Date: 05-23-19

RE: Addendum No. 1 to the Bidding Documents for Diesel Lab Ventilation Upgrades at the Mailman Trades Building, Northern Maine Community College

Please include the following recommended changes:

CHANGES TO THE SPECIFICATIONS

A. Section 00 41 13 – Contractor Bid Form: DELETE section in its entirety. **ADD** in its place, Section 00 41 13, attached, re-issued with revisions.

B. Section 01 23 00 – Alternates: ADD Section, attached in its entirety.

C. **Section 099123 – Interior Painting: ADD**: Paragraph 1.2 A 4.to read as follows:

1.2 A. 4. FSK Insulation Covering

D. Section 099123 – Interior Painting: ADD: Paragraph 3.2 to read as follows:

3.2 F. Aluminum and Aluminum Foil Substrates: Remove loose surface oxidation.

3.2 G. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.

E. Section 099123 – Interior Painting: REVISE Paragraph 3.5 A to read as follows:

"3.5 A. Steel and Galvanized Metal Substrates: uninsulated metal ductwork, mechanical and electrical piping FSK insulation covering, and structural steel.

F. Section 23 07 00 – Mechanical Insulation: DELETE Paragraph 3.9 in its entirety. **ADD** in its place, the following:

" 3.9 DUCT AND PLENUM APPLICATION SCHEDULE

A. Outside air intake ducts and plenums between the OA Gravity Intake Ventilator and the MOD: Rigid Fiber Glass Board, 2" thickness, field painted per Division 9 requirements.

B. Relief/Exhaust ducts and plenums between the exhaust/relief air outlet (fan or louver) and the MOD/Gravity Relief Damper (as noted on the drawings): Rigid Fiber Glass Board, 2" thickness, field painted per Division 9 requirements."

G. Section 23 09 93 – Sequence of Operations for HVAC Controls: DELETE section in its entirety. **ADD** in its place, Section 23 09 93, attached, re-issued with revisions.

CHANGES TO THE DRAWINGS

A. **Sheet A-100: REVISE** Finish Note 2 to read as follows:
"2. Paint all exposed Mechanical and Electrical items associated with new work to match wall and ceiling"

B. **Sheet A-100: DELETE** Finish Note 3.

C. **Sheet A-100: A6: REVISE** Mechanical Equipment notes to read as follows:

" Mechanical Equipment on prefab curb. See MEP for notes and location and structural reinforcement notes."

D. **Sheet A-101: REVISE** General Note to read as follows:

"See MEP for Mechanical and Electrical notes and layout."

E. **Sheet A-100: A1: REVISE:** Exposed duct, paint (typ.)

F. **Sheet A-101: A1: REVISE:** New Electrical work, paint (typ.)

G. **Sheet A-101: A6: DELETE**: All ducts above 9'-0" to be unfinished. See MEP for notes.

H. **Sheet A-101: A6: REVISE**: Paint vertical duct to match wall (typ.)

I. **Sheet A-101: A6: ADD:** Paint new structural steel reinforcement at roof opening. Paint existing structural steel to match existing as required at new work. (typ.)

J. **Sheet 1-101: A6: ADD**: Paint aluminum faced duct insulation to match existing (typ.)

K. **Sheet MD-100: DELETE** the sheet in its entirety. **ADD** in its place, Sheet MD-100, attached, re-issued with revisions.

L. **Sheet MH-100: DELETE** the sheet in its entirety. **ADD** in its place, Sheet MH-100, attached, re-issued with revisions.

M. **Sheet MH-500: DELETE** the sheet in its entirety. **ADD** in its place, Sheet MH-500, attached, re-issued with revisions.

Attachments: Specification Section 00 41 13, Specification Section 01 23 00, Specification Section 23 09 93, Sheet MD-100, Sheet MH-100, Sheet MH-500.

END OF ADDENDUM #1

00 41 13
Contractor Bid Form

Diesel Lab Ventilation Upgrades
Mailman Trades
Northern Maine Community College

To: *Barry Ingraham*
Dean of Technology and Facilities
Northern Maine Community College
33 Edgemont Drive
Presque Isle, Maine 04769

The undersigned, or *Bidder*, having carefully examined the form of contract, general conditions, specifications and drawings dated *May 10, 2019*, prepared by *Allied Engineering, Inc* for *Diesel Lab Ventilation Upgrades*, as well as the premises and conditions relating to the work, proposes to furnish all labor, equipment and materials necessary for and reasonably incidental to the construction and completion of this project for the **Base Bid** amount of:

$ _____ .00

1. Allowances *are not included* on this project.
   No Allowances

   $ *insert dollar amount of Allowance*

2. Alternate Bids *are included* on this project.
   Alternate Bids are as shown below
   Any dollar amount line below that is left blank by the Bidder shall be taken as a bid of **$0.00**.

1	*Alternate 1: Vehicle Exhaust Hose Replacement (2 each)*	$ _____ .00
2	*Not Used*	$ _____ .00
3	*Not Used*	$ _____ .00
4	*Not Used*	$ _____ .00
5	*Not Used*	$ _____ .00

3. The Bidder acknowledges receipt of the following addenda to the specifications and drawings:

   Addendum No. ____ Dated: _____

   Addendum No. ____ Dated: _____

   Addendum No. ____ Dated: _____

   Addendum No. ____ Dated: _____

   Addendum No. ____ Dated: _____

4. Bid security *is required* on this project.
   If noted above as required, the Bidder shall include a satisfactory Bid Bond (section 00 43 13) or a certified or cashier's check for 5% of the bid amount with this completed bid form submitted to the Owner.

5. Filed Sub-bids *are not required* on this project.

Diesel Lab Ventilation Upgrades
Mailman Trades
Northern Maine Community College

6. The Bidder agrees, if this bid is accepted by the Owner, to sign the designated Owner-Contractor contract and deliver it, with any and all bonds and affidavits of insurance specified in the Bid Documents, within twelve calendar days after the date of notification of such acceptance, except if the twelfth day falls on a State of Maine government holiday or other closure day, or a Saturday, or a Sunday, in which case the aforementioned documents must be received before 12:00 noon on the first available business day following the holiday, other closure day, Saturday, or Sunday.

   As a guarantee thereof, the Bidder submits, together with this bid, a bid bond or other acceptable instrument as and if required by the Bid Documents.

7. This bid is hereby submitted by:

Signature: _____

Printed name and title: _____

Company name: _____

Mailing address: _____

City, state, zip code: _____

Phone number: _____

Email address: _____

State of incorporation, if a corporation: _____

List of all partners, if a partnership: _____

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Execute accepted alternates under the same conditions as other work of the Contract.

C. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1: Vehicle Exhaust Hose Replacement.

1. Base Bid: Two of the three existing High Temperature Vehicle exhaust hoses located at the North End of the Diesel Lab shall be retained for re-use, complete with tailpipe adaptors and manual cable/pulley retraction system. Hoses shall be connected to the new duct main as shown on the drawings.
2. Alternate: Replace the two existing flexible exhaust hoses, tailpipe adaptors, and cable/pulley retraction system at the north end of diesel lab with new 6” diameter, high temperature hoses, 25’ long, with quick connect, tailpipe adaptors, and cable/pulley retraction system as outlined on the drawings, and to match the eight other hoses replaced under the base bid.

END OF SECTION 012300

SECTION 230993 - SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Related Sections include the following:

1. Division 23 Section “Common Work Results for Mechanical”
2. Section 230900 – Instrumentation and Control for HVAC for control equipment and devices and submittal requirements.
3. Division 23 Section “Testing, Adjusting, and Balancing”
4. Division 26

1.2 GENERAL

A. This Section includes control sequences for HVAC systems, subsystems, and equipment. Provide control devices, control software and control wiring as required for automatic operation of each sequence specified. The system is BAS controlled using electric actuation.

1. Provide automatic control for system operation as described herein, although word “automatic” or “automatically”, is not used.
2. Manual operation is limited only where specifically described; however, provide manual override for each automatic operation.
3. Where manual start-up is called for, also provide scheduled automatic start-stop capabilities.

B. These sequences are intended to be performance based. Implementations that provide the same functional result using different underlying detailed logic will be acceptable.

C. Unless otherwise indicated, control loops shall be enabled and disabled based on the status of the system being controlled to prevent windup. When a control loop is enabled or re-enabled, it and all its constituents (such as the proportional and integral terms) shall be set initially to a Neutral value. A control loop in Neutral shall correspond to a condition that applies the minimum control effect, i.e., valves/dampers closed, VFDs at minimum speed, etc.

D. The term “proven” (i.e., “proven on”/ “proven off”) shall mean that the equipment’s DI status point (where provided, e.g. current switch, DP switch, or VFD status) matches the state set by the equipment’s DO command point.

E. The term “software point” shall mean an analog variable, and “software switch” shall mean a digital (binary) variable, that are not associated with real I/O points. They shall be read/write capable (e.g., BACnet analog variable and binary variable).

F. Functions called for in sequence of operations are minimum requirements and not to limit additional BAS system capabilities. Determine, through operation of the system, proportional bands, interval time, integral periods, adjustment rates, and any other input information required to provide stable operation of the control programs.

G. To avoid abrupt changes in equipment operation, the output of every control loop shall be capable of being limited by a user adjustable maximum rate of change, with a default of 25% per minute.

H. Setpoints, timers, deadbands, PID gains, etc., listed in sequences shall be adjustable by the user with appropriate access level whether indicated as adjustable in sequences or not. Software points shall be used for these variables. Fixed scalar numbers shall not be embedded in programs except for physical constants and conversion factors.

I. Values for all points, including real (hardware) points used in control sequences shall be capable of being overridden by the user with appropriate access level (e.g., for testing and commissioning). If hardware design prevents this for hardware points, they shall be equated to a software point and the software point shall be used in all sequences.

J. For each item of equipment, provide following functions which are not specifically mentioned in each Sequence of Operation:

1. Start-Stop, manual, and scheduled
2. On-Off status of each piece of equipment
3. Run-time
4. Alarm

K. Provide Sequenced starting of HVAC equipment, whether or not specifically mentioned in each Sequence of Operation: At initial start-up; for automatic starting on emergency power, or after power blackout.

L. All setpoints shall be monitored and adjustable. Setpoints listed herein are approximate. It is the responsibility of the BAS contractor to calibrate the system and all setpoints to actual working conditions once the system is on line.

M. Alarms

1. All alarms shall include a Time/Date Stamp using the standalone control module time and date.
2. Each alarm can be configured in terms of criticality (Critical/Not Critical), operator acknowledgement (Requires Acknowledgement/Does Not Require Acknowledgement), and conditions required for an alarm to clear automatically (Requires Acknowledgement of a Return to Normal/Does Not Require Acknowledgement of a Return to Normal).
3. An operator shall be able to sort alarms based on level, time/date, and current status.
4. Alarms should be reported with the following information:

a. Date and time of the alarm
b. Level of the alarm
c. Description of the alarm
d. Equipment tags for the units in alarm
e. Possible causes of the alarm, if provided by the fault detection routines
f. The source that serves the equipment in alarm

5. There shall be 5 levels of alarm

a. Level 1: Critical/life safety
b. Level 2: Significant equipment failure
c. Level 3: Non-critical equipment failure/operation
d. Level 4: Energy conservation monitor
e. Level 5: Maintenance indication, notification
f. 19.

6. Hierarchical Alarm Suppression: For each piece of equipment or space controlled by the BAS, define its relationship (if any) to other equipment in terms of “source,” “load,” or “system.”

a. Source: A component is a “source” if it provides resources to a downstream component, such as a chiller providing chilled water to an AHU.
b. Load: A component is a “load” if it receives resources from an upstream component, such as an AHU that receives chilled water from a chiller.
c. The same component may be both a load (receiving resources from an upstream source) and a source (providing resources to a downstream load).
d. System: A set of components is a “system” if they share a load in common (i.e., collectively act as a source to downstream equipment, such as a set of chillers in a lead/lag relationship serving air handlers).

1) If a single component acts as a source for downstream loads (e.g., an AHU as a source for its VAV boxes), then that single source component shall be defined as a “system” of one element.
2) For equipment with associated pumps (chillers, boilers, cooling towers):

a) If the pumps are in a one-to-one relationship with equipment they serve, the pumps shall be treated as part of the system to which they are associated (i.e., they are not considered loads) since a pump failure will necessarily disable its associated equipment.
b) If the pumps are headered to the equipment they serve, then the pumps may be treated as a system, which is a load relative to the upstream equipment (e.g., chillers) and a source relative to downstream equipment (e.g., air handlers).

e. For each system as defined above, there shall be a SystemOK flag, which is either true or false.
f. SystemOK shall be true when all of the following are true:

1) The system is proven on.

2) The system is achieving its temperature and/or pressure setpoint(s) for at least five minutes
3) The system is ready and able to serve its load

g. SystemOK shall be false while the system is starting up (i.e., before reaching setpoint) or when enough of the system's components are unavailable (in alarm, disabled, or turned off) to disrupt the ability of the system to serve its load. This threshold shall be defined by the design engineer for each system.

1) By default, Level 1 through Level 3 component alarms (indicating equipment failure) shall inhibit SystemOK. Level 4 and Level 5 component alarms (maintenance and energy efficiency alarms) shall not affect SystemOK.
2) The operator shall have the ability to individually determine which component alarms may or may not inhibit SystemOK.

h. The BAS shall selectively suppress (i.e., fail to announce; alarms may still be logged to a database) alarms for load components if SystemOK is false for the source system that serves that load.

1) If SystemOK is false for a cooling water system (i.e., chiller, cooling tower, or associated pump) then only high temperature alarms from the loads shall be suppressed.
2) If SystemOK is false for a heating water system (i.e., boiler or associated pump) then only low temperature alarms from the loads shall be suppressed.
3) If SystemOK is false for an airside system (air handler, fan coil, VAV box, etc.), then all alarms from the loads shall be suppressed.

i. This hierarchical suppression shall cascade through multiple levels of load-source relationship, such that alarms at downstream loads shall also be suppressed.
j. The following types of alarms will never be suppressed by this logic:

1) Life/safety and Level 1 alarms
2) Failure-to-start alarms (i.e., equipment is commanded on, but status point shows equipment to be off)
3) Failure-to-stop/hand alarms (i.e., equipment is commanded off, but status point shows equipment to be on)

N. Time-Based Suppression Block: This block is used to suppress reset requests and alarms after a change in setpoint. This includes automatic changes in setpoint, e.g., due to a change in occupancy sensor status, as well as changes made by occupants. This block shall calculate a time delay period after any change in setpoint based on the difference between the controlled variable (e.g., zone temperature) at the time of the change and the new setpoint. The default time delay period shall be:

1. For thermal zone temperature alarms: 10 minutes per °F of difference, but no longer than 120 minutes
2. For thermal zone temperature cooling requests: 5 minutes per °F of difference, but no longer than 30 minutes

3. For thermal zone heating requests: 5 minutes per °F of difference, but no longer than 30 minutes

O. Normal positions for controlled devices:

1. Unless noted, the following dampers shall fail closed:

a. Outside air dampers
b. Relief air dampers
c. Exhaust air closure dampers

1.3 GRAPHICAL USER INTERFACE

A. All points shown in the points list or described in the sequence shall be shown on the graphics.

B. All setpoints including setpoints internal to control algorithms shall be adjustable from all BAS operator interfaces. All commands shall be overridable from all BAS operator interfaces. All control points shall be adjustable or overridable from the same graphic page that displays the points.

C. All points required by the sequence of operation including, but not limited to, the points listed in the sequences of operation below, as well as all of the points' associated values, shall be connected to the BAS and available to the BAS operators on all operator workstations and all operator interface devices as part of a graphical display that depicts the mechanical system controlled.

PART 2 - AIR HANDLING SYSTEMS

2.1 MODIFICATIONS AND ALTERATIONS TO THE CONTROL SEQUENCE FOR EXISTING HV-3

A. Unless otherwise noted herein, the existing control sequence for HV-3 shall remain as currently programmed.

B. Occupied mode:

1. Occupied mode shall be determined by a user defined occupancy schedule.
2. System starts supply fan to run continuously.
3. Unit operation shall be interlocked with operation of EF-1, EF-2, and EF-3. With EF-1 and EF-2 de-energized, HV-3 OA damper shall be open to minimum position to provide 1,000 cfm of OA. EF-3 shall be commanded on and shall operate at minimum speed to provide 1,100 cfm of exhaust air. Return damper set at 9,000 cfm (or total supply air minus 1,000 cfm)
4. Upon manual activation of either EF-1 or EF-2, HV-3 OA damper opens to provide 2,200 cfm of OA. Return air damper closes to 7,800 cfm (or total supply air minus 2,200 cfm).

5. Upon manual activation of both EF-1 and EF-2, HV-3 OA damper opens to provide 4,400 cfm OA. Return damper closes to 5,600 cfm (or total supply flow minus 4,400 cfm).
6. Economizer Cooling: Disabled.

C. Unoccupied mode:

1. OA damper 100% closed, RA damper 100% open.
2. Maintain the night setback (NSB) temperature. Enable unit heating to maintain NSB temperature.
3. EF-3 off.

D. Display of input points thru BAS:

1. System graphic
2. System occupied/unoccupied mode.
3. HV OA damper position and command
4. HV RA damper position and command

2.2 MODIFICATIONS AND ALTERATIONS TO THE CONTROL SEQUENCE FOR EXISTING DEISEL CLASSROOM UNIT VENTILATOR

A. Unless otherwise noted herein, the existing control sequence for the unit ventilator shall remain as currently programmed.

B. Occupied mode:

1. Occupied mode shall be determined by a user defined occupancy schedule.
2. System starts supply fan to run continuously.
3. OA damper to 20% OA.
4. CO2 control as currently exists.
5. Interlock operation of EF-4 with unit ventilator. EF-4 operates continuously with unit ventilator in occupied mode.
6. Economizer Cooling: Operation to be maintained as currently exists.

C. Unoccupied mode:

1. OA damper 100% closed, RA damper 100% open.
2. Maintain the night setback (NSB) temperature. Enable unit heating to maintain NSB temperature.
3. EF-4 off.

D. Display of input points thru BAS:

1. System graphic
2. System occupied/unoccupied mode.

PART 3 - VENTILATION SEQUENCES

3.1 EXHAUST FANS

A. Interlock: Wire to control circuit to energize fan.

1. Sequence applies to the following fans:

1) EF-4

2. Fan operation shall be interlocked with operation of the existing Diesel Classroom unit ventilator, and shall be energized based on occupancy schedule. Fans schedules shall be coordinated with associated air system occupancy schedule.

B. Manual Switch:

1. Sequence applies to the following fans:

a. EF-1
b. EF-2

2. Fan energized by local wall switch.
3. Interlock with associated louver MOD. On call for operation, MOD opens and fan starts subject to proof of end switch.

C. Emergency Ventilation Sequence & General Ventilation Sequence

1. Sequence applies to the following fans:

a. EF-3

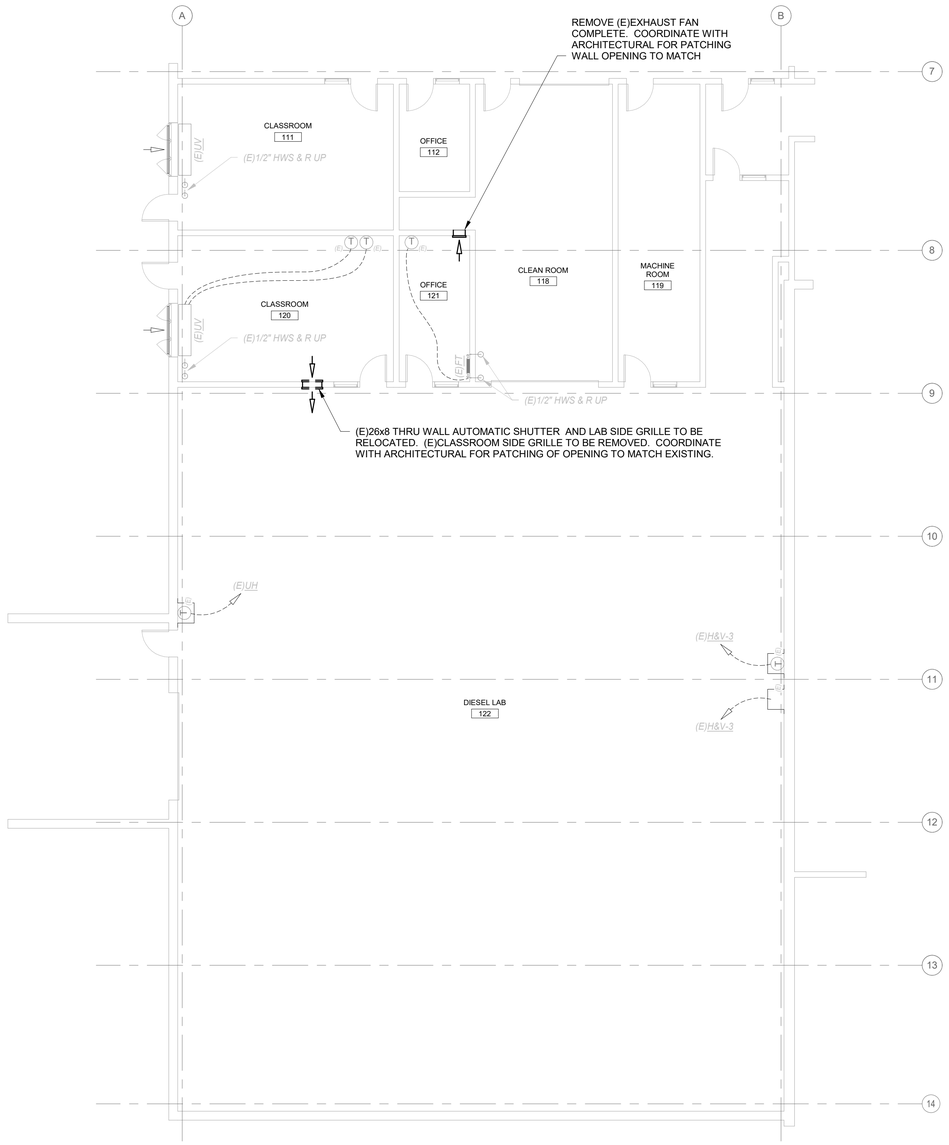
2. Exhaust Fan interlocked with operation of HV-3
3. General Ventilation Sequence: When HV-3 is in Occupied mode, EF-3 shall be commanded on, associated MOD shall open, and fan shall start upon proof of end switch. Fan shall operate continuously at minimum cfm.
4. Emergency Ventilation Sequence: Upon detection of 3 ppm NOx and/or 25 ppm CO, as detected by general bay NOx and CO sensors, HV-3 OA damper shall open to provide 5,000 cfm of OA, return damper closes to 5,000 cfm (or supply flow minus 5,000 cfm), exhaust fan EF-3 ramps up to provide 7,500 cfm, and MOD's at GRV-1 open. The sensors shall further activate an audible alarm upon rise of NOx to 5 ppm and/or CO to 35 ppm. All associated control wiring and interlock shall be by this division. Coordinate with Division 26 for installation of combination starters to manually energize the exhaust fan and associated supply air fan. Provide time delay relays for each EF set at 15 minutes (adj) to prevent short cycling of operation by CO/NOx sensors.

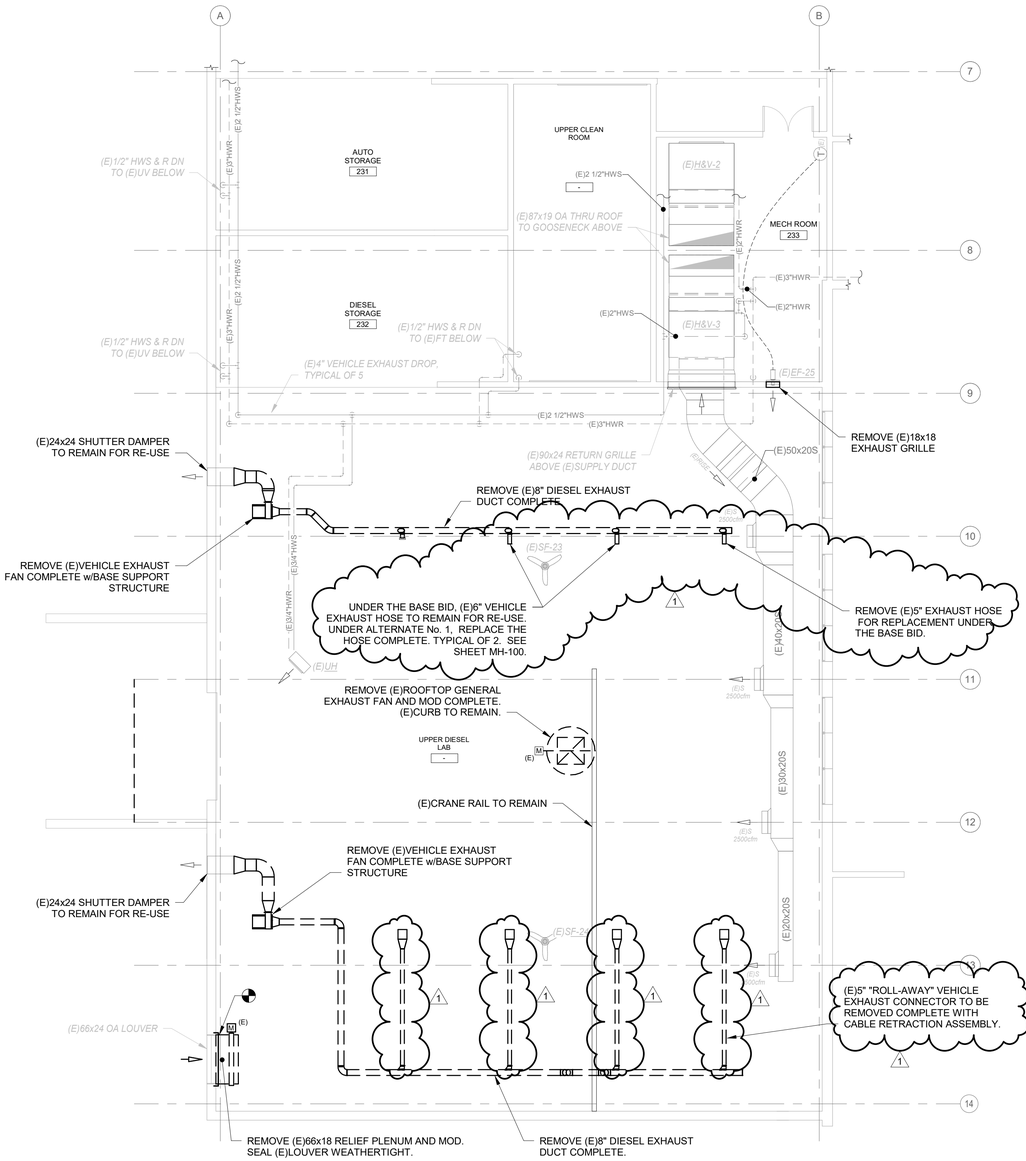
a. Provide adequate quantity of sensors to detect gases for specific floor areas per approved manufacturer's recommendations.

5. Display the following thru BAS for the above:

    a. Fan status ON/OFF.
    b. Emergency Ventilation Mode Status.
    c. Reduced Ventilation Mode Status.
    d. MOD position and command for EF-3 and GRV-1.
    e. EF-3 fan speed
    f. Status alarm for EF-3

END OF SECTION 230993





PLAN NORTH

A1	DEMOLITION PART PLAN - LOWER LEVEL
1/8" = 1'-0"	

A6	DEMOLITION PART PLAN - UPPER LEVEL
1/8" = 1'-0"	

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Allied Engineering
Structural Mechanical Electrical Commissioning

REVISIONS

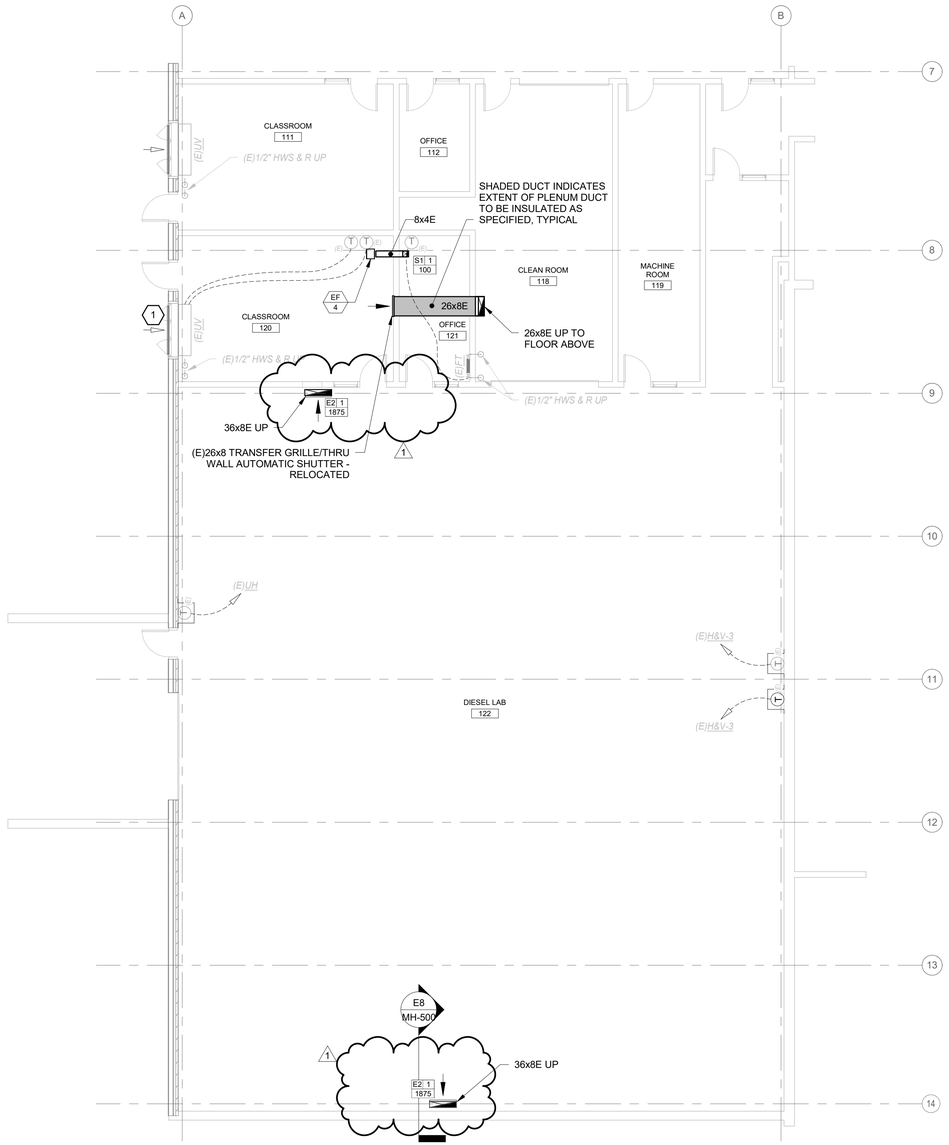
No.	DATE	BY	DESCRIPTION
1	05-23-2019	AEI	ADDENDUM No. 1

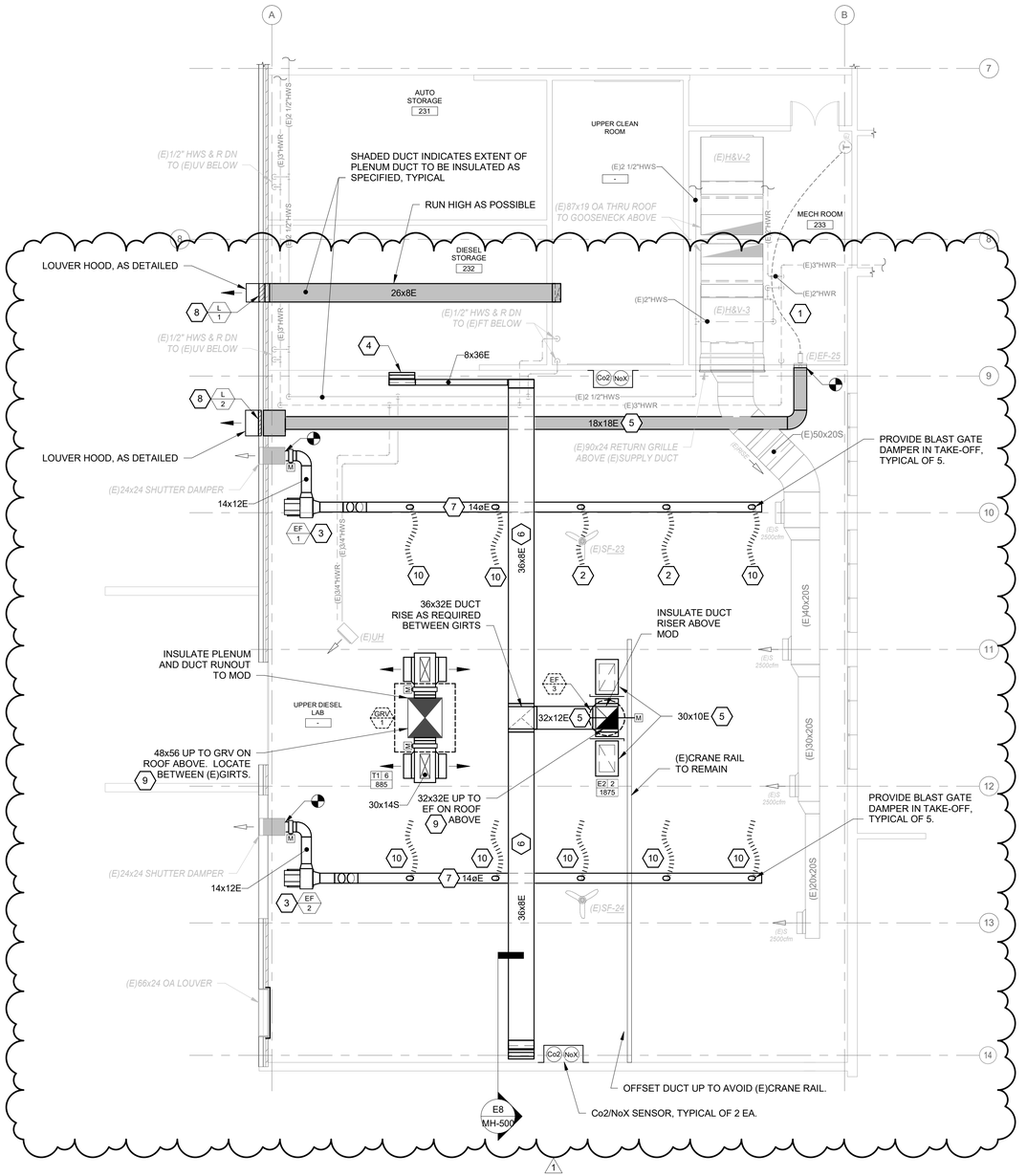
Date: 10 MAY, 2019
Drawn By: REW
Checked By: ASD
Project Mgr: ASD
Project No: 19035
Cad File:
Graphic Scale: 0" 1"

MECHANICAL DEMOLITION PART PLANS - LOWER AND UPPER LEVELS

DIESEL LAB VENTILATION UPGRADES
MAILMAN TRADES BUILDING - NMCC
PRESQUE ISLE, MAINE

MD-100





PLAN NORTH

KEYED NOTES:

1. REFER TO SPECIFICATION SECTION 230993 FOR MODIFICATIONS TO THE CURRENT OPERATING SEQUENCE OF EXISTING EQUIPMENT.
2. UNDER THE BASE BID, EXISTING FLEX HOSE SHALL REMAIN. FURNISH BLAST GATE AT CONNECTION TO NEW MAIN. LOCK EXISTING BLAST GATE DAMPER OPEN. UNDER ALTERNATE No. 1, REPLACE THE EXISTING HOSE AND EXHAUST ADAPTER AS NOTED IN KEYED NOTE No. 10 BELOW.
3. SUSPEND FAN FROM STRUCTURE ABOVE, VIA UNISTRUT BASE RAILS SUSPENDED USING 1/2" RODS AT EACH END OF EACH RAIL.
4. OFFSET 8x36E DUCT AS INDICATED TO AVOID EXISTING BEAM/EXISTING CLASSROOM DOOR BELOW. DROP DOWN FACE OF WALL TO LOW EXHAUST GRILLE. MOUNT GRILLE 2'-0" ABOVE FINISHED FLOOR.
5. RUN DUCT HIGH AS POSSIBLE, TIGHT TO UNDERSIDE OF EXISTING GIRTS.
6. RUN DUCT UP TIGHT TO UNDERSIDE OF ROOF DECK, ABOVE STEEL BEAMS, BETWEEN EXISTING GIRTS.
7. RUN DUCT HIGH AS POSSIBLE, TIGHT TO UNDERSIDE OF EXISTING GIRTS..
8. FRAME OPENINGS w/600S200-43 MEMBER, ALL 4 SIDES. CONNECT EACH MEMBER w/TSN AL 325 w/(3)FASTENERS EACH LEG (MINIMUM). REFER TO ARCHITECTURAL PLANS FOR MOUNTING REQUIREMENTS.
9. FRAME OPENINGS PER DETAIL F5 - SHEET MH500.
10. FURNISH AND INSTALL NEW HIGH TEMPERATURE VEHICLE EXHAUST HOSE (VENTAIRE HTN) WITH EXHAUST ADAPTERS. REFER TO OVERHEAD, NON-DISAPPEARING HOSE DETAIL ON SHEET MH-500 FOR DETAILS AND ACCESSORIES. FURNISH AND INSTALL A MANUAL CABLE/PULLEY RETRACTION SYSTEM WITH CABLE TERMINATIONS AT THE NORTH AND SOUTH WALLS.

A1	MECHANICAL PART PLAN - LOWER LEVEL	A6	MECHANICAL PART PLAN - UPPER LEVEL
1/8" = 1'-0"		1/8" = 1'-0"	

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Structural Mechanical Electrical Commissioning

REVISIONS

No.	DATE	BY
1	05-23-2019	AEI
ADDENDUM No. 1		

Date: 10 MAY, 2019
Drawn By: REW
Checked By: ASD
Project Mgr: ASD
Project No: 19035
Cad File:
Graphic Scale: 0" 1"

MECHANICAL PART PLANS - LOWER AND UPPER LEVELS

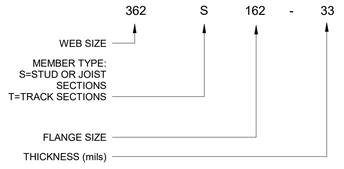
DIESEL LAB VENTILATION UPGRADES
MAILMAN TRADES BUILDING - NMCC
PRESQUE ISLE, MAINE

MH-100

CFMF FASTENERS AND CONNECTORS:

CONNECTOR	SUBSTRATE	DESCRIPTION	PRODUCT
SCREWS	METAL TRACK	#12 x 5/8" PAN HEAD	GENERIC
	STUD-TO-STUD	#12 x 5/8" HEX HEAD	GENERIC
	METAL TO STRUCT. STEEL	#12-24 x 1 1/4" HEX HEAD, #5 TIP	BUILDEX "TEKS" HILTI KWIK-PRO
	WOOD FRMG or PLWD	#12-20 x 2 3/4" PHILLIPS FLAT HEAD, #4 WINGS	BUILDEX "TEKS" HILTI KWIK-PRO
P.A.F.'s	CONCRETE or GROUTED CMU	0.157"Ø x 1 1/4"	HILTI X-U
	STRUCTURAL STEEL	0.157"Ø x 5/8"	HILTI X-U

NOTES:
1. SEE SECTIONS AND DETAILS FOR LOCATION AND NUMBER OF CONNECTORS



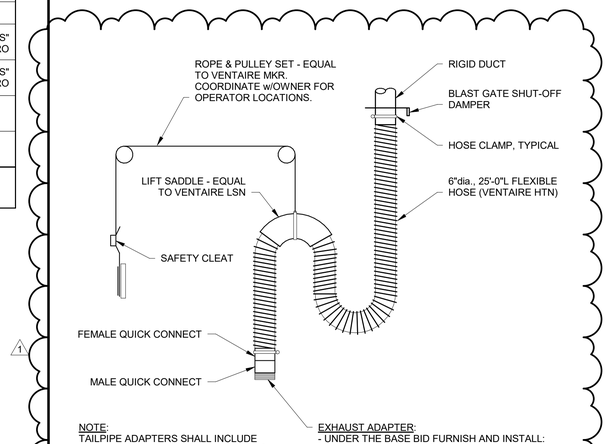
THE LAST TWO NUMBERS INDICATE THE STEEL THICKNESS

SSMA	GAUGE	DESIGN	MINIMUM	Fy
33 mils	20	0.0346"	0.0329"	33ksi
43 mils	18	0.0451"	0.0428"	33ksi
54 mils	16	0.0566"	0.0538"	50ksi
68 mils	14	0.0713"	0.0677"	50ksi
97 mils	12	0.1017"	0.0966"	50ksi

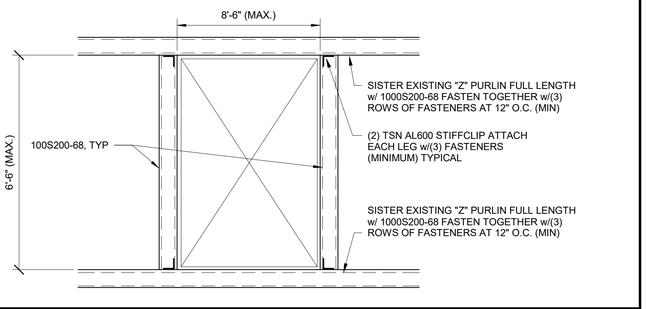
MEMBER IDENTIFICATION:

NOTES:
1. MEMBER TYPES AND SIZES SHOWN IN THIS DRAWING SET FOLLOW THE STEEL STUD MANUFACTURERS ASSOCIATION (SSMA) STANDARDS. ANY MANUFACTURER WHOSE PRODUCT GEOMETRIES MEET OR EXCEED SSMA STANDARDS ARE ACCEPTABLE.

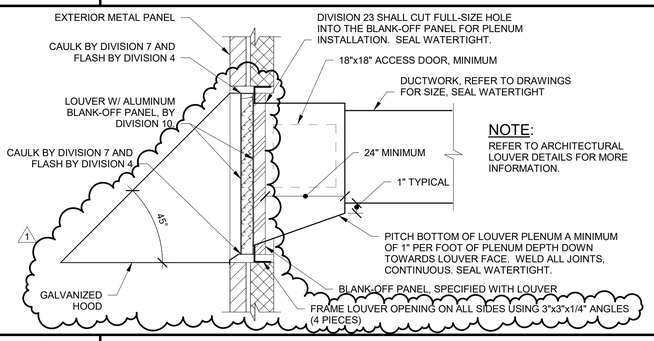
E1 | TYPICAL CFMF CONNECTION SCHEDULE
NONE



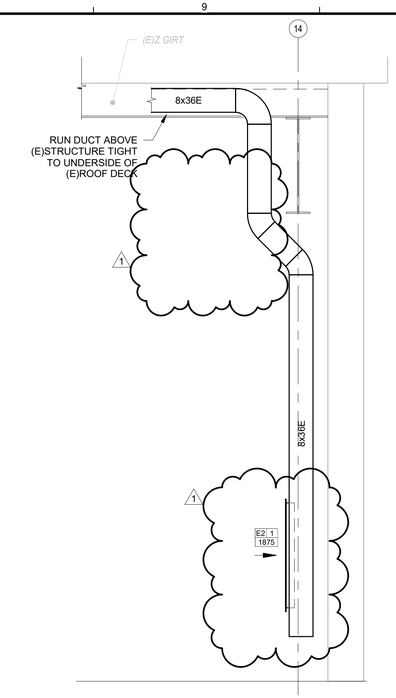
E3 | DETAIL - NON-DISAPPEARING VEHICLE EXHAUST HOSE
NOT TO SCALE



F5 | TYPICAL FRAMED OPENING IN MAIN ROOF
3/4" = 1'-0"



E5 | DETAIL - EXTERIOR LOUVER
NOT TO SCALE



E8 | DETAIL - HIGH/LOW EXHAUST DUCT ELEVATION
1/2" = 1'-0"

LOUVER SCHEDULE

TAG	MAKE - MODEL	AIR SYSTEM	DUTY	CFM	DIMENSIONS HEIGHT (IN.)	WIDTH (IN.)	MIN. FREE AREA (SF)	GROSS VELOCITY (FT/MIN)	NET VELOCITY (FT/MIN)	% FREE AREA	BLADE DEPTH	BEGINNING POINT OF WATER PENETRATION AT 0.01 OZ./SF	MAX P.D. MAX W.C.	SCREEN	NOTES
L-1	RUSKIN ELF445DX	(E)UV	RELIEF	750	24	26	1.9	173.1	394.7	43.8%	4"	873 FPM	0.06	SEE SPEC	
L-2	RUSKIN ELF445DX	(E)EF-25	EXHAUST	1,410	24	36	2.8	235.0	503.6	46.7%	4"	873 FPM	0.06	SEE SPEC	

GRAVITY ROOF VENTILATOR SCHEDULE

TAG	MAKE - MODEL	ASSOICATED AIR SYSTEM	INTAKE OR RELIEF?	CFM	HOOD DIMENSIONS LENGTH (in.)	WIDTH (in.)	HEIGHT (in.)	MIN. FREE AREA (SF)	THROAT DIMENSIONS LENGTH (in.)	WIDTH (in.)	MIN. FREE AREA (SF)	NUMBERS OF TIERS	MAX P.D. MAX W.C.	FILTERS	WEIGHT LBS	ROOF CURB
GRV-1	GREENHECK FGI	EF-3	INTAKE	5,310	96	84	25		56.0	48	18.7	NA	0.10	YES	299	30"

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REGISTERS - GRILLES - DIFFUSERS (RGD) SCHEDULE

TAG	MFR.	MODEL	TYPE	NECK SIZE	FACE SIZE	MAX CFM	MAX TOTAL P.D. (IN.W.C.)	MAX NC LEVEL	BORDER TYPE	BLOW	NOTES
S-1	PRICE	520	STEEL DOUBLE DEFL. SUPPLY	1 6" X 6"	7.75" X 7.75"	130	0.10"	20	SURFACE MT.	ADJUSTABLE	
T-1	PRICE	630	ALUM. TRANSFER, 3/4" SPACING, 45 DEG VANES	36" X 12"	37.25" X 13.25"	885	0.03"	NA	SURFACE MOUNT	----------	
E-1	PRICE	630	ALUM. RETURN, 3/4" SPACING, 45 DEG VANES	8" X 8"	9.75" X 9.75"	110	0.05"	20	SURFACE MT.	----------	6" DIA RUNOUT
E-2	PRICE	630	ALUM. RETURN, 3/4" SPACING, 45 DEG VANES	34" X 20"	35.75" X 21.75"	1,875	0.05"	26	SURFACE MT.	----------	

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FAN SCHEDULE

TAG	SERVES	MFR.	MODEL	TYPE	DRIVE	CFM	SP (IN. WC.)	MOTOR HP	MOTOR TYPE	SPEED CONTROL	DISC. SWITCH FURN BY	VOLTS/PH	ARRANGEMENT	ROTATION	MAX dBA	WEIGHT (LBS.)	DAMPER	NOTES
EF-1	NORTH VEHICLE EXHAUST	GREENHECK	9-IPA	UTILITY SET	BELT	2,500	2.5	5	ODP	NO	FAN MFR	460/3/60	10	CW	83.0	280	MOD	
EF-2	SOUTH VEHICLE EXHAUST	GREENHECK	9-IPA	UTILITY SET	BELT	2,500	2.5	5	ODP	NO	FAN MFR	460/3/60	10	CW	83.0	280	MOD	
EF-3	EMERGENCY VENTILATION	GREENHECK	CUE-300HP-C-VGD	UPBLAST	DIRECT	7,500	0.75	3	ECM	YES	FAN MFR	460/3/60	NA	NA	19.7 Sones	410	MOD	1
EF-4	OFFICE AIR TRANSFER	GREENHECK	SP-A700VG	CEILING	DIRECT	100	0.25"	218.W	EC	YES	FAN MFR	120/1/60	NA	NA	2.8 Sones	43	NA	

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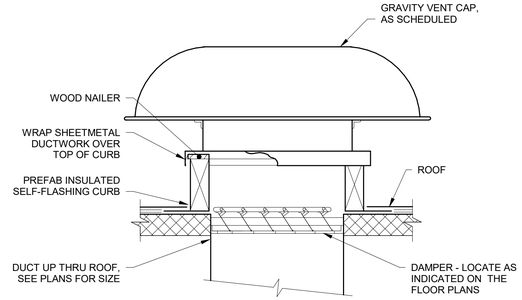
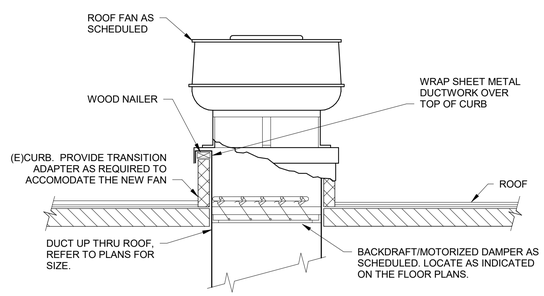
1. PROVIDE ADAPTER CURB TO REDUCE THE EXISTING CURB COPENING (APPROXIMATELY 40"x40") TO MATCH THE NEW FAN REQUIREMENTS.

A1 | MECHANICAL SCHEDULES
NONE



C8 | DETAIL - ROOFTOP GRAVITY INTAKE/RELIEF
NOT TO SCALE



NOTE:
REFER TO ARCHITECTURAL DRAWINGS FOR ROOF CURB FLASHING DETAILS.

A8 | DETAIL - ROOF MOUNTED EXHAUSTER
NOT TO SCALE

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REVISIONS

No.	DATE	BY	DESCRIPTION
1	05-23-2019	AEI	ADDENDUM No. 1

Date: 10 MAY, 2019
Drawn By: REW
Checked By: ASD
Project Mgr: ASD
Project No: 19035
Cad File:
Graphic Scale: 0" 1"

MECHANICAL DETAILS AND SCHEDULES

DIESEL LAB VENTILATION UPGRADES
MAILMAN TRADES BUILDING - NMCC
PRESQUE ISLE, MAINE

MH-500