



Office of General Services

DESIGN & CONSTRUCTION GROUP
THE GOVERNOR NELSON A. ROCKEFELLER
EMPIRE STATE PLAZA
ALBANY, NY 12242

ADDENDUM NO. 1 TO PROJECT NO. Q2007

HVAC AND ELECTRICAL WORK
REPLACE BOILER CONTROLS,
POWERHOUSE, BUILDING 21
RIVERVIEW CORRECTIONAL FACILITY
1110 TIBBITS DR,
OGDENSBURG, NY

August 20, 2026

NOTE: This Addendum forms a part of the Contract Documents. Insert it in the Project Manual. Acknowledge receipt of this Addendum in the space provided on the Bid Form.
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HVAC WORK SPECIFICATIONS

1. SECTION 230926.01 PREFUNCTIONAL CHECKLIST: Add the accompanying Section (Pages PFC-1 through PFC-9) to the Section currently bound to the Project Manual.
2. SECTION 230926.02 FUNCTIONAL PERFORMANCE TESTING: Add the accompanying Section (Pages FPT-1 through FPT-9) to the Section currently bound to the Project Manual.
3. SECTION 260221 MOTORS AND MOTOR CONTROLLERS: Discard the Section bound in the Project Manual and substitute with the accompanying Section (pages 260221-1 through 260221-11) noted "REVISED 07/31/2026".
4. SECTION 260529 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS: Add the accompanying Section (Pages 260529-1 through 260529-5) to the Project Manual.

ELECTRICAL WORK SPECIFICATIONS

5. SECTION 260221 MOTORS AND MOTOR CONTROLLERS: Delete this section in its entirety.

HVAC WORK DRAWINGS

6. Revised Drawings:
 - a. Drawing Nos. M-100, M-601, M-602, and M-900, Noted REVISED DRAWINGS, dated 07/31/2026, accompanies this addendum and supersedes the same numbered originally issued drawings.

ELECTRICAL WORK DRAWINGS

7. Revised Drawings:
 - a. Drawing Nos. E-001, E-101, E-102, and E-700, Noted REVISED DRAWINGS, dated 07/31/2026, accompanies this addendum and supersedes the same numbered originally issued drawings.

END OF ADDENDUM

Brady M. Sherlock, P.E.
Director, Division of Design
Design & Construction

PFC, Variable-Frequency Motor Controllers

Test Type: **Pre-Functional Testing**

Status: **Incomplete**
STATEMENT OF COMPLETION

Sign-off: **0 of 2**

The above equipment and systems integral to them are complete and ready for functional testing. The checklist items are complete and have been checked off only by parties having direct knowledge of the event respective to each responsible contractor. This prefunctional checklist is submitted for review and acceptance, subject to an attached list of outstanding items yet to be completed. A Statement of Correction will be submitted upon completion of any outstanding areas. None of the outstanding items preclude safe and reliable functional tests being performed.

Mechanical Contractor

Date

Commissioning Authority

Date

Prefunctional checklist items shall be completed by the contractor(s) as part of startup & initial checkout, prior to Functional Performance Testing.

Equipment Verification

Equipment Parameters	Equipment Data	As Installed?	Actual Installed Data
VFD		☐ Yes ☐ No	
EF-3		☐ Yes ☐ No	
Manufacturer		☐ Yes ☐ No	
VLT Model Number		☐ Yes ☐ No	
Serial Number		☐ Yes ☐ No	
HP Rating		☐ Yes ☐ No	
NEMA 1/12 Frame Size		☐ Yes ☐ No	
Volts/Phase/Hertz		☐ Yes ☐ No	
FLA		☐ Yes ☐ No	
Electro-Mechanically Controlled Bypass (EMB)		☐ Yes ☐ No	
Integral Line Reactor		☐ Yes ☐ No	
EF-4		☐ Yes ☐ No	
Manufacturer		☐ Yes ☐ No	
VLT Model Number		☐ Yes ☐ No	
Serial Number		☐ Yes ☐ No	
HP Rating		☐ Yes ☐ No	
NEMA 1/12 Frame Size		☐ Yes ☐ No	
Volts/Phase/Hertz		☐ Yes ☐ No	

#	Question	Answer	Details
1	Verify that all applicable electrical safety reviews, safety meetings, procedures, precautions, and PPE are adhered to by the appropriate personnel while working in and around electrical equipment during installation, startup, testing, and commissioning.	☐ Yes ☐ No ☐ N/A	

Mechanical Contractor_____

COMMISSIONING AGENT

1	This completed checklist has been reviewed. Its completion is acknowledged with exceptions, if applicable, noted.	☐ Yes ☐ No ☐ N/A	
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Commissioning Authority_____

COMPLETED ITEMS

1	OEM`s Startup Completed	☐ Yes ☐ No ☐ N/A	
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Mechanical Contractor_____

2	OEM`S Field Report Completed	☐ Yes ☐ No ☐ N/A	
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Mechanical Contractor_____

3	3rd Party NETA Testing Completed	☐ Yes ☐ No ☐ N/A	
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Mechanical Contractor_____

DOCUMENTATION SUBMITTED

#	Question	Answer	Details
1	OEM Technical Product Data	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
2	OEM Performance Data	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
3	OEM Harmonics Study	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
4	OEM Shop Drawings	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
5	Factory Certified Test Report	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
6	Manufacturer Special Warranty Documents	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
7	I,O&M Manuals	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
8	OEM Recommended Maintenance Materials	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
9	Posted Instructions	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
10	OEM Recommended Spare Parts	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
11	OEM Warranty Data	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____

GENERAL AND ELECTRICAL INSTALLATION

#	Question	Answer	Details
1	General installation appearance good, no apparent damage.	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
2	Interior and exterior of enclosure wiped clean.	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
3	Equipment installed per OEM's instructions and specifications.	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
4	Inspect proper equipment bonding.	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
5	Inspect proper equipment grounding.	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
6	Inspect condition of internal wiring and cabling.	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
7	Bolt torque markings visible.	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
WORKING / ELECTRICAL CLEARANCES			
1	Left Side Clearance Maintained	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
2	Front Clearance Maintained	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
3	Right Side Clearance Maintained	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
NAMEPLATES CORRECT			

#	Question	Answer	Details
1	Control hardware installation complete.	☐ Yes ☐ No ☐ N/A	Mechanical Contractor_____
2	Control wiring installation complete.	☐ Yes ☐ No ☐ N/A	Mechanical Contractor_____
3	Control software installation complete.	☐ Yes ☐ No ☐ N/A	Mechanical Contractor_____
4	Communication Modules operational.	☐ Yes ☐ No ☐ N/A	Mechanical Contractor_____

DIGITAL DISPLAY / HMI / OPERATOR INTERFACE

#	Question	Answer	Details
1	HMI	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
2	Output Voltage Displayed	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
3	Output Frequency Displayed	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
4	Output Current Displayed	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
5	Alarm LED Indication	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
6	Warning LED Indication	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
7	On LED Indication	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
8	Hand On Operating Key	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
9	Off Operating Key	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
10	Auto/On Operating Key	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
11	Reset Operating Key	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
12	Directional Keys	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____

#	Question	Answer	Details
13	Programming Keys	☐ Yes ☐ No ☐ N/A	Mechanical Contractor_____
MANUAL BYPASS WITH ISOLATION SWITCH			

#	Question	Answer	Details
1	The contractor has notified the OEM Field Service or agent of the OEM of the startup schedule	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
2	Startup must be performed by an OEM qualified Field Service Technician or agent of the OEM specially authorized to perform startup and warranty repairs of these OEM products.	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
3	Startup report to include written certification from OEM Field Service or agent of the OEM that all specified features, controls and safeties have been installed and are functioning properly and that the installation and application comply with the OEM's recommendations.	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
4	Specified point-to-point I/O mchecks have been completed and documentation record submitted.	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
5	3rd Party NETA Testing completed field inspection and testing in accordance with NETA ATS, except Section 4.	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____
6	3rd Party NETA Testing completed inspections and testing in accordance with NETA ATS, Section 7.17.	☐ Yes ☐ No ☐ N/A	 Mechanical Contractor_____

VFD SETTINGS VERIFIED

Sensor Calibration					
Sensor & Location	Location OK?	First Gauge or BAS Value	Instrument Measured Value	Final Gauge or BAS Value	Pass
					Yes No
					Yes No
					Yes No
					Yes No
					Yes No

END TEST

FPT-1: TESS VFD

Test Type: **Functional Performance Testing**

Status: **Not started**

Asset Summary			
Unit #:		Description:	Variable Frequency Drive
Service:		Serial #:	
System Description			

Questionnaire			
#	Question	Answer	Details
1	VFD VERIFICATION		
0.0.1	FLA	☐ Yes ☐ No ☐ N/A	
1.0.1	OEM	☐ Yes ☐ No ☐ N/A	
0.0.2	LRA	☐ Yes ☐ No ☐ N/A	
1.0.2	Model	☐ Yes ☐ No ☐ N/A	
0.0.3	Inrush Amps	☐ Yes ☐ No ☐ N/A	
1.0.3	S/N	☐ Yes ☐ No ☐ N/A	
0.0.4	Insulation Class	☐ Yes ☐ No ☐ N/A	
1.0.4	Bypass Provided	☐ Yes ☐ No ☐ N/A	

#	Question	Answer	Details
0.0.5	Output Current Overload - 120% for 60-Seconds	☐ Yes ☐ No ☐ N/A	
1.0.5	Circuit Breaker Disconnect, 100-kAIC	☐ Yes ☐ No ☐ N/A	
0.0.6	Power Factor	☐ Yes ☐ No ☐ N/A	
1.0.6	Line Fuses, 100-kAIC	☐ Yes ☐ No ☐ N/A	
0.0.7	Continuous Duty	☐ Yes ☐ No ☐ N/A	
1.0.7	Input Voltage - 480VAC, 3-Phase	☐ Yes ☐ No ☐ N/A	
0.0.8	RTD Monitor - TEC System, NT538 AD	☐ Yes ☐ No ☐ N/A	
1.0.8	Max Power Input - kW	☐ Yes ☐ No ☐ N/A	
0.0.9	THD - Total Harmonic Distortion Requirement - Voltage	☐ Yes ☐ No ☐ N/A	
1.0.9	Input Amps	☐ Yes ☐ No ☐ N/A	
0.0.10	TDD - Total Demand Distortion Requirement - Current Demand	☐ Yes ☐ No ☐ N/A	
0.0.11	Temperature Rise	☐ Yes ☐ No ☐ N/A	
0.0.12	Enclosure Type - NEMA 12 with A/C	☐ Yes ☐ No ☐ N/A	
0.0.13	Enclosure Seismic Category	☐ Yes ☐ No ☐ N/A	
0.0.14	Enclosure Seismic Requirement	☐ Yes ☐ No ☐ N/A	
0.1 DOCUMENTATION SUBMITTED			
0.1.1	OEM Data / Cut Sheets	☐ Yes ☐ No ☐ N/A	
0.1.2	OEM Drawings	☐ Yes ☐ No ☐ N/A	
0.1.3	OEM Performance	☐ Yes ☐ No ☐ N/A	

#	Question	Answer	Details
0.1.4	OEM Factory Test Report	☐ Yes ☐ No ☐ N/A	
0.1.5	OEM I,O&M Manual	☐ Yes ☐ No ☐ N/A	
0.2 FIELD DOCUMENTATION COMPLETED			
0.2.1	OEM Check Out and Start-Up Field Report	☐ Yes ☐ No ☐ N/A	
0.2.2	OEM Commissioning Services Report	☐ Yes ☐ No ☐ N/A	
0.2.3	OEM Performance Test	☐ Yes ☐ No ☐ N/A	
0.2.4	OEM Harmonic Analysis Verification Report	☐ Yes ☐ No ☐ N/A	
0.2.5	OEM Output Voltage Waveform Verification Report	☐ Yes ☐ No ☐ N/A	
0.2.6	Infrared (Thermographic) Scan Tests Report	☐ Yes ☐ No ☐ N/A	
0.2.7	VFD Properly Tagged - VFD-CHP-1	☐ Yes ☐ No ☐ N/A	
0.3 ELIMINATE / MITIGATE REACTIVE POWER - VFD NOT OPERATING			
0.3.1	Installation of Standby Circuit Components Completed	☐ Yes ☐ No ☐ N/A	
0.3.2	Wiring Modifications Required for Standby Circuit Components Completed	☐ Yes ☐ No ☐ N/A	
0.3.3	Wire Terminations of Standby Circuit Components Completed	☐ Yes ☐ No ☐ N/A	
0.4 PRE-TEST CHECKS			
0.4.1	VFD is installed per the OEM's instructions and contract documents.	☐ Yes ☐ No ☐ N/A	
0.4.2	All Associated Systems that provide services for operation are available, as applicable, including, electrical, mechanical, and control systems.	☐ Yes ☐ No ☐ N/A	
0.4.3	Control Loop and I/O Checks Completed by Others	☐ Yes ☐ No ☐ N/A	
0.4.4	ANSI / NETA ATS (Acceptance Testing	☐ Yes ☐ No ☐ N/A	

#	Question	Answer	Details
	Specifications), Latest Edition, 3rd Party Testing Complete		
0.4.5	The Owner, Operators, Contractors, and OEM Reps Have Been Notified of The FPT Testing	☐ Yes ☐ No ☐ N/A	
0.4.6	Commissioning Team members required for testing are present.	☐ Yes ☐ No ☐ N/A	
0.5 TESTING SAFETY			
0.5.1	All applicable Owner and Contractor safety reviews, meetings, procedures, precautions, and PPE requirements have been reviewed by the appropriate service and operating personnel performing startup, testing, and commissioning.	☐ Yes ☐ No ☐ N/A	
0.5.2	All applicable Owner and Contractor safety procedures, test equipment, and PPE are adhered to by the appropriate service and operating personnel working in and around operating mechanical equipment and electrical equipment during startup, energization, testing, commissioning, and service.	☐ Yes ☐ No ☐ N/A	
0.5.3	All requirements of Owner Safety, Contractor Safety, and Site LOTO procedures are to be followed during equipment startup, testing, and commissioning.	☐ Yes ☐ No ☐ N/A	
0.6 CONTRACTOR			
0.6.1	All items within the Field Documentation and Pre-Test Checklist have been completed. The System and Components have been started and are currently running under automatic control and the system has successfully demonstrated compliance with functional testing parameters. Required Commissioning Team Members are present and the Functional Performance Testing may commence.	☐ Yes ☐ No ☐ N/A	
0.7 CXA FPT CERTIFICATION			
0.7.1	As applicable, this Functional Performance Test has been witnessed by the Commissioning Agent. This FPT has been successfully completed, except where noted within. Any outstanding FPT deficiencies will be added to the Commissioning Issues Log for record. The Contractor is to address any noted deficiencies.	☐ Yes ☐ No ☐ N/A	
0.8 EQUIPMENT TEST SUMMARY			

#	Question	Answer	Details
0.8.1	VFD Normal Operation	☐ Pass ☐ Fail ☐ N/A	
0.8.2	VFD Bypass Operation	☐ Pass ☐ Fail ☐ N/A	
0.8.3	Standby Circuit Operation - Disconnect VFD Power From Source When NOT Operating	☐ Pass ☐ Fail ☐ N/A	
0.9 SEQUENCE / INTERLOCK / OPERATING MODES			
0.9.1	Start-Up	☐ Pass ☐ Fail ☐ N/A	
0.9.2	Shutdown	☐ Pass ☐ Fail ☐ N/A	
0.9.3	MANUAL Control	☐ Pass ☐ Fail ☐ N/A	
0.9.4	AUTOMATIC Control	☐ Pass ☐ Fail ☐ N/A	
0.9.5	Interface /Data / Communication Operational - ModBus TCP/IP	☐ Pass ☐ Fail ☐ N/A	
0.9.6	Diagnostic Shutdown - Manual Reset	☐ Pass ☐ Fail ☐ N/A	
0.9.7	Diagnostic Shutdown - Auto Reset	☐ Pass ☐ Fail ☐ N/A	
0.10 CONTROLS / INDICATIONS / SHUTDOWNS / FAILURES / ALARMS			
0.10.1	HMI Control - Start / Stop / Reset	☐ Pass ☐ Fail ☐ N/A	
0.10.2	Local Control - Start / Stop / Reset	☐ Pass ☐ Fail ☐ N/A	
0.10.3	E-Stop, HMI	☐ Pass ☐ Fail ☐ N/A	
0.10.4	E-Stop, Local Push Button	☐ Pass ☐ Fail ☐ N/A	
0.10.5	HMI Parameter Monitoring - Run / Common Alarm / Common Trip	☐ Pass ☐ Fail ☐ N/A	
0.10.6	Local Parameter Monitoring - Run / Common Alarm / Common Trip	☐ Pass ☐ Fail ☐ N/A	
0.10.7	Power ON Light - RED	☐ Pass ☐ Fail ☐ N/A	

#	Question	Answer	Details
0.10.8	VFD Running Light - GREEN	☐ Pass ☐ Fail ☐ N/A	
0.10.9	VFD Fault Light - AMBER	☐ Pass ☐ Fail ☐ N/A	
0.10.10	VFD Protection - Short Circuit	☐ Pass ☐ Fail ☐ N/A	
0.10.11	VFD Protection - Under Voltage	☐ Pass ☐ Fail ☐ N/A	
0.10.12	VFD Protection - Over Voltage	☐ Pass ☐ Fail ☐ N/A	
0.10.13	VFD Protection - Over Current	☐ Pass ☐ Fail ☐ N/A	
0.10.14	VFD Protection - Phase Loss	☐ Pass ☐ Fail ☐ N/A	
0.10.15	VFD Protection - Phase Reversal	☐ Pass ☐ Fail ☐ N/A	
0.10.16	VFD Protection - Ground Fault / Ground Short Circuit	☐ Pass ☐ Fail ☐ N/A	
0.10.17	VFD Protection - Momentary Power Loss	☐ Pass ☐ Fail ☐ N/A	
0.10.18	VFD Protection - Phase Unbalance	☐ Pass ☐ Fail ☐ N/A	
0.10.19	VFD Protection - Single Cycle Voltage Loss	☐ Pass ☐ Fail ☐ N/A	
0.10.20	VFD Protection - AUTO Restart	☐ Pass ☐ Fail ☐ N/A	
0.10.21	VFD Protection - Motor Overload	☐ Pass ☐ Fail ☐ N/A	
0.10.22	Pump Motor Winding RTD - 1 RTD Per Phase, 3 RTDs Total	☐ Pass ☐ Fail ☐ N/A	
0.10.23	VFD Protection - Motor Over Temperature	☐ Pass ☐ Fail ☐ N/A	
0.10.24	Pump Motor Bearing RTD - 1 RTD Per Bearing, 2 RTDs Total	☐ Pass ☐ Fail ☐ N/A	
0.10.25	VFD Protection - Motor Bearing Over Temperature	☐ Pass ☐ Fail ☐ N/A	
0.10.26	Pump Motor Disconnect Switch - VFD Shutdown	☐ Pass ☐ Fail ☐ N/A	

#	Question	Answer	Details
	Switch OPEN		
0.10.27	Pump Motor Vibration Switch - VFD Shutdown Excessive Vibration	☐ Pass ☐ Fail ☐ N/A	
0.10.28	Pump Motor Oil Level Switch - VFD Shutdown Low Oil Level	☐ Pass ☐ Fail ☐ N/A	
0.10.29	Audible Indications	☐ Pass ☐ Fail ☐ N/A	
0.10.30	Visual Indications	☐ Pass ☐ Fail ☐ N/A	
0.10.31	Audible Alarms	☐ Pass ☐ Fail ☐ N/A	
0.10.32	Visual Alarms	☐ Pass ☐ Fail ☐ N/A	
0.10.33	Equipment Failure Alarms	☐ Pass ☐ Fail ☐ N/A	
0.10.34	Informational Alarms	☐ Pass ☐ Fail ☐ N/A	
0.10.35	Alarm Acknowledge	☐ Pass ☐ Fail ☐ N/A	
0.10.36	Status Changes	☐ Pass ☐ Fail ☐ N/A	
0.11 STANDARD OPERATING REQUIREMENTS			
0.11.1	Control Power Operational	☐ Yes ☐ No ☐ N/A	
0.11.2	VFD Operation - Pump Rotation Checked	☐ Yes ☐ No ☐ N/A	
0.11.3	VFD Operating Order	☐ Yes ☐ No ☐ N/A	
1.10.4	VFD Normal Operation	☐ Yes ☐ No ☐ N/A	
1.10.5	VFD Bypass Operation	☐ Yes ☐ No ☐ N/A	
1.10.6	START Command	☐ Yes ☐ No ☐ N/A	
1.10.7	STOP Command	☐ Yes ☐ No ☐ N/A	

#	Question	Answer	Details
1.10.8	Speed Control	☐ Yes ☐ No ☐ N/A	
1.10.9	Percent Load Indication	☐ Yes ☐ No ☐ N/A	
1.10.10	Motor Running Indication	☐ Yes ☐ No ☐ N/A	
1.10.11	Drive Fault Indication	☐ Yes ☐ No ☐ N/A	
1.10.12	Speed / Frequency Feedback / Reference	☐ Yes ☐ No ☐ N/A	
1.10.13	Speed Feedback / Reference	☐ Yes ☐ No ☐ N/A	
1.10.14	Output Voltage Check	☐ Yes ☐ No ☐ N/A	
1.10.15	Output Current Check	☐ Yes ☐ No ☐ N/A	
1.10.16	RTD Monitoring System Alarm	☐ Yes ☐ No ☐ N/A	
1.10.17	Motor Space Heater Circuit - 120VAC	☐ Yes ☐ No ☐ N/A	
1.10.18	Control Power Failure Mode - UPS Operation	☐ Yes ☐ No ☐ N/A	
1.10.19	Integral Air Conditioning System Operation	☐ Yes ☐ No ☐ N/A	
1.11 START / STOP / PROCEDURE / MODES			
1.11.1	START - Minimum Speed	☐ Yes ☐ No ☐ N/A	
1.11.2	START - Ramp to Control Point	☐ Yes ☐ No ☐ N/A	
1.11.3	Running - Ramp UP / Ramp DOWN Over 30-Seconds, Field Adjustable	☐ Yes ☐ No ☐ N/A	
1.11.4	AUTO Run	☐ Yes ☐ No ☐ N/A	
1.11.5	Fully Automatic Strategy	☐ Yes ☐ No ☐ N/A	
1.11.6	Time-of-Day Automatic Strategy	☐ Yes ☐ No ☐ N/A	



Documents				
Name		Type	Added On	Added By

SECTION 260221- MOTORS AND MOTOR CONTROLLERS

PART 1 - GENERAL

1.1 PRODUCTS FURNISHED BUT NOT INSTALLED

- A. Deliver the following items to the Electrical Work Contractor for installation and connection to power wiring:
 - 1. Motor including 2 copies of approved wiring diagrams. Motor shall match existing motor size and HP and be compatible with Fan and existing motor arrangement.
 - 2. Motor controllers including 2 copies of approved wiring diagrams.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Coordinate all wiring work for Controller as specified under the E contract.

1.3 REFERENCES

- A. NEMA MG-1 - Motors and Generators.
- B. NEMA ICS - General Standards for Industrial Control and Systems.
- C. UL508 - Electric Industrial Control Equipment.
- D. IEEE 519 - Recommended Practices and Requirements for Harmonic Control in Electric Power Systems.

1.4 SUBMITTALS

- A. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
- B. Manufacturer's installation instructions shall be provided along with product data.
- C. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
- D. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 013300 does not apply to this Section.
- E. Submittal Package: Submit the product data, and quality control submittals specified below at the same time as a package.
- F. Product Data:

1. All Motors:
 - a. Catalog sheets, specifications and installation instructions.
 - b. Data proving that voltage rating of each motor is in accordance with specified NEMA standard motor voltage.
 - c. Data proving that the service factor and temperature rise for the motor's insulation system conforms to NEMA standards for each motor's specific application.
 - d. Data proving that the motor efficiency rating conforms to NEMA testing and marking standards MG1-12.54 and 12.55.
 - e. Mounting drawing to existing fan shaft.
2. Motor Controllers: Catalog sheets, specifications, and installation instructions. Submit product data for motor controllers simultaneously with product data required for motors.
 - a. Identify each controller for use with corresponding motor.
 - b. Describe overload devices being supplied with each motor controller (include equipment manufacturer's recommendations).
 - c. Enumerate and describe all accessories being supplied with each motor controller.
3. Additional Data for Motors Controlled by Solid State or Adjustable Speed Motor Controllers:
 - a. Data proving that the motor has been designed for use with associated controller.
 - b. Data proving that the motor has been designed for use with DC injection braking.

G. Quality Control Submittals:

1. Harmonic analysis report.
2. Company Field Advisor Data: Include:
 - a. Name, business address and telephone number of Company Field Advisor secured for the required services.
 - b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
 - c. Services and each product for which authorization is given by the Company listed specifically for this project.

H. Contract Closeout Submittals:

1. System acceptance test report.
2. Certificate: Affidavit, signed by the Company Field Advisor and notarized, certifying that the system meets the contract requirements and is operating properly.
3. Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Director's Representative.

1.5 QUALITY ASSURANCE

A. Equipment Qualifications For Products Other Than Those Specified:

1. At the time of submission provide written notice to the Director of the intent to propose an “or equal” for products other than those specified. Make the “or equal” submission in a timely manner to allow the Director sufficient time to review the proposed product, perform inspections and witness test demonstrations.
2. If products other than those specified are proposed for use furnish the name, address, and telephone numbers of at least 5 comparable installations that can prove the proposed products have performed satisfactorily for 3 years. Certify in writing that the Director’s Representative of the 5 comparable installations will allow inspection of their installation by the Director’s Representative and the Company Field Advisor.
 - a. Make arrangements with the Director’s Representative of 2 installations (selected by the Director) for inspection of the installations by the Director’s Representative. Also obtain the services of the Company Field Advisor for the proposed products to be present. Notify the Director a minimum of 3 weeks prior to the availability of the installations for the inspection, and provide at least one alternative date for each inspection.
 - b. Only references from the actual Director’s Representative (Security Supervisor, Maintenance Supervisor, etc.) will be accepted. References from dealers, system installers or others, who are not the actual Director’s Representative of the proposed products, are not acceptable.
 - 1) Verify the accuracy of all references submitted prior to submission and certify in writing that the accuracy of the information has been confirmed.
3. The product manufacturer shall have test facilities available that can demonstrate that the proposed products meet the contract requirements.
 - a. Make arrangements with the test facility for the Director’s Representative to witness test demonstrations. Also obtain the services of the Company Field Advisor for the proposed product to be present at the test facility. Notify the Director a minimum of 3 weeks prior to the availability of the test facility, and provide at least one alternative date for the testing.
4. Provide written certification from the manufacturer that the proposed products are compatible for use with all other equipment proposed for use for this system and meet all contract requirements.

B. Harmonic Analysis:

1. The adjustable speed motor controller manufacturer shall perform a harmonic current magnitude and voltage distortion analysis and provide certified calculations specific to this installation, showing that the total harmonic distortion caused by the adjustable speed motor controller will be below the specified level. The analysis shall be accordance with IEEE 519.
2. The results shall be based on a computer aided/modeled circuit simulation of the actual system, based upon the materials and equipment proposed to be furnished and installed.
3. The results shall be based on a computer aided/model circuit from the controller to the distribution transformer supplying the controller, based upon the materials and equipment proposed to be furnished and installed, and associated portions of the existing electrical system.

- a. Basic parameters relative to the existing system are specified herein. Additional information deemed necessary by the controller manufacturer to provide a certified harmonic analysis report shall be obtained by a field investigation of the existing system, at no additional cost to the State.
- C. Service Availability: A fully equipped service organization shall be available to service the completed Work.
- D. Company Field Advisor: Secure the services of a Company Field Advisor from the Company providing the solid state controllers and the adjustable speed controllers for a minimum of 8 working hours for the following:
 1. Render advice regarding installation, programming, final adjustment, and testing.
 2. Witness final system test and then certify with an affidavit that the motor controllers are installed in accordance with the contract documents and are operating properly.
 3. Train facility personnel on the operation and maintenance of the motor controllers (minimum of two 1 hour sessions).
 4. Explain available service programs to facility supervisory personnel for their consideration.

PART 2 - PRODUCTS

2.1 MOTORS

- A. Classification:
 1. Classification According to Application: Comply with NEMA standards for general-purpose alternating-current squirrel-cage induction motors, except:
 - a. Furnish NEMA definite-purpose or special-purpose motors when required to suit the application.
 - b. Furnish NEMA type other than squirrel-cage construction when required to suit the application.
 2. Classification According to Environmental Protection and Methods of Cooling: Comply with NEMA requirements for a dripproof machine unless otherwise specified or indicated on the drawings, or required to suit the application.
- B. Efficiency: Motors shall be stamped with a NEMA nominal efficiency rating in accordance with NEMA testing and marking standards MG1-12.54 and 12.55.
 1. Nominal full-load three phase motor efficiency:

OPEN MOTORS			
RPM	1200	1800	3600
HP			
1.0	80.0	82.5	
1.5	84.0	84.0	82.5

2.0	86.5	84.0	84.0
3.0	86.5	86.5	84.0
5.0	88.5	87.5	85.5
7.5	89.5	88.5	87.5
10	90.2	89.5	88.5
15	91.0	90.2	89.5
20	90.2	91.0	90.2
25	91.7	92.4	91.0
30	92.4	93.0	92.4
40	93.0	93.0	92.4
50	92.4	94.1	92.4
60	93.0	93.6	93.0
75	93.6	94.1	93.6
100	93.6	94.1	93.6
125	94.1	94.1	93.6
150	94.5	94.5	94.5
200	94.5	95.0	95.4

CLOSED MOTORS			
RPM	1200	1800	3600
HP			
1.0	81.5	84.0	
1.5	85.5	85.0	84.0
2.0	86.5	84.0	85.5
3.0	88.5	88.5	86.5
5.0	88.5	88.5	87.5
7.5	89.5	91.0	88.5
10	89.5	91.0	89.5
15	90.2	91.0	89.5
20	91.0	91.7	90.2
25	91.7	92.4	90.2
30	92.4	93.6	91.0
40	93.0	93.0	91.0
50	93.6	93.6	92.4
60	93.6	94.1	94.1
75	94.1	94.5	94.1
100	94.1	95.0	94.1
125	94.1	95.0	94.1
150	95.0	95.0	94.1
200	95.0	95.8	95.01

2. Furnish motors having an efficiency higher than that indicated above where specified to comply with utility company energy efficiency rebate program requirements.

C. Motor (Nameplate) Voltage:

1. 277/480 V, Three Phase, 4W, Premises Wiring Systems:

- a. Motors 1/2 hp and Larger: NEMA standard motor voltage 460 V, three phase, 60 Hz. 440 V motors are not acceptable.

D. Horsepower Capacity:

- 1. Fan to berated for minimum of10 HP, matching existing.
- 2. Each motor shall not be overloaded by the apparatus it operates under every condition of operation.
- 3. The horsepower capacity shall be the continuous rating based on the nameplate horsepower rating. (The motor may not be overloaded up to the horsepower obtained by multiplying the rated horsepower by the service factor shown on the nameplate).
- 4. Where a minimum horsepower capacity is listed, furnish a motor larger than the minimum, if required in a particular case.
- 5. Pay additional cost due to necessary increase in feeder sizes, circuit breaker sizes, etc., provided under the Electric Contract.

E. Bearings: Equip motors 1/2 hp and larger with ball bearings unless otherwise specified or indicated on the drawings.

F. Speed: 3530 RPM.

G. Frame: 213TDZ , matching existing

H. Additional Requirements For Motors Used With Solid State and Adjustable Speed Motor Controllers:

- 1. Designed specifically for use with type of controller required.
- 2. Designed for DC injection braking.

I. Brake: Where indicated, equip motors with electro/mechanical brake system.

2.2 NAMEPLATES

A. General: Precision engrave letters and numbers with uniform margins, character size minimum 3/16 inch high.

- 1. Phenolic: Two color laminated engraver's stock, 1/16 inch minimum thickness, machine engraved to expose inner core color (white).
- 2. Aluminum: Standard aluminum alloy plate stock, minimum .032 inches thick, engraved areas enamel filled or background enameled with natural aluminum engraved characters.
- 3. Materials for Outdoor Applications: As recommended by nameplate manufacturer to suit environmental conditions.

2.3 ADJUSTABLE SPEED MOTOR CONTROLLERS (VFD's)

A. Type 'AS-PWM' for Motor: Microprocessor based, sine-coded pulse-width-modulation design variable frequency/variable voltage adjustable speed motor controller:

1. Companies and Models: Furnish the Company's model which meets the requirements of the motor and driven equipment combination, suits the electrical system parameters, and accommodates the operating features and accessories:
 - a. Square D: BOD, ATV. Refer to Drawings for additional information.
 - b. Allen-Bradley Co. Inc.'s 1333 (3/4-50 hp/230 V, 1-5 hp/460 V), 1336 (1-100 hp/230 V, 1-500 hp/460 V), 1352 (25-1400 hp/460 V).
 - c. Eaton Corp.'s AF-1500 (1-20 hp/230 V, 1-30 hp/460 V, IS5000+ (5-600 hp/460 V).
 - d. General Electric Co.'s AF-300B (3/4-30 hp/230 V, 1/4-300 hp/460 V).
 - e. Westinghouse Electric Corp.'s Accutrol 110 (1-75 hp/230 V, 2-20 hp/460 V).
2. Operating Features and Accessories:
 - a. Suitable for torque load type for application proposed (Fans, AHU's)
 - b. Soft start: Adjustable time range of 2 to 600 seconds.
 - c. Cushioned start: Timed acceleration/deceleration linearly in steps up to the preset speed.
 - d. Reversing.
 - 1) Regenerative braking which directs the regenerative energy from the motor back into the ac line.
 - 2) Heavy duty dynamic braking which directs the regenerative energy from the motor into a resistor.
 - e. DC injection braking to bring motor to stop.
 - f. Provision to energize electro/Mechanical brake to hold the driven equipment stopped, after the motor has stopped.
 - g. Ground fault protection.
 - h. Ambient operating temperature range 0 to 40 degrees C. Maximum humidity 95 percent.
 - i. Digital display showing operational functions:
 - 1) Speed.
 - 2) Output voltage.
 - 3) Output current.
 - 4) Elapsed time.
 - j. Digital display, or LED's showing diagnostic functions, including:
 - 1) Overcurrent.
 - 2) Overvoltage.
 - 3) Undervoltage.
 - 4) Overtemperature.
 - 5) Ground fault.
 - 6) Overload.
 - k. Input voltage: Suitable for use on 480 V ac 3 phase circuit.
 - l. Output voltage 0 to 480 V ac, 3 phase.
 - m. Frequency:
 - 1) Input: 60 Hz.

- 2) Selectable Output: 3 to 60 Hz, with separately adjustable min/max frequency limits and capability to lock these limits so that they cannot be exceeded.
 - 3) Frequency Reject: Programmable (both the width and the midpoint of up to 3 bands, or end points) to reject operation within the selected bands.
 - 4) Output regulation: + .06 percent.
- n. 100 percent continuous current rating, 150 percent for one minute every 10 minutes.
- o. Local control panel for manual operation:
- 1) Refer to drawings for basis of design control buttons/interface
- p. Local programming panel for:
- 1) Acceleration rate.
 - 2) Deceleration rate.
 - 3) Start torque (boost).
 - 4) Maximum frequency.
 - 5) Volts/Hz pattern.
 - 6) Restart Mode: Automatic restart upon return of input power, manual reset/restart on overload.
 - 7) Restart Mode: Manual reset/restart upon return of input power or overload.
 - 8) Start and direction, local or remote.
 - 9) Stop mode, ramp or coast.
- q. Interface Input for Automatic Speed Control: Isolated, direct proportional automatic speed follower which responds to an externally supplied signal from the speed reference signal source for automatic motor speed control when the controller is in the automatic mode of operation.
- 1) 0-10 V dc.
 - 2) 4-20mA dc.
 - 3) Variable resistance.
 - 4) 3 to 15 psi pneumatic/electric transducer.
- r. Interface Input For Automatic Speed Control: Interface which accepts signals from programmable logic control, or computer, for automatic speed and direction control when the controller is in the automatic mode of operation.
- s. Interface Input For Emergency Stop: Isolated input to receive signal from the fire alarm system, to stop motor upon alarm condition.
- t. Interface Output To Indicate Speed: Interface which follows motor speed, enabling the motor speed to be displayed at the Direct Digital Building Control System primary operator station.
- u. Start/stop control voltage maximum 120 V, wire.
- v. Auxiliary output contacts, 120 V ac, 1 amp:
- 1) Spares, for future use: 1 N.O., 1 N.C.
 - 2) For Remote Indication at the Direct Digital Building Control System Primary Operation Station:
 - a) Run: 1 N.O.

- b) Fault: 1 N.O., 1 N.C.
 - c) At Speed: 1 N.O.
- w. Electronic overload device that monitors the motor function to provide motor overload protection at all speeds. Manual or automatic reset as specified under local programming panel.
- x. Motor winding protection, responsive to the motors' imbedded temperature measuring detectors.
 - 1) NEMA 12 enclosure.
- y. Input circuit breaker/disconnect switch with external operator.
- z. Controllers designed, equipped, and installed such that the controllers reflect 5 percent or less total harmonic distortion at the source specified under System Acceptance Test. Equip controller with:
 - 1) Input isolation/voltage matching transformer, or 3 percent input line reactor if voltage matching is not required.
 - 2) Transient protective devices on input terminals; Innovative Technology Inc.'s P-Plus Protector.
 - 3) Additional equipment (line filters, etc.) as recommended by the adjustable speed motor controller manufacturer to maintain total harmonic distortion below specified level.
- aa. Automatic bypass switch to automatically switch to full speed across the line operation upon drive fault (except short circuit, ground fault, or motor thermal overload).
 - 1) Solid state, soft start, or reduced voltage magnetic motor controller arranged and wired to operate motor when switch is in bypass mode. Across-the-line magnetic motor controller may be used for motors less than 7-1/2 hp (208 V), 15 hp (480 V).
- bb. Output isolation contactor to open circuit to motor whenever controller is in stop mode.
- cc. Interlock system to prevent the load side disconnect switch (at the motor) from being opened while the adjustable speed motor controller is energized. Motor controller input disconnect must be opened before load side disconnect switch can be opened. Coordinate interlock system with Electrical Work Contractor.
- dd. Remote operator station, NEMA 1 enclosure:
 - 1) Start.
 - 2) Stop.
 - 3) Frequency (Speed).
 - 4) Forward/Reverse.
- ee. Provide additional operating features and accessories as required by the manufacturer of the equipment which the adjustable speed motor controller is driving.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install the Work of this Section in accordance with the manufacturer's printed instructions.
- B. Nameplates: Identify indicating motor controlled. Identify each interlock switch, indicating purpose of switch:
 - 1. NEMA 12 Enclosures: Rivet or bolt and gasket nameplate to the cover.

3.2 FIELD QUALITY CONTROL

- A. System Acceptance Test:
 - 1. Preparation: Notify the Director's Representative at least 3 working days prior to the test so arrangements can be made prior to the test to have a Facility Representative witness the test.
 - 2. Make the following tests:
 - a. Demonstrate that each solid state and adjustable speed motor controller performs its intended function.
 - b. Use the harmonics meter to determine the total harmonic distortion caused by the adjustable speed motor controllers.
 - 1) While the motors are running, measure the total harmonic distortion at the transformer serving the building.
 - 2) While the motors are running, measure the total harmonic distortion at the distribution transformer supplying the controllers.
 - 3) If total harmonic distortion caused by the adjustable speed motor controllers exceeds specified limit, install additional equipment as necessary to keep the total harmonic distortion caused by the adjustable speed motor controllers under the specified limit.
 - 3. Supply all equipment necessary for system adjustment and testing.
 - 1) Submit written report of test results signed by the Company Field Advisor and the Director's Representative. Mount a copy of the final report in a plexiglass enclosed frame assembly in a conspicuous location on or adjacent to each motor controller.
- B. Preliminary System Test:
 - 1. Preparation: Have the Company Field Advisor program and adjust the completed solid state and adjustable speed motor controllers and then operate them long enough to assure that they are performing properly.
 - 2. Run a preliminary test for the purpose of:

- a. Determining whether motor controllers are in a suitable condition to conduct an acceptance test.
- b. Checking instruments and equipment.
- c. Training facility personnel.

END OF SECTION 260221

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

1. Steel slotted support systems.
2. Conduit and cable support devices.
3. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
4. Fabricated metal equipment support assemblies.

1.3 SUBMITTALS

- A. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
- B. Manufacturer's installation instructions shall be provided along with product data.
- C. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
- D. Product Data: For each type of product.
 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - a. Slotted support systems, hardware, and accessories.
 - b. Clamps.
 - c. Hangers.
 - d. Sockets.
 - e. Eye nuts.
 - f. Fasteners.
 - g. Anchors.
 - h. Saddles.
 - i. Brackets.
 2. Include rated capacities and furnished specialties and accessories.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch- (10-mm-) diameter holes at a maximum of 8 inches (200 mm) o.c. in at least one surface.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Atkore International (Unistrut).
 - b. Eaton (B-line).
 - c. nVent (CADDY).
 - d. Or equal.
 - 2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
 - 3. Material for Channel, Fittings, and Accessories: [Galvanized steel] [Plain steel] [Stainless steel, Type 304] [Stainless steel, Type 316].
 - 4. Channel Width: 1-1/4 inches .
 - 5. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 6. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
 - 7. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 - 8. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- C. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Hilti, Inc.
 - 2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
 - 3) MKT Fastening, LLC.
 - 4) Or equal.
 - 2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

- a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Eaton (B-line).
 - 2) Hilti, Inc.
 - 3) ITW Ramset/Red Head; Illinois Tool Works, Inc.
 - 4) Or equal.
- 3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
- 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
- 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM F3125/F3125M, Grade A325 (Grade A325M).
- 6. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
 - 1. NECA 1.
 - 2. NECA 101
 - 3. NECA 102.
 - 4. NECA 105.
 - 5. NECA 111.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as scheduled in NECA 1, where its Table 1 lists maximum spacings that are less than those stated in NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with two-bolt conduit clamps
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).
- C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To New Concrete: Bolt to concrete inserts.
 - 2. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 3. To Existing Concrete: Expansion anchor fasteners.
 - 4. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
- D. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

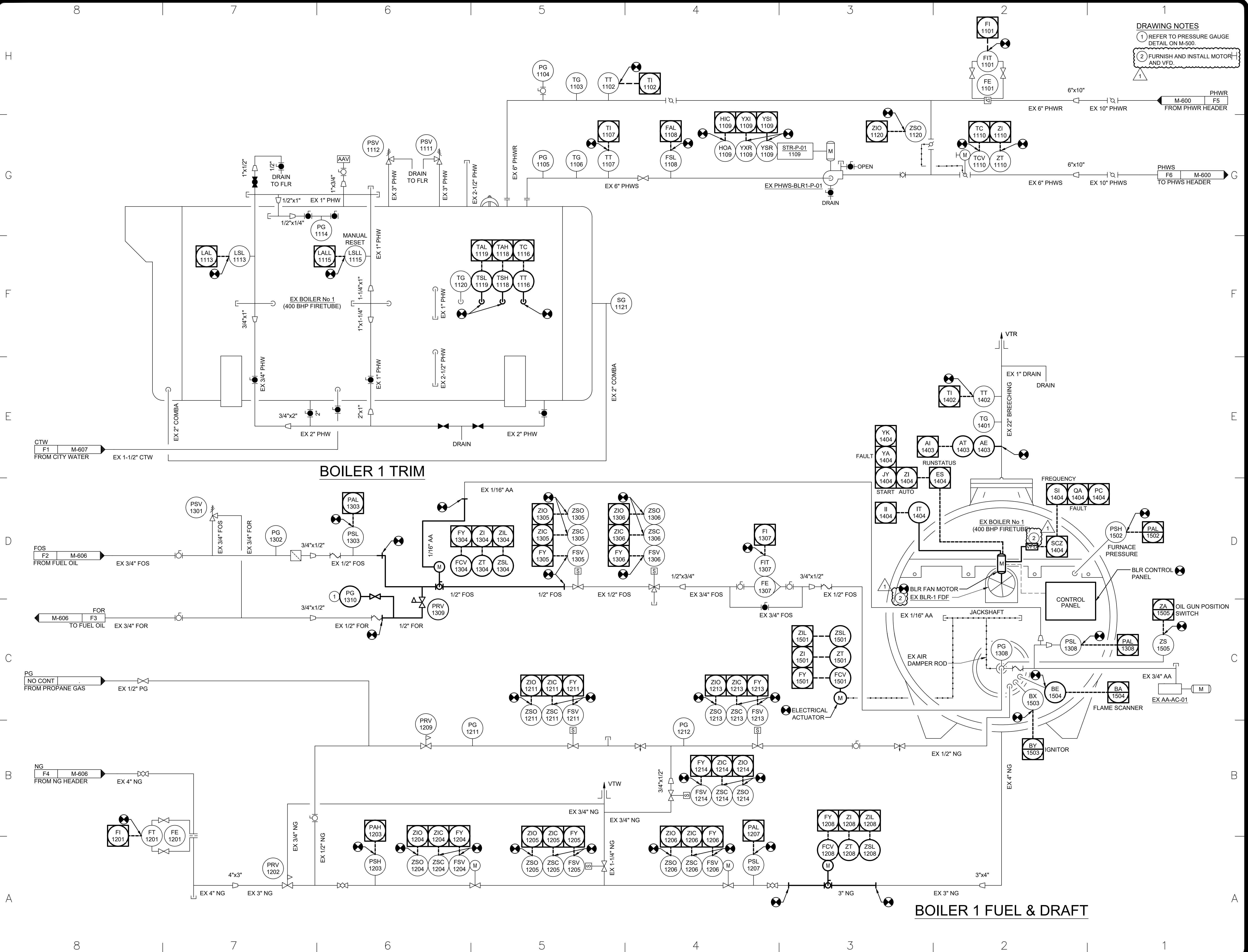
3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3000-psi 28-day compressive-strength concrete with 4"x4" wire mesh.
- C. Anchor equipment to concrete base as follows:
 - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

END OF SECTION 260529



DRAWING NOTES
1 REFER TO PRESSURE GAUGE
DETAIL ON M-500.
2 FURNISH AND INSTALL MOTOR
AND VFD.

NEW YORK STATE OFFICE OF General Services
DESIGN & CONSTRUCTION
CONSULTANT
CERTIFICATE OF AUTHORIZATION #: 021037
rmf
RMF ENGINEERING, INC.

WARNING:
THE ALTERATION OF THIS MATERIAL IN ANY WAY,
UNLESS DONE UNDER THE DIRECTION OF A COMPARABLE
PROFESSIONAL, I.E. ARCHITECT FOR AN ARCHITECT,
ENGINEER FOR AN ENGINEER OR LANDSCAPE ARCHITECT
FOR A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE
NEW YORK STATE EDUCATION LAW AND/OR REGULATIONS
AND IS A CLASS 'A' MISDEMEANOR.

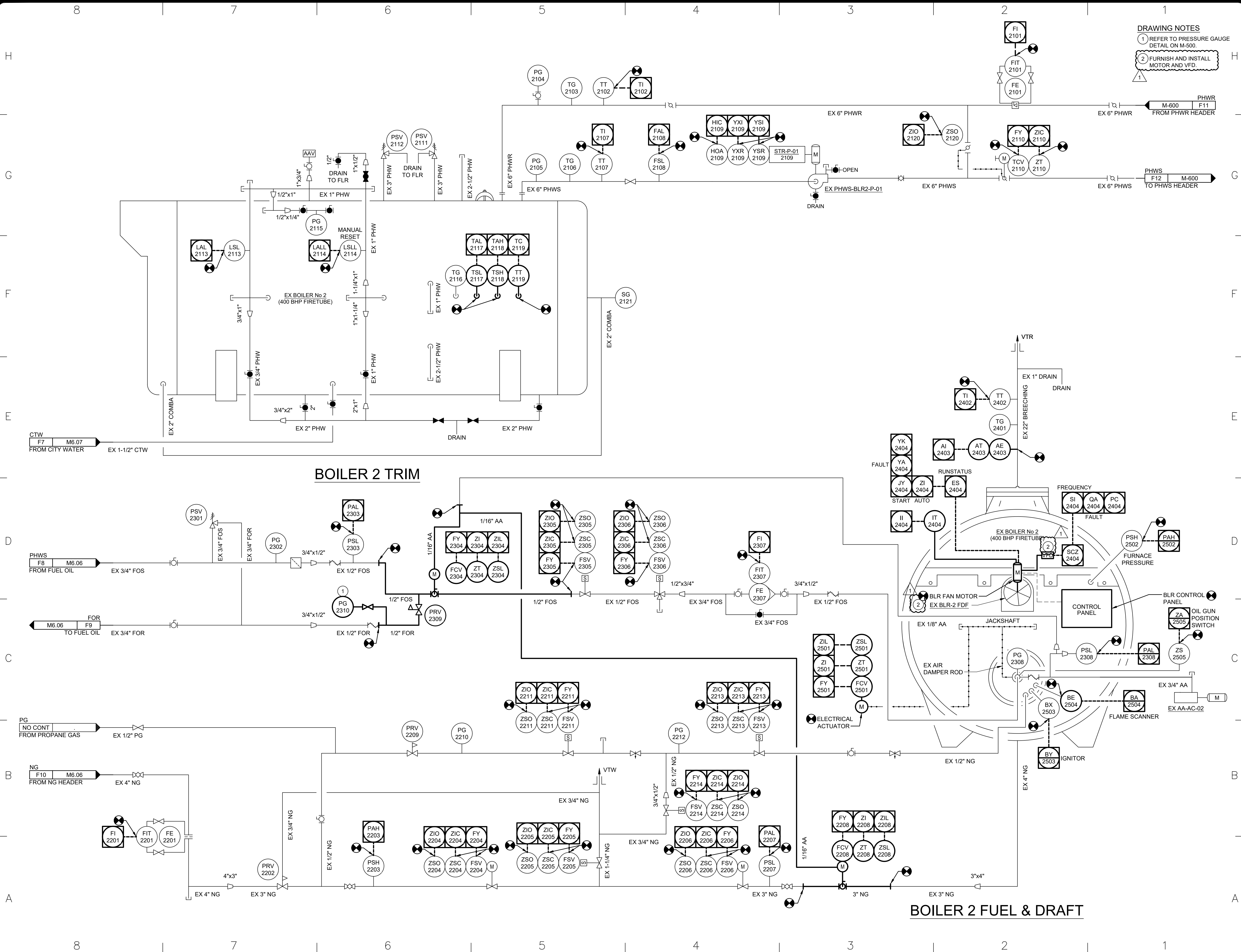
NYS ENERGY CODE STATEMENT:
I, UNDERSIGNED, DO HEREBY CERTIFY THAT TO THE BEST
OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT,
THE INFORMATION SHOWN ON THESE DRAWINGS AND
SPECIFICATIONS BEARING MY SEAL COMPLIES WITH THE
APPLICABLE REQUIREMENTS OF THE NEW YORK STATE
2025 ENERGY CONSERVATION CODE.

2025 BUILDING CODE OF NEW YORK STATE
TO THE BEST OF THE REGISTERED DESIGN PROFESSIONAL'S
KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT,
THESE PLANS AND/OR SPECIFICATIONS ARE IN COMPLIANCE
WITH THE 2025 UNIFORM CODE.

REGISTRATION EXPIRES:
01/31/2029
STATE OF NEW YORK
MICHAEL J. [Signature]
No. 09854
PLUMBING ENGINEER

CONTRACT: HVAC
TITLE: REPLACE BOILER CONTROLS, POWERHOUSE, BUILDING 21
LOCATION: RIVERVIEW CORRECTIONAL FACILITY 1110 TIBBITTS DR OGDENSBURG, NY
CLIENT: DEPARTMENT OF CORRECTIONS AND COMMUNITY SUPERVISIONS

1	07/31/2026	REVISED DRAWINGS
	02/23/2026	BID DOCUMENTS
MARK	DATE	DESCRIPTION
PROJECT NUMBER:	Q2007-H	
DESIGNED BY:	PKG	
DRAWN BY:	SMS	
FIELD CHECK:	-	
APPROVED:	-	
SHEET TITLE:		
BLR-1 - TRIM AND TRAIN - SCHEMATIC - WORK		
DRAWING NUMBER:		
M-601		
SHEET	20	OF 42



DRAWING NOTES
1 REFER TO PRESSURE GAUGE
DETAIL ON M-500.
2 FURNISH AND INSTALL
MOTOR AND VFD.

NEW YORK STATE OFFICE OF General Services
DESIGN & CONSTRUCTION
CONSULTANT
CERTIFICATE OF AUTHORIZATION #: 021037
rmf
RMF ENGINEERING, INC.

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ENGINEER FOR AN ENGINEER OR LANDSCAPE ARCHITECT
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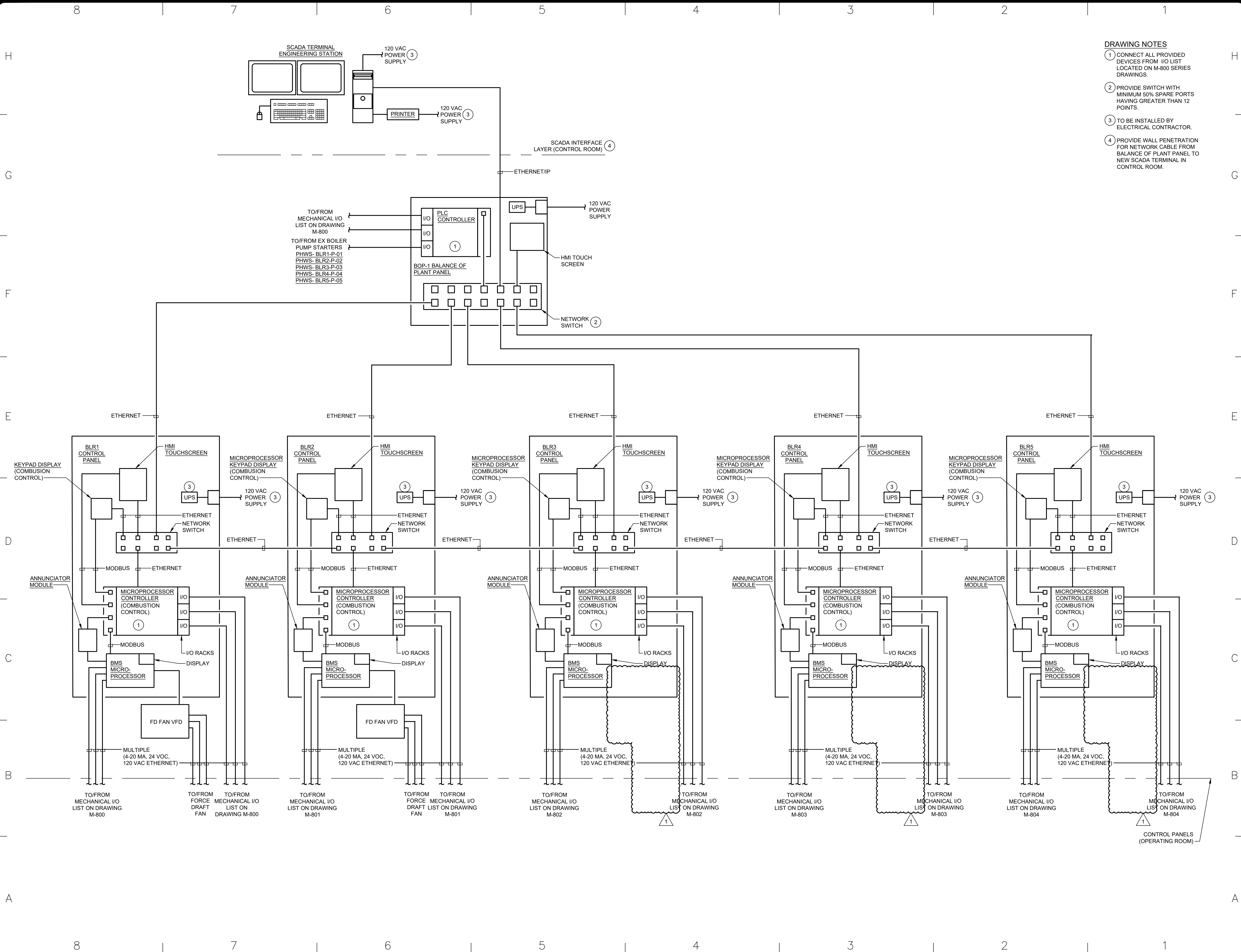
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WITH THE 2025 UNIFORM CODE.

REGISTRATION EXPIRES:
01/31/2029
STATE OF NEW YORK
No. 09854
Professional Engineer
04/06/2020

CONTRACT: HVAC
TITLE: REPLACE BOILER CONTROLS,
POWERHOUSE, BUILDING 21
LOCATION: RIVERVIEW CORRECTIONAL FACILITY
1110 TIBBITTS DR
OGDENSBURG, NY
CLIENT: DEPARTMENT OF CORRECTIONS
AND COMMUNITY SUPERVISIONS

1	07/31/2026	REVISED DRAWINGS
	02/23/2026	BID DOCUMENTS
MARK	DATE	DESCRIPTION
PROJECT NUMBER:	Q2007-H	
DESIGNED BY:	PKG	
DRAWN BY:	SMS	
FIELD CHECK:	-	
APPROVED:	-	
SHEET TITLE:		
BLR-2 - TRIM AND TRAIN - SCHEMATIC - WORK		
DRAWING NUMBER:		
M-602		
SHEET	21	OF 42



- DRAWING NOTES**
- 1 CONNECT ALL PROVIDED DEVICES FROM I/O LIST LOCATED ON M-800 SERIES DRAWINGS.
 - 2 PROVIDE SWITCH WITH MINIMUM 50% SPARE PORTS HAVING GREATER THAN 12 POINTS.
 - 3 TO BE INSTALLED BY ELECTRICAL CONTRACTOR.
 - 4 PROVIDE WALL PENETRATION FOR NETWORK CABLE FROM BALANCE OF PLANT PANEL TO NEW SCADA TERMINAL IN CONTROL ROOM.

NEW YORK STATE
Office of General Services
DESIGN & CONSTRUCTION

CONSULTANT

CERTIFICATE OF AUTHORIZATION #: 021037

rnf
RMF ENGINEERING, INC.

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NYS ENERGY CODE STATEMENT:

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2025 BUILDING CODE OF NEW YORK STATE

TO THE BEST OF THE REGISTERED DESIGN PROFESSIONAL'S KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND/OR SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2025 UNIFORM CODE.



REGISTRATION EXPIRES: 01/31/2029

CONTRACT:

HVAC

TITLE:

REPLACE BOILER CONTROLS, POWERHOUSE, BUILDING 21

LOCATION:

RIVERVIEW CORRECTIONAL FACILITY
1110 TIBBITTS DR
OGDENSBURG, NY

CLIENT:

DEPARTMENT OF CORRECTIONS AND COMMUNITY SUPERVISIONS

1	07/31/2026	REVISED DRAWINGS
	02/23/2026	BID DOCUMENTS
MARK	DATE	DESCRIPTION
PROJECT NUMBER:	Q2007-H	
DESIGNED BY:	PKG	
DRAWN BY:	SMS	
FIELD CHECK:	-	
APPROVED:	-	
SHEET TITLE:		
CONTROLS AND SCADA SYSTEM - SCHEMATIC - WORK		
DRAWING NUMBER:		
M-900		
SHEET	38	OF 42

GENERAL REMOVAL NOTES:

1. REFER TO E-001 FOR LEGENDS, ABBREVIATIONS & GENERAL NOTES.
2. THESE REMOVAL DRAWINGS ARE SCHEMATIC IN NATURE & ARE BASED ON CASUAL FIELD OBSERVATIONS. IT IS NOT THE INTENTION OF THESE DRAWINGS TO INDICATE EVERY DEVICE/FIXTURE REQUIRING REMOVAL, RATHER GENERAL SYSTEMS WHICH ARE TO BE REMOVED. IN GENERAL:

MECHANICAL EQUIPMENT & MISC. ELECTRICAL EQUIPMENT:

- WHERE INDICATED TO BE REMOVED:
- REFER TO BOTH ELECTRICAL AND MECHANICAL DRAWINGS FOR AN ACCURATE DEPICTION OF ALL REMOVAL REQUIRED FOR THIS CONTRACT.
 - REMOVE ALL WIRE & EXPOSED CONDUIT BACK TO SOURCE PANEL (UNLESS OTHERWISE NOTED).
 - REMOVE ANY ASSOCIATED MOTOR STARTERS &/OR DISCONNECTS.
 - REMOVE CIRCUIT WIRING FROM SOURCE PANEL, LABEL BREAKER AS SPARE.
 - PROVIDE REVISED TYPED PANELBOARD DIRECTORIES FOR ALL PANELS TO REMAIN WHERE CIRCUITS ARE TO BE REMOVED.

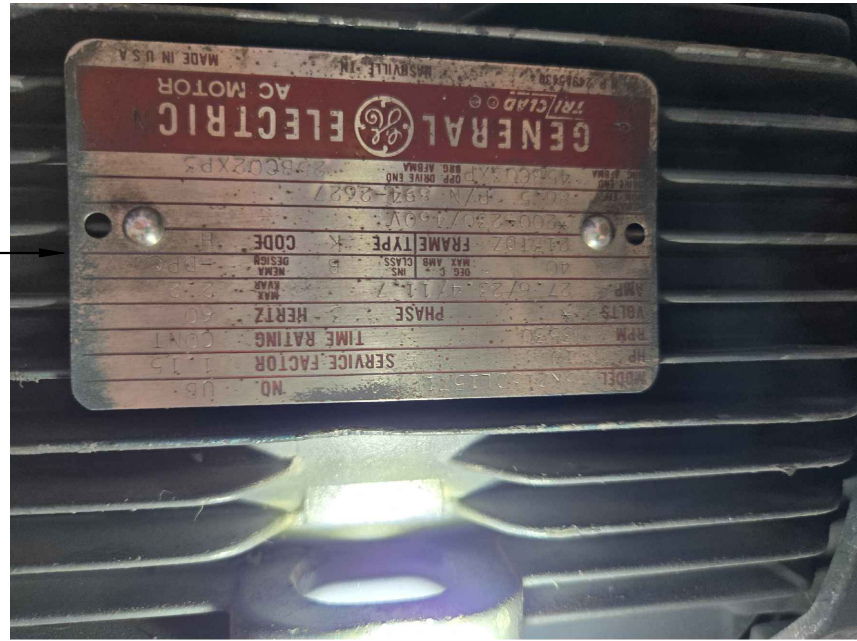
GENERAL CIRCUIT AND FEEDER REMOVAL AND REPLACEMENT:

- MAINTAIN ANY NON-IMPACTED PANELBOARDS AND ANY NON-IMPACTED CIRCUITS WHICH ARE TO REMAIN.
- WHERE CIRCUITS ARE AFFECTED BY MODIFICATION/REMOVAL ACTIVITIES, PROVIDE NECESSARY CIRCUIT EXTENSIONS AND ALL NECESSARY LABOR/MATERIALS AS NECESSARY TO REPAIR AND RE-CONNECT CIRCUIT(S).

KEY NOTES:

- ① PROVIDE DISCONNECTION OF BOILER CONTROL PANEL. REMOVE ASSOCIATED CONDUIT/CONDUCTORS BACK TO SOURCE PANEL LP-1. COORDINATE REMOVAL REQUIREMENTS WITH H-CONTRACT.
- ② BOILER CONTROL PANEL TO BE REPLACED. SOURCE CIRCUIT ASSUMED TO BE FED VIA ASSOCIATED BOILER DISC. PANEL. REMOVE ASSOCIATED CIRCUIT, CONDUIT, AND CONDUCTORS, BACK TO SOURCE PANEL. COORDINATE WITH H-CONTRACT.
- ③ COORDINATE SHAFT POSITION, HEIGHT AND MOUNTING PROVISIONS. PROVIDE SUBMITTAL FOR REPLACEMENT THAT MATCHES REMOVED MOTOR CHARACTERISTICS.
- ④ H CONTRACT TO REMOVE EXISTING FAN MOTOR. E CONTRACT TO PROVIDE DISCONNECTION.

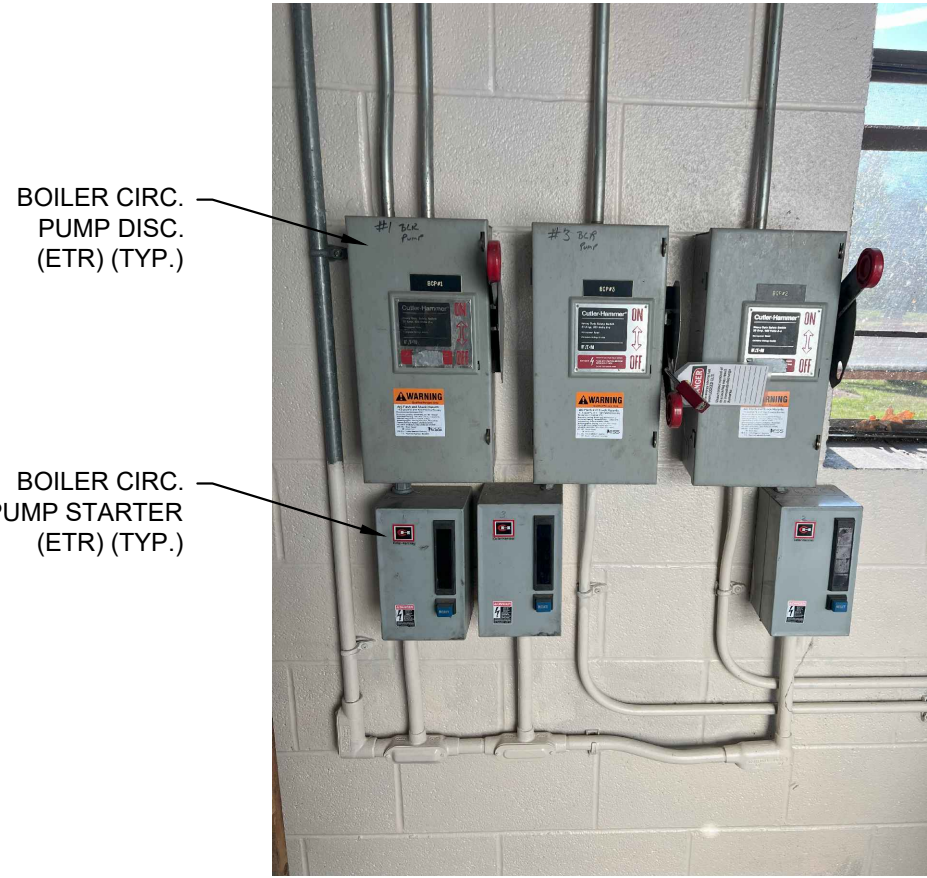
REPLACE EACH MOTOR (TYPICAL OF 2) WITH NEW INVERTER DUTY RATED PREMIUM EFFICIENCY TYPE.



7 FAN MOTOR NAMEPLATE, TYP.
SCALE: NTS



4 BOILER REFERENCE PHOTO, TYP.
SCALE: NTS



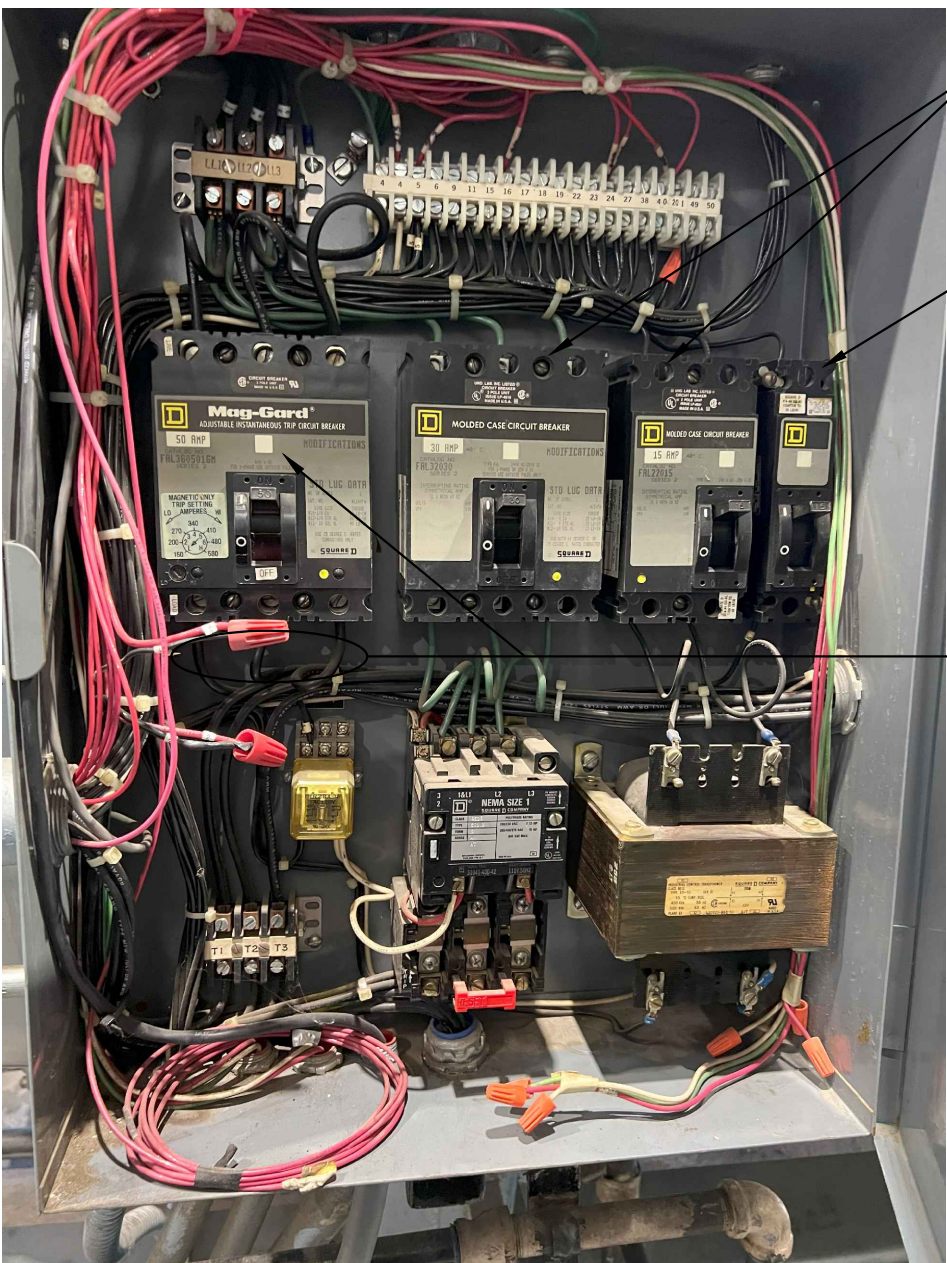
2 REFERENCE PHOTO
SCALE: NTS



6 REFERENCE PHOTO
SCALE: NTS



3 REFERENCE PHOTO
SCALE: NTS

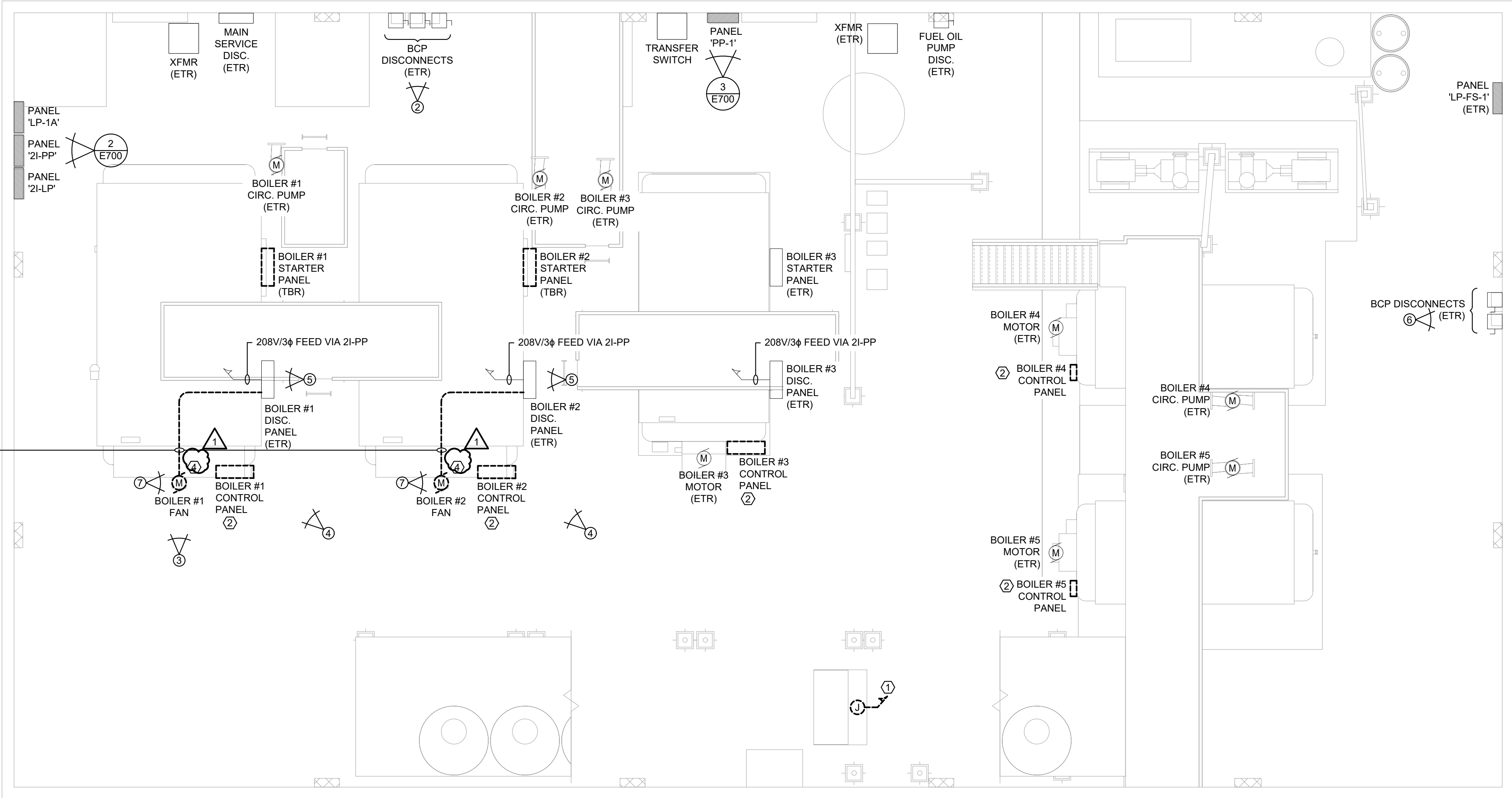


5 REFERENCE PHOTO - BOILER DISC. PANEL
SCALE: NTS

MAINTAIN BREAKER FIELD WIRING AND FUNCTIONALITY FOR OTHER MISC. BOILER LOADS.

FIELD VERIFY. OPEN BREAKER, DISCONNECT AND REMOVE POWER FEED FROM BREAKER TO BOILER CONTROL PANEL. ADD LABELING SIMILAR TO THE FOLLOWING "BREAKER NO LONGER IN SERVICE - PREVIOUSLY FED BOILER CONTROL PANEL".

OPEN BREAKER, DISCONNECT AND REMOVE FIELD WIRING FROM 50A BREAKER TO BOILER FAN TYPICAL FOR BOILER #2. ADD LABELING SIMILAR TO THE FOLLOWING "BREAKER NO LONGER IN SERVICE - PREVIOUSLY FED BOILER DRAFT FAN".



1 ELECTRICAL REMOVALS PLAN
SCALE: 1/4" = 1'-0"

0' 2' 4' 8'
SCALE: 1/4" = 1'-0"



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CONTRACT:

ELECTRICAL

TITLE:

REPLACE BOILER CONTROLS, POWERHOUSE, BUILDING 21

LOCATION:

RIVERVIEW CORRECTIONAL FACILITY
1110 TIBBITTS DR
OGDENSBURG, NY

CLIENT:

DEPARTMENT OF CORRECTIONS
AND COMMUNITY SUPERVISIONS

MARK	DATE	DESCRIPTION
1	07/31/2026	REVISED DRAWINGS
	06/30/2026	BID DOCUMENTS
PROJECT NUMBER:	Q2007-E	
DESIGNED BY:	BCW	
DRAWN BY:	CCH	
FIELD CHECK:		
APPROVED:		
SHEET TITLE:	REMOVALS PLAN	

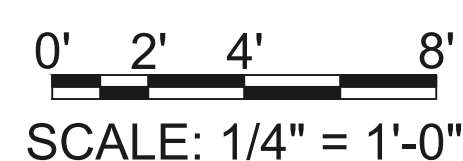
DRAWING NUMBER:

E-101



1. REFER TO E-001 FOR LEGENDS, ABBREVIATIONS AND GENERAL PROJECT NOTES.
2. REFER TO E-001 FOR RACEWAY SCHEDULE FOR APPROVED RACEWAY USAGE.
3. REFER TO E-700 FOR PANEL SCHEDULE FOR CIRCUIT CHARACTERISTICS.
4. REFER TO E-001 FOR BRANCH CIRCUIT SCHEDULE (BCS) FOR CIRCUIT REQUIREMENTS.
5. ALL CONDUCTORS SHALL BE THHN/TW/THWN-2.
6. INSTALLATION SHALL BE PER NECA1 GUIDELINES.
7. PROVIDE HANGERS & SUPPORTS AS REQUIRED.
8. PROVIDE GROUNDING PER NEC FOR ALL ELECTRICAL EQUIPMENT AND ASSOCIATED EQUIPMENT.
9. PROVIDE SUBMITTAL DATA FOR ALL PROPOSED HARDWARE, DEVICES, CONDUIT, HANGERS, ETC. FOR ENGINEER REVIEW & APPROVAL PRIOR TO ORDERING.
10. ALL CONDUCTORS AND EQUIPMENT NOT SHOWN FOR CLARITY. COORDINATE WITH ALL TRADES AND PROVIDE COMPLETE ELECTRICAL CIRCUITING FOR ALL INSTALLED EQUIPMENT. ALL REQUIREMENTS TO BE PER NEC.

- ① PROVIDE UNISTRUT MOUNTING SYSTEM FOR INSTALLATION OF ELECTRICAL EQUIPMENT. COORDINATE INSTALLATION LOCATION IN FIELD WITH H-CONTRACT AND DIRECTOR'S REPRESENTATIVE. SEE MOUNTING SYSTEM DETAIL, THIS DRAWING.
- ② PROVIDE RECEPTACLE FOR SCADA TERMINAL ENGINEERING STATION. PROVIDE CIRCUIT WITHIN NEAREST 120V PANEL. COORDINATE INSTALLATION HEIGHT/REQUIREMENTS WITH H-CONTRACT. UTILIZE ADJACENT EXISTING DATA/NETWORK CONNECTION.
- ③ AS-PWM VFD FURNISHED AND INSTALLED BY H CONTRACT. REFER ALSO TO E-700.
- ④ REFER TO SINGLE LINE DIAGRAM, DRAWING E-700, FOR CONDUCTOR/CONDUIT SIZES AND QUANTITIES.
- ⑤ PANEL 'BP' CONDUIT ROUTING SHOWN IS DIAGRAMMATIC IN NATURE. COORDINATE EXACT ROUTING IN FIELD WITH DIRECTOR'S REPRESENTATIVE PRIOR TO ROUGH-IN. REFER TO SINGLE LINE DIAGRAM, DRAWING E-700 FOR ADDITIONAL INFORMATION REGARDING CONDUCTOR/CONDUIT SIZES AND QUANTITIES.
- ⑥ CONDUIT ROUTING SHOWN IS DIAGRAMMATIC IN NATURE. COORDINATE EXACT ROUTING IN FIELD WITH DIRECTOR'S REPRESENTATIVE PRIOR TO ROUGH-IN. REFER TO SINGLE LINE DIAGRAM, DRAWING E-700 FOR ADDITIONAL INFORMATION REGARDING CONDUCTOR/CONDUIT SIZES AND QUANTITIES.
- ⑦ PROVIDE NEW 120V, 40A CIRCUIT FROM PANEL LP-1A FOR BOP PANEL. UTILIZE EXISTING SPACE WITHIN PANEL LP-1A MADE AVAILABLE DURING REMOVALS. COORDINATE INSTALLATION WITH H-CONTRACT.
- ⑧ PROVIDE (2) #12 & #12G, 3/4" C TO EXISTING PANEL 'LS-FS-1'. PROVIDE 20A/1P BREAKER IN PANEL LP-FS-1.

DEPARTMENT OF CORRECTIONS
AND COMMUNITY SUPERVISIONS

SHEET 41 OF 42

