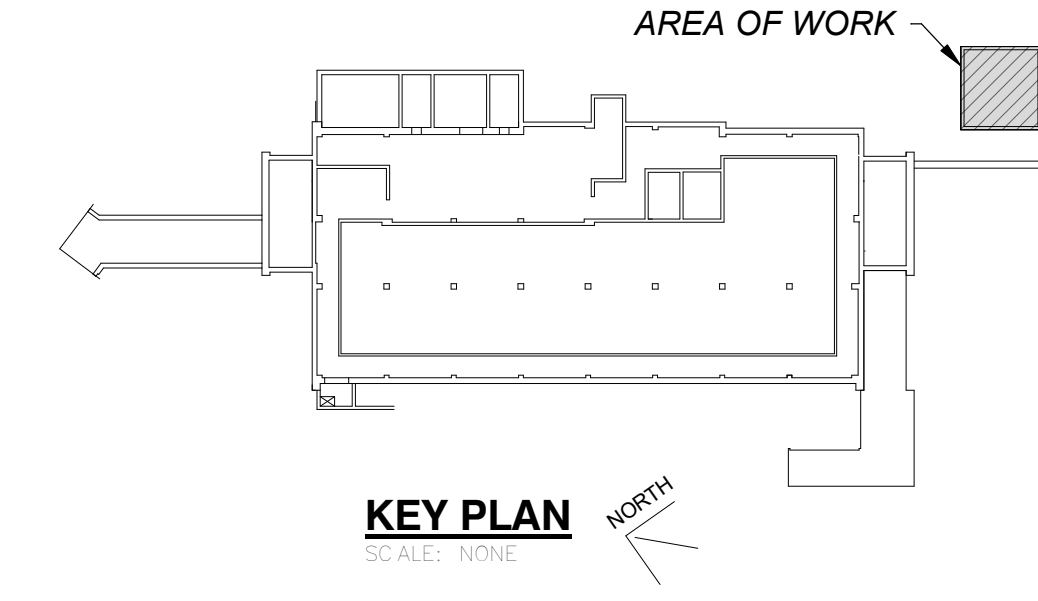
CHILLER PAD DETAIL
 1"=1'-0"

- COORDINATE SIZE AND LOCATION WITH MECHANICAL AND CIVIL DRAWINGS.



CHILLER ENCLOSURE DETAIL
 1/2"=1'-0"

- MAXIMUM TIE SPACING 36" HORIZONTALLY AND 24" VERTICALLY.
- PROVIDE W/1 WALL TIES EVERY 2 2/3'-FT. OF WALL AREA MAXIMUM.
- WALL CONSTRUCTION IS COMPOSITE MULTI-WYTHE TO MATCH EXISTING W/ 4" CMU, 1 1/4" GROUTED COLLAR JOINT, AND 4" BRICK VENEER.



KEY PLAN
 SCALE: NONE

VALVES & FITTINGS

- REFRIGERANT STRAINER
- THERMOSTATIC EXPANSION VALVE
- GLOBE VALVE
- O, S, & Y GATE VALVE W/SUPERVISORY SWITCH
- GATE VALVE
- CHECK VALVE
- HOSE GATE VALVE
- PLUG VALVE OR BALANCING COCK
- NEEDLE VALVE
- STRAINER
- STRAINER W/VALVE, HOSE END & CAP
- RELIEF VALVE
- AUTOMATIC FLOW CONTROL VALVE
- MOTOR OPERATED CONTROL VALVE (2-WAY)
- MOTOR OPERATED CONTROL VALVE (3-WAY)
- TEMPERATURE REGULATING VALVE
- SOLENOID VALVE
- PRESSURE REDUCING VALVE
- FLOAT VALVE
- BUTTERFLY VALVE
- BALL VALVE
- BALANCING VALVE
- BOILER BLOW DOWN VALVE - SLOW OPENING
- BOILER BLOW DOWN VALVE - FAST OPENING
- CALIBRATED BRONZE BALANCING VALVE
- ANCHOR
- EXPANSION JOINT, SLIDING, WITH ANCHOR
- EXPANSION JOINT, BELLOWS
- PIPE GUIDE
- ELBOW
- TEE
- ELBOW DOWN
- ELBOW UP
- TEE DOWN
- TEE UP
- CAP
- UNION
- PIPE INCREASER OR DECREASER
- FLANGE
- BLIND FLANGE
- AIR VENT
- FLOW SWITCH
- VENTURI FLOW METER
- PRESSURE/TEMPERATURE TAP
- PRESSURE GAUGE
- WATER HAMMER ARRESTER
- HOSE CONNECTION W/CAP

ABBREVIATIONS

- ADA AMERICANS WITH DISABILITIES ACT
- AFF ABOVE FINISHED FLOOR
- BAS BUILDING AUTOMATION SYSTEM
- BOP BOTTOM OF PIPE
- DCW DOMESTIC COLD WATER
- DHW DOMESTIC HOT WATER
- DN DOWN
- (E) EXISTING
- E.A. EXHAUST AIR
- FFE FINISHED FLOOR ELEVATION
- I.E. INVERT ELEVATION
- N.I.C. NOT IN CONTRACT
- O.A. OUTSIDE AIR
- R RELOCATED
- R.A. RETURN AIR
- SAN SANITARY
- S.A. SUPPLY AIR
- T.A. TRANSFER AIR
- T&P TEMPERATURE & PRESSURE
- TYP. TYPICAL
- UNO UNLESS NOTED OTHERWISE
- V VENT
- VTR VENT THROUGH ROOF
- W WASTE

DUCTWORK

- SUPPLY DIFFUSER:
NECK SIZE
DIFFUSER SYMBOL - SEE SCHEDULE
- DESIGN AIRFLOW (CFM)
QUANTITY FOR ROOM OR SPACE
ARROWS INDICATE DIRECTION OF THROW
- SUPPLY DIFFUSER
SLOT TYPE
- RETURN/EXHAUST GRILLE:
GRILLE SYMBOL - SEE SCHEDULE
- FLARED SPIN-IN FITTING
W/ MANUAL VOLUME DAMPER
- TRANSFER AIR OPENING
- OPPOSED BLADE DAMPERS
- PARALLEL BLADE DAMPERS
- UNIT HEATER (HORIZONTAL)
- POWER OR GRAVITY ROOF
VENTILATOR - EXHAUST (ERV)
- RECTANGULAR DUCT (1ST FIGURE, SIDE SHOWN 2ND FIGURE, SIDE NOT SHOWN)
- ACOUSTICAL LINING (DUCT DIMENSIONS FOR NET FREE AREA)
- DIRECTION OF FLOW
- DUCT SECTION (SUPPLY)
- DUCT SECTION (EXHAUST/RETURN)
- INCLINED RISE (R) OR DROP (D)
(ARROW IN DIRECTION OF FLOW)
- TRANSITIONS
- TRANSITION: ROUND TO RECTANGULAR
- STANDARD BRANCH FOR RECTANGULAR
SUPPLY OR RETURN DUCT
- SPLITTER DAMPER
- MANUAL VOLUME DAMPER
- MOTOR OPERATED DAMPERS
- ACCESS DOOR (AD)
- DYNAMIC FIRE DAMPER:
- CLASS I SMOKE DAMPER
- CLASS I COMBINATION
FIRE/SMOKE DAMPER
- RADIANT DAMPER
- HEAT STOP, FLOOR/CEILING OR
ROOF/CEILING ASSEMBLY
- TURNING VANES
- FLEXIBLE DUCT
- FLEXIBLE CONNECTION
- ROUND DUCT SYMBOL
- FLAT OVAL DUCT SYMBOL
- UNDERCUT DOOR

REFRIGERATION

- AD — AMMONIA DISCHARGE
- AL — AMMONIA LIQUID
- AR — AMMONIA RELIEF
- AS — AMMONIA SUCTION
- HGB — HOT GAS BYPASS
- C — CONDENSER WATER SUPPLY
- CR — CONDENSER WATER RETURN
- CHWS — CHILLED-HOT WATER SUPPLY
- CHWR — CHILLED-HOT WATER RETURN
- GCWS — GLYCOL CHILLED WATER SUPPLY
- GCWR — GLYCOL CHILLED WATER RETURN
- CWS — CHILLED WATER SUPPLY
- CWR — CHILLED WATER RETURN
- RL — REFRIGERANT LIQUID
- RS — REFRIGERANT SUCTION
- RD — REFRIGERANT DISCHARGE

MISCELLANEOUS SYMBOLS

- HEAVY LINE INDICATES NEW
- LIGHT LINE INDICATES EXISTING
- DIRECTION OF FLOW ARROW
- POINT OF CONNECTION OF NEW TO EXISTING

HEATING

- LPS — LOW PRESSURE STEAM (0-15 PSI)
- MPS — MEDIUM PRESSURE STEAM (15-50 PSI)
- HPS — HIGH PRESSURE STEAM (ABOVE 50 PSI)
- LPC — LOW PRESSURE CONDENSATE
- MPC — MEDIUM PRESSURE CONDENSATE
- HPC — HIGH PRESSURE CONDENSATE
- PC — PUMPED CONDENSATE
- BFW — FEED WATER
- HTWS — HIGH TEMPERATURE HOT WATER SUPPLY
- HTWR — HIGH TEMPERATURE HOT WATER RETURN
- MTWS — MEDIUM TEMPERATURE HOT WATER SUPPLY
- MTWR — MEDIUM TEMPERATURE HOT WATER RETURN
- HWS — LOW TEMPERATURE HOT WATER SUPPLY
- HWR — LOW TEMPERATURE HOT WATER RETURN
- GHS — GLYCOL HEATING WATER SUPPLY
- GHR — GLYCOL HEATING WATER RETURN
- HCS — DUAL TEMPERATURE WATER SUPPLY
- HCR — DUAL TEMPERATURE WATER RETURN
- BBD — BOILER BLOW-DOWN
- G — GAS
- F & T TRAP
- THERMODYNAMIC TRAP
- BUCKET TRAP
- THERMOSTATIC TRAP
- FLOAT TRAP

MISCELLANEOUS PIPING

- A — COMPRESSED AIR
- F — FIRE LINE
- F — UNDERSLAB FIRE LINE
- DE — DISTILLED WATER
- FOS — FUEL OIL SUPPLY
- FOR — FUEL OIL RETURN
- FOV — FUEL OIL VENT
- HE — HELIUM
- H — HYDROGEN
- ICW — INDUSTRIAL COLD WATER
- IHR — INDUSTRIAL HOT WATER RETURN
- IHW — INDUSTRIAL HOT WATER SUPPLY
- LN — LIQUID NITROGEN
- LOX — LIQUID OXYGEN
- LPG — LIQUID PETROLEUM GAS
- NO — NITROUS OXIDE
- N — NITROGEN
- OX — OXYGEN
- PN — PNEUMATIC TUBE RUN
- VAC — VACUUM
- VPD — VACUUM PUMP DISCHARGE
- BR — BRINE RETURN
- B — BRINE SUPPLY

TEMPERATURE CONTROLS

- SEE TEMPERATURE CONTROL DRAWINGS FOR ADDITIONAL LEGEND
- TEMPERATURE SENSOR
 - NIGHT SETBACK THERMOSTAT
 - PUSH BUTTON
 - HUMIDITY SENSOR
 - OCCUPANCY SENSOR
 - VARIABLE FREQUENCY DRIVE (VFD)
 - MOTOR STARTER

GENERAL NOTES:

1. THESE LEGENDS ARE COMPOSED OF STANDARD SYMBOLS AND ARE PERTINENT TO THE CONDITIONS ON THIS SET OF DRAWINGS TO THE EXTENT APPLICABLE.
2. ADDITIONAL LEGENDS AND/OR ANOTHER LEGEND SHEET MAY APPEAR IN THIS SET OF DRAWINGS TO INDICATE SPECIFIC CONDITIONS IN LIEU OF SYMBOLS SHOWN ON THIS SHEET.
3. EXISTING FACILITIES TO BE REMOVED ARE INDICATED BY USE OF THE FOLLOWING SYMBOL
4. NOT ALL SYMBOLS SHOWN ON THIS LEGEND ARE NECESSARILY USED ON THE FOLLOWING SHEETS.
5. DRAWINGS ARE DIAGRAMMATIC, DO NOT SCALE FOR INSTALLATION. FIELD VERIFY ALL DIMENSIONS PRIOR TO INSTALLATION.

SCHENDT ENGINEERING CORPORATION
CONSULTING ENGINEERS
5100 CENTRAL EXP. BLVD. SUITE 200
COLORADO SPRINGS, CO 80933
PH: (719) 637-8800 • sec@schendt.com

COLORADO LICENSED
BRIAN A. BURGESS
PE #30063
PROFESSIONAL ENGINEER
Digitally signed by Brian Burgess, DN
Date: 12.09.2022

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UCCS CRAGMOR HALL
CHILLER REPLACEMENT
1420 AUSTIN BLUFFS PARKWAY, COLORADO
SPRINGS, CO 80933

DESIGNED BY
BAB

DRAWN BY
NDK

CHECKED BY
KMM

PROJECT NO.
21142

DATE
12/09/2022

SHEET TITLE
**MECHANICAL
LEGEND**

SHEET NO.
M0.01

GENERAL NOTES

GENERAL MECHANICAL REQUIREMENTS

- 1. PROVIDE ALL REQUIRED PERMITS, INSPECTIONS, AND COORDINATION WITH GOVERNING AUTHORITIES. INSTALLATION SHALL COMPLY WITH ALL APPLICABLE CODES, TO INCLUDE:
a. 2021 INTERNATIONAL BUILDING CODE (IBC)
b. 2021 INTERNATIONAL MECHANICAL CODE (IMC)
c. 2021 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
d. 2018 INTERNATIONAL FUEL GAS CODE (IFGC)
e. 2018 INTERNATIONAL PLUMBING CODE (IPC)
f. 2021 INTERNATIONAL FIRE CODE (IFC)
g. NFPA 70-NATIONAL ELECTRICAL CODE (NEC) 2020
2. WHERE CONFLICTS ARISE BETWEEN THE DRAWINGS, SPECIFICATIONS, SCHEDULES, NOTES OR OTHER ITEMS IN THE CONTRACT DOCUMENTS, THE MOST STRINGENT OF THE CONDITIONS SHALL APPLY.
3. UNLESS OTHERWISE NOTED, THE WORK DESCRIBED ON THE PLANS AND SPECIFICATIONS SHALL INCLUDE THE FURNISHING AND INSTALLATION OF ALL LABOR AND MATERIALS NECESSARY FOR COMPLETE AND OPERATIONAL SYSTEMS. CONTRACTOR SHALL FURNISH THESE EVEN IF ALL ITEMS REQUIRED (I.E. OFFSETS, ISOLATION AND BALANCING DEVICES, MAINTENANCE CLEARANCES, ETC.) ARE NOT SPECIFICALLY SHOWN.
4. DATA GIVEN ON THE DRAWINGS IS AS ACCURATE AS COULD BE SECURED. ABSOLUTE ACCURACY IS NOT GUARANTEED; THE CONTRACTOR SHALL OBTAIN AND VERIFY EXACT LOCATIONS, MEASUREMENTS, SPACE REQUIREMENTS, POTENTIAL CONFLICTS WITH OTHER TRADES, ETC. AT THE SITE AND SHALL SATISFACTORILY ADAPT HIS WORK TO ACTUAL CONDITIONS AT THE PROJECT SITE. THE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND SHALL NOT BE SCALED. THIS DOES NOT RELIEVE ANY SUB-CONTRACTOR FROM COORDINATING WORK WITH ALL OTHER TRADES AND FROM ADJUSTING HIS WORK AS REQUIRED BY THE ACTUAL CONDITIONS OF THE PROJECT. THE CONTRACTOR SHALL VISIT THE SITE BEFORE SUBMITTING A BID TO BECOME THOROUGHLY FAMILIAR WITH THE ACTUAL CONDITIONS OF THE PROJECT. NO EXTRAS WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF EXISTING CONDITIONS.
5. THE CONTRACTOR SHALL TAKE FIELD MEASUREMENTS AND VERIFY FIELD CONDITIONS AND SHALL CAREFULLY COMPARE SUCH FIELD MEASUREMENTS AND CONDITIONS AND OTHER INFORMATION KNOWN TO THE CONTRACTOR WITH THE CONTRACT DOCUMENTS BEFORE COMMENCING ANY ACTIVITIES AFFECTED THEREBY.
6. SUBMIT RFI (REQUEST FOR INFORMATION) IF QUESTIONS OR CONCERNS ARISE. ALL RFI'S SHALL HAVE A PROPOSED SOLUTION.
7. VERIFY THE ELECTRICAL SERVICE PROVIDED BY THE ELECTRICAL CONTRACTOR BEFORE ORDERING ANY EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS.
8. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PROVIDE MANUFACTURER'S RECOMMENDED SERVICE CLEARANCE AROUND ALL EQUIPMENT. COMPLETE MANUFACTURER'S START-UP REPORTS AND SUBMIT TO ENGINEER WITH O&M MANUALS UPON COMPLETION.
9. GUARANTEE ALL MATERIALS, LABOR, WORKMANSHIP AND THE PROPER OPERATION OF ALL EQUIPMENT INSTALLED FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE. REPAIR OR REPLACE AT NO EXPENSE TO THE OWNER, ALL DEFECTS WHICH MAY ARISE DURING THIS TIME DUE TO INFERIOR OR DEFECTIVE MATERIALS, EQUIPMENT OR WORKMANSHIP.
10. DEFINITIONS:
a. (N) INDICATES "NEW" EQUIPMENT TO BE PROVIDED UNDER THIS CONTRACT.
b. (E) INDICATES "EXISTING" EQUIPMENT ON SITE WHICH MAY OR MAY NOT NEED TO BE RELOCATED AS A PART OF THIS WORK.
c. (D) INDICATES EXISTING EQUIPMENT SCHEDULED FOR DEMOLITION.
d. (R) INDICATES EQUIPMENT TO BE RELOCATED.
e. "FURNISH" MEANS TO "SUPPLY" AND USUALLY REFERS TO AN ITEM OF EQUIPMENT.
f. "INSTALL" MEANS TO "SET IN PLACE, CONNECT AND PLACE INTO FULL OPERATIONAL ORDER".
g. "PROVIDE" MEANS TO FURNISH AND INSTALL.
11. KEEP DEMOLITION & CUTTING TO MINIMUM REQUIRED FOR PROPER EXECUTION OF WORK. NO CUTTING (NOT SHOWN ON THE CONTRACT DOCUMENTS) SHALL BE DONE WITHOUT THE APPROVAL OF THE ARCHITECT, ENGINEER, OR OWNER AS TO LOCATIONS, METHOD AND EXTENT OF THE CUTTING.
12. WHERE DEMOLITION WORK IS NOTED, REMOVE ALL ASSOCIATED APPURTENANCES, HANGERS, FASTENERS, DUCT, PIPING, CONTROLS, ETC. THIS SHALL ALSO INCLUDE ANY ABANDONED EQUIPMENT, APPURTENANCES, HANGERS, FASTENERS, DUCT, PIPING, CONTROLS, ETC. NOT REQUIRED FOR NEW WORK.
13. REPAIR ALL ACCIDENTAL OR INTENTIONAL DAMAGE, PLACES WHERE DEMOLITION HAS OCCURRED, AND WHERE NEW EQUIPMENT HAS BEEN INSTALLED TO MATCH EXISTING CONSTRUCTION WITH NO NOTICEABLE DIFFERENCE IN CONTINUITY, APPEARANCE, OR FUNCTION.
14. ALL PRODUCTS SHALL BE NEW AND UNDAMAGED, UNLESS NOTED OTHERWISE. CONTRACTOR SHALL REPLACE OR REPAIR ALL PRODUCTS TO NEW CONDITION, FOR EXAMPLE, DENTED CASINGS AND EQUIPMENT DOORS, DENTED AND BENT GRILLES, REGISTERS, AND DIFFUSERS, DENTED DUCTWORK, SCRATCHED PAINT, ETC.
15. WHEN PRODUCTS ARE SPECIFIED BY MANUFACTURER AND MODEL NUMBER, EQUIVALENT PRODUCTS BY OTHER MANUFACTURERS LISTED MAY BE PROVIDED. PRODUCT EQUIVALENCY SHALL BE DETERMINED BY ENGINEER. CONTRACTOR IS RESPONSIBLE FOR COORDINATION AND DESIGN OF SUBSTITUTED EQUIPMENT; THIS SHALL INCLUDE ADDITIONAL WEIGHT, PROPER FIT, AND ALL OTHER ASPECTS.
16. FIRE STOPPING REQUIREMENT. PENETRATIONS THRU RATED WALLS AND FLOORS SHALL BE SEALED WITH A MATERIAL CAPABLE OF PREVENTING THE PASSAGE OF FLAMES AND HOT GASSES WHEN SUBJECTED TO THE REQUIREMENTS OF THE TEST STANDARD SPECIFIC FOR FIRE STOPS ASTM-E-814. ACCEPTANCE MATERIALS INCLUDE: DOW CORNING RTV FIRE STOP FOAM FOR BARE PIPE, METAL CONDUIT, AND ELECTRICAL CABLE; 3M FIRE DAM 150 CAULK FOR BARE PIPE, METAL CONDUIT, AND BUILDING CONSTRUCTION GAPS; 3M FS-195 INTUMESCENT STRIPS FOR INSULATED PIPES, PLASTIC PIPE OR CONDUIT, AND ELECTRICAL CABLE.

- 17. NOTIFY ENGINEER ONE WEEK IN ADVANCE WHEN WORK IS COMPLETE AND READY FOR OBSERVATION.
18. SUBMIT MECHANICAL AND PLUMBING EQUIPMENT, MATERIALS, AND CONTROLS SUBMITTALS TO ENGINEER FOR REVIEW PRIOR TO ORDERING EQUIPMENT.
19. MAINTAIN A MARK-UP SET OF DRAWINGS WHICH INDICATE VARIATIONS IN THE ACTUAL INSTALLATION FROM THE ORIGINAL DESIGN. SUBMIT "AS-BUILT" DRAWINGS TO THE ARCHITECT/ENGINEER FOR REVIEW PRIOR TO FINAL PAY APPLICATION. VARIATIONS SHALL BE APPROVED PRIOR TO SUBMITTING AS-BUILTS.
20. SUBMIT ELECTRONIC PDF OF OPERATION AND MAINTENANCE MANUALS AND WARRANTIES. SUBMIT TWO (2) HARD COPIES OF ALL OPERATION AND MAINTENANCE MANUALS AND WARRANTIES IN TABBED 3-RING BINDERS TO OWNER. O&M MANUALS SHALL BE PREPARED IN FULL COMPLIANCE WITH THE 2021 IECC 408.1.1. O&M MANUALS SHALL CONTAIN ALL TEAM CONTACTS, EMERGENCY CONTACTS, WARRANTY PROCEDURES, COMPREHENSIVE LIST OF EXTENDED WARRANTIES, COMPREHENSIVE FILTER SCHEDULE INDICATING SIZE AND TYPE OF FILTER FOR EACH PIECE OF EQUIPMENT, COMPREHENSIVE BELT SCHEDULE INDICATING SIZE AND TYPE OF BELTS FOR EACH PIECE OF EQUIPMENT, APPROVED SUBMITTALS, MANUFACTURERS' STARTUP REPORTS, TAB REPORT, CONTROLS, AND MANUFACTURERS' OPERATING MANUALS.
21. PROVIDE TRAINING FOR ALL SYSTEMS. APPROVED O&M'S SHALL BE USED FOR TRAINING. PROVIDE TRAINING AGENDA'S WITH NAME OF QUALIFIED TRAINER FOR ALL SYSTEMS. SUBMIT TRAINING ATTENDANCE SHEET FOR ALL TRAINING SESSIONS.
22. PROVIDE EMT CONDUIT FOR ALL EXPOSED LOW VOLTAGE AND CONTROL CABLING.
23. PAINT ALL EXPOSED CONDUIT, PIPING, AND DUCTWORK.
24. ISOLATE ALL PRESSURIZED PIPE (WATER, ETC.) AT EACH RISER, BRANCH, AND PIECE OF EQUIPMENT, AND AREA SERVED.

METERS AND GAGES:

- 1. THERMOMETERS: LIGHT POWERED DIGITAL IMMERSION WELL. THERMICE 5X9 OR EQUIVALENT. PROVIDE WHERE DEPICTED ON DRAWINGS AND ADJACENT TO TEMPERATURE SENSORS. PROVIDE P/T PORT ADJACENT TO THERMOMETER.
2. PRESSURE GAGES: THERICE 700, LIQUID DIAL, 4" DIAL, LAMINATED GLASS, +/-1%. PROVIDE WHERE DEPICTED ON DRAWINGS AND ADJACENT TO PRESSURE SENSORS. PROVIDE P/T PORT ADJACENT TO GAGE.
3. PROVIDE SPECIFIED METERS AND GAGES ON EQUIPMENT REGARDLESS OF METERS AND GAGES PROVIDED WITH OR INTEGRAL TO EQUIPMENT.

MECHANICAL HANGERS AND SUPPORTS:

- 1. PIPING 1.5" AND SMALLER: GALVANIZED CLEVIS OR TRAPEZE HANGERS. INSULATED PIPING SHALL HAVE SHEET METAL SHIELDS. PIPING SHALL BE FASTENED TO TRAPEZE HANGERS WITH CLAMP.
2. PIPING 1.5" AND LARGER: GALVANIZED CLEVIS OR TRAPEZE HANGERS. INSULATED PIPING ON CLEVIS HANGERS SHALL HAVE 180 DEGREE CALCIUM SILICATE INSERTS WITH SHEET METAL SHIELDS. INSULATED PIPING ON TRAPEZE HANGERS SHALL HAVE 360 DEGREE CALCIUM SILICATE INSERTS WITH SHEET METAL SHIELDS. PIPING SHALL BE FASTENED TO TRAPEZE HANGERS WITH CLAMP OVER INSERT.
3. INSULATED PIPING: HANGERS MAY NOT PENETRATE INSULATION, EXCEPT AT VERTICAL SUPPORTS AND AT SADDLES.
4. HANGERS AND SUPPORTS SHALL BE DESIGNED BY THE CONTRACTOR.
5. SUSPEND EACH TRADE'S WORK SEPARATELY FROM THE STRUCTURE.
6. MAXIMIZE ACCESS TO ALL EQUIPMENT AND OFFSET PIPING AS REQUIRED.
7. PIPING SHALL BE HELD TIGHT TO STRUCTURE EXCEPT WHERE NOTED OTHERWISE. UPPER SUPPORT FASTENERS ATTACHING TO METAL DECKING SHALL BE HORIZONTAL IN SHEAR, NOT VERTICAL.
8. NO EQUIPMENT OR PIPING IS PERMITTED TO BE SUPPORTED FROM THE BOTTOM CHORD OF STRUCTURAL MEMBERS, UNLESS PERMITTED BY STRUCTURAL ENGINEER.
9. PROVIDE COOPER B-LINE DURA-BLOK SUPPORTS OR EQUIVALENT FOR ALL PIPING ON CONCRETE.

IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

- 1. LABEL ALL EQUIPMENT WITH EQUIPMENT TAG FROM CONTRACT DOCUMENTS AND AS TO AREA SERVED. LABELS SHALL BE MELAMINE ON VINYL WITH 1" TALL LETTERS.
2. LABEL PIPING AND ACCESS PANELS AS INDICATED ON DRAWINGS WITH ADHESIVE LABELS WITH 1.5" TALL LETTERS AND WITH FLOW ARROWS. PIPING LABELS SHALL BE ATTACHED EVERY 20 FEET. LABELS AND LETTERING COLOR SHALL CONFORM TO ANSI/ASME A13.1.
3. LABEL ALL CONTROL DEVICES WITH DEVICE NAME AND EQUIPMENT CONTROLLED. WITH 0.5" TALL CLEAR LABELS WITH BLACK LETTERS.
4. PROVIDE VALVE TAGS ON ALL VALVES ON HYDRONIC PIPING.

TESTING, ADJUSTING AND BALANCING (TAB)

- 1. PROVIDE COMPLETED HVAC BALANCING REPORT AT FINAL INSPECTION TO THE AUTHORITY HAVING JURISDICTION AND TO THE ENGINEER PRIOR TO PUNCH LIST.
2. TAB CONTRACTOR SHALL BE NEBB, AABC, OR TABB CERTIFIED.
3. SETPOINTS REQUIRED TO BE DETERMINED BY TAB CONTRACTOR SHALL BE INDICATED ON THE REPORT. I.E., DUCT STATIC PRESSURE SETPOINT, PUMP STATIC PRESSURE SETPOINT, AND MINIMUM OA DAMPER POSITION.
4. ALL DEVICES SHALL BE BALANCED WITHIN 0.0 TO + 10%.
5. PUMPS 1-HP AND LARGER SHALL BE MEASURED AND PLOTTED ON PUMP CURVE.
6. AFTER SUBMITTING TAB REPORT, TAB CONTRACTOR SHALL DEMONSTRATE 10% OF REPORT TO OWNER/ENGINEER UPON REQUEST. IF WORK IS DETERMINED TO BE OUT OF COMPLIANCE, THEN CONTRACTOR WILL BE REQUIRED TO CORRECT AND DEMONSTRATE UNTIL WITHIN COMPLIANCE.
7. MARK BALANCED SETTING ON ALL BALANCING VALVE HANDLES WITH PERMANENT MARKER.

HVAC PIPE INSULATION

- 1. REFER TO THE MECHANICAL INSULATION SCHEDULE ON THE DRAWINGS FOR INSULATION TYPE, THICKNESS AND JACKETING REQUIREMENTS.
2. INSULATE CHILLED WATER VALVE BODIES, STRAINERS, AIR SEPARATORS AND PUMP VOLUTES.
3. PROVIDE STUCCO EMBOSSED ALUMINUM JACKETING ON ALL PIPING OUTDOORS.
4. PROVIDE PVC JACKETING ON ALL EXPOSED PIPING BELOW 8 FEET INDOORS AND IN MECHANICAL ROOMS.
5. INSULATION SHALL BE CONTINUOUS THROUGH WALLS AND HANGERS.
6. INSULATION SHALL BE CONTINUOUS OVER VALVES, PUMPS, STRAINERS, AIR SEPARATORS, CHECK VALVES THAT ARE OVER 1" PER 2021 IECC C404.4. UNIONS AND STRAINERS SHALL HAVE REMOVABLE COVERS.
7. EXISTING INSULATION THAT IS DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED WITH INSULATION OF TYPE AND THICKNESS TO MATCH EXISTING.

INSTRUMENTATION AND CONTROL FOR HVAC

- 1. PROVIDE BLUE EMT CONDUIT FOR ALL LOW VOLTAGE AND CONTROL CABLING.
2. PROVIDE COMPLETE GRAPHICS FOR ALL CONTROLLED SYSTEMS. PROVIDE UNITS FOR ALL DATE, SUCH AS CFM, PSI, F, % SPEED, HZ, % OPEN, % CLOSED, NORMAL/ALARM, ON/OFF, START/STOP.
3. PROVIDE OPERATING SCHEDULES FOR ALL CONTROLLED EQUIPMENT. VERIFY EXACT OPERATING SCHEDULE WITH USER OR CONTACT ENGINEER.
4. SETUP TRENDS FOR ALL MOTOR STATUSES, DISCHARGE AIR TEMPERATURES, OA DAMPERS, AND CONTROL VALVES.
5. IN ADDITION TO SEQUENCES OF OPERATIONS, PROVIDE ALL ASHRAE 90.1 REQUIRED SEQUENCES, SUCH AS OPTIMAL START, 5F DEAD BAND BETWEEN HEAT AND COOL, MAXIMUM 30% REHEAT ON VAV, INTEGRATED ECONOMIZER, VAV STATIC PRESSURE RESET, ETC.
6. PROVIDE OPERATIONAL NOTES ON GRAPHICS SO USER CAN EASILY UNDERSTAND SEQUENCE.
7. PROVIDE RELAYS AS REQUIRED TO PROVIDE GRAPHICS FOR ALL SAFETIES, SUCH AS SMOKE DETECTORS, FREEZE-STATS, PRESSURE HIGH AND LOW LIMITS, FLOW SWITCHES, FILTER SWITCHES, ETC. PROVIDE ADDITIONAL TEXT ON GRAPHIC INDICATING FIELD SETPOINT.
8. LABEL SAFETIES SUCH AS FREEZE-STATS, PRESSURE HIGH LIMITS, FILTER SWITCHES, WITH CALIBRATED SETTING.
9. SETUP ALL ALARMS AND ALARM PRIORITIES. PROVIDE MATRIX AND DEMONSTRATE DURING TRAINING.
10. ANY SETPOINT LISTED AS ADJUSTABLE (ADJ) IN SEQUENCE OF OPERATIONS SHALL BE ABLE TO BE OVERRIDDEN BY USER ON GRAPHICS.
11. PROVIDE COPY OF CONTROL AS-BUILTS AND DEVICES ON BAS.
12. PROVIDE STATUS VIA ANIMATION AND WITH TEXT, I.E. STATUS 'ON'.
13. PROVIDE ALGORITHM TO ELIMINATE SENSORS THAT GO OUT OF RANGE AND SEND ALARM.
14. INTEGRATE ALL VFD CONTROLLERS. PROVIDE HARDWIRED START/STOP, STATUS, AND SPEED AND DISPLAY ON GRAPHICS. PROVIDE KW, KWH, OUTPUT SPEED, AND FAULT/ALARM VIA COMMUNICATIONS INTERFACE CARD.
15. MECHANICAL CONTRACTOR TO PROVIDE P/T PORT, AND THERMOMETER OR PRESSURE GAUGE, ADJACENT TO ALL TEMPERATURE SENSORS AND PRESSURE SENSORS.
16. LABEL LOCATION OF ALL CONTROL DEVICES ON AS-BUILTS.
17. MEASUREMENT AND VERIFICATION ENERGY MONITORING POINTS: PROVIDE MONTHLY EXPORTED CSV FILE INDICATING AVERAGE TEMPERATURE FOR MONTH, DAYS IN MONTH, AND ENERGY USAGE FOR EACH ENERGY CONTROL POINT (I.E. KWH ELECTRICITY, AND KW ELECTRIC DEMAND). RESET VALUES FOR EACH MONTH.

HYDRONIC PIPING

- 1. PROVIDE BRONZE NIPPLES OR BRONZE UNIONS BETWEEN DISSIMILAR MATERIALS. PROVIDE UNIONS AT EQUIPMENT CONNECTIONS ONLY. PROVIDE ISOLATION VALVES UP AND DOWN STREAM OF UNIONS.
2. PROVIDE UNIONS AT ALL EQUIPMENT CONNECTIONS 1" AND LARGER, AND AT ALL CONTROL VALVES.
3. PROVIDE FULL PORT BRONZE BALL VALVES WITH EXTENDED STEMS FOR PIPING 2" AND SMALLER.
4. PROVIDE BUTTERFLY VALVES FOR PIPING 2.5" AND LARGER. BONDED EPDM SEAT, LUG BODY STYLE, NYLON 11 COATED DUCTILE IRON DISC. BRAY 31H OR EQUAL.
5. PROVIDE BALL VALVE AND 0.75" HOSE CONNECTION WITH CAP ON STRAINERS.
6. HYDRONIC PIPING 2" AND SMALLER: PROVIDE TYPE L DRAWN TEMPER COPPER COMPLYING WITH ASTM B88 WITH SOLDERED OR BRAZED FITTINGS. PRO PRESS STYLE FITTINGS OR OTHER STYLE MECHANICAL FITTINGS ARE NOT ALLOWED.
7. HYDRONIC PIPING LARGER THAN 2": ASTM A53 SCHEDULE 40 STEEL WITH WELDED FITTINGS. GROOVED JOINTS AND OTHER MECHANICAL STYLE FITTINGS ARE NOT ALLOWED.
8. PROVIDE LINK SEALS AT ALL BELOW GRADE EXTERIOR WALL PENETRATIONS. PROVIDE BACKER ROD AND CAULK TO FILL ANNULAR WHEN INSTALLED ABOVE GRADE.
9. HYDRONIC PIPING 2" AND SMALLER: BRONZE BALL VALVES, STRAINERS, AND APPURTENANCES.
10. PROVIDE MANUAL AIR VENTS AT ALL HIGH POINTS.
11. PROVIDE P/T PORTS AT ALL CONTROL DEVICES AND INLET AND OUTLET OF MECHANICAL EQUIPMENT. P/T PORTS AT INLET AND OUTLET OF MECHANICAL EQUIPMENT SHALL BE INSTALLED AT THE SAME ELEVATION.
12. PROVIDE DRAIN VALVES WITH HOSE END CONNECTIONS AND CAPS AT ALL LOW POINTS.
13. PROVIDE DOW FROST HD INHIBITED PROPYLENE GLYCOL AS REQUIRED FOR FREEZE PROTECTION DOWN TO 0.0F FREEZE POINT (APPROXIMATELY 30%).
14. PROVIDE ISOLATION VALVES AT EVERY HYDRONIC BRANCH TO EACH FLOOR, PIECE OF EQUIPMENT, AND TO ISOLATE MECHANICAL ROOM.

WATER TREATMENT

- 1. PROVIDE WATER TREATMENT REPORT PER SPECIFICATIONS.
2. PROVIDE SYSTEM FLUSH.

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5100 CANTON ROAD, SUITE 1070, SPRINGS, CO 80903
PH: (719) 637-8850 • sec@schendt.com

COLORADO LICENSED PROFESSIONAL ENGINEER
Brian Burgess, P.E. No. 103065
Digitally signed by Brian Burgess, DN: cn=Brian Burgess, o=Schendt Engineering, Inc., email=b.gburgess@schendt.com, c=US
Date: 12.09.2022

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1420 AUSTIN BLUFFS PARKWAY, COLORADO SPRINGS, CO 80903

DESIGNED BY

BAB

DRAWN BY

NDK

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DATE

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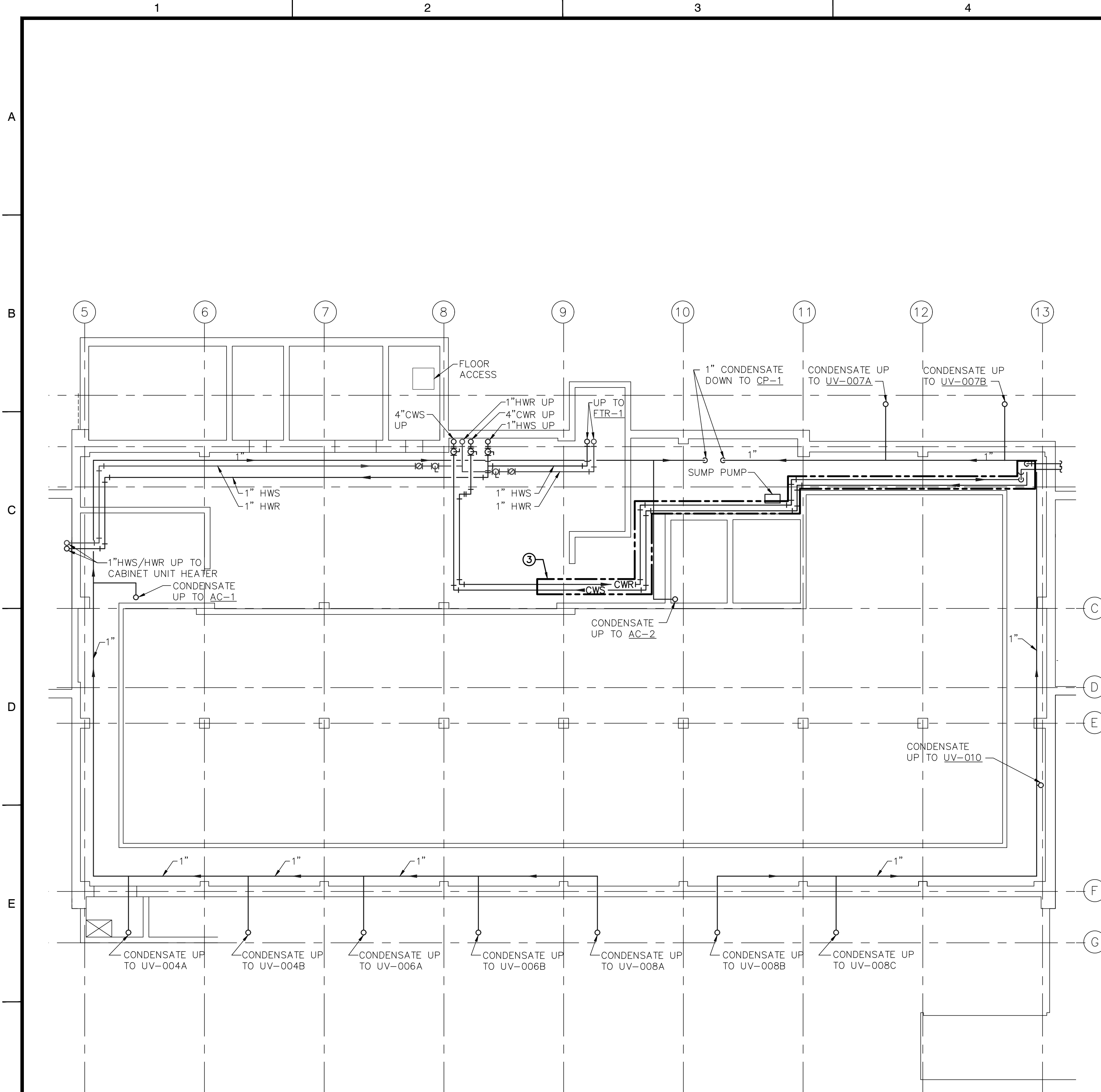
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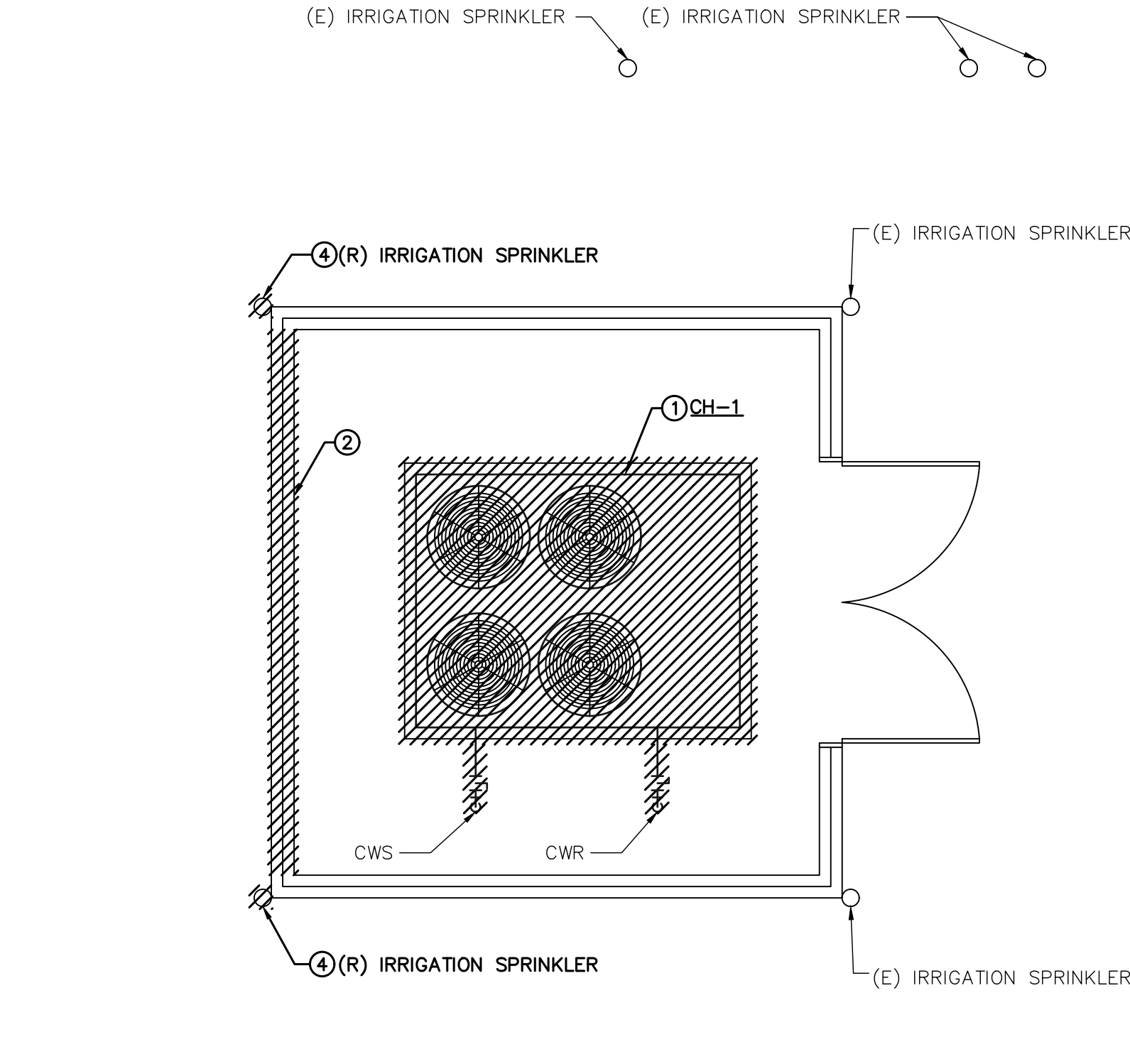
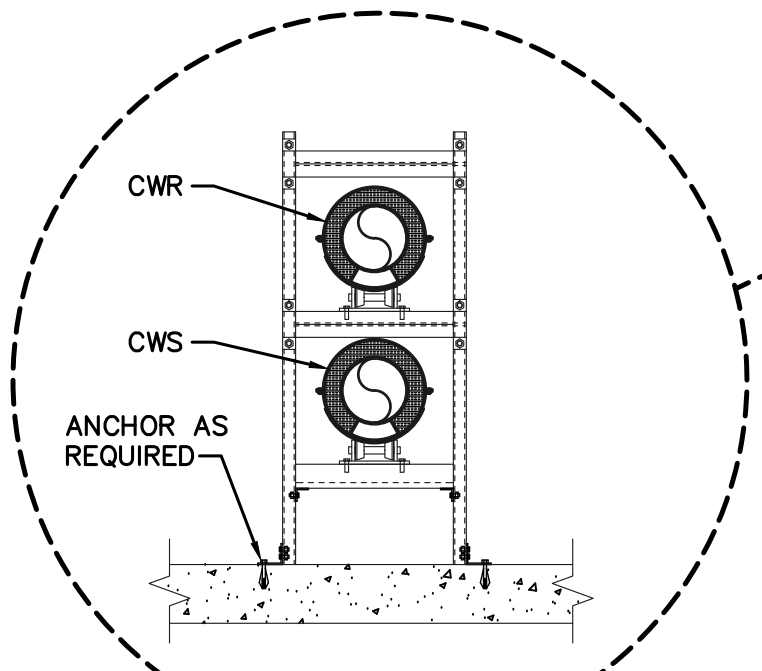
MECHANICAL GENERAL NOTES

NO. 02

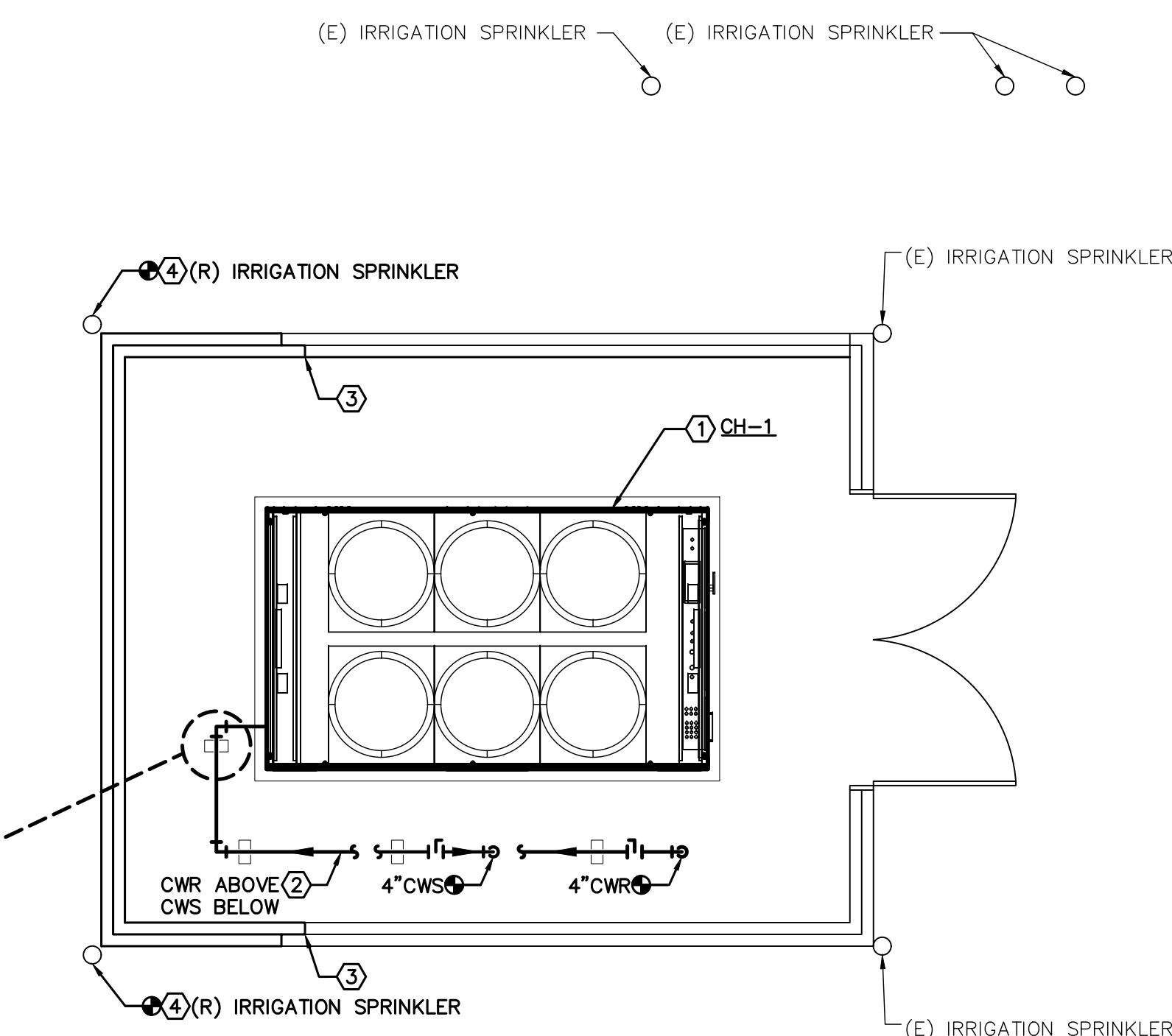
M0.02



MECHANICAL PLAN - TUNNEL AREA
 SCALE: 1/8" = 1'-0"



MECHANICAL DEMOLITION PLAN - CHILLER YARD
 SCALE: 1/4" = 1'-0"



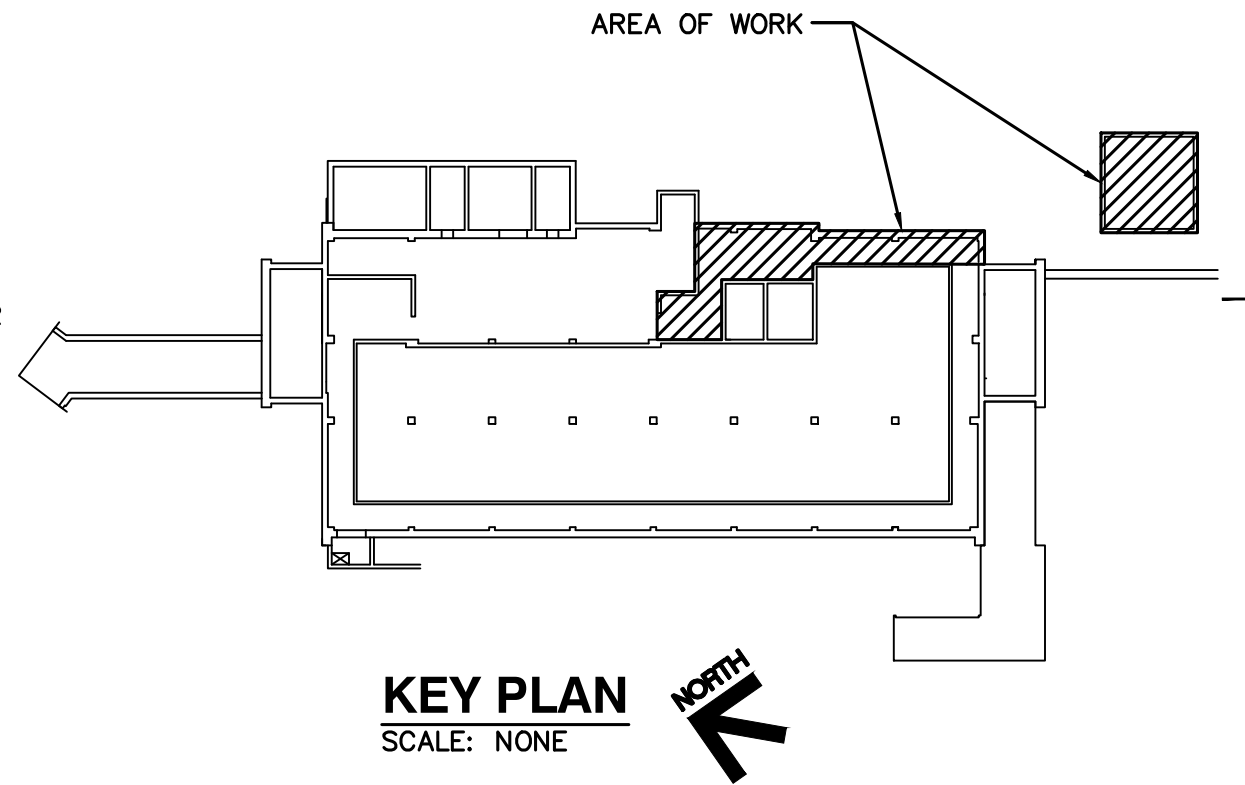
MECHANICAL NEW WORK PLAN - CHILLER YARD
 SCALE: 1/4" = 1'-0"

DEMOLITION KEY NOTES

- ① REMOVE CHILLER CH-1, ASSOCIATED PIPING, AND APPURTENANCES. REMOVE HOUSEKEEPING PAD. REFER TO STRUCTURAL DRAWINGS.
- ② BRICK AND CMU WALL TO BE REMOVED. REFER TO STRUCTURAL DRAWINGS.
- ③ REMOVE DAMAGED INSULATION AS REQUIRED AND PROVIDE NEW INSULATION TO MATCH EXISTING.
- ④ REMOVE AND RELOCATE IRRIGATION SPRINKLER HEAD AND UNDERGROUND PIPING AS REQUIRED.

NEW WORK KEY NOTES

- ① PROVIDE CHILLER CH-1 AND HOUSEKEEPING PAD. HOUSEKEEPING PAD SHALL EXTEND MINIMUM OF 4' BEYOND EACH SIDE OF CHILLER. REFER TO STRUCTURAL DRAWINGS.
- ② PROVIDE CHILLED WATER PIPING. COORDINATE PIPE ROUTING AND ELEVATIONS WITH NEW CHILLER AND EXISTING CONDITIONS. REFER TO M7.02 FOR ADDITIONAL REQUIREMENTS.
- ③ REFER TO STRUCTURAL DRAWINGS FOR CHILLER ENCLOSURE REQUIREMENTS. PAINT EXTENDED WALL TO MATCH EXISTING ADJACENT WALL AND FINISH ON BOTH SIDES.
- ④ EXTEND UNDERGROUND PIPING AS REQUIRED FOR RELOCATED SPRINKLER. MATCH EXISTING PIPING MATERIAL AND INSTALLATION SUCH AS SWING JOINTS AND OTHER APPURTENANCES. IRRIGATION PIPING SHALL NOT BE LOCATED UNDER MECHANICAL YARD CONCRETE.



KEY PLAN
 SCALE: NONE

SCHENDT
ENGINEERING
CORPORATION
CONSULTING ENGINEERS
 5100 COX ROAD, SUITE 100, COLORADO SPRINGS, CO 80933
 • PH: (719) 637-8800 • SEC@SCHENDT.COM

COLORADO LICENSED
 BRIAN A. BURGESS
 PE #30065
 PROFESSIONAL ENGINEER
 Digitally signed by Brian Burgess, PE
 Date: 12.09.2022

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CHILLER REPLACEMENT
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 SPRINGS, CO 80933

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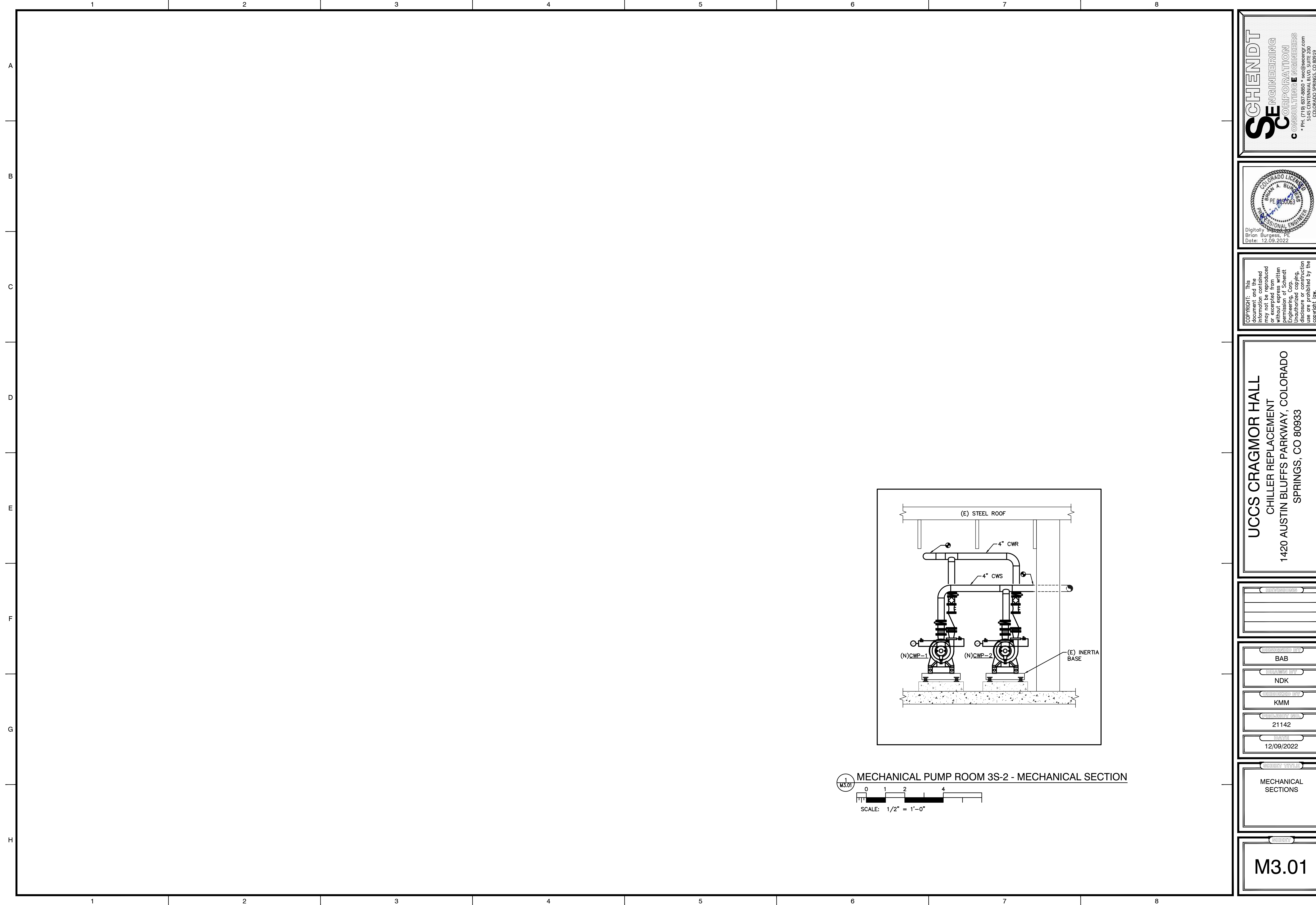
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DATE
12/09/2022

SHEET TITLE
MECHANICAL PLAN - CRAWL AREA & CHILLER YARD

SHEET

M1.01



M3.01 MECHANICAL PUMP ROOM 3S-2 - MECHANICAL SECTION

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

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SC CORPORATION
CONSULTING ENGINEERS

5100 Cass Street, Suite 100
 Colorado Springs, CO 80904
 • PH: (719) 687-8800 • sec@schendt.com

COLORADO LICENSED
 BRIAN A. BURGESS
 PE #300063
 PROFESSIONAL ENGINEER

Digital Signature
 Brian Burgess, PE
 Date: 12.09.2022

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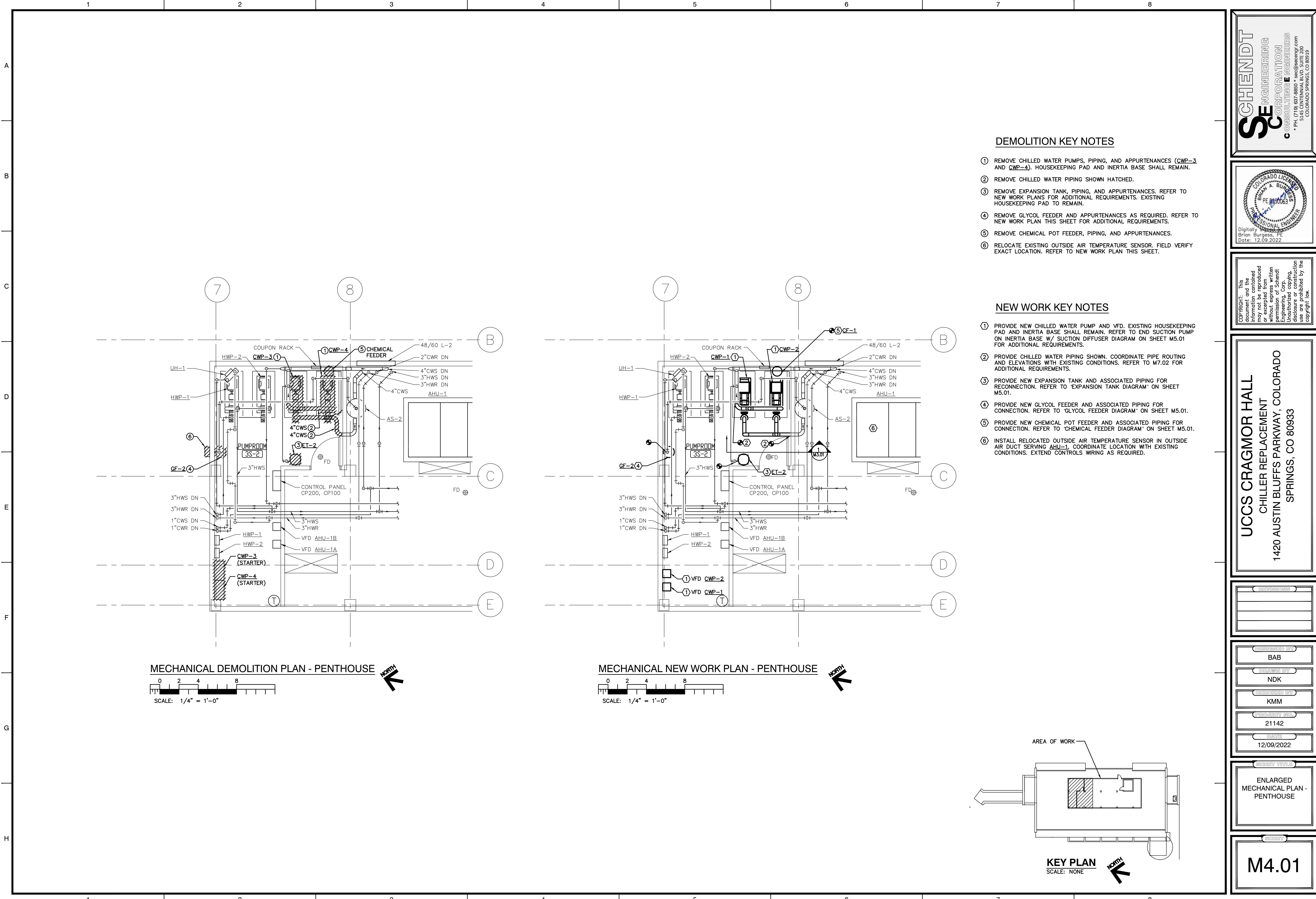
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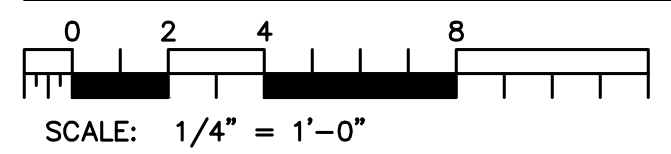
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SHEET TITLE
MECHANICAL SECTIONS

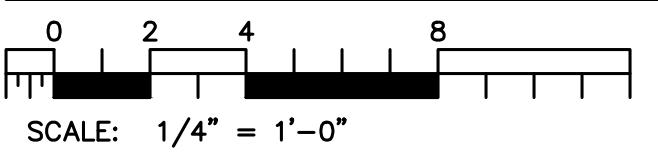
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M3.01



MECHANICAL DEMOLITION PLAN - PENTHOUSE



MECHANICAL NEW WORK PLAN - PENTHOUSE

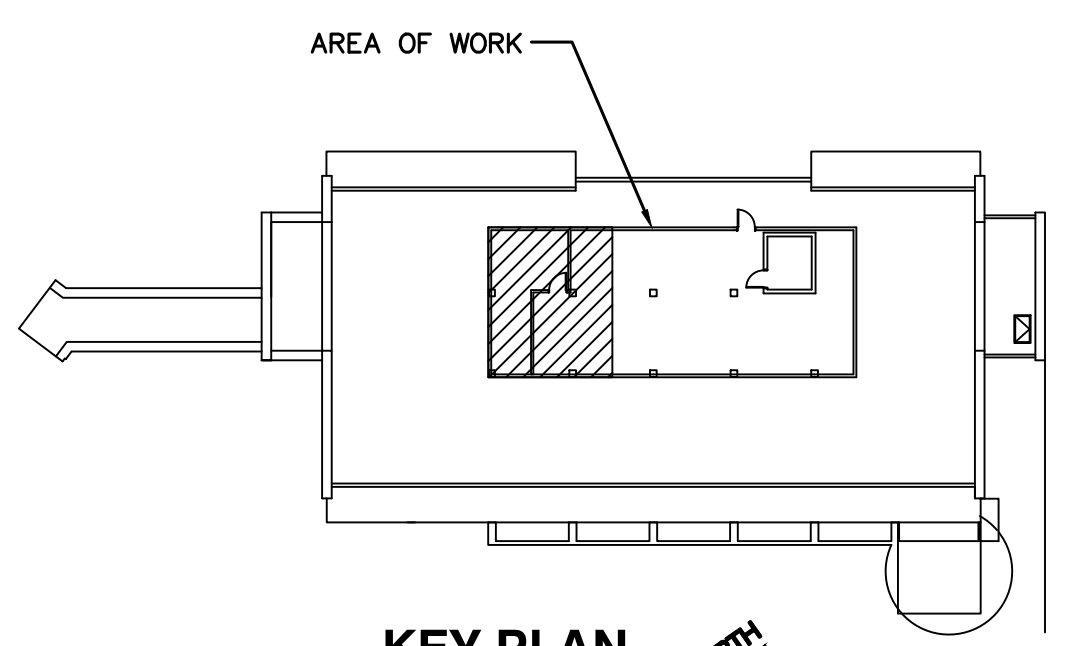


DEMOLITION KEY NOTES

- ① REMOVE CHILLED WATER PUMPS, PIPING, AND APPURTENANCES (CWP-3 AND CWP-4). HOUSEKEEPING PAD AND INERTIA BASE SHALL REMAIN.
- ② REMOVE CHILLED WATER PIPING SHOWN HATCHED.
- ③ REMOVE EXPANSION TANK, PIPING, AND APPURTENANCES. REFER TO NEW WORK PLANS FOR ADDITIONAL REQUIREMENTS. EXISTING HOUSEKEEPING PAD TO REMAIN.
- ④ REMOVE GLYCOL FEEDER AND APPURTENANCES AS REQUIRED. REFER TO NEW WORK PLAN THIS SHEET FOR ADDITIONAL REQUIREMENTS.
- ⑤ REMOVE CHEMICAL POT FEEDER, PIPING, AND APPURTENANCES.
- ⑥ RELOCATE EXISTING OUTSIDE AIR TEMPERATURE SENSOR. FIELD VERIFY EXACT LOCATION. REFER TO NEW WORK PLAN THIS SHEET.

NEW WORK KEY NOTES

- ① PROVIDE NEW CHILLED WATER PUMP AND VFD. EXISTING HOUSEKEEPING PAD AND INERTIA BASE SHALL REMAIN. REFER TO END SUCTION PUMP ON INERTIA BASE W/ SUCTION DIFFUSER DIAGRAM ON SHEET M5.01 FOR ADDITIONAL REQUIREMENTS.
- ② PROVIDE CHILLED WATER PIPING SHOWN. COORDINATE PIPE ROUTING AND ELEVATIONS WITH EXISTING CONDITIONS. REFER TO M7.02 FOR ADDITIONAL REQUIREMENTS.
- ③ PROVIDE NEW EXPANSION TANK AND ASSOCIATED PIPING FOR RECONNECTION. REFER TO 'EXPANSION TANK DIAGRAM' ON SHEET M5.01.
- ④ PROVIDE NEW GLYCOL FEEDER AND ASSOCIATED PIPING FOR CONNECTION. REFER TO 'GLYCOL FEEDER DIAGRAM' ON SHEET M5.01.
- ⑤ PROVIDE NEW CHEMICAL POT FEEDER AND ASSOCIATED PIPING FOR CONNECTION. REFER TO 'CHEMICAL FEEDER DIAGRAM' ON SHEET M5.01.
- ⑥ INSTALL RELOCATED OUTSIDE AIR TEMPERATURE SENSOR IN OUTSIDE AIR DUCT SERVING AHU-1. COORDINATE LOCATION WITH EXISTING CONDITIONS. EXTEND CONTROLS WIRING AS REQUIRED.



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CORPORATION
CONSULTING ENGINEERS

5100 CANTON ROAD
DENVER, CO 80231
PH: (719) 637-8800 • sec@schendt.com

COLORADO LICENSED
BRIAN A. BURGESS
PE #307063
PROFESSIONAL ENGINEER

Digitally signed by
Brian Burgess, PE
Date: 12.09.2022

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CHILLER REPLACEMENT
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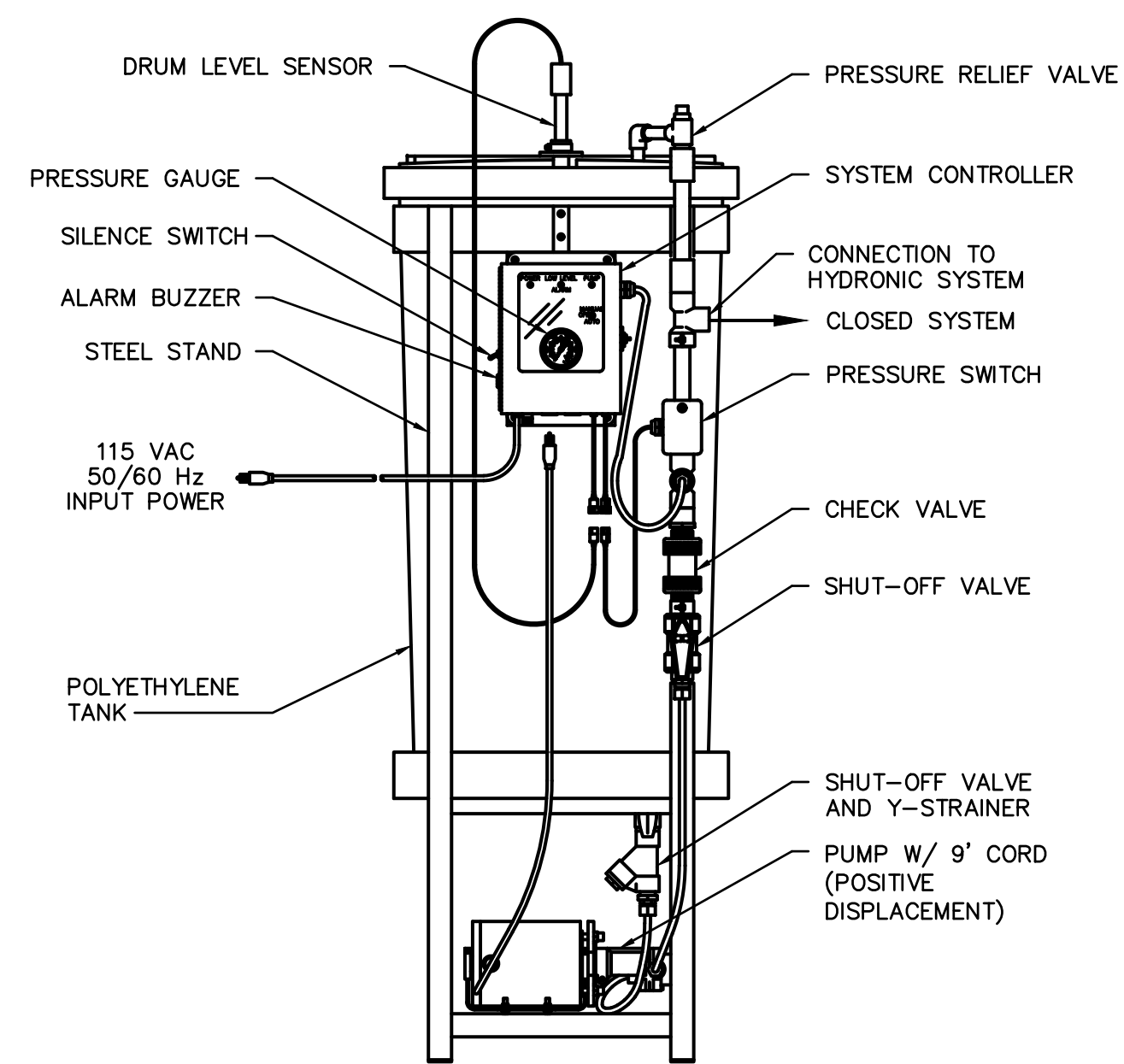
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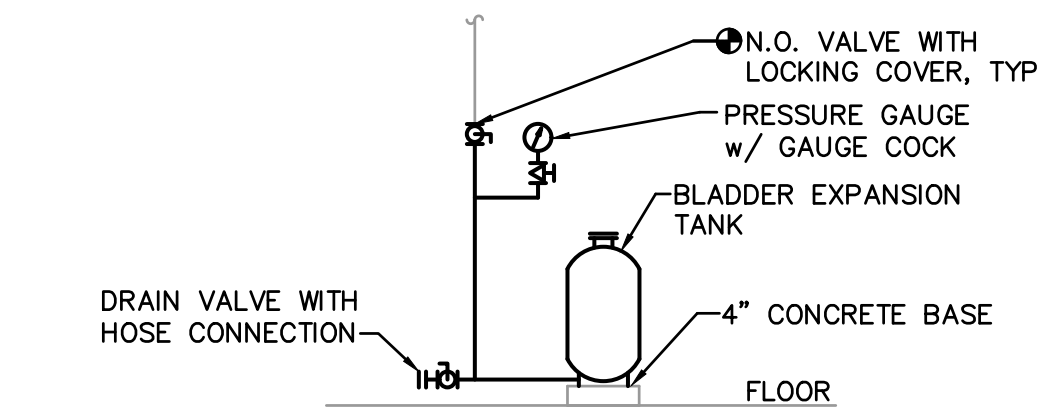
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SHEET TITLE
ENLARGED MECHANICAL PLAN - PENTHOUSE

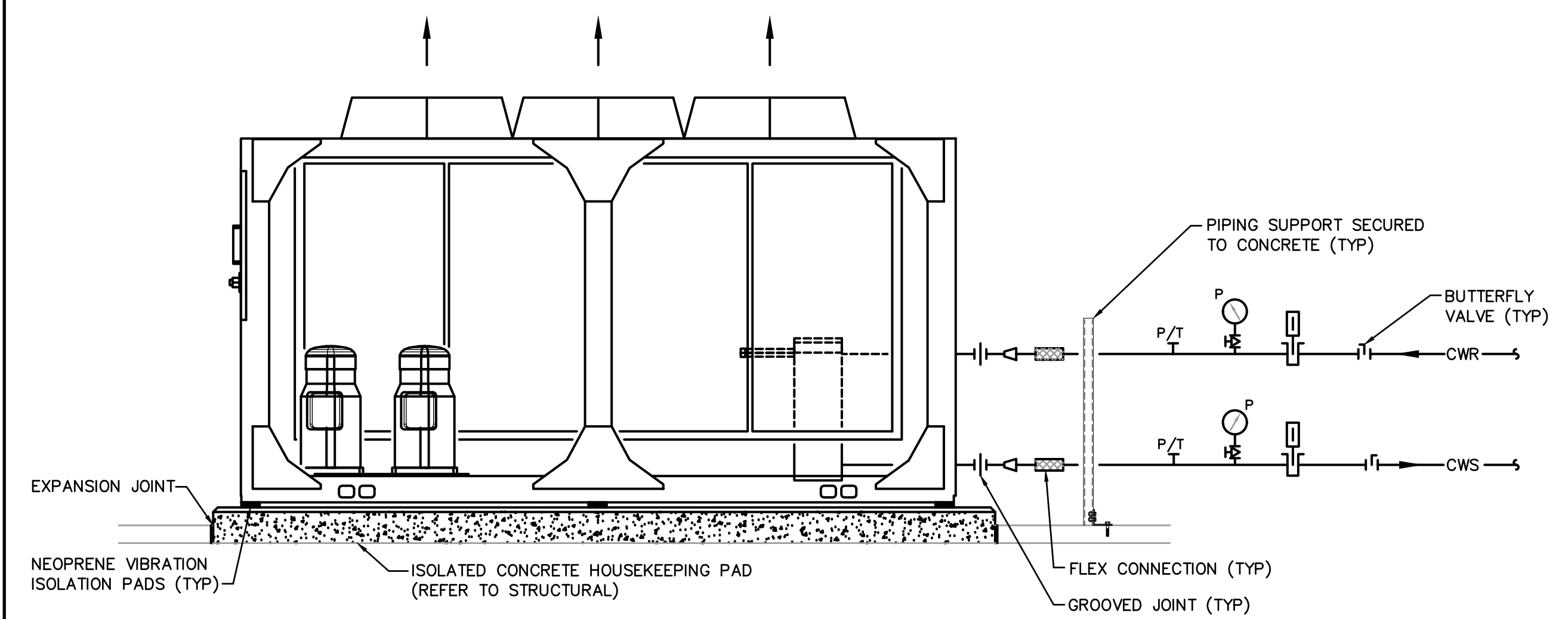
M4.01



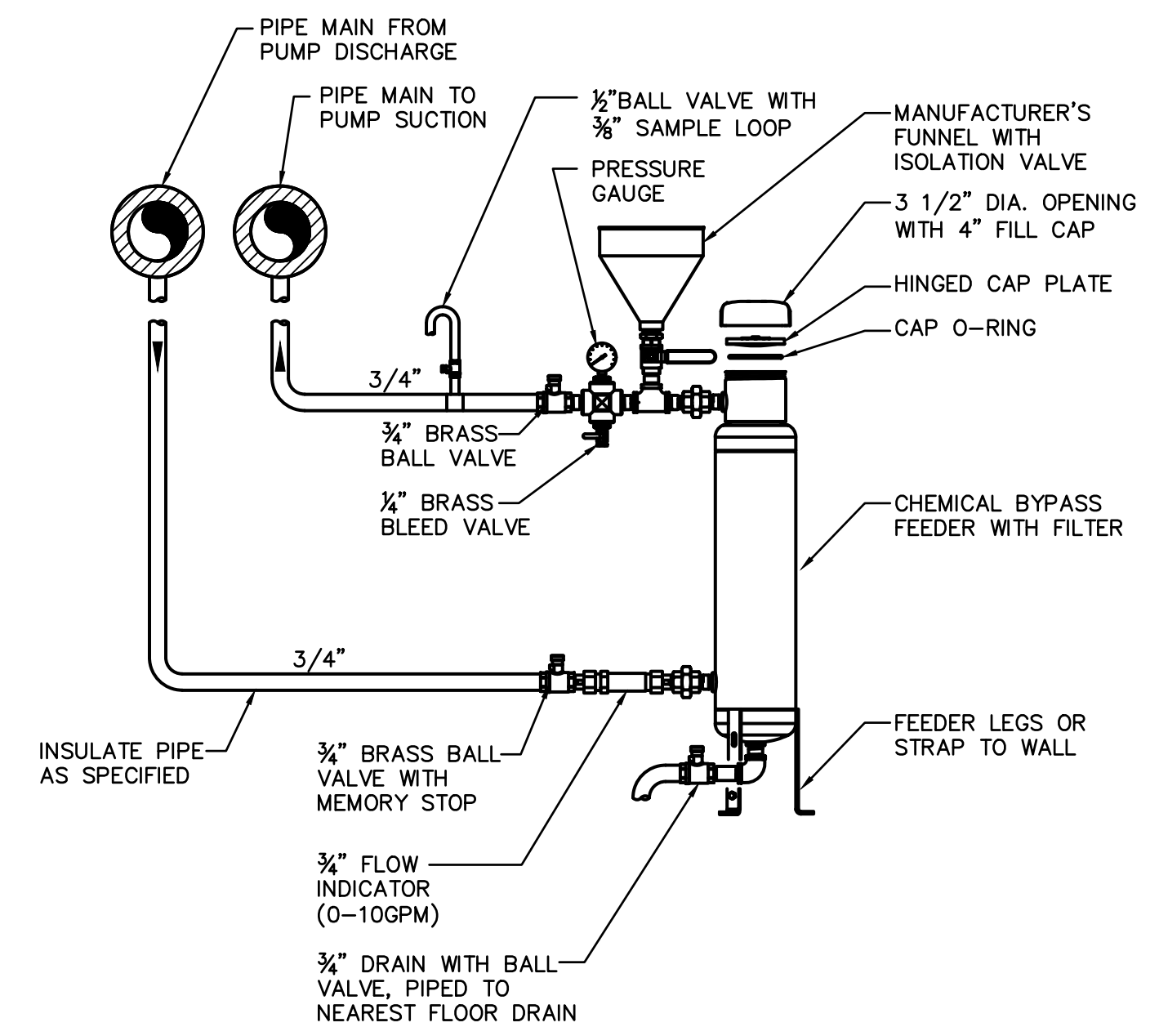
GLYCOL FEEDER DIAGRAM
NO SCALE



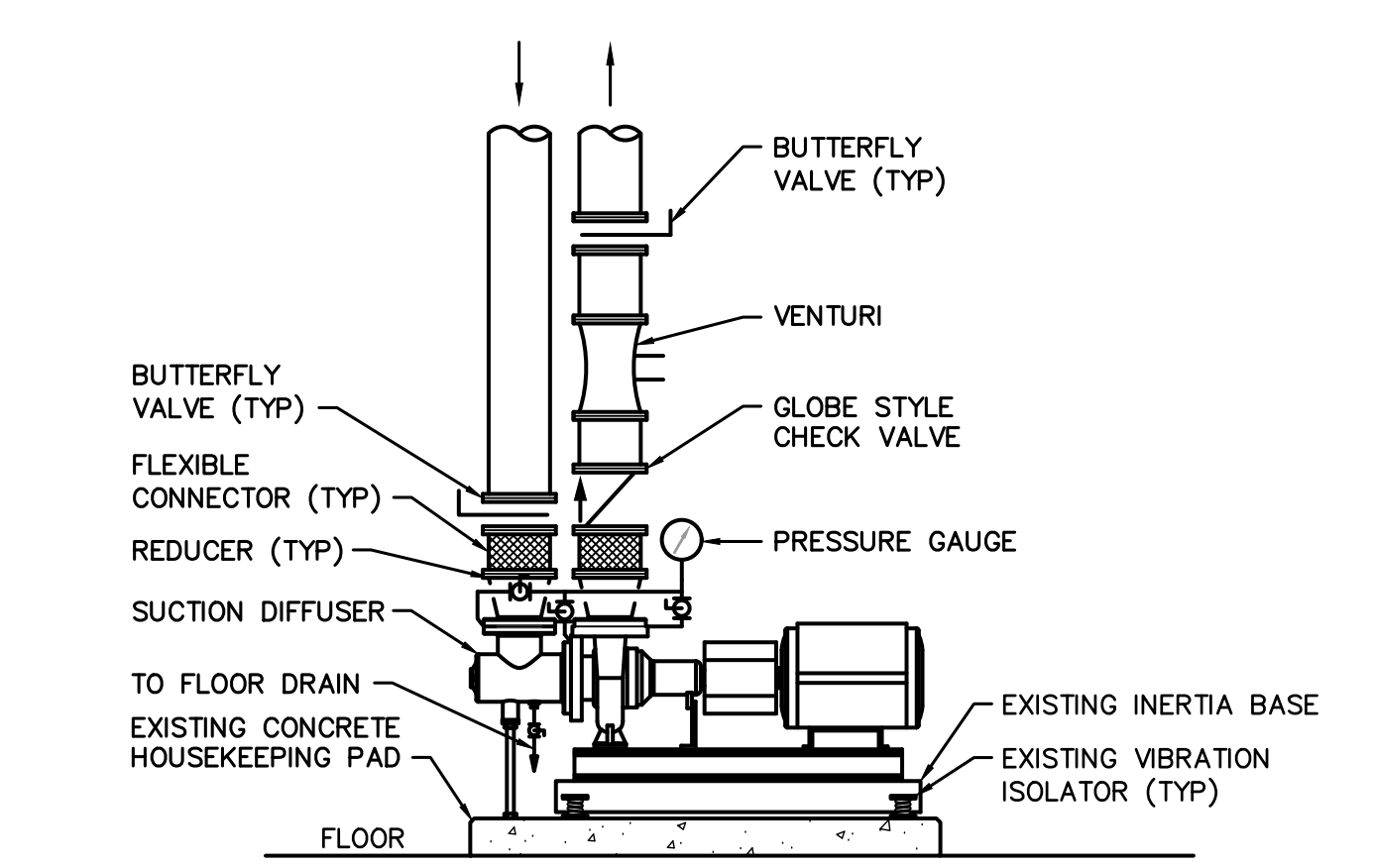
EXPANSION TANK DIAGRAM
NO SCALE



AIR COOLED CHILLER PIPING DIAGRAM
NO SCALE



CHEMICAL FEEDER DIAGRAM
NO SCALE



**END SUCTION PUMP ON INERTIA BASE
W/SUCTION DIFFUSER DIAGRAM**
NO SCALE

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CORPORATION
CONSULTING ENGINEERS
5100 Cass Road, Suite 1000
Colorado Springs, CO 80933
PH: (719) 637-8800 • sec@schendt.com

COLORADO LICENSED
BRIAN A. BURGESS
PE #00063
PROFESSIONAL ENGINEER
Digitally signed by
Brian Burgess, PE
Date: 12.09.2022

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MECHANICAL
DIAGRAMS

M5.01

CHEMICAL POT FEEDER SCHEDULE		
MARK	N/A	CF-1
MANUFACTURER	N/A	ADV. CONTROLS
MODEL NO.	NONE EXISTING	BF-05D3
SERVICE	-	CHILLED WATER
MIXING TANK DATA:		
MATERIAL	-	STEEL
CAPACITY (GAL)	-	5
PHYSICAL DIMENSIONS		
HEIGHT (IN)	-	35
DIAMETER (IN)	-	10
REMARKS:	1	2,3,4,5,6,7
REMARKS:		
1. EXISTING CHEMICAL POT FEEDER TO BE REMOVED.		
2. PROVIDE NEW CHEMICAL POT FEEDER		
3. PROVIDE 3/4" BRASS DRAIN VALVE & FITTINGS FOR DOME BOTTOM		
4. PROVIDE 3/4" TEE, ISOLATION VALVE AND FUNNEL KIT WITH 0-300 PSI PRESSURE GAUGE		
5. PROVIDE 3/4" BRASS ISOLATION VALVES W/ UNIONS & NIPPLES		
6. PROVIDE SS BAG FILTER WITH SERVICE CAGE		
7. REFER TO DETAIL SHEET MS.01		

GLYCOL FEEDER SCHEDULE		
MARK	GF-2	GF-2
MANUFACTURER	SAGE EQUIPMENT CO	NEPTUNE
MODEL NO.	WC 370	G-50-1A
SERVICE	CHILLED WATER	CHILLED WATER
MIXING TANK DATA:		
MATERIAL	POLYETHYLENE	POLYETHYLENE
CAPACITY (GAL)	50	50
PUMP DATA		
FLOW (GPM)	1.5	1.5
HEAD (FT)	231	231
CUT-IN PRESSURE SETTING (PSIG)	-	10
CUT-OUT PRESSURE SETTING (PSIG)	-	20
ELECTRICAL CHARACTERISTICS		
VOLTS	120	120
PHASE	1	1
HERTZ	60	60
REMARKS:	1	2,3,4,5
REMARKS:		
1. EXISTING GLYCOL FEEDER TO BE REMOVED.		
2. PROVIDE WITH NEMA 4X CONTROL PANEL WITH HAND-OFF-AUTO SELECTOR SWITCH, PUMP ON INDICATOR LIGHT, LOW TANK LEVEL INDICATOR LIGHT, LOW LEVEL FLOAT SWITCH, PRESSURE SWITCH, AND DRY CONTACTS FOR REMOTE ALARM INDICATION.		
3. PROVIDE WITH BALL VALVE, CHECK VALVE, PRESSURE RELIEF VALVE, AND PRESSURE GAGE ON PUMP DISCHARGE.		
4. PROVIDE BALL VALVE AND Y-STRAINER ON PUMP SUCTION.		
5. PROVIDE WITH AUDIBLE ALARM.		

AIR SEPARATOR SCHEDULE	
MARK	AS-2
SERVICE	CHILLED WATER
MANUFACTURER	BELL AND GOSSET
MODEL NO.	ROLAIRTROL R-4
FLOW (GPM)	133
PRESSURE DROP (FT)	-
LINE SIZE (IN)	4
WEIGHT (LB)	-
REMARKS:	1
REMARKS:	
1. EXISTING AIR SEPARATOR TO REMAIN.	

PUMP SCHEDULE								
MARK	HWP-1	HWP-2	CWP-3	CWP-1	CWP-4	CWP-2	P-5	CP-1
LOCATION	PUMP ROOM 3S-2	PUMP ROOM 3S-2	PUMP ROOM 3S-2	PUMP ROOM 3S-2	PUMP ROOM 3S-2	PUMP ROOM 3S-2	PENTHOUSE	CRAWL SPACE
SERVICE	HOT WATER	HOT WATER	CHILLED WATER	CHILLED WATER	CHILLED WATER	CHILLED WATER	AHU-1 HW	CONDENSATE
PUMP DATA								
MANUFACTURER	B&G	B&G	B&G	B&G	B&G	B&G	B&G	B&G
MODEL NO.	1510	1510	1510	1510	1510	1510	60	SDS
TYPE	END SUCTION	END SUCTION	END SUCTION	END SUCTION	END SUCTION	END SUCTION	INLINE	-
SIZE	2X1.5X8	2X1.5X8	3X2X9.875	3X2X11	3X2X9.875	3X2X11	1AA	1BT366
SERIAL NO.	CQ8190-02 J30	CQ8190-01 J30	CQ8191-02 J30	-	CQ8191-01 J30	-	-	-
FLOW (GPM)	69	69	96	190	96	190	2	40
HEAD (FT)	65	65	100	100	100	100	25	29
IMPELLER SIZE (IN)	8.375	8.375	9.875	10.5	9.875	10.5	-	-
SPEED (RPM)	1,750	1,750	1,800	1,694	1,800	1,694	1,750	1,550
EFFICIENCY (%)	-	-	-	72.2	-	72.2	-	-
GLYCOL TYPE	POLYPROPYLENE	POLYPROPYLENE	POLYPROPYLENE	POLYPROPYLENE	POLYPROPYLENE	POLYPROPYLENE	POLYPROPYLENE	-
GLYCOL CONCENTRATION (%VOL)	30	30	30	30	30	30	30	-
SUCTION DIFFUSER								
MODEL NO.	DA-3	DA-3	DA-3	ED-3X	DA-3	ED-3X	-	-
FLOW COEFFICIENT (Cv)	-	-	-	238	-	238	-	-
PRESSURE DROP (FT)	-	-	-	1.27	-	0.637313749	-	-
MOTOR DATA								
HORSEPOWER	3	3	10	10	10	10	1/4	1/3
FRAME SIZE	-	-	215T	-	215T	-	-	-
SPEED (RPM)	-	-	1,760	1,750	1,760	1,750	-	-
VOLTS	208	208	208	208	208	208	115	115
PHASE	3	3	3	3	3	3	1	1
HERTZ	60	60	60	60	60	60	60	60
DUTY	CONT.	CONT.	CONT.	CONT.	CONT.	CONT.	CONT.	FLOAT
WEIGHT (LB)	-	-	-	413	-	413	-	-
CONTROL	-	-	-	VFD	-	VFD	-	-
REMARKS:	1	1	2	3,4,5,6,7,8,9	2	3,4,5,6,7,8,9	1	1
REMARKS:								
1. EXISTING PUMP TO REMAIN.								
2. EXISTING PUMP TO BE REMOVED.								
3. PROVIDE NEW BASE MOUNTED CHILLED WATER PUMP.								
4. PROVIDE WITH SUCTION DIFFUSER.								
5. PROVIDE WITH MECHANICAL SEALS.								
6. PROVIDE WITH WELDED STRUCTURAL C-CHANNEL BASE.								
7. PROVIDE WITH INVERTER DUTY MOTOR.								
8. PROVIDE WITH MOTOR SHAFT GROUNDING KIT.								
9. PROVIDE PUMP VFD (ABB, ACH 580 BASIS OF DESIGN).								

EXPANSION TANK SCHEDULE			
MARK	ET-2	ET-2	ET-2
MANUFACTURER	WESSELS	WESSELS	WESSELS
MODEL NO.	NLA 85	NLA 85	NLA 85
TYPE	DIAPHRAM	BLADDER	BLADDER
SYSTEM SERVED	CHILLED WATER	CHILLED WATER	CHILLED WATER
SYSTEM CONTENT (GAL.)	UNKNOWN	UNKNOWN	UNKNOWN
MIN. FILL PRESSURE (PSIG)	10	10	10
MAX. SYS OPERATING PRESS (PSIG)	26	26	26
AVERAGE WATER TEMP. (°F)	55	55	55
TANK VOLUME (GAL.)	23	23	23
ACCEPTANCE VOLUME (GAL)	14	14	14
DIMENSIONAL DATA			
TANK DIAMETER (IN.)	16	16	16
TANK HEIGHT (IN.)	37	37	37
SYSTEM CONNECTION SIZE (IN)	1	1	1
OPERATING WEIGHT (LB)	90	90	90
REMARKS:	1	2,3,4,5,6	-
REMARKS:			
1. EXISTING EXPANSION TANK TO BE REMOVED.			
2. NEW EXPANSION TANK TO BE PROVIDED.			
3. PROVIDE WITH HEAVY DUTY REPLACEABLE BUTYL BLADDER COMPATIBLE FOR USE WITH PROPYLENE GLYCOL.			
4. PROVIDE WITH FLOOR MOUNTING SKIRT.			
5. PROVIDE WITH LIFTING RINGS.			
6. PROVIDE WITH STANDARD SCHRADER VALVE.			

AIR COOLED CHILLER SCHEDULE			
MARK	CH-1	CH-1	CH-1
MANUFACTURER	TRANE	TRANE	TRANE
MODEL NO.	CGAFC60	CGAM060	CGAM060
COMPRESSOR TYPE	SCROLL	SCROLL	SCROLL
GENERAL			
NOMINAL CAPACITY (TONS)	60	60	60
ACTUAL CAPACITY (TONS)	50.57	55.58	55.58
SITE ELEVATION (FT)	6,400	6,400	6,400
REFRIGERANT TYPE	R22	R410A	R410A
REFRIGERANT CHARGE (LB/CTR)	67	57	57
REFRIGERANT CIRCUITS	2	2	2
COOLING STAGES	4	4	4
EVAPORATOR			
ENTERING WATER TEMPERATURE (°F)	55	56	56
LEAVING WATER TEMPERATURE (°F)	45	44	44
DELTA T (°F)	10	12	12
MINIMUM FLOW (GPM)	72	67	67
MAXIMUM FLOW (GPM)	216	-	-
DESIGN FLOW (GPM)	192	190	190
FLOW (GPM/TON)	3.8	3.4	3.4
FOULING FACTOR	0.00025	0.0001	0.0001
WATER PRESSURE DROP (FT)	30	16.2	16.2
PIPE SIZE (IN)	4	3	3
CONDENSER			
AMBIENT AIR TEMP. (°F)	95	95	95
FAN (QTY)	6	6	6
AIRFLOW (CFM)	40,700	51,051	51,051
ELECTRICAL DATA			
VOLTS	208	208	208
PHASE	3	3	3
HERTZ	60	60	60
PHYSICAL DIMENSIONS			
LENGTH (IN.)	113.9	150.0	150.0
WIDTH (IN.)	88.4	88.0	88.0
HEIGHT (IN.)	78.4	85.0	85.0
SHIPPING WEIGHT (LB)	6,218	5,177	5,177
OPERATING WEIGHT (LB)	6,474	5,232	5,232
REMARKS:	1	2,3,4,5,6,7,8	-
REMARKS:			
1. EXISTING CHILLER TO BE REMOVED.			
2. PROVIDE EXTRA HIGH EFFICIENCY CHILLER.			
3. PROVIDE WITH LOW AMBIENT CONTROLS.			
4. PROVIDE WITH CONDENSER HAIL GUARDS.			
5. PROVIDE WITH SINGLE POINT ELECTRICAL CONNECTION AND DISCONNECT SWITCH.			
6. PROVIDE WITH BACNET INTERFACE.			
7. PROVIDE 65KA SHORT CIRCUIT CURRENT RATING.			
8. PROVIDE WITH SUPER QUIET SOUND PACKAGE.			

MECHANICAL INSULATION SCHEDULE											
MECHANICAL SYSTEMS TO BE INSULATED	TEMPERATURE RANGE (°F)	PIPE OR DUCT SIZE	INSULATION MATERIAL	INSULATION FORM	DENSITY (LB/FT3)	CONDUCTIVITY (BTU-IN/HR-FT2-°F)	MEAN RATING TEMPERATURE (°F)	INSULATION THICKNESS (INCHES)	R-VALUE (BTU/HR-SF-°F)	VAPOR BARRIER REQUIRED	REMARKS
PIPING SYSTEM											
DOMESTIC COLD WATER	ALL	1/2" TO 1-1/4"	FIBERGLASS	PIPE	3.5 - 5.5	0.23	75	0.5	2.2	YES	2,3
DOMESTIC COLD WATER	ALL	1-1/2" & LARGER	FIBERGLASS	PIPE	3.5 - 5.5	0.23	75	1	4.3	YES	2,3
CHILLED WATER	40-60	1/2" TO 3/4"	FIBERGLASS	PIPE	3.5 - 5.5	0.23	75	0.5	2.2	YES	2,3,4,6
CHILLED WATER	40-60	1" TO 6"	FIBERGLASS	PIPE	3.5 - 5.5	0.23	75	1	4.3	YES	2,3,4,6
CHILLED WATER	40-60	8" TO 12"	FIBERGLASS	PIPE	3.5 - 5.5	0.23	75	1.5	6.5	YES	2,3,4,6
EQUIPMENT											
CHILLED WATER PUMPS	35-100	N/A	FIBERGLASS	BOARD	3	0.23	75	1.5	6.52	YES	2,4,5
CHILLED WATER AIR SEPARATORS	35-100	N/A	FIBERGLASS	BOARD	3	0.23	75	1.5	6.52	YES	1
EXISTING PIPING, DUCTWORK AND EQUIPMENT INSULATION											
EXISTING PIPE AND DUCT INSULATION REPAIR	ALL	ALL									1
REMARKS:											
1. EXISTING INSULATION THAT HAS BEEN DAMAGED SHALL BE REPLACED WITH INSULATION TYPE AND THICKNESS TO MATCH EXISTING.											
2. INSULATION SHALL HAVE AN ALL-SERVICE-JACKET											
3. PIPE FITTING INSULATION SHALL BE MITERED AND SEALED WITH MASTIC OR COVERED WITH PVC FITTING COVERS.											
4. FIELD INSTALL 0.016" ALUMINUM JACKET IN MECHANICAL ROOMS. ASJ JACKET IN AREAS NOT EXPOSED TO DAMAGE.											
5. CHILLED WATER PUMPS SHALL BE ENCLOSED IN AN ALUMINUM ENCLOSURE CONSTRUCTED OF REMOVABLE PANELS HELD TOGETHER WITH VELCRO OR SNAP-LOCK LATCHES. ENCLOSURE SHALL BE LINED ON THE INSIDE WITH 1.5" OF FIBERGLASS BOARD INSULATION.											
6. FIELD INSTALL 0.016" THICK ALUMINUM JACKET ON EXTERIOR PIPING. SEAL ALL JOINTS WATER AND VAPOR TIGHT.											



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1420 AUSTIN BLUFFS PARKWAY, COLORADO
SPRINGS, CO 80933

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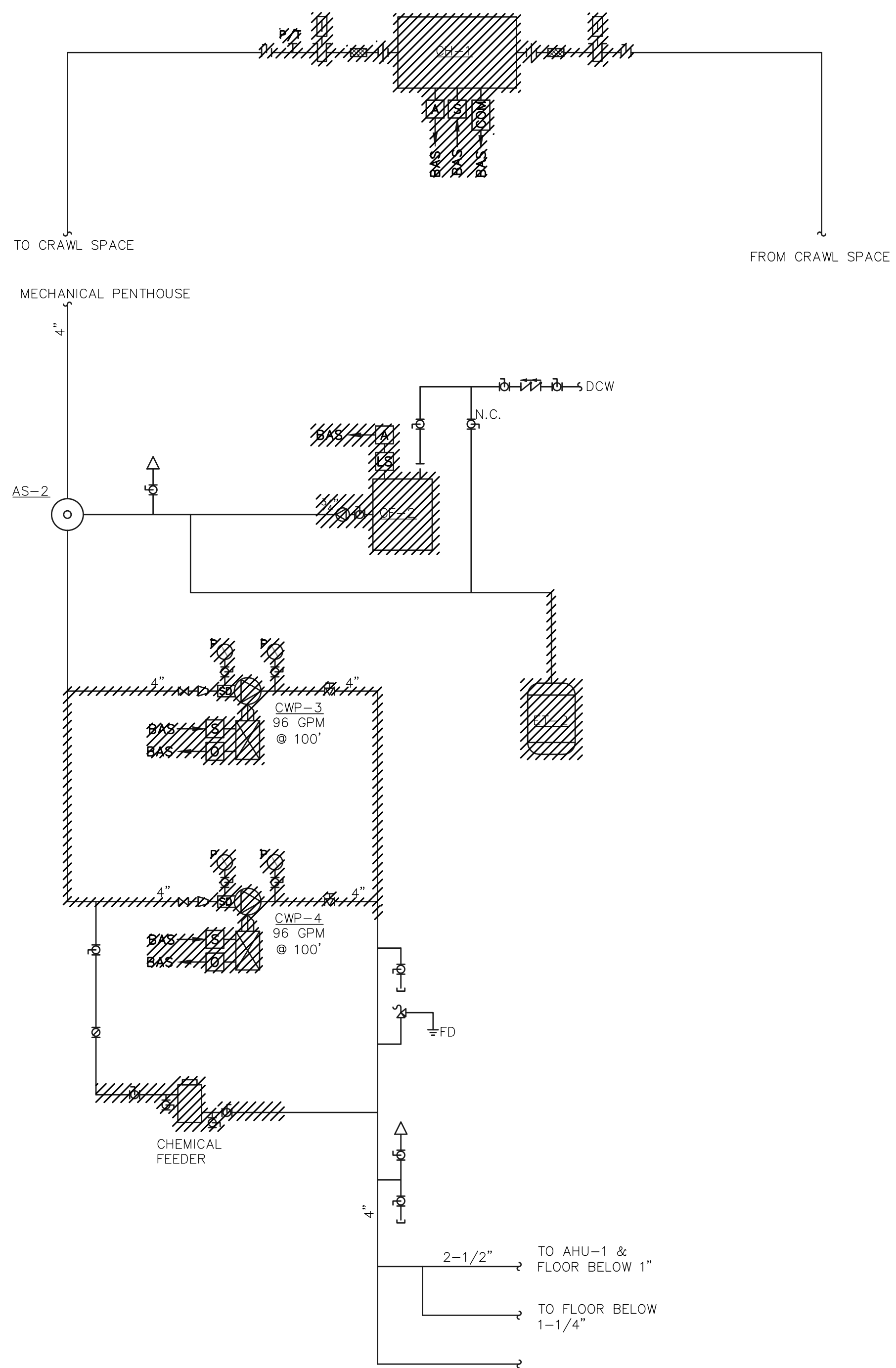
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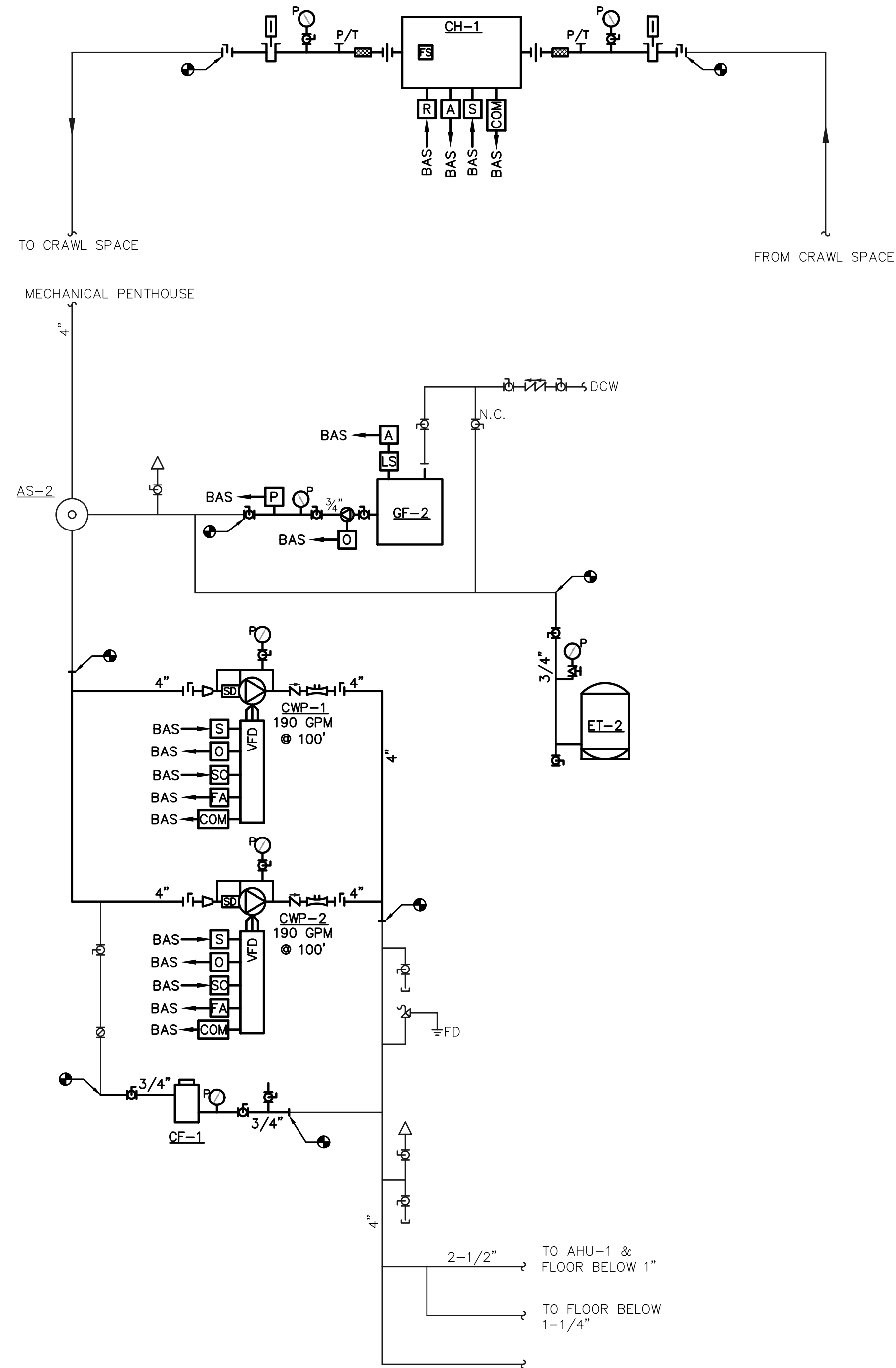
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SHEET TITLE
MECHANICAL SCHEDULES

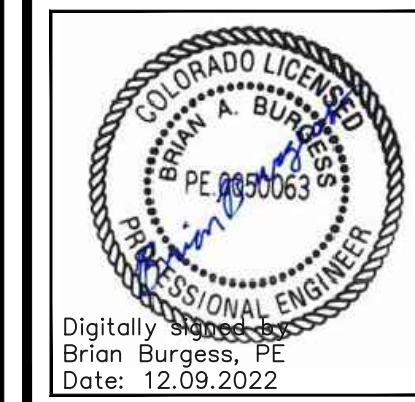
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M6.01



EXISTING CHILLED WATER SYSTEM SCHEMATIC
NO SCALE



NEW CHILLED WATER SYSTEM SCHEMATIC
NO SCALE



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PROJECT NO.
21142

DATE
12/09/2022

SHEET TITLE
MECHANICAL
CONTROLS

SHEET NO.
M7.02

POWER SYMBOLS	
	SIMPLEX RECEPTACLE
	DUPLEX RECEPTACLE
	RECEPTACLE FUNCTIONS: (TYPICAL) G - GROUND FAULT CIRCUIT INTERRUPTER L - LOCKING TYPE, WEATHER PROOF COVER WP - WEATHERPROOF # - NUMBER INDICATES CIRCUIT NUMBER (WHERE APPLICABLE) IG - ISOLATED GROUND AC - ABOVE COUNTER
	DOUBLE DUPLEX RECEPTACLE
	SPECIAL RECEPTACLE (SIZE AND TYPE AS INDICATED BY NEMA NO.)
	CLOCK RECEPTACLE
	4" SQUARE JUNCTION BOX WITH BLANK COVER UNLESS OTHERWISE NOTED
	LARGE JUNCTION BOX. SIZE AS NOTED

BRANCH CIRCUIT PANELBOARDS	
	PANELBOARD (NEW)
	PANELBOARD (EXISTING)

POWER SYSTEMS	
	SERVICE AND DISTRIBUTION EQUIPMENT MDP - MAIN DISTRIBUTION PANEL MCC - MOTOR CONTROL CENTER ATS - AUTOMATIC TRANSFER SWITCH UPS - UNINTERRUPTIBLE POWER SUPPLY SDP - SUB DISTRIBUTION PANEL ST - SHUNT TRIP
	STARTER
	SAFETY DISCONNECT
	FUSED DISCONNECT
	COMBINATION STARTER/DISCONNECT
	TRANSFORMER

ONE - LINE SYMBOLS	
	CIRCUIT BREAKER XXXAT - TRIP RATING XXXAF - FRAME RATING
	SAFETY DISCONNECT
	FUSED DISCONNECT
	STARTER
	COMBINATION/STARTER DISCONNECT
	FUSED SWITCH - (600V & BELOW) XXXAF - FUSE RATING XXXAS - SWITCH RATING
	FUSED SWITCH - (ABOVE 600V)
	TRANSFORMER: DELTA CONNECTION WYE CONNECTION
	SURGE ARRESTOR
	GROUND CONNECTION (SIZE AS INDICATED)
	MOTOR, # INDICATES HORSEPOWER
	FUSED POTENTIAL TRANSFORMER
	CURRENT TRANSFORMER
	AUTOMATIC TRANSFER SWITCH
	MISCELLANEOUS LOAD
	PANELBOARD
	SPD - SURGE PROTECTIVE DEVICE
	KWH METER

GENERAL DEMOLITION NOTES	
(APPLY TO ALL ELECTRICAL DEMOLITION SHEETS)	
1. THE OWNER OR ITS REPRESENTATIVE MAY CHOOSE TO KEEP ANY OR ALL OF THE COMPONENTS WHICH ARE REMOVED AND NOT REUSED AS PART OF THIS PROJECT. MATERIALS WHICH ARE NOT RECLAIMED BY THE OWNER SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR, OFF OF THE OWNER'S PROPERTY.	
2. THE CONTRACTOR SHALL COMPLETELY REMOVE ALL ELECTRICAL WIRING, CONDUIT, BOXES, DEVICES, DISCONNECTS, FIXTURES, MOUNTING HARDWARE, ETC. WHICH ARE ASSOCIATED WITH THE EQUIPMENT INDICATED BY HATCHING UNLESS OTHERWISE NOTED.	
3. THE EQUIPMENT SHOWN AS HATCHED ON THE DRAWINGS REPRESENT THE MAJORITY OF THE EQUIPMENT TO BE REMOVED. IT DOES NOT NECESSARILY SHOW ALL THE ASSOCIATED HARDWARE SUCH AS CONDUIT, BOXES, WIRING, ETC.	
4. THE CONTRACTOR SHALL COORDINATE AND SCHEDULE ALL NECESSARY POWER OUTAGES WITH THE OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING WITH SUCH WORK. THE CONTRACTOR SHALL INSURE THAT THE OPERATIONS IN ADJACENT AREAS OR PORTIONS OF THE FACILITY ARE NOT INTERRUPTED OR RESTRICTED WITHOUT PRIOR APPROVAL.	

GENERAL NOTES	
(APPLY TO ALL ELECTRICAL SHEETS)	
1. ALL CONDUITS AND OTHER CONVEYANCES SHALL BE CONCEALED. IN THE EVENT THAT A NEW DEVICE IS BEING INSTALLED IN AN EXISTING DRYWALL PARTITION AND/OR WALL, PROVIDE A CUT-IN TYPE BOX AND FISH FLEXIBLE CONDUIT DOWN INSIDE THE WALL FROM ABOVE THE CEILING SYSTEM. RIGIDLY SUPPORT THE FLEXIBLE CONDUIT ABOVE THE CEILING AND REPAIR THE DRYWALL AROUND THE CONDUIT. TRANSITION TO EMT ONCE ABOVE THE CEILING SYSTEM.	
2. SIZES OF WIRE AND CABLES ARE BASED ON COPPER CONDUCTORS, UNLESS INDICATED OTHERWISE.	
3. ALL PENETRATIONS IN OR THROUGH FIRE RATED PARTITIONS SHALL BE FIRE STOPPED SUCH THAT THE PENETRATION MEETS OR EXCEEDS THE FIRE RATING OF THE WALL.	
4. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL COORDINATION BETWEEN THE APPROPRIATE DISCIPLINES AND CONTRACTORS.	
5. ALL EXPOSED CONDUITS, BOXES, ETC. IN ROOMS TO BE PAINTED SHALL BE PAINTED TO MATCH THE SURROUNDING SURFACE. EXPOSED CONDUIT, BOXES, ETC. IN ROOMS WHICH ARE NOT PAINTED MAY BE LEFT UN-PAINTED. EXPOSED CONDUIT, BOXES, ENCLOSURES, ETC. ON THE EXTERIOR OF BUILDINGS SHALL BE PAINTED TO MATCH THE SURROUNDING SURFACES.	
6. THE CONTRACTOR IS RESPONSIBLE FOR PATCHING, PAINTING, REPAIRING OR THE REPLACEMENT OF ALL WALLS, CEILINGS OR OTHER BUILDING ELEMENTS WHICH ARE DISTURBED AS PART OF THE DEMOLITION AND/OR INSTALLATION OF ELECTRICAL WORK.	
7. REFER TO THE ELECTRICAL CONNECTIONS SCHEDULE FOR ADDITIONAL REQUIREMENTS ASSOCIATED WITH PLUMBING AND HVAC EQUIPMENT.	
8. COORDINATE AND/OR PROVIDE CONCRETE HOUSE KEEPING PADS FOR FLOOR MOUNTED ELECTRICAL EQUIPMENT. PADS SHALL BE 3.5" AFF WITH CHAMFERED EDGE. PADS SHALL EXTEND BEYOND THE EQUIPMENT EDGES BY 3" IN EVERY DIRECTION.	

CIRCUITING SYMBOLS	
	PROVIDE A MINIMUM WIRE SIZE OF #12 CONDUCTORS IN 3/4" C. PROVIDE 1 PHASE CONDUCTOR FOR EACH BRANCH CIRCUIT. DEDICATED NEUTRALS AND GROUNDS SHALL BE PROVIDED FOR ELECTRONIC/COMPUTER LOADS AND FOR CIRCUITS WITH GFCI TYPE RECEPTACLES.
	RACEWAY CONCEALED ABOVE CEILING OR IN WALL, EXPOSED IN EQUIPMENT ROOMS OR UNFINISHED SPACES.
	RACEWAY UNDERGROUND OR UNDERFLOOR
	RACEWAY UP
	RACEWAY DOWN
	RACEWAY CHANGE IN ELEVATION
	CAPPED CONDUIT
	CABLE TRAY (SIZE AS INDICATED)
	FLEXIBLE CONDUIT CONNECTION (LIQUIDTIGHT)
	PLUG AND CORD SEC.
	HOME RUN CONDUIT, SIZE AS INDICATED

GENERAL SYMBOLS	
(E)	EXISTING
(N)	NEW
(R)	RELOCATED
(F)	FUTURE
(TR)	TO REMAIN
(TYP.)	TYPICAL
	DRAWING KEYNOTE (APPLIES TO ENTIRE SHEET WHEN SHOWN UNDER PLAN TITLE)
	DEMOLITION KEYNOTE (APPLIES TO ENTIRE SHEET WHEN SHOWN UNDER PLAN TITLE)
	REVISION CALL-OUT
	EQUIPMENT IDENTIFIER
	LIGHT LINE - EXISTING
	HEAVY LINE - NEW WORK
	HATCHING INDICATES DEMOLITION WORK EXISTING CONDITIONS TO BE REMOVED

ABBREVIATIONS			
ABB	DESCRIPTION	ABB	DESCRIPTION
ABB	ALTERNATING CURRENT	NC	NORMALLY CLOSED
A	AMPERE	NEC	NATIONAL ELECTRICAL CODE
AC	AIR CIRCUIT BREAKER	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
ACB	AMPERE FRAME, FUSE	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
AF	ABOVE FINISHED CEILING	NIC	NOT IN CONTRACT
AFC	ABOVE FINISHED FLOOR	NL	NIGHT LIGHT
AFF	AMPS INTERRUPTING CAPACITY	NO	NORMALLY OPEN
AIC	ALUMINUM	NP	NAMEPLATE
AL	ANNUNCIATOR	NTS	NOT TO SCALE
ANN	ABOVE RAISED FLOOR	OC	ON CENTER
ARF	AMMETER SWITCH	OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
AS	AMP TRIP	OFOI	OWNER FURNISHED, OWNER INSTALLED
AT	AUTOMATIC TRANSFER SWITCH	OHP	OVERHEAD PROJECTOR
ATS	BELOW FINISHED FLOOR BREAKER BUILDING	OL	OVERLOAD RELAY
BFF	BELOW FINISHED FLOOR BREAKER BUILDING	P	PHASE, POLE, OR POWER
BRKR	BREAKER	PA	PUBLIC ADDRESS
BLDG	BUILDING	PH	PHASE
C	CONDUIT	PLC	PROGRAMMABLE LOGIC CONTROLLER
CB	CIRCUIT BREAKER	PB	PUSH BUTTON
CATV	CABLE TELEVISION	PF	POWER FACTOR
CCTV	CLOSED-CIRCUIT TELEVISION	PIN	PERSONAL IDENTIFICATION NUMBER
CER	COMMUNICATIONS EQUIPMENT ROOM	PIV	POST INDICATOR VALVE
CKT	CIRCUIT	PNL	PANEL
CO/COR	CONTRACTING OFFICER/CONTRACTING OFFICERS REPRESENTATIVE	PTZ	PAN/TILT/ZOOM
CPT	CONTROL POWER TRANSFORMER	PVC	POLYVINYL CHLORIDE
CR	CONTROL RELAY	QTY	QUANTITY
CRS	COATED RIGID STEEL CURRENT TRANSFORMER	RCPT	RECEPTACLE
CT	CURRENT TRANSFORMER	REF	REFERENCE DIMENSION FROM ARCHITECTURAL DRAWINGS (ELEVATION OF FIRST FLOOR)
DACT	DIGITAL ALARM COMMUNICATION TRANSMITTER	RM	ROOM
DIA	DIAMETER	RVD	REQUIRED VOLTAGE
DC	DIRECT CURRENT	RVNR	NONREVERSING
DIV	DIVISION	RVR	REDUCED VOLTAGE REVERSING
Δ	DELTA CONNECTED	RX	RECEIVER
EC	ELECTRICAL CONTRACTOR	SACP	SECURITY ALARM CONTROL PANEL
EES	EARTH ELECTRODE SYSTEM	SMR	SURFACE MOUNTED RACEWAY (WIREMOLD CONVEYANCE)
ELCU	EMERGENCY LIGHTING CONTROL UNIT	SPKR	SPEAKER
EMH	ELECTRICAL MANHOLE	SS	STAINLESS STEEL
EMT	ELECTRICAL METALLIC TUBING	STR	STARTER SURF SURFACE SWITCH
ENT	ELECTRICAL NONMETALLIC TUBING	SW	SWITCH
EOL	END OF LINE RESISTOR	SWBD	SWITCHBOARD
EPO	EMERGENCY POWER OFF	SWGR	SWITCHGEAR
EWC	ELECTRIC WATER COOLER	SYMM	SYMMETRICAL
F.O.	FIBER OPTIC	TB	TERMINAL BLOCK
FA	FIRE ALARM	TBD	TO BE DETERMINED
FACP	FIRE ALARM CONTROL PANEL	TDR	TIME DELAY RELAY
FBD	FURNISHED BY OTHERS	TJB	TERMINAL JUNCTION BOX
FDR	FEEDER	T.O.	TELECOMMUNICATIONS OUTLET
FLR	FLOOR	TSP	TWISTED SHIELDED PAIR
FMCS	FACILITY MONITORING & CONTROL SYSTEM	TX	TRANSMITTER
FVNR	FULL VOLTAGE NONREVERSING	TYP	TYPICAL
FVR	FULL VOLTAGE REVERSING	UON	UNLESS OTHERWISE NOTED
G	GROUND	UPS	UNINTERRUPTIBLE POWER SUPPLY
GC	GENERAL CONTRACTOR	USB	UNIVERSAL SERIAL BUS
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	V	VOLTMETER, VOLT
GFR	GROUND FAULT RELAY	VA	VOLT-AMPERE
GRC	GALVANIZED RIGID CONDUIT	VAC	VOLTAGE, ALTERNATING CURRENT
HH	HANDHOLE	VAR	VOLT-AMPERE REACTIVE
HID	HIGH-INTENSITY DISCHARGE	VCR	VIDEO CASSETTE RECORDER
HOA	HAND-OFF-AUTO	VFD	VARIABLE FREQUENCY DRIVE (VFD SAME AS AFD)
IAW	IN ACCORDANCE WITH	VS	VOLTMETER SWITCH
ICCB	INSULATED CASE CIRCUIT BREAKER	VT	VOLTAGE TRANSFORMER
IMC	INTERMEDIATE METALLIC CONDUIT	W	WATT
I/O	INPUT-OUTPUT	WHD	WATT-HOUR DEMAND METER
JB	JUNCTION BOX	WP	WEATHERPROOF
K	KEY INTERLOCK	XFMR	TRANSFORMER
KA	KILOAMPERE	Z	IMPEDANCE
KVA	KILOVOLT-AMPERE		
KVAR	KILOVOLT-AMPERE REACTIVE		
KW	KILOWATT		
KWH	KILOWATT HOUR		
LAN	LOCAL AREA NETWORK		
LPS	LIGHTNING PROTECTION SYSTEM		
LV	LOW VOLTAGE		
MC	MECHANICAL CONTRACTOR		
MCB	MAIN CIRCUIT BREAKER		
MCC	MOTOR CONTROL CENTER		
MCCB	MOLDED CASE CIRCUIT BREAKER		
MCER	MAIN COMMUNICATIONS EQUIPMENT ROOM		
MCP	MOTOR CIRCUIT PROTECTOR		
MFR	MANUFACTURER		
MH	MANHOLE		
MLO	MAIN LUGS ONLY		
MTD	MOUNTED		
MTS	MANUAL TRANSFER SWITCH		
MUX	MULTIPLEXER		

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CONSULTING ENGINEERS
5100 CANTON ROAD • STE. 1070 • SPRINGS, CO 80906
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STEVEN R. PECK
33321
Digital Signature
Steven R. Peck
Date: 12/09/2022

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CHILLER REPLACEMENT
1420 AUSTIN BLUFFS PARKWAY, COLORADO
SPRINGS, CO 80933

DESIGNED BY	
DRAWN BY	
CHECKED BY	
DATE	

DESIGNED BY
BAB

DRAWN BY
TAH

CHECKED BY
SRP

PROJECT NO.
21142

DATE
12/09/2022

SHEET TITLE
ELECTRICAL LEGEND

SHEET NO.
E0.01

ELECTRICAL GENERAL NOTES:

SCOPE OF WORK

WORK COVERED SHALL CONSIST OF FURNISHING ALL LABOR, EQUIPMENT, SUPPLIES AND MATERIALS IN PERFORMING ALL OPERATIONS NECESSARY FOR THE INSTALLATION OF COMPLETE AND OPERATING ELECTRICAL SYSTEMS. PROVE SATISFACTORY OPERATION OF ALL EQUIPMENT AND CONTROLS TO THE CONSULTING ENGINEER ON REQUEST.

GENERAL ELECTRICAL REQUIREMENTS:

- PROVIDE ALL REQUIRED PERMITS, INSPECTIONS, AND COORDINATION WITH GOVERNING AUTHORITIES. INSTALLATION SHALL COMPLY WITH ALL APPLICABLE CODES, TO INCLUDE:
 - 2021 INTERNATIONAL BUILDING CODE (IBC)
 - 2021 INTERNATIONAL EXISTING BUILDING CODE (IEBC)
 - 2021 INTERNATIONAL MECHANICAL CODE (IMC)
 - 2021 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
 - 2018 INTERNATIONAL FUEL GAS CODE (IFGC)
 - 2018 INTERNATIONAL PLUMBING CODE (IPC)
 - 2021 INTERNATIONAL FIRE CODE (IFC)
 - NFPA 70- NATIONAL ELECTRICAL CODE (NEC) 2020
- WHERE CONFLICTS ARISE BETWEEN THE DRAWINGS, SPECIFICATIONS, SCHEDULES, NOTES OR OTHER ITEMS IN THE CONTRACT DOCUMENTS, THE MOST STRINGENT OF THE CONDITIONS SHALL APPLY.
- UNLESS OTHERWISE NOTED, THE WORK DESCRIBED ON THE PLANS SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR COMPLETE AND OPERATIONAL ELECTRICAL SYSTEMS. PROVIDE ALL ITEMS REQUIRED FOR THE WORK WHETHER SPECIFICALLY SHOWN OR NOT. WORK SHALL BE PERFORMED BY QUALIFIED TRADESMEN AND INSTALLERS. CONTRACTOR IS RESPONSIBLE FOR REVIEWING ALL CONSTRUCTION DOCUMENTS AND COORDINATING ALL RELATED ELECTRICAL WORK WHETHER OR NOT SPECIFICALLY SHOWN ON ELECTRICAL DRAWINGS.
- DATA GIVEN ON THE DRAWINGS IS AS ACCURATE AS COULD BE SECURED. ABSOLUTE ACCURACY IS NOT GUARANTEED; THE CONTRACTOR SHALL OBTAIN AND VERIFY EXACT LOCATIONS, MEASUREMENTS, SPACE REQUIREMENTS, POTENTIAL CONFLICTS WITH OTHER TRADES, ETC. AT THE SITE AND SHALL SATISFACTORILY ADAPT HIS WORK TO ACTUAL CONDITIONS AT THE PROJECT SITE. THE DRAWINGS ARE DIAGRAMMATIC IN NATURE AND SHALL NOT BE SCALED. THIS DOES NOT RELIEVE ANY SUB-CONTRACTOR FROM COORDINATING WORK WITH ALL OTHER TRADES AND FROM ADJUSTING HIS WORK AS REQUIRED BY THE ACTUAL CONDITIONS OF THE PROJECT. THE CONTRACTOR SHALL VISIT THE SITE BEFORE SUBMITTING A BID TO BECOME THOROUGHLY FAMILIAR WITH THE ACTUAL CONDITIONS OF THE PROJECT. NO EXTRAS WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF EXISTING CONDITIONS.
- CONTRACTOR SHALL PARTICIPATE IN THE CONTINUAL SURVEY OF THE EXISTING ELECTRICAL SYSTEMS TO TRACE AND IDENTIFY EXISTING CIRCUITS TO CONFIRM RECORD DRAWINGS. PRIOR TO THE START OF WORK, CONTRACTOR SHALL FIELD VERIFY ALL BRANCH CIRCUITS AND MAINTAIN ANY CIRCUIT THAT EXTENDS OUTSIDE THE LIMITS/SCOPE OF WORK.
- WHERE ELECTRICAL SYSTEMS AND CIRCUITS PASS THROUGH LIMITS OF WORK AREA TO SERVE OTHER PORTIONS OF THE FACILITY, ELECTRICAL CONTRACTOR SHALL SUITABLY PROTECT TO PREVENT DAMAGE OR TEMPORARILY RELOCATE TO MAINTAIN NORMAL POWER.
- VERIFY EQUIPMENT ELECTRICAL REQUIREMENTS PRIOR TO PROVIDING CIRCUITS TO EQUIPMENT.
- INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND NEC. COMPLETE MANUFACTURER'S START-UP REPORTS AND SUBMIT TO ENGINEER UPON COMPLETION.
- ALL CURBS, ROOF JACKS, ROOF THIMBLES, ETC. SHALL BE COMPATIBLE WITH ROOFING SYSTEM TO BE PROVIDED.
- GUARANTEE ALL MATERIALS, LABOR, WORKMANSHIP AND THE PROPER OPERATION OF ALL EQUIPMENT INSTALLED FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE. REPAIR OR REPLACE, AT NO EXPENSE TO THE OWNER, ALL DEFECTS WHICH MAY ARISE DURING THIS TIME DUE TO INFERIOR OR DEFECTIVE MATERIALS, EQUIPMENT OR WORKMANSHIP.
- DEFINITIONS:
 - (N) INDICATES "NEW" EQUIPMENT TO BE PROVIDED UNDER THIS CONTRACT.
 - (E) INDICATES "EXISTING" EQUIPMENT ON SITE WHICH MAY OR MAY NOT NEED TO BE RELOCATED AS A PART OF THIS WORK.
 - (D) INDICATES EXISTING EQUIPMENT SCHEDULED FOR "DEMOLITION".
 - "FURNISH" MEANS TO "SUPPLY" AND USUALLY REFERS TO AN ITEM OF EQUIPMENT.
 - "INSTALL" MEANS TO "SET IN PLACE, CONNECT AND PLACE INTO FULL OPERATIONAL ORDER".
 - "PROVIDE" MEANS TO "FURNISH AND INSTALL".
- KEEP DEMOLITION & CUTTING TO MINIMUM REQUIRED FOR PROPER EXECUTION OF WORK. NO CUTTING (NOT SHOWN ON THE CONTRACT DOCUMENTS) SHALL BE DONE WITHOUT THE APPROVAL OF THE ENGINEER OR OWNER AS TO LOCATIONS, METHOD AND EXTENT OF THE CUTTING.
- REPAIR ALL ACCIDENTAL OR INTENTIONAL DAMAGE TO MATCH EXISTING CONSTRUCTION WITH NO NOTICEABLE DIFFERENCE IN CONTINUITY, APPEARANCE, OR FUNCTION.
- WHEN PRODUCTS ARE SPECIFIED BY MANUFACTURER AND MODEL NUMBER, EQUIVALENT PRODUCTS BY OTHER MANUFACTURERS LISTED MAY BE PROVIDED. PRODUCT EQUIVALENCY SHALL BE DETERMINED BY ENGINEER. CONTRACTOR IS RESPONSIBLE FOR COORDINATION AND DESIGN OF SUBSTITUTED EQUIPMENT; THIS SHALL INCLUDE ADDITIONAL WEIGHT, PROPER FIT, AND ALL OTHER ASPECTS.
- PROVIDE COOPER B-LINE DURA-BLOK SUPPORTS OR EQUIVALENT FOR ALL CONDUITS ON CONCRETE.
- SUBMIT ELECTRONIC BOOKMARKED PDF OF ELECTRICAL EQUIPMENT SUBMITTALS TO ENGINEER FOR REVIEW PRIOR TO ORDERING EQUIPMENT.
- MAINTAIN A MARK-UP SET OF DRAWINGS WHICH INDICATES VARIATIONS IN THE ACTUAL INSTALLATION FROM THE ORIGINAL DESIGN. SUBMIT "AS-BUILT" DRAWINGS TO THE ENGINEER FOR REVIEW PRIOR TO FINAL PAY APPLICATION.
- SUBMIT ELECTRONIC PDF OF OPERATION AND MAINTENANCE MANUALS AND WARRANTIES. SUBMIT TWO (2) HARD COPIES OF ALL OPERATION AND MAINTENANCE MANUALS AND WARRANTIES IN TABBED 3-RING BINDERS TO OWNER. O&M MANUALS SHALL BE PREPARED IN FULL COMPLIANCE WITH THE 2015 IECC 408.2.5.2 "MANUALS". O&M MANUALS SHALL CONTAIN ALL TEAM CONTACTS, EMERGENCY CONTACTS, WARRANTY PROCEDURES, COMPREHENSIVE LIST OF EXTENDED WARRANTIES, APPROVED SUBMITTALS, AND MANUFACTURERS' OPERATING MANUALS.
- PROVIDE ALL CUTTING, CHANNELING, CHASING, DRILLING, AND OTHER METHODS REQUIRED FOR THE ELECTRICAL WORK. PATCH, REPAIR, AND FINISH ALL WORK TO MATCH THE OVERALL FINISH REQUIREMENTS OF THE PROJECT.
- PROVIDE ADEQUATE TEMPORARY POWER AND LIGHTING FOR THE CONSTRUCTION SITE AS REQUIRED AND IN COMPLIANCE WITH NEC AND OSHA REQUIREMENTS.
- UTILITY COORDINATION: VERIFY ALL UTILITY REQUIREMENTS AND COORDINATE WORK WITH LOCAL UTILITIES PROVIDING ELECTRICAL AND COMMUNICATIONS SERVICES TO THE PROJECT. ALL UTILITY FEES AND COSTS SHALL BE PAID BY THE CONTRACTOR.
- ALL MATERIALS SHALL BE NEW; SHALL BE SUITABLE FOR THE PURPOSE; AND SHALL BE UL LISTED AS APPLICABLE. DAMAGED OR DEFECTIVE MATERIALS SHALL BE REPLACED.
- FIRE STOPPING: PENETRATIONS THRU RECESS WALLS AND FLOORS SHALL BE SEALED WITH

MATERIALS CAPABLE OF PREVENTING THE PASSAGE OF FLAMES AND HOT GASSES WHEN SUBJECTED TO THE REQUIREMENTS OF THE TEST STANDARD SPECIFIC FOR FIRE STOPS ASTM-E-814. PROVIDE SHOP DRAWING SUBMITTALS FOR ALL APPLICATIONS AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION.

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES:

- CONDUCTORS: 600 VOLT-RATED, COPPER, STRANDED, THHN/THWN OR XHHW INSULATION
- #12 AWG MINIMUM SIZE, UNLESS OTHERWISE NOTED, AND SHALL BE OF SIZES AND TYPES AS INDICATED OR REQUIRED BY THE NEC.
- TERMINATIONS AND SPLICES SHALL BE MADE IN AN ACCEPTABLE MANNER PER NEC.

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS:

- GROUND AND BOND THE ELECTRICAL SYSTEM IN COMPLIANCE WITH NEC ARTICLE 250, LATEST AHJ ADOPTED EDITION.
- ALL BONDING CONDUCTORS SHALL BE COPPER UNLESS OTHERWISE NOTED. ALL CIRCUITS SHALL INCLUDE GROUND CONDUCTOR, CONDUIT SHALL NOT BE USED AS THE SOLE EQUIPMENT GROUNDING CONDUCTOR.

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS:

- ALL WIRING SHALL BE IN CONDUIT OR TUBING UNLESS OTHERWISE NOTED.
- EMT AND FLEXIBLE METALLIC CONDUIT SHALL BE USED ABOVE GRADE.
- PROVIDE APPROVED COUPLINGS AND CONNECTORS FOR ALL RACEWAY TYPES.
- CONDUIT SHALL BE ROUTED CONCEALED IN FINISHED SPACES.
- CONDUIT COLORS SHALL BE OWNER STANDARD OR AS FOLLOWS:
 - ELECTRICAL: NO COLOR WITH LABEL INDICATING PANEL NAME AND CIRCUIT NUMBER
 - EMERGENCY POWER/LIGHTING: RED WITH LABEL INDICATING PANEL NAME AND CIRCUIT NUMBER
 - FIRE ALARM: RED WITH FIRE ALARM LABEL IN BLACK
 - SECURITY: BLACK
 - PUBLIC ADDRESS: WHITE
 - BUILDING AUTOMATION: BLUE
 - PHONE/DATA: GREEN
 - ELECTRONIC HEALTH RECORD SYSTEM: YELLOW
- WHERE EXPOSED, CONDUIT SHALL BE ROUTED TO FOLLOW BUILDING LINES AS CLOSELY AS POSSIBLE. CONDUIT SHALL NOT BE ROUTED ON ROOFS OR EXTERIOR WALLS EXCEPT IN SHORTEST LENGTHS NECESSARY TO SERVE EQUIPMENT.
- FINAL CONNECTIONS TO MOTORS AND OTHER VIBRATING OR ROTATING EQUIPMENT SHALL BE MADE IN FLEXIBLE METALLIC CONDUIT. PROVIDE LIQUID TIGHT CONDUIT AND FITTINGS WHERE CONDUIT IS EXPOSED TO WET ENVIRONMENTS.
- WIRE CONNECTORS SHALL BE BOLTED, COMPRESSION, OR SCREW-TYPE; PUSH-IN OR SPRING TENSION TYPES ARE NOT ACCEPTABLE.
- BOXES AND ENCLOSURES: OUTLET BOXES SHALL BE GALVANIZED STEEL OR CAST WEATHERPROOF TYPES. JUNCTION BOXES AND ENCLOSURES SHALL BE PAINTED STEEL. PROVIDE BOXES AND ENCLOSURES OF PROPER SIZE AND TYPE SUITABLE FOR THE COMPLETED INSTALLATION AND ENVIRONMENT.

WIRING DEVICES:

- SWITCH DEVICES: COMMERCIAL GRADE, WHITE, 20A, 120-277VAC, OR AS OTHERWISE NOTED. TERMINATIONS SHALL BE FACTORY-MADE PIGTAILS OR SCREW TERMINALS.
- RECEPTACLE DEVICES: COMMERCIAL GRADE, WHITE, 20A, 125VAC, OR AS OTHERWISE NOTED. TERMINATIONS SHALL BE FACTORY-MADE PIGTAILS OR SCREW TERMINALS.
- DEVICE COVERS: NYLON COLORED TO MATCH DEVICES UNLESS OTHERWISE NOTED. WEATHERPROOF RECEPTACLE COVERS SHALL BE "IN-USE" TYPE.

IDENTIFICATION FOR ELECTRICAL SYSTEMS:

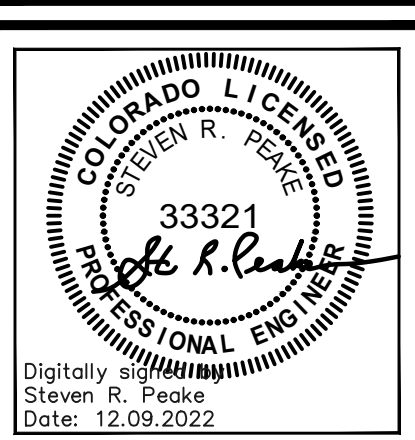
- LABEL ALL NEW AND EXISTING RECEPTACLES, DISCONNECTS, AND J-BOXES (ASSOCIATED WITH THIS WORK) WITH PANEL AND CIRCUIT NUMBER, WITH 1/2" TALL CLEAR ADHESIVE LABELS.
- LABEL PANELBOARDS AS INDICATED ON THE EXTERIOR OF THE PANEL TRIM ABOVE THE DOOR WITH 1"x4" BLACK PHENOLIC PLAQUE WITH WHITE ENGRAVED LETTERING. INDICATE AVAILABLE FAULT CURRENT AS SHOWN ON THE DRAWINGS ON THE DEADFRONT OR INSIDE THE PANELBOARD DOOR.

FUSES:

- SERVICE ENTRANCE: CLASS RK1
- FEEDERS: CLASS RK1
- MOTOR BRANCH CIRCUITS: CLASS RK5, TIME DELAY.
- CONTROL CIRCUITS: CLASS CC, FAST ACTING

ENCLOSED SWITCHES:

- DISCONNECT SWITCHES: HORSEPOWER RATED, HEAVY-DUTY FUSED OR NON-FUSED AS INDICATED.
- DISCONNECTS FOR SINGLE-PHASE, FRACTIONAL HP MOTORS SHALL BE MOTOR-RATED TOGGLE SWITCHES, MOTORS WITHOUT INTEGRAL THERMAL PROTECTION, SHALL BE PROVIDED THERMAL OVERLOADS SIZED TO THE MOTOR FULL-LOAD RATING.
- DISCONNECTS FOR EQUIPMENT WITH REMOTE MOUNTED VFD'S SHALL HAVE AUXILIARY CONTACTOR AND #14 WIRES ROUTED BACK TO VFD TO DISABLE.



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UCCS CRAGMOR HALL
CHILLER REPLACEMENT
1420 AUSTIN BLUFFS PARKWAY, COLORADO
SPRINGS, CO 80933

DESIGNED BY
BAB

DRAWN BY
TAH

CHECKED BY
SRP

PROJECT NO.
21142

DATE
12/09/2022

SHEET TITLE
ELECTRICAL
GENERAL NOTES

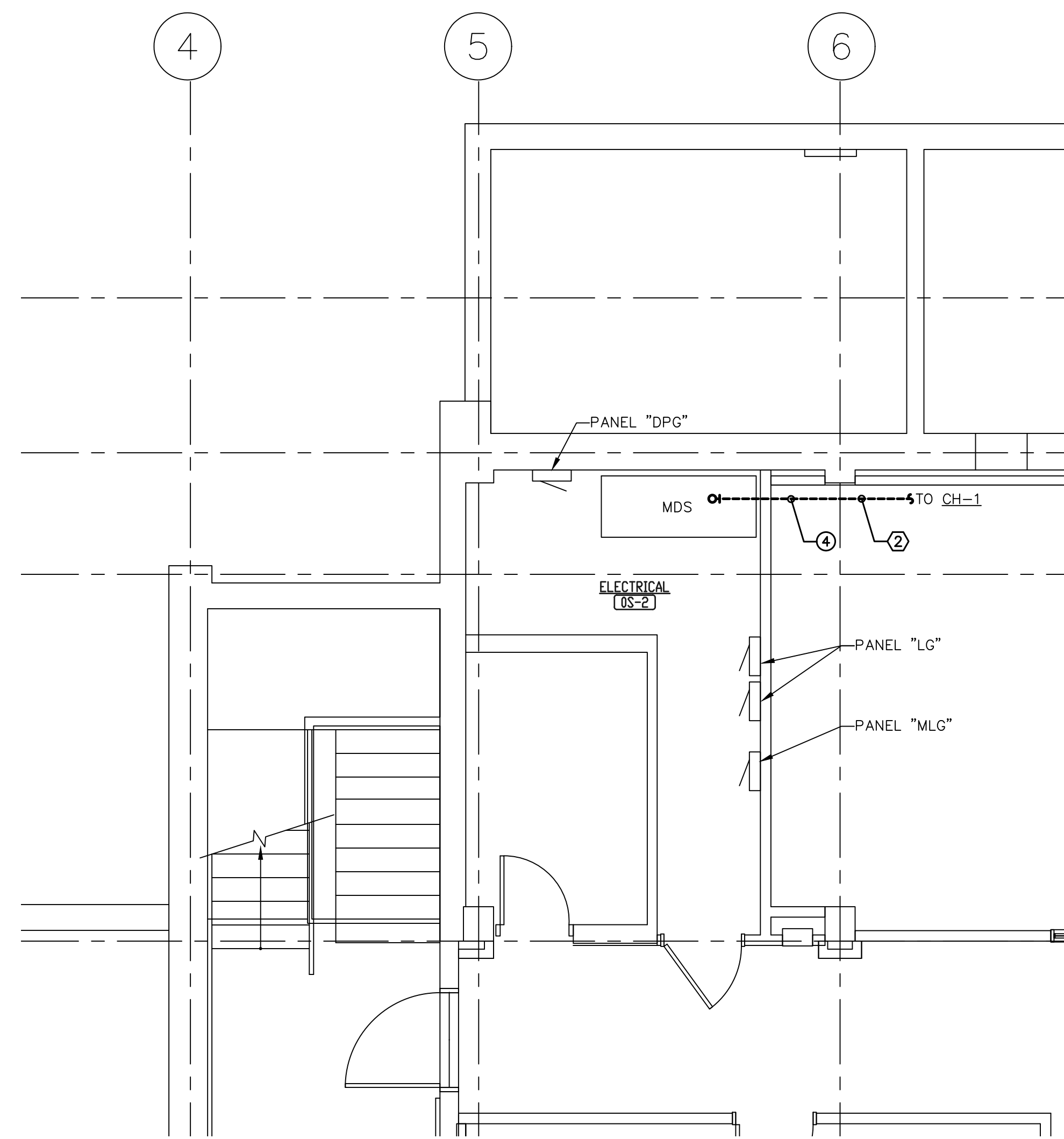
SHEET NO.
E0.02

EQUIPMENT SCHEDULE - DEMOLITION												
KEY	ITEM DESCRIPTION	A/C VOLTS	PH	HP	AMPS	KW	CIRCUIT NO. FROM MDS	FEEDERS	LOCAL DISC SW	FUSE SIZE	BRKR SIZE	NOTE
(D) CH-1	CHILLER	208	3	50	266	95.98		3"C-3#350, #4G	400A	300A	300A	1
TOTAL EQUIP LOAD:		208	3	266	96.0							

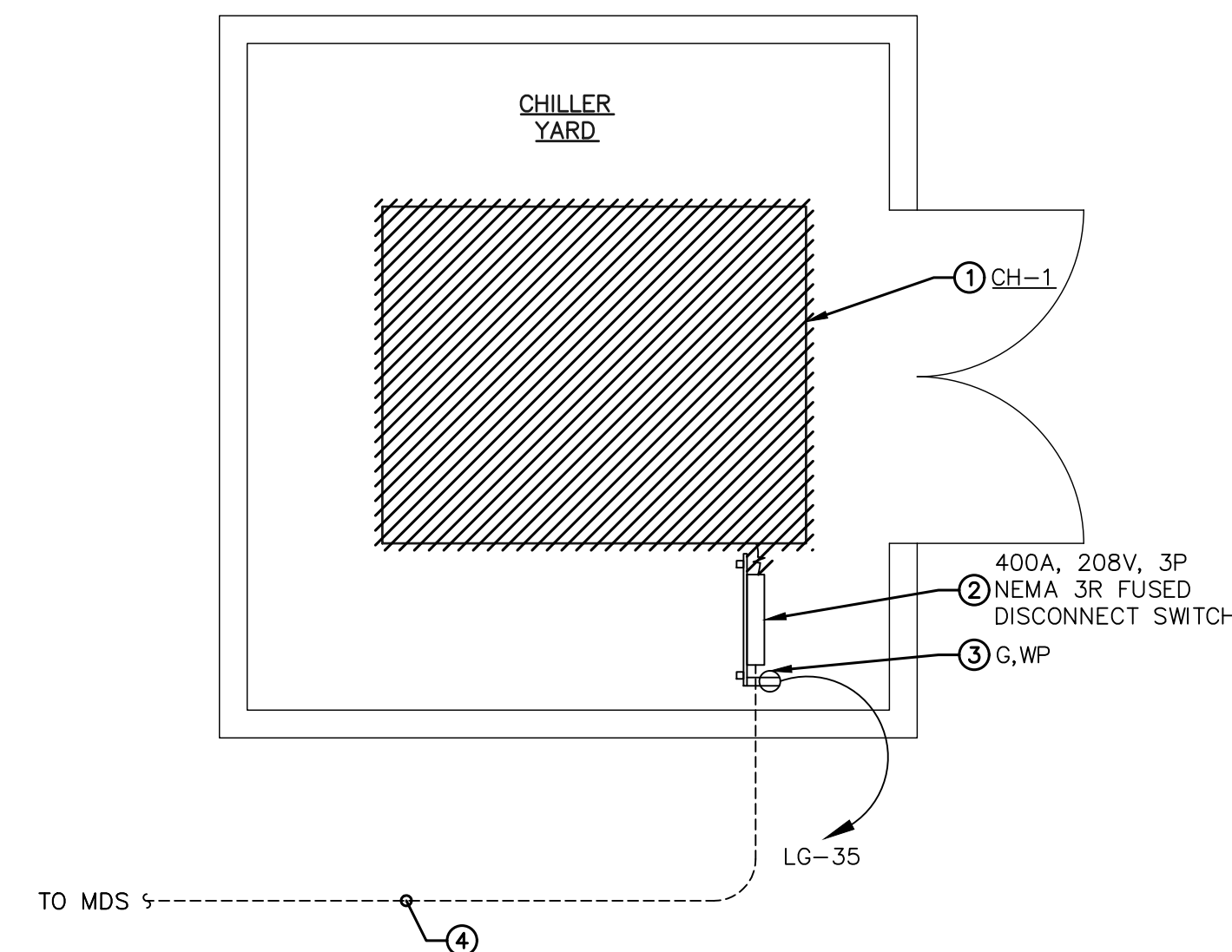
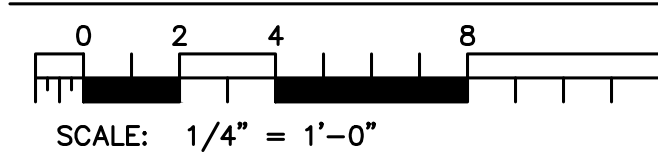
NOTES:
1 EXISTING FEEDER TO REMAIN FOR CONNECTION TO NEW CHILLER.

EQUIPMENT SCHEDULE - NEW												
KEY	ITEM DESCRIPTION	A/C VOLTS	PH	HP	AMPS	KW	CIRCUIT NO. FROM MDS	FEEDERS	LOCAL DISC SW	FUSE SIZE	BRKR SIZE	NOTE
(N) CH-1	CHILLER	208	3	-	221	79.71		(E)3"C-3#350, #4G	-	-	300A	1
TOTAL EQUIP LOAD:		208	3	221	79.7							

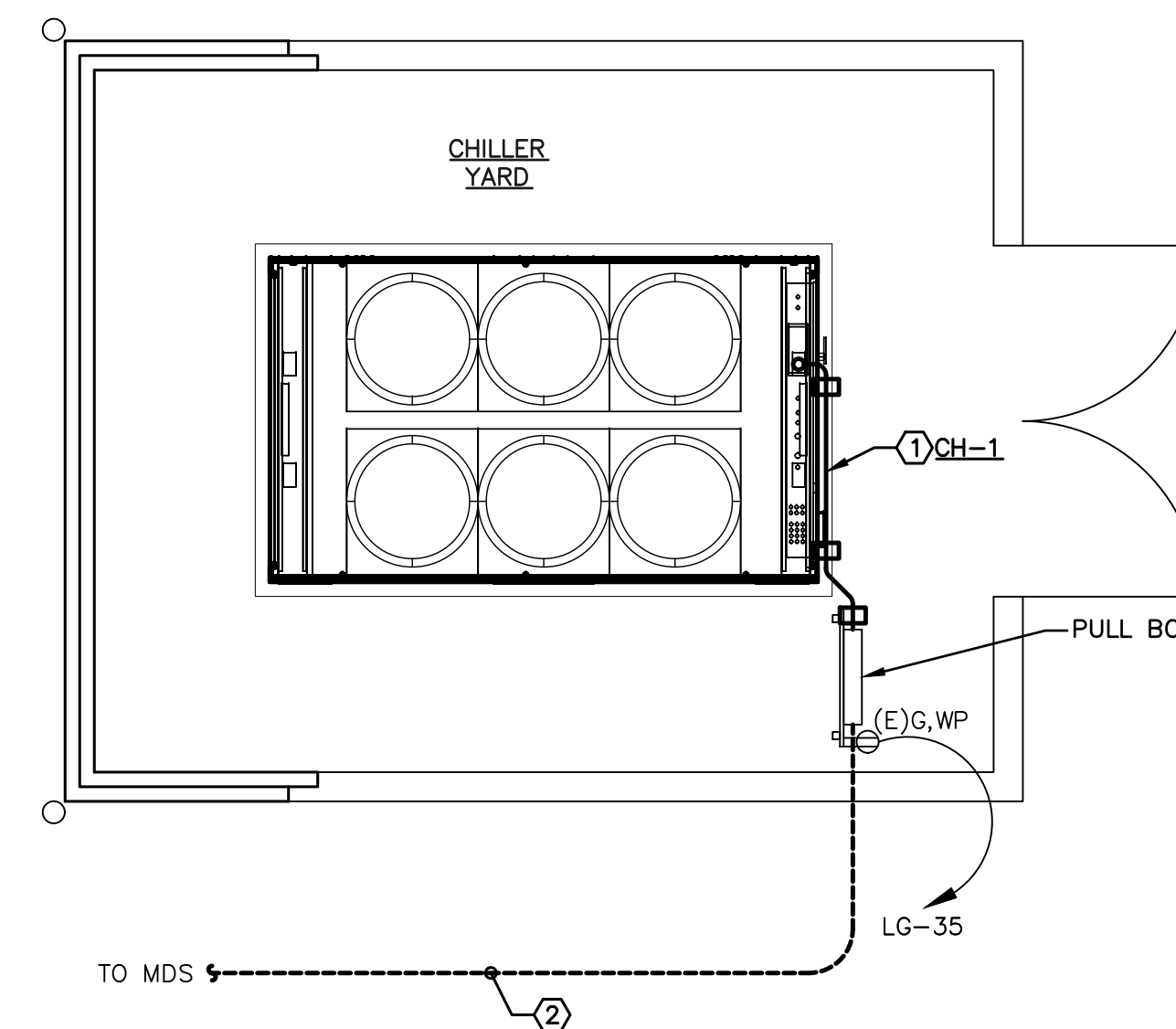
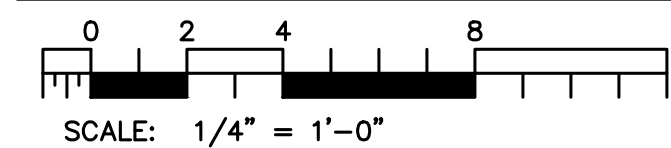
NOTES:
1 EQUIPMENT PROVIDED WITH SINGLE POINT POWER CONNECTION AND PROTECTED WITH INTEGRAL 300A, 3P, MOLDED CASE CIRCUIT BREAKER.



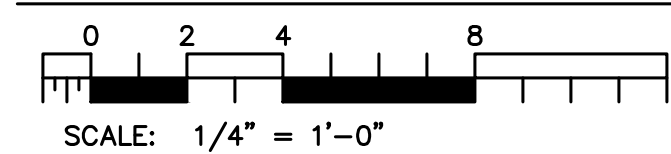
ELECTRICAL PLAN - ELECTRICAL ROOM 0S-2



ELECTRICAL DEMOLITION PLAN - CHILLER YARD



ELECTRICAL NEW WORK PLAN - CHILLER YARD

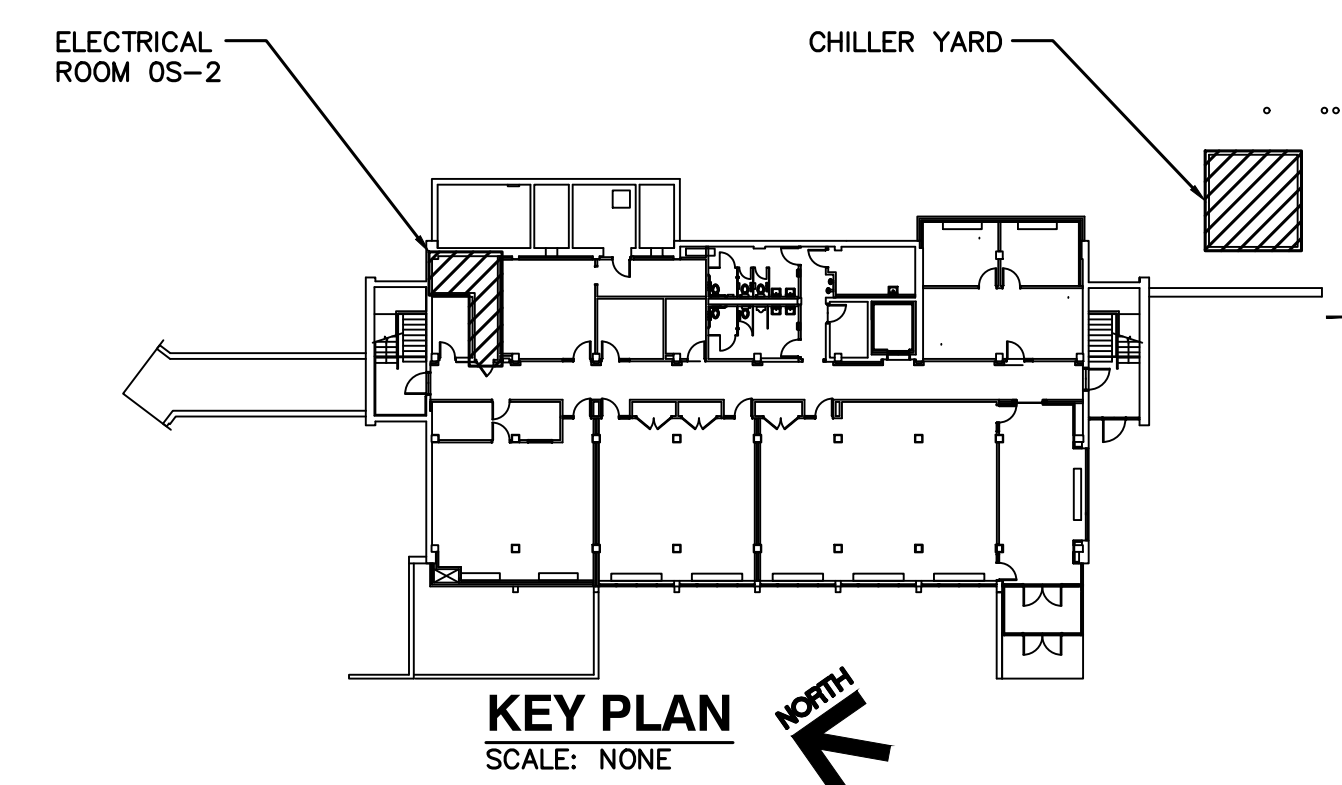


DEMOLITION KEY NOTES

- EXISTING CHILLER (CH-1) TO BE REMOVED AND REPLACED WITH NEW. DISCONNECT FROM POWER AND PREP FOR INSTALLATION OF NEW. EXISTING FEEDER TO REMAIN FOR CONNECTION TO NEW CHILLER. SEE NEW WORK PLAN THIS SHEET FOR ADDITIONAL REQUIREMENTS.
- EXISTING DISCONNECT SWITCH TO BE RE-PURPOSED AS A PULL BOX. REMOVE INTERNAL WORKING COMPONENTS AND PREP FOR REUSE. MAINTAIN NEMA 3R RATING AND CAULK/SEAL ALL FASTENER PENETRATIONS AS REQUIRED. REFER TO NEW WORK PLAN THIS SHEET FOR ADDITIONAL REQUIREMENTS.
- EXISTING WEATHERPROOF MAINTENANCE RECEPTACLE TO REMAIN.
- REMOVE EXISTING CONDUCTORS BACK TO MDS.

NEW WORK KEY NOTES

- EXTEND CONDUIT AND PROVIDE LIQUID-TIGHT FLEXIBLE CONNECTION AS REQUIRED TO NEW CHILLER CONTROL PANEL. PROVIDE DURA-BLOCK CONDUIT SUPPORTS AS REQUIRED. REFER TO ONE-LINE DIAGRAM ON SHEET E6.01 FOR ADDITIONAL REQUIREMENTS.
- PROVIDE NEW FEEDER CONDUCTORS IN EXISTING CONDUIT FROM MDS TO NEW CHILLER SINGLE POINT CONNECTION AND TERMINATE IN CONTROL PANEL.



KEY PLAN
SCALE: NONE

SCHENDT ENGINEERING CORPORATION
CONSULTING ENGINEERS
5100 CENTRAL BLVD, SUITE 200
COLORADO SPRINGS, CO 80913
PH: (719) 637-8800 • sec@schendt.com

COLORADO LICENSED PROFESSIONAL ENGINEER
STEVEN R. PECK
33321
Steven R. Peck
Date: 12/09/2022

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CHILLER REPLACEMENT
1420 AUSTIN BLUFFS PARKWAY, COLORADO SPRINGS, CO 80933

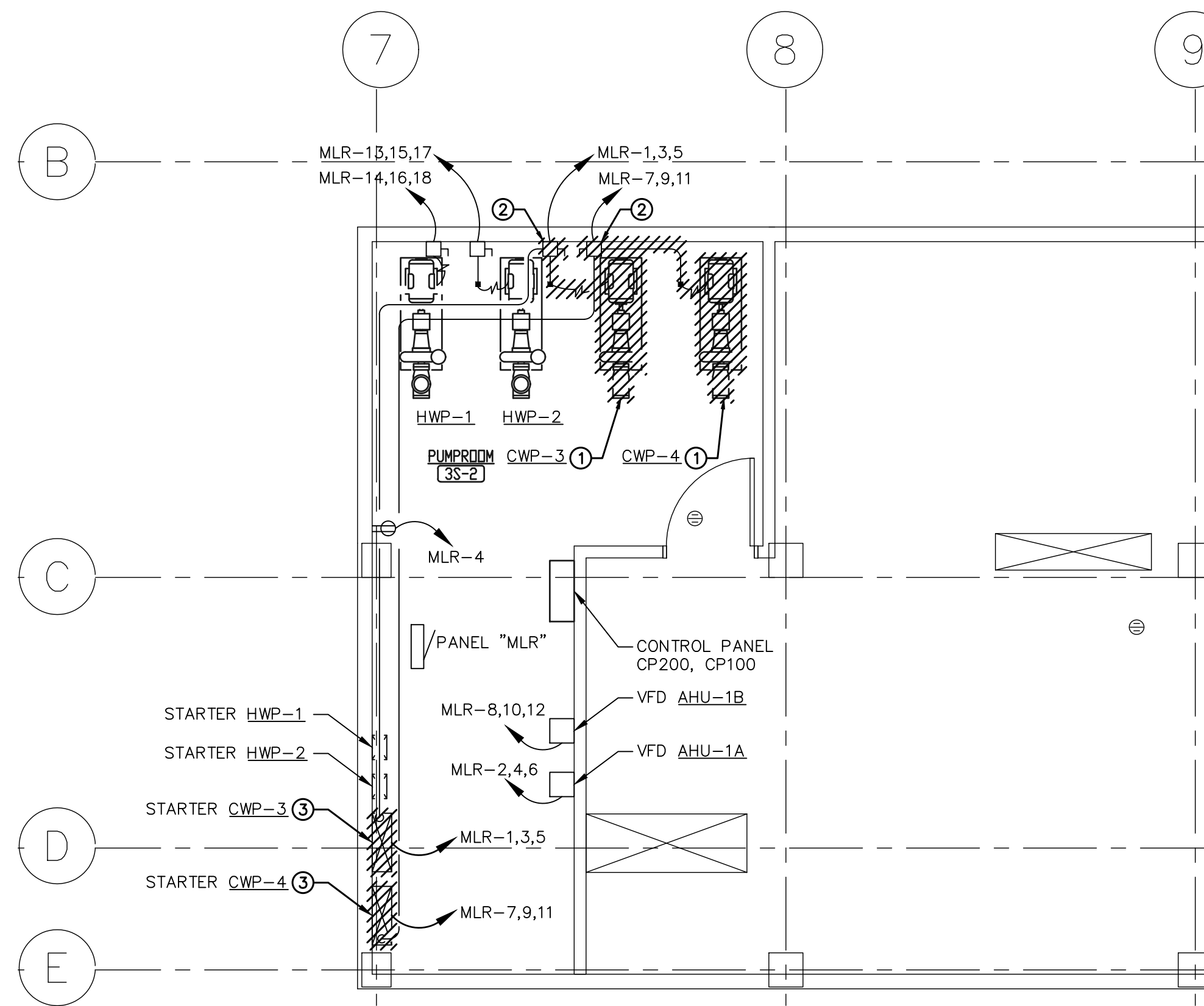
DESIGNED BY	BAB
DRAWN BY	TAH
CHECKED BY	SRP
PROJECT NO.	21142
DATE	12/09/2022

ELECTRICAL PLAN - FIRST FLOOR

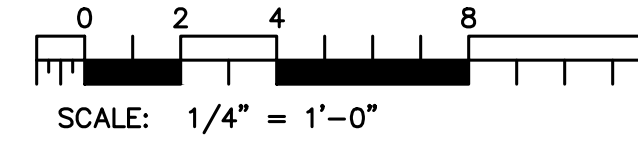
E4.01

EQUIPMENT SCHEDULE - DEMOLITION												
KEY	ITEM DESCRIPTION	A/C VOLTS	PH	HP	FLA	KW	CIRCUIT NO.	FEEDERS	LOCAL DISC SW	FUSE SIZE	BRKR SIZE	NOTE
(D) CWP-3	CHILLED WATER PUMP	208	3	10	30.8	11.10	MLR-1,3,5	1"C-3#6, #10G	60A	-	60A	1
(D) CWP-4	CHILLED WATER PUMP	208	3	10	30.8	11.10	MLR-7,9,11	1"C-3#6, #10G	60A	-	60A	1
TOTAL EQUIP LOAD:		208	3		62	22.2						

NOTES:
 1 REMOVE STARTER & PREP FOR INSTALLATION OF NEW VFD. SAVE LOAD & LINE SIDE CONDUIT AND CONDUCTORS FOR REUSE IN NEW WORK.



ELECTRICAL DEMOLITION PLAN - PUMP ROOM 3S-2

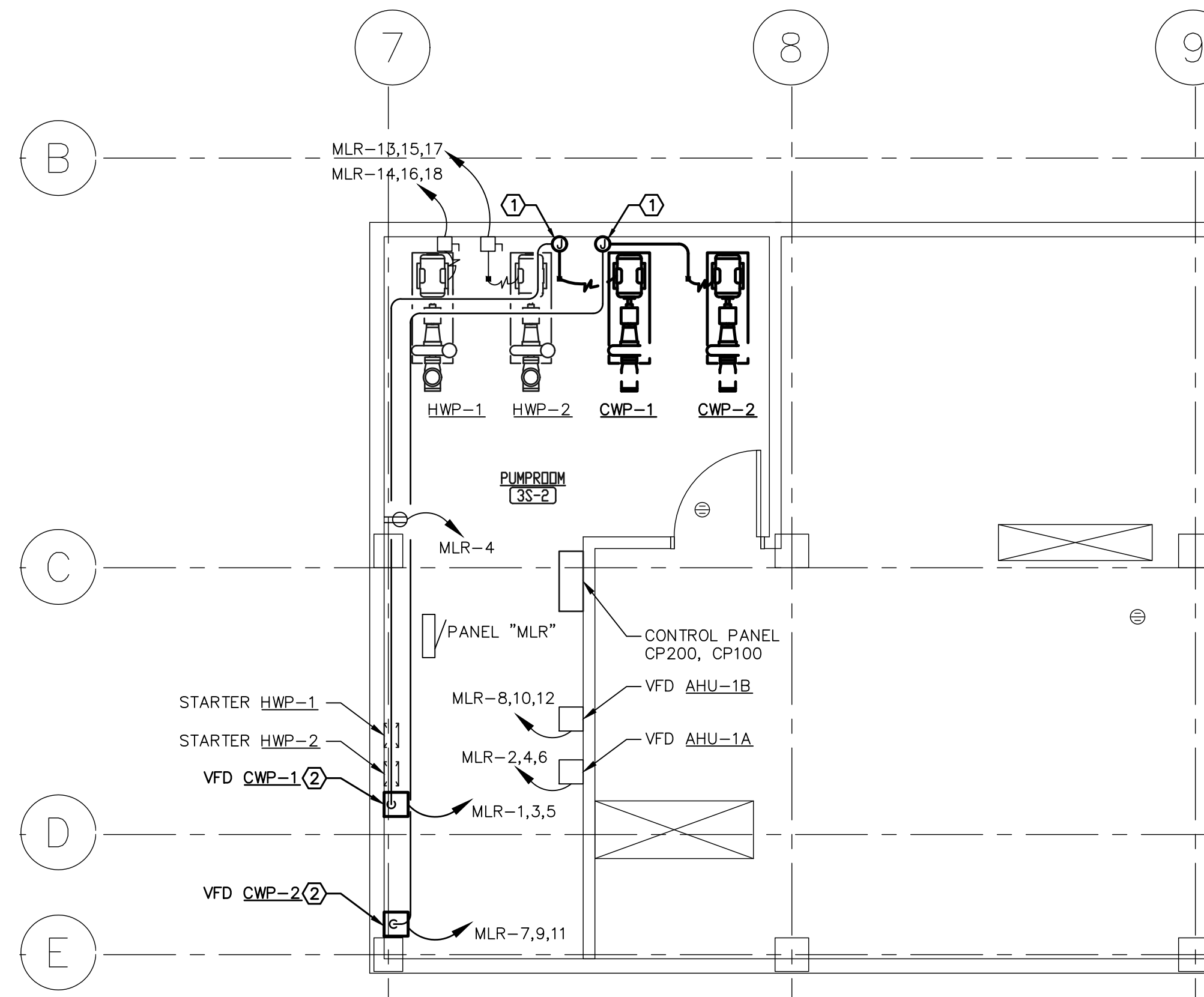


DEMOLITION KEY NOTES

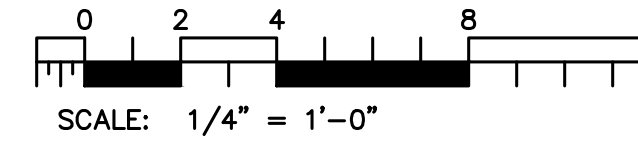
- EXISTING PUMP TO BE REMOVED AND REPLACED WITH NEW. DISCONNECT FROM POWER AND PREP FOR INSTALLATION OF NEW. EXISTING FEEDER TO BE REMOVED. EXISTING CONDUIT MAY REMAIN FOR REUSE, PROVIDE MODIFICATIONS AND APPURTENANCES AS REQUIRED. SEE NEW WORK PLAN THIS SHEET FOR ADDITIONAL REQUIREMENTS.
- REMOVE EXISTING DISCONNECT SWITCH, ASSOCIATED FLEXIBLE CONDUIT, AND BRANCH CIRCUIT WIRING TO PUMP. REFER TO NEW WORK PLAN THIS SHEET FOR ADDITIONAL REQUIREMENTS.
- REMOVE PUMP STARTER. EXISTING BRANCH CIRCUIT WIRING TO REMAIN FOR CONNECTION TO NEW VFD. REFER TO NEW WORK PLAN THIS SHEET FOR ADDITIONAL REQUIREMENTS.

EQUIPMENT SCHEDULE - NEW												
KEY	ITEM DESCRIPTION	A/C VOLTS	PH	HP	FLA	KW	CIRCUIT NO.	FEEDERS	LOCAL DISC SW	FUSE SIZE	BRKR SIZE	NOTE
(N) CWP-1	CHILLED WATER PUMP	208	3	10	30.8	11.10	MLR-1,3,5	1"C-3#6, #10G	VFD	-	60A	1
(N) CWP-2	CHILLED WATER PUMP	208	3	10	30.8	11.10	MLR-7,9,11	1"C-3#6, #10G	VFD	-	60A	1
TOTAL EQUIP LOAD:		208	3		62	22.2						

NOTES:
 1 VFD PROVIDED BY MECHANICAL AND INSTALLED BY ELECTRICAL.

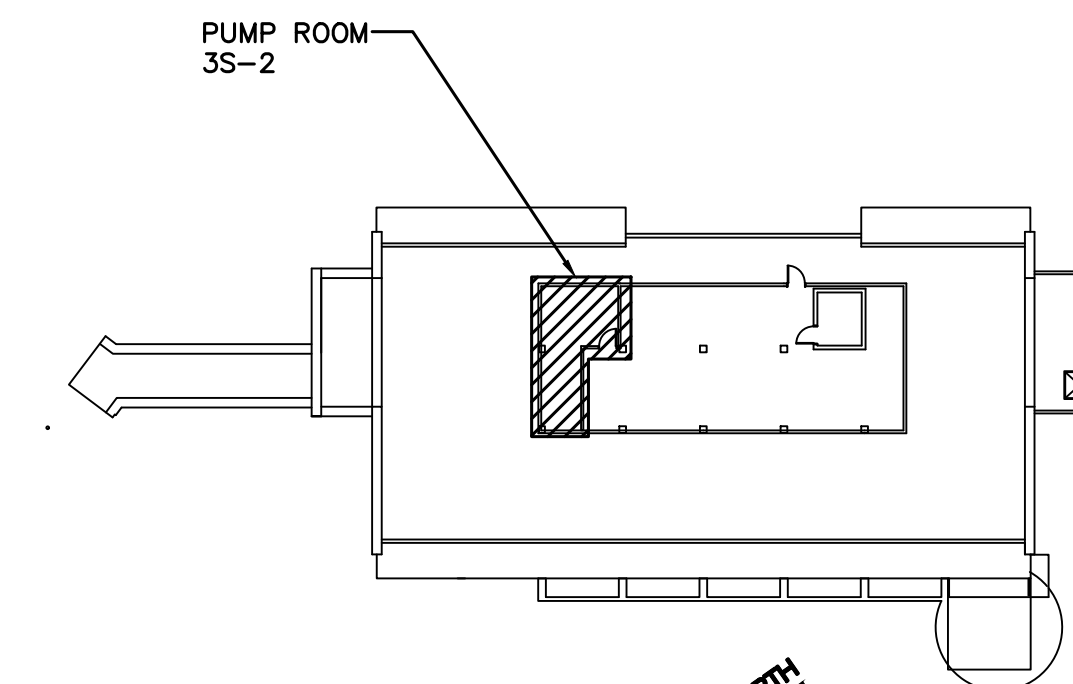


ELECTRICAL NEW WORK PLAN - PUMP ROOM 3S-2



NEW WORK KEY NOTES

- PROVIDE NEW JUNCTION BOX AT PREVIOUS DISCONNECT SWITCH LOCATION. EXTEND EXISTING FEEDER TO NEW PUMP LOCATION AND CONNECT. INSTALL CONDUCTORS IN NEW FLEXIBLE CONDUIT CONNECTIONS TO NEW PUMPS.
- INSTALL NEW VFD AT PREVIOUS STARTER LOCATION. EXTEND AND RECONNECT EXISTING BRANCH CIRCUIT WIRING TO NEW VFD AS REQUIRED. PROVIDE CONDUIT MODIFICATIONS AS REQUIRED AND CONDUCTORS TO NEW PUMPS.



KEY PLAN
SCALE: NONE

SCHENDT ENGINEERING CORPORATION
 CONSULTING ENGINEERS
 5100 CASPER BLVD, SUITE 200
 COLORADO SPRINGS, CO 80933
 • PH: (719) 637-8800 • FAX: (719) 637-8800
 • EMAIL: info@schendt.com

PROFESSIONAL ENGINEER
 33321
 Steven R. Peck
 Digitally signed by Steven R. Peck
 Date: 12/09/2022

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 CHILLER REPLACEMENT
 1420 AUSTIN BLUFFS PARKWAY,
 SPRINGS, CO 80933

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CHECKED BY
SRP

PROJECT NO.
21142

DATE
12/09/2022

SHEET TITLE
ELECTRICAL PLAN - PENTHOUSE

SHEET NO.
E4.02

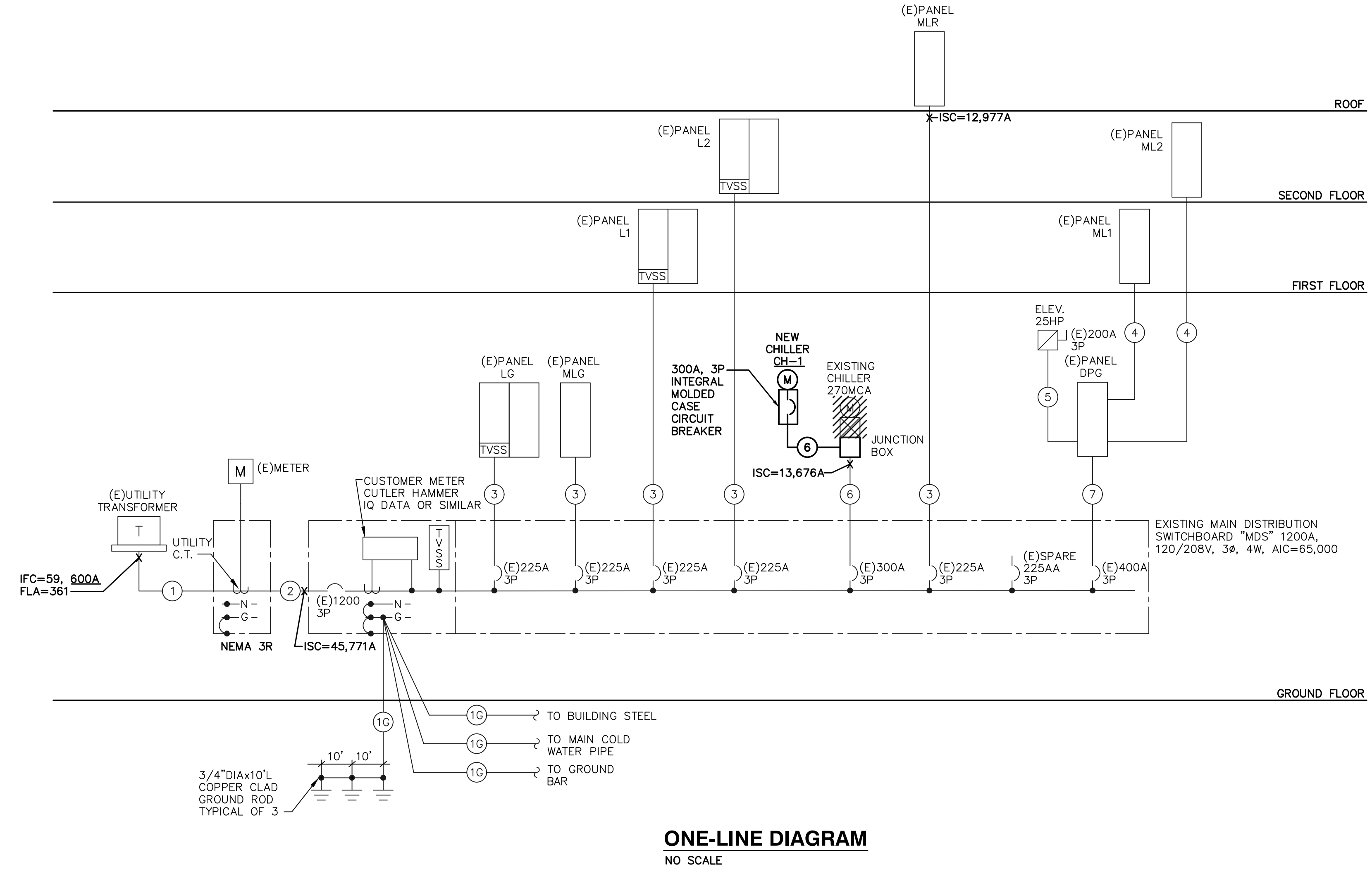
LOAD SUMMARY - MDS

	V	PHASE	A	KVA
PANEL RATING	208	3	1200	431.8
EXISTING LOAD (KVA)				
REMOVED LOADS	V	PHASE	FLA	KVA
(D) CWP-3	208	3	30.8	11.1
(D) CWP-4	208	3	30.8	11.1
(D) CH-1	208	3	266	95.9
REMOVED LOAD (KVA)				
ADDED LOADS	V	PHASE	FLA	KVA
(N) CWP-1	208	3	30.8	11.1
(N) CWP-2	208	3	30.8	11.1
(N) CH-1	208	3	221	79.6
ADDED LOAD (KVA)				
				101.78
NET CHANGE (KVA)				-16.3
NEW DEMAND (KVA)				329.6
NEW DEMAND (A)				915.9

PANEL:		MLR		TYPE:		HVAC		PROJECT NAME:		UCCS CRAGMOR HALL	
FED FROM:		MDS		MOUNTING:		SURFACE		PROJECT NO.:		21142	
VOLTAGE:		120/ 208		NEUTRAL BUS:		Y		NOTES:		THIS IS AN EXISTING PANELBOARD	
PHASE:		3 PHASE, 4 WIRE		GROUND BUS:		Y				[M] MODIFIED LOAD, USE EXISTING BREAKER	
MAIN OC DEVICE:		NA		AMPS		ISO GND:		N		80% OF BREAKER RATING ASSUMED FOR UNKNOWN LOADS	
MAIN LUGS:		225		AMPS							
A.I.C. RATING:		10000		AMPS							

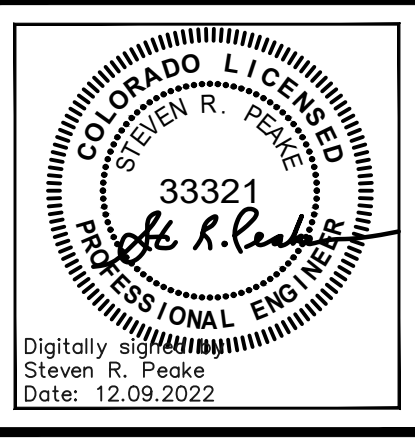
DESCRIPTION	LTG (VA)		RECEP (VA)	MOTOR (VA)	OTHER (VA)	TOTAL (VA)	BRKR AMP	CIRCUIT PHASE	BRKR AMP	TOTAL (VA)	OTHER (VA)	MOTOR (VA)	RECEP (VA)	LTG (VA)		DESCRIPTION
	FLUHD	LED												LED	FLUHD	
CWP-1				3720		3720	60	01 A 02		60	3720	3720				SUPPLY FAN AHU-1A
				3720		3720		03 B 04			3720	3720				
				3720		3720	3	05 C 06	3		3720	3720				
				3720		3720	60	07 A 08		35	2033	2033				
CWP-2				3720		3720		09 B 10			2033	2033				RETURN FAN AHU-1B
				3720		3720	3	11 C 12	3		2033	2033				
				2033		2033		13 A 14		35	2033	2033				PUMP HWP-1
PUMP HWP-2				2033		2033		15 B 16			2033	2033				
				2033		2033		17 C 18	3		2033	2033				
LIGHTS	781					781	20	19 A 20	1	15	670	670				EXHAUST FAN EF-1
RECEPTACLES			900			900	20	21 B 22	1	15	670	670				CIRC PUMP P-5
CONTROL PANEL CP100 & CP200	400					400	20	23 C 24	1	15	200	200				SMOKE DAMPER ELEVATOR SHAFT
SPARE						0	10	25 A 26	1		0	0				SPARE
UNIT HEATER UH-1				510		510	20	27 B 28			0	0				SPACE
SPACE						0		29 C 30			0	0				SPACE
SPACE						0		31 A 32			0	0				SPACE
SPACE						0		33 B 34			0	0				SPACE
SPACE						0		35 C 36			0	0				SPACE
SPACE						0		37 A 38		20	0	0				
SPACE						0		39 B 40			0	0				LIGHTNING ARRESTOR
SPACE						0		41 C 42	3		0	0				

CONNECTED LOAD AND PHASE SUMMARY					DEMAND LOAD SUMMARY				
LOAD TYPE	PH A	PH B	PH C	TOTAL	LOAD TYPE	POWER FACTOR	CONNECTED LOAD (KW)	DEMAND FACTOR	NEC CALCULATED LOAD (KVA)
LIGHTING LED	0.0	0.0	0.0	0.0 KVA	LIGHTING LED	100%	0.0 KW	125%	0.0 KVA
LIGHTING FL/HID	0.8	0.0	0.4	1.2 KVA	LIGHTING FL/HID	95%	1.1 KW	125%	1.5 KVA
RECEPTACLES	0.0	0.9	0.0	0.9 KVA	RECEPTACLES				
MOTORS	17.9	18.4	17.5	53.8 KVA	FIRST 10KVA	95%	0.9 KW	100%	0.9 KVA
OTHER	0.0	0.0	0.0	0.0 KVA	REMAINDER	95%	0.0 KW	50%	0.0 KVA
TOTAL	18.7	19.3	17.9	55.9 KVA	MOTORS				
PHASE BALANCE	A-B	B-C	C-A	PNL PF	LARGEST	80%	8.9 KW	125%	14.0 KVA
	97%	92%	95%	0.81	REMAINDER	80%	34.1 KW	100%	42.7 KVA
MIN PANEL AMPACITY	= 164 AMPS				OTHER	95%	0.0 KW	125%	0.0 KVA
					TOTAL		45.0 KW		59.0 KVA



FEEDER SCHEDULE

KEY #	DESCRIPTION	NOTES
1	[4(4#350KCMIL) 3-1/2"C.]	
2	[4(4#350KCMIL & 1#3/0G) 3-1/2"C.]	
3	(4#4/0 & 1#4G) 2"C.	
4	(4#1/0 & 1#6G) 2"C.	
5	(3#1/0 & 1#6G) 1-1/2"C.	
6	(3#350KCMIL & 1#4G) 3"C.	
7	(4#500KCMIL & 1#3G) 3-1/2"C.	
1G	(1#3/0G) 3/4"C.	



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UCCS CRAGMOR HALL
CHILLER REPLACEMENT
1420 AUSTIN BLUFFS PARKWAY, COLORADO
SPRINGS, CO 80933

DESIGNED BY
BAB

DRAWN BY
TAH

CHECKED BY
SRP

PROJECT NO.
21142

DATE
12/09/2022

SHEET TITLE
ONE-LINE DIAGRAM

E6.01