



ISSUED FOR TENDER
Tuesday, March 24, 2020

DAS MECHANICAL HVAC CONSULTANTS
DESIGNED AIR SYSTEMS Limited

181 PRINCE JOHN WAY
NANAIMO BC V9T 1K1
PH: (250)758-8139
FAX: (250)751-1056

DRAWN	SF
CHECKED	JL
APPROVED	SF
DATE	Sept. 12 2019
PAGE	1 of 2

NO. DATE	REVISIONS
A 15/11/19	Issued For Review
B 24/03/20	Issued For Tender

PROJECT: Cowichan Hatchery Heat Recovery Ventilator HVAC Upgrades Plan

PROJECT NO. 2380 Hatchery Rd. Duncan, BC

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

SHEET NO. **M-1**

REVISION: B

DIFFUSER SCHEDULE	
TYPE	QUANTITY
	SIZE
Supply Diffuser: Price Model SDGE-A--VCS3-B12, Extruded Aluminium, Spiral Duct Grille, Double deflection, 3/4" Blade spacing, Front blades parallel to Short dimension, Steel opposed blade damper. White powder coat finish. Size as Noted: L x H - DuctØ	
Return grille: Price Model 630-FLA-B12, Fixed Louvre, 45° deflection, 3/4" spacing, Aluminium, Standard surface mount boarder, Blades Parallel to long dimension, countersunk screwholes, White powder coat finish. Size as noted.	

HVAC LEGEND	
	New Ductwork or Equipment
	OV - New oval ductwork
	Acoustically Lined Ductwork
	Insulated Ductwork (min 1")
	Volume Damper
	Return/Exhaust Air Flow Direction
	Supply/Fresh Air Flow Direction
	Return Grille
	Supply Diffuser Square
	Thermostat
	Duct sensor
	Control Wire
	Refrigerant Lines
NOTE: BOLD line Indicates New THIN line Indicates Existing	

ERV EQUIPMENT SCHEDULE													
Equip. #	Quantity Req'd	Location	Area Served	Equipment Description	Model	Air Flow (Cfm)	"W.G.	Weight (Lbs)	Voltage	FLA	MCA	MOCP	HP
HRV-1	1	Outside on stand	Hatchery incubation	Heat Recovery Ventilator	Greenheck: ERVe-20-15L	Supply: 1500 Exhaust: 1600	0.5	975	208/3/60	24.7*	25	Supply: 3/4 Exhaust: 3/4	

Equipment Notes:
 HRV-1 complete with:
 - Special Design Request for "Sensible Only Wheel" (E1900816)
 - Special Design Request for "Electric Heat" (E1900816-1)
 *4.8kw defrost pre-heater (amperage included in table above)
 - Stop Wheel Economizer Control
 - HI-Pro Polyester Coating - Colour Ivory code 031

ELECTRIC HEAT EQUIPMENT SCHEDULE										
Equip. #	Quantity Req'd	Location	Area Served	Equipment Description	Model	KW	CFM Req'd/ Min Cfm	Voltage	FLA	MOCP
DH-1	1	HRV-1 Supply air Duct inside building		Duct Heater	Thermolec: FC-22x8-8kW, ΔT=16°F	8	1200	208/3/60	22.2	27.75

Equipment Notes:
 DH-1 Complete With
 - SCR Controllers
 - CTH291 0-10 VDC Electronic Thermostat
 - DS-600 Remote Temperature Sensor
 - Weather Proof (Located On Wet Environment)

HVAC NOTES	
DUCTWORK AND EQUIPMENT	
1.	All ductwork shall be fabricated for G90 coated galvanized steel lock forming grade to ASTM A525 & A527. All duct construction and installation shall be to current SMACNA standards. In addition, all ductwork shall be constructed and installed to meet the seismic requirements of part 4 of the National Building Code, and the SMACNA Seismic Restraint Guide. All round ductwork larger and 8"Ø (200mm) shall be spiral lock seam pipe to SMACNA standards. Seal all ductwork.
2.	Flexible ductwork shall be non-corrosive spiral wound reinforcing with flexible vinyl coated Fibreglas cloth membrane, rated for max 10" w.g. [2490Pa] positive pressure and 1" w.g. [249Pa] negative pressure. UL or ULC labelled. Use stainless steel or plastic banded connections. Maximum 3ft [914mm] Flexible ductwork per duct branch.
3.	Constructed plenums and hoods to be fabricated from minimum 22ga. galvanized steel and reinforced for rigidity.
4.	Duct dimensions, as indicated, include 1" [25mm] duct lining where lining is specified. Otherwise, ductwork dimensions shown on plans are clear inside, free area, measurements.
5.	Line the first 8ft [2.5m] of supply and return plenums with 1" [25mm] acoustic lining.
6.	Provide neoprene flexible connections to all ducted mechanical equipment.
7.	Any existing equipment, grilles, diffusers, flex duct, controls etc. that are removed from service in the alteration, and which are no longer required in the new installation, shall be turned over the building owners' representative on site.
8.	Install min. 1" [25mm] Mineral fibre blanket to ASTM C553 faced with factory applied vapour retarder jacket to CGSB 51-GP-52Ma on all Ductwork and vents in unheated spaces, cold and dual temperature supply air ducts, concealed or exposed and Outside air ducts within heated space.
9.	Install turning vanes in all mitered rectangular elbows over 15"x15" [400mmx400mm] Factory or shop fabricated double thickness with trailing edge, to recommendations of SMACNA.
10.	Support ductwork using strap hangers of same material as duct, but next sheet metal thickness heavier than duct, plated threaded rod flat bar or angle hangers as required. Support duct risers at their base and at each floor and at not greater than 11.75ft [3.6 m]. intervals.
11.	Exterior Supply or Return ductwork to be insulated with min 3" [75] rigid (polyisocyanurate) insulation, 6mil Vapour Barrier and clad with finished 20ga steel or 0.032" aluminium. Seal all seams with Sikaflex-221 or equal. Cross-break cladding to shed water from top of ductwork.
12.	Exterior Refrigeration lines to be insulated with min. 1/2" [12mm] Armaflex or equal. Insulation to be clad for UV Protection
TESTING, ADJUSTING AND BALANCING:	
1.	The mechanical contractor is to engage the services of an accredited third party air balancing and commissioning agency following ASHRAE TAB procedures.
2.	The contract will not be considered substantially complete prior to the consultant's review of the TAB documents.
3.	All air systems shall be balanced to air quantities shown on plans, including new, existing and previously installed, systems and equipment as indicated in the plans.
FIRE SEPARATIONS:	
1.	Coordinate with Architectural plans and specifications for fire separation requirements and locations. Provide fire dampers where required.
2.	Where existing ductwork is removed, maintain fire rating of any penetration in fire rated walls.
3.	Where fire dampers are required. Supply and install access panels in the ductwork adjacent to the dampers. Fire dampers shall be 1.5 Hr rated and UL fire rated.

GENERAL MECHANICAL NOTES:	
GENERAL	
1.	It is the intention of the specifications and plans to call for finished-work, tested and ready for operation. Unless otherwise noted or specified, provide all equipment and/or materials as shown on plans and defined in the specifications. Any incidental accessories necessary to make the work complete and perfect in all respects and ready for operation shall be furnished, delivered and installed without additional expense to the owner.
2.	Drawings are of schematic nature only. Contractor shall make due allowance in bid for relocation and/or rerouting of piping where conflicts may occur. Architectural plans govern for locations of equipment and fixtures. In case of large discrepancies between the mechanical and architectural and structural drawings, contact general and consultant before proceeding with work.
3.	Verify the location of all existing equipment, ductwork, piping, controls etc. Coordinate with other disciplines prior to starting work. No consideration or allowance will be given for failure to determine existing as-built conditions
4.	Shutdown of any existing systems shall be coordinated with the owner, and all authorities having jurisdiction of the time and duration of shutdown.
5.	Confirm with and obtain permission from base building and the general contractor prior to cutting and/or coring of existing structure. Contract structural engineer to provide review and schedules for all wall or roof penetrations, and new equipment installation. Structural Engineer to provide details for installation and/or additional structural support if required.
6.	Contractor is to make good all exposed surfaces at completion of mechanical work.
CODES & STANDARDS	
1.	All work shall comply with National and Local Building Codes. Sheet metal work shall comply with ASHRAE and SMACNA standards and the current edition of BC Housing Design Guidelines and Construction Standards.
GUARANTEE	
1.	The completed installation shall be guaranteed for a period of 1 year from the date of substantial completion.
PERMITS	
1.	All applicable permits and associated fees are to be included in the contract.
ROOFING	
1.	All roof penetrations by RCABC approved contractor.
FIRE SEPARATIONS	
1.	Where pipes, ducts, cables etc., partially penetrate or pass through fire rated wall or floors, or smoke separation walls of floors, seal all voids between pipe or duct and wall with a U.L.C. approved caulking to the hourly rating required by the B.C. Building Code 2012, local codes and as indicated here or on Architectural plans. A firm regularly engaged in this work shall install fire stopping.
SEISMIC RESTRAINTS	
1.	Supply and install Seismic restraints for all new equipment and ductwork as required to meet the current BC Building Code and SMACNA "Seismic Restraint Manual Guidelines For Mechanical Systems".
2.	All seismic restraint devices shall be equal to Mason Industries, as supplied by Vibra-Sonic Control. Certified shop drawings are required for all materials supplied.
3.	Coordinate seismic engineer to review and provide a sign-off of all equipment and/or seismic devices installed. This Engineer is to provide letters of Assurance as required by the Authority having Jurisdiction.
ELECTRICAL COORDINATION	
1.	The electrical information provided here is for coordination purposes only. Mechanical, Electrical and Controls contractors are to coordinate and review each other's drawings, specifications and addenda before submitting tender. Contractors are to coordinate and review HVAC equipment shop drawings before ordering equipment or starting the work. Co-ordinate to provide electrical connections and controls as required for a complete and operational system. No Extra costs for replacing or repairing uncoordinated electrical or controls work will be allowed.
SUBMISSIONS	
1.	Submit to the consultant the following documents: Operation and Maintenance manuals including Balance Reports and As-built drawings (3 sets). Equipment submittals/shop drawings. Submit AutoCAD files of the As-Built drawings. All documents & files must be approved by consultant prior to completion.

CONTROLS - SEQUENCE OF OPERATIONS	
1.	Sequence of Operation HRV-1 a) This unit is designed to operate independently to satisfy the heating, and ventilation requirements of the zone it serves. The heat is provided an electric duct heater (DH-1). See control sequence below. 1.1. Occupied Mode: a) Maintain user set operating set points. Modulate the heating, to maintain the desired setpoint. b) HRV-1 is to be installed with a time clock to enable during occupied mode. 1.2. Unoccupied Mode: a) Time clock indicates off - unit shuts down. b) If the units fails to maintain the set point, and falls below 18°C shut the supply fan down. 2. Standard of acceptance: a) Time clock - Intermatic GTM40AVE or equal
3.	Sequence of Operation DH-1 a) This heater is designed to operate with HRV-1 with independent to satisfy the heating, and ventilation requirements of the zone it serves. DH-1 is to be c/w duct mounted sensor and wall thermostat (manual override option) to control adjustable supply air temperature. 3.1. Occupied Mode: a) Maintain user set operating set points. Modulate the heating, to maintain the desired setpoint. 3.2. Unoccupied Mode: a) Time clock indicates off - unit shuts down. b) DH-1 to be interlocked so heating circuit is de-energized when HRV-1 is cycled off.
4.	Standard of acceptance: Electronic thermostat - CTH291 (0-10vdc) Remote temperature sensor - DS-600
Note: All controls are to supplied and installed by controls contractor - subtrade to mechanical contractor. All low voltage wiring by controls contractor. Line voltage connections by electrical contractor - subtrade to mechanical contractor. All line and low voltage wiring to be installed in liquid tight conduit.	

NO. DATE	REVISIONS
A 15/11/19	Issued For Review
B 24/03/20	Issued For Tender
PROJECT Cowichan Hatchery 2380 Hatchery Rd. Duncan, BC	
SHEET NO. M-2	
REVISION B	

ISSUED FOR TENDER
Tuesday, March 24, 2020

DAS DESIGNED AIR SYSTEMS <small>Limited</small>	MECHANICAL HVAC CONSULTANTS	
	181 PRINCE JOHN WAY NANAIMO BC V9T 1K1 PH: (250)758-8139 FAX: (250)751-1056	
	DRAWN	SF
	CHECKED	JL
	APPROVED	SF
DATE	Sept. 12 2019	
PAGE	2 of 2	