Talbott Springs Elementary School Replacement
Howard County Public School System

general contracting
construction management
design/build

To: All Plan Holders
Project: Talbott Springs Elementary School Replacement
Columbia, Maryland
Re: Addendum #3

Ladies and Gentleman:

Enclosed herein, please find Addendum #3, dated 7/2/20.

Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bid to be considered as non-responsive.

To the Contract Drawings and Specifications for the referenced project as stated below, as prepared by TCA Architects in conjunction with Dustin Construction, Inc., this addendum includes changes and clarifications to the Contract Documents as follows:

Item:		Pages
1.	TCA Addendum #3	47
2.	Revised Section 011112 – Specification Cross Reference	8
3.	Revised Section 011113 - General Scope	18
4.	Revised Section 011113 – General Trades	19
5.	Revised Section 013100 – Progress Schedules	8
6.	Revised Section 015000 – Construction Facilities and Temporary Controls	11
7.	Pre-Bid RFI Summary Log	5
8.	Pre-Bid RFI Responses	34

Including this cover, Addendum #3 consists of one hundred fifty one (151) pages. Advise this office at once if any attachments are missing.

Enclosures:
Addendum #3

cc. Daniel Lubeley - Howard County Public School System
Daniel Hagan – Howard County Public School System
Robert Gill – Howard County Public School System
Douglas Pindell – Howard County Public School System
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01 July 20

Addendum No. 3

Talbott Springs Elementary School

Howard County Public School System
Project Number: 1804

The following is intended to clarify, correct, revise, and restate various parts of the Drawings and Specifications all of which shall form part of this Contract.

Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bid to be considered as non-responsive.

DESCRIPTION:

Provide natural gas sub-meter serving boilers, as required per the Advanced Energy Metering LEED Credit. Provide normal power circuits to stair room controller power supplies.

CHANGE TO SPECIFICATIONS:

23 0519 METERS AND GAUGES FOR HVAC PIPING
ADD Paragraph 2.6 as follows:

"2.6 Thermal mass flow meters for natural gas:

A. Thermal mass flow meter is to employ a low maintenance, non-moving parts technology to sense flow and is generally unaffected by debris in the flow stream. Highly accurate over a wide operating range, the hybrid analog/digital sensing circuitry shall be highly responsive to changes in flow. The tap design shall allow for installation without interruption of the gas service. The meter can also be removed for service without disrupting flow.

B. Thermal mass flow meter shall be equal to Onicon F-5100 with output signals going directly to the main control system and capable of communicating and displaying directly with the building automation system."

26 2713 METERING AND VERIFICATION
REVISE Sub-paragraph 1.1.A as follows:

"A. Energy metering components and software used to transmit, collect, and display data obtained from energy meters in order to capture energy consumption and demand from building electrical loads **and overall gas load**. Energy metering components and software include the following:"

ADD Sub-paragraph 1.2.A as follows:

"**A. Meters and Gauges: Section 23 0519.**"

ADD Sub-paragraph 1.9.B as follows:

"**B. Coordinate output of gas meter provided under Division 23 and provide necessary hardware to integrate meter into overall system."**

ADD Sub-paragraph 2.5.A.6 as follows:

"**6. Include 120V power supply and NEMA Type 4X Enclosure.**"

REVISE Sub-paragraph 2.6.A.5 as follows:

"5. Produce configurable reports and display data for engineering units available from the meters incorporated in to the system; **cfh, cf,** kWh, kW.

a. Software will allow for the following LEED compliance report options:

(1) Total building electrical energy.
(2) Total mechanical loads.
(3) Chillers.
(4) Pumps.
(5) Total outdoor lighting loads.
(6) Total indoor lighting loads
(7) Total plug loads.
(8) Total solar PV system loads (if applicable).
(9) Total gas consumed.
(10) Gas consumption rate."

26 3213 GENERATORS, WEATHER-PROTECTED

REVISE Sub-paragraph 3.6.C as follows:

"C. Provide and utilize load bank for testing. Load banks shall be capable of providing full load at ~~0.8~~ **1.0** power factor."

26 3600 TRANSFER SWITCHES

REVISE Sub-paragraph 2.3.E.1 as follows:

"1. Upon return of the normal source to within the limits of the voltage sensor, the switch shall retransfer to the normal source after a retransfer to normal time delay. The time delay shall be factory preset for 15 minutes. (Field-adjustable range of 0.5 to 30 minutes.) Retransfer shall be a ~~closed-transition~~ **break-before-make** operation. A synch-check function shall confirm synchronization prior to retransfer.

CHANGE TO DRAWINGS IN VOLUME 3:

P-101 FLOOR PLAN FIRST FLOOR AREA 'A' PLUMBING
ADD Natural gas DDC sub-meter to branch gas piping serving boilers.

M-700 ATC SEQUENCES
ADD Natural gas DDC sub-meter control sequence.

M-705 DDC POINT SCHEDULE
ADD Natural gas DDC sub-meter I/O points.

E-101 FLOOR PLAN FIRST FLOOR AREA 'A' LIGHTING
ADD Normal power connection for stair room controllers.

E-102 FLOOR PLAN FIRST FLOOR AREA 'B' LIGHTING
ADD Normal power connection for stair room controllers.

E-103 FLOOR PLAN FIRST AND SECOND FLOOR AREA 'C' LIGHTING
ADD Normal power connection for stair room controller.

E-206 PART PLANS POWER
ADD Metering System Input Module for gas meter.

E-501 ELECTRICAL DETAILS AND DIAGRAMS
ADD Metering System Input Module on metering diagram (Diagram #4) for gas meter.

END OF ADDENDUM NO. 3

PART 1 - GENERAL

1.1 Section includes

A. Meters and gauges for HVAC systems.

1.2 Related sections

A. Pipe installation and testing: Section 23 0500.

B. Valve tags and charts: Section 23 0523.

1.3 Submittals

A. Shop drawings: Meter and gauge schedule showing manufacturer's figure number, scale range, location, and accessories for each meter and gauge.

B. Product data: For each type of meter, gauge, device, and fitting specified.

1. Scale range.
2. Ratings.
3. Calibrated performance curves.

C. Show flow measurement locations on valve charts specified in Section 23 0523, General-Duty Valves for HVAC Piping.

PART 2 - PRODUCTS

2.1 Acceptable manufacturers

A. Meters and gauges:

1. AMETEK; U.S. Gauge
2. Ashcroft; Dresser Instrument
3. Miljoco Corporation
4. Taco, Inc.
5. H.O. Trerice Co.
6. Weiss Instruments
7. Weksler; Dresser Instrument

B. Pressure-temperature connections:

1. Miljoco Corporation
2. Peterson Equipment Company
3. Sisco
4. Texas Fairfax Company
5. H.O. Trerice Co.
6. Utilities Materials and Controls, Inc.
7. Weiss Instruments

2.2 Thermometers

A. General: Industrial, adjustable angle type, accurate to within plus or minus one percent of range span, baked enamel finish, blue reading organic liquid tube, glass or clear acrylic plastic window, dust and moisture tight.

1. Scale size: 9 inches (230 mm).
2. Graduation: To the scale shown on the drawings or of a scale so that the normal working temperature of the system is near the mid-point of the scale.
3. Case: Cast aluminum.

B. Pipe-mounted thermometers: Brass well, separable sockets.

1. Where mounted in insulated piping, thermometers shall have six-inch (150-mm) stem length and sockets with 2.5-inch (64-mm) lagging extension necks. Where mounted in uninsulated piping, they shall have 3.5-inch (89-mm) stem lengths and sockets without lagging extension.
2. Where thermometer wells only are required, provide separable socket with 2.5-inch (64-mm) lagging extension, fitted with attached chain and cap.

C. Duct-mounted thermometers: Perforated aluminum stem, length maximum 24 inches (610 mm) or of length to have end of bulb near center of duct. Provide union flange fitting where stem passes through duct side or unit casing. Provide lagging extension flange on insulated ductwork.

2.3 Pressure gauges

A. Glycerine filled pressure gages shall be accurate to within plus or minus one percent of range span, silver brazed bronze bourdon-tube system, brass movement, aluminum dial with white background, black graduations and numerals and adjustable pointer, bottom connected.

1. Dial diameter: 4 inches (100 mm).
2. Internal fluid: Glycerine.
3. Case: Stainless steel

B. Pressure gauges shall be accurate to within plus or minus one percent of range span, silver brazed bronze bourdon-tube system, bronze movement, aluminum dial with white background, black graduations and numerals and adjustable pointer, bottom connected.

1. Dial diameter: 6 inches (150 mm).
2. Those installed adjacent to pumps or in pulsating locations shall be provided with pulsating dampeners or snubbers.
3. Case: Cast aluminum or glass filled nylon.

C. Graduation: To the scale shown on drawings, or so pointer is nearly straight up at system normal working pressure.

D. Gauges shall be straight pressure type, except gauges on suction side of pumps and inlet side of suction strainers shall be compound type.

E. Gauge cock (pressure gauge isolation valve):

1. Ball valve: Bronze, three-piece body, full port, with Type 316 stainless steel trim, 150 psi (1034 kPa) saturated steam, 600 psi (4137 kPa) non-shock cold water, oil, or gas, equal to Nibco 595.

F. Pressure gauge for fuel gas service: ASME B40.1, Grade A phosphor-bronze Bourdon-tube pressure gauge, with bottom connection, designed for pressure 10 psi (69 kPa) and less with 1/10 of 1 psi increments; equal to Trerice No. 760B.

1. Case: Drawn steel or brass, with 2.5-inch (64-mm) diameter glass lens.
2. Connector: Brass, 0.25-inch (DN 8) NPS.
3. Scale: White coated aluminum, with black graduations and markings.

4. Accuracy: Plus or minus 1.6 percent of range.

2.4 Combination pressure-temperature connections

A. Combination pressure-temperature connections: Equal to UMAC Universal Lancaster Test Plugs, Peterson "Pete's Plug," Sisco, Fairfax P/T Plugs, H.O. Trerice test plugs, or Miljoco test plugs. Plugs shall have self-closing valve which will operate at a temperature up to 300 degrees F (149 degrees C). Body and cap shall be brass, and shall receive either a temperature or pressure probe. Provide with a kit including gauges and thermometers in a protective case.

2.5 Electromagnetic flow meters for chilled water and heating water

A. Inline insertion electromagnetic flow-detecting meter coupled to a wall-mounted remote meter controller, equal to Onicon F-3100 Series. Fully digital measurements for volumetric flow, totalized flow, and flow velocity via correlation transit-time mode. Suitable for chilled water and heating water conditions and pipe sizes and wall thicknesses as shown on the drawings.

B. Construction: Carbon-steel body with AISI Type 304 stainless-steel internal flow tube and ANSI Class 150 raised-faced flanged end connections.

C. Controller: NEMA 250 Type 4x reinforced nylon enclosure, 64- by 128-pixel backlit 2-line alphanumeric LCD graphic display. Complete with cabling to interconnect meters, transmitters, and temperature sensors to controllers.

D. Process liquids:

1. Chilled water from 35 to 125 degrees F (1.7 to 52 degrees C) and 0 to 200 psig (0 to 1390 kPa).
2. Heating water from 80 to 150 degrees F (27 to 66 degrees C) and 0 to 200 psig (0 to 1390 kPa).

E. Temperature transducer: Clamp-on or wetted surface type equal to GE GS868. Provided in thermowells, multiple-wire RTD platinum transducer compatible with flow meter, its controller, and liquid operating conditions.

1. Accuracy: Plus or minus 2 percent.
2. Output: Conditioned pulse and analog 4 to 20 mA current signal.
3. Sizes: NPS 1-1/2 to 14 (DN 40 to 350).

F. Pressure transmitters: Wetted surface type equal to GE GS868. Provided in thermowells, multiple-wire transmitter compatible with flow meter, its controller, and liquid operating conditions.

1. Accuracy: Plus or minus 2 percent.
2. Output: Conditioned pulse and analog 4 to 20 mA current signal.
3. Sizes: NPS 1-1/2 to 14 (DN 40 to 350).

G. Input-outputs: Meters capable of providing the following flow and energy measurements:

1. Chilled and heating water:

a. Water temperature, conductivity, and pressure.
b. Water flow in feet per second (m/s), BTU per hour (kW/hour), and gallons per minute (l/s).
c. Totalized water flow in the above units.

H. Velocity accuracy: Plus or minus 0.4 percent of range from 3.3 to 33 feet/second (1.0 to 10.1 m/s).

I. Velocity range: Minus 40 to 40 feet/second (minus 12.2 to 12.2 m/s).

J. Communication: Provide MODBUS TCP communications card for DCS data transfer, capable with DDC-BAS and existing.

K. Power: 120 Vac, single phase, 60 Hertz, 35 mA maximum.

L. Output: Conditioned pulse and analog 4 to 20 mA current signals.

M. Sizes: NPS 1 (DN 25) for maximum 85 gpm (5.4 l/s) to NPS 12 (DN 300) for maximum 11,000 gpm (694 l/s).

2.6 Thermal mass flow meters for natural gas:

A. Thermal mass flow meter is to employ a low maintenance, non-moving parts technology to sense flow and is generally unaffected by debris in the flow stream. Highly accurate over a wide operating range, the hybrid analog/digital sensing circuitry shall be highly responsive to changes in flow. The tap design shall allow for installation without interruption of the gas service. The meter can also be removed for service without disrupting flow.

B. Thermal mass flow meter shall be equal to Onicon F-5100 with output signals going directly to the main control system and capable of communicating and displaying directly with the building automation system.

PART 3 - EXECUTION

3.1 Installing thermometers

A. Pipe line thermometers shall be installed as indicated on the drawings.

B. Thermometer shall be readable from the floor level.

C. Duct thermometers for air handling units and dedicated outdoor air systems shall be located as follows, except thermometers are not required if air system is not ducted:

1. Rooftop air-handling units: (2 per unit)

a. RA duct: rigid bulb, plus 30 to 180 degrees F (minus 1.1 to plus 82.2 degrees C).
b. Discharge duct: rigid bulb, plus 30 to 180 degrees F (minus 1.1 to plus 82.2 degrees C).

2. Rooftop dedicated outdoor air system units: (2 per unit)

a. CA discharge duct: rigid bulb; minus 20 to plus 130 degrees F (minus 28.9 to plus 54.4 degrees C).
b. Exhaust air inlet duct: rigid bulb; minus 20 to plus 130 degrees F (minus 28.9 to plus 54.4 degrees C).

D. Furnish and deliver to Owner at final inspection, three additional pipe line thermometers as above specified, with 6-inch (152-mm) stem lengths, for use in the thermometer wells. Ranges shall be minus 40 to plus 110 degrees F (minus 40 to 43.3 degrees C); 20 to 120 degrees F (minus 6.7 to 48.9 degrees C), and 50 to 550 degrees F (10 to 287.8 degrees C).

3.2 Installing pressure gauges

A. Each gauge connection shall have a gauge cock. Connections to pipe lines shall be 0.5 inch (DN 15), with 0.5 inch (DN 15) by 0.25 inch (DN 8) reducer for valve, the assembly of sufficient length to clear insulation.

B. Where gauge cocks only are called for on drawings, provide the 0.5-inch (DN 15) connections to pipe line with reducer and the gauge cock.

C. Provide one compound and one straight pressure gauge of appropriate scale to Owner at final inspection.

3.3 Installing combination pressure-temperature connections

A. Option: Provide combination pressure-temperature connections, complete with kits, where thermometer wells or gauge cocks only are called for on the drawings.

3.4 Installing flow meters

A. Install a flow meter fitting or permanently installed meter as indicated on drawings. When locating the fittings, assure that sufficient straight run of pipe is provided both upstream and downstream from fittings as recommended by the manufacturer for accurate readings. Size of fittings shall be same as pipe size.

1. Provide each fitting with an identification tag as specified for valve tags, giving station identification number, pipe size, meter scale and required flow in gpm (l/s).
2. Show flow meter locations on valve charts specified in Section 23 0523.
3. Calibrate flow meter during balancing.
4. Provide connection to the building automation system.

END OF SECTION

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PART 1 - GENERAL

1.1 Section includes

A. Energy metering components and software used to transmit, collect, and display data obtained from energy meters in order to capture energy consumption and demand from building electrical loads **and overall gas load**. Energy metering components and software include the following:

1. Energy meters with pulse output.
2. Pulse data collection modules.
3. Energy monitoring hubs.
4. Energy monitoring software.
5. Current transformers.

1.2 Related sections

A. **Meters and Gauges: Section 23 0519.**

B. Wires and cables: Section 26 0519.

C. Conduits: Section 26 0533.

D. Switchboards: Section 26 2413.

E. Panelboards: Section 26 2416.

F. RJ45 10/100 Ethernet cabling: Division 27.

1.3 References

A. ANSI C12.1: American National Standard for Electric Meters - Code of Electricity Metering.

B. UL 916: Standard for Energy Management Equipment.

C. UL 61010-1: Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use

1.4 Definitions

A. Firmware: Software (programs or data) that has been written onto read-only memory (ROM). Firmware is a combination of software and hardware. Storage media with ROMs that have data or programs recorded on them are firmware.

B. Monitoring: Acquisition, processing, communication, and display of equipment status data, metered electrical parameter values, power quality evaluation data, event and alarm signals, tabulated reports, and event logs.

C. USB: Universal serial bus.

1.5 Submittals

A. Product data: For energy metering components and software.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for energy metering components.

2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Bill of materials: Provide detailed list of energy metering components and software.

C. Shop drawings: For energy metering components.

1. Include plans, elevations, sections, and attachment details.
2. Include details of equipment assemblies. Indicate dimensions, method of field assembly, components, and location and size of each field connection.
3. Block diagram: Show interconnections between components specified in this section and devices furnished with power distribution system components. Indicate communication paths and identify networks and other devices to be used. Describe characteristics of network and other data communication lines.
4. Include diagrams for power, signal, and control wiring. Identify terminals and wiring designations and color-codes to facilitate installation, operation and maintenance. Coordinate nomenclature and presentation with a block diagram.

D. Field quality-control reports.

E. Sample warranty: For manufacturer's special materials and workmanship warranty.

F. Operation and maintenance data: For energy metering components and software, include in operation and maintenance manuals. In addition to items specified in Division 01, include the following:

1. Recommended preventive maintenance procedures for system components, including schedule of tasks such as inspection, cleaning, and calibration; and task descriptions.
2. Troubleshooting procedures.
3. Detailed spare parts list.
4. Operating and programming instructions.

    a. Operator's manual with procedures for operating software including logging on and off, handling alarms, producing reports, and changing set points and variables.
    b. Programming manuals with description of software program database creation and modification.
    c. Backup copy of graphic files, programs, and database on compact disk or portable storage device with a USB interface.
    d. Complete original-issue copies of furnished software, including operating systems, custom programming language, and graphics on compact disk or portable storage device with a USB interface.

5. Software and firmware operational documentation.

    a. Software operating and upgrade manuals.
    b. Software licenses.
    c. Software service agreement.
    d. Hard copies of manufacturer's specification sheets, operating specifications, design guides, user's guides for software, and PDF files on compact disk or portable storage device with a USB interface of the hard-copy submittal.
    e. Program software backup: On compact disk or portable storage device with a USB interface, complete with data files.
    f. Device address list.
    g. Printout of software application and graphic screens.

1.6 Delivery, storage, and handling

A. Store energy metering components indoors in clean dry space with uniform temperature to prevent condensation. Protect equipment from exposure to dirt, fumes, water, corrosive substances, and physical damage.

1.7 Warranty

A. Special materials and workmanship warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of energy metering that fail in materials or workmanship within specified warranty period.

1. Warranty period: Five years from date of substantial completion.
2. Warranty shall include parts, labor, and system calibration.

1.8 Quality assurance

A. Electrical components, devices, and accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency accepted by the authority having jurisdiction, and marked for intended location and application.

1. UL label and local testing (where required): As specified in Section 26 0500, Common Work Results for Electrical.

B. Installer qualifications: An authorized representative who is trained and approved by manufacturer.

C. Comply with referenced standards and listings previously identified including ANSI C12.1, NFPA 70, UL 916, and UL 61010-1.

1.9 Coordination

A. Coordinate features of electrical equipment (e.g., switchboard, panelboards) and energy metering components to form an integrated interconnection of compatible components. Match components and interconnections for optimum performance of specified functions.

B. **Coordinate output of gas meter provided under Division 23 and provide necessary hardware to integrate meter into overall system.**

1.10 Software service agreement

A. Technical support: Beginning at substantial completion, service agreement shall include software support for two years.

B. Upgrade service: At substantial completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.

1. Upgrade notice: At least 30 days to allow Owner to schedule and access the system and to upgrade computer equipment if necessary.

PART 2 - PRODUCTS

2.1 Acceptable manufacturers

A. Basis-of-design product: Subject to compliance with requirements, provide Series 2000 energy meters and associated components and software manufactured by Leviton Manufacturing Company, or comparable product by one of the following:

1. buildingIS
2. Eaton Corporation
3. Electro Industries / GaugeTech
4. E-Mon / Honeywell
5. EZ Meter / Davidge Controls
6. Leviton Manufacturing Co., Inc.
7. Schneider Electric; Square D products
8. Sensus / Xylem
9. Siemens Industry, Inc.

2.2 Single-Unit Energy Meter

A. Separately mounted, modular, permanently installed, solid-state instrument for energy monitoring.

1. Liquid crystal display (LCD) to access energy measurements and phase diagnostics.
2. 3-phase 4-wire wye configurations.
3. Metering loads between 100 amperes and 5000 amperes.
4. Paralleling up to three sets of current transformers per phase.
5. Minimum of plus/minus 0.5% accuracy of metered loads with solid core current transformers, and plus/minus 1.0% accuracy of metered loads with split core current transformers.
6. Isolated pulse output with output ranges from 10Wh to 1kWh.
7. Pulse output communication to pulse data collection module.

B. Parameters:

1. Real power consumption (kWh).
2. Peak power demand (kW), resettable.

2.3 Multi-Unit Energy Meters

A. Multiple unit meter, permanently installed, solid-state instrument for energy monitoring.

1. Meters configurable for up to (8) 3-phase 4-wire wye loads.
2. Liquid crystal display (LCD) to access energy measurements and phase diagnostics.
3. Metering loads between 100 amperes and 5000 amperes.
4. Paralleling up to three sets of current transformers per phase.
5. Minimum of plus/minus 0.5% accuracy of metered loads with solid core current transformers, and plus/minus 1.0% accuracy of metered loads with split core current transformers.
6. Isolated pulse output with output ranges from 10Wh to 1kWh.
7. Pulse output communication to pulse data collection module.

B. Parameters:

1. Real power consumption (kWh).
2. Peak power demand (kW), resettable.

2.4 Branch Circuit Energy Meters

A. Branch circuit meter, permanently installed, solid-state instrument for energy monitoring.

1. Supports up to 48, 1Ø branch circuits.
2. Liquid crystal display (LCD) to access energy measurements and phase diagnostics.
3. 1-phase, 2-wire, or 3-phase 4-wire wye configurations.
4. Metering loads up to 100 amperes
5. Paralleling up to three sets of current transformers per phase.

6. Minimum of plus/minus 0.5% accuracy of metered loads with solid core current transformers, and plus/minus 1.0% accuracy of metered loads with split core current transformers.
7. Isolated pulse output with output ranges from 10Wh to 1kWh.
8. Pulse output communication to pulse data collection module.

B. Parameters:

1. Real power consumption (kWh).
2. Peak power demand (kW), resettable

2.5 Meter data collection and communication

A. Pulse data collection modules: Equal to Leviton VerifEye High Density Pulse Module.

1. 23 independent pulse count inputs.
2. Pulse count values stored in non-volatile memory.
3. User selectable pulse rate.
4. 32-bit pulse counter: Rollover at 4.295 billion per channel.
5. RS-485 Modbus/RTU communication to data acquisition server.
6. **Include 120V power supply and NEMA Type 4X Enclosure.**

B. Data acquisition server: Equal to Leviton VerifEye Energy Monitoring Hub.

1. Includes embedded processor, operating system, onboard memory, and USB expansion port.
2. Interval recording: Capability to collect and log information at intervals from 1 to 60 minutes, user selectable (default 15 minutes).
3. Timestamp acquired data and store it in a non-volatile memory
4. RS-485 Modbus/RTU communication to pulse data collection modules.
5. RJ45 10/100 Ethernet communication to local area network (LAN)
6. Include 120V power supply and NEMA Type 1 Enclosure.

2.6 Energy monitoring software

A. Equal to Leviton VerifEye Building Manager Online (BMO) 3.0 Code Compliance Module.

1. Reporting and graphing of energy information stored at data acquisition server and collected from energy meters.
2. Web hosted software platform; fully functional without software other than standard web browsers including, but not limited to, Microsoft Internet Explorer, Google Chrome, and Firefox Mozilla.

    a. Software shall support multiple Leviton VerifEye Energy Monitoring Hubs.

3. Collection, analysis, and reporting of data from energy metering equipment used to capture electrical energy consumption and demand measurements.
4. Collect and report data in intervals 15 minute intervals by default; other user defined intervals available.
5. Produce configurable reports and display data for engineering units available from the meters incorporated in to the system; **cfh, cf,** kWh, kW.

    a. Software will allow for the following LEED compliance report options:

        (1) Total building electrical energy.
        (2) Total mechanical loads.
        (3) Chillers.

(4) Pumps.
(5) Total outdoor lighting loads.
(6) Total indoor lighting loads
(7) Total plug loads.
(8) Total solar PV system loads (if applicable).
(9) **Total gas consumed.**
(10)**Gas consumption rate.**

6. Date picking capability to allow for reports to be selected from the following time options:

   a. Last hour, 8 hours, today, yesterday, 7 days, week, 30 days, month, last month, last 12 months, this year, last year.
   b. User defined custom period including date and time range as narrow as a single 15 minute interval.

7. Construction of virtual meters with the following parameters:

   a. Any number of like kind data points (kWh + kWh, etc.)
   b. Combinations of data points from any Hub found in the software license
   c. Combinations of virtual meters to create an additional virtual meter.
   d. Virtual meter (VM) point data begins on the date and time the VM is created.

8. Exportable tabular data in all report options; Microsoft Excel, .csv, etc.
9. Graphical representations of data in 15 minute intervals or other intervals as determined by the end user.
10. Basic energy consumption and cost reporting.
11. Report header will display the range of total available date for the meter or virtual meter assigned to the report.
12. Creation of alarms for low and high readings for energy metrics reported on incorporated meters.

2.7 Current transformers

A. Capacities and characteristics: Solid or split core current transformers, sized to accommodate the feeders being metered.

   1. Solid core: 20 amperes to 400 amperes.
   2. Split core: 50 amperes to 5000 amperes.

2.8 Wires and cables

A. Electrical power wiring: Comply with requirements in Section 26 0519 Wires and Cables.

B. Communications cabling:

   1. Low-voltage cabling for input/output pulse communications: Multiple conductor, color-coded, No. 20 AWG copper, minimum, plenum rated.
   2. RS-485 Modbus/RTU communication cabling: 3-pair twisted, No. 22 AWG, stranded (7x30) tinned-copper conductors, plenum rated, equal to Belden 88777.
   3. RJ45 10/100 Ethernet cabling: Comply with Division 27.

PART 3 - EXECUTION

3.1 Examination

A. Examine pathway elements intended for cables. Check raceways, cable trays, and other elements for

compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting performance of the work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Installation

A. Comply with NECA 1.

B. Communications cabling installation:

1. Provide communications cabling between energy metering components per manufacturer's recommendations.
2. Comply with requirements of installing cable rated below 100 volts in Part 3 of Section 26 0519 Wires and Cables.

C. Provide one current transformer per each power phase of each electrical load. Place current transformers around the feeders serving the electrical loads as indicated on the Drawings.

D. Software:

1. Provide software to Owner via the Architect.
2. Graphics application:

a. Use system schematics indicated as starting point to create graphics.
b. Develop project-specific library of symbols for representing system equipment and products.
c. Incorporate digital images of project-completed installation into graphics where beneficial to enhance effect.
d. Submit sketch of graphic layout with description of text for each graphic for Owner's and Architect's review before creating graphic using graphics software.
e. Seek Owner input in graphics development once using graphics software.
f. Final editing shall be done on-site with Owner's review and feedback.
g. Refine graphics as necessary for Owner acceptance.
h. On receiving Owner acceptance, print a hard copy to include in operation and maintenance manual. Prepare a scanned copy PDF file of each graphic and include with softcopy of the system operation and maintenance manual.

3.3 Field quality control

A. Manufacturer’s field service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

B. Perform the following tests and inspections with the assistance of a factory-authorized service representative.

1. Visually inspect communications cable placement and terminations.
2. Test low-voltage cable used for input/output (I/O) pulse communications.

a. Test every I/O point to verify that safety and operating control set points are as indicated and as required to operate controlled system safely and at optimum performance.
b. Test every I/O point throughout its full operating range.
c. Test every pulse loop to verify that operation is stable and accurate.
d. Adjust pulse loop proportional, integral, and derivative settings to achieve optimum performance while complying with performance requirements indicated. Document testing of each pulse loop's precision and stability via trend logs.

e. Test and adjust every pulse loop for proper operation according to sequence of operation.
f. Test software and hardware interlocks for proper operation.
g. Operate each I/O point at the following:

(1) Upper quarter of range.
(2) Lower quarter of range.
(3) At midpoint of range.

h. Exercise each I/O point.
i. For every I/O point in the system, read and record each value at pulse data collection module, at data acquisition server, and at field instrument simultaneously. Value displayed at pulse data collection module and at field instrument shall match.
j. Prepare and submit a report documenting results for each I/O point in the system, and include in each I/O point a description of corrective measures and adjustments made to achieve desire results.

3. Testing RJ45 10/100 Ethernet communications cabling: Comply with Division 27.
4. Energy meter components and software setup:

a. Set components date and time.
b. Test, calibrate, and connect pulse metering system.
c. Set and verify demand interval for energy meters.
d. Report settings and calibration results.
e. Set up reporting software.

5. Energy meter components and software test:

a. Connect a load of known kilowatt rating, 1.5 kW minimum, to a circuit supplied by metered feeder.
b. Turn off circuits supplied by metered feeder and secure them in off condition.
c. Run test load continuously for eight hours minimum, or longer, to obtain a measurable meter indication. Use test-load placement and setting that ensures continuous, safe operation.
d. Check and record meter reading at end of test period and compare with actual electricity used, based on test-load rating, duration of test, and sample measurements of supply voltage at test-load connection. Record test results.
e. Generate test report from the meter reading tests.

C. Electricity metering will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.4 Operating instructions

A. As specified in Section 26 0500, provide operating instructions.

B. Engage a factory-authorized service representative to train Owner's personnel to use, adjust, operate, and maintain the energy metering components and software.

1. Provide at least two sessions of four consecutive hours for instruction to Owner's personnel.
2. Include training on software to be provided:

a. System programming and configuration changes.
b. Control and monitoring.

END OF SECTION

PART 1 – GENERAL

1.1 Section includes

A. Packaged engine generator set for standby, emergency power application including the following:

1. Natural gas engine with electronic generator set controls, governor, and voltage regulator.
2. Located in outdoor, weather-protected, sound-attenuated enclosure.
3. Complete with remote annunciator, sub-base fuel tank, and generator accessories.

1.2 Related sections

A. Sections specifying requirements for commissioning are specified in Divisions 01 and 23.

B. Natural gas piping: Section 23 1123.

C. Grounding and bonding: Section 26 0526.

D. Equipment foundations: Section 26 0528.

E. Transfer switches: Section 26 3600.

1.3 References

A. ANSI/NECA/EGSA 404: Standard for Installing Generator Sets.

B. CFR Title 40, Protection of Environment.

C. IEEE 115: Test Procedures for Synchronous Machines.

D. IEEE 446: Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.

E. NECA/EGSA 404: Standard for Installing Generator Sets.

F. NEMA MG 1: Motors and Generators.

G. NETA ATS: Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

H. NFPA 30: Flammable and Combustible Liquids Code.

I. NFPA 37: Installation and Use of Stationary Combustion Engines and Gas Turbines.

J. NFPA 70: National Electrical Code.

K. NFPA 110: Emergency and Standby Power Systems.

L. UL 1236: Battery Chargers for Charging Engine Starter Batteries.

M. UL 2200: Stationary Engine Generator Assemblies.

1.4 Definitions

A. CFR: Code of Federal Regulations.

B. EPA: Environmental Protection Agency.

C. NIST: National Institute of Standards and Technology

D. NSPS: New Source Performance Standards.

1.5 Submittals

A. Product data: For each type of packaged generator set indicated. Include rated capacities, operating characteristics, manufacturers' technical data on features and functions, finishes, and furnished accessories. Include product data for each of the following:

1. Engine generator set.

a. Thermal damage curve for generator.
b. Time-current characteristic curves for generator protective device.
c. Documentation proving that generator(s) provided have sufficient starting kVA to start the loads under any load sequence.

2. Generator accessories including batteries and battery charger, silencer, and jacket heater.
3. Remote alarm annunciator panel.
4. Enclosure components and accessories.
5. Sub-base fuel tank.

B. Bill of materials: Provide detailed list of components.

C. Shop drawings: For each type of generator set and related equipment, detail assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1. Dimensioned outline plan and elevation drawings of engine-generator set and other components specified.
2. Design calculations: Calculate requirements for designing vibration isolation bases.
3. Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include base weights.
4. Wiring diagrams: Power, signal, and control wiring.
5. Piping schematics for fuel system, lubricating oil, jacket coolant, and cooling water.

D. Coordination drawings: Floor plans, drawn to 1/4"=1'-0" scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Dimensioned concrete base; outline of equipment; and required clearances; relationship between components and adjacent architectural, structural, and mechanical elements.

a. Underground conduit stub-up locations.
b. Overhead conduit riser locations.
c. Ground rods, ground ring, and grounding cable locations.
d. Identify equipment sections including front and rear orientation.

E. Source quality-control test reports.

1. Certified summary of performance tests: Certify compliance with specified requirement to meet performance criteria for sensitive loads.
2. Report of factory test on units to be shipped for this Project, showing evidence of compliance with specified requirements.
3. Report of sound generation.
4. Report of exhaust emissions showing compliance with applicable regulations.

a. Factory certification of compliance with EPA emissions regulations.

F. Field quality-control test reports.

G. Operation and maintenance data: For packaged engine generator sets, accessories, and remote annunciator panel to include in operation and maintenance manuals. In addition to items specified in Division 01, include the following:

1. List of tools and replacement items recommended to be stored at Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.
2. Detailed operating instructions for event conditions.
3. Fuel adjustment procedures and maximum tolerances of wear on bearings and other rubbing surfaces that will require corrective measures.
4. Sub-base fuel tank.

H. Warranty: Certificate of special warranty.

I. Air quality permits: Submit air quality construction and operational permits for Owner record.

1.6 Quality assurance

A. Generator accessories, appurtenances, and installation of the same, shall comply with referenced codes and standards listed in Part 1 and applicable federal, state, and local codes and regulations.

B. Comply with requirements for commissioning specified in Divisions 01 and 23.

C. Emissions: Equipment shall be certified to U.S. EPA Stationary Emission Regulation, 40 CFR, Part 60.

D. Permits: Serve as the Owner's representative during the application process. Collect generator information, prepare and submit required applications for air quality construction and operational permits required by the State of Maryland Department of the Environment in compliance of state environmental regulations. Include payment for applicable permit costs. Approved permits and registration shall be issued to the Owner.

E. Equipment shall bear UL label, and shall be locally tested by an electrical testing specialist, acceptable to local authority having jurisdiction where required.

F. Source limitations: Obtain packaged generator sets and auxiliary components through one source from a single manufacturer.

G. Installer qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this project.

1. Installer has training in electrical safety as required by NFPA 70E and is qualified as defined in NEMA PB 2.

H. Testing agency qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL), and that is acceptable to authorities having jurisdiction.

1. Testing agency's field supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

I. Service and maintenance agency qualifications: Manufacturer's authorized service and maintenance representative characteristics shall include the following:

1. Located in the Baltimore/Washington, DC metropolitan area.
2. Staff is factory employed and trained.
3. Service available 24 hours a day, seven days a week, 365 days a year.
4. Maintains an adequate stock of manufacturer's genuine or approved parts to service this equipment.
5. Service and maintenance contracts available.

1.7 Coordination

A. Obtain interconnection diagrams, interface hardware, accessory components, and installation manual for generator, and other components of the system. Coordinate installation to provide a complete, integrated, operating generator system.

1. Coordinate installation and interface connections with other emergency power supply system equipment.

B. Coordinate size and location of concrete bases for package engine generators. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

1.8 Project conditions

A. Environmental conditions: Engine-generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:

1. Ambient temperature: 5 to 40 deg C.
2. Relative humidity: 0 to 95 percent.
3. Altitude: Sea level to minimum 1000 feet (300 m).
4. Available gas pressure from utility 0.25 psi (7 in WC) to 0.4 psi (11 in WC).

1.9 Warranty

A. Special warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period:

1. Warranty period: Five years from date of substantial completion.
2. Warranty shall include all parts and labor with no deductible.

1.10 Commissioning

A. This project includes commissioning under the direction of a Commissioning Agent (CxA). Contractor's and subcontractors' responsibilities are described in Divisions 01 and 23 for Commissioning Requirements.

B. Cooperate with the CxA to accomplish the requirements of the Commissioning Plan during the construction and correction periods.

1.11 Extra materials

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fuses: One for every ten of each type and rating, but no less than one of each.
2. Indicator lamps: One for every five of each type used, but no fewer than two of each.

3. Filters: One set each of lubricating oil, fuel, and combustion-air filters.

1.12 Maintenance service

A. Initial maintenance service: Beginning at Substantial Completion, provide 60 months full maintenance by skilled employees of manufacturer's designated service organization. Include quarterly exercising to check for proper starting, load transfer, and running under load. Include routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Provide parts and supplies same as those used in the manufacture and installation of original equipment.

PART 2 – PRODUCTS

2.1 Manufacturers

A. Basis-of-design product: Subject to compliance with requirements, provide products manufactured by Kohler, or comparable product by one of the following:

1. Cummins Power Generation/Onan
2. MTU
3. Kohler Power Systems Co.; Generator Division

2.2 Generator set

A. Generator set characteristics: The generator set system shall comprise a package of equipment including:

1. A natural gas engine and alternator assembly to provide emergency electric power.
2. Generator-mounted start-stop control system.
3. Mounted accessories as specified.
4. Factory-assembled and -tested, engine-generator set.

B. Generator set ratings:

1. Duty rating shall be based on emergency/standby service.
2. Operate at 1800 rpm and 480/277 volts AC, 3-phase, 4-wire, 60 hertz.
3. The generator set shall be rated at values indicated on the drawings at 0.8 pf based on the project conditions listed in Part 1.

C. Performance characteristics:

1. The engine-generator set shall be able to handle the starting step load effects of the connected equipment. Each automatic transfer switch shall be considered a step unless otherwise indicated.
2. Generator set characteristics shall not exceed the following:

a. Starting voltage dip: 30 percent.
b. Peak voltage dip: 15 percent.
c. Frequency dip: 10 percent.
d. Voltage regulation (no load to full load): Plus or minus 1percent of rated output voltage.
e. Voltage regulation (random): Plus or minus 0.5 percent of rated output voltage.
f. Frequency regulation (steady-state): Isochronous.
g. Frequency regulation (random): Plus or minus 0.25 percent of rated frequency from no load to full load.

3. AC output waveform: Distortion at no load measured line-to-line or line-to-neutral.

a. Total harmonic distortion (THD): Less than 5 percent
b. Singe harmonic: Less than 3 percent.

c. Telephone influence factor (TIF): Less than 50, as determined by NEMA MG 1.
d. Telephone harmonic factor (THF): Less than 3, as determined by IEC 60034.

4. Steady-state frequency stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.
5. Sustained short-circuit current: For a 3-phase, bolted short circuit at system output terminals, system shall supply a minimum of 300 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to generator system components.
6. Start time: Comply with NFPA 110, Type 10, system requirements.
7. Excitation system: Performance shall be unaffected by voltage distortion caused by nonlinear load.

D. Engine:

1. Natural gas engine: Four-cycle, natural gas with fan and water pump. It shall have the number cylinders and minimum displacement to achieve required brake horsepower rating at 1800 rpm.

a. Carburetor.
b. Secondary gas regulators.
c. Fuel-shutoff solenoid valves.
d. Flexible fuel connectors.
e. Natural gas source pressure shall be 7 to 11 inches H_2O for proper operation.

E. Generator: Three-phase, single bearing, synchronous type built to NEMA MG 1 standards.

1. Alternator: Brushless, 4-pole, 2/3 pitch windings, 125 degrees C standard temperature rise. Class H insulation shall be used on the stator and rotor, and both shall be further protected with 100 percent epoxy impregnation and an overcoat of resilient insulating material on end coils to protect against fungus or abrasion. The alternator shall incorporate a resettable thermal protector for exciter/regulator protection. The alternator shall be twelve lead, wye connected.
2. Regulator: Permanent magnet excitation for power source to voltage regulators, solid-state controlled, exciter/regulator, matching the characteristics of the alternator and engine. Voltage regulation with adjustable electronic isochronous governor. Readily accessible voltage droop, voltage level, and voltage gain controls shall be provided. The solid state regulator module shall be shock mounted and epoxy encapsulated for protection against vibration and atmospheric deterioration.
3. The subtransient reactance of the alternator shall not exceed 12 percent, based on the standby rating of the generator set.

F. Mounting:

1. Unit shall be capable of installation on rail system within enclosure base and include vibration isolation as required.

G. Cooling system: Closed loop, liquid-cooled system with engine mounted radiator and blower type fan, sized to maintain safe operation at 104 degrees F (40 degrees C) maximum ambient temperature. The radiator shall be equipped for a duct adapter flange connected to exterior cabinet with flexible connection.

1. Centrifugal jacket water pump: Built on the engine and driven from the engine crankshaft or camshaft, ample capacity to circulate the required flow of engine jacket water through the radiator to remove the total heat rejected from the engine to the jacket water and lubricating oil at 110 percent rated load in 104 degrees F (40 degrees C) ambient while maintaining the optimum jacket water temperature leaving and entering the engine recommended by the engine manufacturer.

2. Thermostatic control valve: Shall maintain constant water temperature to the engine. Provide modulating type thermostatic valves using self-contained thermostats without external bulbs. Provide valves with one or more interchangeable thermostatic elements. Provide nonadjustable type thermostat with operating temperature factory set at the temperature recommended by the engine manufacturer. Design valve so that in event of thermostatic element failure it will fail safe, permitting water flow through the engine.

H. Fuel system: Natural gas.

1. Fuel system shall consist of the following fuel supply:

a. Uninterrupted natural gas fuel supply specified in Section 23 1123.

I. Exhaust system:

1. Provide a silencer, including flexible exhaust fitting, properly sized and installed according to the manufacturer's recommendation. Mounting shall be provided by the installing contractor. The silencer shall be mounted so that its weight is not supported by the engine.

a. Muffler/silencer: Critical type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.

(1) Minimum sound attenuation of 25 dB at 500 Hz.
(2) Sound level measured at a distance of 10 feet (3 m) from exhaust discharge after installation is complete shall be 75 dBA or less.

2. Exhaust pipe size shall be sufficient to ensure that exhaust backpressure does not exceed the maximum limitations specified by the generator set manufacturer.

J. Automatic starting system:

1. Starting motor: DC electric starting system with positive engagement drive. The motor voltage shall be as recommended by the engine manufacturer.
2. Automatic controls: Fully automatic generator set start-stop controls in the generator control panel. Controls shall provide shutdown for low oil pressure, high water temperature, overspeed, and overcrank; and one auxiliary contact for activating accessory items. Controls shall include a multi-cycle, cranking limit with lockout contacts for starting by switch on remote panel.

K. System accessories:

1. Jacket water heater: Unit mounted thermal circulation type water heater incorporating a thermostatic switch, capable of maintaining engine jacket water to 90 degrees F in ambient temperature of minus 10 degrees F. Comply with NFPA 110 requirements for Level 1 equipment for heater capacity.
2. Starting and station batteries: Lead-acid storage battery set of the heavy duty starting type. 24Vdc battery voltage shall be compatible with the starting system. The battery set shall be of sufficient capacity to provide for 1 1/2 minutes total cranking time without recharging. Include a battery rack and necessary cables and clamps.
3. Battery charger: UL 1236 listed. Engine starting, current limiting battery charger to automatically recharge batteries. The charger shall have adjustable float and equalize voltage. DC amperage output shall be no less than 10 amperes. Output voltage shall be compatible with starting system. AC input voltage shall be 120V. Charger shall include fused overload protection; circuit breaker overcurrent protection; solid-state, silicon diode full wave rectifiers; voltage surge suppressors; DC voltmeter and AC ammeter; temperature voltage regulator; relays indicating AC power failure, low-, and high-battery voltage.

L. Generator control panel:

1. Type: Generator mounted NEMA 250 Type 1, vibration isolated, dead front, made of sheet metal gauge steel, with lockable hinged door.
2. Panel shall contain, but not be limited to, the following equipment:

    a. Voltmeter, 2 percent accuracy.
    b. Ammeter, 2 percent accuracy.
    c. Ammeter voltmeter, phase selector switch.
    d. Frequency meter, dial type. (45-65 Hz)
    e. Automatic starting controls.
    f. Voltage level adjustment rheostat.
    g. Dry contacts for remote alarms wired to terminal strips.
    h. Fault indicators for low oil pressure, high water temperature, overspeed, and overcrank.
    i. Three position selector switch with the following functions: auto, manual, off/reset.
    j. Emergency stop switch.
    k. Panel light.
    l. Running time meter
    m. Oil pressure and water temperature gauges

3. Remote outputs for monitoring.

M. Generator output circuit breaker(s):

1. Type: Molded-case circuit breaker for standby loads and molded-case electronic trip type for emergency loads, size as indicated on drawings. Circuit breaker shall conform to standards established by UL 489, and NFPA 70. Circuit breaker trip elements shall have inverse time delay for overload conditions and instantaneous magnetic tripping for short-circuit protection.
2. The circuit breaker trip curve shall be coordinated with alternator thermal damage curve as required by generator manufacturer data.

    a. Generator/exciter field circuit breakers do not meet the specified electrical standards and are unacceptable for line protection.

3. Shunt trip device: The shunt trip shall open the generator circuit breaker in the event of an engine shutdown signal, and shall operate from the cranking battery voltage.
4. Circuit breakers shall be lockable in the open position.

2.3 Generator enclosure

A. Manufacturer's standard enclosure: Prefabricated weather-resistant, sound attenuated enclosure sized to house the generator, sub-base fuel tank, battery charger, batteries, and required accessories. Enclosure shall be factory-assembled by the generator manufacturer.

B. Sheet metal steel enclosure primed with corrosion protection and painted with electrostatically-applied powder coat finish of manufacturer's standard color. Enclosure shall include roof, side walls, and end walls. Hardware shall be stainless steel.

1. Lifting provisions: Capacity to support total assembly weight during rigging.
2. Access doors: Provide sufficient access for maintenance and operation from outside the enclosure.

    a. Handles key lockable, all doors keyed alike.

3. Air intake and sound attenuation louver openings shall be screened to limit entry of rodents.
4. Roof shall be designed to prevent collection of rainwater.

5. Provide factory-mounted exhaust silencer inside the enclosure. Exhaust shall exit the enclosure through a rain collar and terminate at a rain cap. Exhaust connections to the generator set shall be made with seamless flexible connections.

C. Sound attenuation: Enclosure shall be constructed to mitigate noise level to 76.5 dBA maximum at 23 feet (7 m) from enclosure at rated generator output.

D. Accessories:

1. Enclosure manufacturer shall provide the hardware required to mount the exhaust silencers while maintaining the enclosure's weather resistance.

2.4 External vibration isolation devices

A. Elastomeric isolator pads: Oil- and water-resistant elastomer, arranged in single or multiple layers, molded with a non-slip pattern and galvanized-steel baseplates of sufficient stiffness for uniform loading over pad area, and factory cut to sizes that match requirements of supported equipment.

1. Material: Double layer, standard neoprene.

2.5 Remote alarm annunciator panel

A. Surface-mounted panel, complying with the requirements of NFPA 110, Level 1 equipment, providing visible and audible alarm signals powered by the storage battery of the generator. Unit enclosure: Fabricated of sheet steel, with removable front panel. The front panel shall contain LED type indicating lamps (visible signals) as listed below. The enclosure shall contain the required printed circuits, internal wiring, terminal block and battery voltage sensors. Provide knockouts for external wiring through bottom of box.

B. Provide on face of panel the following switches:

1. Lamp test pushbutton.
2. Audible alarm: Silence switch.

(See schedule, next page)

LAMP LEGEND	GENERATING SET CONDITION INDICATED	DERANGEMENT SIGNALS	
		Audible	Visible
EXERCISING	Generator exercising	No	Yes
GENERATING	Generating Power to Load	Yes	Yes
OVERCRANK	Failed to Start	Yes	Yes
LOW ENG TEMP	Low Lube Oil Pressure	Yes	Yes
HI ENG TEMP PRE	Excessive Engine Temperature Pre-Alarm	Yes	Yes
HI ENG TEMP	Excessive Engine Temperature	Yes	Yes
LOW OIL PRESS PRE	Low Lube Oil Pressure Pre-Alarm	Yes	Yes
LOW OIL PRESS	Low Lube Oil Pressure	Yes	Yes
OVERSPEED	Engine Overspeed	Yes	Yes
LOW FUEL	Low Fuel Supply	Yes	Yes
LOW COOLANT	Low Engine Coolant Level	Yes	Yes
AUTO SWITCH	Control Switch Not in Automatic Position	Yes	Yes
LOW CRANK VOLT	Low Engine Cranking Voltage	Yes	Yes
LOW BATT VOLT	Low Battery Voltage	Yes	Yes
HI BATT VOLT	High Battery Voltage	Yes	Yes
ALARM CONTACT	Contacts for Common Alarm	Yes	Yes
PORTABLE GENERATOR RUNNING	Generator connected to docking station is running.	Yes	Yes

2.6 Monitoring system

A. Monitoring system: Provide contacts from generator for monitoring by the power monitoring system for the following functions:

1. Generator off.
2. Generator running.
3. Generator exercising.
4. Generator alarms: Overcrank, low oil pressure, high or low engine temperature, overspeed, batteries.

B. Provide control interface at the annunciator panel for monitoring the generator status through the building fire alarm system and building automation system.

2.7 System operation

A. Loss of normal power:

1. System is given signal to start by one of the automatic transfer switches or a remote device. Loss of power can occur at any automatic transfer switch, which can cause the generator to start. On receipt of this signal, generator shall automatically start, accelerate to rated frequency and build up to rated voltage.
2. Priority shall be set to actuate the automatic transfer switch designated in the following order:

a. ATS-1: Life safety.
b. Fire Pump Controller
c. ATS-2: Standby.

3. After the first transfer switch closes to the bus, subsequent transfer switches shall close to the bus after pre-determined time delays.

B. Failure of generator to start:

1. If a unit fails to start, after the overcrank time delay (in the generator set control) has expired, the unit will be shut down, and an alarm will sound.

C. Return of normal power:

1. When normal power has been restored to the normal power system bus and sensed at each transfer switch, the loads shall be transferred back to normal source.
2. The generator shall operate until all transfer switches have returned to normal power switch position and operate at no load for a cool-down period. When the cool-down period has been completed, the generator shall shut down.
3. If a system start signal is received during the cool-down period, generator shall remain online and operate as described in "Loss of Normal Power" above.

2.8 Source quality control

A. Prototype testing: Perform factory performance tests using prototype generator of same engine model and alternative configuration, and assembled with like components and accessories. Provide three certified copies of the successful test reports.

1. Tests: Comply with NFPA 110, Level 1, energy converters in Paragraphs 3.2.1, 3.2.1.1, and 3.2.1.2.
2. Alternator tests: Comply with IEEE 115.
3. Equivalent components and accessories: Submit evidence that items furnished with the unit, but that are not identical to those on the prototype, are reliable and compatible with the application.

PART 3 - EXECUTION

3.1 Examination

A. Examine rough-in requirements for connecting piping and wiring for generator and verify conditions. Verify actual sizes and locations of connections are correct before packaged engine-generator installation.

3.2 Preparation

A. Battery equalization: Equalize charging of battery cells according to manufacturer's written instructions.

3.3 Installation - generators

A. Install generators, complete with controls, accessories, sub-base tanks, and enclosure, as indicated on the drawings and in accordance with manufacturer's recommendations.

B. Comply with generator manufacturer's written installation and alignment instructions and with NFPA 37 and 110.

C. Install the remote alarm annunciator panel where indicated on drawings.

D. Set generators plumb and level on concrete base with vibration isolators. Secure to anchor bolts installed in the concrete base.

E. Install generators so as to provide access for maintenance and service, including removal of drivers and accessories.

F. Install piping, wiring, accessories, and appurtenances in accordance with the applicable specifications and manufacturers' recommendations. Ground equipment.

G. Comply with applicable portions of NECA 404.

H. Generator and enclosure accessories shall be connected to the building electrical distribution system via branch circuits and feeders as indicated on drawings.

I. Verify proper fuel pressure for natural gas engines.

3.4 Identification

A. Materials: Refer to Section 26 0553 for requirements on identification of electrical systems. Identify units, devices, fuse blocks, relays, controls, and wiring. Identify equipment ratings.

B. Nameplates: Refer to Section 26 0553 for requirements on identification of electrical systems. Provide nameplate for each unit and associated components located on front of assembly.

C. Control components mounted within the assembly shall be identified with tags and other identification materials, and correspond to designations on manufacturer's drawings.

D. Operating instructions: Provide fabricated frame on side of unit to house operating instruction manuals.

3.5 Field quality control

A. Perform tests and inspections and prepare test reports.

1. Manufacturer's field service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections; and to assist the Contractor in testing.

B. Tests and inspections:

1. Perform tests recommended by manufacturer. Perform electrical tests and visual and mechanical inspection for "AC Generators and or Emergency Systems" specified in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. NFPA 110 acceptance tests: Perform tests required by NFPA 110 that are additional to those specified here including, but not limited to, single-step full-load pickup test.
3. Battery tests: Record individual cell voltages.

    a. Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions.
    b. Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery.
    c. Verify acceptance of charge for each element of the battery after discharge.
    d. Verify that measurements are within manufacturer's specifications.

4. Battery-charger tests: Verify specified rates of charge for both equalizing and float charging conditions.
5. System integrity tests: Methodically verify proper installation, connection, and integrity of each element of engine-generator system before and during system operation. Check for air, exhaust, and fluid leaks. Retain subparagraph below for long, restricted exhaust systems.

6. Voltage and frequency transient stability tests: Use recording oscilloscope to measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases, and verify that performance is as specified.
7. Harmonic-content tests: Measure harmonic content of output voltage under 25 percent and at 100 percent of rated linear load. Verify that harmonic content is within specified limits.
8. Noise level tests: Measure A-weighted level of noise emanating from generator-set installation, including engine exhaust and cooling-air intake and discharge, at four locations, and compare measured levels with required values.

C. Coordinate generator testing with tests for transfer switches and run them concurrently.

D. Test instruments shall have been calibrated within the last 12 months, traceable to standards of NIST, and adequate for making positive observation of test results. Make calibration records available for examination on request.

E. Leak test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.

F. Operational test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

G. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

H. Remove and replace malfunctioning units; retest and reinspect as specified above.

I. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

J. The unit shall operate without undue noise or vibration, or excessive heating. Correct defects and retest until unit is operating satisfactorily.

K. Demonstrate satisfactory operation of each feature required of the generator set and accessories.

L. Test emergency power system: After completion and acceptance of the generator tests, perform an operational test of the emergency power system. Perform a power failure test on the emergency electrical system. This shall be performed by interrupting the normal power source and verifying proper generator start and transfer switch operation.

M. Report results of tests and inspections in writing. Record adjustable device settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.

3.6 Acceptance testing

A. In addition to the factory and field tests required in Part 2, perform a scheduled on-site test and demonstration of the completely installed generator before making final electrical connections.

B. Test shall be witnessed by the Architect, Owner's representative, and manufacturer's representative. Manufacturer's representative shall conduct demonstrations.

C. Provide and utilize load bank for testing. Load banks shall be capable of providing full load at ~~0.8~~ **1.0** power factor.

D. Test procedures: Test the generator in accordance with NFPA 110 and as follows:

1. Test the generator for at least four hours under full load, starting and stopping at least five times.

a. The unit shall operate without undue noise or vibration, or excessive heating. Correct defects and retest until unit is operating satisfactorily.
b. Demonstrate satisfactory operation of each feature required of the generator set and accessories.

3.7 Cleaning

A. Upon completion of installation, inspect system components. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish. Clean components internally using methods and materials recommended by the manufacturer.

3.8 Operating instructions

A. As specified in Section 26 0500, provide operating instructions.

B. Provide at least two sessions of four consecutive hours of additional instruction time for each system specified in this section.

END OF SECTION

PART 1 - GENERAL

1.1 Section includes

A. Automatic transfer switches rated 600 V and less, including:

1. Automatic transfer switch with open transition operation and microprocessor-based controls.

1.2 Related sections

A. Equipment Foundations: Section 26 0528.

B. Identification of Electrical Systems: Section 26 0553.

C. Overcurrent Protective Device Coordination Study: Section 26 0573.

D. Generators: Section 26 3213.

1.3 References

A. NFPA 110: Emergency and Standby Power Systems.

B. UL 1008: Transfer Switch Equipment.

1.4 Submittals

A. Product data: Include assembly ratings and dimensioned plans, sections, and elevations showing minimum clearances, cable termination sizes, conductor entry, gutter space, installed features and devices, and material lists for each switch.

B. Bill of Materials: Provide detailed list of components.

C. Shop drawings: Dimensioned plans, elevations, sections, and details showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material lists for each transfer switch specified. Wiring diagrams showing detail wiring for transfer switch, differentiating between manufacturer-installed and field-installed wiring, and including power and control wiring.

2. Single-Line Diagram: Show connections between transfer switch, power sources, and load.

D. Coordination Drawings: Floor plans, drawn to 1/4"=1'-0" scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Dimensioned concrete base; outline of equipment; and required clearances; relationship between components and adjacent architectural, structural, and mechanical elements.
2. Underground conduit stub-up locations.
3. Overhead conduit riser locations.
4. Ground connections to grounding system.
5. Identify equipment sections including front and rear orientation.

E. Source quality-control test reports.

F. Field quality-control test reports.

G. Certifications:

1. Product certificate signed by manufacturer certifying that products furnished comply with requirements and that switches have been tested for applicable load ratings and short-circuit closing and withstand ratings.
2. Manufacturer's test reports showing that controllers meet the specified requirements.
3. Evidence that manufacturer, installer, and equipment meet the requirements specified in "Quality Assurance" below.

H. Operation and Maintenance Data: For transfer switches and associated components, provide product data, shop drawings, and test reports in operation and maintenance manual. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

1. Features and operating sequences, both automatic and manual

1.5 Quality assurance

A. Transfer switches shall comply with UL 1008. Where specified requirements exceed requirements of UL 1008, switch shall meet the stricter requirements.

B. Automatic transfer switch shall be manufactured by the same manufacturer. Design shall have been in production for not less than 10 years, with at least 100 installations operating successfully.

1. Manufacturer shall maintain records of each switch, by serial number, for no less than 20 years.

C. Qualifications of manufacturer: Maintain a factory-authorized service center capable of providing training, parts, and emergency maintenance repairs within a response period of less than eight hours from time of notification.

D. Qualifications of supplier/installer:

1. Staff factory-trained and -authorized in the installation, testing, and operation of the specified equipment.
2. Provides emergency service on call 24 hours a day, seven days a week.
3. Maintains an adequate stock of manufacturer's genuine or approved parts to service this equipment.
4. Has service contracts available which can meet requirements specified for the equipment of this project.

1.6 Coordination

A. Coordinate layout and installation of switches and components with other construction including conduit, piping, equipment, and adjacent surfaces. Maintain required clearances for workspace and equipment access doors and panels.

B. Coordinate size and location of concrete bases.

C. Coordinate location of underslab conduit.

1.7 Delivery, storage, and handling

A. Store switches indoors in clean dry space with uniform temperature to prevent condensation. Protect switches from exposure to dirt, fumes, water, corrosive substances, and physical damage.

1.8 Project conditions

A. Product Selection for Restricted Space:

1. Drawings indicate maximum dimensions for switches, including clearances between switches, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
2. Contractor shall make all necessary field measurements to verify that equipment shall fit in allocated space in full compliance with minimum clearances specified in NFPA 70.

B. Environmental Limitations:

1. Do not deliver or install equipment until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above equipment is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:

    a. Ambient Temperature: Not exceeding minus 22 deg F (minus 30 deg C) to plus 104 deg F (plus 40 deg C).
    b. Altitude: Not exceeding 6600 feet (2000 m).

1.9 Warranty

A. Special warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of transfer switch and associated auxiliary components that fail in materials or workmanship within specified warranty period.

1. Warranty period: Five years from date of substantial completion.
2. Warranty shall include all parts and labor.

PART 2 - PRODUCTS

2.1 Acceptable manufacturers

A. Basis-of-design product: Subject to compliance with requirements, provide products manufactured by ASCO, or comparable product by one of the following:

1. Onan/Cummins Power Generation
2. ASCO/Schneider Electric

2.2 General transfer switch requirements

A. Equipment shall be based on the following: 480/277 volts, 3-phase, 4-pole; Level 1 equipment according to NFPA 110; rated in accordance with UL 1008 for continuous loading and total system transfer; suitable for motor, resistance heating, electric-discharge lighting, and tungsten filament lamp loads. Unit ratings involving ampacity, number of poles, and withstand close rating are indicated on drawings.

B. Tested Fault-Current Closing and Withstand Ratings (3 cycles): Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.

1. Provide transfer switches with ratings based on available fault current determined by Short-Circuit Analysis performed under Section 26 0573 or as indicated on one-line diagram, whichever is larger.

C. Neutral Switching. Provide neutral pole switched simultaneously with phase poles on four-pole transfer switches.

D. Oversize Neutral: Ampacity and switch rating of neutral path through units shall be double the nominal rating of the switch.

E. Enclosure: NEMA 250, Type 1; NEMA ICS 6; and UL 508.

F. Terminal block: Termination of all auxiliary contacts, switches, pilot lights, and appurtenances mounted in transfer switch enclosure.

G. Clearly label and identify each indicating light and switch as to its purpose or function.

2.3 Automatic transfer switch

A. Ratings: Unit ratings involving ampacity, number of poles, and withstand close rating are indicated on drawings.

B. Switching arrangement:

1. Delayed, Open Transition Transfer Operation: Double-throw design, with break-before-make capability. The normal and emergency contacts shall be positively interlocked mechanically and electrically to prevent simultaneous closing. Main contacts shall be mechanically locked in both the normal and emergency positions without the use of hooks, latches, magnets, or springs.

a. ATS-1.
b. ATS-2.

2. Switch Characteristics:

a. Designed for continuous-duty, repetitive transfer of full-rated current between active power sources.
b. The contact driving system shall be mechanically held and electrically operated by a single motor operator.
c. Contacts: Silver alloy, capable of making or breaking any load within the rating of the switch.

(1) Contacts that close to start the engine generator: Include a time delay of transfer switch and engine starting signals, factory set at 5.0 seconds (adjustable from 0-5 minutes).

d. Interlocked, molded case circuit breakers or contactors are not acceptable.

C. Controls: Microprocessor-based controller integrally mounted in the transfer switch with all components and wiring accessible from the front.

1. Tested and rated as follows:

a. For storage at temperatures from minus 25 to plus 85 degrees C.
b. For operation:

(1) At minus 20 to plus 70 degrees C.
(2) At 0 to 99 percent humidity, non-condensing.
(3) Withstands infinite power interruptions.
(4) Withstands surges when tested in accordance with ANSI/IEEE C37.90.1.

2. Include a real-time clock with nickel-cadmium battery backup.
3. Monitoring: On both normal and emergency sources, include three-phase over or under voltage, over or under frequency, and phase sequence detection, and phase differential monitoring.
4. Communications: Industry standard open-architecture communication protocol for high-speed serial communications via multidrop connection to other controllers and to a master terminal with up to 4000 feet of cable, or farther with the addition of a communication repeater.

a. Serial communication port: RS422/485 compatible

5. Self-diagnostics: Shall perform periodic checks of the memory I/O and communications circuits, with a power failure circuit.
6. Password protection shall limit access to designated personnel.
7. Operation: Keypad with multi-character liquid crystal display.
8. Memory / Flash-backup: Accessible both locally and from remote controller, including:

   a. Number of hours transfer switch has been in the emergency position (total since reset).
   b. Number of transfers in either direction (total since reset).
   c. Date, time, and description of the last 4 source failures.
   d. Date of the last exercise period.
   e. Date the record was reset.

D. Provide close differential voltage sensing of all phases of both the normal and alternate sources of power. Factory settings preset for:

   1. Dropout at 87 percent of nominal voltage (adjustable 75-98 percent)
   2. Pickup at 95 percent of nominal voltage (adjustable 85-100 percent).

E. The transfer of the load shall occur only if the alternate source has attained factory setting of 95 percent of nominal voltage (adjustable 85-100 percent) and 95 percent of nominal frequency (adjustable 90-100 percent) and the transfer to alternate time delay has expired. The time delay shall be factory set for 5 seconds and adjusted in the field to comply with system priority requirements outlined in Part 2 below. (Field adjustable range of 0 to 2 minutes.)

   1. Upon return of the normal source to within the limits of the voltage sensor, the switch shall retransfer to the normal source after a retransfer to normal time delay. The time delay shall be factory preset for 15 minutes. (Field-adjustable range of 0.5 to 30 minutes.) Retransfer shall be a ~~closed-transition~~ **break-before-make** operation. A synch-check function shall confirm synchronization prior to retransfer.

F. Time delay for engine generator cooldown: Unloaded, running, factory-set at 5 minutes (adjustable 0-5 minutes).

G. Indicating lights: LED type. Green, indicating that the normal source is connected to the load, and red, indicating that the alternate source is connected to the load.

H. Test switch: Simulates a normal source outage.

I. Reset switch: To manually retransfer the automatic transfer switch to the normal source, except that retransfer shall occur automatically if alternate source fails.

J. In-phase monitor control for transfer and retransfer of motor loads.

K. Automatic exerciser with load for 0.5 hour monthly. The automatic exerciser function shall be enabled in one transfer switch selected by the Owner.

L. Relay protection:

   1. Full-phase voltage on normal side.
   2. Three-phase voltage frequency on generator side.

M. Auxiliary contacts: Provide number of sets of auxiliary contacts necessary to initiate generator starting and interface with Owner monitoring system.

N. The transfer switch shall have the following programming functions available:

1. Block transfer to emergency source.

O. The transfer switch shall control the load functions.

2.4 Transfer switch operation and emergency system priority

A. Priority Status: Transfer switch priority shall apply as follows:

1. ATS-1.
2. ATS-2.

B. Transfer to Generator Source: Switches shall transfer to emergency power source in order of priority status listed above. In the event that the emergency source cannot generate enough capacity to carry the total emergency system load, switches shall transfer in decreasing order of priority until system capacity is reached. Switches can later be transferred to the emergency source if additional capacity is available. Field adjust the time delay settings to achieve system transfer of loads as follows:

1. ATS-1: Use factory setting or 5 seconds, whichever is less. Total system transfer time shall not exceed 10 seconds per NFPA 110.
2. ATS-2: Time delay: 10 seconds.

C. Generator Failure: In the event generator system power is not sufficient to carry the loads of each emergency branch, transfer switches shall open and shed load in reverse priority order.

D. Transfer Back to Normal Source: Switches shall transfer back to normal source in reverse priority order as follows:

1. Delayed, Open Transition Operation – When the normal source has been restored and is within the pre-selected ranges for voltage and frequency, and after an adjustable time delay to ensure the integrity of the normal power source, the load shall be transferred back to normal source in a break-before-make transfer scheme. The generator set will continue to run for a user adjustable time to allow the generator set to run unloaded for cool down, after which the engine will be shut down. Upon completion, the system will then be ready for automatic operation.

2.5 Source quality control

A. Factory-test components, assembled switches, and associated equipment. Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test in accordance with NEMA ICS 1.

B. As a condition of approval, the manufacturer of the automatic transfer switches shall verify that their switches are listed by Underwriters Laboratories, Inc., Standard UL-1008 with 3-cycle short circuit closing and withstand as follows:

RMS Symmetrical Amperes 480 VAC

Amperes	Closing and Withstand	Current Limiting Fuse Rating
100-400	42,000	200,000
600-800	65,000	200,000
1000-1200	85,000	200,000
1600-4000	100,000	200,000

Where available fault current levels, as determined by Short-Circuit Analysis, exceed closing and withstand ratings listed above, provide integrally mounted current-limiting fuses to meet this rating.

C. During the 3-cycle closing and withstand tests, there shall be no contact welding or damage. The 3-cycle tests shall be performed without the use of current limiting fuses. The test shall verify that contacts separation has not occurred, and there is contact continuity across all phases. Test procedures shall be in accordance with UL-1008, and testing shall be certified by Underwriters' Laboratories, Inc.

D. When conducting temperature rise tests to UL-1008, the manufacturer shall include post-endurance temperature rise tests to verify the ability of the combination transfer bypass/isolation switch to carry full rated current after completing the overload and endurance tests.

E. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.

PART 3 – EXECUTION

3.1 Installation

A. Install transfer switches on concrete equipment foundations (housekeeping pad).

1. Anchor equipment to concrete housekeeping pad according to manufacturer’s written instructions, and requirements in other sections of Division 26.
2. Install each unit level and plumb.

B. Maintain minimum clearances and workspace at equipment according to manufacturer’s written instructions and NFPA 70.

C. Install in accordance with national, state, and local codes, and manufacturer's instructions.

D. Include items not specifically mentioned but necessary for proper operation.

E. Connect wiring as indicated on the drawings and in accordance with manufacturer's recommendations.

F. Identify components.

3.2 Connections

A. Ground equipment according to Division 26 Section “Grounding and Bonding for Electrical Systems.”

B. Wiring to Remote Components: Provide type and number of cables and conductors in raceway as recommended by manufacturer between emergency distribution system components for control and communication requirements.

3.3 Identification

A. Materials: Refer to Division 26 Section "Identification of Electrical Systems." Identify units, devices, fuse blocks, relays, controls, and wiring. Identify equipment ratings.

B. Nameplates: Refer to Division 26 Section "Identification of Electrical Systems" for additional requirements. Provide nameplate for each switch and major control or display component located on front of assembly.

1. Furnish master nameplate, stamped metal, listing standard manufacturer information including voltage, ampere, frequency, and short-circuit ratings; manufacturer's model and project designations.

C. Control components mounted within the assembly, such as fuse blocks, relays, pushbuttons, switches, etc., shall be identified corresponding to designations on manufacturer's drawings using tags and other identification materials.

3.4 Field quality control

A. Test transfer switches and components by operating them in all modes. Perform tests recommended by manufacturer under supervision of manufacturer's factory-authorized representative. Tests shall include simulation of building power outages to verify coordination of transfer timing sequences with switchgear.

B. Correct deficiencies and report results in writing. Record adjustable relay settings.

C. Coordinate tests with tests of generator plant and run them concurrently.

3.5 Cleaning

A. Inspect and clean surfaces and repair damaged finishes to match original finish.

B. Clean interior of equipment according to manufacturer's instructions.

3.6 Operating instructions

A. As specified in Section 26 0500, provide operating instructions.

B. Provide a period of 4 hours for equipment instruction to operating personnel.

C. Coordinate this instructional training with that for generator equipment.

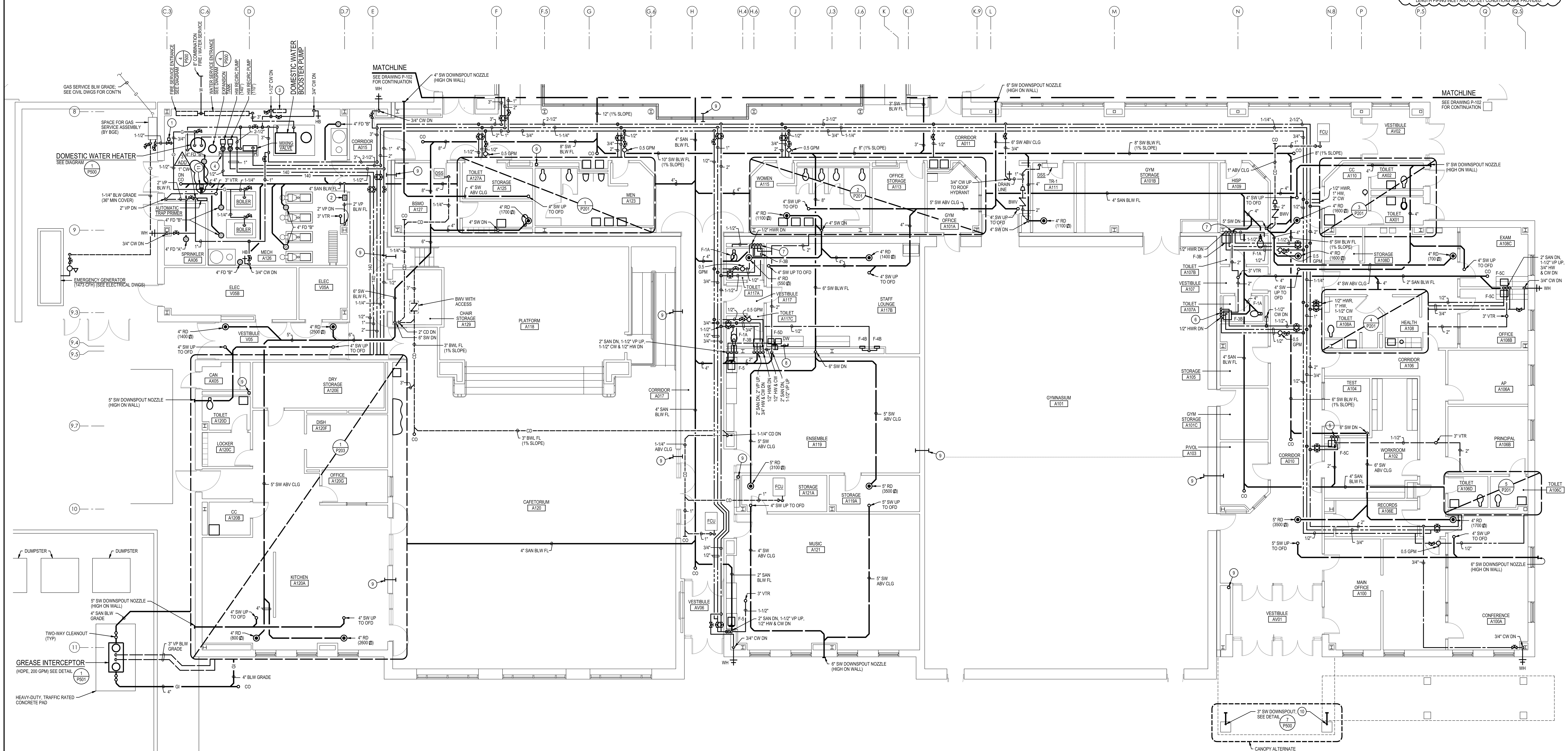
END OF SECTION

GENERAL NOTES:

A. DO NOT LOCATE DUCTWORK OR PIPING ABOVE ELECTRICAL PANELS OR EQUIPMENT.

SPECIFIC NOTES:

1. MAIN GAS SOLENOID VALVE WITH AUTOMATIC RESET (CONTROLLED BY EMERGENCY GAS SHUT-OFF SWITCH IN MECHANICAL ROOM)
2. EMERENCY GAS SHUT-OFF SWITCH (CONTROLS MAIN GAS SOLENOID VALVE)
3. BACKFLOW PREVENTER ASSEMBLY ; SEE DIAGRAM 11/P500 (SERVES HEATING AND CHILLED WATER SYSTEMS)
4. MOUNT MIXING VALVE & RECIRC PUMPS ON SLOTTED METAL CHANNELS MAX 48" AFF. ANCHOR CHANNELS SUPPORT TO CONCRETE PAD
5. 2" SAN DN, 1-1/2" VP UP, 1/2" HW & CW DN
6. 2" SAN DN, 2" VP UP, 1/2" HW & CW DN
7. 2" SAN DN, 2" VP UP, 1-1/2" CW & 1/2" HW DN
8. 3/4" DRAIN FROM DISH MACHINE; PROVIDE AIR GAP FITTING (COUNTER MOUNTED) & CONNECT TO SINK TAILPIECE; PROVIDE 1/2" HW TO DISH MACHINE WITH SHUT-OFF VALVE.
9. 4" RADON VENT; SEE DETAIL 3/P500
10. STORM WATER BOOT POSITIONED INSIDE MASONRY COLUMN ENCLOSURE AT CANOPY LOCATIONS. PROVIDE CLEANOUT EXTENSION AND EXTERIOR CLEANOUT COVER POSITIONED FLUSH WITH EXTERIOR FACE BRICK. COORDINATE HEIGHT OF CLEANOUT TO ALIGN WITH EXTERIOR CANOPY FACE BRICK CANOPY. REFER TO ARCHITECTURAL DRAWINGS.
11. (3 ADD) NATURAL GAS DDC SUB-METER. COORDINATE INSTALLATION OF DDC FLOW METER SUCH THAT MANUFACTURER'S RECOMMENDED STRAIGHT LENGTH PIPING INLET AND OUTLET CONDITIONS ARE PROVIDED.



FIRST FLOOR PLAN - AREA 'A'

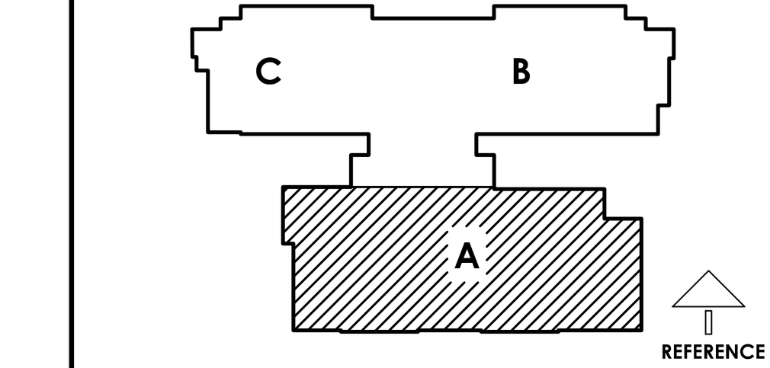
SCALE: 1/8"=1'-0"

NORTH

8 4 0 8 16

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

NOTE: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.



FIRST FLOOR KEY PLAN

tca|architects
1369 Generals Highway • Crownsville, Maryland 21032

STATE OF MARYLAND · MICHAEL PATRICK SHERREN · 33986 · PROFESSIONAL ENGINEER

JPA PROJECT NO. 6667-16

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Mechanical & Electrical Consulting Engineers
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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the state of Maryland, License No. 33986, Expiration date: 01-16-2021.

NEW TALBOTT SPRINGS ELEMENTARY SCHOOL
COLUMBIA, MARYLAND
HOWARD COUNTY PUBLIC SCHOOL SYSTEM

revisions

IAC CD / BLDG PERMIT SET
1 MAY 20

ADDENDUM NO. 3
1 JULY 20

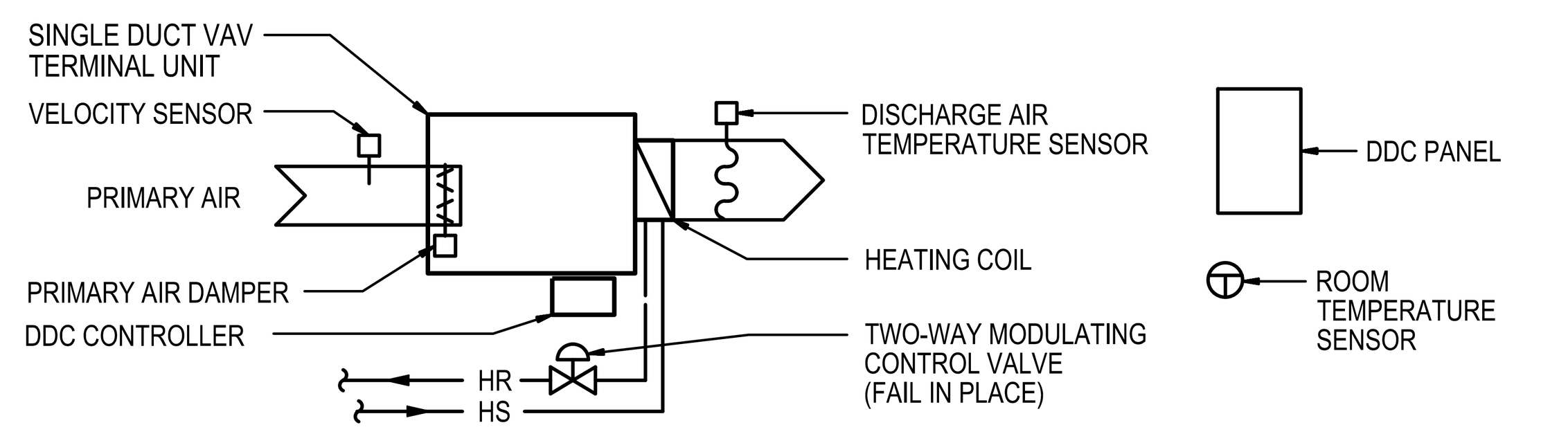
BID AND CONSTRUCTION
16 JUNE 20

FLOOR PLAN
FIRST FLOOR
AREA 'A'
PLUMBING

P-101

1 OF 10
PROJECT NO. 1804

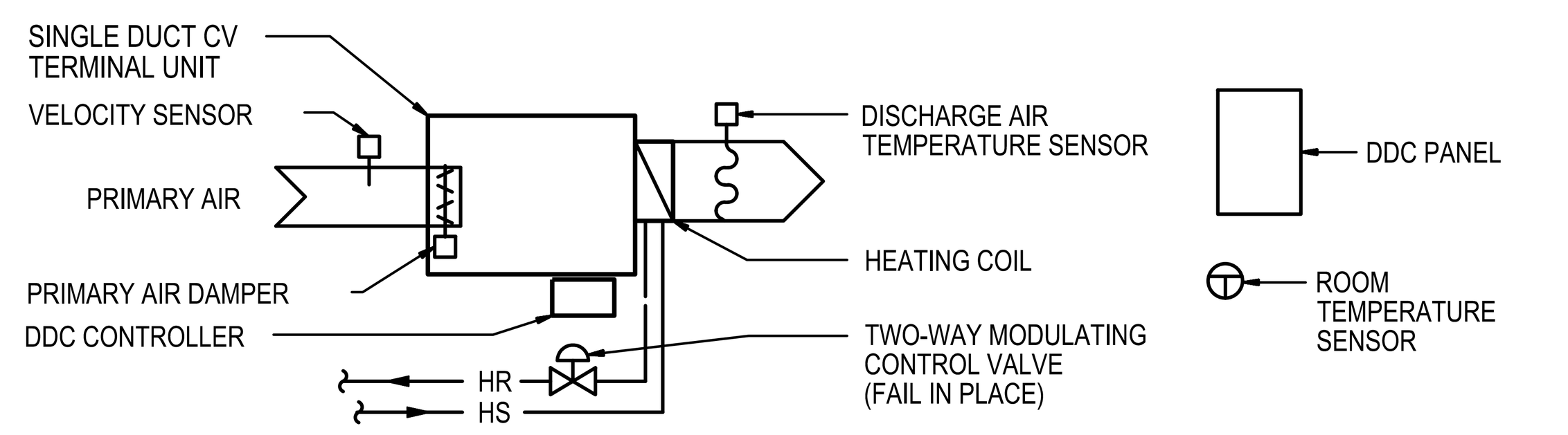
June 29, 2020 4:51 p.m.



SINGLE-DUCT VARIABLE AIR VOLUME (VAV) TERMINAL UNITS
(SINGLE DUCT AIR TERMINAL SCHEDULE CONTROL SEQUENCE A)

A. VAV TERMINAL UNIT ROOM TEMPERATURE SENSOR HEATING AND COOLING SETPOINTS ARE CONTROLLED BY THE RESPECTIVE ZONE OCCUPIED- UNOCCUPIED DDC SCHEDULE AND THE ASSOCIATED VAV AIR-HANDLING UNIT MODE OF OPERATION.
1. OCCUPIED HEATING SETPOINT SHALL BE 70 DEGREES F AND OCCUPIED COOLING SETPOINT SHALL BE 76 DEGREES F FOR ROOM TEMPERATURE CONTROL.
2. REFER TO THE MULTIPLE-ZONE VAV AIR-HANDLING UNIT SEQUENCE OF OPERATION FOR REQUIRED ROOM TEMPERATURE SENSOR HEATING AND COOLING SETPOINTS UNDER "DEHUMIDIFICATION MODE", AS THESE TEMPERATURE SETPOINTS VARY FROM THE NORMAL ROOM TEMPERATURE OCCUPIED HEATING AND COOLING SETPOINT VALUES.
3. UNOCCUPIED HEATING SETPOINT SHALL BE 55 DEGREES F AND UNOCCUPIED COOLING SETPOINT SHALL BE 85 DEGREES F.

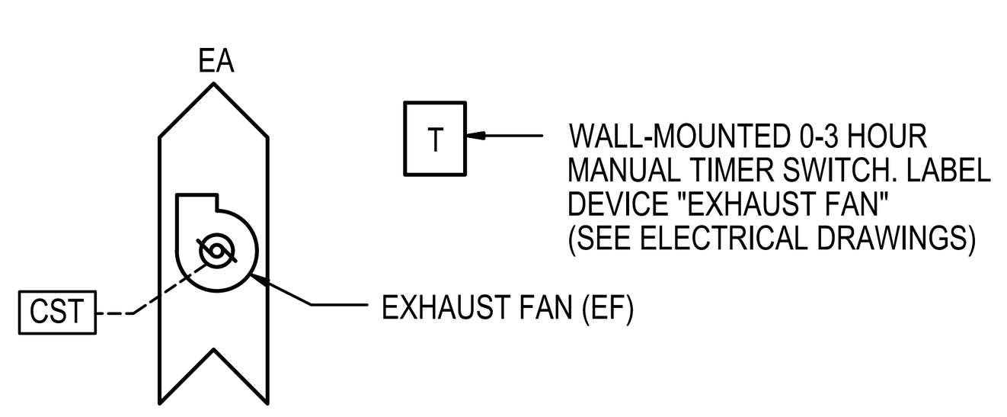
B. OPERATION:
1. THE TERMINAL UNIT PRIMARY AIR DAMPER SHALL MODULATE BETWEEN ITS MAXIMUM AND MINIMUM SCHEDULED AIRFLOW VALUES TO MAINTAIN THE ASSOCIATED COOLING SETPOINT OF THE ROOM TEMPERATURE SENSOR.
2. WHEN THE PRIMARY AIR DAMPER HAS REACHED ITS MINIMUM AIRFLOW SETPOINT AND THE SPACE TEMPERATURE FALLS BELOW THE ASSOCIATED HEATING SETPOINT OF THE ROOM TEMPERATURE SENSOR, THE HEATING COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN THE ASSOCIATED HEATING SETPOINT OF THE ROOM TEMPERATURE SENSOR, SUBJECT TO A HIGH LIMIT DISCHARGE AIR TEMPERATURE OF 85 DEGREES F (ADJUSTABLE).
3. WHEN THE DISCHARGE TEMPERATURE RISES ABOVE AN ADJUSTABLE HIGH LIMIT TEMPERATURE (85 DEGREES F; ADJUSTABLE), PRIMARY AIR DAMPER SHALL MODULATE TOWARDS ITS MAXIMUM AIRFLOW SETPOINT TO MAINTAIN THE HIGH LIMIT SETPOINT. ONCE PRIMARY AIR DAMPER HAS REACHED ITS MAXIMUM SETPOINT, UNIT DISCHARGE TEMPERATURE SHALL BE PERMITTED TO INCREASE ABOVE THE HIGH LIMIT DISCHARGE TEMPERATURE SETPOINT.



SINGLE-DUCT CONSTANT VOLUME (CV) TERMINAL UNITS
(SINGLE DUCT AIR TERMINAL SCHEDULE CONTROL SEQUENCE B)

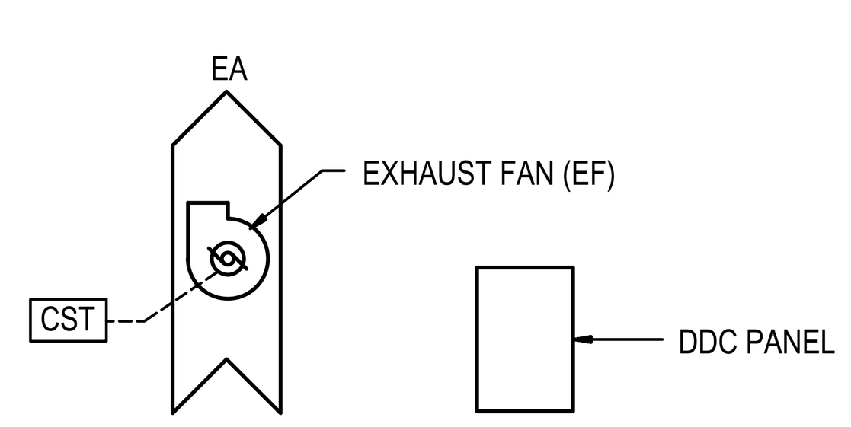
A. CONSTANT VOLUME TERMINAL UNIT ROOM TEMPERATURE SENSOR HEATING SETPOINT IS CONTROLLED BY RESPECTIVE ZONE OCCUPIED- UNOCCUPIED DDC SCHEDULE.
1. OCCUPIED HEATING SETPOINT SHALL BE 73 DEGREES F AT ALL TIMES DURING BOTH ROOM TEMPERATURE CONTROL AND "DEHUMIDIFICATION MODE" OPERATION.
2. UNOCCUPIED HEATING SETPOINT SHALL BE 55 DEGREES F.

B. OPERATION:
1. THE TERMINAL UNIT PRIMARY AIR DAMPER SHALL MODULATE TO MAINTAIN THE DESIGN AIRFLOW SETPOINT.
2. THE TERMINAL UNIT HEATING COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN THE ASSOCIATED HEATING SETPOINT OF THE ROOM TEMPERATURE SENSOR.



EXHAUST FAN WITH 0-3 HOUR TIMER SWITCH CONTROL
(FAN SCHEDULE CONTROL SEQUENCE C)

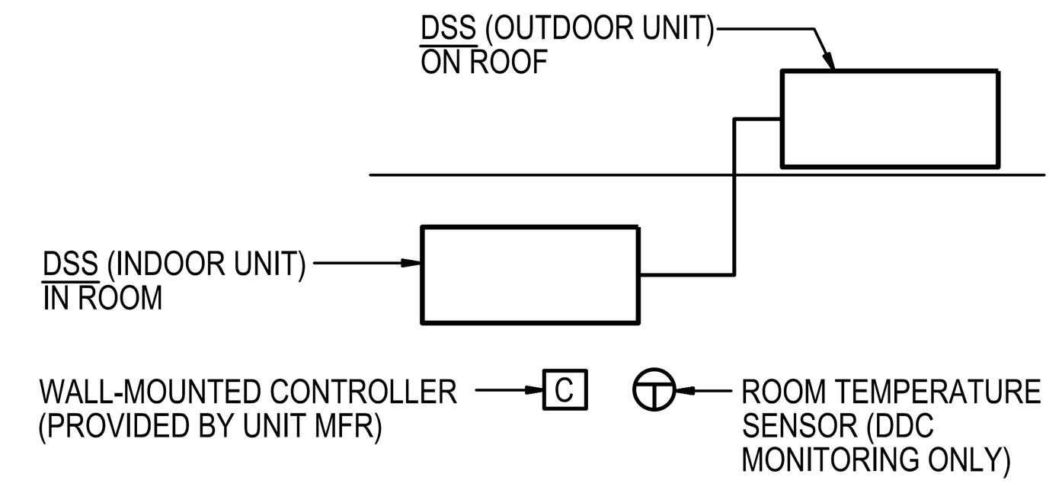
A. OPERATION:
1. EXHAUST FAN OPERATION SHALL BE MANUALLY ENERGIZED AND DEENERGIZED THROUGH A LOCAL WALL-MOUNTED TIMER SWITCH. FAN CONTROL, LOCAL SWITCH, AND WIRING PROVIDED BY ELECTRICAL (NO ATC REQUIRED FOR FAN OPERATION).
2. CURRENT SENSING TRANSDUCER PROVIDED AT FAN FOR REMOTE DDC MONITORING.



EXHAUST FAN WITH OCCUPIED/UNOCCUPIED CONTROL
(FAN SCHEDULE CONTROL SEQUENCE A)

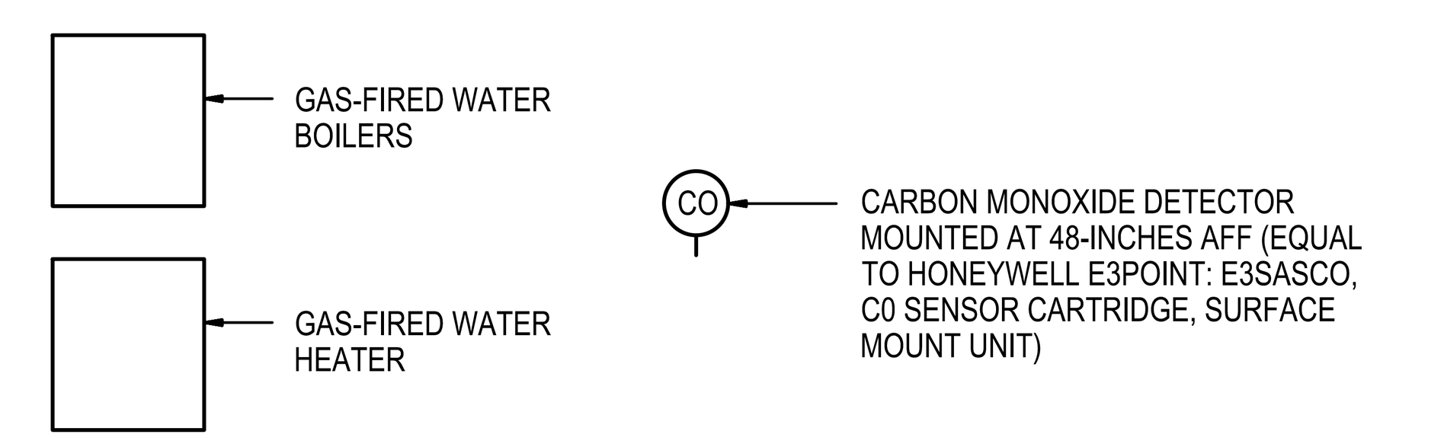
A. OCCUPIED CYCLE:
1. EXHAUST FAN SHALL BE INTERLOCKED WITH THE SCHEDULED ZONE, THROUGH THE DDC SYSTEMS OCCUPIED/UNOCCUPIED SCHEDULE. WHENEVER THE ZONE IS IN "OCCUPIED", EXHAUST FAN SHALL RUN CONTINUOUSLY.

B. ALL OTHER BUILDING CYCLES:
1. EXHAUST FAN SHALL BE DEENERGIZED WHENEVER THE ZONE IS IN OPERATING IN ANY OTHER CYCLE (INCLUDING THE "UNOCCUPIED", "WARM-UP, COOL-DOWN, OR RECIRCULATION", OR "MAINTENANCE" CYCLES).



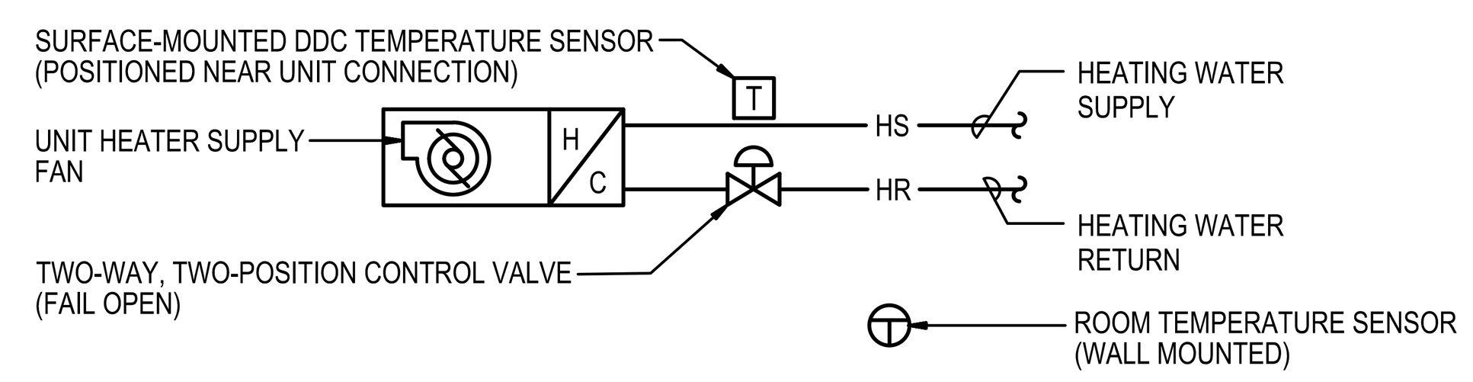
DUCTLESS SPLIT SYSTEM UNITS

THE DUCTLESS SPLIT AIR CONDITIONING SYSTEMS ARE TO BE SUPPLIED WITH ALL NECESSARY CONTROLS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING AND WIRING ALL CONTROL EQUIPMENT SUPPLIED WITH SYSTEM. CONTRACTOR SHALL ALSO PROVIDE ANY SWITCHES AND RELAYS TO ACCOMPLISH THE MANUFACTURER'S PACKAGED CONTROL SEQUENCE.



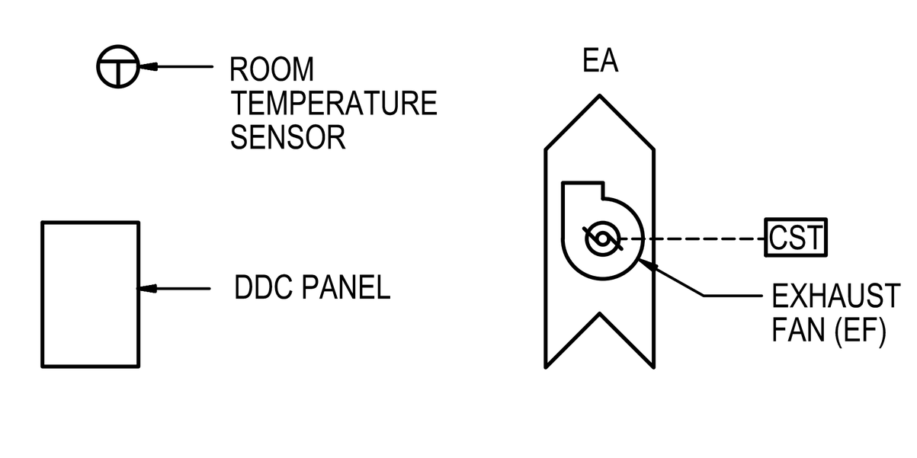
CARBON MONOXIDE DETECTION AND WARNING EQUIPMENT
(SERVING MAIN MECHANICAL ROOM)

A. OPERATION:
1. UPON SENSING ALARM LEVEL (ADJUSTABLE) OF CARBON MONOXIDE WITHIN SPACE, DETECTOR SHALL SOUND LOCAL ALARM AND SEND ALARM SIGNAL TO DDC.



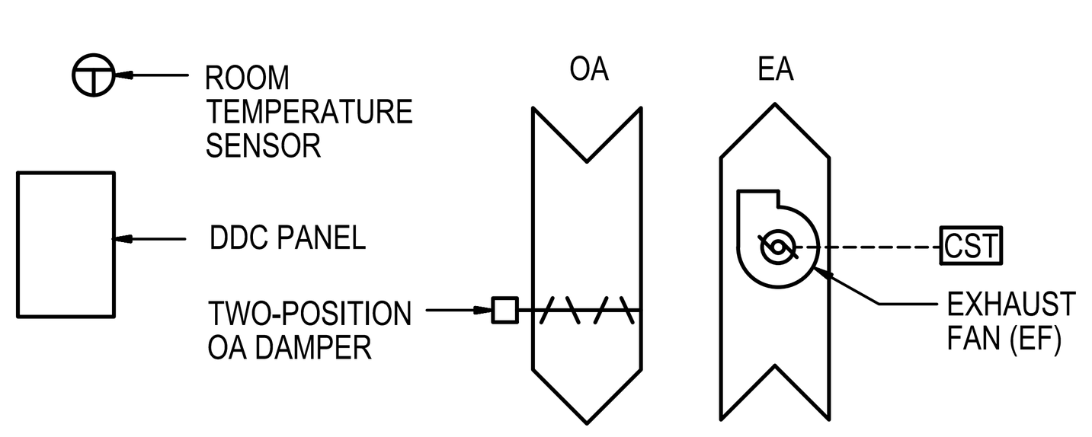
UNIT HEATER
(BOTH CUH AND PUH TYPES)

A. OPERATION:
1. THE HEATING COIL CONTROL VALVE SHALL OPEN WHEN THE SPACE TEMPERATURE IS BELOW THE ROOM SENSOR SETPOINT (65 DEGREES F; ADJUSTABLE).
2. ONCE THE SPACE TEMPERATURE RISES 2 DEGREES F ABOVE THE ROOM SENSOR SETPOINT, THE HEATING COIL CONTROL VALVE SHALL CLOSE.
3. THE UNIT HEATER SUPPLY FAN SHALL BE ENERGIZED WHEN THE SURFACE TEMPERATURE OF THE HEATING WATER SUPPLY PIPING IS 105 DEGREES F (ADJUSTABLE) AND ABOVE, AS SENSED BY THE SURFACE MOUNTED DDC TEMPERATURE SENSOR. UNIT HEATER SUPPLY FAN SHALL BE DEENERGIZED WHEN THE SURFACE TEMPERATURE OF THE HEATING WATER SUPPLY PIPING FALLS BELOW 105 DEGREES F.



EXHAUST FAN WITH ROOM TEMPERATURE SENSOR CONTROL
(FAN SCHEDULE CONTROL SEQUENCE D)

A. OPERATION:
1. ON A RISE IN TEMPERATURE 5 DEGREES ABOVE ROOM TEMPERATURE SENSOR SETPOINT (80 DEGREES F; ADJUSTABLE), THE EXHAUST FAN SHALL BE ENERGIZED AND RUN CONTINUOUSLY.
2. WHEN ROOM TEMPERATURE SENSOR IS SATISFIED, THE FAN SHALL BE DEENERGIZED .

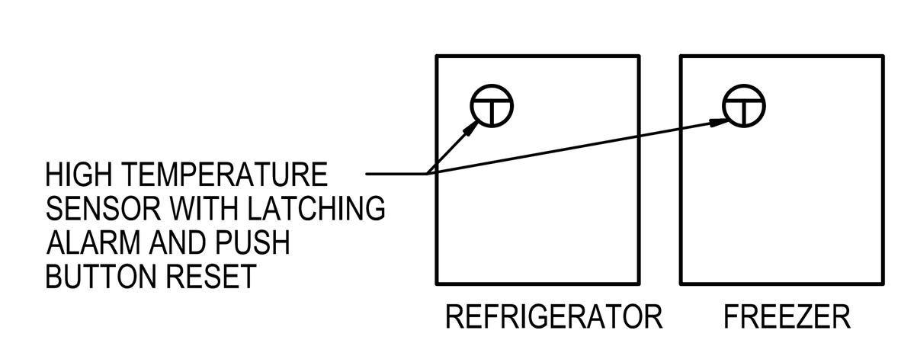


EXHAUST FAN WITH ROOM TEMPERATURE SENSOR AND COMPANION OA DAMPER CONTROL
(FAN SCHEDULE CONTROL SEQUENCE B)

A. OPERATION:
1. ON A RISE IN TEMPERATURE 5 DEGREES ABOVE ROOM TEMPERATURE SENSOR SETPOINT (80 DEGREES F; ADJUSTABLE), THE OA DAMPER SHALL BE PROVEN OPEN. ONCE PROVEN OPEN BY THE DAMPER'S ASSOCIATED END SWITCH, THE EXHAUST FAN SHALL BE ENERGIZED AND RUN CONTINUOUSLY.
2. WHEN ROOM TEMPERATURE SENSOR IS SATISFIED, THE FAN SHALL BE DEENERGIZED AND THE OA DAMPER SHALL CLOSE.

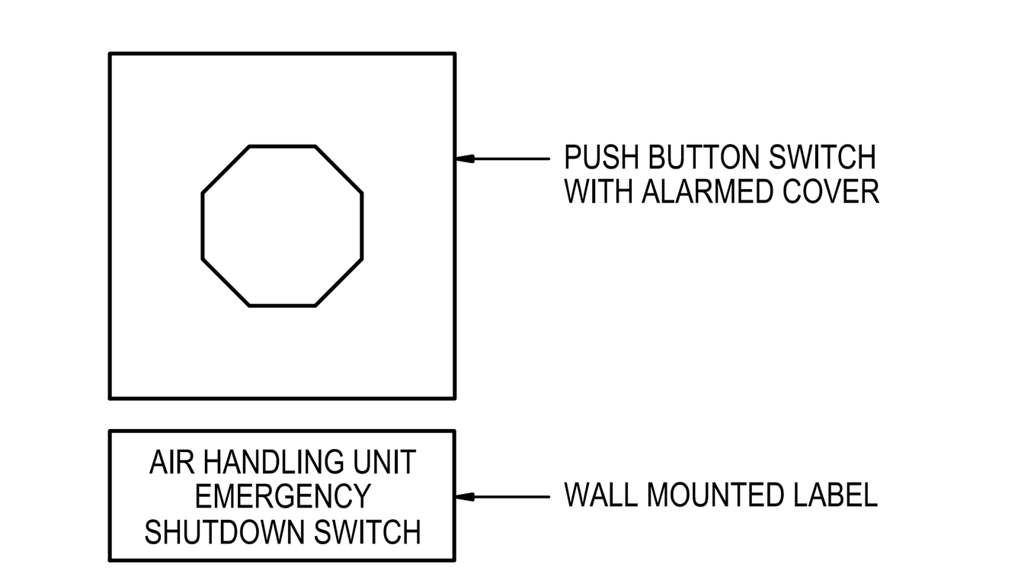
ATC SYSTEM GENERAL REQUIREMENTS

1. UNLESS OTHERWISE NOTED, OCCUPIED HEATING SETPOINT SHALL BE 70 DEGREES F AND OCCUPIED COOLING SETPOINT SHALL BE 76 DEGREES F FOR ROOM TEMPERATURE CONTROL. REFER TO SEQUENCES OF OPERATION FOR REQUIRED HEATING AND COOLING TEMPERATURE SETPOINTS ASSOCIATED WITH " DEHUMIDIFICATION MODE", WHICH DIFFER FROM "ROOM TEMPERATURE" CONTROL SETPOINTS. CONSTANT VOLUME AIR TERMINAL UNITS SHALL BE PROVIDED WITH A SINGLE OCCUPIED HEATING TEMPERATURE SETPOINT OF 73 DEGREES F AT ALL TIMES. UNLESS OTHERWISE INDICATED, UNOCCUPIED HEATING SETPOINT SHALL BE 55 DEGREES F AND UNOCCUPIED COOLING SETPOINT SHALL BE 85 DEGREES F.
2. UNLESS OTHERWISE INDICATED, PROVIDE DDC CONTROLS.
3. SMOKE DETECTORS, SMOKE DAMPERS, AND FREEZE DETECTORS SHALL BE HARD WIRED AND SHALL NOT REQUIRE OPERATION OF DDC SYSTEM SOFTWARE TO OPERATE OR TO DEENERGIZE SYSTEM FANS.
4. DESIGN SETPOINTS SHALL ALWAYS BE ENTERED INTO THE POINT DESCRIPTION AREA. FOR CONTROL SYSTEMS THAT DO NOT HAVE THIS ABILITY, ALL POINT DESCRIPTORS INCLUDING DESIGN SETPOINTS SHALL BE ADDED TO THE GRAPHICS.
5. THE ATC CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING AND WIRING ALL CONTROL EQUIPMENT SUPPLIED WITH HVAC SYSTEMS AND COMPONENTS AND FOR PROVIDING POWER CIRCUITS FOR THESE CONTROL SYSTEMS. CONTROLS CONTRACTOR SHALL ALSO PROVIDE ANY ANCILLARY COMPONENTS INCLUDING BUT NOT LIMITED TO SWITCHES, RELAYS, WIRING, CONDUIT, TERMINAL BOXES, JUNCTION BOXES, AND COMMUNICATION INTERFACES AS REQUIRED TO ACCOMPLISH INTENDED CONTROL FUNCTIONS AND/OR CONTROL SEQUENCE NOTED IN THE SPECIFICATIONS.
6. FUNCTION OF CONTROLS SHALL BE AUTOMATICALLY RESTORED TO NORMAL OPERATION WITHOUT OPERATOR INTERVENTION WHEN SAFETIES ARE RESET OR WHEN POWER IS RESTORED AFTER AN OUTAGE. FREEZESTAT AND PRESSURE DIFFERENTIAL SAFETY DEVICES SHALL REQUIRE MANUAL RESET AT THEIR RESPECTIVE UNIT. EMERGENCY FAN DISCONNECT TRIPPING SHALL BE RESET WHEN THE DISCONNECT SWITCH IS RESET. SMOKE DETECTOR TRIPPING SHALL BE RESET WHEN THE ALARM IS NO LONGER PRESENT IN THE FIRE ALARM SYSTEM.
7. ON A LOSS IN NETWORK COMMUNICATION TO A PARTICULAR DEVICE OR SYSTEM, THAT DEVICE SHALL FAIL TO IT'S NORMAL POSITION OR THAT SYSTEM SHALL FAIL TO LOCAL AUTOMATIC CONTROL.
8. ALL SETPOINTS SHALL BE ADJUSTABLE.
9. ALL ANALOG CONTROL OUTPUTS SHALL BE TRUE ANALOG SIGNALS.
10. WHERE EMERGENCY SWITCH POINT IS INDICATED, HARD WIRING OF SHUT DOWN IS REQUIRED AS INDICATED ABOVE. ADDITIONALLY, A SOFTWARE INPUT MONITORING EMERGENCY FAN DISCONNECT SWITCH STATUS IS REQUIRED SO THAT A SYSTEM USER IS ABLE TO DIAGNOSE THE CAUSE OF THE SHUT DOWN.
11. WHERE SMOKE DETECTOR POINT IS INDICATED, HARD WIRING OF SHUT DOWN IS REQUIRED AS INDICATED ABOVE. ADDITIONALLY, A SOFTWARE INPUT MONITORING THE SMOKE DETECTOR STATUS IS REQUIRED SO THAT A SYSTEM USER IS ABLE TO DIAGNOSE THE CAUSE OF THE SHUT DOWN.
12. BACNET INTERFACE SHALL BE PROVIDED FOR ALL EQUIPMENT WITH DIGITAL CONTROLLERS, INCLUDING BOILERS AND CHILLER(S) TO EXPEDITE TROUBLESHOOTING. A VENDORS CONTROL TECHNICIAN FAMILIAR WITH INTEGRATION OF THEIR EQUIPMENT SHALL BE REPRESENTED ONSITE TO PROVE ALL BACNET INTEGRATION IS CORRECT. THIS ONSITE REVIEW SHOULD OCCUR DIRECTLY AFTER START-UP HAS OCCURRED BY THEIR TECHNICIAN.
13. EACH ROOFTOP AIR HANDLING UNIT AND DEDICATED OUTDOOR AIR SYSTEM SHALL BE PROVIDED WITH A DEDICATED DDC PANEL ENCLOSURE. DDC PANEL ENCLOSURES SERVING ROOFTOP EQUIPMENT SHALL BE LOCATED OUTDOORS AT THE EQUIPMENT SERVED. ALL DDC PANEL ENCLOSURES LOCATED OUTDOORS SHALL RATED FOR OUTDOOR USE, INCLUDING ALL POWER FOR ASSOCIATED PANEL COMPONENTS (HEATERS, FANS, ETC.).
14. EACH ROOFTOP MULTI-ZONE VARIABLE-AIR-VOLUME AIR HANDLING UNIT SHALL BE PROVIDED WITH A DEDICATED ZONE HIGH/LOW LIMIT TEMPERATURE SENSOR HARD-WIRED DIRECTLY TO THE UNIT CONTROLLER. OPERATION OF HIGH/LOW LIMIT TEMPERATURE SENSOR SHALL NOT REQUIRE NETWORK COMMUNICATION BETWEEN THE DDC SYSTEM AND ROOM TEMPERATURE SENSOR, ALLOWING FOR STAND-ALONE UNIT OPERATION. HIGH/LOW LIMIT SENSORS SHALL BE PROVIDED IN ADDITION TO ANY AIR TERMINAL UNIT ROOM TEMPERATURE SENSORS.
15. PROVIDE UPS AT SERVER COMMUNICATION TO ALL JOHNSON CONTROLS NAE, TRIDIUM JACE, OR STRUXUREWARE FRONT-END CONTROLLERS. IN ADDITION, UPS BACKUP IS REQUIRED ON ALL DDC/EMS BUILDING SUPERVISORY INTERFACE CONTROLLERS AND ALL CENTRAL HEATING AND COOLING PLANT CONTROL PANELS / CONTROLLERS FOR COMMUNICATION WITH THE FRONT END HCPSS SERVER LOCATED AT THE MENDENHALL BUILDING.
16. PROVIDE NORMALLY CLOSED RELAYS FOR INTERLOCK ON ALL EQUIPMENT THAT SHALL FAIL "ON". ALL RELAYS SHALL BE LABELED FOR USE AND WHAT STATUS LIGHT INDICATES. STATUS LIGHT REQUIRED FOR FAIL "ON" RELAYS, AS THE LIGHT "ON" INDICATES EQUIPMENT DISABLED. HVAC SYSTEMS AND OUTDOOR LIGHTING SHALL BE PROVIDED WITH "FAIL ON" CONTROL. IN THE EVENT OF A BUILDING LAN FAILURE OR WAN OUTAGE TO THE MENDENHALL BUILDING. NORMALLY CLOSED CONTACTS SHALL BE PROVIDED FOR BOILERS, HEATING WATER PUMPS AND OUTDOOR LIGHTING, WITH RELAYS LABELED TO INDICATE THAT RELAY LIGHT OFF MEANS "ENABLED".
17. CONTROL GRAPHICS SHALL BE PROVIDED BY THE CONTROL VENDOR'S ASSOCIATED CONTROL PLATFORM GRAPHIC PACKAGE (JOHNSON CONTROLS, TRIDIUM, OR SCHNEIDER ELECTRIC). USE OF THIRD PARTY GRAPHIC PACKAGES ARE NOT ACCEPTABLE.
18. ONCE BUILDING AUTOMATION SYSTEM SUBMITTAL (INCLUSIVE OF ALL PARTS/MATERIALS AND SEQUENCES OF OPERATION) IS REVIEWED BY THE A/E, A SAMPLE BUILDING AUTOMATION SYSTEM GRAPHICS SUBMITTAL SHALL BE PREPARED BY THE CONTROLS CONTRACTOR. SAMPLE BUILDING AUTOMATION SYSTEM GRAPHICS SUBMITTAL INCLUSIVE OF GRAPHICS FOR THE ENTIRE PROJECT SHALL BE SUBMITTED TO HCPSS AND THE COMMISSIONING AGENT FOR INITIAL REVIEW. INITIAL SUBMITTAL REVIEW COMMENTS SHALL BE ADDRESSED AND INCORPORATED INTO A FINAL SAMPLE GRAPHICS SUBMITTAL FOR ADDITIONAL HCPSS AND COMMISSIONING AGENT REVIEW.
19. ALL CURRENT SENSING TRANSDUCER SETTINGS SHALL BE FIELD CALIBRATED WITH THE ASSOCIATED MOTOR OPERATING AT THE LOWEST SPEED POSSIBLE, REGARDLESS OF THE TESTING AND BALANCING SETPOINT. FOR EC TYPE MOTORS, CALIBRATE TRANSDUCER "OFF" SETTING FOR EACH DEVICE BY FIRST DETERMINING PASSIVE CURRENT DRAW WHEN MOTOR IS CONNECTED TO AC POWER SOURCE BUT SHAFT IS NOT ROTATING, THEN FIELD ADJUSTING THE SENSOR "OFF" POINT TO BE SLIGHTLY HIGHER THAN THIS PASSIVE CURRENT VALUE. LOOP WIRES TO INCREASE AMOUNT OF CURRENT MEASURED BY TRANSDUCER WHEN PASSIVE CURRENT VALUE IS BELOW THE MINIMUM DEVICE SETTING.
20. PROVIDE MULTI-POINT TRENDS (WITH GRAPHICS) ON EACH PIECE OF EQUIPMENT'S GRAPHICS SCREEN. TRENDS SHALL BE CAPTURED/ DISPLAYED OVER A 7-DAY PERIOD BASED ON CHANGE OF VALUE SAMPLING. ALL POINTS LISTED ON SCHEMATIC DIAGRAMS AND POINTS LISTED AS TRENDABLE SHALL BE INCLUDED WITHIN MULTI-POINT TRENDS. TRENDS SHALL BE ABLE TO BE EXPORTED TO A CSV FILE FROM THE GRAPHICS PAGES.
21. CONTROL VALVES SHALL BE INSTALLED IN A HORIZONTAL PIPE WITH ACTUATOR POSITIONED UPWARD TO PREVENT UNNECESSARY WEAR TO THE VALVE STEM AND PACKING.
22. FOR ROOM TEMPERATURE SENSORS, ROOM HUMIDITY SENSORS, AND CARBON DIOXIDE WALL TERMINATION PROBES - MOUNT DEVICE ON WALL, SECURELY ANCHORED USING TOGGLE BOLTS (RAWL PLUGS ARE NOT ACCEPTABLE). MOUNTING HEIGHT FROM FLOOR TO TOP OF DEVICE SHALL BE 48 INCHES, AS REQUIRED FOR ACCESSIBILITY TO PERSONS USING WHEELCHAIRS. ALL WALL-MOUNTED SENSORS SHALL BE PROVIDED WITH FOAM INSULATION TAPE CONSISTING OF EVENLY CUT STRIPS THAT MAKE UP THE ENTIRE LENGTH AND WIDTH OF THE SENSORS BACK AND OVERLAP TO AVOID AIRFLOW INFILTRATION. SECURE THE FOAM INSULATION TAPE TO THE BACK OF THE SENSOR, COVERING THE ENTIRE BACK WITH A SLIGHT OVERHANG (APPROXIMATELY 1/8 INCH). PENETRATE A HOLE IN THE BACK OVERLAP WITH A TOOL OF THE SIMILAR SIZE NEEDED FOR THE WIRE TO BE PULLED THROUGH THE FOAM INSULATION TAPE. MOUNT THE SENSOR TO THE WALL AND MAKE THE FINAL WIRING CONNECTIONS.
23. MOUNT ROOM SENSORS AND OTHER DEVICES AS DESCRIBED WITHIN NOTE 22 ABOVE. USE WALL BOXES WITH INSULATED BACKPLATE SECURELY ANCHORED FLUSH INTO THE WALL. MOUNTING OF DEVICES WITHOUT USE OF INSULATED BACKPLATE IS NOT ACCEPTABLE. USE CONDUIT FROM CEILING TO SENSOR EITHER FISHED THROUGH WALL CAVITY OR CHASED INTO WALL AND PATCHED TO MATCH EXISTING SURFACE. ALL CONDUIT AND WALL PENETRATIONS SHALL BE SEALED TO PREVENT INFILTRATION INTO THE SENSOR AREA.



HIGH TEMPERATURE REFRIGERATOR/ FREEZER ALARM

A. OPERATION
1. WHENEVER THE SETPOINT OF THE HIGH TEMPERATURE SENSOR IN THE REFRIGERATOR OR THE FREEZER IS EXCEEDED, THE ALARM REPORTING DEVICE OF THE DDC SYSTEM SHALL BE ACTIVATED. SETPOINTS SHALL BE DETERMINED IN COOPERATION WITH SCHOOL FOOD SERVICE PERSONNEL. LOCAL ALARM SHALL ALSO SOUND IN THE KITCHEN.
2. ALARMS SHALL BE PROVIDED WITH AN ADJUSTABLE ACTIVATION TIME DELAY TO AVOID ACCIDENTAL ACTIVATION DURING LOADING AND UNLOADING OF CONTENTS. INITIAL TIME DELAY SHALL BE 30 MINUTES (ADJUSTABLE).
3. ALARM SHALL BE A LATCHING ALARM WHICH SHALL REQUIRE MANUAL RESET AT THE FREEZER OR REFRIGERATOR VIA A PUSH BUTTON.
4. ALARM REPORTING DEVICE SHALL NOTIFY SCHOOL PERSONNEL OF CONDITION.

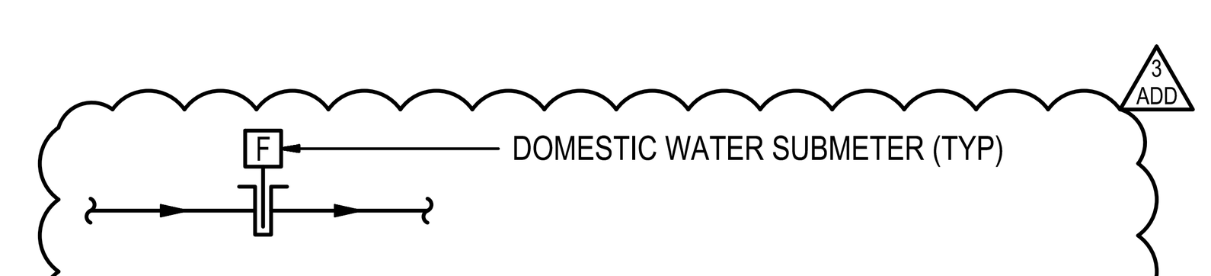


NOTE:
PROVIDE A SINGLE SWITCH TO SHUT DOWN ALL EQUIPMENT INDICATED WITH (E) IN THE CONTROL SEQUENCE.

EMERGENCY FAN DISCONNECT SWITCH DETAIL
MOUNT NEXT TO FIRE ALARM PANEL AT VESTIBULE AV01 (SEE DRAWING MP-101 FOR LOCATION)

ATC SYMBOLS AND ABBREVIATIONS

	ROOM TEMPERATURE SENSOR
	FAN
	PUMP
	PATH OF AIRFLOW
	DAMPER AND DAMPER OPERATOR; (OA) OUTSIDE AIR, (RA) RETURN AIR, (EA) EXHAUST AIR, (PR) PRESSURE RELIEF
S	SMOKE DAMPER AND DAMPER OPERATOR
	AIR INSERTION TEMPERATURE OR HUMIDITY SENSOR
F	FREEZESTAT
	2-WAY CONTROL VALVE
H	HUMIDITY SENSOR
	IMMERSION TEMPERATURE SENSOR
F	DDC FLOW METER
	OUTDOOR AIR INSERTION TEMPERATURE SENSOR WITH SUN SHIELD
T	SURFACE MOUNTED TEMPERATURE SENSOR
DP	DIFFERENTIAL PRESSURE SENSOR
S	WALL-MOUNTED SWITCH ("T" DENOTES TIMER SWITCH; "P" DENOTES PILOT LIGHT)
	MOTOR
H/C	H/C: HEATING COIL, C/C: CHILLED WATER COOLING COIL, P/C: PREHEAT COIL
E	EMERGENCY FAN DISCONNECT SWITCH
SD	AIR DUCT SMOKE DETECTOR
SPS	DUCT STATIC PRESSURE SENSOR, (HL) HIGH LIMIT, (LL) LOW LIMIT
CST	CURRENT SENSING TRANSDUCER
CO_2 (M)	CARBON DIOXIDE (CO2) WALL TERMINATION PROBE FOR CARBON DIOXIDE MEASUREMENT AND CONTROL SYSTEM (CDMCS); "M" DENOTES "MONITORING ONLY" PROBE.
CO	CARBON MONOXIDE SENSOR
ACCU	AIR-COOLED CONDENSING UNIT
RAHU	ROOFTOP AIR HANDLING UNIT
CA	CONDITIONED OUTDOOR AIR
CATU	CONDITIONED OUTDOOR AIR TERMINAL UNIT
CDMCS	CARBON DIOXIDE MEASUREMENT AND CONTROL SYSTEM
CUH	CABINET UNIT HEATER
DOAS	DEDICATED OUTDOOR AIR SYSTEM
DSS	DUCTLESS SPLIT SYSTEM
EA	EXHAUST AIR
EF	EXHAUST FAN
FCU	FAN COIL UNIT
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTDOOR AIR
PR	PRESSURE RELIEF
PUH	PROPELLER UNIT HEATER
RA	RETURN AIR
RF	RETURN FAN
SA	SUPPLY AIR
SATU	SUPPLY AIR TERMINAL UNIT
SF	SUPPLY FAN
VAV	VARIABLE AIR VOLUME



NATURAL GAS SUBMETER
(SERVING BOILERS - SEE DWG P-101)

NATURAL GAS SUBMETER SHALL BE CONTINUOUSLY MONITORED AND TRENDED THROUGH THE DDC SYSTEM.

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Engineering Your Vision
Mechanical & Electrical Consulting Engineers

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 33086, Expiration date: 01-16-2021.

NEW TALBOTT SPRINGS ELEMENTARY SCHOOL
COLUMBIA, MARYLAND
HOWARD COUNTY PUBLIC SCHOOL SYSTEM

revisions

IAC CD / BLDG PERMIT SET	1 MAY 20
ADDENDUM NO. 3	1 JULY 20
BID AND CONSTRUCTION	16 JUNE 20

ATC SEQUENCES

M-700

DDC - INPUT/OUTPUT POINT SCHEDULE

SYSTEM APPARATUS OR AREA POINT DESCRIPTION	INPUT TO DDC																		OUTPUT FROM DDC							SYSTEM FEATURES												GENERAL			SUPPLEMENTARY NOTES
	ANALOG									BINARY									ANALOG				BINARY			ALARMS						PROGRAMS									
	TEMPERATURE	PRESSURE	CFM	FLOW	RELATIVE HUMIDITY	POSITION	CONCENTRATION (CO OR CO2)	SPEED	CO2 DIFFERENTIAL	STATUS	CURRENT SENSING TRANSDUCER	SMOKE DETECTORS	FREEZESTAT	EMERGENCY SWITCH	FILTER DP	END SWITCH	LOCAL SWITCH ACTIVATION	ALARM	SETPOINT ADJUSTMENT	POSITION	HUMIDITY	CO2 CONCENTRATION	OFF/ON	OPEN-CLOSE	HEATING-COOLING	FAILURE	HIGH ANALOG	LOW ANALOG	HIGH BINARY	HIGH BINARY	FAULT (GENERAL)	TIME SCHEDULING (OCC/UNOCC)	LEAD/LAG	WARM UP / COOL DOWN / RECIRC	REDUCED OCCUPANCY CYCLE	RUNTIME REGISTER	ECONOMIZER	COLOR GRAPHICS	INTERFACE W/ EQUIPMENT CONTROLS		
SINGLE-ZONE VAV ROOFTOP AIR-HANDLING UNIT												X	X	X																		X		X	X		X	X			RAHU-1 AND RAHU-2
SUPPLY FAN ARRAY								X		X	X							X	X				X			X															
RETURN FAN ARRAY								X		X	X							X	X				X			X															
MIXED AIR TEMPERATURE SENSOR	X																																								
PREHEAT COIL DISCHARGE TEMP SENSOR	X																		X																						
COOLING COIL DISCHARGE TEMP SENSOR	X																		X																						
HEATING COIL DISCHARGE TEMP SENSOR	X																																								
UNIT DISCHARGE TEMPERATURE SENSOR	X																		X																						
OA, RA, AND EA DAMPERS																				X																					
OA AIRFLOW STATION			X																X																				X		
PREHEAT COIL CONTROL VALVE																				X																					
HEATING COIL CONTROL VALVE																				X																					
COOLING COIL CONTROL VALVE																				X																					
LOCAL OA TEMPERATURE SENSOR	X																																								BACK-UP FOR GLOBAL SENSOR
PIPING VESTIBULE TEMP SENSOR	X																											X													
AHU ELECTRIC RESISTANCE HEATERS										X	X																														TYP OF 2
ROOM TEMPERATURE SENSOR	X																		X								X	X													
ROOM CO2 SENSOR							X												X								X														
ROOM HUMIDITY SENSOR					X														X								X														
HL/LL STATIC PRESSURE SENSORS		X																									X	X													
MULTIPLE-ZONE VAV ROOFTOP AIR-HANDLING UNIT												X	X	X																		X		X	X		X	X			RAHU-3
SUPPLY FAN ARRAY								X		X	X							X	X				X			X															
RETURN FAN ARRAY								X		X	X							X	X				X			X															
MIXED AIR TEMPERATURE SENSOR	X																		X																						
PREHEAT COIL DISCHARGE TEMP SENSOR	X																		X									X													
COOLING COIL DISCHARGE TEMP SENSORS	X																		X																						BOTH DX + CHILLED WATER
UNIT DISCHARGE TEMPERATURE SENSOR	X																		X																						
RETURN AIR TEMPERATURE SENSOR	X																																								
RETURN AIR HUMIDITY SENSOR					X														X								X														
UNIT OA, RA, AND EA DAMPERS																				X																					
DUCT-MOUNTED RA DAMPERS																X								X		X															
OA AIRFLOW MEASURING STATION			X																X																				X		
PREHEAT COIL CONTROL VALVE																				X																					
COOLING COIL CONTROL VALVE																				X																					
AIR-COOLED CONDENSING UNIT										X	X								X				X								X										
LOCAL OA TEMPERATURE SENSOR	X																																								BACK-UP FOR GLOBAL SENSOR
PIPING VESTIBULE TEMP SENSOR	X																											X													
AHU ELECTRIC RESISTANCE HEATERS										X	X																														TYP OF 2
HIGH/LOW LIMIT ROOM TEMPERATURE SENSOR	X																		X								X	X													
ROOM HUMIDITY SENSOR					X														X								X														
STATIC PRESSURE SENSOR SP-1		X																	X																						
HL/LL STATIC PRESSURE SENSORS		X																											X	X											
DEDICATED OUTDOOR AIR SYSTEM												X	X	X																		X						X			DOAS-1 AND DOAS-2
SUPPLY FAN ARRAY								X		X	X							X	X				X			X															
EXHAUST FAN ARRAY								X		X	X							X	X				X			X															
OA LEAVING WHEEL TEMP SENSOR	X																																								
OA LEAVING WHEEL HUMIDITY SENSOR					X																																				
HEATING COIL DISCHARGE SENSOR	X																																								
COOLING COIL DISCHARGE SENSOR	X																		X																						
UNIT DISCHARGE AIR SENSOR	X																		X								X	X													
ENTERING UNIT EA SENSOR	X																																								
ENTERING WHEEL EA SENSOR	X																																								
EA LEAVING WHEEL TEMP SENSOR	X																		X									X													
OA, EA, AND RECIRCULATION DAMPERS																X								X		X															
DOAS CA AND EA ISOLATION DAMPERS																X								X		X															
ZONE CA AND EA ISOLATION DAMPERS																X								X		X															
HEATING COIL CONTROL VALVE																				X																					
COOLING COIL CONTROL VALVE																				X																					
LOCAL OA TEMPERATURE SENSOR	X																																								BACK-UP FOR GLOBAL SENSOR
LOCAL OA HUMIDITY SENSOR					X																																				BACK-UP FOR GLOBAL SENSOR
DOAS ELECTRIC RESISTANCE HEATERS										X	X																														
ENTHALPY WHEEL VFD								X		X	X								X				X			X					X										HARDWIRE INTERFACE W/ VFD
ENTHALPY WHEEL OA & EA BYPASS DAMPERS																X				X																					
HX FACE & BYPASS DAMPERS																X				X																					
STATIC PRESSURE SENSOR SPS-A		X																	X																						
HL AND LL STATIC PRESSURE SENSORS		X																											X	X											
ROOM TEMPERATURE SENSOR	X																		X																						
ROOM HUMIDITY SENSORS					X														X								X														
ELEVATOR SUMP PUMPS										X								X													X										
HIGH TEMP REFRIG/FREEZER ALARM	X																										X														
CARBON MONOXIDE DETECTOR							X			X								X													X										
DOMESTIC WATER SUBMETER				X																																					TYPICAL
EXTERIOR LIGHTING																							X									X						X			
PHOTOCELL				X																																					LIGHT LEVEL INPUT TO DDC
DOMESTIC HW SYSTEM																																									
CIRCULATOR PUMP										X	X												X			X															TYPICAL OF 2
INSERTION TEMPERATURE SENSOR	X																											X													
NATURAL GAS SUBMETER				X																																		X			

3 ADD

~~GENERAL NOTES:~~

1. IF ANY BACNET POINTS ARE NOT CONFIGURED PROPERLY BY THE EQUIPMENT MANUFACTURER, THE EQUIMPMENT MANUFACTURER OR MANUFACTURER'S REPRESENTATIVE MUST MAKE CORRECTIONS TO THESE BACNET POINT CONFIGURATIONS AT NO COST TO THE OWNER.
2. ALL POINTS THAT ARE NOTED IN THE SEQUENCE OF OPERATION AS "ADJUSTABLE" SHALL BE INCLUDED WITHIN THE GRAPHICS POINTS LIST, INCLUDING ALL MULTI-STATE UNIT MODES OF OPERATION POINTS.

DDC - INPUT/OUTPUT POINT SCHEDULE

SYSTEM APPARATUS OR AREA POINT DESCRIPTION	INPUT TO DDC																		OUTPUT FROM DDC							SYSTEM FEATURES												GENERAL			SUPPLEMENTARY NOTES
	ANALOG									BINARY									ANALOG				BINARY			ALARMS						PROGRAMS									
	TEMPERATURE	PRESSURE	CFM	FLOW	RELATIVE HUMIDITY	POSITION	CONCENTRATION (CO OR CO2)	SPEED	CO2 DIFFERENTIAL	STATUS	CURRENT SENSING TRANSDUCER	SMOKE DETECTORS	FREEZESTAT	EMERGENCY SWITCH	FILTER DP	END SWITCH	LOCAL SWITCH ACTIVATION	ALARM	SETPOINT ADJUSTMENT	POSITION	HUMIDITY	CO2 CONCENTRATION	OFF/ON	OPEN-CLOSE	HEATING-COOLING	FAILURE	HIGH ANALOG	LOW ANALOG	HIGH BINARY	HIGH BINARY	FAULT (GENERAL)	TIME SCHEDULING (OCC/UNOCC)	LEAD/LAG	WARM UP / COOL DOWN / RECIRC	REDUCED OCCUPANCY CYCLE	RUNTIME REGISTER	ECONOMIZER	COLOR GRAPHICS	INTERFACE W/ EQUIPMENT CONTROLS		
GLOBAL POINTS																																						X			
OA TEMPERATURE AND HUMIDITY	X				X																																				
EMERGENCY FAN DISCONNECT														X																											
GENERATOR TRANSFER SWITCH										X																															
HEATING WATER SYSTEM																							X									X						X			
HEATING WATER PUMPS										X	X												X			X							X			X					
HEATING WATER PUMP VFDS								X		X								X	X				X								X										HARDWIRE INTERFACE W/ VFD
DDC FLOW METER				X															X									X													
MINIMUM FLOW BYPASS VALVE																X				X																					
DIFFERENTIAL PRESSURE SENSOR		X																	X								X														
BOILER CONTROLLERS																							X								X								X		SEE SPECIFIC NOTE 1
HS TEMPERATURE SENSORS	X																		X									X													SETPOINT ADJ + ALARM T-3 ONLY
HR TEMPERATURE SENSOR	X																																								
LOCAL OA TEMPERATURE SENSOR	X																																								
BUILDING CHILLED WATER SYSTEM																							X									X						X			
CHILLED WATER PUMPS										X	X												X			X							X			X					
CHILLED WATER PUMP VFDS								X		X								X	X				X								X										HARDWIRE INTERFACE W/ VFD
DDC FLOW METER				X															X									X													
MINIMUM FLOW BYPASS VALVE																X				X																					
DIFFERENTIAL PRESSURE SENSORS		X																	X								X														TYP OF 2
CHILLER CONTROL PANEL																							X			X													X		SEE SPECIFIC NOTE 1
CS TEMPERATURE SENSOR	X																		X								X														
CR TEMPERATURE SENSORS	X																																								
LOCAL OA TEMPERATURE SENSOR	X																																								
CHILLER EVAP HEATER + HEAT TRACE										X	X															X															
FOUR-PIPE FAN COIL UNITS																																X		X				X			
SUPPLY FAN										X	X												X																		
HEATING COIL CONTROL VALVE																				X																					
COOLING COIL CONTROL VALVE																				X																					
ROOM TEMPERATURE SENSOR	X																		X																						
DISCHARGE TEMPERATURE SENSOR	X																																								DDC MONITORING
DRAIN PAN OVERFLOW SENSOR																													X												
DX / HEATING WATER FAN COIL UNITS																																X		X				X			
SUPPLY FAN										X	X												X																		
HEATING COIL CONTROL VALVE																				X																					
AIR-COOLED CONDENSING UNIT										X	X												X			X															
ROOM TEMPERATURE SENSOR	X																		X																						
DISCHARGE TEMPERATURE SENSOR	X																																								DDC MONITORING
DRAIN PAN OVERFLOW SENSOR																													X												
UNIT HEATERS																																						X			BOTH PUH AND CUH TYPES
ROOM TEMPERATURE SENSOR	X																		X																						
HEATING WATER CONTROL VALVE																								X																	
SURFACE MTD TEMPERATURE SENSOR	X																		X																						
DUCTLESS SPLIT SYSTEMS																																						X			
TEMPERATURE SENSOR	X																										X														
EF WITH OCC/UNOCC CONTROL																																X						X			FAN SEQUENCE A
EXHAUST FAN										X	X												X			X															
EF WITH ROOM SENSOR + OA DAMPER																																						X			FAN SEQUENCES B AND D
EXHAUST FAN										X	X												X			X															
ROOM TEMPERATURE SENSOR(S)	X																		X								X														
OA DAMPER																X								X		X															FAN SEQUENCE B ONLY
EF WITH 0-3 HR TIMER SWITCH																																						X			FAN SEQUENCE C
EXHAUST FAN										X	X												X																		
SINGLE DUCT TERMINAL UNITS																																						X			CONSTANT AND VARIABLE AIR VOLUME
ROOM TEMPERATURE SENSOR	X																		X													X		X							
DISCHARGE TEMP SENSOR	X																										X														
HEATING COIL CONTROL VALVE																				X																					
PRIMARY AIR DAMPER						X														X																					
AIRFLOW SENSOR			X																X									X													
EXTERNAL ROUND RETROFIT TERMINAL UNITS																																X						X			
PRIMARY AIR DAMPER																				X																					
AIRFLOW SENSOR			X																X																						
ROOM CO2 DIFFERENTIAL									X										X								X														SEE SPECIFIC NOTE 2
ROOM TEMPERATURE SENSOR	X																		X																						TERMINAL UNITS SERVING FCUS ONLY
EA DAMPER W/ AIRFLOW STATION																																						X			TYPICAL
AIRFLOW MEASURING STATION			X																X																						
EA ATC DAMPER																				X																					
CO2 MONITORING & CONTROL SYSTEM																																						X			
ROOM CO2 DIFFERENTIAL									X										X								X												X		

3

GENERAL NOTES:

1. IF ANY BACNET POINTS ARE NOT CONFIGURED PROPERLY BY THE EQUIPMENT MANUFACTURER, THE EQUIMPMENT MANUFACTURER OR MANUFACTURER'S REPRESENTATIVE SHALL MAKE CORRECTIONS TO THESE BACNET POINT CONFIGURATIONS AT NO COST TO THE OWNER.
2. ALL POINTS THAT ARE NOTED IN THE SEQUENCE OF OPERATION AS "ADJUSTABLE" SHALL BE INCLUDED WITHIN THE GRAPHICS POINTS LIST, INCLUDING ALL MULTI-STATE UNIT MODES OF OPERATION POINTS.

SPECIFIC NOTES:

1. IN ADDITION TO POINTS INDICATED, PROVIDE BACNET INTERFACE WITH MANUFACTURER'S BOILER CONTROLLER FOR REMOTE MONITORING THROUGH DDC SYSTEM. PROVIDE UP TO 25 MONITORING POINTS (SELECTED BY OWNER) FOR EACH PIECE OF EQUIPMENT.
2. PROVIDE BACNET INTERFACE WITH MANUACTURER'S CONTROLLERS AT SENSOR SUITES FOR OBTAINING ROOM CARBON DIOXIDE DIFFERENTIAL FOR EACH ROOM SERVED BY THE CO2 MONITORING AND CONTROL SYSTEM.

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STATE OF MARYLAND · PATRICK S. WREN · 33986 · PROFESSIONAL ENGINEER

JPA PROJECT NO. 6667-16

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NEW TALBOTT SPRINGS ELEMENTARY SCHOOL
COLUMBIA, MARYLAND
HOWARD COUNTY PUBLIC SCHOOL SYSTEM

revisions

IAC CD / BLDG PERMIT SET 1 MAY 20
ADDENDUM NO. 3 1 JULY 20
BID AND CONSTRUCTION 16 JUNE 20

DDC POINT SCHEDULE

M-705

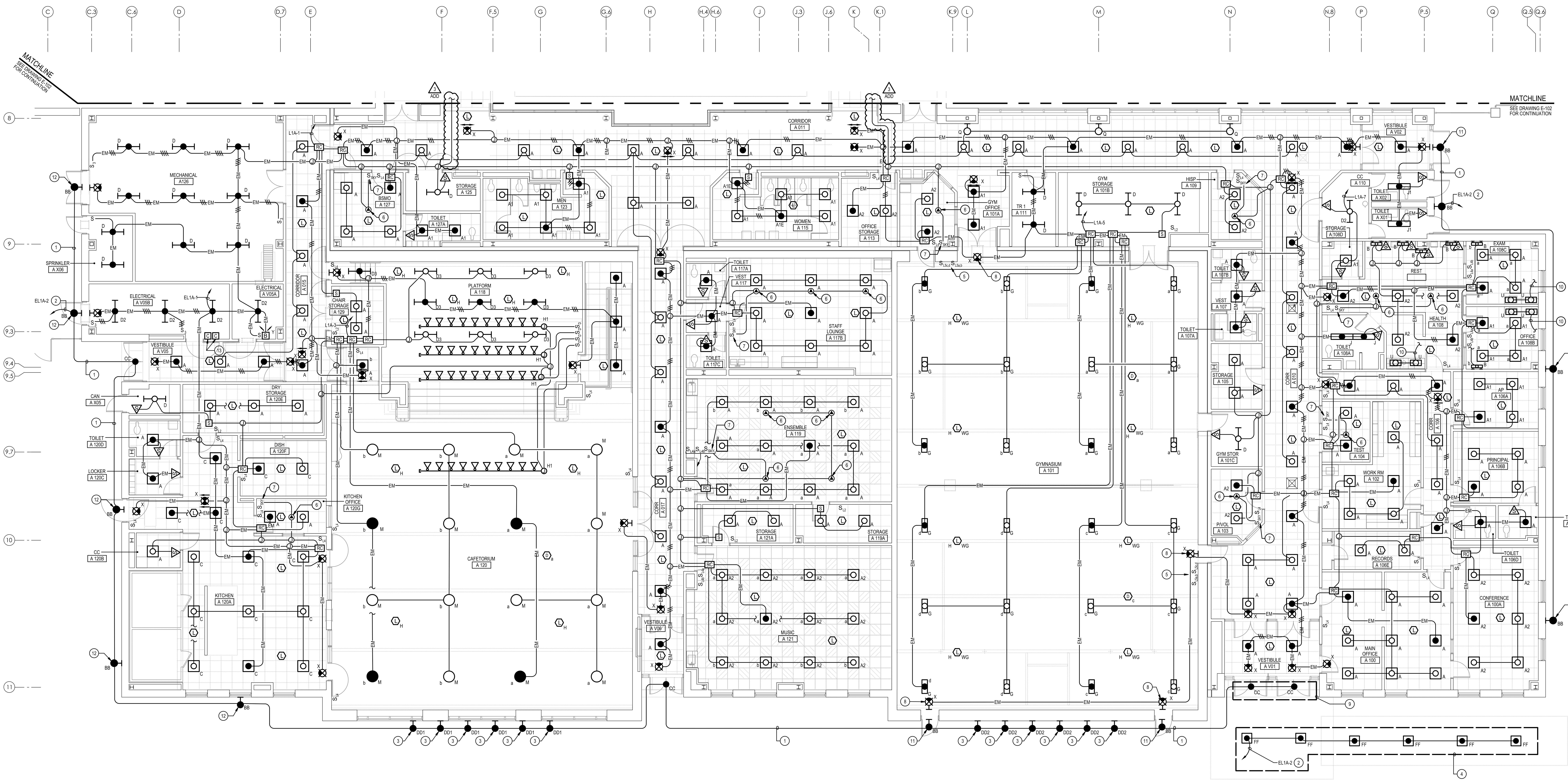
27 OF 28
PROJECT NO. 1804

June 29, 2020 4:50 p.m.

LIGHTING CONTROL SCHEMES FIRST FLOOR AREA A	
ROOM NAME	SCHEME
A X01 TOILET	4A
A X02 TOILET	4A
A X05 CAN	4A
A X06 SPRINKLER	5
A V01 VESTIBULE	3
A V02 VESTIBULE	3
A V05 VESTIBULE	3
A V05A ELEC	5
A V05B ELEC	5
A V06 VESTIBULE	3
A 010 CORRIDOR	3
A 011 CORRIDOR	3
A 015 CORRIDOR	3
A 017 CORRIDOR	3
A 100 MAIN OFFICE	2
A 100A CONFERENCE	2
A 101 GYMNASIUM	11
A 101A GYM OFFICE	2
A 101B GYM STORAGE	4B
A 101C GYM STORAGE	4A
A 102 WORK ROOM	2
A 103 PARENT VOLUNTEER	2
A 104 SECURE TESTING	2
A 105 STORAGE	4A
A 106 CORRIDOR	3
A 106A ASSISTANT PRINCIPAL	2
A 106B PRINCIPAL	2
A 106C TOILET	4A
A 106D TOILET	4A
A 106E RECORDS	2
A 107 VESTIBULE	4A
A 107A TOILET	4A
A 107B TOILET	4A
A 108 HEALTH	10
A 108A TOILET	4A
A 108B OFFICE	2
A 108C EXAM	2
A 108D STORAGE	4A
A 109 HISPANIC VOLUNTEER	2
A 110 CUSTODIAL CLOSET	4A
A 111 TELECOM ROOM 1	5
A 113 OFFICE STORAGE	2
A 115 WOMENS RESTROOM	4
A 117 VESTIBULE	4A
A 117A TOILET	4A
A 117B STAFF LOUNGE	2
A 117C TOILET	4A
A 118 PLATFORM	9
A 119 ENSEMBLE	1
A 119A STORAGE	4B
A 120 CAFETORIUM	9
A 120A KITCHEN	2
A 120B CUSTODIAL CLOSET	4A
A 120C LOCKER	4A
A 120D TOILET	4A
A 120E DRY STORAGE	4B
A 120F DISHWASHING	2
A 120G KITCHEN OFFICE	2
A 121 MUSIC	1
A 121A STORAGE	4B
A 123 MENS RESTROOM	4
A 125 STORAGE	4A
A 126 MECHANICAL ROOM	5
A 127 BSMO	2
A 127A TOILET	4A
A 129 CHAIR STORAGE	4B

SPECIFIC NOTES:

1. ROUTE CONDUIT AND WIRING IN CONCEALED CEILING SPACE INSIDE BUILDING.
2. CIRCUIT VIA LIGHTING CONTACTOR LC2 LOCATED IN ELECTRICAL ROOM V05B.
3. MOUNT FIXTURE 15'-4" ABOVE AREA 'A' FLOOR TO CENTER OF JUNCTION BOX.
4. PROVIDE FIXTURES UNDER MAIN ENTRANCE CANOPY ALTERNATE.
5. PROVIDE PROTECTIVE COVER FOR WALL STATIONS IN GYMNASIUM EQUAL TO SAFETY TECHNOLOGY INTERNATIONAL STI-6518 BOPPER STOPPER WITH SPRING-LOADED HINGE, CLEAR POLYCARBONATE COVER.
6. CONNECT TO SKYLIGHT DIFFUSER CONTROLLER 0.1A-277V
7. INSTALL SKYLIGHT DIFFUSER CONTROL SWITCH FURNISHED BY SKYLIGHT MANUFACTURER.
8. PROVIDE WIREGUARD ON EXIT SIGNS IN GYMNASIUM.
9. PROVIDE FIXTURES ONLY IF MAIN ENTRANCE CANOPY ALTERNATE IS NOT ACCEPTED.
10. CONNECT TO NEAREST 120V CONVENIENCE RECEPTACLE CIRCUIT SERVING THE SPACE.
11. MOUNT FIXTURE 9'-0" ABOVE AREA 'A' FLOOR.
12. MOUNT FIXTURE 12'-0" ABOVE AREA 'A' FLOOR.
13. LIGHTING CONTACTORS LC1 AND LC2.

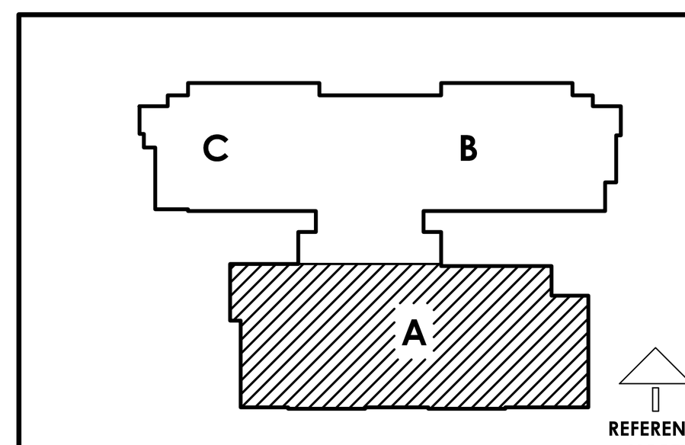


1 E-101 FIRST FLOOR PLAN - AREA 'A' - LIGHTING
SCALE: 1/8" = 1'-0"

NORTH

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

NOTE: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.



FIRST FLOOR KEY PLAN

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JPA PROJECT NO. 6667-16

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NEW TALBOTT SPRINGS ELEMENTARY SCHOOL
COLUMBIA, MARYLAND
HOWARD COUNTY PUBLIC SCHOOL SYSTEM

revisions

IAC CD / BLDG PERMIT SET
1 MAY 20

ADDENDUM NO. 3
1 JULY 20

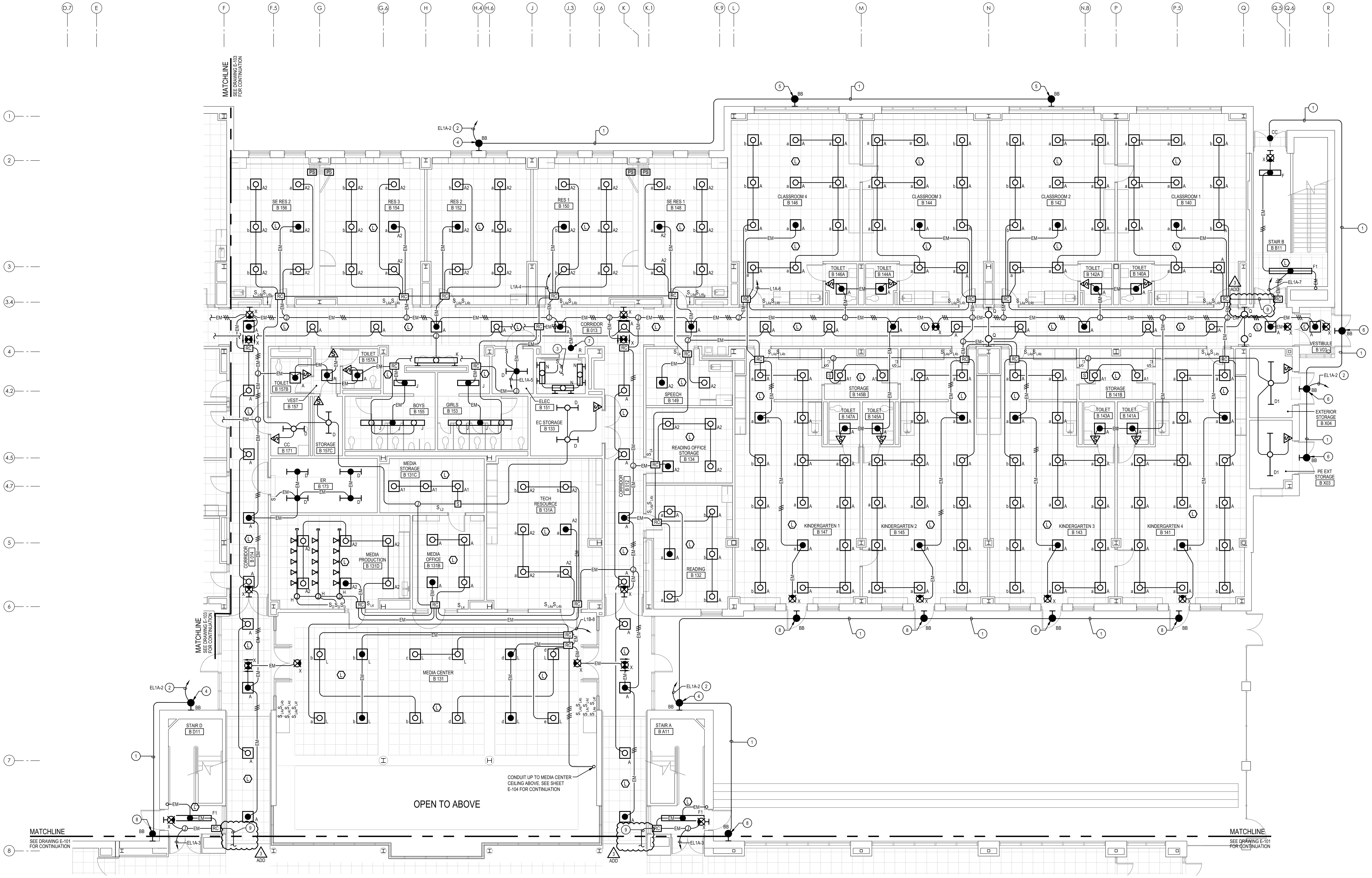
BID AND CONSTRUCTION
16 JUNE 20

FLOOR PLAN
FIRST FLOOR
AREA 'A'
LIGHTING

E-101

OF
PROJECT NO. 1804

June 29, 2020 4:50 p.m.



SPECIFIC NOTES:

1. ROUTE CONDUIT AND WIRING IN CONCEALED CEILING SPACE INSIDE BUILDING.
2. CIRCUIT VIA TIMESWITCH TS1 LOCATED IN ELECTRICAL ROOM V05A.
3. PROVIDE 2#10 WITH #12 GROUND IN 3/4" CONDUIT BETWEEN ELEVATOR PIT LIGHTING AND RECEPTACLE. SEE DRAWINGS E-104 AND E-202 FOR CONTINUATION.
4. MOUNT FIXTURE 15'-0" ABOVE FLOOR TO CENTER OF JUNCTION BOX.
5. MOUNT FIXTURE 10'-0" ABOVE FLOOR TO CENTER OF JUNCTION BOX.
6. MOUNT FIXTURE 11'-0" ABOVE FLOOR TO CENTER OF JUNCTION BOX.
7. LIGHTING FIXTURE SHALL OPERATE CONTINUOUSLY, 24/7, AT FULL LIGHT OUTPUT REGARDLESS OF OCCUPANCY OR OVERRIDE CONTROL FOR CORRIDOR.
8. MOUNT FIXTURE 12'-0" ABOVE FLOOR TO CENTER OF JUNCTION BOX.
9. 277V UNSWITCHED NORMAL LIGHTING CIRCUIT. CIRCUIT SHALL CONNECT TO STAIR ROOM CONTROLLER POWER SUPPLY ONLY.

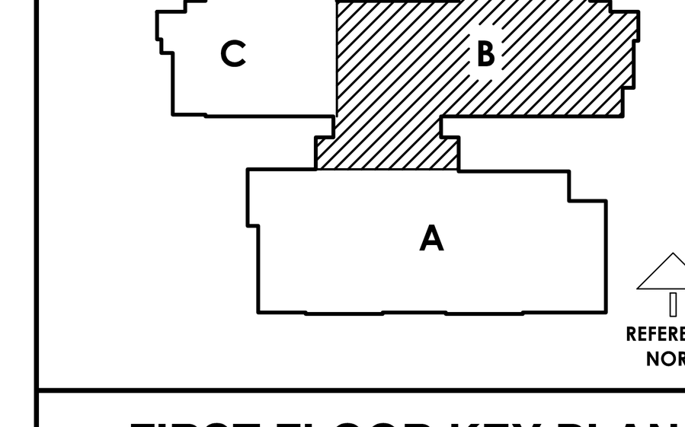
3 ADD

LIGHTING CONTROL SCHEMES
FIRST FLOOR AREA B

ROOM NAME	SCHEME
B X03 PE EXTERIOR STORAGE	4A
B X04 EXTERIOR STORAGE	4A
B V03 VESTIBULE	3
B A11 STAIR A	3
B B11 STAIR B	3
B D11 STAIR D	3
B 012 CORRIDOR	3
B 013 CORRIDOR	3
B 014 CORRIDOR	3
B 131 MEDIA CENTER	8
B 131A TECH RESOURCE	1
B 131B MEDIA OFFICE	2
B 131C MEDIA STORAGE	4B
B 131D MEDIA PRODUCTION	7
B 132 READING	1
B 133 E.C. STORAGE	4A
B 134 READING STORAGE	2
B 140 CLASSROOM 1	1
B 140A TOILET	4A
B 141 KINDERGARTEN 4	1
B 141A TOILET	4A
B 141B STORAGE	4B
B 142 CLASSROOM 2	1
B 142A TOILET	4A
B 143 KINDERGARTEN 3	1
B 143A TOILET	4A
B 144 CLASSROOM 3	1
B 144A TOILET	4A
B 145 KINDERGARTEN 2	1
B 145A TOILET	4A
B 145B STORAGE	4B
B 146 CLASSROOM 4	1
B 146A TOILET	4A
B 147 KINDERGARTEN 1	1
B 147A TOILET	4A
B 148 S.E. RESOURCE 1	4A
B 149 SPEECH	2
B 150 RESOURCE 1	1
B 151 ELECTRICAL ROOM	5
B 152 RESOURCE 2	1
B 153 BOYS RESTROOM	4
B 154 RESOURCE 3	1
B 155 GIRLS RESTROOM	4
B 156 S.E. RESOURCE 2	1
B 157 VESTIBULE	4A
B 157A TOILET	4A
B 157B TOILET	4A
B 157C STORAGE	4A
B 171 CC	4A
B 173 ELECTRICAL ROOM	5

1 / E-102 FIRST FLOOR PLAN - AREA 'B' - LIGHTING
SCALE: 1/8" = 1'-0"

SCALE: 1/8" = 1'-0"
NOTE: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.



FIRST FLOOR KEY PLAN

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NEW TALBOTT SPRINGS ELEMENTARY SCHOOL
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revisions

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FLOOR PLAN FIRST FLOOR AREA 'B' LIGHTING

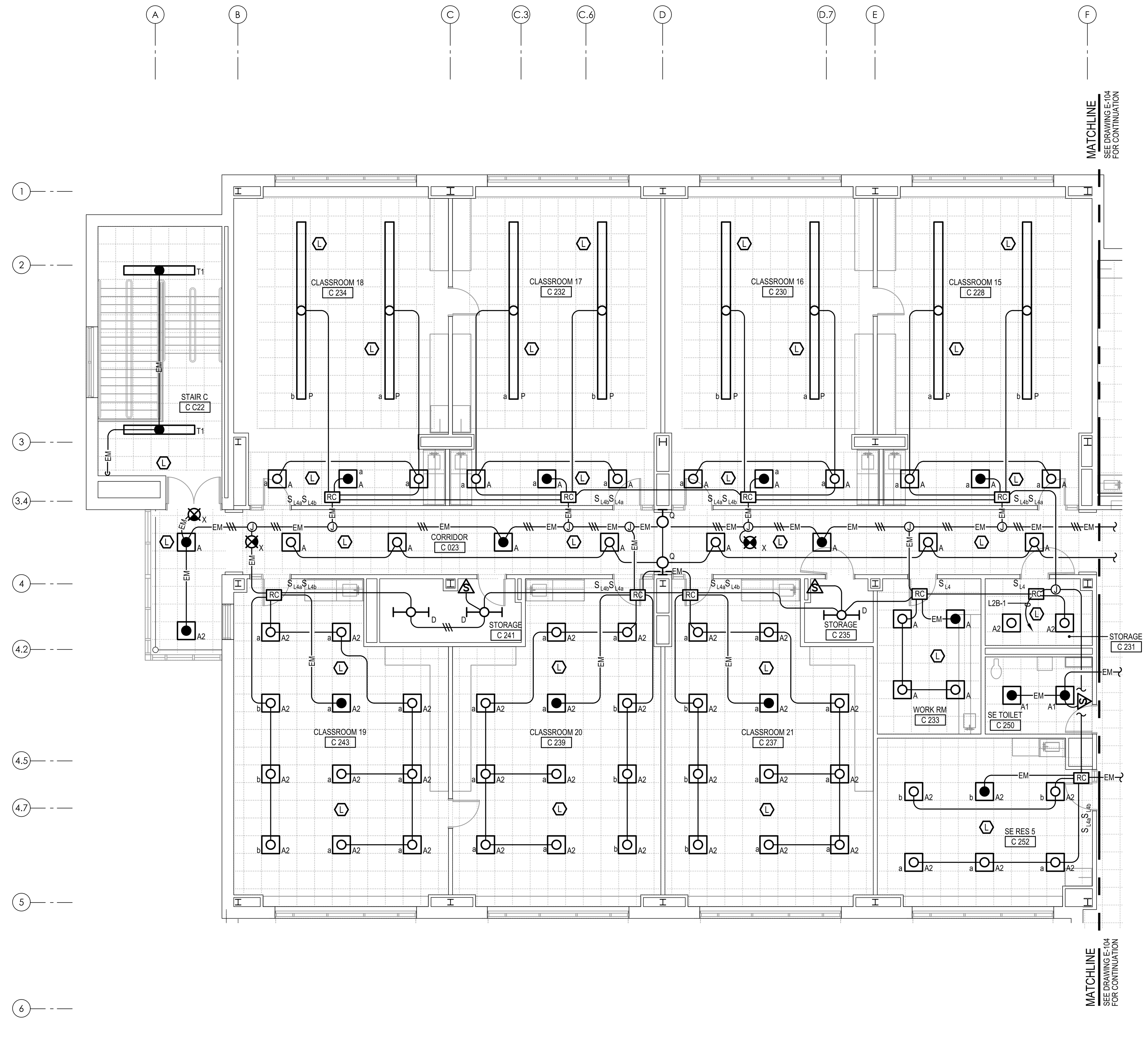
E-102

June 29, 2020 4:50 p.m.

SPECIFIC NOTES:

1. ROUTE CONDUIT AND WIRING IN CONCEALED CEILING SPACE INSIDE BUILDING.
2. CIRCUIT VIA LIGHTING CONTACTOR LC2 LOCATED IN ELECTRICAL ROOM V05B.
3. MOUNT FIXTURE 11'-0" ABOVE SECOND FLOOR TO CENTER OF JUNCTION BOX.
4. MOUNT FIXTURE 10'-0" ABOVE FIRST FLOOR TO CENTER OF JUNCTION BOX.
5. MOUNT FIXTURE 12'-0" ABOVE FIRST FLOOR TO CENTER OF JUNCTION BOX.
6. 277V UNSWITCHED NORMAL LIGHTING CIRCUIT. CIRCUIT SHALL CONNECT TO STAIR ROOM CONTROLLER POWER SUPPLY ONLY.

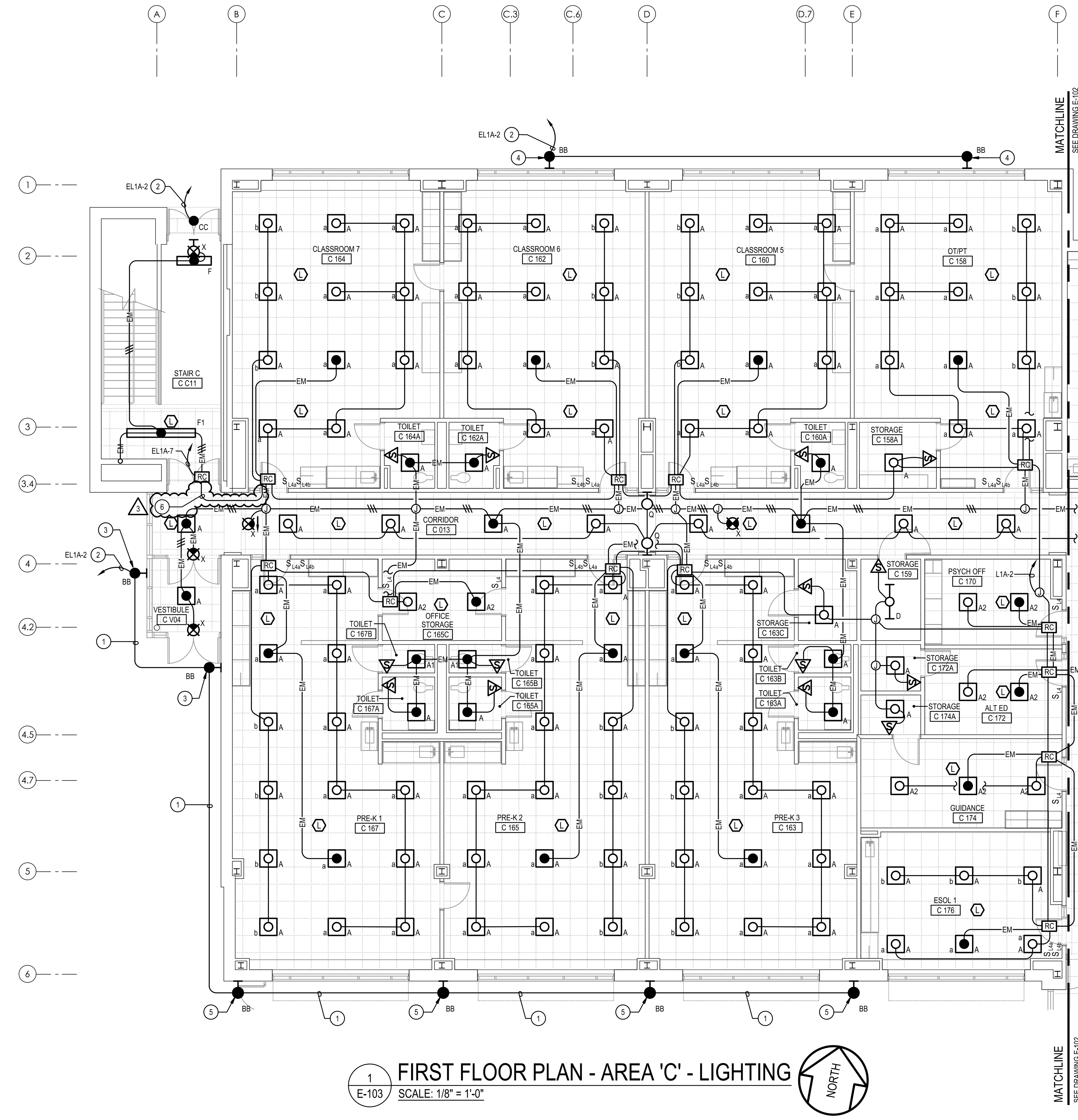
3



2 E-103 SECOND FLOOR PLAN - AREA 'C' - LIGHTING

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

NORTH



1 E-103 FIRST FLOOR PLAN - AREA 'C' - LIGHTING

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

NORTH

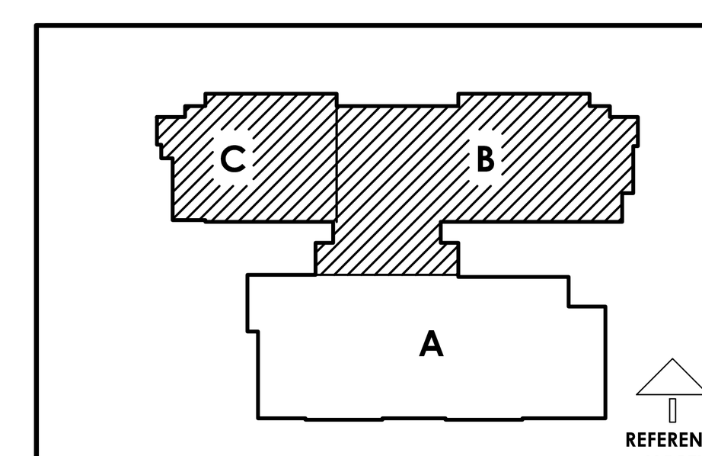
LIGHTING CONTROL SCHEMES SECOND FLOOR AREA C	
ROOM NAME	SCHEME
C C22 STAIR C	3
C 023 CORRIDOR	3
C 228 CLASSROOM 15	1
C 230 CLASSROOM 16	1
C 231 STORAGE	2
C 232 CLASSROOM 17	1
C 233 WORK ROOM	2
C 234 CLASSROOM 18	1
C 235 STORAGE	4A
C 237 CLASSROOM 21	1
C 239 CLASSROOM 20	1
C 241 STORAGE	4A
C 243 CLASSROOM 19	1
C 250 S.E. TOILET	4A
C 252 S.E. RESOURCE 1	1

LIGHTING CONTROL SCHEMES FIRST FLOOR AREA C	
ROOM NAME	SCHEME
C V04 VEST	3
C C11 STAIR C	3
C 013 CORRIDOR	3
C 158 OTPT THERAPY	1
C 158A STORAGE	4A
C 159 STORAGE	4A
C 160 CLASSROOM 5	1
C 160A TOILET	4A
C 161 ELECTRICAL ROOM	5
C 162 CLASSROOM 6	1
C 162A TOILET	4A
C 163 PRE-KINDERGARTEN 3	1
C 163A TOILET	4A
C 163B TOILET	4A
C 163C STORAGE	4A
C 164 CLASSROOM 7	1
C 164A TOILET	4A
C 165 PRE-KINDERGARTEN 2	1
C 165A TOILET	4A
C 165B TOILET	4A
C 165C OFFICE STORAGE	2
C 167 PRE-KINDERGARTEN 1	1
C 167A TOILET	4A
C 167B TOILET	4A
C 170 PSYCH OFF	2
C 172 ALT ED OFF	2
C 172A STORAGE	4A
C 174 GUIDANCE	2
C 174A STORAGE	4A
C 176 ESOL 1	1

8 4 0 8 16

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

NOTE: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.



FIRST FLOOR KEY PLAN

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1 JULY 20

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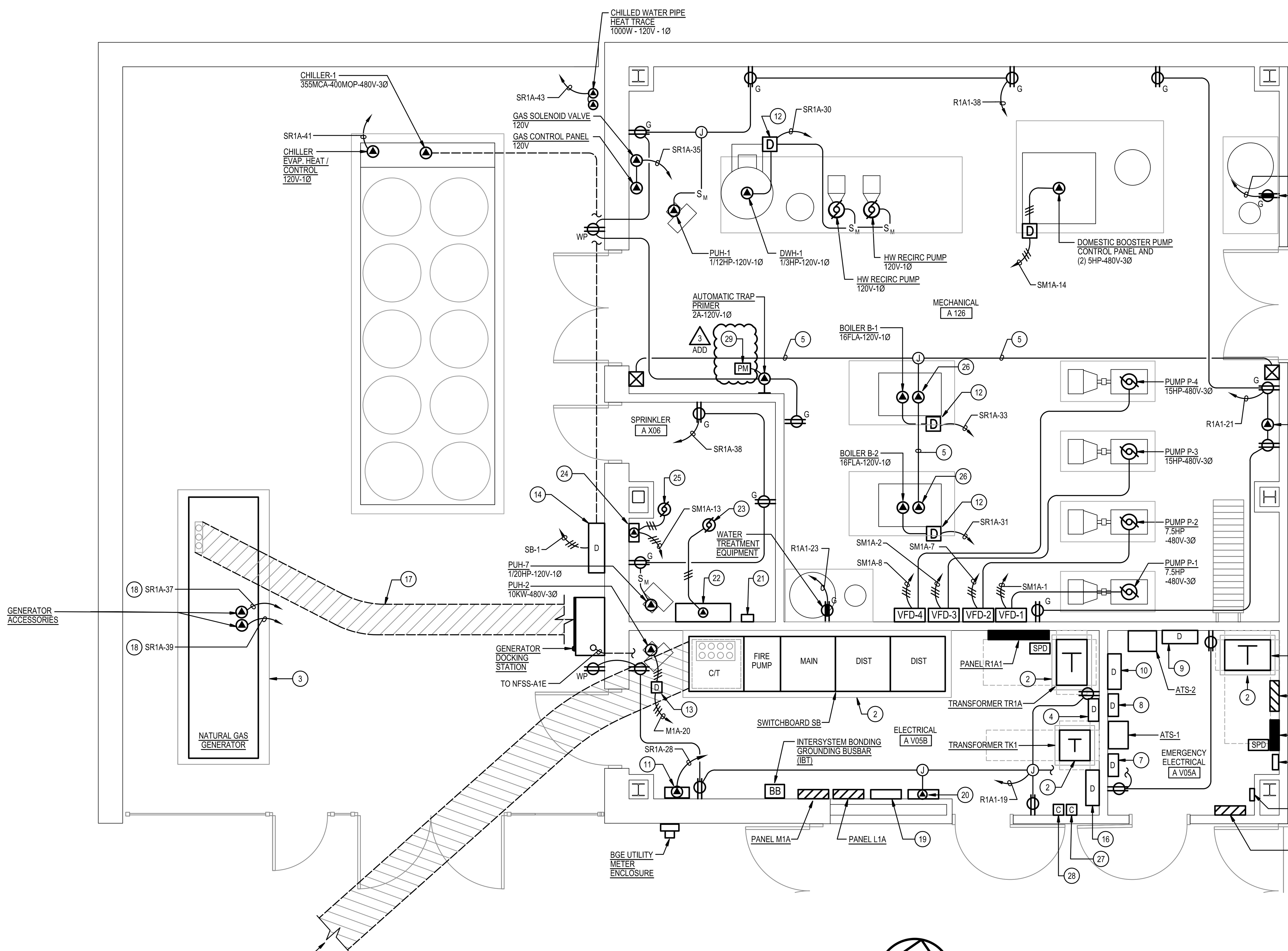
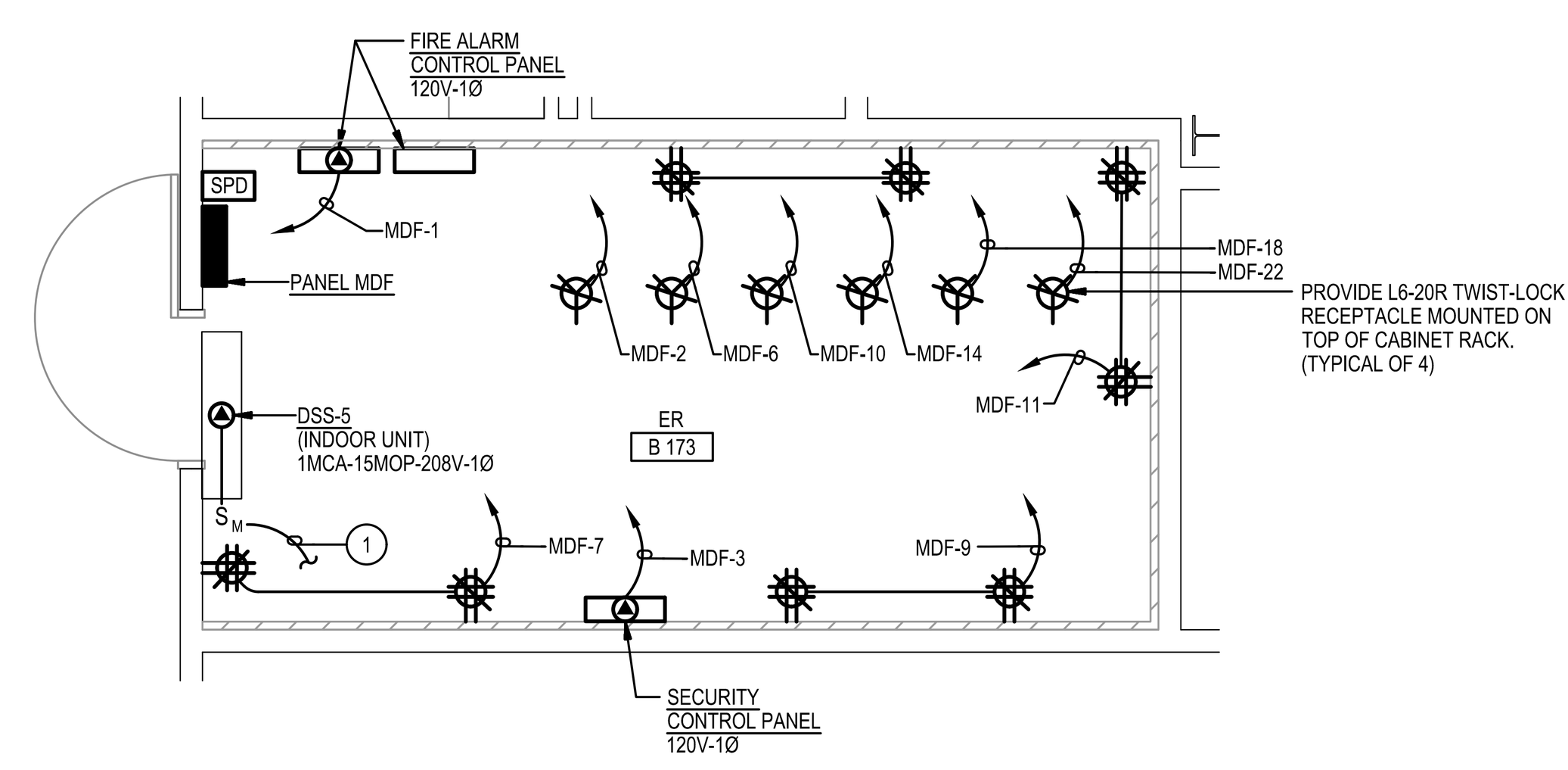
16 JUNE 20

FLOOR PLAN FIRST AND SECOND FLOOR AREA 'C' LIGHTING

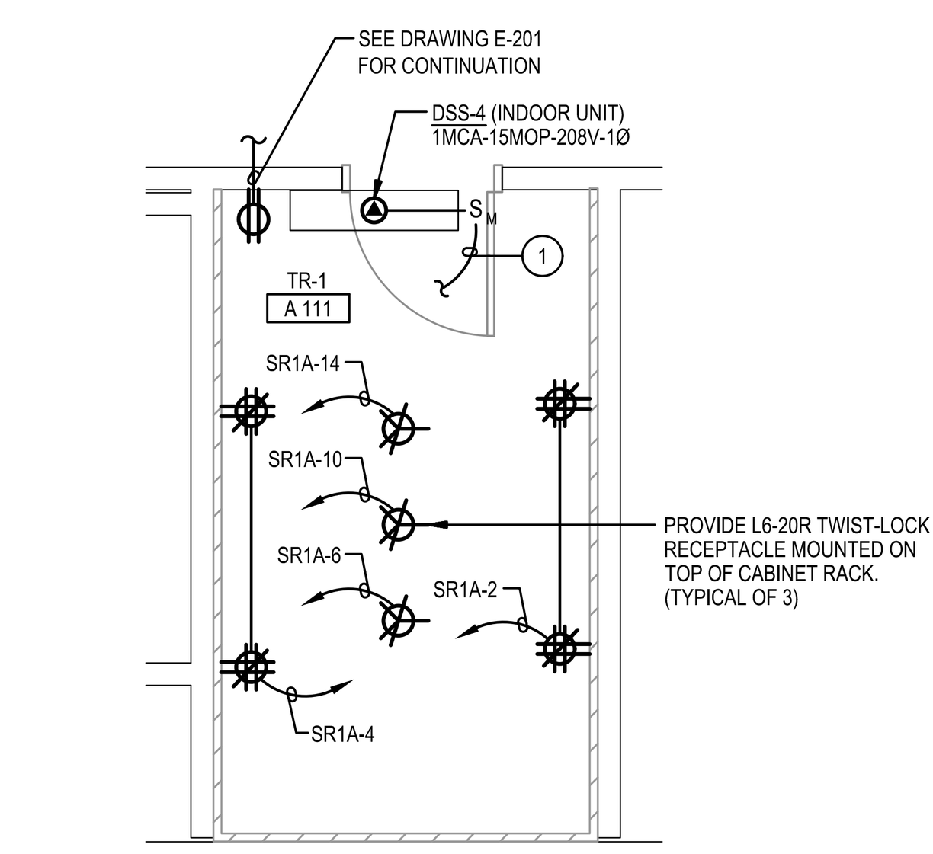
E-103



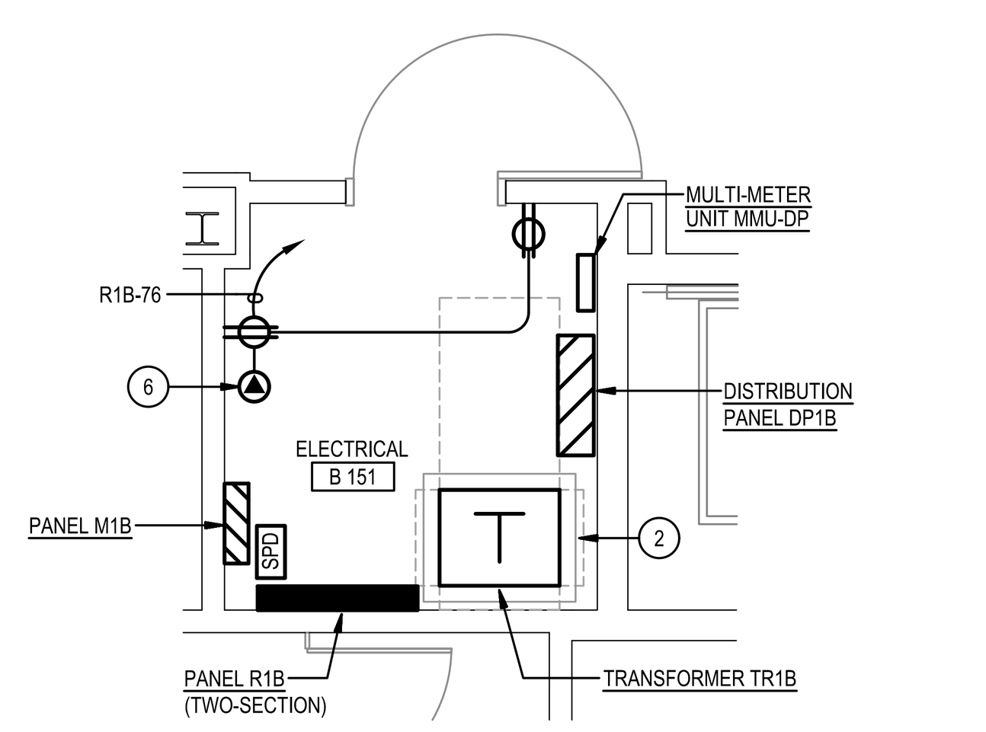
1 / E-206 PART PLAN - ELEC & MECH ROOM
SCALE: 1/4" = 1'-0"



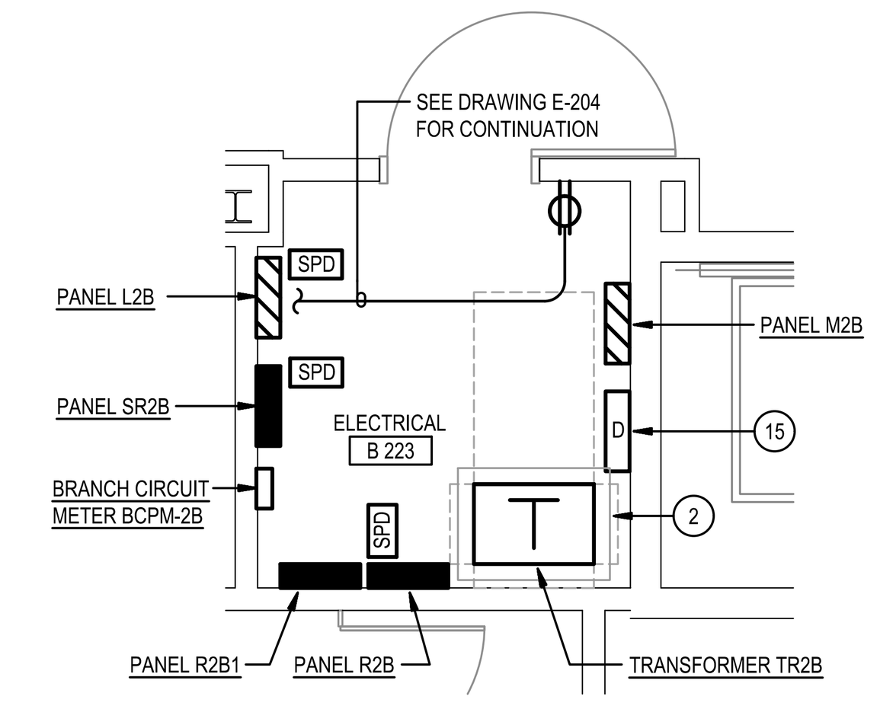
4 / E-206 PART PLAN - ER ROOM B173
SCALE: 1/4" = 1'-0"



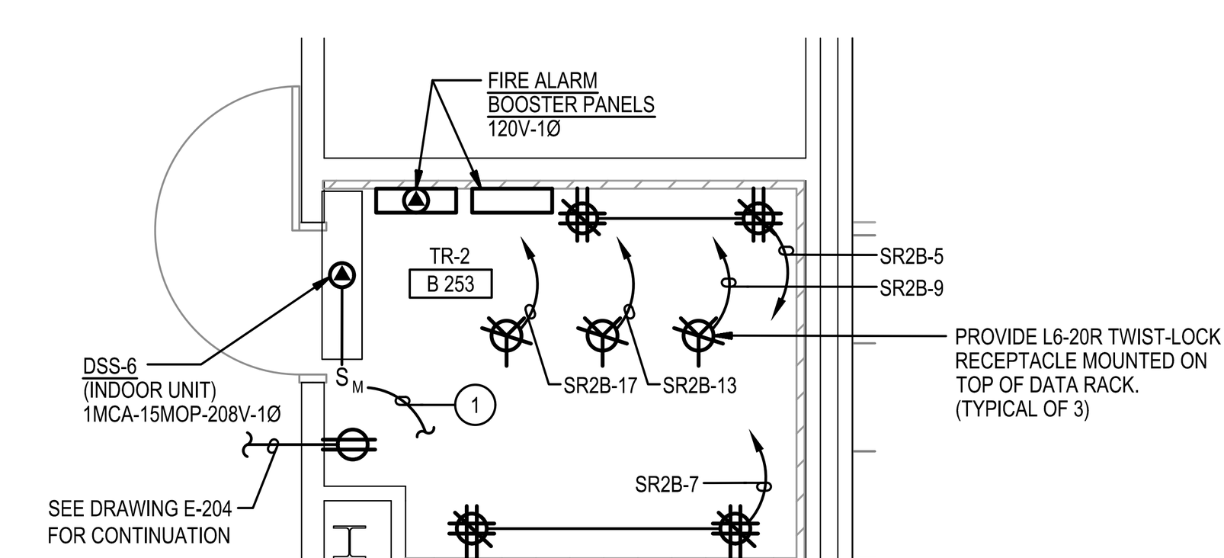
5 / E-206 PART PLAN - TR-1 ROOM A111
SCALE: 1/4" = 1'-0"



2 / E-206 PART PLAN - ELEC ROOM B151
SCALE: 1/4" = 1'-0"



3 / E-206 PART PLAN - ELEC ROOM B223
SCALE: 1/4" = 1'-0"



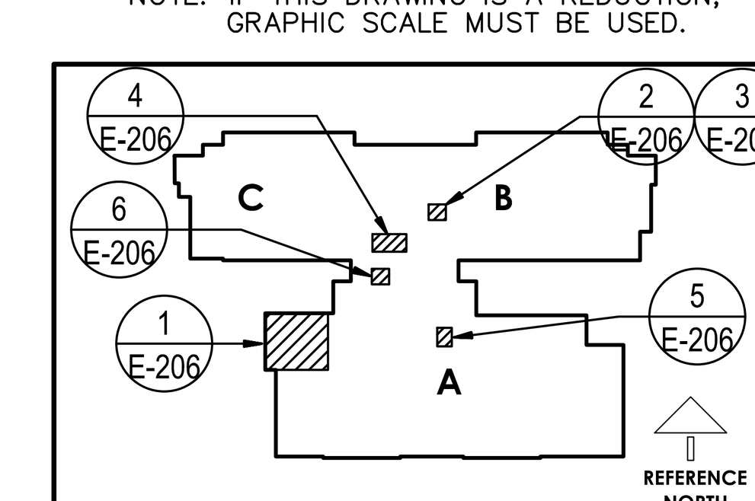
6 / E-206 PART PLAN - TR-2 ROOM B253
SCALE: 1/4" = 1'-0"

SPECIFIC NOTES:

1. PROVIDE CONNECTION TO ASSOCIATED DSS (OUTDOOR UNIT) PER MECHANICAL EQUIPMENT MANUFACTURER'S REQUIREMENTS.
2. PROVIDE 4" EQUIPMENT PAD FOR ELECTRICAL EQUIPMENT.
3. PROVIDE 6" EQUIPMENT PAD FOR OUTDOOR ELECTRICAL EQUIPMENT.
4. PROVIDE NON-FUSED SAFETY SWITCH (DISCONNECT) NFSS-TK1. REFER TO RISER DIAGRAM 1/E-501 FOR ADDITIONAL INFORMATION.
5. PROVIDE MANUFACTURER'S REQUIRED WIRING IN 3/4" CONDUIT FOR EMERGENCY BOILER-OFF SHUTDOWN.
6. CONNECT TO VACUUM PUMP RECEPTACLE PROVIDED BY EQUIPMENT MANUFACTURER.
7. PROVIDE ENCLOSED SWITCH NFSS-A1N. REFER TO RISER DIAGRAM 1/E-501 FOR ADDITIONAL INFORMATION.
8. PROVIDE ENCLOSED SWITCH NFSS-A1E. REFER TO RISER DIAGRAM 1/E-501 FOR ADDITIONAL INFORMATION.
9. PROVIDE ENCLOSED SWITCH NFSS-A2N. REFER TO RISER DIAGRAM 1/E-501 FOR ADDITIONAL INFORMATION.
10. PROVIDE ENCLOSED SWITCH NFSS-A2E. REFER TO RISER DIAGRAM 1/E-501 FOR ADDITIONAL INFORMATION.
11. ALTERNATE: PROVIDE POWER SUPPLY ASSEMBLY WITH EXTERNAL DOOR-MOUNTED EMERGENCY PUSHBUTTON FOR SOLAR PV SYSTEM RAPID SHUTDOWN. REFER TO DIAGRAM 7/E-205 FOR CONNECTIONS AND ADDITIONAL INFORMATION.
12. PROVIDE 2P-30A-240V NON-FUSED ENCLOSED SWITCH IN LOCKABLE NEMA 1 ENCLOSURE.
13. PROVIDE 3P-30A-600V ENCLOSED SWITCH IN NEMA 1 ENCLOSURE. FUSE PER MANUFACTURER RECOMMENDATIONS.
14. PROVIDE 3P-400A-600V ENCLOSED SWITCH IN NEMA 4X STAINLESS STEEL ENCLOSURE. FUSE PER MANUFACTURER RECOMMENDATIONS.
15. PROVIDE ENCLOSED SWITCH NFSS-TR2B. REFER TO RISER DIAGRAM 1/E-501 FOR ADDITIONAL INFORMATION.
16. PROVIDE FUSED SAFETY SWITCH (DISCONNECT) FSS-K1. REFER TO RISER DIAGRAM 1/E-501 FOR ADDITIONAL INFORMATION.
17. GENERATOR FEEDERS IN GENERATOR DUCT BANK. REFER TO RISER DIAGRAM 1/E-501 AND DETAIL 2/E-502 FOR ADDITIONAL INFORMATION.
18. GENERATOR ACCESSORY CIRCUITS IN GENERATOR DUCT BANK. REFER TO RISER DIAGRAM 2/E-502 FOR ADDITIONAL INFORMATION.
19. MULTI-METER UNIT SB AND PV METERS.
20. ENERGY METER COMMUNICATIONS GATEWAY
21. PROVIDE ENCLOSED CIRCUIT BREAKER ECB-FP. REFER TO RISER DIAGRAM 1/E-501 FOR ADDITIONAL INFORMATION.
22. FIRE PUMP CONTROLLER AND TRANSFER SWITCH. REFER TO RISER DIAGRAM 1/E-501 FOR CONNECTION REQUIREMENTS.
23. FIRE PUMP: 20HP-480V-3Ø-3W
24. JOCKEY PUMP CONTROLLER WITH INTEGRAL DISCONNECT SWITCH.
25. JOCKEY PUMP: 3/4HP-480V-3Ø-3W
26. CONNECT TO BOILER CONTACT FOR BOILER SHUT-DOWN.
27. 30A-277V, 6-POLE FEED-THRU LIGHTING CONTACTOR LC1 SERVING EXTERIOR NORMAL POWER LIGHTING.
28. 30A-277V, 6-POLE FEED-THRU LIGHTING CONTACTOR LC2 SERVING EXTERIOR EMERGENCY POWER LIGHTING.
29. GAS METER PULSE INPUT MODULE WITH LINE-VOLTAGE POWER SUPPLY IN NEMA 4X ENCLOSURE. CONNECT TO GAS METER AND METERING SYSTEM. REFER TO DIAGRAM 4/E-501 FOR ADDITIONAL DETAILS. (3 ADD)

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

NOTE: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.



FIRST FLOOR KEY PLAN

tca architects
1369 Generals Highway • Crownsville, Maryland 21032

James Posey Associates
Engineering Your Vision
Mechanical & Electrical Consulting Engineers

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 24861. Expiration date: 02-24-2022.

NEW TALBOTT SPRINGS ELEMENTARY SCHOOL
COLUMBIA, MARYLAND
HOWARD COUNTY PUBLIC SCHOOL SYSTEM

revisions

IAC CD / BLDG PERMIT SET 1 MAY 20
ADDENDUM NO. 3 1 JULY 20
BID AND CONSTRUCTION 16 JUNE 20

PART PLANS POWER

E-206

PROJECT NO. 1804

June 29, 2020 4:50 p.m.

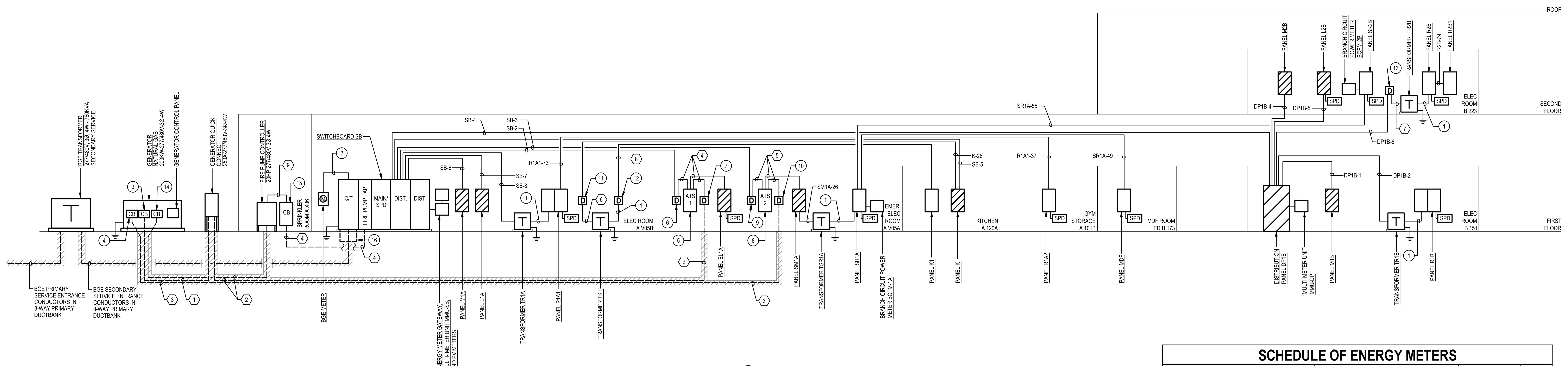


DIAGRAM
1 / E-501

POWER RISER DIAGRAM

NOT TO SCALE

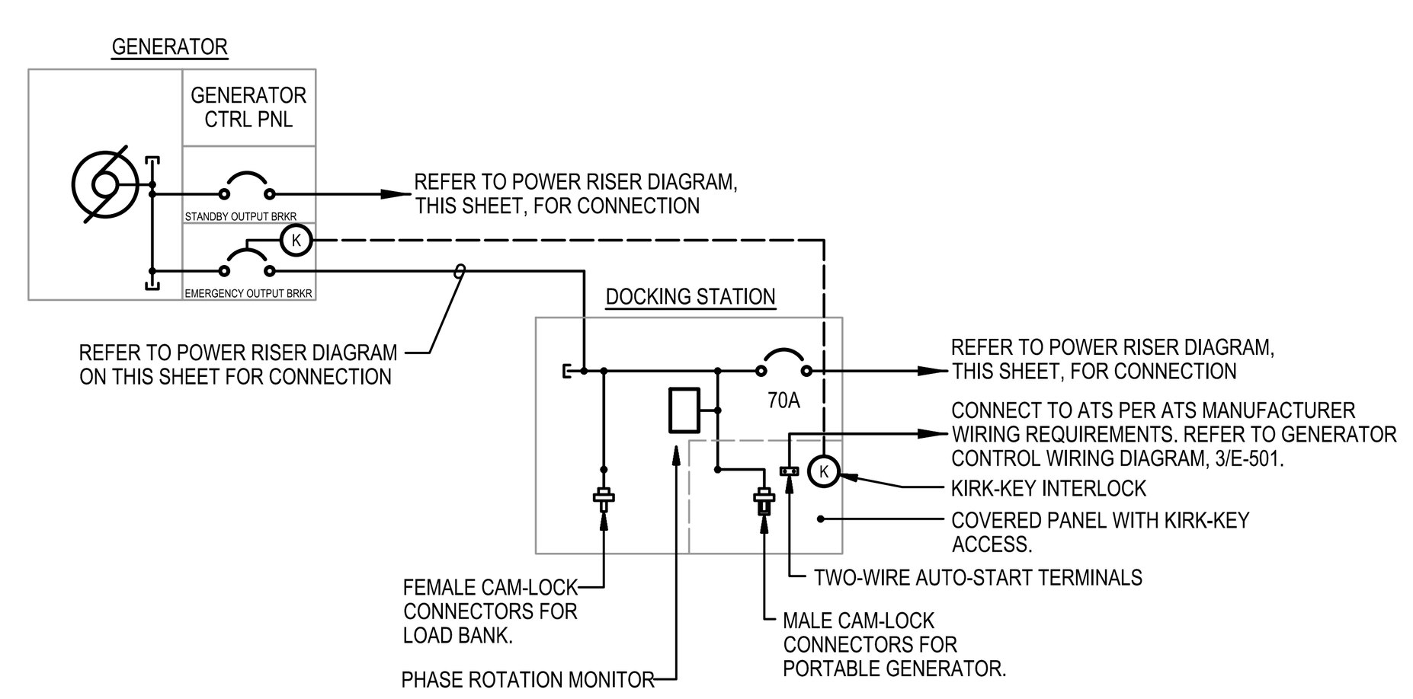
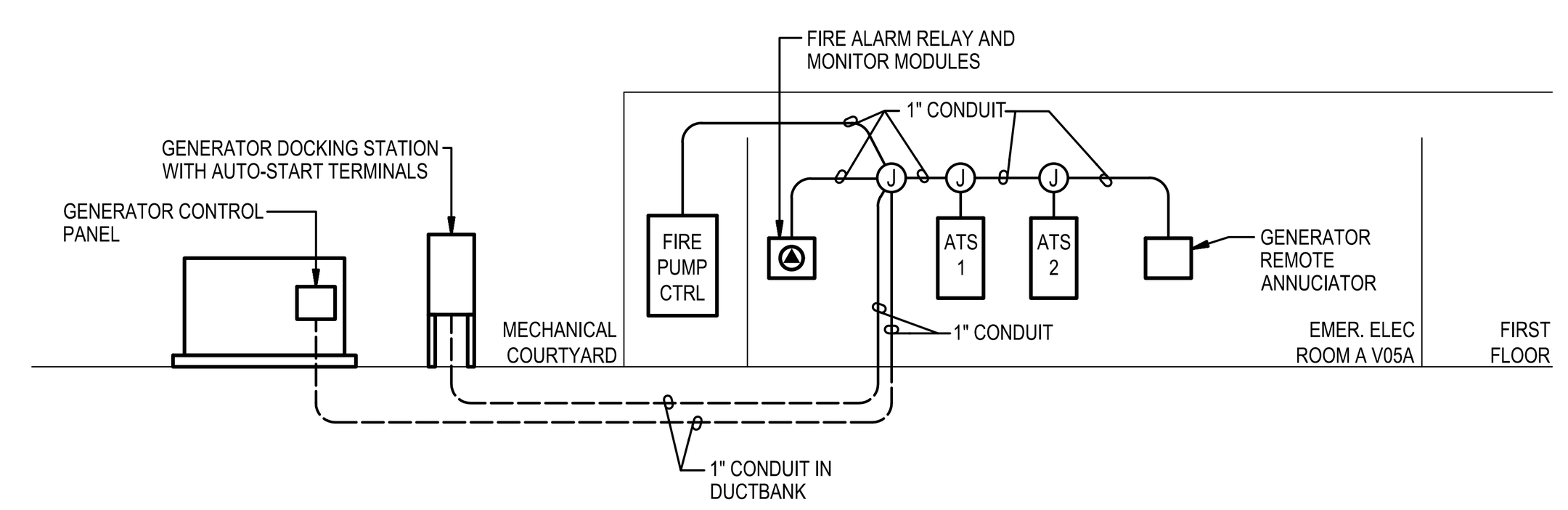


DIAGRAM
2 / E-501

GENERATOR DOCKING STATION CONNECTION

NOT TO SCALE



GENERAL NOTES:

A. PROVIDE INTERCONNECTIONS AND CONTROL WIRING BETWEEN EQUIPMENT AS RECOMMENDED BY THE MANUFACTURER. RACEWAY SIZES AS INDICATED.

DIAGRAM
3 / E-501

GENERATOR CONTROL WIRING DIAGRAM

NOT TO SCALE

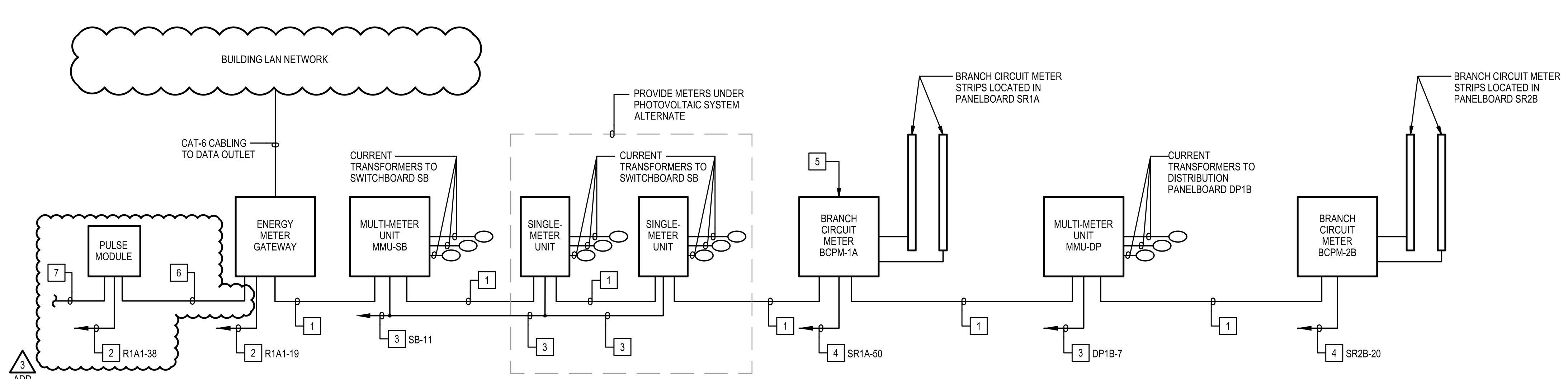


DIAGRAM NOTES:

1. CAT-6 CABLING IN 3/4" CONDUIT. (NOT SHOWN ON PLAN)
2. 120V POWER SUPPLY CONNECTION
3. 480V CONNECTION FOR POTENTIAL TRANSFORMER AND POWER SUPPLY.
4. 208V POWER SUPPLY AND VOLTAGE CONNECTION.
5. PROVIDE (2) BRANCH CIRCUIT METERS TO SUPPORT 60 INDIVIDUAL BRANCH CIRCUITS.
6. RS485 WIRING, PER MANUFACTURER'S REQUIREMENTS, IN 3/4" CONDUIT.
7. 2#18AWG FOR TO GAS METER LOCATION. COORDINATE GAS METER LOCATION WITH DIVISION 22 CONTRACTOR.

3 ADD

DIAGRAM
4 / E-501

ENERGY METER NETWORK DIAGRAM

NOT TO SCALE

SPECIFIC NOTES:

1. REFER TO TRANSFORMER SCHEDULE FOR SECONDARY FEEDER SIZING.
2. PROVIDE 2" EMPTY CONDUIT TO UTILITY METER SOCKET ENCLOSURE LOCATION.
3. GENERATOR OUTPUT CIRCUIT BREAKER 1: 250A-480V-3Ø-4W-ELECTRONIC TRIP.
4. GENERATOR OUTPUT CIRCUIT BREAKER 2: 200A-480V-3Ø-4W
5. AUTOMATIC TRANSFER SWITCH (ATS) 1: 70A-480V-3Ø-4W, SWITCHED NEUTRAL.
6. ENCLOSED NON-FUSED SWITCH NFSS-A1N: 100A-480V-3Ø-4W IN NEMA TYPE 1 ENCLOSURE.
7. ENCLOSED NON-FUSED SWITCH NFSS-A1E: 100A-480V-3Ø-4W IN NEMA TYPE 1 ENCLOSURE.
8. AUTOMATIC TRANSFER SWITCH (ATS) 2: 200A-480V-3Ø-4W, SWITCHED NEUTRAL.
9. ENCLOSED NON-FUSED SWITCH NFSS-A2N: 200A-480V-3Ø-4W IN NEMA TYPE 1 ENCLOSURE.
10. ENCLOSED NON-FUSED SWITCH NFSS-A2E: 200A-480V-3Ø-4W IN NEMA TYPE 1 ENCLOSURE.
11. ENCLOSED NON-FUSED SWITCH NFSS-TK1: 100A-480V-3Ø-4W IN NEMA TYPE 1 ENCLOSURE.
12. ENCLOSED FUSED SWITCH NFSS-K1: 200A-240V-3Ø-4W, FUSED AT 150A IN NEMA TYPE 1 ENCLOSURE.
13. ENCLOSED NON-FUSED SWITCH NFSS-TR2B: 200A-480V-3Ø-4W IN NEMA TYPE 1 ENCLOSURE.
14. GENERATOR OUTPUT CIRCUIT BREAKER 3: 60A-480V-3Ø-4W
15. ENCLOSED CIRCUIT BREAKER ECB-FP: 150A-480V-3Ø-4W IN NEMA TYPE 1 ENCLOSURE.
16. PROVIDE PIT (TROUGH) UNDER C/T SECTION OF SWITCHBOARD, 2 FEET DEEP AND MEASURES 1" LESS THAN THE WIDTH AND DEPTH OF THE CT SECTION OF SWITCHBOARD SB, PER BGE REQUIREMENTS.

FEEDER KEY:

1. 4#250 + #4G IN 3-1/2" DUCT IN GENERATOR DUCTBANK.
2. 4#4 + #8G IN 3-1/2" DUCT IN IN GENERATOR DUCTBANK.
3. 4#3/0 + #6G IN 3-1/2" DUCT IN GENERATOR DUCTBANK.
4. 4#4 + #8G IN 1-1/4" CONDUIT.
5. 4#3/0 + #6G IN 2-1/2" CONDUIT.
6. 3#3 + #8G IN 1-1/4" CONDUIT.
7. 3#1/0 + #6G IN 2" CONDUIT.
8. 4#1/0 + #6G IN 2" CONDUIT.
9. 3#4 + #8G IN 1-1/4" CONDUIT.

SCHEDULE OF ENERGY METERS

NUMBER	LOAD(S) TO BE MEASURED	CT VOLTAGE	CT RATING (AMPS)	METER SERIES	NOTES
1	SWITCHBOARD SB	480V-3Ø	2000	8000	1
2	CHILLER	480V-3Ø	400	8000	1
3	PANEL EL1A (VIA ATS-1)	480V-3Ø	100	8000	1
4	PANEL SM1A (VIA ATS-2)	480V-3Ø	200	8000	1
5	PANEL K	480V-3Ø	400	8000	1
6	PANEL M1A	480V-3Ø	200	8000	1
7	PANEL L1A	480V-3Ø	100	8000	1
8	PANEL R1A1 (VIA XFMR TR1A)	480V-3Ø	400	8000	1
9	SOLAR PV INVERTER #1	480V-3Ø	100	2000	1, 4
10	SOLAR PV INVERTER #2	480V-3Ø	100	2000	1, 4
11	DIST. PANEL DP1B	480V-3Ø	800	8000	2
12	PANEL M1B	480V-3Ø	400	8000	2
13	PANEL R1B (VIA XFMR TR1B)	480V-3Ø	200	8000	2
14	ELEVATOR (20 HP)	480V-3Ø	100	8000	2
15	PANEL M2B	480V-3Ø	400	8000	2
16	PANEL L2B	480V-3Ø	100	8000	2
17	PANEL R2B (VIA XFMR TR2B)	480V-3Ø	200	8000	2
18	PANEL SR1A	208V-3Ø	400 (AT MAINS)	7100	3
19	PANEL SR2B	208V-3Ø	100 (AT MAINS)	7100	3

NOTES:
1. PROVIDE CT CONNECTIONS WITHIN SWITCHBOARD SB.
2. PROVIDE CT CONNECTIONS WITHIN DISTRIBUTION PANEL DP1B.
3. PROVIDE CT CONNECTIONS AT MAINS AND FOR EVERY FEEDER / BRANCH CIRCUIT CONNECTED TO PANELBOARD.
4. PROVIDE METER UNDER PHOTOVOLTAIC SYSTEM ALTERNATE.

SCHEDULE OF ENERGY METER READINGS

ITEM	DESCRIPTION	METER NUMBER(S)
A	TOTAL BUILDING LOAD	1
B	CHILLER	2
C	TOTAL GENERATOR LOADS	3 + 4
D	TOTAL KITCHEN LOADS	5
E	TOTAL MECHANICAL LOADS	2 + (4 -18 + W + Y) + 6 + 12 + 15
F	TOTAL LIGHTING LOADS	3 + 7 + 16
G	TOTAL PLUG LOADS	8 + 13 + 17 + X + Z
H	TOTAL PV LOADS (ALTERNATE)	9 + 10
J	ELEVATOR	14
ITEM	DESCRIPTION	CIRCUIT NUMBER(S)
W	PANEL SR1A MECHANICAL LOADS	SR1A-1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,18,20,22,24,26
X	PANEL SR1A PLUG LOADS (TELECOM)	SR1A-49,51,53,2,4,6,8,10,12,14,16
Y	PANEL SR2B MECHANICAL LOADS	SR2B-1,2,4,6,8
Z	PANEL SR2B PLUG LOADS (TELECOM)	SR2B-5,7,9,11,13,15,17,19

SCHEDULE OF TRANSFORMERS

TRANSFORMER		LOCATION	PRIMARY FEEDER	SECONDARY TAP WIRING & CONDUIT (NOTE A)	GROUNDING ELECTRODE CONDUCTOR	EQUIPMENT SERVED	NOTES
DESIG.	KVA						
TR1A	75	ELEC RM A V05B	SB-8	4 #250 + #2G - 3"C	#2	PANEL R1A1	
TK1	45	ELEC RM A V05B	K-26	4 #1/0 + #6G - 2"C	#6	PANEL K1	
TSR1A	75	ELEC RM A V05A	SM1A-26	4 #250 + #2G - 3"C	#2	PANEL SR1A	
TR1B	75	ELEC RM B 151	DP1B-2	4 #250 + #2G - 3"C	#2	PANEL R1B	
TR2B	75	ELEC RM B 223	DP1B-6	4 #250 + #2G - 3"C	#2	PANEL R2B	

TRANSFORMER GENERAL NOTES:

A. TRANSFORMER SECONDARY TAP: CONDUCTORS INDICATED REFLECT PHASE, NEUTRAL (IN WYE-CONFIGURATION), AND SUPPLY-SIDE BONDING JUMPER (SSBJ) IN ACCORDANCE WITH NEC ARTICLES 450, 240.21, AND 250.30.

B. TRANSFORMER SHALL HAVE 480-VOLT, 3-PHASE, DELTA PRIMARY AND 120/208-VOLT, 3-PHASE, WYE SECONDARY.

SCHEDULE OF VARIABLE FREQUENCY DRIVES

DRIVE DESIGNATION	EQUIPMENT SERVED	DRIVE LOCATION	MOTOR CHARACTERISTICS			NOTES
			HP	FLA	VOLTAGE / PHASE	
VFD-1	PUMP P-1	MECH ROOM A 126	7.5	11	480V - 3Ø	-
VFD-2	PUMP P-2	MECH ROOM A 126	7.5	11	480V - 3Ø	-
VFD-3	PUMP P-3	MECH ROOM A 126	15	20	480V - 3Ø	-
VFD-4	PUMP P-4	MECH ROOM A 126	15	20	480V - 3Ø	

VARIABLE FREQUENCY DRIVE GENERAL NOTES:

A. VFD DIMENSIONS SHALL NOT EXCEED THE EQUIPMENT FOOTPRINT ALLOCATED. PROVIDE COMPACT DRIVE ASSEMBLIES.

B. MOTOR RATINGS INDICATE NOMINAL HORSEPOWER (HP) AND MINIMUM FULL LOAD AMPERES (FLA).

VARIABLE FREQUENCY DRIVE SPECIFIC NOTES:

1. ----
2. ----

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JPA PROJECT NO. 6667-16

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jamesposey.com

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the state of Maryland, License No. 24861, Expiration date: 02-24-2022.

NEW TALBOTT SPRINGS ELEMENTARY SCHOOL

COLUMBIA, MARYLAND

HOWARD COUNTY PUBLIC SCHOOL SYSTEM

revisions

IAC CD / BLDG PERMIT SET
1 MAY 20

ADDENDUM NO. 3
1 JULY 20

BID AND CONSTRUCTION
16 JUNE 20

ELECTRICAL DETAILS AND DIAGRAMS

E-501

011112 - Specification Cross Reference *(Revised Addendum #3 07/02/2020)* [3]

Responsibility Key:

P	Primary Contractor
I	Included (See Scope)
C	For Coordination

Specification	01A	02A	02C	03A	04A	05A	07A	08A	11A	15A	16A
Division 0 (In its entirety)	P	P	P	P	P	P	P	P	P	P	P
Division 1 (in its entirety)	P	P	P	P	P	P	P	P	P	P	P
023000 - Subsurface Exploration		I	I							I	I
024113 - Selective Demolition		I	P								
031100 - Concrete Formwork				P							
031500 - Concrete Accessories				P							
032000 - Concrete Reinforcement				P							
033000 - Cast-in-Place Concrete	C	I		P	C	C		C	C	C	C
042000 - Unit Masonry	C			C	P	C	C	C	C	C	C
047200 - Cast Stone Masonry	C			C	P	C		C		C	C
050519 - Post-Installed Anchors	C			I	I	P					
051200 - Structural Steel	C			C	C	P		I	C	C	C
052100 - Steel Joists	C			C	C	P	C	C	C	C	C
053113 - Steel Floor Decking				C		P		C	C	C	C
053123 - Steel Roof Decking						P	C	C	C	C	C
054000 - Cold-Formed Metal Framing	P			C		C	I	C	C		C
054300 - Slotted Channel Framing Systems	P					C	I	C			
055000 - Metal Fabrications	I			C	C	P	C			C	C
055100 - Roof Related Metal Fabrications						P	I				
057500 - Column Covers [3]	P					C					
060573 - Wood Treatment	P										
061000 - Rough Carpentry	P				C	C	C	C		C	C
062000 - Finish Carpentry	P										
070800 - Commissioning of Building Envelope Systems					P		P	P			
071000 - Damproofing and Waterproofing	I			I	I						
072100 - Thermal Insulation	I			I	I		I	I	I	I	I
~~***072113 - Foam Board Insulation***~~ [3]					P					C	C
072119 - Foamed-in-Place Insulation					P						
072200 - Roof and Deck Insulation							P				

Specification	01A	02A	02C	03A	04A	05A	07A	08A	11A	15A	16A
072700 - Air Barrier Membrane Components					P						
074113 - Manufactured Roof Panels							P			C	C
074213 - Metal Soffit Panels							P			C	C
075113 - Built-Up Asphalt Roofing							P			C	C
075556 - Hot Fluid-Applied Roofing							P			C	C
076200 - Flashing and Sheet Metal							P			C	C
077200 - Roof Accessories	C					C	I		I	I	I
078100 - Spray Fire Resistive Material	P					C					
~~078123 - Intumescent Fire Resistive Material~~ [3]	P					C				I	
079200 - Joint Sealants	I	I		I	I	I	I	I	I	I	I
081100 - Metal Doors and Frames	P				C			C			
083473 - Sound Control Door Assemblies [3]	P				C			C			
084113 - Aluminum Entrances and Storefronts	C				C	C		P			
084523 - Insulated Translucent Fiberglass Panel Systems	C				C	C		P			
086000 - Skylights							P				
087100 - Door Hardware	P							I			
087170 - Perimeter Acoustical Door Seals [3]	P							I			
087200 - Weatherstripping and Seals [3]	P							I			
088100 - Glass Glazing	C							P			
089119 - Fixed Metal Louvers										P	
092216 - Non Structural Metal Framing	P				C						
092226 - Suspension Systems	P			C	C	C	C	C			
092900 - Gypsum Board	P										
093013 - Ceramic Flooring	P			C	C				C	C	C
093016 - Quarry Tiling	P			C	C				C	C	C
096400 - Wood Flooring	P			C							
096500 - Resilient Flooring	P			C							
096623 - Epoxy Terrazzo Flooring	P			C							
096800 - Carpeting	P			C							
098000 - Acoustical Treatment	P				C						
098413 - Sound Absorptive Panels	P										
098414 - Utility Sound Absorptive Panels	P										
098416 - Radiused Sound Diffusing Panels	P										

Specification	01A	02A	02C	03A	04A	05A	07A	08A	11A	15A	16A
099100 - Painting	P			C	C	C					
101100 - Visual Display Surfaces	P				C	C					
101200 - Display Cases and Poster Cases	P				C	C					I
101400 - Signage	P										
101416 - Plaques	P										
102100 - Toilet Partitions	P				C	C				C	C
102123 - Cubicle Curtains	P										
102226 - Operable Partitions	P				C	I					I
102800 - Toilet and Bath Accessories [3]	P				C					C	C
104313 - Automated External Defibrillator	P										
104321 - Evacuation Device Cabinet	P										
104413 - Fire Extinguisher Cabinets and Accessories	P				C	C					
105113 - Metal Lockers	P			C	C	C					
105600 - Metal Storage Assemblies [3]	P			C	C	C					
107500 - Flagpoles	P	C									
108113 - Bird Deterrent							P				
~~***108200 - Toilet and Bath Accessories***~~ [3]	P				C					C	C
113100 - Appliance Installation	P									I	I
114000 - Foodservice Equipment				C					P	I	I
115213 - Projection Screens	P					C					
116100 - Platform Performance Equipment	P										I
116143 - Cyclorama Curtains	P					C					
116600 - Athletic Equipment	P			C	C	C				C	I
116653 - Gymnasium Dividers	P				C	C				C	I
116813 - Play Structures		P									
122100 - Window Blinds	P				C						
122413 - Roller Window Shades	P				C						I
123000 - Casework	P				C				P	C	I
126000 - Sail Shades	P										
142000 - Elevators	P				C						
210101 - Fire-Supression General Provision	C	C		C	C	C	C	C		P	C
210500 - Common Work Results for Fire Supression	C	C		C	C	C	C	C		P	C
210502 - Sleeves and Plates for Fire Suppression Piping	C	C		C	C	C	C	C		P	C

Specification	01A	02A	02C	03A	04A	05A	07A	08A	11A	15A	16A
210507 - Firestopping for Fire-Supression Systems	C	C		C	C	C	C	C		P	C
211000 - Water-based Fire-Supression System	C	C		C	C	C	C	C	C	P	C
213400 - Packaged Fire Pump [3]	C	C		C	C	C	C	C	C	P	C
220101 - Plumbing General Provisions	C	C		I	C	C	C	C	C	P	C
220500 - Common Work Results for Plumbing	C	C		I	C	C	C	C	C	P	C
220501 - Excavation and Fill for Plumbing Work	C	C		I	C	C	C	C	C	P	C
220502 - Sleeves and Plates for Plumbing Piping	C	C		I	C	C	C	C	C	P	C
220503 - Access Doors for Plumbing Piping and Equipment	C	C		I	C	C	C	C	C	P	C
220505 - Equipment Connections for Plumbing	C	C		I	C	C	C	C	C	P	C
220506 - Curbs and Flashings for Plumbing Piping and Equipment	C	C		I	C	C	C	C	C	P	C
220507 - Firestopping for Plumbing Work	C	C		I	C	C	C	C	C	P	C
220509 - Plumbing Expansion System	C	C		I	C	C	C	C	C	P	C
220513 - Common Motor Requirements for Plumbing Equipment	C	C		I	C	C	C	C	C	P	C
220519 - Meters and Gauges for Plumbing Lining	C	C		I	C	C	C	C	C	P	C
220523 - General-Duty Valves for Plumbing Piping	C	C		I	C	C	C	C	C	P	C
220529 - Hangers and Supports for Plumbing Piping and Equipment	C	C		I	C	C	C	C	C	P	C
220533 - Heat Tracing for Plumbing Piping	C	C		I	C	C	C	C	C	P	C
220548 - Vibration Control Supports for Plumbing	C	C		I	C	C	C	C	C	P	C
220700 - Plumbing Insulation	C	C		I	C	C	C	C	C	P	C
220719 - Plumbing Piping Insulation	C	C		I	C	C	C	C	C	P	C
220800 - Plumbing Commissioning	C	C		I	C	C	C	C	C	P	C
221116 - Domestic Water Piping	C	C		I	C	C	C	C	C	P	C
221119 - Domestic Water Piping Specialties	C	C		I	C	C	C	C	C	P	C
221123 - Domestic Water Pumps	C	C		I	C	C	C	C	C	P	C
221316 - Sanitary Waste and Vent Piping	C	C		I	C	C	C	C	C	P	C
221319 - Sanitary Waste Piping Specialties	C	C		I	C	C	C	C	C	P	C
221413 - Storm Drainage Piping	C	C		I	C	C	C	C	C	P	C
221423 - Storm Drainage Piping Specialties	C	C		I	C	C	C	C	C	P	C
221429 - Sump Pumps	C	C		I	C	C	C	C	C	P	C
223400 - Fuel Fired Domestic Water Heaters	C	C		I	C	C	C	C	C	P	C
~~***224200 - Institutional Plumbing Fixtures***~~ [3]	C	C		I	C	C	C	C	C	P	C
230100 - Operation and Maintenance of HVAC Systems	C	C		C	C	C	C	C	C	P	C
230101 - HVAC General Provisions	C	C		C	C	C	C	C	C	P	C

Specification	01A	02A	02C	03A	04A	05A	07A	08A	11A	15A	16A
230500 - Common Work Results for HVAC	C	C		C	C	C	C	C	C	P	C
230501 - Excavation and Fill for HVAC	C	C		C	C	C	C	C	C	P	C
230502 - Sleeves and Plates for HVAC Piping	C	C		C	C	C	C	C	C	P	C
230503 - Access Doors for HVAC Piping and Equipment	C	C		C	C	C	C	C	C	P	C
230504 - HVAC Demolition	C	C		C	C	C	C	C	C	P	C
230506 - Curbs and Flashing for HVAC Piping and Equipment	C	C		C	C	C	C	C	C	P	C
230507 - Firestopping for HVAC Work	C	C		C	C	C	C	C	C	P	C
230508 - HVAC Piping Specialties	C	C		C	C	C	C	C	C	P	C
230509 - HVAC Expansion System	C	C		C	C	C	C	C	C	P	C
230513 - Common Motor Requirements for HVAC Equipment	C	C		C	C	C	C	C	C	P	C
230519 - Meters and Gauges for HVAC Piping	C	C		C	C	C	C	C	C	P	C
230523 - General-Duty Valves for HVAC Piping	C	C		C	C	C	C	C	C	P	C
230529 - Hangers and Supports for HVAC Piping and Equipment	C	C		C	C	C	C	C	C	P	C
230533 - Heat Tracing for HVAC Piping	C	C		C	C	C	C	C	C	P	C
230548 - Vibration Control Supports for HVAC	C	C		C	C	C	C	C	C	P	C
230593 - Testing, Adjusting, and Balancing	C	C		C	C	C	C	C	C	P	C
230700 - HVAC Insulation	C	C		C	C	C	C	C	C	P	C
230713 - Duct Insulation	C	C		C	C	C	C	C	C	P	C
230716 - HVAC Equipment Insulation	C	C		C	C	C	C	C	C	P	C
230719 - HVAC Piping Insulation	C	C		C	C	C	C	C	C	P	C
230800 - HVAC Commissioning	C	C		C	C	C	C	C	C	P	C
230901 - Automatic Temperate Control System	C	C		C	C	C	C	C	C	P	C
230902 - Control Systems Wiring	C	C		C	C	C	C	C	C	P	C
230907 - Control Dampers	C	C		C	C	C	C	C	C	P	C
230908 - Control Valves	C	C		C	C	C	C	C	C	P	C
230913 - Instrumentation and Control Devices for HVAC	C	C		C	C	C	C	C	C	P	C
230914 - Carbon Dioxide Measurement and Control System	C	C		C	C	C	C	C	C	P	C
230923 - Direct Digital Building Systems Control	C	C		C	C	C	C	C	C	P	C
231123 - Natural Gas Piping	C	C		C	C	C	C	C	C	P	C
232113 - Hydronic Piping	C	C		C	C	C	C	C	C	P	C
232123 - HVAC Pumps	C	C		C	C	C	C	C	C	P	C
232300 - Refrigerant Piping	C	C		C	C	C	C	C	C	P	C
232500 - HVAC Water Treatment	C	C		C	C	C	C	C	C	P	C

Specification	01A	02A	02C	03A	04A	05A	07A	08A	11A	15A	16A
233113 - Metal Ducts	C	C		C	C	C	C	C	C	P	C
233300 - Duct Accessories	C	C		C	C	C	C	C	C	P	C
233400 - HVAC Fans	C	C		C	C	C	C	C	C	P	C
233600 - Air Terminal Units	C	C		C	C	C	C	C	C	P	C
233713 - Diffusers and Grilles	C	C		C	C	C	C	C	C	P	C
233723 - Roof Mounted Gravity Ventilators	C	C		C	C	C	C	C	C	P	C
233714 - Louvers	C	C		C	C	C	C	C	C	P	C
234100 - Particulate Air Filtration	C	C		C	C	C	C	C	C	P	C
235216 - Condesing Boilers	C	C		C	C	C	C	C	C	P	C
236313 - Air-Cooled Refrigerant Condesing Units	C	C		C	C	C	C	C	C	P	C
236419 - Positive Displacement Chilllers	C	C		C	C	C	C	C	C	P	C
237200 - Dedicated Outdoor Air Systems Units	C	C		C	C	C	C	C	C	P	C
237322 - Air-Handling Units with Coils	C	C		C	C	C	C	C	C	P	C
238127 - Ductless Split-System Units	C	C		C	C	C	C	C	C	P	C
238219 - Fan-Coil Units	C	C		C	C	C	C	C	C	P	C
238238 - Electric Resistance Terminal Units	C	C		C	C	C	C	C	C	P	C
238239 - Unit Heaters	C	C		C	C	C	C	C	C	P	C
260101 - Electrical General Provision	C	C		I	C	C	C	C	C	I	P
260500 - Common Work Results for Electrical	C	C		I	C	C	C	C	C	I	P
260501 - Excavation and Fill for Electrical Work	C	C		I	C	C	C	C	C	I	P
260503 - Access Doors for Electrical Systems	C	C		I	C	C	C	C	C	I	P
260507 - Firestopping for Electrical Work	C	C		I	C	C	C	C	C	I	P
260519 - Wires and Cable	C	C		I	C	C	C	C	C	I	P
260521 - Wiring Connections	C	C		I	C	C	C	C	C	I	P
260526 - Grounding and Bonding	C	C		I	C	C	C	C	C	I	P
260528 - Equipment Foundations	C	C		I	C	C	C	C	C	I	P
260533 - Conduits	C	C		I	C	C	C	C	C	I	P
260534 - Boxes	C	C		I	C	C	C	C	C	I	P
260541 - Low-Voltage Service Entrance	C	C		I	C	C	C	C	C	I	P
260544 - Underground Ducts Utility Structures	C	C		I	C	C	C	C	C	I	P
260553 - Identification for Electrical Systems	C	C		I	C	C	C	C	C	I	P
260573 - Overcurrent Protective Device Studies	C	C		I	C	C	C	C	C	I	P
260800 - Electrical Commisioning	C	C		I	C	C	C	C	C	I	P

Specification	01A	02A	02C	03A	04A	05A	07A	08A	11A	15A	16A
260923 - Stand-Alone Lighting Control Devices	C	C		I	C	C	C	C	C	I	P
260936 - Stand-Alone Modular Lighting Controls	C	C		I	C	C	C	C	C	I	P
262200 - Transformers	C	C		I	C	C	C	C	C	I	P
262413 - Switchboards	C	C		I	C	C	C	C	C	I	P
262416 - Panelboards	C	C		I	C	C	C	C	C	I	P
262550 - Generator Docking Station [3]	C	C		I	C	C	C	C	C	I	P
262713 - Metering and Verification	C	C		I	C	C	C	C	C	I	P
262716 - Cabinets and Enclosures	C	C		I	C	C	C	C	C	I	P
262726 - Wiring Devices	C	C		I	C	C	C	C	C	I	P
262800 - Enclosued Circuit Protective Devices	C	C		I	C	C	C	C	C	I	P
262813 - Fuses	C	C		I	C	C	C	C	C	I	P
262914 - Enclosed Motor Controllers	C	C		I	C	C	C	C	C	I	P
262923 - Variable Frequency Drives	C	C		I	C	C	C	C	C	I	P
263100 - Photovoltaic Collectors	C	C		I	C	C	C	C	C	I	P
263213 - Generators, Weather-Protected	C	C		I	C	C	C	C	C	I	P
263600 - Transfer Switches	C	C		I	C	C	C	C	C	I	P
264313 - Surge Protective Devices	C	C		I	C	C	C	C	C	I	P
265100 - Interior Lighting	C	C		I	C	C	C	C	C	I	P
265600 - Exterior Lighting	C	C		I	C	C	C	C	C	I	P
270500 - Telecommunications Pathways and Spaces	C	C		C	C	C	C	C	C	C	P
271000 - Structured Cabling	C	C		C	C	C	C	C	C	C	P
274000 - IP Video Distribution	C	C		C	C	C	C	C	C	C	P
274100 - Audio Visual and Sound Enhancement	C	C		C	C	C	C	C	C	C	P
274116 - Intergrated Audio-Visual Systems	C	C		C	C	C	C	C	C	C	P
274200 - Specialized AV Systems	C	C		C	C	C	C	C	C	C	P
275000 - Intercom and Clocks	C	C		C	C	C	C	C	C	C	P
281000 - Access Control and Intrusion Systems	C	C		C	C	C	C	C	C	I	P
282000 - Video Surveillance Systems	C	C		C	C	C	C	C	C	I	P
283100 - Fire Detection and Alarm Systems	C	C		C	C	C	C	C	C	I	P
312000 - Earth Moving		P		I	C	C				I	I
321216 - Asphalt Paving		P		C	C	C					I
321816 - Playground Protective Equipment		P		C	C	C					I
323000 - Site Improvments		P		C	C	C					I

Specification	01A	02A	02C	03A	04A	05A	07A	08A	11A	15A	16A
329100 - High Performance Modular Biofiltration System		P		C	C	C					I
329219 - Seeding and Sodding		P		C	C	C					I
329300 - Plants		P		C	C	C					I
330000 - On-site and Off-site Utilities		P		C	C	C				I	I

PART 1 – GENERAL SCOPE OF WORK FOR ALL TRADES

A. CONTRACT PACKAGE PROPOSALS:

1. Proposals in compliance with the Notice to Bidders and Invitation to Bid will be received for the contract packages included herein.

2. Refer to Document Contract Package / Specifications Cross-reference.

3. All contract package proposals must include all items in the package. No exceptions, exclusions, or qualifications are permitted.

4. Contractor shall review the list of unit prices found in the Form of Proposal**,** and accepts these rates for potential changes to the work, both adds and deducts, for the duration of the project.

5. Contractor shall be required to carefully review all alternate proposal requests contained within the Contract Documents. Contractor shall provide costs for all work contained in the alternates, associated and/or specifically indicated as part of the Contract Package. Contractor shall be responsible for providing all such work upon acceptance of the alternates by the Owner. Failure to list a price on the alternate proposals will be considered zero cost and does not relieve the contractor from performing the scope of work if the alternate is accepted.

6. In the case of a scope conflict between design documents and the terms contained within the scopes of work, the terms outlined in the scope of work shall prevail.

7. There are modifications to the AIA Document A232-2009, General Conditions of the Contract for Construction listed at the conclusion of this General Scope of Work which supersede contractual requirements listed within specification section in Division 0.

8. Due to the threat associated with the COVID-19 virus, all trade Contractors will be required to document and provide appropriate planning, training, PPE and documentation of same prior to starting work onsite. Any Contractors working within occupied Howard County facilities will be required to establish a safe work plan with Howard County public schools prior to beginning work.

B. QUESTIONS CONCERNING THE CONTRACT PACKAGE:

1. All questions concerning the Contract Packages, Form of Proposal and all technical specifications must be brought to the attention of the Construction Manager in writing by the deadline established in the Notice to Bidders.

2. Work listed in any specification section, which is described, as being in accordance with a related reference section, shall be performed by the Contractor in whose section the work is listed.

C. CONTRACT PACKAGE INSTRUCTIONS:

1. Contract package specific scope of work instruction sections follow this section and are listed separately by package.

2. The Contractor shall provide all labor, materials, tools, equipment and supervision necessary to complete all of the work required by the Specification Sections designated in the Contract Package / Specifications Cross-reference, as being part of the Contract Package for which he is submitting a proposal.

3. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to the completion of the scope in accordance with the complete set of Contract Documents.

4. The Contract Package instructions are provided to highlight the major portions of the work of each Contract Package and to include supplemental requirements. The Contract Package instructions are not intended to list every portion of the work that is required by the specifications assigned to each Contract Package.

5. The terms Contractor, Trade Contractor, Subcontractor, Supplier, Second Tier Subcontractor, etc. are considered interchangeable when it comes to both the General and Specific scope line items, Contracts and or Purchase Orders.

DUPLICATION OF WORK:

1. A duplication of any portion(s) of the work in another Contract Package shall not relieve the Contractor of his responsibility to perform all of the work required by his Contract Package instructions. If any such duplication of work is discovered, the Construction Manager shall decide which contract(s) shall be adjusted to eliminate any such duplication of work.

2. In the event of a conflict between drawings or specified requirements, the Contractor will be responsible to provide the superior quality, quantity, or more costly product and installation as deemed by the Construction Manager, Owner or Architect.

E. MBE REQUIREMENTS

1. The Project has an established overall Minority Business Enterprise (MBE) participation goals as listed in Division 0. MBE firms must be certified by the Maryland Department of Transportation (MDOT) in order to be counted towards the goals.

2. Trade Contractor shall endeavor to maximize participation by MDOT certified minority firms in its bid. Trade contractor shall complete and submit all required MBE forms for this project and shall include in its agreements with certified MBE Trade Contractors a requirement to submit these MBE forms to the Owner.

3. Only contractors, vendors or suppliers certified by MDOT (Maryland Department of Transportation) are recognized as certified MBE.

4. In the event MBE participation cannot be achieved, documentation must be provided as described in Division 0.

5. Contractor must provide verification of payment to MBE via canceled check or notarized lien waiver within thirty (30) days of payment from Owner to Contractor if MBE costs were submitted on Contractor's requisition. This verification is to be sent to the Construction Manager no later than the month's following pay application.

6. Contractor is to create on the schedule of values a line called "MBE Inclusion." The **mandatory assigned value will be 1% of the total contract value.** This is in addition to the retainage requirements of the contract. Monies will be released as determined by contractor's performance, similar to any other line item in the schedule of values.

F. WAGE RATES AND SALES TAX

1. Prevailing Wage Rates do apply to this project. Contractor shall pay wages to workers in strict accordance with above mentioned Wage for this Contract. Contractor shall comply with all applicable Labor Standards Provisions and is also responsible for ensuring that all subsequent tier Contractors comply with the submission on their required payrolls.

   All certified payroll reports shall be submitted electronically as required and confirmation receipts are to be faxed to Dustin Construction at 301-810-4345. Any fines incurred for failure to comply and improper or untimely reporting shall be backcharged directly to Contractor. Please see Division 0 for more information.

2. This project is subject to State of Maryland sales tax.

G. PERMITS, TESTING AND INSPECTIONS

1. The Owner and or Design Team is to secure the Building, Sediment Control and Grading permit only. All other required permits, sub permits, trade permits, approvals, bonds, etc. are the respective trade contractor's responsibility.

2. All testing associated with this contractor's work will be furnished by the Contractor unless specifically called out to be the Owner or Construction Manager's responsibility via the individual trade package Specific Scope of Work, Contract Drawings or Specifications. Contractor shall provide full cooperation with all testing agencies, all materials to be tested, and lastly correction of failed test report no more than 48hours after receipt or notification of failure. Cost of correction is the Contractor's responsibility.

3. Contractor shall coordinate with all jurisdictional agencies and inspectors.

4. Contractor shall perform all work to comply with the rules and the regulations of the governing bodies and state local laws. Contractor shall obtain all required bonds and permits, secure all inspections, and provide all tests and certifications required by code. Contractor shall provide copies of all its permits and inspection certificates to the Construction Manager for their records.

5. This Contractor is responsible for providing the required testing and certification through an approved agency for all equipment assemblies that require a UL rating.

6. Provide start up services, testing, turnover and warranty of all materials and equipment, as per specifications. Submit a turnover plan as part of the submittal process indicating the equipment, testing, reporting and witnessing requirements.

7. Contractor shall participate in the commissioning per the specifications.

8. Contractor shall provide any and all trade certifications, licenses, and sign-offs required to secure any and all approvals, permits, and certifications.

H. INSURANCE, BONDS AND RELEASES

1. The Owner shall procure the Builder's Risk Insurance Policy. The deductible portion shall be paid by the Contractor responsible for any claims against the Builders' Risk Insurance.

2. Unless noted otherwise within the Contract Documents, the following insurance shall be provided by Trade Contractor. All costs associated with required insurances shall be included in the Trade Contractor's cost. Trade Contractor must submit proof of Insurance on a standard ACORD form, for that portion of the insurance which remains the Trade Contractor's, such as off-site, automobile, etc., with additional insureds as required, in accordance with the limits below. Coverage for Additional insured shall include both Ongoing operations and Products and Completed Operations on a Primary and Non-Contributory basis. Waiver of Subrogation shall be provided in favor of the Additional Insureds.

Workman's Compensation and Employers Liability
Statutory Limits – Workers Compensation covering all state and local requirements
Employers Liability Limits
$500,000 Each Accident
$500,000 Employee for injury by disease
$500,000 Aggregate for injury by disease

Automobile Liability
$1,000,000 Per Accident for all Owned, Non-Owned and Hired Autos

Commercial General Liability
$1,000,000 Per occurrence
$2,000,000 Aggregate
$2,000,000 Products and Completed Operations Aggregate
$1,000,000 Personal and Advertising Injury

Umbrella Liability or Excess Liability
$5,000,000 Per occurrence
$5,000,000 Aggregate

3. Contractor to include a 100% performance bond and a 100% payment bond from a surety company acceptable to the Construction Manager. Contractor also required to include bid bond per the specifications.

4. Contractor to include with pay applications required lien releases.

5. Contractor shall comply with all insurance regulations as required by local jurisdictions and the contract documents. Additionally, the Contractor is required to provide insurance certificates for each of his subcontractors and material suppliers who will be onsite. All insurance certificates must be submitted prior to start of work onsite.

6. Despite any reference throughout the bid documents to the contrary, a bid bond is required to be in place for a minimum of **180 calendar days** from the time of bid.

I. SUBMITTALS AND RFI'S

1. Electronic files may be available for use by Contractor for a fee to be determined by the Architect. Contractor agrees to sign waiver and assumes all liability and understands this is solely for their beneficial use for preparation of shop and coordination drawings. Files most likely will be in REVIT format, any costs associated with conversion of files from REVIT to Contractor's required file type, is to be done at the respective Contractor's time and expense. Failure to provide files in a timely fashion does not relieve this contractor of responsibility of submission time frames dictated here-in. Any delay in construction due to a delay in the submittal and or procurement process will be this contractor's responsibility. Any and all acceleration costs of subsequent trades will be the responsibility of this contractor.

2. Contractor shall provide all required submittals to the Construction Manager within fifteen (15) business days after issuance of the Contract, to avoid delay to work of all other Contractors. Contractor shall use a submittal cover sheet with all applicable required information completed; conforming and in accordance with the intent of the document.

3. No substitutions will be allowed without **pre-bid** written approval of the Architect and/or Owner, and must be clearly identified as such. Non-conformance submittals which are rejected shall not be cause for schedule delay.

4. Unless specified elsewhere, Contractor to submit for approval one (1) pdf of all submittals for proper distribution to Architect, Consultants, and Engineers for review. Contractor to submit additional hardcopies to Jurisdiction Having Authority upon request at no additional cost. After submittals are approved for use, Contractor to then scan and return one (1) pdf copy back to the Construction Manager for distribution to other trades for coordination. Contractor acknowledges the design team is allotted a minimum of 14 calendar days for review of submittals and cannot claim delay due to submittal review if reviewed within this allotment. Hard copies of submittals shall be provided upon request.

5. Within five (5) business days of the issuance of theContract, , despite any other reference, the Contractor will forward to the Construction Manager the following:
    a. Safety Program
    b. Submittal Log
    c. Submittal Request Log detailing submittals from other trades required by this contractor

d. Closeout Log
e. Contractor's subcontract list with full contact information

6. RFI'S are to be submitted electronically for processing by the Construction Manager to the design team and owner. Contractor acknowledges the design team is allotted a minimum review time per the specifications and therefore a delayed response is not cause for a delay.

J. SUSTAINABLE DESIGN REQUIREMENTS (LEED)

1. Contractor is aware this is a LEED "Silver" project and shall comply in a timely fashion with requests of Construction Manager to properly plan and document this project.

2. All Contractors are responsible for LEED Version 4 requirements per Division 1 in addition to LEED requirements listed in individual specification sections pertaining to work installed under their respective contract packages.

3. In accordance with Division 1, Contractor to create on the schedule of values a line called "LEED." The **mandatory assigned value will be 1% of the total contract value.** This is in addition to the retainage requirements of the contract. Monies will be released as determined by contractor's performance, similar to any other line item in the schedule of values.

K. SAFETY

1. Contractor shall be required to conduct his activities in a safe manner and shall be responsible for observing the safety regulations of MOSH, OSHA, and local life safety agencies. Contractor shall comply with applicable laws, ordinances, rules, regulations and orders of governing authorities having jurisdiction including the Construction Manager or Third-Party Inspection service, for the safety of persons and property to protect them from damage, injury or loss, immediately and without recourse to additional cost.

2. The Contractor's personnel, his Subcontractors, and Suppliers' personnel shall at all times demonstrate proper behavior and act in a courteous manner. The Contractor shall remove from the Project or cause to be removed from the Project any such personnel who demonstrate unacceptable behavior (as determined by the Contractor and/or Construction Manager). Removal from the Project shall be permanent.

3. Contractor shall furnish, install, provide, and maintain all traffic control (including flagmen) for this Contractor's work as required by the Contract Documents and/or governing authorities having jurisdiction over them.

4. Contractor shall furnish, install, and maintain all safety and/or warning signs as required for this work and/or per the direction of the authorities having jurisdiction over the work.

5. Contractor shall furnish, install, and maintain all fall protection and barricades, including toe boards, with its scaffolding systems

6. Contractor is to furnish, install, and maintain temporary general use fire extinguishers onsite per MOSH/OSHA requirements for general protection. All Trades are to provide own fire extinguishers, blankets, and any other provisions for burning, welding, soldering, braising, or any hot/fire work performed by the Contractor in performance of their work in any area as specifically necessary.

7. Contractor is to erect and maintain, as required by conditions and progress of the work, all necessary safeguards for safety and protection, including fences, railings, barricades, lighting, posting of danger signs, caution tape, flagging, and other warnings against hazards. Contractor is to ensure all of its own work forces and subcontractors are equipped and utilizes required Personal Protective Equipment (PPE) to facilitate its scope. Contractor is responsible for initiating, maintaining and supervising all safety precautions and programs in connection with this contract as related to the scope of work being performed. The Contractor

shall provide safe access to his work for the Owner, Construction Manager, Architect, Consultants, Testing Agencies, etc. to inspect and test the work.

8. The Contractor shall conduct required Safety Meetings and shall provide a copy of the minutes and attendance list for each meeting to the Construction Manager's Superintendent.

9. In the event the Owner or Construction Manager is cited for MOSH/OSHA violations due to, arising out of, relating to, or in any way attributable to actions or inactions by the Contractor and/or by any of its subcontractors, agents, servants, employees, or representatives, the Contractor shall be liable for and shall be responsible for all losses, costs, expenses and damages incurred by the Owner and/or Construction Manager including, but not limited to:
    a. Legal Fees;
    b. Fines and/or penalties assessed;
    c. Reimbursement for employee costs to attend any related meetings and/or proceedings;
    d. Reimbursement for incidental costs such as document searches, document production, and document copying;
    e. Increased insurance premiums

10. In the event that any work on the project is delayed or disrupted because of any MOSH/OSHA directives or citations arising out of, relating to, or in any way attributable to actions or inactions by the Contractor (and/or by any of its Contractors, agents, servants, employees, or representatives), the Contractor shall be liable for and shall be responsible to pay for all losses, costs, expenses and damages incurred by the Owner and/or Construction Manager.

11. If required, Contractors with any storage vessels onsite must obtain a Hazardous Materials Permit from **Howard County** Department of Permitting Services for any tank, barrel, or container, which contains flammable or hazardous fuel/material. Furthermore, any tank, barrel, or container, which contains flammable or hazardous fuel/material, shall be protected in a manner acceptable to MOSH. This includes, but not limited to, chain-link fencing with posts driven a minimum 2′-6" below grade or 6" steel bollards 8′ long driven 3′ into the earth 4′ on center around perimeter of area. No fuel or any substance may be placed in tanks until condition is reviewed and approved by MOSH or in writing by the Contractor's Safety Officer. Under no circumstance shall any tank, barrel, or container, which contains flammable or hazardous fuel/material, be placed within 10′ of any temporary or permanent road.

12. Under no circumstance shall trades be working without clear separation from staff and or students. Contractor's employee(s) are required to have undergone full background checks prior to being allowed onsite. Contractor includes any and all costs for each employee undergoing the background check as part of the base bid. Employees which fail to comply with this regulation will be immediately removed from the project.

13. All contractors working with Portland Cement or a Portland Cement based product, is required to provide Eye Wash Station(s) as required by MOSH or OSHA. Contractor to provide multiple stations located as necessary to comply.

14. Perimeter and floor opening protection will be installed and maintained by designated Contractors. If the protection interferes with completion of work, then respective Contractor shall remove and replace the protection in compliance with the CM's Project Safety Plan and all OSHA/MOSH standards. If a Contractor creates a hole, opening, fall or trip hazard, the same Contractor must properly cover, secure and label such hazard.

15. All Contractors shall designate a Safety Officer who is required to have and maintain an OSHA 10-hour certification. This Safety Officer can be the Contractors Foreman as long as the Contractor does not have more than 45 workers on site.

L. PUNCHLIST, AS-BUILTS, WARRANTIES, O&M'S AND CONTRACT CLOSEOUT

1. Contractor shall maintain a set of as-built drawings as required by the contract documents. Contractor will also assist the Construction Manager with updating the Construction Manager's field as-built drawings. Contractor understands that as-built drawings will be checked on a monthly basis and will be reviewed as a prerequisite to requisition approval. Contractor shall submit three (3) hard copy sets and (1) pdf copy of final certified as-built drawings within ten (10) days prior to substantial completion to the Construction Manager. Contractor shall also submit as-builts and pay for all as-built submission fees as required by AHJ. Contractor shall provide complete operation and maintenance manuals with spare parts list within ten (10) business days prior to substantial completion Construction Manager.

2. All work to complete lists, inspection lists, etc, shall be completed within ten (10) business days of issuance to contractor, or sooner as deemed by the project schedule.

3. All punch list work must be completed within five (5) business days of issuance of such list, distributed via fax, e-mail, or standard mail, which ever format is issued first. In the event the Contractor fails to complete all list items which pertain to their scope of work within the proscribed time frame, the Contractor shall reimburse the Owner directly at a rate of five hundred dollars ($500.00) per calendar day until all applicable punch list items are complete. This is in addition to any other damages clause in the contract. If the Contractor fails to reimburse the Owner directly within ten (10) business days after issuance of the invoice, the Contractor's Surety for the project shall be held liable for compensation and payment to the Owner. The Surety shall issue payment to the Owner within fifteen (15) business days of receipt of invoice from the Owner. The issuance of payment and performance bonds to the Contractor by the Surety shall be construed as acceptance of this condition of the contract. In no way does any verbiage or implied conditions of the bond supersede this condition of the contract.

4. Contractor to create on the schedule of values a line called "Punchlist". The **mandatory assigned value will be 1% of the total contract value.** This is in addition to the retainage requirements of the contract. Monies will be released as determined by contractor's performance, similar to any other line item in the schedule of values. This is in no way intended to be the full value of the Contractor's potential punchlist, and is intended to motivate a timely completion of open punchlist items.

5. Contractor shall furnish and install touch-up paint at all equipment installed by this Contractor.

6. After completion of Commissioning, Contractor shall be responsible for all training requirements for all equipment and systems it has installed per the specifications. Contractor includes professional recording of all required training. Media to be provided within five (5) business days of each training session. In addition to the training requirements of respective specifications, contractor to include additional training of 10 hours per system installed, to be used at Owner's digression. All additional training to be tracked via ticket basis, any unused hours will be credited back to the Owner.

7. Contractor shall be responsible for replacing and repairing at no cost to the Owner and / or the Construction Manager any work performed by this Contractor that is determined to be unacceptable to the Owner, Construction Manager, and / or applicable inspectors. In said event, the Contractor shall coordinate and prioritize its work as to eliminate impact to the project schedule.

8. Contractor warrants its work in accordance with the requirements of the specifications. The Contractor shall guarantee or warranty its work against deficiencies and defects in materials and / or workmanship from the date of substantial completion of all or a portion designated by the Construction Manager, Architect and Owner for one (1) year for general trades and two (2) years for all MEP items. Contractor shall furnish all operations manuals, maintenance manuals, cleaning instructions, supplier / manufacturer warranties, and the like for all work performed.

9. Contractor shall participate in Project walk through(s) immediately prior to the expiration of all warrantees and/or guarantees provided under the work of this contract. Any deficiencies noted will be corrected by Trade Contractor at no additional cost to the Construction Manager/Owner.

10. Contractor shall provide start up services, turnover, and warranty of all materials and equipment, as per specifications. Contractor shall submit a turnover plan as part of the submittal process indicating the equipment, testing, reporting and witnessing requirements

11. Contractor to create on the schedule of values a line called "Closeout Documents and As-Builts." The **mandatory assigned value will be 1% of the total contract value.** This is in addition to the retainage requirements of the contract. Monies will be released as determined by contractor's performance, similar to any other line item in the schedule of values.

12. Contractor to include attic stock per the specifications. Contractor to submit list within 10 business days of award the required attic stock per the specifications for review and approval by Construction Manager. Any materials originally intended for attic stock, which were used during project completion shall be replaced at no charge to the owner within 10 business days following substantial completion. All attic stock shall be given in full packaging. Where specifications call for a percentage, material shall be rounded up to the next full package. Opened material will not be accepted for attic stock.

M. CLEAN UP

1. Contractor to create on the schedule of values a line called "Cleanup." The **mandatory assigned value will be 1% of the total contract value.** This is in addition to the retainage requirements of the contract. This is an arbitrary value and not to be construed as the required value of cleanup. Monies will be released as determined by contractor's performance of daily clean-up, similar to any other line item in the schedule of values.

2. The Contractor shall provide daily clean-up and disposal of all trash, debris, and excess material generated by this work and or workers. Contractor includes all required brooms, shovels, employee PPE, etc. Means and Methods shall be as required within the Construction Manager's Waste Management Plan for the Project. Should the Contractor's cleanup be unsatisfactory, the Construction Manager shall perform the work at the Contractor's expense, and deduct said costs from respective contractor's contract. A formal notice to cure is not required for Construction Manager to cleanup on the contractor's behalf.

3. Contractor shall be responsible for all street cleaning as necessary for dirt and debris that may be generated by its trucks and / or equipment and including this Contractor's suppliers and subcontractors.

4. When performing cleaning work, use only approved HEPA type vacuum units. No "blowing out" (pressure cleaning) will be allowed.

5. At the start of final cleaning of spaces, contractors requiring access into spaces to perform work, inclusive of punchlist work, will be required to wear "booties" to help protect finished spaces, provided at contractor's own expense. This will be a zero-tolerance policy, any contractor's forces which fail to comply will be removed from site and respective Contractor is then responsible for all costs with re-cleaning of room(s) as necessary to Owner satisfaction, inclusive of removal of furniture and furnishing(s) if need be.

N. SCHEDULE

1. Substantial Completion dates for this project are as follows:
- ***a. New School Substantial Completion – 05/27/2022***
- ***b. Phase 2 Site Substantial Completion – 08/09/2022***
- ***c. Phase 3 Site/Project Substantial Completion – 12/05/2022[3]***

2. Liquidated damages in the amounts as stated in the contract documents will be assessed in the event a Contractor fails to achieve or contributes to the cause of the failure to not reach any or all Substantial Completion(s) as stipulated.[3]

3. The Anticipated Notice to Proceed provided in the Preliminary Schedule is exactly that. Should NTP not be provided on the date provided in the Preliminary Schedule, the Contractor shall still be responsible for achieving substantial completion dates as stipulated. [3]

4. The Construction Manager has issued with the bid a "Preliminary Schedule" to assist Contractors in evaluating when they can be expected to be onsite and the associated duration to complete their work. After award, the Construction Manager will solicit major trades' input on the schedule in regards to sequencing and durations. In the event a Contractor wishes for more time, they will be given an opportunity to submit a request on a first come first serve basis, and if the overall schedule allows, duration changes may be accommodated. Despite any reference to the contrary, the Construction Manager is the sole and final judge of durations necessary to complete the work. The Construction Manager will publish a Construction Schedule with input from the Contractors after the bid. The Construction Manager's schedule is the baseline to measure acceptable progress. The Construction Manager will make updates to the schedule as necessary with input from the Contractors. If a Contractor fails to maintain scheduled progress, the Construction Manager will issue a notice to cure. In the event the Contractor fails to get back on schedule within three (3) days, the Construction Manager and or Owner reserves the right to supplement the Contractor's forces with others and deduct all costs from the Contractor's contract balance. Only one (1) notice is required to be issued. The Preliminary Schedule is not the Construction Schedule and is subject to revisions at the sole discretion of the Construction Manager.

5. This work shall be performed in accordance with the schedule as updated irrespective of the amount of overtime or level of manpower, equipment, and supervision required. The Contractor shall not be entitled to any damages, time extensions or other compensation from the Owner or Construction Manager by reason of delay or interruption of its work caused by other Contractors working on the project, weather impact, plan approval and/or permit issuance, or Owner related delays. Incorporated into the project schedule are days for inclement weather. Neither the Owner nor Construction Manager will be charged for any incidental stand-by-time by the Contractor, or any of its agents, sub-subcontractors, suppliers, vendors, or deliveries.

6. Contractor shall maintain at all times sufficient manpower levels to meet scheduling requirements and avoid delay to other phases and or trades work. The Construction Manager shall determine whether the Contractor's manpower level is sufficient to diligently execute the work. ***This includes but is not limited to overtime, second shifts, multiple work crews, etc. as required. Contractors shall pay special attention to the Summer 2022 phase as this work in particular may require these additional requirements. Contractors shall complete this work by the substantial completion date as outlined in the preliminary schedule by any means necessary as part of the base bid and no additional compensation will be made to the Contractor.*** [3]

7. Contractor shall be responsible for coordinating his work with the other trades so that conflicts are avoided and that the expeditious progress of the project is not hampered. Any Contractor who believes that a potential conflict may exist shall notify the Construction Manager immediately and follow-up in writing within three (3) days.

8. The Contractor agrees that if in the good faith judgment of the Construction Manager, the Contract completion date will not be met, the Contractor shall immediately, without any further direction, take any and / or all of the following actions and any other additional actions as otherwise directed by the Construction Manager, necessary to insure timely completion, at no additional cost to the Construction Manager and / or Owner:
    - Increase the Contractor's resources, equipment and manpower in such quantities and crafts that will ensure, in the good faith judgment of the Construction Manager, timely completion of the Contract completion dates.
    - Increase the number of working hours per shift, shifts working per day, working days per week, the amount of construction equipment, and/or any combination thereof, that will insure, in the good faith judgment of the Construction Manager, timely completion of the Contract completion dates

- Reschedule activities to achieve maximum practical concurrency of accomplishment of activities that will insure, in the good faith judgment of the Construction Manager, timely completion of the Contract completion dates

9. Jobsite hours are as follows:

   Monday – Thursday – 6:30am to 4pm
   Friday- 6:30am – 3:30pm
   Saturday – 6:30am – 3:30pm (As required, coordinated no later than Tuesday prior)
   Sunday – As required, coordinated no later than Wednesday prior

   In the event a trade such as a mason wants to work over the weekend, regardless of losing or not losing hours during the work week, the MEP trades should adjust manpower accordingly during the week to avoid unneeded overtime. This overtime will not be paid by Owner or Construction Manager.

   In addition, if any hours for any trade is lost during the typical Monday through Friday work week due to weather, Saturday(s) will be the mandatory makeup day(s) until lost weather hours during the week are made whole. Lost weather is viewed on a per project basis, not a per week or month basis.

10. Contractor is aware of and will comply with all required noise ordinances and levels as prescribed by any and all Authorities Having Jurisdiction (AHJs), including but not limited to Howard County, and the State of Maryland.

    Decibel (db) levels are measured at the project's property line. In the event a fine is issued for failure to comply, the offending contractor, as determined by Construction Manager, will be backcharged same amount. Contractors which will knowingly exceed these decibel levels must apply for a temporary exemption with the appropriate AHJ.

11. Multiple mobilizations may be required and are included within this Contractor's work.

12. This contractor understands that other contractors may be on site during the work of this contract. Contractor agrees to make every effort to cooperate and coordinate the schedule of the work with that of the other Contractors as to not delay the project. Contractor shall coordinate on a daily basis with other Contractors and Construction Manager to avoid conflicts in installation. Correction or re-installation of work due to lack of coordination will be done at no cost to the Owner or Construction Manager.

13. Notwithstanding any other provision of the Contract Documents, Contractor agrees that in no event shall it make a claim or other demand for compensation for any delay, disruption or hindrance to the prosecution of the Work, unless Contractor is subjected to a complete and full work stoppage resulting in a continuous delay, disruption or hindrance in the prosecution of critical path Work of five (5) days or longer due to causes beyond its fault or control, in whole or in part.

O. PAY APPLICATIONS

1. The Contractor shall provide a Schedule of Values with a detailed breakdown per building area within 30 days of award. General conditions shall include cost of bond(s), MBE, Punchlist, General cleanup, and contract closeout cost stipulations only. All mobilization, material, equipment and installation costs shall be included in each line item.

2. The Owner and Construction Manager shall have the right to access and audit the Contractor's project records and documents as necessary to verify that Contractor has complied with all the terms and conditions of the contract. In the event of a claim by the contractor against the Owner, the Owner and Construction Manager shall have the right to access and audit all of the Contractor's records, books, estimates, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the claim. All change order cost paid to the Contractor on a cost reimbursable basis shall be subject to audit by the Owner and

Construction Manager. Audit of change orders cost may require access to the supporting documentation of the lump sum contract. The Owner shall also have the right to audit all the related records of subcontractors who are paid on a cost reimbursable basis. Contractor shall include a clause to this effect in its contract with subcontractors.
Contractor and subcontractors shall preserve all project documents for a period of three (3) years after final acceptance of the project by the Owner.

3. Notwithstanding anything to the contrary elsewhere in the contract documents, the Owner will pay the Contractor cost only (no markup) for materials stored onsite or at an approved offsite location. The Contractor shall provide manufacturer/supplier invoices to validate amounts requested. Stored materials must be onsite or at the approved offsite location at the time the Contractors draft requisition is submitted to the Construction Manager. In addition to supplier invoice(s), bill of sale and insurance certificates must be attached to the draft requisition. Approval of stored materials are also subject to inspection at offsite facility by Owner and/or Construction Manager. Contractor includes all costs related to travel expenses in the event the Owner and/or Construction Manager wish to verify stored materials offsite. Failure to comply with any or all of these requirements will result in the billing of stored materials being rejected.

4. Pay applications are due as follows:
    - No later than the 20th of each month, projecting to the end of the month, Contractor to submit draft application to Construction Manager via pdf/email.
    - No later than the 25th of each month, the Owner, Architect and Construction Manager to review and make comments on draft applications, and return comments via pdf/email back to the Contractor for revision
    - No later than the 28th of each month, Contractor to submit final pdf for confirmation by Construction Manager, at which time Construction Manager will advise final hard copy to be sent to main
    - No later than the 30th of each month, Contractor to mail final hard copy to Construction Manager's main office for processing and subsequent payment

P. POTENTIAL CHANGE ORDERS

1. Contractor shall submit within 30 days after receipt of Contract, built–up wage rates for each type of employee which will be used by the prime on all costs proposals for the remainder of the job (yearly increases due to salary increases, union agreements, etc. are allowable with adequate documentation) to the CM for approval. The contractor must certify that the built-up wage rates are correct and auditable as submitted. This rate shall be the total sum of the employee's Base Rate + Fringe Benefits + Payroll Taxes + Insurance (break down by Workman's Comp & Liability, each shown as % of base rate). In no event will the built up wage rate be allowed to exceed the current RS MEANS wage rate. If the CM and contractor cannot agree on built-up wage rates, the Owner and or Construction Manager shall have the right to immediately audit the contractor's employee wage and time records.

2. Contractor is responsible for the review of the complete Contract Documents for their scope of work and coordination with contiguous work. All drawings and specifications must be read in conjunction with each other. Contractor recognizes that the plans and specifications are not necessarily complete, refined or detailed for construction of the Project. Trade Contractor represents it is experienced in the construction of similar projects and realizes that refinement, detailing and final completion of design will occur at no cost increase unless there is a major change in scope issued by the Owner, Architect, or Construction Manager.

3. Unless noted otherwise in the trade specific scope of work, no escalation will be entertained. All material, labor and equipment escalation costs are inclusive with the Trade Contract and therefore, have been fully priced according to the baseline completion dates.

4. All costs for proposed changes in work must be submitted within ten (10) calendar days from the date of written request (letter, meeting minutes, fax, email, etc). In the event the Contractor fails to submit a complete itemized proposal within the timeframe Contractor will be contractually bound to accept the

following:

I. **Additions -** Contractor shall proceed at no cost change or time extension and will perform the work at once or when required in order to avoid any impact to the Project's schedule as directed by the Construction Manager.

II. **Credits -** The Construction Manager will estimate the cost of the credit and the Contractor will be bound to accept a deduct change order for the amount as estimated by the Construction Manager

III. **T&M** - In the event the Contractor is directed to proceed with extra work on a time and material (T&M) basis, Costs for this work must be submitted as an itemized proposal within ten (10) calendar days from the date the work was actually performed and verified. Any T&M tickets not signed by the Construction Manager or Owner on the date(s) the work was performed will be rejected and any payment denied.

a. A complete itemized proposal includes but is not limited to:
b. A copy of the document which initiated the change
c. Change request format sheets as found in the specifications or as provided by the Construction Manager
d. Contractor's itemized breakdown take off
e. Subcontractor's itemized breakdown take off (as necessary)
f. Rental ticket invoices, material invoices, vendor invoices
g. Any other backup as requested by the Construction Manager or Owner.

Q. MISCELLANEOUS SCOPE

1. CM's field office facilities, telephones and facsimiles are not for Contractor use.

2. CM will provide dumpsters for trades use except for the ***02A³,*** 02C and 07A Contractors. These Contractors shall provide their own dumpsters.

3. Smoking, Vaping and use of tobacco products onsite or within the building shall not be permitted. Smoking/Vaping areas shall be located no closer than 20 ft. from the property line. Compliance shall be in accordance with LEED and the Drug Free School Zone Policy.

4. Contractor agrees to bind every Sub-Contractor and Vendor by the terms of the Contract Documents and this Agreement; however, it shall not be construed as creating any contractual relations between any of the Sub-Contractors or Vendors and the Construction Manager or Owner.

5. Contractor shall be required to store material in an area designated and agreed upon by the Construction Manager's Superintendent. Contractor acknowledges specified laydown, staging, etc. areas may have to be adjusted/relocated during the course of construction, Contractor agrees to be in compliance at no additional cost to Construction Manager or the Owner

6. The Contractor will provide full-time, onsite, competent, English speaking supervision and adequate facilities in order to coordinate and supervise the work. The onsite representative is to be authorized to make decisions on the contractor's behalf. The onsite supervisor is not to be utilized to operate equipment. This supervisor is to be a full-time employee of the Contractor. Utilization of a subcontractor or lower tiered subcontractor as the Contractor's representative will not be tolerated. Contractor will be backcharged $250/day for each day there is lack of competent, English speaking, Contractor full time employed supervision.

7. The Contractor shall attend weekly Foreman's Meetings as scheduled by the Construction Manager. The Meeting Agenda shall include general site issues and detailed discussion of work to be performed for the following two (2) weeks. Failure to attend foreman's meeting will result in a $250 backcharge for each unattended meeting starting 2 weeks prior to mobilization through punchlist completion.

8. The Contractor's assigned Project Manager shall attend a Project Manager's Meeting, initially every six to eight weeks, as the job progresses, they will be monthly. Agenda to include status of submittals, RFI's, change requests by Owner or Design Team, procurement issues, manpower, inspections, testing, closeout documents, etc. Failure to attend a scheduled Project Manager's Meeting will result in a $250 backcharge for each unattended meeting starting 2 weeks prior to mobilization through punchlist completion. This is for Project Manager's, not superintendents, foreman, lead foreman etc.

9. The Contractor's assigned Project Manager and onsite supervisor must have the physical capabilities to exit their vehicles and walk the jobsite on a day to day basis. No special accommodations will be made by the Construction Manager.

10. Contractor will provide field reports for its own forces and all of its Subcontractors' to the Construction Manager's field Superintendent on a daily basis. These reports must include at a minimum, manpower (detailed by classification of workers), activities performed (detailed by Area of the building or site), and equipment utilized. This is considered a prerequisite for release of payments to the contractor.

11. The Contractor is advised that surrounding facilities will remain operational throughout the entire duration of the contract. The Contractor shall conduct his operations in such manner to avoid any disruption to the surrounding facilities.

12. Contractor shall recover and verify existing benchmarks and provide all layout and survey work required for work installed under their respective Contract Packages.

13. Contractor shall perform its own survey of existing conditions and notify the Construction Manager of any discrepancy prior to the start of the Contractor's work. Start of work shall constitute this Contractor's acceptance of the existing conditions.

14. Contractor is responsible for providing a complete and operational scope of work in accordance with the Contract Documents and all state, county, and local authority having jurisdiction over the work.

15. Contractor has a full understanding and knowledge of contract documents and takes full responsibility for their implementation and coordination.

16. Contractor is responsible for dewatering any and all excavations created by this Contractor caused by any means including rain water, run-off from perimeter properties, underground water, leeching water, underground streams, and the like. Contractor is responsible for cleaning of substrate which Contractor's work is to be applied to, i.e. cleaning of footings in order to start masonry.

17. If there are Owner, Construction Manager, or other trade furnished items that are to be installed by the Contractor, the Contractor must provide a minimum of forty-five (45) day written notice to the Construction Manager prior to the installation date of each item. The Contractor shall be liable for costs associated with delay should this Contractor fail to meet this requirement. This Contractor shall schedule, receive, inspect, inventory, store, rig, and install all items furnished by others that are to be installed by this Contractor. Contractor is responsible at the time of delivery for the verification of these items for correctness, and shall report any discrepancies in writing to the Construction Manager within forty-eight (48) hours. If discrepancies are not reported within that time frame, the Contactor shall be responsible for those items in its charge.

18. Contractor shall schedule all material and equipment deliveries through the Construction Manager. Contractor shall phase, sequence, deliver, and store its materials and equipment in a manner which provides

full and continual access for all trades. Contractor to coordinate night work as required keeping continual access to the site with the Construction Manager.

19. Contractor shall be responsible for the site / building in its charge. It shall protect adjacent and its own work and materials from soiling or damage.

20. Contractor is responsible for contacting and coordinating with Miss Utility and or a private utility locating company for locating and marking existing utilities if required to perform this work

21. Contractor to submit a truck route plan within 30 days of notice of award. Strict adherence to approved plan will be enforced. Complaints by the neighborhood will not be tolerated, contractor will be held accountable via backcharge of $250 per complaint.

22. It is recommended Contractor submit a 3rd party detailed preconstruction survey of access, roadways, sidewalks, existing facility, etc. prior to mobilization (in the form of video, photos, etc.). In the event it is determined access points and roadways to the site are damaged and must be replaced, all contractors will share in the cost as determined by the Construction Manager if a 3rd party preconstruction survey cannot prove otherwise.

23. Contractor includes any and all temporary utilities, i.e. water and power, to perform its work as permanent utilities may not be available for use. Construction Manager will provide temporary toilets for Contractors use.

24. On-site construction-use power will not be available prior to the structure topping out. After this point the power to be provided will be 208/120V. Any power requirements beyond what is specifically listed in the 16A Contractor's scope will be the Contractor's to provide and coordinate.

25. Contractor shall coordinate with all other trades regarding built-in and embedded items required by the Contract Documents

26. Contractor shall furnish and install covering and protection for all equipment provided or installed by this Contractor.

27. Contractor shall provide for all its material deliveries, hoist equipment with operators, hot / cold weather protection (including tenting, heaters, and enclosures), scaffolding, and related items needed for work to proceed expeditiously, and without interruption.

28. Contractor shall include material and labor cost increases for the duration of the project. Unless specifically noted otherwise in contractor's specific scope of work, no escalation will be entertained. All material, labor and equipment escalation costs are inclusive with the Trade Contract and therefore have been fully priced according to the baseline completion dates.

29. Contractors are reminded that the project site is a school first and a construction site second. Contractors shall not disrupt instruction and learning at any time. All deliveries must be scheduled through the Construction Manager 48 hours prior to delivery. No deliveries arrival or dismissal, No interactions with staff, students or the public.

30. Every effort has been made by the Construction Manager to correctly make all numerical references. In the event a Specific Scope item incorrectly numerically references another Specific Scope item within own package and or other trade package, and or Specification Section, Contractor includes intent of Specific Scope item as if numerical reference was correct.

31. Contractor includes all provisions and labor necessary to construct all mockups listed throughout the construction documents and specifications.

32. Contractor is advised that work that doesn't disrupt the school operations may be able to start prior to the NTP date, such as surveying, layout, Miss Utility markings etc.

33. There is no Contractor parking on site.

R. TEMPORARY FACILITIES

1. The following specific temporary facilities will be provided for the use of all project stakeholders. All temporary facilities will be installed to be complete including all necessary access and egress, inspections, perimeter and stair railings, etc.

Description	Install, Green Tag & Remove Responsibility	Rental Cost & Maintenance Responsibility	Cost of Consumables, Fuel, Maintenance, Etc.	Duration of Installation	Proposed Install Location
Work Platform Top Stair A	01A	01A	01A	3 MO	Stair A
Work Platform Top Stair B	01A	01A	01A	3 MO	Stair B
Work Platform Top Stair C	01A	01A	01A	3 MO	Stair C
Work Platform Top Stair D	01A	01A	01A	3 MO	Stair D
Temporary Stair to Roof (1)	01A	01A	01A	6 MO	Per CM Direction
600A Temp Building Electrical Service	16A	16A	16A	12 MO	Per Scope
200A Temp Field Office Electric Service	16A	16A	16A	15 MO	Per Scope
Temporary Lighting	16A	16A	16A	AS NEEDED	Per Scope
Temporary Heat	15A	15A	15A	AS NEEDED	Per Scope
1" Temporary Water (Building Only)	02A	02A	02A	12 MO	Per Scope
¾" Temporary Water (Site Only)	02A	02A	02A	18 MO	Per Scope
¾" Temp Water & Sanitary (CM Field Office)	02A	02A	02A	18 MO	Per Scope
Temp Storm Lines	02A	02A	02A	AS NEEDED	Per Scope & logistics
Temporary Close-In of all Window Openings	01A	01A	01A	AS NEEDED	All Window Openings
Temporary Exterior Doors	01A	01A	01A	AS NEEDED	15 Location TBD
Cattle Gates, Guards, Tie-Off & Doors at L2	01A	01A	01A	12 MO	Per Scope
Temporary Access Roads & Parking Areas	02A	02A	02A	Per Logistics Plan	Per Logistics Plan
Manned Tire Wash Rack(s)	02A	02A	02A	15 MO	Per Logistics Plan

S. TRADE RESPONSIBILITY DETAILS

1. For convenience, typical wall sections/details with trade responsibilities have been provided at the end of this section. These are meant to be used in conjunction with the written scopes and are for information only. If there are any discrepancies, the written scope shall take precedence.

T. SPECIAL CONSIDERATIONS

1. Strict adherence to all Noise Ordinances. Trucks will not be able to stage prior to normal working hours in accordance with the Ordinance. Backup alarms and idling diesel engine's exceed noise ordinance limitations prior to 7am.

2. Excavation and/or drilling work under this contract is unclassified to design sub-grade, and includes but not limited to, excavation and removal of soil, shale, rock, fill, abandoned utilities, abandoned tanks, abandoned wells, abandoned structures, and any and all other subsurface conditions encountered in the contract area to each respective trades lowest design elevation in same area. The Contractor shall make his own soil and subsurface investigations, examination, tests, and exploratory borings of existing subsurface conditions to

determine the nature of the soil conditions underlying the project site and thereby assuming all responsibility in excavating for this project without recourse to subsurface information obtained from the engineer, or indirectly from the Owner. The risk of unanticipated soil conditions from current elevations to this trade lowest design elevation in same area is solely the Contractor's. No extra or additional compensation for excavation or claims otherwise will be made or paid under this contract until added excavations below this trade lowest design elevation in same area is required. Contractor is responsible for furnishing and placing any import fill material that may be required to complete the work.

3. Specific scopes of work apply to the main building scope as well as any indicated outbuildings located within the sites limit of disturbance and requiring similar work being performed under this contract.

4. No parking will be allowed onsite due to space restrictions. It is strongly recommended contractor's forces try to car pool as much as possible. Workers personal vehicles will not be permitted to park onsite or adjacent to the building pad. Foreman or Superintendent parking will be restricted to a small designated parking area which is on a first come, first serve basis.

5. Contractors shall ensure a 15' clear perimeter at all times around new school facility as well as the old school facility.

6. Daily food trucks will not be permitted on site. Eating within the building footprint will not be tolerated at any time during construction. Contractors are to consume food either off site or within personal vehicles. All trades are to properly dispose of food trash either offsite or to Construction Manager provided dumpster(s). In the event food trash needs to be collected from the grounds of the site, there will be zero warning to trades and all trades onsite will be backcharged cost plus 15% equally, despite respective quantity of workers onsite for the first offense. Second offense will be cost plus 20%. Third offense will be cost plus 25%, and so on.

7. Contractor acknowledges that the existing school will need to be accessed through the main entrance and the existing bus loop and service road throughout construction. Contractor includes any and all means and methods to allow for this.

U. MODIFICATIONS TO SPECIFICATION SECTION 00 0700 – AIA DOCUMENT A232-2009, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

1. Notwithstanding anything contrary, elsewhere in the Contract Documents, the following revisions apply to the AIA
    a. 1.1.2. The Contract - Delete the last sentence.
    b. 2.4 Owner's Right to Carry Out the Work - Replace "seven-day" with "48-hourperiod".
    c. 4.2.22 Workmanship – Delete "Expeditiously corrected t" replace with "within 48 hours of written notification".
    d. 5.1.2 – Add "The period covered by each application for payment shall be one calendar month ending on the 25th day of each month".
    e. 9.3.1 – Delete "At least fifteen days before the date established for each progress payment and replace with "On the 25th day of each month".
    f. 9.8.4 - Add "Commencement of Mechanical, Electrical, and Plumbing warranties shall be contingent upon Commissioning Authorities written approval and certification of commissioning requirements" following the last sentence.
    g. 9.8.5 – Delete 2nd sentence and Replace with "Upon such acceptance and consent of surety, if any, the Owner, at the Owner's sole discretion, may make payment of all or a percentage portion of retainage applying to such Work or designated portion thereof".

h. 10.3.2 – Delete last sentence and Replace with "By Change Order, The Contract Time may, at the sole discretion of the Owner and Construction Manager, be extended appropriately and the Contract Sum may be increased in the amount of the Owner's reasonable additional costs of shut-down-delay and start-up".

i. 11.3.1.3 – Delete "Owner" and replace with "Contractor".

j. 11.3.1.3 – Add – The cost of the property insurance deductible shall be$10,000.00.

k. 13.5.1 – In the 3rd sentence delete "timely notice" and replace with "72-hour notice".

l. 13.5.2 – In the 1st sentence delete "timely notice" and replace with "72-hournotice".

2. Notwithstanding anything contrary, elsewhere in the Contract Documents, the following revisions apply to the AIA Document A-132 Standard Form of Agreement Between Owner and Contractor

a. 3.1 – Delete 1st sentence of the 2nd paragraph and Replace with "The Contractor shall complete the various portions of the work in accordance with the construction schedule issued by the Construction Manager after Award of Contract.

b. 5.2.1 – Add "The period covered by each application shall be one calendar month ending on the 25th day of each month" to the end of the last sentence.

END OF GENERAL SCOPE OF WORK SECTION

PART 2 – SPECIFIC SCOPE OF WORK

1. Contractor has reviewed and understands the Contract Package / Specification Cross Reference listed under Section 011112.

2. Contractor includes General Scope of Work listed under Part 1 of Section 011113.

3. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to the completion of the General Trades work in accordance with the complete set of Contract Documents.

General Carpentry, Rough Carpentry Scope:

1. Contractor shall furnish and install all rough carpentry work as required by the Contract Documents, including but not limited to concealed or temporary wood work, blocking, in-wall blocking, roof blocking, wood furring, grounds, bucks, wood plates, plywood, plywood sheathing, plywood wainscoting, trimming and working of wood or wood fibered materials, nailers, compressible fillers, isolation pads, and all other rough carpentry and accessories including but not limited to anchor bolts, fasteners of any type, glue, adhesive, etc. Contractor shall furnish and install all other general carpentry work and wood blocking required by job conditions.

2. Contractor shall furnish and install all wall concealed and exposed wood blocking for all items furnished by this and other Contract Packages, (Fire Treated (FRT)), as required. Contractor is not responsible for metal strapping in metal stud walls or for any 01A work. 01A Contractor to provide continuous 20-gauge metal strapping (two (2) rows per elevation) at all metal stud walls for cabinets, visual display boards, (i.e., chalk, tack, marker), lockers, handrails, etc. for any item which is surface-mounted.

3. Contractor shall furnish and install solid wood blocking behind all wall hung cabinets, display boards, televisions, etc. even if these items are designated "NIC" or, "future", or "by others". This blocking is not required behind base cabinets unless specifically required or shown. This is in addition to any strapping requirements.

4. Contractor shall furnish and install all plywood backing and backboards required for Mechanical, Electrical, Telephone and Data installations, Contractor to assume all walls of each room unless specifically detailed otherwise, 8'-0" high, starting 8" AFF. Contractor to mask off FRT label prior to painting of plywood by painter.

5. Contractor shall infill/cover, maintain, and remove as necessary all stair treads (concrete, steel, or any other material) with wood. Construction Manager will advise when protection may be removed. Any patching required as a result of installation or removal of this protection is the responsibility of 01A Contractor.

6. Contractor shall furnish, install, maintain, and remove all wood safety rails and toe boards at all floors, roof, expansion joints, stairs, slab penetrations, pits, deck edges and openings. Any patching if required to structure due to installation is by 01A. Rails must be wood and in compliance with all MOSH/OSHA standards. Steel safety cables are by 05A.

7. Contractor includes horizontal wood handrail at all openings with sills less than 42" in height which could be a fall hazard per MOSH/OSHA standards. Wood rail to be installed per all MOSH/OSHA standards. Contractor includes removal immediately before opening is filled in with final material such as louver, window, etc.

8. In the event of pending weather, the 01A Contractor is to protect exterior blocking as practical from exposure to weather. 01A Contractor shall be responsible for replacing material if it is deemed unacceptable due to exposure to the elements.

9. 01A is to furnish and install temporary doors at all electric, telephone, data and machine rooms. 01A to include hinges, hasps, and temporary closer as necessary. Construction Manager to provide lock.

Expansion Joint Cover Assemblies Scope:

1. 01A Contractor shall furnish and install all floor and wall expansion joint cover assemblies complete as required by the Contract Documents. Expansion joint cover assemblies at drywall or acoustical ceiling locations to be furnished and installed by the 01A package. If caulking is required at 01A assembly in 01A work, 01A is to provide caulk as well. In the event control or expansion joints are not shown but are required to control cracking/expansion per manufacturer's recommended installation procedure or if specified in Division 9, 01A is to furnish and install these assemblies complete.

2. Contractor includes all coordination with Concrete, Masonry and Steel Contractors for required blockouts. Contractor includes all incidentals with installation inclusive of grout, flash patching, minor chipping and prep work for a complete installation.

Frames, Doors, and Hardware Scope:

1. Contractor to furnish and install all hollow metal doors and frames, borrowed lite frames, special function doors, ***sound control door assemblies[3]***, and hardware complete per the Contract Documents.

2. Contractor includes storage at offsite location of all doors and hardware as space is extremely limited. Contractor to coordinate with construction manager and other trades for shipment of hollow metal frames. Contractor can assume no less than 3 shipments. No wood doors will be allowed onsite until conditioned air is available and without written approval of construction manager.

3. Contractor to provide (1) 3' x 7' hollow metal frame for installation within masonry mockup panel.

4. With the exception of Automatic Door Operators at Aluminum entrances, which are furnished and installed by 08A, all other electrified hardware is furnished and install by 01A. For further clarity, 01A is to furnish and install automatic door operators per the contract documents at hollow metal frames. 01A is to furnish and install magnetic hold opens as indicated with 16A making connection to the fire alarm system. 01A is to furnish and install magnetic locks, with assistance from 16A for required conduit rough-in. The 01A Contractor shall provide controls, power wiring, junction boxes, rectifiers, and transformers and connection with electrified hardwired being provided in their package. The 01A, 08A and 16A Contractor shall coordinate required conduit or pathways being furnished by 16A for 01A or 08A use. The 01A, 08A and 16A contractor to ensure proper power requirements are brought to each location as well as required interaction with security and fire alarm system. With respect to any electrified hardware, it is the 16A contractor's responsibility to bring power to each door location, and install required power pack (furnished by others) at each door location (central locations will not be utilized due to length of run limitations on provided low voltage wiring); actual electrified door hardware is installed by 01A (or 08A at aluminum entrances) then 16A has power wiring and verification of wiring and final connections. 01A and 08A would then have associated respective adjustments. Security card readers are 16A to furnish and install with coordination from both 01A and 08A depending on location.

5. Contractor to include final keying of all cylinders furnished under this scope as well as storefront and overhead doors scope per Owner/CM direction. All hardware is to be shipped with "construction cores", keyed identically for ease of construction and installation as well as controlled access of other trades by Construction Manager. After final cleaning is performed, all construction cores are to be replaced with final keyed cores. Contractor to provide to Construction Manager six (6) complete sets of construction use keys for CM use and distribution as necessary to other trades.

6. 08A Contractor shall furnish and install all door hardware for all aluminum doors.

7. Contractor shall include all costs to deliver hollow-metal frames in sufficient time to avoid delay to masonry construction. In the event delivery dates are not met, this contractor will be responsible for any and all costs, as well as repair of frames that have to be installed in "toothed" openings if damaged or moved during installation.

8. Contractor shall coordinate with Masonry and Drywall Contractors to ensure timely installation of hollow metal work. 01A Contractor shall install all hollow metal work plumb, level, square, and true to line and shall be responsible for properly bracing, maintaining and repairing the work until the Masonry Contractor's acceptance. The 01A Contractors drywall subcontractor is to set hollow metal frames in metal stud partitions. Frames are furnished

by 01A.

9. Contractor shall review all door and hardware schedules for correctness and compatibility.

10. Contractor to protect wood and fiberglass doors from damage. This, at a minimum, will be ¼" cardboard on both sides of door from floor to 6' above floor and maintained as necessary until substantial completion. This is to be part of base bid cost.

11. 01A Contractor includes infill of all hollow metal window, side light, borrowed light, etc. openings with plywood supported at 2'-0" OC as necessary as masonry progresses and frames are blocked in on lower floor(s) This is for security as well as weather protection. Removal of this material is by 01A to allow for painting of frames by 01A prior to installation of permanent glass by 08A. If 08A Contractor installs glass prior to painting of frame, it will be the 08A contractor's responsibility to remove and reinstall after paint at no charge.

12. Contractor shall allow for a minimum of two coordination meetings with the Owner to determine how the final keying of the building will be performed.

13. Contractor includes final key cabinet furnish and installation, location to be determined by Owner. This is to include complete full setup of key cabinet inclusive of all necessary tagging inside cabinet and stamped on each key provided.

14. Immediately prior to substantial completion, the 01A Contractor to verify installation of all hardware provided and installed under this scope of work, as well as verification of proper installation at all aluminum doorways installed by the 08A Contractor to ensure proper installation and function of all hardware. 01A Contractor is responsible for repairs/corrections to hardware installed by 01A Contractor. 08A Contractor is responsible for repairs/corrections to hardware installed by 08A Contractor.

15. Manufacturer's Representative to review installation of all hardware provided under this package. Each Manufacturer Representative is to make final adjustment on all door hardware, inclusive of all hardware supplied to other Contractors for installation, two weeks prior to substantial completion, at six months later after substantial completion, and at the end of the installation warranty period if need be.

16. Provide 20 additional cylinders and cores keyed to building master key system for gym equipment, overhead doors, and all key switches.

17. As required, at wood, metal and/or fiberglass (FRP) doors, 01A shall furnish doors with metal frame vision kits. 08A Contractor will set glazing and secure glazing in position after painting.

Fire Resistive Material Scope of Work:

1. Contractor to furnish and install all joint firestopping systems per the Contract Documents. This work includes floor-to-floor joints, floor to wall joints, head of wall joints, and wall-to-wall joints for all GWB partitions. In addition, all beam or joist penetrations perpendicular to walls (i.e., bottoms and sides of joist or beams, voids between walls and joist, beam and deck shall comply with contract documents). Joint system as it interacts with aluminum storefront/curtainwall/windows and glass or hollow metal frame and glass, is by 08A.

2. 01A Contractor shall furnish and install all continuous fire barrier material at face of exterior sheathing as identified on the Contract Documents.

3. 01A Contractor shall furnish and install all spray applied fireproofing and intumescent fire protection as required per plans and specifications.

4. Contractor includes protection of other trades materials during installation of this scope of work.

5. Contractor includes protection of own work while performing this scope of work.

6. As spray fireproofing is required on the project, every effort will be made to have all structural steel in areas complete prior to installation of spray resistive materials, but some items such as deck opening angles, wall clips, etc. cannot be installed until after walls have been topped out. Trade Contractor includes respray of areas as necessary to complete this scope of work.

Metal Stud Framing, Drywall and Ceilings Specific Scope of Work:

1. Contractor shall furnish and install all gypsum shaft wall assemblies, drywall and acoustical work as required by the Contract Documents, including but not limited to, cold formed metal framing, insulation, drywall and acoustical assemblies, ceiling tiles, wall panels, and the like work required by the Contract Documents. Furnish and install all gypsum board, suspended acoustical ceilings, suspension systems, acoustical treatment, acoustical panels, "Clouds", cold formed metal framing, non-strucutral metal framing, C-shaped loading bearing metal framing, metal stud kickers, hat channel, z channel, z-clips, metal furring, metal blocking, metal straps, interior and exterior gypsum sheathing and accessories, acoustical joint sealers, drywall accessories, firestopping/firesafing (as it relates to this Contractor's work), fire caulking (as it relates to this Contractor's work), acoustical and non-acoustical joint sealants (as it relates to this Contractor's work), framing components for suspended / furred ceilings, corner bead, edge trim, control joints, building insulation, and all related work.

2. Contractor includes furnish and installation of, perimeter extruded aluminum trim, acoustical treatment, sound absorption/diffusive wall panels, impact resistant wall protection, tectum wall panels, light gage metal framing, soffit framing, soffit vents, soffit screens, acoustical, thermal and firesafing insulation, , drywall accessories, reglets, drywall ceilings, bulkheads and all related work.

3. 01A Contractor shall install all access panels, provided by others, in drywall & masonry construction in accordance with the Contract Documents, or as necessary for 01A, 11A, 15A, and 16A Contractors. All other access panels which are specifically referenced shall be furnished and installed by 01A, regardless of wall type in which they are installed.

4. 01A Contractor shall furnish and install all acoustical treatments per Contract Documents complete, including all support/blocking as necessary. This includes all suspended acoustical ceiling panels, FRP ceiling panels, acoustical wall panels, reflective and low frequency ceiling panels and the like per the Contract Documents. Contractor includes all necessary hat channels, "Z" Channels, suspension systems and attachment devices as necessary for a complete system.

5. 01A Contractor shall furnish and install a complete fire rated ceiling assembly in accordance with the Contract Documents.

6. 01A Contractor shall be responsible for the repair and touch-up of minor scrapes, gouges, etc., caused by the installation of adjacent work.

7. 01A Contractor to caulk all areas where drywall meets a dissimilar surface.

8. The 01A Contractor shall furnish and install any insulation as shown or described unless specifically assigned to another package. 04A Contractor to furnish and install rigid and spray foam insulation as detailed, including but not limited to behind brick, precast, cast stone, finish block, and metal panel areas regardless of backup material. Contractor to coordinate with 01A, 04A, 05A, 07A, 08A, 01A, 15A, and 16A for exterior façade elements prior to start of application.

9. 01A Contractor shall coordinate with other Contractors on location of all work installed in drywall partitions, drywall ceilings, and acoustical ceilings. Contractor shall provide all metal grounds required for all surface mounted items included in the Contract Documents. Contractor shall ensure that all required inspections have been made prior to closing walls and ceilings. Contractor shall call for final close-in inspection of all walls and ceilings.

10. 01A Contractor shall be responsible for the layout of all metal stud work and install hollow metal door and window frames in metal stud walls. Hollow metal frames to be furnished by the 01A Contractor.

11. 01A Contractor shall furnish and install bent plates, angles, straps, steel pipes and plates, clip angles, etc., as required for attaching stud work to the structure.

12. 01A Contractor shall inspect the drywall work with a drop light before and after the prime coat of paint, and perform all necessary point-up. The Architect and Construction Manager will also inspect before and after the prime coat of paint.

13. 01A Contractor shall fill all deck flutes above all drywall construction with fire safing and fire sealant as required. In the event stud framing attaches to the underside of steel, 9A is responsible for insulation, firestopping and caulk between top of steel and deck, if required at these locations.

14. 01A Contractor shall provide **daily cleanup** of all trash and debris generated by the work and place in dumpster furnished by the Construction Manager. Upon completion of each phase of work in any given area, the Trade Contractor shall leave the area in broom clean condition. Should the Trade Contractor's cleanup be unsatisfactory, the Construction Manager shall perform the work at the Trade Contractor's expense.

15. In addition to the requirement of providing daily cleanup of self-generated debris from work and or workers, the 01A, 04A, 01A, 15A, and 16A contractors are to include 1 man per every 15 men contractor has onsite, with a mandatory minimum of one man if contractor has less than 15 men onsite. This requirement will be utilized for contractors to participate in a composite cleanup crew. Composite cleanup days will be every Wednesday from 7am to 2pm. Construction Manager will provide trash carts, dumpsters and sweeping compounds, all other equipment, PPE or otherwise, i.e. brooms, shovels, etc., are to be contractor provided.

16. The 01A Contractor will coordinate all layout work with Owner furnished items

17. The 01A Contractor will carefully examine the mechanical documents. Any shaft utilized for return air that does not indicate a duct riser is to be made air tight by the 01A Contractor. This is a means and methods item, which may include sealing sill and top track plates and fully taping/sealing joints in concealed areas.

18. The 01A Contractor is to furnish, install, and maintain fire extinguishers onsite and in building per MOSH/OSHA requirements for general building protection. All Trades are to provide fire extinguishers, blankets, and any other provisions for burning, welding, soldering, braising, or any hot/fire work performed by the Contractor in performance of their work in any area as specifically necessary.

19. The 01A Contractor to provide continuous 20-gauge metal strapping (two (2) rows per elevation) at all metal stud walls for cabinets, visual display boards, (i.e., chalk, tack, marker), lockers, handrails, etc. for any item which is surface-mounted. If this strapping is insufficient, the Contractor requiring supplemental blocking or strapping must furnish and install these items as part of base bid cost.

20. Contractor will provide 5/8" plywood over 2” thick rigid insulation board as roof protection while working on the roof.

21. Quantity of materials intended to be delivered and stored onsite must be coordinated and approved by the Construction Manager due to site constraints. It is the intent to have materials onsite to keep a steady flow of work but not any more material than can be installed in a two (2) week period of time. Offsite provisions for material storage and all cost are to be included in base bid

22. The 01A Contractor shall install metal deck where deck is supported by metal framing provided under the 01A Contract Package. 05A Contractor will supply all metal decking and deck closure angle as necessary.

23. Whether indicated or not, wherever a metal stud wall sits on metal deck, the 01A Contractor will be required to furnish and install, under the metal stud track, a 16-gauge metal plate spanning three flutes of the metal deck at a minimum.

24. Contractor shall perform all welding required to complete its work at stud work.

25. All drywall work to be a minimum "Level 4" finish if not specified higher otherwise.

26. Contractor shall provide ventilator when installing drywall to reduce dust and humidity.

27. Contractor is responsible for all scaffolding and lifts required to complete its work.

Tiling Specific Scope:

1. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to the completion of the tile work in accordance with the complete set of Contract Documents.

2. Contractor shall furnish and install all Ceramic and Quarry Tile work as required by the Contract Documents, including but not limited to all wall tile & base, grouts, and adhesives including incidentals as required by the Contract Documents.

3. Contractor shall provide all substrate preparation required by the Contract Documents, manufacturer recommendations, and as necessary, to obtain an acceptable installation of the work included in this Contract Package. Substrate preparation includes, but is not limited to, work required to remediate cracks, curling of concrete at expansion and control joints, floor and wall joint preparation, primers, special adhesives, etc.

4. Contractor shall furnish and install all waterproofing and other incidentals as required on walls for work under this package.

5. Contractor shall furnish and install all crack suppression and incidentals as required on walls for work under this package.

6. Contractor shall furnish and install all required patterns, colors, cuts, and shapes as required by the Contract Documents.

7. Contractor will coordinate with expansion or control joints as field installed and submit shop drawings, which note coordination with as built concrete joints.

8. Contractor shall caulk around any penetration and all work as required by the Documents, which is installed under this package.

9. Contractor shall include tile cleaning and sealing.

10. Contractor shall provide daily cleanup of all trash and debris generated by the work and place in dumpster furnished by Construction Manager. Upon completion of each phase of work in any given area, the 01A Contractor shall leave the area in broom clean condition. Should the 01A Contractor's cleanup be unsatisfactory, the Construction Manager shall perform the work at the Contractor's expense.

11. Contractor shall coordinate with the Construction Manager regarding layout of tiling prior to commencement of work.

12. Contractor shall provide all layout and survey work necessary to complete their work as required by the Contract Documents.

Flooring Specific Scope of Work

1. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to the completion of the work in accordance with the complete set of Contract Documents.

2. Contractor shall furnish and install all resilient flooring and accessories as required by the Contract Documents,

including but not limited to all resilient vinyl composition floor tile, slip resistant resilient floor tile, entrance mats and frames, vinyl base, resilient molding accessories, transition strips, reducing strips, flooring accessories, and underlayments.

3. Contractor shall furnish and install all carpeting and accessories as required by the Contract Documents, including, but not limited to all carpet, entrance carpet, reducing strips, adhesives, and underlayments.

4. Contractor shall furnish and install opaque concrete sealer on all exposed concrete floors within the building footprint after final cleaning and immediately before substantial completion. This includes all equipment and housekeeping pads.

5. Contractor to provide floor preparation as necessary to install work under this package.

6. The 03A Contractor is obligated to finish slabs in compliance with the Contract Documents. Contractor to include floor prep and flash patching at all floor drains and cleanout to achieve proper slope for ADA and installation of material, no exclusions, all costs are part of base bid. Grinding of concrete is not part of this package and is to be assumed by the 03A Contractor provided this contractor gives proper notice of unacceptable conditions two weeks prior the start of work.

7. Contractor shall provide all layout and survey work necessary to complete their work as required by the Contract Documents.

8. Contractor shall provide 100% skim coat at all floor areas of Ardex or approved equal product and sand smooth, on any substrate to receive flooring under this contract package. All costs for this skim coat are to be included as part of base bid.

9. Contractor shall coordinate with the Construction Manager regarding layout of flooring prior to commencement of the work.

10. Contractor shall furnish and install base required by the Contract Documents, including base at all casework and locker bases and rooms with exposed or sealed concrete. Floor finish shall be continuous under all casework and furnishings or as directed by Construction Manager.

11. Contractor shall provide temporary protection of finished work in place. At a minimum, Contractor shall protect finished flooring in classrooms with reinforced kraft paper (wall to wall) and at corridors “Anchor 38100 Cover Board, 45 mil”; (wall to wall). All joints are to be fully taped with “blue painter’s tape” by this contractor. Contractor includes maintenance and replacement as necessary.

12. Contractors shall provide daily cleanup of all trash and debris generated by the work and place in dumpster furnished by the Construction Manager. Upon completion of each phase of work in any given area, the Contractor shall leave the area in broom clean condition. Should the Contractor's cleanup be unsatisfactory, the Construction Manager shall perform the work at the Contractor's expense.

13. Contractor shall provide all final stripping, cleaning, sealing, and waxing as required by the Contract Documents and as recommended by the manufacturer.

14. In any area where 01A material abuts 01A and 01A floor finish, the 01A Contractor shall flash patch a transition a minimum of 10' from interface with adjacent trade to provide a flat transition between materials. This is part of base bid cost.

15. Contractor to provide transition or termination strips, whichever is suitable, at all dissimilar floor joints/transitions unless a stone threshold is specifically referenced in the location.

16. Contractor to caulk or provide trim as necessary where flooring meets other material (i.e., floor drains, equipment pads, boxes, walls).

17. Contractor to furnish and install all striping, patterns, logos, or other markings on the floor as indicated on the Contract Documents.

18. Contractor to coordinate slab depressions if required with the 03A Concrete Contractor prior to pouring of any slab.

Wood Flooring Specific Scope of Work

19. 01A Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to the completion of the Wood Flooring work in accordance with the complete set of Contract Documents.

20. 01A Contractor shall furnish and install all Wood Flooring and accessories as required by the Contract Documents, including but not limited to all subfloor systems, base, marker lines and paint, and accessories.

21. 01A Contractor to provide floor preparation, including broom clean, as necessary to install work under this package.

22. The 03A Contractor is obligated to finish slabs in compliance with the Contract Documents, which is commonly known as ¼" in 10'. At new athletic floor areas, the 03A Contractor will be held to 1/8 inch in 10 feet or more stringent if specified. 01A Contractor to include floor prep and flash patching as necessary above and beyond this heightened requirement for their work and installation of material, no exclusions, all costs are part of base bid. Grinding of concrete is not part of this package and is to be assumed by the 03A Contractor provided this contractor gives proper notice of unacceptable conditions via providing a "grid" and "shooting" the floor no less than two weeks prior to the start of work.

23. 01A Contractor shall provide all layout and survey work necessary to complete their work as required by the Contract Documents.

24. 01A Contractor shall coordinate with the Construction Manager regarding layout of flooring prior to commencement of the work.

25. Contractors shall provide daily cleanup of all trash and debris generated by the work and place in dumpster furnished by the Construction Manager. Upon completion of each phase of work in any given area, the Contractor shall leave the area in broom clean condition. Should the Contractor's cleanup be unsatisfactory, the Construction Manager shall perform the work at the Contractor's expense.

26. 01A Contractor to provide transition or termination strips, whichever is suitable, at all dissimilar floor joints/transitions unless a stone threshold is specifically referenced in the location.

27. 01A Contractor to furnish and install all striping, patterns, logos, or other markings on the floor as indicated on the Contract Documents.

28. 01A Contractor to coordinate slab depressions with 03A Concrete Contractor.

29. The 01A Contractor shall include an underlayment moisture/vapor barrier as specified.

30. 01A Contractor shall furnish to the 01A Contractor required inserts for gym equipment for the 01A Contractor to install (inserts only). The 01A Contractor is required to core drill as necessary for 01A to complete installation. 01A Contractor to layout and install in athletic floor.

Painting and Coatings Specific Scope of Work:

1. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to the completion of the Painting work in accordance with the complete set of Contract Documents.

2. Contractor shall furnish and install all priming, block filling, exterior and interior finish painting, fire and smoke assembly identification (stenciling), and high-performance coatings as required by the Contract Documents.

3. Contractor includes minor cleaning and scraping, preparation and sealing of all concrete floors which are to be sealed. Contractor to assume dark tinted stain despite any reference to the contrary. Two coats minimum, including all surfaces of housekeeping pads.

4. Contractor shall furnish and install all painting and finishing of interior and exterior exposed surfaces including, but not limited to, concrete, masonry, drywall, hollow metal frames and doors, access panels, railings (excluding prefinished or stainless steel), supports, structures, braces, exposed piping, exposed ductwork, exposed structural steel, exposed metal deck, miscellaneous metals, wood work and painted, sealed or coated floors and all others areas as required by the Contract Documents.

5. Contractor shall provide all required surface preparation prior to painting, including minor wipe down.

6. Unless stated otherwise, all coats of block fill, primer and paint are to be back rolled after spray installation.

7. Contractor shall be responsible for all minor touch-up and repainting work caused by installation of adjacent work.

8. Contractor shall paint all exposed mechanical room piping as required by the Contract Documents. Contractor shall paint all exposed piping, steel, deck and all exposed ductwork, as designated.

9. All rust and scale shall be sanded off of hollow metal doors and frames, exposed metal pan stairs, stringers, and bare areas primed by this Contractor.

10. Contractor shall not prime a surface until the previous Contractor has completed his work, and point up.

11. Contractors shall provide daily cleanup of all trash and debris generated by the work and place in dumpster furnished by the Construction Manager with the exception of material deemed as hazardous (i.e., epoxy, paint thinners, high performance coatings, etc.). Contractor must dispose of hazardous material offsite in a legal manner. Upon completion of each phase of work in any given area, the Contractor shall leave the area in broom clean condition. Should the Contractor's cleanup be unsatisfactory, the Construction Manager shall perform the work at the Contractor's expense.

12. Contractor to include proper preparation for painting of all galvanized materials specified to be painted.

13. Contractor shall be responsible for disposing of empty paint, sealer or any other chemical product or container off site in a legal manner.

14. Contractor shall caulk drywall to CMU or concrete for clean end of wall or ceiling condition.

15. Contractor includes caulking of all interior hollow metal, and or aluminum frames, as well as interior side of all exterior hollow metal or aluminum frames. This includes jambs and heads.

16. Contractor shall reference all sections of the Specifications, including Mechanical, Electrical, and Pluming, for painting requirements. All mechanical/plumbing and electrical work, if required to be painted, is part of this Contractor’s scope. This does not include stenciling of mechanical and electrical pipe and duct work.

17. The 15A and 16A Contractors shall provide all stenciling of mechanical piping, ductwork, equipment, conduit, etc. General painting of exposed piping ductwork, equipment, conduit, etc. will be performed by this Contractor.

18. Contractor to include stenciling of “FIRE WALL” at 8’ O.C. as appropriate.

19. Unless additional coats are specified, the Contractor will furnish and install a minimum of two (2) coats of blockfiller/primer to any substrate to receive finish paint.

20. Contractor to include stenciling/labeling of all fire walls, smoke walls, smoke partitions as directed by contract documents and by local jurisdiction.

21. Under no circumstance will contractor paint over fire or UL labels and or ratings, regardless if material or substrate is pre-primed. Labels and ratings are to be taped off by this contractor, or any and all costs to recertify labels or ratings will be at this contractor's expense. Tape to be removed after painting by 01A contractor.

22. Contractor is responsible for any rework as a result of dirt blown into finish, unless notice is given to the Construction Manager 72 hours prior to beginning work that the site is in need of cleaning. Start of work is acceptance of conditions.

23. Contractor to include any masking off of materials as required to properly protect other finished materials. Contractor to product adjacent finished surfaces. Overspray to be cleaned at this contractor's expense.

24. Contractor to provide protection for all sprinkler heads during painting. Protection to be removed after painting by 01A contractor.

25. All hollow metal which is to be painted, door frames, window frames, doors, etc. are to be sprayed per the specifications. Brush or rolling will not be permitted. Therefore, protection of finished adjacent materials in complete and finished spaces is included and part of this contractor's scope of work.

26. Contractor acknowledges and includes painting of exposed metal deck, minimum 2 coats primer, 2 coats finish.

27. 01A Contractor includes infill of all hollow metal window, side light, borrowed light, etc. openings with plywood supported at 2'-0" OC as necessary as masonry progresses and frames are blocked in on lower floor(s) This is for security as well as weather protection. Removal of this material is by 01A to allow for painting of frames by 01A prior to permanent glass by 08A is installed. If 08A contractor installs glass prior to painting of frame, it will be the 08A contractor's responsibility to remove and reinstall after paint at no charge.

Display Cases and Boards Specific Scope of Work:

1. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to the completion of the display work in accordance with the complete set of Contract Documents.

2. Contractor shall furnish and install all display cases, markerboards, projection boards, tackboards, fabric-wrapped tackboards, tackstrips, frames and trim, and accessories as required by the Contract Documents. For all cork material, contractor to install only after material has acclimated to building conditions for a minimum of 7 days, or as per manufacturers recommendations, whichever is more stringent.

3. Contractor shall provide all locks, display rails, end stops, and any other accessory required by the Contract Documents.

4. Contractor shall furnish and install all tackboard panels, glazed sliding doors, shelves, standards and supports, back panels, illumination and all other accessories required by the Contract Documents at display cases.

5. Contractor to caulk or provide fillers a necessary to provide a finished appearance where this Contractor's work abuts other materials.

6. Contractor shall provide daily cleanup of all trash and debris generated by the work and place in dumpster furnished by the Construction Manager. Upon completion of each phase of work in any given area, the Contractor shall leave the area in broom clean condition. Should the Contractor's cleanup be unsatisfactory, the Construction Manager shall perform the work at the Contractor's expense.

7. Contractor to coordinate any electrical requirements for materials being provided under this package with the 16A contractor prior to wall rough in, or any costs to change wall rough in will be at this Contractor's expense.

Signage Specific Scope:

1. Contractor to furnish and install all interior signage, panel signage, plaques, exterior stainless-steel letters, interior formed plastic letters, vinyl letters and graphics, signage accessories and the like inclusive of fasteners and or mastics(s) per the Contract Documents.

2. Contractor shall furnish and install all in-wall blocking required for this work, prior to wall close-in by 08A and 01A contractors.

3. Contractor includes all incidental caulking of own work for a complete installation.

4. Contractor shall silicone all sign perimeters to mounting surface to deter student removal.

5. Room identification signage to be mounted at latch side of door, 48" AFF to bottom of sign, and 9" from edge of door frame to center of sign, and to have a clear perimeter sealant. Note, no tactile characters can be less than 48" AFF or more than 60" AFF. In the event a sign is taller than 12", mounting location needs to be confirmed by design team. In the event a sign cannot be mounted as stated, contractor to immediately notify Construction Manager as this is a potential ADA concern.

6. Contractor includes backer panel on all signage mounted on glass.

7. Contractor shall furnish and install all other dimensional characters, both interior and exterior, as identified in the Contract Documents.

8. Furnish and Install one (1) Project Construction Sign to be placed at a location determined by Construction Manager. Sign can be obtained from Maryland Correctional Enterprises; Contact: Charles Behnke 410-799-5102.

9. Provide all attic stock as required.

10. All street and or parking signage is provided and installed by the 02A Contractor, with the exception of the Site Project Sign.

Cubicle Curtains & Track Specific Scope:

1. Contractor to furnish and install all cubicle curtains complete including but not limited to, track, curtain, track accessories, curtain carriers, exposed fasteners, concealed fasteners, etc. as indicated on the contract documents

2. Contractor includes field measuring of spaces prior to fabrication.

Toilet Partitions and Accessories Specific Scope of Work:

1. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to the completion of the Toilet Partitions and Accessories work in accordance with the complete set of Contract Documents.

2. Contractor shall furnish and install all toilet partitions and urinal screens as required by the Contract Documents, including all necessary hardware, bracing, and finishes for a complete installation.

3. Contractor shall furnish and install all toilet, bath and laundry accessories as required by the Contract Documents including, but not limited to, paper towel dispensers, soap dispensers, tempered glass mirrors, toilet tissue dispensers, grab bars, utility hooks, feminine napkin dispensers and disposals, shower curtain rods, folding shower seats, and mop strips. This includes any accessories required in classrooms, kitchen, or other common areas as indicated.

4. Contractor shall be responsible for field measuring prior to release of materials.

5. Contractor shall coordinate with Construction Manager regarding all locations and mounting heights for toilet accessories. The Contractor's shop drawings shall show specific size and location of all blocking required by the

work included in this Contract Package. Contractor shall be responsible for adherence to all ADA and handicapped regulations.

6. Contractor incudes all incidentals to this work inclusive of caulking for a complete installation

7. Contractor will cut, reinforce, and trim toilet partitions if necessary to install items common between two (2) stalls and shown as a thru wall accessory.

8. Contractors shall provide daily cleanup of all trash and debris generated by the work and place in dumpster furnished by the Construction Manager. Upon completion of each phase of work in any given area, the Contractor shall leave the area in broom clean condition. Should the Contractor's cleanup be unsatisfactory, the Construction Manager shall perform the work at the Contractor's expense.

9. Contractor to coordinate with floor and wall finish contractor for installation of fasteners as applicable. Any damaged finishes which occurs during installation of work under this scope, will be the responsibility of this contractor.

10. Contractor responsible for final adjustment of hardware per the specification immediately prior to substantial completion.

Metal Lockers *and Shelving[3]* Specific Scope of Work:

1. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to the completion of the Metal Lockers work in accordance with the complete set of Contract Documents.

2. Contractor shall furnish and install all metal lockers ***and metal storage assemblies[3]*** as indicated, including all necessary accessories per the Contract Documents.

3. Contractor to submit numbered layout drawing for all lockers, prior to fabrication, and use of ordering locker number plaques for approval, as some lockers may be deleted during this process.

4. Contractor will provide fillers and caulk as required to provide a finished appearance where lockers abut other materials.

5. Contractor shall provide daily cleanup of all trash and debris generated by the work and place in dumpster furnished by the Construction Manager. Upon completion of each phase of work in any given area, the Contractor shall leave the area in broom clean condition. Should the Contractor's cleanup be unsatisfactory, the Construction Manager shall perform the work at the Contractor's expense.

Projection Screen Specific Scope:

1. Contractor shall furnish and install all projection screens and accessories as required by the Contract Documents.

2. Contractor shall include cost to train Owner’s personnel in base bid.

3. Contractor will provide all necessary supports, mounting brackets and support hardware for projection screens. Ceiling hung projection screens shall be supported from structural steel above. Support from the ceiling grid will not be permitted. Contractor to advise during structural steel coordination any need for supplemental steel support; in the event this is not coordinated, the need for supplemental steel is then this Contractor’s responsibility. In the event structural steel is not immediately above projection screen elevation, Contractor includes beam clamps, all thread, hangers, kendorff etc. to utilize structural steel at above floor or roof level and no additional structural steel will be provided immediately above ceiling elevation.

4. Contractor to coordinate any electrical requirements for materials being provided under this package with the 16A contractor prior to wall rough in, or any costs to change wall rough in will be at this Contractor’s expense.

5. All items within this Contract Package, which are specified or required to have electrical service or electrical outlets, shall be furnished with complete integral wiring by this Contractor, for single connection at a junction box or disconnect by the 16A Electrical Contractor.

6. Key switch operation is to be on building master key system.

Stage Curtains Specific Scope:

1. Contractor to furnish and install all stage curtains and tracks complete per the Contract Documents.

2. Contractor to include stage curtains, scrims, drops, draw-curtain tracks and curtain rigging, per contract documents.

3. Contractor shall include cost to train Owner's personnel in base bid.

4. Contractor to coordinate any electrical requirements for materials being provided under this package with the 16A contractor prior to wall rough in, or any costs to change wall rough in will be at this contractor's expense.

5. All items within this Contract Package, which are specified or required to have electrical service or electrical outlets, shall be furnished with complete integral wiring by this Contractor, for single connection at a junction box or disconnect by the 16A Electrical Contractor.

Athletic Equipment and Dividers Specific Scope:

1. Contractor to furnish and install all Athletic Equipment and Gymnasium Dividers complete per the Contract Documents.

2. Furnish and install all warranties as specified.

3. Contractor to include all gymnasium wall padding, forward folding basketball backboards, badminton/volleyball floor sleeves and standards with netting, climbing ropes, and relocation of the climbing wall from the existing school per contract documents.

4. Furnish and install basketball equipment by a specified manufacturer, including overhead supported and wall mounted backstops, with the specified backboards, safety devices, safety pads, safety devices, height adjusters, winches, electric operators, goals, and nets.

5. 01A Contractor shall furnish, core drill and install volleyball floor sleeves. Coordinate with 01A Contractor. 01A Contractor to layout and cut to install inserts in floor only.

6. Furnish and install electrically operated, center-roll divider system complete with all accessories as required.

7. This Contractor is responsible for protection of all adjacent finished work and will be responsible to clean, repair or replace any finished material damaged due to work by this trade damaging finished materials.

8. All items within this Contract Package, which are specified or required to have electrical service or electrical outlets, shall be furnished with complete integral wiring, including control wiring, by this Contractor, for single connection at a junction box or disconnect by the 16A Electrical Contractor.

9. Contractor shall include cost to train Owner's personnel in base bid.

10. Key switch operation is to be on the building master key system.

Roller Shades and Blinds Specific Scope:

1. Contractor to furnish and install all roller shades complete per the Contract Documents.

2. Contractor to furnish and install all venetian blinds and accessories complete per the Contract Documents.

3. Contractor to coordinate with HM Frame and Aluminum Frame suppliers for method of attachment.

4. Whether indicated or not, the 01A Contractor will be required to furnish extension wands as necessary to operate shades.

5. Contractor will be responsible for final adjustment, cleaning and touch up immediately prior to substantial completion.

6. Contractor to include own labor and equipment for unloading of deliveries, deliveries which arrive without contractor forces onsite will be immediately denied access to the site.

7. Contractor acknowledges no materials can be released until mandatory preorder conference has occurred. Contractor to schedule conference through Construction Manager.

Millwork & Casework Scope:

1. Contractor to furnish and install all plastic laminate casework, plastic laminate counter tops, solid polymer sills and stools, built-in counters, pencil sharpener and flag holder hooks, coat hooks and coat rods, wood stairs at the platform, display shelving in the art rooms, display shelving behind media center storefront, built-in shelves, locks, sinks in casework, fixtures, caulking, fillers and grommets, etc. or as detailed in the Contract Documents. Any final plumbing related connections are to be by 15A.

2. Contractor will be required to modify casework as necessary to allow for MEP trade rough in, as well as provide cutouts for outlets, switches, devices, sinks and fixtures installed in Casework by others, cutouts are to be field performed.

3. Contractor to include all hardware including keying requirements for all work provided within this scope of work, in accordance with respective specification section. No hardware will be provided by other trades to make this scope of work complete

4. Contractor to provide all glass and glazing required for a complete installation of work provided under this contract. No glass or glazing will be provided by other trades to make this scope of work complete.

5. Contractor is responsible for all hardware necessary to anchor or affix its work in a permanent location.

6. Contractor to protect casework being furnished and installed under this package from damage. Casework protection shall be, at a minimum, 1/4" Masonite blue taped to the countertops. Contractor responsible for replacement of damaged casework and or countertops. This is part of base bid cost.

7. All items within this Contract Package, which are specified or required to have electrical service or electrical outlets, shall be furnished with complete integral wiring by this Contractor, for connection at a junction box by the 16A Electrical Contractor. This requirement does not include receptacles, which may be shown in casework. This Contractor shall provide cutouts for outlets, switches, devices and fixtures installed in Casework by other Trades.

Operable Partitions Specific Scope

1. Contractor to include all necessary work to furnish and install all operable partitions, complete as required per the Contract Documents

2. Contractor includes all necessary coordination with the 05A Contractor for attachment to structure as required. Any additional supports or framing required for this scope above what is shown on the Contract Documents will be supplied by this contractor at no additional cost.

3. Contractor includes all tackboard and markerboard finishes as required.

Passenger Elevator Specific Scope:

1. Contractor to furnish and install all elevators complete per Contract Documents.

2. Contractor to provide pit layout as a separate submittal within two weeks of Letter of Intent, Notice to Award, or Contract, whichever is issued first.

3. Regardless to any reference to the contrary, elevators are to be provided with battery lowering by Elevator Manufacturer.

4. Mechanical and Electrical final connections will be performed by others. Contractor shall provide all connectors, piping, integral wiring and piping, as well as all equipment connections, cords with plugs, etc., incidental to this phase of the work. Coordinate with Electrical and Mechanical Contractors to provide complete installation.

5. Contractor to coordinate floor finishes and recessed areas with Steel, Concrete, and Flooring Contractor(s). Cab flooring is by others.

6. Contractor is to supply all necessary brackets, embeds, or other mounting hardware that must be installed concurrently with the Concrete Contractor or Masonry Contractor.

7. Contractor to coordinate all metal fabrications as required for installation and accessories including but not limited to attachment plates, structural steel shapes for subsills, sump pits and pit ladders.

8. Contractor to coordinate with 03A, 04A, 05A, 15A, & 16A, Contractors for location of pit ladder, sump pit, fire alarm devices, sprinkler heads.

9. Contractor to coordinate integration of the elevator with the fire control system including any necessary submittals to local or state fire control agencies.

10. It is understood that elevator(s) will be used for access to upper floors prior to substantial completion of the project. This contractor includes all associated costs to obtain a construction use permit no later than June 1, 2022, and install adequate cab protection so Owner can use cab for distribution of furniture. After said distribution, a final inspection will be obtained. It is the Construction Manger's assumption with a construction use permit, Construction Manager personal can be assigned to run the elevator and the 01A Contractor's personnel are not needed for this function. If this assumption is false, this contractor to include labor for running of the elevator for the months of June and July 2022 for use by Owner/CM.

11. 01A Contractor has included the cost for permits, maintenance and extended warranties during the construction use period. 01A Contractor to assume a construction use period of two (2) months. Actual usage will be tracked monthly via ticket and a contract adjustment, if necessary will be made at scope completion.

12. Contractor to include forty (40) hours labor use of the platform by other trades to accomplish installation of all MEP devices and Sprinkler Head, Masonry Shaft point up, fire caulking etc. Actual hours will be tracked via ticket and a contract adjustment, if necessary will be made at scope completion. This is in addition to the anticipated construction use.

13. Contractor shall provide a wall mounted fire extinguisher in the Elevator Machine Room whether indicated or not.

14. Contractor will secure and schedule all necessary pre-inspections and inspections as required by the applicable local or state agencies. Contractor shall coordinate with other trades regarding final inspections.

15. Contractor includes cost of 24 month warranty and initial maintenance service to include 24 months full maintenance by skilled employees in base bid.

16. Despite any reference to the contrary, the elevator is to be key operated from the hall call button. IE the doors to this elevator are intended to be shut at all times and to not allow free unattended use by students.

17. Despite any reference to the contrary, the elevator buttons at hall calls and within the cab are all to be of the "high impact" variety.

18. Contractor shall supply their own equipment to offload their materials into the building and shall not assume "rollable" access will be available at time of mobilization.

Furnishings Relocation Specific Scope:

1. Contractor shall remove and relocate all items (remaining items after the School personnel have moved out of area) excluding only computers (PCs) and personal effects, from the existing school to the new school. The Contractor shall be responsible for providing all boxes, bins, labels, packing materials etc. and for packing, boxing, palletizing all items. The Contractor shall unpack and move all items to their final location as directed by the CM/Owner.

2. Contractor shall inventory packed teachers items, supplies, furniture, and pre-boxed items (if any). Identify existing room number/name and teacher name on packed teacher's items. Labeling devices shall be user-friendly and be easily removed without damage to the Property. Use numbering system, etc. to link individual supplies to existing furniture/location from which removed so supplies may be returned to same/similar location when unpacked.

3. Contractor shall remove and relocate all significant items of furniture (i.e. pianos, instruments, art supplies, kilns, etc.).

4. The Contractor shall remove and relocate remaining FF&E from the existing school to the new school. For bidding purposes Contractor shall assume 25% of the existing FF&E will need to be relocated. The Contractor shall expect the following inventory as typical FF&E, which includes but is not limited to:

    4.1 Classrooms: Approximately 30 desks, 30 chairs, 1 teacher wardrobe unit, teacher desk and chair, 2 file cabinets and 2 bookcases.
    4.2 Administrative and Guidance Offices: Approximately 1 desk, 1 chair, 1 credenza, and 1 bookshelf for each office.
    4.3 Itinerant and Miscellaneous Offices: Approximately 1 desk, 1 chair, 1 credenza and 1 bookshelf for each office.

5. The Contractor shall relocate remaining FF&E to HCPSS warehouse within Howard County as directed by the CM/Owner. The Contractor shall assume a total of 10 – 40' box trailers.

6. The Contractor shall move and compile all Owner salvaged items to the gymnasium of the existing school to allow for removal from the school by others. The Contractor should assume 4 movers for 2 eight hour days for this task.

7. The Contractor shall be responsible for missing and/or damaged items.

Miscellaneous Scope Items for General Trades Package:

1. Contractor shall furnish and install all Fire Protection Cabinets and Fire Extinguishers per the Contract Documents, including all blocking and accessories as required for complete installation.

2. Contractor shall furnish and install AED's and cabinets.

3. Contractor shall furnish and install all evacuation devices and cabinets.

4. Contractor shall furnish and install all flagpoles and required footings per the Contract Documents.

5. Contractor shall furnish and install all ceiling hooks in the OTPT Room as required per the Contract Documents.

6. 01A Contractor shall install appliances per section 113100 and Equipment Drawings per the Contract Documents. Rain Barrel installation is by 07A.

7. Contractor shall furnish a minimum of one knox box, installation is by 04A. Quantities and locations to be as shown on the drawings. Knox Box is to be authorized by local fire marshal prior to release.

8. ***Contractor shall furnish and install all column covers along with all necessary framing and hardware as necessary per Contract Documents.***[3]

9. 01A is to furnish, install, and maintain fire extinguishers onsite and in building per MOSH/OSHA requirements for general building protection during construction. All trades are to provide fire extinguishers, blankets, and any other provisions for burning, welding, soldering, braising, or any hot/fire work performed by the Contractor in performance of their work in any area as specifically necessary.

10. In addition to the requirement of providing daily cleanup of self-generated debris from work and or workers, the 04A, 01A, 01A, 15A and 16A contractors are to include 1 man per every 15 men contractor has onsite, with a mandatory minimum of one man if contractor has less than 15 men onsite. This requirement will be utilized for contractors to participate in a composite cleanup crew. Composite cleanup days will be every Wednesday from 7am to 2pm. Construction Manager will provide trash carts, dumpsters and sweeping compounds, all other equipment, PPE or otherwise, i.e. brooms, shovels, etc., are to be contractor provided.

11. Provide one (1) 8'-0" wide temporary scaffold stairs with access to roof level for Trade access at perimeter of building (Location TBD by CM).

12. 01A Contractor to furnish, install, and maintain temporary exit signs as necessary in compliance with MOSH/OSHA standards during construction. Signs are to be removed at Construction Manager's direction. Any patching as necessary is to be included as part of base bid cost.

PART 3 – ALTERNATE SCOPE OF WORK

1. Contractor has reviewed the Alternates scope of work listed elsewhere within the specifications and has included all costs in the event the Owner elects to proceed in whole or in part.

Shade Sail Structure Specific Scope of Work (Alternate #1)

1. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to the completion of the Shade Sail Structure work in accordance with the complete set of Contract Documents and as detailed on A-530.

2. This scope includes the furnish and installation of all structural components necessary for the support of the shade structure as well as coordination with other Contractors for installation and integration of same with their work. Any inspections necessary for certification of this work is included. Any thermal breaks are included in this installation.

3. Upon completion of all finishes, this Contractor includes the installation of any caulking, architectural trim or escutcheons necessary for a weather-tight and aesthetically pleasing installation. Contractor shall paint or touch up all galvanized components following installation.

Main Entrance Canopy Specific Scope of Work (Alternate #2)

1. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to the completion of the Main Entrance Canopy work in accordance with the complete set of Contract Documents and as detailed on A-531.

2. This work includes all miscellaneous framing and blocking required as well as the painting of all exposed steel elements.

Quartz Tile Specific Scope of Work (Alternate #3)

1. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to the substitution of quartz tile in lieu of vinyl composition tile (VCT) in all areas shown on the floor finish plans in accordance with the complete set of Contract Documents.

Epoxy Terrazzo Specific Scope of Work (Alternate #4)

1. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to the completion of the Epoxy Terrazzo work in accordance with the complete set of Contract Documents.

2. Contractor shall furnish and install all Epoxy Terrazzo including all divider strips, control joint strips, cleaners, epoxy grouts, sealers and all other accessories, as required by the Contract Documents, as part of the Alternate #6.

3. Contractor to provide floor preparation as necessary to install work under this package.

4. The 03A Contractor is obligated to finish slabs in compliance with Specification Section 033000. 01A Contractor to include floor prep and flash patching as necessary for their work and installation of material, no exclusion, all costs are part of base bid. Grinding of concrete is not part of this package and is to be assumed by the 03A Contractor provided this contractor gives proper notice of unacceptable conditions two weeks prior the start of work.

5. 01A Contractor shall provide all layout and survey work necessary to complete their work as required by the Contract Documents.

6. 01A Contractor shall coordinate with the Construction Manager regarding layout of flooring prior to commencement of the work.

7. 01A Contractor includes all cleaning, sealing and polishing as required.

8. 01A Contractor shall provide temporary protection of finished work in place. At a minimum, Contractor shall protect finished flooring with Kraft paper reinforced by nylon strings which is to be taped at all joints. Contractor includes maintenance and replacement as necessary. Contractor includes full protection of all adjacent walls while terrazzo grinding operations are taking place.

9. Contractors shall provide daily cleanup of all trash and debris generated by the work and place in dumpster furnished by the Construction Manager. Upon completion of each phase of work in any given area, the Contractor shall leave the area in broom clean condition. Should the Contractor's cleanup be unsatisfactory, the Construction Manager shall perform the work at the Contractor's expense.

10. 01A Contractor to caulk or provide trim as necessary where flooring meets other material (i.e., floor drains, equipment pads, boxes, walls).

11. 01A Contractor to coordinate slab depressions with 03A Concrete Contractor.

Ceramic Tile In Lieu of Painted Finish Scope of Work (Alternate #5)

1. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to

the substitution of ceramic tile in lieu of painted finish on concrete masonry units in toilet rooms as listed on the finish schedule in areas shown on the floor finish plans in accordance with the complete set of Contract Documents.

Wood Grain Hollow Metal Doors Scope of Work (Alternate #6)

1. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to the substitution of wood grain hollow metal doors in lieu of painted hollow metal doors in all areas shown on the plans in accordance with the complete set of Contract Documents.

Venetian Blinds Specific Scope of Work (Alternate #7)

1. Contractor shall provide all labor, material, equipment, and supervision necessary for and reasonably incidental to provide venetian blinds at interior glazing at all locations shown on the drawings in accordance with the complete set of Contract Documents.

PART 4 – ALLOWANCES

1. In addition to the composite clean-up crew requirements listed above, contractor to include an additional 500 general laborer hours to be used at Construction Manager or Owner discretion. Hourly cost to be based on wage scale. Hours are to be tracked on a ticket, in the event the cost exceeds this allowance, an additive change order will be issued based on wage scale, in the event it is less, a deductive change order will be issued.

END OF 01A SECTION

SECTION 013100

PROGRESS SCHEDULES

(Revised Addendum #3 - 7/2/20)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes: Project Progress Schedule information.

B. Related Sections: Section 01 3300 - Submittal Procedures.

1.3 PRELIMINARY PROGRESS SCHEDULE/COORDINATION MEETING

A. The Bid Schedule (preliminary progress schedule) is included in this Section. It shows major categories of the Construction pertaining to the Project and is the Schedule for establishment of the various Contract milestones.

B. This Bid Schedule (preliminary progress schedule) is provided for informational purposes only. Contractor acknowledges that by submitting a bid, they will meet the Substantial Completion date as listed in the contract documents unless modified by an approved Change Order.

1.4 FULLY DEVELOPED CONSTRUCTION SCHEDULE/ACCEPTANCE

A. A copy of the “final” Construction Schedule will be prepared and distributed. Any disputes arising concerning the Schedule will be resolved by the Construction Manager’s decision.

B. The Construction Schedule shall then constitute the Schedule to be used by the Construction Manager for managing the Work for this Project, including but not limited to, planning, organizing, and directing the Work and reporting progress, until subsequently revised.

1.5 CRITICAL PATH METHOD (CPM) CONSTRUCTION SCHEDULING

A. General

1. The CPM Schedule network plan including any appropriate milestone dates and the computer produced reports shall be part of the Owner/Contractor agreement as stipulated herein.

2. All Contractors shall provide all information required by the Construction Manager for development of a network plan and schedule for this in accordance with the requirements of this section of the General Requirements.

3. The purpose of the Plan and schedule will be to assure adequate planning and execution of the work of the various Contractors, and to assist the Construction Manager in monitoring the progress of the work and evaluating proposed changes to the Contract and Schedule.

4. The Project management tool commonly called the Critical Path Method (CPM) will be employed for the planning, scheduling and reporting of all work to be performed under the

Contract. The precedence diagraming method shall be utilized in preparing the CPM Schedule network diagrams.

5. There are other contracts and work which will run concurrently with this Contract, and may run subsequently to the work of this Contract. The project network diagram and schedule will reflect the major interferences between the work of this contract and the concurrent and succeeding work of other contracts.

6. The Construction Manager may modify the network diagram to provide interface points for other contractors for this Project.

7. Activity times delays shall not automatically mean that an extension of the Contract Completion Date is warranted or due the Contractor. A contract modification of delay may not affect existing critical activities or cause non critical activities to become critical. A contract modification to delay may result in only absorbing a part of the available total float that may exist within an activity chain on Network thereby not causing any effect on any interim milestone date of the Contact completion date.

8. Total float is defined as the amount of time between the early start date and the late start date, or the early finish date and the late finish date, for each and every activity in the schedule. Float is for the exclusive use and benefit of the Owner. Extensions of time to interim milestone dates or the Contract Completion Date under the Contract will be granted only to the extent that equitable time adjustments to the activity or activities affected by the Contract Modification or delay exceeds the total float of the affected or subsequent paths and extends any interim milestone date of the Contract Completion Date.

1.6 INITIAL SUBMITTAL AND NETWORK PREPARATION

A. To the extent necessary for the Construction Manager to reflect in a computerized CPM Schedule network diagram the Contractor's proposed plan for completion of their work, all Contractors shall be prepared to meet with and assist the Construction Manager, and furnish information subsequent to award of the Contract.

B. A Duration Request Form will be sent to all Contractors at the same time as contracts are sent for signature. Within fourteen (14) calendar days after receipt of the blank Duration Request Form all Contractors shall provide their proposed plans of operation to the Construction Manager. The Contractor's plan of operations shall consist of, but not limited to, the following:

   1. A completed Duration Request Form with proposed Durations for the listed Construction Activities filled in by the Contractor (in work days).
   2. Additional Construction Activities, not already listed on the Duration Request Form, which the Contractor feels necessary to include into the CPM Schedule (with Durations for each in work days).
   3. List of proposed Durations for major procurement items (in work days).
   4. Proposed Sequencing of Contractor's Construction Activities.

C. The Construction Manager and each Contractor will then meet and jointly develop the CPM Project Schedule, based on the Contractors proposed plan and sequences of operation. Any areas of such plans which, in the opinion of the Construction Manager, will conflict with timely completion of the project will be subject to revision by the Construction Manager unless adequate justification for these plans, duration and logic (as determined by Construction Manager) is provided by the Contractor within ten (10) calendar days of the Construction Manager's notice to the Contractor of the Construction Managers' intent to revise the schedule. At these meetings, the Contractors, with the aid of the Construction Manager, will manually construct a precedence diagram describing the activities to be accomplished, their dependency relationships and their durations. The Construction Manager will then, using the manual precedence diagram prepare a computer produced schedule showing starting and completion dates for each activity.

D. In preparing the manual precedence diagram, each Contractor will be responsible for assuring any/all subcontractor work, as well as his own work, is included and that the diagram shows a coordinated plan of work.

E. The manually prepared precedence diagram when fully developed will show the sequence and interdependence of activities required for complete performance of all the work and will be divided into activities with a maximum duration of twenty (20) working days each, unless otherwise directed by the Construction Manager, except for non-construction activities such as procurement of material, delivery of equipment, and concrete curing.

F. Proposed durations assigned to each activity shall reflect each Contractors best estimate of time required to complete each activity considering the scope and resources planned for that activity.

G. Failure by any of the Contractors or Construction Manager to include the element of work required for performance of the contract shall not excuse any of the Contractors form completing all their work within the contract Completion date. If the Construction Manager questions any of the Contractor's proposed durations, said Contractor shall within ten (10) calendar days provide estimates of his labor and intended crew and/or equipment sized required for the activity which support the proposed duration to the satisfaction of the Construction Manager.

H. Seasonal weather conditions will be considered in the planning and scheduling of all work influenced by high or low temperatures to ensure the completion of all contract work within the allotted contract time milestone completion dates.

1.7 REVIEW AND APPROVAL

A. Within ten (10) calendar days after receipt of the computer produced CPM Schedule and reports provided by the Construction Manager, each Contractor shall meet with the Construction Manager, if required, for joint review, correction, or adjustment of the proposed plan and schedule. After these joint meetings, the computer produced CPM Schedule and reports will be revised in accordance with agreements reached during the joint reviews. A copy each of the computer produced CPM Schedule and reports will be provided to each Contractor. The revised CPM Schedule will be reviewed by each Contractor, and if found to be as previously agreed upon, will be accepted within ten (10) working days. Final review and acceptance by the Owner will take place after all Contractors have approved the revised CPM Schedule.

B. Upon establishment of an agreed upon schedule, each Contractor will sign the CPM Schedule network drawings and computer produced reports, which will then indicate the acceptance and approval of the project schedule, sequence of activities and time for completion. Acceptance of the approved project schedule by all Contractors and the Construction Manager will be a condition precedent to the making of any partial payments under the Contract.

1.8 SCHEDULING UPDATING AND REVISIONS

A. The approved Project Schedule will be updated by the Construction Manager on a regular basis for the purpose of recording and monitoring the progress of the work. The CM will distribute, and review, a Schedule Update consisting of the following four categories; Activities Behind Schedule, Activities Due to be completed, Activities of long duration which are due to be completed after the next progress meeting, and Activities which are scheduled to commence prior to the next progress meeting.

B. Based on the result of the schedule update, when the schedule no longer represents the actual prosecution and progress of the work, a major revision to the schedule logic sequence and the precedence diagram may be required by the Construction Manager or requested by the Contractor.

C. A Contractor may also request revisions to the logic sequence and precedence diagram in the event his planning for the project is revised. If a Contractor desires to make changes in the Approval Project Schedule to reflect revisions in this method of operating and scheduling, he shall notify the Construction Manager in writing stating the reasons for the proposed revision.

D. If revision to the schedule logic sequence is contemplated a Contractor or the Construction Manager shall so advice the other in writing at least two (2) weeks prior to the next Schedule Update Meeting, describing the revision and setting forth the reasons therefore.

E. All reasonable requests by the Contractor for revisions will be implemented by the Construction Manager if not objected to by any of the other Contractors.

F. Construction Manager directed revisions to the schedule will not be implemented without written notice to the Contractors', who shall respond within ten (10) days, either agreeing with the Construction Manger's proposed revision or setting forth justification why the change is reasonable, such change will not be implemented.

G. Updating the schedule to reflect actual progress made up to the date of an update shall not be considered revision to logic sequence and schedule. In case of the disagreements concerning actual progress to date, the Construction Manager's determination shall govern.

H. If a Contractor does not record any exception to the Published Project Schedule update within ten (10) calendar days of its receipt, he will be deemed to have accepted and approved it.

1.9 SUBMITTAL SCHEDULE

A. The Construction Schedule will also incorporate the Submittal Schedule that must be adhered to as detailed in the AIA Document 232 section 3.10.2.

1.10 RESPONSIBILITY FOR COMPLETION

A. The Contractor agrees that whenever it becomes apparent from the Construction Schedule that the Date of Substantial Completion of the Work will not be met, it will take some or all of the following actions at no additional cost to the Owner.
   1. Increase construction manpower in such quantities and craft as will substantially eliminate, in judgment of the Construction Manager, backlog of work.
   2. Increase number of working hours per shift, shifts per working day, working days per week, or amount of construction equipment, or any combination that will substantially eliminate, in judgment of the Construction Manager, backlog of work.
   3. Reschedule activities to achieve maximum practical concurrence of accomplishment of activities.

B. Failure of the Contractor to comply with these requirements shall be basis for determination by the Construction Manager and Owner that the Contractor is not prosecuting its work with such diligence as will ensure completion within the Time stipulated. Upon such determination, the Owner may take such action as may be deemed appropriate, including withholding of the Progress Payments otherwise due and/or supplementing the Contractor's efforts at the Contractor's expense.

C. It shall be the responsibility of all Contractors to maintain their progress so as not to delay the progress of the project or the progress of other Contractor's. If a Contractor delays the progress of the project or the progress of other Contractors, it shall be the responsibility of Contractor causing the delay to increase the number of shifts, days of work, and/or to the extent permitted by law, to institute or increase overtime operations all without additional cost to the Owner to regain the time lost and to maintain the overall schedule. Each Contractor is required by virtue of this contract to cooperate in every way with all other Contractors in order to maintain the schedule completion date. No additional compensation will be considered for such cooperation.

D. Liquidated damages in the amounts as stated in the contract documents will be

assessed in the event a Contractor fails to achieve or contributes to the cause of the failure to not reach any or all Substantial Completion(s) as stipulated.[3]

E. The Anticipated Notice to Proceed provided in the Preliminary Schedule is exactly that. Should NTP not be provided on the date provided in the Preliminary Schedule, the Contractor shall still be responsible for achieving substantial completion dates as stipulated.

1.11 PROPOSED PROGRESS SCHEDULE

A. The Bid Schedule, which serves as preliminary progress schedule, is included at end this Section.

B. The Anticipated Notice to Proceed provided in the Preliminary Schedule is exactly that. Should NTP not be provided on the date provided in the Preliminary Schedule, the Contractor shall still be responsible for achieving substantial completion dates as stipulated. [3]

C. Background:
1. The existing School will stay in use during construction.
2. It will be necessary for the Contractors to schedule their work to avoid interference with the School's operations. The Site is an operating school first and construction site second. This may require work at other than normal construction work hours, weekends, and/or prolonged days as necessary to meet the Schedule. The various Trades will require numerous mobilizations. Temporary and interim measures will be required to maintain operations and advance construction.
3. Any utility interruptions or outages must be scheduled outside of the school's operating hours.
4. The Contractors are to commence with the submittal process immediately upon issuance of the Notice of Intent to Award from the Construction Manager.

PART 2 - PRODUCTS (Not Used)

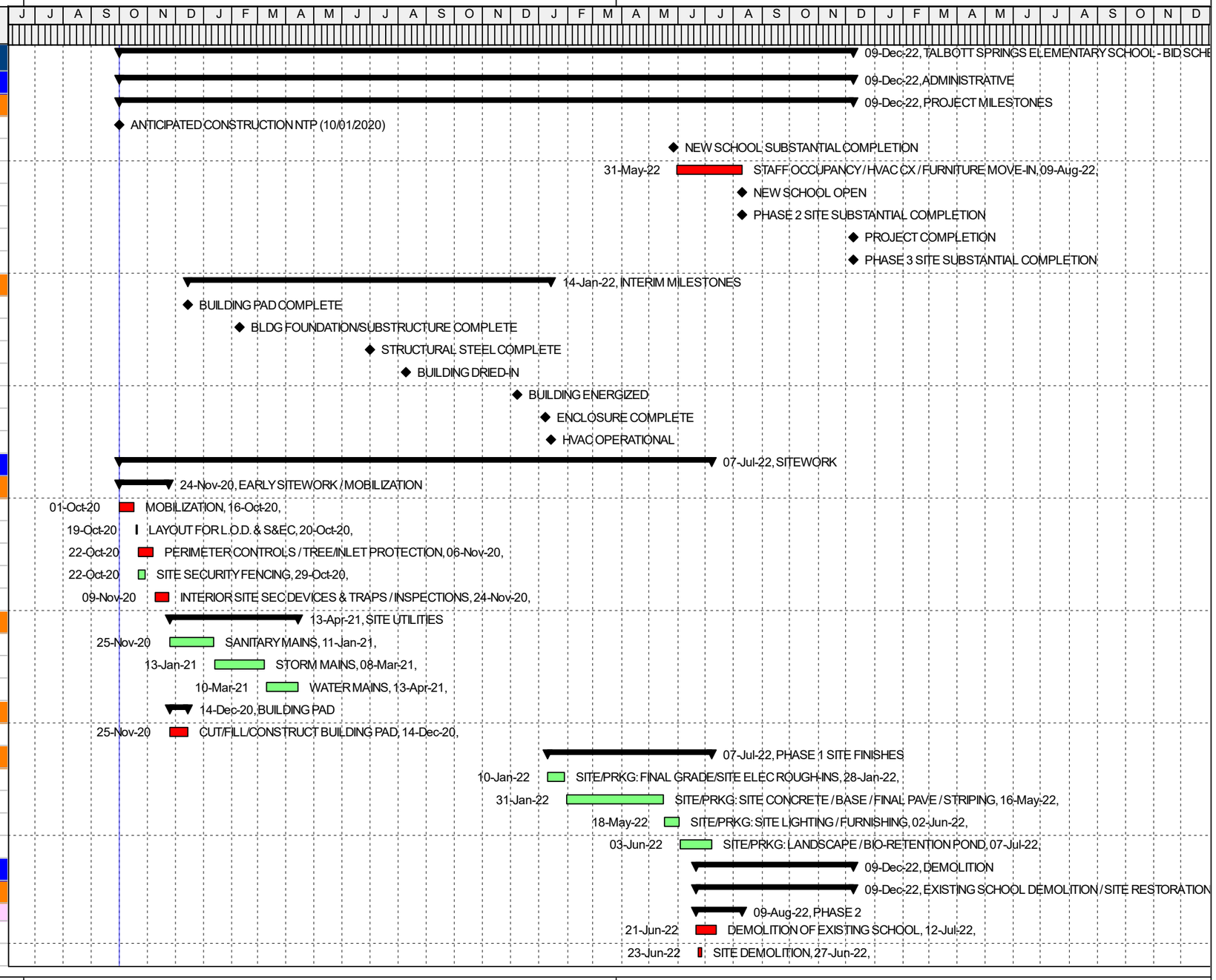
PART 3 - EXECUTION

A. Refer to the following Preliminary Bid Schedule, attached.

END OF SECTION

TALBOTT SPRINGS ELEMENTARY SCHOOL - BID SCHEDULE (Revised Addendum #3 - 7/2/20)

Activity ID	Activity Name	iginal ration	Start	Finish
TALBOTT SPRINGS ELEMENTARY SCHOC		556	01-Oct-20	09-Dec-22
ADMINISTRATIVE		556	01-Oct-20	09-Dec-22
PROJECT MILESTONES		556	01-Oct-20	09-Dec-22
MS-1000	ANTICIPATED CONSTRUCTION NTP (10/01/20	0	01-Oct-20*	
MS-1020	NEW SCHOOL SUBSTANTIAL COMPLETION	0		27-May-22
MS-1040	STAFF OCCUPANCY / HVAC CX / FURNITURE M	50	31-May-22	09-Aug-22
MS-1060	NEW SCHOOL OPEN	0		09-Aug-22
MS-1100	PHASE 2 SITE SUBSTANTIAL COMPLETION	0		09-Aug-22
MS-1080	PROJECT COMPLETION	0		09-Dec-22
MS-1120	PHASE 3 SITE SUBSTANTIAL COMPLETION	0		09-Dec-22
INTERIM MILESTONES		396	14-Dec-20	14-Jan-22
MI-1000	BUILDING PAD COMPLETE	0		14-Dec-20
MI-1020	BLDG FOUNDATION/SUBSTRUCTURE COMPI	0		08-Feb-21
MI-1040	STRUCTURAL STEEL COMPLETE	0		01-Jul-21
MI-1060	BUILDING DRIED-IN	0		09-Aug-21
MI-1100	BUILDING ENERGIZED	0		08-Dec-21
MI-1080	ENCLOSURE COMPLETE	0		07-Jan-22
MI-1120	HVAC OPERATIONAL	0		14-Jan-22
SITEWORK		357	01-Oct-20	07-Jul-22
EARLY SITEWORK / MOBILIZATION		32	01-Oct-20	24-Nov-20
SW-1000	MOBILIZATION	10	01-Oct-20	16-Oct-20
SW-1020	LAYOUT FOR L.O.D. & S&EC	2	19-Oct-20	20-Oct-20
SW-1060	PERIMETER CONTROLS / TREE/INLET PROTE	10	22-Oct-20	06-Nov-20
SW-1040	SITE SECURITY FENCING	5	22-Oct-20	29-Oct-20
SW-1080	INTERIOR SITE SEC DEVICES & TRAPS / INSP	10	09-Nov-20	24-Nov-20
SITE UTILITIES		75	25-Nov-20	13-Apr-21
SW-2000	SANITARY MAINS	25	25-Nov-20	11-Jan-21
SW-2020	STORM MAINS	30	13-Jan-21	08-Mar-21
SW-2040	WATER MAINS	20	10-Mar-21	13-Apr-21
BUILDING PAD		10	25-Nov-20	14-Dec-20
BP-1000	CUT/FILL/CONSTRUCT BUILDING PAD	10	25-Nov-20	14-Dec-20
PHASE 1 SITE FINISHES		100	10-Jan-22	07-Jul-22
SW-3000	SITE/PRKG: FINAL GRADE/SITE ELEC ROUGH	10	10-Jan-22	28-Jan-22
SW-3020	SITE/PRKG: SITE CONCRETE / BASE / FINAL P.	60	31-Jan-22	16-May-22
SW-3040	SITE/PRKG: SITE LIGHTING / FURNISHING	10	18-May-22	02-Jun-22
SW-3060	SITE/PRKG: LANDSCAPE / BIO-RETENTION P(	20	03-Jun-22	07-Jul-22
DEMOLITION		120	21-Jun-22	09-Dec-22
EXISTING SCHOOL DEMOLITION / SITE RESTORATION		120	21-Jun-22	09-Dec-22
PHASE 2		35	21-Jun-22	09-Aug-22
D-20	DEMOLITION OF EXISTING SCHOOL	15	21-Jun-22	12-Jul-22
D-20	SITE DEMOLITION	3	23-Jun-22	27-Jun-22



Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

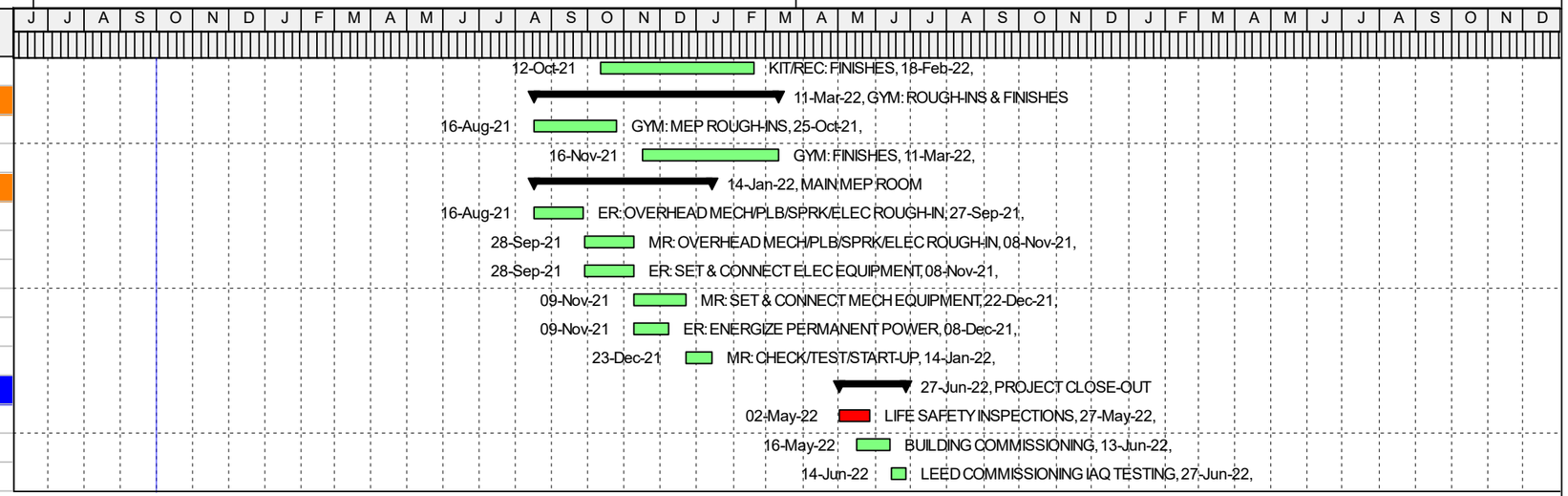
DUSTIN CONSTRUCTION

Activity ID	Activity Name	iginal ration	Start	Finish
D-21	GRADE BUS LOOP AND PARKING	5	28-Jun-22	05-Jul-22
D-20	UTILITIES	9	06-Jul-22	18-Jul-22
D-21	FINAL GRADE	2	19-Jul-22	20-Jul-22
D-20	SITE CONCRETE/ASPAHLT PAVING	9	21-Jul-22	02-Aug-22
D-20	LANDSCAPING / BIO-RETENTION	5	03-Aug-22	09-Aug-22
PHASE 3		90	03-Aug-22	09-Dec-22
D-30	DEMOLITION OF REMAINDER OF EXISTING S	15	03-Aug-22	23-Aug-22
D-30	SITE DEMOLITION	10	24-Aug-22	07-Sep-22
D-30	GRADING FOR PLAYAREAS	20	08-Sep-22	05-Oct-22
D-30	FENCING	10	06-Oct-22	19-Oct-22
D-30	LANDSCAPING / BIO-RETENTION	35	20-Oct-22	09-Dec-22
STRUCTURE		110	16-Dec-20	01-Jul-21
SUBSTRUCTURE		70	16-Dec-20	22-Apr-21
ST-1000	FOUNDATIONS TO SLAB ON GRADE	30	16-Dec-20	08-Feb-21
ST-1120	BEARING WALL	40	10-Feb-21	22-Apr-21
SUPERSTRUCTURE		40	23-Apr-21	01-Jul-21
ST-2000	STRUCTURE	40	23-Apr-21	01-Jul-21
ENCLOSURE		120	02-Jul-21	04-Feb-22
BUILDING ENCLOSURE		120	02-Jul-21	04-Feb-22
EN-1060	ROOFING BUILD OUT	20	02-Jul-21	09-Aug-21
EN-1000	INSULATION / AIR BARRIER	30	02-Jul-21	26-Aug-21
EN-1020	MASONRY VENEER	60	12-Jul-21	26-Oct-21
EN-1040	WINDOWS & EXTERIOR GLAZING	40	28-Oct-21	07-Jan-22
EN-1080	EXTERIOR PUNCHLIST	15	10-Jan-22	04-Feb-22
ROOFTOP UNITS		108	10-Aug-21	21-Feb-22
BUILDING ROOFTOP UNITS		108	10-Aug-21	21-Feb-22
RTU-100	SET ROOFTOP UNITS	5	10-Aug-21	17-Aug-21
RTU-102	MEP CONN'S TO ROOFTOP UNITS	30	19-Aug-21	08-Oct-21
RTU-104	START-UP ROOFTOP UNITS	20	17-Jan-22	21-Feb-22
ROUGH-INS & FINISHES		210	02-Jul-21	29-Apr-22
1ST FLOOR: ROUGH-INS & FINISHES		210	02-Jul-21	29-Apr-22
RF-1F-1(	1F: MEP ROUGH-INS / FRAMING	100	02-Jul-21	22-Nov-21
RF-1F-1(	1F: FINISHES	80	10-Jan-22	29-Apr-22
2ND FLOOR: ROUGH-INS & FINISHES		150	31-Aug-21	04-Apr-22
RF-2F-1(	2F: MEP ROUGH-INS / FRAMING	85	31-Aug-21	03-Jan-22
RF-2F-1(	2F: FINISHES	65	04-Jan-22	04-Apr-22
CAFETERIA/AUDITORIUM/GYM SUPPORT: ROUGH-INS		150	28-Sep-21	29-Apr-22
RF-C-10(	CAF/AUD/GS: MEP ROUGH-INS	70	28-Sep-21	07-Jan-22
RF-C-10	CAF/AUD/GS: FINISHES	50	21-Feb-22	29-Apr-22
KITCHEN/RECEIVING: ROUGH-INS & FINISHES		160	02-Jul-21	18-Feb-22
RF-KIT-1(	KIT/REC: MEP ROUGH-INS	70	02-Jul-21	11-Oct-21

Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

DUSTIN CONSTRUCTION

Activity ID	Activity Name	iginal ration	Start	Finish
RF-KIT-1(	KIT/REC: FINISHES	90	12-Oct-21	18-Feb-22
GYM: ROUGH-INS & FINISHES		145	16-Aug-21	11-Mar-22
RF-GYM-	GYM: MEP ROUGH-INS	50	16-Aug-21	25-Oct-21
RF-GYM-	GYM: FINISHES	80	16-Nov-21	11-Mar-22
MAIN MEP ROOM		105	16-Aug-21	14-Jan-22
MEP-10(	ER: OVERHEAD MECH/PLB/SPRK/ELEC ROU	30	16-Aug-21	27-Sep-21
MEP-20(	MR: OVERHEAD MECH/PLB/SPRK/ELEC ROU	30	28-Sep-21	08-Nov-21
MEP-10:	ER: SET & CONNECT ELEC EQUIPMENT	30	28-Sep-21	08-Nov-21
MEP-20:	MR: SET & CONNECT MECH EQUIPMENT	30	09-Nov-21	22-Dec-21
MEP-10-	ER: ENERGIZE PERMANENT POWER	20	09-Nov-21	08-Dec-21
MEP-20-	MR: CHECK/TEST/START-UP	15	23-Dec-21	14-Jan-22
PROJECT CLOSE-OUT		40	02-May-22	27-Jun-22
CO-1000	LIFE SAFETY INSPECTIONS	20	02-May-22	27-May-22
CO-1020	BUILDING COMMISSIONING	20	16-May-22	13-Jun-22
CO-1040	LEED COMMISSIONING IAQ TESTING	10	14-Jun-22	27-Jun-22



Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

DUSTIN CONSTRUCTION

SECTION 015000

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS
(Revised Addendum #3 - 7/2/20)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1. 2 SUMMARY

A. This Section includes requirements for construction facilities and temporary controls, including temporary utilities, support facilities, and security and protection.

B. The Contractors are advised that the existing School will be occupied during construction and temporary protection must be used to ensure safety of students and faculty.

C. Temporary utilities include, but are not limited to, the following:
1. Water service and distribution.
2. Temporary electric power and light.
3. Temporary conditioning.
4. Ventilation.
5. Sanitary facilities.

D. Support facilities include, but are not limited to, the following:
1. Field offices and storage sheds.
2. Temporary enclosures.
3. Hoists.
4. Temporary project identification sign.
5. Waste disposal services.
6. Construction aids and miscellaneous services and facilities.
7. Access roads/staging areas.

E. Security and protection facilities include, but are not limited to, the following:
1. Temporary fire protection.
2. Barricades, warning signs, and lights.
3. Environmental protection.

1. 3 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
1. Building code requirements.
2. Health and safety regulations.
3. Utility company regulations.
4. Police, fire department, and rescue squad rules.
5. Environmental protection regulations.

B. Standards: Comply with NFPA 241 “Standard for Safeguarding Construction, Alterations, and Demolition Operations,” ANSI A10 Series standards for “Safety Requirements for Construction and Demolition,” and NECA Electrical Design Library “Temporary Electrical Facilities.”

C. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service.

1. Install service in compliance with NFPA 70 “National Electric Code”.

D. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use.
   1. Obtain required certifications and permits.

1.4 PROJECT CONDITIONS

A. Temporary Utilities: At earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.

B. Conditions of Use:
   1. Keep temporary services and facilities clean and neat in appearance.
   2. Operate in safe and efficient manner.
   3. Relocate temporary services and facilities as work progresses.
   4. Do not overload facilities or permit them to interfere with progress.
   5. Take necessary fire-prevention measures.
   6. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials. If acceptable to the Architect, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.

B. Lumber and Plywood: Comply with requirements in Section 061000 - Rough Carpentry.
   1. For job-built temporary offices, shops, and sheds within construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding.
   2. For signs and directory boards, provide exterior-type, Grade B-B high-density concrete form overlay plywood of sizes and thicknesses indicated.

C. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less.
   1. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.

D. Water: Provide potable water approved by local health authorities.

2. 2 EQUIPMENT

A. General:
   1. Provide new equipment.
      a. If acceptable to the Architect, the Contractor may use undamaged, previously used equipment in serviceable condition.
   2. Provide equipment suitable for use intended.

B. Water Hoses:
   1. Provide 3/4-inch, heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet long, with pressure rating greater than maximum pressure of water distribution system.
   2. Provide adjustable shutoff nozzles at hose discharge.

C. Electrical Outlets:
   1. Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-Volt plugs into higher voltage outlets.

2. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.

D. Electrical Power Cords:
   1. Provide grounded extension cords; use hard-service cords where exposed to abrasion and traffic.
   2. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress.
   3. Do not exceed safe length-voltage ratio.

E. Lamps and Light Fixtures:
   1. Provide general service incandescent lamps of wattage required for adequate illumination.
   2. Provide guard cages or tempered-glass enclosures where exposed to breakage.
   3. Provide exterior fixtures where exposed to moisture.

F. Heating/Cooling Units: Provide temporary heating/cooling units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.

G. Temporary Offices

   1. Provide field office trailers as required with lockable entrances, operable windows, and serviceable finishes.
   2. Provide heated and air-conditioned units on foundations adequate for normal loading.
   3. Temporary Trailer Permit maybe required and should be anticipated.

H. Temporary Toilet Units:
   1. Provide self-contained, single-occupant toilet units of chemical, aerated recirculation, or combustion type.
   2. Provide units properly vented and fully enclosed with glass-fiber-reinforced polyester shell or similar nonabsorbent material.

I. Fire Extinguishers:
   1. Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces.
      a. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.
   2. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

J. Access Roads/Staging Areas: As shown on Site Utilization Plan at the end of this section. 8” of #2 Stone on Marafi 500 Stabilization Fabric.

K. Temporary Erosion and Sediment Control as required.

L. Waste Disposal Facilities:
   1. Containers will be provided on the Site to handle waste from construction activities.
   2. The Contractors are required to containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from salvageable and recycled waste materials.
   3. Comply with Section 015050 - Construction Waste Management for required procedures.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Use qualified personnel for installation of the Temporary Facilities.
   1. Locate the Facilities where they will serve the Project adequately and result in minimum interference of construction operations.
   2. Relocate and modify the Facilities as required.

B. Provide each Facility ready for use when needed to avoid delay.
   1. Maintain and modify as required.
   2. Do not remove until the Facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3. 2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service. Where company provides only part of service, provide remainder with matching, compatible materials and equipment. Comply with company recommendations.
   1. Arrange with the Owner for time when service can be interrupted, if necessary, to make connections for temporary services.
   2. Provide adequate capacity at each stage of construction.
   3. Use Charges: Cost of some use charges for temporary facilities may not be chargeable to the Owner.

B. Water Service: The Mechanical Contractor shall provide water service as required for completion of the Work from existing system or portable system as indicated.

C. Temporary Electric Power Service: The Electrical Contractor shall provide electric service as required for completion of the Work.

D. Temporary Lighting:
   1. The Electrical Contractor shall provide lighting as required for completion of the Work.
   2. Temporary light levels by the Electrical Contractor are to meet levels required by safety regulations or as indicated within the Contract Documents.
   3. Relocate as work progresses.
   4. If higher light levels are required for specific trades, i.e., painting, tile, drywall, the Trade Contractor doing task is to supplement with light stands.

E. Temporary Heat/Cooling:
   1. The Mechanical Contractor shall provide ventilation, and air conditioning as required, for completion of the Work.
   2. Existing systems possibly (with Owner-approval) can be utilized to extent that continued use of the School is not compromised.
   3. The Contractors shall supplement as required.

F. Toilets:
   1. The Construction Manager will provide temporary toilets for trades use.

G. Drinking Water Facilities: Each Contractor will make its own provisions for bottled drinking water units, including paper supply.

H. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

3.3 SUPPORT FACILITIES INSTALLATION

A. Locate field offices, storage sheds, and other temporary construction and support facilities for easy access.
   1. Maintain support facilities until near time of Substantial Completion.
   2. Remove prior to Substantial Completion.
   3. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under certain conditions, with approval by the Owner.

B. Provide incombustible construction for offices, shops, and sheds located within construction area, or within 30 feet of the Building lines.
   1. Comply with requirements of NFPA 241.

C. Field Offices:
   1. Provide insulated, weather-tight temporary offices of sufficient size to accommodate required office personnel at the Project site.
   2. Keep office used for the Progress Meetings clean and orderly.

D. Contractor's Field Office: Provide adequate space for field office personnel as required for completion of its Work.

E. Storage and Fabrication Sheds:
   1. Install storage and fabrication sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility service.
   2. Sheds may be open shelters or fully enclosed spaces within the Building or elsewhere on the Site.

F. Temporary Enclosures:
   1. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
      a. Where heat is needed and the permanent Building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
      b. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 sq ft or less with plywood or similar materials.
      c. Close openings through floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
      d. Where temporary wood or plywood enclosure exceeds 100 sq ft in area, use UL-labeled, fire-retardant-treated material for framing and main sheathing.
   2. Provide temporary pedestrian tunnels through work areas as required and indicated in the Contract Documents.

H. Temporary Lifts and Hoists:
   1. Provide facilities for hoisting materials and employees.
   2. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

I. Project Identification and Temporary Signs:
   1. Furnish and install the Project Identification Sign in accordance with the IAC Administrative Procedures Guide (APG), Appendix E. See attachment at end of this Section.
   2. Install signs where indicated to inform the Public and persons seeking entrance to the Project.
   3. Support on posts or framing of preservative-treated wood or steel.
   4. Do not permit installation of unauthorized signs.
   5. No sign or advertisement shall be displayed without the Owner's/Construction Manager approval.
   6. Obtain all sign permits, as required by the Local Authorities.
   7. The Contractor to install County and State signs in locations directed by the Owner within one month of the Contract Award Date.
   8. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.

J. Temporary Exterior Lighting:
   1. The Electrical Contractor will light any temporary emergency exit tunnels, if tunnels are shown and/or required by the Contract Documents.

K. Collection and Disposal of Waste:

1. Collect waste from construction areas and elsewhere daily.
2. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly.
3. Do not hold materials more than 7 days during normal weather or 3 days when temperature is expected to rise above 80 deg F.
4. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly.
5. Dispose of material lawfully and as specified in Section 015050 - Construction Waste Management.

L. The 02A Contractor will build, maintain, remove, and restore access roads and staging areas for use of all Contractors that are shown on the Contract Documents, as indicated in the Bid Packages Section and the Site Logistics Plan at the end of this section. If other roads are needed, they are the responsibility of the Contractor requiring access.

3. 4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities at each phase until time of Substantial Completion.

B. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of types needed to protect against reasonably predictable and controllable fire losses.
1. Comply with NFPA 10 “Standard for Portable Fire Extinguishers” and NFPA 241 “Standard for Safeguarding Construction, Alterations, and Demolition Operations”.

C. Permanent Fire Protection: At earliest feasible date in each phase of the Project, complete installation of permanent fire protection facilities, including connected services, and place into operation and use. Instruct key Owner-personnel on use of the Facilities.

D. Barricades, Warning Signs, and Lights:
1. Comply with standards and code requirements for erection of structurally adequate barricades.
2. Paint with appropriate colors, graphics, and warning signs to inform personnel and the Public of hazard being protected against.
3. Where appropriate and needed, provide lighting, including flashing red or amber lights.

E. Security Enclosure and Lockup:
1. Install substantial temporary enclosure of partially completed areas of construction.
   a. Provide locking entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
2. Where the Materials and Equipment must be stored, and are of value or attractive for theft, provide secure lockup.
3. Enforce discipline in connection with installation and release of the Materials to minimize opportunity for theft and vandalism.
4. Each Contractor is responsible for its own security.
5. The 02A Contractor will install temporary fencing, where indicated in the Contract Documents.

F. Environmental Protection: Provide protection, operate the Temporary Facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the Site.

3. 5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of the Temporary Facilities. Limit availability of the Temporary Facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain the Facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
   1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
   2. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

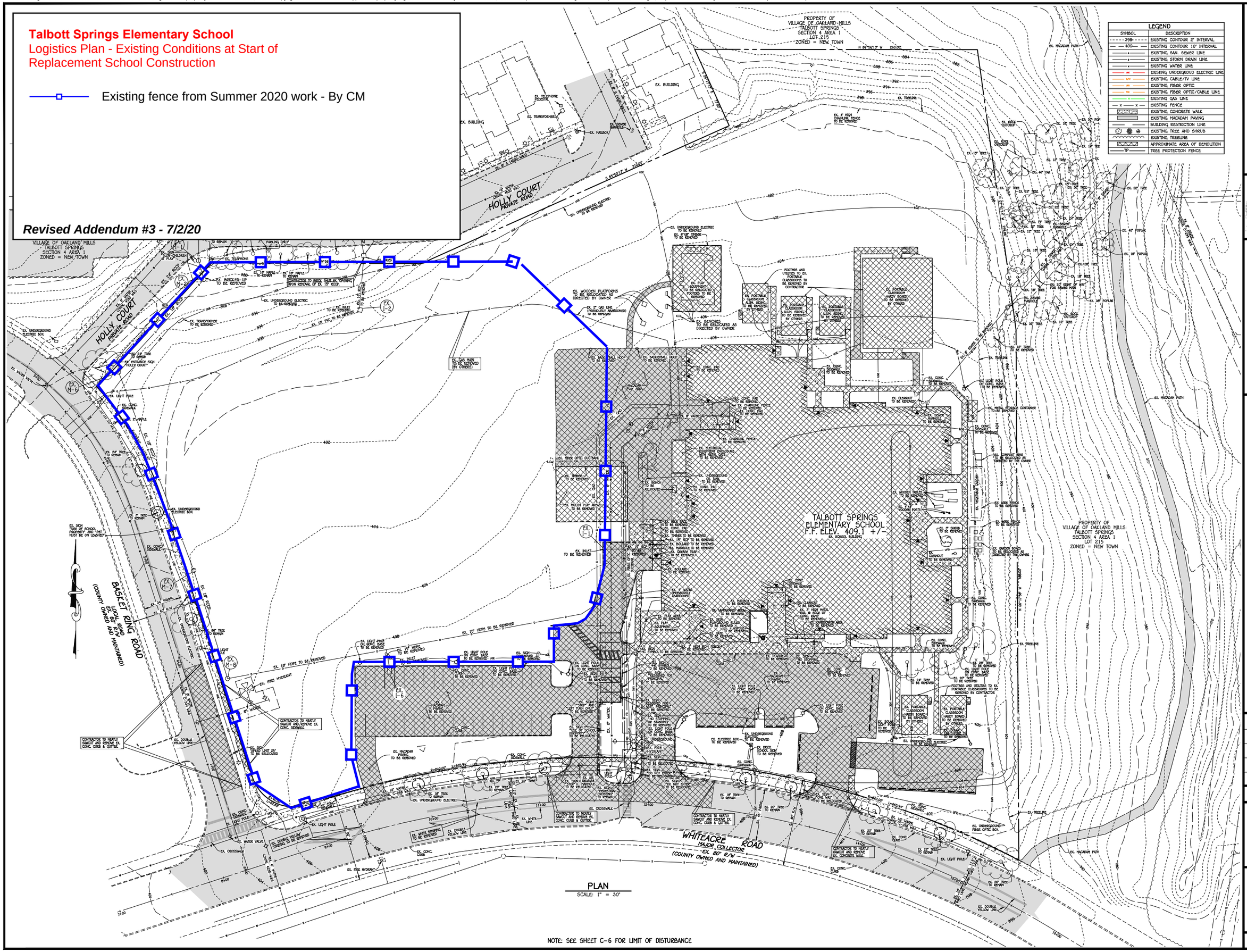
C. Termination and Removal:
   1. Unless the Architect and/or Construction Manager request that it be maintained longer, remove each Temporary Facility when need has ended, when replaced by authorized use of permanent facility, or no later than time of Substantial Completion.
   2. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the Temporary Facility.
   3. Repair any damaged work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
   4. Materials and facilities that constitute the Temporary Facilities are the Contractor's property.
      a. The Owner reserves right to take possession of the Project Identification Signs.
   5. Remove temporary paving not intended for or acceptable for integration into permanent paving.
      a. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil in area.
      b. Remove materials contaminated with road oil, asphalt, and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns, repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by the Governing Authority.
   6. At time of Substantial Completion, clean and renovate permanent facilities used during construction period including, but not limited to, the following:
      a. Replace air filters and clean inside of ductwork and housing.
      b. Replace significantly worn parts and parts subject to unusual operating conditions.
      c. Replace lamps burned out or noticeably dimmed by hours of use.
      d. Flush sprinkler and heating pipes and clean strainers.

END OF SECTION

Talbott Springs Elementary School
Logistics Plan - Existing Conditions at Start of Replacement School Construction

Existing fence from Summer 2020 work - By CM

Revised Addendum #3 - 7/2/20



NOTE: SEE SHEET C-6 FOR LIMIT OF DISTURBANCE

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NEW TALBOTT SPRINGS ELEMENTARY SCHOOL
COLUMBIA, MARYLAND
HOWARD COUNTY PUBLIC SCHOOL SYSTEM

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IAC CD / BLDG PERMIT SET 10 APRIL 20

NOT FOR CONSTRUCTION FOR REVIEW ONLY

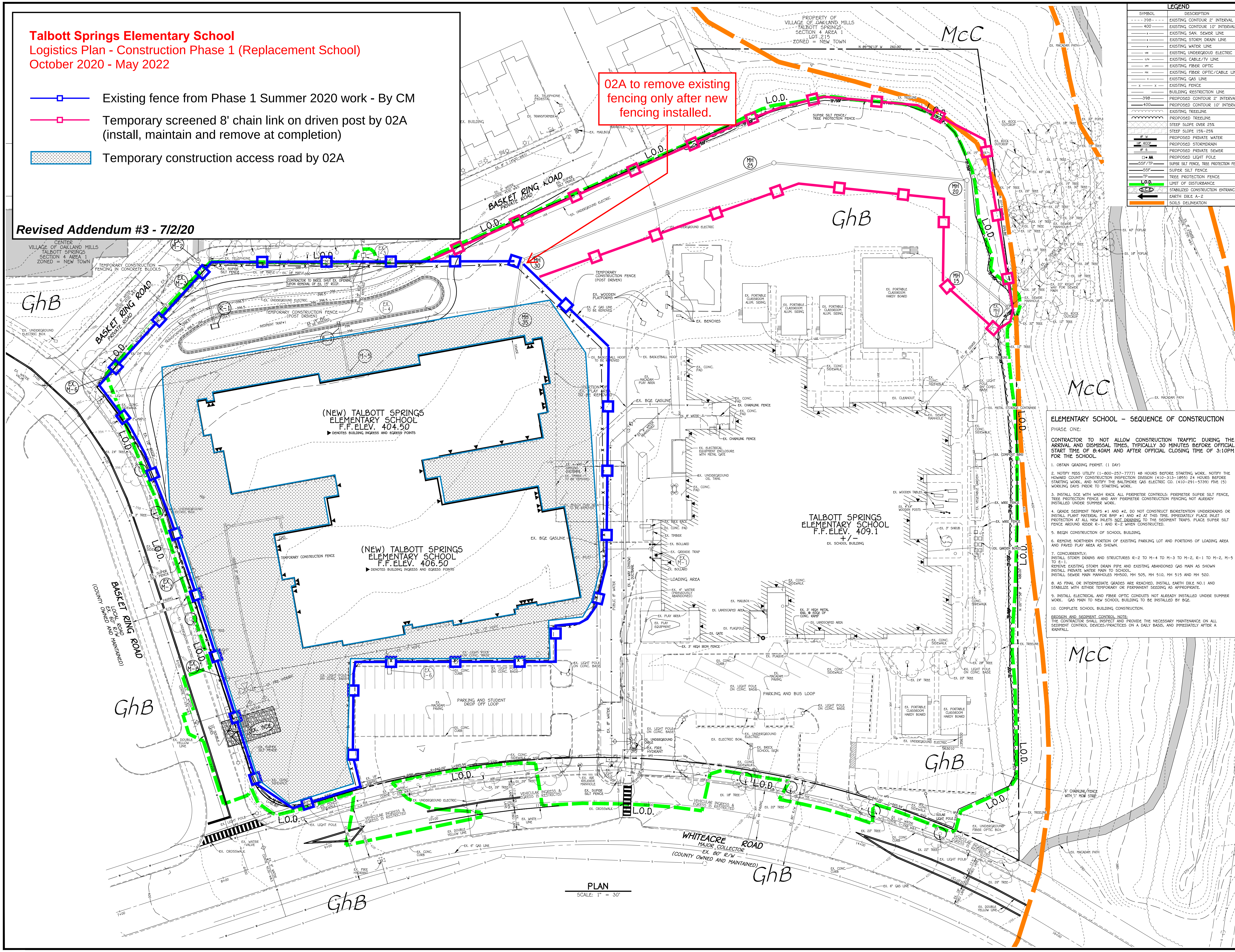
OVERALL DEMOLITION PLAN

C-3

Talbott Springs Elementary School
Logistics Plan - Construction Phase 1 (Replacement School)
October 2020 - May 2022

- Existing fence from Phase 1 Summer 2020 work - By CM
- Temporary screened 8' chain link on driven post by 02A (install, maintain and remove at completion)
- Temporary construction access road by 02A

Revised Addendum #3 - 7/2/20



SYMBOL	DESCRIPTION
398	EXISTING CONTOUR 2' INTERVAL
400	EXISTING CONTOUR 10' INTERVAL
S	EXISTING SAN. SEWER LINE
D	EXISTING STORM DRAIN LINE
W	EXISTING WATER LINE
UGE	EXISTING UNDERGROUD ELECTRIC LINE
C/TV	EXISTING CABLE/TV LINE
UFO	EXISTING FIBER OPTIC
FOC	EXISTING FIBER OPTIC/CABLE LINE
G	EXISTING GAS LINE
X X	EXISTING FENCE
	BUILDING RESTRICTION LINE
398	PROPOSED CONTOUR 2' INTERVAL
400	PROPOSED CONTOUR 10' INTERVAL
	EXISTING TREELINE
	PROPOSED TREELINE
	STEEP SLOPE OVER 25%
	STEEP SLOPE 15%-25%
8" W	PROPOSED PRIVATE WATER
18" RCCP	PROPOSED STORMDRAIN
8" S	PROPOSED PRIVATE SEWER
AA	PROPOSED LIGHT POLE
SSF/TP	SUPER SILT FENCE, TREE PROTECTION FENCE
SSF	SUPER SILT FENCE
TP	TREE PROTECTION FENCE
L.O.D.	LIMIT OF DISTURBANCE
S.C.E.	STABILIZED CONSTRUCTION ENTRANCE
	EARTH DIKE A-2
	SOILS DELINEATION

ELEMENTARY SCHOOL – SEQUENCE OF CONSTRUCTION

PHASE ONE:

CONTRACTOR TO NOT ALLOW CONSTRUCTION TRAFFIC DURING THE ARRIVAL AND DISMISSAL TIMES, TYPICALLY 30 MINUTES BEFORE OFFICIAL START TIME OF 8:40AM AND AFTER OFFICIAL CLOSING TIME OF 3:10PM FOR THE SCHOOL.

1. OBTAIN GRADING PERMIT. (1 DAY)
2. NOTIFY MISS UTILITY (1-800-257-7777) 48 HOURS BEFORE STARTING WORK. NOTIFY THE HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION (410-313-1855) 24 HOURS BEFORE STARTING WORK, AND NOTIFY THE BALTIMORE GAS ELECTRIC CO. (410-291-5739) FIVE (5) WORKING DAYS PRIOR TO STARTING WORK.
3. INSTALL SCE WITH WASH RACK ALL PERIMETER CONTROLS: PERIMETER SUPER SILT FENCE, TREE PROTECTION FENCE AND ANY PERIMETER CONSTRUCTION FENCING NOT ALREADY INSTALLED UNDER SUMMER WORK.
4. GRADE SEDIMENT TRAPS #1 AND #2, DO NOT CONSTRUCT BIORETENTION UNDERDRAINS OR INSTALL PLANT MATERIAL FOR BMP #1 AND #2 AT THIS TIME. IMMEDIATELY PLACE INLET PROTECTION AT ALL NEW INLETS NOT DRAINING TO THE SEDIMENT TRAPS. PLACE SUPER SILT FENCE AROUND RISER R-1 AND R-2 WHEN CONSTRUCTED.
5. BEGIN CONSTRUCTION OF SCHOOL BUILDING.
6. REMOVE NORTHERN PORTION OF EXISTING PARKING LOT AND PORTIONS OF LOADING AREA AND PAVED PLAY AREA AS SHOWN.
7. CONCURRENTLY;
INSTALL STORM DRAINS AND STRUCTURES R-2 TO M-4 TO M-3 TO M-2, R-1 TO M-2, M-5 TO E-1.
REMOVE EXISTING STORM DRAIN PIPE AND EXISTING ABANDONED GAS MAIN AS SHOWN
INSTALL PRIVATE WATER MAIN TO SCHOOL.
INSTALL SEWER MAIN MANHOLES MH500, MH 505, MH 510, MH 515 AND MH 520.
8. AS FINAL OR INTERMEDIATE GRADES ARE REACHED, INSTALL EARTH DIKE NO.1 AND STABILIZE WITH EITHER TEMPORARY OR PERMANENT SEEDING AS APPROPRIATE.
9. INSTALL ELECTRICAL AND FIBER OPTIC CONDUITS NOT ALREADY INSTALLED UNDER SUMMER WORK. GAS MAIN TO NEW SCHOOL BUILDING TO BE INSTALLED BY BGE.
10. COMPLETE SCHOOL BUILDING CONSTRUCTION.

EROSION AND SEDIMENT CONTROL NOTE:
THE CONTRACTOR SHALL INSPECT AND PROVIDE THE NECESSARY MAINTENANCE ON ALL SEDIMENT CONTROL DEVICES/PRACTICES ON A DAILY BASIS, AND IMMEDIATELY AFTER A RAINFALL.

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NEW TALBOTT SPRINGS ELEMENTARY SCHOOL
COLUMBIA, MARYLAND
HOWARD COUNTY PUBLIC SCHOOL SYSTEM

revisions
IAC CD / BLDG PERMIT SET 1 MAY 20

BID AND CONSTRUCTION 16 JUNE 20

DEMOLITION, SEDIMENT, AND EROSION CONTROL PLAN PHASE 1

C-6

I:\2003\03007\Engineering\Dwgs\03007 2019 CD-6 SEDIMENT CONTROL PLAN (PHASE 1).dwg, SHEET C-6, 6/15/2020 11:49:44 AM, 1:1

Talbott Springs Elementary School
Logistics Plan - Construction Phase 2
June 2022 - August 2022

Temporary screened 8' chain link on driven post by 02A (install, maintain and remove at completion)

Note: 02A to remove all previously installed temporary measures including fences, gates, access roads, etc.

Revised Addendum #3 - 7/2/20

02A to provide temporary sump/pump out for drains that discharge into future phases of construction until final connection can be completed

02A to include 2EA, 20LF rolling gates at locations to be determined by CM.

PLAN
SCALE: 1" = 30'

LEGEND

SYMBOL	DESCRIPTION
398	EXISTING CONTOUR 2' INTERVAL
400	EXISTING CONTOUR 10' INTERVAL
S	EXISTING SAN. SEWER LINE
D	EXISTING STORM DRAIN LINE
W	EXISTING WATER LINE
UE	EXISTING UNDERGROUD ELECTRIC LINE
CTV	EXISTING CABLE/TV LINE
UFO	EXISTING FIBER OPTIC
FO	EXISTING FIBER OPTIC/CABLE LINE
G	EXISTING GAS LINE
x x	EXISTING FENCE
	BUILDING RESTRICTION LINE
398	PROPOSED CONTOUR 2' INTERVAL
400	PROPOSED CONTOUR 10' INTERVAL
	EXISTING TREELINE
	PROPOSED TREELINE
	STEEP SLOPE OVER 25%
	STEEP SLOPE 15%-25%
6" V	PROPOSED PRIVATE WATER
18" RCCP	PROPOSED STORMDRAIN
18" RCCP	STORMDRAIN BUILT UNDER PRIOR PHASE
8" S	PROPOSED PRIVATE SEWER
	PROPOSED LIGHT POLE
SSF/TP	SUPER SILT FENCE, TREE PROTECTION FENCE
SSF	SUPER SILT FENCE
TP	TREE PROTECTION FENCE
L.O.D.	LIMIT OF DISTURBANCE
SCE	STABILIZED CONSTRUCTION ENTRANCE
	EARTH DIKE A-2
	SOILS DELINEATION

ELEMENTARY SCHOOL – SEQUENCE OF CONSTRUCTION

NOTE: CONTRACTOR TO NOT ALLOW CONSTRUCTION TRAFFIC DURING THE ARRIVAL AND DISMISSAL TIMES, TYPICALLY 30 MINUTES BEFORE OFFICIAL START TIME OF 8:40AM AND AFTER OFFICIAL CLOSING TIME OF 3:10PM FOR THE SCHOOL.

PHASE TWO:

11. INSTALL SEDIMENT TRAP 2. INSTALL EARTH DIKE TO SEDIMENT TRAP.

12. CONCURRENTLY:
REMOVE ALL EXISTING SMALL PORTABLE CLASSROOMS. BEGIN REMOVAL OF A PORTION OF THE EXISTING SCHOOL BUILDING AND SIDEWALKS AS NOTED ON PLANS. REMOVE EXISTING PARKING AND PARENT DROP OFF LOOP AND INSTALL CURB AND GUTTER AND BASE PAVING FOR THE NEW PARKING / BUS LOOP AND SERVICE AREA.

13. INSTALL SIDEWALKS AND LIGHTING ALONG SOUTH AND WEST SIDES OF SCHOOL.

14. ALL CONSTRUCTION WASTE GENERATED FROM THE DEMOLITION OF THE EXISTING SCHOOL BUILDING SHALL BE COMBINED TOGETHER IN COMMON BINS AND TRANSFERRED BY AN INDEPENDENT RECYCLER TO A MATERIALS RECOVERY FACILITY (MRF) FOR REMOTE SORTING AND WEIGHING OF ALL WASTE INCLUDING WASTE WHICH IS DIVERTED FROM LANDFILLS AND COMPLY WITH THE CONSTRUCTION WASTE MANAGEMENT GOALS FOR THIS PROJECT.

15. CONCURRENTLY:
REMOVE PHASE 1 PORTION OF EXISTING BUS LOOP / PARKING AND GRADE NEW PARKING LOT. CONSTRUCT SEDIMENT TRAP #3. INSTALL STORM DRAINS AND STRUCTURES I-1 TO E-4, I-3 TO R-5 TO R-4 TO R-3 TO M-9 TO E-2,E-6 TO EX. M-7, R-7 TO EX. M-8, I-4 TO E-3, TRENCH DRAIN AND PIPING TO M-9. INSTALL CURB AND GUTTER AND BASE PAVING FOR NEW PARKING AREA AND STUDENT DROP OFF LOOP.

16. INSTALL SURFACE PAVING ALL AREAS. STRIPE PARKING SPACES, PEDESTRIAN CROSSWALKS, HANDICAP AREAS, ONE WAY MARKINGS, AND FIRE LANES.

EROSION AND SEDIMENT CONTROL NOTE:
THE CONTRACTOR SHALL INSPECT AND PROVIDE THE NECESSARY MAINTENANCE ON ALL SEDIMENT CONTROL DEVICES/PRACTICES ON A DAILY BASIS, AND IMMEDIATELY AFTER A RAINFALL.

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NEW TALBOTT SPRINGS ELEMENTARY SCHOOL
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HOWARD COUNTY PUBLIC SCHOOL SYSTEM

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SEDIMENT AND EROSION CONTROL PLAN PHASE 2

C-8

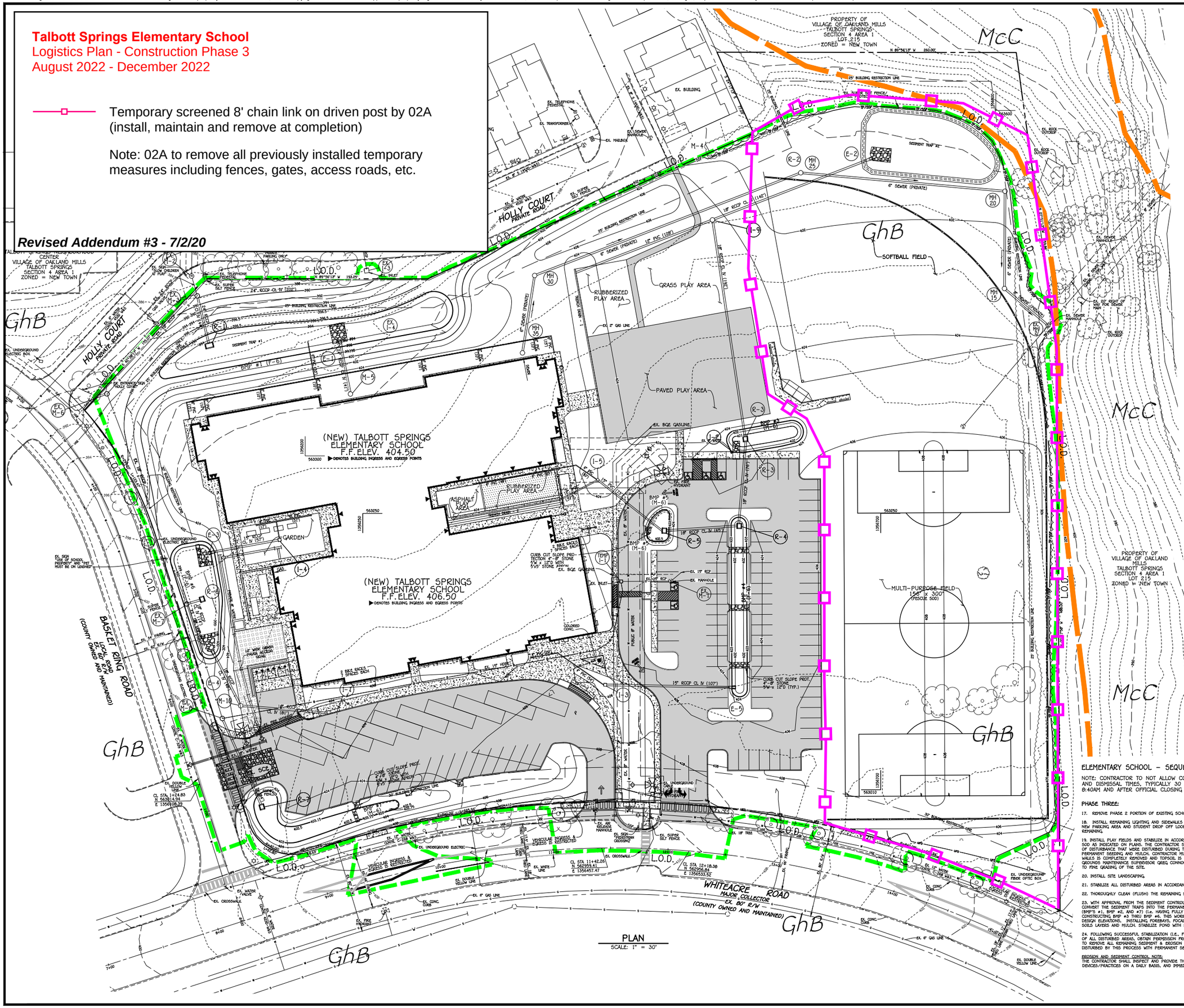
8 OF 21
PROJECT NO. 1801

Talbott Springs Elementary School
Logistics Plan - Construction Phase 3
August 2022 - December 2022

Temporary screened 8' chain link on driven post by 02A (install, maintain and remove at completion)

Note: 02A to remove all previously installed temporary measures including fences, gates, access roads, etc.

Revised Addendum #3 - 7/2/20



PLAN
SCALE: 1" = 30'

LEGEND	
SYMBOL	DESCRIPTION
398	EXISTING CONTOUR 2' INTERVAL
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	EXISTING TREELINE
	PROPOSED TREELINE
	STEEP SLOPE OVER 25%
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8" W	PROPOSED PRIVATE WATER
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L.O.D.	LIMIT OF DISTURBANCE
SCE	STABILIZED CONSTRUCTION ENTRANCE
	SOILS DELINEATION

ELEMENTARY SCHOOL - SEQUENCE OF CONSTRUCTION

NOTE: CONTRACTOR TO NOT ALLOW CONSTRUCTION TRAFFIC DURING THE ARRIVAL AND DISMISSAL TIMES, TYPICALLY 30 MINUTES BEFORE OFFICIAL START TIME OF 8:40AM AND AFTER OFFICIAL CLOSING TIME OF 3:10PM FOR THE SCHOOL.

PHASE THREE:

17. REMOVE PHASE 2 PORTION OF EXISTING SCHOOL BUILDING AND LARGE PORTABLE CLASSROOM.

18. INSTALL REMAINING LIGHTING AND SIDEWALKS NOT ALREADY INSTALLED AND UPON COMPLETION OF NEW PARKING AREA AND STUDENT DROP OFF LOOP, REMOVE PHASE 2 EXISTING BUS LOOP / PARKING REMAINING.

19. INSTALL PLAY FIELDS AND STABILIZE IN ACCORDANCE WITH THE PERMANENT SEEDING AND MULCH AND SOD AS INDICATED ON PLANS. THE CONTRACTOR SHALL ALSO FINE GRADE ALL AREAS WITHIN THE LIMITS OF DISTURBANCE THAT WERE DISTURBED DURING THE BUILDING CONSTRUCTION AND STABILIZE WITH PERMANENT SEEDING AND MULCH. CONTRACTOR MUST ENSURE ALL GRAVEL USED FOR PARKING LOT AND WALKS IS COMPLETELY REMOVED AND TOPSOIL IS SCREENED AND PLACED ON THE FIELDS. CONTACT GROUNDS MAINTENANCE SUPERVISOR GREG CONNOR AT 410-313-2577 FOR INSPECTION ONE WEEK PRIOR TO FINE GRADING OF THE SITE.

20. INSTALL SITE LANDSCAPING.

21. STABILIZE ALL DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDING SPECIFICATIONS.

22. THOROUGHLY CLEAN (FLUSH) THE REMAINING STORM DRAIN SYSTEMS.

23. WITH APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR, CONSTRUCT OUTFALL FOR BMP#2 AND CONVERT THE SEDIMENT TRAPS INTO THE PERMANENT SWM FACILITIES IN ACCORDANCE WITH SHEET C-4 (BMP'S #1, BMP #2, AND #7) (i.e. HAVING FULLY ESTABLISHED 3" GRASS OR PAVEMENT) AS WELL AS CONSTRUCTING BMP #3 THRU BMP #6. THIS WORK INCLUDES, REMOVING SEDIMENT, RE-GRADING TO DESIGN ELEVATIONS, INSTALLING FOREBAYS, FOCAL POINT SYSTEM, UNDERDRAINS, STONE AND PLANTING SOILS LAYERS AND MULCH. STABILIZE POND WITH PERMANENT SEEDING AND INSTALL SWM LANDSCAPING.

24. FOLLOWING SUCCESSFUL STABILIZATION (I.E., FULLY-ESTABLISHED VEGETATION (3" GRASS OR PAVING) OF ALL DISTURBED AREAS, OBTAIN PERMISSION FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR TO REMOVE ALL REMAINING SEDIMENT & EROSION CONTROL DEVICES AND THEN STABILIZE THOSE AREAS DISTURBED BY THIS PROCESS WITH PERMANENT SEEDING.

EROSION AND SEDIMENT CONTROL NOTE:
THE CONTRACTOR SHALL INSPECT AND PROVIDE THE NECESSARY MAINTENANCE ON ALL SEDIMENT CONTROL DEVICES/PRACTICES ON A DAILY BASIS, AND IMMEDIATELY AFTER A RAINFALL.

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SEDIMENT AND EROSION CONTROL PLAN PHASE 3

C-9

9 OF 21
PROJECT NO. 1801

RFI Summary Log

Grouped by Trade Contractor

Talbott Springs Elementary School **Project # 147** **Dustin Construction, Inc.**

RFI #	Subject	Date Submitted	Date Req'd	Date Resp	Days Late
000.PB 009	Alternates	6/25/2020	7/2/2020		
000.PB 010	02A Engineer's Estimate	6/25/2020	7/2/2020		
000.PB 011	Sitework	6/25/2020	7/2/2020		
000.PB 012	Site Visit	6/25/2020	7/2/2020		
000.PB 013	Permit	6/25/2020	7/2/2020		
000.PB 014	Alternate Assignment	6/25/2020	7/2/2020		
000.PB 015	HAZMAT Report	6/25/2020	7/2/2020		
Action Electrical Contractors					
000.PB 006	Photovoltaic Collector Installer	6/25/2020	7/2/2020	7/2/2020	0
000.PB 022	Computer Relocation	6/30/2020	7/7/2020		
BoMark Electric					
000.PB 002	LDC Screens	6/23/2020	6/30/2020	7/2/2020	2
000.PB 028	MC Fire Alarm Cable	7/1/2020	7/8/2020		
Bowen and Kron Enterprises, Inc.					
000.PB 043	Security and Fire Watch	7/2/2020	7/9/2020		
000.PB 044	Existing Building	7/2/2020	7/9/2020		
Engineered Construction Products, Inc.					
000.PB 035	Storefront Items	7/2/2020	7/9/2020		
Glass Concepts					
000.PB 005	Storefront	6/25/2020	7/2/2020	7/2/2020	0

RFI #	Subject	Date Submitted	Date Req'd	Date Resp	Days Late
Glass Industries					
000.PB 030	Aluminum Door Hardware	7/1/2020	7/8/2020		
000.PB 031	Storefront Questions	7/1/2020	7/8/2020		
Gray & Son, Inc.					
000.PB 036	Existing Building Conditions	7/2/2020	7/9/2020		
Interior Specialists					
000.PB 027	Demolition Specific Scope	7/1/2020	7/8/2020		
Interstate Corporation					
000.PB 020	Roof Accessories	6/29/2020	7/6/2020		
000.PB 021	Skylights	6/29/2020	7/6/2020		
Key Systems					
000.PB 003	Generator Clarifications	6/23/2020	6/30/2020	7/2/2020	2
000.PB 032	16A Specific Scope	7/1/2020	7/8/2020		
Master Care Flooring					
000.PB 001	096400 - Wood Flooring Substitution Request	6/22/2020	6/29/2020	7/2/2020	3

RFI Summary Log
Grouped by Trade Contractor

RFI #	Subject	Date Submitted	Date Req'd	Date Resp	Days Late
P. Flanigan and Sons					
000.PB 037	Mill and Overlay	7/2/2020	7/9/2020		
RD Bean					
000.PB 023	Skylights	7/1/2020	7/8/2020		
000.PB 024	Hot Asphalt Scheduling	7/1/2020	7/8/2020		
000.PB 025	Skylight Controls	7/1/2020	7/8/2020		
000.PB 026	Roofer Wage Rate	7/1/2020	7/8/2020		
Ross Contracting, Inc.					
000.PB 045	02A Specific Scope Clarifications	7/2/2020	7/9/2020		
000.PB 046	02C Specific Scope Clarifications	7/2/2020	7/9/2020		
The Crown Electric Company					
000.PB 033	MBE Requirements	7/1/2020	7/8/2020		
000.PB 034	Electrical Service	7/1/2020	7/8/2020		
000.PB 052	Div 27 Manufacturer	7/2/2020	7/9/2020		
TJ Distributors					
000.PB 029	Gymnasium Equipment	7/1/2020	7/8/2020		
Towson Mechanical					
000.PB 004	Cross Reference Clarifications	6/23/2020	6/30/2020	7/2/2020	2
000.PB 007	Moving Scope of Work	6/25/2020	7/2/2020		
000.PB 008	Door Operator Substitution	6/25/2020	7/2/2020	7/2/2020	0
Urban Zink					
000.PB 038	Rock Removal	7/2/2020	7/9/2020		
000.PB 039	02A Specific Scope	7/2/2020	7/9/2020		

RFI #	Subject	Date Submitted	Date Req'd	Date Resp	Days Late
000.PB 040	Outdoor Structures	7/2/2020	7/9/2020		
000.PB 041	Topsoil	7/2/2020	7/9/2020		
000.PB 042	As-Built Drawings	7/2/2020	7/9/2020	7/2/2020	-7

William F. Klingensmith

000.PB 016	Specification Cross Reference	6/29/2020	7/6/2020	7/2/2020	-4
000.PB 017	01A Scope Items	6/29/2020	7/6/2020		
000.PB 018	Temporary Electric for Trailer	6/29/2020	7/6/2020		

RFI Summary Log
Grouped by Trade Contractor

RFI #	Subject	Date Submitted	Date Req'd	Date Resp	Days Late
000.PB 019	Form of Proposal - Subcontractors	6/29/2020	7/6/2020		
000.PB 047	Concrete Pavers	6/29/2020	7/6/2020		
000.PB 048	Plumbing Fixture Trim	7/2/2020	7/9/2020		
000.PB 049	Wall Types	7/2/2020	7/9/2020		
000.PB 050	Gypsum Board	7/2/2020	7/9/2020		
000.PB 051	Drywall Finishing	7/2/2020	7/9/2020		

Request for Information 000.PB001

Detailed RFI

Talbott Springs Elementary School
9550 Basket Ring Road
Columbia, MD 21045

Project # 147

Dustin Construction, Inc.

RFI #: 000.PB001 **Date Submitted: 6/22/2020**

Answer Company	Answered By	Author Company
TCA Architects 1369 Generals Highway Crownsville, MD 21032	Jim Davis	Master Care Flooring, Inc 4000 Coolidge Avenue Baltimore, MD 21229

Author RFI Number

Subject	Trade Contractor
096400 - Wood Flooring Substitution Request	Master Care Flooring

Cc:	Company Name	Contact Name	Copies	Notes

Question **Date Required: 6/29/2020**

Please advise if Action Floor Systems is an approved manufacturer for Specification Section 096400.

Suggestion

Answer **Date Answered:**

The owner will not consider substitutions of materials, systems or equipment as specified in the proposed Contract Documents during the bidding period. for additional information on submitting substitution requests, refer to 00 2000 / INSTRUCTIONS TO BIDDERS; AIA Document A107, Section 3.3 - SUBSTITUTIONS.

June 26, 2020

- found on page 22 (of 1164) - "BID_SPECS_VOL_1_TSES.pdf"

June 17, 2020

TCA Architects
1369 Generals Highway
Crownsville, MD 21032

Re: Talbott Springs Elementary School – **Approval Request**
Columbia, MD **Section 096400 – Wood Flooring**

Dear Sir:

Attached please find Action Floor Systems Excel NR floor system submitted for consideration as an equal to the Robbins Eclipse floating floor system as covered under Section 096400 Wood Flooring.

Action's Eclipse NR floor system uses the same factory assembled subfloor system with 7/16" resilient pads attached to sub-floor panel and 25/32" x 2 1/4" 2nd btr grade FSC certified MFMA maple strip flooring.

Specifications, cut sheet, system data sheet, systems comparison sheet, Floor Score certificate, FSC certification and substitution request attached.

Thank you for you for reviewing this substitution request.

Sincerely,

David L. Fields
Regional Representative
Action Floor Systems

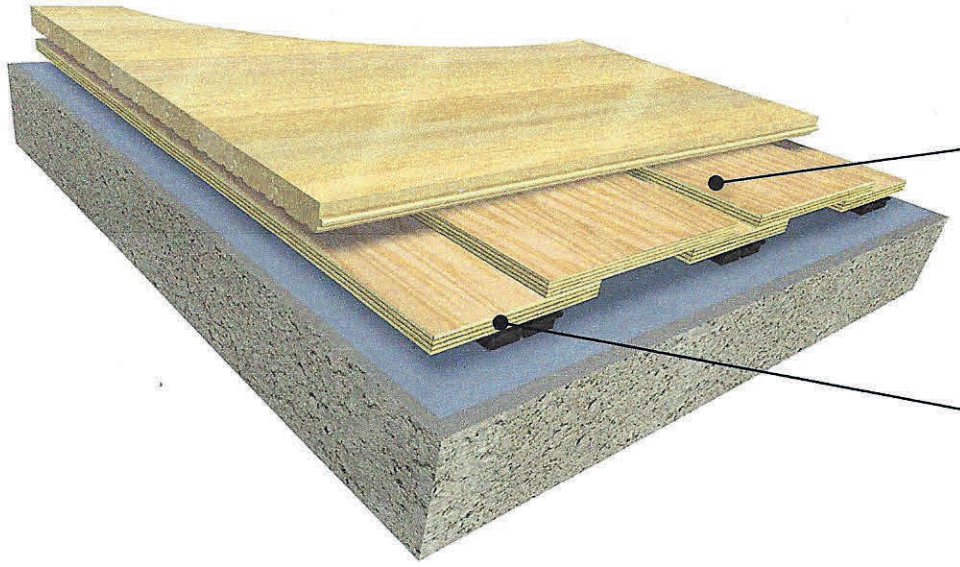
Corporate Headquarters:
Action Floor Systems, LLC 4781 N. US Hwy 51, Mercer, WI 54547
toll free: 800 746-3512 | *voice:* 715 476-3512 | *fax:* 715 476-3585 | *web:* actionfloors.com

David L. Fields
Action Floor Systems, LLC 11317 NW 79th Manor, Parkland, FL 33076
voice: 843 761-7665 | *cell:* 843 312-5828 | *email:* davef@actionfloors.com

SYSTEM DATA SHEET

Excel NR™ Floor System

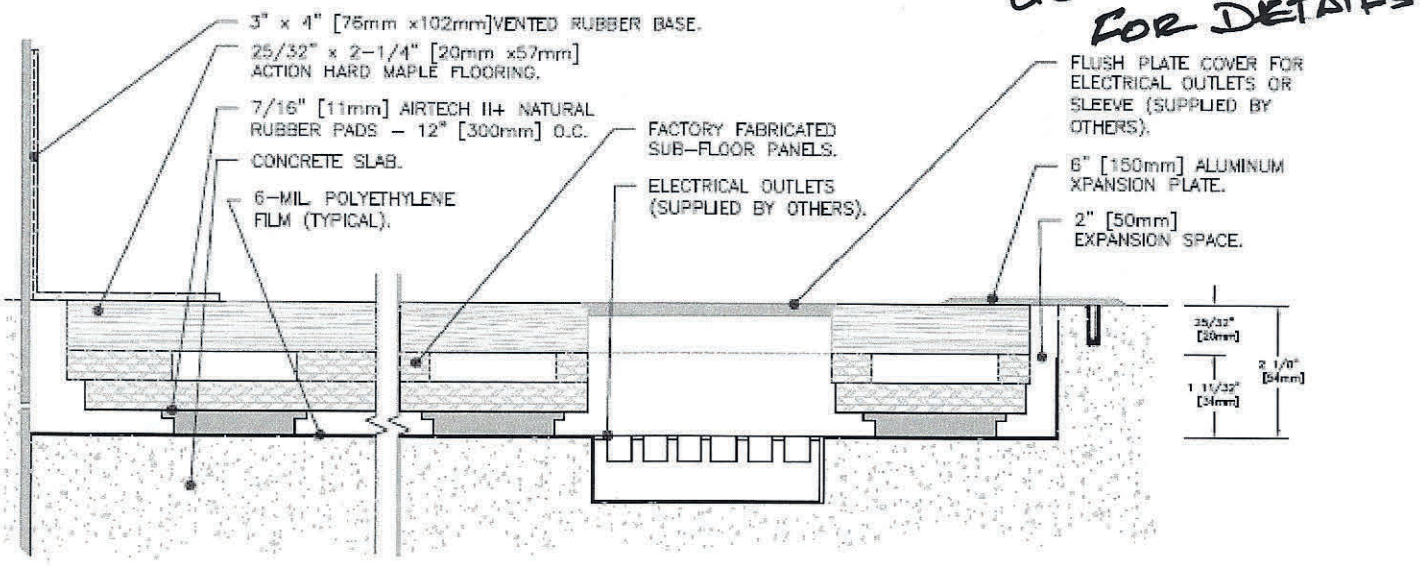
SYSTEM TYPE: FLOATING RESILIENT



MFMA NORTHERN HARD MAPLE BY ACTION:	Random Length (RL). Action Long Length (FJ) Expansion Ridge Technology (ERT)
TESTING AGENCY:	Certified by ISSS
PERFORMANCE MEETS OR EXCEEDS:	MFMA PUR EN 14904 Type 4 DIN 18032 Part 2 ASTM – F2772 FIBA Level 1
SLAB DEPRESSION:	25/32" (20 mm): 2-1/8" (54 mm) 33/32" (27 mm): 2-3/8" (60 mm)
LEED:	FloorScore®-certified Proprietary certified EPD® FSC®-certified Maple and Subfloor available MR credits – based on products, selected materials and facility locations
PERFORMANCE AND SYSTEM STABILITY:	• Factory fabricated • Excellent ball bounce • SCORES Compliant • Stable double layer plywood subfloor system • Excellent shock absorption

- Innovative design that achieves outstanding playing performance characteristics in a floating floor system.
- Factory fabricated subfloor provides a level of consistency and uniformity on the installed system maximizing performance and satisfaction.
- The manufacturer and flooring shall be independently verified by the guidelines of the ISO 14040:2006 and ISO 14044:2006 Life Cycle Assessment (LSA) confirming a negative carbon footprint.
- Carbon Evaluation must be inclusive and based on all corporate facilities, offices and mills.
- The manufacturer and flooring shall be independently verified by the guidelines of the ISO 14064-1:2006 World Resources Institute Greenhouse Gas Protocol, Scope 1, 2 and 3.
- The manufacturer and flooring shall be registered in the Collaborative for High Performance Schools (CHPS) Product Database.
- Floor system manufacturer must provide a Life Cycle Assessment and an Environmental Product Declaration (EPD®) in accordance with the Product Category Rule Version 2.2014.
- Floor system manufacturer must be FloorScore® Certified in accordance with CDPH 01350.

SEE ATTACHED CUTSHEET FOR DETAILS



Complete product specifications and system drawings are available online at: **www.actionfloors.com**

ACTION FLOOR SYSTEMS, LLC
4781 N. US Hwy 51 • Mercer, WI 54547
TOLL FREE: 800-746-3512 • VOICE: 715-476-3512
FAX: 715-476-3585 • EMAIL: info@actionfloors.com
actionfloors.com

Action Excel NR System Comparison

Action Excel NR vs. Robbins Eclipse

	Excel NR	Eclipse
Tested by Certified Independent Agency	Y	Y
MFMA PUR Certified	Y	Y
EN 14904$^{(2006)}$ Type 4 Certified	Y	Y
DIN 18032-2 Certified	Y	Y
ASTM F2772-09 Certified	Y	Y
Fully Unitized Subfloor Design	Y	Y
Factory Fabricated Subfloor	Y	Y
MFMA Mill Member	Y	Y
25/32" Maple Flooring	Y	Y
Random Length Flooring	Y	Y
Finger Jointed Flooring	Y	Y
Certified Zero Waste Production Facility	Y	N
Optional ERT (milled expansion ridge)	Y	Y
Certified Negative Carbon Footprint	Y	N
ISO 14000		

The above comparison is based on each systems' standard construction required to meet the MFMA PUR test criteria along with EN 14904$^{(2006)}$ Type 4 Certified Test Criteria, the most recent internationally accepted standard, and DIN 18032 Part 2 Certified Test Requirements.

The Action Excel NR features true "material smart use" design using subfloor materials where needed to deliver a floor system that will meet the test of time. The factory fabricated subfloor ensures accuracy and consistent construction to deliver a floor system featuring uniformity and consistent playability. Excel NR exceeds the industry standards for performance by going beyond EN 14904$^{(2006)}$, DIN 18032 Part 2 and MFMA PUR standards. Action's Excel NR performance floor system is tested and certified by an ISSS certified independent testing laboratory.

For more information including CAD, 3-D BIM models or a Word doc. specification, visit our website or contact our corporate office at 800-746-3512.

Action®
FLOOR SYSTEMS

Action Excel NR™

Floating Resilient Floor System

SPORTS FLOOR SPECIFICATIONS

Action Floor Systems, LLC 4781 N. US Hwy 51 Mercer, WI 54547
toll free: 800-746-3512 | *voice:* 715-476-3512 | *fax:* 715-476-3585 | *email:* info@actionfloors.com | *web:* actionfloors.com

Contact ACTION FLOOR SYSTEMS, LLC at www.actionfloors.com or (800)746-3512 for specific project conditions or modifications of this specification.

PART 1 – GENERAL

1.01 DESCRIPTION

A. Related Sections: Cast-in-Place Concrete
   1. The general contractor shall provide a level slab, steel troweled to a tolerance of 1/8" (3mm) in a 10'0" (3m) radius and subject to the approval of the wood floor contractor. High spots shall be ground down and low spots shall be filled with an approved leveling compound by the general contractor to the tolerance specified above.
   2. MFMA does not acknowledge the use of FF/FL numbers to measure levelness/flatness tolerances in gymnasium concrete slabs.
   3. Concrete shall not use river gravel or pea gravel and have an average of 3500 psi. compressive strength after 28 days. Concrete must be cured for 60 days before installation can begin.
   4. The concrete slab shall be depressed: 2-1/8" (60mm) for 25/32" (20mm) flooring.

B. Related Sections: Membrane Waterproofing
   1. Concrete slabs on or below grade shall be adequately waterproofed beneath the slab and at the perimeter walls and on earth side of below grade walls by general contractor using suitable type membrane.

C. Related Sections: Thresholds

D. Related Sections: Game Standard Inserts

1.02 REFERENCES

A. MFMA – Maple Flooring Manufactures Association
B. MFMA PUR – MFMA Performance Uniformity Rating
C. DIN 18032-2 - Performance Standard
D. ASTM F2772 - Athletic Performance of Indoor Sport Systems
E. EN 14904 – European Committee of Standardization for Indoor Sports Surfaces
F. FIBA – International Basketball Federation
G. FSC – Forest Stewardship Council
H. FloorScore – Certified product by CDPH 01350

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications
   1. Basis of design shall be **Action Excel NR** as provided by Action Floor Systems, LLC. All system component parts must be supplied by Action Floor Systems, LLC.
   2. Manufacturer shall be a MFMA Mill Member in good standing, an established firm experienced in the field, and have been in business a minimum of ten (10) years; Action Floor Systems, LLC or an approved equal.
   3. Floor system manufacturer shall be solvent with no bankruptcy proceedings the previous seven (7) years.
   4. Carbon Evaluation must be inclusive and based on all corporate facilities; offices and mills.
   5. Floor system manufacturer and flooring shall be independently verified by the guidelines of the ISO 14064-1:2006 World Resource Institutes Greenhouse Gas Protocol, Scope 1, 2 and 3.
   6. Floor system manufacturer and flooring shall be independently verified by the guidelines of the ISO 14040:2006 and ISO 14044:2006 Life Cycle Assessment (LCA), confirming a negative carbon footprint.
   7. Floor system manufacturer and flooring shall be registered in the Collaborative for High Performance Schools (CHPS) Product Database.
   8. Flooring system shall be independently verified to meet or exceed the SCORES criteria for environmental design and athletic performance: Sustainable Construction of Renewable Engineered Surfaces.

9. Floor system manufacturer must provide a Life Cycle Assessment and an Environmental Product Declaration (EPD) in accordance with the Product Category Rule Version 2.2014.
10. Floor system manufacturer must be FloorScore Certified in accordance with CDPH 01350.

B. Floor Contractor/Installer requirements
   1. The flooring contractor must be approved by Action Floor Systems, LLC.

C. Floor System Performance Requirements.
   1. Flooring system shall be independently tested to meet or exceed the athletic performance requirements of:
      a. MFMA PUR (2011)
      b. EN 14904 (2006)
      c. ASTM F2772
      d. FIBA (2012)
   2. Independent performance testing laboratory shall have Scientific Body Membership in the International Association of Sports Surface Sciences (ISSS).

1.04 SUBMITTALS

A. Manufacturers product data: Submit **Excel NR** specification sheets.
B. Samples: Submit one (1) sample of **Excel NR**, if requested by architect.
C. Maintenance literature: Submit one (1) copy of manufactures maintenance instructions.

1.05 WORKING CONDITIONS

A. The wood flooring shall not be installed until all masonry, plastering, tile, marble and terrazzo work is completed, and overhead mechanical trades and painters have finished in wood floor area. The building must be reasonably dry; all openings must be closed in; permanent heating and air conditioning installed and operating.
B. The concrete subfloor shall be determined dry by industry standard testing procedures, free of foreign materials and turned over to the Flooring Contractor broom clean. Moderate room temperature of 65 degrees (18 C) or more shall be maintained a week preceding and throughout the duration of the work. Humidity conditions within the building shall approximate the humidity conditions that will prevail when the building is occupied.
C. Permanent heat, light and ventilation shall be installed and operating during and after installation, maintaining a range of temperature and humidity compatible with the expected low and high moisture content of the flooring. The wood moisture content range is determined by the flooring contactor based on the facility's mechanical controls and geographical location.
D. Flooring must be stored in a dry, well-ventilated area, not in contact with masonry, to acclimate to building conditions and shall be installed at moisture content compatible with the normally expected environmental range of temperature and relative humidity achieved while the facility is occupied.
E. Industry standards recommend maintaining indoor relative humidity between 35 percent and 50 percent, and air temperatures between 55 degrees and 75 degrees year-round. By limiting wide swings in atmospheric conditions inside the facility, the expansion and contraction of the flooring system will be limited as the flooring is manufactured at a moisture content most compatible with this range. A 15 percent fluctuation in indoor relative humidity will not adversely affect the maple. Excessive shrinkage and/or expansion may occur with indoor relative humidity variations that exceed 15 percent. The geographical region and HVAC determine the typical range of temperature and humidity for each facility. In buildings where air conditioning is not available, the use of circulating or venting fans will help facilitate excessive shrinkage or expansion.
F. General Contractor shall lock floor area after floor is finished to allow proper cure time. If general contractor or owner requires use of gym after proper cure time, they shall protect the floor by covering with non-marring craft paper or red rosin paper with taped joints until acceptance by owner of complete gymnasium floor.

1.06 WARRANTY

A. Action Floor Systems, LLC. warrants the material it ships to be free from defects in materials and workmanship for a period of one year and the flooring installer warrants the installation of the flooring to be free of defects in materials and workmanship for a period of one year. The exclusive remedy under this warranty shall be replacement of defective material supplied by Action Floor Systems, LLC. or correction of defective installation by the flooring installer. All implied warranties of merchantability or fitness for intended use are limited to the period of this warranty. This warranty excludes consequential damages.

B. This warranty does not cover damage caused by fire, winds, floods, chemicals, or other abuse, or by failure of other contractors to adhere to specifications, or neglect of reasonable precaution to provide adequate ventilation during hot and humid weather. This warranty also excludes damage due to excessive dryness or excessive moisture from humidity, spillage, migration through the slab or wall or any other source. This warranty also excludes damage to floors due to ordinary wear and tear, faulty construction of the building, (other than the flooring installation), separation of the concrete slab underlying the floor, settlement of the walls, or use of water on the floor.

C. During the warranty period, the floor cannot be coated without the permission of the floor contractor.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Flooring 25/32" x 2 1/4" - 2nd Grade (FSC) Certified

* 1. Flooring shall be Northern Hard Maple standard strip flooring, 25/32" x 2-1/4" (20mm x 57mm) ~~or 1-1/2"~~ (38mm), TGEM, MFMA grade marked & stamped as manufactured by Action Floor Systems, LLC.
* 2. Grades available are MFMA ~~1st~~, 2nd&Btr. ~~3rd&Btr. and 3rd grade~~.

~~3. Long Length Strip Flooring by Action Floor Systems, LLC (optional).~~

~~4. FSC Certified lumber (optional).~~ FSC Certified - Per Specification

* 5. Expansion Ridge Technology (ERT) 1/64" milled expansion spacer (optional).

~~6. Factory Sand and Seal Long Length Strip Flooring (optional)~~.

B. Subfloor

* 1. Vapor barrier shall be 6-mil polyethylene.
* 2. The Action Excel NR panels shall be pre-assembled with 7/16" (11mm) AirTech II pads as supplied by Action Floor Systems.
* 3. Construction adhesive shall be PL 400 or equal.

C. Fasteners

* 1. Sub floor panel fasteners shall be 3/4" (19mm) coated staples
* 2. Flooring fasteners shall be 1-3/4" (45mm) cleats, or 15-gauge coated staples.

D. Wall Base

* 1. Wall base shall be 3" x 4" (76mm x 102mm) vented cove base with pre-molded corners (specify black or brown), as supplied by Action Floor Systems, LLC.

~~E. Protective Floor Cover (optional)~~

~~1. Action AirRide cover system with patented air blower system. System includes Phthalate-free, seamless 10'-0" wide, 20.5 ounce vinyl covers and A-frame rack~~.

PART 3 - EXECUTION

3.01 INSPECTION

A. Inspect concrete slab for proper tolerance and dryness reporting any discrepancies in writing to the general contractor.

B. All work to put the concrete slab in acceptable condition shall be the responsibility of the general contractor.

C. Slab shall be broom cleaned by the general contractor.

3.02 INSTALLATION

A. Cover concrete slab with polyethylene lapping edges 6" (150mm) and seal with adhesive or 2" (50mm) duct tape.

B. Place Excel NR panels end-to-end in a brick pattern at right angles to the direction of the finish flooring with specified side spacing as directed by installation instructions, leaving a ¼" (6mm) gap between panel ends, use construction adhesive and fasten with staples.
C. Place solid blocking at all bleacher stack areas and doorways.
D. Machine nail strip flooring approximately 12" (300mm) o.c. End joints must be properly driven up. Provide adequate expansion at regular intervals across the floor during installation as dictated by the average humidity conditions of the area according to the recommendations of the local Action Floor Systems, LLC. flooring contractor. Allow 2" (50mm) expansion voids at perimeter and all vertical obstructions.

3.03 FLOOR SANDING

A. Use coarse, medium and fine grade sandpaper.
B. After sanding, buff entire floor using 100-grit screen or equal grit sandpaper, with a heavy-duty buffing machine.
C. Vacuum or tack floor before first coat of finish.
D. Floor shall present a smooth surface without drum stop marks, gouges, streaks or shiners.

3.04 FINISHING

A. Inspect entire area of floor to ensure that the surface is acceptable for finishing, completely free from sanding dust and perfectly clean.
B. Apply seal and finish per manufacturer's instructions.
C. Buff and vacuum or tack between each coat after it dries.
D. Apply game lines accurately after the seal coat, after buffing and vacuuming. Lay out in accordance with drawings. For game lines, use current rules of association having jurisdiction. Lines shall be straight with sharp edges in colors selected by the architect. Game line paint shall be compatible with finish.

3.05 BASE INSTALLATION

A. Affix rubber base to wall with recommended adhesive or screws. Miter all corners carefully. Use pre-molded outside corners. Install aluminum thresholds as required, anchoring firmly in concrete floor beyond limits of wood flooring.

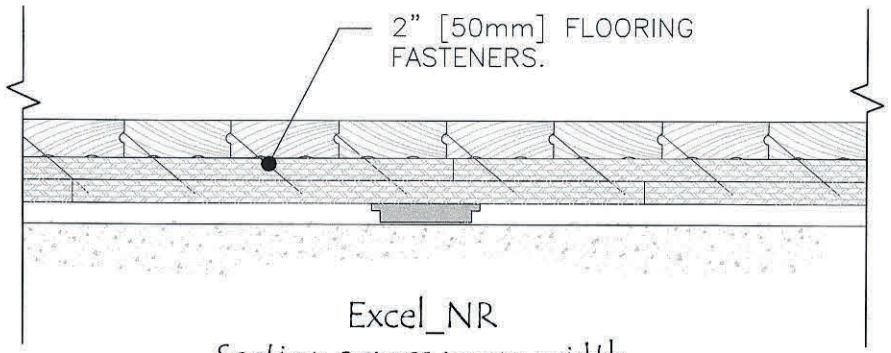
3.06 CLEAN UP

A. Clean up all unused materials and debris and remove from premises, properly dispose of all waste materials.

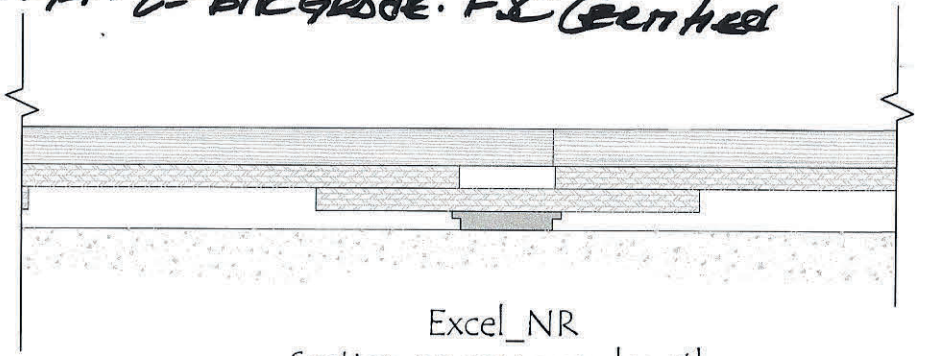
3.07 MAINTENANCE

A. Upon completion of floor installation, the owners, attendants or individuals in charge and responsible for the upkeep of the building are to see that the care and maintenance instructions of the MFMA are followed. Failure to do so may void warranty.

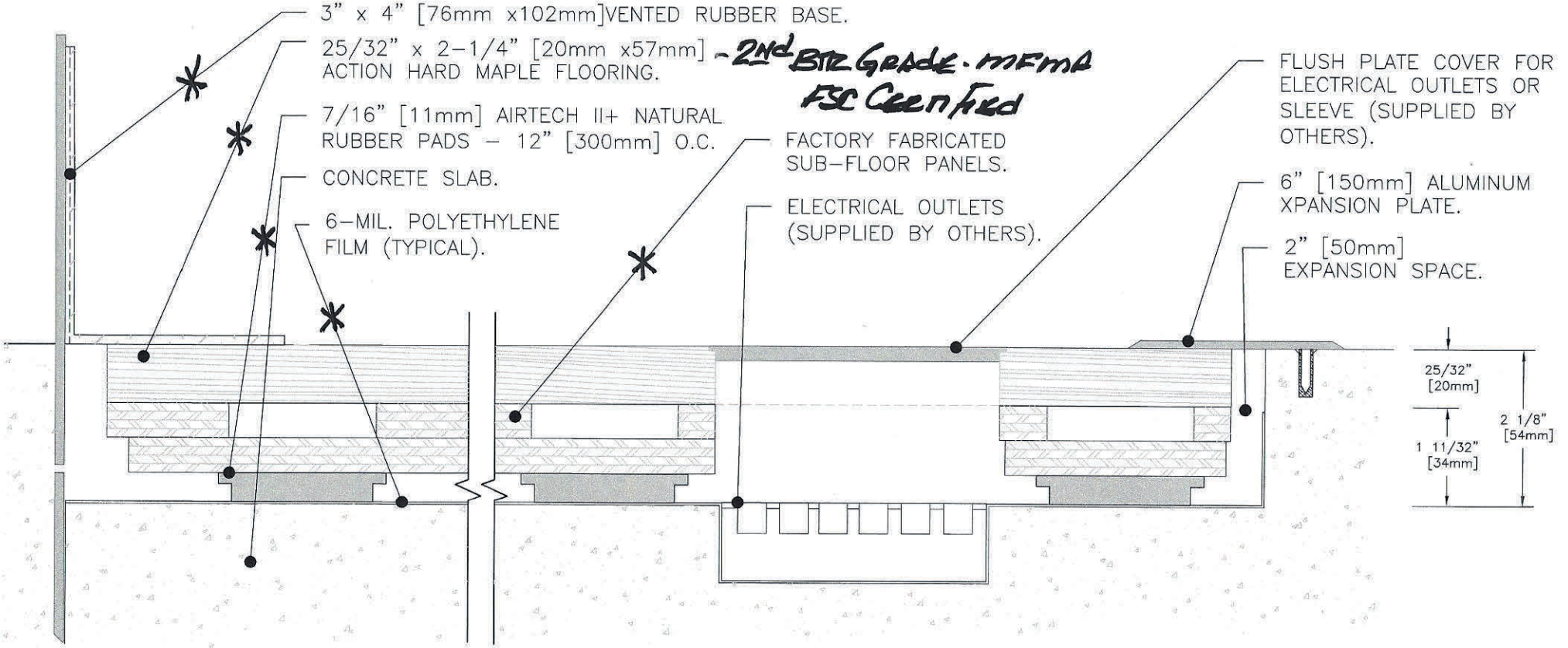
MAPLE FLOORING. 25/32" x 2¼". 2nd BTR GRADE. FSC CERTIFIED



Excel_NR
Section across room width



Excel_NR
Section across room length



Excel_NR

SCS Global Services *does hereby certify that an independent assessment has been conducted on behalf of:*

Action Floor Systems

4781 N US Hwy 51, Mercer, WI, United States

For the following product(s):

Solid Hardwood:

Unfinished Solid Hardwood Flooring 25/32"

The product(s) meet(s) all of the necessary qualifications to be certified for the following claim(s):

FloorScore®

Indoor Air Quality Certified to SCS-EC10.3-2014 v4.0

Conforms to the CDPH/EHLB Standard Method v1.2-2017 (California Section 01350), effective April 1, 2017, for the school classroom and private office parameters when modeled as Flooring.

Measured Concentration of Total Volatile Organic Compounds (TVOC): Less than/equal to 0.5 mg/m^3 (in compliance with CDPH/EHLB Standard Method v1.2-2017)

floor score

CERTIFIED BY SCS Global Services

ANSI ACCREDITED

ISO/IEC 17065
Product Certification Body
#0821

Registration # SCS-FS-04219

Valid from: November 1, 2019 to October 31, 2020

SCS Global Services is currently the only certification body approved by the Resilient Floor Covering Institute (RFCI) to provide FloorScore® product certification; certified products are only listed on the SCS Green Products Guide, http://www.scsglobalservices.com/certified-green-products-guide.

SCSglobal SERVICES

Stanley Mathuram, PE, Vice President
SCS Global Services
2000 Powell Street, Ste. 600, Emeryville, CA 94608 USA

Rainforest Alliance

CERTIFICATE

for

ACTION FLOOR SYSTEMS, LLC

4781 North US Highway 51
Mercer, Wisconsin 54547 United States

CERTIFICATE SCOPE

Certificate Type: *Single Chain of Custody*
Standard(s): *FSC-STD-40-004 V3-0*
Product Group(s): *Hardwood Flooring, Softwood Plywood, Softwood Lumber Boards, Softwood Framing Lumber and Studs*
Valid from *November 15, 2017* **to** *November 14, 2022*
Certificate Registration Code: *RA-COC-000796*
FSC® License Code: *FSC-C023843*
Certificate Issue Number: *IN-2017-1*

Additional details regarding the scope, including a full list of products and species are available at info.fsc.org.

Laura Terrall, Director, Certification

Rainforest Alliance
233 Broadway, 28th Floor
New York, NY 10279 USA

Rainforest Alliance is an FSC accredited certifier FSC® A000520

The validity of this certificate shall be verified on info.fsc.org. This certificate does not constitute evidence that a particular product supplied by the certificate holder is FSC certified and/or FSC Controlled Wood. Products offered, shipped or sold by the certificate holder can only be considered covered by the scope of this certificate when the required FSC claim is clearly stated on invoices and shipping documents.

This certificate is the property of Rainforest Alliance. This certificate and all copies or reproductions of this certificate shall be returned or destroyed if requested by Rainforest Alliance.

FSC
www.fsc.org
FSC® A000520
The mark of responsible forestry

RAINFOREST ALLIANCE CERTIFIED

Advancement of Construction Technology

SUBSTITUTION REQUEST
(During the Bidding Phase)

Project: TALBOTT SPRINGS ELEM SCHOOL
COLUMBIA. MD

To: TCA ARCHITECTS

Re: APPROVAL REQUEST

Substitution Request Number:

From: ACTION FLOOR SYSTEMS

Date: JUNE 17. 2020

A/E Project Number:

Contract For:

Specification Title: WOOD FLOORING

Section: 096400 Page:

Description: ROBBINS · ECLIPSE FLOATING FLOOR

Article/Paragraph: PART 2.201 A.

Proposed Substitution: ACTION · EXCEL NQ
Manufacturer: ACTION FLOOR SYSTEMS - MERCER. WI Phone: 800.746.3512
Trade Name: Model No.:

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product. ✓
- Same warranty will be furnished for proposed substitution as for specified product. ✓
- Same maintenance service and source of replacement parts, as applicable, is available ✓
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule. NONE
- Proposed substitution does not affect dimensions and functional clearances. NONE
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution. N/A

Submitted by: David L. Fields
Signed by:
Firm: ACTION FLOOR SYSTEMS
Address: 4781 N. US. HWY 51
MERCER. WI 54547
Telephone: 800.746.3512

A/E's REVIEW AND ACTION

- ☐ Substitution approved - Make submittals in accordance with Specification Section 01330.
- ☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
- ☐ Substitution rejected - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed by: Date:

Supporting Data Attached: ☐ Drawings X☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐

Request for Information 000.PB002

Detailed RFI

Talbott Springs Elementary School
9550 Basket Ring Road
Columbia, MD 21045

Project # 147

Dustin Construction, Inc.

RFI #: 000.PB002 **Date Submitted: 6/23/2020**

Answer Company	Answered By	Author Company
TCA Architects 1369 Generals Highway Crownsville, MD 21032	Jim Davis	Bomark Electric Company 11408 Cronridge Drive, Suite F Owings Mills, MD 21117

Author RFI Number

Subject	Trade Contractor
LDC Screens	BoMark Electric

Cc:	Company Name	Contact Name	Copies	Notes

Question **Date Required: 6/30/2020**

In Spec section 27 40 00 – IPTV spec there's a list of LDC screens but no quantities of each size are shown nor are there any locations or sizes on the drawings. Please clarify.

Suggestion

Answer **Date Answered:**

June 24, 2020

1. LED monitor models are listed in Section 274000.
2. PR and PR1 outlets should have Epson 700u projectors.
3. V outlets shall have 55" LED displays:
    a. A100 - Two V outlets
    b. A106B - One V outlet
    c. A106A - One V outlet
4. Additional screen sizes are included in anticipation of potential need/selection by owner. Quantities TBD.

Bryan Jones

ESP

Request for Information 000.PB003

Detailed RFI

Talbott Springs Elementary School
9550 Basket Ring Road
Columbia, MD 21045

Project # 147

Dustin Construction, Inc.

RFI #: 000.PB003 **Date Submitted: 6/23/2020**

Answer Company	Answered By	Author Company
TCA Architects 1369 Generals Highway Crownsville, MD 21032	Jim Davis	Key Systems, Inc. 10839 Philadelphia Road White Marsh, MD 21162

Author RFI Number

Subject
Generator Clarifications

Trade Contractor
Key Systems

Cc:	Company Name	Contact Name	Copies	Notes

Question **Date Required: 6/30/2020**

1. Section 263213, 1.12 A. please confirm how many visits per year for this 60-month maintenance contract on generator? 2 visits per year or 4 visits per year?

2. Section 263213, 3.6, C. specifies generator must be load bank tested using load banks to provide full load at 0.8 power factor which is a resistive/reactive type load bank. This is a much more expensive load bank test to be performed on-site for a small 200 kW generator. Typically load bank testing of generator on-site will be performed by factory technicians using resistive type (1.0 pf) load banks only according to NFPA 110. This 200 kW generator will be tested at 0.8 power factor at the generator factory. So please confirm acceptance testing of 200 KW generator on-site can be performed via resistive type load banks only as is typical?

3. Section 263600, 2.1 A. does not list Kohler as acceptable manufacturer for the ATS's for this project. Considering Kohler is basis of design for the generator please confirm Kohler ATS are acceptable provided specs are met?

4. Section 263600, 2.2 B. specifies 3 cycle WCR for ATS. Please confirm if specific breaker rated are acceptable in lieu of 3 cycle (any breaker) rated ATS's as they are less expensive?

5. Section 263600, 2.3 B. 1. Specifies a "delayed, open transition" ATS with break before make transition. Please confirm if ATS shall be open transition type with in phase monitor per 2.3 J. or each ATS must be provided with delayed transition, third neutral ATS position instead?

Suggestion

Answer **Date Answered:**

June 30, 2020

1. Provide 2 visits per year.
2. Resistive testing is acceptable as its industry standard for this size generator.
3. The owner will not consider substitutions of materials, systems or equipment as specified in he proposed Contract Documents during the bidding period. Refer to 00 2000 / NSTRUCTIONS TO BIDDERS; Section 3.3 - SUBSTITUTIONS for additional information on submitting substitution requests
4. Specific breakers are acceptable if breakers meet requirements of specification 26 0573 "Overcurrent Protective Device Studies".
5. Switch shall be delayed open transition time with in-phase monitor per 2.3.J. Delay function shall meet requirements of article 2.4.

Request for Information 000.PB004

Detailed RFI

Talbott Springs Elementary School
9550 Basket Ring Road
Columbia, MD 21045

Project # 147

Dustin Construction, Inc.

RFI #: 000.PB004 **Date Submitted: 6/23/2020**

Answer Company	Answered By	Author Company
Dustin Construction, Inc. 2510 Urbana Pike, Suite 201 Ijamsville, MD 21754	Aaron Mengel	Towson Mechanical 8651 Oakleigh Road Parkville, MD 21234

Author RFI Number

Subject

Cross Reference Clarifications

Trade Contractor

Towson Mechanical

Cc:	Company Name	Contact Name	Copies	Notes

Question **Date Required: 6/30/2020**

The following specification section is listed in the Specification Cross Reference but is not in the specification book:

07 8123 Intumescent Fire Resistive Material

The following specification sections are in the spec book but are not listed in the Table of Contents:

08 7170 Perimeter Acoustical Door Seals
08 7200 Weatherstriping & Seals

Spec section 08 3473 is not listed in the cross reference. Who is responsible for that?

Suggestion

Answer **Date Answered: 7/2/2020**

Reference the updated Specification Section 011112 provided in Add. 3

Request for Information 000.PB005

Detailed RFI

Talbott Springs Elementary School
9550 Basket Ring Road
Columbia, MD 21045

Project # 147

Dustin Construction, Inc.

RFI #: 000.PB005 **Date Submitted: 6/25/2020**

Answer Company	Answered By	Author Company
TCA Architects 1369 Generals Highway Crownsville, MD 21032	Jim Davis	Glass Concepts, Inc. 5306 Kings Court Frederick, MD 21703

Author RFI Number

Subject	Trade Contractor
Storefront	Glass Concepts

Cc:	Company Name	Contact Name	Copies	Notes

Question **Date Required: 7/2/2020**

1. Frames E,F,G,H call for curtain wall. Would it be ok to use storefront at these locations being they are only 8' and 10' in height? (max height for storefront is 12' before going to curtainwall)

2. Spec 084113 2.01 calls for Kawneer with no substitutions - this will impact pricing. Would EFCO or YKK be acceptable as an equal?

Suggestion

Answer **Date Answered:**

The owner will not consider substitutions of materials, systems or equipment as specified in the proposed Contract Documents during the bidding period. for additional information on submitting substitution requests, refer to 00 2000 / INSTRUCTIONS TO BIDDERS; AIA Document A107, Section 3.3 - SUBSTITUTIONS.

June 26, 2020

- found on page 22 (of 1164) - "BID_SPECS_VOL_1_TSES.pdf"

Request for Information 000.PB006

Detailed RFI

Talbott Springs Elementary School
9550 Basket Ring Road
Columbia, MD 21045

Project # 147

Dustin Construction, Inc.

RFI #: 000.PB006 **Date Submitted: 6/25/2020**

Answer Company	Answered By	Author Company
TCA Architects 1369 Generals Highway Crownsville, MD 21032	Jim Davis	Action Electrical Contractors, Inc. 1050 Hardees Drive, Suite C Aberdeen, MD 21001

Author RFI Number

Subject	Trade Contractor
Photovoltaic Collector Installer	Action Electrical Contractors

Cc:	Company Name	Contact Name	Copies	Notes

Question **Date Required: 7/2/2020**

Is KW Solar Solutions an acceptable installer for the Photovoltaic Collectors? They are not listed in Spec Section 26 3100, under 2.1 Acceptable installers.

Suggestion

Answer **Date Answered:**

The owner will not consider substitutions of materials, systems or equipment as specified in the proposed Contract Documents during the bidding period. for additional information on submitting substitution requests, refer to 00 2000 / INSTRUCTIONS TO BIDDERS; AIA Document A107, Section 3.3 - SUBSTITUTIONS.

June 26, 2020

- found on page 22 (of 1164) - "BID_SPECS_VOL_1_TSES.pdf"

Request for Information 000.PB008

Detailed RFI

Talbott Springs Elementary School
9550 Basket Ring Road
Columbia, MD 21045

Project # 147

Dustin Construction, Inc.

RFI #: 000.PB008 **Date Submitted: 6/25/2020**

Answer Company	Answered By	Author Company
TCA Architects 1369 Generals Highway Crownsville, MD 21032	Jim Davis	Towson Mechanical 8651 Oakleigh Road Parkville, MD 21234

Author RFI Number

Subject

Door Operator Substitution

Trade Contractor

Towson Mechanical

Cc:	Company Name	Contact Name	Copies	Notes

Question **Date Required: 7/2/2020**

Please advise if the attached substitution request is acceptable

Suggestion

Answer **Date Answered:**

The owner will not consider substitutions of materials, systems or equipment as specified in the proposed Contract Documents during the bidding period. for additional information on submitting substitution requests, refer to 00 2000 / INSTRUCTIONS TO BIDDERS; AIA Document A107, Section 3.3 - SUBSTITUTIONS.

June 26, 2020

- found on page 22 (of 1164) - "BID_SPECS_VOL_1_TSES.pdf"

Advancement of Construction Technology

SUBSTITUTION REQUEST

(During the Bidding Phase)

Project: Talbott Springs Elementary School

9550 Basket Ring Road, Columbia, MD 21045

To: TCA Architects

Re:

Substitution Request Number:

From: record automatic doors

Date: 6-24-2020

A/E Project Number: 1804

Contract For:

Specification Title: Door Hardware

Description: Besam SW100 Series

Section: 087100 Page: 17

Article/Paragraph: 2.12.K.1.a

Proposed Substitution: record - USA 8100 Series

Manufacturer: record - USA Address: 4324 Phil Hargett Court, Monroe, NC 28110 Phone: 704.289.9212

Trade Name: record automatic doors Model No.: 8100

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: Curtis De Jager

Signed by: Curtis De Jager

Firm: record automatic doors

Address: 245 Granite Springs Rd, Richmond VA

Telephone: 800.260.8833

A/E's REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01330.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: Date:

Supporting Data Attached: ☑ Drawings X☑ Product Data ☐ Samples ☐ Tests ☑ Reports ☐ _____

8100 Series

Swing Door Heavy Duty Operator!

www.recorddoors.com

record

your global partner for entrance solutions

8100 Series

8100 Series Swing Doors
Heavy Duty Operator

A proven planetary gear system in tandem with a perfected lever system arm assures the smoothest, most quiet operation available without exception. Libraries, doctor offices, and healthcare facilities demand that their daily routines proceed without the common noisy distractions associated with many competitive products. Eliminate your worry of post install performance by specifying record-usa's 8100 series without hesitation.

Combined with World famed Swiss precision technology and a patented control system with 32 bit processor technology, the 8100 series is powerful and intelligent and guarantees rapid and reliable door control and operation, even when complex functions are desired.

When programming the 8100 series with record-usa's available hand held remote you will be greatly impressed with the quick and easy diagnostics and software updates that make field adjustment easy to configure and to program. Using state of the art computer chip technology incorporating flash memory, the installing contractor can program multiple entranceways to open and close at the very exact speed and with each and every opening!

record-usa's 8100 series swinging door operator makes everyone's decision making process simpler in that it truly can be selected for most any application. An ingenious design platform allows each unit to be used on virtually any door configuration including with or without an aluminum door:

8600 Series

The record 8600 overhead concealed package incorporates the 8500 series operator but is supplied complete with a medium stile, center pivoted aluminum door panel, standard 1 ¾" X 4 ½" jambs, cylinder and lock; push bar; offset-pull handle; finger guards and threshold (wide stiles also available.)

8700 Series

When the requirement of an overhead concealed unit that can be used on offset or butt hinge applications is evident, the record-usa 8700 series provides attractive aesthetics as well as durable performance. The 8700 series is supplied with a continuous hinge gear only.

- Surface applied or overhead concealed
- Right hand or left hand doors
- Inswinging or outswinging doors
- Single, pairs or double egress doors
- Doors that require 120 degree door swing
- Balanced doors
- Swing clear doors
- Interior doors
- Surface applied
- Center hung doors
- Butt hung doors
- Deep reveal applications
- Libraries, elderly care facilities, universities, hospitality, storefronts
- Front entrances in retail applications
- Up to 350 pounds per door leaf*
- 30" doors through 96" door openings
- Meets ANSI A 156.19 requirements when adjusted properly
- Meets ANSI A 156.10 requirements when adjusted properly
- Exterior doors
- Fire rated openings
- Available clear or dark bronze anodized, custom painted, and clad
- ADA applications
- Electric strikes without additional relays or delays
- Push to start applications eliminate the need for additional activation accessories and complex field wiring
- Latch assist function assures closing in areas with heavy stack conditions commonly associated with doors in air conditioned and heated environments

* Consult factory for heavier doors

→record USA
4324 Phil Hargett Court – Post Office Box 3099 – Monroe, NC 28110
tel. +1 704 289-9212 – e-mail: info@recorddoors.com – www.recorddoors.com

→Headquarters
agta record ltd – Allmendstrasse 24 – 8320 Fehraltorf – Switzerland
tel.: +41 44 954 91 91 – e-mail: info@agta-record.com – www.agta-record.com

www.recorddoors.com

record
your global partner for entrance solutions

SECTION 08 71 13 [08716]

AUTOMATIC DOOR OPERATORS (Heavy Duty-Low Energy)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. The heavy duty low energy automatic swing door operator shall consist of aluminum operator housing, electro-mechanical motor, operator assembly, swing arm and electronic control. Installation shall be performed by a local AAADM certified installer.

1.2 RELATED SECTIONS

A. Section 08410 - Aluminum entrances & storefronts
B. Section 08120 - Aluminum doors & frames
C. Section 08210 - Wood doors & frames
D. Section 08110 - Hollow metal doors & frames
E. Section 08710 - Door hardware
F. Section 08810 - Glass and glazing
G. Section 07920 - Caulking & sealants
H. Division 1600 - Electrical
I. Division 26 and 28 Sections for emergency generated power source electrical connections including conduit and wiring for automatic entrance door operators, fire alarm, smoke EVAC system, electrified hardware and related power supply terminations, and access control devices.

1.3 REFERENCES – (Codes & Approvals)

A. Unit described complies with current ANSI A156.19 for Power Assist and Low Energy Power Operated Doors.
B. Unit is listed with UL 325-1997standard for Door, Drapery, Gate, Louver, and Window Operators and Systems (File E218616).
C. Unit is listed with UL991 Tests for Safety-Related Controls Employing Solid-State Devices
D. CNL approved (UL listing for use in Canada).
E. Unit complies with NFPA 101 Life Safety Code. (Section 1.4 of UL 325 includes NFPA 101)
F. Unit complies with NFPA 70 National Electrical Code. (Section 1.1 of UL 325 includes NFPA 70)
G. Unit complies with IBC (2003)
H. Unit exceeds BHMA testing - ANSI BHMA A156.19 Section 5 Cycle Testing. (tested 1,000,000 ops)
I. Listed in accordance with the Uniform Building Code standard 7-2, "Fire Tests of Door Assemblies", (1997) Part I in addition to UL 10C.

1.4 PERFORMANCE REQUIREMENTS

A. Operator to be used on doors weighing up to 350 pounds per leaf.
B. Operator capable of operating within temperature ranges of -40°F and +140°F

1.5 SUBMITTALS

A. Submit under provisions of Section 01300
B. Product Data: Submit manufacturer's product data and standard details for automatic operators.

C. Shop Drawings: Submit shop drawings detailing exact dimensions for each door unit including door operator details, activation components, and electric hardware interface, wiring details and electrical requirements.
D. Anodized/Finish Samples

1.6 OPERATION AND MAINTENANCE DATA

A. Owner's manual will be supplied as part of the close out documentation.

1.7 QUALITY ASSURANCE

A. Operator shall be manufactured by an AAADM registered manufacture. Manufactured to meet or exceed the American National Standard for Low Energy Power Operated Pedestrian Doors ANSI / BHMA 156.19.
B. Source Limitations: Obtain automatic door operators and installation services through one source from a single manufacturer.

1.8 INSTALLER QUALIFICATIONS

A. Equipment must be installed by an AAADM Certified, record-USA factory trained and record-USA authorized company with a minimum of 5 years experience in the installation this the specified product type.
B. Installing company of the equipment, to provide local central dispatch system for warranty service, this is to be available 24 hours a day, 365 days per year. A sticker will be placed in a prominent position on the header of each installed unit giving details of local service company, name and telephone number. If a SMART panel option is used, then details of the telephone number to be called will be programmed into the device.

1.9 WARRANTY

A. All automatic door components are warranted to be free of defects in materials or workmanship under normal use for a period of two years from the date of substantial completion.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Acceptable manufacturer:

record-usa series 8100 Electromechanical Automatic Operator.

Consideration will be given to products considered to be equal or better than those specified. Only those manufacturers listed or a product approved by the architect as an equal will be allowed to be used.

2.2 EQUIPMENT

The swing door operator consists of operator housing, swing power operator, electronic control, wire harnesses and connecting hardware.

2.3 AUTOMATIC SWING DOOR OPERATOR

A. Operator**:** Electro-mechanical operator, powered by 24 volt, 1/4 hp motor.

B. Operator is to be non-handed to ensure maximum versatility in adapting to varying field conditions. Opening Force shall be adjustable by means of one screw, to compensate for different manual push forces required on varying door widths.

C. The non-handed operator is completely contained in extruded aluminum housing. All aluminum sections are 6063-T5 alloy while the structural walls of the base plate have a minimum thickness of 0.187" (3/16") while the access cover (non-structural) has a minimum wall thickness of 0.094" (3/32"). The operator housing width by height shall not exceed 4-1/2" x 5". Length of operator housing determined by site conditions and/or specifications herein. Motor/gear box shall be secured to operator housing via tamper proof extruded channel on the back member of operator housing.

D. Electronic Controls: Microprocessor controlled unit shall control the operation and switching of the swing power operator. The microprocessor control to provide low voltage power supply for all means of actuation. No external or auxiliary low voltage power source will be allowed. The controls include time delay for normal cycle.

E. Connecting Hardware: Surface mounted operator is connected to the door by means of a steel door arm. The door arm is secured to the top rail of the swing door using one piece threaded tubular inserts for aluminum doors, 1/4-20 binding head and post screws (sex bolts) for wood and hollow metal doors. The standard power arm and connecting arm shall accommodate up to 12" reveals and opening angles to 120 degrees. The arm will be equipped with a mechanical device which will in the case of extreme force, "sheer" thus protecting any internal mechanical components from damage, in the case of abuse.

F. Manual Use: The operator shall serve as a manual door closer in the direction of swing with or without electrical power.

G. External Control: A three position switch will be mounted in the end cover of the housing, along with a "fault warning" LED. The switch will be clearly marked, ON/OFF/HOLD OPEN. The LED will flash if the microprocessor detects a fault of any kind.

H. Simplified Access: An access port that eliminates the need to remove the cover for service or adjustment is included as standard and located on the bottom of the unit unless specified elsewhere.

I. Power Open: When an opening signal is received by the control unit, the door shall be opened at the operator-adjusted opening speed. Before the door is fully open at back check, it slows automatically to low speed. The motor stops when the selected door opening angle has been reached. The open position is held by the motor. If the door is obstructed while opening, it will either stop or reverse (field selectable).

J. Field Adjustable Open Stop: The operator shall provide a field adjustable mechanical open stop to accommodate opening angles from 80 to 180 degrees.

K. Normal Close: Closing shall be provided by means of spring, adjustable tension will be by means of a single screw.

L. Power Close: Closing shall be provided by means of a spring and motor. When the hold open time has elapsed, the operator will close the door automatically, using spring force and motor. The door will slow to low speed at latch check before it reaches the fully closed position. The door is kept closed by spring power or extended closing force by the motor.

M. Power Assist: Operator can be adjusted to lower the open forces when used manually. Power Assist will be active only while pushing or pulling the door and will allow the door to close when an opening force is no longer applied to the door.

N. Electronic Dampening: Operator to include standard electric dampening system which automatically counteracts additional forces applied to the door during the opening or closing cycle by reducing door speed.

O. Stack Pressure Feature: The electronic control allows for increases of forces to overcome stack pressure issues. The control automatically compensates for lower manual push forces when the door is used in manual mode. The door must comply with ANSI A156.19, when using this feature.

P. Lock engage circuit: If locking is unsuccessful when the door reaches the closed position, the operator will automatically reverse open 10 degrees and reclose in an attempt to successfully lock the door.

Q. Test of Safety Sensors: If optional safety sensors are specified, the control will monitor the sensors before opening and closing the door. If sensors are not functioning correctly, automation is deactivated and the door will function as a manual swing door with a door closer and a fault is registered in the controls log.

R. Fire rated surface applied operators connect to the surface of an existing fire rated labelled door frame or wall. Connecting hardware and UL approved fire exit hardware is required. See UL materials directory.

S. A separate contact will be provided that upon receipt of a signal from an external source (fire alarm), the unit will close if in an open condition and not operate as an automatic door, until the signal from the external source has been reset.

T. Signage: Provide signage in accordance with ANSI/BHMA A156.19.

2.4 OPTIONAL FEATURES

A. S.M.A.R.T. panel LCD display: Will display the current status of the operator, any faults that the control sees and if required display a screen giving contact details for fault notification.
B. Battery back-up: Accessibility and convenience at non-fire rated opening under power failure. The minimum size Uninterrupted Power Supply (UPS) should be rated at 1500VA.

2.5 PUSH PLATE CONTROL DEVICE

Actuation device is either:

A. Hard wired push plate switches. These will be either surface mounted with an appropriate enclosure or in a concealed single gang electrical box.
B. Radio controlled push plate switches.
C. Touch less Activation sensor plates, 4 ½ inch square microwave technology, adjustable from 2” to 24:”

Option: Suitable bollard for remotely mounting push plates in areas where no suitable mounting for existing methods of mounting the push plates exist.

Option: Push to Activate - is a programmable feature. Push or pull the door open from any position, and the door will gently power open, time out and slowly close.

Door can be used as a manual door with no damage to the operator.

ELECTRICAL CHARACTERISTICS AND COMPONENTS

A. ELECTRICAL CHARACTERISTICS: Power consumption must be less than or equal to the following: Nominal power 67 watts, Nominal current .08A at 120 VAC. Peak power consumption 2.9A, Standby .02A with power consumption of 13 watts.
B. OVERLOAD PROTECTION: Electric motor is equipped standard with a built-in thermal overload protection.

C. ELECTRICAL CONTRACTOR NOTE: provide two low voltage 18 gauge stranded wires from automatic operator to (50 feet max.) activation devices (if required).

2.6 ALUMINUM FINISHES

A. All exposed aluminum surfaces are dark bronze anodized (AAC23A44) or clear anodized (AAC22A31). Custom finishes such as stainless steel clad, powder coatings or paint are available, if specified (architect to provide color).

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify the openings are plumb and are dimensioned properly. Insure adequate support has been provided at the operator header. Proceed with the installation only after conditions are deemed satisfactory.

3.2 INSTALLATION AND ADJUSTMENT

A. Install equipment in accordance with the manufacturers' installation instructions. Adjust equipment per instructions and current ANSI/BHMA 156.19 American National Standard for Power assist and low energy power operated doors.
B. Door Operators: Connect door operators to electrical power distribution system as specified in Division 26 Sections.
C. Controls: terminate wire to: controls, press plates, safety sensors.

End of Section

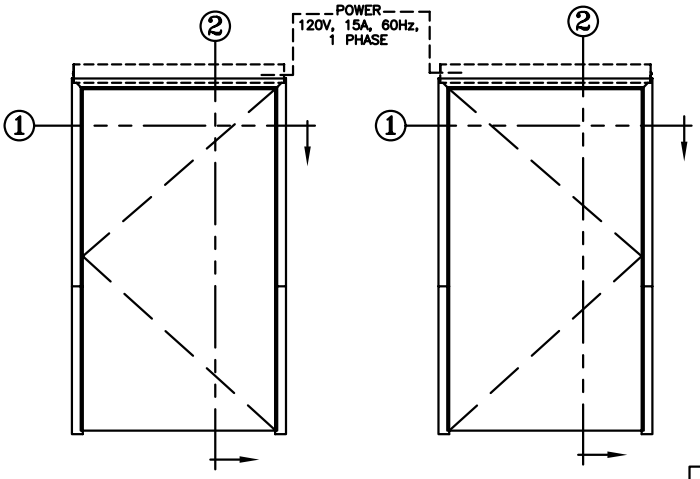
record-usa
4910 STARCREST DR.
MONROE, NC 28110
(704) 289 - 9212

JOB NAME: _____

LOCATION: _____

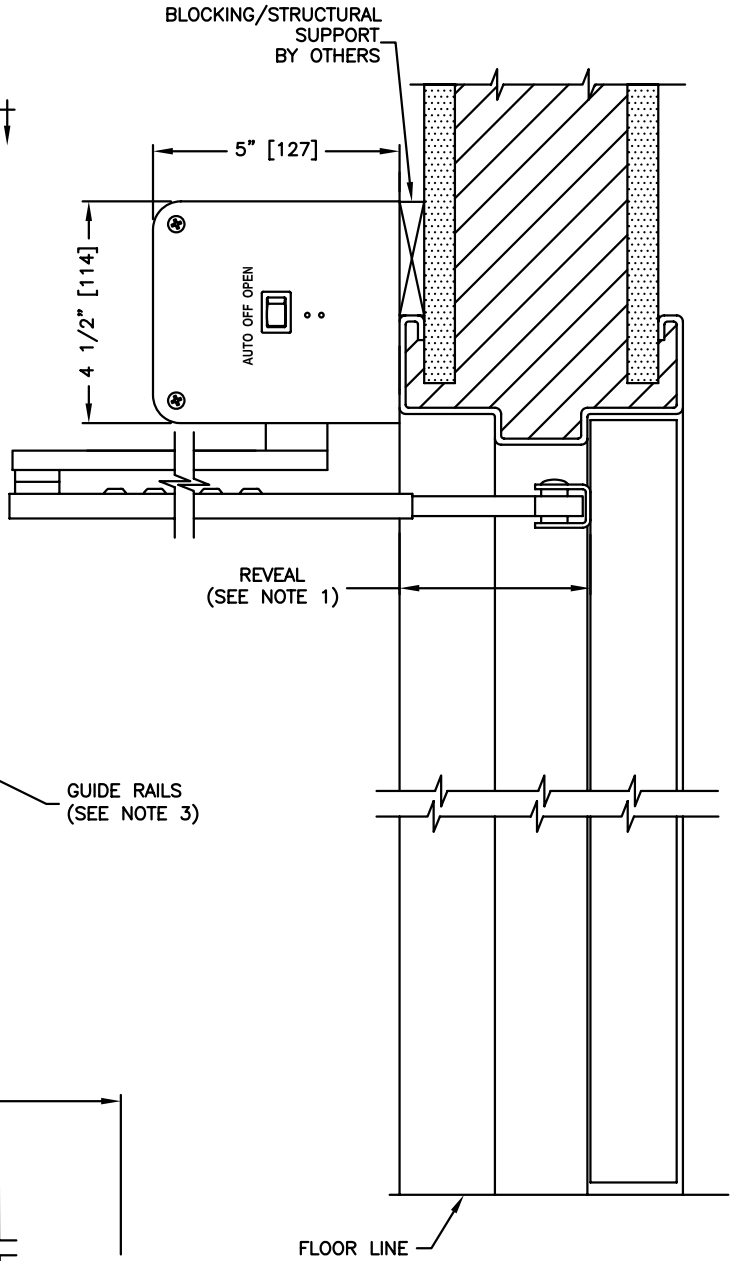
AUTOMATIC SWING DOOR OPERATORS

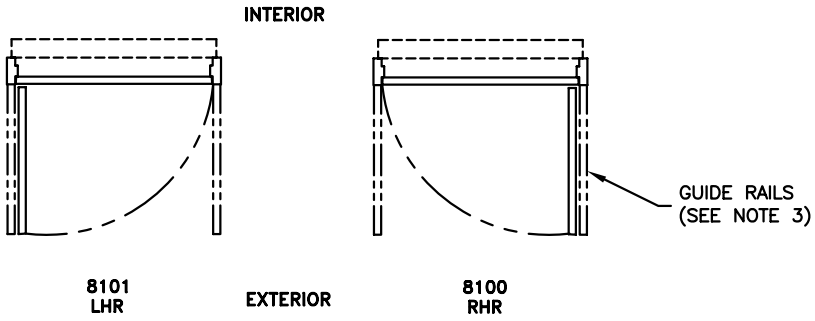
SERIES: 8100 LOW/HIGH ENERGY OPERATOR
MODEL: 8100 (RHR) 8101 (LHR),
TYPE: OUTSWING (STANDARD ARM) PAGE 81–2.01



ELEVATION VIEW

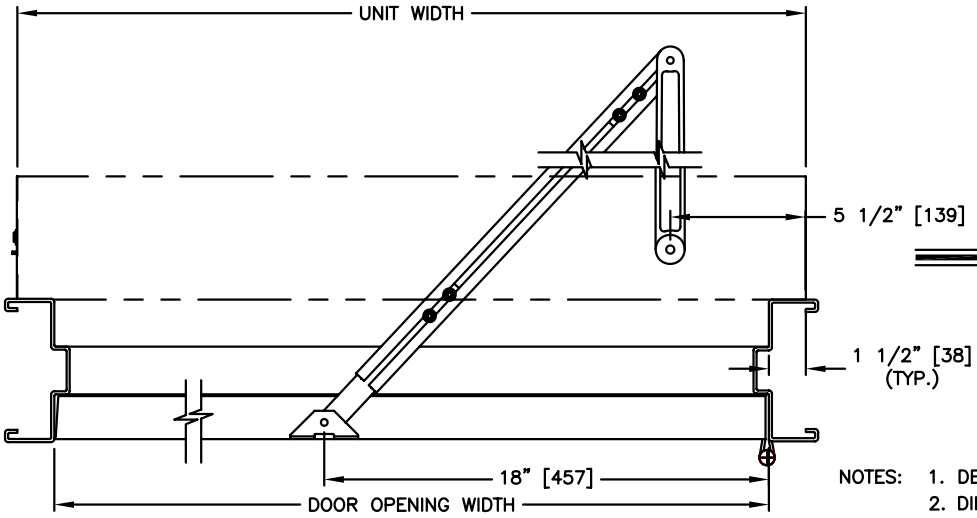
SCALE: 1/4" = 1'0"





PLAN VIEW

SCALE: 1/4" = 1'0"



SECTION: 1

SCALE: 1/8 SIZE

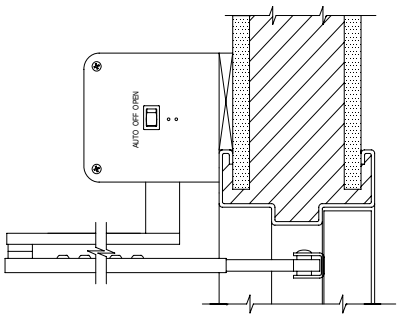
RHR SHOWN
(LHR OPPOSITE)

SECTION: 2

SCALE: 1/4 SIZE

NOTES:
1. DEPTH OF REVEAL UP TO 12" [305]
2. DIMENSIONS IN INCHES [MILLIMETERS].
3. SELECTION OF OPERATOR FROM 8100 (LOW ENERGY) TO 8000 (HIGH ENERGY) WILL DETERMINE THE NEED FOR GUIDE RAILS AND SAFETY SYSTEMS AND IS THE RESPONSIBILITY OF THE INSTALLER

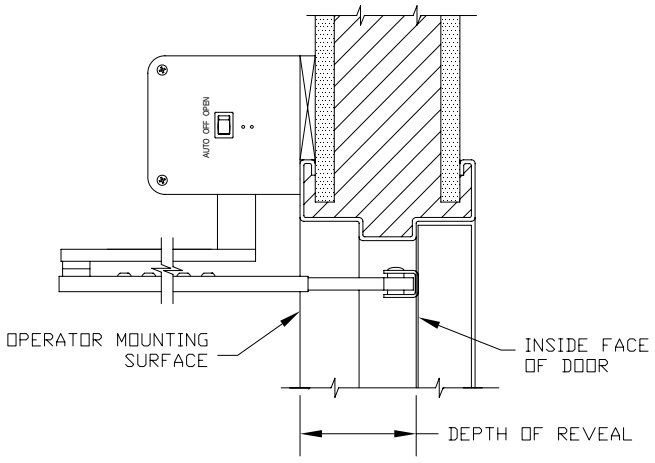
The record-usa Series 8100 Electromechanical Swing Door Operators provide a virtually quiet, dependable solution to automatic swing door applications. The rugged drive train produces smooth dependable performance for all types of door automation.



Series 8100 surface mounted operators mount to the top jamb on new or existing doors. The operator and control are mounted to a back plate and are totally enclosed in a 4½" x 5" removable extruded aluminum cover. The operator can be used with aluminum, hollow metal and wood doors on interior and exterior applications.

Series 8100 operator is provided complete with operator / control, cover and back plate, and door arm. Available control inputs are activation, door and header mounted safety, electric strike interface, and building fire alarm. The operator utilizes a durable, quiet gear design combining the precision of planetary gear technology, compression spring power transfer and a sophisticated cam design to maximize door performance and control. The 8000 operator can be applied to butt hung, center pivoted, swing clear, and offset pivoted doors. The standard arm configuration will accommodate depth of reveals up to 12".

The application of surface mounted automatic door operators must take into account two important frame variables: depth of reveal and wall side clearance. Depth of reveal is the dimension from the surface to which the operator is mounted to the face of the door on the operator side (as shown in the detail below). Depth of reveal should be minimized in all applications because the further away from the door the operator is mounted, the more stress is put on the arm and the operator. Side wall clearance is the dimension from an adjacent wall to the face of the door in the full open position. This dimension is critical only on in-swing units. The arm bracket or slide track mounted to the door must be smaller than the side clearance to avoid having the bracket/track hit the wall.



APPLICATION INFORMATION: Series 8100 product line is designed to be applied to virtually any type of door requiring automation. All units are matched to the door opening to which they will be applied so that any special layout requirements are considered when the unit is manufactured. Contact record-usa for assistance with your specific application needs.

The enclosures in which the units are mounted are sized to match the door opening. In the case of surface mounted units, the enclosure (back plate and cover) is designed to overlap the frame on both sides of the opening by 1½", making the overall length equal to the frame opening plus 3". If there are job conditions which prevent this overlap from being accommodated, or if additional overlap is desired, the exact overall length should be specified. Standard door opening sizes for the Series 8000 operator enclosures are as follows (add 3 inches for unit length):

Singles: 36", 37", 42", 43", 48", 49"
Duals: 72", 74", 84", 86", 96", 98.

While these sizes represent the standard door opening sizes, every job is treated individually so that any special requirements which may exist can be designed into the specification writer's exact requirements.

HARDWARE: Surface mounted units are supplied with one of three different types of door arms: standard (out-swing and in-swing), slide track arm (out swing and in-swing), and offset track arm for in-swing units requiring the breakout function. The standard arm used on out-swing units can accommodate depths of reveal up to 12". For applications which have a reveal greater than 12", contact record-usa for design assistance. On in-swing units, the standard arm may be used unless there is an adjacent wall. In this case the slide track arm would be the recommended choice because of its minimum projection off the face of the door. This application allows for a minimal side clearance between the door and the wall in the open position (as small as 1-1/2").

CONTROL SWITCHES: Series 8100 operators are provided with a state-of-the-art flash memory microprocessor control which intelligently and continually monitors the position of the door during its opening and closing cycles. The control provides trouble-free operation while processing activation and safety signals. Separate inputs are provided for approach and safety sensors that are header mounted and/or door mounted. The control also includes a fused 24VDC accessory power output that provides up to 1 amp of power to drive various activation and/or swing side safety devices. Fire alarm systems with normally closed contacts can be connected directly to the control. When these contacts are opened, the operator will only allow the door to be used manually.

SEE NOTES AT BOTTOM	record	record	Horton	Horton	Besam	Besam	Stanley	Nabco	Nabco	Gildor	LCN	LCN	Norton	Dorma	Dorma	LCN	LCN
General Features	8100 Series	6100 series	7000	4000LE	SM 405/455	850	Magic Force	500	710		Benchmark	AE	LEO	ED400	ED700	Sr. Swing	Mid Swing
Opening Force < 15 pounds	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Closing Force < 8 pounds	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjustable Opening Speeds	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
48" Single Door Openings	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
non handed	Yes	Yes	No	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
push or pull same unit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Maximum 350 # Door Weight	Yes	No	No	Yes	No	Yes	Yes	No	No	Yes	No	No	No	No	No	Yes	Yes
High Frequency Use	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Complies W/ ANSI 156.19	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Complies W/ ANSI 156.10	Yes	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No
Electro-Mechanical	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Electro-Hydraulic	No	No	No	No	No	No	No	No	Yes	No	No	Yes	Yes	No	No	No	No
Exterior Application	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interior Application	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Surface Applied	Yes	Yes	Yes	Yes	SM455	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Overhead Concealed	Yes	No	Yes	Yes	SM405	No	Yes	Yes	No	Yes	No	No	No	Yes	No	Yes	Yes
Full Length Header	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Push To Start	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Auto-Reverse	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Obstruction Stop	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stack Feature	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No	No	No
Microprocessor Control	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Latch Assist	Yes	Yes	No	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	Yes	No
Adjustable Latch check speed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	*Yes	*Yes	Yes	Yes	Yes	Yes
Programmable Controls	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Positive Stop	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes
Built in Interface w/ El Strike	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	No	No
Built in Interface for Bodyguard	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	No	Yes	No	No	Yes	Yes	No	No
Built in support for rail beams	Yes	Yes	No	Yes	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	No
Painted Finishes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes
Clad or formed steel covers	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes
UL Listed-Electrical UL325	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
UL Listed- 3 Hour Fire UL228	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diagnostic evaluation	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	No	No
2 year Warranty	Yes	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
	33	23	7	21	11	15	29	11	1	23	17	9	-3	20	19	19	17

Note: Blue = Manufacturers High End Products

Note: Red = Manufacturer's Low End Product

Note: Models indicated are standard features and may not reflect a manufacturer's ability to provide a particular feature or option.

*Auto Equalizer & Norton LEO have adjustable latch speed only

**Auto Equalizer has plated finishes and does not have clad finishes

Request for Information 000.PB016

Detailed RFI

Talbott Springs Elementary School
9550 Basket Ring Road
Columbia, MD 21045

Project # 147

Dustin Construction, Inc.

RFI #: 000.PB016 **Date Submitted: 6/29/2020**

Answer Company	Answered By	Author Company
Dustin Construction, Inc. 2510 Urbana Pike, Suite 201 Ijamsville, MD 21754	Aaron Mengel	William F. Klingensmith, Inc. 7307 Baltimore Avenue, Suite 209 College Park, MD 20740

Author RFI Number

Subject	Trade Contractor
Specification Cross Reference	William F. Klingensmith

Cc:	Company Name	Contact Name	Copies	Notes

Question **Date Required: 7/6/2020**

Which package has 083473 Sound Control Door Assemblies, not assigned.

Which package has 105600 Metal Storage Assemblies, not assigned.

Which package has 055000 Metal Fabrications paragraph 2.21 Prefinished Metal Benches.

Which package has 057500 Metal Column Covers, not assigned.

Section 078123 Intumescent Fire Resistive Material is missing.

Which package has 087170 Perimeter Acoustical Door Seals, not assigned.

Which package has 087200 Weatherstripping & Seals, not assigned.

Suggestion

Answer **Date Answered: 7/2/2020**

Reference the updated Specification Section 011112 provided in Add. 3

Request for Information 000.PB042

Detailed RFI

Talbott Springs Elementary School
9550 Basket Ring Road
Columbia, MD 21045

Project # 147

Dustin Construction, Inc.

RFI #: 000.PB042 **Date Submitted: 7/2/2020**

Answer Company	Answered By	Author Company
Dustin Construction, Inc. 2510 Urbana Pike, Suite 201 Ijamsville, MD 21754	Aaron Mengel	Urban N. Zink, Contractor, Inc. PO Box S Chase, MD 21027

Author RFI Number

Subject

As-Built Drawings

Trade Contractor

Urban Zink

Cc:	Company Name	Contact Name	Copies	Notes

Question **Date Required: 7/9/2020**

Please provide as-built drawings for the existing building.

Suggestion

Answer **Date Answered: 7/2/2020**

As-Built Drawings shall not be provided