ksqdesign

ADDENDUM 02

BID ADDENDUM NUMBER | 02

Date | 11/17/2021

PROJECT | Yorktown Central School District
District Wide Improvements 2020 Phase II

PROJECT NUMBER | 1910404.00

OFFICE ADDRESS | KSQ DESIGN

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NOTICE TO CONTRACTORS|

This Addendum issued prior to receipt of Bid shall and does hereby become a part of the Construction Documents for the above project.

All principal Contractors shall be responsible for seeing that their Subcontractors are properly apprised of the Contents of this Addendum.

All information contained in this Addendum shall supersede and shall take precedence over any conflicting information in the original Bidding Documents dated 10/25/2021 and all pervious addenda.

All Contractors shall acknowledge receipt of this Addendum in the space provided in the Proposal Form. Failure to do so may subject Bidder to disqualification.

A. CHANGES TO SPECIFICATIONS

07 71 00 ROOF SPECIALTIES

a. Revise paragraph 2.8-A. as follow:

A. Roof Walkway: Provide roof walkway pads as shown in plans:

23 05 93 TESTING, ADJUSTING AND BALANCING

a. Replace entire section with attached.

B. CHANGES TO DRAWINGS

Drawing MS-A402:

1. Revise roof plan note on RTU-5 as follow: "**NEW STEEL SUPPORTS BY MC. SEE STRUCT. DWGS**"

Drawing CES-A402:

a. Revise General Notes as follow:
   1. **ALL ROOF PENETRATIONS, CURBS, FLASHING AND PATCHING ARE TO BE BY MC.**
   2. **ALL STEEL DUNNAGE & STRUCTURAL MODIFICATIONS ARE TO BE BY MC.**
   3. **MC TO COORDINATE MECH. EQUIPMENT LOCATIONS – SEE "M" DWG'S.**

Drawing YHS-H103:

a. Replace entire sheet with attached.

Drawing MS-H102:

a. Replace entire sheet with attached.

Drawing MS-H501:

a. Replace entire sheet with attached.

Drawing CES-H101:

a. Replace entire sheet with attached.

Drawing CES-H701:

a. Replace entire sheet with attached.

Drawing CES-E000:

a. Replace entire sheet with attached.

Drawing CES-E102:

a. Replace entire sheet with attached.

Drawing MES-H101:

a. Replace entire sheet with attached.

Drawing MES-H701:

a. Replace entire sheet with attached.

Drawing MES-E000:

a. Replace entire sheet with attached.

Drawing MES-E101:

a. Replace entire sheet with attached.

Drawing BES-H101:

a. Replace entire sheet with attached.

2. CLARIFICATIONS:

1. RFI Question: Location: All Schools; Please confirm that as per the walkthrough there is no Asbestos Abatement. The only asbestos is at Mildred E.S. Middle School in the caulking on the Exhaust Fan Curbs and is not to be disturbed.

    a. The project does not include asbestos abatement. The existing flashing shall not be disturbed.

2. RFI Questions: Location: Mohansic ES; The new steel to support ACCU-1 and ACCU-2 is shown on Drawing MES-A-111. The Structural Steel drawing MES-S101 only indicates new steel for ACCU-2. Please advise if there is also new steel support for ACCU-1.

    a. From the existing drawings, and previous site visit, it appears that the ACCU-1 is being placed on existing structurally reinforced concrete slab, if this is true then no steel support is required under the unit. If

there are bar joists in that area, we would require steel under the unit, similar to ACCU-2, though the joists would have to be analyzed to ensure they can support the additional load.

3. RFI Question: Location: Crompond ES; Please confirm the associated motors for AHU & Exhaust Fans serving Gymnasium & Cafetorium are Inverter Duty and are VFD Compatible. In addition, please provide CFM Values for the Cafetorium and Gymnasium RGD's for balancing.
    a. **Delta cannot confirm the Inverter Duty Motors with the exhaust fans. The modified CES-H701 reflect maintaining the existing starters w/o VFDs for the AHU and Exhaust fan. Appropriate changes to the electrical plans to delete the VFD scope have been made. CES-H101and CES-E101 reflect the deletion of these drives as well.**
    b. **CFMs to existing diffusers have been added to CES-H101.**
    c. **The specification 23 05 93 has been modified to explicitly require a pre-balance of the AHU and exhaust fans.**
4. RFI Question: Location: Mohansic ES; Please confirm associated motors for AHU & Exhaust Fans serving Gymnasium & Cafetorium are Inverter Duty and are VFD Compatible. In addition, please provide CFM Values for both Air Handlers/Exhaust Fans and Gymnasium RGD's for balancing.
    a. **Delta cannot confirm the Inverter Duty Motors with the exhaust fans. The modified MES-H701 reflects maintaining the existing starters w/o VFDs for the AHU and Exhaust fan. Appropriate changes to the electrical plans to delete the VFD scope have been made. MES-H101 and MES-E101 reflect the deletion of these drives as well.**
    b. **CFMs to existing diffusers have been added to MES-H101.**
    c. **The specification 23 05 93 subparagraph 3.5A has been added to explicitly require a pre-balance of the AHU and exhaust fans.**
5. RFI Question: Location: Yorktown High School; Please confirm as mentioned at the walkthrough, new RTU-3 is to be positioned over location of existing RTU with the intent to reuse existing roof penetrations.
    a. **The Location of the new RTU is approximately as shown on the mechanical and structural drawings. The exact location to be field determined. The existing penetrations are not to be reused. Notes have been modified on YHS-H103 to clarify the MC's responsibility for infilling the existing and cutting new penetrations.**
6. RFI Question: Location: All Schools; The Insurance requirements for this project call for an additional policy: Owner's Contractor's Policy (OCP). Are subcontractors required to obtain this policy in addition to the contractor? Are subcontractors required to supply insurance to the school district and do they have to match or exceed the project requirements?
    a. **Only prime contractor is required to provide OCP policy. As per Article 11 the contractor and each subcontractor shall maintain the insurances required by the contract.**
7. RFI Question: Location: Brookside ES; Drawing BES-A402 Note 4 says "ROOF FANS ARE TO BE CAPPED AND SEALED BY MC." No Roof fans are shown on BES-A402. Please confirm the only fan to be removed is the wall fan (EEF-3) in the Gym that is shown on drawing BES-H101.
    a. **Yes, there is only the one fan to be removed, EEF-3.**
8. RFI Question: Location: Crompond ES; Can you please provide a model number for the Basis of Design for the ACCU-1 & ACCU-2, Hitachi Air Cooled Condensing Units.
    a. **Refer to Addendum #1.**
9. RFI Question: Drawing MS-A402 – Note on RTU-5 says New Steel Supports by GC but the general note says all work on this drawing by MC. Please clarify the scope for each contractor.

a. **All steel supports are by MC.**

10. RFI Question: Drawing CES-A402 – General note 1 & 2 says work by GC but another note says all work on this drawing by MC. Please clarify the scope for each contractor.
    a. **Work under general notes 1 and 2 is by MC.**
11. RFI Question: Drawing MES-A111 – General Note 4 says all work in this sheet by MC. However, ceiling modification should be by GC. Please advise on this.
    a. **Ceiling modifications for AHU associated work is by MC.**
12. RFI Question: Drawing MES-A111 – General Note 4 says all work in this sheet by MC. However, ceiling modification should be by GC. Please advise on this.
    a. **Ceiling modifications for AHU associated work is by MC.**
13. RFI Question: Drawing BES-A111 – General Note 4 says all work in this sheet by MC. However, ceiling modification should be by GC. Please advise on this.
    a. **Ceiling modifications for AHU associated work is by MC.**
14. RFI Question: Drawings #YHS-A401, CES-A402, & MES-A402 Indicates M.C. is to provide New Rubber Guard Walkway. Can you provide a detail of the roof & the required walkway path? Also provide the specs for this material.
    a. **Walk pads are specified under specifications section 07 71 00 – 2.8-A.1 ROOF WALKWAYS – Basis-of-Design Product.**
15. RFI Question: Drawings CES-A402, & MS-A402 have conflicting notes on who is responsible steel work.
    a. **All steel supports are by MC.**
16. Can you please confirm Mechanical Contractor is to provide toilet and handwash facilities for all trades? If so, please advise on desired quantity of toilet and handwash facilities required at each of the (5) schools.
    a. **As stated in section 013150 and 015000, the Mechanical Contractor provides toilet and handwashing facilities for all workers/trades, with sufficient quantities per OSHA guidelines to properly handle the amount of workers onsite at each school building.**

ENCLOSURES:

1. **SPECIFICATIONS:**
    a. **23 05 93 TESTING, ADJUSTING AND BALANCING**
2. **DRAWINGS:**

GENERAL	CIVIL	STRUCT	ARCH	MECH	ELEC	PLUMB	FIRE PROT.
				YHS-H103	CES-E000		
				MS-H102	CES-E102		
				MS-H501	MES-E000		
				CES-H101	MES-E101		
				CES-H701			
				MES-H101			
				MES-H701			
				BES-H101			

END OF ADDENDA 02

SECTION 23 05 93 - TESTING, ADJUSTING AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Balancing Air Systems:
   a. Constant-volume air systems.
   b. Variable air volume systems
2. Testing, adjusting, and balancing existing systems and equipment.
3. Control system verification.

1.3 DEFINITIONS

A. AABC: Associated Air Balance Council.

B. BAS: Building automation systems.

C. NEBB: National Environmental Balancing Bureau.

D. TAB: Testing, adjusting, and balancing.

E. TABB: Testing, Adjusting, and Balancing Bureau.

F. TAB Specialist: An independent entity meeting qualifications to perform TAB work.

G. TDH: Total dynamic head.

1.4 PREINSTALLATION MEETINGS

A. TAB Conference: If requested by the Owner, conduct a TAB conference at Project site after approval of the TAB strategies and procedures plan to develop a mutual understanding of the details. Provide a minimum of 14 days' advance notice of scheduled meeting time and location.

1. Minimum Agenda Items:

   a. The Contract Documents examination report.
   b. The TAB plan.
   c. Needs for coordination and cooperation of trades and subcontractors.
   d. Proposed procedures for documentation and communication flow.

1.5 ACTION SUBMITTALS

A. Sustainable Design Submittals:

1. TAB Report: Documentation indicating that Work complies with ASHRAE/IES 90.1, Section 6.7.2.3 - "System Balancing."

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: Within 30 days of Contractor's Notice to Proceed, submit documentation that the TAB specialist and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.

B. Contract Documents Examination Report: Within 30 days of Contractor's Notice to Proceed, submit the Contract Documents review report as specified in Part 3.

C. System Readiness Checklists: Within 30 days of Contractor's Notice to Proceed, submit system readiness checklists as specified in "Preparation" Article.

D. Examination Report: Submit a summary report of the examination review required in "Examination" Article.

E. Certified TAB reports.

F. Sample report forms.

G. Instrument calibration reports, to include the following:

1. Instrument type and make.
2. Serial number.
3. Application.
4. Dates of use.
5. Dates of calibration.

1.7 QUALITY ASSURANCE

A. TAB Specialists Qualifications: Certified by AABC.

1. TAB Field Supervisor: Employee of the TAB specialist and certified by AABC.
2. TAB Technician: Employee of the TAB specialist and certified by AABC as a TAB technician.

B. TAB Specialists Qualifications: Certified by NEBB or TABB.

1. TAB Field Supervisor: Employee of the TAB specialist and certified by NEBB or TABB.
2. TAB Technician: Employee of the TAB specialist and certified by NEBB or TABB as a TAB technician.

C. Instrumentation Type, Quantity, Accuracy, and Calibration: Comply with requirements in ASHRAE 111, Section 4, "Instrumentation."

D. ASHRAE/IES 90.1 Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6.7.2.3 - "System Balancing."

1.8 FIELD CONDITIONS

A. Partial Owner Occupancy: Owner may occupy completed areas of building before Substantial Completion. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems designs that may preclude proper TAB of systems and equipment.

B. Examine installed systems for balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are applicable for intended purpose and are accessible.

C. Examine the approved submittals for HVAC systems and equipment.

D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine ceiling plenums and underfloor air plenums used for supply, return, or relief air to verify that they are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.

F. Examine equipment performance data including fan and pump curves.

1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.

G. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.

H. Examine test reports specified in individual system and equipment Sections.

I. Examine HVAC equipment and verify that bearings are greased, belts are aligned and tight, filters are clean, and equipment with functioning controls is ready for operation.

J. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible, and their controls are connected and functioning.

K. Examine strainers. Verify that startup screens have been replaced by permanent screens with indicated perforations.

L. Examine control valves for proper installation for their intended function of throttling, diverting, or mixing fluid flows.

M. Examine heat-transfer and VRF coils for correct piping connections and for clean and straight fins.

N. Examine system pumps to ensure absence of entrained air in the suction piping.

O. Examine operating safety interlocks and controls on HVAC equipment.

P. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

A. Prepare a TAB plan that includes the following:

1. Equipment and systems to be tested.
2. Strategies and step-by-step procedures for balancing the systems.
3. Instrumentation to be used.
4. Sample forms with specific identification for all equipment.

B. Perform system-readiness checks of HVAC systems and equipment to verify system readiness for TAB work. Include, at a minimum, the following:

1. Airside:

a. Verify that leakage and pressure tests on air distribution systems have been satisfactorily completed.
b. Duct systems are complete with terminals installed.
c. Volume, smoke, and fire dampers are open and functional.
d. Clean filters are installed.
e. Fans are operating, free of vibration, and rotating in correct direction.
f. Variable-frequency controllers' startup is complete, and safeties are verified.
g. Automatic temperature-control systems are operational.
h. Ceilings are installed.
i. Windows and doors are installed.
j. Suitable access to balancing devices and equipment is provided.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.

1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
2. After testing and balancing, install test ports and duct access doors that comply with requirements in Section 233300 "Air Duct Accessories."
3. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Section 230713 "Duct Insulation," Section 230716 "HVAC Equipment Insulation," and Section 230719 "HVAC Piping Insulation."

B. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

C. Take and report testing and balancing measurements in inch-pound (IP) units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Cross-check the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.

D. Confirm operation and calibration of Air Flow monitoring stations in Outside Air Intakes.

E. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.

F. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

G. Verify that motor starters are equipped with properly sized thermal protection.

H. Check dampers for proper position to achieve desired airflow path.

I. Check for airflow blockages.

J. Check condensate drains for proper connections and functioning.

K. Check for proper sealing of air-handling-unit components.

L. Verify that air duct system is sealed as specified in Section 233113 "Metal Ducts."

3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Pre-balance existing systems before any demolition occurs.
   1. Test air systems at the Fans for total air delivered/exhausted.
   2. Test Fan for RPM and amperage vs. maximum rated power.
   3. Report discrepancies greater than 10% with the final design quantities to the Engineer.

B. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.

   1. Measure total airflow.

      a. Set outside-air, return-air, and relief-air dampers for proper position that simulates minimum outdoor-air conditions.
      b. Where duct conditions allow, measure airflow by main Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses, close to the fan and prior to any outlets, to obtain total airflow.
      c. Where duct conditions are not suitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.

   2. Measure fan static pressures as follows:

      a. Measure static pressure directly at the fan outlet or through the flexible connection.
      b. Measure static pressure directly at the fan inlet or through the flexible connection.
      c. Measure static pressure across each component that makes up the air-handling system.
      d. Report artificial loading of filters at the time static pressures are measured.

   3. Adjust fan speed by varying sheave diameter if variable or replace sheave if fixed. Provide new belts and tension appropriately.

   4. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.
   5. Obtain approval from Architect for adjustment of fan speed higher or lower than indicated speed. Comply with requirements in HVAC Sections for air-handling units for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit performance.
   6. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload occurs. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.

C. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows.

   1. Measure airflow of submain and branch ducts.
   2. Adjust submain and branch duct volume dampers for specified airflow.
   3. Re-measure each submain and branch duct after all have been adjusted.

D. Adjust air inlets and outlets for each space to indicated airflows.

   1. Set airflow patterns of adjustable outlets for proper distribution without drafts.

2. Measure inlets and outlets airflow.
3. Adjust each inlet and outlet for specified airflow.
4. Re-measure each inlet and outlet after they have been adjusted.

E. Verify final system conditions.

1. Re-measure and confirm that minimum outdoor, return, and relief airflows are within design. Readjust to design if necessary.
2. Re-measure and confirm that total airflow is within design.
3. Re-measure all final fan operating data, rpms, volts, amps, and static profile.
4. Mark all final settings.
5. Test system in economizer mode. Verify proper operation and adjust if necessary.
6. Measure and record all operating data.
7. Record final fan-performance data.

F. Motors 1/2 HP and Larger: Test at final balanced conditions and record the following data:

1. Manufacturer's name, model number, and serial number.
2. Motor horsepower rating.
3. Motor rpm.
4. Phase and hertz.
5. Nameplate and measured voltage, each phase.
6. Nameplate and measured amperage, each phase.
7. Starter size and thermal-protection-element rating.
8. Service factor and frame size.

G. Motors Driven by Variable-Frequency Controllers: Test manual bypass of controller to prove proper operation.

3.6 PROCEDURES FOR VARIABLE-AIR-VOLUME SYSTEMS

A. Adjust the variable-air-volume systems as follows:

1. Verify that the system static pressure sensor is located two-thirds of the distance down the duct from the fan discharge.
2. Verify that the system is under static pressure control.
3. Select the terminal unit that is most critical to the supply-fan airflow. Measure inlet static pressure and adjust system static pressure control set point so the entering static pressure for the critical terminal unit is not less than the sum of the terminal-unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge system losses.
4. Calibrate and balance each terminal unit for maximum and minimum design airflow as follows:

    a. Adjust controls so that terminal is calling for maximum airflow. Some controllers require starting with minimum airflow. Verify calibration procedure for specific project.
    b. Measure airflow and adjust calibration factor as required for design maximum airflow. Record calibration factor.
    c. When maximum airflow is correct, balance the air outlets downstream from terminal units.
    d. Adjust controls so that terminal is calling for minimum airflow.

e. Measure airflow and adjust calibration factor as required for design minimum airflow. Record calibration factor. If no minimum calibration is available, note any deviation from design airflow.

5. After terminals have been calibrated and balanced, test and adjust system for total airflow. Adjust fans to deliver total design airflows within the maximum allowable fan speed listed by fan manufacturer.

   a. Set outside-air, return-air, and relief-air dampers for proper position that simulates minimum outdoor-air conditions.
   b. Set terminals for maximum airflow. If system design includes diversity, adjust terminals for maximum and minimum airflow so that connected total matches fan selection and simulates actual load in the building.
   c. Where duct conditions allow, measure airflow by Pitot-tube traverse. If necessary, perform multiple Pitot-tube traverses to obtain total airflow.
   d. Where duct conditions are not suitable for Pitot-tube traverse measurements, a coil traverse may be acceptable.
   e. If a reliable Pitot-tube traverse or coil traverse is not possible, measure airflow at terminals and calculate the total airflow.

6. Measure fan static pressures as follows:

   a. Measure static pressure directly at the fan outlet or through the flexible connection.
   b. Measure static pressure directly at the fan inlet or through the flexible connection.
   c. Measure static pressure across each component that makes up the air-handling system.
   d. Report any artificial loading of filters at the time static pressures are measured.

7. Set final return and outside airflow to the fan while operating at maximum return airflow and minimum outdoor airflow.

   a. Balance the return-air ducts and inlets the same as described for constant-volume air systems.
   b. Verify that terminal units are meeting design airflow under system maximum flow.

8. Re-measure the inlet static pressure at the most critical terminal unit and adjust the system static pressure set point to the most energy-efficient set point to maintain the optimum system static pressure. Record set point and give to controls contractor.
9. Verify final system conditions as follows:

   a. Re-measure and confirm that minimum outdoor, return, and relief airflows are within design. Readjust to match design if necessary.
   b. Re-measure and confirm that total airflow is within design.
   c. Re-measure final fan operating data, rpms, volts, amps, and static profile.
   d. Mark final settings.
   e. Test system in economizer mode. Verify proper operation and adjust if necessary. Measure and record all operating data.
   f. Verify tracking between supply and return fans.

3.7 PROCEDURES FOR VRF DUCT COILS

A. Verify piping connections are properly made.

B. Verify the Expansion valve is functioning properly.

C. Record Discharge air temperature at different setpoints or load conditions.

3.8 PROCEDURES FOR CONDENSING UNITS

A. Verify proper rotation of fans.

B. Measure entering- and leaving-air temperatures.

C. Record fan and motor operating data at different load and ambient conditions.

3.9 SOUND TESTS

A. After the systems are balanced and construction is Substantially Complete, measure and record sound levels at 5 locations as designated by the Architect.

B. Instrumentation:

1. The sound-testing meter shall be a portable, general-purpose testing meter consisting of a microphone, processing unit, and readout.
2. The sound-testing meter shall be capable of showing fluctuations at minimum and maximum levels, and measuring the equivalent continuous sound pressure level (LEQ).
3. The sound-testing meter must be capable of using 1/3 octave band filters to measure mid-frequencies from 31.5 Hz to 8000 Hz.
4. The accuracy of the sound-testing meter shall be plus or minus one decibel.

C. Test Procedures:

1. Perform test at quietest background noise period. Note cause of unpreventable sound that affects test outcome.
2. Equipment should be operating at design values.
3. Calibrate the sound-testing meter prior to taking measurements.
4. Use a microphone suitable for the type of noise levels measured that is compatible with meter. Provide a windshield for outside or in-duct measurements.
5. Record a set of background measurements in dBA and sound pressure levels in the eight un-weighted octave bands 63 Hz to 8000 Hz (NC) with the equipment off.
6. Take sound readings in dBA and sound pressure levels in the eight un-weighted octave bands 63 Hz to 8000 Hz (NC) with the equipment operating.
7. Take readings no closer than 36 inches from a wall or from the operating equipment and approximately 60 inches from the floor, with the meter held or mounted on a tripod.
8. For outdoor measurements, move sound-testing meter slowly and scan area that has the most exposure to noise source being tested. Use A-weighted scale for this type of reading.

D. Reporting:

1. Report shall record the following:

    a. Location.
    b. System tested.
    c. dBA reading.
    d. Sound pressure level in each octave band with equipment on and off.

2. Plot sound pressure levels on NC worksheet with equipment on and off.

3.10 CONTROLS VERIFICATION

A. In conjunction with system balancing, perform the following:

1. Verify temperature control system is operating within the design limitations.
2. Confirm that the sequences of operation are in compliance with Contract Documents.
3. Verify that controllers are calibrated and function as intended.
4. Verify that controller set points are as indicated.
5. Verify the operation of lockout or interlock systems.
6. Verify the operation of valve and damper actuators.
7. Verify that controlled devices are properly installed and connected to correct controller.
8. Verify that controlled devices travel freely and are in position indicated by controller: open, closed, or modulating.
9. Verify location and installation of sensors to ensure that they sense only intended temperature, humidity, or pressure.

B. Reporting: Include a summary of verifications performed, remaining deficiencies, and variations from indicated conditions.

3.11 PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING EXISTING SYSTEMS

A. Perform a preconstruction inspection of existing equipment that is to remain and be reused.

1. Measure and record the operating speed, airflow, and static pressure of each fan.
2. Measure motor voltage and amperage. Compare the values to motor nameplate information.
3. Check the refrigerant charge.
4. Check the condition of filters.
5. Check the condition of coils.
6. Check the operation of the drain pan and condensate-drain trap.
7. Check bearings and other lubricated parts for proper lubrication.
8. Report on the operating condition of the equipment and the results of the measurements taken. Report deficiencies.

B. Before performing testing and balancing of existing systems, inspect existing equipment that is to remain and be reused to verify that existing equipment has been cleaned and refurbished. Verify the following:

1. New filters are installed.
2. Coils are clean and fins combed.
3. Drain pans are clean.
4. Fans are clean.

5. Bearings and other parts are properly lubricated.
6. Deficiencies noted in the preconstruction report are corrected.

C. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.

1. Compare the indicated airflow of the renovated work to the measured fan airflows, and determine the new fan speed and the face velocity of filters and coils.
2. Verify that the indicated airflows of the renovated work result in filter and coil face velocities and fan speeds that are within the acceptable limits defined by equipment manufacturer.
3. If calculations increase or decrease the airflow rates and water flow rates by more than 5 percent, make equipment adjustments to achieve the calculated rates. If increase or decrease is 5 percent or less, equipment adjustments are not required.
4. Balance each air outlet.

3.12 TOLERANCES

A. Set HVAC system's airflow rates and water flow rates within the following tolerances:

1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 10 percent.
2. Air Outlets and Inlets: Plus or minus 10 percent.
3. Heating-Water Flow Rate: Plus or minus 10 percent.

B. Maintaining pressure relationships as designed shall have priority over the tolerances specified above.

3.13 PROGRESS REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems balancing devices. Recommend changes and additions to systems balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

B. Status Reports: Prepare biweekly progress reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.14 FINAL REPORT

A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.

1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
2. Include a list of instruments used for procedures, along with proof of calibration.
3. Certify validity and accuracy of field data.

B. Final Report Contents: In addition to certified field-report data, include the following:

1. Pump curves.
2. Fan curves.
3. Manufacturers' test data.
4. Field test reports prepared by system and equipment installers.
5. Other information relative to equipment performance; do not include Shop Drawings and Product Data.

C. General Report Data: In addition to form titles and entries, include the following data:

1. Title page.
2. Name and address of the TAB specialist.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.
7. Contractor's name and address.
8. Report date.
9. Signature of TAB supervisor who certifies the report.
10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
11. Summary of contents including the following:

    a. Indicated versus final performance.
    b. Notable characteristics of systems.
    c. Description of system operation sequence if it varies from the Contract Documents.

12. Nomenclature sheets for each item of equipment.
13. Data for terminal units, including manufacturer's name, type, size, and fittings.
14. Notes to explain why certain final data in the body of reports vary from indicated values.
15. Test conditions for fans and pump performance forms including the following:

    a. Settings for outdoor-, return-, and exhaust-air dampers.
    b. Conditions of filters.
    c. Face and bypass damper settings at coils.
    d. Fan drive settings including settings and percentage of maximum pitch diameter.
    e. Inlet vane settings for variable-air-volume systems.
    f. Settings for supply-air, static-pressure controller.
    g. Other system operating conditions that affect performance.

D. System Diagrams: Include schematic layouts of air distribution systems. Present each system with single-line diagram and include the following:

1. Quantities of outdoor, supply, return, and exhaust airflows.
2. Duct, outlet, and inlet sizes.
3. Balancing stations.
4. Position of balancing devices.

E. Apparatus-Coil Test Reports:

1. Coil Data:

a. System identification.
b. Location.
c. Coil type.
d. Number of rows.
e. Fin spacing in fins per inch o.c.
f. Make and model number.

2. Test Data (Indicated and Actual Values):

a. Airflow rate in cfm.
b. Average face velocity in fpm.
c. Air pressure drop in inches wg.
d. Outdoor-air, wet- and dry-bulb temperatures in deg F.
e. Return-air, wet- and dry-bulb temperatures in deg F.
f. Entering-air, wet- and dry-bulb temperatures in deg F.
g. Leaving-air, wet- and dry-bulb temperatures in deg F.

F. Fan Test Reports: For supply, return, and exhaust fans, include the following:

1. Fan Data:

a. System identification.
b. Location.
c. Make and type.
d. Model number and size.
e. Manufacturer's serial number.
f. Arrangement and class.
g. Sheave make, size in inches, and bore.
h. Center-to-center dimensions of sheave and amount of adjustments in inches.

2. Motor Data:

a. Motor make, and frame type and size.
b. Horsepower and rpm.
c. Volts, phase, and hertz.
d. Full-load amperage and service factor.

3. Test Data (Indicated and Actual Values):

a. Total airflow rate in cfm.
b. Total system static pressure in inches wg.
c. Fan rpm.
d. Discharge static pressure in inches wg.
e. Suction static pressure in inches wg.

G. Round, Flat-Oval, and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:

1. Report Data:

a. System and air-handling-unit number.
b. Location and zone.
c. Traverse air temperature in deg F.

d. Duct static pressure in inches wg.
e. Duct size in inches.
f. Duct area in sq. ft..
g. Indicated airflow rate in cfm.
h. Indicated velocity in fpm.
i. Actual airflow rate in cfm.
j. Actual average velocity in fpm.
k. Barometric pressure in psig.

H. System-Coil Reports: For reheat coils and water coils of terminal units, include the following:

1. Unit Data:

a. System and air-handling-unit identification.
b. Location and zone.
c. Room or riser served.
d. Coil make and size.
e. Flowmeter type.

2. Test Data (Indicated and Actual Values):

a. Airflow rate in cfm.
b. Entering-water temperature in deg F.
c. Leaving-water temperature in deg F.
d. Water pressure drop in feet of head or psig.
e. Entering-air temperature in deg F.
f. Leaving-air temperature in deg F.

I. Instrument Calibration Reports:

1. Report Data:

a. Instrument type and make.
b. Serial number.
c. Application.
d. Dates of use.
e. Dates of calibration.

3.15 VERIFICATION OF TAB REPORT

A. The TAB specialist's test and balance engineer shall conduct the inspection in the presence of Construction Manager.

B. Commissioning authority shall randomly select measurements, documented in the final report, to be rechecked. Rechecking shall be limited to either 10 percent of the total measurements recorded or the extent of measurements that can be accomplished in a normal 8-hour business day.

C. If rechecks yield measurements that differ from the measurements documented in the final report by more than the tolerances allowed, the measurements shall be noted as "FAILED."

D. If the number of "FAILED" measurements is greater than 10 percent of the total measurements checked during the final inspection, the testing and balancing shall be considered incomplete and shall be rejected.

E. If TAB work fails, proceed as follows:

1. TAB specialists shall recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes; resubmit the final report and request a second final inspection.
2. If the second final inspection also fails, Owner may contract the services of another TAB specialist to complete TAB work according to the Contract Documents and deduct the cost of the services from the original TAB specialist's final payment.
3. If the second verification also fails, design professional may contact AABC Headquarters regarding the AABC National Performance Guaranty.

F. Prepare test and inspection reports.

3.16 ADDITIONAL TESTS

A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions.

END OF SECTION 23 05 93

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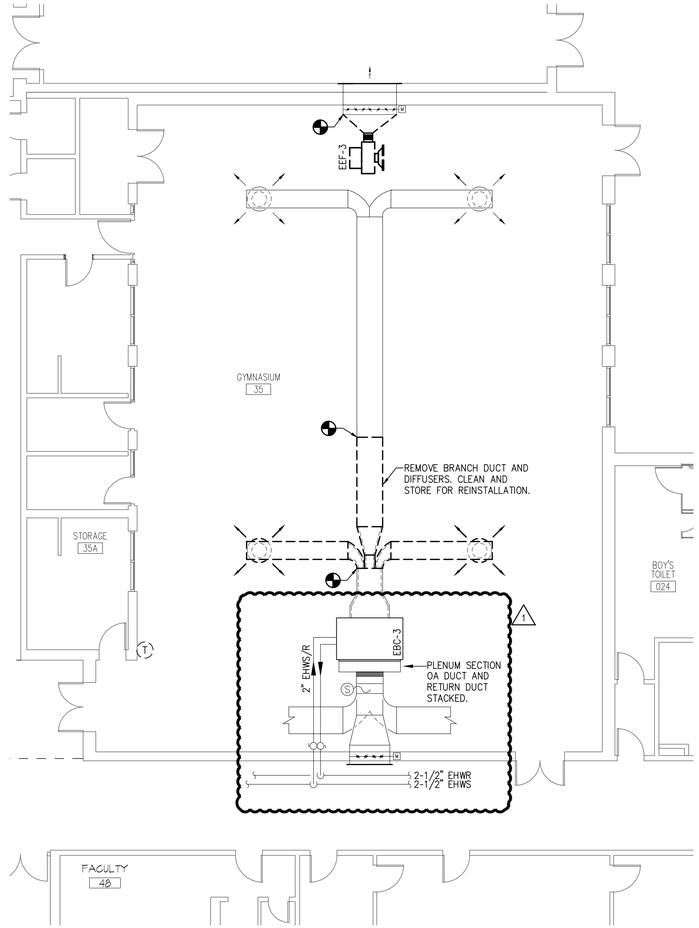
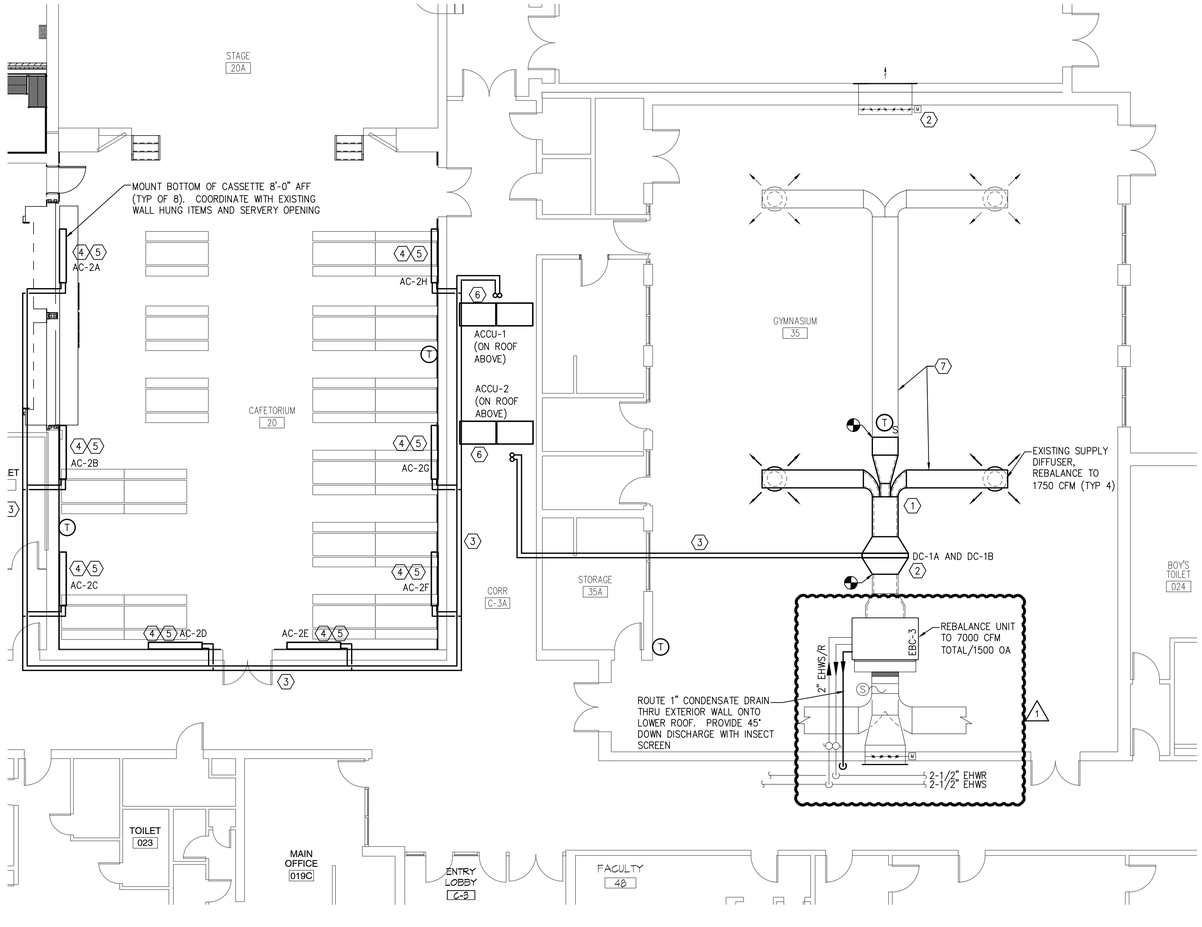
GENERAL NOTES	
1	FIELD VERIFY ALL EXISTING DUCT DIMENSIONS AND CLEARANCES. REPORT DISCREPANCIES TO THE ENGINEER.
2	THE CONTRACTOR SHALL PROTECT EXISTING SERVICES AND EQUIPMENT DURING THE WORK.

(#)	RENOVATION KEY NOTES
1	RELOCATE DIFFUSERS AND BRANCH DUCT ONE TRUSS BAY TO ACCOMMODATE NEW VRF DUCT COIL.
2	EXISTING MOTORIZED DAMPER TO OPEN TO 30% WHEN BLOWER COIL OA DAMPER IS OPEN.
3	REFRIGERANT LINES SIZE PER MANUFACTURERS RECOMMENDATIONS. INSTALL REFRIGERANT PIPING ABOVE ROOF WHEN CROSSING CORRIDORS. DO NOT INSTALL IN CORRIDORS OR ABOVE CORRIDOR CEILINGS
4	ROUTE CONDENSATE TO THE ADJACENT LOWER ROOF. PROVIDE CONDENSATE PUMP WITH EACH INDOOR CASSETTE. HIDE REF. PIPING AND CONDENSATE DRAIN IN "LINE-HIDE" WHERE EXPOSED ON CAFE WALLS
5	MOUNT CASSETTES AT APPROXIMATELY 8 FEET AFF. ALL CASSETTES SHALL BE AT A UNIFORM HEIGHT COORDINATE LOCATIONS TO AVOID EXISTING ELECTRICAL. REFER TO DETAIL 6/BES-H501
6	INSTALL CONDENSING UNITS ON SUPPORT STAND ATTACHED TO ROOF PER DETAIL 3/BES-H501.
7	MC TO PAINT ALL EXISTING AND NEW DUCTWORK IN GYMNASIUM. COORDIANTE WITH ARCHITECT AND A-DWGS FOR PAINT COLOR



1 GYM REMOVAL PLAN
BES-H101 SCALE: 1/8" = 1'-0"



2 GYM & CAFE RENOVATION PLAN
BES-H101 SCALE: 1/8" = 1'-0"

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

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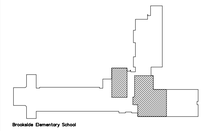
MS - #66-24-02-06-0-007-027
CES - #66-24-02-06-0-003-022
MES - #66-24-02-06-0-004-025
BES - #66-24-02-06-0-002-020



Yorktown CENTRAL SCHOOL DISTRICT

DISTRICT WIDE IMPROVEMENTS 2020 PHASE II

BROOKSIDE ELEMENTARY SCHOOL
2285 BROAD ST.
YORKTOWN HEIGHTS, NY 10598

REVISIONS

No.	Description	Date
1	ADDENDUM #2	2021.11.17

ISSUED: BID ISSUE

DATE: 10/25/2021

SCALE: AS NOTED

SHEET NAME:
GYMNASIUM & CAFETERIA REMOVAL & RENOVATION PLANS

SHEET NUMBER:
BES-H101

PROJECT NUMBER: 1710402

REMOVALS

- JUNCTION BOX
- HVAC STARTER/MOTOR CONTROLLER
- DISCONNECT ELECTRIC TO MOTOR AND REMOVE IN ITS ENTIRETY BACK TO SOURCE
- EXISTING LIGHT FIXTURE

1 POWER & SYSTEMS

- DISCONNECT SWITCH, RATINGS AS INDICATED ON FLOOR PLANS
- FEEDER CONDUIT WITH CONDUCTORS
- LP-1 — BRANCH CIRCUIT HOMERUN TO PANELBOARD. NUMBER OF ARROWS INDICATES NUMBER OF CIRCUITS. CAPITAL LETTER WITH NUMERALS INDICATE PANEL DESIGNATION AND NUMERAL INDICATES PANEL CIRCUIT BREAKER NUMBER.
- ACCU-* — CONDENSING UNIT (OUTDOOR), (PROVIDED UNDER MC CONTRACT, LINE VOLTAGE WIRING BY EC)
- GROUND FAULT CIRCUIT INTERRUPTING RECEPTACLE (GFCI) WITH UL LISTED WEATHERPROOF WHILE IN USE COVER.
- EXISTING SURFACE MOUNTED PANELBOARD
- EXISTING RECESS MOUNTED PANELBOARD

ABBREVIATIONS

ABBREVIATION	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFR	ABOVE FINISHED ROOF
AWG	AMERICAN WIRE GUAGE
BFG	BELOW FINISHED GRADE
C	CONDUIT
CB	CIRCUIT BREAKER
EAHU	EXISTING AIR HANDLING UNIT
EC	ELECTRICAL CONTRACTOR
EGC	EQUIPMENT GROUNDING CONDUCTOR
EXR	EXISTING TO REMAIN
FBO	FURNISHED BY OWNER
FIBO	FURNISHED AND INSTALLED BY OWNER
G	VANDAL GUARD
GC	GENERAL CONTRACTOR
GFI	GROUND FAULT INTERRUPTER
HID	HIGH INTENSITY DISCHARGE (METAL HALIDE)
MC	MECHANICAL CONTRACTOR
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
RGS	RIGID GALVANIZED STEEL
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
WP	WEATHER PROOF WHILE IN USE COVER

MOUNTING HEIGHTS

UNLESS OTHERWISE NOTED, MOUNT DEVICES AND EQUIPMENT AT HEIGHTS MEASURED FROM FINISHED FLOOR TO DEVICE/ EQUIPMENT CENTERLINE AS LISTED BELOW.

COORDINATE DEVICE LOCATIONS WITH ARCHITECTURAL ELEVATIONS PRIOR TO ROUGH-IN.

WHERE STRUCTURAL OR OTHER INTERFERENCE'S PREVENT COMPLIANCE WITH MOUNTING HEIGHTS LISTED BELOW, CONSULT OWNER'S REPRESENTATIVE FOR APPROVAL TO CHANGE LOCATION BEFORE INSTALLATION.

DISCONNECT SWITCH HANDLE, UON 48"

GENERAL NOTES - INSTALLATION

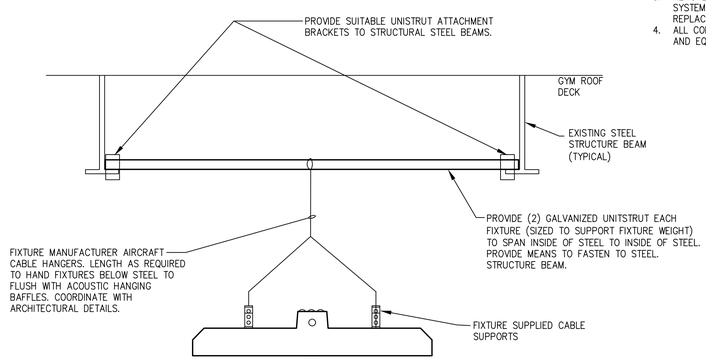
1. NEW BRANCH CIRCUITRY SHALL BE INSTALLED ABOVE CEILING WHERE POSSIBLE, AS HIGH AS POSSIBLE.
2. ALL EQUIPMENT SHOWN ON REMOVALS PLANS SHALL BE REMOVED, UNLESS OTHERWISE NOTED. REMOVE ONLY ASSOCIATED WIRING WITHIN ROOM. ASSOCIATED EXISTING BRANCH CIRCUIT WIRING HOMERUN BACK TO PANEL IN EACH ROOM SHALL REMAIN FOR CONNECTION TO NEW LIGHTING BRANCH CIRCUIT WIRING SHOWN, UNLESS OTHERWISE NOTED.
3. COORDINATE ALL CONDUIT RUNS WITH OTHER TRADES PRIOR TO ROUGH-IN. RELOCATE ANY CONDUITS AS NECESSARY TO PERMIT INSTALLATION OF DUCTWORK OR PIPING.
4. INSTALL ALL CIRCUITING CONCEALED INSIDE WALL CAVITY WHERE EVER POSSIBLE. PROVIDE SURFACE MOUNTED BACKBOXES AND RACEWAY FOR WIRING DEVICES LOCATED ON EXISTING SOLID WALL CONSTRUCTION. PROVIDE SHALLOW TYPE BACKBOXES FOR SURFACE MOUNTED POWER AND SWITCHING APPLICATIONS. REFER TO ARCHITECTURAL PLANS FOR WALL TYPES.
5. FIRESTOP ALL LOW VOLTAGE SLEEVES AND PENETRATIONS AFTER INSTALLATION OF CABLE.
6. PROVIDE OPEN TOP CABLE HANGERS 4' ON CENTER SUPPORTED TO SUPPORT ALL LOW VOLTAGE CABLING ABOVE ACCESSIBLE CEILINGS. PROVIDE SEPARATE CABLE
9. HANGERS FOR FIRE ALARM CABLING. INSTALL ALL EXPOSED CABLES IN EMT CONDUIT OR SURFACE RACEWAY IN FINISHED AREAS.
7. ALL LOW VOLTAGE CABLING SHALL BE PLENUM RATED.
8. OBTAIN WIRING AND INSTALLATION DIAGRAMS FOR ALL ELECTRICAL CONNECTIONS TO EQUIPMENT PROVIDED BY MECHANICAL CONTRACTOR PRIOR TO ROUGHING. WORK THAT IS NOT PROPERLY COORDINATED WILL BE RELOCATED AT NO COST TO THE OWNER.

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	LAMPS	VOLTAGE	MOUNTING	CEILING TYPE	MANUFACTURERS	NOTES
L1	NOMINAL 2' X 4' LED HIGH BAY TROFFER (3) LED LIGHT BARS, RUGGED ALUMINUM MATTE WHITE HOUSING. GLOSS WHITE WIRE GUARD OVER HOUSING. nLIGHT nMS360D INTEGRAL 360 DEGREE HIGH MOUNT MOTION SENSOR WITH DIMMING, PRE-WIRED. nLIGHT N80 CONTROL, ELDOLED DIMMING DRIVER 0-10V CONTINUOUS DIMMING DRIVER DOWN TO 1% STANDARD EFFICIENCY.	LED 102 WATTS, 18000 LUMENS, 90+ CRI, 4000K TEMPERATURE	120V	(2) FACTORY 10' V AIRCRAFT CABLES PER FIXTURE TO UNI-STRUT	EXPOSED STRUCTURE	LITHONIA "IBG SERIES" OR EQUAL BY METALUX OR HUBBELL	AIRCAFT CABLES MOUNT FIXTURES FROM UNI-STRUT TO FLUSH WITH ACCOUSTIC BAFFLES ~26'-0"AFF

(XX) SYMBOL REPRESENTS KEYED NOTE THAT APPLIES TO THAT DRAWING ONLY.

(X) SYMBOL REPRESENTS REMOVAL KEYED NOTE THAT APPLIES TO THAT REMOVAL DRAWING ONLY.



1 BES-000 GYM LIGHTING HIGH BAY INSTALLATION DETAIL
SCALE: NONE

GENERAL NOTES

1. PROVIDE 50 ACT CEILING TILES OF EACH SIZE; 2'X2' AND 2'X4' TILES TO MATCH EXISTING WITHIN THE BUILDING. COORDINATE WITH OWNER FOR EXACT TYPE. REUSE AND RELOCATE EXISTING GOOD TILES PREVIOUSLY HOUSING FIRE ALARM CEILING DEVICES TO INSTALL REPLACEMENT DEVICES INTO. IF TILE IS NOT ACCEPTABLE FOR MOUNTING, PROVIDE REPLACEMENT FROM QUANTITY ABOVE.
2. ALL DEVICES AND EQUIPMENT SHOWN ON DEMOLITION PLANS SHALL BE REMOVED, INCLUDING WIRING AND CONDUIT BACK TO SOURCE, UNLESS OTHERWISE NOTED.
3. EC IS RESPONSIBLE TO PATCH AND PAINT AS NECESSARY TO MATCH FINISHED SPACE MATERIALS AND PAINT AROUND ALL FIRE ALARM WALL MOUNTED DEVICE BOXES WHEN INSTALLED WHERE EXISTING WALL DEVICE WAS LOCATED. COORDINATE WITH OWNER FOR PAINT TYPES.
4. PATCH AND PAINT ANY REMOVED WALL MOUNTED DEVICES AND CONDUIT LOCATIONS TO MATCH FINISHED SPACE MATERIALS AND PAINT. PROVIDE BLANK COVERPLATES AND PAINT TO MATCH FINISHED SPACE WHERE DEVICES WERE INSTALLED IN CMU BLOCK WALLS. COORDINATE WITH OWNER FOR PAINT TYPES.
3. REMOVE AND REINSTALL EXISTING ACOUSTICAL CEILING SYSTEM TILES AS REQUIRED TO INSTALL ELECTRICAL WORK. REPLACE ANY DAMAGED TILES AS A RESULT OF WORK.
4. ALL CONTRACTORS SHALL PROTECT EXISTING SURFACES AND EQUIPMENT.

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YHS - #66-24-02-06-0-005-028
MS - #66-24-02-06-0-007-027
CES - #66-24-02-06-0-003-022
MES - #66-24-02-06-0-004-025
BES - #66-24-02-06-0-002-020

Crompond Elementary School

Yorktown CENTRAL SCHOOL DISTRICT

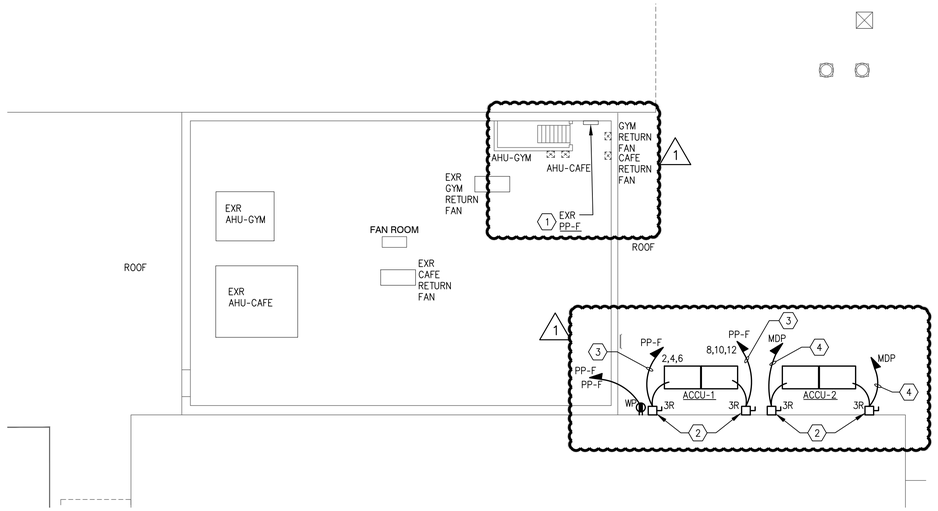
DISTRICT WIDE IMPROVEMENTS 2020 PHASE II

CROMPOND SCHOOL
2901 MANOR STREET.
YORKTOWN HEIGHTS, NY 10598

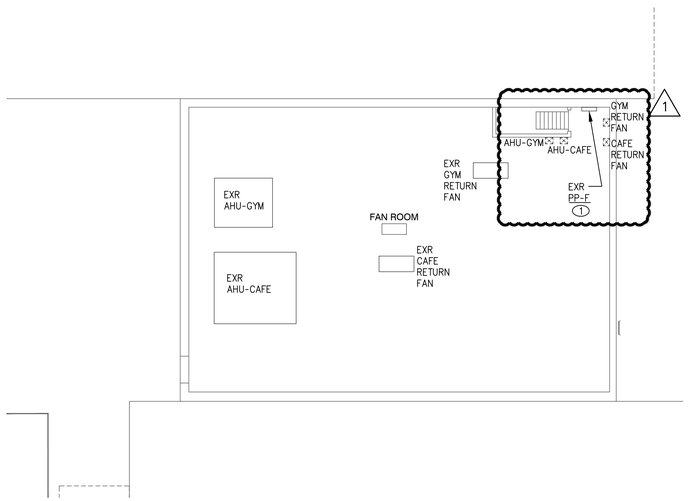
REVISIONS

No.	Description	Date
1	ADDENDUM #2	2021.11.17

ISSUED: BID ISSUE
DATE: 10/25/2021
SCALE: AS NOTED
SHEET NAME: ELECTRICAL LEGEND & ABBREVIATIONS
SHEET NUMBER: CES-E000



2 FAN ROOM POWER & SYSTEMS PLAN
CES-E102 SCALE: 1/8" = 1'-0"



1 FAN ROOM REMOVALS PLAN
CES-E102 SCALE: 1/8" = 1'-0"

1

KEYED NOTES

1. PROVIDE (2) 60 AMP, 208 VOLT, 3-POLE, 22K AIC, CIRCUIT BREAKERS INSTALLED WITHIN EXISTING PANELBOARD. INSTALL (1) 60A/3P IN CIRCUIT (2,4,6) AND (1) 60A/3P IN CIRCUIT (8,10,12). CIRCUIT BREAKERS TO BE UL LISTED FOR INSTALLATION INTO EXISTING PANELBOARD MANUFACTURED BY CUTLER HAMMER POW-R-LINE C PRL1A.
2. PROVIDE (1) 60 AMP, 240 VOLT, 3-POLE, NEMA 3R NON-FUSED HEAVY DUTY DISCONNECT SWITCH MOUNTED ON WALL AT 48" AFR.
3. PROVIDE 3-#6 AWG, 1-#10 AWG EGC IN 1" CONDUIT. ROUTE FEEDER BACK INTO FAN ROOM FOLLOWING ROUTING OF HVAC PIPING. ROUTE FEEDER INSIDE OF BUILDING ABOVE ACCESSIBLE CEILING AREAS IN CORRIDORS.
4. PROVIDE 3-#4 AWG, 1-#8 AWG EGC IN 1" CONDUIT. ROUTE FEEDER BACK INTO FAN ROOM FOLLOWING ROUTING OF HVAC PIPING. ROUTE FEEDER INSIDE OF BUILDING ABOVE ACCESSIBLE CEILING AREAS IN CORRIDORS TO BOILER ROOM.

1

REMOVAL KEYED NOTES

1. REMOVE SPARE CIRCUIT BREAKER NUMBER 2,4,6 (30A/3P) AND CIRCUIT BREAKER NUMBER 8,10,12 (20A/3P) AND TURN OVER TO OWNER.

NORTH

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

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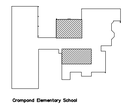


Yorktown CENTRAL SCHOOL DISTRICT

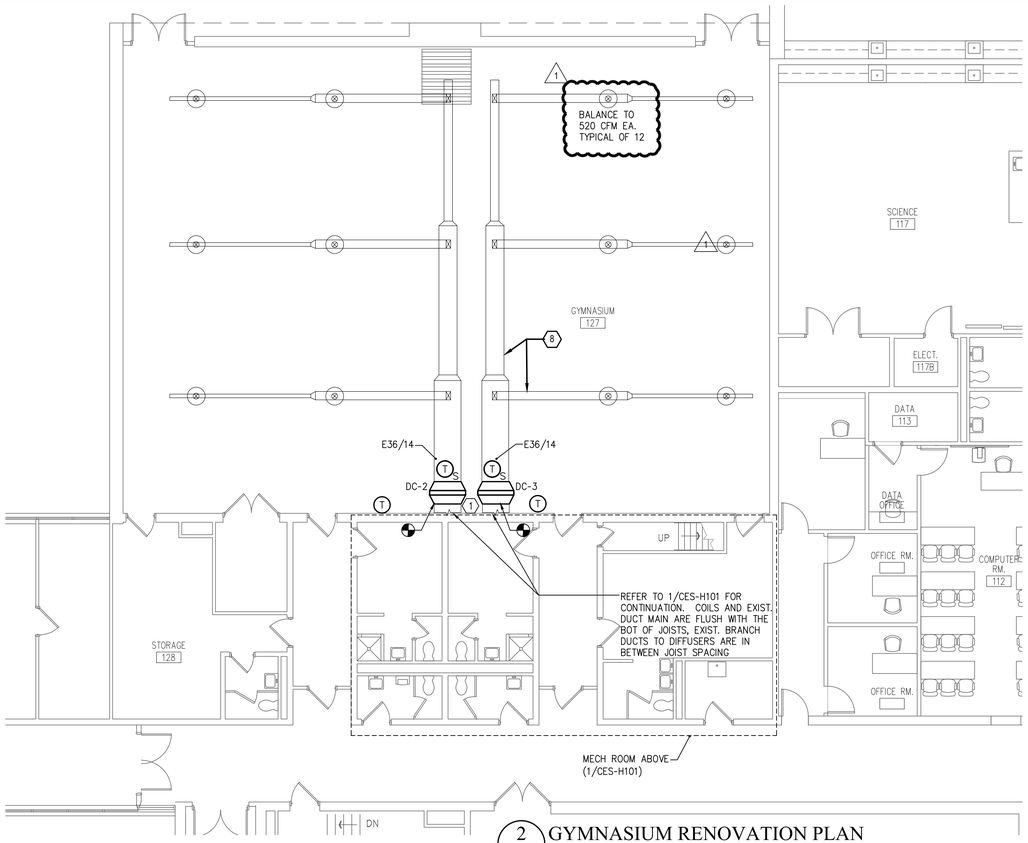
DISTRICT WIDE
IMPROVEMENTS 2020
PHASE II

CROMPOND SCHOOL
2901 MANOR STREET.
YORKTOWN HEIGHTS, NY
10598

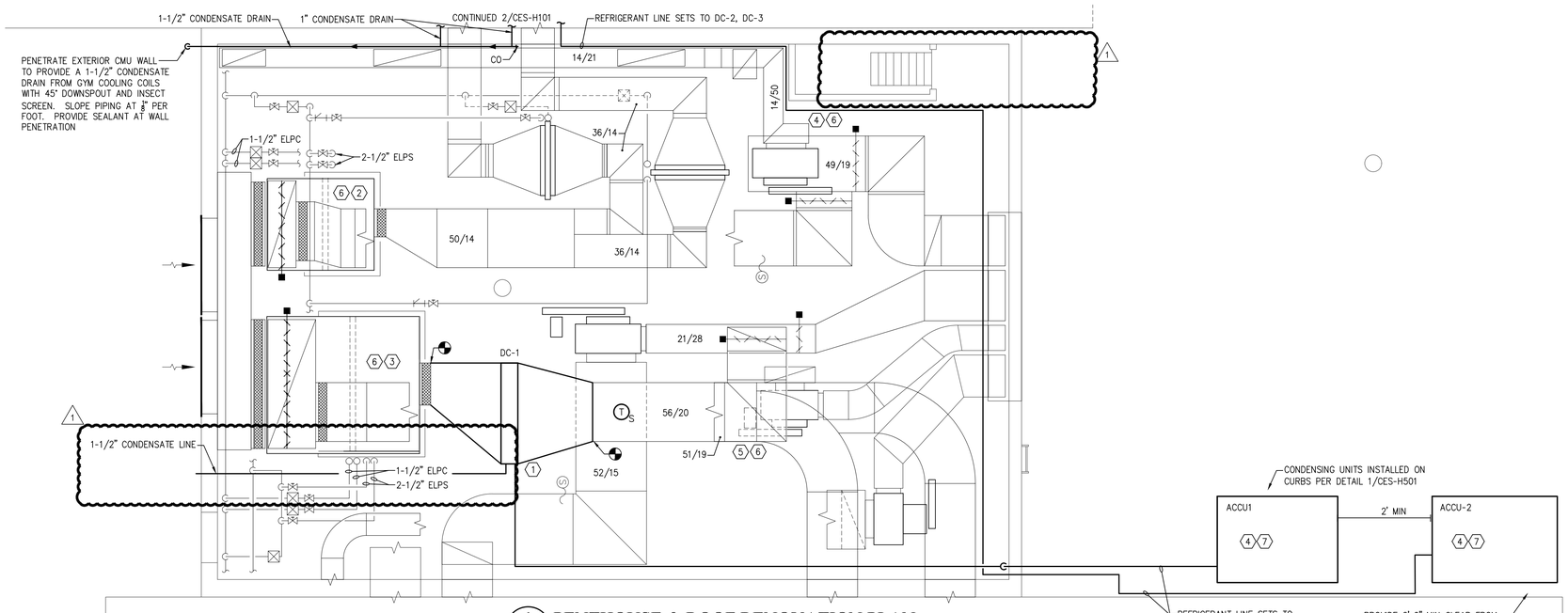
REVISIONS

No.	Description	Date
1	ADDENDUM #2	2021.11.17

ISSUED: BID ISSUE
DATE: 10/25/2021
SCALE: AS NOTED
SHEET NAME:
FAN ROOM
POWER & SYSTEMS PLANS
SHEET NUMBER:
CES-E102



2 GYMNASIUM RENOVATION PLAN
CES-H101 SCALE: 1/8" = 1'-0"



1 PENTHOUSE & ROOF RENOVATION PLAN
CES-H101 SCALE: 1/4" = 1'-0"

GENERAL NOTES	
1	FIELD VERIFY ALL EXISTING DUCT DIMENSIONS AND CLEARANCES. REPORT DISCREPANCIES TO THE ENGINEER.
2	THE CONTRACTOR SHALL PROTECT EXISTING SERVICES AND EQUIPMENT DURING THE WORK.

(#)	RENOVATION KEY NOTES
1	PROVIDE DRIP PAN UNDER COOLING COIL. ROUTE CONDENSATE DRAIN INTO MECH ROOM AND DRAIN OUT ON ROOF
2	RE-BALANCE H&V UNIT TO 6100 CFM TOTAL AND 1500 CFM OUTSIDE AIR.
3	RE-BALANCE H&V UNIT TO 6800 CFM TOTAL AND 2000 CFM OUTSIDE AIR.
4	RE-BALANCE EXHAUST FAN TO 1000 CFM
5	RE-BALANCE EXHAUST FAN TO 1500 CFM
6	PROVIDE VFD TO BE USED FOR BALANCE PURPOSES.
7	PROVIDE SUPPORT DUNNAGE FOR CONDENSING UNITS PER DETAIL 1/CES-H501.
8	MC TO PAINT ALL EXISTING AND NEW DUCTWORK INSIDE GYMNASIUM. COORDINATE WITH ARCHITECT ON PAINT COLOR

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

ARCHITECT

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SED CONTROL NUMBERS
YHS - #66-24-02-06-0-005-028
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MES - #66-24-02-06-0-004-025
BES - #66-24-02-06-0-002-020

Crompond Elementary School

Yorktown CENTRAL SCHOOL DISTRICT

DISTRICT WIDE IMPROVEMENTS 2020 PHASE II

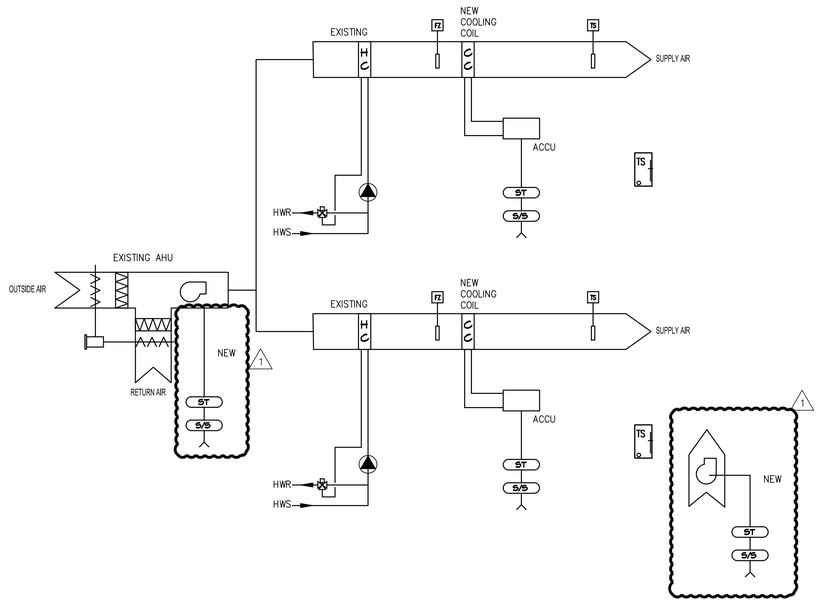
CROMPOND SCHOOL
2901 MANOR STREET.
YORKTOWN HEIGHTS, NY 10598

REVISIONS

No.	Description	Date
1	ADDENDUM #2	2021.11.17

ISSUED: BID ISSUE
DATE: 10/25/2021
SCALE: AS NOTED
SHEET NAME:
GYMNASIUM & ROOF RENOVATION PLANS

SHEET NUMBER:
CES-H101



SEQUENCE OF OPERATIONS

1

THE EXISTING AHU'S NORMAL SEQUENCE OF OPERATIONS SHALL BE MAINTAINED INCLUDING:
a. OCCUPIED/UNOCCUPIED SCHEDULE OF OPERATION.
b. HEATING SETPOINTS AND CONTROL.
c. OUTSIDE AIR VENTILATION (REBALANCED TO NEW CFM).

NEW DUCT COOLING COIL SEQUENCE OF OPERATION

1. THE COOLING COIL VRF SYSTEM SHALL ONLY BE ENABLED WHEN THE ASSOCIATED AHU IS OPERATING.

2. PRE-OCCUPIED START-UP
 2.a. IF ONE HOUR PRIOR TO THE NORMAL START SCHEDULE THE SPACE CALLS FOR COOLING A PRE-COOLING CYCLE SHALL COMMENCE.
  2.a.1. THE AHU RETURN AIR DAMPER SHALL OPEN.
  2.a.2. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED.
  2.a.3. THE AHU SUPPLY FAN SHALL START.
 2.b. THE SYSTEM SHALL BRING THE SPACE TO NORMAL OCCUPIED TEMPERATURES.
  2.b.1. THE DISCHARGE TEMPERATURE IN THE SUPPLY DUCT SHALL NOT BE LOWER THAN 65°F TO PREVENT CONDENSATION ON THE OUTSIDE OF UNINSULATED DUCTS.
 2.c. THE SA TEMPERATURE SETPOINT SHALL BE LOWERED BY 2 DEGREES F EVERY 15 MINUTES UNTIL EITHER THE ROOM TEMPERATURE IS SATISFIED OR THE MINIMUM SA TEMPERATURE IS REACHED.
 2.d. SETPOINT TEMPERATURES ARE THE NORMAL OCCUPIED VALUES.
 2.e. THE DX COMPRESSOR SHALL START IF FREE COOLING IS NOT AVAILABLE.

3. SETPOINT TEMPERATURES: COOLING: 72 DEGREES (ADJUSTABLE).

1

4. OCCUPIED SCHEDULE OPERATION:
 4.a. THE SUPPLY FAN SHALL RUN.
 4.b. THE OUTSIDE AIR DAMPER SHALL OPEN TO THE MINIMUM POSITION. THE EXHAUST FAN SHALL START.
 4.c. THE CONTROLLER SHALL CONTINUE TO MONITOR THE SPACE TEMPERATURE AND MODULATE VRF COMPRESSOR.
  4.c.1. THE CAFETERIA SUPPLY AIR TEMPERATURE SHALL BE LIMITED TO A MINIMUM OF 60 DEGREES TO PREVENT CONDENSATION ON THE OUTSIDE OF UNINSULATED DUCTS.
  4.c.2. THE GYM SUPPLY AIR TEMPERATURE SHALL BE MAINTAINED AT OR ABOVE 55 DEGREES.

5. SPECIAL EVENT OVERRIDE:
 5.1. THE SYSTEM SHALL HAVE AN OVERRIDE FUNCTION THAT MAY BE INITIATED BY THE HEAD END COMPUTER. THE OVERRIDE SHALL BE ABLE TO SPECIFY THE DATE, START AND FINISH TIMES OF THE EVENT.
 5.2. THE OVERRIDE COMMAND WILL HAVE A BUILT IN ONE-HOUR PRE-OCCUPIED CYCLE.

STATUS ALARMS AND SETPOINTS

1. THE VRF CONTROLLER SHALL INTERFACE EITHER DIRECTLY OR VIA A BACNET CONNECTION WITH BUILDING AUTOMATION SYSTEM'S HEAD END.

2. THE HEAD SHALL AT A MINIMUM BE ABLE TO READ THE STATUS OF THE FOLLOWING:
 2.a. SPACE TEMPERATURE AND SETPOINT.
 2.b. VRF COOLING STATUS.
  2.b.1. SUPPLY AIR TEMPERATURE.

3. ADJUSTABLE SETPOINTS SHALL INCLUDE:
 3.1. SPACE TEMPERATURE.
 3.2. SPECIAL EVENT OVERRIDE.
 3.a. MINIMUM SUPPLY AIR TEMPERATURE.

4. THE FOLLOWING ALARMS SHALL BE REPORTED:
 4.1. SPACE TEMPERATURE 3 DEGREES ABOVE OR BELOW THE SETPOINT (ADJUSTABLE).
 4.2. VRF COMPRESSOR FAILURE.

1 AHU & VRF DUCT COIL SEQUENCE OF OPERATIONS
CES-H701 SCALE: NTS

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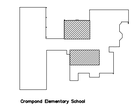


Yorktown CENTRAL SCHOOL DISTRICT

DISTRICT WIDE IMPROVEMENTS 2020 PHASE II

CROMPOND SCHOOL
2901 MANOR STREET.
YORKTOWN HEIGHTS, NY 10598

REVISIONS

No.	Description	Date
1	ADDENDUM #2	2021.11.17

ISSUED: BID ISSUE
DATE: 10/25/2021
SCALE: AS NOTED
SHEET NAME: CONTROL DIAGRAMS
SHEET NUMBER: CES-H701

REMOVALS

- JUNCTION BOX
- HVAC STARTER/MOTOR CONTROLLER
- DISCONNECT ELECTRIC TO MOTOR AND REMOVE IN ITS ENTIRETY BACK TO SOURCE
- EXISTING LIGHT FIXTURE

POWER & SYSTEMS

- DISCONNECT SWITCH, RATINGS AS INDICATED ON FLOOR PLANS
- FEEDER CONDUIT WITH CONDUCTORS
- LP-1 — BRANCH CIRCUIT HOMERUN TO PANELBOARD. NUMBER OF ARROWS INDICATES NUMBER OF CIRCUITS. CAPITAL LETTER WITH NUMERALS INDICATE PANEL DESIGNATION AND NUMERAL INDICATES PANEL CIRCUIT BREAKER NUMBER.
- ACCU-* — CONDENSING UNIT (OUTDOOR), (PROVIDED UNDER MC CONTRACT, LINE VOLTAGE WIRING BY EC)
- GROUND FAULT CIRCUIT INTERRUPTING RECEPTACLE (GFCI) WITH UL LISTED WEATHERPROOF WHILE IN USE COVER.
- EXISTING SURFACE MOUNTED PANELBOARD
- EXISTING RECESS MOUNTED PANELBOARD
- $_{M}$ — MANUAL DISCONNECT SNAP SWITCH, 2-POLE, 240V

ABBREVIATIONS

ABBREVIATION	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFR	ABOVE FINISHED ROOF
AWG	AMERICAN WIRE GUAGE
BFG	BELOW FINISHED GRADE
C	CONDUIT
CB	CIRCUIT BREAKER
EAHU	EXISTING AIR HANDLING UNIT
EC	ELECTRICAL CONTRACTOR
EGC	EQUIPMENT GROUNDING CONDUCTOR
EXR	EXISTING TO REMAIN
FBO	FURNISHED BY OWNER
FIBO	FURNISHED AND INSTALLED BY OWNER
G	VANDAL GUARD
GC	GENERAL CONTRACTOR
GFI	GROUND FAULT INTERRUPTER
HID	HIGH INTENSITY DISCHARGE (METAL HALIDE)
MC	MECHANICAL CONTRACTOR
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
RGS	RIGID GALVANIZED STEEL
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
WP	WEATHER PROOF WHILE IN USE COVER

MOUNTING HEIGHTS

UNLESS OTHERWISE NOTED, MOUNT DEVICES AND EQUIPMENT AT HEIGHTS MEASURED FROM FINISHED FLOOR TO DEVICE/ EQUIPMENT CENTERLINE AS LISTED BELOW.

COORDINATE DEVICE LOCATIONS WITH ARCHITECTURAL ELEVATIONS PRIOR TO ROUGH-IN.

WHERE STRUCTURAL OR OTHER INTERFERENCE'S PREVENT COMPLIANCE WITH MOUNTING HEIGHTS LISTED BELOW, CONSULT OWNER'S REPRESENTATIVE FOR APPROVAL TO CHANGE LOCATION BEFORE INSTALLATION.

DISCONNECT SWITCH HANDLE, UON 48"

GENERAL NOTES - INSTALLATION

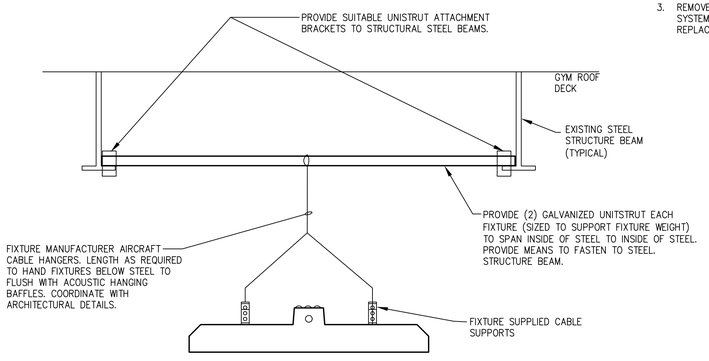
1. NEW BRANCH CIRCUITRY SHALL BE INSTALLED ABOVE CEILING WHERE POSSIBLE, AS HIGH AS POSSIBLE.
2. ALL EQUIPMENT SHOWN ON REMOVALS PLANS SHALL BE REMOVED, UNLESS OTHERWISE NOTED. REMOVE ONLY ASSOCIATED WIRING WITHIN ROOM. ASSOCIATED EXISTING BRANCH CIRCUIT WIRING HOMERUN BACK TO PANEL IN EACH ROOM SHALL REMAIN FOR CONNECTION TO NEW LIGHTING BRANCH CIRCUIT WIRING SHOWN, UNLESS OTHERWISE NOTED.
3. COORDINATE ALL CONDUIT RUNS WITH OTHER TRADES PRIOR TO ROUGH-IN. RELOCATE ANY CONDUITS AS NECESSARY TO PERMIT INSTALLATION OF DUCTWORK OR PIPING.
4. INSTALL ALL CIRCUITING CONCEALED INSIDE WALL CAVITY WHERE EVER POSSIBLE. PROVIDE SURFACE MOUNTED BACKBOXES AND RACEWAY FOR WIRING DEVICES LOCATED ON EXISTING SOLID WALL CONSTRUCTION. PROVIDE SHALLOW TYPE BACKBOXES FOR SURFACE MOUNTED POWER AND SWITCHING APPLICATIONS. REFER TO ARCHITECTURAL PLANS FOR WALL TYPES.
5. FIRESTOP ALL LOW VOLTAGE SLEEVES AND PENETRATIONS AFTER INSTALLATION OF CABLE.
6. PROVIDE OPEN TOP CABLE HANGERS 4' ON CENTER SUPPORTED TO SUPPORT ALL LOW VOLTAGE CABLING ABOVE ACCESSIBLE CEILINGS. PROVIDE SEPARATE CABLE
9. HANGERS FOR FIRE ALARM CABLING. INSTALL ALL EXPOSED CABLES IN EMT CONDUIT OR SURFACE RACEWAY IN FINISHED AREAS.
7. ALL LOW VOLTAGE CABLING SHALL BE PLENUM RATED.
8. OBTAIN WIRING AND INSTALLATION DIAGRAMS FOR ALL ELECTRICAL CONNECTIONS TO EQUIPMENT PROVIDED BY MECHANICAL CONTRACTOR PRIOR TO ROUGHING. WORK THAT IS NOT PROPERLY COORDINATED WILL BE RELOCATED AT NO COST TO THE OWNER.
9. ALL CONTRACTORS SHALL PROTECT EXISTING SURFACES AND EQUIPMENT.

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	LAMPS	VOLTAGE	MOUNTING	CEILING TYPE	MANUFACTURERS	NOTES
L1	NOMINAL 2' X 4' LED HIGH BAY TROFFER (3) LED LIGHT BARS, RUGGED ALUMINUM MATTE WHITE HOUSING. GLOSS WHITE WIRE GUARD OVER HOUSING. nLIGHT nMSI360D INTEGRAL 360 DEGREE HIGH MOUNT MOTION SENSOR WITH DIMMING, PRE-WIRED. nLIGHT N80 CONTROL, ELDOLED DIMMING DRIVER 0-10V CONTINUOUS DIMMING DRIVER DOWN TO 1% STANDARD EFFICIENCY.	LED 102 WATTS, 18000 LUMENS, 90+ CRI, 4000K TEMPERATURE	120V	(2) FACTORY 10' V AIRCRAFT CABLES PER FIXTURE TO UNI-STRUT	EXPOSED STRUCTURE	LITHONIA "IBG SERIES" OR EQUAL BY METALUX OR HUBBELL	AIRCAFT CABLES MOUNT FIXTURES FROM UNI-STRUT TO FLUSH WITH ACCOUSTIC BAFFLES ~26'-0"AFF

(XX) SYMBOL REPRESENTS KEYED NOTE THAT APPLIES TO THAT DRAWING ONLY.

(X) SYMBOL REPRESENTS REMOVAL KEYED NOTE THAT APPLIES TO THAT REMOVAL DRAWING ONLY.



1 MES-000 GYM LIGHTING HIGH BAY INSTALLATION DETAIL
SCALE: NONE

GENERAL NOTES

1. PROVIDE 50 ACT CEILING TILES OF EACH SIZE; 2'X2' AND 2'X4' TILES TO MATCH EXISTING WITHIN THE BUILDING. COORDINATE WITH OWNER FOR EXACT TYPE. REPLACE DAMAGED TILES FROM THE RESULT OF FIRE ALARM CEILING WORK. REUSE AND RELOCATE EXISTING GOOD TILES PREVIOUSLY HOUSING FIRE ALARM CEILING DEVICES TO INSTALL REPLACEMENT DEVICES INTO. IF TILE IS NOT ACCEPTABLE FOR MOUNTING, PROVIDE REPLACEMENT FROM QUANTITY ABOVE.
2. ALL DEVICES AND EQUIPMENT SHOWN ON DEMOLITION PLANS SHALL BE REMOVED, INCLUDING WIRING AND CONDUIT BACK TO SOURCE, UNLESS OTHERWISE NOTED.
3. EC IS RESPONSIBLE TO PATCH AND PAINT AS NECESSARY TO MATCH FINISHED SPACE MATERIALS AND PAINT AROUND ALL FIRE ALARM WALL MOUNTED DEVICE BOXES WHEN INSTALLED WHERE EXISTING WALL DEVICE WAS LOCATED. COORDINATE WITH OWNER FOR PAINT TYPES.
4. PATCH AND PAINT ANY REMOVED WALL MOUNTED DEVICES AND CONDUIT LOCATIONS TO MATCH FINISHED SPACE MATERIALS AND PAINT. PROVIDE BLANK COVERPLATES AND PAINT TO MATCH FINISHED SPACE WHERE DEVICES WERE INSTALLED IN CMU BLOCK WALLS. COORDINATE WITH OWNER FOR PAINT TYPES.
3. REMOVE AND REINSTALL EXISTING ACOUSTICAL CEILING SYSTEM TILES AS REQUIRED TO INSTALL ELECTRICAL WORK. REPLACE ANY DAMAGED TILES AS A RESULT OF WORK.

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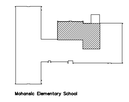


Yorktown CENTRAL SCHOOL DISTRICT

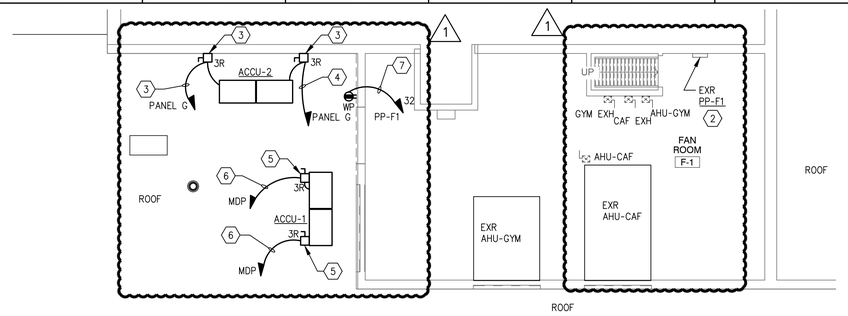
DISTRICT WIDE IMPROVEMENTS 2020 PHASE II

MOHANSIC ELEMENTARY SCHOOL
704 LOCKSLEY RD.
YORKTOWN HEIGHTS, NY 10598

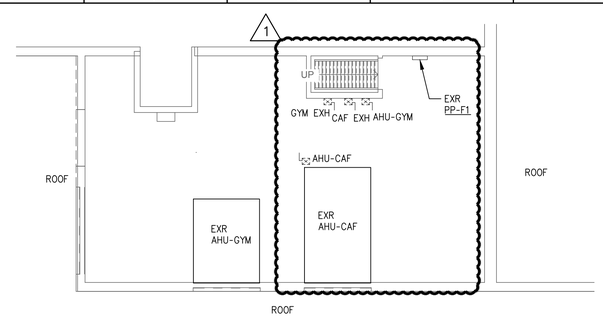
REVISIONS

No.	Description	Date
1	ADDENDUM #2	2021.11.17

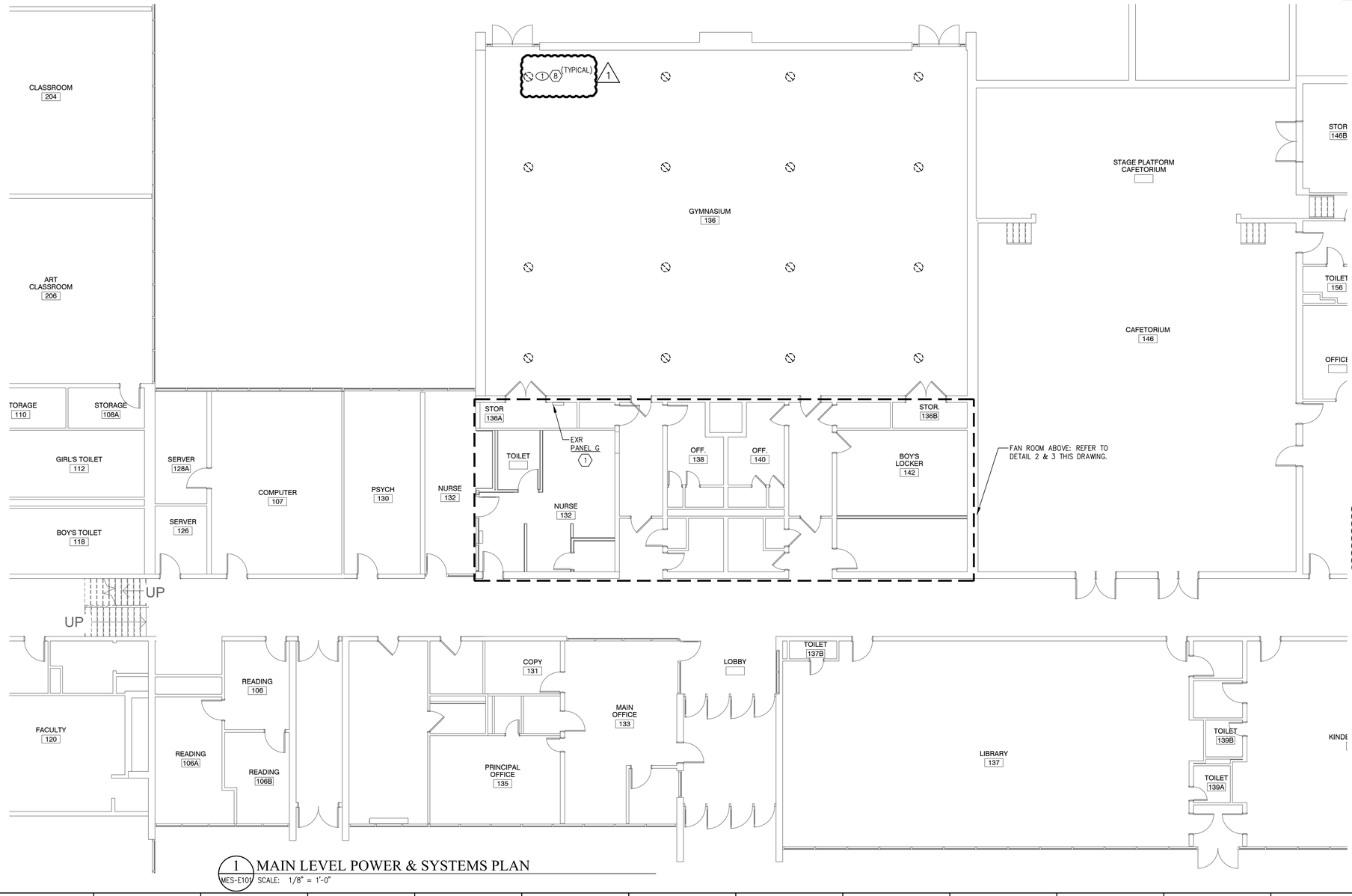
ISSUED: BID ISSUE
DATE: 10/25/2021
SCALE: AS NOTED
SHEET NAME:
ELECTRICAL LEGEND & ABBREVIATIONS
SHEET NUMBER:
MES-E000



2 FAN ROOM POWER & SYSTEMS PLAN
MES-E101 SCALE: 1/8" = 1'-0"



3 FAN ROOM REMOVALS PLAN
MES-E101 SCALE: 1/8" = 1'-0"



1 MAIN LEVEL POWER & SYSTEMS PLAN
MES-E101 SCALE: 1/8" = 1'-0"

KEYED NOTES

1. PROVIDE (2) 60 AMP, 208 VOLT, 3-POLE, 22K AIC CIRCUIT BREAKERS INSTALLED WITHIN EXISTING PANELBOARD SPACE TO SERVE ACCU-2. CIRCUIT BREAKERS TO BE UL LISTED FOR INSTALLATION INTO EXISTING PANELBOARD MANUFACTURED BY CUTLER HAMMER POW-R-LINE C PRL1A.
2. UTILIZE (1) 20 AMP, 1-POLE, 22K AIC SPARE CIRCUIT BREAKER WITHIN EXISTING PANELBOARD TO SERVE GFCI RECEPTACLE.
3. PROVIDE (1) 60 AMP, 240 VOLT, 3-POLE, NEMA 3R NON-FUSED HEAVY DUTY DISCONNECT SWITCH MOUNTED ON WALL AT 48" AFR.
4. PROVIDE 3-#6 AWG, 1-#10 AWG EGC IN 1" CONDUIT. ROUTE FEEDER INTO FAN ROOM FOLLOWING ROUTING OF HVAC PIPING.
5. PROVIDE (1) 60 AMP, 240 VOLT, 3-POLE, NEMA 3R NON-FUSED HEAVY DUTY DISCONNECT SWITCH MOUNTED TO CONDENSING UNIT HOUSING AT 48" AFR.
6. PROVIDE 3-#4 AWG, 1-#8 AWG EGC IN 1" CONDUIT. ROUTE FEEDER BACK INTO FAN ROOM FOLLOWING ROUTING OF HVAC PIPING. ROUTE FEEDER INSIDE OF BUILDING ABOVE ACCESSIBLE CEILING AREAS IN CORRIDORS TO BOILER ROOM PANEL MDP.
7. PROVIDE 2-#12 AWG, 1-#12 AWG EGC IN 3/4" CONDUIT. ROUTE FEEDER BACK INTO FAN ROOM FOLLOWING ROUTING OF HVAC PIPING. MOUNT RECEPTACLE ON WALL AT 36" AFR.
8. INSTALL 2'X4' LED HIGH BAY FIXTURE IN SAME LOCATIONS AS REMOVED FIXTURES, EXTEND EXISTING WIRING TO INSTALLED LIGHT FIXTURE. REFER TO MES-E000 FOR LIGHT FIXTURE SCHEDULE AND LIGHT FIXTURE MOUNTING DETAIL. LIGHTING TO BE REPLACED UNDER ALTERNATE EC-2D

1

REMOVAL KEYED NOTES

1. DISCONNECT AND CAP EXISTING WIRING SERVING LIGHTING IN GYM. REMOVE EXISTING LIGHT FIXTURES SHOWN DASHED, EXISTING FIXTURES TO BE REPLACED WITH 2'X4' LED HIGH BAY FIXTURE.

NORTH

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

PROJECT NUMBER: 1710402

ARCHITECT

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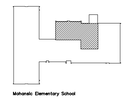

Yorktown CENTRAL SCHOOL DISTRICT

DISTRICT WIDE
IMPROVEMENTS 2020
PHASE II

MOHANSIC ELEMENTARY
SCHOOL
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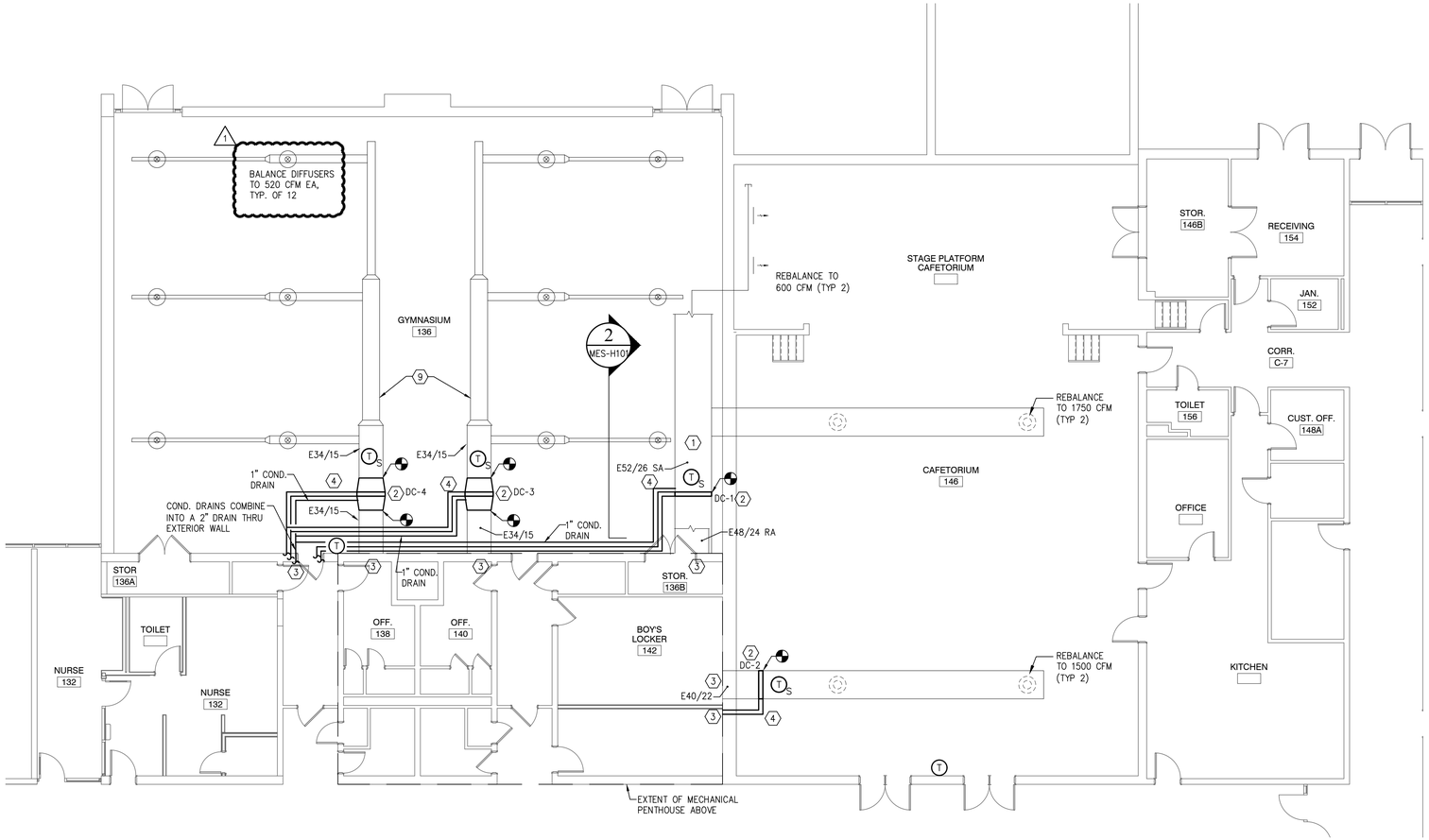
YORKTOWN HEIGHTS, NY 10598

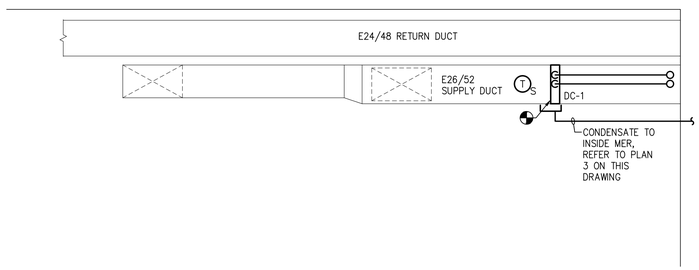
REVISIONS

No.	Description	Date
1	ADDENDUM #2	2021.11.17

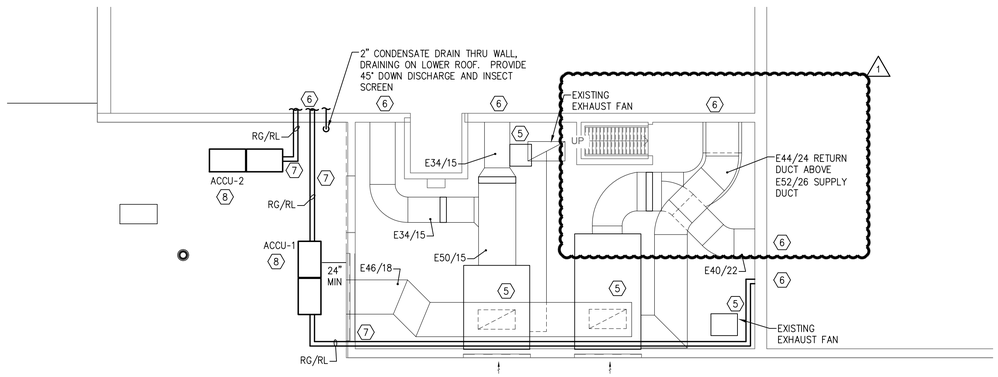
ISSUED: BID ISSUE
DATE: 10/25/2021
SCALE: AS NOTED
SHEET NAME:
MAIN LEVEL & FAN ROOM POWER & SYSTEMS PLAN
SHEET NUMBER:
MES-E101



1 GYMNASIUM & CAFETERIA RENOVATION PLAN
MES-H101 SCALE: 1/8" = 1'-0"



2 SECTION A-A
MES-H101 SCALE: 1/4" = 1'-0"



3 ROOF AND PENTHOUSE RENOVATION PLAN
MES-H101 SCALE: 1/8" = 1'-0"

GENERAL NOTES

1	FIELD VERIFY ALL EXISTING DUCT DIMENSIONS AND CLEARANCES. REPORT DISCREPANCIES TO THE ENGINEER.
2	THE CONTRACTOR SHALL PROTECT EXISTING SERVICES AND EQUIPMENT DURING THE WORK.

(#) RENOVATION KEY NOTES

1	RETURN DUCT (NOT SHOWN) RUNS ABOVE THE SUPPLY DUCTWORK.
2	PROVIDE DRAIN PAN AND LITTLE GIANT OR EQUAL CONDENSATE SUMP PUMP AND ROUTE TO FAN ROOM FLOOR DRAIN. REFER TO DETAIL 2/MES-H101.
3	SEE DRAWING 3/MES-H101 FOR CONTINUATION.
4	VRF REFRIGERANT PIPING SIZE PER MANUFACTURER'S RECOMMENDATIONS.
5	REMOVE EXISTING STARTER & PROVIDE VFD.
6	SEE DRAWING 1/MES-H101 FOR CONTINUATION.
7	SIZE REFRIGERANT LINES PER MANUFACTURERS RECOMMENDATION.
8	INSTALL VRF CONDENSING UNITS ON STEEL SUPPORT FRAME AS PER DETAIL 2/MES-H501.
9	MC TO PAINT ALL GYMNASIUM EXISTING AND NEW DUCTWORK TO MATCH SCHOOL COLORS. COORDINATE WITH ARCHITECT ON COLORS

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

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

ARCHITECT

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SED CONTROL NUMBERS

YHS - #66-24-02-06-0-005-028
MS - #66-24-02-06-0-007-027
CES - #66-24-02-06-0-003-022
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Mohansic Elementary School

Yorktown CENTRAL SCHOOL DISTRICT

DISTRICT WIDE IMPROVEMENTS 2020 PHASE II

MOHANSIC ELEMENTARY SCHOOL
704 LOCKSLEY RD.
YORKTOWN HEIGHTS, NY 10598

REVISIONS

No.	Description	Date
1	ADDENDUM #2	2021.11.17

ISSUED: BID ISSUE

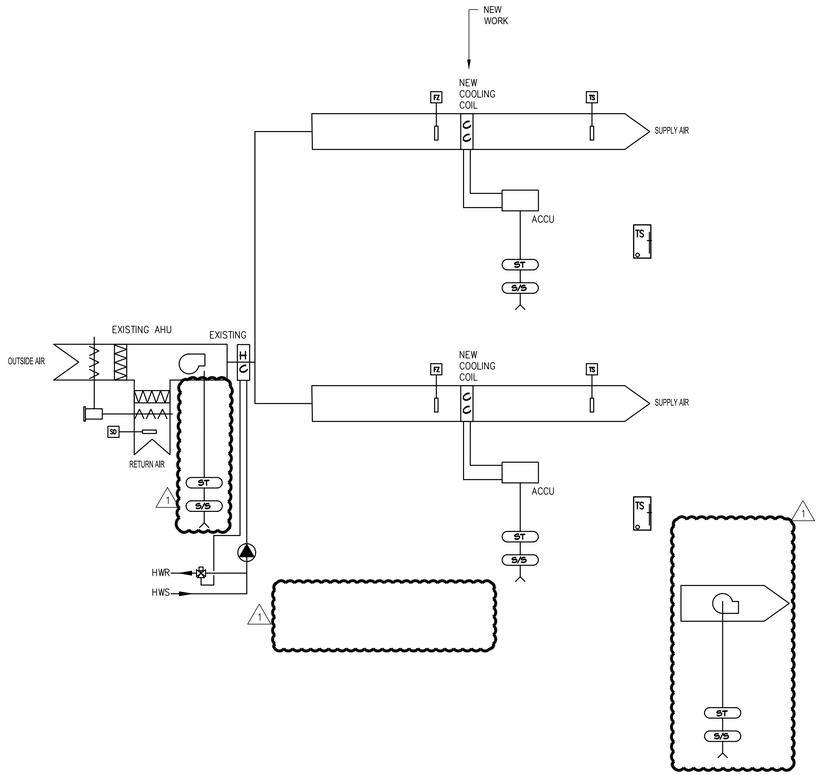
DATE: 10/25/2021

SCALE: AS NOTED

SHEET NAME:
GYMNASIUM, CAFETERIA, & ROOF RENOVATION PLANS

SHEET NUMBER:

MES-H101



SEQUENCE OF OPERATIONS

THE EXISTING AHU'S NORMAL SEQUENCE OF OPERATIONS SHALL BE MAINTAINED INCLUDING:
a. OCCUPIED/UNOCCUPIED SCHEDULE OF OPERATION.
b. HEATING SETPOINTS AND CONTROL.
c. OUTSIDE AIR VENTILATION (REBALANCED TO NEW CFM).
d. THE VFD SHALL MAINTAIN THE ORIGINAL UNIT TOTAL AIR FLOW IN THE HEATING MODE.

NEW DUCT COOLING COIL SEQUENCE OF OPERATION
1. THE COOLING COIL VRF SYSTEM SHALL ONLY BE ENABLED WHEN THE ASSOCIATED AHU IS OPERATING.

2. PRE-OCCUPIED START-UP
 2.a. IF ONE HOUR PRIOR TO THE NORMAL START SCHEDULE THE SPACE CALLS FOR COOLING A PRE-COOLING CYCLE SHALL COMMENCE.
  2.a.1. THE AHU RETURN AIR DAMPER SHALL OPEN.
  2.a.2. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED.
  2.a.3. THE AHU SUPPLY FAN SHALL START.
 2.b. THE SYSTEM SHALL BRING THE SPACE TO NORMAL OCCUPIED TEMPERATURES.
  2.b.1. THE DISCHARGE TEMPERATURE IN THE SUPPLY DUCT SHALL NOT BE LOWER THAN 65°F TO PREVENT CONDENSATION ON THE OUTSIDE OF UNINSULATED DUCTS.
 2.c. THE SA TEMPERATURE SETPOINT SHALL BE LOWERED BY 2 DEGREES F EVERY 15 MINUTES UNTIL EITHER THE ROOM TEMPERATURE IS SATISFIED OR THE MINIMUM SA TEMPERATURE IS REACHED.
 2.d. SETPOINT TEMPERATURES ARE THE NORMAL OCCUPIED VALUES.
 2.e. THE DX COMPRESSOR SHALL START IF FREE COOLING IS NOT AVAILABLE.

3. SETPOINT TEMPERATURES: COOLING: 72 DEGREES (ADJUSTABLE).

4. OCCUPIED SCHEDULE OPERATION:
 4.a. THE SUPPLY FAN SHALL RUN AT THE COOLING CFM TO MAINTAIN A MAXIMUM OF 500 FPM ACROSS THE COOLING COIL.
 4.b. THE OUTSIDE AIR DAMPER SHALL OPEN TO THE MINIMUM POSITION. THE EXHAUST FAN SHALL START.
 4.c. THE CONTROLLER SHALL CONTINUE TO MONITOR THE SPACE TEMPERATURE AND MODULATE VRF COMPRESSOR.
  4.c.1. THE CAFETERIA SUPPLY AIR TEMPERATURE SHALL BE LIMITED TO A MINIMUM OF 60 DEGREES TO PREVENT CONDENSATION ON THE OUTSIDE OF UNINSULATED DUCTS.
  4.c.2. THE GYM SUPPLY AIR TEMPERATURE SHALL BE MAINTAINED AT OR ABOVE 55 DEGREES.

5. SPECIAL EVENT OVERRIDE:
 5.1. THE SYSTEM SHALL HAVE AN OVERRIDE FUNCTION THAT MAY BE INITIATED BY THE HEAD END COMPUTER. THE OVERRIDE SHALL BE ABLE TO SPECIFY THE DATE, START AND FINISH TIMES OF THE EVENT.
 5.2. THE OVERRIDE COMMAND WILL HAVE A BUILT IN ONE-HOUR PRE-OCCUPIED CYCLE.

STATUS ALARMS AND SETPOINTS

1. THE VRF CONTROLLER SHALL INTERFACE EITHER DIRECTLY OR VIA A BACNET CONNECTION WITH BUILDING AUTOMATION SYSTEM'S HEAD END.

2. THE HEAD SHALL AT A MINIMUM BE ABLE TO READ THE STATUS OF THE FOLLOWING:
 2.a. SPACE TEMPERATURE AND SETPOINT.
 2.b. VRF COOLING STATUS.
  2.b.1. SUPPLY AIR TEMPERATURE.

3. ADJUSTABLE SETPOINTS SHALL INCLUDE:
 3.1. SPACE TEMPERATURE.
 3.2. SPECIAL EVENT OVERRIDE.
 3.a. MINIMUM SUPPLY AIR TEMPERATURE.

4. THE FOLLOWING ALARMS SHALL BE REPORTED:
 4.1. SPACE TEMPERATURE 3 DEGREES ABOVE OR BELOW THE SETPOINT (ADJUSTABLE).
 4.2. VRF COMPRESSOR FAILURE.

1 VRF DUCT COIL SEQUENCE OF OPERATIONS
BES-H701 SCALE: NTS

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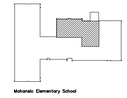


Yorktown CENTRAL SCHOOL DISTRICT

DISTRICT WIDE IMPROVEMENTS 2020 PHASE II

MOHANSIC ELEMENTARY SCHOOL
704 LOCKSLEY RD.
YORKTOWN HEIGHTS, NY 10598

REVISIONS

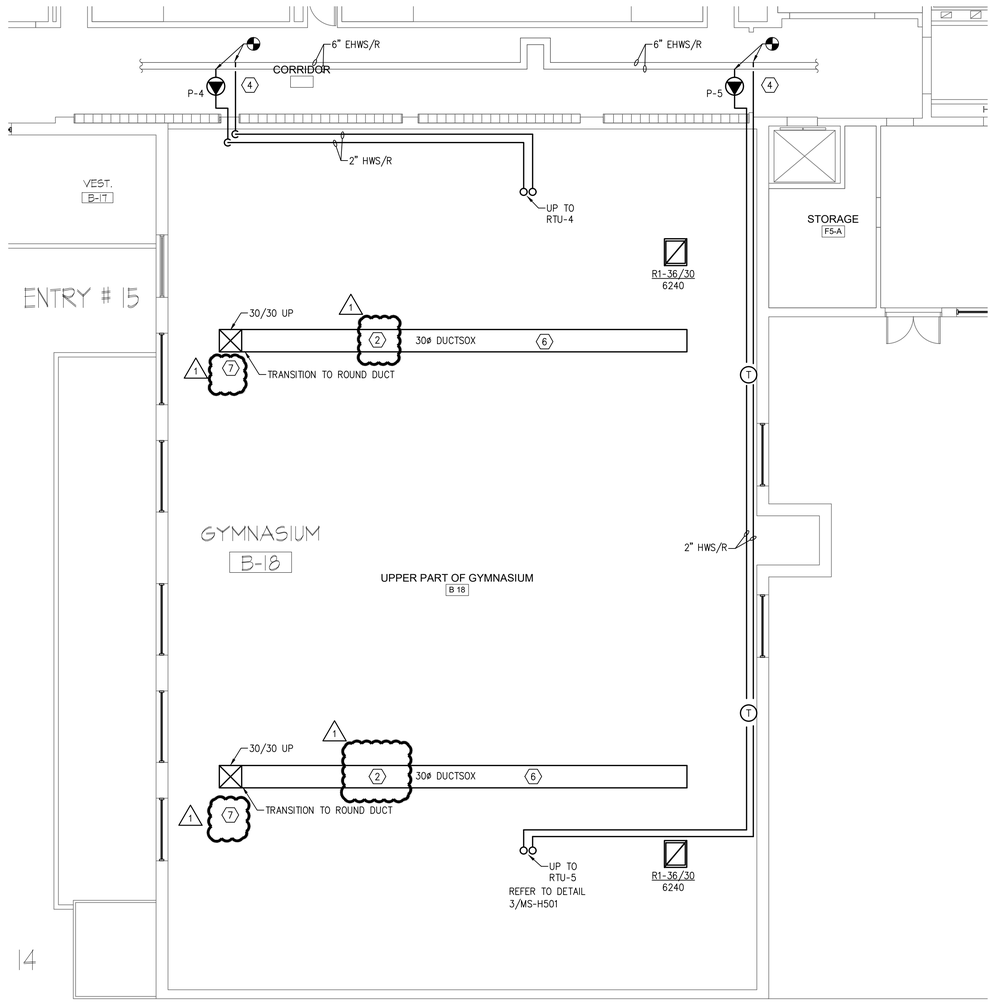
No.	Description	Date
1	ADDENDUM #2	2021.11.17

ISSUED: BID ISSUE
DATE: 10/25/2021
SCALE: AS NOTED
SHEET NAME:
CONTROL DIAGRAMS

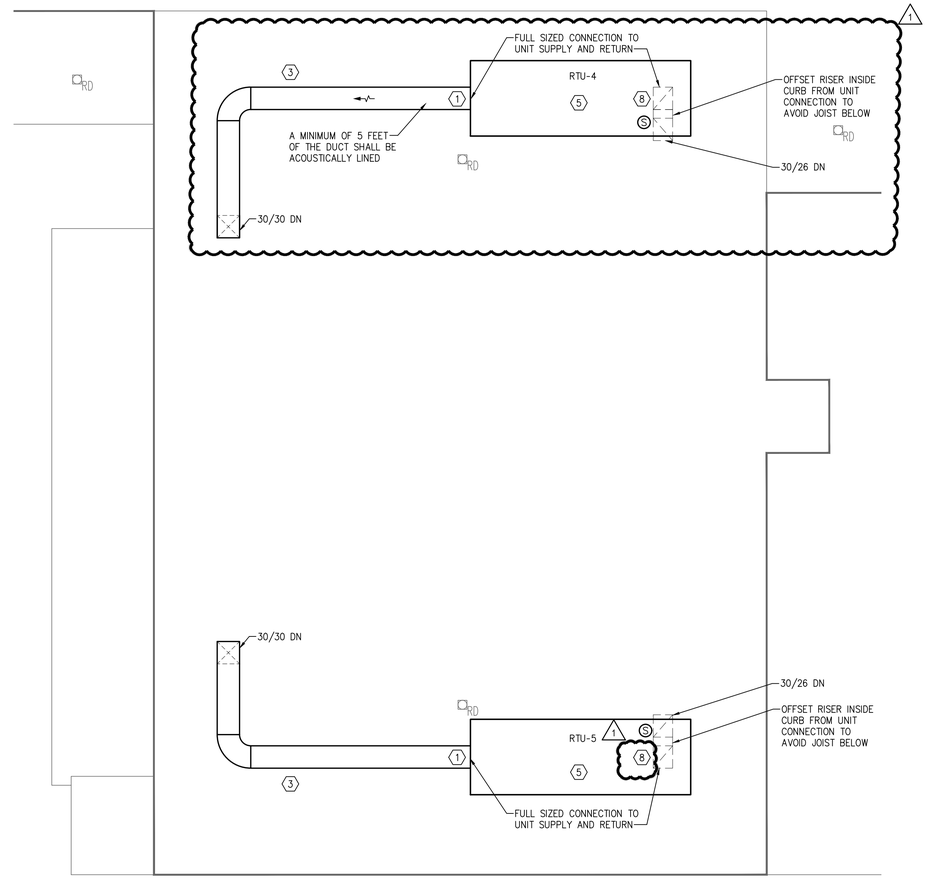
SHEET NUMBER:
MES-H701

GENERAL NOTES	
1	FIELD VERIFY ALL EXISTING DUCT DIMENSIONS AND CLEARANCES. REPORT DISCREPANCIES TO THE ENGINEER
2	ALL EXTERIOR DUCTS SHALL BE INSULATED WITH A MINIMUM OF 2" OF RIGID FIBER WITH PVC JACKET.
3	DUCTSOX SHALL BE PERMEABLE FABRIC WITH GROMMET NOZZLES SIZED BY THE MANUFACTURER TO PROVIDE THE CFM AND OPTIMUM FLOW VELOCITY. REFER TO SPECIFICATION 23.31.15.
4	MC TO REMOVE AND RE-INSTALL ANY STEEL JOIST BRIDGING IF NECCESSARY TO ACCOMODATE 30" DUCTSOX
5	THE CONTRACTOR SHALL PROTECT EXISTING SERVICES AND EQUIPMENT DURING THE WORK.

(#)	RENOVATION KEYED NOTES:
1	ALL EXTERIOR DUCTWORK TO BE INSULATED WITH A MINIMUM OF 2" FOAM BOARD INSULATION WITH PVC JACKET.
2	DUCT DOWN THROUGH ROOF. MOUNT DUCT SOCK FLUSH TO BOTTOM OF JOIST. REFER TO DETAIL 4/MS-H501
3	SUPPORT DUCTS ON ROOF PER DETAIL 1/MS-H501 & 6/MS-H501. PROVIDE SUPPORTS AT BENDS AND AT MINIMUM 10'-0" OC.
4	REFER TO DETAIL 2/MS-H501 FOR PUMP PIPING ARRANGEMENT.
5	RTU TO SIT ON CURB AND MC TO PROVIDE STRUCTURAL SUPPORT FOR RTU BELOW ROOF. REFER TO MS-S101 & 5/MS-H501
6	DUCT SOCK SHALL HAVE A PERMEABLE FABRIC AND DOWNWARD VENTS ON LEFT AND RIGHT SIDES. REFER TO DETAIL 7/MS-H501
7	MC TO PAINT GYMNASIUM DUCTWORK. COORDINATE WITH ARCHITECT FOR PAINT COLOR
8	PROVIDE ACOUSTICAL LINER TO ENTIRE LENGTH OF RETURN DUCT



1 GYMNASIUM PLAN
MS-H102 SCALE: 1/8" = 1'-0"



2 GYMNASIUM ROOF PLAN
MS-H102 SCALE: 1/8" = 1'-0"

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

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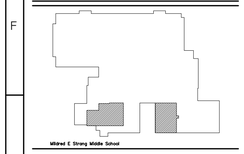


Yorktown CENTRAL SCHOOL DISTRICT

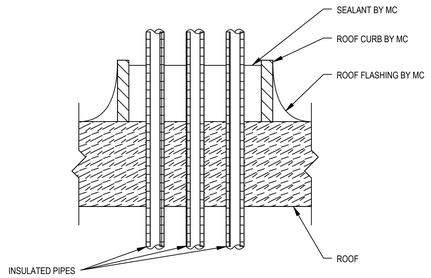
DISTRICT WIDE IMPROVEMENTS 2020 PHASE II

MILDRED E. STRANG MIDDLE SCHOOL
2701 CROMPOND RD.
YORKTOWN HEIGHTS, NY 10598

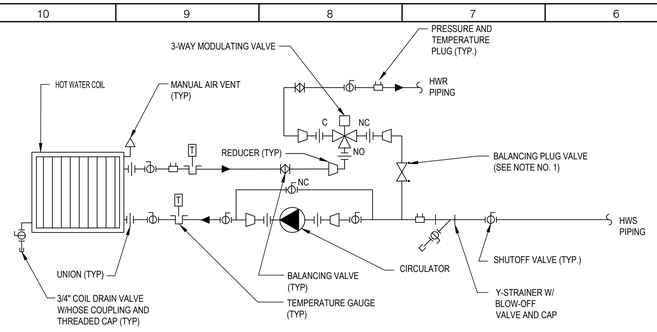
REVISIONS

No.	Description	Date
1	ADDENDUM #2	2021.11.17

ISSUED: BID ISSUE
DATE: 10/25/2021
SCALE: AS NOTED
SHEET NAME: GYMNASIUM RENOVATION PLANS
SHEET NUMBER: MS-H102



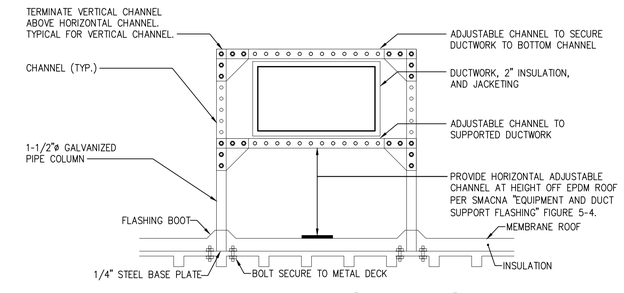
3 ROOF PIPING PENETRATION DETAIL
MS-H501 SCALE: NOT TO SCALE



SEQUENCE OF OPERATION
1. PUMP STARTS ON CALL FOR HEAT AND 3-WAY VALVE SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE WITHOUT CYCLING.
2. FREEZE PROTECTION OVERRIDE, OF OA. TEMPERATURE <35° PUMP IS ON 3-WAY OPENS TO BYPASS IF NOT HEATING.

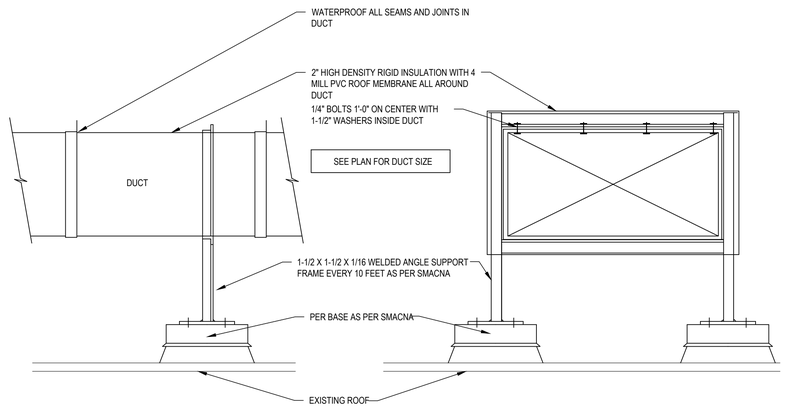
NOTE
1. SET BALANCING VALVES TO EQUAL THE PRESSURE DROP ACROSS THE HYDRONIC COIL

2 3-WAY COIL DETAIL
MS-H501 SCALE: NOT TO SCALE

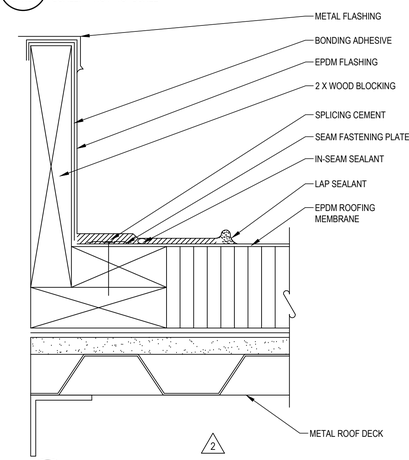


NOTE: SEE SPECIFICATION 23 05 40 "HANGER & SUPPORTS"
NOTE: ADD WIND RESTRAINTS AS NEEDED.
NOTE: SUPPORT DUCTWORK EVERY 10 FT. EVERY OTHER DUCT SUPPORT MAY BE MOUNTED ON FEET DIRECTLY ON ROOF MEMBRANE INSTEAD OF BEING ANCHORED TO THE ROOF DECK.
NOTE: REFER TO 6/MS-H501

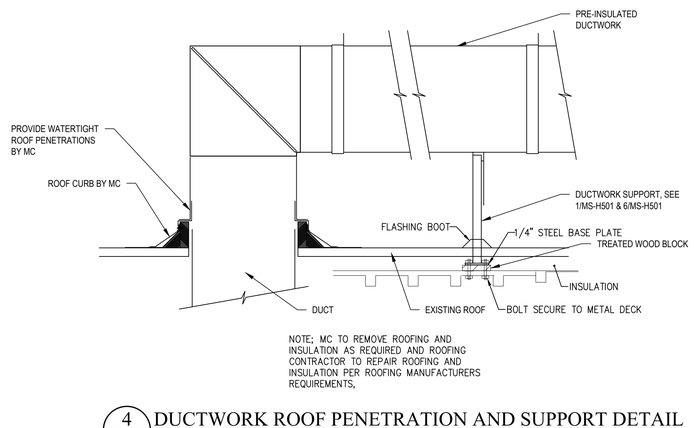
1 DUCTWORK ROOF SUPPORT DETAIL 1 (ANCHORED)
MS-H501 SCALE: NOT TO SCALE



6 DUCTWORK ROOF SUPPORT DETAIL 2 (UN-ANCHORED)
MS-H501 SCALE: NOT TO SCALE

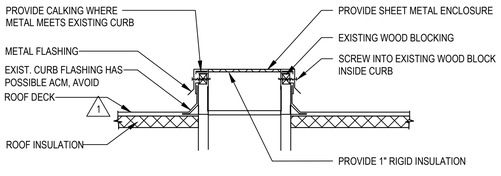


5 RTU ROOF CURB DETAIL
MS-H501 SCALE: NOT TO SCALE

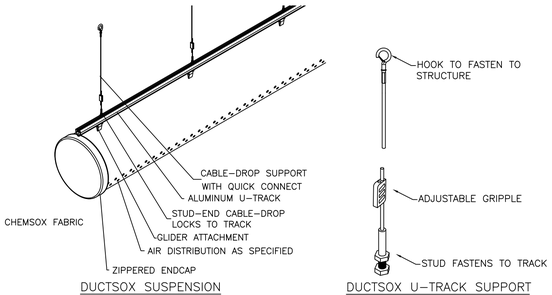


NOTE; MC TO REMOVE ROOFING AND INSULATION AS REQUIRED AND ROOFING CONTRACTOR TO REPAIR ROOFING AND INSULATION PER ROOFING MANUFACTURERS REQUIREMENTS,

4 DUCTWORK ROOF PENETRATION AND SUPPORT DETAIL
MS-H501 SCALE: NOT TO SCALE



8 ROOF CURB CAP DETAIL
MS-H501 SCALE: NOT TO SCALE



7 DUCTSOX SUSPENSION DETAIL
MS-H501 SCALE: NOT TO SCALE

VENTILATION REQUIREMENTS

Space Designation	Area Area SF	Ocuupants /1000 SF	Ocuupants Total	Ventilation Required Per Occup.	Ventilation Required Per SF	Uncorrected Ventilation	Efficiency Factor	Corrected CFM
MS Gym	6,100	7	43	20.00	0.18	1,950	80%	2,440
Total	6,100		43			1,950	80%	2,440

PUMP SCHEDULE

TAG	SERVICE	TYPE	FLUID	GPM	HEAD	RPM	ELECTRICAL HP	ELECTRICAL VOLTS/PH/HZ	DISCONNECT TYPE	DISCONNECT FURNISHED BY	DISCONNECT INSTALLED BY	BASIS OF DESIGN	MODEL
P-4	RTU-4	IN-LINE CIRC.	HW	15	23	1725	3/4	120/1/60	SWITCH	EC	EC	TACO	1611
P-5	RTU-5	IN-LINE CIRC.	HW	15	23	1725	3/4	120/1/60	SWITCH	EC	EC		

ROOFTOP AIR-CONDITIONING UNIT SCHEDULE

TAG	SERVICE	TYPE	AIRFLOW (CFM)	OUTSIDE AIR (CFM)	SUPPLY FAN ESP (IN. WG)	SUPPLY FAN TOTAL SP (IN. WG)	SUPPLY FAN FAN TYPE	SUPPLY FAN HP	EXHAUST FAN ESP (IN. WG)	EXHAUST FAN TOTAL SP (IN. WG)	EXHAUST FAN FAN TYPE	EXHAUST FAN HP	DX COOLING CAPACITY IEER	CAPACITY NOMINAL TONAGE	CAPACITY TOTAL (MBH)	CAPACITY SENS. (MBH)	CAPACITY LATENT (MBH)	ENTERING AIR (MIXED) DRY BULB (°F)	ENTERING AIR (MIXED) WET BULB (°F)	LEAVING AIR DRY BULB (°F)	LEAVING AIR WET BULB (°F)	HEATING ENTERING WATER (°F)	LEAVING WATER (°F)	ENTERING AIR DRY BULB (°F)	LEAVING AIR DRY BULB (°F)	GPM	WATER PD (FT)	AIR PD (IN)	OUTPUT MBH	MEDIUM	NOTES	BASIS OF DESIGN
RTU-4	GYMNASIUM	RTU	6250	1300	1.5	3	PLENUM	7.5	.75		PLENUM	5	14.2	16	200.18	166.83	33	79	64.76	53.8	53.64	180	150	59.4	99	15	1.1	0.5	276	HW	1,2,3,4,5,6	AAON
RTU-5	GYMNASIUM	RTU	6250	1300	1.5	3	PLENUM	7.5	.75		PLENUM	5	14.2	16	200.18	166.83	33	79	64.76	53.8	53.64	180	150	59.4	99	15	1.1	0.5	276	HW	1,2,3,4,5,6	AAON

1. COORDINATE SIZE AND LOCATION OF UNIT WITH EXISTING FRAMING. MOUNT/SECURE/ANCHOR UNIT ON DUNNAGE PROVIDED BY MC.
2. COORDINATE SIZE AND LOCATION OF ROOF PENETRATIONS WITH GC FOR SUPPLY AND RETURN DUCT.
3. ALL WORK IS BY MC (ABATEMENT, STEEL, CURBS, ROOF FLASHING, ETC.). ONLY ITEM EXCLUDED IS ELECTRICAL BY EC.
4. PROVIDE SMOKE DETECTOR IN RETURN AIR STREAM
5. PROVIDE 2 STAGE FILTER; 2" MERV-8 & 4" MERV-14
6. RTU SHALL HAVE A FRONT, HORIZONTAL DISCHARGE AND BOTTOM, VERTICAL RETURN

1

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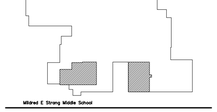


Yorktown CENTRAL SCHOOL DISTRICT

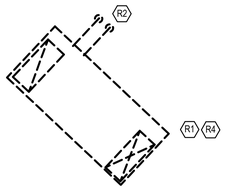
DISTRICT WIDE IMPROVEMENTS 2020 PHASE II

MILDRED E. STRANG MIDDLE SCHOOL
2701 CROMPOND RD.
YORKTOWN HEIGHTS, NY 10598

REVISIONS

No.	Description	Date
1	ADDENDUM #2	2021.11.17

ISSUED: BID ISSUE
DATE: 10/25/2021
SCALE: AS NOTED
SHEET NAME: DETAILS & SCHEDULES
SHEET NUMBER: MS-H501

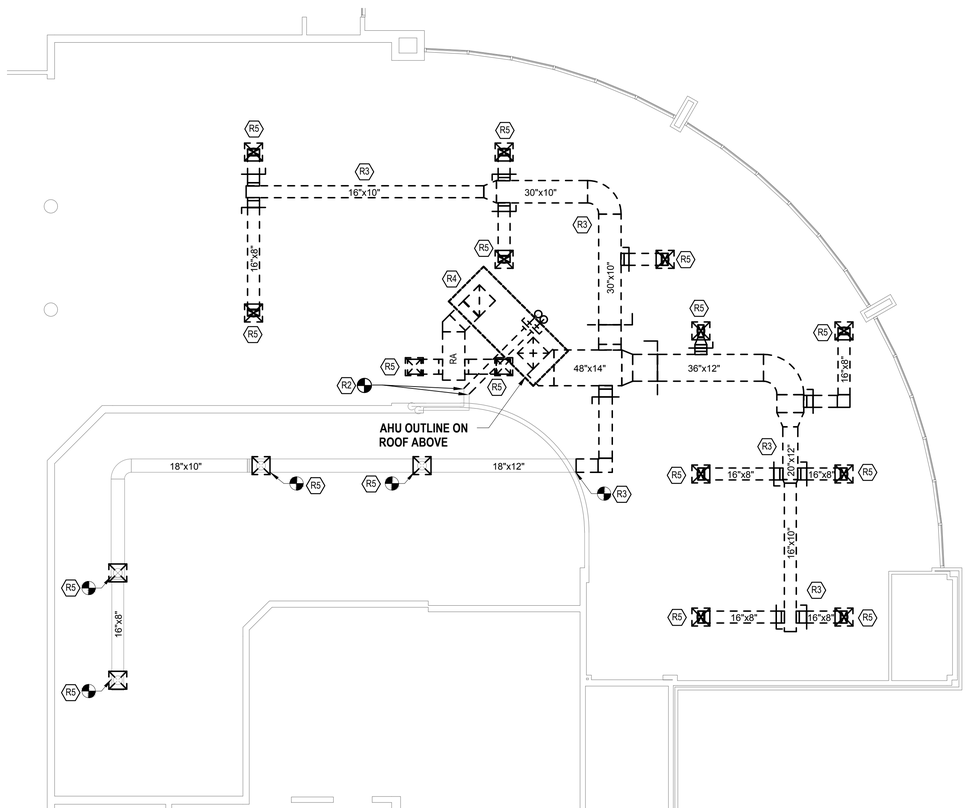


1 CAFETERIA ROOF REMOVALS PLAN
YHS-H103 SCALE: 1/8" = 1'-0"

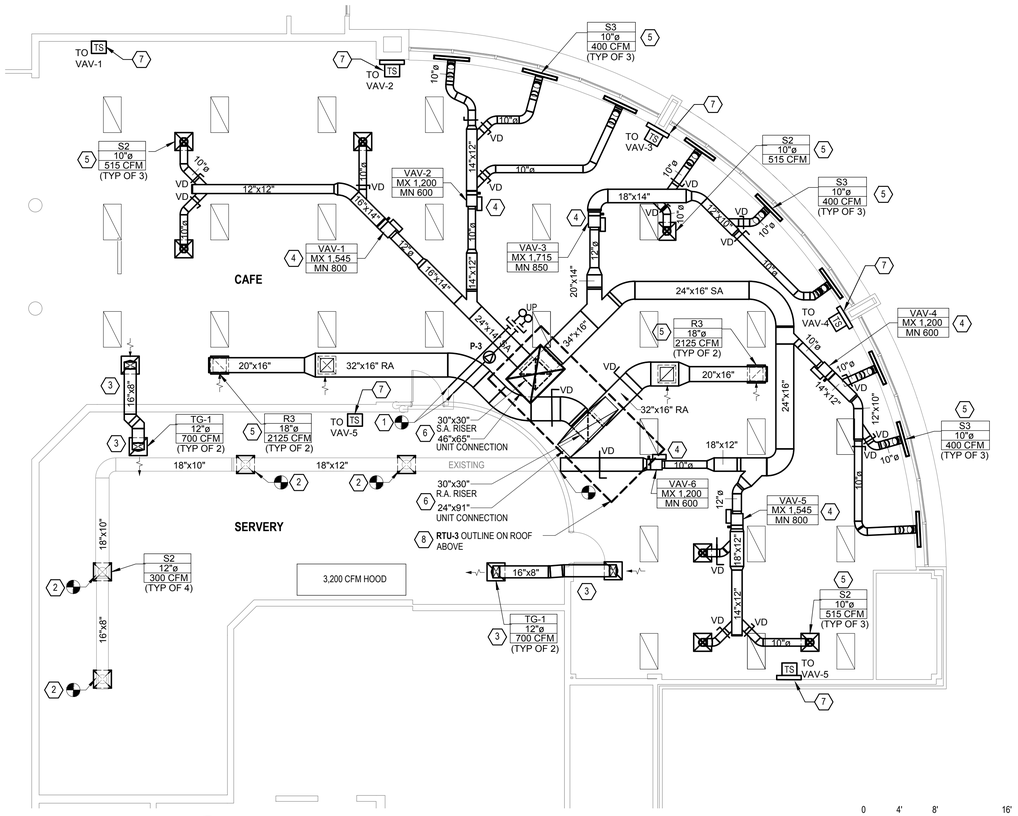
R#	1& 2/YHS-H103 REMOVAL KEY NOTES
R1	REMOVE EXISTING RTU IN ITS ENTIRETY. REMOVE ALL ASSOCIATED DUCTWORK. CONTRACTOR TO INFILL EXISTING ROOF DUCT PENETRATIONS TO MATCH EXISTING METAL DECK. GRAPHICALLY THE EXACT LOCATION OF THE EXISTING RTU IS SLIGHTLY DIFFERENT THAN SHOWN ON 1&2/YHS-H103. EXISTING DUCT RISERS UP TO UNIT ARE BETWEEN THE EXISTING W21x73 BEAMS
R2	REMOVE 2-1/2" HWS/R PIPING FROM ABOVE THE ROOF BACK TO POINT OF DISCONNECTION AND CAP.
R3	REMOVE ALL ASSOCIATED DUCTWORK.
R4	REMOVE EXISTING CONTROL PANEL, CONDUIT AND WIRING FOR EXISTING AHU.
R5	REMOVE EXISTING CEILING DIFFUSERS.

GENERAL NOTES	
1	THE CONTRACTOR SHALL PROTECT EXISTING SERVICES AND EQUIPMENT DURING THE WORK.

#	3/YHS-H103 RENOVATION KEY NOTES
1	PROVIDE 2-1/2" HWS/R PIPING FROM POINT OF CONNECTION TO RTU-3 ON ROOF. LOCATE PIPING ROOF PENETRATIONS DIRECTLY ADJACENT TO THE RTU, WITH AS MINIMAL AMOUNT OF OUTSIDE EXPOSURE AS POSSIBLE. PROVIDE WITH INLINE CIRCULATION PUMP P-3 ABOVE THE CAFE CEILING AND OTHER VALVING AS NOTED ON DETAIL 2/YHS-H501. MOUNT STARTER/DISCONNECT ABOVE THE CEILING ON THE SERVERY CMU WALL
2	PROVIDE 2'X2' CEILING SUPPLY DIFFUSER IN EXISTING LOCATION AS REMOVED DIFFUSER AND CONNECT INTO EXISTING DUCTWORK. RE-BALANCE TO 400 CFM PER S.A. DIFFUSER
3	PROVIDE TRANSFER DUCT AND CEILING GRILLES AS SHOWN. REMOVE (1) 16"x8" CMU BLOCK IN WALL ABOVE SERVERY CEILING TO ROUTE DUCTWORK. PROVIDE 1/2" DUCT LINING ON THE INSIDE OF THE DUCT ON THE TOP
4	PROVIDE VARIABLE AIR VOLUME BOX. PLACE BOX IN BETWEEN JOISTS/BEAMS WHERE ACCESSIBLE AND PROVIDE A MINIMUM OF FIVE (5) ROUND DUCT DIAMETERS OF STRAIGHT DUCT RUN INTO THE VAV INLET.
5	PROVIDE CEILING DIFFUSER WITH A VOLUME DAMPER ON ALL SUPPLY/RETURN BRANCH DUCTWORK IN ORDER TO BALANCE THE SYSTEM.
6	PROVIDE INTERIOR DUCT LINING ON BOTH SUPPLY/RETURN DUCT RISERS DOWN FROM RTU-3 & ON THE FIRST 5FT OF HORIZONTAL SUPPLY/RETURN DUCTWORK. PROVIDE ALL SUPPLY DUCTWORK WITH 1" INSULATION
7	PROVIDE ZONE TEMPERATURE SENSOR AND WIRE TO ASSOCIATED ZONE VAV BOX. PROVIDE TEMPERATURE SENSOR ON INSULATED BLOCK WHEN MOUNTING ON EXTERIOR WALL
8	REFER TO STRUCTURAL DRAWING YHS-S102 FOR EXACT RTU-3 LOCATION OVERTOP OF EXISTING BEAMS AND ADDED SUPPLEMENTAL SUPPORTS UNDERNEATH ROOF. CONTRACTOR TO CUT NEW ROOF DUCT PENETRATIONS FOR RTU-3 INSTALLATION. DUCT RISERS WILL BE BETWEEN THE EXISTING W21X73 BEAMS



2 CAFETERIA REMOVALS PLAN
YHS-H103 SCALE: 1/8" = 1'-0"



3 CAFETERIA AND SERVERY RENOVATION PLAN
YHS-H103 SCALE: 1/8" = 1'-0"

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

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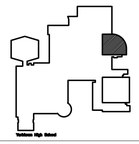
SED CONTROL NUMBERS

YHS - #66-24-02-06-0-005-028
MS - #66-24-02-06-0-007-027
CES - #66-24-02-06-0-003-022
MES - #66-24-02-06-0-004-025
BES - #66-24-02-06-0-002-020



Yorktown CENTRAL SCHOOL DISTRICT

DISTRICT WIDE IMPROVEMENTS 2020 PHASE II

YORKTOWN HIGH SCHOOL
2727 CROMPOND RD.
YORKTOWN HEIGHTS, NY 10598

REVISIONS

No.	Description	Date
1	ADDENDUM #2	2021.11.17

ISSUED: BID ISSUE
DATE: 10/25/2021
SCALE: AS NOTED
SHEET NAME: CAFETERIA & SERVERY REMOVAL & RENOVATION PLANS
SHEET NUMBER: YHS-H103