SECTION 15732 - PACKAGED ROOFTOP AIR-CONDITIONING UNITS
PART 1 - GENERAL
1.1 SECTION REQUIREMENTS
A. Submittals: Product Data and Shop Drawings.
B. Comply with ASHRAE 15.
C. EER: Equal to or greater than prescribed by the energy code adopted by the Authority Having Jurisdiction.
D. Warranties: Submit a written warranty, signed by the manufacturer, agreeing to the repair or replacement of components that fail within 5 years of Substantial Completion.
PART 2 - PRODUCTS
2.1 PACKAGED UNITS, 5 TO 20 TONS
A. Factory assembled and tested, consisting of compressors, condensers, evaporator coils, condenser and evaporator fans, refrigeration and temperature controls, filters, and dampers.
1. Refer to Rooftop Heating/Cooling Unit Schedule on drawing M600 for capacities, and manufacturers.
2. Evaporator Fans: Belt or direct driven, forward curved centrifugal.
3. Exhaust/Relief Fans: Direct drive, forward curved centrifugal or propeller.
4. Condenser Fans: Direct drive propeller.
5. Refrigerant Coils: Aluminum fins and copper coil.
6. Compressors: Serviceable hermetic or fully hermetic, with safety controls, hot gas bypass, and timed off controls.
7. Heat Exchangers: Gas fired, with gas controls, electronic ignition, high limit cutout, and forced draft proving switch.
8. Economizer controls (Comparative Enthalpy, 100% capacity).
9. Smoke Detectors: Photoelectric in supply and/or return as called for in schedule on sheet M600.
10. Operating Controls: Two stage heating and two stage cooling on units 7-1/2 tons and over.
11. Roof curb.
12. Control Wiring from T-stat to rooftop unit: Shall be 18ga / 7 conductor, rated for plenum applications.
13. Control Wiring from T-stat to remote sensor: Shall be a separate 18ga / 2 conductor shielded, rated for plenum applications.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Install units level and plumb and firmly anchored.
B. Connect gas piping to burner with pipe same size as gas train inlet, and provide union with sufficient clearance for burner removal and service.
C. Install ducts to termination in roof mounting frames. Terminate ducts through roof structure.
D. Connect units to wiring systems and to ground.
END OF SECTION 15732

SECTION 15810 - DUCTS AND ACCESSORIES
PART 1 - GENERAL
1.1 SECTION REQUIREMENTS
A. Submittals: Product Data for fire and smoke dampers.
B. Comply with NFPA 90A for systems serving spaces more than 25,000 cu. ft. in volume or building Types II, IV, and V construction more than 3 stories in height.
C. Comply with NFPA 90B for systems serving spaces in 1 or 2 family dwellings or serving spaces less than 25,000 cu. ft..
D. Comply with NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Operations," for kitchen hood ducts.
E. Comply with UL 181 and UL 181A for ducts and closures.
F. Testing, Adjusting, and Balancing Agency Qualifications: AABC certified (to be furnished by Tenant).
PART 2 - PRODUCTS
2.1 DUCTS
A. Spiral Duct: Spiral Lock Seam, without insulation, G90 galvanized finish, ASTM A-653/924
1. Basis of Design Manufacturers: Lindab SPIROsafe, alternates to the basis of design must be submitted for review.
2. Fittings: Factory produced standing seam construction with internal sealing. Fittings with a major axis of 36" or smaller shall be 20 gauge. Fittings with a major axis of 37"-48" shall be 18 gauge.
B. Galvanized Steel Sheet: Forming steel, ASTM A 653/653M, G90 coating designation.
C. Duct Liner: ASTM C 1071, Type II, with an airstream surface coated with a temperature resistant coating. Thickness: 1-1/2 inch. R-value : 8.
1. Adhesive: ASTM C 916, Type I.
2. Mechanical Fasteners: Galvanized steel pin, length as required to penetrate liner plus a 1/8 inch projection maximum into the airstream.
D. Joint and Seam Tape: Comply with UL 181A.
E. Joint and Seam Sealant: Comply with UL 181A.
F. Rectangular Metal Duct Fabrication: Comply with SMACNA's "HVAC Duct Construction Standard" for metal thickness, reinforcing types and intervals, tie rod applications, and joint types and intervals.
2.2 ACCESSORIES
A. Volume-Control Dampers: Factory fabricated volume control dampers, complete with required hardware and accessories. Single blade and multiple opposed blade, standard leakage rating, and suitable for horizontal or vertical applications.
B. Fire Dampers: Factory-fabricated fire dampers, complete with required hardware and accessories. UL labeled according to UL 555, "Fire Dampers".
C. Flexible Connectors: Flame retardant or noncombustible fabrics, coatings, and adhesives complying with UL 181, Class 1.
D. Flexible Ducts: Factory fabricated, insulated, round duct, with an outer jacket enclosing 2 inch thick, glass fiber insulation, R-value: 6.0, around a continuous inner liner.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Duct System Pressure Class: Construct and install each duct system with 2 inch positive and negative duct pressure classifications.
B. Conceal ducts from view in finished and occupied spaces. Except where noted as exposed.
C. Avoid passing through electrical equipment spaces and enclosures.
D. Support and connect metal ducts according to SMACNA's "HVAC Duct Construction Standard".
E. Install duct accessories according to applicable portions of details of construction as shown in SMACNA standards.
F. Install liner and/or insulation on ductwork per the material schedule on sheet M010.
G. Install volume control dampers in lined duct with methods to avoid damage to liner and to avoid erosion of duct liner.
H. Install fire and smoke dampers according to manufacturer's UL approved written instructions.
I. Install fusible links in fire dampers.
J. Provide saddle taps at tees for exposed ductwork.
3.2 TESTING, ADJUSTING, AND BALANCING
A. The Tenant will supply an independent balance agent to to balance and adjust the HVAC installation. The balance agent will be responsible for any pulley or belt changes required.
B. The GC is to have trained staffed available during the balancing to correct issues noted by the balance agent.
C. The balance agent is to balance airflow within distribution systems, including submains, branches, and terminals to indicated quantities +/- 10%. The hood exhaust system shall be balanced to a tolerance of -0+10% and the make-up air system to a tolerance of -10+0%.
D. The balance agent is to supply a copy of the balance report to the Tenant, engineer and general contractor for review.
END OF SECTION 15810

SECTION 15855 - DIFFUSERS, REGISTERS, AND GRILLES
PART 1 - GENERAL
1.1 SECTION REQUIREMENTS
A. Submittals: None.
PART 2 - PRODUCTS
2.1 OUTLETS AND INLETS
A. All air terminal devices:
1. Refer to Grills, Registers, and Diffusers Schedule for equipment schedule
2. Manufacturer: As scheduled (NO SUBSTITUTIONS)
3. Material: As scheduled.
4. Finish: As scheduled.
5. Mounting: As scheduled.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Coordinate location and installation with duct installation and installation of other ceiling and wall mounted items.
B. Locate ceiling diffusers, registers, and grilles, as indicated on the architectural "reflected ceiling plans." Unless otherwise indicated, locate units in center of acoustical ceiling panels.
END OF SECTION 15855

HVAC MATERIAL SCHEDULE

CATEGORY	APPLICATION	ALLOWABLE MATERIAL
DUCT	EXPOSED SUPPLY	RECT. LINED OR ROUND AS SHOWN, NO EXPOSED DUCT-SEALING MASTIC
	EXPOSED RETURN	RECTANGULAR, NO EXPOSED DUCT-SEALING MASTIC
	EXPOSED GEN. EXHAUST	RECTANGULAR OR ROUND AS SHOWN, NO EXPOSED DUCT-SEALING MASTIC
	CONCEALED, SUPPLY	RECT. OR ROUND AS SHOWN, LINED OR INSULATED
	CONCEALED, RETURN	RECT. OR ROUND AS SHOWN, LINED OR INSULATED
	CONCEALED, GEN. EXHAUST	RECT. OR ROUND AS SHOWN
	CONCEALED, TYPE I HOOD EXHAUST	RECTANGULAR 16 GA. BLACK IRON W/ WRAP OR UL 1978 FACTORY-MANUFACTURED DUCT W/ WRAP (SUBMIT SHOP DRAWINGS FOR FACTORY-MANUFACTURED DUCT PRIOR TO ORDERING FOR APPROVAL)

HVAC GENERAL NOTES

A GENERAL NOTES APPLY TO HVAC SHEETS.
B WORK SHALL COMPLY WITH STATE AND LOCAL CODE REQUIREMENTS AS APPROVED AND AMENDED BY THE AUTHORITY HAVING JURISDICTION, INCLUDING APPLICABLE SECTIONS OF NFPA, THE MECHANICAL CODE, AND ANY INTERIM AMENDMENTS AT THE TIME OF THE PROPOSAL. PURCHASE PERMITS ASSOCIATED WITH THE WORK. OBTAIN INSPECTIONS REQUIRED BY CODE. SEE ARCHITECTURAL SHEETS FOR THE PREVAILING CODES.
C CONTRACTOR AND SUBCONTRACTORS SHALL REVIEW A COMPLETE SET OF THE CONSTRUCTION DOCUMENTS.
D COORDINATE WORK WITH THE WORK OF OTHER TRADES, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND OF THE EXISTING CONDITIONS AT THE PROJECT SITE.
E DRAWINGS FOR THE MECHANICAL WORK ARE DIAGRAMMATIC, SHOWING THE GENERAL LOCATION, TYPE, LAYOUT, AND EQUIPMENT REQUIRED. THE DRAWING SHALL NOT BE SCALED FOR EXACT MEASUREMENTS, REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS. REFER TO MANUFACTURER'S STANDARD INSTALLATION DRAWINGS FOR EQUIPMENT CONNECTIONS AND INSTALLATION REQUIREMENTS. PROVIDE DUCTWORK, CONNECTIONS, OFFSETS, ACCESSORIES, AND MATERIALS NECESSARY FOR A COMPLETE SYSTEM.
F DUCT DIMENSIONS ON PLANS INDICATE DIMENSIONS OF INTERNAL FREE AREA.
G PERFORATED CEILING DIFFUSERS SHALL BE 4-WAY UNLESS NOTED OTHERWISE.
H COORDINATE ROOF WORK WITH THE OWNER'S CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.
I UNLESS NOTED OTHERWISE RECTANGULAR DUCT ELBOWS GREATER THAN 45° SHALL BE MITERED ELBOWS WITH DOUBLE-THICKNESS TURNING VANES AND RECTANGULAR DUCT ELBOWS 45° OR LESS SHALL BE RADIUSED ELBOWS WITH AN INSIDE RADIUS OF AT LEAST 1/2 THE WIDTH OF THE DUCT.
J REPLACE AIR FILTERS WITH NEW, CLEAN MERV 8 AIR FILTERS AT TURNOVER.
K THE TERM "FURNISH" MEANS SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS. THE TERM "INSTALL" DESCRIBES THE OPERATIONS AT THE PROJECT SITE INCLUDING THE ACTUAL UNLOADING, UNPACKING, ASSEMBLY, ERECTING, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS. THE TERM "PROVIDE" MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE.
L INSTALL LABELING CALLED FOR IN THE MECHANICAL DRAWINGS USING ENGRAVED PHENOLIC PLATES (WHITE WITH BLACK LETTERING) FURNISHED BY TSV.
M PROVIDE P3000 12 GA. UNISTRUT WITH PG FINISH FOR DUCT SUPPORTS AND OTHER UNISTRUT IN AREAS EXPOSED TO VIEW. SLOTTED UNISTRUT AND OTHER UNISTRUT WITH HOLES IS NOT ACCEPTABLE.

HVAC ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
CD	CEILING DIFFUSER
CU	CONDENSING UNIT
(E)	EXISTING
EF	EXHAUST FAN
ER	EXHAUST REGISTER
EXT'G	EXISTING
HD	HOOD
MUA	MAKEUP AIR UNIT
OBD	BLADE DAMPER
RG	RETURN GRILLE
RTU	ROOFTOP UNIT
SR	SUPPLY REGISTER
VSC	VARIABLE SPEED CONTROL
CO2AS	TENANT'S CO2 ALARM SUPPLIER
GC	GENERAL CONTRACTOR
HES	TENANT'S HVAC EQUIPMENT SUPPLIER
HS	TENANT'S HOOD SUPPLIER
KES	TENANT'S KITCHEN EQUIPMENT SUPPLIER
TAB	TENANT'S TEST AND BALANCE VENDOR
TCC	TENANT'S CABLING CONTRACTOR
TDC	TENANT'S DUCT CLEANER
TEMS	TENANT'S ENERGY MANAGEMENT SYSTEM SUPPLIER
TLS	TENANT'S LIGHT/LAMP SUPPLIER
TMB	TENANT'S MENU BOARD SUPPLIER
TMS	TENANT'S MILLWORK SUPPLIER
TP	TENANT'S PHONE SUPPLIER
TPS	TENANT'S PANELBOARD SUPPLIER
TRS	TENANT'S RAILING SUPPLIER
TSV	TENANT'S SIGN VENDOR
TUV	TENANT'S UV SANITIZER SUPPLIER
WCS	TENANT'S WALK-IN COOLER SUPPLIER
WHS	TENANT'S WATER HEATER SUPPLIER

HVAC SYMBOLS

CEILING DIFFUSER
CEILING-MOUNTED RETURN OR EXHAUST REGISTER
SUPPLY REGISTER
RETURN GRILLE
FLEXIBLE DUCT
MITERED CORNER WITH TURNING VANES
DUCTWORK INTERNAL FREE DIMENSIONS (WIDTH/HEIGHT) RECTANGULAR TO ROUND DUCT TRANSITION
DUCT-MOUNTED SMOKE DETECTOR
MOTOR-OPERATED DAMPER
MANUAL VOLUME DAMPER
GREASE DUCT CLEANOUT
MITERED CORNER WITHOUT TURNING VANES
GRIDPOINT THERMOSTAT
GRIDPOINT ZONE SENSOR MODULE
GRIDPOINT SUPPLY PROBE
PLAN NOTE: SEE PLAN NOTES LISTED ON THE SAME SHEET FOR NOTE MEANING
CONNECT TO EXISTING
EQUIPMENT TAG: SEE EQUIPMENT SCHEDULE ON SHEET M600 FOR EQUIPMENT INFORMATION
AUDIO/VISUAL REMOTE SMOKE DETECTOR ANNUNCIATOR WITH REMOTE KEY OPERATED RESET
GRILL, REGISTER, OR DIFFUSER TAG:
TAG
NECK SIZE
AIRFLOW [CFM]

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FOR CONSTRUCTION

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Issue Record:
06/06/2025 PERMIT SET
08/29/2025 FOR CONSTRUCTION

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Checked: RTJ

Project No.
2502013

Contents:
HVAC SPECIFICATIONS

M010

Air System Sizing Summary for RTU-1

Project Name: 2501013 CMG - Lynden, WA
Prepared by: National Engineering
05/05/2025
12:08PM

Air System Information

Air System Name	RTU-1	Number of zones	1
Equipment Class	PKG ROOF	Floor Area	1336.0 ft²
Air System Type	SZCAV	Location	Bellingham, Washington

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load	7.1	Tons	Load occurs at	Jun 1300	
Total coil load	84.9	MBH	OA DB / WB	83.0 / 66.6	°F
Sensible coil load	69.5	MBH	Entering DB / WB	74.8 / 63.6	°F
Coil CFM at Jun 1300	3500	CFM	Leaving DB / WB	56.3 / 55.2	°F
Max block CFM	3500	CFM	Coil ADP	54.2	°F
Sum of peak zone CFM	3500	CFM	Bypass Factor	0.100	
Sensible heat ratio	0.819		Resulting RH	57	%
CFM/Ton	494.6		Design supply temp	55.8	°F
ft²/Ton	188.8		Zone T-stat Check	1 of 1	OK
BTU/(hr ft²)	63.6		Max zone temperature deviation	0.0	°F
Water flow @ 10.0 °F rise	N/A				

Central Heating Coil Sizing Data

Max coil load	61.3	MBH	Load occurs at	Des Htg	
Coil CFM at Des Htg	3500	CFM	BTU/(hr ft²)	45.9	
Max coil CFM	3500	CFM	Ent. DB / Lvg DB	58.5 / 74.9	°F
Water flow @ 20.0 °F drop	N/A				

Supply Fan Sizing Data

Actual max CFM	3500	CFM	Fan motor BHP	0.00	BHP
Standard CFM	3468	CFM	Fan motor kW	0.00	kW
Actual max CFM/ft²	2.62	CFM/ft²	Fan static	0.00	in wg

Outdoor Ventilation Air Data

Design airflow CFM	600	CFM	CFM/person	66.67	CFM/person
CFM/ft²	0.45	CFM/ft²			

Air System Sizing Summary for RTU-2

Project Name: 2501013 CMG - Lynden, WA
Prepared by: NATIONAL ENGINEERING LLC
05/09/2025
01:03PM

Air System Information

Air System Name	RTU-2	Number of zones	1
Equipment Class	PKG ROOF	Floor Area	790.0 ft²
Air System Type	SZCAV	Location	Bellingham, Washington

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Sum of space airflow rates
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load	5.0	Tons	Load occurs at	Aug 1400	
Total coil load	60.5	MBH	OA DB / WB	85.6 / 67.1	°F
Sensible coil load	57.5	MBH	Entering DB / WB	76.5 / 65.6	°F
Coil CFM at Aug 1400	3500	CFM	Leaving DB / WB	61.1 / 60.1	°F
Max block CFM	3500	CFM	Coil ADP	59.4	°F
Sum of peak zone CFM	3500	CFM	Bypass Factor	0.100	
Sensible heat ratio	0.951		Resulting RH	65	%
CFM/Ton	684.0		Design supply temp	60.6	°F
ft²/Ton	156.6		Zone T-stat Check	1 of 1	OK
BTU/(hr ft²)	76.6		Max zone temperature deviation	0.0	°F
Water flow @ 10.0 °F rise	N/A				

Central Heating Coil Sizing Data

Max coil load	76.8	MBH	Load occurs at	Des Htg	
Coil CFM at Des Htg	3500	CFM	BTU/(hr ft²)	97.2	
Max coil CFM	3500	CFM	Ent. DB / Lvg DB	54.2 / 74.8	°F
Water flow @ 20.0 °F drop	N/A				

Supply Fan Sizing Data

Actual max CFM	3500	CFM	Fan motor BHP	0.00	BHP
Standard CFM	3468	CFM	Fan motor kW	0.00	kW
Actual max CFM/ft²	4.43	CFM/ft²	Fan static	0.00	in wg

Outdoor Ventilation Air Data

Design airflow CFM	900	CFM	CFM/person	18.37	CFM/person
CFM/ft²	1.14	CFM/ft²			

MECHANICAL COMPLIANCE SUMMARY

2021 WSEC Compliance Forms for Commercial Buildings including Group R2, R3 & R4 over 3 stories and all R1

Project & Applicant Information	Project Title	Chipotle Mexican Grill - Lynden - 2021 WSEC - 2021 WSEC	For Building Department Use: Date: Jun 02, 2025
	Project Address	8083 Guide Meridian Rd. Lynden, WA 98264	
	Applicant Name	Richard T. Jones	
	Applicant Phone	614-751-9610	
	Applicant Email	rtjones@nationalengineering.com	

For questions about this report, contact WSEC Commercial Technical Support at 360-539-5300 or via email at com.techsupport@waenergycodes.com

General Occupancy	All Commercial		General Building Use Type	Dining, Fast Food		Building Cond. Floor Area	1,992
General Project Types	Alteration	New Building or Addition Mechanical Scope		Alteration Mechanical Scope	Single Zone Systems & Equipment	Project Cond. Floor Area	1,992
						Floors Above Grade	1
Mechanical Project Description	Chipotle Mexican Grill fast food restaurant.					Compliance Method	General Prescriptive

Mechanical Compliance Scope and Method	Project Type	Mechanical Scope	Economizer Exception(s) Applied?	DOAS Ventilation Provided?	Higher Equipment Efficiency Option Applied?	Equipment Efficiency Compliance Verification
	Alteration	Single Zone Systems & Equipment	Yes	No	NA	COMPLIES
Additional Energy Efficiency (AEC) Measures Included	No mechanical additional energy efficiency measures included in project		Load Management (LDM) Measures Included		No mechanical load management measures included in project	
Additional Efficiency Credits Included (AEC)						
Does building include occupancy classifications requiring DOAS?	No		Does project include DOAS equipment?			No
Based on project scope do TSPR requirements apply?	No		Do all systems comply with Appendix D standard reference design or qualify for an exception to TSPR?			No

Scope & Space Conditioning	ALTERATION - SINGLE ZONE SYSTEMS & EQUIPMENT	Compliance Verification	COMPLIES

Single Zone Air Systems Category - Air conditioner, split & single package, SC, SDHV

Air Systems Summary Information

System/Equip ID	Quantity of Items	Supply Airflow Control	Ventilation Standard	Ventilation CFM (Total if Multiple Items)	Ventilation Air Source	Paired with DOAS	Ventilation energy recovery	Energy Recovery Efficiency (%)
RTU-1		Constant volume	IMC Ventilation	600	Integral		Not provided, not required	
RTU-2		Constant volume	IMC Ventilation	900	Integral		Not provided, not required	

Air Systems & Equipment - Cooling

System/ Equip ID	Cooling System/Equip Type	Specific Type	Cooling Capacity per item (Btu/h)	Econo Full Load Multiplier (Full/1PLV)	Required Cooling Efficiency (Code Min & Econo)	Proposed Cooling Efficiency	CE Units	Efficiency Compliance Verification
RTU-1	Air conditioner, air cooled	Single package DX	117	0	13.4	15.2	SEER2	COMPLIES
RTU-2	Air conditioner, air cooled	Single package DX	118	0	13.4	15.2	SEER2	COMPLIES

Air System Design Load Summary for RTU-1

Project Name: 2501013 CMG - Lynden, WA
Prepared by: National Engineering
05/05/2025
12:08PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jun 1300			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 83.0 °F / 66.6 °F			HEATING OA DB / WB 15.0 °F / 12.2 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	168 ft²	5644	-	168 ft²	-	-
Wall Transmission	1504 ft²	2964	-	1504 ft²	6009	-
Roof Transmission	1336 ft²	6262	-	1336 ft²	4646	-
Window Transmission	168 ft²	753	-	168 ft²	5248	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	28 ft²	64	-	28 ft²	445	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	1488 W	4244	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	9	1161	2430	0	0	0
Infiltration	-	2350	305	-	11345	0
Miscellaneous	-	35464	11750	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	-	59627	14485	-	27693	0
Zone Conditioning	-	63202	14485	-	27598	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	3500 CFM	0	-	3500 CFM	0	-
Ventilation Load	600 CFM	6367	915	600 CFM	33752	0
Supply Fan Load	3500 CFM	0	-	3500 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	69509	15400	-	61350	0
Central Cooling Coil	-	69509	15409	-	0	0
Central Heating Coil	-	-	0	-	61350	-
>> Total Conditioning	-	69509	15409	-	61350	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air System Design Load Summary for RTU-2

Project Name: 2501013 CMG - Lynden, WA
Prepared by: NATIONAL ENGINEERING LLC
05/09/2025
01:03PM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Aug 1400			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 85.6 °F / 67.1 °F			HEATING OA DB / WB 15.0 °F / 12.2 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	287 ft²	17498	-	287 ft²	-	-
Wall Transmission	653 ft²	2435	-	653 ft²	2611	-
Roof Transmission	790 ft²	3227	-	790 ft²	2747	-
Window Transmission	287 ft²	1673	-	287 ft²	8929	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	0 ft²	0	-	0 ft²	0	-
Floor Transmission	0 ft²	0	-	0 ft²	0	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	800 W	2497	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	0 W	0	-	0	0	-
People	49	8719	10045	0	0	0
Infiltration	-	2910	-1284	-	11345	0
Miscellaneous	-	3565	0	-	0	0
Safety Factor	0% / 0%	0	0	0%	0	0
>> Total Zone Loads	-	42522	8761	-	25633	0
Zone Conditioning	-	45694	8761	-	25918	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Return Fan Load	3500 CFM	0	-	3500 CFM	0	-
Ventilation Load	900 CFM	11839	-5777	900 CFM	50691	0
Supply Fan Load	3500 CFM	0	-	3500 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	57533	2984	-	76809	0
Central Cooling Coil	-	57533	2985	-	0	0
Central Heating Coil	-	-	-	-	76809	-
>> Total Conditioning	-	57533	2985	-	76809	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Air Systems & Equipment Details

System/Equip ID	Discrete Area(s) Served	Location In Project Documents - Plan/Detail #	System/Equip Compliance Path
RTU-1	1202	M100 and M600	General Prescriptive
	System/Equip ID for a single or multiple items?: Single item		
	Heating Section/Auxiliary Heating Type: Electric resistance (or None)		Economizer Compliance Method: Air-side economizer provided
	WSEC Equip Efficiency Reference Table - Cooling: Table C403.3.2(1) Unitary Air Conditioners & Condensing Units		
RTU-2	790	M100 and M600	General Prescriptive
	System/Equip ID for a single or multiple items?:		
	Heating Section/Auxiliary Heating Type: Electric resistance (or None)		Economizer Compliance Method: Air-side economizer provided
	WSEC Equip Efficiency Reference Table - Cooling: Table C403.3.2(1) Unitary Air Conditioners & Condensing Units		

Single Zone Air Systems Category - Unit heaters & duct heaters

Air Systems Summary Information

System/Equip ID	Quantity of Items	Supply Airflow Control	Ventilation Standard	Ventilation CFM (Total if Multiple Items)	Ventilation Air Source	Paired with DOAS	Ventilation energy recovery	Energy Recovery Efficiency (%)
DH-2			IMC Ventilation	900	Other System			
DH-1			IMC Ventilation	600	Other System			

Air Systems & Equipment - Heating

System /Equip ID	Heating System/Equip Type	Specific Type	Heat Pump Heating Capacity (Btu/h)	Cooling Capacity (Btu/h)	AEC Efficiency Multiplier	Proposed Heat Pump Heating Efficiency	HPH Units	Proposed Low OSA Temp Efficiency	LTH Units	Efficiency Compliance Verification
DH-1	Duct heater	Electric resistance			1					COMPLIES
DH-2	Duct heater	Electric resistance			1					COMPLIES

Air Systems & Equipment Details

System/Equip ID	Discrete Area(s) Served	Location In Project Documents - Plan/Detail #	System/Equip Compliance Path
DH-2	790	M100 and M600	General Prescriptive
	System/Equip ID for a single or multiple items?: Single item		
DH-1	1202	M100 and M600	General Prescriptive
	System/Equip ID for a single or multiple items?: Single item		

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Issue Record:

06/06/2025	PERMIT SET
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Checked: EEP

Project No.
2502013

Contents:
MECH ENERGY COMPLIANCE

M020

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Project:
Chipotle Mexican Grill - Lynden - 2021 WSEC - 2021 WSEC
8083 Guide Meridian Rd.
Lynden, WA 98264

Date: 2025-06-02

Applies	Code Section	Code Provision	Compliance Information Required In Permit Documentation	Location in Documents	Building Department Notes
SCOPE					
NA	C103.6.3	Construction documents - General	For a shell & core or tenant space (first build-out) project, indicate if there is no mechanical scope included in the project.		
YES	C103.1	Construction documents - General	For an alteration project, indicate if there is no mechanical scope included in the project.	M020	
PERFORMANCE CRITERIA & SYSTEM DESIGN					
YES	C403.1	Exempt process equipment	Identify equipment used by manufacturing, industrial or commercial processes that are not for space conditioning or maintaining comfort and amenities for occupants; identify provisions applicable to this equipment per C403.1 exception	M600	
NA	C403.1.1	HVAC total system performance ratio (TSPR)	For systems serving office (including medical office), retail, library, or education occupancies, or serving R-2 dwelling units or common areas, provide a TSPR report that demonstrates the proposed design ratio is equal to or greater than the standard reference design ratio, or exception applied		
YES	C403.1.2	Calculation of heating and cooling loads	Provide load calculations in accordance with ASHRAE Std 183 or equivalent, using design parameters per C302 and Appendix C; include load adjustments to account for energy recovery	M020	
NA	C403.1.3	Data centers	Provide documentation that demonstrates that data center systems comply with the maximum allowed Design MLC and Annualized MLC per ASHRAE 90.4-2019.		
NA	C403.2.1 C403.4.2.2	Zone isolation	If there are HVAC zones that are intended to be occupied non-simultaneously, identify isolation zone areas on plans; if multiple zones intended to be occupied simultaneously will be combined into a single isolation zone, include on plans that the combined zone area does not exceed 25,000 sf and does not include more than one floor; or exception applied		
NA	C403.2.1 C403.4.2.2	Zone isolation	Indicate locations of associated zone isolation dampers in HVAC and DOAS distribution systems and exhaust systems		
NA	C403.2.1 C403.4.2.2	Zone isolation	Refer to HVAC Controls section in Requirements List for applicable automatic setback and shutdown controls requirements		
EQUIPMENT SELECTION & PERFORMANCE					

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NA	C403.3.2.6	Electric heating / cooling equipment	Verify all packaged and split electric equipment with > 6,000 Btu/h cooling capacity and any amount of heating is a heat pump with reverse-cycle defrost and operates in heat pump mode when outdoor air temperature is > 25 degree F; include in equipment schedules		
NA	C403.3.2.6	Electric heating / cooling equipment	Verify electric heat in the main supply duct before VAV boxes served by cooling only systems > 6,000 Btu/h is a heat pump with reverse-cycle defrost and operates in heat pump mode when outdoor air temperature is > 25 degree F; include in equipment schedules.		
YES	C401.3 C403.1.4	HVAC Heating Fuel	For all heating equipment, identify whether it qualifies for the C403.1.4 general prescriptive path, a C403.1.4 exception, or for the C401.3 Fossil Fuel Heating path; for equipment qualifying for the C403.1.4 general prescriptive path by exception, document the exception and provide supporting information	Qualify for exception 3 since the building's conditioned floor area is 1,992 SF which is less that 2,500 SF.	
NA	C401.3 C403.1.4 C406.1	HVAC Heating Fuel	For projects with equipment utilizing the C401.3 Fossil Fuel Heating path, provide an accounting of the total heating capacity and the C401.3 equipment heating capacity for each distinct area utilized in the C406 calculation.		
NA	C403.1.4	HVAC Heating Fuel, exception 2 Dwelling and sleeping units	To qualify for exception 2, provide a list of each separate space in the dwelling or sleeping unit, indicate the number of exterior walls the space has, the presence of fenestration, and the allowed watts; document the heat provided in each space is below the allowed capacity in the space		
NA	C403.1.4	HVAC Heating Fuel, exception 5 Air-to-air heat pumps	To qualify for exception 5, provide documentation that the heat pump is sized to meet the heating load at an outdoor air temperature ≤ 32°F and has a ratio of heating capacity at 47°F to supplemental resistance heat capacity ≥ 2.0 in zone 4 and ≥ 1.0 in zone 5; indicate unit control by either a thermostat designed for heat pump use, a multistage thermostat with an outdoor air temperature thermostat wired to energize supplemental heat only on the last stage or heating and when the outdoor air temperature is ≤32°F, or equipment is NAECA rated with integral control		

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NA	C403.1.4	HVAC Heating Fuel, exception 6 Air-to-water heat pumps	To qualify for exception 6, provide documentation that building heating is provided by air-to-water heat pumps with a heating capacity ≥75% of the design heating load at 29°F; indicate controls configured to lock out supplemental heat when the outdoor air temperature is ≥36°F unless the hot water supply set point has not been maintained for 20 minutes; indicate controls configured to use the compressor as the first stage of heating down to the compressor minimum rated temperature except during start up and defrost		
NA	C403.1.4	HVAC Heating Fuel, exception 7 Ground source heat pumps	To qualify for exception 7, provide documentation building heating provided by ground source heat pumps; ; indicate controls configured to lock out supplemental resistance heat when the source-side entering water temperature is ≥42°F unless the hot water supply set point has not been maintained for 20 minutes; indicate controls configured to use the compressor as the first stage of heating; indicate the ground source heat exchanger shall be sized so heat pump annual output is ≥70% for the total annual heating output based upon the final year of a 30-year simulation using IGSHPA listed software		
NA	C403.1.4	HVAC Heating Fuel, exception 8 Small systems	To qualify for exception 8, document the capacity or area served for the electric resistance and fossil fuel systems and demonstrate that it is ≤ 5% of the building total heating capacity or area		
NA	C401.3.6	Electrification readiness	For all equipment following the fossil fuel path, indicate on plans that spare electrical branch circuit and service entrance conduit is installed and sized to support future conversion of fossil fuel heaters to heat pumps; indicate on plans additional room in the electric room and transformer rooms and vaults be provided and sized to accommodate future service upgrades for conversion of all fossil fuel equipment to heat pumps.		
YES	C403.3.1	Equipment and system sizing	Indicate that output capacities of heating and cooling equipment and systems are no greater than the smallest available equipment size that exceeds the calculated loads; note exceptions applied	M020,M600	
YES	C403.3.2 C403.9.1	HVAC equipment performance requirements (efficiency)	Provide equipment schedules on plans and in WSEC mechanical equipment compliance reports; indicate equipment type, calculated loads, capacity, rated and WSEC minimum efficiencies for all heating and cooling equipment; include supply and ventilation air cfms and operating hours for all air systems; identify heating and cooling equipment that does not have a corresponding WSEC minimum efficiency (manufacturer rated)	M020,M600	

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NA	C405.8	Electric motor efficiency	List all motors ≥ 1/12 hp (that are not integral to a rated piece of equipment) in the mechanical or electrical equipment schedules on plans; indicate motor type and applicable efficiency table, hp, rpm, number of poles and rated efficiency, or exception applied		
NA	C403.3.2.1	Gas and oil-fired forced air furnace and unit heaters	For gas and oil fired forced air furnaces with capacity ≥ 225,000 Btu/h and all unit heaters, indicate in equipment schedule intermittent ignition or IID, flue or draft damper, and rated jacket loss		
NA	C403.3.3	Hot gas bypass limitation for DX cooling equipment	For cooling equipment with hot gas bypass, provide either multiple step unloading or continuous capacity modulation; indicate bypass capacity per Table C403.3.3		
NA	C403.3.2.7	Humidification	For cooling systems with humidification equipment that are also required to have air economizer, indicate humidifier is adiabatic (direct evaporative or fog atomization), or exception applied		
NA	C403.3.2	Hydronic equipment	Refer to Requirements List section Hydronic Systems - Equipment Selection & Performance for selection criteria specific to chillers and boilers		
YES	C403.9	Heat rejection equipment	Refer to Requirements List section Heat Rejection Systems - Equipment Selection & Performance for selection criteria specific to cooling towers, dry coolers and condensers (air-cooled and evaporative)	M600	
NA	C403.13	Dehumidification in spaces for plant growth	Indicate dehumidification equipment serving plant growth spaces and which C403.13 compliance option is met		
EQUIPMENT SELECTION & PERFORMANCE - DEDICATED OUTSIDE AIR SYSTEMS (DOAS)					
NA	C403.3.5.5 C403.7.3	DOAS supplemental heating and cooling	If DOAS has heating capability, indicate heating controlled to limit supply air to ≤ 55°F. If heating is used for defrost control, indicate heat is to be locked out when outdoor air temperature is ≤ 35°F, modulates to 10% of peak capacity. Provide sizing calculations that show heating capacity sized at design temperatures to prevent damage to unit and heat supply air ≤ 55°F.		
NA	C403.3.5.5	DOAS supplemental heating and cooling	If DOAS has cooling capability, indicate cooling coil is used only for dehumidification only, is sized to meet the peak dehumidification requirement at design conditions, and is controlled to maintain supply air or zone relative humidity.		

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NA	C403.3.5 C403.3.5.4	Dedicated outdoor air systems	For buildings with occupancies required to comply with the DOAS provisions per Table C403.3.5, identify on plans all occupancies in the building and indicate which occupied spaces are required to have ventilation air delivered by a DOAS; or exception applied		
NA	C403.3.5 C403.3.5.4	Dedicated outdoor air systems	If natural ventilation exception is applied, identify these spaces on plans; indicate operable window area complies with IMC Section 402; provide documentation describing how required ventilation will be provided during all occupied hours, including during inclement weather		
NA	C403.3.5 C403.3.5.4	Dedicated outdoor air systems	If high efficiency VAV exception is applied, identify these spaces on plans; refer to Single Zone VAV section for Groups A-1, A-2 and A-3 occupancy classifications, or Multiple Zone VAV for other than Groups A-1, A-2 and A-3 (per Table C403.3.5)		
NA	C403.3.5 C403.3.5.6	Dedicated outdoor air systems	If compliance with the DOAS provisions is deemed to be impractical, provide documentation that demonstrates the alternate design strategy applied that achieves a comparable level of energy efficiency, as pre-approved by the AHJ		
NA	C403.3.5	Dedicated outdoor air systems	Refer to Requirements List section after Multiple-Zone Air Systems for High Efficiency Multiple-Zone VAV Systems exception to C403.3.5 DOAS		
NA	C403.3.5	Dedicated outdoor air systems	Refer to Requirements List section after High Efficiency Multiple-Zone Air Systems for High Efficiency Single-Zone VAV Systems exception to C403.3.5 DOAS		
NA	C403.3.5.1	DOAS energy recovery method and effectiveness	For all DOAS systems, indicate exhaust air ER method and basis of rated effectiveness (sensible or latent); indicate ≥ 68% sensible or ≥ 60% enthalpy recovery ratio at design conditions; or exception applied		
NA	C403.3.5.2	DOAS fan power	For DOAS with no fans or fan arrays with input power ≥ 1kW, indicate total system fan power does not exceed 1 watt per cfm		
NA	C403.3.5.2	DOAS fan power	For DOAS with any fans or fan arrays with input power ≥ 1kW, indicate total system fan power complies with fan power limitation per Section C403.8.1		
NA	C403.3.5.3	Heating / cooling system fan controls with DOAS	Indicate systems and equipment associated with the delivery of zone level heating and cooling (fans, hydronic pumps, primary air dampers, etc.) are configured to shut off, and central equipment is configured to turn down, when there is no call for heating or cooling in the zone they serve		

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NA	C403.3.5.3	Heating / cooling system fan controls with DOAS	If applying Exception to heating / cooling fans used for air mixing in the space during deadband periods, include fan watts per cfm in equipment schedule		
NA	C403.3.5.4	Decoupled DOAS supply air	Indicate method of delivery of DOAS supply air to the occupied space (directly into space, downstream of terminal heating / cooling coils); or exception applied		
NA	C403.6.5	Multiple zone DOAS	For DOAS serving multiple zones with DDC controls, indicate controls configured to reduce the volume of outdoor air in each zone independently when the zone is unoccupied; or exception applied		
ADDITIONAL ENERGY EFFICIENCY MEASURE - DEDICATED OUTSIDE AIR SYSTEMS (DOAS)					
NA	C406.2.2.6	High performance DOAS - Energy recovery effectiveness and fan power	For all building occupancies, to comply with this additional efficiency credit, demonstrate compliance withC403.3.5		
NA	C406.2.2.6	High performance DOAS - Energy recovery effectiveness and fan power	Indicate energy recovery sensible effectiveness of all DOAS is ≥ 80%		
NA	C406.2.2.6	High performance DOAS - Energy recovery effectiveness and fan power	For each system, indicate that total system fan power does not exceed 0.769 watts per cfm or is ≤ 80% of the fan power allowance for a constant volume system calculated per C403.8.1		
FANS AND FAN CONTROLS					
YES	C403.8.1.2	Fan power limitation	For all HVAC fan systems associated with conditioned space and containing 1 or more fans with electrical input ≥ 1 kW shall provide the total nameplate hp and the fan system electrical input power calculated per C403.8.1.2 in equipment schedules on project plans	M600	
YES	C403.8.1.1	Fan power limitation	For all HVAC and DOAS systems associated with conditioned space with 1 or more fans with electrical input power ≥ 1 kW, provide fan system electrical input power calculations per Section C403.8.1.2 to verify it complies with fan power budget per Section C403.8.1.1	M600	
NA	C403.8.2	Motor nameplate hp	For HVAC systems with total fan motor nameplate hp > 5hp, indicate fan motors specified are the smallest available motor hp size greater than fan bhp, note exceptions applied		

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YES	C405.8	Fractional hp fan motors	For all fractional hp fan motors (1/12 - < 1 hp), indicate that motors comply with applicable WSEC efficiency tables; if motor type is not listed in an efficiency table, indicate whether fan has an electronically commutated motor, has motor rated efficiency of at least 70%, or exception applied	M600	
NA	C403.8.3	Fan efficiency	For individual fans or fan arrays, indicate in equipment schedule that rated FEI for all applicable fans part of a variable-air volume system is ≥ 0.95 and ≥ 1.0 in all other systems, or exception applied; indicate these fans are sized at the design point of operation		
NA	C403.8.4	Low-capacity ventilation fans	For all ventilation system fans with motors ≤ 1/12 hp, indicate in equipment schedule the fan flow rate and efficacy (cfm/watt), or exception applied; refer to Table C403.8.4		
NA	C403.2.4	Variable flow capacity - fans	For fan motors ≥ 5 hp, indicate method of variable flow control (VSD or equivalent method) in equipment schedule, or exception applied		
YES	C403.8.5.1	Fan airflow control	For DX air handling units with cooling capacity ≥ 42,000 Btu/h and evaporative and chilled water air handling units with fan ≥ 0.25 hp, indicate whether system is single zone or multiple zone and related control method (cooling capacity controlled in response to space temperature, space temperature is controlled by modulating supply airflow, or both)	M600	
YES	C403.8.5.1	Fan airflow control	For mechanical cooling systems (includes DX and chilled water coils) that control cooling capacity in response to space temperature - Provide a minimum of two stages of fan control; indicate minimum fan speed is ≤ 66% of full speed drawing ≤ 40% of full speed fan power during periods of low cooling or ventilation only	M600	
NO	C403.8.5.1	Fan airflow control	For other mechanical cooling systems (includes DX and chilled water coils) that control space temperature by modulating airflow (in lieu of, or in addition to, controlling capacity in response to space temperature) - Provide fan controls for modulating supply airflow; indicate minimum fan speed is ≤ 50% of full speed drawing ≤ 30% of full speed fan power during periods of low cooling or ventilation only; or exception applied		
NA	C403.8.6	Large-diameter ceiling fans	Where provided, indicate large-diameter ceiling fans to be tested and labeled in accordance with AMCA 230.		
ADDITIONAL ENERGY EFFICIENCY MEASURE - IMPROVED HVAC TSPR					

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NA	C406.2.2.1	Improved HVAC TSPR	To comply with this additional efficiency credit, indicate systems are required to provide a TSPR report per C403.1.1; demonstrate that the proposed design ratio is at minimum 5% higher than the standard reference design ratio; for projects prorating the credit the TSPR report must show the proposed design exceeds the claimed increase used for proration		
ADDITIONAL ENERGY EFFICIENCY MEASURE - MORE EFFICIENT HVAC EQUIPMENT COOLING AND FAN PERFORMANCE					
NA	C406.2.2.2	More efficient cooling and fan performance	To comply with this additional efficiency credit, provide a list of all cooling equipment in the building or credit area and calculations that demonstrate (based on cooling output capacity) that 90% or more of all HVAC cooling equipment serving conditioned floor areas are listed in the tables of Section C403.3.2		
NA	C406.2.2.2 C406.2.2.2.1	More efficient cooling and fan performance	In addition to system selection requirement, demonstrate that 90% or more of all HVAC cooling capacity serving conditioned floor areas in the building or credit area is delivered by equipment at least 5% better than the listed WSEC efficiency, seasonal or annualized where available other wise use full load efficiency		
NA	C406.2.2.2 C406.2.2.2.1	More efficient cooling and fan performance	For projects prorating the credit in accordance with Equation 4-15 include calculations for equipment representing at least 90% of the cooling capacity in the building or credit area that demonstrate the capacity weighted average better than code efficiency; for equipment with multiple requirements the seasonal or annualized efficiency shall be used		
NA	C406.2.2.2 C406.2.2.2.3	More efficient cooling and fan performance	In addition to system selection and efficiency requirements, if fan energy is not included in equipment rating or if it is but the fan has been upsized from rated conditions, demonstrate fan power is ≤ 95% of the allowed fan power in Section C403.8.1.		
ADDITIONAL ENERGY EFFICIENCY MEASURE - MORE EFFICIENT HVAC EQUIPMENT HEATING PERFORMANCE					
NA	C406.2.2.3	More efficient HVAC equipment heating performance	To comply with this additional efficiency credit, provide a list of all heating equipment in the building or credit area and calculations that demonstrate that 90% or more of all HVAC heating capacity serving conditioned floor area is delivered by equipment listed in the tables of Section C403.3.2		

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NA	C406.2.2.3 C406.2.2.3.2	More efficient HVAC equipment heating performance	In addition to system selection requirement, demonstrate that 90% or more of all HVAC heating capacity serving the building or credit area is delivered by equipment at least 5% better than the listed WSEC efficiency, seasonal or annualized where available other wise use full load efficiency		
NA	C406.2.2.3 C406.2.2.3.2	More efficient HVAC equipment heating performance	For projects prorating the credit in accordance per Equation 4-16 include calculations for equipment representing at least 90% of the heating capacity serving the building or credit area that demonstrate the capacity weighted average better than code efficiency; for equipment with multiple code requirements the seasonal or annualized efficiency shall be used		
NA	C406.2.2.3 C406.2.2.3.2	More efficient HVAC equipment heating performance	In C402.1.1 low energy and C402.1.1.2 semi-heated spaces demonstrate that 90% of the heating capacity in the building or area is provided by electric infrared or gas-fired radiant equipment for localized heating applications.		
VENTILATION, EXHAUST & ENERGY RECOVERY					
NA	C403.7.1.2	Demand control ventilation design	For each required demand control ventilation system, indicate outdoor air automatically changes in response to a CO2 sensor and utilizes a variable speed fan control to reduce systems flow; or exception applied		
YES	C403.2.2.1	Ventilation	If mechanically delivered, indicate that ventilation systems are configured to provide not more than 150% of, but at least the minimum required volume of outdoor air to each zone per IMC, ASHRAE 62.1 or other applicable code (WAC, OSHA, etc.); or exception applied	M600	
NA	C403.2.2.1	Ventilation	If delivered via natural ventilation, identify required elements per IMC including: minimum openable area to the outdoors or qualifying adjoining spaces; criteria for ensuring required ventilation is provided during all occupied hours of the year (including during inclement outdoor conditions)		
YES	C403.2.2.2	Exhaust	Indicate that exhaust systems are configured to provide not more than 150% of, but at least the minimum required volume from each zone per IMC, or other applicable code (WAC, OSHA, etc.); or exception applied	M600	
YES	C403.4.2.4	Exhaust system off-hour controls	Refer to Requirements List section HVAC Controls for off-hour controls requirements for exhaust systems	M600	

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NA	C403.7.6.1	Balanced ventilation for Group R-2 occupancy	For Group R-2 dwelling and sleeping units, indicate that each habitable space is provided with a balanced ventilation system; indicate system is provided with energy recovery with ≥ 60% sensible recovery effectiveness		
NA	C403.7.1.1	Demand control ventilation	Identify spaces with ventilation provided by single zone system with air economizer; for each space indicate controls are configured to provide demand controlled ventilation or provide supporting documentation for applied exception		
NA	C403.7.1.1	Demand control ventilation	Provide list of spaces with IMC ventilation occupant load and the occupant outdoor airflow rate listed; for spaces with occupant load ≥ 15 people/1,000 sf per IMC or occupant air flow rate ≥ 15 cfm / person indicate controls are configured to provide demand controlled ventilation or provide supporting documentation for applied exception		
NA	C403.7.2	Occupancy sensors	For gyms, classrooms, auditoriums, conference rooms and other spaces with occupant load ≥ 25 people/1,000 sf per IMC, that have an area > 500 sf, indicate occupancy-based ventilation air control when space is unoccupied and method (closes outdoor air damper or shuts-off equipment); or alternate means provided to automatically reduce ventilation air when space is partially occupied; or exception applied		
NA	C403.7.3	Ventilation air heating control	For ventilation air systems with supplemental heating capacity that operate in conjunction with heating and cooling systems, indicate that ventilation air is tempered (via heating or heat recovery) to no greater than 55° F when the space conditioning system is in cooling mode		
NA	C403.7.4.2	Ventilation controls for Group R-1 guestrooms	Indicate method of ventilation and exhaust isolation for each guest room and automatic controls that are configured to turn off ventilation and exhaust airflow when each room is unoccupied		
NA	C403.8.4	Group R occupancy exhaust fan efficacy	Refer to Requirements List section Fans & Fan Controls		
NA	C403.7.5 C403.7.5.1	Enclosed loading dock ventilation	For enclosed loading docks, indicate ventilation / exhaust system method of activation (gas detection system for CO and NO2, or occupancy sensors), and control method (staged or modulating); if total ventilation system fan motor nameplate horsepower is > 5 hp, indicate VSD or equivalent motor drives		

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NA	C403.7.5 C403.7.5.2	Enclosed parking garage ventilation	For enclosed parking garages, indicate ventilation / exhaust system activated by gas detection system for CO and NO2, and control method (staged or modulating); or exception applied; if total ventilation system fan motor nameplate horsepower is > 5 hp, indicate VSD or equivalent motor drives		
NA	C403.7.6.2	Ventilation / exhaust systems energy recovery	For systems with design ventilation air > 5,000 cfm, or design supply air cfm and % ventilation air exceeding the values in Tables C403.7.6(1) or (2), indicate exhaust air energy recovery method; or exception applied with supporting calculations		
NA	C403.7.6.2	Ventilation / exhaust systems energy recovery	For rooms served by multiple systems with aggregate design ventilation air > 5,000 cfm, or aggregate design supply air cfm and % ventilation air exceeding the values in Tables C403.7.6(1) or (2), indicate exhaust air energy recovery method; or exception applied with supporting calculations		
NA	C403.7.6.2	Ventilation / exhaust systems energy recovery	Indicate energy recovery rated sensible recovery effectiveness ≥ 68% or a enthalpy recovery ratio ≥ 60%		
YES	C403.7.7.1.1 C403.7.7.1.2 C403.7.7.1.3	Kitchen exhaust hood system	Indicate on plans the type, duty, UL rating and exhaust airflow rate of each kitchen hood	M600	
YES	C403.7.7.1.1 C403.7.7.1.2 C403.7.7.1.3	Kitchen exhaust hood system	Provide calculations that show a balanced accounting of total kitchen exhaust (include all hoods) with % of: supply air, transfer air from adjacent spaces, and make-up air	M600	
YES	C403.7.7.1.1 C403.7.7.1.2 C403.7.7.1.3	Kitchen exhaust hood system	For hoods with make-up air drawn directly into the exhaust air cavity of each hood, indicate that replacement air does not exceed 10% of hood exhaust airflow rate	M600	
YES	C403.7.7.1.1 C403.7.7.1.2 C403.7.7.1.3	Kitchen exhaust hood system	For kitchens with total hood exhaust exceeding 2,000 cfm, indicate that each hood is UL 710 rated and maximum exhaust airflow rate of each hood is per Table C403.7.7.1.2; or exception applied	M600	
YES	C403.7.7.1.1 C403.7.7.1.2 C403.7.7.1.3	Kitchen exhaust hood system	For kitchens with total hood exhaust exceeding 2,000 cfm, indicate demand control kitchen ventilation configured to a minimum 50% reduction in exhaust and replacement air system flows in response to alliance operation; or exception applied	M600, Hood Drawings	
NA	C403.7.7.2	Laboratory exhaust systems energy recovery	For buildings with total lab exhaust > 5,000 cfm, indicate method of energy recovery used to pre-condition laboratory make-up air; energy recovery effectiveness (min 25°F increase in outside air temperature); or alternative method per exception (VAV exhaust, semi-conditioned makeup, or CERM calculation)		

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YES	C403.7.7.3	Transfer air	For spaces where conditioned supply air is utilized as transfer air to balance mechanical exhaust, indicate basis of transfer airflow (supply required to meet loads, health/safety requirement, air that would normally be exhausted); or exception applied	M100,M600	
YES	C403.7.8.1 C403.7.8.3	Shutoff dampers for building isolation	Indicate locations of outdoor air intake, exhaust and relief outlet dampers on plans; indicate whether dampers are Class 1 motorized, or gravity and exception applied (include leakage rating, cfm/sf)	M100,M600	
NA	C403.7.8.1 C403.7.8.3	Shutoff dampers for stairway and elevator hoistway shaft vents	Indicate location of stairway and elevator hoistway shaft vent dampers on plans; verify dampers are Class 1 motorized; or exception applied		
YES	C403.7.8.2 C403.7.8.3	Shutoff dampers for return air	Indicate locations of return air dampers that are integral to airside economizer operation; verify dampers are motorized; indicate whether dampers are Class 1, or within packaged equipment eligible for leakage rating exception (include leakage rating, cfm/sf)	M600	
YES	C403.7.8.4	Damper actuation	Indicate automatic controls configured to close outdoor air intake, exhaust and relief outlet dampers during unoccupied equipment operation; not including economizer cooling, night flush or IMC required outdoor air / exhaust	M600	
NA	C403.7.8.4	Damper actuation	Indicate method of activation of stairway and elevator hoistway shaft vent dampers (fire alarm or interruption of power)		
NA	C404.11.4	Exhaust system energy recovery for heated indoor pools and permanent spas	For buildings with pools or spas with water surface area > 200 sf, indicate exhaust air energy recovery method and use of waste heat (preheat ventilation air, pool water or service hot water); or exception applied		
NA	C404.11.4	Exhaust system energy recovery for heated indoor pools and permanent spas	Indicate energy recovery system has the rated effectiveness and is configured to decrease the exhaust air temperature at design conditions by ≥ 36°F		
HVAC CONTROLS					
YES	C403.4.1	Thermostatic controls (thermostats and humidistats)	Indicate locations of thermostatic and humidity control devices and the zones they serve on plans, including perimeter system zones	M100	

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NA	C403.4.1	Thermostatic controls (thermostats and humidistats)	Where adjacent (neighboring) zones are controlled by separate thermostats (including perimeter systems used to offset heat gain or loss), and are connected by permanent openings > 10% of either zone's area, indicate controls configured to prevent adjacent zones from operating in conflicting modes (one in heat, other in cool); applies to adjacent perimeter zones, adjacent nonperimeter zones, and adjacent perimeter and nonperimeter zones		
NA	C403.4.1	Thermostatic controls (thermostats and humidistats)	If applying Exception 2 to interior zones adjacent to perimeter zones, indicate that setpoints and deadband settings in these zones are coordinated so cooling in an interior zone does not occur until the temperature in that zone is 5°F higher than the adjacent perimeter zone temperature in heating		
NA	C403.4.1	Thermostatic controls(thermostats and humidistats)	If applying Exception 3 for DOAS, indicate supply air temperature heating setpoint is ≤ 65°F and cooling setpoint is ≥ 72°F, or method of supply air temperature reset		
NA	C403.4.1.1	Heat pump supplementary heat	Indicate staged heating operation with compression as the first stage of heating and supplemental heating controlled with outdoor lock-out temperature set to 40°F or less, or indicate exception applied and specify equipment meeting the exception requirements		
NA	C403.4.1.2	Deadband	Indicate zone thermostatic controls configured with 5°F minimum deadband for systems that control both heating and cooling		
NA	C403.4.1.3	Setpoint overlap restriction (thermostats)	If separate heating and cooling thermostatic control devices are used to serve a zone, indicate locations of both thermostatic control devices and the zone they serve on plans		
NA	C403.4.1.3	Setpoint overlap restriction (thermostats)	Indicate a limit switch, mechanical stop or DDC control with programming to prevent simultaneous heating and cooling		
NA	C403.4.1.4	Heated or cooled vestibules	Indicate thermostatic controls within heating or cooled vestibules with a heating setpoint ≤ 60°F and cooling setpoint ≥ 85°F; indicate controls are configured to turn off heating when outdoor temperature is > 45°F; or note exception applied		
NA	C403.4.1.4	Heated air curtains	Indicate controls are configured to turn off air curtain heating when outdoor temperature is > 45°F		

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NA	C403.4.1.6	Door switches for HVAC system thermostatic control	Doors required to have opening switches for HVAC thermostatic control to the outdoors from a conditioned space and are > 48 sf, indicate automatic controls configured to setback the HVAC system(s) when the door is open for > 5 minutes; indicate method of HVAC system setback control (turns off the HVAC system or resets the heating setpoint to 55°F and cooling setpoint to 85°F), or exception applied (either C402.5.11 or C403.4.1.6)		
YES	C403.4.2 C403.4.2.1 C403.4.2.2	Automatic setback and shutdown	Indicate zone thermostatic controls configured with required automatic setback and manual override functions, setback temperatures, and control method (automatic time clock or 7 day programmable controls); note exceptions applied	M600	
NA	C403.4.2.3	Automatic (optimum) start and stop	Indicate all HVAC systems are provided with automatic start and stop controls; indicate start controls are configured to adjust the equipment start time as required to bring each area served up to design temperature just prior to scheduled occupancy; indicate stop controls are configured to reduce heating setpoint and increase cooling setpoint by at least 2°F prior to scheduled unoccupied periods		
YES	C403.4.2.4	Exhaust system off-hour controls	For exhaust systems serving conditioned spaces in all occupancies other than Group R, indicate method of control and that controls are configured to turn exhaust systems on and off in concert with the ventilation air systems providing their make-up air, or exception applied	M600	
NA	C403.4.2.5	Transfer and destratification fan system off-hour controls	For transfer fan or mixing fan systems serving conditioned spaces in all occupancies other than Group R, indicate method of control and that controls are configured to turn fans on and off in concert with the associated HVAC systems, or exception applied		
NA	C403.4.7	Combustion heating equipment	For combustion heating equipment other than boilers or radiant heaters with output capacity > 225,000 Btu/h, indicate modulating or staged combustion control		
NA	C403.4.7.1	Combustion decorative vented appliance, combustion fireplace and fire pit controls	Indicate controls that are configured to limit operation of combustion appliance, fireplace and fire pit to ≤ 1 hour without override, or that occupancy sensor controls are provided		

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NA	C403.7.4.1	Temperature setpoint controls for Group R-1 guestrooms	For hotels / motels with over 50 guest rooms, indicate automatic controls for HVAC equipment serving guest rooms are configured to setback (heating) and set-up (cooling) temperature setpoint by at least 4°F when room is rented and unoccupied, and adjust setpoint to 60°F (heating) and 80°F (cooling) when room is unrented / vacated; indicate control method - activated by room entry, occupancy sensor or networked guestroom control system		
NA	C403.7.4.2	Ventilation controls for Group R-1 guestrooms	Refer to Requirements List section Ventilation, Exhaust & Energy Recovery		
NA	C403.4.9 C403.4.10	Thermostatic controls for Group R2 / R3 dwelling units and Group R2 sleeping units	For primary space conditioning systems, indicate 5-2 programmable thermostats capable of two setback periods per day; indicate each non-primary system is provided with at minimum an adjustable thermostat, or exception applied. For all thermostats indicate purpose (heating only, cooling only, or both) and required temperature range; indicate thermostats are configured for at minimum a 5°F deadband		
YES	C403.5.1	DX air handler variable cooling control(Located under Integrated Economizer Control)	For DX air handlers with cooling capacity ≥ 65,000 Btu/h, indicate number of cooling stages provided and method (multiple compressors and / or variable speed compressors); indicate minimum displacement (capacity reduction) as % of full load; indicate thermostats are configured with the same number of cooling stages and displacement	M600	
YES	C403.5.1	DX air handler variable cooling control (Located under Integrated Economizer Control)	Indicate control method (cooling capacity controlled in response to space temperature, space temperature controlled by modulating supply airflow, or both)	M010,M600	
NA	C403.4.11.1 C403.4.11.2 C403.4.11.3	DDC system applications, controls and display	Provide central and zone level DDC controls as required based on system application, capacity or size thresholds and other qualification per Table C403.4.11.1		
NA	C403.4.11.1 C403.4.11.2 C403.4.11.3	DDC system applications, controls and display	Identify all DDC system input / output control points in project documents		
NA	C403.4.11.1 C403.4.11.2 C403.4.11.3	DDC system applications, controls and display	Indicate control capability includes monitoring zone and system level demand for fan pressure, pump pressure, heating and cooling; indicate capability to transfer demand information from zones to air / hydronic distribution system controllers, and to central plant systems and equipment controllers		

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MECH ENERGY COMPLIANCE

M021

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NA	C403.4.11.1 C403.4.11.2 C403.4.11.3	DDC system applications, controls and display	Indicate system has the capability and is configured for trending and graphically displaying input / output points		
NA	C403.4.11.4	DDC demand response setpoint adjustment	For buildings with ≥ 780,000 Btu/h of mechanical cooling, indicate controls are configured to automatically increase the cooling setpoint and decrease the heating setpoint ≥ 2°F based upon a binary input to the control system approved by the utility		
NA	C403.4.1.7	Demand responsive controls	Indicate thermostatic controls for heating or cooling systems are provided with demand response controls are capable of increasing the cooling setpoint and decreasing the heating setpoint ≤ 4°F; indicate the controls are capable of receiving and responding automatically to a demand response signal.		
NA	C403.2.3	HVAC System Fault detection and diagnostics	For buildings ≥ 100,000 square feet, indicate HVAC systems have fault detection and diagnostics with sensors and communications to automatically identify HVAC system faults, provide prioritized recommendations for repair, and communicate faults and recommendations to remotely located authorized personnel.		
ADDITIONAL ENERGY EFFICIENCY MEASURE - DWELLING UNIT HVAC CONTROLS					
NA	C406.2.1	Dwelling unit HVAC controls	To comply with this additional efficiency credit, provide control design for a manual main control or occupancy sensor based controls, or provide control specification and product cut sheets demonstrating compliance with learning thermostat or geographic sensing options.		
ADDITIONAL EFFICIENCY CREDIT - FAULT DETECTION AND DIAGNOSTICS					
NA	C406.2.2.7	Fault detection and diagnostics	To comply with this additional efficiency credit, demonstrate HVAC controls comply with items 1 through 6 in Section C403.2.3; only buildings not required to comply with Section C403.2.3 or C403.6.10(16) can use this credit		
LOAD MANAGEMENT MEASURE - HVAC LOAD MANAGEMENT					
NA	C406.3.2	HVAC load management	To comply with this additional efficiency credit, indicate automatic controls connected to central DDC having digital input capable of being activated by external utility signal; where utility real-time demand or pricing program exists indicate system configured to utilize this signal; otherwise indicate building demand monitoring installed and controls configured to utilize demand signals		

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NA	C406.3.2	HVAC load management	Indicate electric cooling controls configured to gradually increase the cooling setpoint by at least 3°F over 3 hours during summer peak periods; , indicate electric heating controls configured to gradually decrease the heating setpoint by at least 3°F over 3 hours during winter peak periods		
DUCTWORK, SHAFTS AND PLENUMS					
YES	C403.10.1.1 C403.10.2	Duct construction	Indicate on plans that all ductwork is constructed and sealed per IMC	M010	
YES	C403.10.1.1 C403.10.2	Duct construction	For outdoor air ductwork, also indicate on plans that ductwork meets air leakage requirements per C402.5 and vapor retarder requirements per the IBC	M010	
YES	C403.10.2.1 C403.10.2.2 C403.10.2.3	Duct pressure classifications	Identify location of low, medium and high pressure ductwork on plans	M010	
NA	C403.10.2.3	High pressure duct leakage test	Indicate high pressure duct leakage testing requirements on plans; provide test results to jurisdiction when completed		
YES	C403.10.1.1 C403.10.1.2	Duct insulation	For outdoor air ductwork located within conditioned space (upstream or downstream of shutoff damper), identify climate zone, duct airflow, and indicate duct insulation R-value per Table C403.10.1.1 on plans; or exception applied	M010	
NA	C403.10.1.1 C403.10.1.2	Duct insulation	For supply and return air ductwork located within unconditioned space or outdoors, identify climate zone and indicate ductwork insulation R-value per Table C403.10.1.2 on plans; or exception applied		
YES	C403.10.1.1 C403.10.1.2	Duct insulation	For supply air ductwork located within conditioned space, identify on plans if design supply air temperature is < 55°F or > 105°F; indicate ductwork insulation R-value per Table C403.10.1.2 on plans; or exception applied	M010	
YES	C403.10.1.1 C403.10.1.2	Duct insulation	For return and exhaust air ductwork located within conditioned space (upstream of the shutoff damper) and downstream of an energy recovery media, indicate ductwork insulation R-value per Table C403.10.1.2; or exception applied	M010	
YES	C403.10.1.1 C403.10.1.2	Duct insulation	For exhaust and relief air ductwork located within conditioned space and downstream of the shutoff damper, indicate ductwork insulation R-value per Table C403.10.1.2; or exception applied	M010	
NA	C403.10.1.1 C402.1.3	Shaft and plenum insulation	For outdoor air shafts and plenums, indicate on plans that the R-value of insulation on these elements complies with Table C402.1.3 for steel-framed walls		

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PIPING					
NA	C403.10.3	Piping insulation	Indicate design temperature range of fluid conveyed in piping and thickness of insulation (in inches) on hydronic piping plans; or exception applied		
NA	C403.10.3.1	Protection of piping insulation	Indicate method of protection of pipe insulation from damage / degradation on hydronic piping plans		
YES	C403.10.4	HVAC refrigerant piping insulation	Indicate refrigerant piping insulation to be installed on all hot gas lines and on some liquid lines per C403.10.4; indicate insulation conductivity ≤ 0.26 Btu × in/(h × ft2 × °F)	M010	
ECONOMIZERS					
YES	C403.5	Air economizer required	Identify all cooling systems requiring air economizer controls in equipment schedules on plans and in WSEC mechanical equipment compliance reports	M600	
YES	C403.5	Air economizer exceptions	Indicate all systems utilizing air economizer exceptions in WSEC mechanical equipment compliance report, including those with water-side economizer in lieu of air economizer; indicate on plans and in WSEC mechanical equipment compliance reports all eligible exception(s) taken and measures to comply with exception(s)	M020,M600	
YES	C403.4.1 C403.5.1	Integrated economizer operation - air and water	Indicate air and water-side economizers are configured for partial cooling operation even where additional mechanical cooling is required to meet the load	M600	
YES	C403.4.1 C403.5.1	Integrated economizer operation - air and water	For DX air handlers with single or multiple stages of mechanical cooling; indicate controls are configured with air economizer as the first stage of cooling	M600	
YES	C403.4.1 C403.5.1	Integrated economizer operation - air and water	Refer to Requirements List section HVAC Controls for additional requirements for DX air handlers	M600	
YES	C403.5.2	Economizer heating system impact - air and water	Verify control method of HVAC systems with economizers does not increase building heating energy usage during normal operation	M600	
YES	C403.5.3.1	Air economizer capacity	Indicate modulating outdoor air and return air dampers are configured to provide up to 100% outdoor air for cooling	M600	
YES	C403.5.1 C403.5.3.2	Air economizer controls and integrated operation	Indicate that economizer controls are configured to provide partial economizer cooling when additional mechanical cooling is also required to meet the cooling load	M600	
YES	C403.5.1 C403.5.3.2	Air economizer controls and integrated operation	Indicate that control of economizer dampers is not based only on mixed air temperature; or exception applied for systems with cooling capacity ≤ 65,000 Btu/h	M600	

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YES	C403.5.3.3	Air economizer high limit controls	Indicate high limit shut-off control method and required high limit per Table C403.5.3.3	M600	
YES	C403.5.3.4	Relief of excess outdoor air	Refer to Requirements List section Ventilation, Exhaust & Energy Recovery	M100,M600	
YES	C403.5.3.4	Relief of excess outdoor air	Indicate relief air outlets are sized and configured to relieve excess building air during air economizer operation to prevent building over-pressurization	M600	
YES	C403.5.3.4	Relief of excess outdoor air	Indicate relief air outlet are located to avoid recirculation into the building	M100,M600	
NA	C403.5.4.1	Water economizer capacity	For eligible systems where water-side economizer may be provided in lieu of air economizer, indicate system is capable of 100% design cooling capacity at 50°F db / 45°F wb outdoor air temperatures; indicate if threshold for 100% design cooling capacity via economizer must be lowered to 45°F db / 40°F wb due to dehumidification requirements		
NA	C403.5.4.2	Water economizer maximum pressure drop	Indicate that the pressure drop across precooling coils and heat exchangers in water economizer systems do not exceed 15 feet (4572 mm)		
YES	C403.5.5	DX equipment economizer fault detection and diagnostics	For DX air handlers with economizer and cooling capacity ≥ 54,000 Btu/h, provide a fault detection and diagnostics (FDD) system to monitor economizer system operation and report faults	M600	
HYDRONIC SYSTEMS - EQUIPMENT SELECTION & PERFORMANCE					
NA	C403.3.2.3	Maximum air cooled chiller capacity	For chilled water plants and buildings with > 500 tons of cooling capacity, indicate air-cooled chiller capacity is ≤ 100 tons, or exception applied		
NA	C403.3.2.2	Large capacity cooling systems	For buildings ≥ 300 tons of cooling capacity, indicate method of multi-stage or variable capacity control (VSD, multiple staged compressors, or max capacity of any single unit		
NA	C403.3.2.4	Non-standard water-cooled centrifugal chillers	For water-cooled centrifugal chillers not designed for operation at standard conditions, provide calculations documenting maximum full load and part load rated equipment performance requirements		
NA	C403.3.3	Hot gas bypass limitation for chillers	For cooling equipment with hot gas bypass, provide either multiple step unloading or continuous capacity modulation; indicate bypass capacity per Table C403.3.3		
NA	C403.4.3 C403.3.4.4	Large capacity boiler systems	For hydronic systems with only a single boiler that has > 500,000 Btu/h input capacity, indicate multi-stage or modulating burner		

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NA	C403.4.3 C403.3.4.4	Large capacity boiler systems	For boiler system (single or multiple) with > 1,000,000 Btu/h input capacity, indicate turndown ratio per Table C403.3.4.4 and method (multiple single input boilers, modulating boilers, or combination)		
NA	C403.3.4.1	Large capacity boiler systems	For all boiler systems with input capacity ≥ 2,500,000 Btu/h and all systems where one stack serves 2 or more boilers with a combined input capacity ≥ 2,500,000 Btu/h, indicate combustion air positive shut-off is provided to restrict airflow through the combustion chamber during standby (e.g. flue or vent damper).		
NA	C403.3.4.2	Large capacity boiler systems	For boiler systems with combustion air fans ≥ 10 hp, indicate variable speed fan		
NA	C403.3.4.3	Large capacity boiler systems	For boiler systems with input capacity ≥ 5,000,000 and a steady state full-load combustion efficiency <90 percent, indicate combustion air volume to be automatically controlled to limit stack-gas oxygen concentrations specified in Table C403.3.4.3. List exception if it applies.		
NA	C403.3.4.5 C403.3.4.5.1 C403.3.4.5.2	High capacity space heating gas boiler system (new buildings)	For gas hot water space heating systems with ≥ 1,000,000 Btu/h and ≤ 10,000,000 Btu/h capacity, indicate boiler thermal efficiency ≥ 90 percent; coils and heat exchangers sized at design conditions to have a boiler return water temperature ≤ 120°F; values and controls to ensure under all operating conditions the water temperature entering the boiler is ≤ 120°F or the supply water recirculating directly into the return system is ≤ 20 percent of design flow of the operating boilers.		
NA	C403.2.4	Variable flow capacity - pumps	For pump motors ≥ 5 hp, indicate method of variable flow control (VSD or equivalent method) in equipment schedule, or exception applied		
NA	C403.3.7	Hydronic system flow rate	Indicate chilled water and condenser water flow types and operating hours, and maximum flow rates in less than or equal to Table C403.3.7.		
NA	C403.3.8.1	Chilled-water coil selection	Indicate chilled-water coils sized to provide a 15°F difference between leaving and entering water temperature and a minimum 57°F leaving water temperature at design conditions., or exception applied		
NA	C403.3.8.2	Hot-water coil selection	Indicate hot-water coils sized to provide a 20°F difference between leaving and entering water temperature and a maximum 118°F entering water temperature at design conditions., or exception applied		

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NA	C403.4.12	Pressure independent control valves	For heating and cooling water coils with a design flow ≥ 5 gpm, indicate modulating pressure independent control values are provided		
HYDRONIC SYSTEMS - CONTROLS					
NA	C403.4.3	Boiler sequencing	Indicate automatic controls that sequence operation of multiple boilers		
NA	C403.4.3.2	Two-pipe changeover systems	Indicate changeover deadband is ≥ 15°F outdoor air temperature; indicate controls are configured so that heating / cooling modes are active for at minimum 4 hours before changeover and that the delta between heating / cooling supply temperatures at changeover point is		
NA	C403.4.1.5	Heating water temperature setback	For hot water boilers that provide building heating via one- or two-pipe systems, indicate controls that provide heating water temperature setback based on outdoor temperature		
NA	C403.4.4	Hydronic system part load controls and supply-water temperature reset	For heating and chilled water systems with ≥ 300,000 Btu/h output capacity, indicate system controls are configured to automatically reset supply water temperature based upon demand; or exception applied		
NA	C403.4.4	Hydronic system part load controls and supply-water temperature reset	Indicate automatic pump flow controls are configured to reduce system flow rate by ≥ 50%, or the maximum allowed by the equipment manufacturer, based upon the heating or cooling loads; or describe why not required		
NA	C403.4.4	Hydronic system part load controls and supply-water temperature reset	For hydronic systems with output capacity ≥ 300,000 Btu/h that serve heating water systems, chilled water systems and water-cooled unitary air conditioners, indicate that pumps are provided with a variable speed drive if one of the following conditions apply: 1) System pump motor hp is ≥ 2 hp and pumps are designed to operate continuously or per time schedule; 2) System pump motor hp is ≥ 7.5 hp and pumps are controlled by automatic DDC configured to only operate pumps when there is a call for zone heating or cooling		
NA	C403.4.4	Hydronic system part load controls and supply-water temperature reset	Where variable speed drives are required, indicate system is configured so that pump motor power is ≤ 30% of design wattage at 50% of design flow rate; indicate pump flow is controlled to maintain one control valve nearly wide open, or to maintain a minimum differential pressure; or exception applied		

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NA	C403.4.6	Hydronic system variable pump flow control	For individual pumps required to have variable speed controls, indicate manner of pump speed control (differential pressure, static pressure setpoint, zone heating or cooling demand, or based on the relationship between variable speed controller frequency and power)		
NA	C403.4.5	Chiller / boiler plant pump isolation	Indicate controls are configured to automatically reduce overall plant flow and shut-off flow through individual chillers and boilers when not in use		
NA	C403.4.3.3.1	Water loop heat pump - temperature deadband	Indicate method of water loop temperature control (central plant equipment controls are configured to provide ≥ 20°F water supply temperature deadband between heat rejection and heat addition modes, or controls are configured for system loop temperature optimization		
NA	C403.4.3.3.2	Water loop heat pump - heat rejection equipment	Indicate type of cooling tower (open- or closed-circuit) in equipment schedule; indicate whether the cooling tower is used directly in the heat pump loop or in conjunction with a separate heat exchanger; indicate method used to limit system heat loss when heat rejection is not needed		
NA	C403.4.3.3.3	Water loop heat pump - isolation valves	For hydronic heat pump systems with total system power > 10 hp, indicate 2-way isolation valves on each heat pump and variable flow system control		
HEAT REJECTION SYSTEMS - EQUIPMENT SELECTION & PERFORMANCE					
NA	C403.9.1.3	Centrifugal fan open-circuit cooling towers	For open-circuit centrifugal fan cooling towers with ≥ 1,100 gpm capacity, indicate cooling towers comply with efficiency requirements for axial fan open circuit cooling towers		
HEAT REJECTION & RECOVERY - CONTROLS					
NA	C403.9.1.1 C403.9.1.2	Fan speed control	For each fan powered by an individual motor or array of motors, with total connected fan power ≥ 5 hp (including motor service factor), indicate method of automatic fan speed control (adjusted based on leaving fluid temperature or condenser temperature / pressure of heat rejection device); verify fan selection provides ≤ 30% design wattage at 50% design airflow		
NA	C403.9.1.1 C403.9.1.2	Fan speed control	For multiple-cell heat rejection equipment with VSD, indicate controls are configured to ramp all fans in unison (not staged on / off operation)		

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NA	C403.9.1.4	Cooling tower flow turndown	For open-circuit cooling towers configured with multiple- or variable-speed condenser water pumps, indicate system is designed so all cells can be run in parallel; indicate method of condenser pump turn down control		
NA	C403.9.2.1	Heat recovery for service water heating	For buildings with 24-hour operation and > 1,500,000 Btu/h of heat rejection capacity and design service hot water load > 250,000 Btu/h, indicate condenser heat recovery to pre-heat service water; or exception applied. Provide calculations showing the amount of recovered heat that is utilized (60% of peak heat rejection load or pre-heat service water to 85°F).		
NA	C403.9.2.2	Steam condensate systems heat recovery	For buildings with on-site steam heating systems, indicate condensate water heat recovery and use of recovered heat		
NA	C403.9.2.2	Steam condensate systems heat recovery	For buildings that use off-site generated steam where condensate is not returned to the source, indicate on-site condensate water heat recovery		
NA	C403.9.2.3	Refrigeration condenser heat recovery	For buildings with food service, meat or deli departments that have ≥ 500,000 Btu/h of remote refrigeration capacity for coolers / freezers, indicate condenser heat recovery and use of captured energy (service water heating, space heating, or dehumidification reheating)		
NA	C403.9.2.3	Refrigeration condenser heat recovery	For buildings with ≥ 40,000 sf conditioned floor area and ≥ 1,000,000 Btu/h of remote refrigeration capacity, indicate condenser heat recovery to pre-heat service water; indicate remaining recovered heat is applied to space heating or dehumidification reheating		
NA	C403.9.2.4	Condenser heat recovery for space heating	For buildings that operate > 70 hour per week, that are not served by a DOAS with energy recovery, and have > 1,500,000 Btu/h of heat rejection capacity and ≥ 0.45 cfm per sf of design minimum supply airflow with reheat, indicate condenser heat recovery is provided for space heating that complies with Sections C403.9.2.4.1 or C403.9.2.4.2 or C403.9.2.4.4		
NA	C403.9.2.4.1 C403.9.2.4.4	Water to water heat recovery	Indicate that 90% or more of the total building space heating and ventilation air design loads are served by heat energy rejected from either a heat recovery chiller or the cooling loop of water to water heat pump equipment		
NA	C403.9.2.4.2	Exhaust heat recovery	Indicate that waste heat is recovered from least 90% of the total building exhaust airflow such that leaving exhaust air temperature while in heat recovery mode is 55° F dry bulb; note exhaust air systems eligible for exception to this requirement		

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NA	C403.9.2.4.3	Process heat recovery	In spaces with 5 watts per sf of year-round cooling loads from lights and equipment, indicate these spaces are served by water-cooled equipment configured for heat recovery		
NA	C403.9.2.4.3	Process heat recovery	If these spaces are served by economizer (air or water), indicate automatic controls are configured to disable economizer operation while system is in heat recovery mode		
ADDITIONAL ENERGY EFFICIENCY MEASURE - IMPROVED LOW CARBON DISTRICT ENERGY SYSTEMS (10%)					
NA	C406.2.2.4	Improved low-carbon district energy systems (10 percent better).	Provide calculations showing 90% or more of the annual service water and space heat energy use or 90% or more of the annual service water heat, space heat and space cooling energy use is met by a district energy exchange system complying with C406.2.2.4.1 or a district energy heating and/or cooling system complying with C406.2.2.4.2; provide documentation the system is operational and is in accordance with this section prior to the final inspection.		
NA	C406.2.2.4.1	Improved low-carbon district energy exchange systems (10 percent better)	Provide calculations and documentation that 45% of the annual district-system-net-load-met (sum of heating and cooling energy provided to attached buildings) comes from heat recovery between connected buildings, waste heat, or renewable energy resources; and no more than 25% of the annual heat input to the system comes from fossil fuel or electric-resistance sources.		
NA	C406.2.2.4.2	Improved low-carbon district energy heating and cooling or heating only systems (10 percent better)	Provide calculations and documentation that distribution losses are less than or equal to 5% of the annual load delivered to buildings served by the system; and that the system complies with one of the following: 1) 45% of the annual district-system-net-load-met (sum of heating and cooling energy provided to attached buildings) comes from heat recovery between connected buildings, waste heat, or renewable energy resources and no more than 25% of the annual heat input to the system comes from fossil fuel or electric-resistance sources, or, 2) 10% or less of the system annual heat input to the system comes from fossil fuels, electric-resistance sources, or heat pump sources with an annual COP < 3		
ADDITIONAL ENERGY EFFICIENCY MEASURE - IMPROVED LOW CARBON DISTRICT ENERGY SYSTEMS (20%)					

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NA	C406.2.2.5	Improved low-carbon district energy systems (20 percent better).	Provide calculations showing 90% or more of the annual service water and space heat energy use or 90% or more of the annual service water heat, space heat and space cooling energy use is met by a district energy exchange system complying with C406.2.2.4.1 or a district energy heating and/or cooling system complying with C406.2.2.4.2; provide documentation the system is operational and is in accordance with this section prior to the final inspection.		
NA	C406.2.2.5.1	Improved low-carbon district energy exchange systems (20 percent better)	Provide calculations and documentation that 50% of the annual district-system-net-load-met (sum of heating and cooling energy provided to attached buildings) comes from heat recovery between connected buildings, waste heat, or renewable energy resources; and no more than 10% of the annual heat input to the system comes from fossil fuel or electric-resistance sources.		
NA	C406.2.2.5.2	Improved low-carbon district energy heating and cooling or heating only systems (20 percent better)	Provide calculations and documentation that distribution losses are less than or equal to 5% of the annual load delivered to buildings served by the system; and that the system complies with one of the following: 1) 50% of the annual district-system-net-load-met (sum of heating and cooling energy provided to attached buildings) comes from heat recovery between connected buildings, waste heat, or renewable energy resources and no more than 25% of the annual heat input to the system comes from fossil fuel or electric-resistance sources, or, 2) 10% or less of the system annual heat input to the system comes from fossil fuels, electric-resistance sources, or heat pump sources with an annual COP < 4		
LOAD MANAGEMENT MEASURE - COOLING ENERGY STORAGE					
NA	C406.3. 5	Cooling energy storage	To comply with this additional efficiency credit, indicate automatic controls connected to central DDC having digital input capable of being activated by external utility signal; where utility real-time demand or pricing program exists indicate system configured to utilize this signal; otherwise indicate building demand monitoring installed and controls configured to utilize demand signals		
NA	C406.3. 5	Cooling energy storage	Provide calculation of ice or chilled water storage capacity with standby loss ≤ 1.5% per day; indicate automatic controls to activate storage to reduce peak period electric demand; provide calculation of storage capacity		
MULTIPLE ZONE AIR SYSTEMS					

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NA	C403.6.1	Air systems serving multiple zones	Identify supply air systems serving multiple zones and the zones they serve on plans; indicate whether system is VAV and method of primary air control; or provide supporting documentation for applied exception to VAV		
NA	C403.6.1	VAV air terminal primary supply airflow	Provide equipment schedules on plans that list all VAV air terminals and types (fan-powered series and parallel air terminals, single duct and dual duct air terminals, etc.)		
NA	C403.6.1	VAV air terminal primary supply airflow	For each air terminal include: maximum primary supply airflow rates during zone peak heating and zone peak cooling; maximum terminal airflow during reheating, recooling or mixing; minimum ventilation airflow rate, and the basis for these values; if IMC or ASHRAE 62.1 multiple zone equation is the basis for minimum flow rates, provide this calculation on plans		
NA	C403.6.2	Single duct VAV terminal units	Indicate single duct terminal units are configured to reduce primary supply air before reheating or recooling		
NA	C403.6.3	Dual duct systems - terminal units	For systems with separate warm air and cool air ducts, indicate terminal units are configured to reduce the flow from one duct to minimum before mixing with air from the other duct		
NA	C403.6.8 C403.6.9	VAV system static - pressure sensors and DDC set points	Indicate locations of duct static pressure sensors on plans; include at least one sensor per major duct branch; verify controller setpoint pressure at each sensor is ≤ 1.2 inch w.g.		
NA	C403.6.8 C403.6.9	VAV system static - pressure sensors and DDC set points	For systems with zone level DDC, indicate controls are configured to monitor zone damper positions and reset static pressure setpoint based on the zone requiring most pressure; include control logic that automatically detects and generates an alarm if any zone excessively drives reset logic, and allows building operators to exclude zones from reset logic		
NA	C403.6.4	VAV system supply air reset	Indicate controls automatically reset supply air temperature in response to building loads or outdoor air temperature; or exception applied		
NA	C403.6.4	VAV system supply air reset	Indicate zones expected to experience relatively constant loads and that maximum air flow is designed to deliver peak capacity at the fully reset supply air temperature.		
NA	C403.6.5	Multiple-zone VAV system ventilation optimization controls	For systems with zone level DDC controls, indicate controls are configured to automatically reduce outdoor airflow in response to changes in system ventilation efficiency; or exception applied		

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NA	C403.6.6	Parallel fan powered VAV air terminals	Indicate controls automatically activate or shut off the air terminal fan based on call for heating and / or ventilation; indicate controls are configured to activate the terminal fan as the first stage of heating prior to activating the heating coil; indicate control method of primary air during warmup or temperature setback mode		
HIGH EFFICIENCY MULTIPLE-ZONE VAV SYSTEMS - EXCEPTION TO C403.3.5 DOAS, MUST COMPLY WITH ALL 15 PROVISIONS TO BE ELIGIBLE					
NA	C403.6.10, Item 1	Minimum area served and zoning	Indicate that each high efficiency multiple-zone VAV systems serves an area ≥ 3,000 sf and includes ≥ 5 zones		
NA	C403.6.10, Item 2	Air economizer	Indicate system is configured for 100% air economizer operation and complies with all related economizer requirements per C403.5 (without economizer exceptions)		
NA	C403.6.10, Item 3	Direct digital controls (DDC)	Provide DDC controls for all components of system per C403.4.11 (regardless of system size); identify all DDC system input / output control points; indicate capability for trending and graphical display		
NA	C403.6.10, Items 4 and 5	Supply and outdoor airflow measurement and control	For systems with minimum required outdoor air > 2,500 cfm, provide an airflow monitoring station that is configured to measure outdoor air intake under all load conditions; indicate control sequence that increases or reduces outdoor air cfm based on VAV terminal feedback of ventilation efficiency (per C403.6.5 without exceptions) or and DCV (per C403.7.1)		
NA	C403.6.10, Items 4 and 5	Supply and outdoor airflow measurement and control	Provide a supply airflow monitoring station that is configured to measure supply air delivered to VAV terminals under all load conditions		
NA	C403.6.10.I tem 6	Zone isolation and maximum area served	Verify maximum area served by a single VAV system is ≤ 50,000 sf, or one entire floor, whichever is greater; in addition if a system serves > 25,000 sf, that includes areas that are expected to be occupied non-simultaneously, indicate zone isolation controls per C403.2.1		
NA	C403.6.10, Item 7	Interior / exterior zone design supply air temperature	Verify that VAV terminals serving interior cooling driven loads are sized per a design supply air temperature that is 5°F higher than VAV terminals serving exterior zones while in cooling mode		
NA	C403.6.10, Item 8	Maximum air terminal inlet velocity	Identify all air terminals with minimum primary airflow setpoints > 50% of maximum setpoint in mechanical equipment schedule for these air terminals indicate inlet velocity does not exceed 900 fpm		

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NA	C403.6.10, Item 9	Maximum allowable system brake horsepower	For each fan system serving a multiple-zone VAV HVAC, provide calculations that verify fan system electrical input power is ≤ 90% of the fan power budget in accordance with Section C403.8.1.1		
NA	C403.6.10, Item 10	Fan-powered terminal unit motor and control	Indicate all series and parallel fan-powered terminals have electronically commutated motors (ECM); indicate DDC control system is configured to vary air terminal fan speed as a function of the load; indicate fan speed during periods of low heating, low cooling, or ventilation-only mode is ≤ 66% of peak design air flow, or provide supporting documentation for applied exception		
NA	C403.6.10, Item 11	Application of single duct and fan-powered terminal units	Indicate VAV terminal types on plans; verify fan-powered terminal units only serve perimeter zones with envelope loads and interior zones with high occupant density and DCV per C403.7.1; verify all other zones are served by single duct terminal units		
NA	C403.6.10, Item 12	Fan-powered terminal unit primary air reset	Indicate DDC controls are configured to automatically reset the primary supply air cfm setpoint of all fan-powered terminal units to the minimum required to maintain ventilation during occupied heating or deadband mode, based upon the VAV air handling unit minimum ventilation air fraction		
NA	C403.6.10, Item 13	Controls for high occupant density spaces	For zones > 150 sf with high occupant density (≥ 25 people / 1000 sf), indicate zone is served by a dedicated terminal unit with DCV control that resets terminal unit ventilation setpoint based on measured CO2; also indicate occupancy sensor control that automatically reduces minimum ventilation to zero and sets back room heating and cooling setpoints by ≥ 5°F when space in unoccupied		
NA	C403.6.10, Item 14	Dedicated cooling systems serving data centers and server, electronic equipment and telecom spaces	For data centers and server, electronic equipment, telecom or similar spaces with design cooling loads > 5 W/sf, indicate spaces are served by dedicated cooling systems that are independent of the HPVAV systems serving the rest of building		
NA	C403.6.10, Item 14	Dedicated cooling systems serving data centers and server, electronic equipment and telecom spaces	Indicate dedicated cooling systems are configured for 100% air economizer operation and comply with all related economizer requirements per C403.5 (without economizer exceptions), or heat recovery per C403.5, Exception 9		
NA	C403.6.10, Item 15	Central plant efficiency	Indicate whether systems are served by a high efficiency heating water plant, or a high efficiency chilled water plant		

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NA	C403.6.10, Item 15	Central plant efficiency	If complying via high efficiency heating water plant: Indicate all VAV terminals have hydronic heating coils served by a heating water system with either gas-fired boiler(s) with thermal efficiency (Et) ≥ 92%, air-to-water heat pumps, or heat recovery chillers; indicate hydronic heating coils are sized per a maximum 120°F entering water temperature during peak demand		
NA	C403.6.10, Item 15	Central plant efficiency	If complying via high efficiency chilled water plant: Indicate all VAV air handlers have cooling coils served by chillers with rated IPLV efficiency that exceeds WSEC listed IPLV by at least 25% per Table C403.3.2(7) (note water-cooled IPLV is max, all others are min); indicate smallest chiller or compressor in plant is ≤ 20% of the total plant capacity, or provide thermal storage sized for ≥ 20% of total plant capacity		
NA	C403.6.10, Item 16	Fault detection and diagnostics	Indicate DDC system includes automatic fault detection and diagnostics (FDD) configured to monitor operation and provide fault reporting of all required parameters for all VAV air handlers and VAV air terminal units in the HPVAV system		
HIGH EFFICIENCY SINGLE-ZONE VAV SYSTEMS - EXCEPTION TO C403.3.5 DOAS, MUST COMPLY WITH ALL 8 PROVISIONS TO BE ELIGIBLE					
NA	C403.12, Item 1	Air economizer	Indicate system is configured for 100% air economizer operation and complies with all related economizer requirements per C403.5 (without economizer exceptions)		
NA	C403.12, Item 2	Direct digital controls (DDC)	Provide DDC controls for all components of system per C403.4.11 (regardless of system size); identify all DDC system input / output control points; indicate capability for trending and graphical display		
NA	C403.12, Item 3	Outdoor airflow measurement and control	For systems with minimum required outdoor air ≥ 1,000 cfm, provide an airflow monitoring station that is configured to measure outdoor air intake under all load conditions; indicate controls that adjust outdoor air cfm via DCV per C403.7.1		
NA	C403.12, Item 4	Maximum allowable fan power	For each fan system serving a single-zone VAV system, provide calculations that verify fan system electrical input power is ≤ 90% of the fan power budget in accordance withC403.8.1.1		
NA	C403.12, Item 5	Supply airflow control	Provide controls that adjust supply airflow based on the heating and cooling loads; indicate control sequence that limits minimum fan speed to 30% of peak design airflow or required ventilation during unoccupied mode, whichever is less		

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NA	C403.12, Item 6	Controls for high occupant density spaces	For zones > 150 sf with high occupant density (≥ 25 people / 1000 sf), indicate DCV control that resets ventilation setpoint based on measured CO2; also indicate occupancy sensor control that automatically reduces minimum ventilation to zero and sets back room heating and cooling setpoints by ≥ 5°F when space in unoccupied		
NA	C403.12, Item 7	High efficiency system option	Indicate which system performance option is applied - high efficiency DX cooling and heat pump or high efficiency gas heating; or heating coils served by a high efficiency heating water plant; or cooling coils served by high efficiency chilled water plant		
NA	C403.12, Item 7	High efficiency system option	If complying via high efficiency DX: Indicate full load and part load rated cooling efficiency exceeds WSEC listed efficiency by at least 15%; if heating is supplied by a gas-fired furnace, indicate thermal efficiency (Et) is ≥ 90%; if system is a heat pump, indicate heating efficiency (HSPF or COP) exceeds WSEC listed efficiency by at least 10%; control of cooling and heating coil output shall be configured with a minimum of 2-stages or modulating		
NA	C403.12, Item 7	High efficiency system option	If complying via high efficiency heating water plant: Indicate hydronic heating coils are served by a heating water system with either gas-fired boiler(s) with thermal efficiency (Et) ≥ 92%, air-to-water heat pumps, or heat recovery chillers; indicate hydronic heating coils are sized per a maximum 120°F entering water temperature during peak demand		
NA	C403.12, Item 7	High efficiency system option	If complying via high efficiency chilled water plant: Indicate cooling coils are served by chillers with rated IPLV efficiency that exceeds WSEC listed IPLV by at least 25% per Table C403.3.2(7) (note water-cooled IPLV is max, all others are min); indicate smallest chiller or compressor in plant is ≤ 20% of the total plant capacity, or provide thermal storage sized for ≥ 20% of total plant capacity		
NA	C403.12, Item 8	Fault detection and diagnostics	Indicate DDC system includes automatic fault detection and diagnostics (FDD) configured to monitor operation and provide fault reporting of all required parameters for all HPVAV single-zone air systems		
EXTERIOR HEATING SYSTEMS					
NA	C403.11.1	Heating outside a building	Indicate systems providing heating in non-enclosed outdoor occupied spaces are radiant systems		

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M022

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NA	C403.11.1	Heating outside a building	Indicate occupancy sensing or timer switch controls configured to automatically shut off heating system when area served is unoccupied		
NA	C403.11.2	Snow melt systems	Indicate automatic controls configured to shut off system when pavement temperature exceeds 50°F and no precipitation is falling, and when outdoor air temperature exceeds 40°F		
NA	C403.11.3	Freeze protection system controls	Indicate automatic controls to shut off system when outdoor temperature exceeds 40°F, or conditions protect fluid from freezing		
HVAC EQUIPMENT ENERGY USE METERING					
NA	C409.3.1	HVAC equipment energy use metering	For new buildings and building additions > 25,000 sf, verify energy use metering of all equipment used to provide space heating and cooling, dehumidification and ventilation will be provided per C409; indicate equipment eligible for exception		
DOCUMENTATION AND SYSTEM SPECIFIC REQUIREMENT TO SUPPORT COMMISSIONING (CX)					
YES	C408.1	Scope of mechanical systems commissioning	For buildings with areas required to comply with C403.3.5 (DOAS) or with ≥ 180,000 Btu/h total output cooling capacity or ≥240,000 Btu/h total output heating capacity or energy recovery equipment ≥ 300 cfm, indicate that all mechanical systems regardless of individual capacity are required to be commissioned; or provide building heating / cooling capacity calculation demonstrating eligibility for exception	M010	
YES	C408.1	Scope of mechanical systems commissioning	Indicate that all systems, equipment and controls for which the WSEC requires control functions and / or configuration to perform specific functions are included in the Cx scope	M010	
YES	C408.1.1 C408.1.4.1	Commissioning requirements in construction documents	Indicate in plans and specifications that Cx per C408 is required for all applicable mechanical systems	M010	
YES	C408.1.1 C408.1.4.1	Commissioning requirements in construction documents	Include general summary that includes at minimum: narrative description of activities, responsibilities of the Cx team, schedule of activities including verification of project close out documentation per C103.6, and conflict of interest plan (if required)	M010	
YES	C408.1.1 C408.1.4.1	Commissioning requirements in construction documents	Include in general summary that a Cx project report or Compliance Checklist (Figure C408.1.4.1) shall be completed by the Certified Cx Professional and provided to the owner prior to the final mechanical inspection.	M010	

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YES	C408.1.2.2	Functional performance testing criteria	Identify in plans and specifications the intended operation of all equipment and controls during all modes of operation, including interfacing between new and existing-to-remain systems	M010	
YES	C408.2.2	Air system and hydronic system balancing	Indicate in plans that air and fluid flow rates shall be tested and balanced within the tolerances defined in the specifications; indicate systems shall be balanced in a manner to first minimize throttling losses, then adjusted to meet design flow conditions	M010	
YES	C408.2.2.1	Air system balancing devices	Indicate devices that provide the capability to balance all supply air outlets, zone terminals and air handling equipment requiring system balancing	M010,M100,M600	
NA	C408.2.2.2	Hydronic system balancing devices	Indicate devices that provide the capability to isolate, balance and measure flow across all hydronic equipment requiring system balancing including heating and cooling coils and pumps; or exception applied		
PROJECT CLOSE OUT DOCUMENTATION					
YES	C103.6	Documentation and project close out submittal requirements	Indicate in plans that project close out documentation and training of building operations personnel is required for all mechanical components, equipment and systems governed by this code; indicate close out documentation shall include: record documents, O&M manuals, applicable WSEC mechanical equipment compliance reports and calculations	M010	

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Contents:
MECH ENERGY COMPLIANCE

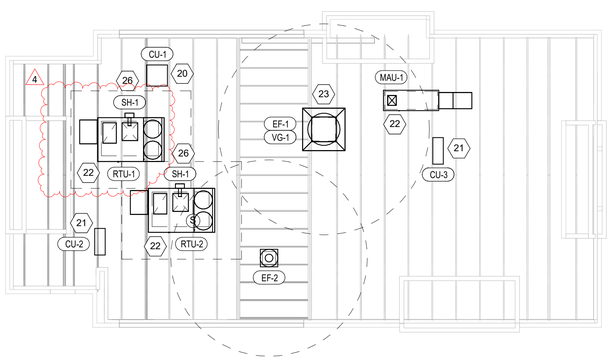
M023

HVAC PLAN NOTES

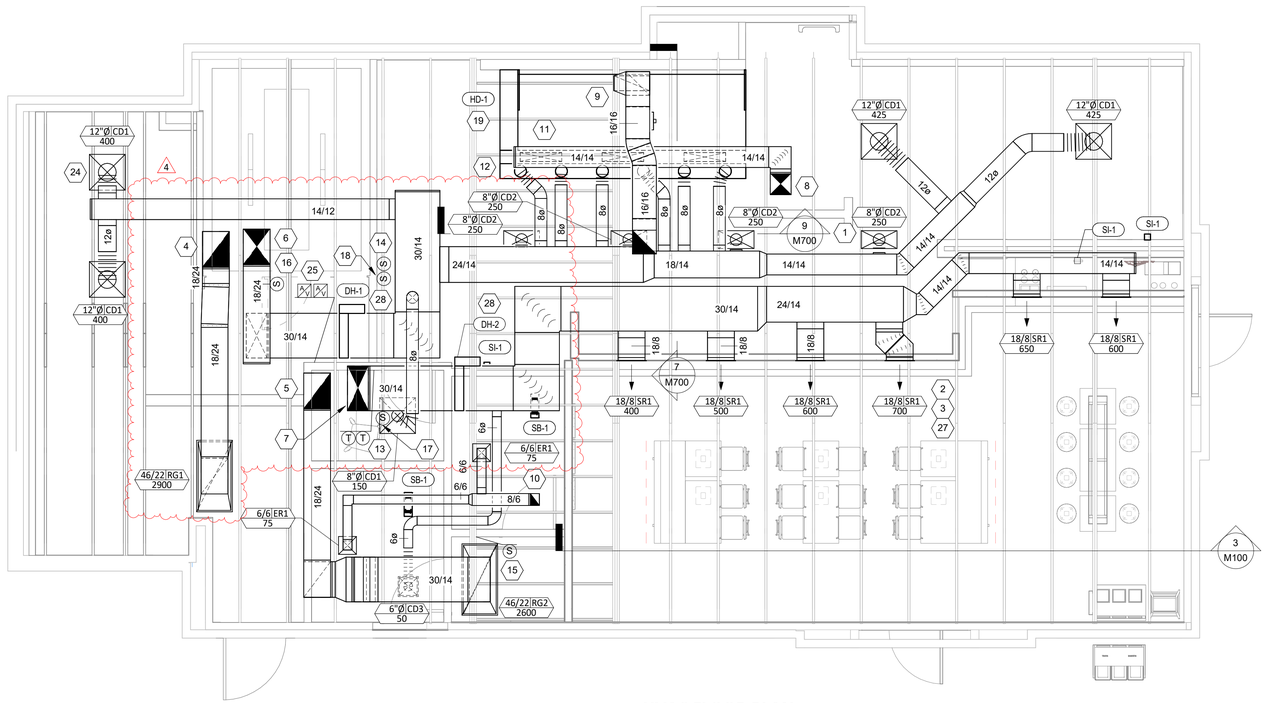
1 SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR CEILING MOUNTED EQUIPMENT LOCATION. TYPICAL.
2 PAINT DUCTWORK VISIBLE THROUGH DINING ROOM SUPPLY REGISTERS AND RETURN GRILL BLACK. TYPICAL.
3 ADJUST SUPPLY REGISTERS SO THAT SUPPLY AIR HITS WALL ON OPPOSITE SIDE OF ROOM AT APPROXIMATELY 7' AFF WITH NO DRAFTS FELT IN THE DINING ROOM.
4 24/18 DUCT UP FOR TRANSITION TO RTU-1 RETURN CONNECTION IN ROOF CURB. RTU-1 SHALL HAVE AN INTEGRAL SMOKE DETECTOR MOUNTED IN THE RETURN AIR STREAM. INTERLOCK SMOKE DETECTOR TO RTU-1 OPERATION.
5 24/18 DUCT UP FOR TRANSITION TO RTU-2 RETURN CONNECTION IN ROOF CURB. RTU-2 SHALL HAVE AN INTEGRAL SMOKE DETECTOR MOUNTED IN THE RETURN AIR STREAM. INTERLOCK SMOKE DETECTOR TO RTU-2 OPERATION.
6 24/18 DUCT UP FROM BUILDING SUPPLY THROUGH ROOF. TRANSITION TO RTU-1 SUPPLY CONNECTION IN ROOF CURB.
7 30/14 DUCT UP FROM BUILDING SUPPLY TO RTU-2 SUPPLY CONNECTION. TRANSITION IN ROOF CURB.
8 14/14 DUCT UP THROUGH ROOF. TRANSITION TO MAU-1 SUPPLY CONNECTION IN ROOF CURB.
9 16/16 DUCT UP FROM HOOD THROUGH ROOF TO EF-1 COMPLIANT WITH NFPA 96. PROVIDE RADIUSED ELBOWS WITH AN INSIDE RADIUS OF 0.5W AT ELBOWS IN GREASE DUCT.
10 8/6 DUCT UP THROUGH ROOF TO EF-2.
11 28/6 DUCT DOWN TO MAKEUP AIR PSP DUCT CONNECTION. TRANSITION TO SUPPLY PLENUM OPENING SIZE. TYPICAL FOR 3.
12 8" DIA. DUCT DOWN TO AC PSP DUCT CONNECTION. TRANSITION TO SUPPLY PLENUM OPENING SIZE. TYPICAL. CAP UNUSED DUCT CONNECTIONS.
13 INSTALL SINGLE GANG VERTICAL J-BOX GRIDPOINT THERMOSTATS FURNISHED BY TEMS FOR RTU-1 AND RTU-2 AT THIS LOCATION AT 48" AFF. COORDINATE WITH ELECTRICAL SWITCHING IN THIS AREA. PROVIDE WIRING AS SHOWN IN DETAIL 8/E710.
14 INSTALL GRIDPOINT ZONE SENSOR MODULE FURNISHED BY TEMS FOR RTU-1 AT THIS LOCATION 72" AFF DIRECTLY TO WALL (NO JUNCTION BOX). COORDINATE LOCATION WITH EQUIPMENT. PROVIDE WIRING AS SHOWN IN DETAIL 8/E710.
15 INSTALL GRIDPOINT ZONE SENSOR MODULE FURNISHED BY TEMS FOR RTU-2 AT THIS LOCATION 66" AFF DIRECTLY TO WALL (NO JUNCTION BOX). COORDINATE LOCATION WITH EQUIPMENT. PROVIDE WIRING AS SHOWN IN DETAIL 8/E710.
16 INSTALL GRIDPOINT SUPPLY PROBE FURNISHED BY TEMS FOR RTU-1 IN THE SUPPLY DUCTWORK UPSTREAM FROM THE FIRST BRANCH CONNECTION. PROVIDE WIRING AS SHOWN IN DETAIL 8/E710.
17 INSTALL GRIDPOINT SUPPLY PROBE FURNISHED BY TEMS FOR RTU-2 IN THE SUPPLY DUCTWORK UPSTREAM FROM THE FIRST BRANCH CONNECTION. PROVIDE WIRING AS SHOWN IN DETAIL 8/E710.
18 INSTALL REMOTE TEMPERATURE SENSOR FOR HOOD HD-1 AT THIS LOCATION 72" AFF. COORDINATE LOCATION WITH EQUIPMENT. PROVIDE (2) #18 G. THERMISTOR CABLE FROM TEMPERATURE SENSOR TO HOOD CONTROL PANEL.
19 INSTALL KITCHEN HOOD, HD-1. SUPPORT HOOD PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND AS DETAILED IN THE ARCHITECTURAL AND STRUCTURAL DRAWINGS. INSTALL HOOD ACCORDING TO THE REQUIREMENTS OF ITS LISTING, IN COMPLIANCE WITH NFPA 96, THE BUILDING CODE, AND AUTHORITIES HAVING JURISDICTION. HOOD SHALL HAVE AN INTEGRAL DUCT COLLAR TEMPERATURE SENSOR TO AUTOMATICALLY ENERGIZE THE EXHAUST AND MAKEUP AIR FANS IF COOKING TEMPERATURES ARE DETECTED. EXHAUST DUCT SYSTEM TO BE WELDED OR FACTORY-MANUFACTURED WATER AND AIR TIGHT. INSTALL CLEANOUTS PER CODE AND AS SHOWN. INSTALL HOOD PER DETAILS 2, 4, AND 9/M700. CHIPOTLE WILL PROVIDE AN INDEPENDENT TESTING AGENCY FOR TESTING THE INTEGRITY OF THE GREASE DUCT SYSTEM.
20 INSTALL REMOTE CONDENSING UNIT FOR WALK-IN COOLER ON ROOF AS DETAILED IN THE ARCHITECTURAL AND STRUCTURAL DRAWINGS. INSTALL REFRIGERANT LINE SET, THERMOSTATIC EXPANSION VALVE, SOLENOID VALVE, TEMPERATURE CONTROL, SIGHT GLASS, FILTER DRIER, PRESSURE CONTROL, LOW AMBIENT CONTROLS, AND WEATHERPROOF HOUSING. TRAP AND SLOPE REFRIGERANT LINES PER MANUFACTURER'S RECOMMENDATIONS. INSTALLATION SHALL COMPLY WITH ASHRAE/ANSI STANDARD 15. INSTALL THE REFRIGERANT LINE SET UNDER THE ROOF DECK TO WITHIN 3' OF THE CONDENSING UNIT. CUT 2-1/2" HOLE IN WALK-IN COOLER ROOF FOR REFRIGERANT LINE SET AND SEAL PER THE COOLER MANUFACTURER'S INSTALLATION INSTRUCTIONS AFTER LINE SET IS INSTALLED.
21 INSTALL REMOTE CONDENSER FOR ICE MACHINE ON ROOF AS DETAILED IN THE ARCHITECTURAL AND STRUCTURAL DRAWINGS. INSTALL REFRIGERANT LINE SET, THERMOSTATIC EXPANSION VALVE, SOLENOID VALVE, TEMPERATURE CONTROL, SIGHT GLASS, FILTER DRIER, PRESSURE CONTROL, LOW AMBIENT CONTROLS, AND WEATHERPROOF HOUSING. TRAP AND SLOPE REFRIGERANT LINES PER MANUFACTURER'S RECOMMENDATIONS. SEAL PIPING PENETRATIONS THROUGH ROOF. INSTALLATION SHALL COMPLY WITH ASHRAE/ANSI STANDARD 15. INSTALL THE REFRIGERANT LINE SET UNDER THE ROOF DECK TO WITHIN 3' OF THE REMOTE CONDENSER. IF REFRIGERANT PIPING TO ICE MAKER IS EXPOSED TO PUBLIC VIEW CONCEAL WITHIN A STAINLESS STEEL SHROUD AS SHOWN IN THE ARCHITECTURAL DRAWINGS.
22 INSTALL ROOFTOP EQUIPMENT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND AS DETAILED IN THE ARCHITECTURAL AND STRUCTURAL DRAWINGS.
23 INSTALL EXHAUST FAN EF-1 PER DETAIL 5/M700 AND AS DETAILED IN THE ARCHITECTURAL AND STRUCTURAL DRAWINGS. INSTALL GREASE VIROGUARD SYSTEM FURNISHED BY CHIPOTLE ON EXHAUST FAN, EF-1.
24 PROVIDE SUPPLY DIFFUSER CONNECTION TO SUPPLY SYSTEM PER DETAIL 1/M700. TYPICAL.
25 PROVIDE AUDIO/VISUAL REMOTE SMOKE DETECTOR ANNUNCIATOR WITH REMOTE KEY OPERATED RESET. WIRE A UNIT BACK TO EACH SMOKE DETECTOR. MOUNT UNIT 60" AFF. TYPICAL.
26 INSTALL REME HALO AIR PURIFIER FURNISHED BY TUV IN RTU PER DETAIL 6/M700. SEE ELECTRICAL DRAWINGS FOR POWER CONNECTION INFORMATION. INSTALL UV WARNING STICKERS ON FACE OF ENCLOSURE PER DETAIL AND ON ANY RTU ACCESS DOOR(S) THROUGH WHICH THE REME HALO WOULD BE VISIBLE IF OPENED.
27 SEE ARCHITECTURAL ELEVATIONS FOR DINING DIFFUSER LOCATIONS.
28 INSTALL DUCT HEATERS, DH-1 AND DH-2, SO THAT CLEARANCES ARE MET BY THE MANUFACTURER REQUIREMENTS.

△4

3 M100 **HVAC DINING ROOM SECTION**
1/4" = 1'-0"



2 M100 **HVAC ROOF PLAN**
1/8" = 1'-0"



1 M100 **HVAC FLOOR PLAN**
1/4" = 1'-0"

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Contents:
HVAC PLAN

M100

SANITIZING EQUIPMENT SCHEDULE

TAG	COUNT	DESCRIPTION	FURNISHED BY	INSTALLED BY	BASIS FOR DESIGN		REMARKS
					MANUFACTURER	MODEL	
SB-1	2	BATHROOM AIR PURIFICATION UNIT	TUV	GC	RGF ENVIRONMENTAL GROUP	BRU ASSEMBLY	SEE ELECTRICAL SHEETS FOR CONNECTION INFORMATION
SH-1	2	HVAC AIR PURIFICATION UNIT	TUV	GC	RGF ENVIRONMENTAL GROUP	REME-HALO	SEE DETAIL 6/M700 FOR INSTALLATION INFORMATION.
SI-1	3	ICE MACHINE TREATMENT SYSTEM	TUV	GC	RGF ENVIRONMENTAL GROUP	IMS-B-GA	SEE PLUMBING DRAWINGS FOR INSTALLATION INFORMATION.

VIROGUARD SCHEDULE

TAG	QUANITITY	DESCRIPTION	DUCT CONNECTION SIZE	FAN	FURNISHED BY	INSTALLED BY	BASIS FOR DESIGN MANUFACTURER
VG-1	1	VIROGUARD HOOD EXHAUST FAN ROOFTOP CONTAINMENT SYSTEM	16" X 16"	CAPTIVE-AIRE DU180HFA	TDC	GC	ENVIROMATIC

GRILLS, REGISTERS, AND DIFFUSERS SCHEDULE

TAG	DESCRIPTION	FACE SIZE	MATERIAL	FINISH	MOUNTING	FURNISHED BY	INSTALLED BY	BASIS FOR DESIGN		NOTES
								MANUFACTURER	MODEL	
CD1	PERFORATED CEILING DIFFUSER	24" X 24"	ALUMINUM	WHITE	LAY-IN CEILING	GC	GC	NAILOR	4320A TYPE L	PROVIDE INTEGRAL OBD
CD2	PERFORATED CEILING DIFFUSER	24" X 12"	ALUMINUM	WHITE	LAY-IN CEILING	GC	GC	NAILOR	4320A TYPE L	PROVIDE INTEGRAL OBD, REMOVE 4-WAY DEFLECTOR
CD3	PERFORATED CEILING DIFFUSER	12" X 12"	ALUMINUM	WHITE	GYP CEILING	GC	GC	NAILOR	4320A TYPE S	PROVIDE INTEGRAL OBD
ER1	PERFORATED CEILING EXHAUST	12" X 12"	ALUMINUM	WHITE	GYP CEILING	GC	GC	NAILOR	4330R TYPE S	PROVIDE INTEGRAL OBD
RG1	PERFORATED CEILING RETURN	48" X 24"	ALUMINUM	WHITE	LAY-IN CEILING	GC	GC	NAILOR	4330R TYPE L	
RG2	PERFORATED CEILING RETURN	48" X 24"	ALUMINUM	WHITE	GYP CEILING	GC	GC	NAILOR	4330R TYPE S	
SR1	DOUBLE DEFLECTION SUPPLY REGISTER	SEE NECK SIZE	ALUMINUM	WHITE	WALL	GC	GC	NAILOR	51DH	PROVIDE INTEGRAL OBD

FAN SCHEDULE

TAG	DRIVE TYPE	EXHAUST FLOW [CFM]	E.S.P. [in W.C.]	WEIGHT [lbs]	ELECTRICAL		FURNISHED BY	INSTALLED BY	BASIS FOR DESIGN		REMARKS
					MOTOR POWER	V/P/H			MANUFACTURER	MODEL	
EF-1	DIRECT	2550 CFM	1.20 in-wg	400	2	208/3/60	HS	GC	CAPTIVE-AIRE	DU180HFA	FURNISHED WITH DISCONNECT AND VENTED ROOF CURB
EF-2	DIRECT	150 CFM	0.60 in-wg	100	0.18 HP	120/1/60	HS	GC	CAPTIVE-AIRE	DR12HFA	FURNISHED WITH DISCONNECT, VARIABLE SPEED CONTROLLER, BACKDRAFT DAMPER AND ROOF CURB

DUCT HEATER SCHEDULE

TAG	DESCRIPTION	TOTAL [CFM]	DUCT SIZE		NUMBER OF STEPS	MBH	EAT [DEG. F]	ELECTRICAL		FURNISHED BY	INSTALLED BY	BASIS FOR DESIGN		REMARKS
			DUCT WIDTH	DUCT HEIGHT				KW	V/P/H			MANUFACTURER	MODEL	
DH-1	KITCHEN DUCT HEATER	3500 CFM	30"	14"	2	108	59	32	208/3/60	GC	GC	INDEECO	OPEN COIL	THERMAL CUTOUT, AIRFLOW SWITCH, VERIFY DUCT SIZE PRIOR TO ORDERING
DH-2	DINING ROOM DUCT HEATER	3500 CFM	30"	14"	2	124	54	36	208/3/60	GC	GC	INDEECO	OPEN COIL	THERMAL CUTOUT, AIRFLOW SWITCH, VERIFY DUCT SIZE PRIOR TO ORDERING

AIR BALANCE SCHEDULE

Tag	Supply Flow [CFM]	Return Flow [CFM]	Exhaust Flow [CFM]	Subtotal [CFM]
EF-1	0	0	2550	-2550
EF-2	0	0	150	-150
MAU-1	1300	0	0	1300
RTU-1	3500	2900	0	600
RTU-2	3500	2600	0	900
Net Pressurization [CFM]				100

MAKEUP AIR UNIT SCHEDULE

TAG	DESCRIPTION	AIRFLOW		HEATING CAPACTIY			APPROXIMATE WEIGHT [lbs]	ELECTRICAL		FURNISHED BY	INSTALLED BY	BASIS FOR DESIGN		REMARKS
		SUPPLY FLOW [CFM]	E.S.P. [in. W.C.]	OUTPUT [MBH]	ELECTRIC HEATING (KW)	EAT		MOTOR POWER	V/P/H			MANUFACTURER	MODEL	
MAU-1	MAKEUP AIR UNIT	1300	0.80	123	21	21 °F	650	1 HP	208/3/60	HS	GC	CAPTIVE-AIRE	A1-E.362-15D	FURNISHED WITH SINGLE POINT CONNECTION, DISCONNECTS, ROOF CURB, SCREEN INTAKE, AND WASHABLE ALUMINUM FILTERS

CONTROL FUNCTIONS

A. THE MAIN COOKING EXHAUST FAN AND MAKE-UP AIR UNIT SHALL BE INTERLOCKED TO OPERATE TOGETHER. THIS CONTROL CIRCUIT IS ACTIVATED BY A SWITCH AND INCLUDES A FIRE PROTECTION OVERRIDE.
B. THE TEMPERATURE IN EACH ZONE IS CONTROLLED BY SPACE TEMPERATURE SENSORS CONNECTED TO THE THERMOSTATS LOCATED IN THE OFFICE. ALL ZONES SHALL OPERATE WITH CONTINUOUS FAN OPERATION DURING OCCUPIED TIMES AND INTERMITTENTLY AS NEEDED TO MAINTAIN SET POINTS DURING UNOCCUPIED TIMES. OUTSIDE AIR DAMPERS SHALL BE OPEN CONTINUOUSLY WHEN EITHER IN OCCUPIED MODE OR WHEN THE HOOD SYSTEM IS ON AND SHALL BE CLOSED DURING UNOCCUPIED PERIODS.
C. THE THERMOSTATS SHALL DETERMINE OCCUPIED/UNOCCUPIED STATUS BASED ON THE SCHEDULE IN THE ENERGY MANAGEMENT SYSTEM.

CONDENSING UNIT SCHEDULE

TAG	DESCRIPTION	NOMINAL CAPACITY [TONS]	NUMBER OF COMPRESSORS	NUMBER OF CIRCUITS	REFRIGERANT TYPE	REFRIGERANT CHARGE	WEIGHT	ELECTRICAL			FURNISHED BY	INSTALLED BY	BASIS FOR DESIGN		REMARKS
								MOCP	FLA	V/P/H			MANUFACTURER	MODEL	
CU-1	WALK-IN COOLER REMOTE CONDENSING UNIT	--	1	1	R-448A	9.9	200	15 A	7.2 A	208/3/60	WCS	GC	EVERIDGE	RFO130E4SEA	FURNISHED WITH WALK-IN COOLER
CU-2	ICE MAKER - REMOTE CONDENSER	--	0	1	R-404A	11 lbs 7.4 oz	100			120/1/60	KES	GC	-	-	FURNISHED WITH ICE MAKER
CU-3	ICE MAKER - REMOTE CONDENSER	--	0	1	R-404A	11 lbs 7.4 oz	100			120/1/60	KES	GC	-	-	FURNISHED WITH ICE MAKER

ROOFTOP UNIT SCHEDULE

TAG	DESCRIPTION	NOMINAL CAPACITY [TONS]	EER	AIRFLOW			NET COOLING CAPACITY					# OF COMPRESSORS	# OF CIRCUITS	REFRIG. TYPE	REFRIG. CHARGE	APPROX. WEIGHT [lbs]	ELECTRICAL			FURNISHED BY	INSTALLED BY	BASIS FOR DESIGN		REMARKS
				TOTAL [CFM]	OA [CFM]	ESP [IN. W.C.]	TOTAL [MBH]	SENSIBLE [MBH]	EAT [DEG. F]		COND. EAT [DEG. F]						MOCP	FLA	V/P/H			MANUFACTURER	MODEL	
									DB	WB														
RTU-1	KITCHEN ROOFTOP UNIT	10	12.2	3500	600	0.8	117	73	75	64	91	2	2	R-454B	6.8/6.12	1500	70 A	54.8 A	208/3/60	HES	GC	YORK	KJ120	FURNISHED WITH COMP. ENTHALPY ECON., BAROMETRIC RELIEF, RET. SMOKE DETECTOR W/ REMOTE KEYED ANNUNCIATOR/RESET, M.O.D., MERV-8 FILTERS, CURB, HAIL GUARD, TOOLLESS HINGED ACCESS PANELS, DISCONNECT, & UNIT-MOUNTED CONVENIENCE RECEPTACLE, & CAP UNUSED NATURAL GAS CONNECTION.
RTU-2	DINING ROOM ROOFTOP UNIT	10	12.2	3500	900	0.8	118	71	77	66	91	2	2	R-454B	6.8/6.12	1500	70 A	54.8 A	208/3/60	HES	GC	YORK	KJ120	FURNISHED WITH COMP. ENTHALPY ECON., BAROMETRIC RELIEF, RET. SMOKE DETECTOR W/ REMOTE KEYED ANNUNCIATOR/RESET, M.O.D., MERV-8 FILTERS, CURB, HAIL GUARD, TOOLLESS HINGED ACCESS PANELS, DISCONNECT, & UNIT-MOUNTED CONVENIENCE RECEPTACLE, & CAP UNUSED NATURAL GAS CONNECTION.

KITCHEN HOOD SCHEDULE

TAG	DESCRIPTION	MAX COOKING TEMP.	EXHAUST PLENUM						PERFORATED SUPPLY PLENUMS										NUMBER OF LIGHT FIXTURES	APPROXIMATE WEIGHT [lbs]	FURNISHED BY	INSTALLED BY	BASIS FOR DESIGN		REMARKS
			AIRFLOW [CFM]	SP [in. W.C]	DUCT COLLARS			LENGTH	WIDTH	SP [in. W.C.]	SUPPLY PLENUM LENGTH	SUPPLY PLENUM WIDTH	MAU PLENUM				AC PLENUM								
					NO.	WIDTH	LENGTH						AIRFLOW [CFM]	DUCT COLLARS			AIRFLOW [CFM]	DUCT COLLARS							
														NO.	WIDTH	LENGTH		NO.	DIAMETER				MANUFACTURER	MODEL	
HD-1	TYPE I CANOPY HOOD WITH PERFORATED MAU AND AC SUPPLY PLENUMS	600°F	2550	0.97	1	10"	24"	12' - 9"	4' - 3"	0.1	13' - 9"	19"	1300	3	6"	28"	700	6	8"	8	1100	HS	GC	CAPTIVE-AIRE	5424 ND-2-ACPSP-F	MAT'L: 18 GA. TYPE 430 SS. FURNISHED WITH VERTICAL END PANELS, 24V GAS VALVE, VAPORPROOF INCANDESCENT LIGHT FIXTURES, 16" TALL HE SS FILTERS, INTEGRAL UTILITY CABINET, KITCHEN EXHAUST SUPPRESSION SYSTEM, DUCT COLLAR TEMPERATURE SENSOR, PREWIRE PACKAGE, SPARE FIRE SYSTEM DRY CONTACT, AND 4-POLE 20A CONTACTOR

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Contents:
HVAC SCHEDULES

M600

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PATENT NUMBERS

AC-PSP (UNITED STATES) - US PATENT 7963830 B2.
AC-PSP WALL (CANADA) - CA PATENT 2820509.
AC-PSP ISLAND (CANADA) - CA PATENT 2520330.

HOOD INFORMATION - JOB#7552739

HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL EXH CFM	EXHAUST PLENUM RISER(S)							MUA CFM	AC CFM	HOOD CONSTRUCTION	HOOD CONFIG	
										WIDTH	LENG	HEIGHT	DIA	CFM	VEL	SP				END TO END	ROW
1	HD - 1	5424 ND-2-ACPSP-F	CAPTIVEAIRE	12' 9"	600 DEG	I	HEAVY	200	2550	10"	24"	4"		2550	1530	-0.966"	1300	696	430 SS WHERE EXPOSED	ALONE	ALONE

HOOD INFORMATION

HOOD NO	TAG	FILTER(S)					LIGHT(S)			UTILITY CABINET(S)					FIRE SYSTEM PIPING	HOOD HANGING WEIGHT
		TYPE	QTY	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	QTY	TYPE	WIRE GUARD	LOCATION	SIZE	FIRE SYSTEM TYPE	FIRE SYSTEM SIZE	ELECTRICAL MODEL #	SWITCHES QUANTITY		
1	HD - 1	CAPTRATE SOLO FILTER	9	16"	16"	85% SEE FILTER SPEC	8	L55 SERIES E26	NO	LEFT	12"x54"x24"	TANK FS	4.0/4.0	DCV-1111	1 LIGHT 1 FAN	YES	1217 LBS

HOOD OPTIONS

HOOD NO	TAG	OPTION
1	HD - 1	FIELD WRAPPER 10.00" HIGH FRONT, LEFT, RIGHT.
		INSULATION FOR BACK OF HOOD.
		RISER SENSOR INSTALL 6IN PLEN.
		RIGHT VERTICAL END PANEL 27" TOP WIDTH, 21" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS.
		LEFT VERTICAL END PANEL 27" TOP WIDTH, 21" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS.
		FULL DIMENSION HANGING BRACKET - FRONT.

PERFORATED SUPPLY PLENUM(S)

HOOD NO	TAG	POS	LENGTH	WIDTH	HEIGHT	TYPE	RISER(S) WIDTH	LENG	DIA	CFM	SP
1	HD - 1	Front	165"	19"	6"	MUA	6"	28"		432	0.127"
						MUA	6"	28"		432	0.127"
						MUA	6"	28"		432	0.127"
						AC			8"	116	0.043"
						AC			8"	116	0.043"
						AC			8"	116	0.043"
						AC			8"	116	0.043"
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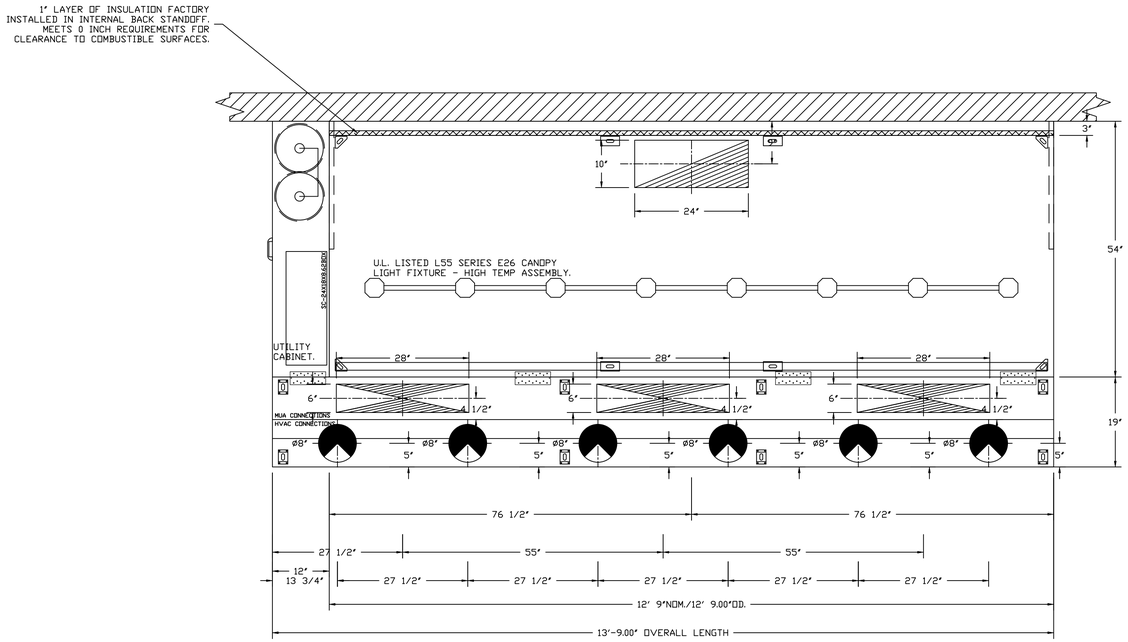


PLAN VIEW - HOOD #1 (HD - 1)
12' 9.00" LONG 5424ND-2-ACPSP-F
NOTE: ADDITIONAL HANGING ANGLES PROVIDED FOR HOODS 12' AND LONGER.

ACPSP SHIPS LOOSE FOR FIELD INSTALLATION

CLEARANCE TO COMBUSTIBLES

HOODS #	SURFACE	*CLEARANCE
1	TOP	18"
	FRONT	0"
	BACK	0"
	LEFT	0"
	RIGHT	18"

- *0" CLEARANCE TO COMBUSTIBLES CONFORMS TO UL710 STANDARD.
- HOOD MOUNTED UTILITY CABINETS REQUIRE 36" SERVICE CLEARANCE.

SPECIFICATION: CAPTRATE® GREASE-STOP® SOLO FILTER

THE CAPTRATE GREASE-STOP SOLO FILTER IS A SINGLE-STAGE FILTER FEATURING A UNIQUE S-BAFFLE DESIGN IN CONJUNCTION WITH A SLOTTED REAR BAFFLE DESIGN, TO DELIVER EXCEPTIONAL FILTRATION EFFICIENCY.

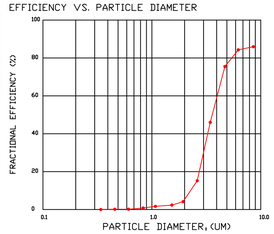
FILTER IS STAINLESS STEEL CONSTRUCTION, AND SIZED TO FIT INTO STANDARD 2-INCH DEEP HOOD CHANNEL(S).

UNITS SHALL INCLUDE STAINLESS STEEL HANDLES AND A FASTENING DEVICE TO SECURE THE TWO COMPONENTS WHEN ASSEMBLED.

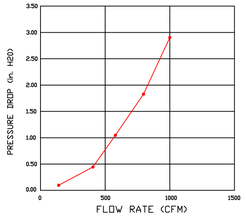
GREASE EXTRACTION EFFICIENCY PERFORMANCE SHALL REMOVE AT LEAST 75% OF GREASE PARTICLES FIVE MICRONS IN SIZE, AND 85% GREASE PARTICLES SEVEN MICRONS IN SIZE AND LARGER, WITH A CORRESPONDING PRESSURE DROP NOT TO EXCEED 1.0 INCHES OF WATER GAUGE.

THE CAPTRATE GREASE-STOP SOLO WAS TESTED TO ASTM STANDARD ASTM F2519-05. MANUFACTURER APPROVED FOR USE IN SOLID FUEL APPLICATIONS AS A SPARK ARRESTER.

EFFICIENCY VS. PARTICLE DIAMETER

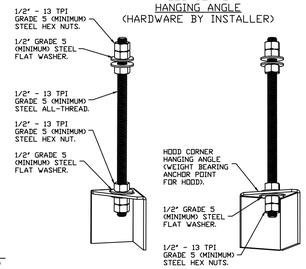


PRESSURE DROP VS. FLOW RATE

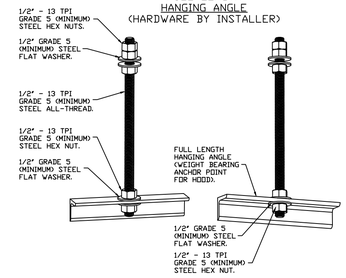


CAPTRATE FILTERS ARE BUILT IN COMPLIANCE WITH:
NFPA #96.
NSF STANDARD #2.
UL STANDARD #1046.
INT. MECH. CODE (IMC).
ULC-S649.

HOOD CORNER HANGING ANGLE (HARDWARE BY INSTALLER)



FULL LENGTH HANGING ANGLE (HARDWARE BY INSTALLER)



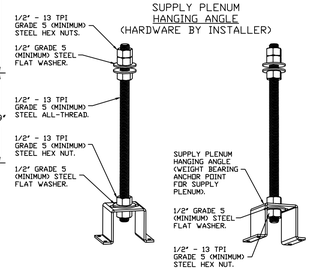
ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION BENEATH HOOD HANGING ANGLES AND ABOVE CEILING ANCHORS. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION ABOVE CEILING ANCHORS. SINGLE HEX NUT BENEATH HANGING ANGLE IS ACCEPTABLE FOR FULL LENGTH HANGING ANGLES. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

SUPPLY PLENUM HANGING ANGLE (HARDWARE BY INSTALLER)



ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION ABOVE CEILING ANCHORS. SINGLE HEX NUT BENEATH HANGING ANGLE IS ACCEPTABLE FOR PSP HANGING ANGLES. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

National Engineering, Ltd
4635 Trueman Blvd, Suite 250
Hilliard, OH 43026
(614) 751-9610

NATIONAL ENGINEERING

☑ Approved ☐ Approved as Noted ☐ Revise and Resubmit ☐ Rejected

BY Edgar Palma **DATE** 6/23/2025

SUBMITTAL# 1 **SPEC** CaptiveAire

Approval is only for general conformance with the design concept and the information given in the Construction Documents. Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with the requirements of the plans and specifications. Review of a specific item shall not include review of an assembly of which the item is a component. The Contractor is responsible for: dimensions to be confirmed and correlated at the jobsite; information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences and procedures of construction; coordination of the Work with that of all other trades and performing all work in a safe and satisfactory manner.

REVISIONS

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CAPTIVEAIRE

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www.captiveaire.com

CHIPOTLE LYNDEN WA #5890_R1
8083 Guide Meridian Road,
Lynden, WA, 98264

DATE: 6/16/2025

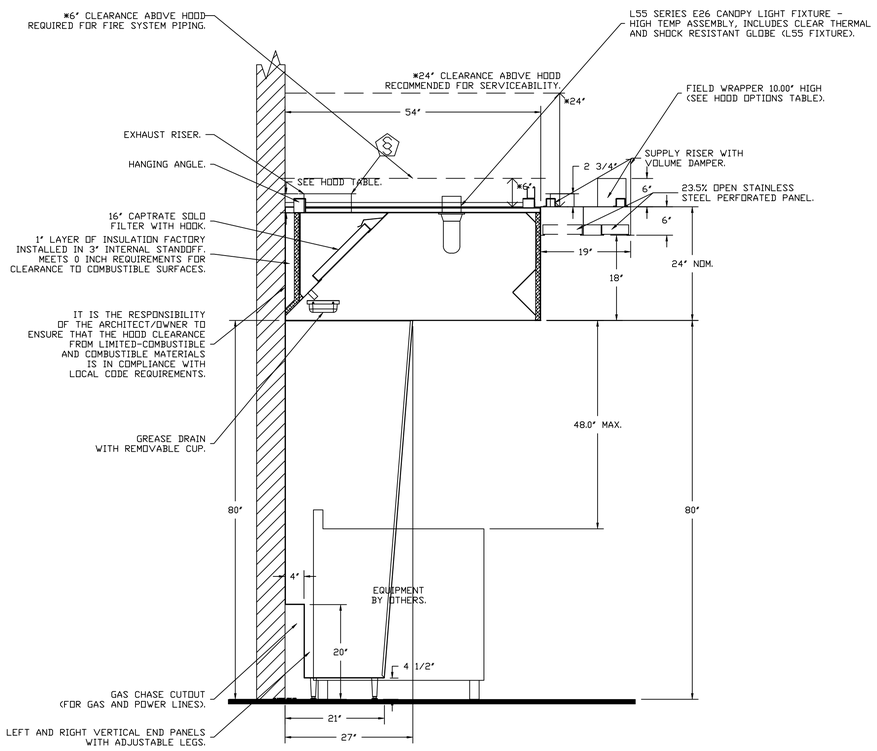
DWG.#: 7552739

DRAWN BY: JMB-40

SCALE: 3/4" = 1'-0"

MASTER DRAWING

SHEET NO. 1



SECTION VIEW - MODEL 5424ND-2-ACPSP-F
HOOD - #1 (HD - 1)

REVISIONS

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MASTER DRAWING

SHEET NO. 2

FIRE SYSTEM INFORMATION – JOB#7552739

FIRE SYSTEM NO	TAG	TYPE	SIZE	MAX FP	DESIGN FP	INSTALLATION	
						SYSTEM	LOCATION ON HOOD
1		TANK FS	4.0/4.0	40	32	FIRE CABINET LEFT	LEFT, HOOD 1

GAS VALVE(S)

FIRE SYSTEM NO	TAG	TYPE	SIZE	SUPPLIED BY
1		SC ELECTRICAL	1.250	CAPTIVEAIRE SYSTEMS

FIRE SYSTEM PARTS LIST KEY

FIRE SYSTEM NO	TAG	KEY NUMBER – PART DESCRIPTION	QTY BY FACTORY	QTY BY DIST
1		0 – 0 – TANK FIRE SUPPRESSION POST-DISCHARGE PROCEDURE UTILITY CABINET LABEL SHEET.	1	0
		0 – 0 – TANK FIRE SUPPRESSION MAINTENANCE GUIDE UTILITY CABINET LABEL SHEET.	1	0
		0 – 0 – 12-F28021-32144-DT-360 DUCT FIRE THERMOSTAT WITH 12 FOOT WIRE LEADS. NO, CLOSE ON TEMP RISE AT 360°F. (A0034310).	1	0
		0 – 0 – 32-00002 QUIK SEAL – 1/2" (UL).	1	0
		0 – 0 – 4429K153 1/2" MALE NPT TO 1/2" FEMALE NPT ELBOW, BRASS.	2	0
		0 – 0 – 4429K422 1/2" X 1/4" BRASS REDUCING BUSHING.	1	0
		0 – 0 – 79525 1/2" 90 PRO-PRESS ELBOW WITH 1/2" NPT FEMALE CONNECTION, VIEGA.	1	0
		0 – 0 – 79580 1/2" X 1/2" PRO-PRESS TEE X 1/2" NPT FEMALE CONNECTION, VIEGA.	2	0
		0 – 0 – 87-120042-001 SECONDARY ACTUATOR VALVE (SVA) – SINGLE ACTUATOR, REQUIRES PRIMARY RELEASE ACTUATOR, TANK FIRE SUPPRESSION.	1	0
		0 – 0 – 87-120045-001 HOSE, SECONDARY ACTUATOR HOSE, 7.5' BRAIDED STAINLESS STEEL, TANK FIRE SUPPRESSION.	1	0
		0 – 0 – 87-300001-001 TANK – PRESSURIZED TANK USED FOR TANK FIRE SUPPRESSION.	2	0
		0 – 0 – 87-300030-001 PRIMARY ACTUATOR KIT (PAK) – ACTUATOR AND RELEASE SOLENOID ASSEMBLY, ONE NEEDED PER FIRE SYSTEM, SUPERVISED, TANK FIRE SUPPRESSION.	1	0
		0 – 0 – 87-300033-001 DIN CONNECTOR, CANFIELD PART #5J560-201-EU0A, TANK FIRE SUPPRESSION, SUBMINATURE SOLENOID CONNECTION (CED VENDOR 30377).	1	0
		0 – 0 – 87-300152-001 HARDWARE, SVA BOLTS, TANK FIRE SUPPRESSION.	8	0
		0 – 0 – 9055455PC PRO PRESS 1/2 PRESS X PRESS 90 ELBOW LD.	7	0
		0 – 0 – 9097200PC PRO PRESS PC611 1/2 PRESS TEE LD.	7	0
		0 – 0 – 98694A115 HARDWARE, DATANKLOCK LOCKING BRACKET SQUARE NUTS 5/16" ZINC, TANK FIRE SUPPRESSION.	4	0
		0 – 0 – A0034332 JUNCTION BOX FOR MANUAL PULL STATION. 1.5" DEEP BACK BOX, RED COLOR.	1	0
		0 – 0 – A31484 1/4" NPT SCHRADER VALVE AND CAP, JB INDUSTRIES. 1/4" FLARE X 1/4" MPT HALF UNION. USED ON TANK SERVICE PORT.	1	0
		0 – 0 – BI145 3/8" BLACK IRON 90 ELL.	3	0
		0 – 0 – DATANKLOCK DISCHARGE ADAPTER TANK LOCKING PLATE FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.	2	0
		0 – 0 – TANK STRAP TANK STRAP – USED FOR TANK FIRE SUPPRESSION.	6	0
		0 – 0 – TFS-UCTANKBRACKET TANK BRACKET FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.	2	0
		0 – 0 – WK-283952-000 DISCHARGE ADAPTER, TANK FIRE SUPPRESSION.	2	0
		16 – 16 – 79210 1/2" X 3/8" NPT MALE ADAPTER, VIEGA.	8	0
		16 – 16 – DL-F NOZZLE – TANK PROTECTION APPLIANCE COVERAGE NOZZLE (INCLUDES METAL BLOW OFF CAP, LANYARD, USED WITH CHROME-PLATED PIPE).	8	0
		26 – 26 – QSA-3/8 QUIK SEAL – 3/8" (UL).	8	0
		34 – 34 – A0034331 24VDC SINGLE ACTION MANUAL ACTUATION DEVICE (PUSH/PULL STATION) WITH PROTECTIVE COVER, ONE (1) NORMALLY OPEN CONTACT. RED COLOR.	1	0

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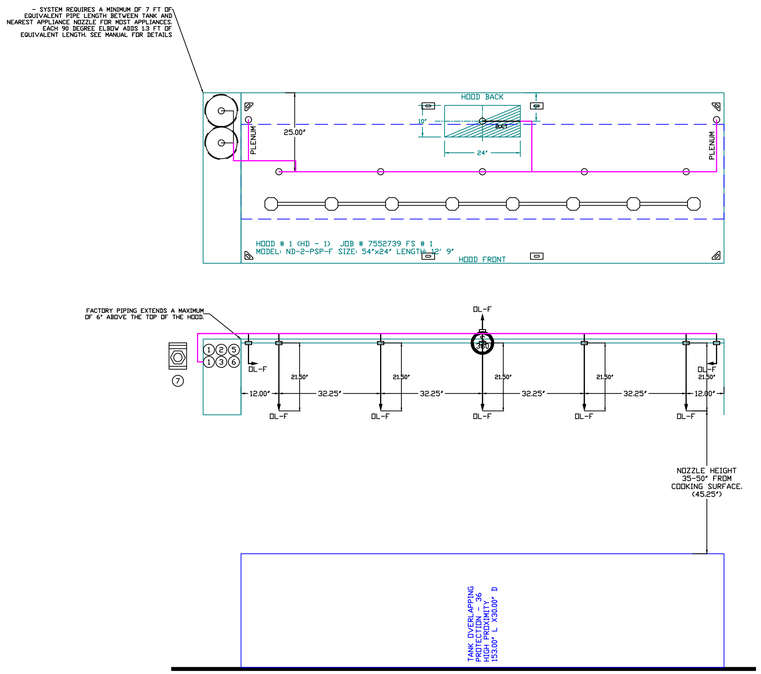
DWG.#: 7552739

DRAWN BY: JMB-40

SCALE: 3/4" = 1'-0"

MASTER DRAWING

SHEET NO. 3



SECTION VIEW - MODEL 5424ND-2-ACPSP-F HOOD - #1

NOTES
- FIELD PIPE DROPS AS SHOWN
- PIPING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY CAS.
- FIELD INSTALLED DROP: FACTORY WILL PROVIDE QTY 2 60IN LONG PIECES OF CHROME PLATED PIPING SHIPPED LOOSE TO BE FIELD-INSTALLED.
- SHIP LOOSE DROP: FACTORY WILL PROVIDE THE EXACT CHROME PIPE LENGTH NEEDED SHIPPED LOOSE TO BE FIELD-INSTALLED.
- RELOCATE NOZZLES IF FLOW PATTERN IS BLOCKED BY SHELVING, SALAMANDERS, ETC.
- OVERLAPPING COVERAGE SHALL NOT BE USED ON ANY APPLIANCE WITH AN OBSTRUCTION.
- IF APPLICABLE, EXTENDED PRE-PIPED DROPS ARE SHIPPED LOOSE.
- FACTORY PIPING EXTENDS A MAXIMUM OF 6" ABOVE THE TOP OF THE HOOD.

- APPLIANCE DIMENSIONS LISTED REPRESENT THE COOKING SURFACE SIZE, NOT THE OVERALL APPLIANCE SIZE.

- THIS PRE-ENGINEERED FIRE SYSTEM COMPLIES WITH U.L. 300 REQUIREMENTS.

- OL-F NOZZLE PART NUMBER REPLACES 3070-3/8H-10-SS

JOB #: 7552739.
JOB NAME: CHIPOTLE LYNDEN WA #5890_R1.

SYSTEM SIZE: TANK-SP-2 DESIGN FP: 32. MAXIMUM FP: 40.
HOOD # 1 12' 9.00" LONG x 54" WIDE x 24" HIGH.
RISER # 1 SIZE: 10" x 24".
HOOD # 1 METAL BLOW-OFF CAPS INCLUDED.

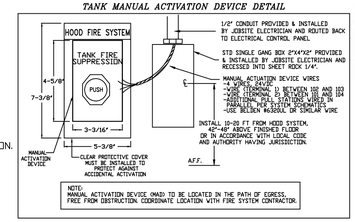
- HEAVY-DUTY APPLIANCES (RATED 600°F) WILL REQUIRE AN ADDITIONAL DOWNSTREAM FIRESTAT IN THE EVENT THAT THE DUCTWORK CONTAINS ANY HORIZONTAL RUNS OVER 25 FT IN LENGTH.
- MEDIUM TO LIGHT-DUTY APPLIANCES (RATED 450°F) WILL NOT REQUIRE ANY ADDITIONAL DOWNSTREAM DETECTION.

AGENT DISTRIBUTION PIPING LIMITATIONS	
PIPE SECTION	MAX PIPE LENGTH (FT)
MAX SUPPLY LINE TO FIRST OVERLAPPING NOZZLE	42
OVERLAPPING NOZZLE APPLIANCE BRANCH	10
DEDICATED NOZZLE APPLIANCE BRANCH	10

LEGEND - FIRE CABINET TANK SYSTEM

1 4 GALLON TANK.
2 PRIMARY ACTUATOR RELEASE.
3 SECONDARY ACTUATOR RELEASE.
4 PRESSURE SUPERVISION SWITCH.
5 PRIMARY HOSE ASSEMBLY.
6 SECONDARY HOSE ASSEMBLY.
7 REMOTE MANUAL ACTUATION DEVICE.

TANK MANUAL ACTIVATION DEVICE DETAIL



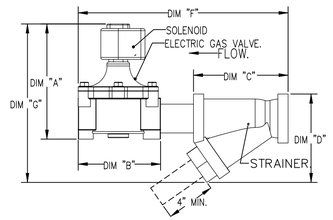
INCLUDES: FIELD INSTALLATION AND HOOKUP DURING NORMAL BUSINESS HOURS BY CERTIFIED INSTALLERS ONLY IN THE LOCATION NOTED ABOVE. TWO SITE VISITS ONLY (ONE VISIT TO SET PULL STATION & SYSTEM HOOKUP AND ONE VISIT FOR ONE TEST; ADDITIONAL VISITS WILL RESULT IN ADDITIONAL CHARGES), ONE MECHANICAL OR ELECTRICAL GAS VALVE PER SYSTEM AT A MAXIMUM SIZE OF 2", PERMIT, AND SYSTEM TEST.
EXCLUDES: UNION LABOR & PREVAILING WAGE (LABOR & WAGES WILL BE ADDED IF APPLICABLE), GAS VALVE INSTALLATION, ELECTRICAL HOOKUP AND CONNECTIONS, HANGING OF FIRE CABINET, SHUNT TRIP, HANDHELD EXTINGUISHER(S), ON-SITE RE-PIPING DUE TO EQUIPMENT LAYOUT CHANGES.

GAS VALVES AND STRAINERS															
GAS VALVE SIZING						GAS VALVE DIMENSIONS						INSTALLATION	PART NUMBERS		
	TYPE	SIZE	VOLTAGE	MIN. INLET PRESSURE	MAX. INLET PRESSURE	FLOW AT 1 IN.W.C. DROP NATURAL GAS	FLOW AT 1 IN.W.C. DROP PROPANE	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "F"	DIM "G"	PIPE ORIENTATION	GAS VALVE PART NUMBER	STRAINER PART NUMBER	GAS VALVE/STRAINER KIT
GAS VALVE FOR FS#1 →	ELECTRICAL	1-1/4"	24 VDC	0 PSI (0 IN.W.C.)	5 PSI (138 IN.W.C.)	1,925,000 BTU/HR	1,249,105 BTU/HR	7-5/8"	6-3/8"	5-1/8"	5-15/16"	13-1/2"	12-1/16"	HORIZONTAL	8214266-24VDC	4417K66	(SC)EGVC1-1/4-24

ELECTRIC GAS VALVES ONLY: SOLENOID ORIENTATION
3/4"-2" 120VAC GAS VALVES CAN BE MOUNTED WITH THE SOLENOID IN ANY POSITION AT OR ABOVE HORIZONTAL
2 1/2"-3" 120VAC GAS VALVES MUST BE MOUNTED WITH THE SOLENOID VERTICAL AND UPRIGHT.
240VAC GAS VALVES MUST BE MOUNTED WITH THE SOLENOID VERTICAL AND UPRIGHT.

ALL GAS VALVES/STRAINERS
PROPER CLEARANCE MUST BE PROVIDED IN ORDER TO SERVICE THE STRAINERS A MINIMUM OF 4" CLEARANCE DISTANCE MUST BE PROVIDED AT THE BASE OF THE STRAINER CUSTOMER MUST VERIFY BTU CONSUMPTION AS WELL AS PRESSURE RATING SPECIFIC GRAVITY OF NATURAL GAS = 0.64, SPECIFIC GRAVITY OF LP = 1.52.

CALCULATIONS
TO CALCULATE GAS FLOW FOR OTHER THAN 1 IN.W.C. PRESSURE DROP
NEW BTU/HR = (BTU/HR AT 1 IN.W.C. PRESSURE DROP) X NEW PRESSURE DROP$^{0.5}$
TO CALCULATE GAS FLOW FOR OTHER THAN 0.64 SPECIFIC GRAVITY
NEW BTU/HR = (BTU/HR AT 0.64) X (0.64 / NEW SPECIFIC GRAVITY)$^{0.5}$.



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SCALE: 1/2" = 1'-0"

MASTER DRAWING

SHEET NO. 4

EXHAUST FAN INFORMATION – JOB#7552739

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SONES
1	EF-1	1	DU180HFA	CAPTIVEAIRE	2550	1.450	1220	TEFC,PREMIUM	2.000	1.2800	3	208	7.3	589 FPM	199	16.6
2	EF-2	1	DR12HFA	CAPTIVEAIRE	150	0.600	1282	TEAO-ECM	0.250	0.0930	1	115	2.9		50	6.1

MUA FAN INFORMATION – JOB#7552739

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	BLOWER	HOUSING	MIN CFM	DESIGN CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	MCA	MOCP	WEIGHT (LBS)	SONES
3	MAU-1	1	A1-E.362-15D	15MF-1-MOD	A1-E.362	800	1300	0.500	1444	ODP	0.750	0.4780	3	208	2.5	90.9A	100A	471	10.6

ELECTRIC MAKE-UP AIR UNIT(S)

FAN UNIT NO	TAG	DSGN KW'S	MAX KW'S	PHASE	VOLTS	AMPERAGE	TEMP RISE	OUTPUT BTUs
3	MAU-1	21	36	3	208	86.6	45 °F	122868

FAN ACCESSORIES

FAN UNIT NO	TAG	EXHAUST			SUPPLY			
		GREASE CUP	GRAVITY DAMPER	WALL MOUNT	SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1	EF-1	YES						
2	EF-2		YES					
3	MAU-1						YES	

CURB ASSEMBLIES

NO	ON FAN	TAG	WEIGHT	ITEM	SIZE
1	# 1	EF-1	39 LBS	CURB	26.500"W X 26.500"L X 20.000"H VENTED.
2	# 2	EF-2	31 LBS	CURB	17.500"W X 17.500"L X 26.000"H.
3	# 3	MAU-1	65 LBS	CURB	21.000"W X 71.000"L X 20.000"H INSULATED.

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MASTER DRAWING

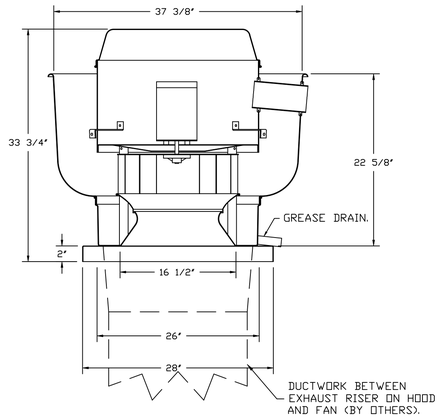
SHEET NO. 5

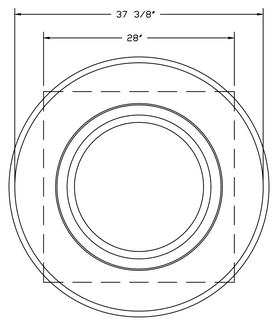
FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION
1	EF-1	1	GREASE BOX
		1	REMOVE HINGE KIT LABEL FROM THE FAN BASE
		1	2 YEAR PARTS WARRANTY
2	EF-2	1	I 12-BDD DAMPER
		1	ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL -RTC- (TELCO MOTOR), CCW ROTATION
		1	2 YEAR PARTS WARRANTY
3	MAU-1	1	SIZE 1 TEMPERED COMMERCIAL DOWN DISCHARGE FOR DIRECT DRIVE AHUS
		1	EH 1 MUA CONTROLS SHEET METAL
		1	MOTORIZED BACKDRAFT DAMPER FOR A1-D HOUSING - MEETS AMCA CLASS 1A RATING
		1	TOTAL CFM MONITORING
		1	FREEZESTAT
		1	SINGLE POINT CONNECTION - ELECTRIC HEATER - THREE PHASE - BLOWER & HEATER MUST BE THE SAME VOLTAGE & PHASE. IF A NON-DCV PREWIRE IS USED ON THE EH, #28, #47, MA OR E2 PREWIRE OPTION MUST BE SELECTED. DO NOT PROVIDE SUPPLY STARTER IN PREWIRE
		1	UNIT MOUNTED VFD FOR USE WITH ECPM03
		1	2 YEAR PARTS WARRANTY

HMI SCHEDULE				
UNIT NUMBER	HMI #	HMI LOCATION	TEMP AVERAGING	MODBUS ADDRESS
FAN #3	HMI #1 - UNIT	IN UNIT	NOT AVERAGED	55

FAN #1 DU180HFA - EXHAUST FAN (EF-1)





TOP VIEW

FEATURES:

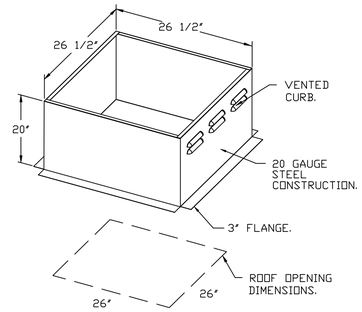
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT SWITCH.

NORMAL TEMPERATURE TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

ABNORMAL FLARE-UP TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

OPTIONS

- GREASE BOX.
- REMOVE HINGE KIT LABEL FROM THE FAN BASE.
- 2 YEAR PARTS WARRANTY.



REVISIONS

	DESCRIPTION	DATE:
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CHIPOTLE LYNDEN WA #5890_R1
8083 Guide Meridian Road,
Lynden, WA, 98264

DATE: 6/16/2025

DWG.#: 7552739

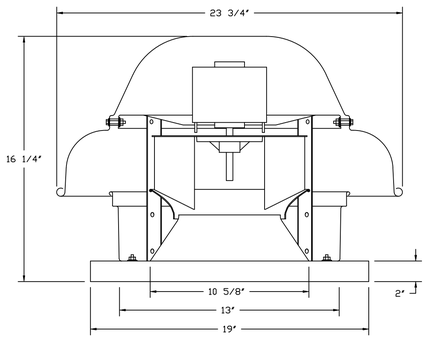
DRAWN BY: JMB-40

SCALE: 3/4" = 1'-0"

MASTER DRAWING

SHEET NO. 6

FAN #2 DR12HFA - EXHAUST FAN (EF-2)

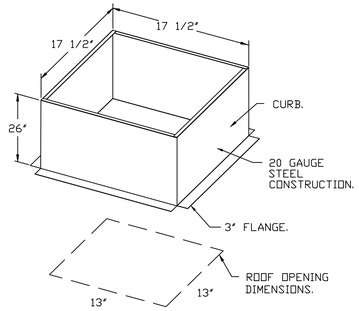


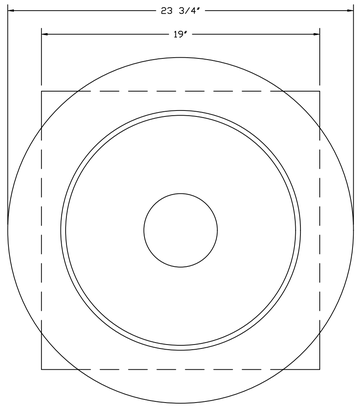
FEATURES:

- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- UL705.
- SAFETY DISCONNECT.
- STANDARD BIRD SCREEN.
- SPEED CONTROL.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).

OPTIONS

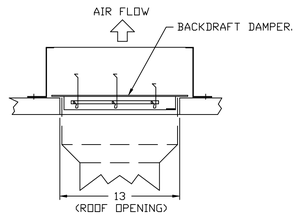
- I 12-BDD DAMPER.
- ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL -RTC- (TELCO MOTOR), CCW ROTATION.
- 2 YEAR PARTS WARRANTY.





TOP VIEW

BACKDRAFT DAMPER INSTALLATION



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DWG.#: 7552739

DRAWN BY: JMB-40

SCALE: 3/4" = 1'-0"

MASTER DRAWING

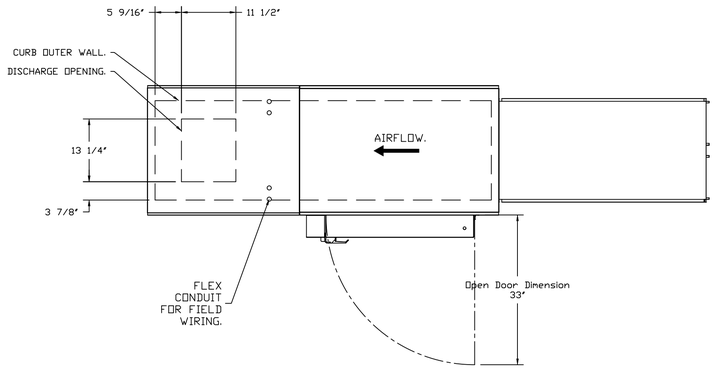
SHEET NO. 7

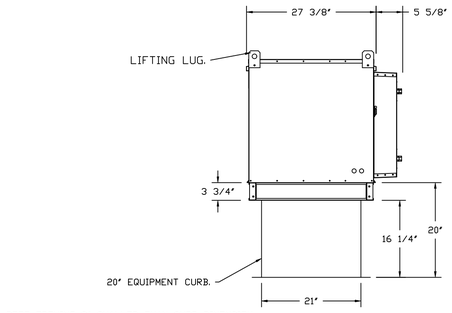
FAN #3 A1-E.362-15D - HEATER (MAU-1)
1. ELECTRIC HEATED MAKE UP AIR UNIT WITH 15" MIXED FLOW DIRECT DRIVE FAN AND A 3 STAGES TOTAL, 1 MODULATING, 36KW 240 - 3 COIL.
2. INTAKE HOOD WITH EZ FILTERS.
3. DOWN DISCHARGE - AIR FLOW RIGHT -> LEFT.
4. DOWN DISCHARGE CONSTRUCTION FOR SIZE 1 DIRECT DRIVE AHUS.
5. SIZE 1 ELECTRIC HEATER WITH MUA CONTROLS SHEET METAL.
6. MOTORIZED BACK DRAFT DAMPER 16" X 18" FOR SIZE 1 STANDARD & MODULAR HEATER UNITS W/EXTENDED SHAFT, STANDARD GALVANIZED CONSTRUCTION, 3/4" REAR FLANGE, LOW LEAKAGE, TFB120S ACTUATOR INCLUDED.
7. CFM MONITORING FOR MUA UNITS. USES RIVET NUTS, 1/4" AIRFLOW TUBING AND PUSH TO CONNECT FITTINGS.
8. FREEZESTAT.
9. SINGLE POINT CONNECTION FOR THREE PHASE ELECTRIC HEATERS - NOT USED WITH MULTIPLE HEAT MODULES.
10. UNIT MOUNTED VFD FOR USE WITH ECPM03.
11. 2 YEAR PARTS WARRANTY.

*NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE AS OUTLINED IN AMCA PUBLICATION 201. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THROAT, RADIUS BACK WITH TURNING VANES. FLEXIBLE DUCTWORK AND SQUARE THROAT/SQUARE BACK ELBOWS SHOULD NOT BE USED. ANY TRANSITION AND/OR TURNS IN THE DUCTWORK WILL CAUSE SYSTEM EFFECT. SYSTEM EFFECT WILL DRASTICALLY INCREASE STATIC PRESSURE AND REDUCE AIRFLOW. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECTS AND REDUCE PERFORMANCE OF THE EQUIPMENT.
SUGGESTED STRAIGHT DUCT SIZE IS 14" x 14".

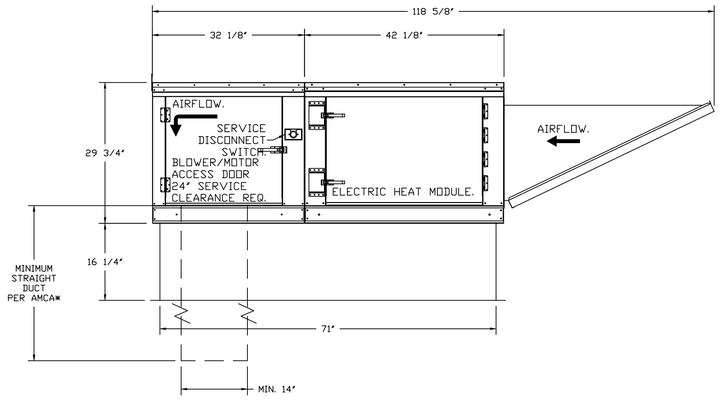
SUPPLY SIDE HEATER INFORMATION:

WINTER TEMPERATURE = 24°F. TEMP. RISE = 52°F.
KWs CALCULATED OFF ACTUAL AIR DENSITY.
KWs AT ALTITUDE OF 0.0 FT. = 21.
KWs AT ALTITUDE OF 61 FT. = 21.

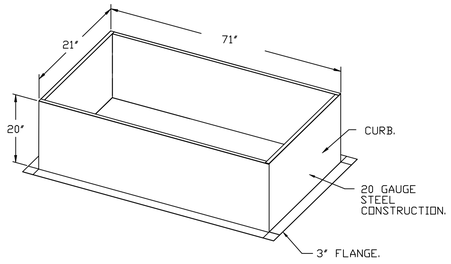




ROOF OPENING 2" SMALLER THAN CURB DIMENSION.



OPTIONS:
- FULL BOTTOM CORNERS.



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CHIPOTLE LYNDEN WA #5890_R1
8083 Guide Meridian Road,
Lynden, WA, 98264

DATE: 6/16/2025

DWG.#: 7552739

DRAWN BY: JMB-40

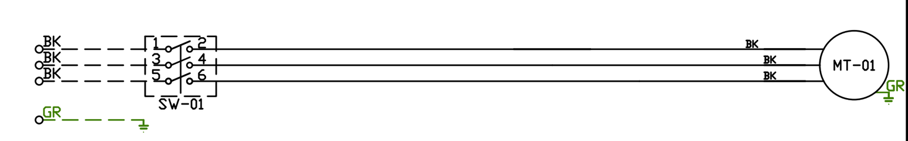
SCALE: 3/4" = 1'-0"

MASTER DRAWING

SHEET NO. 8

Exhaust Fan Wiring

Exhaust Fan Wiring	JOB 7552739 - CHIPOTLE LYNDEN WA #5890_R1	
DRAWING NUMBER EXH7552739-1	SHIP DATE 6/16/2025	MODEL DU180HFA



Installed Options

Component Identification

Label	Description	Location
MT-01	Fan Motor	[3]
SW-01	Main disconnect switch	[3]

MOTOR INFO
EXHAUST 2.0HP-208V-3P-7.3FLA
VFD PART: ESV222N02YXB571

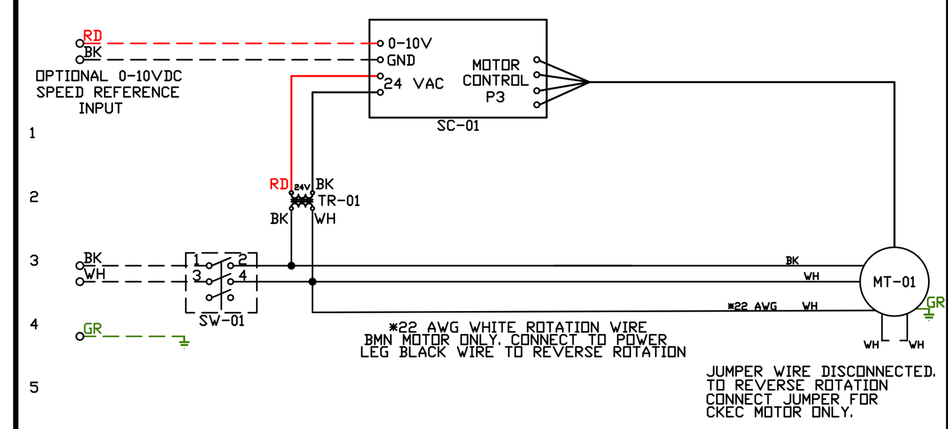
ELECTRICAL INFORMATION
MOTOR/CTRL MCA: 9.2A
MOTOR/CTRL MOP: 15A

NOTES
— — — DENOTES FIELD WIRING
——— DENOTES INTERNAL WIRING

WIRE COLOR
BK - BLACK YW - YELLOW
BL - BLUE GR - GREEN
BR - BROWN GY - GRAY
OR - ORANGE PR - PURPLE
RD - RED PK - PINK
WH - WHITE

Exhaust Fan Wiring

Exhaust Fan Wiring	JOB 7552739 - CHIPOTLE LYNDEN WA #5890_R1	
DRAWING NUMBER EXH7552739-2	SHIP DATE 6/16/2025	MODEL DR12HFA



Installed Options

Component Identification

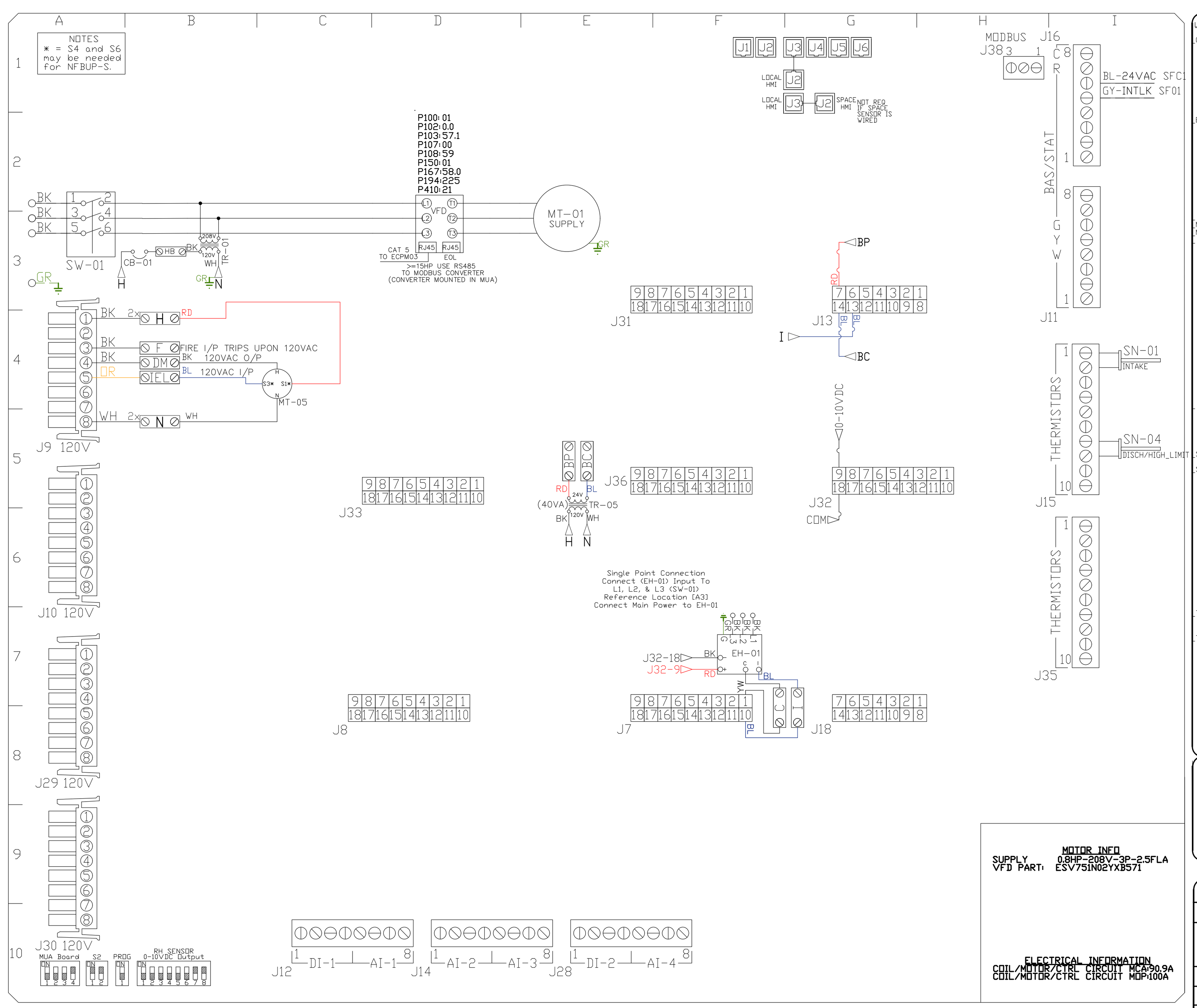
Label	Description	Location
MT-01	Fan Motor	[3]
SC-01	RTC-FSC-1	[1]
SW-01	Main disconnect switch	[3]
TR-01	24VAC 20VA Transformer	[2]

MOTOR INFO
EXHAUST 0.2HP-115V-1P-2.9FLA

ELECTRICAL INFORMATION
MOTOR/CTRL MCA: 3.7A
MOTOR/CTRL MOP: 15A

NOTES
— — — DENOTES FIELD WIRING
——— DENOTES INTERNAL WIRING

WIRE COLOR
BK - BLACK YW - YELLOW
BL - BLUE GR - GREEN
BR - BROWN GY - GRAY
OR - ORANGE PR - PURPLE
RD - RED PK - PINK
WH - WHITE



MOTOR INFO
SUPPLY 0.8HP-208V-3P-2.5FLA
VFD PART: ESV751N02YXB571

ELECTRICAL INFORMATION
COIL/MOTOR/CTRL CIRCUIT MCA: 90.9A
COIL/MOTOR/CTRL CIRCUIT MOP: 100A

COMPONENT LIST

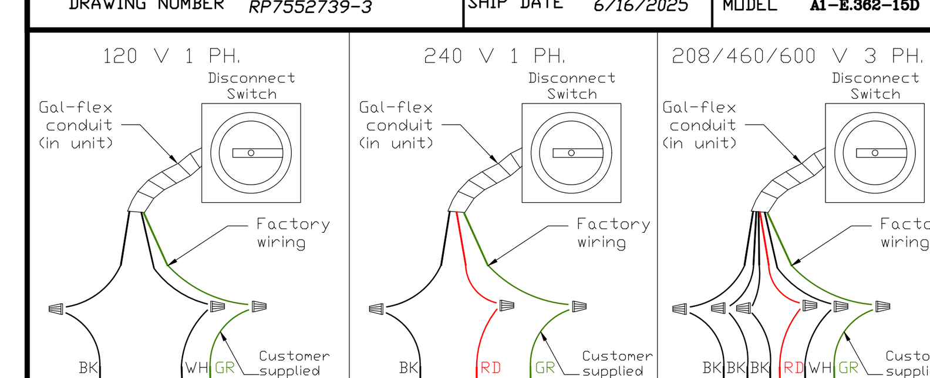
LABEL	DESCRIPTION	
CB-01	CIRCUIT_BREAKER	B3
EH-01	ELEC_HEAT_MODULE	F7
MT-01	SUPPLY_MOTOR	E3
MT-05	INTAKE_DAMPER_MTR	C4
SN-XX	TEMP_SENSOR	14/15/16/17
SW-01	DISCONNECT_SWITCH	A3
TR-01	CTRL_TRANSFMR	B3
TR-05	BOARD_POWER_TRFMR	E5

LEGEND
— — FIELD WIRING
—— FACTORY WIRING
BK- BLACK YW- YELLOW
BL- BLUE GY- GREY
BR- BROWN PR- PURPLE
OR- ORANGE RD- RED
WH- WHITE GR- GREEN
OR/BL- OR/BL STRIPE
BL/RD- BL/RD STRIPE
RD/GN- RD/GN STRIPE
WH/BL- WH/BL STRIPE

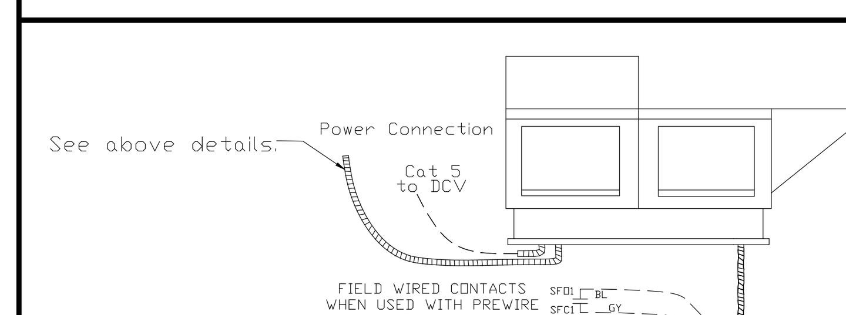
JOB NAME CHIPOTLE LYNDEN...	
DRAWING TITLE	
DESCRIPTION OF OPERATION MUA BOARD (DETAILS TO FOLLOW)	
JOB NO 7552739	DRAWN BY AUTO
TYPE FACTORY	DATE 6/16/2025
DWG # MW7552739-3	

Installation Wiring

Installation Wiring	JOB 7552739 - CHIPOTLE LYNDEN WA #5890_R1	
DRAWING NUMBER RP7552739-3	SHIP DATE 6/16/2025	MODEL A1-E.362-15D



STANDING POWER
RD & WH Wire (115V, 1 PHASE)
OPTIONAL FOLLOW FAN SCHEMATICS
SINGLE POINT ELECTRIC HEATER INPUT MUST BE SIZED FOR COIL AND MOTOR



Installed Options

Single Point Connection

Field Wired Switch

HMI SCHEDULE

UNIT NUMBER	HMI #	HMI LOCATION	TEMP AVERAGING	MODBUS ADDRESS
FAN #3	HMI #1 - UNIT	IN UNIT	NOT AVERAGED	55

NOTES

WIRE COLOR
BK - BLACK YW - YELLOW
BL - BLUE GR - GREEN
BR - BROWN GY - GRAY
OR - ORANGE PR - PURPLE
RD - RED PK - PINK
WH - WHITE

REVISIONS

	DESCRIPTION	DATE:
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8083 Guide Meridian Road,
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DATE: 6/16/2025

DWG.#: 7552739

DRAWN BY: JMB-40

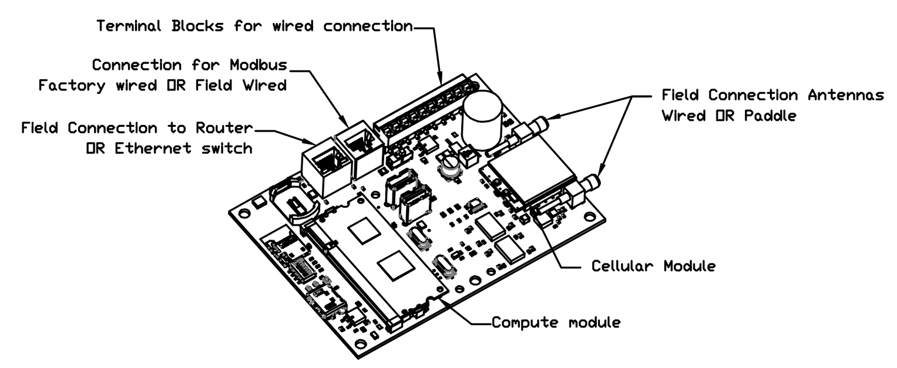
SCALE: 3/4" = 1'-0"

MASTER DRAWING

SHEET NO. 9

ELECTRICAL PACKAGE – JOB#7552739

NO	TAG	PACKAGE #	LOCATION	SWITCHES		OPTION	FANS CONTROLLED					
				LOCATION	QUANTITY		FAN TAG	TYPE	φ	HP	VOLT	FLA
1		DCV-1111	UTILITY CABINET LEFT	UTILITY CABINET LEFT	1 LIGHT	SMART CONTROLS DCV	EF-1	EXHAUST	3	2.000	208	7.3
				HOOD # 1	1 FAN		MAU-1	SUPPLY	3	0.750	208	2.5



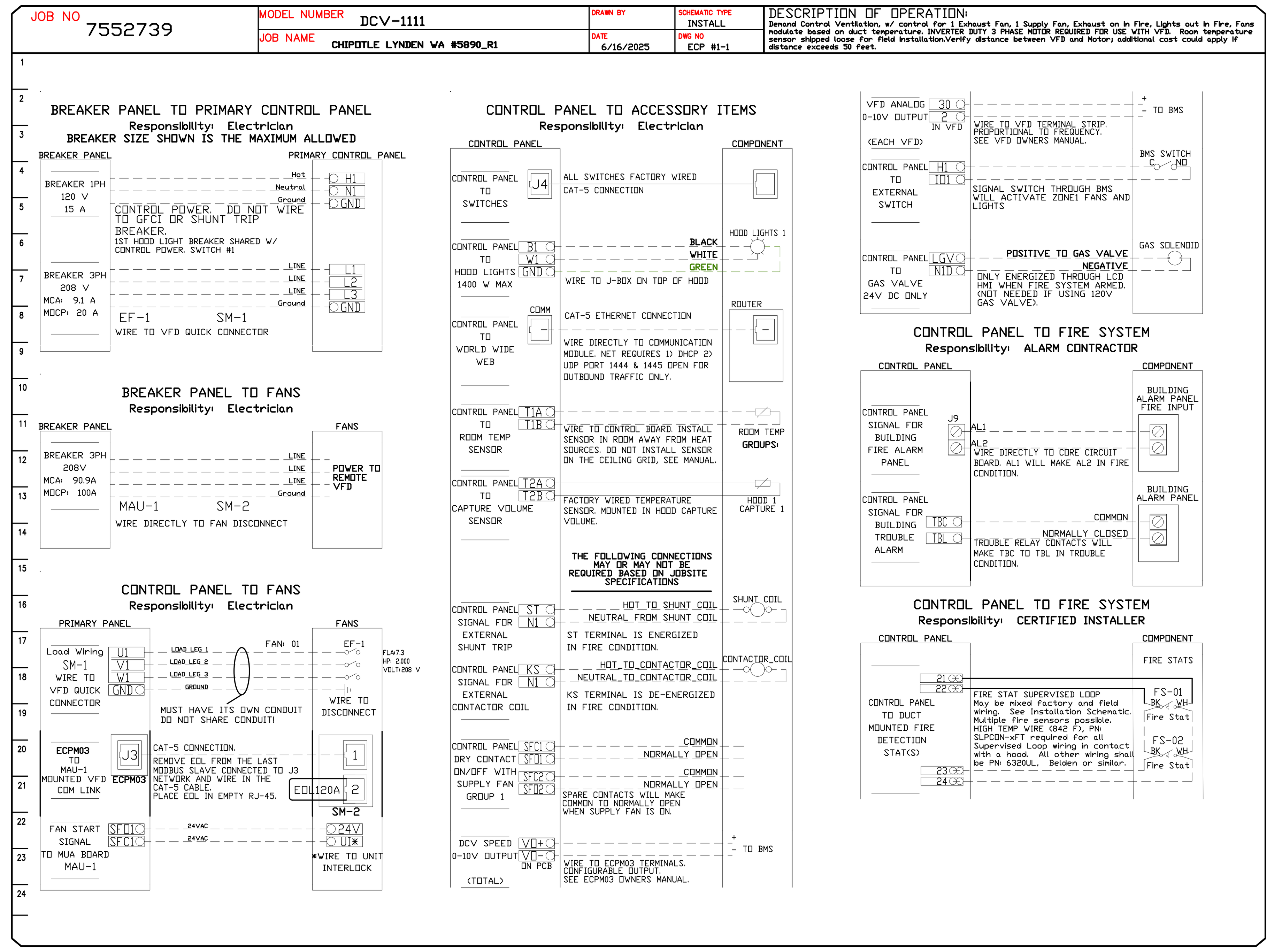
CASlink Monitor and Control

- *Hood control panel to support communications to cloud-based Building Management System.*
- *Hood Control Panel to allow cloud-based Building Management System to monitor real time parameters outlined as MONITOR in the points list.*
- *Hood Control Panel to allow cloud-based Building Management System to control parameters outlined as CONTROL in the points list.*
- *Hood Control Panel to allow cloud-based Building Management System to implement SYSTEM ECONOMIZER control strategies for fully integrated Building Management.*

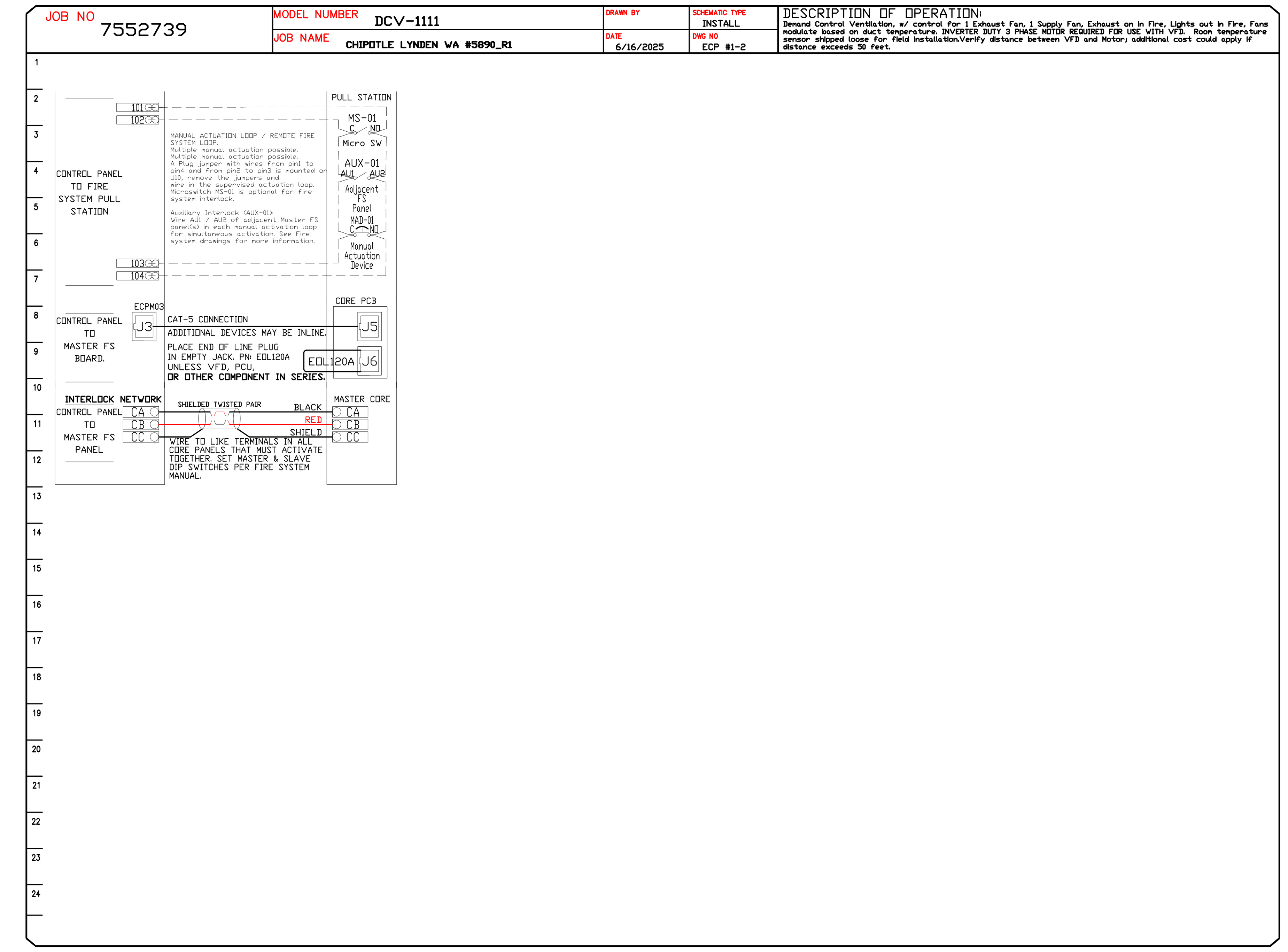
MONITORING AND CONTROL POINTS LIST

DCV Packages	Function
Room Temperature	MONITOR
Duct Temperature(s)	MONITOR
MUA Discharge Temperature	MONITOR
Kitchen RTU Discharge Temperature	MONITOR
Fan Speed	MONITOR
Fan Amperage	MONITOR
Fan Power	MONITOR
VFD Faults	MONITOR
Controller Faults	MONITOR
Fan Faults	MONITOR
Fan Status	MONITOR
PCU Faults	MONITOR
PCU Filter Clog Percentages	MONITOR
Fire Condition	MONITOR
CORE Fire System	MONITOR
Building Pressures	MONITOR
Prep Time Button	MONITOR & CONTROL
Fans Button	MONITOR & CONTROL
Lights Button	MONITOR & CONTROL
Wash Button	MONITOR & CONTROL

SC Packages	Function
Room Temperature(s)	MONITOR
Duct Temperature(s)	MONITOR
MUA DIscharge Temperature	MONITOR
Kitchen RTU Discharge Temperature	MONITOR
Controller Faults	MONITOR
Fan Faults	MONITOR
Fan Status	MONITOR
PCU Faults	MONITOR
PCU Filter Clog Percentages	MONITOR
Fire Condition	MONITOR
CORE Fire System	MONITOR
Building Pressures	MONITOR
Fans Button(s)	MONITOR & CONTROL
Lights Button(s)	MONITOR & CONTROL
Wash Button	MONITOR & CONTROL



JOB NO 7552739
MODEL NUMBER DCV-1111
JOB NAME CHIPOTLE LYNDEN WA #5890_R1
DATE 6/16/2025
SCHEMATIC TYPE INSTALL
DWG NO ECP #1-1
DESCRIPTION OF OPERATION:
BREAKER PANEL TO PRIMARY CONTROL PANEL
CONTROL PANEL TO ACCESSORY ITEMS
BREAKER PANEL TO FANS
CONTROL PANEL TO FANS
CONTROL PANEL TO FIRE SYSTEM



JOB NO 7552739	MODEL NUMBER DCV-1111	DRAWN BY	SCHEMATIC TYPE INSTALL	DESCRIPTION OF OPERATION: Fire System #1 TANK FS - 4.0/4.0.
	JOB NAME CHIPOTLE LYNDEN WA #5890_R1	DATE 6/16/2025	DWG NO ECP #1-3	

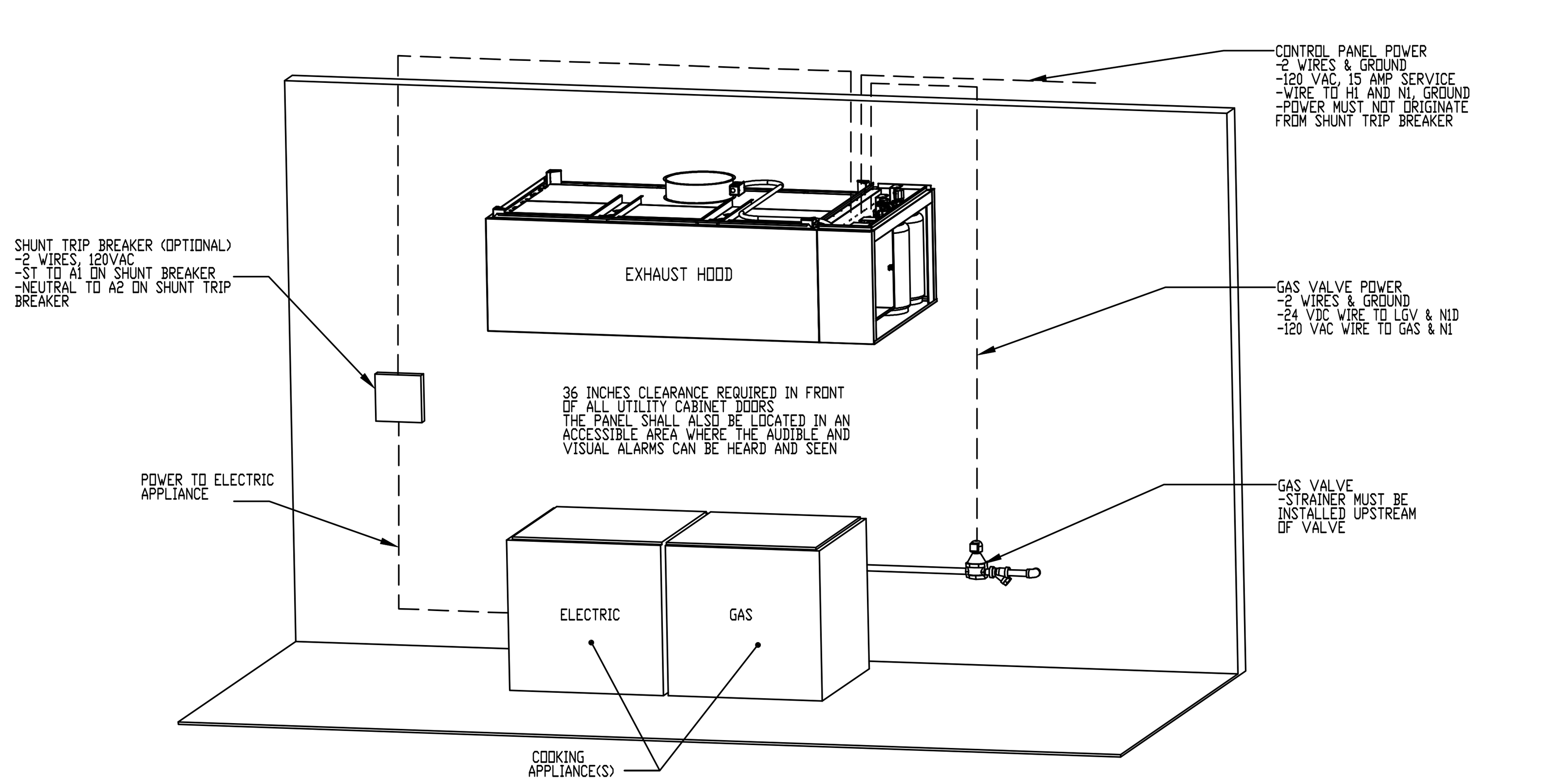
TANK PROTECTION ELECTRICAL DETAIL

02/10/2021 Rev. 2

FS-1: MASTER

ELECTRICIAN:
1. WIRE MAIN CONTROL PANEL PER INCLUDED SCHEMATIC
2. WIRE ALL FANS PER INCLUDED SCHEMATIC
3. WIRE SHUNT TRIP BREAKER (OPTIONAL)
4. WIRE UDS APPLIANCE KILL SWITCH, IF EQUIPPED (OPTIONAL)
5. WIRE GAS VALVE

ELECTRICAL CONTRACTOR REQUIREMENT					
ITEM	CONNECTION IN PANEL	CONNECTION IN DEVICE	VOLTAGE	AMPERAGE	COMMENTS
SHUNT TRIP BREAKER (OPTIONAL)	ST & N1	BREAKER COIL (A1 & A2)	120 VAC	< 4 AMPS	ST TO A1 ON SHUNT BREAKER COIL, AND NEUTRAL TO A2 ON SHUNT TRIP BREAKER COIL
CONTROL PANEL POWER	H1 & N1 + GROUND	CIRCUIT BREAKER	120 VAC	15 AMPS	CONTROL PANEL POWER MUST NOT BE RUN THROUGH SHUNT TRIP BREAKER
UDS APPLIANCE KILL SWITCH (OPTIONAL)	KTS & N1	KTS & N1	120 VAC	< 4 AMPS	KILL SWITCH TERMINALS MUST BE IN SERIES WITH OTHER KILL SWITCHES
REMOTE 120VAC ANSUL AUTOMAN (OPTIONAL)	AU1, AU2	SOLENOID	120 VAC	< 6 AMPS	120V TO AU1, AU2 TO ANSUL ELECTRIC AUTOMAN, ANSUL SOLENOID TO NEUTRAL
GAS VALVE	LGV & N1D (IF 24 VDC) GAS & N1 (IF 120 VAC)	RED/RED/GREEN	24 VDC OR 120 VAC	< 1.0 AMPS	IF 24 VDC - 2 WIRES & GROUND, N1D TO RED, LGV TO RED, AND GREEN TO GROUND IF 120 VAC - 2 WIRES & GROUND GAS TO RED, N1 TO RED, AND GREEN TO GROUND



CONTROL PANEL POWER
-2 WIRES & GROUND
-120 VAC, 15 AMP SERVICE
-WIRE TO H1 AND N1, GROUND
-POWER MUST NOT ORIGINATE FROM SHUNT TRIP BREAKER
SHUNT TRIP BREAKER (OPTIONAL)
-2 WIRES, 120VAC
-ST TO A1 ON SHUNT BREAKER
-NEUTRAL TO A2 ON SHUNT TRIP BREAKER
EXHAUST HOOD
GAS VALVE POWER
-2 WIRES & GROUND
-24 VDC WIRE TO LGV & N1D
-120 VAC WIRE TO GAS & N1
36 INCHES CLEARANCE REQUIRED IN FRONT OF ALL UTILITY CABINET DOORS
THE PANEL SHALL ALSO BE LOCATED IN AN ACCESSIBLE AREA WHERE THE AUDIBLE AND VISUAL ALARMS CAN BE HEARD AND SEEN
POWER TO ELECTRIC APPLIANCE
GAS VALVE
-STRAINER MUST BE INSTALLED UPSTREAM OF VALVE
ELECTRIC
GAS
COOKING APPLIANCE(S)

NOTE: SEE INSTALLATION, OPERATION, AND MAINTENANCE MANUAL FOR FURTHER INSTRUCTIONS

JOB NO 7552739	MODEL NUMBER DCV-1111	DRAWN BY	SCHEMATIC TYPE INSTALL	DESCRIPTION OF OPERATION: Fire System #1 TANK FS - 4.0/4.0.
	JOB NAME CHIPOTLE LYNDEN WA #5890_R1	DATE 6/16/2025	DWG NO ECP #1-4	

TANK PROTECTION LOW-VOLTAGE DETAIL

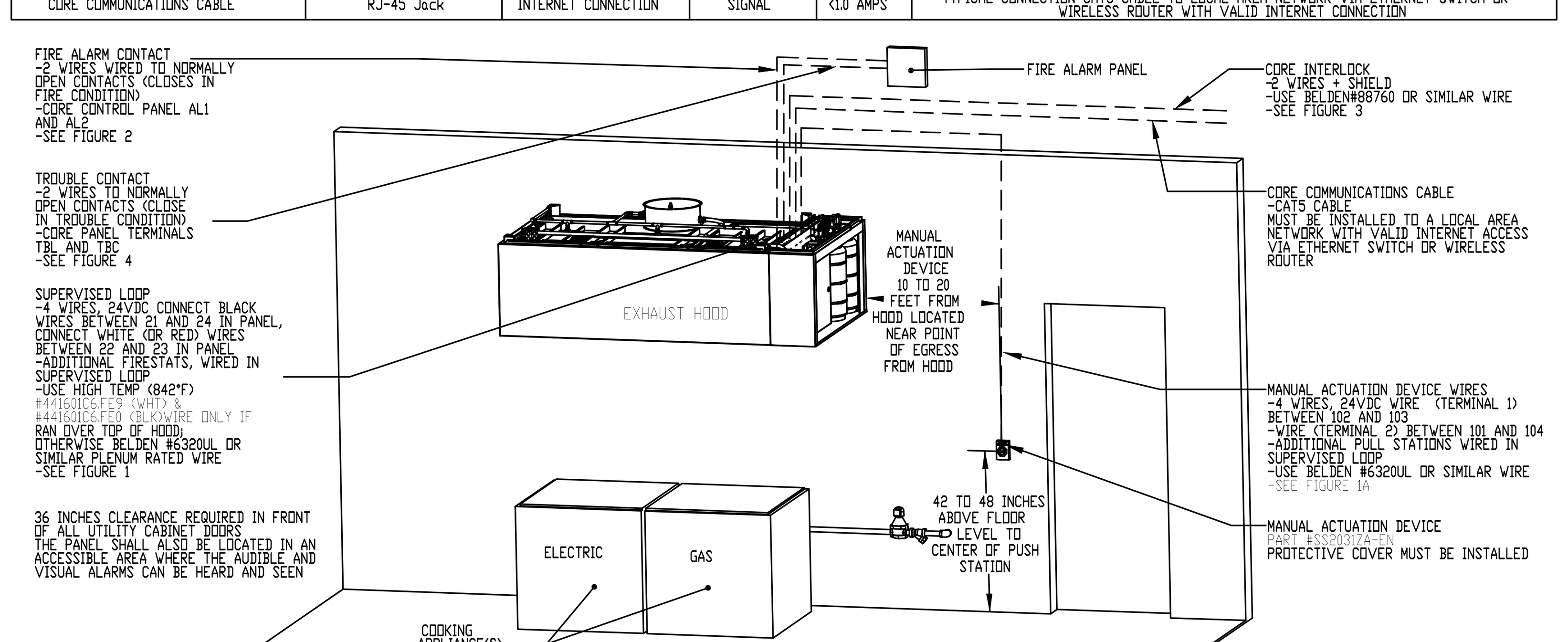
10/01/2023 Rev. 3

FS-1: MASTER

ALARM CONTRACTOR:
1. WIRE MANUAL ACTUATION DEVICE(S), *REMOTE FIRESTAT(S), CORE INTERLOCK(S), FIRE SENSOR(S) AND FIRE ALARM CONTACTS
2. COMPLETE FINAL HOOKUP OF SYSTEM
3. VERIFY FINAL FIRE SYSTEM TEST

*REMOTE FIRESTAT(S) MAYBE BE REQUIRED DEPENDING ON THE DUCT LAYOUT AND HOOD TEMPERATURE RATING. REFERENCE MANUAL FOR LOCATION AND GUIDELINES.

ALARM CONTRACTOR REQUIREMENT					
ITEM	CONNECTION IN PANEL	CONNECTION ON DEVICE	VOLTAGE	AMPERAGE	COMMENTS
MANUAL ACTUATION DEVICE(S)	101 AND 104 102 AND 103	1 & 2	24 VDC	< 1.0 AMPS	WIRE MANUAL ACTUATION DEVICE TERMINAL 1 BETWEEN CORE PANEL TERMINALS 102 AND 103 WIRE MANUAL ACTUATION DEVICE TERMINAL 2 BETWEEN CORE PANEL TERMINALS 101 AND 104 JUMPER 101 TO 104 AND 102 TO 103 IF NO MANUAL ACTUATION DEVICE IS INSTALLED
MANUAL ACTUATION DEVICE COVER	N/A	N/A	N/A	N/A	MANUAL ACTUATION DEVICE COVER MUST BE INSTALLED IF SURFACE MOUNTED, USE COVER EXTENSION STI-6531B
REMOTE FIRESTAT SENSOR(S)	21 AND 24 22 AND 23	BLACK AND WHITE	24 VDC	< 1.0 AMPS	WIRE FIRE SENSOR WHITE WIRES BETWEEN HOOD CORE PANEL TERMINALS 22 AND 23 WIRE FIRE SENSOR BLACK WIRE BETWEEN HOOD CORE PANEL TERMINALS 21 AND 24 HIGH TEMP (842°F) #441601C6.FE9 (WHT) & #441601C6.FE0 (BLK)WIRE OR SIMILAR ONLY IF RAN OF HOOD; OTHERWISE BELDEN #6320UL OR SIMILAR PLENUM RATED WIRE; SEE FIGURE 1
FIRE ALARM CONTACT	AL1, AL2	VARIES	50V MAX (AC/DC)	UP TO 1 AMP	FIRE ALARM RELAY CONTACTS FOR BUILDING FIRE ALARM LOCATED IN THE CORE ELECTRICAL CONTROL PANEL
CORE INTERLOCK(S)	CA, CB, CC	CA, CB, CC	RS-485 COMMUNICATIONS SIGNAL		CORE SYSTEM (1) CA, TO CORE SYSTEM (2) CA. CORE SYSTEM (1) CB, TO CORE SYSTEM (2) CB. CORE SYSTEM (1) CC, TO CORE SYSTEM (2) CC. USE BELDEN# 88760 OR SIMILAR WIRE
TROUBLE CONTACT	TBC, TBL, TOK	VARIES	MAX 120 VAC	UP TO 6 AMPS	WIRE TO TBL & TBC NORMALLY OPEN CONTACT, CLOSES IN TROUBLE CONDITION
CORE COMMUNICATIONS CABLE	RJ-45 Jack	INTERNET CONNECTION	SIGNAL	<1.0 AMPS	TYPICAL CONNECTION CAT5 CABLE TO LOCAL AREA NETWORK VIA ETHERNET SWITCH OR WIRELESS ROUTER WITH VALID INTERNET CONNECTION



FIRE ALARM CONTACT
-2 WIRES WIRED TO NORMALLY OPEN CONTACTS (CLOSES IN FIRE CONDITION)
-CORE CONTROL PANEL AL1 AND AL2
-SEE FIGURE 2
FIRE ALARM PANEL
CORE INTERLOCK
-2 WIRES + SHIELD
-USE BELDEN#88760 OR SIMILAR WIRE
-SEE FIGURE 3
EXHAUST HOOD
ELECTRIC
GAS
COOKING APPLIANCE(S)

ATTENTION: LOW-VOLTAGE DC OR SIGNALING WIRE SHOULD BE ROUTED IN SEPARATE CONDUIT FROM ALL AC SOURCES

NOTE: SEE INSTALLATION, OPERATION, AND MAINTENANCE MANUAL FOR FURTHER INSTRUCTIONS

REVISIONS

DESCRIPTION	DATE:

Highwoods Group
4641 Paragon Park Rd., Raleigh, NC, 27616 PHONE: (919) 875 - 0420 FAX: 9198750577 EMAIL: reg40@captiveaire.com
www.captiveaire.com

CHIPOTLE LYNDEN WA #5890_R1
8083 Guide Meridian Road,
Lynden, WA, 98264

DATE: 6/16/2025

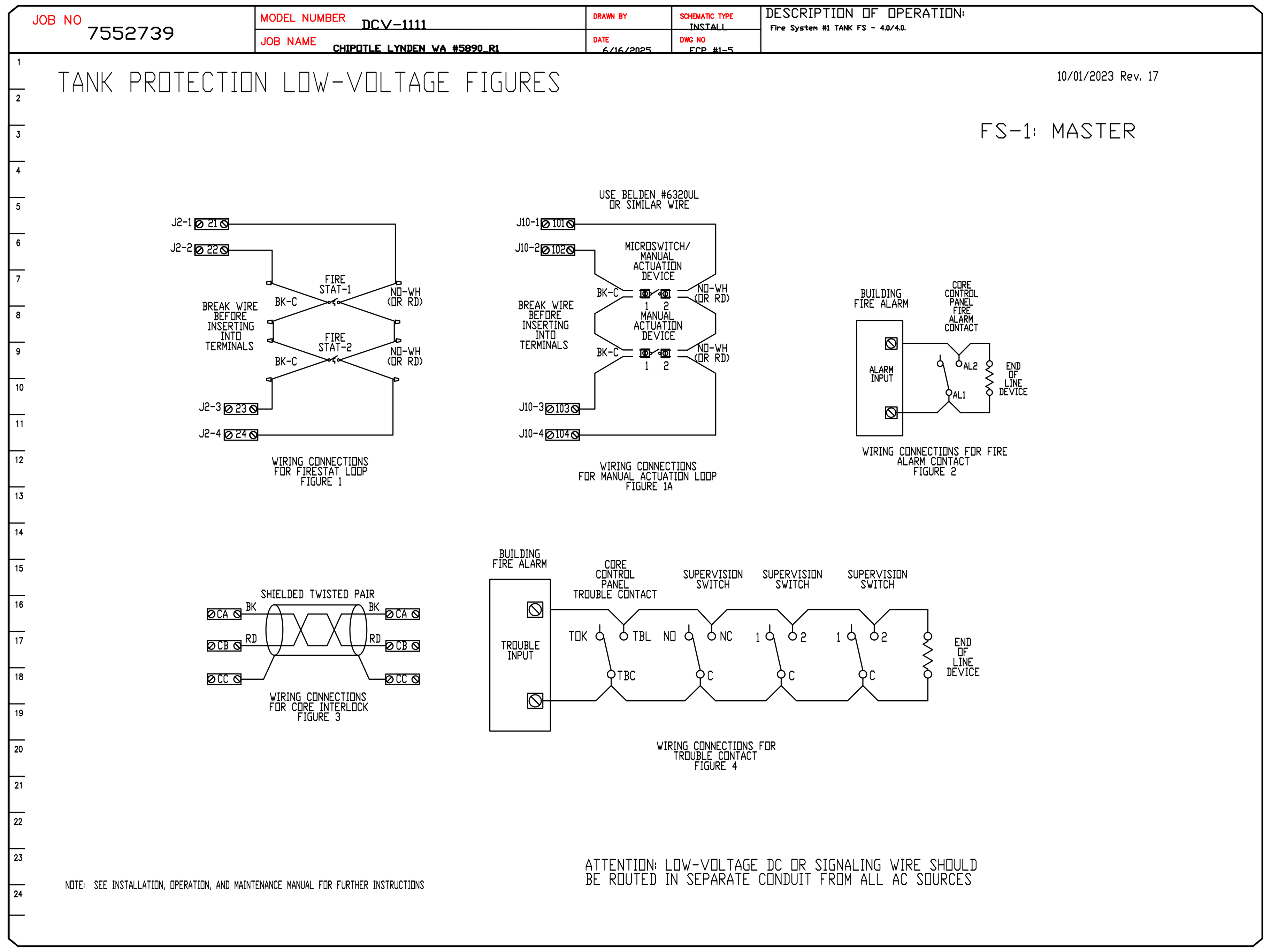
DWG.#: 7552739

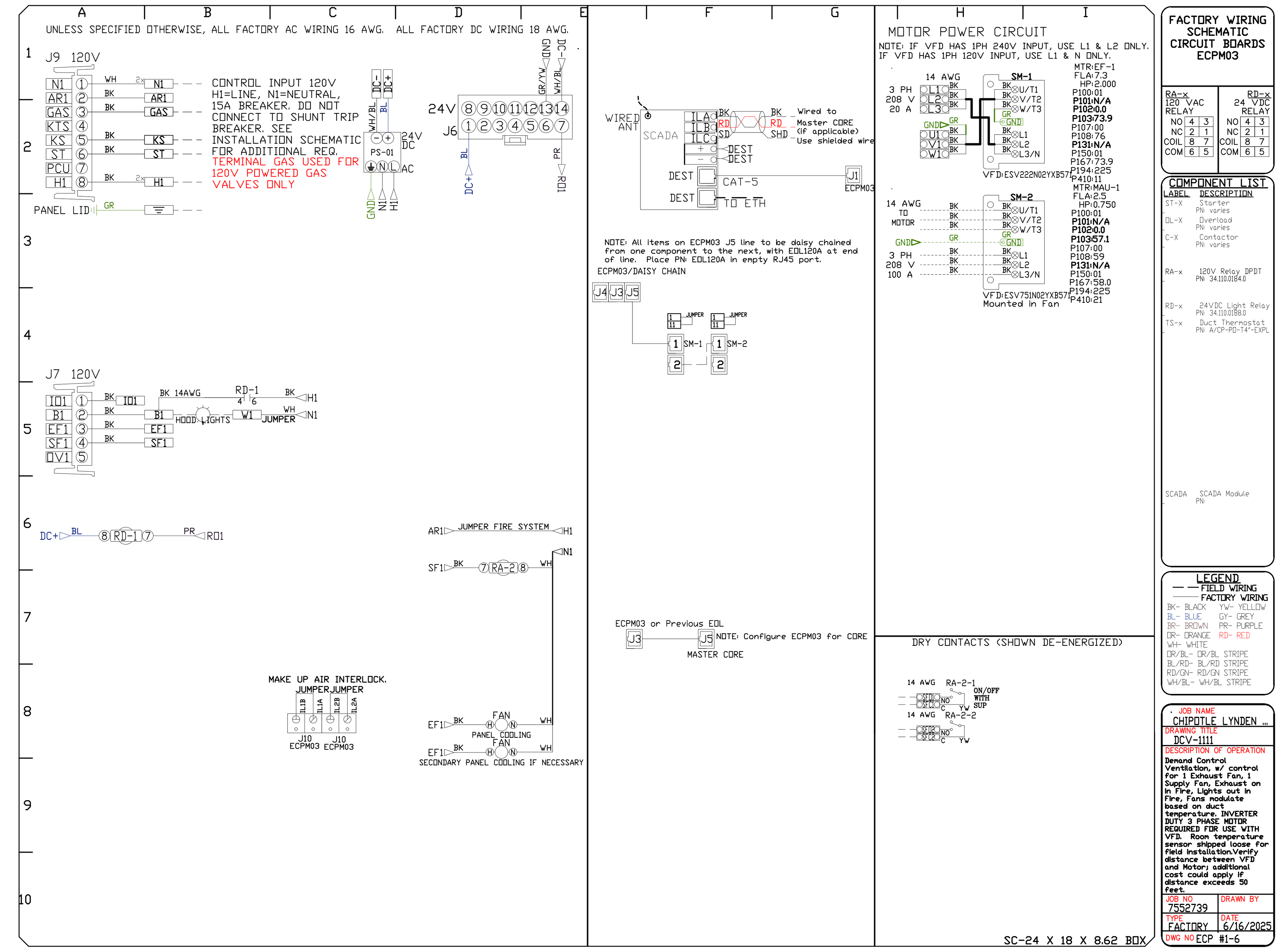
DRAWN BY: JMB-40

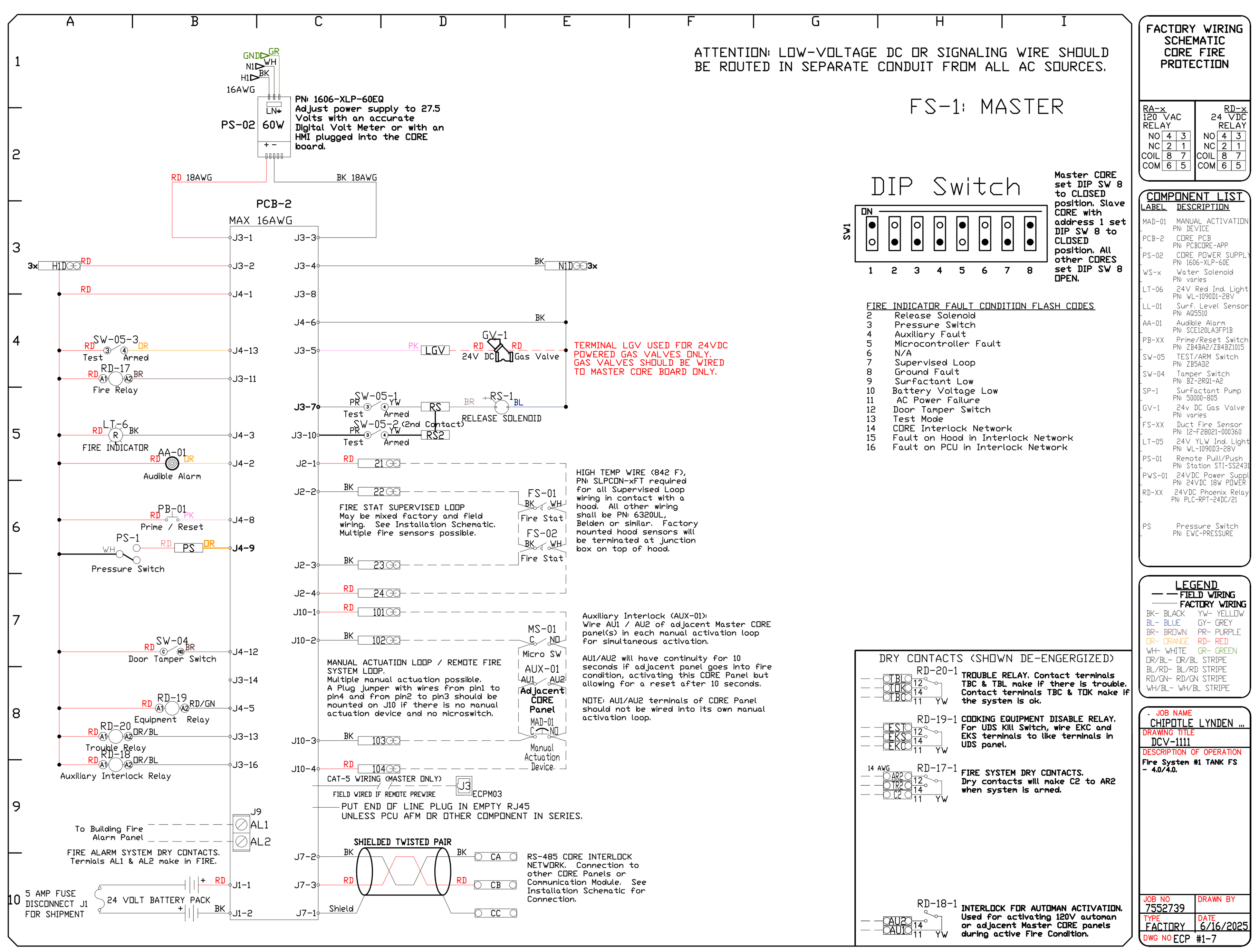
SCALE: 3/4" = 1'-0"

MASTER DRAWING

SHEET NO. 10







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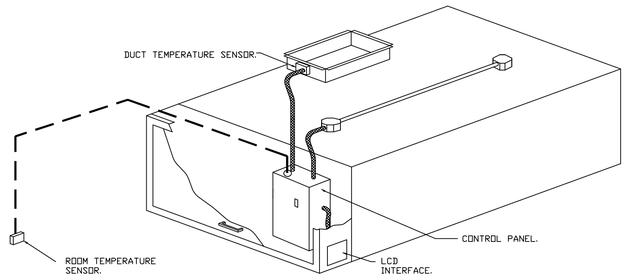
SHEET NO. 11

DEMAND CONTROL VENTILATION HOOD CONTROL PANEL SPECIFICATIONS:

- CONTROLS SHALL BE LISTED BY ETL (UL 508A) AND SHALL COMPLY WITH DEMAND VENTILATION SYSTEM TURNDOWN REQUIREMENTS OUTLINED IN IECC 403.7.5 (2021).
- THE CONTROL ENCLOSURE SHALL BE NEMA 1 RATED AND LISTED FOR INSTALLATION INSIDE OF THE EXHAUST HOOD UTILITY CABINET. THE CONTROL ENCLOSURE MAY BE CONSTRUCTED OF STAINLESS STEEL OR PAINTED STEEL.
- TEMPERATURE PROBE(S) LOCATED IN THE EXHAUST DUCT RISER(S) SHALL BE CONSTRUCTED OF STAINLESS STEEL.
- A DIGITAL CONTROLLER SHALL BE PROVIDED TO ACTIVATE THE HOOD EXHAUST FANS DYNAMICALLY BASED ON A FIXED DIFFERENTIAL BETWEEN THE AMBIENT AND DUCT TEMPERATURES SENSORS. THIS FUNCTION SHALL MEET THE REQUIREMENTS OF IMC 507.1.1.
- A DIGITAL CONTROLLER SHALL PROVIDE ADJUSTABLE HYSTERESIS SETTINGS TO PREVENT CYCLING OF THE FANS AFTER THE COOKING APPLIANCES HAVE BEEN TURNED OFF AND/OR THE HEAT IN THE EXHAUST SYSTEM IS REDUCED.
- A DIGITAL CONTROLLER SHALL PROVIDE AN ADJUSTABLE MINIMUM FAN RUN-TIME SETTING TO PREVENT FAN CYCLING.
- VARIABLE FREQUENCY DRIVES (VFDS) SHALL BE PROVIDED FOR FANS AS REQUIRED. THE DIGITAL CONTROLLER SHALL MODULATE THE VFDS BETWEEN A MINIMUM SETPOINT AND A MAXIMUM SETPOINT ON DEMAND. THE DUCT TEMPERATURE SENSOR INPUT(S) TO THE DIGITAL CONTROLLER SHALL BE USED TO CALCULATE THE SPEED REFERENCE SIGNAL.
- THE VFD SPEED RANGE OF OPERATION SHALL BE FROM 0% TO 100% FOR THE SYSTEM, WITH THE ACTUAL MINIMUM SPEED SET AS REQUIRED TO MEET MINIMUM VENTILATION REQUIREMENTS.
- AN INTERNAL ALGORITHM TO THE DIGITAL CONTROLLER SHALL MODULATE SUPPLY FAN VFD SPEED PROPORTIONAL TO ALL EXHAUST FANS THAT ARE LOCATED IN THE SAME FAN GROUP AS THE SUPPLY FAN.
- THE SYSTEM SHALL OPERATE IN PREP MODE DURING LIGHT COOKING LOAD OR COOL DOWN MODE WHEN SUFFICIENT HEAT REMAINS UNDERNEATH THE HOOD SYSTEM AFTER COOKING OPERATIONS HAVE COMPLETED. OPERATION DURING EITHER OF THESE PERIODS WILL DISABLE THE SUPPLY FANS AND PROVIDE AN EXHAUST FAN SPEED THAT IS EQUAL TO THE MINIMUM VENTILATION REQUIREMENT.
- A DIGITAL CONTROLLER SHALL DISABLE THE SUPPLY FAN(S), ACTIVATE THE EXHAUST FAN(S), ACTIVATE THE APPLIANCE SHUNT TRIP, AND DISABLE AN ELECTRIC GAS VALVE AUTOMATICALLY WHEN FIRE CONDITION IS DETECTED ON A COVERED HOOD.
- A DIGITAL CONTROLLER SHALL ALLOW FOR EXTERNAL BMS FAN CONTROL VIA DRY CONTACT (EXTERNAL CONTROL SHALL NOT OVERRIDE FAN OPERATION LOGIC AS REQUIRED BY CODE).
- AN LCD INTERFACE SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
  - A. ON/OFF PUSH BUTTON FAN & LIGHT SWITCH ACTIVATION.
  - B. INTEGRATED GAS VALVE RESET FOR ELECTRONIC GAS VALVES (NO RESET RELAY REQUIRED).
  - C. VFD FAULT DISPLAY WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  - D. DUCT TEMPERATURE SENSOR FAILURE DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  - E. MIS-WIRED DUCT TEMPERATURE SENSOR DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  - F. A SINGLE LOW VOLTAGE CAT-5 RJ45 WIRING CONNECTION.
  - G. AN ENERGY SAVINGS INDICATOR THAT UTILIZES MEASURED KWH FROM THE VFDS.



TYPICAL HOOD CONTROL PANEL INSTALLATION

SEQUENCE OF OPERATIONS:

THE HOOD CONTROL PANEL IS CAPABLE OF OPERATING IN ONE OR MORE OF THE FOLLOWING STATES AT ANY GIVEN TIME:

- AUTOMATIC: THE SYSTEM OPERATES BASED ON THE DIFFERENTIAL BETWEEN ROOM TEMPERATURE AND THE TEMPERATURE AT THE HOOD CAVITY OR EXHAUST DUCT COLLAR. FANS ACTIVATE AT A CONFIGURABLE TEMPERATURE DIFFERENTIAL THRESHOLD. DEPENDING ON THE JOB CONFIGURATION EACH FAN ZONE CAN BE CONFIGURED AS STATIC OR DYNAMIC. THESE TERMS REFER TO WHETHER A VARIABLE MOTOR (SUCH AS EC MOTORS OR VFD DRIVEN MOTORS) MODULATE WITH TEMPERATURE. IF THE PANEL IS EQUIPPED WITH VARIABLE SPEED FANS AND THE ZONE IS DEFINED AS 'DYNAMIC', THESE WILL MODULATE WITHIN A USER-DEFINED RANGE BASED ON THE TEMPERATURE DIFFERENTIAL. PANELS EQUIPPED WITH VARIABLE SPEED FANS AND A FAN ZONE DEFINED AS 'STATIC', FANS WILL RUN AT A SET SPEED CALCULATED FOR THE DRIVE. DEMAND CONTROL VENTILATION SYSTEMS ARE CAPABLE OF MODULATING EXHAUST AND MAKE UP AIR FAN SPEEDS PER THE REQUIREMENTS OUTLINED IN IECC 403.7.5 (2021).
- MANUAL: THE SYSTEM OPERATES BASED ON HUMAN INPUT FROM AN HMI.
- SCHEDULE: A WEEKLY SCHEDULE CAN BE SET TO RUN FANS FOR A SPECIFIED PERIOD THROUGHOUT THE DAY. THERE ARE THREE OCCUPIED TIMES PER DAY TO ALLOW FOR THE USER TO SET UP A TIME THAT IS SUITABLE TO THEIR NEEDS. ANY TIME THAT IS WITHIN THE DEFINED OCCUPIED TIME, THE SYSTEM WILL RUN AT MODULATION MODE AND FOLLOW THE FAN PROCEDURE ALGORITHM BASED ON TEMPERATURE DURING THIS TIME. DURING UNOCCUPIED TIME, THE SYSTEM WILL HAVE AN EXTRA OFFSET TO PREVENT UNINTENDED ACTIVATION OF THE SYSTEM DURING A TIME WHERE THE SYSTEM IS NOT BEING OCCUPIED.
- OTHER: THE SYSTEM OPERATES BASED ON THE INPUT FROM AN EXTERNAL SOURCE (DDC, BMS OR HARD-WIRED INTERLOCK).
- FIRE: UPON ACTIVATION OF THE HOOD FIRE SUPPRESSION SYSTEM, THE EXHAUST FAN WILL COME ON OR CONTINUE TO TO RUN, THE HOOD MAKEUP AIR WILL SHUTDOWN, AND A SIGNAL WILL BE SENT FOR ACTIVATING THE SHUNT TRIP BREAKER PROVIDED BY THE ELECTRICIAN. FUEL GAS WILL SHUT OFF VIA A MECHANICAL/ELECTRICAL GAS VALVE ACTUATED BY THE HOOD FIRE SUPPRESSION SYSTEM.

SYSTEM DESIGN VERIFICATION (SDV)

IF ORDERED, CAS SERVICE WILL PERFORM A SYSTEM DESIGN VERIFICATION (SDV) ONCE ALL EQUIPMENT HAS HAD A COMPLETE START UP PER THE OPERATION AND INSTALLATION MANUAL. TYPICALLY, THE SDV WILL BE PERFORMED AFTER ALL INSPECTIONS ARE COMPLETE.

ANY FIELD RELATED DISCREPANCIES THAT ARE DISCOVERED DURING THE SDV WILL BE BROUGHT TO THE ATTENTION OF THE GENERAL CONTRACTOR AND CORRESPONDING TRADES ON SITE. THESE ISSUES WILL BE DOCUMENTED AND FORWARDED TO THE APPROPRIATE SALES OFFICE. IF CAS SERVICE HAS TO RESOLVE A DISCREPANCY THAT IS A FIELD ISSUE, THE GENERAL CONTRACTOR WILL BE NOTIFIED AND BILLED FOR THE WORK. SHOULD A RETURN TRIP BE REQUIRED DUE TO ANY FIELD RELATED DISCREPANCY THAT CANNOT BE RESOLVED DURING THE SDV, THERE WILL BE ADDITIONAL TRIP CHARGES.

DURING THE SDV, CAS SERVICE WILL ADDRESS ANY DISCREPANCY THAT IS THE FAULT OF THE MANUFACTURER. SHOULD A RETURN TRIP BE REQUIRED, THE GENERAL CONTRACTOR AND APPROPRIATE SALES OFFICE WILL BE NOTIFIED. THERE WILL BE NO ADDITIONAL CHARGES FOR MANUFACTURER DISCREPANCIES.

REVISIONS

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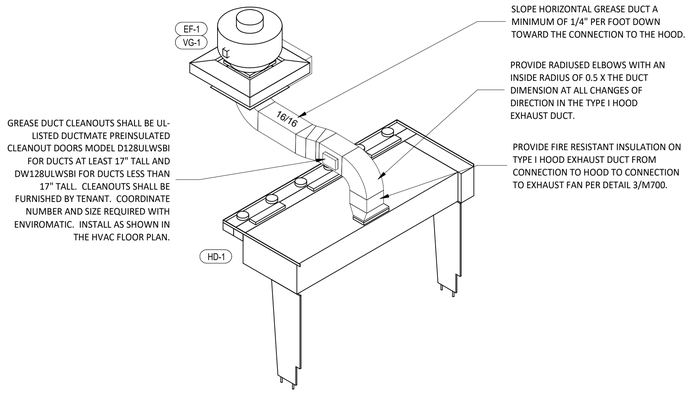
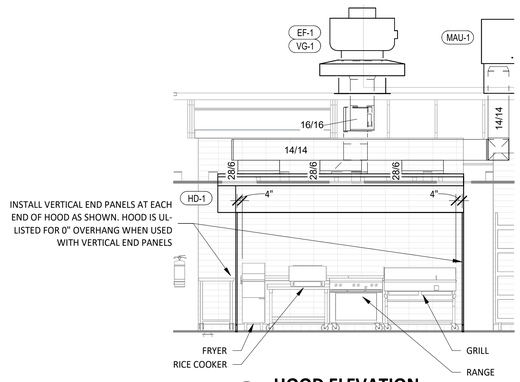
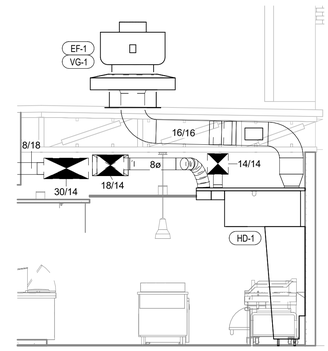
SHEET NO. 12



10 M700 **HOOD EXHAUST ISOMETRIC**
N.T.S.



9 M700 **HOOD ELEVATION**
1/4" = 1'-0"



7 M700 **DUCT SECTION AT HOOD**
1/4" = 1'-0"

INSTALLATION LOCATION

INSTALL AIR PURIFIER WITH JUNCTION BOX ON OUTSIDE FACE OF ROOFTOP UNIT AND WITH UV LAMP TUBE EXTENDING INTO THE INTERIOR OF THE ROOFTOP UNIT. FIELD VERIFY EXACT LOCATION TO AVOID DAMAGING, TOUCHING, OR INTERFERING WITH ANY RTU INTERIOR COMPONENTS. INSTALLATION LOCATION SHALL BE AS FOLLOWS:

TRANE: INSTALL INTO THE SUPPLY AIR STREAM THROUGH THE REMOVABLE PANEL COVERING THE HORIZONTAL DISCHARGE SUPPLY AIR OPENING.

YORK: INSTALL INTO THE SUPPLY AIR PLENUM FROM THE BACK SIDE OF THE UNIT JUST ABOVE THE HEAT EXCHANGER.

6 M700 **UV AIR PURIFIER INSTALLATION**
N.T.S.

NOTE:
1. INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA 96 REQUIREMENTS.
2. HINGE FAN SO IT TIPS BACK TOWARD FAN DRAIN AND TOWARD VIROGUARD DRAIN.

5 M700 **GREASE EXHAUST FAN**
N.T.S.

NOTE:

HOOD FIRE PROTECTION NOZZLES AND DETECTORS ARE SCHEMATIC ONLY. HOOD SUPPLIER SHALL PREPARE HOOD SHOP DRAWINGS SHOWING ACTUAL DEVICE LAYOUT AND SHALL OBTAIN PERMITS ASSOCIATED WITH THIS WORK.

4 M700 **FIRE SUPPRESSION SYSTEM SCHEMATIC**
N.T.S.

FIRE RATED ENCLOSURE - GREASE DUCTS

1. THERMAL CERAMICS FIREMASTER FASTWRAP XL IS TESTED TO ASTM E2336 AND UL LISTED PER HNKT.G18 TO PROVIDE ZERO CLEARANCE TO COMBUSTIBLES AND TO PROVIDE A 1- OR 2-HOUR ENCLOSURE. THROUGH PENETRATIONS FIRESTOP SYSTEMS ARE TESTED IN ACCORDANCE WITH ASTM E 814 (UL 1479). ICC CODE EVALUATION PER REPORT UL ER 14229-01.
2. COMPLIANT TO THE FOLLOWING CODES:
   - NFPA 96
   - INTERNATIONAL MECHANICAL CODES
   - UNIFORM MECHANICAL CODE.
   - CALIFORNIA MECHANICAL CODE
3. INSULATION APPLIED IN TWO LAYERS WITH TIGHT COMPRESSION JOINT ON BOTH LAYERS AT ALL JOINTS.
4. MINIMUM 16 GAUGE CARBON STEEL (OR 18 GAGE STAINLESS STEEL) RECTANGULAR OR ROUND GREASE EXHAUST DUCT
5. INSTALL UL LISTED AND LIQUID TIGHT THERMAL CERAMICS FASTDOOR XL ACCESS DOORS, OR ALTERNATE DOOR UL LISTED PER UL1978, AT ALL CHANGES IN DIRECTION AND AT MINIMUM EVERY 20 FT ON HORIZONTAL RUNS.
6. SUPPORT HANGER SYSTEMS DO NOT NEED TO BE WRAPPED PROVIDED THE HANGER RODS ARE MINIMUM OF 3/8 IN. DIAMETER AND SUPPORTS ARE MINIMUM 2 X 2 X 1/8 IN. STEEL ANGLE OR SMACNA EQUIVALENT SUPPORT SYSTEM.
7. THERMAL CERAMICS DUCT WRAP SHALL BE INSTALLED DIRECTLY ONTO THE DUCT AND APPLIED FROM THE HOOD CONNECTION TO THE CONNECTION TO THE FAN.
8. THERMAL CERAMICS DUCT ENCLOSURE SYSTEM SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND UL LISTINGS.

Morgan Thermal Ceramics
P.O. Box 923
Augusta, Georgia 30903-0923
Phone: (706) 560-4038

3 M700 **FIREMASTER DUCT WRAP - UL HNKT-G18**
N.T.S.

2 M700 **HOOD SECTION VIEW**
N.T.S.

NOTE:
1. METHOD OF INSTALLATION FOR AIRTIGHT SEAL IS TYPICAL FOR ALL FLEX CONNECTIONS TO AIR DISTRIBUTION DEVICES.

1 M700 **DIFFUSER CONNECTION**
N.T.S.

Consultant:
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Phone: (614) 751-9610
Fax: (614) 552-5240
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FOR CONSTRUCTION

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Issue Record:

06/06/2025	PERMIT SET
08/29/2025	FOR CONSTRUCTION

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Contents: HVAC DETAILS

M700