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CITY OF YONKERS/YONKERS PUBLIC SCHOOLS
Purchasing

Mike Spano, Mayor
Tom Collich, Director

TO: **PROSPECTIVE BIDDERS** **NOVEMBER 23, 2021**

FROM: **TOM COLLICH** **4 PAGES**

RE: **IFB-6711 – NEW CONSTRUCTION OF COMMUNITY SCHOOL 35**
ADDENDUM NO. 2 - CITY RESPONSE TO REQUESTS FOR INFORMATION AND CLARIFICATIONS

The contents of this addendum alter and amend the original RFB requirements and take precedence over the related items therein. This addendum forms a part of the contract documents. Bidders must acknowledge receipt of all addenda when submitting their bids. Failure to acknowledge receipt may render a bid non-responsive and ineligible for award. Vendors are responsible for ensuring that they receive all addenda. All addenda will be posted on the Empire State Purchasing Group System (http://www.empirestatebidsystem.com/).

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1. **MODIFY SECTION 015000 TEMPORARY FACILITIES** – Amend paragraph 1.7.A. to state: …Free-standing, self-contained, portable toilets are not to be installed on this project, except as may be needed by regulation to supplement the central restroom trailer facilities.

2. RFI: Are there any drawings showing the proposed diesel tank and related fueling equipment (spec section 230195)?
YJSCB RESPONSE: Refer to Specification Section 230195 in its entirety, and Drawings H200, H300 and H501. Section 230195, paragraph 2.1B.1., first sentence, shall be amended to state: Provide and install a 1,200 gallon aboveground tank with secondary containment and a minimum 2-hour fire rating.

3. RFI: The specs calls out Cummins model DQDAC generator, which is a 300 KW unit. Elsewhere it shows 450 KW. Please advise which one should be priced**.**
YJSCB RESPONSE: Refer to the following:

   REPLACE SPECIFICATION 260425 - DIGITAL LIGHTING CONTROL SYSTEM - Replace the complete section with new attached via this addendum.

   REPLACE SPECIFICATION 260875 - PACKAGED ENGINE GENERATOR SYSTEM - DIESEL INDOOR - Replace the complete section with new attached via this addendum.

4. **REPLACE SECTION 004010 BID FORM – Contract No. 1 – General Construction Work:** Replace the section issued with the bid documents with the one attached to this addendum.

5. **REPLACE SECTION 004011 BID BREAKDOWN SCHEDULE OF VALUES - Contract No. 1 – General Construction Work:** Replace the section issued with the bid documents with the one attached to this addendum.

6. MODIFY SECTION 007001 OWNER'S INSURANCE REQUIREMENTS:

a. Page 1, item (xi) "Pollution Liability" – Add the note "from the General Construction Contractor ONLY" next to "REQUIRED". Only the GC will be required to carry this insurance.

b. Page 5, Item G.1, revise the first sentence to read: "The General Contractor at his own cost and expense shall provide and maintain Contractors Pollution Liability coverage of $5,000,000 per Occurrence and $5,000,000 aggregate, such aggregate must be applicable on a Per Project Basis."

7. MODIFY SECTION 071326 SELF-ADHERING SHEET WATERPROOFING:

a. At 2.4.H, add "and at membrane penetrations" after "construction joints."

b. Add 3.4.C.2 as follows: "2. Seal penetrations through sheet waterproofing to provide watertight seal with detail tape patches or wraps, waterstops and a liquid-membrane troweling per manufacturer's directions."

c. In 3.5.D, add ", waterstops" after "wraps" and add "per manufacturer's directions" to the end of the sentence.

8. RFI: Reference specification section 011010-12, 15. Fire and smoke stop - Please clarify if Contract # 2, 3 and 4 will perform their own penetration firestopping and not included in Contract # 1 scope of work?
YJSCB RESPONSE: Per Section 013113 Coordination Chart, each separate contract is responsible to perform their own penetration firestopping.

9. RFI: Reference specification section 331400 - On drawing C300 dated 11/01/2021, there are two water services shown on McLean Avenue. One of the services is called out as "proposed water service connection to existing water main (typ.)" and the other is not called out at all. On drawing P201 dated 11/01/2021, the called-out water service is shown as a 4" service, but there is no mention of the unidentified service from C300. Please confirm the sizes of the two proposed water services on McLean Avenue.
YJSCB RESPONSE: The unlabeled water service line is a remnant from a previous project configuration and should be disregarded. The labeled water service line connecting to the water main is the correct and only water service connection location.

10. CLARIFICATIONS, ADDITIONAL INFORMATION - DRAWINGS

DRAWING H200 – LEGEND, BASEMENT FLOOR PLANS AND NOTES

a. Provide fire damper and access door on supply air ductwork from ERU-2 at wall penetration between ERM B05 and Data B04.
b. Provide fire damper and access door on supply air ductwork from future ERU-3 at wall penetration between ERM B05 and Data B04.
c. The capacity of the Diesel Fuel storage tank is 1,200 gallons.

DRAWING H201 – 1ST FLOOR PLANS

a. Provide control thermostat sensor at East and West ends of main Corridor.

DRAWING H202 – 2ND FLOOR PLANS

a. Provide expansion compensator on vertical HWS/R piping risers within Mechanical Room.

DRAWING H203 – 3RD FLOOR PLANS

a. Provide expansion compensator on vertical HWS/R piping risers within Mechanical Room.
b. In the Music Room 316, provide flexible connections in the supply and return ductwork prior to the ductwork exiting the room. Provide flexible connections in the supply and exhaust ductwork serving the Toilet rooms prior to the ductwork exiting the Music Room.

DRAWING H204 – 4th FLOOR PLANS

a. Provide control thermostat sensor at East and West ends of main Corridor.

DRAWING H205 – ROOF PLAN

a. The word "Provide" in the note concerning rooftop pipe portals shall be changed to "Furnish".

DRAWING H211 – Community Wing 1st Floor Plans

a. The word "Provide" in the note concerning rooftop pipe portals shall be changed to "Furnish".

DRAWING H213 – COMMUNITY WING BASEMENT – ADD ALT – GYM BASEMENT FIT-OUT

a. The supply air diffuser CFM within the small Toilet Room shall read 200.

DRAWING H302 – 2nd FLOOR PLAN

a. Fin tube at West end of main Corridor shall be labeled FT-A/6'-0".

DRAWING H303 – 3rd FLOOR PLAN

a. Fin tube at West end of main Corridor shall be labeled FT-A/6'-0".

DRAWING P211 – COMMUNITY WING BASEMENT FLOOR PLAN

a. Omit the boxed note at the lower right of the floor plan concerning storm, vents, and underground sanitary.

DRAWING E202 – SECOND FLOOR LIGHTING PLAN

a. In the Stair B West wall, add (1) "J" fixture. Refer to A602 for revised lighting layout. Wire fixture to stair lighting normal circuit. Provide 2#12+1#12G in ¾" to PP-2 #63y. For revised lighting layout, refer to A602.

DRAWING E301 – FIRST FLOOR POWER PLAN

b. Add dedicated 20-amp receptacle with 2#12+1#12-3/4" to Panel board PP-1#62 and data outlet for display unit outside the cafeteria door.
b. Add heat Detector and GFI Receptacle in the janitor's closet 106m. Circuit receptacle to the PP-N#7.

DRAWING E312 – FIRST FLOOR POWER PLAN

a. Add Smoke detectors on each side of the roll up door at the server. Total of 4.

11. **CLARIFICATIONS - ELECTRICAL**

1. The Interior diesel generator shall be broken down into smaller parts to allow access into the basement. It shall arrive onsite broken down as follows:
   a. Engine
   b. Alternator
   c. Skid
   d. Radiator

   This contractor shall coordinate all assembly on site with the manufacturer and General Contractor.

2. The main Distribution Board (MDB) located in the basement electrical room is custom-made 6 section switchboard with maximum height of 84" high to accommodate structural beams in the basement level.

12. LIST OF DOCUMENTS INCLUDED WITH ADDENDUM 2:

Section 004010 Bid Form – Contract No. 1 – General Construction (5 pages 8.5x11)
Section 004011 Bid Breakdown Schedule of Values - Contract No. 1 – General Construction (3 pages 8.5x11)
Section 260425 Digital Lighting Control System (9 pages 8.5x11)
Section 260875 Packaged Engine Generator System - Diesel Indoor (15 pages 8.5x11)

THE OPENING DATE REMAINS FRIDAY, DECEMBER 10, 2021 AT 2:00 PM

IFB-6711 - ADDENDUM NO. 2 – ACKNOWLEDGEMENT

Legal Name of Bidding Firm:_____

Address: _____

Bidder's Representative:_____ **Title**:_____

E-mail:_____**Phone:**_____

Signature: _____**Date:**_____

SECTION 260875

PACKAGED ENGINE GENERATOR SYSTEM – DIESEL INDOOR

PART 1 - GENERAL

Applicable provisions of the conditions of the Contract and Division 1 General Requirements govern the work in this section. Submit shop drawings for checking and approval.

1.1 SCOPE

A. Provide complete factory assembled generator set equipment with digital (microprocessor-based) electronic generator set controls, digital governor, and digital voltage regulator.

B. Provide factory test, startup by a supplier authorized by the equipment manufacturer(s), and on-site testing of the system.

C. The generator set manufacturer shall warrant all equipment provided under this section, whether or not is manufactured by the generator set manufacturer, so that there is one source for warranty and product service. Technicians specifically trained and certified by the manufacturer to support the product and employed by the generator set supplier shall service the generator sets.

1.2 CODES AND STANDARDS

A. The generator set installation and on-site testing shall conform to the requirements of the following codes and standards, as applicable. The generator set shall include necessary features to meet the requirements of these standards.

1. CSA 282, 1989 Emergency Electrical Power Supply for Buildings
2. IEEE446 – Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
3. NFPA37 –
4. NFPA70 – National Electrical Code. Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.
5. NFPA99 – Essential Electrical Systems for Health Care Facilities
6. NFPA110 – Emergency and Standby Power Systems. The generator set shall meet all requirements for Level 1 systems. Level 1prototype tests required by this standard shall have been performed on a complete and functional unit, component level type tests will not substitute for this requirement.

B. The generator set and supplied accessories shall meet the requirements of the following standards:

1. NEMA MG1-1998 part 32. Alternator shall comply with the requirements of this standard.
2. UL142 – Sub-base Tanks
3. UL1236 – Battery Chargers

4. UL2200. The generator set shall be listed to UL2200 or submit to an independent third party certification process to verify compliance as installed.

5. Seismic Certified per IBC 2000, 2003, and 2006. Provide certificate of compliance. Generator sets not certified shall deemed not acceptable.

C. The control system for the generator set shall comply with the following requirements.

1. CSA C22.2, No. 14 – M91 Industrial Control Equipment.
2. EN50082-2, Electromagnetic Compatibility – Generic Immunity Requirements, Part 2: Industrial.
3. EN55011, Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific and Medical Equipment.
4. FCC Part 15, Subpart B.
5. IEC8528 part 4. Control Systems for Generator Sets
6. IEC Std 801.2, 801.3, and 801.5 for susceptibility, conducted, and radiated electromagnetic emissions.
7. UL508. The entire control system of the generator set shall be UL508 listed and labeled.
8. UL1236 –Battery Chargers.

D. The generator set manufacturer shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development, production, installation, and service, in accordance with ISO 9001.

PART 2 - PRODUCTS

2.1 GENERATOR SET

A. Ratings

1. The generator set shall operate at 1800 rpm and at a voltage of: 120/208 Volts AC, Three phase, 4-wire, 60 hertz.
2. The generator set shall be rated at 450 kW, 562.5 kVA at 0.8 PF, Standby rating, based on site conditions of: Ambient temperatures up to 50 degrees C.
3. The generator set rating shall be based on emergency/standby service.

B. Manufacturer

1. Basis of Design and Pre-Approved: Cummins, model DFEJ as supplied by Cummins Sales & Service – East Region, 890 Bronx, NY 10473. Contact: Ed Cheung at email: ed.cheung@cummins.com.

2. It is intended that all products specified herein be of standard ratings, therefore, the KW and KVA, starting KVA and maximum allowable voltage dip, engine displacement ratings, etc., shall be the manufacturer's next size or rating to exactly meet the specifications. No exceptions.

C. Performance

1. Voltage regulation shall be plus or minus 0.5 percent for any constant load between no load and rated load. Random voltage variation with any steady load from no load to full load shall not exceed plus or minus 0.5 percent.
2. Frequency regulation shall be isochronous from steady state no load to steady state rated load. Random frequency variation with any steady load from no load to full load shall not exceed plus or minus 0.5%.
3. The diesel engine-generator set shall accept a single step load of 100% nameplate kW and power factor, less applicable derating factors, with the engine-generator set at operating temperature.
4. Locked rotor kVA shall be match performance of the specified HC5F alternator. Upon 100% application of its nameplate rating of 450 KW, the diesel engine/ac alternator system starting voltage dip shall not exceed 30.1%. Recovery time shall not exceed 3.6 seconds. This shall be tested and verified during the field acceptance system check out test.
5. The alternator shall produce a clean AC voltage waveform, with not more than 5% total harmonic distortion at full linear load, when measured from line to neutral, and with not more than 3% in any single harmonic, and no 3rd order harmonics or their multiples. Telephone influence factor shall be less than 40.
6. The generator set shall be certified by the engine manufacturer to be suitable for use at the installed location and rating, and shall meet all applicable exhaust emission requirements at the time of commissioning.

D. Construction

1. The engine-generator set shall be mounted on a heavy-duty steel base to maintain alignment between components. The base shall incorporate a battery tray with hold-down clamps within the rails.
2. All switches, lamps, and meters in the control system shall be oil-tight and dust-tight. All active control components shall be installed within a UL/NEMA 3R enclosure. There shall be no exposed points in the control (with the door open) that operate in excess of 50 volts.

E. Connections

1. The generator set load connections shall be composed of silver or tin plated copper bus bars, drilled to accept mechanical or compression terminations of the number and type as shown on the drawings. Sufficient lug space shall be provided for use with cables of the number and size as shown on the drawings.
2. Power connections to auxiliary devices shall be made at the devices, with required protection located at a wall-mounted common distribution panel.
3. Generator set control interfaces to other system components shall be made on a permanently labeled terminal block assembly. Labels describing connection point functions shall be provided.

2.2 ENGINE AND ENGINE EQUIPMENT

A. The engine shall be diesel EPA Tier 2 certified, 4 cycle, radiator and fan cooled. The horsepower rating of the engine at its minimum tolerance level shall be sufficient to drive the alternator and all connected accessories. Two cycle engines are not acceptable. Engine accessories and features shall include:

1. An electronic governor system shall provide automatic isochronous frequency regulation. The governing system dynamic capabilities shall be controlled as a function of engine coolant temperature to provide fast, stable operation at varying engine operating temperature conditions. The control system shall actively control the fuel rate and excitation as appropriate to the state of the generator set. Fuel rate shall be regulated as a function of starting, accelerating to start disconnect speed, accelerating to rated speed. The governing system shall include a programmable warm up at idle and cooldown at idle function. While operating in idle state, the control system shall disable the alternator excitation system.
2. Skid-mounted radiator and cooling system shall be rated for full load operation as measured at the alternator air inlet. Radiator fan shall be suitable for use in a system with 0.5 in H_2O restriction. Radiator shall be sized based on a core temperature that is 20F higher than the rated operation temperature, or prototype tested to verify cooling performance of the engine/radiator/fan operation in a controlled environment. Radiator shall be provided with a duct adapter flange. The equipment manufacturer shall fill the cooling system with a 50/50-ethylene glycol/water mixture prior to shipping. Rotating parts shall be guarded against accidental contact.
3. Electric starter(s) capable of three complete cranking cycles without overheating.
4. Positive displacement, mechanical, full pressure, lubrication oil pump.
5. Full flow lubrication oil filters with replaceable spin-on canister elements and dipstick oil level indicator.
6. An engine driven, mechanical, positive displacement fuel pump. Fuel filter with replaceable spin-on canister element. Fuel cooler, suitable for operation of the generator set at full rated load in the ambient temperature specified shall be provided if required for operation due to the design of the engine and the installation.
7. Replaceable dry element air cleaner with restriction indicator.
8. Flexible supply and return fuel lines.
9. Engine mounted battery charging alternator, 40-ampere minimum, and solid-state voltage regulator.
10. Coolant Heater
    a. Engine mounted, thermostatically controlled, coolant heater(s) for each engine. Heater voltage shall be as shown on the project drawings. The coolant heater shall be UL499 listed and labeled.
    b. The coolant heater shall be installed on the engine with silicone hose connections. Steel tubing shall be used for connections into the engine coolant system wherever the length of pipe run exceeds 12 inches. The coolant heater installation shall be specifically designed to provide proper venting of the system. The coolant heaters shall have provisions to isolate the heater for replacement of the heater element without draining the coolant from the generator set. The quick disconnect/automatic sealing couplers shall allow the heater element to be replaced without draining the engine cooling system or significant coolant loss.

c. The coolant heater shall be provided with a DC thermostat, installed at the engine thermostat housing. An AC power connection box shall be provided for a single AC power connection to the coolant heater system.
d. The coolant heater(s) shall be sized as recommended by the engine manufacturer to warm the engine to a minimum of 104F (40C) in a 40F (4C) ambient, in compliance with NFPA110 requirements, or the temperature required for starting and load pickup requirements of this specification.

11. Provide vibration isolators, quantity as recommended by the generator set manufacturer.
12. Starting and Control Batteries shall be calcium/lead antimony type, 24 volt DC, sized as recommended by the engine manufacturer, complete with battery cables and connectors. The batteries shall be capable of a minimum of three complete 15-second cranking cycles at 40F ambient temperature when fully charged.
13. Provide exhaust silencer(s) for each engine of size and type as recommended by the generator set manufacturer and approved by the engine manufacturer. The mufflers shall be critical grade. Exhaust system shall be installed inside sound enclosure.
14. A UL listed/CSA certified 10 amp voltage regulated battery charger shall be provided for each engine-generator set. The charger shall be mounted inside sound enclosure. Input AC voltage and DC output voltage shall be as required. Chargers shall be equipped with float, taper and equalize charge settings. Operational monitors shall provide visual output along with individual form C contacts rated at 4 amps, 120 VAC, 30 VDC for remote indication of:
    a. Loss of AC power - red light
    b. Low battery voltage - red light
    c. High battery voltage - red light
    d. Power ON - green light (no relay contact)
15. Charger shall include an Analog DC voltmeter and ammeter, 12 hour equalize charge timer, and AC and DC fuses.

2.3 AC GENERATOR

A. The AC generator shall be; synchronous, four pole, 2/3 pitch, revolving field, drip-proof construction, single prelubricated sealed bearing, air cooled by a direct drive centrifugal blower fan, and directly connected to the engine with flexible drive disc. All insulation system components shall meet NEMA MG1 temperature limits for Class H insulation system and shall be UL1446 listed. Actual temperature rise measured by resistance method at full load shall not exceed 80 degrees Centigrade.

B. The sub Transient reactance shall not exceed 6.6 at 80 C rating for 208 VAC.

C. Motor starting capability shall be a minimum of 1210 KVA. The generator set shall be capable of recovering to a minimum of 90% of rated no load voltage following the application of the specified kVA load at near zero power factor applied to the generator set.

D. The generator shall be capable of delivering rated output (kVA) at rated frequency and power factor, at any voltage not more than 5 percent above or below rated voltage.

E. A permanent magnet generator (PMG) shall be included to provide a reliable source of excitation power for optimum motor starting and short circuit performance. The PMG and controls shall be capable of sustaining and regulating current supplied to a single phase or three phase fault at approximately 300% of rated current for not more than 10 seconds.

2.4 GENERATOR SET CONTROL

A. The generator set shall be provided with a microprocessor-based control system that is designed to provide automatic starting, monitoring, and control functions for the generator set. The control system shall also be designed to allow local monitoring and control of the generator set, and remote monitoring and control as described in this specification.

B. The control shall be mounted on the generator set or may be mounted in a free-standing panel next to the generator set if adequate space and accessibility is available. The control shall be vibration isolated, and prototype tested to verify the durability of all components in the system under the vibration conditions encountered.

C. The generator set mounted control shall include the following features and functions:

1. Control Switches

a. Mode Select Switch: The mode select switch shall initiate the following control modes. When in the RUN or MANUAL position the generator set shall start and accelerate to rated speed and voltage as directed by the operator. A separate push-button to initiate starting is acceptable. In the OFF position the generator set shall immediately stop, bypassing all time delays. In the AUTO position the generator set shall be ready to accept a signal from a remote device to start and accelerate to rated speed and voltage.

b. EMERGENCY STOP switch: Switch shall be Red "mushroom-head" push-button. Depressing the emergency stop switch shall cause the generator set to immediately shut down and be locked out from automatic restarting.

c. RESET switch: The RESET switch shall be used to clear a fault and allow restarting the generator set after it has shut down for any fault condition.

d. PANEL LAMP switch: Depressing the panel lamp switch shall cause the entire panel to be lighted with DC control power. The panel lamps shall automatically be switched off 10 minutes after the switch is depressed, or after the switch is depressed a second time.

2. Generator Set AC Output Metering. The generator set shall be provided with a metering set including the following features and functions:

a. Digital metering set, 1% accuracy, to indicate generator RMS voltage and current, frequency, output current, output KW, KW-hours, and power factor. Generator output voltage shall be available in line-to-line and line-to-neutral voltages, and shall display all three-phase voltages (line to neutral or line to line) simultaneously.

b. Analog voltmeter, ammeter, frequency meter, power factor meter, and kilowatt (KW) meter. Voltmeter and ammeter shall display all three phases. Meter scales shall be color coded in the following fashion: green shall indicate normal operating condition, amber shall indicate operation in ranges that indicate potential failure, and red shall indicate failure impending. Metering accuracy shall be within 1% at rated output. Both analog and digital metering are required.

c. The control system shall monitor the total load on the generator set and maintain data logs of total operating hours at specific load levels ranging from 0 to 110% of rated load, in 10% increments. The control shall display hours of operation at less than 30% load and total hours of operation at more than 90% of rated load.

d. The control system shall log total number of operating hours, total kWH, and total control on hours, as well as total values since reset.

3. Generator Set Alarm and Status Display

a. The generator set control shall include LED alarm and status indication lamps. The lamps shall be high-intensity LED type. The lamp condition shall be clearly apparent under bright room lighting conditions. Functions indicated by the lamps shall include:

- The control shall include five configurable alarm-indicating lamps. The lamps shall be field adjustable for any status, warning, or shutdown function monitored by the genset. They shall also be configurable for color, and control action (status, warning, or shutdown).
- The control shall include green lamps to indicate that the generator set is running at rated frequency and voltage, and that a remote start signal has been received at the generator set. The running signal shall be based on actual sensed voltage and frequency on the output terminals of the generator set.
- The control shall include a flashing red lamp to indicate that the control is not in automatic state, and red common shutdown lamp.
- The control shall include an amber common warning indication lamp.

b. The generator set control shall indicate the existence of the warning and shutdown conditions on the control panel. All conditions indicated below for warning shall be field-configurable for shutdown. Conditions required to be annunciated shall include:

- low oil pressure (warning)
- low oil pressure (shutdown)
- oil pressure sender failure (warning)
- low coolant temperature (warning)
- high coolant temperature (warning)

- high coolant temperature (shutdown)
- high oil temperature (warning)
- engine temperature sender failure (warning)
- low coolant level (warning)
- fail to crank (shutdown)
- fail to start/overcrank (shutdown)
- overspeed (shutdown)
- low DC voltage (warning)
- high DC voltage (warning)
- weak battery (warning)
- low fuel-daytank (warning)
- high AC voltage (shutdown)
- low AC voltage (shutdown)
- under frequency (shutdown)
- over current (warning)
- over current (shutdown)
- short circuit (shutdown)
- ground fault (warning) (optional--when required by code or specified)
- over load (warning)
- emergency stop (shutdown)
- (4) configurable conditions

c. Provisions shall be made for indication of four customer-specified alarm or shutdown conditions. Labeling of the customer-specified alarm or shutdown conditions shall be of the same type and quality as the above-specified conditions. The non-automatic indicating lamp shall be red, and shall flash to indicate that the generator set is not able to automatically respond to a command to start from a remote location.

4. Engine Status Monitoring

a. The following information shall be available from a digital status panel on the generator set control:

- engine oil pressure (psi or kPA)
- engine coolant temperature (degrees F or C)
- engine oil temperature (degrees F or C)
- engine speed (rpm)
- number of hours of operation (hours)
- number of start attempts
- battery voltage (DC volts)

b. The control system shall also incorporate a data logging and display provision to allow logging of the last 10 warning or shutdown indications on the generator set, as well as total time of operation at various loads, as a percent of the standby rating of the generator set.

5. Engine Control Functions

a. The control system provided shall include a cycle cranking system, which allows for user selected crank time, rest time, and # of cycles. Initial settings shall be for 3 cranking periods of 15 seconds each, with 15-second rest period between cranking periods.

b. The control system shall include an idle mode control, which allows the engine to run in idle mode in the RUN position only. In this mode, the alternator excitation system shall be disabled.

c. The control system shall include an engine governor control, which functions to provide steady state frequency regulation as noted elsewhere in this specification. The governor control shall include adjustments for gain, damping, and a ramping function to control engine speed and limit exhaust smoke while the unit is starting.

d. The control system shall include time delay start (adjustable 0-300 seconds) and time delay stop (adjustable 0-600 seconds) functions.

e. The control system shall include sender failure monitoring logic for speed sensing, oil pressure, and engine temperature which is capable of discriminating between failed sender or wiring components, and an actual failure conditions.

6. Alternator Control Functions

a. The generator set shall include a full wave rectified automatic digital voltage regulation system that is matched, and prototype tested by the engine manufacturer with the governing system provided. It shall be immune from misoperation due to load-induced voltage waveform distortion and provide a pulse width modulated output to the alternator exciter. The voltage regulation system shall be equipped with three-phase line to neutral RMS sensing and shall control buildup of AC generator voltage to provide a linear rise and limit overshoot. The system shall include a torque-matching characteristic, which shall reduce output voltage in proportion to frequency below an adjustable frequency threshold. Torque matching characteristic shall be adjustable for roll-off frequency and rate and be capable of being curve-matched to the engine torque curve with adjustments in the field. The voltage regulator shall include adjustments for gain, damping, and frequency roll-off. Adjustments shall be broad range, and made via digital raise-lower switches, with an alphanumeric LED readout to indicate setting level. Rotary potentiometers for system adjustments are not acceptable.

b. Controls shall be provided to monitor the output current of the generator set and initiate an alarm (over current warning) when load current exceeds 110% of the rated current of the generator set on any phase for more than 60 seconds. The controls shall shut down and lock out the generator set when output current level approaches the thermal damage point of the alternator (over current shutdown). The protective functions provided shall be in compliance to the requirements of NFPA70 article 445.

c. Controls shall be provided to individually monitor all three phases of the output current for short circuit conditions. The control/protection system

shall monitor the current level and voltage. The controls shall shut down and lock out the generator set when output current level approaches the thermal damage point of the alternator (short circuit shutdown). The protective functions provided shall be in compliance to the requirements of NFPA70 article 445.

d. Controls shall be provided to monitor the KW load on the generator set, and initiate an alarm condition (over load) when total load on the generator set exceeds the generator set rating for in excess of 5 seconds. Controls shall include a load shed control, to operate a set of dry contacts (for use in shedding customer load devices) when the generator set is overloaded.

e. An AC over/under voltage monitoring system that responds only to true RMS voltage conditions shall be provided. The system shall initiate shutdown of the generator set when alternator output voltage exceeds 110% of the operator-set voltage level for more than 10 seconds, or with no intentional delay when voltage exceeds 130%. Under voltage shutdown shall occur when the output voltage of the alternator is less than 85% for more than 10 seconds.

f. When required by National Electrical Code or indicated on project drawings, the control System shall include a ground fault monitoring relay. The relay shall be adjustable from 3.8-1200 amps, and include adjustable time delay of 0-10.0 seconds. The relay shall be for indication only, and not trip or shut down the generator set. Note bonding and grounding requirements for the generator set, and provide relay that will function correctly in system as installed.

7. Other Control Functions

a. The generator set shall be provided with a network communication module to allow LonMark compliant communication with the generator set control by remote devices. The control shall communicate all engine and alternator data and allow starting and stopping of the generator set via the network in both test and emergency modes.

b. A battery monitoring system shall be provided which initiates alarms when the DC control and starting voltage is less than 25VDC or more than 32 VDC. During engine cranking (starter engaged), the low voltage limit shall be disabled, and DC voltage shall be monitored as load is applied to the battery, to detect impending battery failure or deteriorated battery condition.

8. Control Interfaces for Remote Monitoring

a. The control system shall provide four programmable output relays. These relay outputs shall be configurable for any alarm, shutdown, or status condition monitored by the control. The relays shall be configured to indicate: (1) generator set operating at rated voltage and frequency, (2) common warning, (3) common shutdown, (4) load shed command.

b. A fused 10 amp switched 24VDC power supply circuit shall be provided for customer use. DC power shall be available from this circuit whenever the generator set is running.

c. A fused 10 amp 24VDC power supply circuit shall be provided for customer use. DC power shall be available from this circuit at all times from the engine starting/control batteries.

d. The control shall be provided with a direct serial communication link for the LonWorks communication network interface as described elsewhere in this specification and shown on the drawings.

2.5 OTHER EQUIPMENT TO BE PROVIDED WITH THE GENERATOR SET

A. Provide and install a 20-light LED type remote alarm annunciator with horn, located as shown on the drawings or in a location that can be conveniently monitored by facility personnel. The remote annunciator shall provide all the audible and visual alarms called for by NFPA Standard 110 for level 1 systems for the local generator control panel. Spare lamps shall be provided to allow future addition of other alarm and status functions to the annunciator. Provisions for labeling of the annunciator in a fashion consistent with the specified functions shall be provided. Alarm silence and lamp test switch(es) shall be provided. LED lamps shall be replaceable and indicating lamp color shall be capable of changes needed for specific application requirements. Alarm horn shall be switchable for all annunciation points. Alarm horn (when switched on) shall sound for first fault, and all subsequent faults, regardless of whether first fault has been cleared, in compliance with NFPA110 3-5.6.2. The interconnecting wiring between the annunciator and other system components shall be monitored and failure of the interconnection between components shall be displayed on the annunciator panel.

B. The annunciator shall include the following alarm labels, audible annunciation features, and lamp colors:

Condition	Lamp Color	Audible Alarm
Normal Power (to Loads)	Green	No
Genset Supplying Load	Amber	No
Genset Running	Green	No
Not in Auto	Red (Flashing)	Yes
High Battery Voltage	Red	Yes
Low Battery Voltage	Red	Yes
Charger AC Failure	Red	Yes
Fail to Start	Red	Yes
Low Engine Temperature	Amber	Yes
Pre-High Engine Temperature	Amber	Yes
High Engine Temperature	Red	Yes
Pre-Low Oil Pressure	Amber	Yes
Low Oil Pressure	Red	Yes
Overspeed	Red	Yes
Low Coolant Level	Amber	Yes
Low Fuel Level	Amber	Yes
Network OK	Green	Yes
(4) Spares	Configurable	Configurable

1. Low battery voltage lamp shall also be lighted for low cranking voltage or weak battery alarm.

C. Provide critical muffler & flex.

D. The generator set shall be provided with breakers as shown per one line diagram. The circuit breaker shall incorporate an electronic trip unit that operates to protect the alternator under all overcurrent conditions, or a thermal-magnetic trip with other overcurrent protection devices that positively protect the alternator under overcurrent conditions. The supplier shall submit time overcurrent characteristic curves and thermal damage curve for the alternator, demonstrating the effectiveness of the protection provided.

E. The generator set shall be provided with a utility grade protective relay, designed to provide thermal overload protection for the alternator, and performance certified for that purpose by a 3rd party testing organization. The supplier shall submit time overcurrent characteristic curves and thermal damage curve for the alternator, demonstrating the effectiveness of the protection provided. Relay shall be installed to allow shutdown of the generator excitation system on an alternator overload condition, with the engine operating for a cool-down period before shutdown. The relay shall not include an instantaneous trip function.

PART 3 - OPERATION

3.1 SEQUENCE OF OPERATION

A. Generator set shall start on receipt of a start signal from remote equipment. The start signal shall be via hardwired connection to the generator set control and a redundant signal over the required network connection.

B. The generator set shall complete a time delay start period as programmed into the control.

C. The generator set control shall initiate the starting sequence for the generator set. The starting sequence shall include the following functions:

D. The control system shall verify that the engine is rotating when the starter is signaled to operate. If the engine does not rotate after two attempts, the control system shall shut down and lock out the generator set and indicate “fail to crank” shutdown.

E. The engine shall fire and accelerate as quickly as practical to start disconnect speed. If the engine does not start, it shall complete a cycle cranking process as described elsewhere in this specification. If the engine has not started by the completion of the cycle cranking sequence, it shall be shut down and locked out, and the control system shall indicate “fail to start”.

F. The engine shall accelerate to rated speed and the alternator to rated voltage. Excitation shall be disabled until the engine has exceeded programmed idle speed and regulated to

prevent over voltage conditions and oscillation as the engine accelerates and the alternator builds to rated voltage.

G. On reaching rated speed and voltage, the generator set shall operate as dictated by the control system in isochronous state.

H. When all start signals have been removed from the generator set, it shall complete a time delay stop sequence. The duration of the time delay stop period shall be adjustable by the operator.

I. On completion of the time delay stop period, the generator set control shall switch off the excitation system and shall shut down.

J. Any start signal received after the time stop sequence has begun shall immediately terminate the stopping sequence and return the generator set to isochronous operation.

PART 4 - OTHER REQUIREMENTS

4.1 SUBMITTALS

A. Within 10 days after award of contract, provide six sets of the following information for review:

1. Manufacturer’s product literature and performance data, sufficient to verify compliance to specification requirements.
2. A paragraph by paragraph specification compliance statement, describing the differences between the specified and the proposed equipment.
3. Manufacturer's certification of prototype testing.
4. Manufacturer's published warranty documents.
5. Shop drawings showing plan and elevation views with certified overall dimensions, as well as wiring interconnection details.
6. Interconnection wiring diagrams showing all external connections required; with field wiring terminals marked in a consistent point-to-point manner.
7. Manufacturer's installation instructions.

4.2 FACTORY TESTING

A. The generator set manufacturer shall perform a complete operational test on the generator set prior to shipping from the factory. A certified test report shall be provided. Equipment supplied shall be fully tested at the factory for function and performance.

B. Factory testing may be witnessed by the owner and consulting engineer. Costs for travel expenses will be the responsibility of the owner and consulting engineer. Supplier is responsible to provide two weeks’ notice for testing.

C. Generator set factory tests on the equipment shall be performed at rated load and rated power factor. Generator sets that have not been factory tested at rated power factor will not be acceptable. Tests shall include: run at full load, maximum power, voltage regulation,

transient and steady-state governing, single step load pickup, and function of safety shutdowns.

4.3 INSTALLATION

A. Provide labor to disassemble generator into separate components for rigging into building. Cummins shall re-assemble rigged equipment in the room along with installing contractor's rigger/equipment. Refer to drawings for access coordination.

B. Equipment shall be installed by the contractor in accordance with final submittals and contract documents. Installation shall comply with applicable state and local codes as required by the authority having jurisdiction. Install equipment in accordance with manufacturer's instructions and instructions included in the listing or labeling of UL listed products.

C. Installation of equipment shall include furnishing and installing all interconnecting wiring between all major equipment provided for the on-site power system. The contractor shall also perform interconnecting wiring between equipment sections (when required), under the supervision of the equipment supplier.

D. Equipment shall be installed on concrete housekeeping pads. Equipment shall be permanently fastened to the pad in accordance with manufacturer's instructions and seismic requirements of the site.

E. Equipment shall be initially started and operated by representatives of the manufacturer.

F. All equipment shall be physically inspected for damage. Scratches and other installation damage shall be repaired prior to final system testing. Equipment shall be thoroughly cleaned to remove all dirt and construction debris prior to initial operation and final testing of the system.

4.4 ON-SITE ACCEPTANCE TEST

A. The complete installation shall be tested for compliance with the specification following completion of all site work. Testing shall be conducted by representatives of the manufacturer, with required fuel supplied by Contractor. The Engineer shall be notified in advance and shall have the option to witness the tests.

B. Installation acceptance tests to be conducted on-site shall include a "cold start" test, a two hour full load test, and a one-step rated load pickup test in accordance with NFPA 110. Provide a resistive load bank and make temporary connections for full load test, if necessary.

C. Perform a power failure test on the entire installed system. This test shall be conducted by opening the power supply from the utility service and observing proper operation of the system for at least 2 hours. Coordinate timing and obtain approval for start of test with site personnel.

4.5 TRAINING

A. The equipment supplier shall provide training for the facility operating personnel covering operation and maintenance of the equipment provided. The training program shall be not less than 4 hours in duration and the class size shall be limited to 5 persons. Training date shall be coordinated with the facility owner.

4.6 SERVICE AND SUPPORT

A. The manufacturer of the generator set shall maintain service parts inventory at a central location which is accessible to the service location 24 hours per day, 365 days per year.

B. The generator set shall be serviced by a local service organization that is trained and factory certified in generator set service. The supplier shall maintain an inventory of critical replacement parts at the local service organization, and in service vehicles. The service organization shall be on call 24 hours per day, 365 days per year.

C. The manufacturer shall maintain model and serial number records of each generator set provided for at least 20 years.

4.7 WARRANTY

A. The generator set and associated equipment shall be warranted for a period of not less than 5 years from the date of commissioning against defects in materials and workmanship.

B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.

END OF SECTION 260875

_____
(Name of Bidder)

BID FORM - REVISED ADDENDUM NO. 2
FOR
COMMUNITY SCHOOL 35
CONTRACT NO. 1 - GENERAL CONSTRUCTION WORK

Yonkers Joint Schools Construction Board
City Hall
40 South Broadway
Yonkers, NY 10701
Attention: Marlyn Anderson, Secretary

(Deliver Bids To: Yonkers Bureau of Purchasing, One Larkin Center, 3rd Floor, Yonkers, N.Y. 10701)

1. The Undersigned hereby declares that it has carefully examined all Bidding and Contract Documents and has inspected the actual location of Work, together with the local sources of supply, and has satisfied itself as to all quantities and conditions, and understands that in signing this Proposal, it waives all rights to plead any misunderstanding regarding the same.

2. The Undersigned further understands and agrees that it is to do, perform and complete all the Work in accordance with the Contract Documents and Contract and to accept in full compensation therefor, the amount of the Total Base Bid, modified by such additive or deductive alternatives, if any, as are accepted by the Owner.

3. In submitting this Bid, the Undersigned agrees:

    a. To hold the Bid open for forty-five (45) days after Bid Opening.
    b. To accept the provisions of the Instructions to Bidders.
    c. To enter into and execute a Contract within ten (10) days of the Notice of Award issue date, and to simultaneously furnish Performance and Labor and Material Bonds.
    d. To commence the Work immediately upon receipt of Notice of Award.

4. The Undersigned agrees that the Work proposed herein will be Substantially Complete the dates indicated in specification Section 011020 - "Milestone Schedule".

5. By submission of this Bid, each Bidder and each person signing on behalf of any Bidder certifies, and in the case of a joint Bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of the party's knowledge and belief:

    a. the prices in this Bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices, with any other Bidder or with any competitor,
    b. unless otherwise required by law, the prices that have been quoted in this Bid have not been knowingly disclosed by the Bidder, and will not knowingly be disclosed by

the Bidder prior to opening, directly or indirectly, to any other Bidder or to any competitor; and

c. no attempt has been made or will be made by the Bidder to induce any other person, partnership or corporation to submit or not to submit a Bid for the purpose of restricting competition.

A Bid shall not be considered for award, nor shall any award be made where a., b., and c. above have not been complied with, provided however, that if in any case the Bidder cannot make the foregoing certification, the Bidder shall so state and shall furnish, with the Bid, a signed statement which sets forth in detail the reasons therefor. Where a., b., and c. above have not been complied with, the Bid shall not be considered for award, nor shall any award be made unless the head of the purchasing unit of the political subdivision, public department, agency or official thereof to which the Bid is made, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

The fact that a Bidder (a) has published price lists, rates or tariffs covering items being procured, (b) has informed prospective customers of proposed or pending publication of new or revised price lists for such items, or (c) has sold the same items to other customers at the same prices being Bid, does not constitute, without more, a disclosure within the meaning of this Section.

6. The Undersigned understands that the Owner reserves the right to accept or reject any or all Bids and to waive any informalities in the bidding.

7. The Undersigned acknowledges the receipt of the following addenda, but agrees that it is bound by all addenda whether or not listed herein:

Addendum Number	Date of Addendum
_____	_____
_____	_____
_____	_____

8. **TOTAL BASE BID**

All labor, material, services and equipment necessary for completion of the Work shown on the Drawings and the Technical Specifications for General Construction Work:

$ _____ (In numbers)

_____ Dollars
(in words)

9. **ALTERNATES**

The Undersigned agrees to provide all work in accordance with the requirements of the Specifications and the Drawings and includes all costs of related coordination, modification, or adjustment for the following:

_____
(Name of Bidder)

ALTERNATE NO. 1: GYMNASIUM BASEMENT FIT-OUT

ADD _____ Dollars ($ _____)

ALTERNATE NO. 2: EXTERIOR SUNSHADES

ADD _____ Dollars ($ _____)

ALTERNATE NO. 3: SOLAR PANELS

ADD _____ Dollars ($ _____)

ALTERNATE NO. 4: VEGETATED ROOFS

ADD _____ Dollars ($ _____)

ALTERNATE NO. 5: Not applicable.

ALTERNATE NO. 6: CASEWORK/MILLWORK/GYM EQUIPMENT

ADD _____ Dollars ($ _____)

ALTERNATE NO. 7: EXTERIOR SIDEWALK AROUND CHURCH

ADD _____ Dollars ($ _____)

10. **UNIT PRICES** - none

11. **ALLOWANCES**

The Undersigned has included the specified allowances in the Total Base Bid quoted.

12. The Undersigned has attached the following documents to this Bid:

a. Bid Breakdown Schedule of Values - Contract No. 1 - General Construction Work
b. Certificate of Compliance with the Iran Divestment Act
c. Certificate of Compliance with the MacBride Principles
d. Yonkers Joint Schools Construction Board Bid Package Diversification Documents
e. City of Yonkers Vendor Background Questionnaire
f. Statement of Contractor's Apprenticeship Program Compliance
g. Bid Security

_____
(Name of Bidder)

h. Statement of Bidder's Qualifications AIA Document A305, including Exhibits A, B, C, D and E.
i. City of Yonkers Bidder's Affidavit

_____ (If corporation, affix
Legal name of person, partnership, joint venture, limited liability company, or corporation (please type) corporate seal)

_____
Address (please type)

_____
Federal ID No. or Social Security No. (please type)

_____
Phone No. (please type)

_____
FAX No. (please type)

_____
Name and title of signer (please type)

_____ _____
Signature Date

If a Corporation
Name Address

_____ , PRESIDENT _____

_____ , SECRETARY _____

_____ , TREASURER _____

If a Partnership
Name of Partners Address

_____ _____

_____ _____

_____ _____

If a Joint Venture
Name of Members Address

_____ _____

_____ _____

_____ _____

If an Individual
Name of Individual Address

_____ _____

_____
(Name of Bidder)

If a Limited Liability Company (LLC)

Name of Members	Address
_____	_____
_____	_____
_____	_____

BID BREAKDOWN SCHEDULE OF VALUES (SOV)
FOR CONTRACT 1 – GENERAL CONSTRUCTION WORK
YJSCB NEW COMMUNITY SCHOOL 35 AT THE ST. DENIS SCHOOL SITE
REISSUED IN ADDENDUM NO 2

SUBMITTED FOR: Contract 1 - General Construction Work

SUBMITTED BY: Company: _____

Address: _____

_____

Phone: _____

Fax No.: _____

Contact Name: _____

Email Address: _____

TO: Yonkers Joint School Construction Board
City Hall, 40 South Broadway
Yonkers, NY 10701

Pursuant to and in accordance with the invitation for proposals for the New Community School 35 at the St. Denis School Site, and having familiarized myself with the conditions of the site, the drawings and specifications (including Instructions to Bidders, Form of Bid Bond, Form of Contract, the General Conditions and the Technical Specifications) as prepared by KG+D Architects, P.C. and their associated consultants, dated November 1, 2021 and addenda, if any, hereby propose to furnish all labor, material, equipment, and services required to construct and complete the work as follows:

1. SUMMARY for Contract No. 1 – General Construction Base Bid and Total Base Bid

   All labor and materials necessary for the General Construction Work for the YJSCB New Community School 35 at the ST. DENIS SCHOOL SITE, as shown on the Bid Documents, including drawings and the specifications, as follows:

   Base Bid Amount: _____Dollars ($_____ _)

   PLUS

   Allowance Amount: One Hundred Thousand Dollars and No Cents ($100,000.00)

   EQUALS

   Total Base Bid Amount: _____Dollars ($_____)

2. BID BREAKDOWN for Contract No. 1 – General Construction Base Bid and Total Base Bid

Schedule of Values Base Bid

1. Bonds and Insurance	_____
2. General Conditions	_____
3. Temporary Provisions	_____
4. Site Protection & Erosion Controls	_____
5. Earthwork, Excavation & Backfill	_____
6. Utility Trenching and Backfill	_____
7. Asphalt & Asphalt Base	_____
8. Site Concrete	_____
9. Concrete Retaining Wall & Ramps	_____
10. Storm/Sanitary/Sewer	_____
11. Fire Service Water Line	_____
12. Site Furnishings & Equipment	_____
13. Steel Fence & Railings	_____
14. Chain Link Fence	_____
15. Landscaping/Topsoil/Seeding/Plants	_____
16. Pavement Striping	_____
17. Building Concrete	_____
18. Building Masonry	_____
19. Structural Steel & Deck	_____
20. Metal Stairs	_____
21. Interior Doors & Hardware	_____
22. Exterior Doors & Hardware	_____
23. Railings and Handrails	_____
24. Rough and Finish Carpentry	_____
25. Architectural Woodwork	_____
26. Waterproofing and Damp Proofing	_____
27. Building Insulation	_____
28. Roofing and Accessories	_____
29. Firestopping and Sealants	_____
30. Plaster Work	_____
31. Doors, Frames & Hardware	_____
32. Aluminum Windows, Doors & Frames	_____
33. Glass, Glazing and Mirrors	_____
34. Fixed Louvers	_____
35. Gypsum Board	_____
36. Porcelain Tile	_____
37. Acoustical Ceilings	_____
38. Flooring/Tile/Carpet	_____
39. Gymnasium Flooring	_____
40. Applied Fireproofing	_____
41. Expansion Control	_____
42. Terrazzo	_____
43. Painting	_____
44. Display Surfaces	_____
45. Toilet Partitions & Accessories	_____

46. Metal Lockers	_____
47. Fire Extinguishers & Cabinets	_____
48. Miscellaneous Specialties	_____
49. Kitchen Equipment	_____
50. Gymnasium Equipment	_____
51. Clean Up	_____
52. Close Out/As-Builts/Punchlist	_____
53. Others (specify)	_____
_____	_____
_____	_____
_____	_____
_____	_____
Total (must equal Base Bid price)	_____

PLUS

Allowance amount	$100,000.00

EQUALS

Total Base Bid (must equal Base Bid plus Allowance) _____

Respectfully submitted,

_____
Name of Firm

Dated _____ By _____
Signature

_____
Printed/Typed Name

_____
Title

SECTION 260425

DIGITAL LIGHTING CONTROL SYSTEM

PART 1 - GENERAL

Applicable provisions of the Conditions of the Contract and Division 1 General Requirements govern work in this section. Submit shop drawings for checking and approval.

1.1 SYSTEM DESCRIPTION

A. The distributed lighting control system as specified herein shall be comprised of stand-alone and networked control devices as indicated.

B. Control devices shall include but not be limited to lighting control panels, room controllers, wall switch stations, occupancy/vacancy sensors, daylight sensors, user interfaces, network interfaces, and related input/output devices.

C. The contractor shall provide all related conduit, wire, boxes, and mounting hardware to provide a complete and functional installation.

1.2 QUALITY ASSURANCE

A. Factory Assembly: All system components shall arrive at the job site completely pre-wired and ready for installation, requiring only the connection of lighting circuits and network terminations. All connections shall be made to clearly and permanently labeled termination points. Systems that require field assembly shall not be acceptable.

B. Component Testing: All system components and assemblies shall be individually tested prior to assembly. Once assembled, all finished products shall be tested for proper operation of all control functions per specifications prior to shipment.

C. NEC Compliance: All system components shall comply with all applicable sections of the National Electrical Code (NEC) as required.

D. NEMA Compliance: All system components shall comply with all applicable portions of NEMA standards pertaining to types of electrical equipment and enclosures.

E. UL Approval: All applicable equipment shall be tested to and listed under UL standard 508 and shall bare labels to indicate compliance. Lighting control relays shall be tested to UL standard 508 for both safety and endurance. System listed other ETL, or other UL sections shall provide documentation proving compliance with UL standard 508.

F. FCC Emissions: All applicable equipment shall comply with FCC emissions standards specified in Part 15, sub-part j for commercial and residential applications and shall bear labels indicating compliance testing. Equipment the does not meet these standards shall not be acceptable.

G. Title 24: All applicable system components and the system as a whole shall be certified as complying with Title 24 requirements.

1.3 SUBMITTALS

A. Submit a line-by-line comparison that describes the differences between each specifications requirement and the equipment / systems being proposed. Comparison shall include a complete listing of how the proposed equipment / systems differ from that specified with regard to size, quantity, quality, method of control, features and functions, control software functions and installation requirements.

B. Prior to fabrication and shipment of lighting control components, the manufacturer shall provide submittal documentation for approval under the general provisions of these specifications.

C. The submittal documentation shall include Class 2 control wire type and routing requirements necessary to match the proposed lighting control components.

D. Submittal documentation shall include a list of components to be supplied, panel schedules, wiring diagrams, detail drawings, and catalog submittal sheets demonstrating compliance with the specified requirements.

E. Provide as part of the submittal package a system riser drawing of sufficient detail to indicate relative placement of major system components and the required connections between each.

F. It shall be the responsibility of the contractor to verify all control wire requirements with the lighting controls manufacturer prior to rough in.

1.4 PROJECT CONDITIONS

A. The contractor shall not install lighting control system components in spaces where the ambient temperature cannot be maintained between 0 degrees to 40 degrees C (32 degrees to 104 degrees F) with a maximum humidity of 90%, non-condensing.

B. All stored and installed lighting control components shall be adequately protected from dust and dirt.

1.5 WARRANTY

A. The lighting control manufacturer shall warrant the system to be free from manufacturing defects for a period of 5 years from shipment.

B. The warranty shall include replacement parts deemed necessary to restore the system to normal operation.

C. The manufacturer shall provide telephone technical support and remote diagnostics where applicable during normal business hours excluding manufacturer holidays.

D. Upon request, the manufacturer shall make available for purchase service contract option(s) which include on-site technician visits for service and repair.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The basis for design is the NX Distributed Lighting Control System from Hubbell Control Solutions.

B. All proposed substitutions (clearly delineated as such) must be submitted in writing for approval a minimum of 10 working days prior to the bid date and must be made available to all bidders.

C. By using pre-approved substitutions, the contractor accepts responsibility and associated costs for all required modifications to circuitry, devices, and wiring.

D. Provide complete shop drawings with deviations to the engineer for review and approval prior to rough-in.

2.2 GENERAL

A. Provide lighting control system hardware that is designed, tested, manufactured, and warranted by a single manufacturer.

B. System components shall be UL listed under the UL916 Energy Management Equipment standard.

2.3 SMART SENSOR MODULE

A. As indicated in the specifications and where shown on the plans, install Hubbell Control Solutions NXSMP series sensor module enabled fixture(s).

B. NXSMP Series Sensor Module shall be designed to install directly into or on the fixture housing or lens.

C. NXSMP Series Sensor Module shall consist of a completely self-contained distributed intelligent device containing the following sensing and control elements:

D. NXSMP Series Sensor Module Occupancy/Vacancy sensor shall provide automatic or vacancy switching of lighting load(s) within an area/zone based on the presence of human activity.

E. NXSMP Series Sensor Module Occupancy/Vacancy sensor shall be microprocessor controlled and utilize IntelliDAPT™ technology to optimize sensor behavior to adapt to space conditions and occupant usage patterns and adjust sensitivity and time delay to maximize energy savings and minimize false On and Off events.

F. NXSMP Series Sensor Module Occupancy/Vacancy sensor shall not require any adjustments of any kind at the time of installation or during operation.

G. NXSMP Series Sensor Module Occupancy/Vacancy sensor shall be powered by Smart Pack SmartPORT™ using plenum rated SmartPORT plug and play cables.

H. NXSMP Series Sensor Module Occupancy/Vacancy sensor shall have a timer that can be adjusted manually from 1 second to 20 minutes.

I. NXSMP Series Sensor Module Occupancy/Vacancy sensor sensitivity shall be adjustable from 1 to 10.

J. NXSMP Series Sensor Module Occupancy/Vacancy sensor shall include non-volatile memory for retaining device settings during power outages.

K. NXSMP Series Sensor Module Occupancy/Vacancy sensor shall have RED real time motion indicator LED visible from the front of the unit.

L. NXSMP Series Sensor Module Occupancy/Vacancy sensor may be programmed for active and inactive times.

M. NXSMP Series Sensor Module Occupancy/Vacancy sensor shall be available with the following 360° coverage patterns:
   1. 1:1 (mounting height to radius) up to 16 feet
   2. 1:1.5 (mounting height to radius) up to 12 feet
   3. 1:3 (mounting height to radius) up to 14 feet
   4. 1:1.4 (mounting height to radius) up to 45 feet indoors 32 feet outdoors

N. NXSMP Series Sensor Module daylight sensor shall continually measure the amount of visible light under the lighting fixture to provide continuous On/Off and full range dimming control of fixture or group under its control.

O. NXSMP Series Sensor Module daylight sensor shall utilize a closed loop daylight harvesting algorithm to maintain the required light level in response to changes in daylight.

P. NXSMP Series Sensor Module daylight sensor shall have independently programmable ramp up and ramp down times to allow the sensor to respond quickly to decrease in daylight and respond more slowly to increase in daylight to minimize the effect of sudden changes in daylight.

Q. NXSMP Series Sensor Module daylight sensor shall be capable of being programmed for active and inactive times.

R. NXSMP Series Sensor Module daylight sensor shall include non-volatile memory for retaining device settings during power outages.

2.6 DIGITAL ROOM CONTROLLER

A. As indicated and where shown on the plans, install Hubbell Control Solutions NXRC series Room Controller(s) to control the quantity of lighting and plug loads required.

B. Where indicated, the room controller shall provide 0 - 10 volt dimming capability for the required number of dimmable lighting loads.

C. The Room Controller shall integrate the functionality of connected control components including wall switch stations, occupancy sensors and daylight sensors to provide the required sequence of operation for the space.

D. Room Controllers and associated room control components shall operate in a totally standalone mode and not require the use of a network, software, computer or server for local control functions.

E. Room Controllers equipped with the optional NXBTC Real Time Clock, shall be capable of storing and running up to 99 local schedules. Setup shall be via Bluetooth using the NX Device Setup App. Schedules shall run autonomously without the need of any coordinator, gateway or master controller.

F. Mechanical:

1. The room controller housing shall measure 5.75" X 3.85" X 1.3" and be constructed of GSM UL rated 94 HB plastic approved for use in a return air plenum.

2. The housing and shall include an integral 1/2" chase nipple for external mounting to standard junction box knockout.

3. Four RJ45 SmartPORT connectors shall be accessible on the side of the enclosure for connection of room control devices.

4. Two recessed push buttons and associated LED indicators shall be accessible on the top of the enclosure to provide override, status, set-up and testing functions.

G. Electrical:

1. The room controller shall have a single power feed and shall be capable of operation at voltages between 120 and 347 volts AC, 50/60 Hz.

2. One or two output relays (model specific) shall provide a total combined power switching capacity of 20 amps per unit.

3. Where indicated provide one or two independent 0 - 10 volt dimming channels (model specific) for full range dimming control of fixtures equipped with compatible dimmable ballast or driver.

4. Each dimming output shall have a current sinking capacity of at least 30 mA.

5. The room controller shall be capable of supplying 250 mA of Class 2 auxiliary DC power for use by wall switch stations, occupancy sensors, and daylight sensors connected to the room controller's four RJ45 SmartPORT connectors.

6. Where indicated, room controllers shall be equipped with power monitoring circuitry capable of measuring and reporting the total connected load for each room controller.

H. Functional:

1. Provide an integral pushbutton and LED indicator for each load for status and to allow operation of the relays and dimmers for testing and verification without requiring other control devices to be connected.

2. The room controller shall have a default operation providing an automatic logical sequence of operation for each load as the room control devices are plugged into the SmartPORT connectors.

3. Default operation for occupancy sensors shall be automatic on, automatic off for all loads.

4. Upon connection of a switch, the operation shall automatically change to manual on, automatic off (vacancy) mode for all loads.

5. Provide capability to convert each load independently to automatic on or vacancy mode using only the integral push buttons and LED indicators on the room controller.

6. When in vacancy mode, provide a 30 second grace period after an off during which automatic on shall be temporarily enabled.

7. It shall be possible to connect up to eight (8) room controllers together using Cat5 patch cables to provide configurations up to 16 switched and dimmed loads operating as a single zone.

8. Provide the following set up and configuration functions without the need for additional devices or software:

a. Assign/reassign relays for control by wall switch station buttons
b. Configure relays for occupancy or vacancy operation
c. Assign/reassign dimmers to raise/lower switches
d. Assign dimming channels for response to daylight sensor control
e. Auto calibrate default daylight sensor sequence of operation
f. Save preset scenes

2.7 LOW VOLTAGE SWITCH STATIONS

A. Low voltage digital wall switch stations shall be of the programmable type using standard Cat5 cabling for connection to system SmartPORT™.

B. Stations shall have one to six buttons and provide lighting control functions as called out and shown on the plans.

C. All switches shall be single gang and be of the generic decorator style allowing easy ganging and use of a wide array of standard wall switch plate options.

D. Provide two RJ-45 ports per switch to allow for daisy chain connection of up to eight switches to each SmartPORT.

E. Switch station color shall be white, ivory, light almond, grey, or black as indicated.

2.8 OCCUPANCY SENSORS

A. Occupancy sensors shall be ceiling or wall mounted and use dual technology (ultrasonic and passive infrared), ultrasonic and/or passive infrared (model specific) sensing technology as indicated.

B. Sensors shall be Class 2 and connect to any room controller SmartPORT using a wiring adaptor and standard Cat5 patch cable.

C. Occupancy sensors shall be self-adaptive and not require manual calibration after installation. Digital circuitry and logic shall automatically make adjustments to the sensitivity and time delay based on learned occupancy patterns and the environment in which the sensor is installed.

D. Sensors using both ultrasonic and passive infrared (dual technology) shall operate such that detection by both technologies is required to initiate occupancy and continued detection by either technology will maintain occupancy.

E. Up to four occupancy sensors may be connected to one room controller.

2.9 DAYLIGHT SENSORS

A. The NX daylight sensor shall provide ambient light level information to the room controller allowing daylight responsive lighting control.

B. The system shall operate in an open loop sequence of operation reducing the amount of electric light as the quantity of daylight entering the room increases.

C. It shall be possible to configure up to six daylight zones in a room. Each zone shall be programmable to proportionally respond to the light level provided by the daylight sensor.

D. The daylight sensor shall be mounted and positioned to provide an unobstructed view of the windows per the manufacturer's directions.

2.10 EMERGENCY LIGHTING INTERFACE

A. Where emergency lighting is to be controlled by the lighting control system, provide UL924 listed load control relays as necessary to insure that emergency lights are automatically turned full on upon loss of normal power to the area.

PART – 3 EXECUTION

3.1 INSTALLATION

A. Install all equipment in accordance with manufacturer’s installation instructions.

B. The lighting controls shall be installed in accordance with specific guidelines and submittal documents provided by the lighting control manufacturer.

C. Where variations from the general specifications or drawings exist, the contractor shall request a clarification prior to rough in or installation.

D. The contractor shall verify all wire type and routing requirements with the lighting controls manufacturer prior to installation. Not part of this section are requirements for work including, but not limited to, raceways, electrical boxes, junction boxes, circuit protection, wiring, and fittings required for installation of the lighting control equipment.

3.2 STARTUP AND PROGRAMMING

A. The system manufacturer shall provide a factory authorized field engineer to the project site after installation has been completed and prior to system energization for the purpose of testing and adjustment of the system. Factory field engineer shall test and verify all system functions and ensure proper operation of the system components in accordance with the specifications and on-site conditions. The installing contractor shall notify the system manufacturer in writing that the system is completely wired and ready to be energized and tested 2 weeks prior to scheduling a field engineer for start-up of the system. Should the field engineer arrive on the job site and find the installation incomplete, the installing contractor shall pay the cost of any future visits by the field engineer required to complete the system start-up.

B. During the start-up procedure, the factory field engineer shall provide programming assistance and guidance to the building operating personnel in order to program the systems for initial operation.

C. Allow for up to 4 hours of on-site training on the use and maintenance of the lighting control system to be scheduled at the completion of startup and programming of the system.

3.3 TECHINICAL SUPPORT

A. The lighting controls manufacturer shall provide reasonable access to factory direct telephone technical support during normal business hours.

END OF SECTION 260425