

PBK, P.O. BOX 880, GRIFFIN, GA 30223

ADDENDUM NUMBER THREE: DATED: October 08, 2026

To: All prime contract bidders of record.

This addendum forms a part of the Contract Documents and modifies the original Specifications and Drawings dated September 11, 2026, as noted below. **Acknowledge receipt of this Addendum in the space provided on the Bid Form;** failure to do so may subject bidder to disqualification.

BID DATE: November 5, 2026

SPECIFICATIONS

1. Section 001113 – INVITATION TO BID

A. Delete this section in its entirety and replace with section of same name included within this addendum.

1. A revision to the **Pre-bid** location has been included to relocate to the Fayette County Board of Education office located at **205 LaFayette Avenue, Fayetteville, GA**. Time and date unchanged from previous addenda.

2. Section 012100 – ALLOWANCES

A. Delete this section in its entirety and replace with section of same name included within this addendum.

1. A lump sum allowance is included to cover the cost of replacing existing gasketing and insulated glass panes in skylights.

3. Section 013540 – SPECIAL PROCEDURES FOR MOVE MANAGEMENT

A. Add this specification section included in this addendum.

1. The section includes instructions for the contractor in regard to moving, relocating, and storing furniture within the existing building.

4. Section 087100 – DOOR HARDWARE

A. Add this specification section to the project manual included in this addendum

1. The section includes both front-end specifications and door hardware sets.

5. Section 230900 – INSTRUMENTATION AND CONTROL FOR HVAC

A. Delete Section 230900 in its entirety and replace with Section 230900, dated

6. Section 232113 – HYDRONIC PIPING

A. On page 13, delete paragraph 3.8 in its entirety and replace it with the following:

“3.8 LOOP WATER SYSTEM START-UP AND TREATMENT

1. After pressure testing piping and correction for any piping leaks, the piping system shall be thoroughly flushed of all foreign matter and debris. At each water source heat pump air conditioner, the hose assemblies shall be temporarily disconnected from the units and the supply hose looped back to the

return piping in order to bypass each WSHP. Close valves to heat exchanger and open bypass valve. The entire piping system shall be filled with fresh water and the system pumps shall be started to circulate the water. The system strainers shall be checked frequently and cleaned as needed. If the water is extremely dirty, the system shall be continuously flushed using the make-up water station and discharging to a drain. Once the system water is clear, the pump shall be stopped, valves opened to the coil, heat exchanger bypass valve shall be closed and valve to heat exchanger opened, each WSHP re-connected to the system and the entire new system re-filled using fresh water and adding a cleaning agent such as trisodium phosphate (TSP). Circulate this solution throughout the piping system and continue to operate for 3 hours. Then turn off the system pump and refill with fresh water. Add chemical treatment as specified in Division 23 - HVAC Water Treatment. Provide 48-hour prior notice to Architect to allow Owner/Architect to witness the water system start up and treatment.

DRAWINGS

STRUCTURAL

1. SHEET S201 BATTING FACILITY FOUNDATION PLAN AND DETAILS

- A. Delete General Note; "TO ACCOUNT FOR ANY POTENTIAL UNREALIZED CONDITIONS, THE GENERAL CONTRACTOR SHALL PROVIDE AN ALLOWANCE FOR AN ADDITIONAL 30 CUBIC YARDS OF CONCRETE. ALLOWANCE SHALL INCLUDE/ACCOUNT FOR ALL COSTS FOR MATERIAL, FABRICATION, DELIVERY, LABOR FOR INSTALLATION/PLACEMENT, FORMWORK, ETC. REINFORCEMENT FOR CONCRETE SHALL ALSO BE INCLUDED AS PART OF ALLOWANCE AND SHALL BE ASSUMED TO BE 3% MINIMUM BY VOLUME, ANY UNUSED PORTION OF THE 30 CUBIC YARDS OF CONCRETE SHALL BE CREDITED BACK TO THE OWNER."

ARCHITECTURAL

1. SHEET AD-101.1 DEMOLITION FLOOR PLAN – SECTOR A-F

- A. Detail No.1, Demolition Floor Plan – Sector A-F; All existing mop sinks marked for demolition in red linework will instead be considered "Existing to Remain"
- B. Delete demo note "D1" from the following spaces: 720, 720.1, 720.6, 720.8, 720.9, 720.10
- C. Add demo keynote "D4" to the following spaces: 716, 116.1, 901, 901.01
- D. General Arch Demolition Notes, No.7: "ALL FURNITURE WILL BE REMOVED OR RELOCATED BY THE OWNER AS NECESSARY PRIOR TO THE COMMENCEMENT OF DEMOLITION WORK OF THIS PROJECT. CONTRACTOR SHALL COORDINATE WITH OWNER AS REQUIRED." **Revise to read** "ALL FURNITURE WILL BE REMOVED, RELOCATED, AND STORED BY THE CONTRACTOR IN ACCORDANCE WITH SPEC SECTION 01 3540."
- E. General Arch Demolition Notes; Add note No.22.: REFER TO REFLECTED CEILING PLANS FOR COMPLETE SCOPE OF CEILING DEMOLITION.

2. SHEET AD-101.2 DEMOLITION FLOOR PLAN – SECTOR G,H,I,K

- A. Detail No.1, Demolition Floor Plan – Sector A-F; All existing mop sinks marked for demolition in red linework will instead be considered “Existing to Remain”
- B. Remove demo note “D1” from the following spaces: 720, 720.1,720.6, 720.8, 720.9, 720.10
- C. General Arch Demolition Notes, No.7: “ALL FURNITURE WILL BE REMOVED OR RELOCATED BY THE OWNER AS NESSESSARY PRIOR TO THE COMMENCEMENT OF DEMOLITION WORK OF THIS PROJECT. CONTRACTOR SHALL COORDINATE WITH OWNER AS REQUIRED.” **Revise to read** “ALL FURNITURE WILL BE REMOVED, RELOCATED, AND STORED BY THE CONTRACTOR IN ACCORDANCE WITH SPEC SECTION 01 3540.”
- D. General Arch Demolition Notes; Add note No.22.: REFER TO REFLECTED CEILING PLANS FOR COMPLETE SCOPE OF CEILING DEMOLITION.
- E. Keynote, No.24; EXISTING PLYWOOD STAGE TO BE REMOVED AND REPLACED; PAINT BLACK. **Revise to read:** EXISTING PLYWOOD STAGE TO BE SANDED, PREPPED, AND REPAINTED; BLACK.

3. SHEET AD-101.3 DEMOLITION FLOOR PLAN – SECTOR L,J,H,LL,K,LL

- A. Detail No.1, Demolition Floor Plan – Sector A-F; All existing mop sinks marked for demolition in red linework will instead be considered “Existing to Remain”
- B. General Arch Demolition Notes, No.7: “ALL FURNITURE WILL BE REMOVED OR RELOCATED BY THE OWNER AS NESSESSARY PRIOR TO THE COMMENCEMENT OF DEMOLITION WORK OF THIS PROJECT. CONTRACTOR SHALL COORDINATE WITH OWNER AS REQUIRED.” **Revise to read** “ALL FURNITURE WILL BE REMOVED, RELOCATED, AND STORED BY THE CONTRACTOR IN ACCORDANCE WITH SPEC SECTION 01 3540.”
- C. General Arch Demolition Notes; Add note No.22.: REFER TO REFLECTED CEILING PLANS FOR COMPLETE SCOPE OF CEILING DEMOLITION.
- D. Keynote, No.24; EXISTING PLYWOOD STAGE TO BE REMOVED AND REPLACED; PAINT BLACK. **Revise to read:** EXISTING PLYWOOD STAGE TO BE SANDED, PREPPED, AND REPAINTED; BLACK.

4. SHEET AD-101AB DEMOLITION FLOOR PLAN – ATHLETIC BUILDINGS

- A. General Arch Demolition Notes, No.7: “ALL FURNITURE WILL BE REMOVED OR RELOCATED BY THE OWNER AS NESSESSARY PRIOR TO THE COMMENCEMENT OF DEMOLITION WORK OF THIS PROJECT. CONTRACTOR SHALL COORDINATE WITH OWNER AS REQUIRED.” **Revise to read** “ALL FURNITURE WILL BE REMOVED, RELOCATED, AND STORED BY THE CONTRACTOR IN ACCORDANCE WITH SPEC SECTION 01 3540.”

5. SHEET A-101K FLOOR PLAN SECTOR K

A. Detail No.1, Level 1 – Area K Floor Plan

1. A CMU chase in Women 605 to accommodate mechanical revisions is included in this addendum. Refer to Supplementary Drawing SDA-101K included in this addendum.

6. SHEET A-101K.LL LOWER LEVEL FLOOR PLAN – SECTOR K

A. Detail No.1, Lower Level – Area K Floor Plan

1. In Football 857, Apply Detail Marker 12/A-621 to all lockers shown.

7. SHEET A-201.2 REFLECTED CEILING PLAN – SECTOR G,H,I,K

- A. Ceiling Materials Legend; Add to Legend: **NEW 09 5100.ACP2**; ACOUSTICAL CEILING PANEL TYPE 2 – VINYL FACED, [COLOR], 2'x2' WITH **09 5100.SWN1** 15/16" SUSPENSION SYSTEM.
- B. Delete ceiling material graphic shown in the following spaces: 821.1, 821.2. Replace with material **NEW 09 5100.ACP2** added above in this addendum.

8. SHEET A-201.3 REFLECTED CEILING PLAN – SECTOR L,J,H.LL,K.LL

- A. Ceiling Materials Legend; Add to Legend: **NEW 09 5100.ACP2**; ACOUSTICAL CEILING PANEL TYPE 2 – VINYL FACED, [COLOR], 2'x2' WITH **09 5100.SWN1** 15/16" SUSPENSION SYSTEM.
- B. Delete ceiling material graphic shown in the following spaces: 854.1, 854.2, 857.2, 857.3. Replace with material **NEW 09 5100.ACP2** added above in this addendum.

9. SHEET A-402 ENLARGED KITCHEN FLOOR PLAN

- A. Delete Sheet A-402 in its entirety and replace with Sheet A-402 included in this addendum.

10. SHEET A-810 DOOR SCHEDULE

A. Add General note No.1

1. Note to read "Install new interchangeable cores associated with security gates at 13 locations. Contractor to coordinate with architect to verifying locations."

11. SHEET A-921 WALL FINISH SCHEDULE

A. Finish Schedule Notes and Remarks, General Notes; Add General note No.8.

1. Note to read "The notation "PT" on this sheet refers a surface required to be painted. Refer to spec section 09 9123."

MECHANICAL

1. SHEET MD-101K.LL – MECHANICAL DEMOLITION LOWER LEVEL - AREA K FLOOR PLAN
 - A. Delete Sheet MD-101K.LL in its entirety and replace with Sheet MD-101K.LL included in this addendum.
2. SHEET MD-301 - MECHANICAL ROOM LARGE SCALE DEMOLITION FLOOR PLAN
 - A. Delete Sheet MD-301 in its entirety and replace with Sheet MD301 included in this addendum.
3. SHEET M-101K - MECHANICAL LEVEL 1 - AREA K FLOOR PLAN
 - A. Delete Sheet M-101K in its entirety and replace with Sheet M-101K included in this addendum.
4. SHEET M-101K.LL - MECHANICAL LOWER LEVEL - AREA K FLOOR PLAN
 - A. Delete Sheet M-101K.LL in its entirety and replace with Sheet M-101K.LL included in this addendum.
5. SHEET M-301 - MECHANICAL ROOM LARGE SCALE NEW WORK FLOOR PLAN
 - A. Delete Sheet M-301 in its entirety and replace with Sheet M-301 included in this addendum.
6. SHEET M-602 - MECHANICAL SCHEDULES, LEGEND & GENERAL NOTES
 - A. Delete Sheet M-602 in its entirety and replace with Sheet M-602 included in this addendum.

SECTION 001113 - INVITATION TO BID

Sealed bids from General Contractors will be received by Fayette County Schools at the Board of Education Office, 205 LaFayette Avenue, Fayetteville, Georgia until 3:00 P.M., Prevailing Time, **November 05, 2026**, for **Whitewater High School - Renovations, Fayette County, Georgia**. At the time and place noted above, the bids for the Project will be publicly opened and read.

A non-mandatory Pre-Bid Conference will be held October 15, 2026, at 1:00 P.M., at the Board of Education Office, 205 LaFayette Avenue, Fayetteville, Georgia

Electronic bidding documents may be obtained at the office of PBK Architects Georgia, P.C., 525 East Taylor Street, P.O. Box 880, Griffin, Georgia 30223. Registration for documents, together with non-refundable deposit of \$250.00 should be filed promptly with the Architects. A share file link for accessing PDFs of bid documents will be emailed as soon as possible. Only bids received from Contractors registered with the Architect will be accepted.

Bidding Documents may be examined at the following location(s):

- a. **Construct Connect c/o CMD Attn: DPC**
800-364-2059
- b. **Dodge Data & Analytics**
413-507-3179
- c. **PBK Architects Georgia, P.C.**
770-227-5473

Only a bid submitted by a Bidder on record with the Architect as having received plans and specifications from the Architect will be opened.

The contract, if awarded, will be on a lump sum basis. No bid may be withdrawn for a period of 60 days after time has been called on date of opening. Bids must be accompanied by a Bid Bond in an amount not less than 5% of the Base Bid. Both a Performance and a Payment Bond will be required in an amount equal to 100% of the Contract Price. The Owner reserves the right to reject any or all bids and to waive technicalities.

For: Fayette County Schools

By: Dr. Jonathan Patterson

END OF SECTION 001113

This page intentionally left blank

SECTION 012100 - ALLOWANCES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
 - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Quantity allowances.
 - 3. Contingency allowances.
- C. Related Requirements:
 - 1. Section 004321 "Allowances Form" for form for allowances to be included with the Bid.
 - 2. Section 012200 "Unit Prices" for procedures for using unit prices.

1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

1.4 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 ALLOWANCES, GENERAL

- A. Owner reserves the right to use unused portions of Allowances for other Work required by the Project.
 - 1. The Owner or Architect shall direct the Contractor as to the use of any unused Allowances.
- B. Allowances shown are generally for unforeseen conditions and are above and beyond any specific contract material and work requirements.
- C. Allowance Log: Keep a log of all allowances used and unused. Submit log with each application of payment.

1.8 LUMP-SUM ALLOWANCES

- A. Requirements in this Article coordinate with AIA Document A201. Revise to suit Project. Line items for each lump sum allowance scheduled shall be included on the "Schedule of Values" included with the Application for Lump Sum Payment.
- B. Contractor's costs associated with the allowances shall be based on the invoice amount from the subcontractor/utility company plus 7 ½ percent for Contractor's handling. Contractor shall coordinate work with subcontractor/utility company, obtain written cost estimate from the subcontractor/utility company, and have estimate approved by Owner prior to beginning work.
- C. Should the lump sum allowances be exceeded, change orders authorizing additional costs shall be executed using the same basis of the original allowance (subcontractor/utility company invoice plus 7 ½ percent for Contractor's handling).
- D. At project closeout, credit all unused allowances remaining in the Schedule of Values to Owner by Change Order.

1.9 QUANTITY ALLOWANCES

- A. Use quantity allowances as scheduled in this section in conjunction with unit prices as scheduled in Section 012200 "Unit Prices" to determine line item values associated with the quantity allowances schedule.
- B. All costs associated with Quantity Allowances are above and beyond quantities required to construct project as indicated on the Drawings.
- C. Line items for each quantity allowance scheduled shall be included on the "Schedule of Values" included with application for payments.
- D. Contractor's costs associated with these line item values shall include all cost necessary, including but not limited to materials, delivery, installation, insurance, applicable taxes, overhead and profit, labor burden, etc.
- E. Should the quantity allowances be exceeded, change orders authorizing additional quantities shall use the same unit price as scheduled in Section 012200 "Unit Prices" for additional cost.
- F. At project closeout, credit all unused allowances remaining in the Schedule of Values to Owner by change order.

1.10 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.
- D. Line items for each contingency allowance scheduled shall be included on the "Schedule of Values" included with applications for payment.
- E. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

PART 2 PRODUCTS

2.1 PRODUCTS AND OR MATERIALS USED IN ALLOWANCES SHALL BE AS DEFINED OR APPROVED ELSEWHERE IN THE CONTRACT DOCUMENTS.

PART 3 EXECUTION

3.1 EXAMINATION

- A. If unsuitable soils or rock are encountered during the Project, the Project Testing Company and the Engineer of Record shall be notified immediately.

3.2 UNSUITABLE SOILS AND ROCK

- A. Removal, disposal and placement of unsuitable soils materials and any rock shall be at the recommendation of the Project's Testing Company and as approved by the Engineer of Record.
 - 1. Removal shall include removal by acceptable methods and equipment of the minimum quantities deemed necessary by the Project's Testing Company
 - 2. Disposal shall include disposal of materials either on site or off site as indicated. Disposal of materials on site shall be at the direction of the Engineer of Record. Rock materials disposed of on site shall be placed in fill slopes as directed by the Engineer of Record. Disposal of materials off site shall be in accordance with applicable laws and regulations. It shall be the responsibility of the Contractor to dispose of off site materials accordingly.
 - 3. Place shall include obtaining suitable backfill and or fill materials or stone obtained from on-site or off-site sources as indicated and placing materials and compacting to Project requirements. Materials obtained from on-site sources shall be obtained from on site locations as directed by the Engineer of Record.
 - 4. No allowances shall be paid unless all quantities are qualified, quantified and approved by the Projects Testing Company and the Engineer of Record.

3.3 REMOVAL & RELOCATION OF EXISTING UTILITIES

- A. Removal or relocation of utilities shall be coordinated by the Contractor.

3.4 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.5 SCHEDULE OF ALLOWANCES

- A. Lump Sum Allowances

- 1. Include a lump sum amount of \$25,000 to cover the cost of additional concrete required by increasing structural footings required by the final load calculations provided by the pre-engineered building supplier.
- 2. Include a lump sum amount of \$40,000 to replace the existing school monument sign.
- 3. Include a lump sum amount of \$40,000 to cover the cost of graphics package to be provided in the kitchen serving line area.
- 4. Include a lump sum amount of \$300,000 to cover the cost of the removal of the existing gymnasium elevator and the installation of a new elevator.
- 5. Include a lump sum amount of \$225,000 to cover the cost of replacing existing gasketing and/or insulated glass panes in skylights where damaged or broken. Contractor to coordinate with Architect to determine existing skylight conditions and scope of gasketing and insulated glass pane replacement.

- B. Quantity Allowances

- 1. Include in the Base Bid an amount to remove and dispose of onsite 200 cubic yards of unsuitable soil or uncompacted earth.

2. Include in the Base Bid an amount to remove and dispose of onsite 200 cubic yards of mass rock.
3. Include in the Base Bid an amount to remove and dispose of onsite 100 cubic yards of Trench rock
4. Include in the Base Bid an amount to furnish and place 20 cubic yards of #57 stone.
5. Include in the Base Bid an amount to furnish and place 20 cubic yards of #4 Stone.
6. Include in the Base Bid an amount to furnish and place 25 cubic yards of suitable backfill/fill material obtained offsite.
7. Include in the Base Bid an amount to furnish and place 25 tons of graded aggregate base material.

C. Contingency Allowance(s):

1. Include in the base bid an amount of \$250,000.

END OF SECTION 012100

SECTION 013540 - SPECIAL PROCEDURES FOR MOVE MANAGEMENT

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general protection and movement procedures for existing furniture and equipment:
- B. Related Requirements:
 - 1. 011000 Section "Summary" for phasing of work.

1.3 DEFINITIONS

- A. Loose furniture and Equipment: Include all desks, chairs, tables, free standing cabinets, cubicles, books, etc., that are not anchored in place.
- B. Dismantle: To disassemble items by hand as required for moving, using small hand tools and small one-hand power tools, so as to protect nearby surfaces; and facilitate moving.
- C. Existing to Remain: Existing items that are not to be removed or dismantled.

1.4 INFORMATIONAL SUBMITTALS

- A. Construction Schedule for Move Management: Indicate for entire Project the following for each activity/phase to be performed in spaces, areas, and rooms, where work is being done:
 - 1. Detailed sequence of move management work, with starting and ending dates, coordinated with Owner's continuing operations and other known work in progress.
 - 2. Utility Services: Indicate how long utility services will be interrupted. Coordinate shutoff, capping, and continuation of utility services.
 - 3. Coordination of Owner's and others' continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
 - 4. Equipment Data: List gross loaded weight, axle-load distribution, and wheel-base dimension data for mobile and heavy equipment proposed for use. Do not use such equipment without Contractor's professional engineer's certification that the structure can support the imposed loadings without damage.
- B. Qualification Data: For move management company.
- C. Preconstruction Documentation: Show preexisting conditions of furniture and equipment, including finish surfaces, that might be misconstrued as damage caused by Contractor's moving operations.
- D. Inventory of Furniture and Equipment Items: Prior to dismantling and moving work, submit a list of items that are to be moved.

1.5 QUALITY ASSURANCE

- A. Move Management Qualifications: An experienced firm regularly engaged in packing and moving furniture and equipment to the extent of work as specified in this section, and that has completed a minimum of five recent projects with a record of successful in-service performance that demonstrate the firm's qualifications to perform this work.
 - 1. Field Supervisor Qualifications: Full-time supervisor experienced in move management work similar in nature and extent to that indicated for this Project. Supervisor shall be on Project site during times that move management work is in progress.
- B. Preconstruction Conference: Conduct conference at Project site.
 - 1. General: Review methods and procedures related to packing and moving including, but not limited to, the following:
 - a. Review equipment protection, work sequencing/phasing, and location involved.

- b. Review areas where existing furniture and equipment is to be moved and confirm they are ready for relocation of furniture and equipment.
- 2. Removal and Dismantling:
 - a. Inspect and discuss condition of furniture and equipment to be moved.
 - b. Review requirements of other work that relies on substrates exposed by removal.

1.6 STORAGE AND PROTECTION OF EQUIPMENT AND FURNITURE

- A. Moved Equipment and Furniture:
 - 1. Pack or crate items prior to moving; cushion against damage during handling. Label contents of containers.
 - 2. Transport items to Owner's temporary classroom/gymnasium or storage areas as indicated.
 - 3. Protect items from damage during transport.
 - 4. Identify each item with a nonpermanent mark to document its original location. Indicate original locations on plans elevations, sections, or photographs by annotating the identifying marks.
 - 5. Secure stored materials to protect from theft.

1.7 COORDINATION

- A. Coordinate move management procedures in this Section with other work at Project site including phasing of the work.

PART 2 PRODUCTS - (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

- A. Preparation for Moving: Examine equipment to be moved to determine best methods to safely and effectively perform moving work. Examine adjacent work to determine what protective measures will be necessary.
 - 1. Verify that affected utilities have been disconnected and capped as necessary.
 - 2. Inventory and record the condition of items to be moved.
 - 3. Before moving equipment and furniture, make permanent record of location of furniture and equipment as required to return furniture and equipment to their original location.
- B. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs and preconstruction videotapes.

3.2 PROTECTION, GENERAL

- A. Ensure that supervisory personnel are on-site and on duty when move management work begins and during its progress.
- B. Protect surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from moving procedures.
 - 1. Use only proven protection methods, appropriate to each area and surface being protected.
 - 2. Protect floors and other surfaces along haul routes from damage, wear, and staining.
- C. Package and protect furniture and equipment as necessary for moving using protective paper, bubble wrap, and cardboard boxes or other protective materials.

3.3 GENERAL MOVING

- A. Pack and remove all loose furniture and equipment in spaces being renovated. Equipment permanently attached to the structure (walls, floors, or ceilings) may remain if protected.
- B. Only furniture and equipment in the phase where work is being performed may be moved.

3.4 MOVING CLASSROOM FURNITURE AND EQUIPMENT

- A. Classroom furniture and equipment shall be moved to Owner's temporary classroom/ gymnasium or other storage rooms approved by the owner.
- B. Furniture moved into classrooms shall be unpacked and set up like it was in the classroom for use as a classroom.
- C. Once the work in the existing classroom is substantially complete and accepted by the Owner, the furniture and equipment shall be repacked, moved, and set up in its original classroom just as it was prior to the work.

3.5 MOVING, STORAGE AND PROTECTION OF FURNITURE AND EQUIPMENT OTHER THAN CLASSROOMS

- A. In other areas of work like the Administration Area, Media Center, etc., the furniture and equipment in these areas shall be packed up and moved to storage areas and protected during work in those phases.
- B. Once the work in these areas is substantially complete and accepted by the Owner, the furniture and equipment shall be moved back into these spaces, unpacked and set up in their original location just as it was prior to the work.
- C. Storage: It is acceptable to use some of the school's existing spaces such as the Gymnasium space for storage as long as this does not interfere with the work or the use of the space by the Owner. Spaces being used by the owner during a phase shall not be used for storage. If storage space is not available in the existing building during a phase, on-site, climatized and protected storage trailers shall be provided.

3.6 CLEANING AND PROTECTING

- A. Once furniture and equipment have been moved to their area of use, Contractor shall clean all finished surfaces, touch-up, or repair any surfaces damaged during move to match original factory finishes, as approved by Architect.

END OF SECTION 013540

This page intentionally left blank

SECTION 087100 - DOOR HARDWARE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Hardware for wood, aluminum, FRP and hollow metal doors.
- B. Hardware for fire-rated doors.
- C. Electrically operated and controlled hardware.
- D. Lock cylinders for doors with balance of hardware specified in other Sections.
- E. Thresholds.
- F. Smoke and draft control seals.
- G. Weatherstripping and gasketing.

1.2 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry
- B. Section 07 92 00 - Joint Sealants
- C. Section 08 11 13 - Hollow Metal Doors and Frames
- D. Section 08 14 16 - Flush Wood Doors
- E. Section 08 16 13 - Fiberglass Reinforced Polyester Doors
- F. Section 08 33 23 - Overhead Coiling Doors
- G. Section 084113 - Aluminum-Framed Entrances and Storefronts
- H. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables
- I. Division 28 - Access Control
- J. Division 28 - Fire Detection and Alarm

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on. Coordinate with blocking and reinforcement requirements for the required hardware with the corresponding door and frame manufacturers prior to fabrication.
- B. Coordinate blocking and reinforcement requirements for the required wall-mounted hardware prior to erecting walls.
- C. Coordinate door hardware for existing doors and existing frames to ensure proper fitment.
- D. Sequence installation to ensure facility services connections are achieved in an orderly and expeditious manner.
- E. Preinstallation Meeting:
 - 1. Convene a preinstallation meeting one week prior to commencing work of this Section.
 - 2. Require attendance by personnel of related trades, installers, and the following:
 - a. Architect.
 - b. Contractor
 - c. Hardware Supplier's Architectural Hardware Consultant (AHC).
 - d. Hardware Installer.
 - e. Owner's Security Consultant.
 - 3. Review installation details and requirements for hardware items.
 - 4. Review coordination details.
- F. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- G. Keying Requirements Meeting:

1. Arrange for a keying meeting, with Architect, Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying complies with project requirements.
2. Attendance Required:
 - a. Contractor.
 - b. Owner.
 - c. Architect.
 - d. Architectural Hardware Consultant (AHC).
 - e. Owner's Security Consultant.
3. Furnish copies of the approved Schedule of Locks and Cylinders to guide the meeting.
4. Agenda:
 - a. Establish keying requirements.
 - b. Verify locksets and locking hardware are functionally correct for project requirements.
 - c. Verify that keying and programming complies with Project requirements.
 - d. Establish keying submittal schedule and update requirements.
5. Incorporate Owner's keying instructions and directives established at the Keying Requirements Meeting into keying submittal including, but not limited to, the following:
 - a. Access control requirements.
 - b. Key control system requirements.
 - c. Schematic diagram of preliminary key system.
6. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.
7. Deliver the Owner-approved Keying Schedule to the permanent core manufacturer.

1.4 SUBMITTALS

- A. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.
- B. Prior to submitting Shop Drawings, Contractor and hardware supplier shall contact Owner's locksmith to receive instructions pertaining to key symbols, master keys, and final approval of individual lock function and hardware attributes.
- C. Shop Drawings:
 1. Door Hardware Schedule
 - a. Submit a detailed listing that includes each item of hardware to be installed on each door.
 - b. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
 - c. Comply with DHI TDH-003-20 using door numbering scheme and hardware set numbers as indicated in Contract Documents.
 - d. Arrange hardware details, opening details and headings in vertical schedule format.
 - e. List groups and suffixes in proper sequence.
 - f. Include complete description for each door listed.
 - g. Include manufacturers names, product names, catalog numbers. Include functions, types, styles, sizes and finishes of each item.
 - h. Include account of abbreviations and symbols used in schedule.
 2. Existing Conditions Field Report:
 - a. Submit list of openings that contain existing doors and existing frames that receive new hardware. Comply with SDI 135.
 - b. Include illustrations of existing openings that receive new hardware. Illustrations shall comply with SDI 135 as follows:
 - 1) Figure 1 for existing frames with single doors
 - 2) Figure 3 for existing frame with pair doors.

- c. Include a summary of the existing frame measurements. Format the summary as shown in SDI 135 Figure 5.
 - d. Identify door openings with same door number and building name shown on Drawings.
 - e. Submit Existing Conditions Field Report with Door Hardware Schedule. Include enumerated list of conflicts with new hardware and existing material.
 3. Electrified Door Hardware Diagrams:
 - a. Include diagrams for power, signal, and control wiring for electrified door hardware that include details of interface with building safety and security systems. Furnish elevations and diagrams for each door opening receiving electrified hardware as follows:
 - 1) Prepared by or under supervision of Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC).
 - 2) Elevations—Include front and back elevations of each door opening showing electrified devices with connections installed and an operations narrative describing how opening operates from either side at any given time.
 - 3) Diagrams—Include point-to-point wiring diagrams that show each device in door opening system with related colored wire connections to each device.
 4. Keying:
 - a. Submit a schedule of locks and cylinders with the hardware schedule. Schedule of locks and cylinders shall comply with the following:
 - 1) Submit schedule of openings that receive locks and cylinders. Include the following information according the Drawings:
 - (a) Column 1: Opening No.
 - (b) Column 2: Opening Location.
 - 2) The schedule shall also contain the following empty columns which shall be reviewed and filled in at the Keying Meeting:
 - (a) Column 3: Core Mark/Key Set.
 - (b) Column 4: Key Quantity.
 - (c) Column 5: Keyway
 - b. Keying Schedule:
 - 1) Furnish keying information in compliance with DHI TDH-004-20 standards.
- D. Informational Submittals:
 1. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
 2. Manufacturer's qualification statement.
 3. Installer's qualification statement.
 4. Supplier's qualification statement.
- E. Closeout Submittals—Furnish the following in compliance with 01 77 00 - Closeout Procedures:
 1. Approved Hardware Schedule with as-installed details noted.
 2. Product data and maintenance data for installed hardware—Include the following:
 - a. Manufacturer's printed instructions for installation, adjusting, troubleshooting, repair, and assembly/disassembly/reassembly, routine procedures for preventative maintenance,
 - b. Manufacturer's data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
 - c. Manufacturer's parts lists and templates.
 3. AHC's inspection reports consisting of the following:
 - a. Date of inspections
 - b. Facility name and address
 - c. Company name and address of inspecting company

- d. Verification of visual inspection and functional operation of door openings with builder's hardware.
- e. Itemized list of product deficiencies with corresponding opening number and manufacturer's product number. Include date of follow-up inspection and AHC's certification when deficiencies are corrected.
- f. List of openings in compliance with Project requirements.
- g. Identify openings with Architect's door number.
- h. Identify fire-rated doors with rating of protection expressed in minutes.
- i. Name and signature of AHC performing inspections.
4. Owner-Approved Key Schedule.
5. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
6. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
7. Maintenance Materials and Tools:
 - a. Furnish the following for Owner's use in maintenance of project:
 - 1) Manufacturer's tools for use with mortise locksets:
 - (a) Cylinder wrench: Tool for installing, removing, and testing cylinders.
 - (b) Spanner wrench: Tool for installing sectional trim.
 - (c) Allen wrench: Tool for installing and removing inside levers.
 - (d) Emergency access keys for privacy locksets.
8. See Section 01 77 00 - Closeout Submittals for additional provisions.

1.5 QUALITY ASSURANCE

- A. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Architect and Contractor.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- C. Installer Qualifications:
 1. Company specializing in performing work of the type specified for commercial door hardware with at least five years of documented experience.
- D. Supplier Qualifications:
 1. The permanent employees must include at least one Architectural Hardware Consultant (AHC) currently certified by the Door and Hardware Institute (DHI).
 2. The supplier's AHC shall be available during normal working hours for hardware consultation to the Owner, Architect, and Contractor.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.
- B. Permanent Cores and Keys: Deliver keys and cores with identifying tags to Owner by security shipment direct from manufacturer.

1.7 WARRANTY

- A. See Section 01 77 00 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide manufacturer warranty against defects in material and workmanship for period indicated, from Substantial Completion. Complete forms in Owner's name and register with manufacturer.
 1. Closers: Ten years, minimum.
 2. Exit Devices: Three years, minimum.
 3. Standard Locksets and Cylinders: Ten years, minimum.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.
- B. Provide individual items of single type, of same model, and by same manufacturer.
- C. Locks: Provide a lock for each door, unless it's indicated that lock is not required.
 - 1. Lock Function:
 - a. Provide lock and latch function numbers and descriptions of manufacturer's series as indicated in Hardware Sets.
 - b. Provide an office lockset for swinging doors for which a lock function is not indicated.
 - c. Provide privacy function mortise locksets with visual indicators for doors serving the following rooms:
 - 1) Single occupant restrooms.
 - 2) Family toilets and bathing rooms.
 - 3) Assisted-use toilets and bathing rooms.
 - 2. Trim: Provide lever handle on both sides of each lock, unless otherwise indicated.
 - 3. Strikes:
 - a. Finish: To match lock or latch.
 - b. Strike Lip:
 - 1) Single Door Openings:
 - (a) Curved lip
 - (b) Lip-to-center (LTC) dimension of sufficient length that minimally clears frame trim.
 - 2) Pair Door Openings:
 - (a) Flat lip
 - (b) 7/8-inch LTC for 1-3/4 thick inactive leaf.
 - c. Frame Strike Box: Provide strike box fabricated for use with aluminum framing, wood inactive leafs, and frames not manufactured with a strike box.
 - d. Center Strike at Pairs of Doors: Flat lip, 7/8-inch LTC.
 - e. Strikes for locksets at new frames shall be 4-7/8 inches (124 mm) tall except where noted otherwise.
 - f. Strikes for locksets at existing frames shall be compatible with the existing strike preparation in the frame.
- D. Door Pulls and Push Plates:
 - 1. Provide a pair of pulls where back-to-back BTB mounting is indicated.
 - 2. On glazed storefront doors, provide matching door pulls/push plates on both faces unless otherwise indicated.
- E. Closers:
 - 1. Provide door closer on each exterior door, unless otherwise indicated.
 - 2. Provide door closer on each fire-rated and smoke-rated door.
 - 3. Spring hinges are not an acceptable self-closing device, unless otherwise indicated.
- F. Overhead Stops and Holders (Door Checks):
 - 1. Provide swinging doors with overhead stops. Omit overhead stop where door opening is specified with one or more of the following items:
 - a. Floor stop.
 - b. Spring-stop arm assembly.
 - c. Wall stop.
- G. Drip Guards: Provide at head of outswinging exterior doors unless protected by roof or canopy directly overhead.
- H. Thresholds:
 - 1. Exterior Applications: Provide at each exterior door, unless otherwise indicated.

- I. Smoke and Draft Control Seals:
 - 1. Provide gasketing for 20-minute fire-rated doors and for smoke-and-draft control doors that complies with local codes, requirements of assemblies tested in accordance with UL 1784.
- J. Weatherstripping and Gasketing:
 - 1. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated.
 - 2. Provide door bottom sweep on each exterior door, unless otherwise indicated.
 - 3. Fabricate as continuous gasketing, do not cut or notch gasketing material.
- K. Electrically Operated and/or Controlled Hardware: Provide necessary power supplies, power transfer hinges, relays, and interfaces as required for proper operation; provide wiring between hardware and control components and to building power connection in compliance with NFPA 70.
- L. See Division 28 for additional access control system requirements.
- M. Fasteners:
 - 1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
 - 2. Aluminum fasteners are not permitted.
 - 3. Screw Drives:
 - a. Provide Phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.
 - b. Provide tamper resistant fasteners 6-lobe, Torx, and Spanner for electric hardware.
 - c. The following are drives are acceptable as tamper-resistant:
 - 1) 6-lobe
 - 2) Torx
 - 3) Spanner
 - 4. Fasteners shall be finished to match corresponding door hardware.
 - 5. Provide machine screws for attachment to reinforced hollow metal and aluminum frames.
 - 6. Self-drilling (Tek) type screws are not permitted.
 - 7. Provide stainless-steel machine screws and lead expansion shields for concrete and masonry substrates.
 - 8. Provide wall grip inserts for hollow wall construction.
 - 9. Provide spacers or sex bolts with sleeves for through bolting of hollow metal doors and frames.
 - 10. Surface Mounted Hardware: Unless otherwise noted, fasteners are to be concealed.
 - 11. Fire-Resistance-Rated Applications:
 - a. Comply with NFPA 80.
 - b. Comply with the fire-rated products manufacturers' UL 10C listings for the specified rating and hardware configuration.
 - c. Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.
 - d. Where doors are not adequately blocked and reinforced, provide steel through bolts for attachment of surface mounted closers, hinges, and exit devices to door panels where proper door blocking is not provided.
 - e. Provide frame-applied intumescent seals and gasketing for fire-rated UL 10C Category B doors.

2.2 PERFORMANCE REQUIREMENTS

- A. Provide door hardware products that comply with the following requirements:
 - 1. Applicable provisions of federal, state, and local codes.
 - 2. Accessibility: ADA Standards, ICC A117.1, and Georgia State Building Code.

3. Fire-Resistance-Rated Doors: Provide hardware compliant with NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
4. Hardware on Fire-Resistance-Rated Doors: Listed and classified by UL (DIR) or ITS (DIR) as suitable for application indicated.
5. Hardware for Smoke and Draft Control Doors: Provide door hardware that complies with local codes, and requirements of assemblies tested in accordance with UL 1784.
6. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.
7. Hardware Preparation for Wood Doors Steel Frames: BHMA A156.115W.
8. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified.

2.3 BUTT HINGES

- A. Manufacturers:
 1. BEST; dormakaba Group.
 2. Hager Companies.
 3. McKinney.
- B. Properties:
 1. Butt Hinges:
 - a. Template screw hole locations.
 - b. Bearings:
 - 1) Standard Weight (SW) Hinges: Minimum of two (2) permanently lubricated non-detachable bearings.
 - 2) Bearing assembly installed after plating.
 - 3) Exposed fully hardened bearings.
 - 4) Bearing Shells: Shapes consistent with barrels.
 - c. Pins:
 - 1) Easily seated, non-rising pins.
 - 2) Fully plate hinge pins.
 - 3) Non-Removable Pins: Slotted stainless-steel screws.
 - d. UL 10C listed and NFPA 80-compliant for use on fire-rated doors.
- C. Finishes:
 1. Comply with BHMA A156.18 requirements for the finishes identified in Hardware Sets.
 2. Fully polish steel hinges prior to plating; front, back, and barrel.
- D. Grades:
 1. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7 for templated hinges.
 2. Comply with BHMA A156.18 Materials and Finishes.
- E. Material:
 1. Provide steel hinges except where stainless-steel hinges are required.
 2. Provide stainless steel hinges at the following locations:
 - a. Exterior doors.
 - b. Interior doors serving wet locations, humid locations, and non-conditioned spaces.
 - c. Where indicated in the Hardware Sets.
- F. Types:
 1. Butt Hinges: Include full mortise hinges.
- G. Other Requirements:
 1. Butt hinges shall have non-removable pins (NRP). Omit NRP feature from hinges at the following doors:
 - a. Doors equipped with passage locksets and passage exit device trim functions.
 - b. Inswinging doors.

- H. At door in existing frames, provide frame leaf of hinges with four patented Twist-to-Shim Collars (QKS). Adjustable hinges shall be handed for the corresponding door swing.
- I. Quantities: Three (3) hinges per leaves up to 90 inches (2286 mm) in height. Add one (1) for each additional 30 inches (762 mm) in height or fraction thereof.
- J. Sizes:
 - 1. Minimum hinge weight, thickness and height according to the following door sizes:
 - a. For doors up to 36 inches (914.4 mm) wide and up to 1-3/4 inches (44 mm) thick provide hinges with a minimum thickness of 0.134-inch and a minimum of 4-1/2 inches (114 mm) in height.
 - b. For doors from 36 inches (914.4 mm) wide up to 42 inches (1066.8 mm) wide and up to 1-3/4 inches (44 mm) thick provide hinges with a minimum thickness of 0.145-inch and a minimum of 4-1/2 inches (114 mm) in height.
 - c. For doors from 42 inches (1066.8 mm) wide up to 48 inches (1219.2 mm) wide and up to 1-3/4 inches (44 mm) thick provide hinges with a minimum thickness of 0.190-inch and a minimum of 5 inches (127 mm) in height.
 - d. For doors greater than 1-3/4 inches (44 mm) thick provide hinges with a minimum thickness of 0.190-inch and a minimum of 5 inches (127 mm) in height.
 - 2. Widths:
 - a. As required to minimally clear surrounding trim.
 - b. Sufficient size to allow 180-degree swing of door.
 - c. Minimum width for 1-3/4 inches (44 mm) thick doors: 4-1/2 inches (114 mm).
- K. Provide hinges from one approved manufacturer according to the following types:
 - 1. Butt Hinges:
 - a. Ball Bearing, Five (5) Knuckle:
 - 1) Steel SW Hinges:
 - (a) BEST: FBB179

2.4 CONTINUOUS HINGES

- A. Manufacturers:
 - 1. Architectural Builders Hardware Mfg. Inc. (ABH).
 - 2. BEST; dormakaba Group.
 - 3. Select Hinges
- B. Properties:
 - 1. Geared Continuous Hinges
 - a. Non-handed.
 - b. Anti-spinning through-fastener.
 - c. UL 10C listed for fire-resistance-rated doors:
 - 1) Metal Door Installation:
 - (a) Rated up to 90 minutes without fire studs.
 - (b) Provide fire studs for fire rating greater than 90 minutes.
 - 2) Wood Door Installation:
 - (a) Rated up to 60 minutes without fire studs.
 - (b) Provide fire studs for fire rating greater than 60 minutes.
 - 3) Fire studs shall be stainless steel. Provide in compliance with the manufacturer's UL 10C listing for the indicated rating and door height.
- C. Finishes:
 - 1. Comply with BHMA A156.18 requirements for the finishes identified in Hardware Sets.
- D. Grades:
 - 1. Continuous Hinges: Comply with BHMA A156.26, Grade 1.
- E. Material:

1. Gear Hinges: 6063-T6 aluminum.
- F. Types:
 1. Include geared, edge mounted hinges.
- G. Quantities: One per door leaf.
- H. Sizes:
 1. Widths:
 - a. As required to clear surrounding trim.
 - b. Sufficient size to allow 180-degree swing of door.
 2. Length: 1-inch less than door height (LDH).
- I. Other Requirements:
 1. Provide hinges lead lined (LL) model for the following door types:
 - a. Lead lined doors
 - b. Doors weighing more than 450 pounds up to 1,000 pounds.
 2. Provide continuous hinges with anti-vandal bearing at the top of the hinge to prevent passage of destructive objects into the gears (SO).
 3. Where door receiving continuous hinge is also receiving a mortise or concealed automatic door bottom, prepare the bottom of the door hinge leaf according to the door bottom manufacturer's template for the corresponding door bottom (ADB).
- J. Products:
 1. Provide 1-3/4 inches (44 mm) thick swinging doors with approved aluminum geared hinges. Provide continuous hinges from one approved manufacturer according to door inset condition as follows:
 - a. No inset, flush with frame:
 - 1) BEST: 661HD
 - b. 3/32" inset:
 - 1) BEST: 671HD
 - c. 1/8" inset:
 - 1) BEST: 667HD

2.5 BOLTS

- A. Manufacturers:
 1. ABH.
 2. Burns Manufacturing, Inc. (Burns).
 3. Hager Companies.
- B. Fire-Rating: At fire rated doors, provide products certified by UL to UL 10C, complying NFPA 80 and NFPA 252 for the indicated fire rating.
- C. Provide products compatible with the corresponding door material.
- D. Properties:
 1. Flush Bolts:
 - a. Provide flush bolts centered in the lock edge of inactive leaf of pair door openings. Provide flushbolt type specified and according to the following types:
 - 1) Manual Flush Bolts:
 - (a) Manually latching upon closing of door leaf.
 - (b) Bolt Throw: 3/4 inch (19.05 mm), minimum.
 - 2) Automatic Flush Bolts:
 - (a) Automatically latching upon closing of door leaf.
 - (b) Bolt Throw: 3/4 inch (19.05 mm), minimum.
 - 3) Self-Latching Flush Bolts:
 - (a) Automatically latching upon closing of door
 - (b) Manually retracted top bolt

- (c) Automatically retracting bottom bolt upon opening the active leaf.
 - (d) Bolt Throws: 3/4 inch (19.05 mm), minimum.
 - 2. Dustproof Strikes: Provide for bottom bolt to allow bolting into floor and metal thresholds.
- E. Other Requirements:
 - 1. Extension Bolts: In leading edge of door, one bolt into floor, one bolt into top of frame.
 - 2. Lever extensions:
 - a. Rod length shall be 12 inches (304.8 mm) minimum.
 - b. Top rod shall have sufficient length to accommodate locating the flushbolt 72 inches (1828.8 mm) AFF to centerline.
 - 3. Omit bottom bolts where noted in the Hardware Sets.
 - 4. Where bottom bolt is omitted at fire-rated doors, provide manufacturers fire bolt compliant with the indicated rating.
- F. Products:
 - 1. Manual Flush Bolts
 - a. ABH: 1857
 - 2. Automatic Flush Bolts.
 - a. Metal Doors:
 - 1) ABH: 1860
 - b. Wood Doors:
 - 1) ABH: 1861
 - 3. Self-Latching Flush Bolt:
 - a. Metal Doors:
 - 1) ABH: 1867
 - b. Wood Doors:
 - 1) ABH: 1873
 - 4. Dustproof Strike:
 - a. ABH: 1870
 - 5. Fire Bolt:
 - a. ABH: 1858

2.6 EXIT DEVICES

- A. Manufacturers:
 - 1. BEST, dormakaba Group.
 - 2. Von Duprin.
 - 3. Sargent.
- B. Properties:
 - 1. Actuation Type: Comply with BHMA A156.3 push pad requirements.
 - 2. Chassis:
 - a. The chassis is constructed from investment cast steel, zinc dichromated.
 - b. Compatibility:
 - 1) Door Face: Provide exit devices according to lock stile width.
 - 2) Handing: As indicated on Drawings.
 - 3) Door Thickness: As indicated on Drawings.
 - 4) Door moldings: Provide devices with shim kits to raise the device from the door surface to accommodate glass light molding and door trim.
 - 5) Function: Provide exit devices compatible with the function and trim specified in the Hardware Sets.
 - 3. Size:
 - a. The actuating portion of the releasing device shall extend not less than one-half of the door leaf width.

- b. Provide vertical rod devices of sufficient length according to the door height indicated on Drawings.
 - c. Provide exit devices and exit device trims to fit the corresponding door thickness.
 - 4. Touchpads:
 - a. T-style metal touchpads and rail assemblies with matching chassis covers end caps.
 - 5. Latch Bolts: Stainless-steel deadlocking with 3/4 inch (19.05 mm) projection using latch bolt.
 - 6. Lever Design: Match project standard lockset trims.
 - 7. Cylinders:
 - a. Include for cylinder for cylinder dogging (CD) and for locking trims. Cylinders shall be compatible with the required permanent key system.
 - b. Provide cylinders with keyed SFIC construction cores.
 - 8. Strike as recommended by manufacturer for application indicated.
 - 9. Sound dampening on touch bar.
 - 10. Dogging:
 - a. Non-Fire-Resistance-Rated Devices:
 - 1) Cylinder Dogging (CD) unless otherwise noted.
 - 2) Provide exit devices less dogging (LD) where specified in the Hardware Sets and at the following locations:
 - b. Fire-Resistance-Rated Devices: Manual dogging not permitted.
 - 11. Touch bar assembly on wide stile exit devices to have a 1/4 inch (6.35 mm) clearance to allow for vision frames.
 - 12. All exposed exit device components to be of architectural metals and true architectural finishes.
 - 13. Handing: Field-reversible.
 - 14. Conceal fasteners on back side of device channel.
 - 15. Vertical Latch Assemblies' Operation: Gravity, without use of springs.
 - a. Latch Bolts: Stainless-steel, with 3/4-inch-throw.
- C. Grades:
 - 1. Comply with BHMA A156.3, Grade 1 requirements.
 - 2. Provide wide stile devices unless otherwise noted. Provide narrow stile devices where stile width is less than 5 inches (127 mm).
 - 3. Provide exit device types according to door configuration as follows:
 - a. Single Doors:
 - 1) Provide rim exit devices unless otherwise noted.
 - 2) Provide mortise exit devices for new doors at existing frames that have 4-7/8 inches (124 mm) tall strike preparations.
 - b. Pair Doors:
 - 1) At pair doors that swing in the same direction, provide both leaves with rim exit devices and a removable mullion except where otherwise noted.
 - 2) Provide both leaves with rim exit devices and a removable mullion except at double egress pairs.
 - c. Provide exit devices tested and certified by UL or by a recognized independent laboratory for mechanical operational testing to 10 million cycles minimum with inspection confirming Grade 1 Loaded Forces have been maintained.
- D. Standards Compliance:
 - 1. UL Listed for Panic and Fire for Class II Circuitry.
 - 2. Provide UL (DIR) listed exit device assemblies for fire-resistance-rated doors. Comply with the manufacturer's listing for the indicated fire-rating.
 - 3. Comply with UL 10C.
- E. Other Requirements:

1. Vertical rod devices:
 - a. Provide less bottom rod (LBR) at scheduled locations to eliminate use of floor mounted strikes. Provide fire bolt assembly for fire-rated LBR devices.
 2. Outside Trims
 - a. Unless otherwise noted, provide lever trim with manufacturer's standard escutcheon plate for the required exit device type and function specified in the Hardware Sets.
 - b. Outside trim shall be compatible with the specified exit device.
 - c. Omit lever trim where an offset pull is specified. Provide cylinder attachment kits for BHMA A156.3 functions 03 and 04. Provide escutcheon plates for 03 and 04 functions where specified for wood doors that receive CVR devices.
 3. Provide shim kits compatible with the exit device to allow devices to minimally clear vision frames and door moldings.
- F. Products:
1. BEST/Precision 2000 Series.

2.7 REMOVABLE MULLIONS

- A. Manufacturers:
1. BEST, dormakaba Group.
 2. Special-Lite.
 3. Same as exit device manufacturer except for aluminum storefront door equipped with electric strike.
- B. Properties:
1. Rectangular shape 3 inches (76.2 mm) by 2 inches (50.8 mm) tubes with minimum 1/8 inch (3.18 mm) wall thickness.
 2. Provide mullions made by the same manufacturer as exit devices.
 3. Pre-drilled holes for installation of exit device strikes.
 4. Spacers: Provide as required for proper installation, based on frame profile and dimensions.
- C. Grades: Complying with BHMA A156.3.
- D. Materials: Manufacturer's standard for items specified.
1. Top and Bottom Brackets: Investment-cast steel.
- E. Other Requirements:
1. Provide Keyed Removable (KR) feature and corresponding cylinders as specified.
 2. Mullions capable of being installed without physical key present.
 3. Physical key required to operate.
 4. Provide cylinders with keyed SFIC temporary construction cores.
 5. Provide wall mount storage kits for removable mullions.
 6. Prep for electric strike specified in the hardware sets. Mullions with an electric strike shall be handed for the opening as indicated on Drawings.
 7. Provide a four-piece set of mullion stabilizers for mullions at exterior doors. Provide two stabilizers on the mullion and one on each door leaf. Stabilizers shall be interlocking. Include shims to adjust for proper alignment between the door and mullion.
 8. Where frame depth does not allow sufficient mounting space, provide angle bracket of sufficient dimension for proper installation of top fitting.
- F. Applications:
1. Fire-Resistance-Rated Openings: Mullions with UL Listed Labels and mullion stabilizers.
- G. Products—Provide mullions from one approved manufacturer as follows:
1. BEST/Precision: KR822 Series.
- H. Products—Provide approved removable mullions according to application types as follows:
1. Door opening with aluminum frame: Special-Lite KRSL60 series.

2. Where electric strike is also required for door opening at aluminum frame: Special-Lite KRSL60E series.
3. Other doors—Provide approved removable mullions from same manufacturer as corresponding exit device as follows:
 - a. BEST/Precision: KR822 Series.

2.8 ELECTRIC STRIKES

- A. Manufacturers:
 1. Camden Door Controls.
 2. RCI; dormakaba Group.
 3. Security Door Controls: www.sdcsecurity.com.
- B. Properties:
 1. Provide UL (DIR) listed burglary-resistant devices.
 2. Provide UL 1034 compliant devices.
 3. Provide UL 10C compliant devices.
 4. Non-handed devices suitable for door frame material and scheduled lock configuration.
 5. Power Fail Mode:
 - a. Fire-rated doors: Fail secure.
 - b. Non-rated doors: Fail secure.
 6. Holding Force: 1,500 lbs.
 7. Accommodating latch projections of 3/4-inch minimum. Include required spacers and backplates for latchbolt and exit device layout.
- C. Grades: Complying with BHMA A156.31, Grade 1.
- D. Code Compliance: As required by authorities having jurisdiction in the State in which the Project is located.
- E. Other requirements:
 1. Voltage: Compatible with 24 VDC.
 2. Include faceplate and bracket that accommodates bolts, latches, and auxiliary deadlatches configuration of the corresponding lock and function specified.
 3. Provide electric strikes that are compatible with the indicated frame material.
 4. Provide in-line power controller to reduce heat of continuous duty electric strikes.
- F. Installation:
 1. Connect electric strikes into fire alarm where non-rated doors are scheduled to release with fire or sprinkler alarm condition.
 2. Connect fail secure electric strikes into fire alarm at fire-rated doors.
- G. Products—Provide electric strikes from one approved manufacturer according to the following types:
 1. Mortise and cylindrical locksets with maximum 3/4-inch latch throw:
 - a. RCI: 2 Series
 2. Electric Strikes for Rim Exit Devices:
 - a. RCI: 016 Series.
 3. In-line power controllers:
 - a. RCI: Model #ICEPK

2.9 LOCK CYLINDERS

- A. Manufacturers:
 1. BEST, dormakaba Group.
 2. Substitutions: Not permitted
- B. Properties:
 1. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.

2. Provide cams and tailpieces for cylinders in accordance with the corresponding hardware manufacturers' requirements and instructions for the specified device.
 3. Include cylinder collars, blocking rings, washers to surround and protect the exposed cylinder and portions thereof from wrenching, cutting, pulling and prying.
 4. Provide key cylinders with appropriate format interchangeable cores where indicated.
- C. Grades:
1. Certified to BHMA A156.5 Grade 1 requirements.
- D. Material:
1. Manufacturer's standard corrosion-resistant brass alloy.
- E. Types: As applicable to each item specified.
1. Core Type: Small format interchangeable core (SFIC).
 2. Number of pinned chambers: Seven-pin.
- F. Applications:
1. When provisions for lock cylinders are referenced elsewhere in the Project Manual to this Section, provide compatible type of lock cylinder, keyed to building keying system, unless otherwise indicated.
- G. Provide cylinders at locations indicated in Hardware Sets and as follows:
1. As required for items with locking devices required by other Sections.
 2. CD Devices.
 3. Exit Device Trims.
 4. KR Mullions and Mullion Storage Kits.
 5. Locksets.
 6. Overhead Doors.
- H. Approved Products:
1. BEST:
 - a. Mortise: 1E Series
 - b. Rim: 12E Series

2.10 MORTISE LOCKS

- A. Manufacturers:
1. BEST, dormakaba Group.
 2. Corbin Russwin.
 3. Sargent: www.
- B. Properties:
1. Provide mortise locksets and latch sets according to the following:
 - a. Handing: As indicated on Drawings.
 - b. Fitting modified ANSI A115.1 door preparation.
 - c. Door Thickness Coordination Fitting:
 - 1) 1-3/4 inch (44 mm) standard lock configuration.
 - 2) Available for up to 2-1/4 inches (57 mm) thick door. Provide locksets according to door thickness specified.
 - d. Latchbolt and Deadbolt Extension: Minimum of 3/8 inch (9.52 mm) into the case when fully extended.
 - e. Latch: Stainless-steel.
 - 1) Latchbolt Throw: 3/4 inch (19.05 mm), minimum.
 - f. Auxiliary Deadlatch: One-piece stainless-steel, permanently lubricated.
 - g. Deadbolt:
 - 1) Material: Stainless-steel.
 - 2) Deadbolt Throw: 1 inch (25.4 mm), minimum.
 - h. Backset: 2-3/4 inch (70 mm).

- i. Cylinders:
 - 1) Cylinder Core Types:
 - (a) 7-pin.
 - (b) Small format interchangeable core (SFIC).
 - (c) Provide cylinders with keyed SFIC temporary construction cores.
- j. Lever Trim:
 - 1) Style:
 - (a) Sectional type.
 - (b) Lever Design: Match lever design of cylindrical locksets.
 - 2) Special, high-strength springs and a positive stop eliminate unsightly sagging levers.
 - 3) Spindle: Trims shall utilize 5/16-inch 0.31 inch (8 mm) high-strength alloy steel spindles for extra durability.
 - 4) Independent support springs for inside and outside levers.
 - 5) Handles: Made of forged or cast brass, bronze, or stainless-steel construction. Levers that contain a hollow cavity are not acceptable.
 - 6) Levers to operate a roller bearing spindle hub mechanism.
- C. Finishes:
 - 1. Comply with BHMA A156.18 requirements for the finishes identified in Hardware Sets.
- D. Grades:
 - 1. Comply with BHMA A156.13, Operational Grade 1 requirements.
- E. Other Requirements:
 - 1. Provide locksets made in a manufacturing facility to compliant with ISO 9001-Quality Management and ISO 14001-Environmental Management.
- F. Products—Provide mortise locks from one approved manufacturer as follows:
 - 1. BEST 40H Series 15H.

2.11 ELECTRONIC LOCKS

- A. Manufacturers:
 - 1. dormakaba.
- B. Properties:
 - 1. Operation Principle: The lock mechanism must utilize a motor-driven electronic deadbolt engineered specifically to operate under lateral pressure and automatically correct door misalignment
 - 2. Side-Load Release: The lock must instantly and reliably unlock under a lateral side-load pressure of up to 1,322 lbs (600 kg) on the door, applied in the direction of travel.
 - 3. Holding Force: Minimum static holding force rating of 2,204 lbs (1,000 kg)
 - 4. Misalignment Correction: The lock mechanism and strike design must automatically pull single-acting doors into correct alignment up to a maximum variance of 5/16 inch (7.94 mm).
- C. Cycle life: certified to withstand a minimum of 1,000,000 cycles of operation.
- D. Grades: Comply with ANSI/BHMA Grade 1.
- E. Electrical Requirements:
 - 1. 12 to 24 VDC ($\pm 15\%$), auto-sensing or auto-regulating.
 - 2. 12 VDC: 0.75A peak (operating/initial current); 40mA standby.
 - 3. 24 VDC: 0.40A peak (operating/initial current); 25mA standby.
- F. Products:
 - 1. YD30S.

2.12 OFFSET PULLS

- A. Manufacturers:
 - 1. ABH.
 - 2. Burns.
 - 3. Rockwood.
- B. Properties:
 - 1. Grade: Comply with BHMA A156.6 J402 requirements.
 - 2. Design: 90-degrees offset
 - 3. Diameter: 1-inch, round
 - 4. Projection: 3-1/2 inches (89 mm) minimum
 - 5. Clearance: 2-1/4 inches (57 mm)
 - 6. Offset: 4 inches (101.6 mm).
 - 7. Material: Compliant with BHMA A156.18 finish number indicated in the hardware set.
 - 8. Fasteners:
 - a. Provide offset pulls with flow-thru button fasteners (12HD) unless otherwise noted.
 - b. Provide fasteners compatible with door thickness.
- C. Products—Provide products from one approved manufacturer as follows:
 - 1. Burns: 39 Series.

2.13 PULL PLATES AND PUSH PLATES

- A. Manufacturers:
 - 1. ABH.
 - 2. Burns.
 - 3. Don-Jo.
- B. Properties:
 - 1. Pulls:
 - a. Pull Type: Straight, round unless otherwise indicated.
 - b. CTC: 10 inches
 - c. Clearance: 2 inches (50.8 mm)
 - d. Grip Dimension: 1-inch diameter minimum.
 - 2. Plates:
 - a. Plate Type: Flat, with square corners, unless otherwise indicated.
 - b. Edges: Beveled.
 - c. Width: 4 inches (101.6 mm).
 - d. Height: 16 inches (406.4 mm).
 - e. Thickness:
 - 1) .050-inch. Unless otherwise noted.
- C. Grades:
 - 1. Pull Plates: Comply with BHMA A156.6 J405 requirements.
 - 2. Push Plates: Comply with BHMA A156.6 J301 requirements. Decorative plates shall conform to BHMA A156.6 J304 requirements.
- D. Material: Stainless-steel.
- E. Fasteners:
 - 1. Single push plates: Surface-mount fasteners.
 - 2. Provide fasteners compatible with door thickness.
- F. Products—Provide push/pull plates from one approved manufacturer as follows:
 - 1. Standard Push Plates:
 - a. ABH: Model #AB70C
 - 2. Pull Plates:
 - a. ABH: Model #AB111 x 70C

2.14 COORDINATORS

- A. Manufacturers:
 - 1. ABH.
 - 2. Burns.
 - 3. Rockwood.
- B. Properties:
 - 1. General: Non-handed devices.
 - 2. Required for pair doors openings consisting of two doors with closers on both doors and at least one of the following:
 - a. Overlapping astragal
 - b. Automatic flush bolts
 - c. Self-latching flush bolt.
 - 3. Provide coordinator in order to allow the inactive leaf to close before the active leaf.
 - 4. Size:
 - a. Size coordinators, fillers, and mounting brackets according to manufacturer's recommendation for the indicated opening configuration consisting of the following:
 - 1) Active leaf width
 - 2) Frame opening width and overall distance between jamb soffits
 - 3) Inactive leaf width
 - 4) Soffit width and height.
- C. Grades:
 - 1. Comply with BHMA A156.3 Type 21A requirements.
 - 2. Meet UL 10C for Positive Pressure.
- D. Types:
- E. Other Requirements:
 - 1. Provide necessary mounting brackets and filler bars to ensure proper installation of coordinator and related hardware.
 - 2. Filler bars are to be sized to match the coordinator width and height. The length of the filler shall be sized to match the gap between the end of the coordinator and the inactive hinge jamb.
 - 3. Provide mounting brackets to allow for installation for soffit mounted hardware. Provide mounting brackets according to soffit width.
 - 4. Coordination: Properly sequence installation of other door hardware affected by placement of coordinators and carry bars.
- F. Products—Provide coordinator devices and accessories from one approved manufacturer as follows:
 - 1. Type 21A Devices
 - a. ABH: 3700 Series.

2.15 SURFACE CLOSERS

- A. Manufacturers:
 - 1. Rack-and-Pinion Closers:
 - a. BEST, dormakaba Group.
 - b. Corbin Russwin.
 - c. LCN.
- B. Grades:
 - 1. Comply with BHMA A156.4, Grade 1 requirements.
 - 2. Underwriters Laboratories Compliance:
 - a. Product Listings:
 - 1) UL (DIR) and ULC for use on fire-resistance-rated doors.

- 2) Meeting requirements of UL 10C for positive pressure.
- C. Properties—Rack-and-Pinion Closers:
1. Mounting: Closers are to be surface mounted.
 2. Maximum Projection from Face of Door: 2-1/8 inches (54 mm).
 3. Construction: Closer bodies shall be corrosion resistant aluminum.
 4. Mechanism:
 - a. Full rack and pinion constructed from corrosion resistant aluminum, incorporating a double lever arm assembly.
 - b. Include separate, tamper-resistant, self-regulating adjusting valves for closing and latching speeds, and backcheck.
 - c. Rack-and-pinion type closers shall include advanced variable backcheck (AVB) feature. AVB shall include selectable adjustment to facilitate degree of backcheck engagement point as follows:
 - 1) Parallel arm mount: 50 degrees.
 - 2) Regular arm and top jamb mount: Between 50 and 80 degrees.
 - d. Spring Power Adjustment: Field-adjustable for BHMA A156.4 sizes 1 through 6.
 - e. Hydraulic Fluid: All-weather type.
 5. Arm Assembly:
 - a. Provide standard arm assemblies unless otherwise noted.
 - b. Provide arms with integral hold-open feature as specified in the Hardware Sets. Omit mechanical hold-open from fire-rated doors.
 - c. Parallel arm to be a heavy-duty rigid arm (SPA).
 - d. Where obstructions limit opening angle and wall or floor stops are prohibited, provide heavy duty spring-stop arms according to required mounting side:
 - 1) Pull Side Mount: Provide S-IS arm assembly.
 - 2) Push Side Mount:
 - (a) Parallel Arm Mount: Provide S-DS arm assembly.
 - (b) Top Jamb Mount: Provide S-IS for standard reveals and S-ISJ for reveals greater than standard.
 - e. Where IS arm assemblies and S-IS arm assemblies are specified in hardware sets, if approved manufacturer does not offer these arm assemblies, provide the following items:
 - 1) An approved closer with a standard arm assembly (regular or top jamb, as indicated) in conjunction with an approved heavy-duty concealed overhead stop.
 - 2) Provide adapter plate to accommodate closer and overhead stop installation.
 6. Covers:
 - a. Type: Full cover.
 - b. Material: Metal.
- D. Other requirements:
1. Provide closers for fire-rated door doors.
 2. Provide closers with delayed action (DA) feature where specified in the Hardware Sets. DA feature shall include a separate independent valve for delay control adjustment. DA closers shall comply with BHMA A156.4 delayed action closer requirements.
 3. Provide adapter plate to accommodate closer and overhead stop installations.
 4. Compatibility:
 - a. Provide arm assemblies as noted in the Hardware Sets and compatible with the installation requirements:
 - 1) Mount closers on non-public side of door and stair side of stair doors unless otherwise noted in hardware sets.
 - 2) At outswinging exterior doors, mount closer on interior side of door.
 - b. Provide adapter plates, shim spacers, and blade stop spacers as required to accommodate the following:

- 1) Frame conditions.
 - 2) Door conditions.
 - 3) Required door hardware.
 - c. Provide conversion plates and brackets to accommodate new closers at existing doors and existing frames. Conversion plates shall match be templated according to the existing mounting hole patterns at the existing door. Provide soffit brackets according to conversion plate provided for parallel arm installations.
- E. Products—Provide closers from one approved manufacturer as follows:
1. Surface Mounted Rack-and-Pinion Closers:
 - a. BEST: EHD9000 Series.

2.16 OVERHEAD STOPS AND HOLDERS

- A. Manufacturers:
1. ABH.
 2. dormakaba; dormakaba Group.
 3. Glynn-Johnson.
- B. Properties:
1. Function:
 - a. As indicated in the hardware sets.
 - b. Function: As indicated in the hardware sets. Provide stop-only function in lieu hold-open at fire-rated doors.
 - c. Provide units with built-in cushion stop except where units are specified as less spring cushion (LS).
 2. Sizes: As recommended by manufacturer's based on hinge/pivot type and frame opening width.
- C. Finishes:
1. Comply with BHMA A156.18 requirements for the finishes identified in Hardware Sets.
 2. Provide all non-ferrous materials at exterior locations (N).
 3. Arms and Brackets: Comply with BHMA A156.18 requirements for the finishes identified in Hardware Sets.
- D. Grades:
1. Comply with BHMA A156.8 , Grade 1 requirements unless otherwise noted.
 2. Underwriters Laboratories Compliance:
 - a. Product Listing: UL (DIR) and ULC for use on fire-resistance-rated doors.
 - b. Comply with NFPA 80 and UL 10C requirements for the indicated fire rating.
 3. Material: Base metal as indicated for each item by BHMA material and finish designation.
 4. Types—As indicated in the Hardware Sets:
 - a. Surface-applied.
- E. Additional Requirements:
1. Consult factory for non-standard templating to accommodate the other required hardware.
 2. Provide angle jamb bracket for pull-side mounting overhead stops at inswing doors specified to receive surface mounted overhead stops.
 3. Threaded pivot screw and nylon washer (T) in lieu of jamb bracket at existing frames and where indicated in the Hardware Sets.
 4. Products—Provide overhead stops and holders from one approved manufacturer as follows:
 - a. Surface Overhead Stops and Holders:
 - 1) Grade 1:
 - (a) Dormakaba: 900 Series

2.17 PROTECTION PLATES

- A. Manufacturers:
 - 1. ABH.
 - 2. Burns.
 - 3. Don-Jo.
- B. Plate Types:
 - 1. Kick Plates:
 - a. Provide along bottom edge of push side of doors with closers, unless otherwise indicated.
 - b. Omit kick plates at the following locations:
 - 1) Aluminum storefront and glass entry doors.
 - 2. Mop Plates: Provide along bottom edge of pull-side door faces to provide protection from cleaning liquids and equipment damage to door surface.
- C. Plate Sizes:
 - 1. Thickness: 0.050-inch
 - 2. Heights:
 - a. Kick Plates: 10 inches tall.
 - b. Mop Plates:
 - 1) 10 inches tall unless otherwise noted.
 - 3. Widths:
 - a. Push Side Mounted Plates:
 - 1) Single Doors:
 - (a) Unless otherwise noted, 2 inches (50.8 mm) less than door width (LDW).
 - 2) Pair Doors:
 - (a) Unless otherwise noted, 1-inch LDW.
 - (b) 2 inches (50.8 mm) LDW at openings with removable mullion.
 - (c) 2 inches (50.8 mm) LDW at openings with push-side astragal.
 - b. Pull Side Mounted Plates:
 - 1) Unless otherwise noted: 1/2-inch LDW.
 - 2) At pair doors with an astragal on the pull side: 1-1/2 inches (38 mm) LDW.
 - 3) At pair doors with surface split astragal set on the pull side: 2 inches (50.8 mm) LDW.
- D. Edges: Beveled sides, top, and bottom edges (B4E).
- E. Grades:
 - 1. Comply with BHMA A156.6 requirements according to type:
 - a. Kick Plates: J102
 - b. Mop Plates: J103
- F. Provide UL labeled stamped into protection plates at fire rated doors where the top of the protection plate is 16 inches (406.4 mm) above the bottom of the door.
- G. Material:
 - 1. Metal Properties: Stainless-steel.
 - a. Metal, Standard Duty: Thickness 0.050 inch (1.27 mm), minimum.
- H. Installation:
 - 1. Fasteners: Countersunk screw fasteners
- I. Products—Provide protection plates from one approved manufacturer as follows:
 - 1. ABH: PP0050 Series.

2.18 STOPS AND HOLDERS

- A. Manufacturers:
 - 1. ABH.
 - 2. Burns.

- 3. Rockwood.
- B. General:
 - 1. Provide overhead stop/holder when wall or floor stop is not feasible.
- C. Grades:
 - 1. Comply with BHMA A156.16 Resilient Material Retention Test requirements.
 - 2. Wall Type Bumper: L02101 with fasteners compatible with wall construction.
 - 3. Floor Stop: L02161 with fasteners compatible with floor construction.
- D. Material: Base metal as indicated for each item by BHMA material and finish designation.
- E. Types:
 - 1. Wall Bumpers: Bumper, convex, wall stop in wrought housing .
 - 2. Floor Stops: Provide with cast dome floor stop.
- F. Products—Provide stops from one approved manufacturer as follows:
 - 1. Cast Dome Floor Stops.
 - a. ABH: Models #AB441H
 - 2. Cast Concave Wall Bumpers:
 - a. ABH: Models #AB405
 - 3. Wrought Convex Wall Bumpers:
 - a. ABH: Models #AB406

2.19 THRESHOLDS

- A. Manufacturers:
 - 1. K.N. Crowder Mfg. Inc (KNC).
 - 2. National Guard Products, Inc (NGP).
 - 3. Reese Enterprises (Reese).
- B. Properties:
 - 1. Threshold Surface:
 - a. Fluted horizontal grooves across full width unless otherwise noted.
 - b. Provide smooth, flat threshold surface for automatic door bottom gasket.
 - 2. Thresholds shall be barrier-free designs.
 - 3. Length: Match corresponding opening width
- C. Grades:
 - 1. Comply with BHMA A156.21 requirements according to type.
 - 2. Provide BHMA A156.21 standard duty thresholds unless otherwise noted.
- D. Types:
 - 1. Saddle Thresholds:
 - a. Exterior Saddle Thresholds:
 - 1) Typical Wall Thickness: 0.162-inch for 1/2-inch tall saddles. 0.125-inch minimum thickness for saddles heights other than 1/2-inch tall.
 - 2) Overall Height: 1/2-inch unless otherwise noted.
 - 3) Width: 5 inches (127 mm) minimum.
 - 2. Bumper Thresholds with Gasket:
 - a. Bumper seal shall be screw-adjustable. Adjustment screws are to be spaced 10 inches (254 mm) on center.
 - b. Include silicone gaskets.
 - c. Overall Height: 1/2-inch.
 - d. Width: 5 inches (127 mm).
 - e. Typical Wall Thickness: 0.105-inch minimum
- E. Fasteners—Requirements according to type as follows:
 - 1. Metal thresholds:

- a. Include stainless-steel machine screws and lead anchors for installing threshold at masonry floors.
 - b. Include stainless-steel wood screws for installing threshold at wood floors.
- F. Products—Provide products from one approved manufacturer according to the following types:
 - 1. Bumper Thresholds:
 - a. NGP Model #896S
 - 2. Saddle Thresholds:
 - a. Exterior Type:
 - 1) NGP Model #425

2.20 WEATHERSTRIPPING AND GASKETING

- A. Manufacturers:
 - 1. KNC.
 - 2. NGP.
 - 3. Reese.
- B. Fabrication: Provide gasketing and weatherstripping products in continuous lengths sized according to type as follows:
 - 1. Length to match corresponding frame component:
 - a. Astragals: Match door height.
 - b. Gaskets and Weatherstrips—Length to match corresponding frame component:
 - 1) Frame head: Match opening width.
 - 2) Frame jambs: Match opening height.
 - c. Door Bottoms and sweeps: Match door width.
- C. Properties:
 - 1. Weatherstripping Air Leakage Performance: Not exceeding 0.3 cfm/sq ft of door opening at 0.3 inches (7.62 mm) of water pressure differential for single doors, and 0.5 cfm/sq ft of door area at 0.3 inches of water pressure differential for double doors for gasketing other than smoke control, as tested according to ASTM E283/E283M; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
 - 2. Fire-Rating: At fire rated doors, provide products certified by UL to UL 10C, complying NFPA 80 and NFPA 252 for application to hollow metal fire doors rated up to 3 hrs., and wood fire doors rated up to 90 minutes.
 - 3. Smoke and Draft Control: Provide products certified by UL to UL 1784 complying NFPA 105.
- D. Drip Caps:
 - 1. Material: Aluminum
 - 2. Application: Surface mounted with screws to exterior side of frame face.
- E. Astragals:
 - 1. Flat Bar Astragal:
 - a. Material: 2 inches (50.8 mm) x 1/8-inch-thick Aluminum
 - b. Application: Surface mounted with screws to pull-side door face of active leaf.
 - 2. Split Astragal:
 - a. Retainer Material: Aluminum
 - b. Application Type: Surface mounted with screws to door face of active leaf and inactive leaf.
- F. Adhesive-Backed Gasketing:
 - 1. Bulb Gasketing:
 - a. Material: Silicone bulb
 - b. Application—Surface mounted with modified acrylic pressure sensitive adhesive, adhered to the following:

- 1) Stops at frame heads.
 - 2) Strike jamb frame stops.
 - 3) Door rabbet of hinge jamb.
 - c. 3-Fin Gasketing:
 - 1) Material: Thermo-Plastic Elastomer, triple-fin
 - 2) Application—Surface mounted with modified acrylic pressure sensitive adhesive, adhered to the following:
 - (a) Door rabbet of heads.
 - (b) Door rabbet of strike jambs.
 - (c) Hinge jamb frame stops.
 - d. Mullion Seal:
 - 1) Material: Closed cell silicone sponge strip
 - 2) Size:
 - (a) Width: 1-1/8 inches (29 mm)
 - (b) Thickness: 3/32-inch
 - (c) Length: Match mullion length.
 - 3) Application: Surface mounted to door-side face of mullion with modified acrylic pressure sensitive adhesive.
- G. Weatherstrips:
 1. Retainer Material: Aluminum
 2. Gasket Material: Silicone bulb
 3. Application: Surface mounted with screws to frame soffit of heads and jambs.
 4. Provide bar-type weatherstrips where other soffit mounted hardware occurs:
 - a. Retainer Material: 1/4-inch-thick x 1-1/2 inches (38 mm) wide solid aluminum
 - b. Gasket Material: Silicone bulb
- H. Door Bottoms:
 1. Automatic Door Bottom:
 - a. Endurance tested to 5 million cycles.
 - b. Flame-Resistant
 - c. Moisture-Resistant
 - d. Housing Fitment: 5/8-inch wide x 1-7/16 inches (37 mm) tall mortise.
 - e. Gasket: Silicone in aluminum housing
 - f. Maximum Drop: 1/2-inch.
 - g. Application: Concealed in bottom of the door, centered in bottom edge of door.
 2. Brush Sweeps:
 - a. Retainer Material: Aluminum.
 - b. Gasket Material: 3/4-inch exposed nylon brush
 - c. Application: Surface mounted with screws at the bottom of the pull-side door face. Provide 5/16-inch wide x 3/4-inch-tall snap-on cover to conceal fasteners.
 - d. Include retainers with integral drip design at exterior outswing doors.
 - e. Unless otherwise noted the nylon brush shall include an EPDM rubber insert.
- I. Grades: Comply with BHMA A156.22.
- J. Products—Provide products from one approved manufacturer according to the following types:
 1. Astragals:
 - a. T Astragal:
 - 1) NGP: 158 Series.
 - b. Split Astragal, Concealed Fasteners:
 - 1) NGP: 97 SET
 2. Head and Jamb Seals:
 - a. Adhesive Gasketing, Bulb:

- 1) NGP: 5050 Series
- b. Adhesive Gasketing, 3-Fin :
 - 1) NGP: 5075 Series
- c. Weatherstrips:
 - 1) NGP: 107S Series
- 3. Mullion Seals:
 - a. NGP: 5100 Series
- 4. Door Bottom Seals:
 - a. Automatic Door Bottoms:
 - 1) NGP: 335 Series
 - b. Drip Sweep:
 - 1) NGP: #C699

2.21 MISCELLANEOUS ITEMS

- A. Properties:
 - 1. Mounting Brackets:
 - a. Provide mounting brackets to eliminate interference of installation of closer soffit plates with other soffit mounted hardware.
 - b. Mounting brackets shall be sized as recommended by the manufacturer according to soffit width and stop height.
 - 2. Silencers:
 - a. Provide at equal locations on door frame stops to mute sound of door's impact upon closing. Provide silencers according to frame material and opening type as follows:
 - 1) Frame Material:
 - (a) Hollow Metal Frames: Provide silencers compliant with BHMA A156.16 L03011 requirements.
 - (b) Wood Frames: Provide silencers compliant with BHMA A156.16 L03021 requirements.
 - 2) Opening Type:
 - (a) Single Door: Provide three on strike jamb of frame.
 - (b) Pair of Doors: Provide two on head of frame, one for each door at latch side.
 - b. Material: Rubber, gray color.
- B. Approved Products:
 - 1. Mounting Brackets:
 - a. Except where soffit component obstacle is greater than 5/8-inch tall provide mounting brackets from one of the following approved manufacturers
 - 1) ABH 3750 Series.
 - 2. Silencers:
 - a. Metal Frames: Provide ABH Model #AB608.

2.22 ELECTRIFIED HARDWARE

- A. Manufacturers:
 - 1. dormakaba; dormakaba Group.
 - 2. RCI; dormakaba Group.
 - 3. Substitutions: See Section 01 25 00.
- B. Properties:
 - 1. Power Supply Units:
 - a. Regulatory Compliance:
 - 1) United States Compliance:
 - (a) UL listed for Class II Output.

- (b) Comply with UL 294 Standards incorporating enhanced Access Control. communications capabilities.
 - b. Enclosures: Lockable NEMA Type 1, with hinged cover and knockouts.
 - c. Power:
 - 1) Output: 24VDC.
 - 2) Incoming Power Voltage: 120 VAC.
 - 3) Input circuit protection fuse.
 - d. Emergency Release Terminals: Designed to release devices upon activation of fire alarm system.
 - e. Auxiliary contacts for remote signaling.
 - f. Include fire alarm system input interface.
 - g. Output Distribution Board with indicator LEDs.
 - h. On/Off LED power indicator.
- 2. Push Button Switches: Interior devices to initiate door opening.
 - a. Action:
 - 1) Push/Release Button.
 - b. Tamper-Resistant :
 - 1) Single gang box installation.
 - 2) 1/4 inch (6.35 mm) thick extruded aluminum plate with beveled edges and stainless-steel tamper-resistant spanner-head screws.
 - c. Plate Width: 2-3/4 inches (70 mm).
 - d. Plate Height: 4-1/2 inches (114 mm).
 - e. Switch Rating: 5 Amp @ 125 VAC
 - f. Temperature Range: -17° F to 120° F.
 - g. Listed to CSA C22.2 No. 14-10.
 - h. UL 294 listed.
 - i. Power: 5 Amp @ 125 VAC switch rating.
 - j. Electrical Box: Standard interior and weather-resistant exterior boxes as required for application.
- C. Approved Products:
 - 1. Power Supplies for electric strikes, electromagnetic locks, electromechanical locksets, keypads, keyswitch LEDs, infrared egress switches, and motion sensors:
 - a. Dormakaba DKPS Series.
 - 2. Push buttons:
 - a. RCI: 975 MO

2.23 KEYS AND CORES

- A. Manufacturers:
 - 1. BEST, dormakaba Group.
 - 2. Substitutions: Not permitted.
- B. Properties:
 - 1. Comply with BHMA A156.28.
 - 2. Cores:
 - a. Permanent Cores—Furnish keyed cores for locksets and cylinders complying with the following:
 - 1) Grade: Meet or exceed A156.5 Grade 1 requirements and exceed extended life cycle testing.
 - 2) Core Format and Profile: SFIC.
 - 3) Keyway: As selected by Owner from manufacturer's offering based on security level required.
 - 4) Keying:
 - (a) Comply with the Owner-Approved Keying Schedule.

- (b) Key System Level: Grand master keyed (GMK) unless otherwise instructed by Owner at Keying Meeting.
 - 5) Finish: Match corresponding lock.
 - b. Construction Cores—Provide locksets and cylinders with construction cores that comply with the following:
 - 1) Construction cores shall be identical to permanent cores except as follows:
 - (a) Keyway: Use manufacturer's standard keyway. The keyway for construction cores shall be incompatible with permanent cores.
 - (b) Keying: Construction cores shall be key-alike.
 - (c) Finish: Faces shall be painted green.
- 3. Keys:
 - a. Keys for construction cores shall be incompatible with permanent cores.
 - b. Furnish keys in following quantities:
 - 1) Construction Core Keys:
 - (a) Construction Core Operating Keys: 2 each.
 - (b) Construction Control Keys: 2 each.
 - 2) Permanent Keys:
 - (a) Top Master Key: 1 each.
 - (b) Master Keys per set: 2 each.
 - (c) Control Keys: 2 each.
 - (d) Change Keys: 3 each for each permanent core except for cores at exterior doors where card reader function is specified.
 - c. Key Control:
 - 1) Furnish key collection envelopes, receipt cards, and index cards in quantity suitable to manage number of keys.
 - 2) Stamping:
 - (a) Furnish permanent keys and cores with key control stamping:
 - (1) Legibly stamp cores with corresponding key symbol identified in the Owner-Approved keying schedule. Key symbol marking shall not be visible when core is installed (CKC).
 - (2) Legibly stamp the bow permanent keys with the phrase "Do Not Duplicate" and with the corresponding key symbol identified in the Owner-Approved keying schedule.
- C. Approved Products:
 - 1. BEST
 - a. Construction Cores: Provide Model #7190224
 - b. Construction Core Control Keys: Provide Model #7147449
 - c. Construction Core Operating Keys: Provide Model #7148872
 - d. Permanent Cores and Keys: Provide BEST Standard keys and cores.

2.24 FINISHES

- A. Provide hardware finished according to the following requirements:
 - 1. Construction Core Faces: Painted green.
 - 2. Cylinder Housings: Match finish of corresponding lock.
 - 3. Permanent Core Faces:
 - a. Match finish of corresponding locks and cylinders.
 - 4. Gasket material fixed in screw-on retainers: Black.
 - 5. Hardware for Aluminum Storefront Doors:
 - a. Except for closers, hardware at aluminum doors shall be finished to match door panel finish.
 - b. Closers: Coating color shall be the BHMA A156.18 appearance equivalent finish of the corresponding hinge finish.

6. Screw-on retainers of gaskets and weatherstrips:
 - a. Head, jamb, and mullion mounted items shall be finished to match corresponding frame color.
 - b. Door mounted items shall be finished to match corresponding door color.
7. Other Hardware: Comply with BHMA A156.18 requirements for the finishes identified in Hardware Sets.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify the following is correct and complete prior to installing door hardware:
 1. Doors and frames are labeled, frames are properly installed, and dimensions are as indicated on Drawings.
 2. Frames are square and plumb.
 3. Electric power is available to power operated devices and of correct characteristics.
 4. Wire has been run to the opening and at the proper location.
 5. Finishing of doors and frames has been completed.
 6. Allow finishes to cure for at least seven calendar days prior to installing hardware.
 7. Masonry wash down is complete.
 8. Confirm walls have sufficient blocking and reinforcements for wall-mounted hardware.
 9. Confirm doors and frames are correctly prepared for hardware and have sufficient blocking and reinforcements for hardware.
- B. Correct all defects and deficiencies prior to proceeding with installation.

3.2 INSTALLATION

- A. Wall Blocking—Provide internal blocking, reinforcements, and supports in walls in accordance with the manufacturer's instructions for the following:
 1. Power Supply Cabinets
 2. Storage kits for removable mullions.
 3. Wall Stops
 4. Other wall-mounted hardware.
- B. Install hardware in accordance with manufacturer's instructions and applicable codes.
- C. Install hardware using the fasteners provided from the manufacturer and in accordance with the manufacturer's instructions.
- D. Drill, tap, and countersink screw holes that are required by the manufacturer but could not be done at the factory. Comply with manufacturer's instructions.
- E. Self-clinching fasteners, rivet nuts, and threaded inserts are not permitted.
- F. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.
- G. Install hardware for smoke and draft control doors in accordance with NFPA 105.
- H. Use templates furnished for the hardware item by its manufacturer.
- I. Do not install surface mounted items until application of finishes to substrate is fully complete.
- J. Wash down masonry walls and complete painting or staining of doors and frames.
- K. Complete finish flooring prior to installation of aluminum thresholds.
- L. Mullion top fitting accessories:
 1. Where frame depth does not allow sufficient mounting space, provide angle bracket of sufficient dimension for proper installation of top fitting.
 2. Where sufficient frame depth is provided and the frame soffit does not allow sufficient mounting space, install metal filler blocks in accordance with the mullion manufacturer's instructions.

- M. Install flushbolts and hardware containing concealed rods prior to installing doors.
- N. Install coordinators, fillers, and mounting brackets after door and hinge installation and prior to installing closers and strike for exit devices.
- O. Where frame soffits receive gaskets, install soffit mounted hardware items to mounting brackets designed to prevent damage to gaskets and gasket housings.
- P. Hardware locations:
 - 1. Comply with ICC A117.1 and mounting heights if indicated on Drawings.
 - 2. Install in compliance with DHI TDH-009-20.
 - 3. For Aluminum Doors and Frames: See Section 084113 .
 - 4. For Steel Doors and Frames: See Section 081113..
 - 5. For Wood Doors: See Section 081213 and 081416.
 - 6. For FRP Doors: See Section 081613.
 - 7. Mounting heights in compliance with:
 - a. ADA Standards.
 - b. Per manufacturer's instructions.
 - 8. Power Supplies:
 - 1) Locate power supplies as indicated on Drawings.
- Q. Weatherstrip and Gaskets:
 - 1. Install weatherstrips and gaskets in continuous lengths to achieve full and uninterrupted seal at heads and at jambs.
 - 2. Install weatherstrips after door and hinge installations and prior to installing closers, strikes for exit devices, and soffit mounted hardware.
 - 3. Install closer soffit plates, strikes for rim exit devices, top strikes for SVR exit devices, and other soffit mounted hardware against bar-type weatherstrip.
 - 4. Clean frames in accordance with gasket manufacturer's instructions prior to installing adhesive-backed gaskets.
 - 5. Clean mullions in accordance with gasket manufacturer's instructions prior to installing adhesive-backed gaskets.
- R. Thresholds:
 - 1. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal.
 - 2. Anchor thresholds to floor with stainless-steel countersunk screws.
 - 3. See Section 079200 for Joint Sealants..
- S. Include in installation for existing doors and frames any necessary field modification and field preparation of doors and frames for new hardware. Provide necessary fillers, reinforcements, and fasteners for mounting new hardware and to cover existing door and frame preparations. Written approval from Architect is required prior to proceeding with field-modifications of existing doors and frames. Comply with NFPA 80 at fire-rated doors.
- T. Install construction cores in locksets and cylinders for use during the construction period. Replace construction cores with permanent cores at Substantial Completion unless otherwise instructed by the Owner.
- U. Install cylinders for overhead doors in accordance with manufacturer's instructions. Comply with Section 083323.
- V. New hardware at existing doors:
 - 1. Fill unused hardware preparations with the appropriate fillers.
 - 2. When fastener holes are left in a fire rated door assembly due to changes or removal of hardware or plant-ons, the holes shall be repaired by the following methods:
 - a. Install steel fasteners that completely fill the holes. Fill the screw or bolt holes with the same material as the door or frame. Fill the holes with material listed for this use and installed in accordance with the manufacturer's procedures.

- b. Fill the screw or bolt holes with the same material as the door or frame.
 - c. Fill the holes with material listed for this use and installed in accordance with the manufacturer's procedures.
 - d. Comply with NFPA 80 requirements.
 - e. Fastener holes up to ½-inch diameter not used by new hardware in the fire door assembly shall be filled with NGP hole filler GAPGUARD FIRE CAULK.
3. Where new hardware requires raceways, the raceway preparation and drilling shall be performed in accordance with NFPA 80 requirements.

3.3 FIELD QUALITY CONTROL

- A. Perform field inspection and testing. Comply with Section 01 40 00 - Quality Requirements.
- B. Enlist services of an AHC to perform the following:
 - 1. Certify that hardware has been furnished and installed in accordance with the following:
 - a. The manufacturer's instructions and as specified.
 - b. Project requirements.
 - 2. Schedule at least two inspections by AHC, the first shall be promptly after hardware installation is complete. The second shall be two weeks prior to Substantial Completion.
 - 3. Include report from AHC inspection results in closeout documents.
- C. Ensure electric hardware functions in accordance with the following:
 - 1. Conformance to operation requirements specified in the Hardware Sets.
 - 2. Power fail modes function correctly upon loss of DC power.
- D. Ensure the following occurs upon fire alarm activation:
 - 1. Fail-safe devices de-energize and fail-safe electromechanical locks unlock.
 - 2. Fire-rated doors equipped with electric strike are positively latched.
- E. Have new and existing fire-rated and smoke-rated doors inspected by a qualified person and compliant with NFPA 80 requirements. Ensure fire-rated door assemblies comply with NFPA 80. Ensure smoke-rated doors comply with NFPA 105.

3.4 ADJUSTING

- A. Adjust work under provisions of Sections 01 73 00 - Execution and 01 77 00 - Closeout Requirements.
- B. Adjust hardware according to instructions in AHC inspection reports.
- C. Adjust hardware for smooth operation.
- D. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.
- E. Adjust closers to comply with ICC A117.1.
- F. Adjustments shall comply with NFPA 80.

3.5 CLEANING

- A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.
- B. Clean adjacent surfaces soiled by hardware installation activities.
- C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.6 PROTECTION

- A. Protect finished Work.
- B. Provide full protective barrier between hardware and the remaining Work during construction period. Apply protective barrier and prevent damage to hardware.
- C. Do not permit adjacent work to damage hardware or finish.

3.7 HARDWARE SETS

Manufacturer list

ABH	Architectural Builders Hardware
BES	BEST
PRE	BEST (Precision)
BRN	Burns Manufacturing
D-J	DON-JO
NGP	National Guard Products
RCI	Rutherford Controls Inc

Option list

Code:	Name:
NRP	Non-Removeable Pin
4.5X4.5_Size	4.5"X4.5"
LAR	Length as Required
DW	Door Width
ODW	Over Door Width
Head & Jambs (2)	Provide at head and both jambs

Finish list

Code:	Name:
28	Brushed Anodized Aluminum
689	Aluminum
AL	Anodized Aluminum
652	Chromium plated, satin
630	Satin Stainless Steel
Grey	Grey
626	Satin chromium plated

Specification Report

Set #1 - ALUM PAIR - MULLION - RIM 01/03 - SDS - CARD READER

Doors: A07, A24, KL12, G28, I18, F70, F92, D10, C29, C37, J01

2.0	Pull	39 x Match Existing Size	630	BRN
1.0	Removeable Mullion	KR822 8	689	PRE
1.0	Exit Device	2401 CD	630	PRE
1.0	Exit Device	2403 CD NCA_03	630	PRE
2.0	Rim Cylinder	12E 7 2 STD	626	BES
2.0	Mortise Cylinder	1E 7 4 STD	626	BES
1.0	Electric Strike	0162	630	RCI
2.0	Door Closer	EHD9016 AVB SDS90 MC90	689	BES
1.0	Gasketing	5100N		NGP
1.0	Power Supply	By Access Control Provider		
1.0	Card Reader	By Access Control Provider		

087100 - Door Hardware

1.0 Balance of Hardware Existing to Remain

NOTE: Door, frame, hinges, gasketing, and threshold are existing to remain. Free egress always. Doors normally closed and locked. Valid credentials at reader will release strike to allow entry. Strike will lock during power outage. Coordinate all wiring, hardware, and installation requirements with General Contractor, Electrical Contractor, and Access Control Contractor.

Set #2 - ALUM PAIR - MULLION - RIM 01/03 - SDS

Doors: A02, B01, B19, I30, I31, I32, G01, G13, G26, G27, G29, I19, F71, F79, F89, C01, C13, J11, J12, J13

2.0 Pull	39 x Match Existing Size	630	BRN
1.0 Removeable Mullion	KR822 8	689	PRE
1.0 Exit Device	2401 CD	630	PRE
1.0 Exit Device	2403 CD NCA_03	630	PRE
2.0 Rim Cylinder	12E 7 2 STD	626	BES
2.0 Mortise Cylinder	1E 7 4 STD	626	BES
2.0 Door Closer	EHD9016 AVB SDS90 MC90	689	BES
1.0 Balance of Hardware	Existing to Remain		

NOTE: Door, frame, hinges, gasketing, and threshold are existing to remain.

Set #3 - EXT FRP SGL RATED - RIM 08 - SDS

Doors: A08

2.0 Continuous Hinge	671 HD UL SO	AL	BES
1.0 Exit Device	FL 2108 CD 4908A	630	PRE
1.0 Rim Cylinder	12E 7 2 STD	626	BES
1.0 Mortise Cylinder	1E 7 4 STD	626	BES
1.0 Door Closer	EHD9016 AVB SDS90 MC90	689	BES
1.0 Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0 Threshold	896S-ADJ	A	NGP
1.0 Gasketing	107S x Head & Jambs (2)		NGP
1.0 Sweep	C699A	A	NGP
1.0 Drip Cap	16A x 4" ODW	A	NGP

Set #4 - EXT FRP PAIR - CVR 01/03 - SDS

Doors: C02

2.0 Pull	39 x Match Existing	630	BRN
1.0 Exit Device	2801 CD	630	PRE
1.0 Exit Device	2803 CD 4903X	630	PRE
1.0 Rim Cylinder	12E 7 2 STD	626	BES
2.0 Mortise Cylinder	1E 7 4 STD	626	BES
2.0 Door Closer	EHD9016 AVB SDS90 MC90	689	BES
2.0 Sweep	C699A	A	NGP
1.0 Balance of Hardware	Existing to Remain		

NOTE: Door, frame, hinges, gasketing, and threshold are existing to remain.

Set #5 - EXT FRP PAIR - CVR 01/03 - SDS
 Doors: A18, C25, J21

2.0	Continuous Hinge	671 HD UL SO	AL	BES
1.0	Exit Device	2801 CD	630	PRE
1.0	Exit Device	2803 CD 4903X	630	PRE
1.0	Rim Cylinder	12E 7 2 STD	626	BES
2.0	Mortise Cylinder	1E 7 4 STD	626	BES
2.0	Door Closer	EHD9016 AVB SDS90 MC90	689	BES
2.0	Kick Plate	PP0050 10" X DW - 1"	630	ABH
1.0	Astragal	97V (SET)		NGP
1.0	Threshold	896S-ADJ	A	NGP
1.0	Gasketing	107S x Head & Jambs (2)		NGP
2.0	Sweep	C699A	A	NGP
1.0	Drip Cap	16A x 4" ODW	A	NGP

Set #6 - EXT FRP PAIR - MULLION - RIM 01/03 - SDS
 Doors: HL07, HL08

2.0	Continuous Hinge	671 HD UL SO	AL	BES
2.0	Pull	39 x Match Existing	630	BRN
1.0	Removeable Mullion	KR822 8	689	PRE
1.0	Exit Device	2101 CD	630	PRE
1.0	Exit Device	2103 CD 4903X	630	PRE
2.0	Rim Cylinder	12E 7 2 STD	626	BES
2.0	Mortise Cylinder	1E 7 4 STD	626	BES
2.0	Door Closer	EHD9016 AVB SDS90 MC90	689	BES
2.0	Kick Plate	PP0050 10" X DW - 1"	630	ABH
1.0	Astragal	97V (SET)		NGP
1.0	Threshold	896S-ADJ	A	NGP
1.0	Gasketing	107S x Head & Jambs (2)		NGP
2.0	Sweep	C699A	A	NGP
1.0	Drip Cap	16A x 4" ODW	A	NGP

Set #7 - EXT FRP PAIR - 45H - SDS
 Doors: A01, A19, KL06, AA07, F69, D01, D02, D06

2.0	Continuous Hinge	671 HD UL SO	AL	BES
1.0	Flushbolt	1861P	630	ABH
1.0	Mortise Lock	45H 7 D 15 H STD	630	BES
1.0	Coordinator	3700 SERIES (brackets as req'd)	689	ABH
2.0	Door Closer	EHD9016 AVB SDS90 MC90	689	BES
2.0	Kick Plate	PP0050 10" X DW - 1"	630	ABH
1.0	Astragal	158NA	A	NGP

1.0	Threshold	896S-ADJ	A	NGP
1.0	Gasketing	107S x Head & Jambs (2)		NGP
2.0	Sweep	C699A	A	NGP

Set #8 - EXT FRP SGL - RIM 03 - SDS - CARD READER
 Doors: D04

2.0	Continuous Hinge	671 HD UL SO	AL	BES
1.0	Exit Device	2103 4903A	630	PRE
1.0	Rim Cylinder	12E 7 2 STD	626	BES
1.0	Electric Strike	0162	630	RCI
1.0	Door Closer	EHD9016 AVB SDS90 MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Threshold	896S-ADJ	A	NGP
1.0	Gasketing	107S x Head & Jambs (2)		NGP
1.0	Sweep	C699A	A	NGP
1.0	Drip Cap	16A x 4" ODW	A	NGP
1.0	Power Supply	By Access Control Provider		
1.0	Card Reader	By Access Control Provider		

NOTE: Free egress always. Door normally closed and locked. Valid credentials at reader will release strike to allow entry. Strike will lock during power outage. Coordinate all wiring, hardware, and installation requirements with General Contractor, Electrical Contractor, and Access Control Contractor.

Set #9 - EXT FRP SGL - RIM 08 - SDS
 Doors: AA01, AA02, D39, HL06, HL09

2.0	Continuous Hinge	671 HD UL SO	AL	BES
1.0	Exit Device	2108 CD 4908A	630	PRE
1.0	Rim Cylinder	12E 7 2 STD	626	BES
1.0	Mortise Cylinder	1E 7 4 STD	626	BES
1.0	Door Closer	EHD9016 AVB SDS90 MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Threshold	896S-ADJ	A	NGP
1.0	Gasketing	107S x Head & Jambs (2)		NGP
1.0	Sweep	C699A	A	NGP
1.0	Drip Cap	16A x 4" ODW	A	NGP

Set #10 - EXT FRP SGL - 45H D - SDS
 Doors: AA04, AA05

2.0	Continuous Hinge	671 HD UL SO	AL	BES
1.0	Mortise Lock	45H 7 D 15 H STD	630	BES
1.0	Door Closer	EHD9016 AVB SDS90 MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Threshold	896S-ADJ	A	NGP
1.0	Gasketing	107S x Head & Jambs (2)		NGP

1.0	Sweep	C699A	A	NGP
1.0	Drip Cap	16A x 4" ODW	A	NGP

Set #11 - EXT FRP SGL - 45H R - SDS
 Doors: AA09, AA10

2.0	Continuous Hinge	671 HD UL SO	AL	BES
1.0	Mortise Lock	45H 7 R 15 H STD	630	BES
1.0	Door Closer	EHD9016 AVB SDS90 MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Threshold	896S-ADJ	A	NGP
1.0	Gasketing	107S x Head & Jambs (2)		NGP
1.0	Sweep	C699A	A	NGP
1.0	Drip Cap	16A x 4" ODW	A	NGP

Set #12 - EXT FRP SGL - 45H R - AFP
 Doors: AA08

2.0	Continuous Hinge	671 HD UL SO	AL	BES
1.0	Mortise Lock	45H 7 R 15 H STD	630	BES
1.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Threshold	896S-ADJ	A	NGP
1.0	Gasketing	107S x Head & Jambs (2)		NGP
1.0	Sweep	C699A	A	NGP
1.0	Drip Cap	16A x 4" ODW	A	NGP

Set #13 - EXT FRP SGL - 45H AT - AFP
 Doors: AA03

2.0	Continuous Hinge	671 HD UL SO	AL	BES
1.0	Mortise Lock	45H 7 AT 15 H STD	630	BES
1.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Threshold	896S-ADJ	A	NGP
1.0	Gasketing	107S x Head & Jambs (2)		NGP
1.0	Sweep	C699A	A	NGP
1.0	Drip Cap	16A x 4" ODW	A	NGP

Set #14 - INT RATED PAIR - MULLION - RIM 08/08 - SDS
 Doors: A12, J02, J23

6.0	Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Removeable Mullion	FLKR822	689	PRE
2.0	Exit Device	FL 2108 4908A	630	PRE
3.0	Rim Cylinder	12E 7 2 STD	626	BES
2.0	Door Closer	EHD9016 AVB SDS90 MC90	689	BES

1.0 Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0 Gasketing	137N x Head & Jambs (2)		NGP
1.0 Gasketing	5100N		NGP

Set #15 - INT RATED PAIR - MULLION - RIM 14/14 - SDS
 Doors: KL11, K10

6.0 Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0 Removeable Mullion	FLKR822	689	PRE
2.0 Exit Device	FL 2114 4914A	630	PRE
1.0 Rim Cylinder	12E 7 2 STD	626	BES
2.0 Door Closer	EHD9016 AVB SDS90 MC90	689	BES
2.0 Kick Plate	PP0050 10" X DW - 1"	630	ABH
1.0 Gasketing	137N x Head & Jambs (2)		NGP
1.0 Gasketing	5100N		NGP

Set #16 - INT RATED PAIR - 45H AT - SDS
 Doors: A14, KL04

6.0 Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0 Flushbolt	1867	630	ABH
1.0 Mortise Lock	45H 7 AT 15 H STD	630	BES
1.0 Coordinator	3700 SERIES (brackets as req'd)	689	ABH
2.0 Door Closer	EHD9016 AVB SDS90 MC90	689	BES
2.0 Kick Plate	PP0050 10" X DW - 1"	630	ABH
1.0 Gasketing	9800 x Meeting Stile		NGP
1.0 Gasketing	137N x Head & Jambs (2)		NGP

Set #17 - INT RATED SGL - RIM 03 - AFP
 Doors: A20

3.0 Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0 Exit Device	FL 2103 4903A	630	PRE
1.0 Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0 Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0 Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
1.0 Gasketing	5050 C x Head & Jambs (2)		NGP

Set #18 - INT RATED SGL - RIM 08 - SDS
 Doors: J24, J25, J29, J30

3.0 Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0 Exit Device	FL 2108 4908A	630	PRE
1.0 Door Closer	EHD9016 AVB SDS90 MC90	689	BES
1.0 Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0 Gasketing	5050 C x Head & Jambs (2)		NGP

Set #19 - INT RATED SGL - RIM 08 - AFP
 Doors: A29

3.0	Hinge	FBF179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Exit Device	FL 2108 4908A	630	PRE
1.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
1.0	Gasketing	5050 C x Head & Jambs (2)		NGP

Set #20 - INT RATED SGL - 45H D - AFP
 Doors: A15, KL05, KL13, KL14

3.0	Hinge	FBF179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 7 D 15 H STD	630	BES
1.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
1.0	Gasketing	5050 C x Head & Jambs (2)		NGP

Set #21 - INT RATED SGL - 45H R - SDS
 Doors: B18, B48

3.0	Hinge	FBF179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 7 R 15 H STD	630	BES
1.0	Door Closer	EHD9016 AVB SDS90 MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Gasketing	5050 C x Head & Jambs (2)		NGP

Set #22 - INT RATED SGL - 45H R - SIS
 Doors: B03, B04, B17, B31, B32, B47, D05, C03

3.0	Hinge	FBF179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 7 R 15 H STD	630	BES
1.0	Door Closer	EHD9016 AVB SIS90 MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Gasketing	5050 C x Head & Jambs (2)		NGP

Set #23 - INT RATED SGL - 45H R - AFP
 Doors: A05, B02, B06, B20, B21, B25, B26, B27, B28, B29, B30, B33, B34, B37, B38, B39, B40, B41, B42, B49, B50, E21, E22, E23, E24, E25, E26, E27, E28, E29, E30, E31, E32, D07, D13, C38

3.0	Hinge	FBF179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 7 R 15 H STD	630	BES
1.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH

1.0 Gasketing 5050 C x Head & Jambs (2) NGP

Set #24 - INT RATED SGL - 45H AT - AFP

Doors: D12

3.0 Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0 Mortise Lock	45H 7 AT 15 H STD	630	BES
1.0 Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0 Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0 Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
1.0 Gasketing	5050 C x Head & Jambs (2)		NGP

Set #25 - INT PAIR - SVR 08/08 - DST

Doors: J05, J06, J17, J19

6.0 Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
2.0 Exit Device	2208 LBR CD 4908A	630	PRE
2.0 Rim Cylinder	12E 7 2 STD	626	BES
2.0 Mortise Cylinder	1E 7 4 STD	626	BES
2.0 Door Closer	EHD9016 AVB DST90 MC90	689	BES
2.0 Kick Plate	PP0050 10" X DW - 1"	630	ABH
2.0 Silencer	AB608-RKW	Grey	ABH

Set #26 - INT PAIR - SVR 08/08 - SDS

Doors: J03, J22

2.0 Continuous Hinge	671 HD UL SO	AL	BES
2.0 Exit Device	2208 LBR 4908A	630	PRE
2.0 Rim Cylinder	12E 7 2 STD	626	BES
2.0 Door Closer	EHD9016 AVB SDS90 MC90	689	BES
2.0 Kick Plate	PP0050 10" X DW - 1"	630	ABH
2.0 Silencer	AB608-RKW	Grey	ABH

Set #28 - INT PAIR - SVR 08/08 - AFP

Doors: A06, KL01, KL03, K07, J04, J20

6.0 Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
2.0 Exit Device	2208 LBR CD 4908A	630	PRE
2.0 Rim Cylinder	12E 7 2 STD	626	BES
2.0 Mortise Cylinder	1E 7 4 STD	626	BES
2.0 Door Closer	EHD9016 AVB AF90P MC90	689	BES
2.0 Kick Plate	PP0050 10" X DW - 1"	630	ABH
2.0 Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
2.0 Silencer	AB608-RKW	Grey	ABH

Set #29 - INT PAIR - MULLION - RIM 08/08 - SDS
 Doors: H07, H15, F73

6.0	Hinge	FBF179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Removeable Mullion	KR822 8	689	PRE
2.0	Exit Device	2108 CD 4908A	630	PRE
3.0	Rim Cylinder	12E 7 2 STD	626	BES
2.0	Mortise Cylinder	1E 7 4 STD	626	BES
2.0	Door Closer	EHD9016 AVB SDS90 MC90	689	BES
2.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Gasketing	5100N		NGP

Set #30 - INT PAIR - MULLION - RIM 08/08 - AFP/SDS
 Doors: H01, H02, H05, H06, H10, H11, H13, H14

6.0	Hinge	FBF179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Removeable Mullion	KR822 8	689	PRE
2.0	Exit Device	2108 CD 4908A	630	PRE
3.0	Rim Cylinder	12E 7 2 STD	626	BES
2.0	Mortise Cylinder	1E 7 4 STD	626	BES
1.0	Door Closer	EHD9016 AVB SDS90 MC90	689	BES
1.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
2.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Gasketing	5100N		NGP
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH

Set #31 - INT PAIR - MULLION - RIM 08/08 - AFP
 Doors: H12

6.0	Hinge	FBF179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Removeable Mullion	KR822 8	689	PRE
2.0	Exit Device	2108 CD 4908A	630	PRE
3.0	Rim Cylinder	12E 7 2 STD	626	BES
2.0	Mortise Cylinder	1E 7 4 STD	626	BES
2.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
2.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Gasketing	5100N		NGP
2.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH

Set #32 - INT PAIR - MULLION - RIM 08/08 - AFP
 Doors: I17, KL02, H04

6.0	Hinge	FBF179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Removeable Mullion	KR822 8	689	PRE
2.0	Exit Device	2108 CD 4908A	630	PRE
3.0	Rim Cylinder	12E 7 2 STD	626	BES
2.0	Mortise Cylinder	1E 7 4 STD	626	BES

2.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
2.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Gasketing	5100N		NGP
2.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH

Set #33 - INT PAIR - MULLION - RIM 08/08 - AFP - STC
 Doors: F91

6.0	Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Removeable Mullion	KR822 8	689	PRE
2.0	Exit Device	2108 CD 4908A	630	PRE
3.0	Rim Cylinder	12E 7 2 STD	626	BES
2.0	Mortise Cylinder	1E 7 4 STD	626	BES
2.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
2.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Gasketing	5100N		NGP
2.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
1.0	Gasketing	5075 Head and jamb (2)		NGP
2.0	Automatic Door Bottom	335NA		NGP

Set #34 - INT PAIR - 45H D

Doors: B05, B07, B16, B35, B36, B46, I26, I37, I38, E01, E15, E16, E43, E44, E45, F01, F10, F64, D14, HL01, HL02, HL05, HL12, HL13, HL14, C05, C06, C12, C28, C30, C36, J26, J27

6.0	Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Flushbolt	1857P	630	ABH
1.0	Dust Proof Strike	1870	630	ABH
1.0	Mortise Lock	45H 7 D 15 H STD	630	BES
1.0	Latch Protector	MLP-111 / ILP-212 (AS REQ'D)	630	D-J
2.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
2.0	Silencer	AB608-RKW	Grey	ABH

Set #35 - INT PAIR - 45H R
 Doors: D15

6.0	Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Flushbolt	1857P	630	ABH
1.0	Dust Proof Strike	1870	630	ABH
1.0	Mortise Lock	45H 7 R 15 H STD	630	BES
2.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
2.0	Silencer	AB608-RKW	Grey	ABH

Set #36 - INT SGL - RIM 08 - AFP - CARD READER
 Doors: F22, F34, F47

3.0	Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
-----	-------	-------------------------------	-----	-----

1.0	Exit Device	2103 4903A	630	PRE
1.0	Rim Cylinder	12E 7 2 STD	626	BES
1.0	Electric Strike	0162	630	RCI
1.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
3.0	Silencer	AB608-RKW	Grey	ABH
1.0	Power Supply	By Access Control Provider		
1.0	Card Reader	By Access Control Provider		

NOTE: Free egress always. Door normally closed and locked. Valid credentials at reader will release strike to allow entry. Strike will lock during power outage. Coordinate all wiring, hardware, and installation requirements with General Contractor, Electrical Contractor, and Access Control Contractor.

Set #37 - INT SGL - 45H D - AFP - CARD READER X 2
 Doors: F90

3.0	Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 7 D 15 H STD	630	BES
1.0	Electronic Lock	YD30S (Fail Safe)		RCI
1.0	Electric Strike	F2164 (Fail Secure)	630	RCI
1.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
3.0	Silencer	AB608-RKW	Grey	ABH
1.0	Power Supply	By Access Control Provider		
1.0	Push Button	975 MO	28	RCI
2.0	Card Reader	By Access Control Provider		

NOTE: Restricted egress. Door normally closed and locked from both side. Valid credentials at either reader will release strike and retract YD30 lock to allow door to open. Strike will remain locked during power outage (fail secure), YD30 lock will retract (fail safe), which allows egress out of office area into hallway. Push-to-exit button installed office side as override for YD30 lock. Coordinate all wiring, hardware, and installation requirements with General Contractor, Electrical Contractor, and Access Control Contractor.

Set #38 - INT SGL - RIM 08 - AFP
 Doors: B08, B09, I01, I09, I10, I36, E08, E58, K09, D20, D23

3.0	Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Exit Device	2108 4908A	630	PRE
1.0	Rim Cylinder	12E 7 2 STD	626	BES
1.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
3.0	Silencer	AB608-RKW	Grey	ABH

Set #39 - INT SGL - 45H D - AFP

Doors: A28, A31, B23, B44, B52, I21, I22, KL08, KL16, G02, G03, G24, E17, E35, E36, K11, K14, F02, F12, F26, F39, F48, F50, F52, F55, F61, D28, HL03, HL04, HL10, HL11, C16, J10, J28, J08

3.0	Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 7 D 15 H STD	630	BES
1.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
3.0	Silencer	AB608-RKW	Grey	ABH

Set #40 - INT SGL - 45H R - AFP

Doors: D40, D41

3.0	Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 7 R 15 H STD	630	BES
1.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
3.0	Silencer	AB608-RKW	Grey	ABH

Set #41 - INT SGL - 45H R - AFP

Doors: KL15, KL17, KL18, KL21, KL22, KL23, E39, E40, K15, K16, K17, K18

3.0	Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 7 R 15 H STD	630	BES
1.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Mop Plate	PP0050 6" X DW - 1"	630	ABH
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
3.0	Silencer	AB608-RKW	Grey	ABH

Set #42 - INT SGL - 45H R

Doors: A03, A04, A16, A17, A27, B10, B12, B13, B15, B54, B55, B56, B57, I04, I05, I07, I11, I13, I14, I16, I24, I25, I35, KL09, KL24, G04, G05, G06, G08, G09, G10, G11, G14, G15, G19, G21, E02, E04, E05, E07, E09, E18, E20, E33, E34, E37, E42, E46, E47, E48, E49, E50, E51, E52, E53, F04, F05, F06, F07, F08, F09, F31, F37, F41, F42, F43, F44, F46, F58, F62, F65, F66, F67, F68, F74, F75, F80, F81, F86, D19, D21, D25, D03, C04, C07, C08, C09, C10, C11, C18, C19, C21, C22, C23, C24, C26, C27, C31, C32, C33, C34, C35

3.0	Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 7 R 15 H STD	630	BES
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
3.0	Silencer	AB608-RKW	Grey	ABH

Set #43 - INT SGL - 45H AT - SDS
 Doors: F93

3.0	Hinge	FBF179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 7 AT 15 H STD	630	BES
1.0	Door Closer	EHD9016 AVB SDS90 MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
3.0	Silencer	AB608-RKW	Grey	ABH
1.0	Mop Plate	PP0050 6" X DW - 1"	630	ABH

Set #44 - INT SGL - 45H AT - SIS
 Doors: D36, D37, D38

3.0	Hinge	FBF179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 7 AT 15 H STD	630	BES
1.0	Door Closer	EHD9016 AVB SIS90 MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
3.0	Silencer	AB608-RKW	Grey	ABH
1.0	Mop Plate	PP0050 6" X DW - 1"	630	ABH

Set #45 - INT SGL - 45H AT - AFP
 Doors: A23, A25, A30, E10, K01, F11, F19, F33, F35, F36, C14, J14, J18, J07

3.0	Hinge	FBF179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 7 AT 15 H STD	630	BES
1.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
3.0	Silencer	AB608-RKW	Grey	ABH

Set #46 - INT SGL - 45H AT
 Doors: A13, A21, A26, B11, B14, I06, I08, I12, I15, KL10, G16, G22, G23, G25, G32, E03, E06, K04, F00, F13, F14, F15, F16, F18, F20, F21, F23, F27, F28, F29, F32, F53, F54, F56, F59, F60, F76, F78, F84, F85, F87, F88, D08, D09, D11, D16, D18, D22, D24, K06

3.0	Hinge	FBF179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 7 AT 15 H STD	630	BES
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
3.0	Silencer	AB608-RKW	Grey	ABH

Set #47 - INT SGL - 45H L
 Doors: A22, G20, E19, E38, E41, E54, F03, F24, F25, F30, F45, F57, F77, D17, C20

3.0	Hinge	FBF179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 0 L 15 H VIB	626	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Mop Plate	PP0050 6" X DW - 1"	630	ABH

1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
3.0	Silencer	AB608-RKW	Grey	ABH

Set #48 - INT SGL - 45H N - AFP
 Doors: K05, K19, K20

3.0	Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 0 N 15 H	626	BES
1.0	Door Closer	EHD9016 AVB AF90P MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Mop Plate	PP0050 6" X DW - 1"	630	ABH
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
3.0	Silencer	AB608-RKW	Grey	ABH

Set #49 - INT SGL - 45H N
 Doors: I02, I03, I27, I28, I29, G17, G18, F82, F83

3.0	Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Mortise Lock	45H 0 N 15 H	626	BES
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
3.0	Silencer	AB608-RKW	Grey	ABH

Set #50 - INT SGL - PUSH/PULL - FPH
 Doors: B22, B24, B43, B45, B51, B53, I33, I34, KL07, KL19, KL20, G30, G31, E11, E12, E13, E14, K12, K13, F38, F40, F49, F51, D27, D29, C15, C17, J09, J15

3.0	Hinge	FBB179 4.5X4.5 (NRP AS REQ'D)	652	BES
1.0	Pull Plate	AB111_X_AB70C	630	ABH
1.0	Door Closer	EHD9016 AVB FHP90 MC90	689	BES
1.0	Kick Plate	PP0050 10" X DW - 2"	630	ABH
1.0	Mop Plate	PP0050 6" X DW - 1"	630	ABH
1.0	Wall Stop	AB405 / AB406 / AB441CU (AS REQ'D)	626	ABH
3.0	Silencer	AB608-RKW	Grey	ABH

Set #51 - GATE
 Doors: TO BE INSTALLED AT SECURITY GATES IN CORRIDORS AT 13 LOCATIONS. CONTRACTOR TO COORDINATE WITH ARCHITECT TO VERIFY LOCATIONS.

1.0	Interchangeable Core	1C7 1 STD	626	BES
-----	----------------------	-----------	-----	-----

Set #52 - OVERHEAD DOOR
 Doors: AA06, D35

NOTE: ALL HARDWARE BY MANUFACTURER

Set #52 – TOILET DOORS
Doors: TA, TB

1.0	Continuous Hinge	667 HD UL SO	AL	BES
1.0	Cylindrical Privacy	9K 3 0 L 15 C	626	BES
1.0	Balance of Hardware	By Toilet Partition Provider/Manufacturer		

Set #53 – CABINETS
Doors: CABINET

1.0	Utility Cylinder	5E Series	626	BES
-----	------------------	-----------	-----	-----

END OF SECTION 087100

SECTION 230900 - INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 GENERAL

1.1 SUMMARY

- A. This Section is included for reference only. Control work is being done outside the contract by the Owner's control company, Siemens, or Siemens as installed by Frazier Service Company.

1.2 WORK INCLUDED

- A. Project Scope Description: The Owner has a separate contract directly with the County wide Siemens energy management and control system company to perform all control work necessary for the equipment in this contract to operate properly. The information in this control specification includes sequences of operation for all equipment specified in this contract. These sequences shall be implemented by the controls contractor for the HVAC systems to operate properly as designed by the engineer. This control specification also includes a delineation of responsibility for devices relating to control work, including control components that are factory provided and factory installed, or factory provided and field installed, or control components provided by the control's contractor.
- B. DDC Control Flow Diagrams: In addition to the Sequence of Control for all equipment in this project, in the specifications, the drawing portion of the contract documents include graphical DDC control flow diagrams that are intended to show HVAC equipment and that equipment's associated major control devices, such as dampers, duct mounted smoke detectors, temperature sensors, etc. These diagrams are not intended to be wiring diagrams or complete input/output summary diagrams, but are intended to assist the Owner's control contractor and the general contractor with a simplified and general overview of control components.
- C. Pre-Bid Coordination Between Owner's Control Company and Contractor:
1. This project involves the control and monitoring of HVAC equipment by the Owner's control company Siemens. The owner has a separate contract with Siemens to perform all control work necessary for the equipment provided by the contractor to operate properly.
 2. Most of the HVAC equipment controlled on this project will be controlled and monitored by field mounted DDC controllers, furnished and installed by the Owner's control company.
 3. For HVAC equipment controlled and monitored by field mounted controllers, the HVAC equipment is specified with electromechanical base unit controls, if available, to facilitate ease of connection to the control contractor's field mounted DDC controllers. For HVAC equipment where electromechanical controls are not an option for unit controls, a basic microprocessor is specified if available. Because different manufacturers do not offer identical unit control options, other approved manufacturers may not offer specified unit control arrangement as the basis of design (e.g., electromechanical). Given the differences in availability by the basis of design manufacturer on unit control options for a line of product, and differences between manufacturers, the exact unit control type provided by the successful manufacturer cannot be known prior to bid.
 4. The Owner's control company is responsible for connecting to the HVAC equipment, and the connection method depends on the type of unit controls provided with the equipment. To facilitate this process, the contractor shall coordinate with the Owner's control company (Siemens) prior to bid, and shall coordinate the type of unit controls available by the manufacturer with Siemens. For equipment with full factory controller control (e.g., outdoor air units), the particular factory communication BMS interface/gateway shall be coordinated with Siemens. This is required to ensure the contractor includes in his bid all costs for the unit controls that Siemens intends to connect to, and so that Siemens can include all costs in their contract with the Owner necessary to connect to the unit controls.

5. The contractor shall include in the submittals for all HVAC equipment a letter signed by the Owner's control company that the unit controls submitted by the manufacturer were coordinated prior to bid with Siemens, and that the unit controls submitted are approved by Siemens for use with the connection method that Siemens intended to utilize. Submittals will not be approved for this equipment without the signed letter.
- D. The following components or equipment are provided under this contract. Some of these components or equipment may be specified in later paragraphs to involve work by the controls contractor to achieve the sequence of control specified herein.
 1. Ductless fan coil unit 24 volt thermostats.
 2. Bi-polar ionization units.
 3. Electric heater thermostats.
 4. Gas unit heater thermostats
- E. Control components not provided under this contract. The following components are not provided under this contract, and these shall be furnished and installed by the control's contractor, unless explicitly listed as installed by the contractor under this contract.
 1. Space temperature sensors.
 2. Duct mounted supply air temperature sensors.
 3. Line voltage exhaust fan thermostats.
 4. Unitary DDC controllers.
 5. Main DDC control panels.
 6. Metal control cabinets.
 7. Control relays/contactors.
 8. Control transformers.
 9. Control wiring.
 10. Conduit for control wiring.
 11. Differential pressure switch for verifying air pressure drop across RTAC filters.
 12. Water temperature sensors
 13. Water flow switches
 14. Differential pressure transmitter

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. The Fayette County School System has a county-wide Siemens energy management and control system. The Owner has a separate contract with Siemens or Frazier Service Company as the manufacturer and/or installer of the control system for all work specified herein.

2.2 WIRING

- A. All control wiring (including but not limited to control, interlock, sensor, thermostat, etc.) shall be provided by the control's contractor outside of this contract. If 120 volt AC power for control devices is required, the control contractor is responsible for providing 120 volt AC under a separate contract with the Owner.

2.3 CONDUIT AND RACEWAY

- A. Conduit and raceway shall be provided and installed by controls contractor under a separate contract with the Owner.

PART 3 EXECUTION

2.4 SEQUENCE OF OPERATION FOR EQUIPMENT INSTALLED UNDER THIS CONTRACT

A. Overall Building Control Description:

1. Time Clock Program: Owner shall provide Contractor with the required start/stop times for each piece of equipment so the Contractor can program the individual start/stop time for each piece of equipment. Equipment which shall be started/stopped by the time clock program is indicated in later paragraphs. All other equipment not started by the time clock program will be started and stopped as described in later paragraphs of this section of specifications.
2. Override Timer Programs: Override timer programs shall override the time clock program during its "OFF" cycles to re-start the equipment in its normal operating mode. Room temperature sensors shall be provided with integral pushbutton override to restart equipment in normal operating mode for a preprogrammed (one hour, adjustable) duration.
3. Night Setback Programs: Night setback/setup temperature programs shall override the time clock program during its "off" cycles, when the space temperature drops/rises below or above setpoint (55°F/85°F, adjustable) to restart the respective equipment to satisfy the room temperature night setback/setup setpoint (as sensed by the respective room temperature sensor.) Anytime night setback/setup program is activated, all exhaust fans shall remain off, outdoor air dampers shall remain shut, automatic volume dampers serving outdoor air intakes shall remain shut, energy recovery devices shall not operate, and 100% outdoor air unit shall not operate.
4. Morning Warm Up and Cool Down Programs: During morning hours, prior to building occupancy, equipment as specified in later paragraphs shall operate until space temperature sensors reach 75°F (adjustable). Control system shall "learn" the time required to perform this function and shall adjust the start time to bring the equipment on at the appropriate time (optimum start). During morning warm up/cool down, equipment as specified in later paragraphs to remain off shall not operate.
5. Fire Safety Controls: All supply air systems above 2000 cfm shall be provided with a supply duct mounted smoke detector and systems over 15,000 cfm shall be provided with a supply and return mounted duct smoke detector, furnished under Division 26. Certain pieces of equipment as indicated in later paragraphs shall also be subject to an emergency shutdown function which shall be activated by closure of the HVAC shutdown relay by a signal from the main fire alarm panel.
6. Emergency Shutdown Controls: All WSHP, RTAC, ERU, and 100% O-A, units shall be subject to an emergency shutdown function which shall be activated by closure of the HVAC shutdown relay in the main fire alarm panel. This equipment shall also be shut down upon a phase loss condition as specified. This is a separate emergency shutdown function than the loop water panel emergency shut down, which shall shut down only WSHP equipment during a loop water problem.
7. Power Outage Recovery Control: In the event of a power outage, the control system shall be restored to its last state (prior to power outage) as quickly as possible after power has been restored. Setpoints shall not be lost during power outages.
8. All existing control and monitoring functions shall be maintained.

B. Sequence of Operation for DX Fan Coil Units (FCU) and Air Cooled Heat Pumps (HP):

1. Unit functions will be enabled for operation by the control system's time clock program, override timer program, night setback/setup program or morning warm up/cool down program.
2. Supply Fan Control: The supply fan shall run continuously when the control system's time clock program is in the occupied mode, override timer program is enabled, night setback/setup program is enabled or morning warm up/cool down program is enabled. Supply fan cycles as required during unoccupied periods.

3. Compressor and Reversing Valve and Electric Heat Control: The compressor(s) and outdoor condenser fan(s) shall be energized in stages as required a call for heating or cooling. Upon a call for cooling, the reversing valve shall be energized. Upon a call for heating, the reversing valve shall be de-energized and the compressor and outdoor fan only shall be energized. Upon a further drop in space temperature, electric strip heat shall be energized in stage(s) as required to provide additional heat. In the heating mode, all components shall be subject to operation of the defrost controller.
 4. Safety Shutdown Control: The units shall be subject to shut down by the following:
 - a. Internal safeties
 - b. Field installed condensate overflow switch in the auxiliary drain pan for units specified with overflow switches
 - c. Duct mounted smoke detector on units over 2, 000 cfm.
 - d. HVAC shutdown relay activated by building fire alarm panel
- C. Sequence of Operation for Single Zone Constant Volume Dx Rooftop Air Conditioners with Gas Heat (RTAC):
1. Unit functions will be enabled for operation by the control system's time clock program, override timer program, night setback/setup program or morning warm up/cool down program.
 2. Supply Fan Control: The supply fan shall run continuously when the control system's time clock program is in the occupied mode, override timer program is enabled, night setback/setup program is enabled or morning warm up/cool down program is enabled. Supply fan cycles as required during unoccupied periods.
 3. Compressor Control: The compressor(s) and outdoor fan(s) shall be energized in stages as scheduled upon a call for cooling.
 4. Safety Shutdown Control: The units shall be subject to shut down by the following:
 - a. Internal safeties
 - b. Duct mounted smoke detector on units over 2, 000 cfm.
 - c. HVAC shutdown relay activated by building fire alarm panel
 - d. Phase loss/reversal three phase only.
 5. Gas Heating System Control: The gas heating system shall be energized in stages or modulated as scheduled upon a call for heating.
 6. Dehumidification (Hot Gas Reheat) Control: Where specified in the RTAC schedule, provide dehumidification controls to energize compressor and hot gas reheat coil to supply neutral dehumidified air when there is no call for cooling, but humidity rises above setpoint. Control shall be staged or modulating as specified in the RTAC schedule.
 7. Economizer Control: On units scheduled with an air side economizer, outside air shall be used to assist in cooling during milder outside temperature conditions. If the outside air enthalpy is below the changeover setpoint, and if there is a call for cooling, the outside air damper will modulate open from its' minimum position and the return air damper will modulate closed to maintain the space temperature. If the outside air damper has modulated fully open and there is still a call for cooling, the compressor(s) shall be energized in stages as scheduled to provide both economizer and compressor cooling (integrated economizer). If the outside air enthalpy (as scheduled) rises above the changeover setpoint, the outside air damper shall return to the minimum position, return dampers shall return to their fully open position, and the compressor(s) only shall be used to satisfy cooling demand.
 8. On units scheduled with a powered economizer exhaust fan, the fan shall be energized and de-energized when the outdoor air damper opens and closes during economizer cycles as required. The air side economizer shall be disabled upon a call for heating, and the outside air damper shall be at its minimum position.

- D. Sequence of Operation for Air Cooled Dx Wall Hung Heat Pumps (WHHP):
1. Unit functions will be enabled for operation by the control system's time clock program, override timer program, night setback/setup program or morning warm up/cool down program.
 2. Supply Fan Control: The supply fan shall run continuously when the control system's time clock program is in the occupied mode, override timer program is enabled, night setback/setup program is enabled or morning warm up/cool down program is enabled. Supply fan cycles as required during unoccupied periods.
 3. Compressor and Reversing Valve and Electric Heat Control: The compressor(s) and outdoor fan(s) shall be energized in stages as scheduled upon a call for heating or cooling. Upon a call for cooling, the reversing valve shall be energized. Upon a call for heating, the reversing valve shall be de-energized. Upon a further drop in space temperature, electric strip heat shall be energized in stage(s) as required to provide additional heat. In the heating mode, all components shall be subject to operation of the defrost controller.
 4. Safety Shutdown Control: The units shall be subject to shut down by the following:
 - a. Internal safeties
 - b. HVAC shutdown relay activated by building fire alarm panel
 - c. Phase loss/reversal three phase only.
- E. Sequence of Operation for Vertical Mounted Water Source Heat Pumps (WSHP):
1. Unit functions will be enabled for operation by the control system's time clock program, override timer program, night setback/setup program or morning warm up/cool down program.
 2. Supply Fan Control: The supply fan shall run continuously when the control system's time clock program is in the occupied mode, override timer program is enabled, night setback/setup program is enabled or morning warm up program/cool down is enabled. Supply fan cycles as required during unoccupied periods.
 3. Compressor and Reversing Valve Control: The compressor(s) shall be energized upon a call for cooling or heating. Upon a call for cooling, the reversing valve shall be energized. Upon a call for heating, the reversing valve shall be de-energized.
 4. Safety Shutdown Control: The units shall be subject to shut down by the following:
 - a. Internal safeties
 - b. Factory installed condensate overflow switch in the primary drain pan of the unit for units specified with overflow switches
 - c. Duct mounted smoke detectors on units over 2,000 cfm.
 - d. HVAC shutdown relay is activated by building fire alarm panel.
 - e. Emergency shutdown from loop water system for no flow, high loop temperature and low loop temperature conditions. The shutdown activated by DDC system shall be an instantaneous shutdown. No WSHP shall be allowed to start until this shutdown is manually reset and indicates normal loop water conditions.
 - f. Field installed condensate overflow switch in the auxiliary drain pan. (This is separate from the factory installed condensate overflow switch previously mentioned.)
 - g. Phase loss/reversal three phase only.
 5. Two-Way Valve Control for Variable Loop Flow Systems: Certain noted WSHPs shall be provided with a two-way, two-position normally open valve. See WSHP schedule for listing of WSHPs that require two-way valves. Upon a call for heating or cooling from any WSHP, the two-way valve shall open and after a thirty second delay of the opening of the valve, the compressor (and reversing valve as applicable) shall be energized. When the call for heating or cooling ceases, a thirty second delay shall exist between the compressor stopping and the valve closing. This delay shall allow the residual heat to be extracted/added to the loop prior to the valve closing. This valve shall be a discrete binary output from the DDC controller.

6. Special Requirements Concerning WSHP Start Up for Variable Loop Flow Systems: At start-up, WSHP start time shall be individually staggered to prevent transient pressure drops in loop piping mains caused by opening of two-way valves. This staggering shall prevent low flow conditions in loop piping which in turn may create nuisance shutdown of WSHPs from the WSHP built in safeties. Contractor shall contact Engineer/Owner to discuss staggering strategies.
- F. Sequence of Operation for Exhaust and/or Supply Fans:
 1. Existing exhaust/supply fan controls methods shall be maintained. See drawings for replacement of existing override timers, line voltage thermostats, etc.
 2. New exhaust/supply fan shall be controlled as scheduled or shown on the drawings.
- G. Sequence of Operation for Ductless Fan Coil Units/Ductless Heat Pumps: DFCU shall operate under the dictates of its own wall mounted low voltage space thermostat to cycle the compressor and reversing valve to maintain space temperature setpoint. Wall mounted condensate pump (where shown) shall shut off system if condensate overflow safety trips.
- H. Sequence of Operation for Door Air Curtain: Start/stop switch from door switch provided by mechanical.
- I. Sequence of Operation for Electric Ceiling Heater: Electric ceiling heater(s) shall cycle their blower (after heating element warm up) and heating element to satisfy the integral or wall mounted thermostat. See schedule/drawings for thermostat type.
- J. Sequence of Operation for Electric Wall Heater: Electric wall heater(s) shall cycle their blower (after heating element warm up) and heating element to satisfy the integral thermostat.
- K. Sequence of Operation for Electric Unit Heater: Electric unit heater(s) shall cycle their blower (after heating element warm up) and heating element to satisfy the integral or wall mounted thermostat. See schedule/drawings for thermostat type.
- L. Sequence of Operation for Gas Fired Unit Heater: Gas fired unit heater(s) shall energize their flue exhauster, gas heat exchanger and blower to satisfy the wall mounted 24V thermostat.
- M. Sequence of Operation for Bi-Polar Ionization Unit: Bi-polar ionization unit shall be enabled whenever airflow is initiated at associated equipment (e.g. WSHP units). Once airflow is initiated, bi-polar ionization units shall operate to produce ions to kill mold, bacteria, viruses, and neutralize odors.
- N. Sequence of Operation for Smoke Damper and Fire/Smoke Dampers: Smoke dampers and fire/smoke dampers shall be provided with a relay (relay provided by electrical), which shall be closed upon activation of the building fire alarm panel. The closing of this relay shall interrupt power to the damper, and it shall automatically close. The damper shall open following restoration of power to the relay. Fire/smoke damper shall additionally be provided with a temperature element which shall close in the event high heat is detected, independent of the fire alarm panel.
- O. Sequence of Operation for Residential Range Hood: Start/stop range hood's built-in fan from integral two-speed fan switch. Hood's fire suppression system shall automatically shut off sources of fuel (electric and/or gas) during activation, and shunt trip breaker serving residential range shall trip to cut off power to range.
- P. Sequence of Operation for Kitchen Ventilation System with Unheated Supply Fan: Kitchen hood shall be provided with two switches. One switch shall cut the hood's light on/off. The other switch, which is illuminated, shall cut the hood's grease exhaust fan(s) on/off, and shall cut the supply fan(s) on/off and open the fan(s)' intake damper. See drawings for quantities of grease exhaust fans and supply fans. The kitchen hood's fire suppression system shall be wired to send a signal to the building fire alarm panel when activated. Also, when activated, the shunt trip breakers serving cooking equipment under the hood shall trip and cut the power off to the cooking equipment. Also, when activated, the supply fan(s) shall stop. Also, when activated, the gas valve serving equipment under the hood shall close.

- Q. Sequence of Operation for Kiln Exhaust Control: Start/stop from integral switch provided with system.
- R. Sequence of Operation for Packaged Terminal Heat Pump: Each unit shall operate under the dictates of its integral thermostat cycling the compressor or strip heat to maintain setpoint.
- S. Sequence of Operation for Combination Louvers Serving as Make Up for Exhaust Fans: Combination louvers shall be powered open/spring closed whenever its associated exhaust fan(s) is started. Louver opening shall proceed exhaust fan operation by an adjustable 30 second time delay to ensure louver is open prior to exhaust fan(s) operation.
- T. Sequence of Operation for Energy Recovery Units:
 - 1. Unit functions will be enabled for operation by the control system's time clock program or override timer program. The unit shall be disabled during night setback/setup program and morning warm up/cool down program.
 - 2. Supply Fan and Exhaust Fan and Enthalpy Wheel Control: The supply and exhaust fans shall start and the enthalpy wheel shall rotate during the times as described in the above paragraph. Energy recovery wheel status shall be monitored by an energy recovery wheel monitor current switch.
 - 3. Outdoor Air and Exhaust Damper Control: The outdoor air and exhaust air dampers shall be powered open during the times as described in the above paragraph.
 - 4. Cooling Mode: The cooling mode shall be enabled when the outside air temperature rises above the outside air cooling setpoint of 72°F (adjustable) (plus hysteresis). During the cooling mode, the factory mounted controller will modulate compressor(s) and condenser fan to maintain a supply air cooling setpoint of 53°F (adjustable). The cooling mode will remain active until the outside air temperature falls below the outside air cooling setpoint (minus hysteresis). Cooling stages shall be maintained by adjustable minimum on, off, stage up and stage down timers.
 - 5. Dehumidification Mode: The dehumidification mode shall be enabled anytime the outside air dew point rises above the outside air dew point setpoint of 54°F (adjustable) (plus hysteresis). During the dehumidification mode, the factory mounted controller shall modulate compressor to maintain the supply air dew point setpoint. The dehumidification mode will remain active until the leaving wheel outside air dew point falls below the supply air dew point setpoint (minus hysteresis). Hot gas reheat shall be modulated to maintain neutral supply air setpoint 72°F (adjustable) minus 1°F.
 - 6. Safety Shutdown Controls: The unit shall be subject to shut down by the following:
 - a. Existing duct mounted smoke detectors on units over 2, 000 cfm.
 - b. HVAC shutdown relay activated by building fire alarm panel
 - c. Emergency shutdown from phase loss for three phase equipment.
 - 7. DDC Controller and DDC Sensors: All sensors and the unit's DDC controller shall be factory installed. Unit shall be provided with interface card to communicate with DDC system.
 - 8. Heating Control: Outdoor air is preheated by energy recovery wheel. Should supply air leaving the wheel drop below the outside air heating setpoint (75°F, adjustable), and when the unit is not in dehumidification mode, gas heater shall modulate to maintain 75°F supply air. The heating mode shall remain active until the outside air temperature climbs above the outside air heating setpoint.
 - 9. Supply Fan Status: The supply fan status input shall be required to be CLOSED for mechanical heating or cooling to operate. If this input opens during normal operation, all mechanical heating and cooling outputs shall be deactivated within 10 seconds.
 - 10. Emergency Shutdown: The emergency shutdown input shall be required to be CLOSED for normal operation. If this input is OPEN, no outputs on the controller will be activated. If this input opens during normal operation, all of the controller outputs shall be deactivated within 10 seconds.

11. Dirty Filter: If the dirty filter input closes during supply fan operation, an alarm will be generated indicating the filters need to be changed.
 12. Freeze Protection: If the supply air temperature falls below the freeze protection limit (default 35°F) and the freeze protection timer expires (default 10 minutes), all outputs shall be deactivated. Normal operation shall be restored when the supply air temperature rises above the freeze protection limit by 5°F.
 13. Unoccupied Mode: During unoccupied mode, the supply fan shall be off, the exhaust fan shall be off, the energy recovery wheel shall be off and the outside damper shall be closed.
- U. Sequence of Operation for Water Source Heat Pump Central Plant
1. General: The building's water source heat pump central plant is composed of two (2) loop water pumps (one lead and one standby), two (2) cooling water pumps (one lead and one standby), two (2) boilers, two (2) boiler hot water pumps, and one (1) cooling tower and a new touchscreen loop water control panel. The loop water control panel shall control the system as specified herein.
 2. Loop Water Pump Control: The loop water pump shall run continuously when the control system's time clock program is in the occupied mode, override timer program is enabled, night setback/setup program is enabled or morning warm up/cool down program is enabled. Only one loop water pump shall run at a time. Pump operation shall be verified by primary flow switch and back-up flow switch. The DDC system shall alternate from lead to standby loop water pump to equalize pump wear. The DDC system shall switch to automatic standby loop water in the event of lead loop water pump failure as specified in "Loop Water Control Panel" paragraph.
 3. Loop Pump Flow Modulation Control:
 - a. Each loop pump shall be provided with a dedicated Variable Frequency Drive (VFD). The VFD package shall accept a 4-20 ma or a 0-10VDC signal from the DDC system, which shall modulate the speed of the loop pump to maintain a differential pressure (DP) of 16 psi (adjustable) at the DP sensor/transmitter shown on the plans. The loop water piping system shall be provided with one (1) analog differential pressure sensor/transmitter which shall provide the DDC system with an analog differential pressure inputs.
 - b. When any WSHP is calling for heating or cooling, the DDC system shall maintain the differential pressure based on the DP sensor/transmitter.
 - c. DDC System Interface With VFD: The DDC system shall be provided with, as a minimum, the following points specifically for interfacing with the pump's VFD:
 - 1) Analog Inputs:
 - (a) Pump #1 speed-actual (0-10VDC)
 - (b) Pump #2 speed-actual (0-10VDC)
 - 2) Analog Outputs:
 - (a) Pump #1 speed-set point (0-10VDC)
 - (b) Pump #2 speed-set point (0-10VDC)
 - 3) Binary Inputs:
 - (a) Pump #1 on status
 - (b) Pump #2 on status
 - (c) Fault condition (VFD #1 failure)
 - (d) Fault condition (VFD #2 failure)
 - (e) Automatic Operation/Manual Operation Status - VFD #1
 - (f) Automatic Operation/Manual Operation Status - VFD #2
 - 4) Binary Outputs:
 - (a) Loop Pump #1 start/stop signal
 - (b) Loop Pump #2 start/stop signal

- d. During normal operation, the DDC system shall alternate between the lead loop water pump and standby loop water pump every seven (7) days. Upon receiving a "fault condition" input from the VFD #1 serving its loop pump, (or if loss of flow is sensed for any reason), the DDC system shall send signal to start standby loop pump, which shall be controlled by its dedicated VFD #2. An alarm message shall be created and this pump shall operate until the VFD #1 is corrected. All WSHPs shall be kept off anytime loss of flow is detected. DDC shall use its analog input signal from the VFDs to display pump speed as a % of full speed along with all status other control parameters. All appropriate control algorithms shall be provided as needed (and as recommended by the pump/VFD/WSHP/etc. manufacturers) to ensure appropriate and trouble-free operation. The controls contractor shall coordinate with the Contractor and TAB agent to insure the VFD is programmed to maintain the pump manufacturer's published minimum gpm.
4. Cooling Water Pump Control: The cooling water pumps shall run according to the "Loop System Control Sequence" specified herein, whenever the control system's time clock program is in the occupied mode, override timer is enabled, or night setback/setup program is enabled. Only one cooling water pump shall run at a time. Flow shall be proven by current sensors at each pump and secondary flow switches in the cooling water piping. The DDC system shall alternate from lead to standby cooling water pump every seven (7) days to equalize pump wear. The DDC system shall switch to automatic standby cooling water in the event of lead cooling water pump failure as specified in "Loop Water Control Display" paragraph.
5. Cooling Tower Control: The cooling tower's fans shall run in stages and modulate as specified, according to the "Loop System Control Sequence" specified herein, whenever the control system's time clock program is in the occupied mode, override timer is enabled, or night setback/setup program is enabled. The cooling tower fans shall modulate via their associated VFD from minimum speed to maximum speed to maintain cooling water supply temperature setpoint. Cooling tower is designed for constant cooling water flow into each cell. Tower fan number 1 shall be modulated first while tower fan number 2 is off. If cooling water supply temperature continues to rise, tower fan number 2 shall be modulated from minimum speed to maximum speed while tower fan number 1 is at maximum speed. As cooling water supply temperature drops, tower fan number 2 shall be slowed to maintain setpoint. As cooling water supply temperature continues to drop, tower fan number 2 shall be stopped while tower fan number 1 operates and tower fan number 1 shall modulate as required to maintain setpoint. Control system shall alternate the lead tower fan on a weekly basis to equalize wear. Vibration switches at each fan shall stop motor if excessive vibration is detected. An immersion type electric heating element(s) shall be energized by the pan heater controller(s) to maintain pan water temperature above 40°F. Unless float type make-up water valve is specified, an electronic water level controller (located at the tower) shall open/close solenoid valve (located in the mechanical room) to add make-up water to maintain proper basin level.
6. Boiler and Hot Water Control:
 - a. General: The WSHP hot water plant shall consist of 2 condensing boilers and 2 hot water pumps (one for each boiler). Piping is set up in a primary - secondary piping arrangement. The boilers shall have factory mounted microprocessor based controllers capable of controlling all aspects of the boiler(s) and associated pump(s). Both boilers' controllers shall be connected to each other via a field installed communication bus to allow communication between the two boilers. The factory mounted boiler controllers will be field set up for lead/lag cascade control mode at the factory controller by the boiler manufacturer's factory authorized agent at startup. One boiler will be configured as the leader control boiler and other as member control boiler. Boiler manufacturer shall be responsible for providing a loop water supply sensor that will be located in the main loop piping. This sensor shall be located a minimum 5ft downstream from the thermal decoupler (hot water supply injection

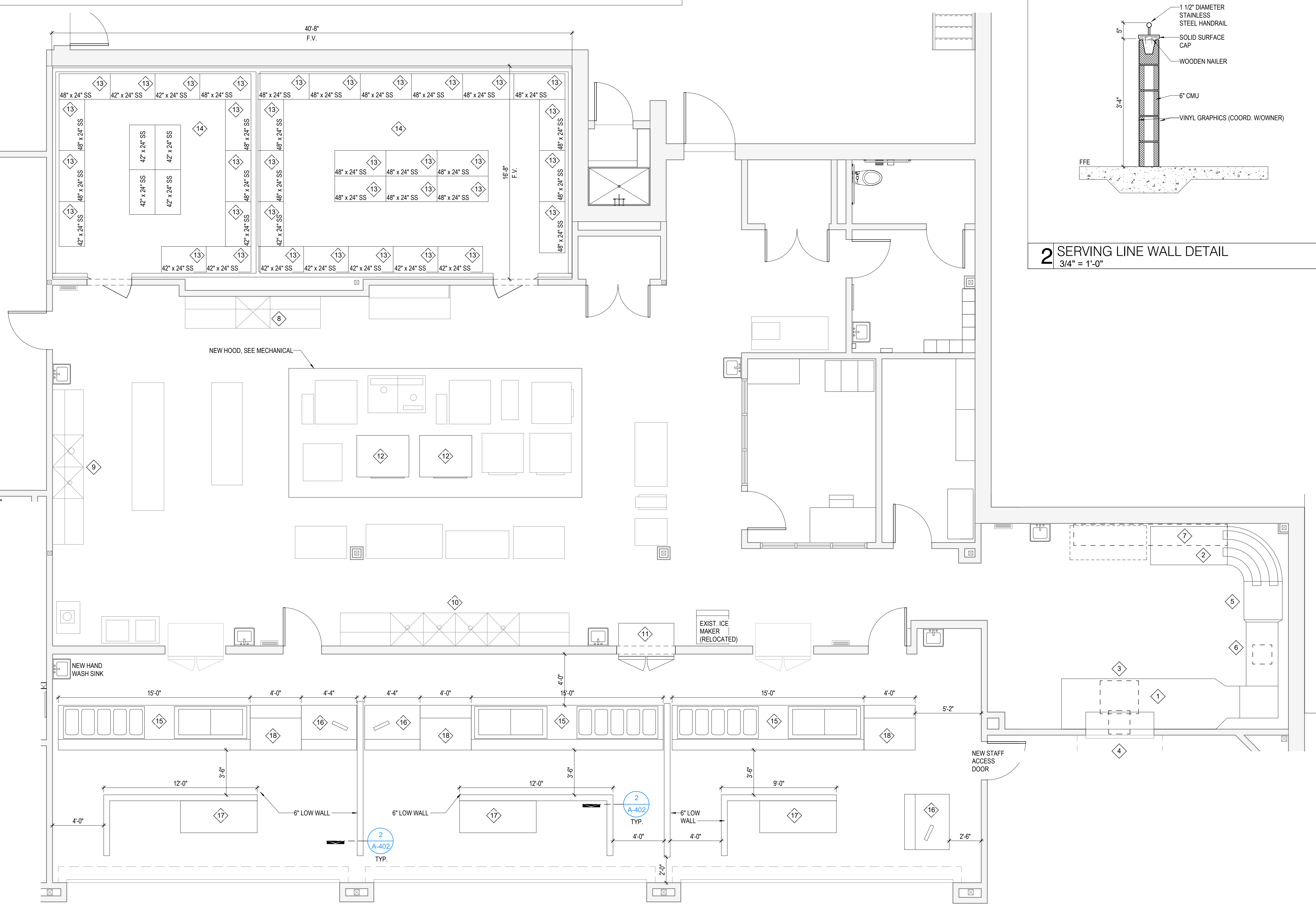
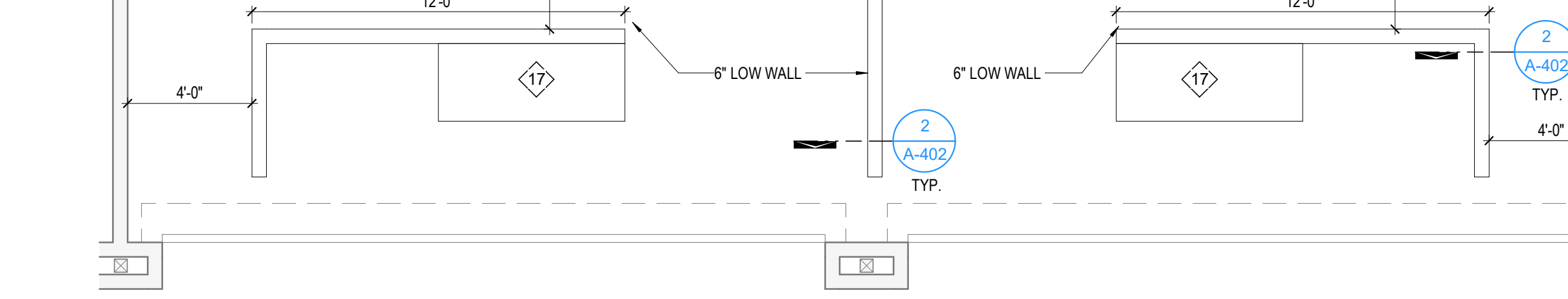
point) in the main loop piping. This sensor shall provide an input control signal to control the boiler(s) leaving temperature setpoint. Boilers shall be modulated to maintain approximately 70° water at the boiler manufacturer provided sensor. (70° water is temperature after mixing boiler supply water with large amount of loop return water. 70° is not water temperature leaving boiler.) The factory boiler controllers will be responsible for controlling most aspects of the hot water control for the WSHP central plant. The DDC system shall only enable/disable boiler and monitor safeties and parameters. Owner shall have the abilities to remotely change set point parameters through the factory BMC interface card provided with the unit. Control contractor shall be responsible for connecting boilers to the BMS through boiler interface (verify communication protocol with control company). Pull all data points available from the boiler's controller into the BMS. These data points shall be viewable and capable of being adjusted (unless boiler manufacturer prohibits adjustment of data point) from the BMS.

- b. Boiler(s) and Hot Water Pump(s) Control: Boiler shall be enabled by the DDC system based on time clock program. Upon a call for heat as sensed by the loop water supply temperature sensor, provided by the boiler manufacturer and installed downstream of the decoupler, boiler(s) will be allowed to operate as follows:
- 1) Upon a call for heat, (as described above) the boiler(s) associated pump shall be energized by the factory boiler controller pending confirmation of all boiler factory safeties (as sensed by the boiler factory controller) and flow confirmation (as sensed by field installed factory provided flow switch)
 - 2) Once all factory safeties are confirmed and flow is confirmed, the boiler(s) factory controller shall be enabled and modulate the burner(s) firing rate in order to maintain the desired loop temperature setpoint (70°F adjustable)
 - 3) Once the loop temperature setpoint is satisfied(determined by factory controller), the gas valve(s) shall be closed and any hot water pumps (associated with boiler(s)) running will continue to run based on the boiler(s) controller pump delay cycle to purge heat from the heat exchanger(s) after shutdown. Once the controller purge cycle is complete the associated pump(s) shall be turned off.
 - 4) Standby boiler shall not be energized (based on factory boiler controller) until lead boiler cannot meet the demand (based on the factory boiler controller). To equalize run time on boilers the boiler lead /standby configuration shall be rotated once every 24 hours or as required by the factory boiler controller.
 - 5) In addition to the above the following factory boiler functions shall be enabled and programmed:
 - (a) Night setback or other unoccupied setpoint adjustment function
 - (b) Freeze protection- Factory settings.
 - 6) Boiler safety shutdown control: The boiler shall be subject to shut down by the following:
 - (a) Internal factory boiler safeties, including low water cut off and high temperature limit cut off.
 - (b) Boiler emergency shut down switch(es) as shown on drawings.
 - (c) Flow switch as required by manufacturer.
 - (d) Shutdown signal from carbon monoxide (CO) monitor.
 - 7) Controls contractor and boiler factory startup personnel shall be present at the same time to assist each other in proper startup and termination of controls for boilers.

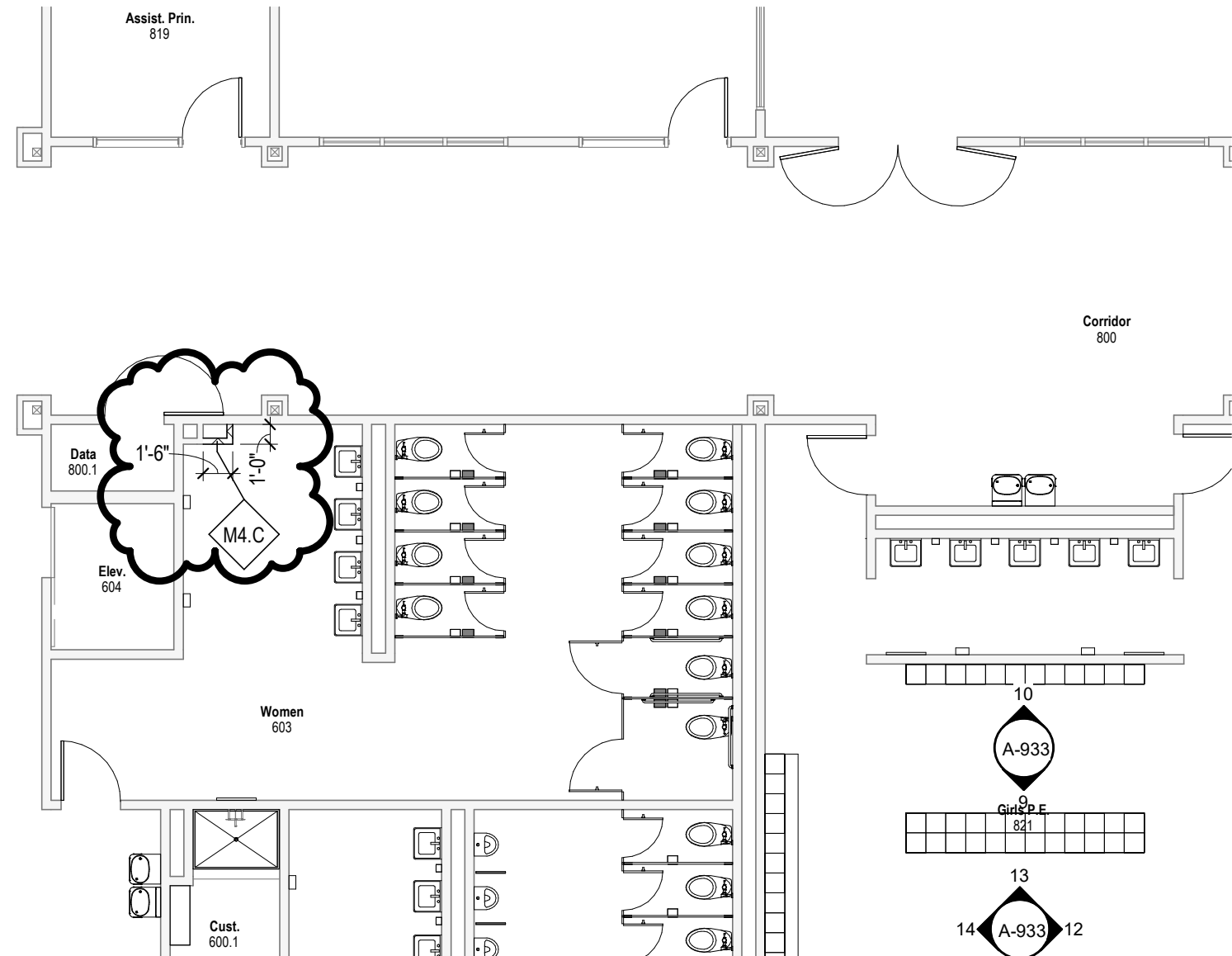
7. Loop System Control Sequence: All loop system temperature setpoints shall be adjustable. The following control action is required on the rise and/or drop in loop supply temperature:
 - a. Loop Supply Temperature of 95°
 - 1) Control Action On Temperature Rise: Instantaneous Emergency Shutdown of WSHP's via DDC communication wiring
 - b. Loop Supply Temperature of 90°
 - 1) Control Action On Temperature Rise: High Temp. Alarm On
 - 2) Control Action On Temperature Drop: End Shutdown
 - c. Loop Supply Temperature of 87°
 - 1) Control Action On Temperature Drop: High Temp. Alarm Off
 - d. Loop Supply Temperatures of 85°:
 - 1) Control Action on Temperature Rise: Tower Fan #1 shall be modulated to minimum speed; Tower fan #2 off. Tower fan #1 shall be modulated from minimum speed to full speed while tower fan #2 is off to maintain 85° loop temperature. Tower fan #2 shall be modulated to minimum speed while tower fan #1 is at full speed as required to maintain 85° loop temperature. Tower fan #2 shall be modulated from minimum speed to full speed while tower fan #1 is at full speed as required to maintain 85° loop temperature. Tower fan #2 shall modulate from full speed to minimum speed, and reverse of sequence shall occur as loop temperature drops to maintain 85° loop temperature. Alternative control schemes (e.g. ramping both fan motors from minimum to maximum simultaneously) shall be incorporated if required by cooling tower manufacturer for proper tower operation.
 - e. Loop Supply Temperature of 76°
 - 1) Control Action On Temperature Rise: Cooling Water Pump On P-3 (or P-4) and Tower Fans Off
 - f. Loop Supply Temperature of 74°
 - 1) Control Action On Temperature Drop: Cooling Water Pump Off P-3 (or P-4)
 - g. Loop Supply Temperature Between 74° and 71°
 - 1) No cooling water pumps or towers On
 - h. Loop Supply Temperature Between 70° and 55°
 - 1) Boiler B-1 and P-5 and Boiler B-2 and P-6 shall be energized to maintain 70° loop supply
 - i. Loop Supply Temperature of 65°
 - 1) Control Action On Temperature Rise: Low temperature alarm off
 - j. Loop Supply Temperature of 63°
 - 1) Control Action On Temperature Drop: Low temperature alarm on
 - k. Loop Supply Temperature of 58°
 - 1) Control Action On Temperature Rise: End Emergency Shutdown
 - l. Loop Supply Temperature of 55°
 - 1) Control Action on Temperature Drop: Instantaneous Emergency Shutdown of WSHP's via DDC communication wiring.
- V. Additional System Monitoring and Control Functions:
 1. General: In addition to the equipment previously specified to be controlled by the control system, the following additional items shall be monitored and/or controlled by the control system. All points shall be available for display from the operator interface. All alarms shall be sent to the Owner's on site (if specified herein) and remote off site central computer.
 2. Freezer and Cooler Temperature: Provide space temperature sensor in kitchen's walk-in cooler and freezer. Provide alarm if space temperature rises above setpoint for more than five (5) minutes.

3. Supply Air Temperature Monitoring: On certain pieces of HVAC equipment as specified herein, provide a supply duct mounted temperature sensor to allow for diagnostics and troubleshooting. The following equipment shall be provided with supply duct mounted temperature sensors:
 - a. Energy Recovery Units
 - b. RTAC Units
 - c. WSHP's
4. Emergency Generator Monitoring: DDC system shall monitor seven binary outputs at the emergency generator, and shall send an alarm if the generator fails to crank in the test mode.
 - a. Generator Run Status
 - b. Low Oil Pressure
 - c. High Coolant Temperature
 - d. Low Coolant Temperature
 - e. Over crank
 - f. Low Battery Voltage
 - g. Crank Test Contacts
5. Electrical Lighting Control Functions: The DDC system shall be provided with necessary input and output points in order to control lighting panels for shutdown of lighting fixtures to comply with the Georgia State Energy Code and ASHRAE 90.1 and for Owner's schedule. The lighting control panels shall be provided by Division 26. See electrical drawings for location of lighting control panel and/or devices and for quantities of input and output points. Conduit and wiring for these lighting control panels to the DDC panel shall be provided by Division 26. The connection of wiring to the DDC panel and programming shall be provided by Division 23. Contractor shall obtain lighting "on/off" schedules from the Owner for use in programming.
6. Domestic Hot Water Temperature Monitoring: Provide temperature sensor in each domestic hot water supply system in the main supply pipe to allow for diagnostic and troubleshooting. Tankless type water heaters with no storage tank do not require monitoring.
7. Hot Water Heater Start/Stop: Provide control output for remote start/stop of each gas fired hot water heater.
8. Phase Monitoring: DDC system shall monitor a binary phase loss input signal from the switchgear. Phase monitoring equipment shall be provided by Division 26, Electrical. Phase monitoring control sequence shall be used by controls contractor to shut down all three phase HVAC equipment as specified herein. DDC system shall maintain a log of each occurrence including date, time and duration of occurrence.
9. MDF and IDF Space Temperature Monitoring: DDC system shall monitor space temperature in data rooms as noted on drawings. DDC system shall send alarm signal to Owner if space temperature rises above Owner's setpoint.
10. Electronic Trap Primer Control: DDC system shall enable/disable electronic trap primers at all floor drains in mechanical corridors and elsewhere as shown. See plumbing drawings for locations and quantities of drains.
11. Carbon monoxide (CO) Detector Monitoring and Control: DDC system shall monitor two binary inputs from each CO detector. The first input is an alarm when CO level rises above concentration level set by Owner. The second input is a trouble alert when CO detector's internal controls sense a malfunction, or that CO detector is at the end of its life, or if power is lost. DDC system shall send alarm to Owner if either input occurs. CO detector shall also shut off boiler(s) when alarm level of 200 ppm has been sensed. CO detector shall activate visual (amber color) and audible alert when concentration level rises above 50 ppm. CO detector shall activate visual (red color) and audible alert when concentration level rises above 200 ppm.

END OF SECTION 230900



ENLARGED KITCHEN PLAN
1/4" = 1'-0"



1 LEVEL 1 - AREA K FLOOR PLAN 1/8" = 1'-0"



GRIFFIN
525 East Taylor Street
Griffin, GA, 30223
770-227-5473 P
SUGAR HILL
E Center at Sugar Hill
5019 West Broad St, Suite M207
Sugar Hill, GA 30518
770-227-5473 P

PROJECT:
Whitewater High School Renovations

SCALE:
1/8" = 1'-0"

PROJECT No: 240477

Addendum No. 1 -
10/07/2026

SKETCH NUMBER:

SDA-101K



MECHANICAL GENERAL NOTES

- A. AFTER REMOVAL OF MECHANICAL SYSTEMS, PATCH AND PAINT ADJACENT WALL, CEILING, FLOORS AND OTHER SURFACES TO MATCH EXISTING, UNLESS THESE SURFACES ARE SHOWN TO BE REMOVED ON THE ARCHITECTURAL DRAWINGS. SEE ARCHITECTURAL DRAWINGS FOR AREAS THAT ARE TO BE REPAINTED BY ARCHITECTURAL.

B. EXISTING STARTERS, DISCONNECTS, CONDUIT, J-BOXES, SWITCHES, ETC., SERVING REMOVED HVAC EQUIPMENT TO BE REMOVED BY ELECTRICAL. ALL ELECTRICAL POWER WORK, INCLUDING DISCONNECTING EXISTING UNITS AND REMOVAL OF ELECTRICAL DEVICES AND WIRING SHALL BE DONE BY ELECTRICAL CONTRACTOR.

C. FOR REMOVED THERMOSTATS AND TEMPERATURE SENSORS, CONTRACTOR SHALL BE ALLOWED TO RE-USE WALL J-BOXES AND CONDUITS IF NEW SENSORS OR THERMOSTATS ARE SHOWN INSTALLED IN EXACT SAME LOCATION AS REMOVED THERMOSTAT. SEE NEW WORK FLOOR PLANS FOR LOCATION OF NEW SENSORS.

D. CONTRACTOR SHALL REMOVE ALL SUPPORTS (BEAM CLAMPS, JOIST HANGERS, ANGLE IRON, UNISTRUT, DROP RODS, WALL BRACKETS, ETC.) FOR ALL REMOVED DUCTWORK, PIPING, AND EQUIPMENT, UNLESS SPECIFICALLY SHOWN OR ALLOWED TO REMAIN FOR REUSE.

E. DUCT SIZES (IF SHOWN) ARE BASED ON ORIGINAL CONTRACT DOCUMENTS, AND HAVE NOT BEEN VERIFIED. DUCT LOCATIONS SHOWN ARE BASED ON ORIGINAL CONTRACT DOCUMENTS, AND HAVE BEEN MODIFIED, WHERE OBSERVED BY THE ENGINEER, TO SHOW THE ACTUAL INSTALLED LOCATION RATHER THAN THE DESIGN LOCATION. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DUCT SIZES AND LOCATIONS. WHERE BRANCH DUCTS ARE REMOVED AND WHERE TRUNK DUCTS ARE BEING PATCHED OR CAPPED, FIELD VERIFY EXACT PATCH OR CAP SIZE.
- F. THE SCOPE OF WORK FOR THE AIR DISTRIBUTION FOR EACH ZONE SERVED BY A WATER SOURCE HEAT PUMP GENERALLY CONSISTS OF REMOVING THE ZONE'S WATER SOURCE HEAT PUMP (WSHP), AS INDICATED, BUT RE-USING THE SHEET METAL SUPPLY AND RETURN DUCTWORK. NEW SUPPLY AND RETURN DUCT (SERVING WSHP'S) SHALL BE INSTALLED AS REQUIRED TO ALLOW CONNECTION TO EXISTING DUCT. SEE NEW WORK PLANS FOR NEW SUPPLY AND RETURN GRILLES AND ASSOCIATED FLEX DUCT. SEE "TYPICAL VERTICAL WSHP DETAIL."

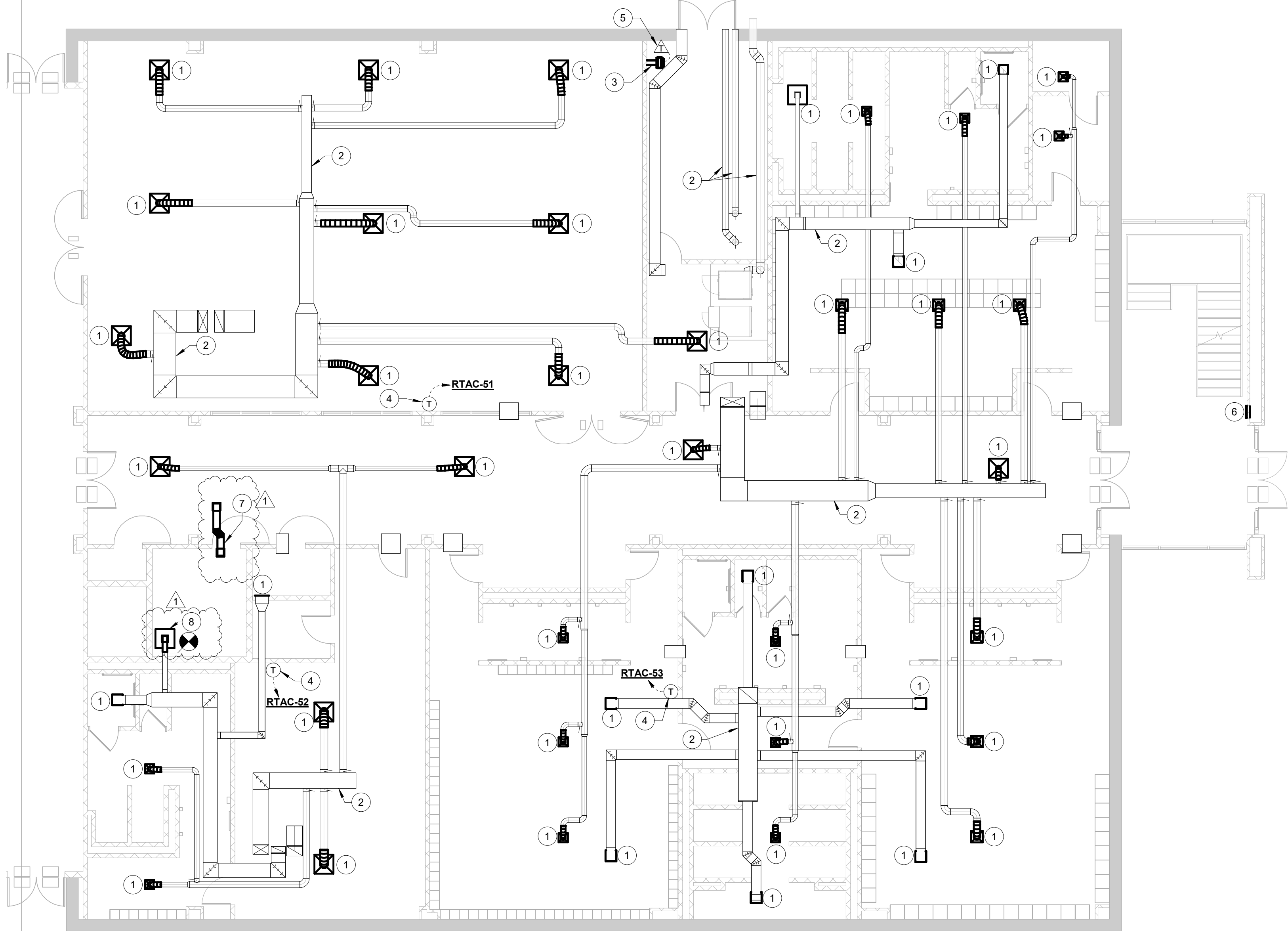
G. THIS DEMOLITION PLAN SHOWS MANY EXISTING TO REMAIN ITEMS. UNLESS SPECIFICALLY SHOWN AS REMOVED, ALL ITEMS ARE EXISTING TO REMAIN.

H. TO ACCOMPLISH THE WSHP DEMOLITION WORK, CONTRACTOR MUST DRAIN PORTIONS OF THE EXISTING LOOP WATER SUPPLY AND RETURN PIPING SYSTEM. CONTRACTOR SHALL NOT CAUSE ANY WATER DAMAGE.

I. REMOVE ALL EXISTING DUCT MOUNTED SMOKE DETECTORS FROM ALL HVAC EQUIPMENT, AND INSTALL NEW DUCT MOUNTED SMOKE DETECTORS IN SAME LOCATION. NEW DUCT MOUNTED SMOKE DETECTORS ARE PROVIDED AND WIRED BY ELECTRICAL, BUT INSTALLED BY MECHANICAL. SOME NOTED DUCT MOUNTED SMOKE DETECTORS ARE SHOWN, BUT CONTRACTOR SHALL CONFIRM EXACT QUANTITY AND EXACT LOCATIONS.

J. CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXISTING TO REMAIN DUCTWORK. SEE DUCT CLEANING SPECIFICATION FOR ADDITIONAL INFORMATION. CONTRACTOR SHALL DOCUMENT BEFORE/AFTER PICTURES OF DUCT SYSTEMS CLEANED, AND PRESENT THEM TO THE OWNER ONCE CLEANING IS COMPLETE.

K. REMOVE ALL EXISTING THERMOSTATS, OVERRIDE TIMERS, CONTACTORS, ETC. AND INSTALL NEW THERMOSTATS, OVERRIDE TIMERS, CONTACTORS, ETC. SOME NOTED DEVICES ARE SHOWN, BUT CONTRACTOR SHALL CONFIRM EXACT QUANTITY AND EXACT LOCATIONS.



MECHANICAL DEMOLITION FLOOR PLAN - AREA K LOWER LEVEL

1/8" = 1'-0"

MECHANICAL NOTES: (THIS SHEET ONLY)

1. REMOVE EXISTING CEILING GRILLE, KEEPING FLEX DUCT INTACT WHERE FLEX DUCT IS INSTALLED. SEE NEW WORK PLAN FOR CONNECTION OF NEW GRILLE.

2. EXISTING DUCTWORK TO REMAIN. (TYPICAL)

3. REMOVE EXISTING ELECTRIC UNIT HEAT AT THIS APPROXIMATE LOCATION. SEE NEW WORK PLAN FOR INSTALLATION OF NEW ELECTRIC UNIT HEATER.

4. CAREFULLY REMOVE EXISTING THERMOSTAT OR DDC SPACE TEMPERATURE SENSOR. SEE NEW WORK PLAN FOR INSTALLATION OF NEW DDC TEMPERATURE SENSOR.

5. REMOVE EXISTING LINE VOLTAGE THERMOSTAT. SEE NEW WORK PLAN FOR INSTALLATION OF NEW THERMOSTAT.

6. REMOVE EXISTING WALL HEATER. SEE NEW WORK PLAN FOR INSTALLATION OF NEW WALL HEATER.

7. COMPLETELY REMOVE EXISTING DUCT, ASSOCIATED GRILLES, AND FIRE/SMOKE DAMPER. PATCH WALL OPENING IN ACCORDANCE WITH ARCHITECTURAL REQUIREMENTS.

8. COMPLETELY REMOVE EXISTING GRILLE AND DUCTWORK UP TO SCOPE OF WORK SYMBOL. CAP AND SEAL DUCT AIR TIGHT.

Whitewater High School
Renovations

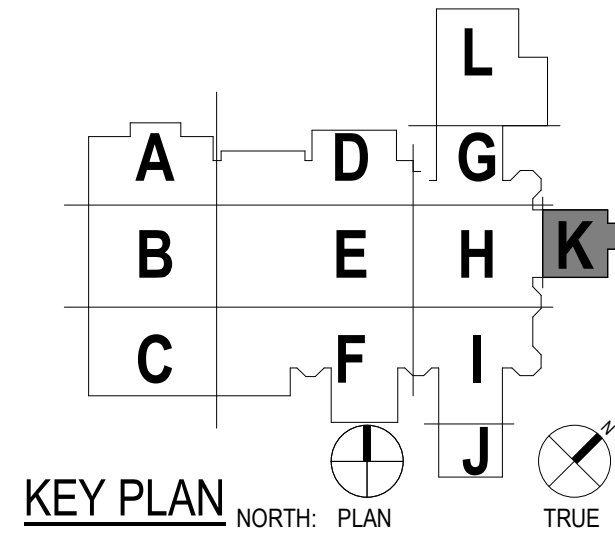
100 Willicat Way
Fayetteville, GA 30215

CLIENT PROJECT NUMBER: 240477

Bid Set



When Excellence and Creativity Merge

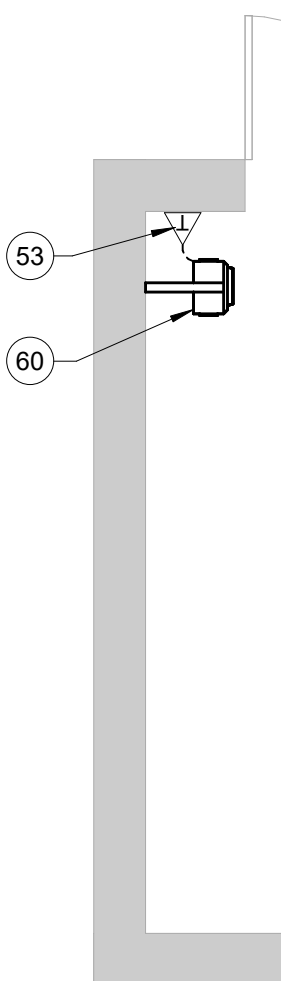


KEY PLAN NORTH PLAN TRUE



CLIENT Fayette County Schools		
DATE 09/11/2026		PROJECT NUMBER 240477
DRAWING HISTORY		
No.	Description	Date
1	ADDENDUM #3	10/07/2026
CHECKED BY: WBF		
DRAWN BY: WBF		

MECHANICAL DEMOLITION
LOWER LEVEL - AREA K
FLOOR PLAN


$$1/4'' = 1'-0''$$

GENERAL NOTE: CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION FROM OWNER PRIOR TO DEMOLITION OF ANY MECHANICAL ROOM EQUIPMENT, HEAT EXCHANGER, PUMPS, BOILER, AND COOLING TOWER. THE CONTRACTOR SHALL NOT PERFORM DEMOLITION OF EXISTING SYSTEMS UNTIL NEW COOLING TOWER, BOILERS, HEAT EXCHANGER, PUMPS, AND PIPING ARE AT THE JOB SITE AND READY TO BE INSTALLED. CONTRACTOR SHALL VERIFY ALLOWABLE DOWN TIME OF CENTRAL PLANT WITH OWNER'S PHASING SCHEDULE.



1 GENERAL: AFTER REMOVAL OF MECHANICAL SYSTEMS, PATCH AND PAINT ADJACENT
2 WALL, FLOOR AND OTHER SURFACES TO MATCH.

3 GENERAL: EXISTING STARTERS, DISCONNECT, CONDUT, J-BOXES, SWITCHES, ETC.
4 SHALL BE REMOVED HVAC EQUIPMENT TO BE REMOVED BY ELECTRICAL.

5 GENERAL: CONTRACTOR SHALL PROVIDE WEATHER PROTECTION FOR ALL BUILDING
6 OPENINGS RESULTING FROM MECHANICAL EQUIPMENT REMOVAL.

7 GENERAL: ALL CONTROL WORK IS BEING PERFORMED BY THE CONTROL COMPANY.
8 GENERAL: ALL CONTROL WIRING SHALL BE REMOVED PRIOR TO TEMPERATURE
9 SENSORS, ETC. SHALL BE PERFORMED BY CONTROLS CONTRACTOR.

10 THIS DEMOLITION PLAN SHOWS MANY EXISTING TO REMAIN ITEMS. UNLESS
11 SPECIFICALLY SHOWN AS EXISTING TO REMAIN, ITEMS ARE TO REMAIN.

12 GENERAL: SEE "GENERAL DEMOLITION" PARAGRAPH IN SPECIFICATION SECTION 230513
13 CONCERNING GENERAL DEMOLITION AND SPECIFIC ITEMS TO BE TURNED OVER TO THE
14 OWNER.

15 GENERAL: TO ACCOMPLISH THE DEMOLITION WORK TO THE EXISTING LOOP AND COOLING
16 WATER SUPPLY AND RETURN PIPING SYSTEMS, THE CONTRACTOR MUST DRAIN PORTIONS
17 OF THE SYSTEM. CONTRACTOR SHALL NOT CAUSE ANY WATER DAMAGE.

18 GENERAL: CONTRACTOR SHALL REMOVE ALL PIPES PRIOR TO FABRICATING PIPE
19 CAPS, OR CONNECTING TO EXISTING PIPING. PIPE SIZES SHOWN ARE BASED ON ORIGINAL
20 DRAWINGS.

21 COMPLETELY REMOVE EXISTING HOT WATER PIPING, SUPPORTS, VALVES, STRAINERS,
22 INSULATION, ETC. AS SHOWN. SEE SHEET M-301 FOR NEW PIPING, PUMPS, VALVES, ETC.
23 REMOVE EXISTING COOLING WATER PUMPS, VALVES, PIPING, ETC. FROM PUMP
24 DISCHARGE TO SCOPE OF WORK SYMBOL. SEE SHEET M-301 FOR CONNECTION OF NEW
25 PIPING TO EXISTING SCOPE OF WORK.

26 REMOVE EXISTING LOOP WATER PUMPS, VALVES, PIPING, ETC. FROM PUMP DISCHARGE TO
27 SCOPE OF WORK SYMBOL. SEE SHEET M-301 FOR CONNECTION OF NEW PIPING TO
28 EXISTING SCOPE OF WORK.

29 EXISTING CONCRETE PAD TO REMAIN AT THIS APPROXIMATE LOCATION.

30 REMOVE EXISTING IN-LINE HOT WATER PUMP.

31 LOOP WATER RETURN PIPING TO REMAIN AT THIS APPROXIMATE LOCATION.

32 LOOP WATER SUPPLY PIPING TO REMAIN AT THIS APPROXIMATE LOCATION.

33 REMOVE EXISTING LOOP SUPPLY PIPING, SUPPORTS, ETC.

34 REMOVE EXISTING FLUE FROM BOILER CONNECTION UP THRU ROOF. REMOVE FLUE CAP.
35 EXISTING ROOF CURB TO REMAIN FOR REUSE.

36 REMOVE EXISTING OUTDOOR AIR THERMOSTATS SERVING BOILERS B-1 AND B-2. FIELD
37 VERIFY EXISTING LOCATION.

38 COMPLETELY REMOVE EXISTING CLOSED LOOP CHEMICAL FEED TANK, ANGLE IRON TANK
39 SUPPORTS, PIPING AND BALL VALVES FROM THIS APPROXIMATE LOCATION. SEE NEW
40 WORK PLAN FOR INSTALLATION OF REMAINING EQUIPMENT.

41 REMOVE EXISTING MAKE-UP WATER PIPING AND ASSOCIATED BACK FLOW PREVENTER,
42 DRAIN PIPING AND PRESSURE REDUCING VALVE TO SCOPE OF WORK SYMBOL. SEE SHEET
43 M-301 FOR CONNECTION OF NEW PIPING TO EXISTING SCOPE OF WORK.

44 REMOVE EXISTING EXPANSION TANK AND ASSOCIATED EXPANSION PIPING AND SUPPORTS
45 FROM THIS APPROXIMATE LOCATION. SEE SHEET M-301 FOR NEW EXPANSION TANK AND
46 PIPING.

47 REMOVE EXISTING VERTICAL WATER SOURCE HEAT PUMP. SEE VERTICAL WSPH
48 DEMOLITION DETAIL FOR OTHER WSPH COMPONENTS TO BE REMOVED.

49 REMOVE EXISTING GAS FIRED BOILER AND ASSOCIATED HOT WATER, DRAIN, AND
50 EXHAUST RELIEF PIPING TO LOW WATER LEVEL CONTROLLER. SEE SHEET M-301 FOR
51 SHEET M-301 FOR INSTALLATION OF NEW BOILERS IN THIS LOCATION.

52 REMOVE EXISTING COOLING TOWER WATER LEVEL CONTROLLER. FIELD VERIFY EXACT
53 LOCATION.

54 REMOVE EXISTING LOOP WATER RETURN TEMPERATURE SENSOR. SEE NEW WORK PLAN
55 FOR NEW TEMPERATURE SENSOR AT THIS LOCATION.

56 EXISTING CALIBRATED VENTURI TO REMAIN. FIELD VERIFY EXISTING LOCATION.

57 REMOVE EXISTING LOOP WATER SUPPLY TEMPERATURE SENSOR. SEE NEW WORK PLAN
58 FOR NEW TEMPERATURE SENSOR AT THIS LOCATION.

59 REMOVE EXISTING TANGENTIAL AIR SEPARATOR. SEE NEW WORK PLAN FOR NEW
60 AIR SEPARATOR.

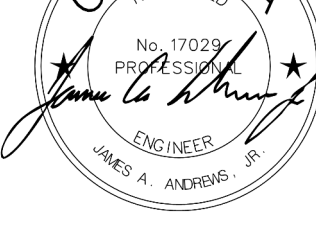
61 REMOVE EXISTING COOLING WATER SUPPLY AND RETURN PIPING FROM CONNECTION TO
62 COOLING TOWER UP TO CONNECTION TO HEAT EXCHANGER AS SHOWN. REMOVE ALL
63 INSULATING INSULATION, ALUMINUM JACKETING, AND HEAT TAPE CIRCUITS FROM EXISTING
64 TOWER. SEE NEW WORK PLAN FOR DETAIL OF NEW PIPING TO EXISTING AND
65 TO NEW COOLING TOWER. REMOVE EXISTING PIPE STANDS.

66 EXISTING CDC PANEL TO BE REMOVED BY CONTROL COMPANY.

67 REMOVE EXISTING HOT WATER SUPPLY TEMPERATURE SENSOR. SEE NEW WORK PLAN
68 FOR NEW TEMPERATURE SENSOR AT THIS LOCATION.

69 EXISTING CENTRAL PLANT CONTROL PANEL TO BE REMOVED BY CONTROL COMPANY.

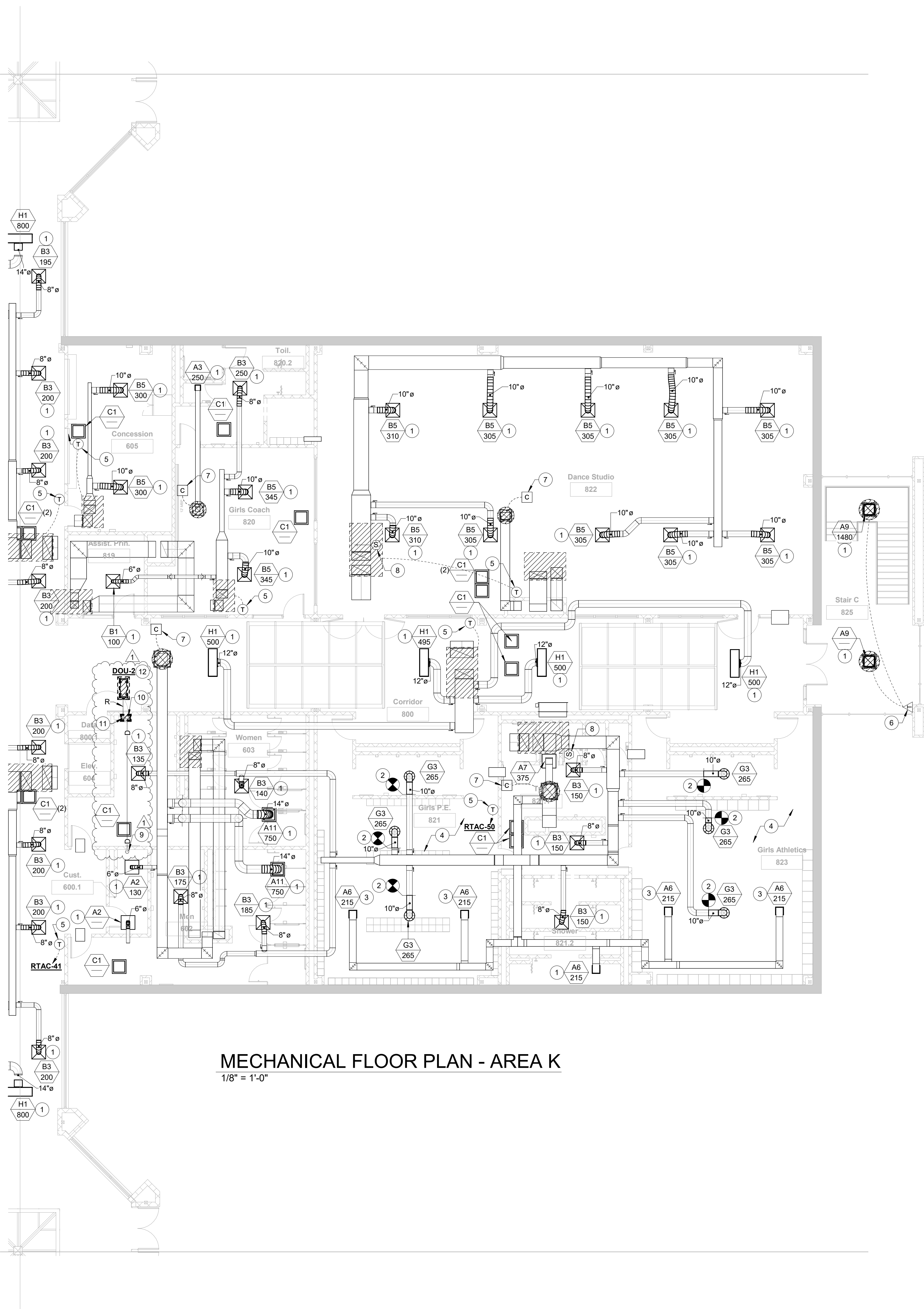
- 33 REMOVE EXISTING GAS FIRED UNIT HEATER. EXISTING FLUE TO REMAIN. SEE NEW WORK
34 PLAN FOR NEW GAS FIRED UNIT HEATER
- 35 EXISTING FLUE FROM UNIT HEATER THRU ROOF TO REMAIN.
- 36 REMOVE EXISTING VENT PIPING FROM BOILER FLUE. TRAIL THRU ROOF. PATCH AND SEAL
OPENING.
- 37 REMOVE EXISTING COOLING WATER CHEMICAL FEED TREATMENT CONTROLLER(S),
38 REMOVE EXISTING TANKS AND PIPING, ETC. AS SHOWN. SEE NEW WORK PLAN FOR
NEW CHEMICAL TREATMENT SYSTEM.
- 39 REMOVE EXISTING COOLING WATER RETURN TEMPERATURE SENSOR. SEE NEW WORK
40 PLAN FOR NEW SENSOR.
- 41 REMOVE EXISTING COOLING WATER SUPPLY TEMPERATURE SENSOR. SEE NEW WORK
42 PLAN FOR NEW SENSOR.
- 43 REMOVE EXISTING COOLING TOWER MOTORS, AND ALL APPURTENANCES.
- 44 REMOVE EXISTING CONCRETE BEAMS AND STEEL BEAMS TO REMAIN.
- 45 REMOVE EXISTING COOLING WATER RETURN DISCHARGE PIPING, TRIPLE VALVE,
46 SUPPORTS, ETC. AS SHOWN. SEE SHEET M-301 FOR NEW PIPING.
- 47 EXISTING LOUVERED DOOR AND TRANSOM LOUVER TO REMAIN FOR COMBUSTION AIR
48 FLOW FOR BOILER AND WATER TOWER. SEE SHEET M-301 FOR MAKE-UP AIR.
- 49 REMOVE EXISTING TOWER PAN HEATER CONTROL PANEL.
- 50 REMOVE EXISTING COOLING TOWER DRAIN AND OVERFLOW PVC PIPING DOWN TO
51 EXISTING 24" ABOVE GRADE. SEE SHEET M-301 FOR NEW PVC STAND PIPE. ALLOW
FOR RECONNECTION OF NEW PIPING AS INDICATED ON NEW WORK PLAN. PIPING BELOW
GRADE SHALL REMAIN FOR REUSE. FIELD VERIFY EXACT PIPE DROP TO BELOW GRADE AS
REQUIRED.
- 52 REMOVE EXISTING PLATE AND FRAME HEAT EXCHANGER. SEE SHEET M-301 FOR
53 INSTALLATION OF NEW HEAT EXCHANGER AT THIS LOCATION.
- 54 REMOVE EXISTING LOOP SUPPLY AND RETURN PIPING FROM HEAT EXCHANGER
55 CONNECTION TO LOCATIONS SHOWN. REMOVE DISCHARGE THERMISTERS, PRESSURE
GAUGES, VALVES, ETC.
- 56 REMOVE EXISTING COOLING WATER SUPPLY DISCHARGE PIPING, TRIPLE VALVE,
57 SUPPORTS, ETC. AS SHOWN. SEE SHEET M-301 FOR NEW PIPING.
- 58 GENERAL: SEE PIPE HANGER DETAILS FOR PIPE SUPPORT. PROVIDE VIBRATION
ISOLATORS AS SPECIFIED IN MECHANICAL. ROOM FOR FIRST TWO HANGERS ADJACENT TO
PIPE.
- 59 REMOVE EXISTING MAKE-UP WATER PIPING, EXTERIOR INSULATION, JACKETING, AND HEAT
60 TAPE UP TO SCOPE OF WORK SYMBOL. AS SHOWN. SEE NEW WORK PLAN FOR
61 RECONNECTION OF NEW MAKE-UP WATER PIPING.
- 62 REMOVE EXISTING COOLING TOWER DRAIN AND OVERFLOW PIPING FROM TOWER TO 24"
63 ABOVE EXISTING CIVIL DRAIN CONNECTION. CIVIL DRAIN CONNECTION TO BE REUSED.
- 64 REMOVE EXISTING AUTOMATIC PARTICLE SEPARATOR AND CONTROL PANEL.
- 65 REMOVE EXISTING AUTOMATIC VENT AND DRAIN TUBING. SEE NEW WORK PLAN FOR
66 NEW AUTOMATIC AIR VENT.
- 67 REMOVE EXISTING UNIT HEATER THERMOSTAT. SEE NEW WORK PLAN FOR NEW
68 THERMOSTAT.
- 69 REMOVE EXISTING FAN THERMOSTAT. SEE NEW WORK PLAN FOR NEW THERMOSTAT.
- 70 EXISTING GAS PIPING TO BE MODIFIED BY PLUMBING. SEE PLUMBING DRAWINGS.
- 71 EXISTING WATER HEATER AND TANKS REMOVED/MODIFIED BY PLUMBING. SEE PLUMBING
72 DRAWINGS.
- 73 REMOVE EXISTING WALL MOUNTED SUPPLY FAN. SEE SHEET M-301 FOR INSTALLATION OF
74 NEW FAN.
- 75 REMOVE EXISTING OUTDOOR AIR DDC TEMPERATURE SENSOR. FIELD VERIFY EXISTING
76 LOCATION. SEE NEW WORK PLAN FOR NEW OUTDOOR AIR SENSOR.
- 77 REMOVE EXISTING BOILER EMERGENCY SHUTDOWN SWITCH. SEE NEW WORK PLAN FOR
78 INSTALLATION OF NEW SWITCH.
- 79 REMOVE EXISTING ELECTRIC UNIT HEATER. SEE NEW WORK PLAN FOR INSTALLATION OF
80 NEW UNIT HEATER.



CLIENT Fayette County Schools			
DATE 09/11/2020		PROJECT NUMBER 240477	
DRAWING HISTORY			
No.	Description	Date	
1	ADDENDUM #2	10/01/2020	
CHECKED BY: WBF			
DRAWN BY: WBF			

MD-301

- A. INSTALL NEW VERTICAL WSP'S ACCORDING TO "VERTICAL WSPH INSTALLATION DETAIL." CONTRACTOR SHALL FIELD VERIFY THE CONTRACTOR CONDITIONS FOR WSPH. CONTRACTOR SHALL NOT ORDER EQUIPMENT UNTIL FIELD VERIFYING THE RETURN/DISCHARGE ARRANGEMENT THAT IS MOST COMPATIBLE WITH EXISTING CONDITIONS. THE RETURN/DISCHARGE ARRANGEMENT IS SHOWN (FOR EXAMPLE, RIGHT RETURN/DISCHARGE OR LEFT RETURN/DISCHARGE) AND THE WSPH LOCATION AND SLOPE/ WSPH DUCT LOCATION SHALL BE VERIFIED ON EXISTING DRAWING DOCUMENTS, AND IT IS NOT NECESSARILY THE INSTALLED RETURN/DISCHARGE ARRANGEMENT OR LOCATIONS.
- B. CONTRACTOR SHALL FIELD VERIFY EXISTING DUCTS AND PIPE LOCATIONS, TRANSITION FROM WSPH SUPPLY CONNECTION TO EXISTING SUPPLY DUCT, FIELD VERIFYING EXISTING DUCT SIZE, FIELD VERIFYING EXISTING DUCT SLOPE, FIELD VERIFYING EXISTING NEW ANGLE IRON SUPPORT STANDS, DUCT SIZES, IF SHOWN, ARE BASED ON ORIGINAL CONTRACT DOCUMENTS, SLOPE WSPH TO DRAIN SIDE.
- B. FOR EACH NEW VERTICAL WSPH, PROVIDE NEW 3" LONG SUPPLY AND RETURN HOSE, SHUT OFF VALVES, STRAINER AND AUTOMATIC FLOW CONTROL VALVE AS INDICATED IN "VERTICAL WSPH CONNECTION DETAIL." CONTRACTOR SHALL FIELD VERIFY REMOVAL DURING DEMOLITION. NEW HOSE SIZE SHALL MATCH EXISTING FIELD VERIFY. SEE WSPH HOSE SCHEDULE FOR MINIMUM SIZE. CONTRACTOR SHALL WSPH GPM. CONTRACTOR SHALL FIELD VERIFY HOSE SCHEDULE SIZES IN ORIGINAL DRAWINGS.
- C. PROJECT ELECTRICAL SCOPE INCLUDES REPLACEMENT OF EXISTING RETURN AIR TYPE LIGHT FIXTURES WITH NEW STAKE TYPE, FLUORESCENT LED LIGHT FIXTURES. CONTRACTOR SHALL ALLOW GRILLE(S) IN EXISTING CEILING GRID WHERE INDICATED TO ALLOW RETURN AIR FLOW INTO PLenum ABOVE CEILING.
- D. ANY EXISTING 6"X6" 8"X8" 12"X12" ETC. SURFACE MOUNT GRILLES ARE BEING REPLACED WITH LAY-IN STYLE GRILLES. CONTRACTOR SHALL FIELD VERIFY AVAILABLE LITE SPACE AS REQUIRED TO ENSURE PROPER AIR FLOW. CONTRACTOR SHALL PROVIDE INSTALLATION OF NEW LAY-IN STYLE GRILLE IN SAME, OR ADJACENT LITE AS GRILLE REMOVED DURING DEMOLITION. CONTRACTOR SHALL AS REQUIRED REMOVE EXISTING GRILLES LAMIN IN A FULL CEILING LITE. ANY GRILLES SHOWN TO BE REPLACED WITH LAY-IN STYLE GRILLES WITH NOT ADEQUATE SPACE, CONTRACTOR SHALL BE REPLACED ONE FOR ONE WITH SURFACE MOUNTED GRILLES OF THE SAME CONNECTION SIZE.



MECHANICAL FLOOR PLAN - AREA K
1/8" = 1'-0"

1. NEW CEILING GRILLE AND FLEX DUCT CONNECTS TO EXISTING DUCT (WHERE DUCT IS CHLORING), CONTRACTOR SHALL FIELD VERIFY EXISTING DUCT SIZES PRIOR TO INSTALLATION. PROVIDE ROUND-TO-ROUND REDUCER AS REQUIRED FOR CONNECTION. PROVIDE ADDITIONAL FLEX DUCT IF REQUIRED TO COORDINATE GRILLE WITH LIGHTS, SPRINKLERS, CEILING MOUNTED SENSORS, ETC.
2. PROVIDE NEW DUCT MOUNTED ROUND DIFFUSER, AND DUCT OF SIZE SHOWN DUCT SHALL BE EXTERNALLY INSULATED TO MATCH EXISTING, FIELD VERIFY EXISTING SIZE. MOUNT NEW ROUND DIFFUSER AT SAME ELEVATION AS CEILING REMOVED DURING DEMOLITION.
3. PROVIDE NEW RETURN GRILLE MOUNTED TO BOTTOM OF DUCT. AT SAME ELEVATION AS CEILING REMOVED DURING DEMOLITION.
4. EXISTING CEILING IN THIS SPACE IS TO BE REMOVED AND NOT REPLACED. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS. EXISTING EXTERNALLY INSULATED DUCT IS TO REMAIN. NEW DUCT SHALL BE EXTERNALLY INSULATED TO MATCH EXISTING.
5. NEW DDC TEMPERATURE SENSOR INSTALLED IN SAME LOCATION AS TEMPERATURE SENSOR REMOVED DURING DEMOLITION. (WHERE INDICATED)
6. PROVIDE AND INSTALL NEW LINE VOLTAGE THERMOSTAT IN SAME LOCATION AS THERMOSTAT REMOVED DURING DEMOLITION.
7. NEW CONTROL, CONTACTOR FOR START/STOP CONTROL OF EXHAUST FAN. CONTACTOR LOCATED IN SAME LOCATION AS CONTACTOR REMOVED DURING DEMOLITION.
8. NEW DUCT MOUNTED SMOKE DETECTOR IN SAME LOCATION AS DETECTOR REMOVED DURING DEMOLITION. PROVIDED AND WIRE BY ELECTRICAL. INSTALLED BY MECHANICAL.
9. CONDENSATE PIPING ELBOWS DOWN INTO CUSTODIAL SINK AT THIS APPROXIMATE LOCATION, BRACKET PIPING TO WALL. PROVIDE ALUMINUM JACKETING FOR ALL PIPING EXPOSED BELOW CEILING.
10. CONDENSATE PIPING RISERS IN CHASE FROM FLOOR BELOW. SEE LOWER LEVEL PLAN FOR CONTINUATION BELOW.
11. REFRIGERANT PIPING RISERS IN CHASE FROM BELOW AND CONTINUES TO NEW PIPE BOX ON ROOF. SEE PIPE BOX ASSEMBLY DETAIL.
12. NEW DUCT/NEW OUTSIDE UNIT MOUNTED ABOVE EQUIPMENT SUPPORT RAIL ON ROOF. SEE NEW CURS ON EXISTING ROOF DETAIL.

AH&P
CONSULTING
ENGINEERS

ANDREWS' HAMMOCK & POWELL, INC.
2501 Center Lane
Suite 100
Macon, Georgia 31210
MACON (478) 415-8301
FAX (478) 415-8211
WWW.AHPENGINE.COM

770-227-5473

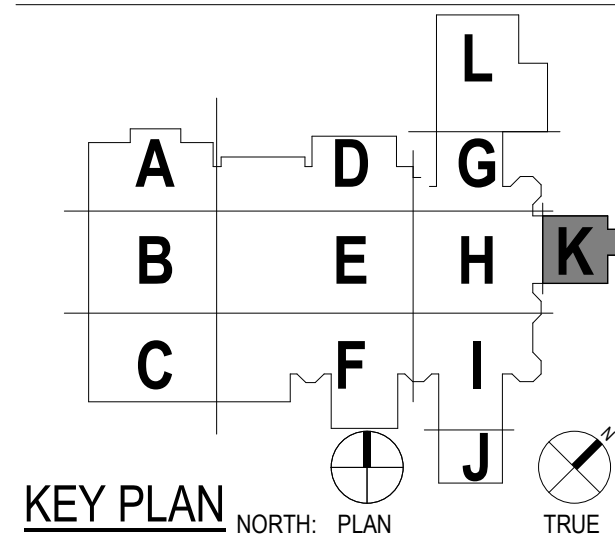
www.pda.com

Whitewater High School Renovations

100 Windward Way
Fayetteville, GA 30215

CLIENT PROJECT NUMBER: 240477

Bid Set



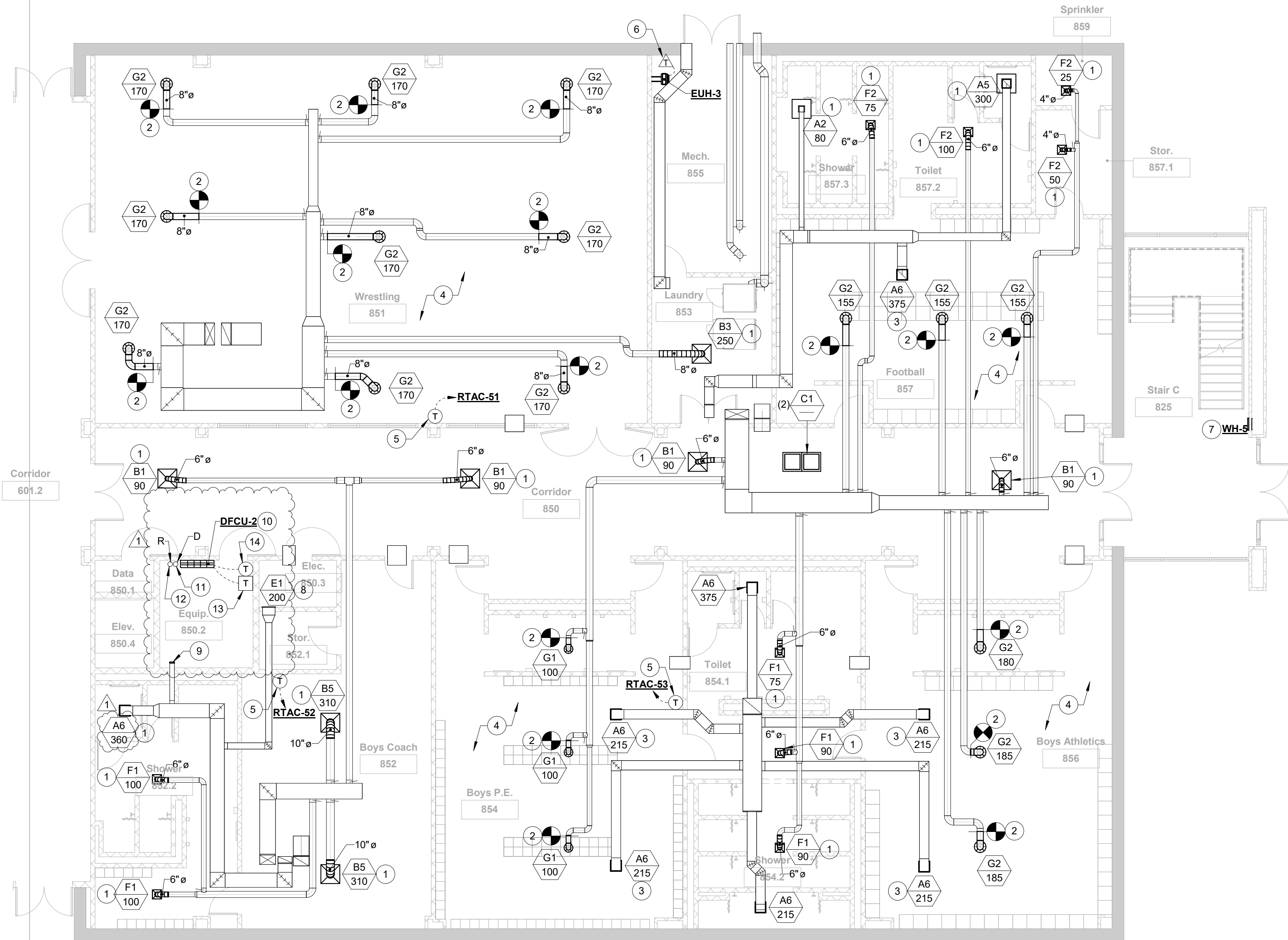
CLIENT					
Fayette County Schools					
DATE			PROJECT NUMBER		
09/11/2026			240477		
DRAWING HISTORY					
No.	Description				Date
1	ADDENDUM #3				10/07/2026
CHECKED BY: WBF					
DRAWN BY: WBF					

MECHANICAL LEVEL 1 - AREA K FLOOR PLAN

M-101K

MECHANICAL GENERAL NOTES

- A. INSTALL NEW VERTICAL WSHPS ACCORDING TO "VERTICAL WSHIP INSTALLATION DETAIL." CONTRACTOR SHALL FIELD VERIFY THE EXISTING CONDITIONS FOR EACH WSHP. AND SHALL NOT ORDER EQUIPMENT UNTIL FIELD VERIFYING THE RETURN/DISCHARGE ARRANGEMENT THAT IS MOST COMPATIBLE WITH EXISTING CONDITIONS. THE RETURN/DISCHARGE ARRANGEMENT SHOWN (FOR EXAMPLE, RIGHT RETURN/END DISCHARGE OR LEFT RETURN/END DISCHARGE) AND THE WSHP LOCATION AND SUPPLY AND RETURN DUCT LOCATION IS BASED ON ORIGINAL CONTRACT DOCUMENTS, AND IS NOT NECESSARILY THE INSTALLED RETURN/DISCHARGE ARRANGEMENT OR LOCATIONS. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DUCT AND PIPE LOCATIONS. TRANSITION FROM WSHP SUPPLY CONNECTION TO EXISTING SUPPLY DUCT, FIELD VERIFYING EXISTING DUCT SIZE. MODIFY EXISTING DUCT AS REQUIRED TO INSTALL WSHPS ATOP NEW ANGLE IRON SUPPORT STANDS. DUCT SIZES, IF SHOWN, ARE BASED ON ORIGINAL CONTRACT DOCUMENTS. SLOPE WSHP TO DRAIN SIDE.
- B. FOR EACH NEW VERTICAL WSHP, PROVIDE NEW 36" LONG SUPPLY AND RETURN HOSE, SHUT OFF VALVES, STRAINER AND AUTOMATIC FLOW CONTROL VALVE AS INDICATED IN "VERTICAL WSHP INSTALLATION DETAIL". TO REPLACE THE ITEMS REMOVED DURING DEMOLITION. NEW HOSE SIZE SHALL MATCH EXISTING FIELD VERIFY. SEE WSHP HOSE SCHEDULE FOR MINIMUM SIZE BASED ON WSHP GPM. HOSE SCHEDULE SIZES ARE BASED ON HOSE SCHEDULE SIZES IN ORIGINAL DRAWINGS.
- C. PROJECT ELECTRICAL SCOPE INCLUDES REPLACEMENT OF EXISTING RETURN AIR TYPE LIGHT FIXTURES WITH NEW STATIC NON-RETURN LED LIGHT FIXTURES. PROVIDE 2'X2' TRANSFER GRILLE(S) IN EXISTING CEILING GRID WHERE INDICATED TO ALLOW RETURN AIRFLOW INTO PLENUM ABOVE CEILING.
- D. MANY EXISTING 6"X6", 8"X8", 12"X12", ETC. SURFACE MOUNT GRILLES ARE BEING REPLACED WITH LAY-IN STYLE GRILLES. CONTRACTOR SHALL FIELD VERIFY AVAILABLE TILE SPACE AS REQUIRED TO ENSURE THAT THERE IS SUFFICIENT SPACE FOR INSTALLATION OF NEW LAY-IN STYLE GRILLE IN SAME, OR ADJACENT TILE AS GRILLE REMOVED DURING DEMOLITION. MODIFY DUCT AS REQUIRED TO ENSURE NEW LAY-IN GRILLES LAND IN A FULL CEILING TILE. ANY GRILLES SHOWN TO BE REPLACED WITH LAY-IN STYLE GRILLES WITHOUT ADEQUATE SPACE SHALL INSTEAD BE REPLACED ONE-FOR-ONE WITH SURFACE MOUNTED GRILLES OF THE SAME CONNECTION SIZE.



MECHANICAL FLOOR PLAN - AREA K LOWER LEVEL
1/8" = 1'-0"

MECHANICAL NOTES: (THIS SHEET ONLY)

- NEW CEILING GRILLE AND FLEX DUCT CONNECTS TO EXISTING DUCT (WHERE DUCT IS SHOWN). CONTRACTOR SHALL FIELD VERIFY EXISTING DUCT SIZES PRIOR TO INSTALLATION. PROVIDE ROUND-TO-ROUND REDUCER AS REQUIRED FOR CONNECTION. PROVIDE ADDITIONAL FLEX DUCT IF REQUIRED TO COORDINATE GRILLE WITH LIGHTS, SPRINKLERS, CEILING MOUNTED SENSORS, ETC.
- PROVIDE NEW DUCT MOUNTED ROUND DIFFUSER, AND DUCT OF SIZE SHOWN. DUCT SHALL BE EXTERNALLY INSULATED TO MATCH EXISTING. FIELD VERIFY EXISTING SIZE. MOUNT NEW ROUND DIFFUSER AT SAME ELEVATION AS CEILING REMOVED DURING DEMOLITION.
- PROVIDE NEW RETURN GRILLE MOUNTED TO BOTTOM OF DUCT, AT SAME ELEVATION AS CEILING REMOVED DURING DEMOLITION.
- EXISTING CEILING IN THIS SPACE IS TO BE REMOVED AND NOT REPLACED. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS. EXISTING EXTERNALLY INSULATED DUCT IS TO REMAIN. NEW DUCT SHALL BE EXTERNALLY INSULATED TO MATCH EXISTING.
- NEW DDC TEMPERATURE SENSOR INSTALLED IN SAME LOCATION AS TEMPERATURE SENSOR REMOVED DURING DEMOLITION. (WHERE INDICATED)
- PROVIDE AND INSTALL NEW LINE VOLTAGE THERMOSTAT IN SAME LOCATION AS THERMOSTAT REMOVED DURING DEMOLITION.
- NEW WALL HEATER MOUNTED IN SAME LOCATION AS HEATER REMOVED DURING DEMOLITION.
- NEW SIDEWALL GRILLE MOUNTED IN SAME LOCATIONS AS GRILLE REMOVED DURING DEMOLITION. FIELD VERIFY EXISTING SIZE PRIOR TO INSTALLATION.
- CAP AND SEAL EXISTING DUCT AIR TIGHT.
- NEW DUCTLESS FAN COIL UNIT MOUNTED AS HIGH ON WALL AS POSSIBLE. COORDINATE EXACT LOCATION WITH EXISTING EQUIPMENT, CONDUIT, PIPE, ETC.
- CONDENSATE PUMP, LITTLE GIANT MODEL VCM-20, MOUNTED BELOW DFCU. CONDENSATE PIPING RISES TO CHASE ON FLOOR ABOVE. SEE MAIN LEVEL FLOOR PLAN FOR CONTINUATION.
- REFRIGERANT RISES TO CHASE ON FLOOR ABOVE. SEE MAIN LEVEL FLOOR PLAN FOR CONTINUATION.
- WALL MOUNTED DDC TEMPERATURE SENSOR TO ALLOW MONITORING OF SPACE TEMPERATURE BY DDC SYSTEM. COORDINATE EXACT LOCATION WITH OWNER AND EXISTING CONDUIT, EQUIPMENT, ETC.
- HARD WIRED LOW VOLTAGE THERMOSTAT CONTROLLER FOR DFCU BY DFCU MANUFACTURER. MOUNT B.E. AT 4'-6" A.F.F. COORDINATE EXACT LOCATION WITH OWNER AND EXISTING CONDUIT, EQUIPMENT, ETC.

Whitewater High School
Renovations

100 Willicat Way
Fayetteville, GA 30215

CLIENT PROJECT NUMBER: 240477

Bid Set

Logo

When Excellence and Creativity Merge

KEY PLAN

NORTH PLAN TRUE

Logo

REGISTERED PROFESSIONAL ENGINEER

James A. Anderson

CLIENT

Fayette County Schools

DATE: 09/11/2026

PROJECT NUMBER: 240477

DRAWING HISTORY

No.	Description	Date
1	ADDENDUM #3	10/07/2026

CHECKED BY: WBF

DRAWN BY: WBF

MECHANICAL LOWER LEVEL
- AREA K FLOOR PLAN

M-101K.LL

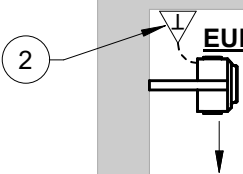
AH&P
CONSULTING
ENGINEERS

ANDREWS, HAMMOCK & POWELL, INC.
250 Charter Lane
Suite 100
Macon, Georgia 31210
Macon (478) 405-8301
FAX (478) 405-8210
WWW.AHPENGR.COM

www.ahp.com

770-227-5473

GREEN, GA


$$1/4'' = 1'-0''$$

GENERAL NOTE:

NOTE: SEE LOOP AND COOLING WATER NEW WORK PIPING SCHEMATIC BELOW FOR MANY ITEMS NOT DETAILED ON FLOOR PLANS FOR CLARITY. ALSO, MANY PIPING COMPONENTS ARE SPECIFIED IN EQUIPMENT DETAILS THAT ARE NOT SHOWN IN THIS DRAWING.

NOTE: PRIOR TO COMPLETING NEW WORK, CONTRACTOR SHALL PERFORM INITIAL FLUSHING OF LOOP WATER PIPING AS DESCRIBED IN SECTION 232113 HYDRONIC PIPING.



LOOP AND COOLING WATER PIPING SCHEMATIC
NOT TO SCALE

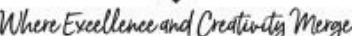
MECHANICAL NOTES: (THIS SHEET ONLY)

- INSTALL NEW SUPPLY FAN IN SAME LOCATION AS FAN REMOVED DURING DEMOLITION.
MODIFY WALL OPENING AS REQUIRED FOR INSTALLATION OF NEW FAN.
4. ALL EXISTING COOLING SUPPLY PIPING CONNECTIONS TO TOWER DIRECTLY UNDER RETURN PIPING
BUT IS SHOWN OFFSET FOR CLARITY.
- GENERAL - MECHANICAL ROOM PIPING SYSTEMS SHALL BE ISOLATED, FLUSHED, AND
PRESSURE TESTED PRIOR TO CONNECTION TO EXISTING LOOP PIPING SYSTEM. SEE
DEMOLITION SPECIFICATIONS FOR MORE INFORMATION.
- FACTORY FURNISHED SERVICE PLATFORM, LADDER, AND MOTOR DAVIT. PROVIDE LADDER
WITH EXTENSION TO GRADE FOR SERVICING COOLING TOWER MOTORS.
- ALL EXISTING LOOP WATER SUPPLY AND RETURN PIPING SHALL BE HEAT TAPED,
INSULATED, AND JACKETED. SEE EXTERIOR ABOVE GRADE PIPING INSULATION DETAIL.
PROVIDE NEW PIPE STANDS FOR PIPE SUPPORT AS SHOWN IN PIPE STAND DETAIL.
4. ALL EXISTING DOWN DRAIN PIPING SHALL BE HEAT TAPED, INSULATED, AND JACKETED.
EXTEND AND MATCH EXISTING CONCRETE PAD THICKNESS AS REQUIRED, TO SUPPORT
NEW PUMPS. SEE CONCRETE PAD EXTENSION DETAIL.
- CONTRACTOR SHALL FLUSH OPEN TRIP DUTY VALVE ON LOOP PUMPS P-1 AND P-2 SINCE
VALVE IS NOT USED FOR BALANCING PURPOSES.
- PROVIDE NEW AUTOMATIC AIR VENT. SEE AUTOMATIC AIR VENT DETAIL.
- NEW DDC COOLING WATER SUPPLY TEMPERATURE SENSOR.
- PROVIDE ENGRAVED BAKELITE LABEL AT EACH WATER CONNECTION TO PLATE AND FRAME
VALVE. LABEL SHALL BE: "COOLING TOWER WATER IN," "COOLING TOWER
WATER OUT," "LOOP WATER IN," "LOOP WATER OUT."
- EXISTING FULLY LOUVERED DOORS FOR LOWER COMBUSTION AIR OPENING AND
VENTILATION SHALL REMAIN IN PLACE FOR BALANCING PURPOSES.
- NEW BASIN HEATER CONTROLLER MOUNTED ON SUPPORT STRUCTURE.
- VERTICAL IN LINE SPLIT COUPLED PUMP. SEE VERTICAL IN LINE PUMP DETAIL.
- CONNECT NEW 1" EXPANSION PIPE TO 6" LS PIPE AT THIS APPROXIMATE LOCATION.
4. ALL EXISTING PLUMBING SHALL BE REMOVED AND RETURN PIPING SHALL BE
PROVIDE NEW COOLING WATER CHEMICAL TREATMENT CONTROLLER, PUMPS, BIOCIDES
AND CORROSION INHIBITOR, SOLENOID VALVES, TANKS, AND PIPING.
- WATER METER WITH GPM OUTPUT SIGNAL, TO COOLING TOWER CHEMICAL TREATMENT
PANEL.
- EXISTING LOOP WATER PIPING TO REMAIN.
- BOILER SUPPLY SHUTOFF VALVE AND Y-STRAINER SHALL BE IN VERTICAL PIPE RISE AS
CLOSE TO FLOOR AS POSSIBLE.
4. ALL EXISTING PLUMBING SHALL BE REMOVED AND RETURN PIPING SHALL BE
PROVIDE NEW COOLING WATER CHEMICAL TREATMENT CONTROLLER, PUMPS, BIOCIDES
AND CORROSION INHIBITOR, SOLENOID VALVES, TANKS, AND PIPING.
- PROVIDE SLOW CLOSING ELECTRONIC MAKE UP WATER VALVE IN PIPE.
- EXISTING WIRING IN CONDUIT FROM SLOW CLOSING ELECTRIC MAKE UP WATER VALVE TO
ELECTRONIC WATER TREATMENT CONTROLLER.
- COOLING TOWER ELECTRONIC WATER LEVEL CONTROLLER.
- EXISTING FLOOR TRENCH DRAIN TO REMAIN.
- PROVIDE NEW LINE SIZE CALIBRATED VENTURI WITH DUAL PRESSURE / TEMPERATURE
PORTS.
- SHUT OFF VALVE IS SHOWN VERTICAL FOR CLARITY, BUT SHALL BE HORIZONTAL.
- PROVIDE "SPOOL PIECE" BETWEEN FLEXIBLE PIPE CONNECTOR AND TRIP DUTY VALVE
(OR PROVIDE REDUCING ELBOW, AS REQUIRED).
- 1" BALL VALVE AND CAP (UPPER VENT) TO ALLOW MAINTENANCE PERSONNEL TO DRAIN
HX-1.
- PROVIDE NEW 6" COOLING WATER SUPPLY PIPING FROM HEAT EXCHANGER UP TO NEW
PUMP.
- PROVIDE 1" BALL VALVE WITH HOSE CONNECTION AND CAP. DRAIN SHALL BE USED FOR
MAINTENANCE FOR DRAINING EQUIPMENT DURING SERVICING.
4. ALL EXISTING PLUMBING SHALL BE REMOVED AND RETURN PIPING SHALL BE
PROVIDE NEW COOLING WATER CHEMICAL TREATMENT CONTROLLER, PUMPS, BIOCIDES
AND CORROSION INHIBITOR, SOLENOID VALVES, TANKS, AND PIPING.
- EXTEND EXISTING CONCRETE PAD AS REQUIRED TO ACCOMMODATE NEW BOILERS. SEE
CONCRETE PAD EXPANSION DETAIL.
- SUCTION DIFFUSER MOUNTED WITH HORIZONTAL INLET AND RIGHT ANGLE SUPPORT
STRUCTURE, AND NEW 1" BALL VALVE. PROVIDE TEMPORARY FINE MESH STRAINER DURING
START UP. (TACO MODEL #SD0600065) WITH 6" SYSTEM CONNECTION. 6" PUMP
CONNECTION.
- CONNECT NEW LOOP PIPING TO EXISTING AT THIS APPROXIMATE LOCATION.
- EXISTING STRUCTURAL SUPPORTS TO REMAIN. BASIS OF DESIGN TOWER IS SAME WIDTH
AS EXISTING TOWER. CONTRACTOR SHALL FIELD VERIFY EXISTING SUPPORT DIMENSIONS
AND ENSURE NEW TOWER CAN BE MOUNTED ATOP EXISTING SUPPORTS.
- TACO MODEL 4908A2D 12S TANGENTIAL ASME STAMPED AIR AND DIRT SEPARATOR WITH
CONNECTION AND DRAIN AND TANGENTIAL ASME WAGGED. SEE DIRT AND AIR SEPARATOR
DETAIL.
- MAXIMUM PRESSURE DROP THRU AIR SEPARATOR SHALL NOT EXCEED 4 FEET AT 700
GPM.
- EXTEND EXISTING CONCRETE PAD AS REQUIRED TO ACCOMMODATE NEW HEAT
EXCHANGER AS INDICATED.
- 5" TRIP DUTY VALVE. TACO MODEL MPV-050.
- 3" HS AND HR PIPING DROP FOR CONNECTION TO BOILER. MAINTAIN MINIMUM 20"
REMOVABLE STRAIGHT PIPE TO ALLOW FOR INSPECTION AND SERVICE.
- GENERAL - BUTTERFLY VALVES ON THIS FLOOR PLAN ARE IDENTIFIED BY THIS SYMBOL
AND SHOWN IN NEW TOWER. IN THE LEGEND, PROVIDE GEAR ACTUATOR WITH HAND WHEEL
FOR ALL BUTTERFLY VALVES 6" AND LARGER. PROVIDE LEVER LOCKS ON VALVES 6"
AND SMALLER.
- NEW MAIN DMC PANEL BY CONTROLS COMPANY.
- WATER HEATER, STORAGE TANK, PUMPS, PIPING, ETC. IN THIS AREA BY PLUMBING. SEE
PLUMBING DRAWINGS.
4. ALL EXISTING PLUMBING SHALL BE REMOVED AND RETURN PIPING SHALL BE
PROVIDE NEW COOLING WATER CHEMICAL TREATMENT CONTROLLER, PUMPS, BIOCIDES
AND CORROSION INHIBITOR, SOLENOID VALVES, TANKS, AND PIPING.
- 8" BOILER FLUE DRIPS FOR CONNECTION TO BOILER.
- EXISTING CONCRETE PIPING SUPPORT PADS TO REMAIN. CONTRACTOR MAY REUSE PIPES
TO SUPPORT NEW PIPING WHERE POSSIBLE. PROVIDE NEW PIPE SUPPORT ATOP PAD FOR
NEW PIPING. PROVIDE NEW PIPING TO SUPPORT NEW PIPING WHERE NECESSARY.
- PROVIDE NEW 6" COOLING WATER RETURN PIPING FROM COOLING TOWER TO HEAT
EXCHANGER.



Whitewater Renovations

Bid Set

[illegible]

MECHANICAL ROOM LARGE SCALE NEW WORK FLOOR PLAN

FAN COIL UNITS												
TAG	CARRIER MODEL NUMBER	SUPPLY CFM	MINIMUM O.A. CFM	TOTAL COOLING CAPACITY (MBH)	SENSIBLE COOLING CAPACITY (MBH)	REV. CYCLE HEATING CAPACITY (MBH)	ELECTRIC HEAT (KW)	APPROX. E.S.P. (IN.W.G.)	SUPPLY MOTOR HP	COOLING COIL CONDITIONS		NOTES
										ENT. AIR TEMP.		
										°F D.B.	°F W.B.	
FCU-1	FTS448	1,400	-	45.6	33.3	27.9	10	0.5	3/4	80	67	1,2,3,4,5,6,7,8,9,10,11
1. HORIZONTAL DRAW THRU FAN COIL UNIT WITH SINGLE WALL CONSTRUCTION AND 1" THICKNESS RM.2 INTERIOR INSULATION, PROVIDE BAKED ENAMEL FINISH. SEE VERTICAL FCU DETAIL.												
2. COOLING CAPACITIES BASED ON AIR ENTERING EVAPORATOR AT SCHEDULED CONDITIONS AND MATCHED WITH INDICATED HEAT PUMP UNIT.												
3. HEATING CAPACITY BASED ON 70°F RETURN AIR AND OUTDOOR AIR AT 17°F, AND MATCHED WITH INDICATED HEAT PUMP UNIT.												
4. PROVIDE DX COOLING COIL WITH FACTORY INSTALLED THERMOSTATIC EXPANSION VALVE FOR REFRIGERANT CONTROL.												
5. SCHEDULED CAPACITIES ARE OVERALL CAPACITIES FOR MATCHED HEAT PUMP UNIT AND EVAPORATOR COIL WITH 2°F LINE LOSS.												
6. EXTERNAL STATIC PRESSURE SCHEDULED DOES NOT INCLUDE WET COOLING COIL, CASING, ELECTRIC HEAT COIL, OR FILTER LOSSES. BLOWER MOTOR MUST OVERCOME E.S.P. AT CONNECTED VOLTAGE.												
7. PROVIDE UNIT MOUNTED FACTORY INSTALLED ELECTRIC STRIP HEATERS OF INDICATED KW AT CONNECTED VOLTAGE. PROVIDE DUAL POINT UNIT POWER CONNECTION FOR FCU AND HEATER.												
8. PROVIDE FAN MOTOR CONTACTOR, TERMINAL STRIP, AND ALL CONTROLS.												
9. PROVIDE INTEGRAL FILTER RACK DESIGNED TO ACCOMMODATE 1" FILTERS.												
10. PROVIDE DOUBLE SLOPED REMOVABLE CONDENSATE DRAIN PAN. PROVIDE TRAPPED CONDENSATE DRAIN. SEE CONDENSATE DRAIN TRAP DETAIL.												
11. PROVIDE ECM CONSTANT TORQUE MOTOR.												

HEAT PUMPS						
TAG	MODEL NUMBER	COOLING CAPACITY (MBH)	MIN. STAGES	MINIMUM AMBIENT COOLING TEMP	HEATING CAPACITY (MBH)	NOTES
HP-1	27TFA48	45.6	2	40	27.9	1,2,3,4,5,6,7,8,9,10,11,12,13
1. COOLING CAPACITIES BASED ON 95°F AMBIENT AIR TEMPERATURE. HEATING CAPACITY BASED ON 17°F AMBIENT TEMP.						
2. ALL REFRIGERANT LINES TO BE INSTALLED AND SIZED PER MANUFACTURER'S INSTALLATION RECOMMENDATIONS.						
3. SCHEDULED CAPACITIES ARE OVERALL CAPACITIES REQUIRED FOR MATACHED HEAT PUMP AND EVAPORATOR COIL WITH 2°F SUCTION LINE LOSS.						
4. PROVIDE INTEGRAL CONTROLS INCLUDING CONTACTORS, CRANKCASE HEATER, 5 MINUTE COMPRESSOR TIME DELAY RELAY, AND COMPRESSOR OVER TEMPERATURE (OVERLOAD) PROTECTION.						
5. PROVIDE ALL CONTROLS, ACCESSORIES, AND SYSTEM MODIFICATIONS TO PERMIT COOLING OPERATION TO SPECIFIED TEMPERATURE.						
6. PROVIDE LIQUID AND SUCTION LINE SERVICE VALVES/GAUGE PORTS.						
7. PROVIDE HIGH PRESSURE SWITCH AND LOW PRESSURE SWITCH.						
8. PROVIDE TIME INITIATED, TEMPERATURE TERMINATE DEFROST CONTROLS.						
9. SEE HEAT PUMP/CONDENSING UNIT DETAIL.						
10. UNIT SHALL UTILIZE R-454B OR R-32 REFRIGERANT.						
11. PROVIDE LOUVERED COIL GUARD.						
12. PROVIDE 2-STAGE SCROLL COMPRESSOR.						
13. MOUNT UNIT ATOP NEW CONCRETE EQUIPMENT PAD. SEE CONCRETE EQUIPMENT PAD DETAIL.						

ELECTRIC DUCT HEATERS						
TAG	TUTCO MODEL NO.	HEATER KW	HEATING OUTPUT MBH	CFM	STAGES	DUCT SIZE
EDH-1	E-SERIES	40	136.5	8,000	2	FIELD VERIFY
EDH-2	E-SERIES	40	136.5	8,000	2	FIELD VERIFY
1. PROVIDE UL LISTED SLIP-IN TYPE OR FLANGE TYPE TO MATCH EXISTING OPEN COIL LOW WATT DENSITY DUCT HEATER WITH REAR INSULATED CONTROL PANEL AND HINGED DOOR. HEATER ENCLOSURE SHALL BE DESIGNED FOR INTERIOR MOUNTING AND SHALL BE NEMA RATED.						
2. PROVIDE AUTOMATIC RESET AND MANUAL RESET THERMAL CUTOUT, CONTROL VOLTAGE TRANSFORMER, AND STAGING CONTACTORS.						
3. PROVIDE FACTORY MOUNTED CIRCUIT BREAKER SWITCH AND STAGED HEATER CONTROL.						
4. PROVIDE AIR PRESSURE PROVING SWITCH.						
5. PROVIDE VERTICAL MOUNTING POSITION. VERIFY LEFT OR RIGHT PANEL ARRANGEMENT AS SHOWN ON DRAWINGS.						
6. CONTRACTOR SHALL VERIFY MANUFACTURER'S INLET AND OUTLET STRAIGHT CONDITIONS INTO COIL. PROVIDE MANUFACTURER'S RECOMMENDED ACCESSORY IF INLET AND OUTLET CLEARANCES CAN NOT BE MAINTAINED TO ACHIEVE PROPER OPERATION.						

DUCTLESS CONDENSING UNITS/HEAT PUMPS						
TAG	CARRIER MODEL NUMBER	TOTAL COOLING MBH	HEATING CAPACITY MBH	MINIMUM AMBIENT COOLING TEMP. °F	NOTES	
		RATED	MIN.	RATED	MIN.	
DOU-1	37MARQA24	24.0	7.2	25.0	8.4	5
DOU-2	37MARQA24	24.0	7.2	25.0	8.4	5
1. COOLING CAPACITY BASED ON 95°F AMBIENT AIR TEMPERATURE AND HEATING AT 47°F AMBIENT AND MATCHED WITH SCHEDULED DUCTLESS FAN COIL UNIT.						
2. PROVIDE REFRIGERANT PIPING SIZED AND DESIGNED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTION. NOTE THAT BOTH REFRIGERANT LINES MUST BE INSULATED PER MANUFACTURER'S INSTRUCTIONS. PROVIDE INSULATED LINE SET, VERIFY EXACT LENGTH.						
3. SCHEDULED CAPACITIES ARE OVERALL CAPACITIES REQUIRED FOR MATCHED CONDENSING UNIT/HEATPUMP AND EVAPORATOR COIL 2°F LINE LOSS.						
4. PROVIDE INTEGRAL CONTROLS INCLUDING CONTACTORS, DEFROST BOARD (HEAT PUMP ONLY), CONTROL TRANSFORMER, ETC						
5. UNIT SHALL UTILIZE R-454B OR R-32 REFRIGERANT. PROVIDE DC ROTARY COMPRESSOR WITH VARIABLE SPEED INVERTER TECHNOLOGY.						
6. MOUNT ON EQUIPMENT SUPPORT RAIL. SEE DUCTLESS UNIT ATOP EQUIPMENT SUPPORT RAIL DETAIL.						
7. PROVIDE FACTORY WIND BAFFLE.						

DUCTLESS FAN COIL UNITS							
TAG	CARRIER MODEL NUMBER	TOTAL COOLING MBH	SENSIBLE COOLING CAPACITY (MBH)	TOTAL SUPPLY CFM	HEATING CAPACITY MBH	APPROX. E.S.P. (IN.W.G.)	NOTES
		RATED	MIN.		RATED	MIN.	
DFCU-1	45MAHAQ24	24.0	7.2		810	25.0	8.4
DFCU-2	45MAHAQ24	24.0	7.2		810	25.0	8.4
1. WALL MOUNTED STYLE DUCTLESS FAN COIL UNIT.							
2. COOLING CAPACITIES BASED ON AIR ENTERING EVAPORATOR AT 80°Fdb, 67°Fwb AND MATCHED WITH INDICATED CONDENSING UNIT/HEATPUMP. HEATING CAPACITY BASED ON 47 F.							
3. PROVIDE FACTORY CONDENSATE PUMP. LITTLE GIANT MODEL VCM-20 WITH MINIMUM DISCHARGE HEAD OF 20 FT. STANDARD INTERNAL PUMP WILL NOT BE ALLOWED. PROVIDE VINYL TUBING TO DISCHARGE AS NOTED ON DRAWINGS, VERIFY LENGTH.							
4. PROVIDE PERMANENT WALL MOUNTED HARD WIRED THERMOSTAT. LOOSE HAND HELD WIRELESS REMOTE WILL NOT BE ALLOWED.							

ROOFTOP AIR CONDITIONING UNITS												
TAG	MODEL NUMBER	TOTAL COOLING MBH	SENSIBLE COOLING MBH	TOTAL SUPPLY CFM	O.A. CFM	HEATING INPUT MBH (LOW/HIGH)	HEATING OUTPUT MBH	APPROX. E.S.P. (IN.W.G.)	SUPPLY FAN HP	MINIMUM STAGES	COOLING ENTERING CONDITIONS	MINIMUM AMBIENT COOLING TEMP
											E.A.T. D.B. °F	E.A.T. W.B. °F
RTAC-57	48FE16	181.3	134.7	3,500	200	-	-	0.5	2.74	2	80	40
RTAC-58	48FE24	251.0	181.2	8,000	200	-	-	0.5	4.8	2	80	40
1. COOLING CAPACITIES BASED ON AIR ENTERING EVAPORATOR AT SCHEDULED CONDITION AND 97°F AMBIENT AIR TEMPERATURE. UNIT SHALL PROVIDE MECHANICAL COOLING DOWN TO SCHEDULED TEMPERATURE. UNIT SHALL UTILIZE R-454B OR R-32 REFRIGERANT.												
2. COOLING ONLY UNIT.												
3. PROVIDE TRAPPED CONDENSATE DRAIN. SEE CONDENSATE DRAIN TRAP DETAIL.												
4. PROVIDE BI-POLAR IONIZATION UNIT(S) GLOBAL PLASMA SOLUTIONS MODEL GPS-FC-24, GPS-FC-48, OR EQUAL AS SPECIFIED. PROVIDE QUANTITY AS REQUIRED TO TREAT SCHEDULED AIRFLOW.												
5. STATIC PRESSURE SCHEDULED DOES NOT INCLUDE WET COOLING COIL, FILTER, HEATING PLANT OR SYSTEM EFFECT LOSSES.												
6. PROVIDE FACTORY NON FUSED DISCONNECT SWITCH. PROVIDE PHASE MONITOR OPTION TO PROTECT AGAINST PHASE LOSS, PHASE IMBALANCE, AND PHASE REVERSAL(3 PHASE UNITS ONLY).												
7. PROVIDE FACTORY INSTALLED POWERED G.F.I. CONVENIENCE OUTLET, TRANSFORMER ETC.												
8. PROVIDE 50% MOTORIZED OUTDOOR AIR INTAKE HOOD WITH OUTSIDE AIR DAMPER AND BIRDSCREEN.												
9. PROVIDE ELECTRO-MECHANICAL CONTROLLER OR BASIC MICROPROCESSOR CONTROLLER.												
10. PROVIDE 2 STAGE SCROLL COMPRESSOR.												
11. PROVIDE LOUVERED CONDENSER COIL, HAIL GUARDS.												
12. PROVIDE HINGED ACCESS DOORS WITH 1/4 TURN LATCHES ON ALL ACCESS DOORS.												
13. UNIT SHALL HAVE HORIZONTAL DISCHARGE AND RETURN MOUNTED ATOP CONCRETE PAD.												
14. UNIT SHALL HAVE VERTICAL DISCHARGE AND HORIZONTAL RETURN MOUNTED ATOP DUCT CURB. SEE DUCT CURB DETAIL.												

ELECTRIC UNIT HEATERS									
TAG	QMARK MODEL NUMBER	HEATER KW	HEATING OUTPUT MBH	CFM	MOTOR HP	THROW	B.E. A.F.F. MOUNTING HEIGHT	NOTES	
EUH-1	MUH	5.0	17.0	350	1/100	12"	EXISTING	1,2,4,5,6	
EUH-2	MUH	3.0	17.0	350	1/100	12"	EXISTING	1,2,4,5,6	
EUH-3	MUH	5.0	17.0	350	1/100	12"	EXISTING	1,2,4,5,6	
EUH-4	MUH	3.0	10.2	350	1/100	12"	8'-0"	1,2,4,5,6	
EUH-5	MUH	3.0	10.2	350	1/100	12"	8'-0"	1,2,3,4,5	
EUH-6	MUH	7.5	25.6	650	1/10	17"	8'-0"	1,2,3,4,5	
EUH-7	MUH	10.0	34.1	650	1/100	18"	9'-0"	1,2,3,4,5	
EUH-8	MUH	10.0	34.1	650	1/100	18"	9'-0"	1,2,3,4,5	
EUH-9	MUH	10.0	34.1	650	1/100	18"	9'-0"	1,2,3,4,5	
EUH-10	MUH	10.0	34.1	650	1/100	18"	9'-0"	1,2,3,4,5	
EUH-11	MUH	10.0	34.1	650	1/100	18"	9'-0"	1,2,3,4,5	
EUH-12	MUH	10.0	34.1	650	1/100	18"	9'-0"	1,2,3,4,5	
1. ELECTRIC PROPELLER TYPE UNIT HEATER WITH HORIZONTAL DISCHARGE.									
2. PROVIDE ADJUSTABLE DISCHARGE LOUVERS.									
3. OPERATE FROM INTEGRAL UNIT MOUNTED FACTORY THERMOSTAT.									
4. PROVIDE FACTORY WALL MOUNTING BRACKET AND ADJUSTABLE SWIVEL BASE.									
5. PROVIDE CONTROL POWER TRANSFORMER, AUTOMATIC RESET THERMAL CUT-OUT, FACTORY DISCONNECT, AND FAN DELAY SWITCH.									
6. OPERATE FROM WALL MOUNTED THERMOSTAT FURNISHED BY UNIT HEATER MANUFACTURER.									

DOOR AIR CURTAINS							
TAG	BERNER MODEL NUMBER	CFM	MAX VELOCITY FPM	MOUNTING HEIGHT B.E. FT. A.F.F.	MOTOR HP/QTY	VOLTAGE/ PHASE	WEIGHT (LB)
DAC-1	CLC09-1042A	1,176	3,388	7'-0"	1/5 / 1	120V/1	45
1. UNHEATED AIR CURTAIN SUITABLE FOR ENTRY DOOR. FIELD VERIFY EXISTING DOOR SIZE.							
2. MAXIMUM NOISE LEVEL TO BE 66 db, "A" SCALE, MEASURED 10FT. FROM NOZZLE.							
3. OPERATES FROM DOOR SWITCH TO START WHEN DOOR IS OPENED. LINE VOLTAGE SEITH IS PROVIDED AND INSTALLED BY MECHANICAL.							
4. MOUNT ON WALL INSIDE BUILDING DIRECTLY ABOVE DOOR.							
5. PROVIDE WHITE FINISH.							

VARIABLE FREQUENCY DRIVES			
TAG	MOTOR HP	SERVICE	NOTES
VFD-1	40	P-1	1,2,3
VFD-2	40	P-2	1,2,3
VFD-3	7.5	CT FAN #1	1,2,3,4
VFD-4	7.5	CT FAN #2	1,2,3,4
1. PULSE WIDTH MODULATED INVERTER STYLE VARIABLE FREQUENCY DRIVE IN NEMA 1 FRAME. DRIVE SHALL BE DESIGNED FOR WALL MOUNTING.			
2. MINIMUM DRIVE EFFICIENCY OF 97% AT FULL SPEED AND FULL LOAD, AND MINIMUM 98% POWER FACTOR AT ALL OPERATING SPEEDS.			
3. PROVIDE DOOR INTERLOCKED THERMAL MAGNETIC CIRCUIT BREAKER TO FUNCTION AS DISCONNECT.			
4. PROVIDE BYPASS.			