AIR HANDLING UNIT UV LIGHT INSTALLATIONS

Rowan-Cabarrus Community College
1333 Jake Alexander Blvd., S.
Salisbury, NC

ADDENDUM 1

ADDENDUM DATE: January 21, 2022

NOTICE TO ALL BIDDERS:

1. This addendum serves to clarify, revise and supersede information in the original Notice to Bid posted January 19, 2022.

2. This bid addendum does not have to be returned with the bid documents but needs to be noted on the Bid Form.

3. Bid Opening Tuesday, March 15, 2022 at 2:00 PM - ZOOM Meeting information:

Join Zoom Meeting
https://rccc-edu.zoom.us/j/99298269582

Meeting ID: 992 9826 9582

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CHANGES TO THE CONTRACT DOCUMENTS:

1. Revised UV Light Schedule and Specifications follow this Addendum. These replace the documents in the Notice to Bid posted January 19, 2022.

END OF ADDENDUM 1

UV LIGHT SCHEDULE

TAG	BUILDING NAME	LOCATION	SERVICE	COIL FACE W x H	APPROXIMATE AIRFLOW CFM	MFR	MODEL	LAMP No.	POWER (VOLTS/PH)	AMPS	LAMP SIZE (IN)	No. OF LAMPS	NOTES
UV-1	NCRC BUILDING	OUTSIDE	AHU-1	120" x 75"	32,000	AMERICAN ULTRAVIOLET	CC	CC60	120/1	14.40	60	8	1-18
UV-2	NCRC BUILDING	OUTSIDE	AHU-2	120" x 75"	32,000	AMERICAN ULTRAVIOLET	CC	CC60	120/1	14.40	60	8	1-18
UV-3	ATC BUILDING	OUTSIDE	RTU-1	90" x 81"	26,000	AMERICAN ULTRAVIOLET	CC	CC60 / CC24	120/1	9.60	60 / 24	4 / 4	1-18
UV-4	ATC BUILDING	OUTSIDE	RTU-2	90" x 57"	18,000	AMERICAN ULTRAVIOLET	CC	CC60 / CC24	120/1	7.20	60 / 24	3 / 3	1-18
UV-5	ATC BUILDING	OUTSIDE	RTU-3	90" x 81"	26,000	AMERICAN ULTRAVIOLET	CC	CC60 / CC24	120/1	9.60	60 / 24	4 / 4	1-18
UV-6	N103	INSIDE	AHU-1	60" x 39"	8,200	AMERICAN ULTRAVIOLET	CC	CC60	120/1	5.40	60	3	1-18
UV-7	N103	INSIDE	AHU-2	60" x 39"	8,200	AMERICAN ULTRAVIOLET	CC	CC60	120/1	5.40	60	3	1-18
UV-8	N103	INSIDE	AHU-3	72" x 39"	9,750	AMERICAN ULTRAVIOLET	CC	CC36	120/1	4.80	36	6	1-18
UV-9	N103	INSIDE	AHU-4	78" x 48"	13,000	AMERICAN ULTRAVIOLET	CC	CC60 / CC18	120/1	6.60	60 / 18	3 / 3	1-18
UV-10	N106	INSIDE	AHU-1	90" x 57"	18,000	AMERICAN ULTRAVIOLET	CC	CC60 / CC24	120/1	7.20	60 / 24	3 / 3	1-18
UV-11	N106	INSIDE	AHU-2.1	75" x 42"	11,000	AMERICAN ULTRAVIOLET	CC	CC36	120/1	4.80	36	6	1-18
UV-12	N106	INSIDE	AHU-2.2	60" x 30"	6,250	AMERICAN ULTRAVIOLET	CC	CC60	120/1	5.40	60	3	1-18
UV-13	N106	INSIDE	AHU-3	123" x 69"	29,500	AMERICAN ULTRAVIOLET	CC	CC60	120/1	14.40	60	8	1-18
UV-14	N106	INSIDE	AHU-4	60" x 36"	7,500	AMERICAN ULTRAVIOLET	CC	CC60	120/1	5.40	60	3	1-18
UV-15	N106	INSIDE	AHU-5	66" x 39"	9,000	AMERICAN ULTRAVIOLET	CC	CC60	120/1	5.40	60	3	1-18
UV-16	N110	INSIDE	AHU-1	114" x 81"	32,000	AMERICAN ULTRAVIOLET	CC	CC60 / CC48	120/1	12.00	60 / 48	4 / 4	1-18

NOTES:

1 . CONTRACTOR SHALL VISIT EACH SITE AND VERIFY SIZE AND LOCATION TO INSTALL UV LIGHTS AND NUMBER OF LIGHTS PRIOR TO ORDERING. COORDINATE SITE VISIT WITH OWNER.
2 . LAMPS SHALL BE RATED FOR 1800 HOURS.
3 . PROVIDE A SPARE SET OF LAMPS.
4 . PROVIDE DOOR INTERLOCK SWITCH FOR ACCESS DOOR.
5 . PROVIDE MOUNTING BRACKETS FROM MANUFACTURER AS REQUIRED.
6 . PROVIDE UV WARNING STICKER.
7 . UV LIGHTS SHALL BE DOWNSTREAM OF THE COOLING COIL IN AN ACCESS SECTION.
8 . INSTALL PER MANUFACTURERS REQUIREMENTS.
9 . COORDINATE LOCATION OF NEAREST POWER SUPPLY WITH OWNER.
10 . PROVIDE A DISCONNECT SWITCH (NEMA-3R FOR OUTDOOR UNITS) MOUNTED ON AIR HANDLER.
11 . EXTEND APPROPIATE WIRE SIZE IN EMT CONDUIT (INDOOR) OR IMC CONDUIT (OUTDOOR) FROM PANEL TO SWITCH AND TO UV LIGHT POWER SUPPLY.
12 . NO MC CABLE ALLOWED.
13 . UPDATE PANEL DIRECTORIES.
14 . PROVIDE CONSTRUCTION RECORD INFORMATION INDICATING CIRCUIT BREAKERS USED.
15 . UV LIGHTS SHALL BE SIZED TO DEACTIVATE COVID TYPE VIRUSES IN THE AIRSTREAM. VERIFY AIRFLOW OF EACH UNIT WITH OWNER.
16 . AIRFLOW APROXIMATED BASED ON 500 FPM ACROSS COOLING COIL FACE.
17 . ALL WORK TO BE INACCORDANCE WITH RCCC STANDARDS.
18 . UV LIGHTS SHALL BE AMERICAN UTLRA VIOLET OR FRESH-AIRE EQUAL.

SECTION 23 73 14 – AIR HANDLER UNIT UV LIGHTS

PART 1 - GENERAL

1.1 SCOPE

Contractor shall install UVC systems for all air handling units cooling coils. The purpose is to provide deactivation of airborne covid type viruses in the airstream and provide microbial disinfection of air handling components to prevent the spread of viruses, and inhibit the growth of spores and molds on the air handling components. This controls the proliferation of microorganisms in HVAC systems, which reduces maintenance requirements and eliminates odors. Improved coil heat transfer, lower pressure drop across the coil, and reduced air handler speed all will contribute to significant customer long-term energy savings and reduced system maintenance.

It is intended that all UVC systems be provided by a single manufacturer for all installations on this project.

1.2 QUALITY ASSURANCE

The UVC system shall be ETL, CSA or UL LISTED by a nationally recognized testing lab (NRTL) per UL 1598 for Luminaries and the lamps and power supplies shall be rated for wet locations and air handler use. The entire UV fixture including lamps and wire harnesses (not just the UV ballast) must comply with Part 18 of the FCC rules and carry the appropriate FCC markings/designation from the UV fixture manufacturer.

1.3 DELIVERY, STORAGE AND HANDLING

Store UVC systems in a clean dry place and protect from weather and construction traffic. Handle UVC systems carefully to avoid damage to components. Do not install damaged components; replace and return damaged components to equipment manufacturer.

Comply with manufacturer's installation instructions placement, wiring, and testing.

Submit a list of spare lamps, including number, type, specific systems served, etc. and turn over to OWNER at end of project and obtain written receipt for same.

PART 2 - PRODUCTS

2.1 UVC SYSTEM

A. Manufacturer must meet the following minimum requirements:

1. Acceptable Manufacturers – American Ultraviolet, Fresh-Aire UV or equal.

C. Quality Assurance

All Power supplies shall be 100% tested utilizing a Hi-Pot tester for short circuit detection and the lamps shall be 100% tested for lighting and filament continuity.

Output Verification: Ultraviolet light lamps shall be of 254nm type. Total output per one inch lamp length shall not be less than 4 microW/cm2, at one meter.

D. Warranty

Fixture and controls shall be manufacturer warranted, non-prorated parts and labor, for a period of two (2) years for lamps, and LIFETIME for the electronics, wire-set and ballast.

2.2 DESIGN REQUIREMENTS

It is intended that the CONTRACTOR coordinate with the HVAC equipment manufacturer and the UVC System manufacturer to select the proper system for each application to insure proper germicidal irradiation of air handling system components.

Irradiation

UVC System lamps are to be installed in sufficient quantity and in such an arrangement so as to provide an equal distribution of UVC energy on the coil and in the drain pan and other surfaces prone to bio-fouling. To maintain energy efficiency, the UVC energy produced shall be of the lowest possible reflected and shadowed losses. The use of ***Blue-Calc***® UV design and sizing software is recommended for proper system sizing and configuration. This UV sizing software shall calculate the number of lamps, calculated UV intensities and location of lamp placements for proper sizing. Lamps shall operate continuously, 24/7.

Intensity

The minimal UVC energy shall not be less than 4 micro W/cm^2 per inch of lamp at 1 Meter. No more than 20% loss (80% of initial output) is allowed over a 2 year period.

Quantity of Lamps

Lamps shall be mounted in horizontal rows constructed with factory supplied adjustable lamp rack modules constructed of aluminum, or a “Tubular” rack configuration for 360deg irradiation of light or similar to provide proper lamp support and safety requirements. Lamps shall be positioned within 12 (300mm) inches off the face of the coil, and not more than 35 inches (90cm) shall separate 1 row of lamps from another.

Lamps

Each lamp shall have a useful service life of 18,000 hours with no more than a 20% output loss at the end of the two (2) years of continuous use. Lamps shall be shielded hard quartz hot filament type with a "getter" cathode filament guard that is essential for the extended lamp life operation of two (2) years. The lamps shall also contain a high quality Teflon® Encapsulation that provides thermal buffering and stable lamp operation over the life of the lamp as well as provided water scaling protection and containment and protection from lamp breakage. Lamps shall not produce ozone.

Mounting Hardware

Hardware should be provided to facilitate mounting of the lamps for proper irradiation. All mounting hardware shall be constructed of aluminum, galvanized steel or as an option 304 stainless steel.

Power Supply

The enclosure shall be constructed of corrosion resistant extruded anodized aluminum with a gasket and be sealed for wet and damp locations. Power supply shall be constructed in a fashion to provide isolation of high voltage supply power from the lamp mounting location through remote tethering of lamps. Power Supply shall have a fused auto-switching multi-voltage 120 to 277 VAC 50/60HZ electronic ballast. It shall be labeled “Suitable for Air Handling Use”, and “Suitable for Wet Locations”. Power Supplies shall have an integral on/ off switch and fuse and shall be field replaceable via a water tight quick connect lamp cord connector.

Installation

Lamps shall be connected to the Power Supplies using 600 VAC rated UV and moisture resistant cabling and have IP67 water-proof cable interconnects. The lamp cables shall include intrinsically sealed IP67 rated lamp over molds to prevent moisture intrusion between the lamp interface and lamp connectors. The lamp cables shall be clearly marked as follows "UVGI Ultraviolet Germicidal Lamp Cable - Protect Eyes from UV Light Rays" and shall be colored in Pantone Blue for easy field identification purposes. Manufacturer shall provide enough cabling to reach all lamps as applicable. Safety interlocks are to be installed at all air handler access points where UVC may be present.

2.3 ACCESSORIES

A. Safety Interlocks

To protect maintenance personnel, all access panels and doors to the UVC assembly and/or within view of the UVC assembly must include mechanical interlock switches to insure that the UVC assembly will be de-energized when any of these accesses are opened.

B. UV System Control Panels
Shall provide UV system control such as surge suppression, interlock control, time ON surge delay, Lamp operation indication to BMS etc.

C. UV Radiometers
Shall monitor lamp operation, UVC intensity and life (hour meter).

D. Warning/Caution Stickers
Warning/Caution Stickers shall be placed on each access panel to prevent accidental eye exposure.

2.4. SPARE LAMPS
Provide one (1) spare set of UVC lamps for each UVC system and turn over to the OWNER.

2.5. DISCONNECT SWITCH

MECHANICAL CONTRACTOR shall provide a separate disconnect switch as required by Code for installation by the ELECTRICAL CONTRACTOR on all installations. Where and equipment service outlet is furnished by rooftop/air handler manufacturer, CONTRACTOR may utilize 120v single phase style power source and corded soft-wired kit to plug the UVC system into service outlet. It is the MECHANICAL CONTRACTOR'S responsibility to coordinate these requirements with equipment suppliers and ELECTRICAL CONTRACTOR

END OF SECTION