

IFB 298370: ADDENDUM No. 2
Amendments/Changes/ Clarification
Project: RTL Exit Phase 1 – 318 Bldg.

IFB ISSUE DATE: April 15, 2015
CLOSING DATE: May 7, 2015

IFB No. 298370 is hereby clarified with the following statements, questions and answers:

The following items shall modify and supplement the project scope of work:

- ECN-01 attached.
- 5 Substitution requests attached.

General Questions (response in Red):

1. Spec section 096500 subpart 2.2 only states that seams be welded, with no mention of head seams. Are head seams acceptable on the vinyl flooring installation?
Battelle Response: Head seams are acceptable and shall be welded. The installation layout shall be coordinated to minimize head seams and approved by Battelle Architect. Head seams shall not occur less than 20'-0" on center.
2. According to the RTL 520 CMS Report of Chemical Moves to 318 Building, there are several radioactive items on the materials list. We thought it was mentioned at the walk, that Battelle would be responsible for moving all the radioactive materials. Can you please confirm if this is so?
Battelle Response: PNNL staff will package and transport all chemicals and stock solutions that meet Department of Transportation requirements for radioactive materials.
3. Please see page A5 101. Detail 6 shows service panel for gas services. Detail 5 shows piping inside the "Multi-Outlet Assembly". Then please see page P1 101 detail 2, showing connections that appear to be only for the service panels. Please advise quantity, type, and location for the piping in the Multi-Outlet Assembly.
Battelle Response: Compressed gas/Specialty gas piping shall not be routed through the multi-outlet assembly but shall be routed above the ceiling in each lab as shown on Drawing P1-101 and terminate at the ceiling panel as shown on Detail 6 on Drawing A5-101. Pipe sizes, types and quantities shall be as shown on P1-101.

The above stated clarifications are the only changes being made at this time.

Failure to acknowledge receipt of this addendum with submittal of your Bid could be cause to reject your offer. All other requirements of the RFP remain as originally stated.

Thank you,

Garrett V. Hyatt

Garrett V Hyatt
Sr. Contracting Professional
cc: File, Bidders List

ENGINEERING CHANGE NOTICE

Battelle

1. SR No R FMP ECN

S720239C -0 -01 -01

(Reference ADM-CM-058 for Creating and Modifying Engineering Calculations, Drawings, and Specifications)

Page 2 of 6

Description of Change Continued:

16. Justification:

Ductwork and venturis are required to accommodate work in Labs 131 and 148 under Phase 2 of the RTL Exit project, S720239D.

17. Other Affected Documents (List Document No., Title, Rev. No., and Date):

None

18. Special Instructions to be included in the work plans (Include SSCs listed in the [FUA](#), Section IV.III requiring controlled operation and/or special instructions included in the [FUA](#) required to maintain the facility operational boundary).

N/A

19. PAAA ([DCRP Subject Area](#))/10 CFR 830 Subpart A apply (Identify part or item of the work to which they apply).

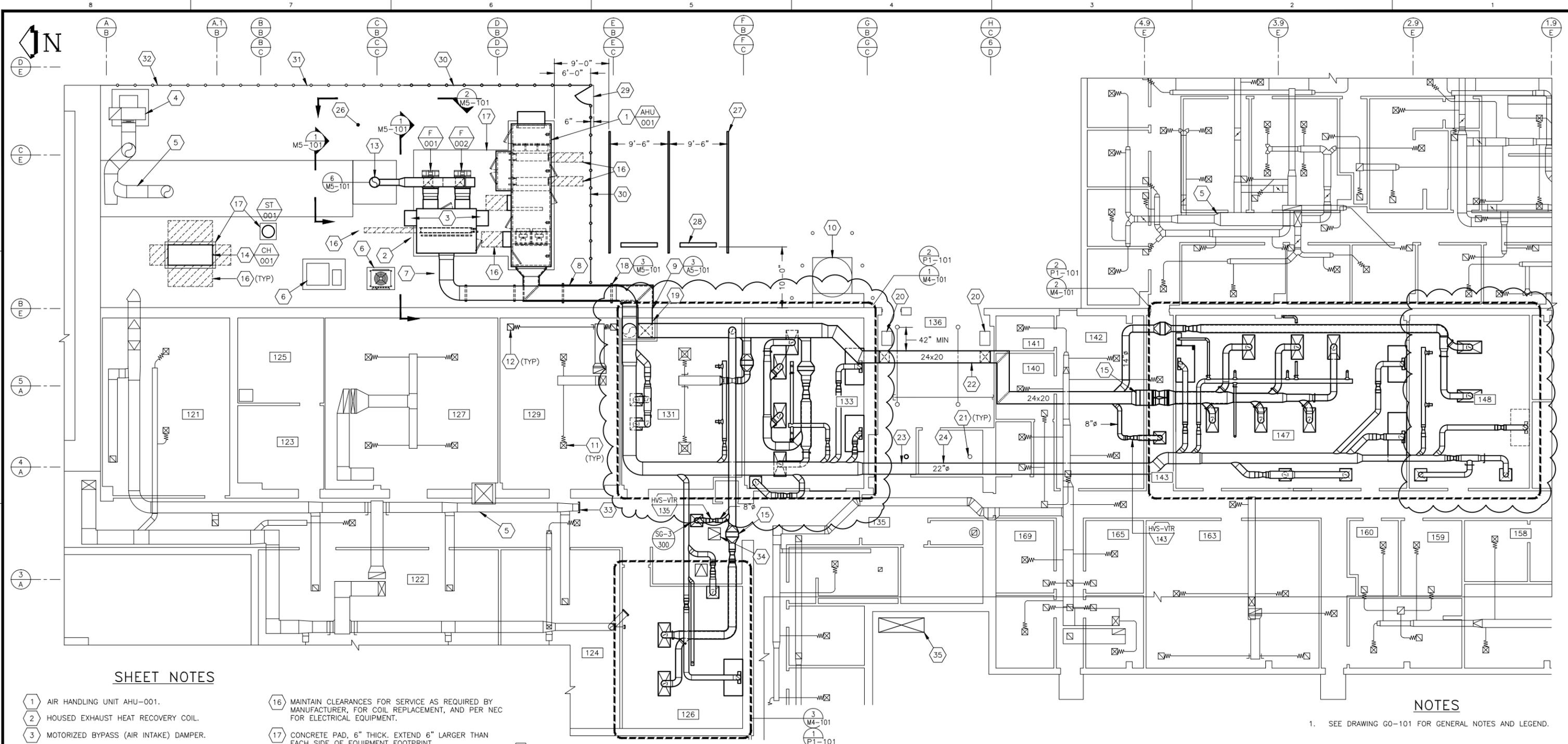
N/A

20. Changes Completed

Date

21. As-Built/Document Revs. Completed

Date



SHEET NOTES

- 1 AIR HANDLING UNIT AHU-001.
- 2 HOUSED EXHAUST HEAT RECOVERY COIL.
- 3 MOTORIZED BYPASS (AIR INTAKE) DAMPER.
- 4 EXISTING RETURN/EXHAUST FAN.
- 5 EXISTING DUCTWORK TO REMAIN.
- 6 EXISTING CONDENSING UNIT.
- 7 28" EXTERNALLY INSULATED EXHAUST AIR DUCT.
- 8 28x28 SUPPLY AIR DUCT W/ 2" SOUNDLINING, ROUTE BELOW EXHAUST DUCT.
- 9 ROUTE 28" EA AND 28x28 SA INTO BUILDING THROUGH WALL.
- 10 EXISTING NITROGEN TANK.
- 11 EXISTING SUPPLY AIR DIFFUSER.
- 12 EXISTING RETURN AIR GRILLE.
- 13 20" EXHAUST STACK, 45 FEET TALL.
- 14 AIR-COOLED CHILLER CH-001.
- 15 DUCT-MOUNTED COOLING COIL, SEE SUPPLY AIR VALVE SCHEDULE ON SHEET M6-102. INSTALL PER SMACNA HVAC DUCT CONSTRUCTION STANDARDS, FIGURE 7-1.
- 16 MAINTAIN CLEARANCES FOR SERVICE AS REQUIRED BY MANUFACTURER, FOR COIL REPLACEMENT, AND PER NEC FOR ELECTRICAL EQUIPMENT.
- 17 CONCRETE PAD, 6" THICK. EXTEND 6" LARGER THAN EACH SIDE OF EQUIPMENT FOOTPRINT.
- 18 DUCT SUPPORT, PROVIDE AT 8-FT MAX INTERVALS.
- 19 VERTICAL DUCTS IN CHASE, SEE ARCHITECTURAL.
- 20 EXISTING RADIANT HEATER, SUSPENDED FROM STRUCTURE
- 21 EXISTING FIRE SPRINKLER, SEE F1-101.
- 22 INSTALL WITH BOTTOM OF DUCT AT 12'-5" AFF MIN.
- 23 INSTALL WITH BOTTOM OF DUCT AT 11' AFF MIN.
- 24 INSTALL DUCT TIGHT TO ADJACENT WALL.
- 25 NOT USED
- 26 WHERE ASPHALT HAS BEEN REMOVED AND AFTER EQUIPMENT INSTALLATION, PROVIDE A COVERING OF 2" MINIMUM 5/8" CRUSHED SURFACING IN ACCORDANCE WITH WSDOT M41-10, SECTION 9-03.9(3) FOR TOP COURSE MATERIAL.
- 27 PROVIDE 4"W x 20'-0"L PARKING STALL STRIPING AS SHOWN. PAINT SHALL BE ACRYLIC EMULSION, COLOR: WHITE, NON-REFLECTORIZED. PAINT SHALL MEET THE REQUIREMENTS OF FA TT-P-1952B. VERIFY LAYOUT WITH THE BATTELLE CM PRIOR TO PAINTING.

- 28 RE-INSTALL EXISTING WHEEL STOP AS SHOWN, CENTERED IN STALL (TYP 2).
- 29 SAW CUT EDGE OF ASPHALT, 6" BEYOND NEW SECTION OF FENCE AS SHOWN.
- 30 PROVIDE SECTION OF 8'-0" HIGH SECURITY FENCE. ALIGN WITH EXISTING, AND PROVIDE 3'-0" ACCESS GATE AS SHOWN. INSTALL WESTERNMOST POST WITH 2" MAXIMUM CLEARANCE AT NEW DUCTWORK AND INSTALL PRIVACY SLATS IN FENCE AND GATE.
- 31 EXISTING 8'-0" FENCE. INSTALL PRIVACY SLATS IN FENCE AND GATE.
- 32 STRAIGHTEN EXISTING FENCE LINE POST AND STRAIGHTEN/RE-ATTACH FENCE FABRIC AS NEEDED.
- 33 CAP EXISTING DUCT.
- 34 PROVIDE ACCESS DOOR IN CEILING FOR VENTURI AND COIL ACCESS, 24"x24" CLEAR SIZE MINIMUM.
- 35 GAS CYLINDER STORAGE CABINET WITH 60-MINUTE FIRE RATED DIVIDER WALL, 24 BOTTLE CAPACITY. GILMORE KRAMER MODEL HP24332S OR EQUAL.

HVAC PLAN
SCALE: 1/8" = 1'-0"

S720239C-FMP01-ECN01
SHEET 3 OF 6

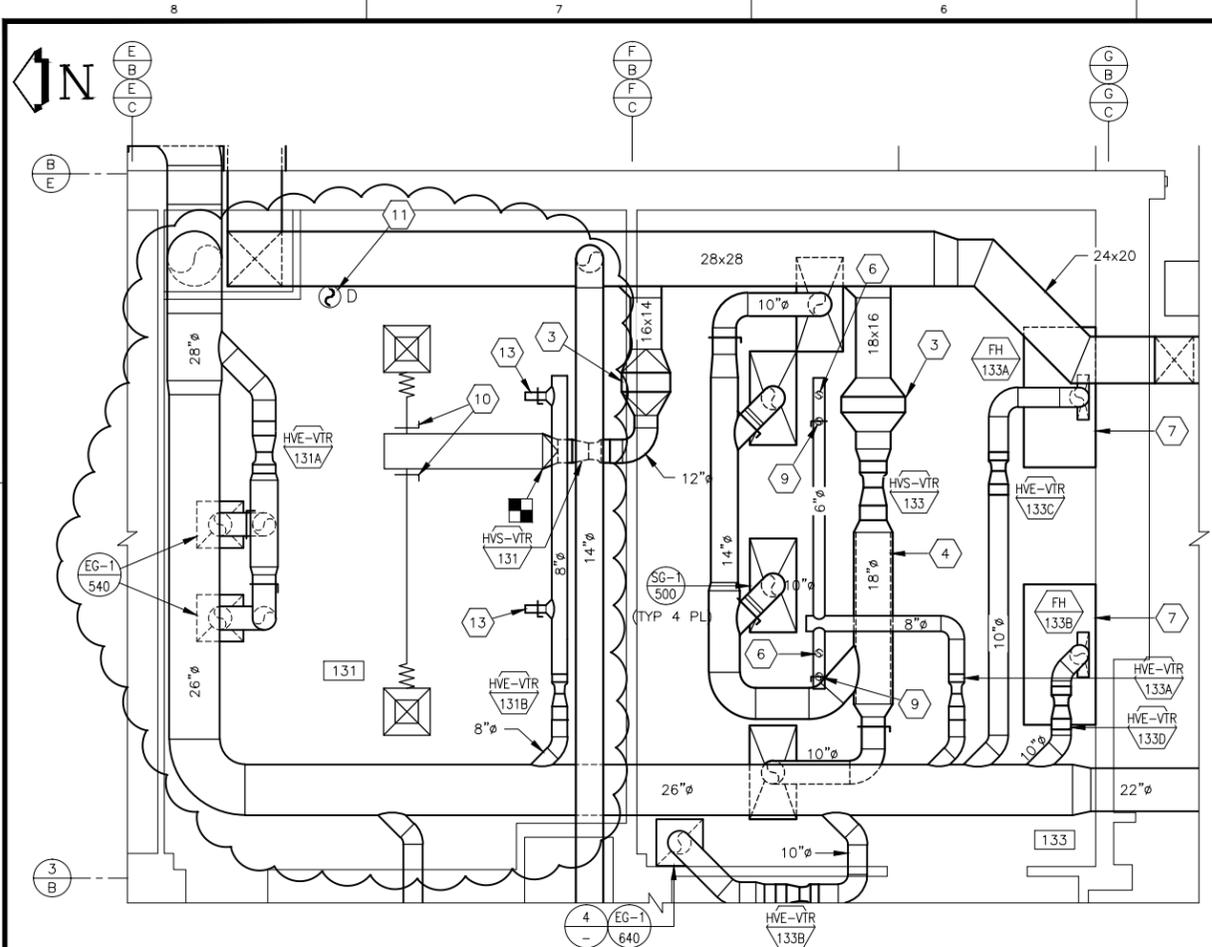
NOTES

- 1. SEE DRAWING GO-101 FOR GENERAL NOTES AND LEGEND.

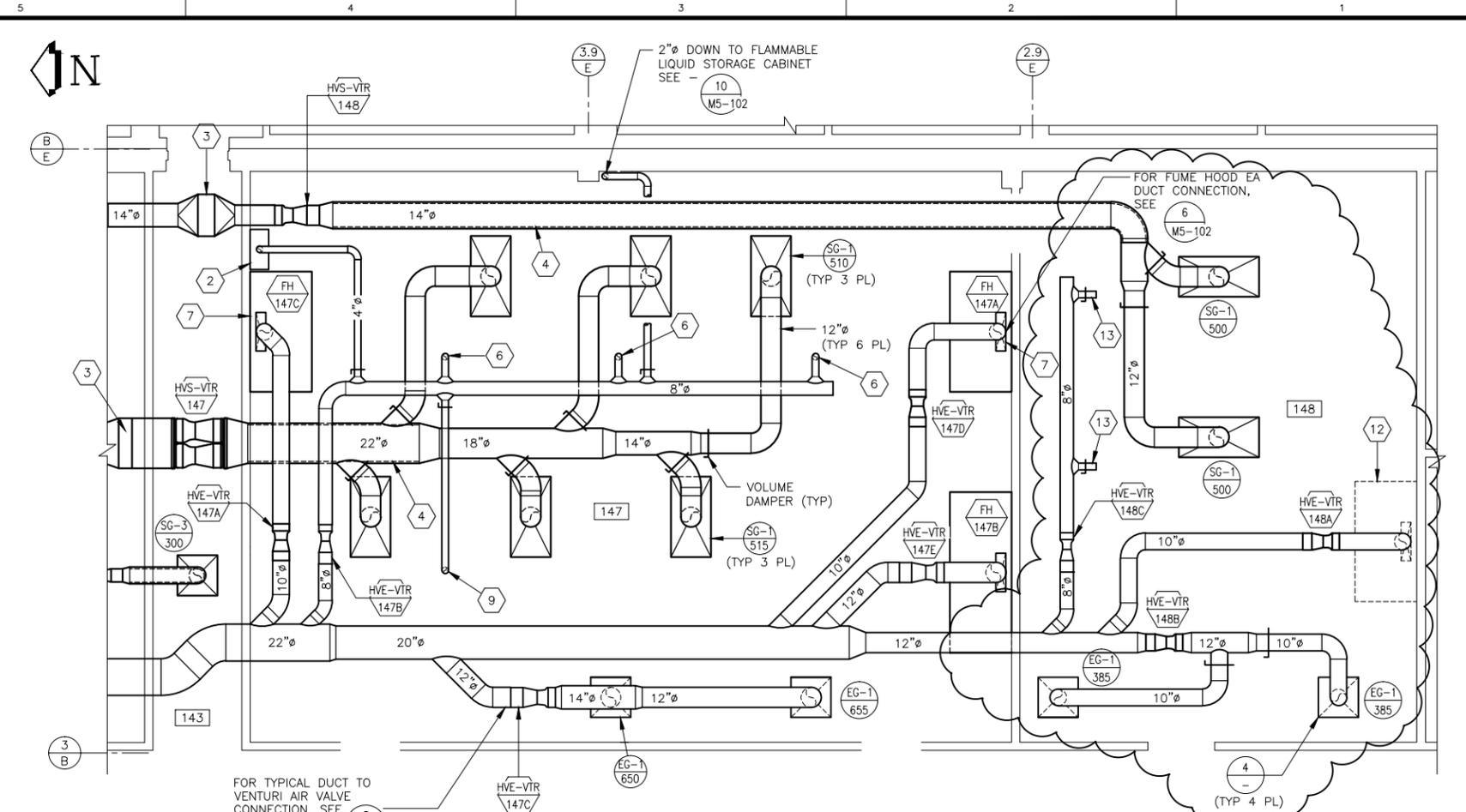
REVISIONS DESCRIPTION

DOCUMENT NO S720239C-M1-101		SERVICE REQUEST NO S720239C	
U. S. DEPARTMENT OF ENERGY PACIFIC NORTHWEST SITE OFFICE			
Pacific Northwest Division		Richland, Washington 99352	
Battelle			
MECHANICAL/CIVIL			
HVAC PLAN			
SITE PLAN			
PROJ TITLE	318 LAB 126, 133, AND 147 MODIFICATIONS		REV NO
BLDG	318	DWG NO	M1-101
SCALE	SHOWN	SHEET	1 OF 1

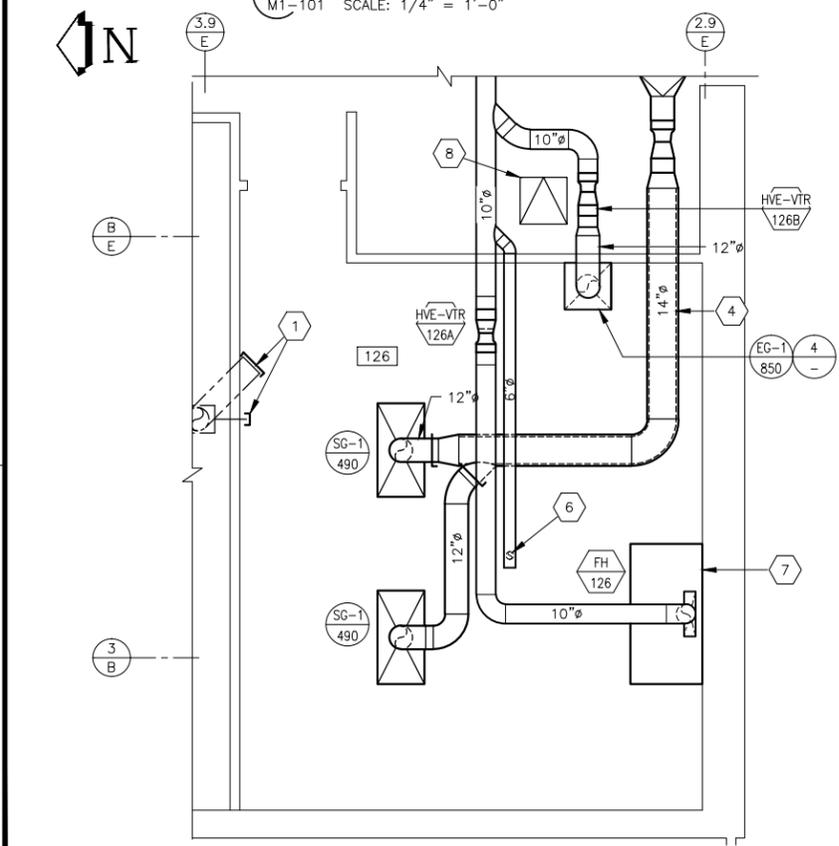
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 PLOT BY: SCOTT, JEFFERY M



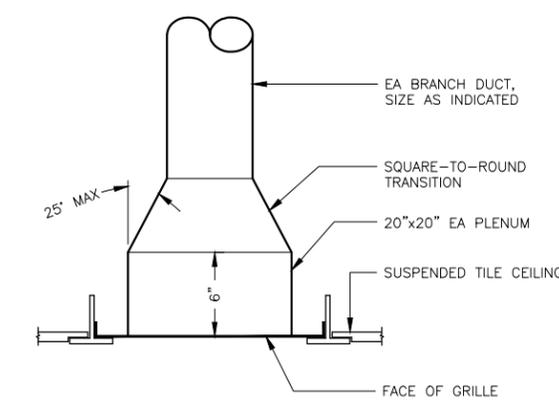
1 HVAC PLAN - LABS 131, 133
M1-101 SCALE: 1/4" = 1'-0"



2 HVAC PLAN - LABS 147, 148
M1-101 SCALE: 1/4" = 1'-0"



3 HVAC PLAN - LAB 126
M1-101 SCALE: 1/4" = 1'-0"



4 EXHAUST GRILLE DETAIL
SCALE: NONE

AIR BALANCE SCHEDULE

ROOM NAME	SUPPLY AIR		FUME HOOD EA		SNORKEL EA*	GENERAL EA		OFFSET CFM
	MAXIMUM CFM	MINIMUM CFM	MAXIMUM CFM	MINIMUM CFM		MAXIMUM CFM	MINIMUM CFM	
LAB 126	980	210	975	230	--	850	80	-100
LAB 131	1,080	225	--	--	100	1,080	225	-100
LAB 133	2,000	510	1,950	460	100	640	50	-100
LAB 147	3,075	745	3,110	780	75	1,305	90	-100
LAB 148	1,000	240	785**	230**	100	770	50	-100
CORRIDOR 135	300	300	--	--	--	--	--	+100
CORRIDOR 143	300	300	--	--	--	--	--	+200

* CONSTANT VOLUME
** INSTALLATION OF FUME HOOD IN LAB 148 IS NOT IN SCOPE

NOTES

- SEE DRAWING G0-101 FOR GENERAL NOTES AND LEGEND.
- AT UPSTREAM AND DOWNSTREAM SIDE OF EACH DUCT-MOUNTED COOLING COIL, PROVIDE DUCT ACCESS DOOR, MINIMUM 10"x10" SIZE.

SHEET NOTES

- CAP EXISTING 12" SA DUCT.
- WALL-MOUNTED GAS BOTTLE CABINET, BALANCE TO 25 CFM.
- DUCT-MOUNTED COOLING COIL, SEE SUPPLY AIR VALVE SCHEDULE ON SHEET M6-102. INSTALL COIL PER SMACNA HVAC DUCT CONSTRUCTION STANDARDS, FIGURE 7-1.
- PROVIDE 1" SOUNDLINING ON VENTURI AIR VALVE SUPPLY AIR DISCHARGE DUCT.
- 28x28 SA, 26x24 EA THROUGH WALL, FOR CONTINUATION SEE M1-101.
- 4" EA DOWN TO VACUUM POT, SEE DETAIL 7/M5-102.
- PROVIDE VENT PIPES FROM FUME HOOD FLAMMABLE AND CORROSIVE CABINET STORAGE TO HOOD EXHAUST PER DETAIL 8, M5-102.
- PROVIDE ACCESS DOOR IN CEILING, 24"x24" MINIMUM SIZE. COORDINATE LOCATION OF ACCESS DOOR AND VENTURI AIR VALVE WITH EXISTING LIGHTING.
- 4" EA DOWN TO SNORKEL, SEE DETAIL 4/A5-101. BALANCE TO 50 CFM.
- BALANCE EXISTING DIFFUSER TO 540 CFM.
- DUCT SMOKE DETECTOR, SEE ELECTRICAL.
- FUTURE FUME HOOD. TERMINATE 10" EXHAUST DUCT AT 8'-0" AFF.
- 4" EA FOR FUTURE SNORKEL. PROVIDE BALANCING DAMPER.

S720239C-FMP01-ECN01
SHEET 4 OF 6

DOCUMENT NO	S720239C-M4-101	SERVICE REQUEST NO	S720239C
U. S. DEPARTMENT OF ENERGY PACIFIC NORTHWEST SITE OFFICE			
Pacific Northwest Division		Richland, Washington 99352	
Battelle			
MECHANICAL LAB 126, 133, 147, AND 148 HVAC PLANS			
PROJ TITLE	318 LAB 126, 133, AND 147 MODIFICATIONS		
SIZE BLDG	318	DWG NO	M4-101
SCALE	SHOWN	REV NO	0
REVISIONS DESCRIPTION		SHEET 1 OF 1	

FUME HOOD SCHEDULE

EQUIP ID USED ON DRAWING	EQUIPMENT ID USED BY BATTELLE	SIZE	DESIGN OPERATING CONDITIONS				MINIMUM VAV AIRFLOW (CFM)	STATIC PRESSURE AT HOOD OUTLET (INCHES OF WATER COLUMN)	HOOD COLLAR SIZE	POWER	LIGHTING	SERVICES
			SASH WIDTH (ACTUAL)	SASH OPENING	FACE VELOCITY (FPM)	AIR FLOW (CFM)						
FH 126	318-HVE-FH-126	72"x36"	62-3/8"	18"	125	975	230	0.09	6"x23"	(4) NEMA 5-20R, GRAY, DUPLEX GFCI, 1-CIRCUIT FOR RECEPTACLES AND LIGHTING, (2) ON RIGHT POST & (2) ON LEFT POST	FLUORESCENT	CA, N2, HE
FH 133A	318-HVE-FH-133A	72"x36"	62-3/8"	18"	125	975	230	0.09	6"x23"	(4) NEMA 5-20R, GRAY, DUPLEX GFCI, 1-CIRCUIT FOR RECEPTACLES AND LIGHTING, (2) ON RIGHT POST & (2) ON LEFT POST	FLUORESCENT	CA, AR
FH 133B	318-HVE-FH-133B	72"x36"	62-3/8"	18"	125	975	230	0.09	6"x23"	(4) NEMA 5-20R, GRAY, DUPLEX GFCI, 1-CIRCUIT FOR RECEPTACLES AND LIGHTING, (2) ON RIGHT POST & (2) ON LEFT POST	FLUORESCENT	CA, AR
FH 147A	318-HVE-FH-147A	72"x36"	62-3/8"	18"	125	975	230	0.09	6"x23"	(4) NEMA 5-20R, GRAY, DUPLEX GFCI, 1-CIRCUIT FOR RECEPTACLES AND LIGHTING, (2) ON RIGHT POST & (2) ON LEFT POST	FLUORESCENT	CA, N2
FH 147B	318-HVE-FH-147B	96"x36"	86-3/8"	18"	125	1,350	320	0.12	6"x30"	(4) NEMA 5-20R, GRAY, DUPLEX GFCI, 1-CIRCUIT FOR RECEPTACLES AND LIGHTING, (2) ON RIGHT POST & (2) ON LEFT POST	FLUORESCENT	CA, N2
FH 147C	318-HVE-FH-147C	72"x36"	62-3/8"	18"	100	785	230	0.09	6"x23"	(4) NEMA 5-20R, GRAY, DUPLEX GFCI, 1-CIRCUIT FOR RECEPTACLES AND LIGHTING, (2) ON RIGHT POST & (2) ON LEFT POST	FLUORESCENT	CA, N2

NOTES: PROVIDE FUME HOOD CONTROLLER WITH SASH POSITION SENSOR, CONNECT TO FMCS. FUME HOODS PROVIDED UNDER DIVISION 11, SECTION 115313.

LAB EXHAUST AIR VALVE SCHEDULE

EQUIP ID USED ON DRAWING	EQUIPMENT ID USED BY BATTELLE	ROOM SERVED, FUME HOOD	MANUFACTURER & MODEL NO	AIR FLOW (CFM)			REMARKS
				UNOCCUPIED	MAX	OCCUPIED	
HVE-VTR 126A	318-HVE-VTR-126A	LAB 126 FH-126	PHOENIX CONTROLS EXVB110M	230	975	230	
HVE-VTR 126B	318-HVE-VTR-126B	LAB 126 GENERAL EXHAUST	PHOENIX CONTROLS EXVB110M	80	850	335	
HVE-VTR 131A	318-HVE-VTR-131A	LAB 131 GENERAL EXHAUST	PHOENIX CONTROLS EXVB112M	325	1,180	490	
HVE-VTR 131B	318-HVE-VTR-131B	LAB 131 SNORKELS	PHOENIX CONTROLS EXVB112M	100	100	100	
HVE-VTR 133A	318-HVE-VTR-133A	LAB 133 VP & SNORKELS	PHOENIX CONTROLS EXVB108M	100	100	100	
HVE-VTR 133B	318-HVE-VTR-133B	LAB 133 GENERAL EXHAUST	PHOENIX CONTROLS EXVB110M	50	640	50	
HVE-VTR 133C	318-HVE-VTR-133C	LAB 133 FH-133A	PHOENIX CONTROLS EXVB110M	230	975	230	
HVE-VTR 133D	318-HVE-VTR-133D	LAB 133 FH-133B	PHOENIX CONTROLS EXVB110M	230	975	230	
HVE-VTR 147A	147-HVE-VTR-147A	LAB 147 FH-147C	PHOENIX CONTROLS EXVB110M	230	785	230	
HVE-VTR 147B	147-HVE-VTR-147B	LAB 147 SNORKEL, FLAM CABINETS	PHOENIX CONTROLS EXVB108M	75	75	75	
HVE-VTR 147C	147-HVE-VTR-147C	LAB 147 GENERAL EXHAUST	PHOENIX CONTROLS EXVB112M	90	1,280	90	
HVE-VTR 147D	147-HVE-VTR-147D	LAB 147 FH-147A	PHOENIX CONTROLS EXVB110M	230	975	230	
HVE-VTR 147E	147-HVE-VTR-147E	LAB 147 FH-147B	PHOENIX CONTROLS EXVB112M	320	1,350	320	
HVE-VTR 148A	148-HVE-VTR-148A	LAB 148 FH-148	PHOENIX CONTROLS EXVB110M	230	785	230	
HVE-VTR 148B	148-HVE-VTR-148B	LAB 148 GENERAL EXHAUST	PHOENIX CONTROLS EXVB110M	340	770	50	
HVE-VTR 148C	148-HVE-VTR-148C	LAB 148 SNORKELS	PHOENIX CONTROLS EXVB108M	100	100	100	

LAB SUPPLY AIR VALVE SCHEDULE

EQUIP ID USED ON DRAWING	EQUIPMENT ID USED BY BATTELLE	ROOM NUMBER	MANUFACTURER & MODEL NO	UNOCCUPIED AIR FLOW	OCCUPIED AIR FLOW	AIRFLOW OFFSET	COOLING COIL									
							MINIMUM	MAX CFM	MIN CFM	(CFM)	SENSIBLE CAPACITY (MBH)	FLUID FLOW (GPM)	EAT DB (°F)	EAT WB (°F)	LAT DB (°F)	WPD (FT WC)	APD (IN WC)	FACE VEL (FPM)	ROWS/FPI
HVS-VTR 126	318-HVS-VTR-126	LAB 126	PHOENIX CONTROLS MAVA114M	210	980	365	-100	13.5	3.0	65	56	52	< 10	< 0.33	< 475	4/10
HVS-VTR 131	318-HVS-VTR-131	LAB 131	PHOENIX CONTROLS MAVA114M	225	1,080	390	-100	16.5	3.5	65	56	52	< 10	< 0.33	< 475	4/10
HVS-VTR 133	318-HVS-VTR-133	LAB 133	PHOENIX CONTROLS MAVA114M	510	2,000	510	-100	16.5	3.5	65	56	52	< 10	< 0.33	< 475	4/10
HVS-VTR 135	318-HVS-VTR-135	CORRIDOR 135	PHOENIX CONTROLS MAVA108M	300	300	300	+300	--	--	--	--	--	--	--	--	--
HVS-VTR 143	318-HVS-VTR-143	CORRIDOR 143	PHOENIX CONTROLS MAVA108M	300	300	300	+300	--	--	--	--	--	--	--	--	--
HVS-VTR 147	318-HVS-VTR-147	LAB 147	PHOENIX CONTROLS MAVA214M	745	3,075	875	-200	26.5	6.0	65	56	52	< 10	< 0.33	< 475	4/10
HVS-VTR 148	318-HVS-VTR-148	LAB 148	PHOENIX CONTROLS MAVA112M	240	1,000	410	-100	13.5	3.0	65	56	52	< 10	< 0.33	< 475	6/8

NOTES: COOLING COIL BASED ON 30% PG, EGT OF 45°F, LGT OF 55°F, PROVIDE WITH STAINLESS STEEL DRAIN PANS. ACCEPTABLE COIL MANUFACTURERS: GREENHECK, TRANE, MCQUAY, COLMAC COIL.

GRILLE AND DIFFUSER SCHEDULE

CALLOUT	MANUFACTURER & MODEL NO	CFM	TYPE	MODULE SIZE (INxIN)	NECK SIZE (IN)	STATIC PRESSURE (IN WC)	NC LEVEL	FINISH	REMARKS
SG-1	TITUS TRITEC	SEE DRAWINGS	SUPPLY DIFFUSER	48x24	12ø	< 0.1	< 25	WHITE	2-WAY THROW PATTERN, PERFORATED FACE
SG-2	NOT USED	--	--	--	--	--	--	--	--
SG-3	TITUS MCD	SEE DRAWINGS	SUPPLY DIFFUSER	24x24	10ø	< 0.1	< 12	WHITE	FRAME FOR LAY-IN CEILING OR SURFACE MOUNT AS APPLICABLE, 2-WAY THROW PATTERN
EG-1	TITUS 8F	SEE DRAWINGS	EXHAUST GRILLE	24x24	20x20	< 0.1	< 12	WHITE	FRAME FOR LAY-IN CEILING

AIR SEPARATOR SCHEDULE

EQUIP ID USED ON DWG	EQUIPMENT IDENTIFICATION NUMBER	MANUFACTURER & MODEL NO	SERVICE	FLUID	ΔP (FT HD)	DIMENSIONS	REMARKS
AS 001	318-CHW-AS-002	SPIROTHERM VDT-250	CHILLED WATER	30% PG	1.0 @ 4 FT/S INLET VELOCITY	6.3"ø x 25.3" H	COMBINATION AIR SEPARATOR AND DIRT STRAINER, INTEGRAL AUTO AIR VENT AND DRAIN VALVE WITH HOSE CONNECTION.
AS 002	318-HRW-AS-001	SPIROTHERM VJR200	HEAT RECOVERY WATER	30% PG	1.0 @ 4 FT/S INLET VELOCITY	4.0"ø x 10.8" H	INTEGRAL AUTO AIR VENT

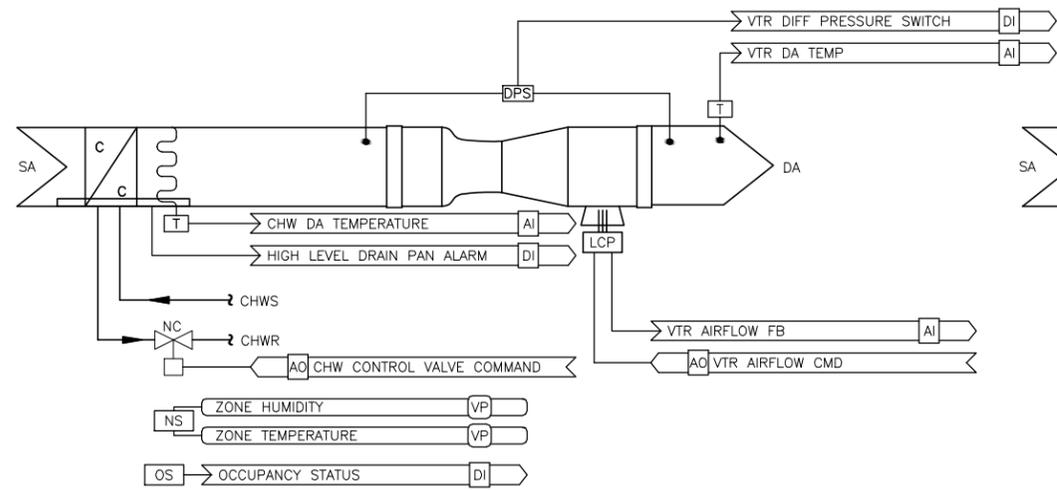
TANK SCHEDULE

EQUIP ID USED ON DRAWING	EQUIPMENT IDENTIFICATION NUMBER	MANUFACTURER & MODEL NO	SERVICE	FLUID	TANK VOLUME (GAL)	DIMENSIONS	OPERATING WEIGHT (LB)	REMARKS
ST 001	318-CHW-ST-001	LOCHINVAR CVU-120	CHILLED WATER SYSTEM	30% PG	120	28"ø x 56"H	1300	ASME, (4) SEISMIC CLIPS, INTERNAL BAFFLE, AUTO AIR VENT, PROVIDE FIELD-INSTALLED INSULATION AND ALUMINUM JACKET PER SPECIFICATIONS
ET 001	318-CHW-ET-002	ARMSTRONG AX-15V	CHILLED WATER SYSTEM	30% PG	8.0	12"ø x 19"H	94	6.3 GAL ACCEPTANCE VOLUME, ASME, 12 PSIG PRE-CHARGE PRESSURE
ET 002	318-HRW-ET-001	ARMSTRONG AX-15V	HEAT RECOVERY WATER SYSTEM	30% PG	8.0	12"ø x 19"H	94	6.3 GAL ACCEPTANCE VOLUME, ASME, 12 PSIG PRE-CHARGE PRESSURE

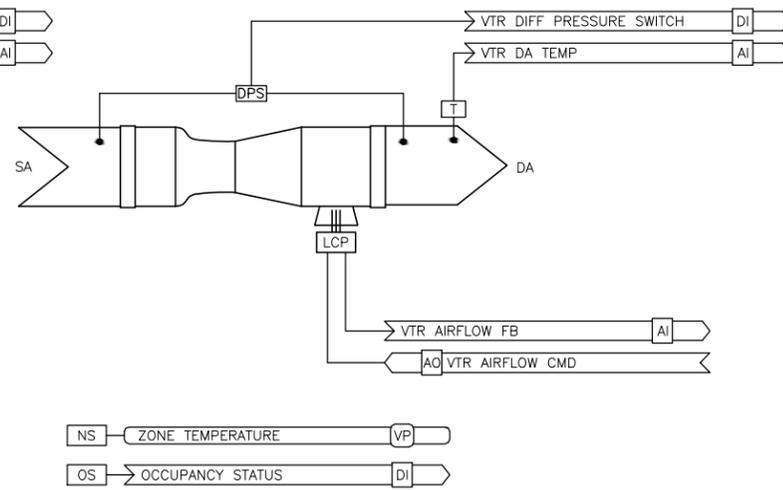
S720239C-FMP01-ECN01
SHEET 5 OF 6

DOCUMENT NO S720239C-M6-102		SERVICE REQUEST NO S720239C	
U. S. DEPARTMENT OF ENERGY PACIFIC NORTHWEST SITE OFFICE			
Pacific Northwest Division		Richland, Washington 99352	
Battelle			
MECHANICAL EQUIPMENT SCHEDULES			
PROJ TITLE 318 LAB 126, 133, AND 147 MODIFICATIONS		REV NO 0	
SCALE 318 SHOWN		DWG NO M6-102	
SHEET 1 OF 1		PLOT DATE: 09/27/2014 3:38 PM	

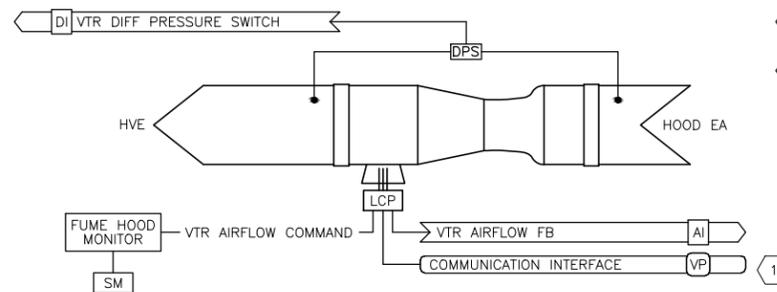
REVISIONS	DESCRIPTION



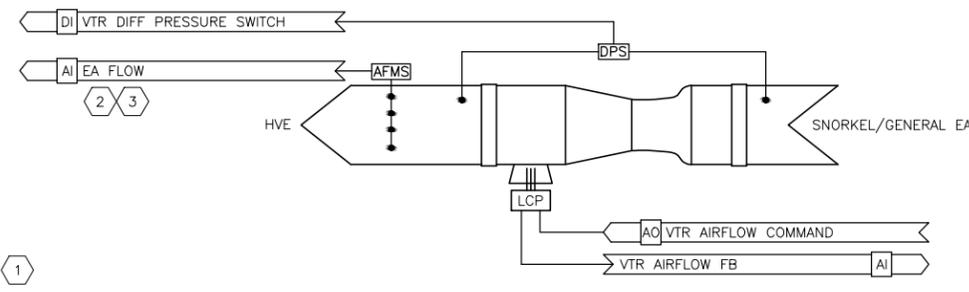
HVS-VTR-A AIRFLOW SCHEMATIC
TYPICAL OF: SEE TABLE THIS SHEET



HVS-VTR-B AIRFLOW SCHEMATIC
TYPICAL OF: SEE TABLE THIS SHEET



HVE-VTR-A HOOD AIRFLOW SCHEMATIC
TYPICAL OF: SEE TABLE THIS SHEET



HVE-VTR-B SNORKEL/GENERAL AIRFLOW SCHEMATIC
TYPICAL OF: SEE TABLE THIS SHEET

LABORATORY SEQUENCE OF OPERATION (EXHAUST TRACKING SUPPLY)

1. GENERAL
 - 1.1. SETPOINTS DESCRIBED IN THE SEQUENCES OF OPERATION SHALL BE ADJUSTABLE FROM THE GRAPHICAL INTERFACE.
 - 1.2. VARIABLE VOLUME TERMINALS SHALL REACT TO PRESSURE CHANGE WITHIN ONE SECOND OR LESS TO MAINTAIN REQUIRED DIRECTIONAL AIRFLOW BETWEEN ROOM AND CORRIDOR IN ALL MODES OF OPERATION USING A VOLUMETRIC (CFM) OFFSET BETWEEN SUPPLY AND EXHAUST.
 - 1.3. PRESSURE OFFSET SETPOINTS SHALL INDICATE THE DESIRED VOLUMETRIC (CFM) OFFSET CONDITION. A NEGATIVE OFFSET SETPOINT INDICATES MORE EXHAUST THAN SUPPLY WHILE A POSITIVE SETPOINT INDICATES MORE SUPPLY THAN EXHAUST.
2. AIR FLOW CONTROL
 - 2.1. THE LABORATORY CONTROLLER SHALL CALCULATE TOTAL ROOM EXHAUST AIRFLOW USING THE AIRFLOW FEEDBACK FROM THE HOOD EXHAUST AND GENERAL EXHAUST VTR VALVES, AND (WHERE INDICATED) THE AIR FLOW MEASURING STATION ON THE SNORKEL. THE SUPPLY AIR MODULATES TO MAINTAIN THE SPACE TEMPERATURE PER THE TEMPERATURE CONTROL SEQUENCE.
 - 2.2. THE GENERAL EXHAUST TRACKS THE SUPPLY AND, IN LABS WITH FUME HOODS THE FUME HOOD EXHAUST. TO MAINTAIN THE ROOM DIFFERENTIAL AIRFLOW OFFSET, THE LABORATORY CONTROLLER SHALL RESET THE MINIMUM SUPPLY AIRFLOW SETPOINT BASED ON THE TOTAL FUME HOOD AIRFLOW TO MINIMIZE THE TOTAL EXHAUST AND TOTAL SUPPLY AIRFLOW TO THE ROOM.
 - 2.3. THE INITIAL ROOM DIFFERENTIAL OFFSET IS -100 CFM FOR LABS 126, 131, 133 AND 148; -200 CFM FOR LAB 147. FINAL SETPOINT TO BE DETERMINED BY TEST AND BALANCE TO MAINTAIN DESIRED DIRECTIONAL AIRFLOW IN LAB DURING ALL MODES OF OPERATION AND TRANSITIONS BETWEEN MODES.
 - 2.4. ROOM DIFFERENTIAL AIRFLOW OFFSET HAS PRECEDENCE OVER ROOM TEMPERATURE CONTROL.
- CONSTANT VOLUME SUPPLY (CORRIDORS, VTR-135 & 143):
 - 2.5. THE CONTROL DAMPER MODULATES TO MAINTAIN THE CONSTANT VOLUME AIR FLOW AS SCHEDULED.
- CONSTANT VOLUME EXHAUST (SNORKELS):
 - 2.6. THE CONTROL DAMPER MODULATES TO MAINTAIN THE CONSTANT VOLUME AIR FLOW AS SCHEDULED.
- VAV FUME HOOD EXHAUST:
 - 2.7. THE FUME HOOD MONITOR MODULATES THE FUME HOOD EXHAUST BETWEEN THE MINIMUM AND MAXIMUM FLOW RATE VALUES TO MAINTAIN THE FACE VELOCITY ACROSS THE FUME HOOD SASH OPENING.
 - 2.8. FEEDBACK FROM THE FUME HOOD AIRFLOW EXHAUST CONTROLLER SHALL BE USED IN THE CALCULATION TO MAINTAIN DIRECTIONAL AIRFLOW.
3. TEMPERATURE CONTROL
 - 3.1. INDEX THE TERMINAL UNITS TO OCCUPIED WHENEVER THE OCCUPANCY STATUS INPUT INDICATES OCCUPIED OR WHEN AN OCCUPIED COMMAND IS SCHEDULED.
 - 3.2. UPON STARTUP, MODULATE THE SUPPLY AIR AND EXHAUST AIR VTR'S TO MAINTAIN THE DESIGN AIR FLOWS.
 - 3.3. THE INITIAL ZONE TEMPERATURE SETPOINT SHALL BE 71.5°F WITH A ROOM OFFSET OF +0.5°F/-0.5°F. A 1.5° DEADBAND SHALL BE USED TO CREATE AN OCCUPIED HEATING AND COOLING SETPOINT.
 - 3.4. COOLING MODE: ON PROOF OF FAN STATUS AND WHEN THE ZONE TEMPERATURE IS ABOVE THE OCCUPIED SPACE COOLING SETPOINT, THE FIRST STAGE OF COOLING IS FOR THE FMCS TO MODULATE THE CHILLED WATER COIL VALVE TO MAINTAIN THE OCCUPIED COOLING SETPOINT. ONCE THE COIL VALVE IS FULLY OPEN, MODULATE THE SUPPLY VTR FROM THE MINIMUM TO MAXIMUM DESIGN AIR FLOW AS REQUIRED TO MAINTAIN THE OCCUPIED COOLING SETPOINT. THE GENERAL EXHAUST AIR VTR SHALL MODULATE TO MAINTAIN THE ROOM DIFFERENTIAL AIRFLOW OFFSET. THE FMCS SHALL MAINTAIN ZONE TEMPERATURE WITHIN +0.5°F/-0.5°F OF ACTIVE SETPOINT.
 - 3.5. HEATING MODE: ON PROOF OF FAN STATUS AND WHEN THE ZONE TEMPERATURE IS BELOW THE OCCUPIED SPACE HEATING SETPOINT, THE FMCS SHALL MODULATE THE SUPPLY AIR VTR TO

THE HEATING SETPOINT. THE GENERAL EXHAUST AIR VTR SHALL MODULATE TO MAINTAIN THE ROOM DIFFERENTIAL AIRFLOW OFFSET. MODULATE THE SUPPLY VTR BETWEEN THE MINIMUM AND MAXIMUM DESIGN AIR FLOWS. FMCS SHALL MAINTAIN ZONE TEMPERATURE WITHIN +0.5°F/-0.5°F OF ACTIVE SETPOINT.

- UNOCCUPIED MODE:
- 3.6. THERE SHALL BE A DAYTIME AND NIGHTTIME OCCUPANCY SEQUENCE. PROVIDE A GRAPHICAL ENABLE/DISABLE COMMAND FOR BOTH THE DAYTIME AND NIGHTTIME UNOCCUPIED MODE.
 - 3.7. INDEX THE TERMINAL UNITS TO THE DAYTIME UNOCCUPIED MODE WHENEVER THE OCCUPANCY STATUS INPUT INDICATES UNOCCUPIED AND TO THE NIGHTTIME UNOCCUPIED MODE WHENEVER AN UNOCCUPIED COMMAND IS SCHEDULED.
 - 3.8. IN THE DAYTIME UNOCCUPIED MODE, OFFSET THE EFFECTIVE HEATING AND COOLING SETPOINTS BY A DIFFERENCE OF THE DAYTIME UNOCCUPIED HEATING AND COOLING OFFSET SETPOINTS (DEFAULT = 2°F COOLING / 2°F HEATING).
 - 3.9. IN THE NIGHTTIME UNOCCUPIED MODE, OFFSET THE EFFECTIVE HEATING AND COOLING SETPOINTS BY A DIFFERENCE OF THE NIGHTTIME UNOCCUPIED HEATING AND COOLING OFFSET SETPOINTS (DEFAULT = 5°F COOLING / 5°F HEATING).
 - 3.10. AN OCCUPANT OVERRIDE BUTTON ON THE ZONE SENSOR INITIATES THE OCCUPIED MODE FOR 1 HOUR. UP TO FOUR HOURS OF OVERRIDE SHALL BE ALLOWED WITH CONSECUTIVE BUTTON PRESSES.
4. ENERGY CALCULATIONS
- 4.1. PROVIDE TOTAL AIRFLOW CALCULATION, IN AIR CHANGES PER HOUR FOR EACH LABORATORY.
5. SAFETIES AND ALARMS
- 5.1. IF THE DIFFERENTIAL PRESSURE ACROSS THE SUPPLY OR EXHAUST VTR INDICATES AN ALARM CONDITION, A SPECIFIC LOW FLOW ALARM INITIATES AT THE OPERATOR WORKSTATION. ALARM SHALL BE DISABLED DURING BUILDING START-UP.
 - 5.2. IF THE ROOM DIFFERENTIAL AIRFLOW OFFSET IS OUT OF RANGE A SPECIFIC ALARM INITIATES AT THE OPERATOR WORKSTATION.
 - 5.3. MONITOR THE COOLING COIL VALVE TO ENSURE PROPER OPERATION. IF THE COOLING VALVE IS FULLY CLOSED (0%) AND THE COIL DISCHARGE AIR TEMPERATURE IS MORE THAN 3°F (ADJUSTABLE) BELOW THE AHU DISCHARGE AIR TEMPERATURE, A SPECIFIC ALARM SHALL BE ISSUED TO THE OPERATOR WORKSTATION. IF THE COOLING VALVE IS FULLY OPEN (100%) AND THE COIL DISCHARGE AIR TEMPERATURE IS MORE THAN 3°F (ADJUSTABLE) ABOVE THE AHU DISCHARGE AIR TEMPERATURE, A SPECIFIC ALARM SHALL BE ISSUED TO THE OPERATOR WORKSTATION.
 - 5.4. A SPECIFIC ALARM SHALL BE INITIATED AT THE OPERATOR WORKSTATION WHENEVER ANY FUME HOOD MONITOR INDICATES THE HOOD IS IN AN EMERGENCY MODE FOR MORE THAN 30 SECONDS.
 - 5.5. A SPECIFIC ALARM SHALL BE INITIATED AT THE OPERATOR WORKSTATION WHENEVER A CONDENSATE DRAIN PAN HIGH LEVEL ALARM INDICATES AN ALARM CONDITION. CLOSE COOLING COIL VALVE UNTIL MANUALLY RESET BY OPERATOR.
 - 5.6. IF ANY SENSOR FAILS, A SPECIFIC ALARM SHALL BE INITIATED AND SENT TO THE OPERATOR WORKSTATION.
 - 5.7. A SPECIFIC ALARM SHALL BE INITIATED AT THE OPERATOR WORKSTATION WHENEVER A CONDENSATE DRAIN PAN HIGH LEVEL ALARM INDICATES AN ALARM CONDITION. CLOSE COOLING COIL VALVE UNTIL MANUALLY RESET BY OPERATOR.

SHEET NOTES

1. PROVIDE BACNET INTERFACE AT FUME HOOD MONITOR FOR INTEGRATION OF FUME HOOD EXHAUST VTR AND FUME HOOD MONITOR.
2. AIR FLOW MEASURING STATION REQUIRED FOR SNORKEL EXHAUST ONLY, NOT GENERAL EXHAUST.
3. IF VENTURI AIR VALVE IS PROVIDED WITH INTEGRAL AIR FLOW MEASURING DEVICE, THEN THE SEPARATE INDICATED AFMS IS NOT REQUIRED.

TYPICAL LAB SUPPLY/EXHAUST VTR SCHEDULE							
LAB	SUPPLY AIR TERMINALS		EXHAUST AIR TERMINALS				
	HVS-VTR-A SUPPLY AIRFLOW SCHEMATIC	HVS-VTR-B SUPPLY AIRFLOW SCHEMATIC	HVE-VTR-A HOOD AIRFLOW SCHEMATIC	HVE-VTR-B GENERAL EXHAUST AIRFLOW SCHEMATIC	HVE-VTR-B SNORKEL AIRFLOW SCHEMATIC		
126	HVS-VTR-126	--	HVE-VTR-126A	--	--	HVE-VTR-126B	--
131	HVS-VTR-131	--	--	--	--	HVE-VTR-131A	HVE-VTR-131B
133	HVS-VTR-133	--	HVE-VTR-133C	HVE-VTR-133D	--	HVE-VTR-133B	HVE-VTR-133A
135	--	HVS-VTR-135	--	--	--	--	--
143	--	HVS-VTR-143	--	--	--	--	--
147	HVS-VTR-147	--	HVE-VTR-147A	HVE-VTR-147D	HVE-VTR-147E	HVE-VTR-147C	HVE-VTR-147B
148	HVS-VTR-148	--	HVE-VTR-148A	--	--	HVE-VTR-148B	HVE-VTR-148C

S720239C-FMP01-ECN01
SHEET 6 OF 6

DOCUMENT NO	S720239C-M7-103	SERVICE REQUEST NO	S720239C
U. S. DEPARTMENT OF ENERGY PACIFIC NORTHWEST SITE OFFICE			
Pacific Northwest Division		Richland, Washington 99352	
Battelle			
MECHANICAL			
SUPPLY AND EXHAUST VALVE CONTROL SEQUENCES			
PROJ TITLE	318 LAB 126, 133, AND 147 MODIFICATIONS		
BLDG	318	DWG NO	M7-103
SCALE	SHOWN	SHEET	1 OF 1

REVISIONS DESCRIPTION

SUBSTITUTION REQUEST FORM



TO Garrett Hyatt, Pacific Northwest National Laboratory
PROJECT RTL Exit Phase 1 - 318 Mods

1. We hereby submit for your consideration the following product instead of the specified item for the above project:

<u>Section</u>	<u>Page</u>	<u>Line/Paragraph</u>	<u>Specified Item</u>
237400	GO-107		Central Station Air Handling Units

2. Proposed Substitution: Mafna

3. Reason for Substitution: To provide a more competitive project

4. Attach complete technical data, including laboratory tests, if applicable.

5. Include complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.

6. Does the substitute affect dimensions shown on Drawings? No

6a. If so, how? _____

7. Will the undersigned pay for changes to the building and systems design, including engineering and detailing costs caused by the requested substitution? YES

8. Describe the effect substitution has on other trades: None

9. Differences between proposed substitution and specified item: None

10. Manufacturer's guarantees of proposed and specified items are: Same Different (explain on attachment)

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

SUBMITTED BY:

[Signature]
Signature
Mechanical Sales, Inc.

Firm
2214 East Riverside Ave

Mailing Address
Spokane, WA 99202

City State Zip 509 327 7395

Telephone April 27, 2015

Date

Please check if there are attachments.

FOR USE BY REVIEWER:

- Accepted Accepted as Noted
- Not Accepted Received Too Late
- Approved for Bidding subject to review and approval of Submittals.

By [Signature]

Date 4-30-2015

Remarks _____

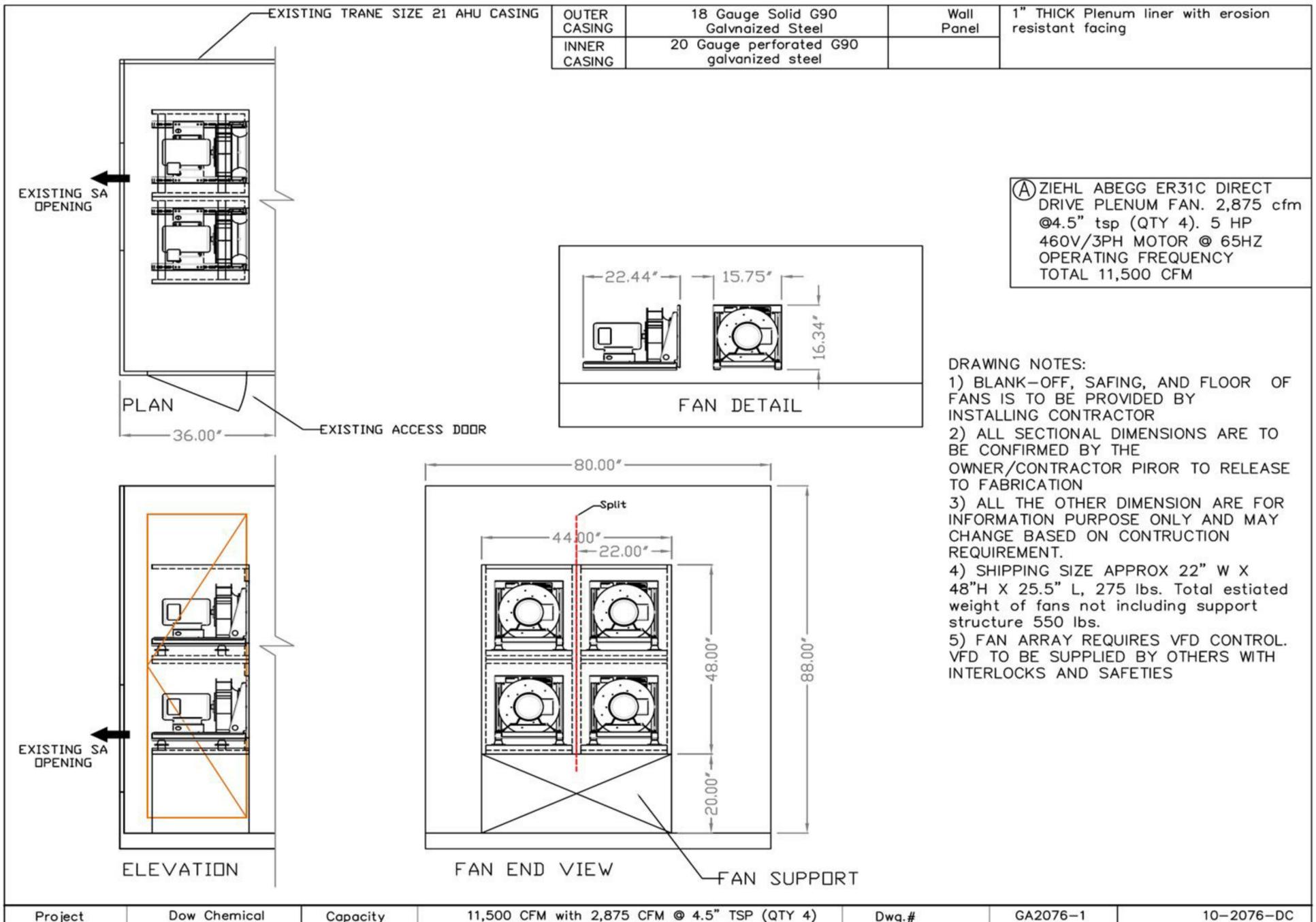
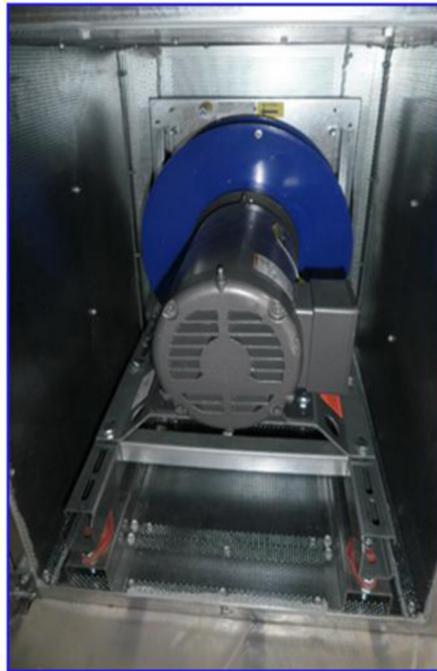
MODULAR MULTI-FAN SYSTEM

PROJECT
 Dow Chemical
 AHU Renovations

CLIENT
 Dow Chemical
 Midland, MI

REPRESENTATIVE
 Fontanesi & Kann
 Oak Park, MI

DATE SHIPPED
 January 7
 2011





Design and Engineering
Smart Air Solutions

ROOFTOP AIR HANDLING UNITS FOR LAB

PROJECT
Baker Institute for Animal Health
AHU-1: 9,850 CFM
AHU-2: 7,540 CFM (no fan)

CLIENT
Cornell University
Ithaca, NY

REPRESENTATIVE
R.L. Kistler
Rochester, NY

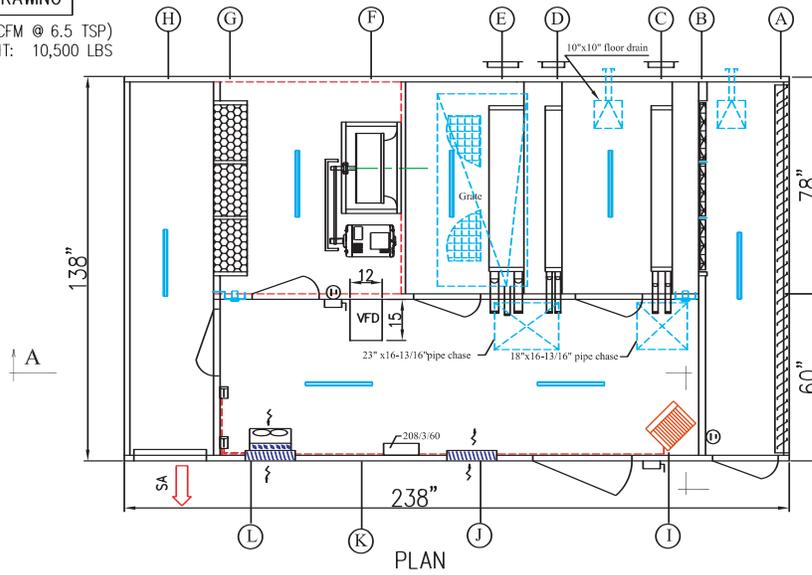
DATE SHIPPED
January 16
2006



OUTER CASING	16G SATIN COAT SOLID PAINTED	BASE	C6X8.2-6" CHANNEL EPOXY PAINTED	PANEL	2" THICK, 3.0 lbs/ft ³ INSULATION	A	ESK 402-2# 66H"x66"L OA LOUVER
INNER CASING	20G-C90 SOLID/22G-C90 PERF	UNDERSIDE FLOOR	20G C90 SOLID-6"-3/4LB insulation	FLOOR	1/8 CHECKERED PLATE	B	2" 30/30 FARR PRE-FILTER (9# 20"x20")

SUBMITTAL DRAWING

AHU-1 (9,850 CFM @ 6.5 TSP)
ESTIMATED WEIGHT: 10,500 LBS



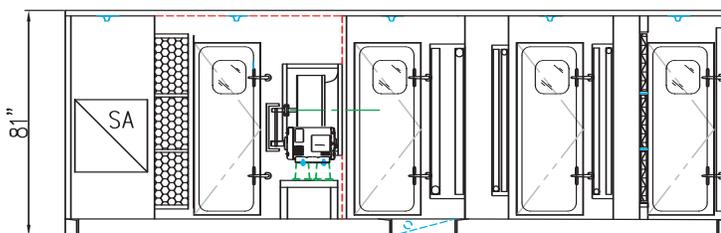
- Legend:**
- Fluorescent light
 - Lighting Switch
 - Test Port
 - Removable Panel
 - Junction Box
 - Thermostat
 - Receptacle
 - Filter gage

- C HRC COIL W-10.0AW-55.5X57.0-4-1
- D PHCCOIL HW-10.0AW-55.5X57.0-2-1
- E CHW COIL W-14.0AW-55.5X57.0-8-1
- F BELT DRIVE SWSI APF 9,850 CFM @ 6.5" TSP 25HP MOTOR 208/3/60, 1800 RPM
- G 12" 80-85% FARR FINAL FILTER (9# 20"x20")
- H 26"x26" SA OPENING
- I UNIT HEATER - BTUH-3.7-2083 3.7 KW
- J OA LOUVER ESK-402 18"HX18"L
- K VARIABLE FREQUENCY DRIVE(VFD) FPC5010
- L EA DAMPER & EXHAUST PANEL FAN TCPE 102A, 500CFM @ 0.3"SP, LOUVER ESK-402 18"HX18"L

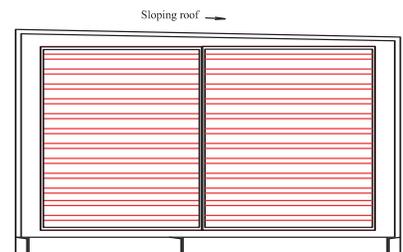
OA
9,850 CFM

Notes:

1. 10"x10" floor drain as shown to be extended & capped.
2. Pipe chase open to below & to be field covered.
3. Power supply: 208V/3/60HZ
4. Support of CHW coil S/S-304.
5. Add approx 6" for overall width.
6. EPDM shipped loose for field installation.



ELEVATION (A-A)



SIDE VIEW

Not included:
1. Roof curb, airflow monitoring, sound attenuator, ladder/platform, inertia base, temperature control.

SUBSTITUTION REQUEST FORM



TO Garrett Hyatt, Pacific Northwest National Laboratory
 PROJECT RTL Exit Phase 1 - 318 Mods

1. We hereby submit for your consideration the following product instead of the specified item for the above project:

Section	Page	Line/Paragraph	Specified Item
232113	GO-107	M	Automatic Flow Control Valve (2" thru 4")

2. Proposed Substitution: Nexus

3. Reason for Substitution: To provide a more competitive project

4. Attach complete technical data, including laboratory tests, if applicable.

5. Include complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.

6. Does the substitute affect dimensions shown on Drawings? No

6a. If so, how? _____

7. Will the undersigned pay for changes to the building and systems design, including engineering and detailing costs caused by the requested substitution? YES

8. Describe the effect substitution has on other trades: None

9. Differences between proposed substitution and specified item: None

10. Manufacturer's guarantees of proposed and specified items are: Same Different (explain on attachment)

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

SUBMITTED BY:
[Signature]
 Signature
 Mechanical Sales, Inc.

Firm
 2214 East Riverside Ave

Mailing Address
 Spokane, WA 99202

City State Zip 509 327 7395

Telephone April 27, 2015

Date

Please check if there are attachments.

FOR USE BY REVIEWER:

Accepted Accepted as Noted
 Not Accepted Received Too Late
 Approved for Bidding subject to review and approval of Submittals

By [Signature]
 Date 4-30-2015

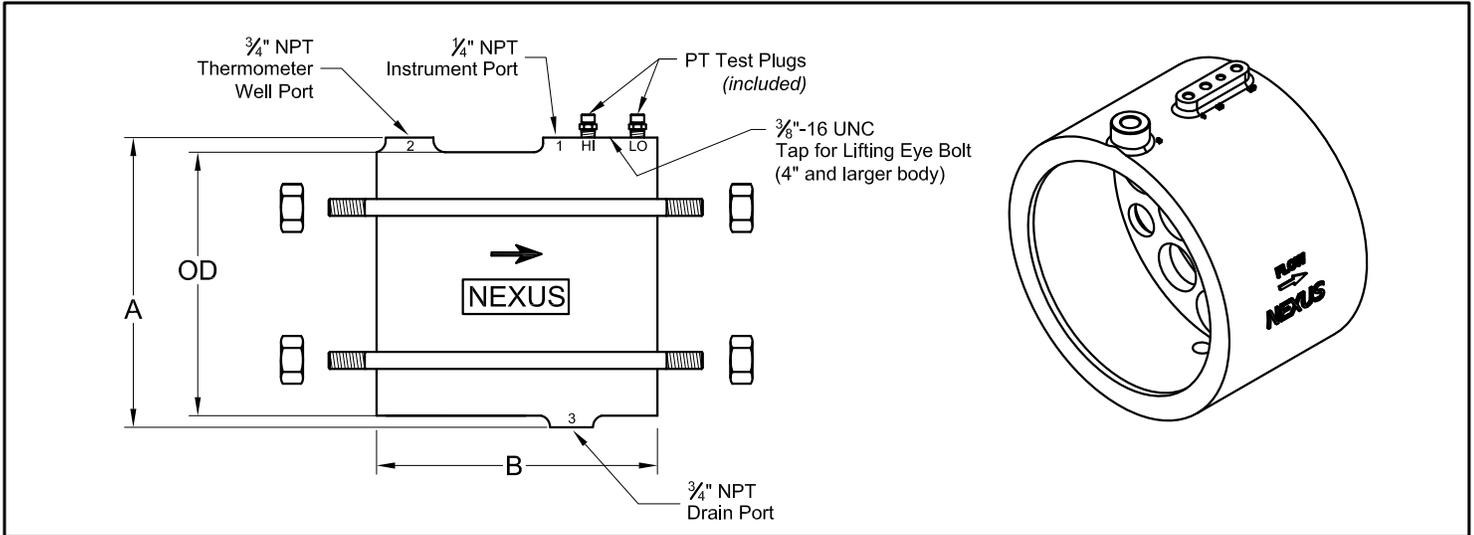
Remarks _____

UltraMatic™ Model UMW

Automatic Flow Control Valve

Wafer Style

(2½" thru 12")



DIMENSIONS [inches]								
SIZE [inches]	LO	STD	HI	EX HI	A	B	OD	WT. [lbs] (Cartridges not included)
2½	✓	✓	-	-	5.1	8.4	4.7	16.2
3	✓	✓	✓	✓	5.6	10.5	5.0	25.8
4	✓	✓	✓	✓	7.4	10.0	6.8	29.5
5	✓	✓	✓	✓	9.3	10.0	7.6	34.7
6	✓	✓	✓	✓	9.2	10.5	8.6	52.0
8	✓	✓	✓	✓	11.6	10.0	11.0	62.7
10	✓	✓	✓	✓	13.9	10.0	13.4	78.0
12	✓	✓	✓	✓	16.7	10.0	16.1	83.5

FLOW RATES Control Range [PSID]				
SIZE [inches]	LO (2-45)	STD (5-50) for 2½" STD (2-45) for 3" thru 12"	HI (2-45) for 3" HI (4-45) for 4" thru 12"	EX HI (4-70) for 3" EX HI (5-45) for 4" thru 12"
	(± 5.0%, 5 GPM increments)			
2½	25 - 70	75 - 100	-	-
3	25 - 70	75 - 120	125 - 165	140, 160, 180, 200, 220, 240
4	75 - 120	125 - 240	140, 160, 180, 200, 220, 240	245 - 480
5	75 - 190	140 - 380	165 - 310	265 - 680
6	75 - 240	245 - 480	125 - 400	485 - 960
8	125 - 480	485 - 840	130 - 800	490 - 1680
10	480 - 720	725 - 1320	730 - 1200	1450 - 2640
12	560 - 1030	1035 - 1940	1100 - 1830	2140 - 3800

ACCESSORIES			
Order Code	Part No.	Description	
<input type="checkbox"/>	A	.... AV-025. AUTOMATIC AIR VENT 250°F, 150 PSIG, positive shut-off, ¼" MNPT	
<input type="checkbox"/>	B	.... BD-075. BLOWDOWN / VENT / DRAIN 325°F, 600 PSIG, ¾" hose bib & cap	
<input type="checkbox"/>	H	.... HT. HANGING TAG with Model No., Location, Flow Rate (Maximum 7 Characters)	
<input type="checkbox"/>	V	.... MV-025. MANUAL AIR VENT 325°F, 400 PSIG, ¼" MNPT, Side Discharge	
<input type="checkbox"/>	W	.... TW-075. THERMOMETER WELL Brass, 1½" well, 3½" O.A.L., ¾" MNPT	
<input type="checkbox"/>	X	.... MV-025L. MANUAL AIR VENT EXTENDED 325°F, 400 PSIG, ¼" MNPT, Side Discharge, 2¼" O.A.L.	
<input type="checkbox"/>	 PTE. PRES / TEMP TEST PLUG EXTENSION 1½" O.A.L.	

MATERIALS & DESIGN DATA	
ULTRAMATIC BODY	....EPOXY COATED DUCTILE IRON, ASTM A536, 400 PSIG, 350°F BRASS PLUGS ARE FURNISHED FOR UNUSED PORTS
FLOW CARTRIDGE	.....304 STAINLESS STEEL MOVING PARTS IN BRASS HOUSING, PAT # 8517051
CARTRIDGE SEAL	.....EPDM
STUDS & NUTS	.....ZINC PLATED STEEL
ACCURACY	.....±5%

PROJECT _____

CONTRACTOR _____

PO/JOB NO. _____

ENGINEER _____

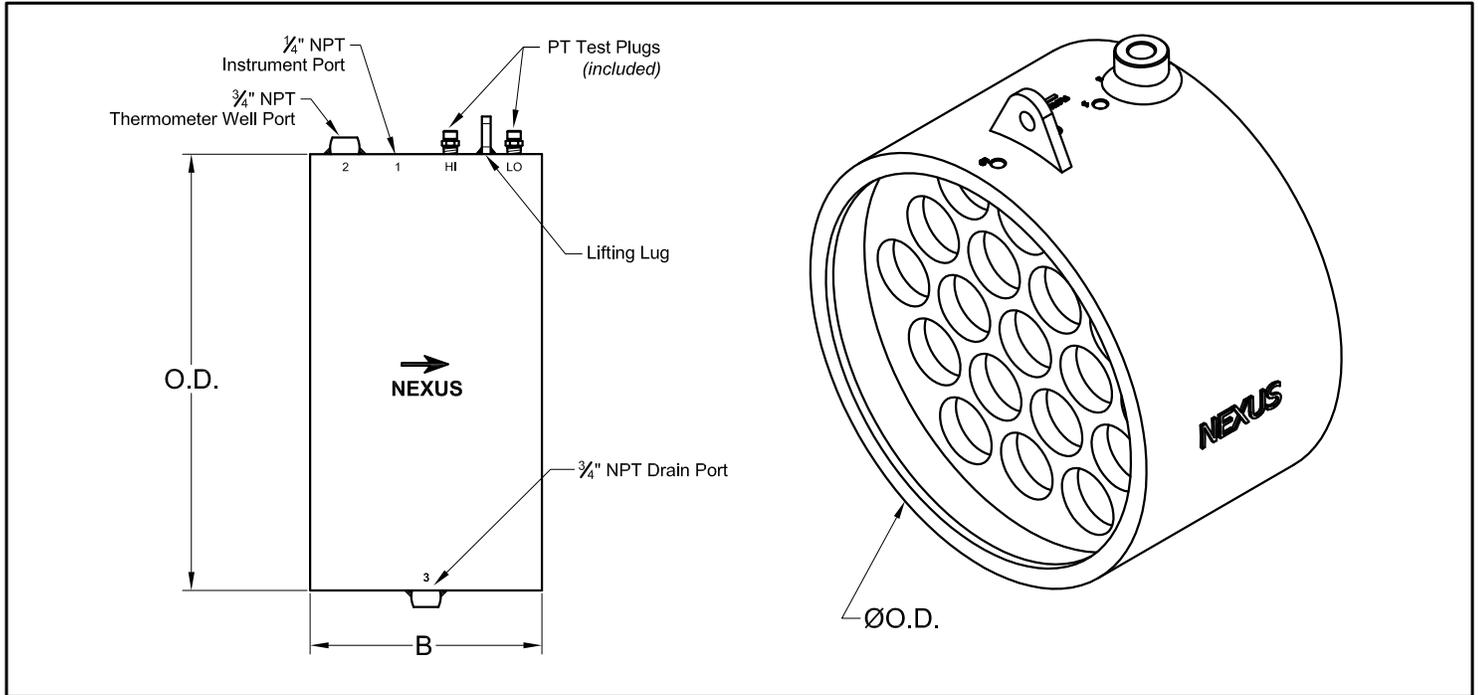
REPRESENTATIVE _____

DATE _____

For part numbers and ordering information please consult the "Ordering Guide" section in Nexus Catalog.

UltraMatic™ Model UMW

Automatic Flow Control Valve
Fabricated Wafer Style
(14" thru 48")



DIMENSIONS & FLOW RATES					
[Inches]		[GPM]			
SIZE [Inches]	B	O.D.	Max. GPM (± 5.0%)		WT. [Lbs] (Cartridges not included)
			"HI" Range (4 - 45)	"EX HI" PSID Range (5 - 45)	
14	10.0	17.5	2,200	4,560	92.0
16	10.0	20.0	3,240	6,480	118.8
18	10.0	21.4	3,720	7,440	130.7
20	10.0	23.6	4,440	8,880	152.7
24	10.0	28.0	6,600	13,200	240.0
30	12.0	34.5	10,200	20,400	339.0
36	12.0	41.0	14,520	29,040	TBD
42	12.0	47.8	19,920	39,840	TBD
48	12.0	54.3	25,920	51,840	TBD

MATERIALS & DESIGN DATA

ULTRAMATIC BODY:STEEL PIPE SA-53 GR. B
or ROLLED STEEL PLATE SA-516 GR. 70,
400 PSIG, 350°F

FLOW CARTRIDGE:304 STAINLESS STEEL MOVING PARTS
IN BRASS HOUSING, PAT # 8517051

CARTRIDGE SEAL:EPDM

ACCURACY:±5%

ORDER DATA

Sample Part #:

U	M	W	1	8	0	0	-	0	3	0	0	0	-						
---	---	---	---	---	---	---	---	---	---	---	---	---	---	--	--	--	--	--	--

Model _____
UltraMatic Size _____
Flow Rate (GPM) _____
Port Accessories _____
Option Order Codes (Accessories) _____

Please consult the Ordering Guide in the Nexus Valve catalog for complete part number and ordering information.

ACCESSORIES

Order Code	Part No.	Description
<input type="checkbox"/>	A	AV-025. AUTOMATIC AIR VENT 250°F, 150 PSIG, positive shut-off, 1/4" MNPT
<input type="checkbox"/>	B	BD-075. BLOWDOWN / VENT / DRAIN 325°F, 600 PSIG, 3/4" hose bib & cap
<input type="checkbox"/>	H	HT. HANGING TAG with Model No., Location, Flow Rate (Maximum 7 Characters)
<input type="checkbox"/>	V	MV-025. MANUAL AIR VENT 325°F, 400 PSIG, 1/4" MNPT, Side Discharge
<input type="checkbox"/>	W	TW-075. THERMOMETER WELL Brass, 1 1/2" well, 3 1/2" O.A.L., 3/4" MNPT
<input type="checkbox"/>	X	MV-025L. MANUAL AIR VENT EXTENDED 325°F, 400 PSIG, 1/4" MNPT, Side Discharge, 2 1/4" O.A.L. PTE. PRES / TEMP TEST PLUG EXTENSION 1 9/16" O.A.L.

PROJECT _____

CONTRACTOR _____

PO/JOB NO. _____

ENGINEER _____

REPRESENTATIVE _____

DATE _____

SUBSTITUTION REQUEST FORM



TO Garrett Hyatt, Pacific Northwest National Laboratory
 PROJECT RTL Exit Phase 1 - 318 Mods

1. We hereby submit for your consideration the following product instead of the specified item for the above project:

Section	Page	Line/Paragraph	Specified Item
232113	GO-107	L	Automatic Flow Control Valve (3/4" thru 1-1/2")

2. Proposed Substitution: Nexus

3. Reason for Substitution: To provide a more competitive project

4. Attach complete technical data, including laboratory tests, if applicable.

5. Include complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.

6. Does the substitute affect dimensions shown on Drawings? No

6a. If so, how? _____

7. Will the undersigned pay for changes to the building and systems design, including engineering and detailing costs caused by the requested substitution? YES

8. Describe the effect substitution has on other trades: None

9. Differences between proposed substitution and specified item: None

10. Manufacturer's guarantees of proposed and specified items are: Same Different (explain on attachment)

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

SUBMITTED BY:

Jerry Harrison
 Signature
 Mechanical Sales, Inc.

Firm
 2214 East Riverside Ave

Mailing Address
 Spokane, WA 99202

City State Zip 509 327 7395

Telephone April 27, 2015

Date

Please check if there are attachments.

FOR USE BY REVIEWER:

Accepted Accepted as Noted
 Not Accepted Received Too Late
 Approved for Bidding subject to review and approval of Submittals

By *Jeff Scott*
 Date 4-30-2015

Remarks _____

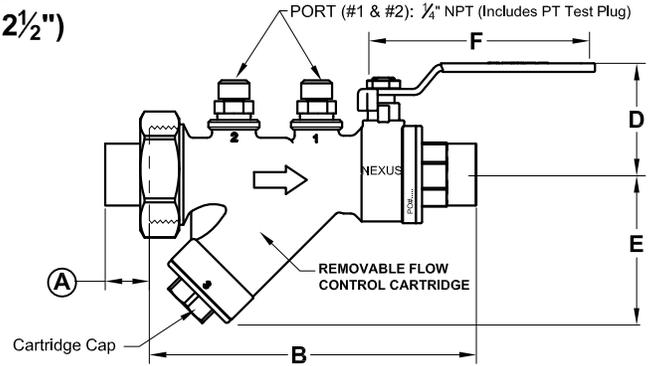
UltraMatic™ Model UM

Automatic Flow Control Valve

(1/2" thru 2 1/2")

Valve Body available in FNPT, Sweat, NexPress or NexLok

DIMENSIONS [inches]													
SIZE [inches]	XLO	LO	STD	A	B				D	E	F	Cv <small>(based on valve body only)</small>	WT [lbs] <small>(Tail Pieces & Nuts not included)</small>
					F (NPT)	S (sweat)	P (NexPress)	L (NexLok)					
1/2		✓			3.9	4.1	4.5	3.1	1.7	1.6	1.9	9	1.2
3/4			✓		5.0	4.9	5.5	5.3	1.8	2.4	3.1	14	1.5
1		✓			3.9	4.2	4.6	3.4	1.7	1.6	1.9	9	1.2
1 1/4			✓		4.9	5.2	5.6	5.5	1.8	2.4	3.1	14	2.3
1 1/2	✓				4.3	4.4	4.6	4.0	1.7	1.6	1.9	9	1.2
2			✓		5.1	5.3	5.6	6.0	1.8	2.4	3.1	14	2.3
2 1/2			✓		6.5	6.6	6.8	-	2.5	3.5	4.3	32	3.9
		✓			5.4	5.3	7.6	-	1.8	2.4	3.1	14	2.5
			✓		6.3	6.5	8.6	-	2.5	3.5	4.3	32	4.4
		✓			6.3	6.7	8.9	-	2.5	3.5	4.3	32	4.5
			✓		9.1	9.7	11.7	-	3.4	5.1	5.5	77	7.8
			✓		9.1	9.9	11.9	-	3.4	5.1	5.5	77	8.0
			✓		9.8	10.6	-	-	3.4	5.1	5.5	77	8.5



TAIL PIECE OPTION	Nexus P/N	Lengths [inches]	Use with Valve Body size		
 MNPT (Male NPT Thread)	TP075-050M	1.00	1/2 LO, 3/4 LO, 1 XLO		
	TP125-050M	1.04	1/2 STD, 3/4 STD, 1 LO, 1 1/4 LO		
	TP125-075M	1.16			
	TP125-100M	1.29			
	TP200-050M	1.04	1 STD, 1 1/4 STD, 1 1/2 LO		
	TP200-075M	1.16			
	TP200-100M	1.39			
TP200-125M	1.85				
 FNPT (Female NPT Thread)	TP200-150M	1.89	1 1/2 STD, 2, 2 1/2		
	TP250-100M	1.93			
	TP250-125M	1.93	1/2 STD, 3/4 STD, 1 LO, 1 1/4 LO		
	TP250-150M	1.97			
	TP250-200M	2.00			
	 SWT (Female Sweat)	TP125-050F	1.00	1 STD, 1 1/4 STD, 1 1/2 LO	
		TP125-075F	1.00		
TP125-100F		1.20			
 NexPress		TP200-100F	1.61	1 1/2 STD, 2, 2 1/2	
		TP200-125F	1.57		
		TP200-150F	1.16	1/2 LO, 3/4 LO, 1 XLO	
		TP250-125F	1.77		
	TP250-150F	1.97			
	 NexLok	TP250-200F	1.36	1 STD, 1 1/4 STD, 1 1/2 LO	
		TP250-250F	1.74		
 NexPress		TP075-050S	0.59	1/2 STD, 3/4 STD, 1 LO, 1 1/4 LO	
		TP125-050S	0.60		
		TP125-075S	0.85		
		 NexPress	TP125-100S	1.00	1 STD, 1 1/4 STD, 1 1/2 LO
			TP200-075S	1.85	
	TP200-100S		1.85	1 1/2 STD, 2, 2 1/2	
	TP200-125S		1.85		
TP200-150S	1.38				
 NexPress	TP250-125S		1.69	1/2 STD, 3/4 STD, 1 LO, 1 1/4 LO	
	TP250-150S		1.97		
	TP250-200S	1.65	1 STD, 1 1/4 STD, 1 1/2 LO		
	TP125-050P	1.46			
	TP125-075P	1.54			
	 NexPress	TPA125-100P	3.85	1 1/2 STD, 2, 2 1/2	
		TPA125-125P	4.23		
TP200-100P		1.58	1/2 STD, 3/4 STD, 1 LO, 1 1/4 LO		
TPA200-125P		3.70			
TPA200-150P		3.63			
 NexLok		TPA250-150P	4.44	1 STD	
		TPA250-200P	4.07		
	TP125-050L	1.03			
TP125-075L	1.29				
TP200-100L	1.66				

FLOW RATE SELECTIONS		
SIZE [inches]	PSID (range)	GPM (± 5.0%)
1/2 LO, 3/4 LO, 1 XLO	2 - 45	0.33, 0.5, 0.75, 1.0, 1.25, 1.5, 1.75, 2.0, 2.25, 2.5, 2.75, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0
	4 - 55	7.0, 8.0
1/2 STD, 3/4 STD, 1 LO, 1 1/4 LO	2 - 45	0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0
	2 - 65	7.0, 8.0, 9.0, 10.5
1 STD, 1 1/4 STD, 1 1/2 LO	2 - 45	8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0
	2 - 60	16.0, 17.0, 18.0, 19.0, 20.0, 21.0, 22.0
	4 - 70	24.0, 25.0, 30.0, 35.0
1 1/2 STD, 2, 2 1/2	2 - 45	25.0, 30.0, 35.0, 40.0, 45.0, 50.0, 55.0, 60.0, 65.0, 70.0, 75.0
	5 - 50	80.0, 85.0, 90.0, 95.0, 100.0

ACCESSORIES		
Order Code	Part No.	Description
<input type="checkbox"/> C	.... CV-1, CV-2.	CHECK VALVE CV-1 for 1/2" LO, 3/4" LO, 1" XLO; CV-2 for 1/2" STD, 3/4" STD, 1" LO, 1 1/4" LO; Center Guided, Non-Slam Check
<input type="checkbox"/> E	.... ES-1, ES-2, ES-3.	EXTENDED HANDLE Stationary housing for full-height vapor barrier
<input type="checkbox"/> H	.... HT.	HANGING TAG with Model No., Location, Flow Rate (Maximum 7 Characters)
<input type="checkbox"/> L	.... SL.	SHORT LEVER HANDLE
<input type="checkbox"/> X	.... PTE.	PRES / TEMP TEST PLUG EXTENSION 1 1/8" O.A.L.

MATERIALS & DESIGN DATA	
BODY, END PCS	.....HOT FORGED BRASS ASTM B283 (CAST BRASS: 1 1/2" STD, 2", 2 1/2"), 600 WOG, 325°F, (NexPress: 200 PSIG, 250°F / NexLok: 250 PSIG, 200°F), INTERCHANGEABLE UNION ENDS
HANDLE & NUT	.....ZINC PLATED / PVC COATED
BALL	.....HARD CHROME PLATED BRASS / STAINLESS STEEL (optional)
BALL SEALS	.....TEFLON
SHAFT	.....BRASS / STAINLESS STEEL (optional), BLOWOUT-PROOF
SHAFT SEALS	.....DUAL FKM O-RINGS
UNION SEAL	.....FKM O-RING
CAP SEAL	.....FKM O-RING
FLOW CARTRIDGE	.....STAINLESS STEEL MOVING PARTS IN BRASS HOUSING, REMOVABLE, PAT # 8517051
CARTRIDGE SEAL	.....EPDM
ACCURACY	.....5%

ORDER DATA									
Sample Part #: UM - 075 - S - 075M - 04,0 - N									
Model	Valve Trim	UltraUM Size	Fixed End	Union End	Flow Rate (GPM)	Accessory Cap Option	N = NO	Optional 3rd Port	Option Order Codes (Accessories)
U	M	075	S	075M	04,0	N			

PROJECT _____

CONTRACTOR _____

PO/JOB NO. _____

ENGINEER _____

REPRESENTATIVE _____

DATE _____

Please consult the "Ordering Guide" section in Nexus Valve Catalog for complete part number and ordering information.

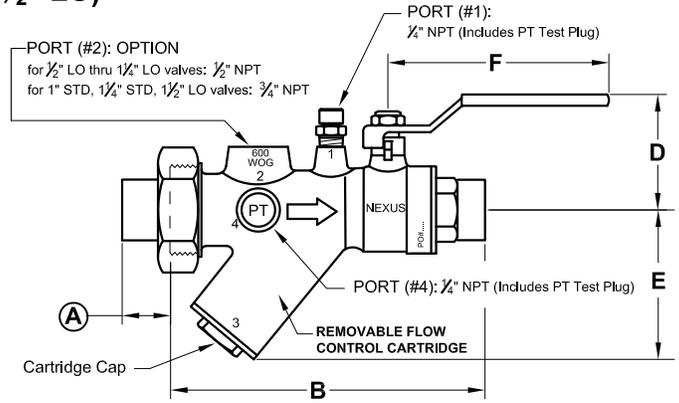
UltraMatic™ Model UM

Automatic Flow Control Valve w/ Accessory Port

(½" thru 1½" LO)

Valve Body available in FNPT, Sweat, NexPress or NexLok

DIMENSIONS [inches]													
SIZE [inches]	XLO	LO	STD	A	B				D	E	F	Cv (based on valve body only)	WT [lbs] (Tail Pieces & Nuts not included)
					F (NPT)	S (sweat)	P (NexPress)	L (NexLok)					
½		✓			3.9	4.1	4.5	3.1	1.7	1.6	1.9	9	1.2
¾			✓		5.0	4.9	5.5	5.3	1.8	2.4	3.1	14	1.5
1		✓			3.9	4.2	4.6	3.4	1.7	1.6	1.9	9	1.2
1¼			✓		4.9	5.2	5.6	5.5	1.8	2.4	3.1	14	2.3
1½	✓				4.3	4.4	4.6	4.0	1.7	1.6	1.9	9	1.2
1		✓			5.1	5.3	5.6	6.0	1.8	2.4	3.1	14	2.3
1¼			✓		6.8	6.9	7.1	-	2.5	3.5	4.3	32	3.9
1½		✓			5.4	5.3	7.6	-	1.8	2.4	3.1	14	2.5
1	✓				6.6	6.8	8.9	-	2.5	3.5	4.3	32	4.4
1½		✓			6.6	7.0	9.2	-	2.5	3.5	4.3	32	4.5



TAIL PIECE OPTION	Nexus P/N	Lengths [inches]	Use with Valve Body size	
 MNPT (Male NPT Thread)	TP075-050M	1.00	½ LO, ¾ LO, 1 XLO	
	TP125-050M	1.04	½ STD, ¾ STD, 1 LO, 1¼ LO	
	TP125-075M	1.16		
	TP125-100M	1.29		
	TP200-050M	1.04	1 STD, 1¼ STD, 1½ LO	
	TP200-075M	1.16		
TP200-100M	1.39			
TP200-125M	1.85			
TP200-150M	1.89			
 FNPT (Female NPT Thread)	TP125-050F	1.00	½ STD, ¾ STD, 1 LO, 1¼ LO	
	TP125-075F	1.00	1 STD, 1¼ STD, 1½ LO	
	TP125-100F	1.20		
	TP200-100F	1.61		
 TP200-125F TP200-150F	TP200-125F	1.57	1 STD, 1¼ STD, 1½ LO	
	TP200-150F	1.16		
	 SWT (Female Sweat)	TP075-050S	0.59	½ LO, ¾ LO, 1 XLO
		TP125-050S	0.60	½ STD, ¾ STD, 1 LO, 1¼ LO
		TP125-075S	0.85	
TP125-100S		1.00		
 TP200-075S TP200-100S TP200-125S TP200-150S		TP200-075S	1.85	1 STD, 1¼ STD, 1½ LO
		TP200-100S	1.85	
	TP200-125S	1.85		
	TP200-150S	1.38		
	 NexPress	TP125-050P	1.46		½ STD, ¾ STD, 1 LO, 1¼ LO
TP125-075P		1.54		
TPA125-100P		3.85		
TPA125-125P		4.23		
 TP200-100P TPA200-125P TPA200-150P		TP200-100P	1.58	1 STD, 1¼ STD, 1½ LO
	TPA200-125P	3.70		
	TPA200-150P	3.63		
	 NexLok	TP125-050L	1.03		½ STD, ¾ STD, 1 LO, 1¼ LO
TP125-075L		1.29	1 STD	
TP200-100L		1.66		

MATERIALS & DESIGN DATA

BODY, END PCSHOT FORGED BRASS ASTM B283, 600 WOG, 325°F, (NexPress: 200 PSIG, 250°F / NexLok: 250 PSIG, 200°F), INTERCHANGEABLE UNION ENDS

HANDLE & NUTZINC PLATED / PVC COATED

BALLHARD CHROME PLATED BRASS / STAINLESS STEEL (optional)

BALL SEALSTEFLON

SHAFTBRASS / STAINLESS STEEL (optional), BLOWOUT-PROOF

SHAFT SEALSDUAL FKM O-RINGS

UNION SEALFKM O-RING

CAP SEALFKM O-RING

FLOW CARTRIDGESTAINLESS STEEL MOVING PARTS IN BRASS HOUSING, REMOVABLE, PAT # 8517051

CARTRIDGE SEALEPDM

ACCURACY5%

ACCESSORIES

	Order Code	Part No.	Description
	<input type="checkbox"/>	A	AV-025. AUTOMATIC AIR VENT 250°F, 150 PSIG, positive shut-off, ¼" MNPT (Not available for: ½"LO, ¾"LO, 1"XLO)
	<input type="checkbox"/>	C	CV-1, CV-2. CHECK VALVE CV-1 for ½"LO, ¾"LO, 1" XLO; CV-2 for ½" STD, ¾"STD, 1"LO, 1¼"LO; Center Guided, Non-Slam Check
	<input type="checkbox"/>	E	ES-1, ES-2, ES-3. EXTENDED HANDLE Stationary housing for full-height vapor barrier
	<input type="checkbox"/>	H	HT. HANGING TAG with Model No., Location, Flow Rate (Maximum 7 Characters)
	<input type="checkbox"/>	L	SL. SHORT LEVER HANDLE
	<input type="checkbox"/>	V	MV-025. MANUAL AIR VENT 325°F, 400 PSIG, ¼" MNPT, Side Discharge
	<input type="checkbox"/>	X	MV-025L. MANUAL AIR VENT EXTENDED 325°F, 400 PSIG, ¼" MNPT, Side Discharge, 2¼" O.A.L.
	<input type="checkbox"/>		PTE. PRES / TEMP TEST PLUG EXTENSION 1½" O.A.L.

FLOW RATE SELECTIONS

SIZE [inches]	PSID (range)	GPM (± 5.0%)
½ LO, ¾ LO, 1 XLO	2 - 45	0.33, 0.5, 0.75, 1.0, 1.25, 1.5, 1.75, 2.0, 2.25, 2.5, 2.75, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0
	4 - 55	7.0, 8.0
½ STD, ¾ STD, 1 LO, 1¼ LO	2 - 45	0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0
	2 - 65	7.0, 8.0, 9.0, 10.5
1 STD, 1¼ STD, 1½ LO	2 - 45	11.0, 12.0, 13.0, 14.0, 15.0
	2 - 60	8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, 20.0, 21.0, 22.0
	4 - 70	24.0, 25.0, 30.0, 35.0, 40.0, 45.0

ORDER DATA

Sample Part #: **UM - 075 - S - 075M - 04,0 - V**

Model	Valve Trim	UltraUM Size	Fixed End	Union End	Flow Rate (GPM)	Accessory Cap Option	Optional 3rd Port Accessory	Option Order Codes (Accessories)
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PROJECT _____

CONTRACTOR _____

PO/JOB NO. _____

ENGINEER _____

REPRESENTATIVE _____

DATE _____

Please consult the "Ordering Guide" section in Nexus Valve Catalog for complete part number and ordering information.

SUBSTITUTION REQUEST FORM



TO Garrett Hyatt, Pacific Northwest National Laboratory
 PROJECT RTL Exit Phase 1 - 318 Mods

1. We hereby submit for your consideration the following product instead of the specified item for the above project:

Section	Page	Line/Paragraph	Specified Item
	M6-101		Coil Housing

2. Proposed Substitution: Mafna

3. Reason for Substitution: To provide a more competitive project

4. Attach complete technical data, including laboratory tests, if applicable.

5. Include complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.

6. Does the substitute affect dimensions shown on Drawings? No

6a. If so, how? _____

7. Will the undersigned pay for changes to the building and systems design, including engineering and detailing costs caused by the requested substitution? YES

8. Describe the effect substitution has on other trades: None

9. Differences between proposed substitution and specified item: None

10. Manufacturer's guarantees of proposed and specified items are: Same Different (explain on attachment)

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

SUBMITTED BY:

Jerry Hansen
 Signature
 Mechanical Sales, Inc.

Firm
 2214 East Riverside Ave

Mailing Address
 Spokane, WA 99202

City State Zip 509 327 7395

Telephone April 27, 2015

Date

Please check if there are attachments.

FOR USE BY REVIEWER:

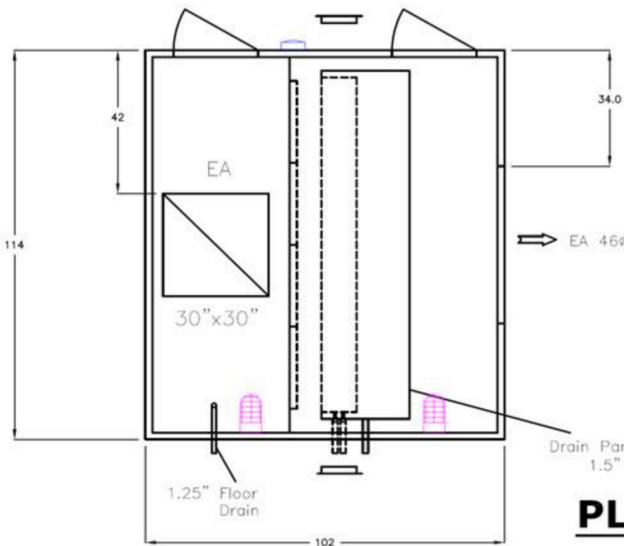
Accepted Accepted as Noted
 Not Accepted Received Too Late
 Approved for Bidding subject to review and approval of Submittals.

By Jeff Scott
 Date 4-30-2015

Remarks _____

**OUTDOOR HEAT RECOVERY UNITS
 FOR UNIVERSITY LAB APPLICATION**

PROJECT	CLIENT	REPRESENTATIVE	DATE SHIPPED
Steacie Building- Carleton University Qty (6) x 20,000cfm	Carleton University Ottawa, ON	Total HVAC Ottawa, ON	July 31 2014

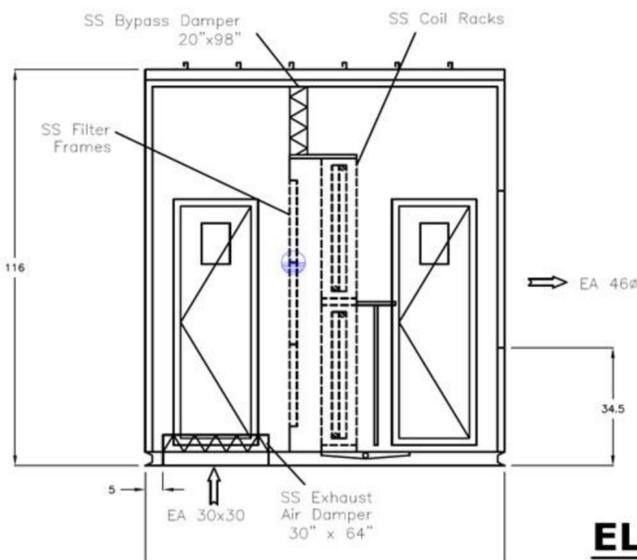


Roof Slope
 1/4" per foot

FUTURE COMPONENT SIZING			
Component	Dimension	Quantity	Support (by MAFNA)
Heat Recovery Coils (Future)	39"(FH)x95"(FL)	2	16 Ga SS Racks
Filters (Future)	24"x24"	12	20 Ga SS Filter Frames with 16Ga Supports

MAFNA AIR TECHNOLOGIES INC. <small>475 SHELDON DRIVE, CAMBRIDGE, ON, CANADA, N1T 2B7 (T): 519-624-4622 (F): 519-662-9854</small>		
Unit	HRU101,103,105	20,000 CFM, Qty 3
Project	Carleton University – Steacie Building Roof Exhaust	
Date	June 13th, 2014	

This document contains confidential information proprietary to Mafna Air Technologies Inc. No portion may be produced or disclosed to others, used in any way, except as authorized in writing by Mafna Air Technologies Inc.



- DRAWING NOTES:**
- 1) Quantity 6 identical outdoor units with sloped roofs
 - 2) Coils and Filters to be added in future by others.
 - 3) MAFNA will supply 16Ga stainless steel coil racks and filter frame supports
 - 4) Unit to be constructed per MAFNA standard construction
 - 5) Door interior and exterior to match unit construction
 - 6) Each unit to ship in single section
 - 7) Units will be constructed to hold overall unit outer length, width and height dimension within a tolerance of 1/2" (approx 12.5mm). All other dimensions are for information purpose only and may change based on construction requirement.

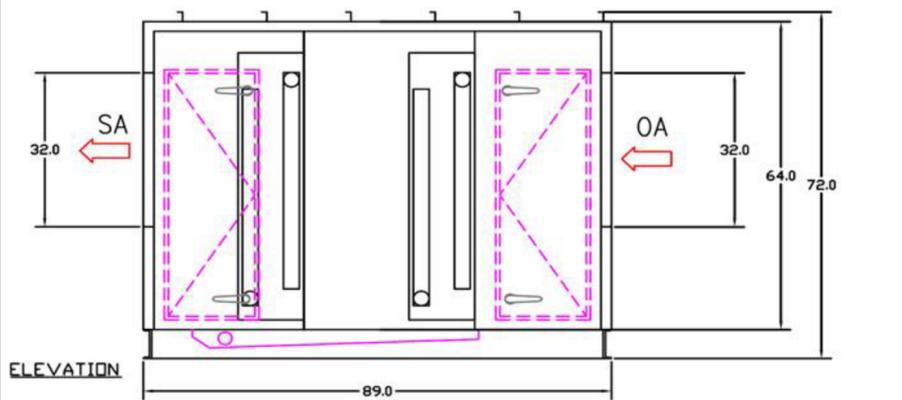
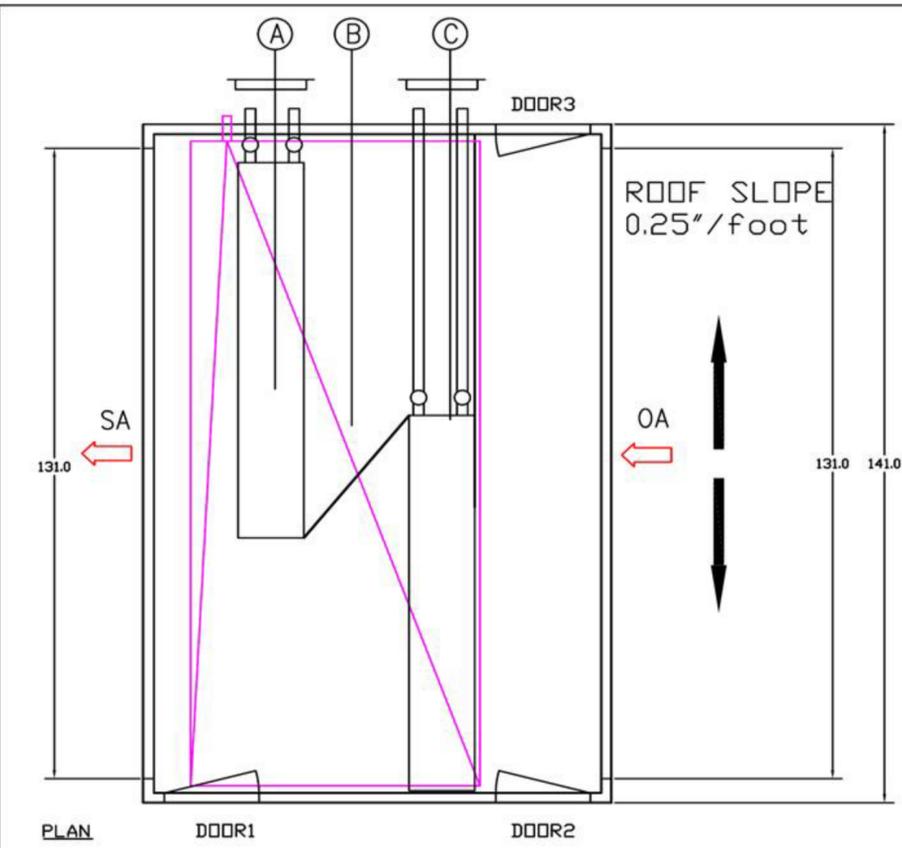
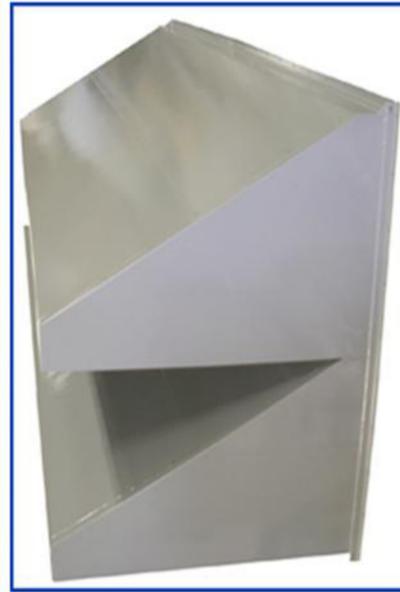
CUSTOM MATCHING COIL ENCLOSURE FOR EXISTING UNIT

PROJECT
 Lubrizol Cooling
 Coil Enclosure
 25,825 CFM

CLIENT
 The Lubrizol
 Corporation
 Garfield Heights, OH

REPRESENTATIVE
 Jacco and Associates
 Hudson, OH

DATE SHIPPED
 July 7
 2010



OUTER CASING	18 Ga SATIN COATED SOLID PAINTED	BASE	C6 - STRUCTURAL CHANNEL
INNER CASING	22Ga 304 STAINLESS STEEL	UNDERSIDE FLOOR	20Ga G90 SOLID, 4" FIBERGLASS INSULATION
PANEL	2" THICK, 3.5 lbs/cft MINIRAL WOOL INSULATION	UNIT FLOOR	1/8" 304, SS- CHECKERED PLATE

SUBMITTAL DRAWING
 ESTIMATED WEIGHT 4,200 LBS

OUTDOOR UNIT

(A)	CHILLED WATER COOLING COIL, 8 ROW
(B)	DRAIN PAN
(C)	CHILLED WATER COOLING COIL, 8 ROW

NOTES:

- 1) Coil Rack to be 16 Ga 304 S/S
- 2) Door sized as 18" width
- 3) Lights are not included

OPENING LIST	
1.	OA OPENING, 131W"x32H"
2.	SA OPENING, 131W"x32H"
3.	CHW COIL REMOVABLE OPENING: 13.5"x56.5" #2
6.	DOOR1 OPENING: 18"x52" +Ve LH
7.	DOOR2 OPENING: 18"x52" +Ve RH
8.	DOOR3 OPENING: 18"x52" +Ve LH
10.	DRAINPAN OPENING: 55"x133"

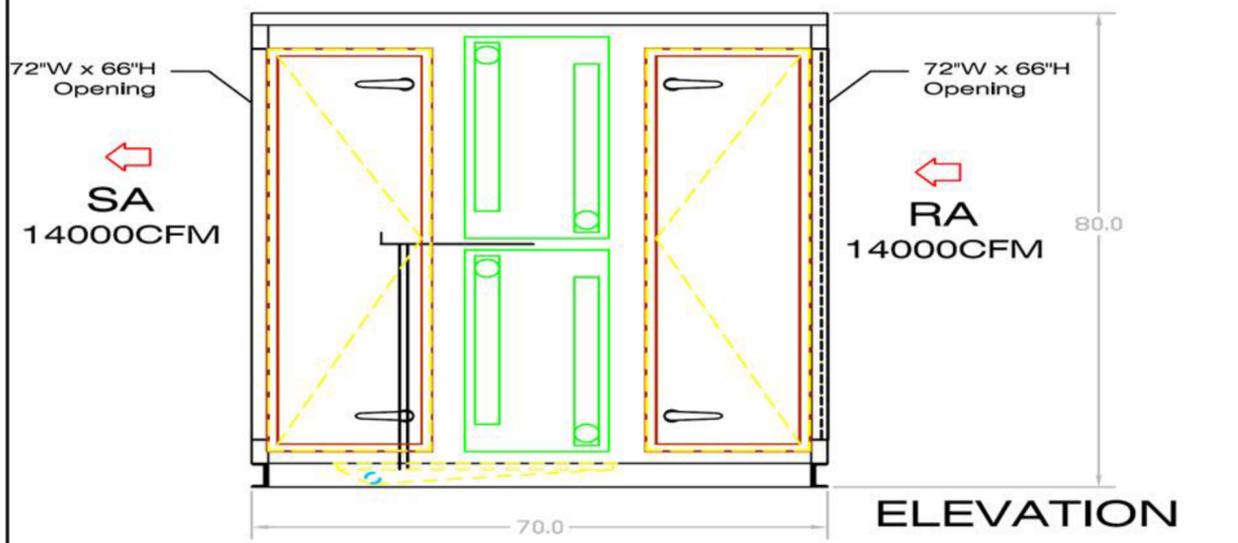
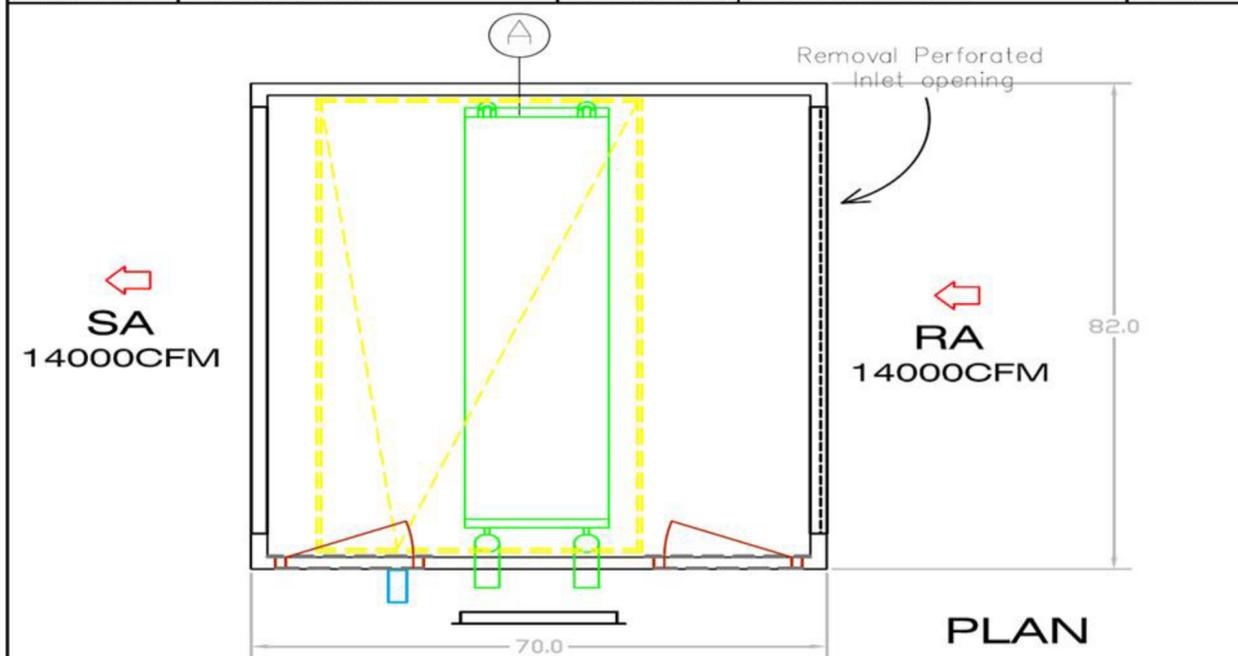
PROJECT	Lubrizol Cooling Coil Enclosure	CAPACITY	25,825 CFM	CC ENCLOSURE	DWG #	10-2062-LCCE
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COIL PLENUM BOXES FOR LAB APPLICATION

PROJECT	CLIENT	REPRESENTATIVE	DATE SHIPPED
Johnson & Johnson, Bldg. 313 CC- 4: 10,000 cfm CC- 5: 14,000 cfm	Ortho Clinical Diagnostic Lab - Johnson & Johnson Rochester, NY	R.L. Kistler, Inc. Rochester, NY	September 30 2008



OUTER CASING	18G SOLID SATIN COAT - PAINTED	BASE	C4 X 5.4 CHANNEL - EPOXY PAINTED	PANEL	2" THICK, 3.5 lbs/ft ³ MINERALWOOL INSULATION
INNER CASING	20G G90 GALVANIZED	UNDERSIDE FLOOR	20G SOLID GALVANIZED	FLOOR	1/8" ALUMINUM CHECKER PLATE - 3/4lbs/ft ³ INSULATION



SUBMITTAL DRAWING

14,000CFM @ 11.0" TSP
 Est. Weight of the unit 2300Lbs

- NOTES:
- UNIT SHIPPED IN ONE SECTION
 - PIPING AND HYDRONICS TO BE DONE ON FIELD BY OTHERS

NOT INCLUDED: ELECTRICAL WORK, DAMPERS AND LIGHTS

INDOOR UNIT

PROJECT	J & J B-13 Postcooling	Capacity	14,000 CFM @ 11.0" TSP	CC- 5	DWG#	2029-JJ-2
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SUBSTITUTION REQUEST FORM



TO Garrett Hyatt, Pacific Northwest National Laboratory
 PROJECT RTL Exit Phase 1 - 318 Mods

1. We hereby submit for your consideration the following product instead of the specified item for the above project:

Section	Page	Line/Paragraph	Specified Item
232113	GO-107	N	Flexible Connections

2. Proposed Substitution: Keflex

3. Reason for Substitution: To provide a more competitive project

4. Attach complete technical data, including laboratory tests, if applicable.

5. Include complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.

6. Does the substitute affect dimensions shown on Drawings? No

6a. If so, how? _____

7. Will the undersigned pay for changes to the building and systems design, including engineering and detailing costs caused by the requested substitution? YES

8. Describe the effect substitution has on other trades: None

9. Differences between proposed substitution and specified item: None

10. Manufacturer's guarantees of proposed and specified items are: Same Different (explain on attachment)

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

SUBMITTED BY:
[Signature]
 Signature
 Mechanical Sales, Inc.

Firm
 2214 East Riverside Ave

Mailing Address
 Spokane, WA 99202

City State Zip 509 327 7395

Telephone April 27, 2015

Date

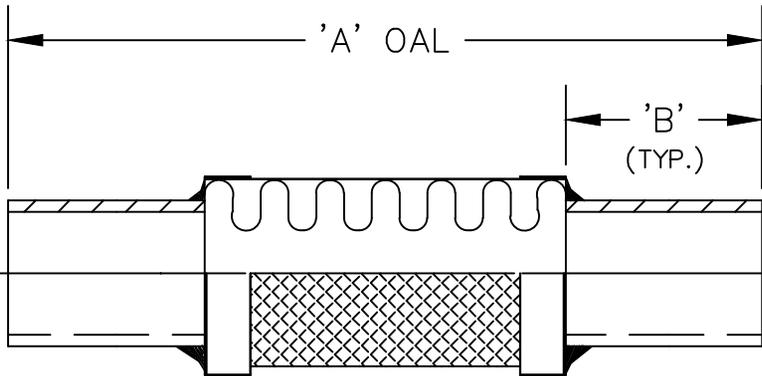
Please check if there are attachments.

FOR USE BY REVIEWER:

Accepted Accepted as Noted
 Not Accepted Received Too Late
 Approved for Bidding subject to review and approval of Submittals.

By [Signature]
 Date 4-30-2015

Remarks _____



BILL OF MATERIAL:

HOSE:	PHOS BRONZE
BRAID:	PHOS BRONZE
FITTINGS:	COPPER

COPPER FEMALE SWEAT ENDS

TAG #	LOCATION	HOSE DIA [IN]	KEFLEX PART #	PRES @ 70°F	LAT. DEFL.	'B' REF	'A' OAL
		1/4"	F002KFCBFSE	810	1/8"	11/16"	6"
		3/8"	F003KFCBFSE	625	1/8"	13/16"	6"
		1/2"	F004KFCBFSE	520	1/8"	1 1/16"	6 1/2"
		3/4"	F006KFCBFSE	420	1/8"	1 9/16"	7"
		1"	F010KFCBFSE	315	1/8"	1 7/8"	8"
		1 1/4"	F012KFCBFSE	290	1/8"	2"	8 1/2"
		1 1/2"	F014KFCBFSE	250	1/8"	2 1/4"	9"
		2"	F020KFCBFSE	225	1/8"	2 3/4"	10 1/2"
		2 1/2"	F024KFCBFSE	135	1/8"	3 1/8"	12"
		3"	F030KFCBFSE	125	1/8"	3 1/2"	12"
		4"	F040KFCBFSE	125	1/8"	4 1/2"	14 1/2"

FOR TEMP. ABOVE 70°F

TEMP. F	FACTOR
70	1.00
200	0.89
300	0.82
400	0.75

NOTE: FOR SAFE WORKING PRESSURE MULTIPLY PRESSURE RATING AT 70°F BY THE APPLICABLE CORRECTION FACTOR.

CUSTOMER: _____
 PROJECT : _____
 ENGINEER: _____
 ARCHITECT: _____

DRAWN DG		KEFLEX PRODUCTS 1425 LAKE AVENUE WOODSTOCK, ILLINOIS 60098			
DATE 8 APRIL 02					
CHECKED		TITLE BRONZE BRAIDED FLEXIBLE CONNECTOR FEMALE SWEAT ENDS			
APPROVED DG					
FILE	SUBBFSE1.DWG	SIZE	FSCM NO.	DWG NO.	REV
JOB	SUBMITTAL	A	87738	SUBMITTAL DRAWING	A
SCALE NONE		SHEET 1 OF 1			