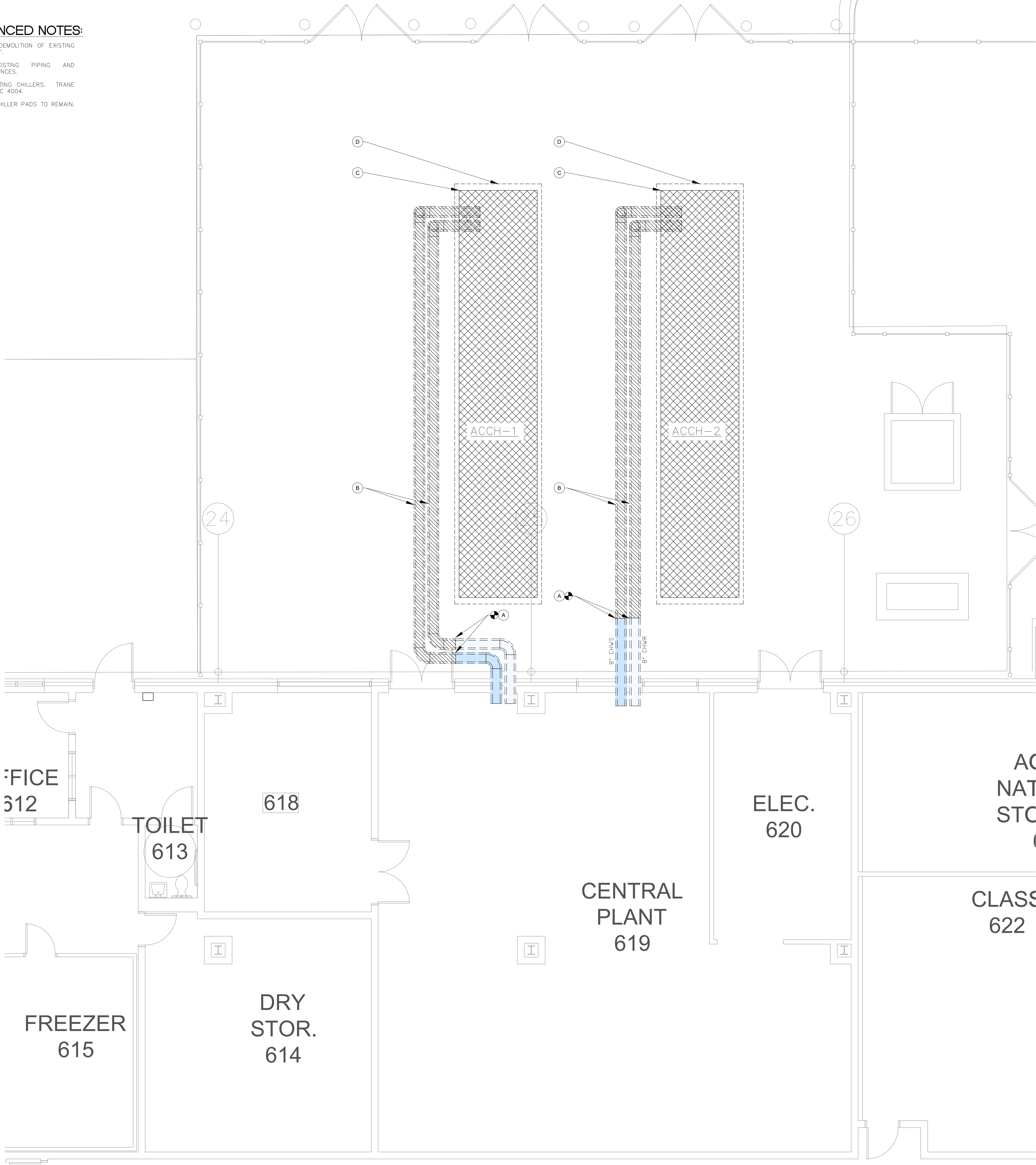




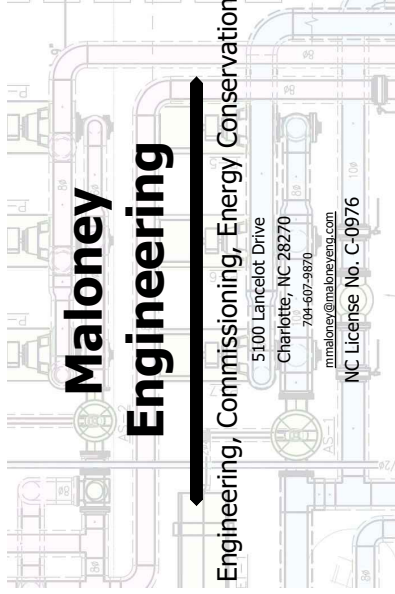


REFERENCED NOTES:

- (A) POINT OF DEMOLITION OF EXISTING PIPING, V/F.
- (B) DEMO EXISTING PIPING AND APPURTENANCES.
- (C) DEMO EXISTING CHILLERS, TRANE MODEL RTAC 4004.
- (D) EXISTING CHILLER PADS TO REMAIN.

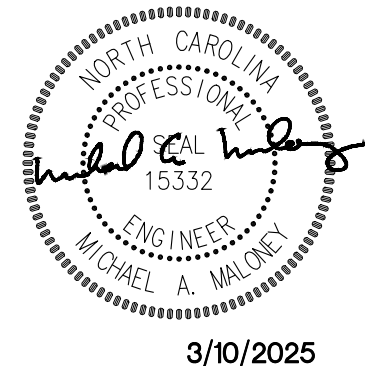


MECHANICAL PLAN - Demo  
SCALE: 1/4" = 1'-0"



Charlotte-Mecklenburg Schools  
3301 Stafford Drive  
Charlotte, North Carolina

SEAL:



- PRELIMINARY - NOT FOR CONSTRUCTION  
● FOR CONSTRUCTION  
○ AS-BUILT DRAWINGS

PROJECT NAME: Mechanical Renovations - Replacement of Chillers - "Like for Like"

LOCATION: Philip O Berry H.S., 1430 Alleghany St., Charlotte, NC 28208

SHEET TITLE: MECHANICAL DEMO

PROJECT NO:

25002

DRAWN BY:

MM

CAD NO:

25002 ME

CHECKED BY:

BS, RM, MM

SCALE:

AS NOTED

DATE:

3/10/2025

REVISIONS:

SHEET NUMBER:

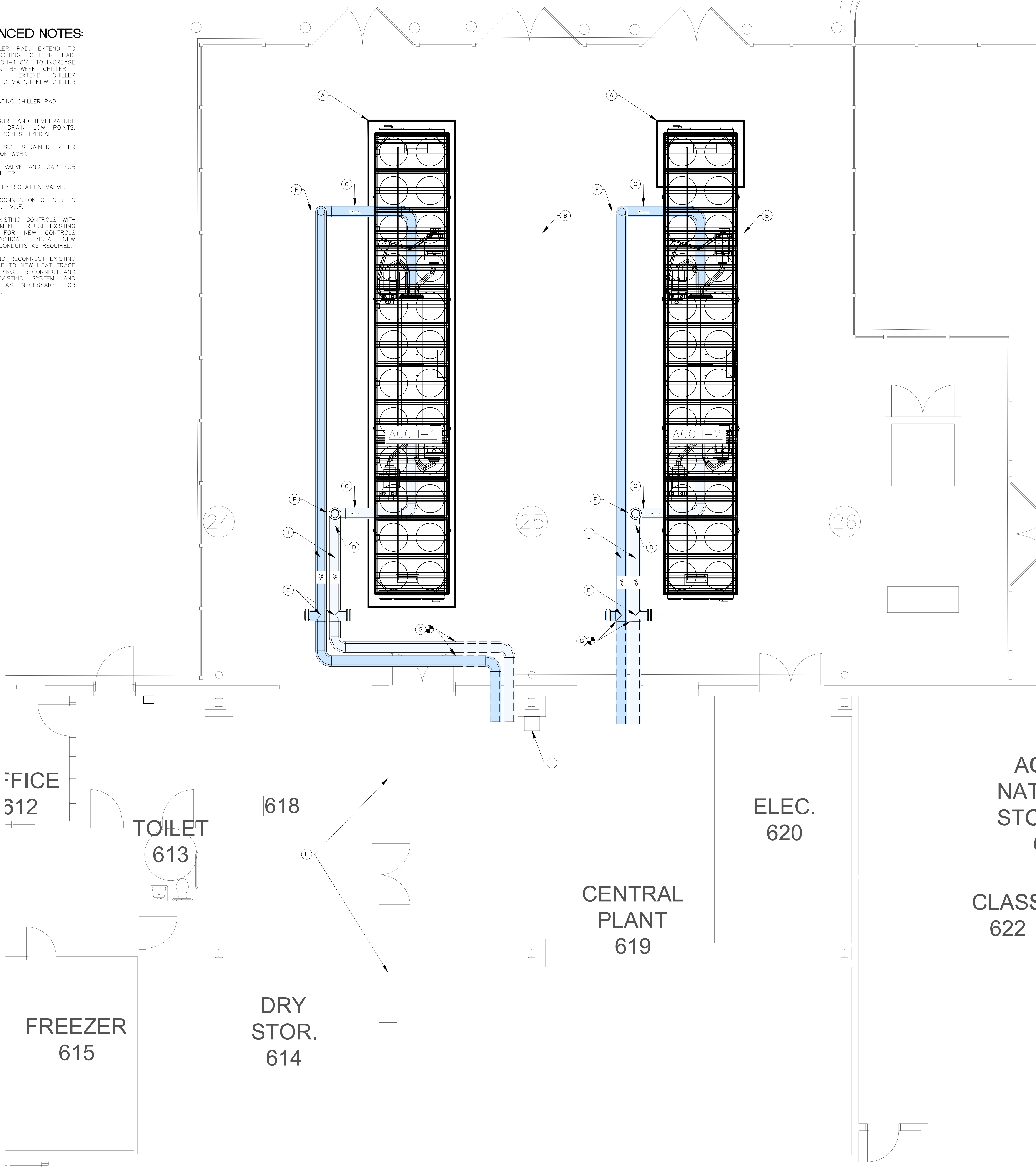
M 1.1

GENERAL NOTES:

1. MATCH EXISTING SUPPORT STRUCTURE AND ROLLER SUPPORTS.
2. MAXIMUM DISTANCE BETWEEN SUPPORTS IS 19" OC.
3. VERIFY FLOW DIRECTIONS BEFORE BEGINNING WORK.
4. INSTALL PIPE NAME AND FLOW DIRECTION ARROW STENCILS ON EXTERIOR PIPING.

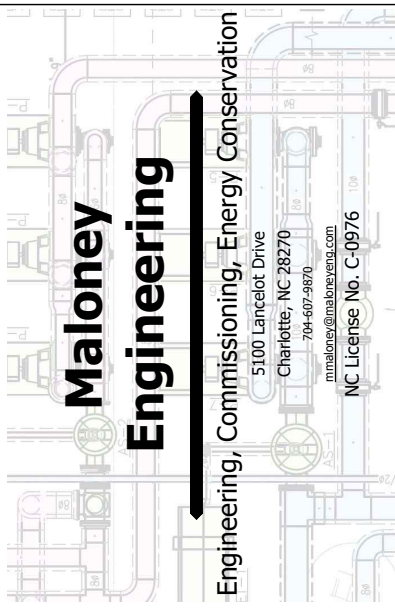
REFERENCED NOTES:

- (A) NEW CHILLER PAD. EXTEND TO MATCH EXISTING CHILLER PAD. EXTEND ACCH-1 8" TO INCREASE SEPARATION BETWEEN CHILLER 1 AND 2. EXTEND CHILLER ACCH-1/2 TO MATCH NEW CHILLER LENGTHS.
- (B) REUSE EXISTING CHILLER PAD.
- (C) NEW PRESSURE AND TEMPERATURE GAUGES. DRAIN LOW POINTS, VENT HIGH POINTS, TYPICAL.
- (D) NEW FULL SIZE STRAINER. REFER TO SCOPE OF WORK.
- (E) FULL SIZE VALVE AND CAP FOR RENTAL CHILLER.
- (F) 8" BUTTERFLY ISOLATION VALVE.
- (G) POINT OF CONNECTION OF OLD TO NEW PIPING, V.I.F.
- (H) UPDATE EXISTING CONTROLS WITH NEW EQUIPMENT. REUSE EXISTING CONDUITS FOR NEW CONTROLS WHERE PRACTICAL. INSTALL NEW WIRE AND CONDUITS AS REQUIRED.
- (I) EXTEND AND RECONNECT EXISTING HEAT TRACE TO NEW HEAT TRACE ON NEW PIPING. RECONNECT AND UPDATE EXISTING SYSTEM AND CONTROLS AS NECESSARY FOR NEW PIPING.



MECHANICAL PLAN - New

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



Charlotte-Mecklenburg Schools  
3301 Stafford Drive  
Charlotte, North Carolina

SEAL:



- PRELIMINARY - NOT FOR CONSTRUCTION
- FOR CONSTRUCTION
- AS-BUILT DRAWINGS

PROJECT NAME:  
Mechanical Renovations - Replacement of Chillers - "Like for Like"

LOCATION:  
Philip O Berry H.S., 1430 Alleghany St., Charlotte, NC 28208

SHEET TITLE:  
MECHANICAL PLAN - NEW

PROJECT NO:  
25002

DRAWN BY:  
MM

CAD NO:  
25002 ME

CHECKED BY:  
BS, RM, MM

SCALE:  
AS NOTED

DATE:  
3/10/2025

REVISIONS:

SHEET NUMBER:

M 1.2



<div>SECTION 23 64 26.13 Air-Cooled, Rotary-Screw Water Chillers</div> <div>PART 1 – GENERAL</div> <div>1.01 REFERENCES</div> <div>A. AHRI 550/590 – Standard for Water Chilling Packages using the Vapor Compression Cycle</div> <div>B. AHRI 370 – Sound Rating of Large Outdoor Refrigerating and Air-Conditioning Equipment</div> <div>C. ASHRAE 15 – Safety Code for Mechanical Refrigeration</div> <div>1.02 SUBMITTALS</div> <div>A. Submit dimensional plan and elevation view drawings, weights and loadings, required clearances, location and size of all field connections, electrical requirements and wiring diagrams.</div> <div>B. Submit product data indicating rated capacities, accessories and any special data.</div> <div>C. Submit manufacturer's installation instructions.</div> <div>1.03 REGULATORY REQUIREMENTS</div> <div>A. Chiller must be built in an ISO 9001 classified facility.</div> <div>1.04 VERIFICATION OF CAPACITY AND EFFICIENCY</div> <div>A. All proposals for chiller performance must include an AHRI approved selection method. Verification of date and version of computer program selection or catalog is available through AHRI.</div> <div>1.05 DELIVERY, HANDLING AND STORAGE</div> <div>A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting chillers.</div> <div>B. Chiller shall be capable of withstanding –40°F (–40°C) to 158°F (70°C) storage temperatures for an indefinite period of time.</div> <div>1.06 WARRANTY</div> <div>A. Provide a full parts warranty for one year from start-up or 18 months from shipment, whichever occurs first.</div> <div>B. Year 2–5 parts warranty whole unit</div> <div>C. 1st year labor warranty whole unit</div> <div>D. 2–5th year labor warranty whole unit</div> <div>E. 1st year refrigerant warranty</div> <div>F. 2–5th year refrigerant warranty</div> <div>PART 2 – PRODUCTS</div> <div>2.01 ACCEPTABLE MANUFACTURERS</div> <div>A. Trane model RTAF</div> <div>B. Approved equals [Carrier, Dakin, York] must have screw compressor and meet the specification including all scheduled performance.</div> <div>2.02 CHILLER OPERATION</div> <div>A. Chiller shall be able to start and operate in ambient conditions down to –4°F (–20°C) and up to 115°F (46°C). Low ambient operation is accomplished with factory installed and tested protection. If field installed low ambient solution is used this shall be purchased and installed at contractor expense.</div> <div>B. Chiller shall be capable of operating with a leaving solution temperature range 40°F to 68°F (4.4 to 20°C) without glycol.</div> <div>C. Chiller shall be capable of starting up with 95°F (35°C) entering fluid temperature to the evaporator. Maximum water temperature that can be circulated with the Chiller not operating is 108°F (52°C)</div> <div>D. Chiller shall provide evaporator freeze protection and low limit control to avoid low evaporator refrigerant temperature trip-outs during critical periods of chiller operation. Whenever this control is in effect, the controller shall indicate that the chiller is in adaptive mode. If the condition exists for more than 30 seconds, a limit warning alarm relay shall energize.</div> <div>E. Rapid Restart™ after power restoration. The Chiller shall be capable of starting in 45 seconds.</div> <div>2.03 COMPRESSORS</div> <div>A. Construct chiller using semi-hermetic, variable speed drive, helical rotary screw compressors.</div> <div>B. Provide compressor motor that is suction gas cooled with robust construction and system design protection.</div> <div>C. Provide oil lubrication system with oil charging valve and oil filter to ensure adequate lubrication during starting, stopping, and normal operation.</div> <div>D. Provide compressor heater to evaporate refrigerant returning to compressor during shut down. Energize heater when compressor is not operating.</div> <div>E. Provide compressor with automatic capacity reduction equipment consisting of capacity control via variable speed drive and/or slide valve. Compressor must start unloaded for soft start on motors.</div> <div>F. Chiller shall be capable of operation down to 15% load without hot gas bypass.</div> <div>2.04 EVAPORATOR</div> <div>A. The evaporator shall be designed, tested, and stamped in accordance with ASME code for a refrigerant side working pressure of 200 psig. Waterside working pressure shall be 150 psig.</div> <div>B. Insulate the evaporator with a minimum of 0.75 inch (K=0.28) UV rated insulation. If the insulation is field installed, the additional money to cover material and installation costs in the field should be included in the bid.</div> <div>C. Evaporator heaters shall be factory installed and shall protect chiller down to –4°F (–20°C). Contractor shall wire separate power to energize heat tape and protect evaporator while chiller is disconnected from the main power.</div> <div>D. Provide shell and tube type evaporator, cast iron or fabricated steel heads, seamless internally and externally finned copper tubes, roller expanded into tube sheets.</div> <div>E. Provide ability to remove evaporator tubes from either end of the heat exchanger.</div> <div>F. Evaporator shall have cleanable tubes</div> <div>G. Provide water drain connection, vent and fittings. Factory installed leaving water</div> <div>temperature control and low temperature cutoff sensors.</div> <div>H. Water connections shall be grooved pipe.</div> <div>I. Proof of flow shall be provided by the equipment manufacturer, mechanically installed and electrically wired, at the factory of origin.</div> <div>2.05 FANS</div> <div>A. All condenser fan TEAO motors have permanently lubricated ball bearings and external overload protection.</div> <div>B. All condenser fans shall have drives to provide variable speed for optimized efficiency. Direct–drive, vertical–discharge condenser fans shall be used. The condenser fan motors shall be permanent magnet motors with integrated drive to provide variable speed fan control for all fans. Units shall be equipped with EC condenser fan motors with permanently lubricated ball bearings and internal overload and over-current protection. Fans shall have insulation IP54 compliance.</div> <div>2.06 CONDENSER</div> <div>A. Construct condenser coils of Long Life Alloy Aluminum brazed fin construction. The condenser coils shall have an integral sub-cooling circuit and shall be designed for at least 350 psig working pressure. Leak tested at 1.5 times working pressure (525 psig). Coils can be cleaned with high pressure water.</div> <div>B. Condenser coils shall be transverse design. If coils are not transverse design, provide coil protection for shipping.</div> <div>2.07 ENCLOSURES/CHILLER CONSTRUCTION</div> <div>A. Chiller panels, base rails and control panels shall be finished with a baked on powder paint. Control panel doors shall have door stays.</div> <div>B. Mount starters and Terminal Blocks in a UL 1995 rated weatherproof panel provided with full opening access doors. If a circuit breaker is chosen, it should be a lockable, through-the-door type with an operating handle and clearly visible from outside of chiller indicating if power is on or off.</div> <div>C. The coating or paint system shall withstand 500 hours in a salt-spray fog test in accordance with ASTM B117.</div> <div>2.08 CHILLER MOUNTED VARIABLE SPEED DRIVE (VSD)</div> <div>A. The water chiller shall be furnished with an air cooled variable speed drive (VSD) as shown on the drawings.</div> <div>B. The VSD efficiency shall be 97% or better at full speed and full load. Fundamental displacement power factor shall be a minimum of 0.96 at all loads for VSD. All other starters shall have a minimum displacement power factor of 0.85.</div> <div>C. Power semi-conductor and capacitor cooling shall be from a liquid or air cooled heat/sink.</div> <div>D. Unit shall have a single point power connection.</div> <div>E. A molded case standard interrupting capacity circuit breaker shall be factory pre-wired with terminal block power connections and equipped with a lockable external operator handle, making it available to disconnect the chiller from main power.</div> <div>F. A control power transformer shall be factory-installed and factory-wired to provide unit control power.</div> <div>G. Unit wiring shall run in liquid-tight conduit.</div> <div>H. High short circuit current rating (SCCR) of 10kA</div> <div>I. Customer wired 15 amp, 115-volt GFCI convenience outlet shall be factory mounted on the exterior of the control panel.</div> <div>2.09 REFRIGERANT CIRCUIT</div> <div>A. All chillers shall have 2 refrigeration circuits, each with one or two (manifoldded) compressor(s) on each circuit.</div> <div>B. Provide for refrigerant circuit:</div> <div>1. Liquid line shutoff valve</div> <div>2. Suction service valve</div> <div>3. Discharge service valve</div> <div>4. Filter (replaceable core type)</div> <div>5. Liquid line sight glass.</div> <div>6. Electronic expansion valve sized for maximum operating pressure</div> <div>7. Charging valve</div> <div>8. Discharge and oil line check valves</div> <div>9. High side pressure relief valve</div> <div>10. Integrated oil loss sensor</div> <div>C. Full operating charge of R513A and oil.</div> <div>1. Provide a fully convertible and compatible next generation low GWP refrigerant chiller.</div> <div>2. If the chiller cannot be factory supplied as a fully convertible and compatible next generation low GWP refrigerant chiller, then the contractor shall provide a field retrofit or a refrigerant guarantee.</div> <div>2.10 CONTROLS</div> <div>A. A color, touch sensitive liquid crystal display (LCD) shall be unit mounted and a minimum of 7" diagonal. Animated graphical representations of chiller subsystem operation shall be used to enhance the user interface.</div> <div>B. Display shall consist of a menu driven interface with easy touch screen navigation to organized sub-system reports for compressor, evaporator, and motor information as well as associated diagnostics.</div> <div>C. The chiller control panel shall provide password protection of all setpoints</div> <div>D. The controller shall have the ability to display all primary sub-system operational parameters on dedicated trending graphs. The operator must be able to create up to 6 additional custom trend graphs, choosing up to 10 unique parameters for each graph to trend log data parameters simultaneously over an adjustable period and frequency polling.</div> <div>E. Chilled water temperature control shall be microprocessor-based, proportional and integral controller to show water and refrigerant temperature, refrigerant pressure,</div> <div>and diagnostics. This microprocessor-based controller is to be supplied with each chiller by the chiller manufacturer.</div> <div>F. The front of the chiller control panel shall display the following in clear language, without the use of codes, look-up tables, or gauges:</div> <div>1. Run time.</div> <div>2. Number of starts.</div> <div>3. Current chiller operating mode.</div> <div>4. Chilled water set point and set point source.</div> <div>5. Electrical current limit set point and set point source.</div> <div>6. Entering and leaving evaporator water temperatures.</div> <div>7. Saturated evaporator and condenser refrigerant temperatures.</div> <div>8. Evaporator and condenser refrigerant pressure.</div> <div>9. Oil tank pressure.</div> <div>10. Differential oil pressure.</div> <div>11. Compressor motor current per phase.</div> <div>12. Compressor motor percent RLA.</div> <div>13. Compressor motor voltage per phase.</div> <div>14. Phase reversal/unbalance/single phasing and over/under voltage protection.</div> <div>15. Low chilled water temperature protection.</div> <div>16. High and low refrigerant pressure protection.</div> <div>17. Load limit thermostat to limit compressor loading on high return water temperature.</div> <div>18. Condenser fan sequencing to automatically cycle fans in response to load, expansion valve pressure, condenser pressure, and differential pressure to optimize chiller efficiency.</div> <div>19. Display diagnostics.</div> <div>20. Oil pressure control based off of maintaining system differential pressure.</div> <div>21. Compressor Status (on/off), RSLA, anti-short cycle timer, and automatic compressor load–log.</div> <div>22. Oil loss indication.</div> <div>G. On chiller, mount weatherproof control panel, containing starters, power and control wiring, factory wired with terminal block power connection. Provide primary and secondary fused control power transformer.</div> <div>H. The chiller controller shall utilize a microprocessor that will automatically take action to prevent chiller shutdown due to abnormal operating conditions associated with: evaporator refrigerant temperature, high condensing pressure and motor current overload.</div> <div>I. Provide the following safety controls with indicating lights or diagnostic readouts:</div> <div>1. Low chilled water temperature protection.</div> <div>2. High refrigerant pressure.</div> <div>3. Low oil flow protection.</div> <div>4. Loss of Oil diagnostic.</div> <div>5. Loss of chilled water flow.</div> <div>6. Contact for remote emergency shutdown.</div> <div>7. Motor current overload.</div> <div>8. Phase reversal/unbalance/single phasing.</div> <div>9. Over/under voltage.</div> <div>10. Failure of water temperature sensor used by controller.</div> <div>11. Compressor status (on or off).</div> <div>J. Provide the following operating controls:</div> <div>1. A variable method to control capacity in order to maintain leaving chilled water temperature based on PI algorithms. Five minute solid state anti-recycle timer to prevent compressor from short cycling. Compressor minimum stop-to-start time limit shall be 2 minutes. If a greater than 5 minute start-to-start, or greater than 2 minute stop-to-start timer is included, hot gas bypass shall be provided to insure accurate chilled water temperature control in light load applications.</div> <div>2. Chilled water pump output relay that closes when the chiller is given a signal to start.</div> <div>3. Load limit thermostat to limit compressor loading on high return water temperature to prevent nuisance trip outs.</div> <div>4. High ambient unloader pressure controller that unloads compressors to keep head pressure under control and help prevent high pressure nuisance trip outs on days when outside ambient is above design.</div> <div>5. Compressor current sensing unloader chiller that unloads compressors to help prevent current overload nuisance trip outs.</div> <div>6. Low ambient lockout control with adjustable setpoint.</div> <div>7. Condenser fan sequencing which adjusts the speed of all fans automatically in response to ambient, condensing pressure and expansion valve pressure differential thereby optimizing chiller efficiency.</div> <div>K. Provide user interface on the front of the panel. If display is on the inside of the panel, then a control display access door shall be provided to allow access to the display without removal of panels. Provide user interface with a minimum of the following features:</div> <div>1. Leaving chilled water setpoint adjustment from LCD input</div> <div>2. Entering and leaving chilled water temperature output</div> <div>3. Percent RLA output for each compressor</div> <div>4. Pressure output of condenser</div> <div>5. Pressure output of evaporator</div> <div>6. Ambient temperature output</div> <div>7. Voltage output</div> <div>8. Current limit setpoint adjustment from LCD input.</div> <div>L. The chiller control panel shall provide leaving</div> <div>chilled water temperature reset based upon return water temperature.</div> <div>M. Digital Communications to</div> <div>BAS system shall consist of a BACnet IP interface. BACnet MS/TP in not acceptable.</div> <div>2.11 SOUND</div> <div>A. Acoustics: Manufacturer must provide both sound power and sound pressure data in decibels. Sound pressure data per AHRI 370 must be provided in 8 octave band format at full load. In addition, A-weighted sound pressure at 30 feet should be provided at 100%, 75%, 50% and 25% load points to identify the full operational noise envelope.</div> <div>B. If manufacturer cannot meet the noise levels, sound attenuation devices and/or barrier walls must be installed to meet this performance level.</div> <div>2.12 ACCESSORIES</div> <div>A. Chiller shall have full architectural louvers panels.</div> <div>B. Chiller shall ship with elastomeric isolators</div> <div>PART 3 – EXECUTION</div> <div>3.01 INSTALLATION</div> <div>A. Install in accordance with manufacturer's requirements.</div> <div>1. Level the chiller using the base rail as a reference. The chiller must be level within 1/2 in over the entire length and width. Use shims as necessary to level the chiller.</div> <div>3.02 SERVICE AND START-UP</div> <div>A. Startup – Provide all labor and materials to perform startup. Startup shall be performed by a factory-trained technician from the original equipment manufacturer (OEM). Technician shall confirm that equipment has been correctly installed and passes specification checklist prior to equipment becoming operational and covered under OEM warranty. This shall be done in strict accordance with manufacturer's specifications and requirements. Third-party service agencies are not permitted.</div> <div>B. A start-up log shall be furnished by the factory approved start-up technician to document the chiller's start-up date and shall be signed by the owner or his authorized representative prior to commissioning the chillers.</div> <div>C. Chiller manufacturers shall maintain service capabilities no more than X miles from the jobsite.</div> <div>D. Provide local service agent with direct access to factory support on equipment.</div> <div>E. During the first 12 months of operation, a factory-trained technician from the original equipment manufacturer (OEM) shall perform quarterly on-site operating inspections to confirm the chiller's operational performance. The manufacturer shall provide the owner with a report describing the condition of the equipment, current operating log, any issues found needing to be addressed, and recommended corrective actions.</div> <div>END OF SECTION</div>	<div><div>Maloney Engineering</div><div>Engineering, Commissioning, Energy Conservation</div><div>3301 Stafford Drive Charlotte, North Carolina 28208 Tel: 704.366.1100 Fax: 704.366.1101 www.maloneyeng.com</div></div> <div>Charlotte-Mecklenburg Schools 3301 Stafford Drive Charlotte, North Carolina</div>	<div>SEAL:</div> <div><div><div>NORTH CAROLINA PROFESSIONAL ENGINEER 15332 MICHAEL A. MALONEY</div><div>3/10/2025</div></div><div><div><div><div><div></div></div><div>PRELIMINARY - NOT FOR CONSTRUCTION</div></div><div><div><div></div></div><div>FOR CONSTRUCTION</div></div><div><div><div></div></div><div>AS-BUILT DRAWINGS</div></div></div></div></div>	<div>PROJECT NAME Mechanical Renovations – Replacement of Chillers – "Like for Like"</div> <div>LOCATION Philip O Berry H.S., 1430 Alleghany St., Charlotte, NC 28208</div> <div>SHEET TITLE CHILLER SPECIFICATIONS</div>	<div>PROJECT NO: 25002</div> <div>CAD NO: 25002 ME</div> <div>SCALE: AS NOTED</div> <div>REVISIONS:</div> <div>SHEET NUMBER</div>	<div>DRAWN BY: MM</div> <div>CHECKED BY: BS, RM, MM</div> <div>DATE: 3/10/2025</div>



ELECTRICAL SPEC.

- Part 1: General**
- A. Provide all work and materials for the installation of complete wiring systems as specified herein and indicated on the drawings.
- B. All electrical permits and inspection fees shall be obtained and paid for by the electrical contractor.
- C. Electrical contractor shall guarantee all work and materials for one year effective the day the project is accepted by the owner.
- D. Work shall be in accordance with the 2020 National Electrical Code, OSHA, State Building Code and all other applicable local requirements. All work shall comply with the latest edition of NECA standards of installation.
- E. All materials, devices, and appliances shall be new, except where otherwise noted, and shall be listed by an approved testing agency where such a listing is available. Factory assembled equipment shall be listed and labeled as an assembly, any equipment not listed shall have prior approval from the local authority having jurisdiction. All materials shall comply with applicable ANSI, IEEE and NEMA standards.
- F. An electrical inspection certificate shall be issued by the local inspection authorities before approval for final payment.
- G. Wiring shall be tested for continuity and grounds before being energized. Faulty wiring shall be replaced at no additional expense to the owner.
- H. The electrical contractor shall connect all equipment requiring electrical connections, unless otherwise noted, except for control wiring for equipment not provided by the electrical contractor. Control wiring for such equipment shall be provided by the respective discipline.
- Part 2: Raceway**
- A. Conduit shall be zinc-coated EMT indoors. EMT fittings shall be steel screw. Minimum size shall be 1/2", unless otherwise noted. Use IMC where required by code or exposed below 8'-0".
- B. Support all conduits with straps and clamps. Run all conduit parallel or perpendicular to building walls.
- C. Junction and pull boxes shall be code gauge galvanized sheet metal.
- D. Liquid-tight flexible metal conduit shall be used for equipment connections, but not as a wiring method otherwise.
- E. Conduit installed underground or in concrete shall have joints made water-tight by use of polytetrafluoroethylene tape.
- Part 3: Conductors**
- A. All conductors shall be single conductor copper. THHN/THWN, solid for sizes #14 through #10. THHN/THWN stranded for sizes #8 and larger.
- B. Branch circuits shall not be smaller than #12 AWG. Control wiring may be #14 AWG.
- C. Conductors shall be color coded black/red/blue for 120/208-volt systems for a, b, and c phases, respectively.
- D. All equipment and device terminations shall be ul listed for use with 150°C insulated conductors at their 150°C ampacity.
- Part 4: Disconnect Switches**
- A. Disconnect switches shall be heavy-duty type in NEMA 1 enclosures (unless otherwise indicated), fused or non-fused as indicated. Fused switches shall have rejection-type fuse clips. Switches shall be square d, or equal. Fuses shall be class r-5, time delay. A set of 3 spare fuses of each size and type shall be furnished to the owner.
- Part 5: Fire Alarm System**
- A. New devices shall be connected to the existing fire alarm system in compliance with all applicable NFPA 72 and other standards as well as the American's with disabilities act (ADA). All final connections, testing and adjustments shall be performed by or under direct supervision of an authorized factory representative. New devices shall be compatible with the existing fire alarm system. The contractor shall field verify exact system manufacturer and type. The fire alarm supplier shall verify the existing system can accommodate the new devices prior to bid. When the existing system cannot handle the devices, the fire alarm supplier shall include in their price the addition of notification appliance circuits (NAC) power extenders as required.
- Part 6: Renovation of Existing**
- A. Each bidder shall visit the project site prior to bid and familiarize himself with the existing conditions. Failure to visit the site shall not excuse the contractor from performing the required work nor shall it be an acceptable reason for requesting additions to the contract.
- B. Existing portions of the facility shall remain in operation during this renovation and/or addition. The contractor shall cause as little disruption as possible to maintain the comfort and safety of the building occupants. All power outages shall be closely coordinated with the owner's representative.
- C. Project involves work on existing electrical panels and feeders required in operating the facility. Temporary power arrangements shall be made to serve those areas affected by this project.
- D.

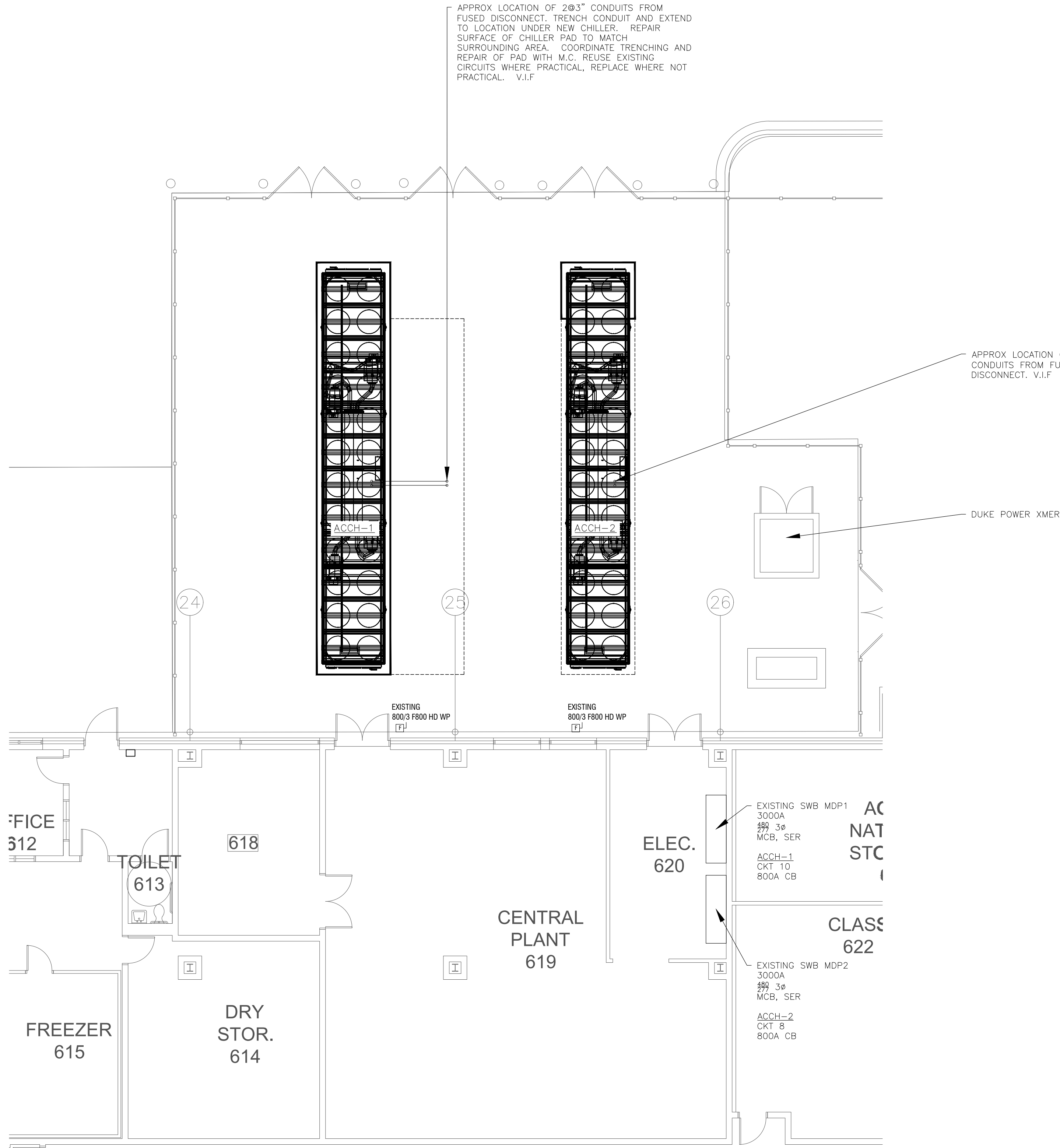
DEMOLITION

- A. General**
1. Work Included
- a) All demolition except asbestos abatement.
2. Asbestos Abatement
- a) No Asbestos.
- b) No other work shall be carried out in any area where asbestos removal is to be done by others until the asbestos removal has been accepted as complete.
- c) If any material is encountered which the Contractor believes may contain asbestos, do not disturb it. Notify Owner's representative. Owner will provide any testing required.
3. Scope of Work
- a) Remove and dispose of as herein specified all equipment and materials indicated on drawings. Minor components may not be shown on drawings. Remove as necessary to present a neat and finished appearance. Remove supports, hangers, etc. and patch holes in structure. Patch structure which is exposed when components are removed. Finish to match surrounding surfaces. Nothing is to be abandoned in place unless specifically noted. Clean area.
- B. Execution**
1. Procedures
- a) The procedures used shall provide for safe conduct of the work, careful removal and disposition of materials specified to be salvaged, protection of property which is to remain undisturbed, coordination with other work in progress, and timely disconnection of utility services. Before beginning any cutting or demolition work, the Contractor shall carefully survey the existing work and examine the drawings and specifications to determine the extent of the work. The Contractor shall take all necessary precautions to insure against damage to existing work to remain in place, to be reused, or to remain the property of the Owner, and any damage to such work shall be repaired or replaced. The Contractor shall carefully coordinate the work of this section with all other work and construct and maintain shoring, bracing and supports, as required. The Contractor shall insure that structural elements are not overloaded and be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under any part of this contract.
- b) The amount of dust resulting from demolition shall be controlled to prevent the spread of dust to other portions of the building and to avoid creation of a nuisance in the surrounding area. Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as ice, flooding and pollution.
- c) Utilities shall be disconnected as required. Where such disconnection will interrupt the utility services to an area not included in the contract, arrangements for such interruption shall be made with the Owner's representative at least 72 hours in advance of the interruption.
- d) The use of burning at the project site for the disposal of refuse and debris will not be permitted.
2. Protection of Existing Work
- a) Existing work to remain shall be protected from damage. Work damaged by the Contractor shall be repaired to match existing work.
- b) Cover items to remain as necessary to protect from dust.
- c) Floors to remain shall be covered to protect them from damage.
- d) At end of each work day and during inclement weather, close exterior openings with weatherproof cover.
3. Disposition of Materials
- a) All material and equipment except where otherwise noted shall be the property and responsibility of the Contractor.
4. Clean-Up
- a) Remove debris and rubbish from building regularly. Do not allow it to accumulate in building or on site.
- b) Remove and transport debris and rubbish in a manner as to prevent spillage on streets or adjacent area. Comply with all applicable regulations concerning hauling and disposal.
- c) At the end of demolition, thoroughly clean area to prepare for new work.

—	CONDUIT CONCEALED IN OR ABOVE CEILING, IN OVERHEAD SLAB OR IN WALL, AS APPLICABLE.
→	HOMERUN TO PANELBOARD, MOTOR CONTROL CENTER, OR SWITCHBOARD AS APPLICABLE.
① ②	JUNCTION BOX SIZE PER N.E.C. UNLESS OTHERWISE INDICATED.
① ②	JUNCTION BOX WITH FLEX CONNECTION TO EQUIPMENT.
\$ 2	SINGLE OR DOUBLE POLE SWITCH AS INDICATED, MOUNTED 48" AFF.
\$ 3 4	THREE-WAY OR FOUR-WAY SWITCH AS INDICATED, MOUNTED 48" AFF.
\$ WP	SWITCH AS SPECIFIED ABOVE WITH CAST WEATHERPROOF COVER AND OUTLET AND BOX ADAPTER IF REQUIRED.
\$ 6	SWITCH AS SPECIFIED ABOVE WITH OUTLETS CONTROLLED INDICATED BY BY SUBSCRIPT.
\$ v	DUAL TECHNOLOGY OCCUPANCY SENSOR MOUNTED AT 48" AFF.
① ②	NEMA 5-20R DUPLEX CONVENIENCE RECEPTACLE MOUNTED 20" UNLESS NOTED OTHERWISE.
① ②	NEMA 5-20R DUPLEX CONVENIENCE RECEPTACLE MOUNTED 48" AFF OR BACKSPASH.
① ②	RECEPTACLE AS SPECIFIED ABOVE EXCEPT WITH INTEGRATED GROUND FAULT CIRCUIT INTERRUPTER (GFCI).
① ②	GFCI RECEPTACLE SIMILAR TO THOSE SPECIFIED ABOVE EXCEPT UL "WY" (WATER-RESISTANT) LISTED AND PROVIDED WITH A WEATHERPROOF COVER.
① ②	NEMA 5-20R RECEPTACLE TO POWER ELECTRIC WATER COOLER (WHERE APPLICABLE). FURNISH GFCI TYPE DEVICE AT UNIT. COORDINATE EXACT COORDINATE EXACT PLACEMENT WITH PLUMBING CONTRACTOR & LOCAL CODE ENFORCEMENT.
① ②	FUSIBLE OR NON-FUSIBLE DISCONNECT FURNISHED WITH EQUIPMENT UNDER OTHER DIVISIONS OF THESE SPECIFICATIONS. TERMINATE WIRING ON LINE SIDE OF DISCONNECT.
① ②	NON-FUSIBLE DISCONNECT. NUMERALS INDICATE SIZE AND POLES. WP INDICATES NEMA 3R ENCLOSURE OR WITH OTHER ENCLOSURE AS INDICATED.
① ②	CIRCUIT BREAKER. NUMERALS INDICATE AMPERE RATING, POLES, AND FRAME. WP INDICATES 3R ENCLOSURE OR WITH OTHER ENCLOSURE AS INDICATED.
\$ M	MOTOR RATED 1-POLE SWITCH.
① ②	CEILING MOUNTED OCCUPANCY SENSOR, WITH DUAL TECHNOLOGY CAPABILITIES. AUTO ON/OFF. FIELD CHANGEABLE TO VACANCY SENSOR.
① ②	WALL OUTLET WITH DIRECT CONNECTION TO KITCHEN EQUIPMENT.
① ②	ENCLOSED CIRCUIT BREAKER. VOLTAGE, AMPERAGE, AND ENCLOSURE TYPE AS NOTED ON DRAWINGS.
① ②	120 OR 240-VOLT, SINGLE PHASE MOTOR, HORSEPOWER AS INDICATED.
① ②	208 OR 240-VOLT, THREE PHASE MOTOR, HORSEPOWER AS INDICATED.

ABBREVIATIONS

- A = ampere  
AF = amp frame  
AT = amp trip  
ADA = Americans with Disabilities Act  
AFF = above finished floor  
ATS = automatic transfer switch  
AHJ = authority having jurisdiction  
C = conduit  
D/C = disconnect  
EX = existing  
E.C. = empty conduit for future use  
EMT = electrical metallic tubing  
EV = electric vehicle  
ECB = enclosed circuit breaker  
FLA = full load amps  
FMC = flexible metal conduit  
GFCI = ground fault circuit interrupter  
IG = isolated ground  
KV = kilovolt  
KVA = kilovolt ampere  
KCMIL = thousand circular mils  
KW = kilowatt  
LT = liquid tight flexible metal conduit  
MCB = main circuit breaker  
MCC = motor control center  
MLO = main lug only  
NTS = manual transfer switch  
N/A = not applicable  
NEC = National Electrical Code  
NTS = not to scale  
NW = Neww = phase  
P = pole (2-pole, 2-pole, 1-pole)  
RM = Remain  
RL = Relocate  
RV = Remove  
TYP = typical  
V = volt  
VFD = variable frequency drive  
U.D.N. = unless otherwise noted  
W = wire (EWH-3-wire system, etc.)  
WP = weatherproof  
XMMR = transformer  
3R = NEMA 3R enclosure

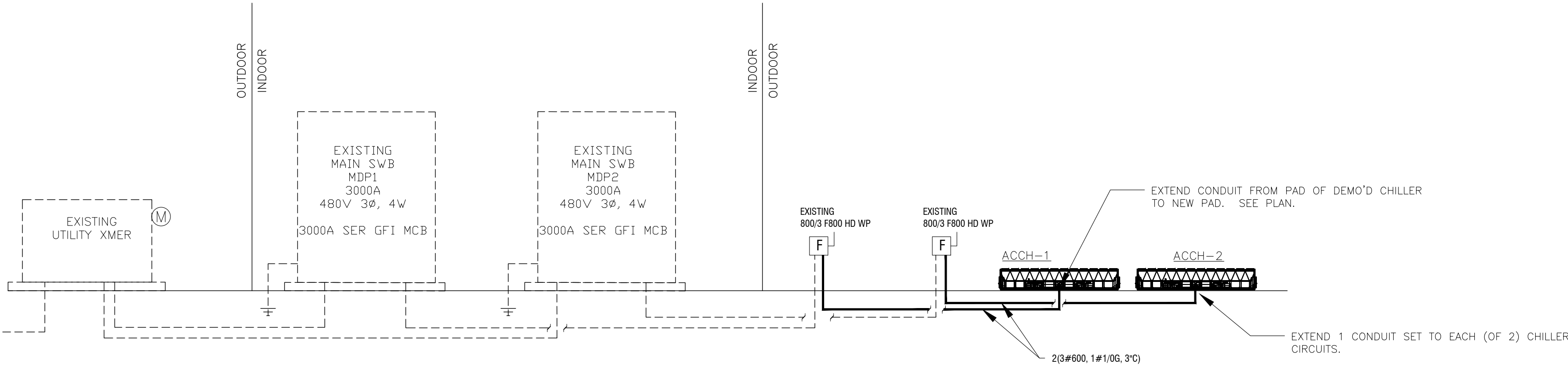


ELECTRICAL PLAN

- SCALE: 1/8" = 1'-0"
- Detail #1 Notes:
- Demand Calculations:
- Existing Chillers - 2 @ 782 MCA
  - New Chillers - 2 @ 778 MCA
  - kW reduction = - 1.66 kW
  - "LIKE FOR LIKE" Replacement

PARTIAL POWER RISER DIAGRAM

SCALE: N/A



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MICHAEL A. MALONEY  
3/10/2025

○ PRELIMINARY - NOT FOR CONSTRUCTION  
● FOR CONSTRUCTION  
○ AS-BUILT DRAWINGS

PROJECT NAME: Mechanical Renovations - Replacement of Chillers - "Like for Like"

LOCATION: Philip O Berry H.S., 1430 Alleghany St., Charlotte, NC 28208

SHEET TITLE: ELECTRICAL PLAN AND RISER

PROJECT NO: 25002	DRAWN BY: MM
CAD NO: 25002 ME	CHECKED BY: BS, RM, MM
SCALE: AS NOTED	DATE: 3/10/2025
REVISIONS:	
SHEET NUMBER:	

E1.1