

**RFCP-007 - SDF EXHAUST FAN MODIFICATION
SHEET 3 - M02**

GENERAL SHEET NOTES

SHEET KEYNOTES

- 12"x10" EXHAUST DUCT DN TO 1'-0" ABOVE CONTAINMENT FLOOR, COVER OPENING W/ 12" SQ. ALUM BIRDSCREEN, PROVIDE VCD @ 5'-0" ABOVE GRATING, SET @ 500 CFM.
- 1 1/4" CONDENSATE DRAIN TO FR, SEE PLUMBING DWG.

NO.	BY	CHK/APP
2	PEM	LDA
1	JKS	AEC

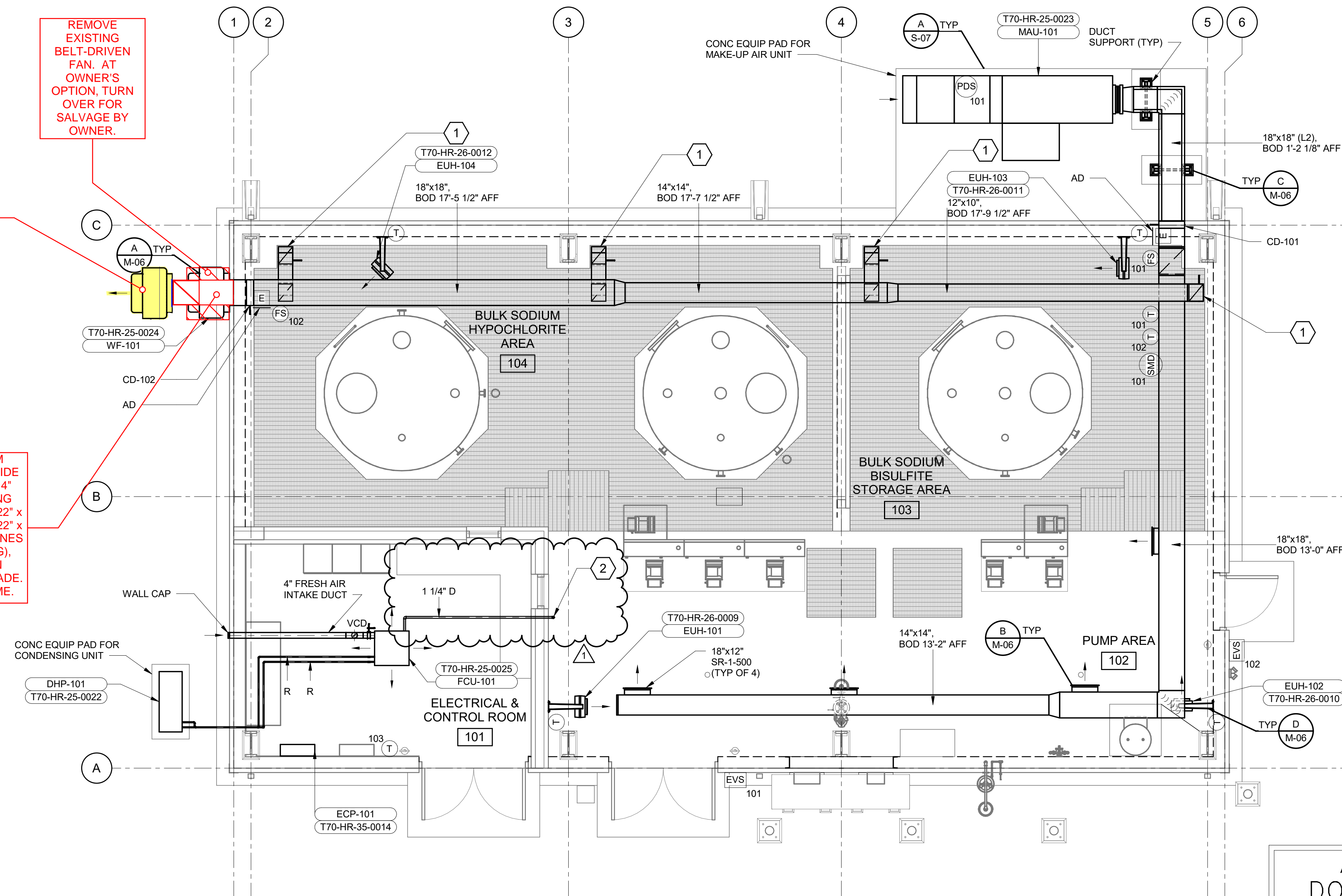
ORIGINAL DRAWING WAS APPROVED FOR REVISIONS FOR THIS PROJECT BY USAID, AKAGI, A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF OHIO, PE 82150 ON 11/27/19

BLACK & VEATCH
Black & Veatch Corporation
Cincinnati, Ohio

CINCINNATI, OHIO
METROPOLITAN SEWER DISTRICT
SSO 700 STF DISINFECTION IMPROVEMENTS
MECHANICAL
SDF HVAC FLOOR PLAN

DESIGNED: AEC
DETAILED: PEM
CHECKED: LDA
APPROVED: LDA
DATE: 11/27/2019

PROJECT NO.
402259
M-02
SHEET
31 OF 58



REMOVE EXISTING BELT-DRIVEN FAN. AT OWNER'S OPTION, TURN OVER FOR SALVAGE BY OWNER.

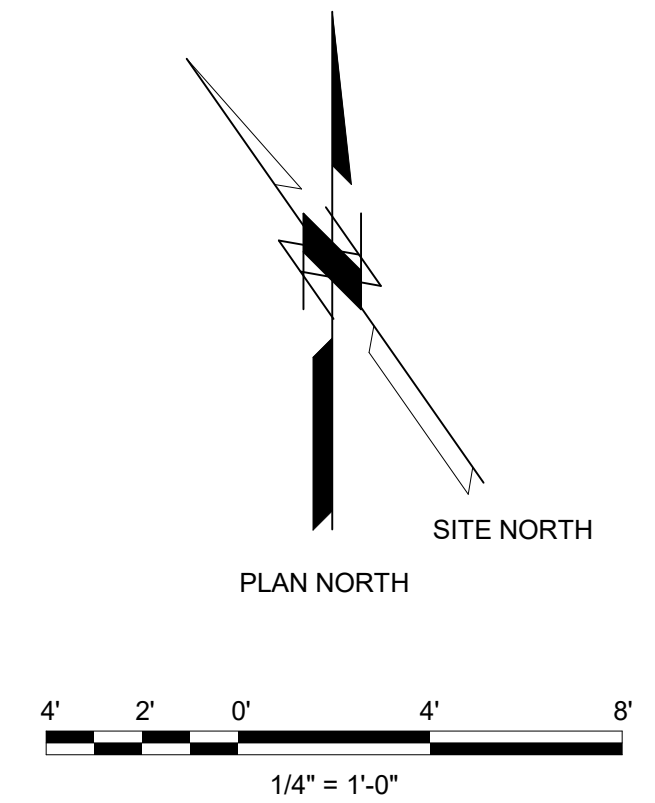
DIRECT DRIVEN EXHAUST FAN WF-101 REVISED

EXTEND 22" x 22" DUCT FROM EXISTING WALL OPENING PROVIDE TRANSITIONING ELBOW 22" x 14" DOWN WITH INTERNAL TURNING VANES, ADD VERTICAL RUN OF 22" x 14" DUCT AND SECOND ELBOW 22" x 22" WITH INTERNAL TURNING VANES (TO MATCH NEW FAN OPENING), MOUNT NEW DIRECT-DRIVEN EXHAUST FAN AT -6' ABOVE GRADE. SUPPORT OFF BUILDING FRAME.

AS-BID DOCUMENTS
USER ACKNOWLEDGES THAT, SHOULD THERE BE ANY DISCREPANCY BETWEEN THESE DOCUMENTS AND THE RECORD SET OF DOCUMENTS AND ANY ADDENDA ISSUED PRIOR TO THE BID, THE RECORD SET OF DOCUMENTS AND THE ORIGINAL ADDENDA SHALL GOVERN.

CONTRACT DRAWING
PRINTS NOT BEARING THIS STAMP WERE MADE PRIOR TO ADVERTISING FOR BIDS AND ARE TO BE CONSIDERED OBSOLETE FOR CONTRACT PURPOSES.

OPERATING FLOOR LEVEL - HVAC PLAN
1/4" = 1'-0"



ACC. NO. 78726

RFCP-007 - SDF EXHAUST FAN MODIFICATION SHEET 4 - M05

FAN COIL UNIT SCHEDULE																		
UNIT NUMBER	LOCATION	MANUFACTURER	MODEL	AIRFLOW (CFM)	AIR PD (IN WC)	EAT		LAT (FDB)	CAPACITY (BTUH)		EWT (F)	WATER FLOW (GPM)	WATER PD (FT)	MOTOR WATTS	POWER SUPPLY		APPROX WEIGHT (LBS)	NO.
						(FDB)	(FWB)		SENSIBLE	TOTAL					VOLTS	PHASE		
FCU-101	ELEC & CONTROL RM 101	mitsubishi/trane	PLA-A42EA7	850	.125	80.1	65.62	---	33180	42000	---	---	---	120	208/230	1	56	1,2

FAN SCHEDULE																		
UNIT NUMBER	LOCATION	MANUFACTURER	MODEL	FAN TYPE	AIRFLOW (CFM)	ESP (IN WC)	BRAKE HP	MOTOR HP	POWER SUPPLY		MINIMUM WHEEL DIAMETER (IN)	WHEEL TYPE	DRIVE	FILTER DATA		APPROX WEIGHT (LBS)	NOTES	
									VOLTS	PHASE				TYPE	THICKNESS (IN)			
WF-101	CHEMICAL AREAS 102/103/104	GREENHECK	CUBE-180	WF	2000	0.375	0.27	1/3	120	1	18	C	BELT	---	---	INTERNAL	100	1
WF-101 REVISED	CHEMICAL AREAS 102/103/104	GREENHECK	CUE-160-B	WF	2000	0.50	0.32	1/2	120	1	16	C	DIRECT	---	---	INTERNAL	90	1

HEATER SCHEDULE																		
UNIT NUMBER	LOCATION	MANUFACTURER	MODEL	TYPE	UNIT ORIENTATION	EAT (F)	EWT (F)	AIR FLOW (CFM)	AIR PD (IN WC)	OUTPUT CAPACITY		WATER FLOW (GPM)	WATER PD (FT)	MOTOR HP	POWER SUPPLY		APPROX WEIGHT (LBS)	NOTES
										(BTUH)	(KW)				VOLTS	PHASE		
EUH-101	CHEMICAL AREAS 102/103/104	CHROMALOX	HD3D	EUHCR	HORIZONTAL	---	---	405	---	---	5	---	---	1/15	480	3	50	1
EUH-102	CHEMICAL AREAS 102/103/104	CHROMALOX	HD3D	EUHCR	HORIZONTAL	---	---	405	---	---	5	---	---	1/15	480	3	50	1
EUH-103	CHEMICAL AREAS 102/103/104	CHROMALOX	HD3D	EUHCR	HORIZONTAL	---	---	405	---	---	5	---	---	1/15	480	3	50	1
EUH-104	CHEMICAL AREAS 102/103/104	CHROMALOX	HD3D	EUHCR	HORIZONTAL	---	---	405	---	---	5	---	---	1/15	480	3	50	1

MAKEUP AIR UNIT SCHEDULE																
UNIT NUMBER	LOCATION	MANUFACTURER	MODEL	HEATING TYPE	AIRFLOW (CFM)	ESP (IN WC)	MOTOR HP	POWER SUPPLY		OUTPUT CAPACITY (BTUH OR (KW))	MINIMUM WHEEL DIA (IN)	FILTER DATA		VIBRATION ISOLATION	APPROX WEIGHT (LBS)	NOTES
								VOLTS	PHASE			TYPE	THICKNESS (IN)			
MAU-101	CHEMICAL AREAS 102/103/104	HASTINGS	SBEM	E	2000	1	1	480	3	(31)	30	PLEATED	2	INTERNAL	500	1,2

CONDENSING UNIT/HEAT PUMP SCHEDULE														
UNIT NUMBER	LOCATION	MANUFACTURER	MODEL	COOLING			HEATING OUTPUT CAPACITY (HEAT PUMP) (BTUH)	POWER SUPPLY		MINIMUM CIRCUIT AMPACITY	ARI MINIMUM EFFICIENCY	MATCHED WITH INDOOR UNIT	APPROX WEIGHT (LBS)	NOTES
				CAPACITY (BTUH)	MINIMUM CAPACITY STEPS	SUCTION TEMPERATURE (F) MINIMUM		MAXIMUM	VOLTS					
DHP-101	ELEC & CONTROL RM 101	mitsubishi/trane	PUZ-A42NKA7	42000	---	---	46000	208/230	1	25	---	FCU-101	215	1,2

PLUMBING FIXTURE SCHEDULE									
UNIT NUMBER	MANUFACTURER	MODEL	DESCRIPTION	WATER (IN)		WASTE (IN)		APPROX WEIGHT (LBS)	NOTES
				HOT	COLD	VENT	VENT		
EEW-1	HAWS	7433FP	EMERGENCY EYE WASH, WALL MOUNTED, FROST-PROOF, REMOTE ACTUATED BALL VALVE, 1/2" IPS TEMPERED WATER SUPPLY SUPPLY.	0"	1"	2"	2"	0.00	1,2,3
ES-1	HAWS	8111FP	EMERGENCY SHOWER, WALL MOUNTED, FROST-PROOF, REMOTE ACTUATED BALL VALVE, 1" IPS TEMPERED WATER SUPPLY.	0"	1"	0"	0"	0.00	1,2,3
ES/EEW-1	HAWS	8336	EMERGENCY SHOWER/EYE/FACE WASH COMBINATION, PEDESTAL MOUNTED, CORROSION RESISTANT, 1 1/4" IPS TEMPERED WATER SUPPLY, 120 VOLT.	0"	1"	0"	0"	0.00	1,2

AIR DEVICE SCHEDULE								
SYMBOL	MANUFACTURER	MODEL	FRAME/BORDER	MODULE SIZE	MATERIAL	FINISH	DAMPER TYPE	NOTES
SR-1	TITUS	272FS	SURFACE MOUNT	18"x12"	ALUMINUM	BAKED ALUM ENAMEL	OPPOSED BLADE	

PLUMBING EQUIPMENT SCHEDULE					
UNIT NUMBER	MANUFACTURER	MODEL	DESCRIPTION	APPROX WEIGHT (LBS)	NOTES
EW-101	STATE	CSB SERIES	ELECTRIC WATER HEATER, COMMERCIAL GRADE, 119 GALLONS STORAGE, 98 GPH RECOVER AT 100 F RISE, 24 KW, 480 VOLT, 3 PHASE, 60 HZ.	0.00	

PIPING ACCESSORIES SCHEDULE				
UNIT NUMBER	MANUFACTURER	MODEL	DESCRIPTION	NOTES
FCO-1	SMITH	4111 SERIES	HEAVY DUTY FLOOR CLEANOUT, SECURED ROUND ADJUSTABLE NICKEL BRONZE TOP.	
FD-1	SMITH	2310 SERIES	MEDIUM DUTY CAST IRON FLOOR DRAIN, ADJUSTABLE TOP, LOOSE SET CAST IRON GRATE.	

HVAC SEQUENCE OF OPERATION

1. GENERAL SYSTEM OPERATIONS.

1.1. EQUIPMENT CONTROL PANEL. EQUIPMENT CONTROL PANEL (ECP) IDENTIFIED IN THE SEQUENCE OF OPERATION SHALL BE PROVIDED WITH THE INDICATING LIGHTS, RUNNING LIGHTS, ALARM LIGHTS, AUDIBLE ALARMS, TIMERS, AND SELECTOR SWITCHES FOR CONTROL AND STATUS INDICATION OF THE EQUIPMENT SERVED. WHERE NO CONTROL PANELS ARE PROVIDED FOR EQUIPMENT, THE LIGHTS AND SWITCHES SHALL BE AT THE STARTER OR MCC. RUNNING LIGHTS SHALL BE PROVIDED TO INDICATE BOTH ENERGIZED AND DE-ENERGIZED CONDITIONS FOR THE EQUIPMENT AND SHALL POSITIVELY INDICATE EQUIPMENT CONDITIONS FROM THE MOTOR STARTER OR CURRENT SENSOR. SWITCH POSITION SHALL NOT BE USED FOR LIGHT ILLUMINATION. INDICATING AND RUNNING LIGHTS SHALL BE LOCATED DIRECTLY ABOVE EACH RESPECTIVE SELECTOR SWITCH WITH LIGHT COLORS AS FOLLOWS:

RED - DE-ENERGIZED
 GREEN - ENERGIZED
 AMBER - ALARM
 WHITE - STATUS

INDICATING LIGHTS AND SELECTOR SWITCHES SHALL BE LOCATED ON THE FACE OF THE TEMPERATURE CONTROL PANEL SERVING THE RESPECTIVE EQUIPMENT. IN ADDITION TO THE LIGHTS, TIMERS, AND SELECTOR SWITCHES DESCRIBED IN THE SEQUENCE OF OPERATION FOR THE INDIVIDUAL EQUIPMENT, EACH CONTROL PANEL SHALL BE PROVIDED WITH THE FOLLOWING:

"CONTROL POWER ON" STATUS LIGHT
 "INDICATING LIGHT TEST" PUSHBUTTON
 ALARM SILENCE PUSHBUTTON
 "ALARM RESET" PUSHBUTTON (WHERE APPLICABLE)

CONTROL PANELS SPECIFIED TO BE PROVIDED WITH ALARM CONDITION INDICATING LIGHTS SHALL BE PROVIDED WITH AN ELECTRICALLY ISOLATED CONTACT TO PROVIDE A COMMON ALARM TO THE PLANT CONTROL SYSTEM (PCS). EACH CONTROL PANEL SHALL BE PROVIDED WITH A MINIMUM OF ONE COMMON ALARM OUTPUT POINT TO THE PCS AND ADDITIONAL INDIVIDUAL ALARM POINTS AS INDICATED BELOW.

EQUIPMENT CONTROL PANEL SHALL COME WITH PHENOLIC NAMEPLATES FOR EACH CONTROL SWITCH INDICATING SWITCH TYPE, EQUIPMENT CONTROLLED, ROOM OR AREA SERVED, AND SWITCH AUTOMATIC POSITION EQUIPMENT INTERLOCK.

1.2. SYSTEM INTERLOCKS AND ALARMS

UNLESS OTHERWISE INDICATED, ALL EQUIPMENT INTERLOCKING DEVICES AS DESCRIBED HEREIN SHALL BE PROVIDED WITHIN THE RESPECTIVE EQUIPMENT CONTROL PANEL (ECP).

1.2.1. SMOKE DETECTION SYSTEMS (DUCT MOUNTED DETECTORS). SMOKE DETECTORS SHALL BE LOCATED IN THE DUCT OF EQUIPMENT LISTED BELOW. IN THE EVENT SMOKE IS DETECTED BY A DETECTOR, A SMOKE DETECTED SIGNAL SHALL BE TRANSMITTED TO THE REMOTE TEST STATION AND FIRE ALARM PANEL OR PLANT CONTROL SYSTEM (PCS) AND ECP WHEN A FIRE ALARM PANEL IS NOT PRESENT. A "SMOKE DETECTED" ALARM LIGHT ON THE RESPECTIVE REMOTE TEST STATION SHALL BE ILLUMINATED. WHERE A ECP IS PRESENT, THE REMOTE TEST STATION SHALL BE MOUNTED ON OR ADJACENT TO THE EQUIPMENT CONTROL PANEL. THE RESPECTIVE EQUIPMENT AND ANY INTERLOCKED EQUIPMENT SHALL BE DE-ENERGIZED AND OUTSIDE AIR DAMPERS ASSOCIATED WITH THE DE-ENERGIZED EQUIPMENT SHALL CLOSE.

IN THE EVENT A SMOKE DETECTOR MALFUNCTIONS, A MALFUNCTION SIGNAL SHALL BE TRANSMITTED TO THE REMOTE TEST STATION OR FIRE ALARM PANEL, ILLUMINATING A "SMOKE DETECTOR MALFUNCTION" INDICATING LIGHT.

SMOKE DETECTOR SMD-101 DE-ENERGIZED EQUIPMENT MAU-101, WF-101

1.2.2. LOW TEMPERATURE PROTECTION. LOW AIR TEMPERATURE THERMOSTATS/SENSORS SHALL BE LOCATED IN THE SYSTEMS INDICATED BELOW. UPON DETECTION OF LOW AIR TEMPERATURE, THE THERMOSTAT SHALL DE-ENERGIZE THE RESPECTIVE EQUIPMENT AND ALL INTERLOCKED EQUIPMENT, CONTROL DAMPER(S) OF THE RESPECTIVE EQUIPMENT AND INTERLOCKED EQUIPMENT SHALL RETURN TO THE NORMAL POSITION, AND A "LOW AIR TEMPERATURE" ALARM LIGHT ON THE FACE OF THE RESPECTIVE EQUIPMENT CONTROL PANEL SHALL BE ILLUMINATED OR ALARM INDICATION SENT TO THE DIRECT DIGITAL CONTROL SYSTEM. AN ADJUSTABLE 0 TO 5 MINUTE TIME DELAY RELAY SHALL BE PROVIDED TO ALLOW FOR STARTING OF THE EQUIPMENT UNDER COLD AMBIENT CONDITIONS. UPON LOW TEMPERATURE SHUTDOWN, THE EQUIPMENT SHALL REQUIRE A MANUAL RESTART.

EQUIPMENT MAU-101 THERMOSTAT T-101 EQUIPMENT CONTROL PANEL ECP-101

1.2.3. HIGH FILTER PRESSURE LOSS. A HIGH LIMIT PRESSURE DIFFERENTIAL FLOW SWITCH SHALL BE LOCATED ACROSS THE FILTER BANK OF THE EQUIPMENT INDICATED BELOW. IN THE EVENT THE PRESSURE DIFFERENTIAL ACROSS THE FILTER EXCEEDS THE PRESET VALUE, A "HIGH FILTER PRESSURE LOSS" ALARM LIGHT ON THE FACE OF THE RESPECTIVE EQUIPMENT CONTROL PANEL OR THERMOSTAT (WHERE FURNISHED WITH LIGHTS) SHALL BE ILLUMINATED.

EQUIPMENT MAU-101 FLOW SWITCH PDS-101 EQUIPMENT CONTROL PANEL ECP-101

1.2.4. VENTILATION SYSTEM FAILURE (AIRFLOW SWITCHES). VENTILATION SYSTEM FAILURE PRESSURE DIFFERENTIAL SWITCHES SHALL BE LOCATED IN THE SYSTEMS INDICATED BELOW. IN THE EVENT THAT AIRFLOW IS NOT ATTAINED OR LOST AS DETERMINED BY THE PRESSURE DIFFERENTIAL FLOW SWITCH, A "VENTILATION SYSTEM FAILURE" SIGNAL SHALL BE TRANSMITTED TO THE FIRE ALARM SIGNALING SYSTEM AND LOCAL SCADA. WHERE A FIRE ALARM SIGNALING SYSTEM IS NOT PRESENT, THE "VENTILATION SYSTEM FAILURE" SIGNAL SHALL BE TRANSMITTED TO THE PLANT CONTROL SYSTEM (PCS). WHERE INDICATED ON THE DRAWINGS, A VISUAL ALARM SHALL BE ILLUMINATED AND AUDIBLE ALARM SHALL SOUND AT EACH ROOM ENTRANCE AND WITHIN THE ROOM. THE FIRE ALARM SIGNALING SYSTEMS HAVE A NORMALLY OPEN CONTACT FOR TRANSMITTING A SIGNAL TO THE RESPECTIVE EQUIPMENT CONTROL PANEL ILLUMINATING AN ALARM INDICATING LIGHT FOR THE RESPECTIVE EQUIPMENT.

EQUIPMENT MAU-101 FLOW SWITCH FS-101 FS-102 EQUIPMENT CONTROL PANEL ECP-101 ECP-101

1.2.5. EMERGENCY VENTILATION SHUTOFF. BREAK-GLASS TYPE EMERGENCY VENTILATION SHUTOFF SWITCHES SHALL BE PROVIDED FOR THE EQUIPMENT INDICATED BELOW. THE SWITCHES SHALL BE LOCATED AT EACH ROOM ENTRANCE. IN THE EVENT A SWITCH IS ACTIVATED, AN ALARM SIGNAL SHALL BE TRANSMITTED TO THE LOCAL EQUIPMENT CONTROL PANEL AND RESPECTIVE EQUIPMENT DE-ENERGIZED REGARDLESS OF INDIVIDUAL FAN SWITCH POSITION. THE OUTSIDE AIR DAMPERS ASSOCIATED WITH THE DE-ENERGIZED EQUIPMENT SHALL CLOSE.

EQUIPMENT MAU-101 EVS SWITCH EVS-101, 102

2. HEATING SYSTEMS.

2.1. UNIT HEATERS. UNIT HEATERS SHALL BE CONTROLLED BY THEIR RESPECTIVE THERMOSTATS.

3. VENTILATING/EXHAUST SYSTEMS.

3.1. "ON-OFF-AUTO" EQUIPMENT CONTROL. EQUIPMENT INDICATED FOR "ON-OFF-AUTO" CONTROL SHALL EACH BE CONTROLLED BY AN INDIVIDUAL "ON-OFF-AUTO" FAN SELECTOR SWITCH. THE SWITCH LOCATION SHALL BE AS INDICATED BELOW. WHEN THE SWITCH IS PLACED IN THE "AUTO" POSITION, THE FAN SHALL BE INTERLOCKED AND CONTROLLED BY THE FAN INTERLOCK. WHEN THE SWITCH IS PLACED IN THE "ON" POSITION, THE FAN SHALL BE ENERGIZED. BEFORE A FAN CAN OPERATE, THE CONTROL DAMPER(S) SHALL BE PROVEN OPEN. WHERE THE FAN IS INTERLOCKED WITH ANOTHER FAN OR EQUIPMENT WITH A FAN, THE FANS SHALL BE ENERGIZED SIMULTANEOUSLY AFTER ALL ASSOCIATED CONTROL DAMPERS ARE PROVEN OPEN. WHEN THE FAN IS DE-ENERGIZED, THE CONTROL DAMPER(S) SHALL RETURN TO THE NORMALLY CLOSED POSITION UNLESS OTHERWISE INDICATED.

EQUIPMENT WF-101 SWITCH LOCATION STARTER ADJACENT TO ECP-101 FAN INTERLOCK MAU-101 CONTROL DAMPER CD-102

CONDENSING UNIT/HEAT PUMP SCHEDULE:
 OUTDOOR COIL ENTERING AIR TEMPERATURE:
 COOLING - 105° F DESIGN/ 0° F MIN
 HEATING - 43° F (HEAT PUMP)

NOTES:
 1. VARIABLE REFRIGERANT FLOW
 2. UNIT IS SUBJECT TO CORROSION FROM A HYDROGEN SULFIDE LADEN ATMOSPHERE. ALL AIRSTREAM COMPONENTS SHALL BE GIVEN A PROTECTIVE SPECIAL COATING OF HERESITE OR APPROVED EQUAL. CONTROL PANELS, WIRING CONNECTIONS AND OTHER SENSITIVE ELECTRONICS SHALL HAVE A CONFORMAL COATING APPLIED.

FAN SCHEDULE:
 FAN TYPE ABBREVIATIONS:
 WF - WALL FAN

WHEEL TYPE ABBREVIATIONS:
 C - CENTRIFUGAL

NOTES:
 1. UNIT IS SUBJECT TO CORROSION FROM A HYDROGEN SULFIDE LADEN ATMOSPHERE. ALL AIRSTREAM COMPONENTS SHALL BE GIVEN A PROTECTIVE SPECIAL COATING OF HERESITE OR APPROVED EQUAL. CONTROL PANELS, WIRING CONNECTIONS AND OTHER SENSITIVE ELECTRONICS SHALL HAVE A CONFORMAL COATING APPLIED.

FAN COIL SCHEDULE:
 NOTES:
 1. PROVIDE WITH FRESH DUCT KIT
 2. PROVIDE WITH LAY-IN CEILING MOUNTING AND SUPPORT SYSTEM

HEATER SCHEDULE:
 TYPE ABBREVIATIONS:
 EUHCR - CORROSION RESISTANT ELECTRIC UNIT HEATER

NOTES:
 1. SURFACE WALL MOUNTING KIT

MAKEUP AIR UNIT SCHEDULE:
 CAPACITY NOTE: CAPACITIES LISTED IN PARENTHESES ARE IN UNITS OF "KW". CAPACITIES LISTED WITHOUT PARENTHESES ARE IN UNITS OF "BTUH".

HEATING TYPE ABBREVIATIONS:
 E - ELECTRIC

NOTES:
 1. FILTER VELOCITY SHALL NOT EXCEED 350 FPM
 2. UNIT IS SUBJECT TO CORROSION FROM A HYDROGEN SULFIDE LADEN ATMOSPHERE. ALL AIRSTREAM COMPONENTS AND EXPOSED HEAT TRANSFER COMPONENTS SHALL BE GIVEN A PROTECTIVE SPECIAL COATING OF HERESITE OR APPROVED EQUAL. CONTROL PANELS, WIRING CONNECTIONS AND OTHER SENSITIVE ELECTRONICS SHALL HAVE A CONFORMAL COATING APPLIED.

PLUMBING EQUIPMENT SCHEDULE:
 NOTES: NONE

PLUMBING FIXTURE SCHEDULE:
 NOTES:
 1. TEMPERED WATER SUPPLY
 2. LOCAL AND REMOTE ALARM SYSTEM
 3. COMMON FLOW SWITCH SERVES BOTH EEW-1 AND ES-1

PLUMBING PIPING ACCESSORIES SCHEDULE:
 NOTES: NONE

4. HEATING AND VENTILATING SYSTEMS.

4.1. MAKEUP AIR UNIT (100% OUTSIDE AIR). MAKEUP AIR UNIT SHALL BE CONTROLLED BY AN INDIVIDUAL "SUMMER-OFF-WINTER" SYSTEM SELECTOR SWITCH. THE SWITCH LOCATION SHALL BE AS INDICATED BELOW. WHEN THE SWITCH IS PLACED IN THE "WINTER" POSITION, THE FAN SHALL OPERATE AND THE SUPPLY AIR SENSOR/THERMOSTAT SHALL MODULATE THE HEATING OUTPUT OF THE UNIT TO MAINTAIN THE DESIRED SUPPLY AIR TEMPERATURE. BEFORE THE FAN CAN OPERATE, THE CONTROL DAMPERS SHALL BE PROVEN OPEN. WHEN THE OUTSIDE AIR TEMPERATURE IS GREATER THAN THE HEATING CHANGEOVER TEMPERATURE SETPOINT AS DETECTED BY THE OUTDOOR AIR SENSOR/THERMOSTAT, THE HEATING SHALL BE LOCKED OUT. WHEN THE SWITCH IS PLACED IN THE "SUMMER" POSITION, THE FAN SHALL OPERATE AND THE HEATING SHALL BE LOCKED OUT. WHEN THE UNIT IS DE-ENERGIZED, THE CONTROL DAMPER(S) SHALL CLOSE.

5. AIR CONDITIONING SYSTEMS.

5.1. PACKAGED SYSTEM. PACKAGED SYSTEM SHALL BE CONTROLLED BY THEIR RESPECTIVE THERMOSTAT. SYSTEM OPERATION SHALL BE CONTROLLED BY AN "OFF-HEAT-AUTO-COOL" (AUTOMATIC CHANGEOVER, PROGRAMMABLE) SYSTEM SWITCH AND AN "AUTO-ON" FAN SWITCH LOCATED ON THE THERMOSTAT SUB-BASE. HEAT PUMPS SHALL ALSO HAVE AN "EMERGENCY HEAT" SYSTEM SWITCH POSITION TO ENERGIZE THE HEATING AND DE-ENERGIZE THE COMPRESSOR.

EQUIPMENT MAU-101 SWITCH LOCATION ECP-101 SUPPLY AIR THERMOSTAT T-102 CONTROL DAMPER CD-101

6. THERMOSTAT SETPOINTS

6.1 THERMOSTAT SETPOINTS SHALL BE AS INDICATED BELOW, UNLESS THE SETPOINT HAS BEEN DESCRIBED PREVIOUSLY IN THIS SEQUENCE OF OPERATIONS.

EQUIPMENT FCU-101 ROOM THERMOSTAT T-103

LOW TEMPERATURE THERMOSTATS - 40 F
 HEATERS - 54 F
 MAKEUP AIR SUPPLY HEATING - 54 F
 PROGRAMMABLE THERMOSTATS - 78 F COOLING
 - 72 F HEATING

AS-BID DOCUMENTS

USER ACKNOWLEDGES THAT, SHOULD THERE BE ANY DISCREPANCY BETWEEN THESE DOCUMENTS AND THE RECORD SET OF DOCUMENTS AND ANY ADDENDA ISSUED PRIOR TO THE BID, THE RECORD SET OF DOCUMENTS AND THE ORIGINAL ADDENDA SHALL GOVERN.

CONTRACT DRAWING

PRINTS NOT BEARING THIS STAMP WERE MADE PRIOR TO ADVERTISING FOR BIDS AND ARE TO BE CONSIDERED OBSOLETE FOR CONTRACT PURPOSES.

<p>ORIGINAL DRAWING WAS APPROVED FOR CONSTRUCTION AND SEALED BY USA D. ANGELO, PROFESSIONAL ENGINEER IN THE STATE OF OHIO, PE 82150 ON 11/27/19</p> <p style="text-align: center;">BLACK & VEATCH</p> <p style="text-align: center;">Black & Veatch Corporation Cincinnati, Ohio</p>	<p>CINCINNATI, OHIO METROPOLITAN SEWER DISTRICT SSO 700 STF DISINFECTION IMPROVEMENTS</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">MECHANICAL SCHEDULES AND SEQUENCE OF OPERATIONS</p>
DESIGNED: AEC DETAILED: PEM CHECKED: LDA APPROVED: LDA DATE: 11/27/2019	<p>IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE</p>
PROJECT NO. 402259 SHEET M-05 34 OF 58	

RFCP-007 - SDF EXHAUST FAN MODIFICATION

SHEET 4.1 - REVISED FAN SELECTION



WF-101 REVISED

Job Name: SSO 700 STF Disinfection Improvements
 Tag: WF-1 REVISED
 Quantity: 1
 Printed Date: March 29, 2022

Model: CUE-160-B

Centrifugal Direct Drive Wall Exhaust Fan

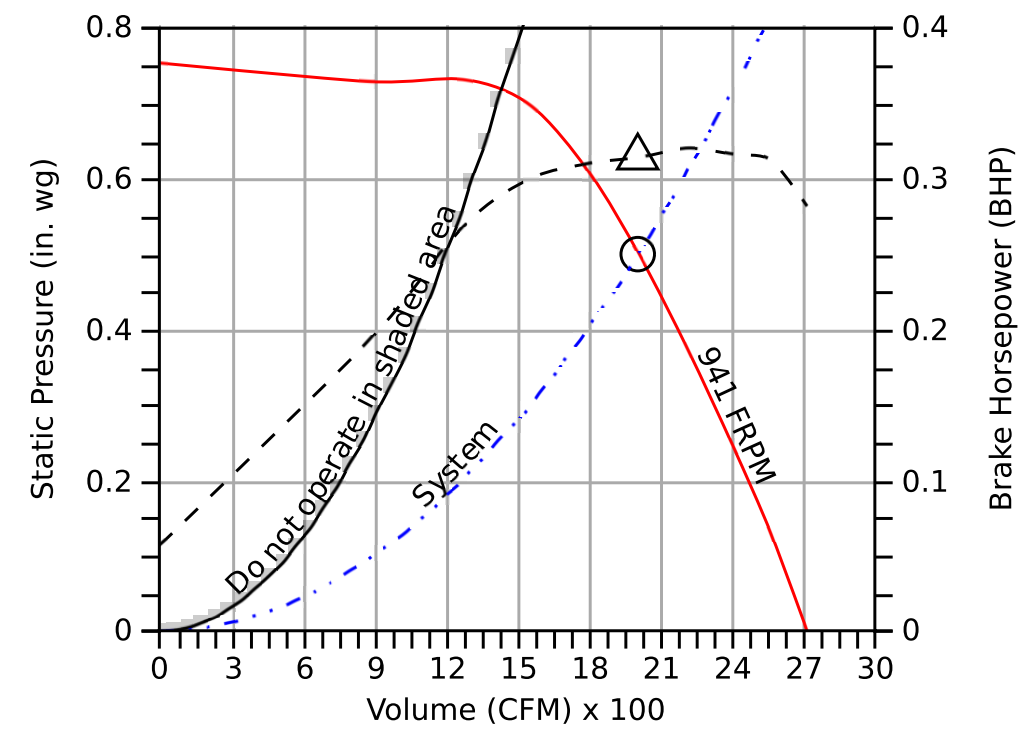
Standard Construction Features: Aluminum housing. Centrifugal backward inclined aluminum (composite for sizes 60-95) wheel. Direct driven motor mounted on vibration isolation.

PROVIDE WITH OPTIONAL SPEED CONTROLLER

Fan Configuration	
Drive type	Direct

Performance	
Requested Volume (CFM)	2,000
Actual Volume (CFM)	2,000
Total External SP (in. wg)	0.5
Operating frequency (Hz)	50
Fan RPM	941
Operating Power (bhp)	0.31
Startup Power (bhp)	0.31
Air Stream Temp (F)	70
Start-up Temp (F)	70
Air Density (lbs/ft ³)	0.074
Elevation (ft)	541
Static Efficiency (%)	50
Outlet Velocity (ft/min)	1,163

Motor	
Size (hp)	1/2
V/C/P	115/60/1
NEC FLA (Amps)	9.8



— Fan curve
 - - - Brake horsepower curve
 ○ Operating Point SP
 △ Operating Bhp point
 — Max system curve
 - - - System curve

Sound

	Octave Bands (hz)								LwA	dBA	Sones
	62.5	125	250	500	1000	2000	4000	8000			
Inlet	71	78	73	70	67	64	58	54	73	61	10.4



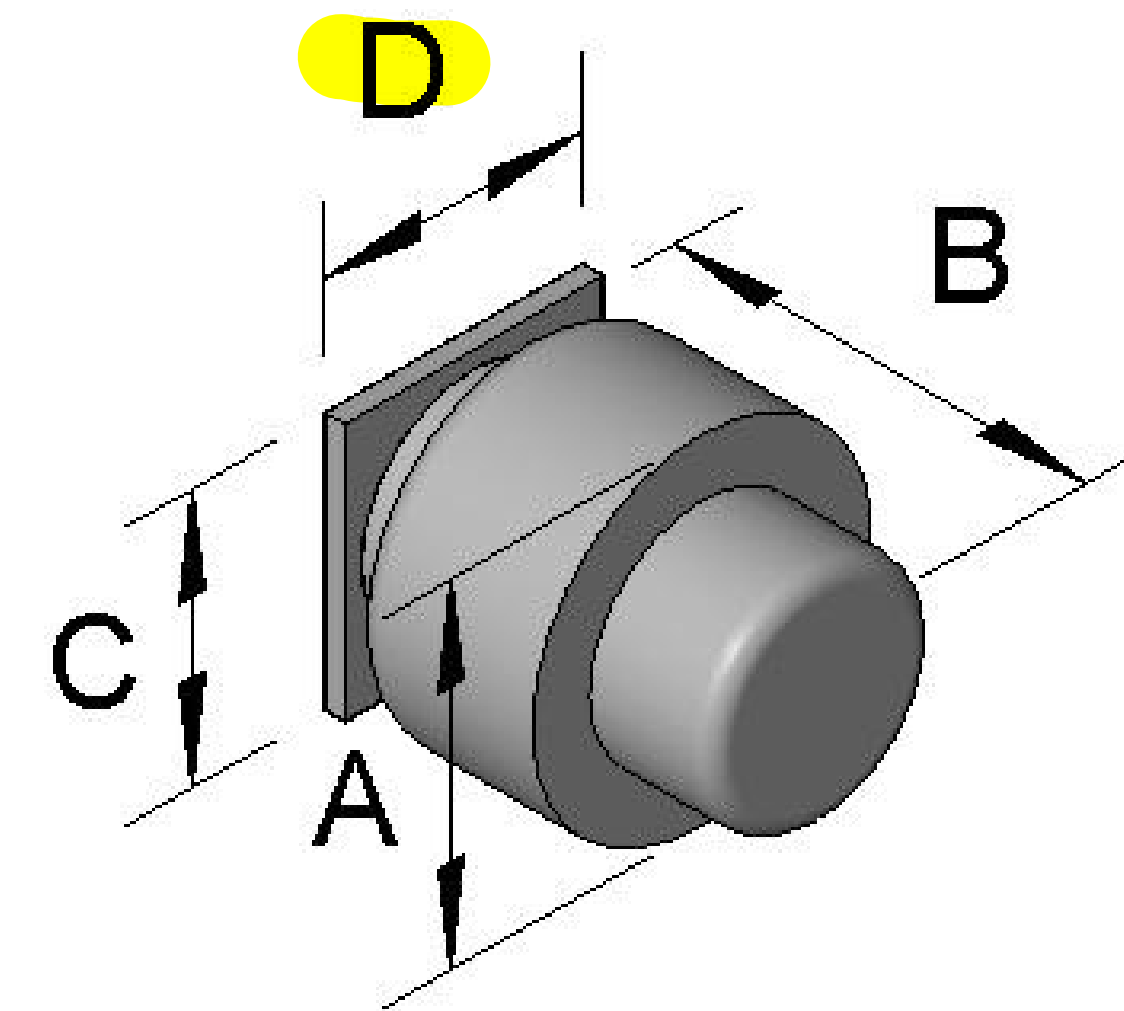
Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA certified ratings seal applies to sound and air performance ratings only. Performance certified is for installation type A: Free inlet, free outlet. Power rating does not include transmission losses. Performance ratings do not include the effects of appurtenances. The sound ratings shown are loudness values in hemispherical sones at 1.5 m (5 ft) in a hemispherical free field calculated per ANSI/AMCA Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels. dBA levels are not licensed by AMCA International. The AMCA Certified Ratings Seal for Sound applies to inlet sone ratings only.



Job Name: SSO 700 STF Disinfection Improvements
 Tag: WF-1 REVISED
 Quantity: 1
 Printed Date: March 29, 2022

WF-101 REVISED

Dimensions and Weights		
Label	Value	Description
-	86	Weight w/o accessories (lbs)
A	29	Overall Height (in)
B	32	Overall Width (in)
C	22	Mounting Cap Height (in)
D	22	Mounting Cap Width (in)
-	18.5	Wall Opening Width (in)
-	18.5	Wall Opening Height (in)



NOTES:

- UNIT IS SUBJECT TO CORROSION FROM A HYDROGEN SULFIDE LADEN ATMOSPHERE. ALL AIRSTREAM COMPONENTS SHALL BE GIVEN A PROTECTIVE SPECIAL COATING OF HERESITE OR APPROVED EQUAL. CONTROLS PANELS, WIRING CONNECTIONS AND OTHER SENSITIVE ELECTRONICS SHALL HAVE A CONFORMAL COATING APPLIED.

*All dimensions are in inches.