COUNTY OF MARQUETTE
HEALTH DEPARTMENT
CONDENSING UNIT REPLACEMENT
NEGAUNEE, MICHIGAN

Symbols

- Keynote
- Revision
- Sign Type
- 100.1 — Door or Borrowed Lite Identifier
- Window Type
- 000 — Partition Type
- 000 — Equipment, Fixture or Furniture Indicator

Detail Cut Detail Callout

Wall Section

Building Section

Room Tag Elevation Callout

Code Information

General

Applicable Codes: 2015 Michigan Building Code
2021 Michigan Mechanical Code
2021 Michigan Plumbing Code
2023 National Electrical Code w/ MI part 8

Jurisdiction: Marquette County

Use or Occupancy

B - Business

Type of Construction

Type II-B

Fire Protection Systems

Building has a partial automatic fire sprinkler system per NFPA 13 (basement only).

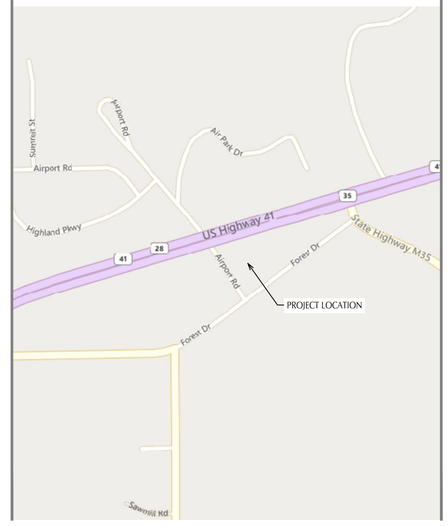
Accessibility

Construction to comply with 2015 Michigan Building Code barrier free provisions and applicable codes referenced therein.

Classification of Renovation Work

Work is a level 1 alteration per 2015 Michigan Rehabilitation Code for Existing Buildings.

Project Location



Sheet Index

NORTHERN DESIGN WORKS

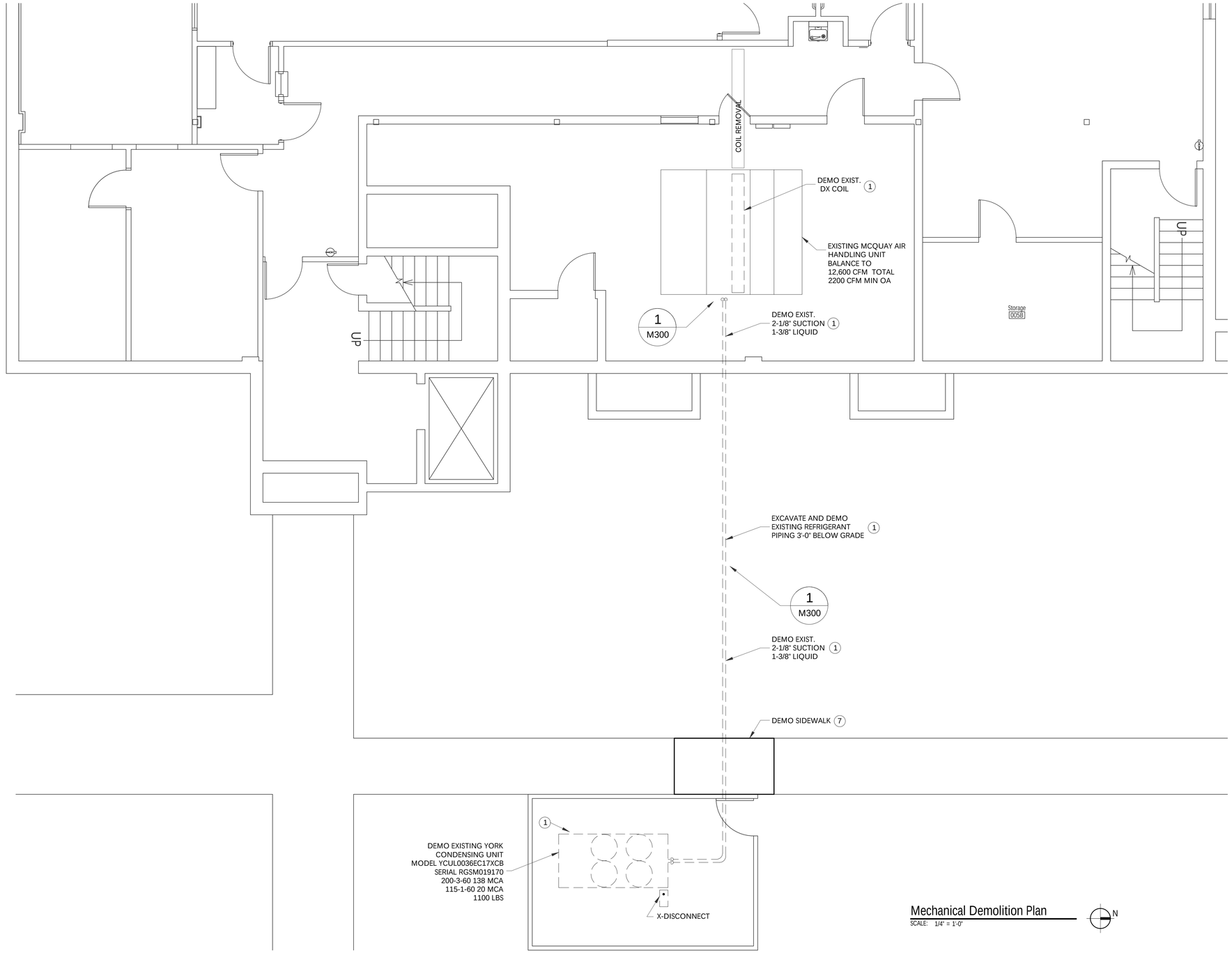
420 Rail Street
Negaunee, MI 49866
www.ndw.us
906-475-6616

Issued for:
Construction
3-19-2024

Project Number:
2402

SEAL

STATE OF MICHIGAN
RICHARD UREN
ARCHITECT
No. 1301045270
LICENSED ARCHITECT



Mechanical Demolition Plan
SCALE: 1/4" = 1'-0"

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Muskegon, MI 49441
T 231 798 9283
F 231 798 9894

1751 Barlow St.
Traverse City, MI 49686
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REC # 5130

Keynotes

1. RECLAIM R-22 REFRIGERANT. DEMO EXISTING INDOOR DX COOLING COIL, OUTDOOR CONDENSING UNIT, REFRIGERATION PIPING AND ALL REFRIGERATION SPECIALTIES. VACUUM INTERIOR OF AHU. PREPARE FOR NEW COOLING COIL AND CONDENSING UNIT.
2. NEW DX COOLING COIL. VERIFY EXISTING COIL DIMENSIONS PRIOR TO ORDERING. SPECIFIED DIMENSIONS ARE BASED ON FIELD MEASUREMENTS OF THE AHU CABINET AND COIL SELECTION INPUTS FOR 500 FPM FACE VELOCITY WITH FIELD FURNISHED FILLER PLATES.
3. NEW CONDENSING UNIT YORK MODEL YC300C00A2GLD5, 208V-3PH. YORK IS BASIS OF DESIGN. OTHER MANUFACTURERS MAY BID AS EQUAL WITH PRIOR APPROVAL OR AS A VOLUNTARY ALTERNATE.
4. CONDENSING UNIT ACCESSORIES: HACR CIRCUIT BREAKER / DISCONNECT, SMART EQUIPMENT CONTROLLER WITH GATEWAY TO BACnet, MS/TP (PROGRAMMABLE TO MODBUS OR N2), PHASE MONITOR, COIL GUARD, LOW AMBIENT CONTROL.
5. FACTORY INSTALLED RAWAL VALVE WITH OIL SEPARATOR.
6. GROUT PVC SLEEVES AT WALL PENETRATION WITH HYDRAULIC CEMENT.
7. SAWCUT AND REMOVE EIGHT FEET OF EXISTING CONCRETE SIDEWALK AND REPLACE WITH NEW 4" AIR ENTRAINED 4,000 PSE CONCRETE WALK TO MATCH EXISTING GRADES.
8. RESTORE DISTURBED AREAS OF SITE WITH 4" TOPSOIL, MDOT TYPE TDS SEED AND MULCH.

General Notes

1. ALL MECHANICAL WORK SHALL BE DONE IN ACCORDANCE WITH THE 2015 MMC, 2018 MPC AND ALL OTHER APPLICABLE CODES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ALL REQUIRED PERMITS, PAY ALL PERMIT FEES AND ARRANGE FOR INSPECTIONS..
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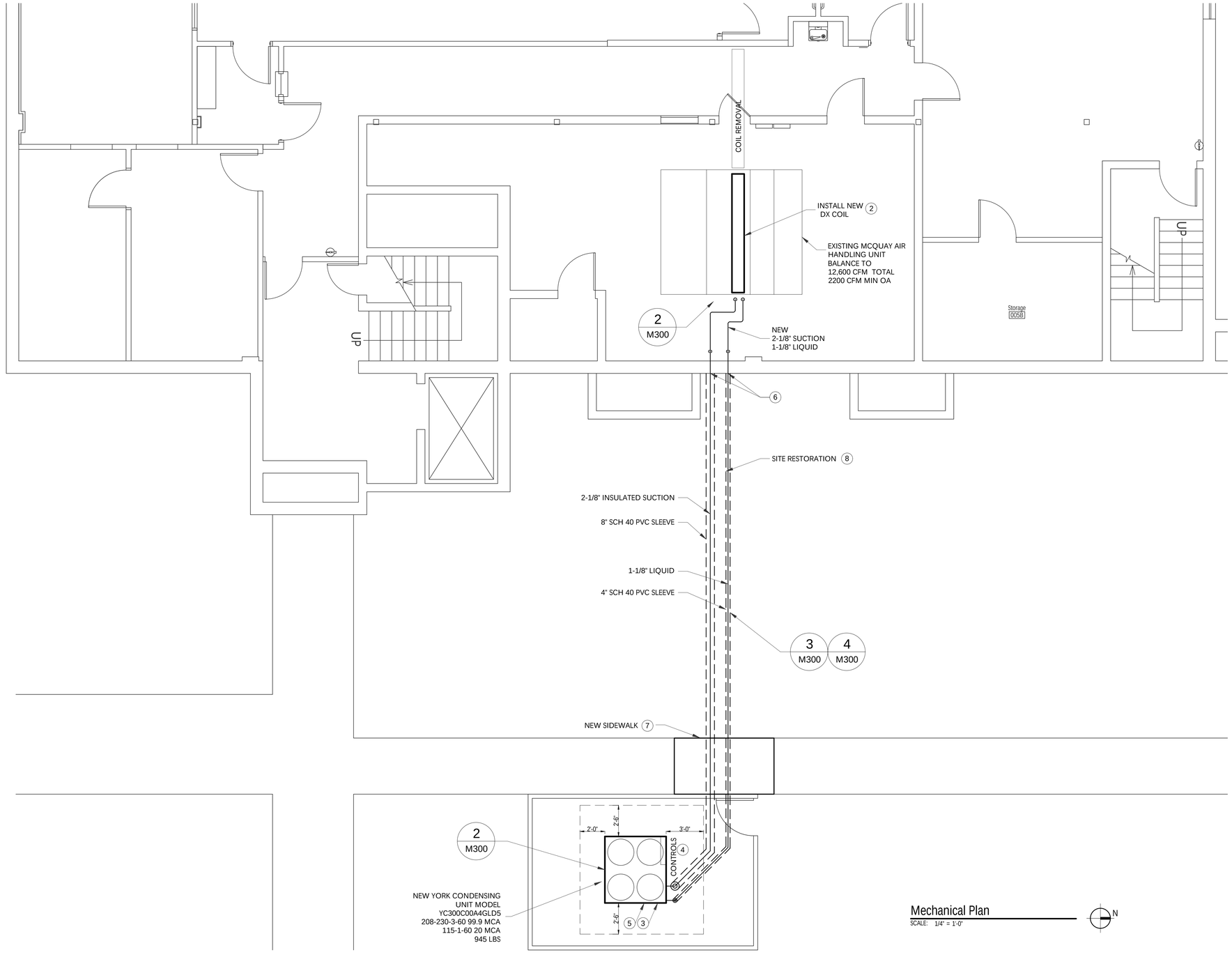
County of Marquette Health Department Condensing Unit Replacement

Mechanical Demolition Plan

ISSUED FOR: For Construction 3-19-2024

NORTHERN DESIGN WORKS
Md100
PROJECT NO. 2402

420 RAIL STREET - NEGAUNEE, MI 49866 906-475-6616



Mechanical Plan
SCALE: 1/4" = 1'-0"

N

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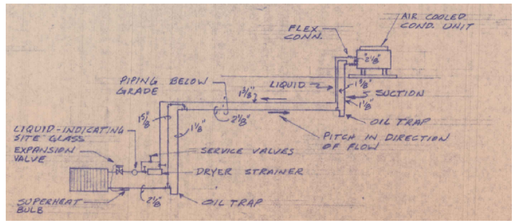


1

EXISTING REFRIGERATION PIPING DETAIL

SCALE: NONE

1
M300

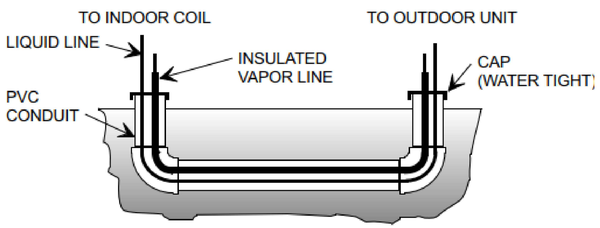


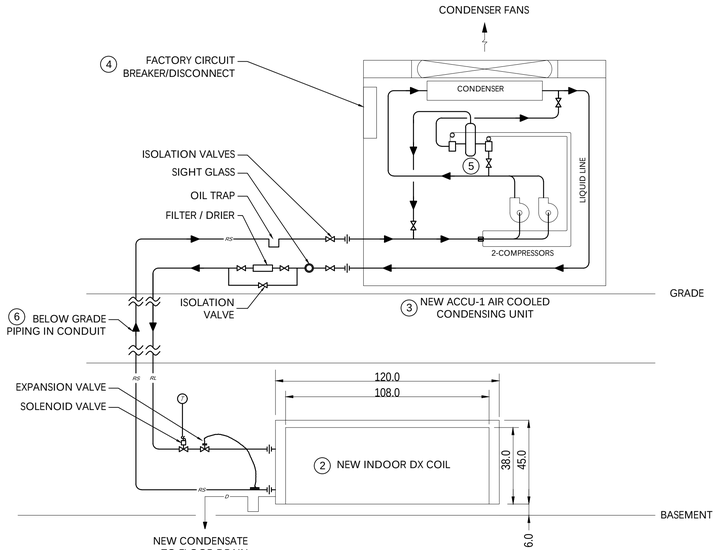
FIGURE 2: Underground Application

- Pack fiberglass insulation and a sealing material such as permagum around refrigerant lines where they penetrate a wall to reduce vibration and to retain some flexibility. If multiple line sets are routed through a common conduit, then all lines must be insulated.
- Insulate all vapor lines with a minimum of 1/2 inch of foam rubber. Liquid lines that will be exposed to direct sunlight or high ambient temperatures such as an attic must also be insulated.

REFRIGERANT SLEEVE DETAIL

SCALE: NONE

3
M300



NEW CONDENSATE TO FLOOR DRAIN

NOTES:

1- REFRIGERANT LINES SHALL BE SIZED AND ROUTED AS PER MANUFACTURER'S RECOMMENDATIONS.

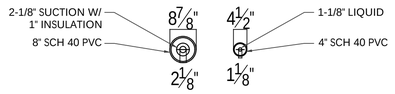
HORIZONTAL DISTANCE BETWEEN ACCU-1 AND DX COIL = 60 FEET.
VERTICAL DISTANCE = ACCU-1 10 FEET ABOVE DX COIL.

INTEGRATE NEW CONDENSING UNIT AND DX COIL CONTROLS WITH EXISTING JOHNSON CONTROL BUILDING MANAGEMENT SYSTEM.
CONTACT TIM MULROY @ JCI. timothy.m.mulroy@jci.com

NEW REFRIGERANT PIPING DETAIL

SCALE: NONE

2
M300



REFRIGERANT SLEEVE DETAIL

SCALE: NONE

4
M300

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County of Marquette Health Department Condensing Unit Replacement

Mechanical Details

ISSUED FOR: For Construction 3-19-2024

NORTHERN DESIGN WORKS
420 RAIL STREET - NEGAUNEE, MI 49866 906-475-6616

M300

PROJECT NO. 2402

Johnson Controls

OD Split System

Split-System Outdoor

Project Name: **Marquette County Health Dept** | Unit Model #: **YC300C00A2GLD5**

Quantity: **1** Tag #: **ACCU-1** | System: **YC300C00A2GLD5**

Cooling Performance

Total gross capacity	300.0	MBH
Total net capacity	300.0	MBH
Ambient DB temp.	89.0	°F
Power input (w/o blower)	22.30	kW
Suction pressure	138.2	psig
Saturated suction temp.	48	°F

Refrigerant

Refrigerant type	R-410A

Electrical Data

Power supply	208-3-60	
Unit min circuit ampacity	99.9	A
Unit max over-current protection	150	A

Dimensions & Weight

Hgt 50 in	Len 59 in	Wth 64 in
Weight with factory installed options	945	lb

Clearances

Right	30 in	Front	36 in	Rear	24 in
Top	120 in	Bottom	0 in	Left	30 in

Note: Please refer to the tech guide for listed maximum static pressures

25 Ton

- Johnson Controls Split System Units are Manufactured at an ISO 9001 Registered Facility.

Unit Features

- Two Stage Cooling
- Unit is designed for R410A refrigerant and is shipped with a small Nitrogen holding charge.
- Unit Cabinet Constructed of Powder Painted Steel, Certified At 750 Hours Salt Spray Test (ASTM B-117 Standards)
- Full Perimeter Base Rails with Built in Rigging Capabilities
- Single Refrigeration Circuit (2 Pipe)
- Scroll Compressors with Crankcase Heater
- Liquid Line Driers (Supplied for Field Installation)
- Aluminum Tube/ Aluminum Fin Microchannel Coils
- Back Seating Suction and Liquid Line Service Valves
- Inherently Protected Fan Motors
- Factory Installed Low Ambient Control to 0°F
- Side or Bottom Single Point Power Connections
- Disconnect Switch
- Phase Monitor
- Coil Guard
- Short Circuit Current: 5kA RMS Symmetrical

Standard Unit Controller: Smart Equipment Control Board

- Anti-Short Cycle Protection, Lead-Lag, Low Voltage Protection, On-Board Diagnostic and Fault Code Display
- Safety Monitoring - Monitors the High and Low-Pressure Switches. The Unit Control Board will Alarm on Compressor Lockouts and Repeated Limit Switch Trips.

BAS Controller

- Smart Equipment Controller with Gateway to BACnet MS/TP (Programmable to Modbus or N2)

Warranty

- One (1) Year Limited Warranty on All Other Parts
- Five (5) Year Limited Warranty on Compressors

Johnson Controls

LOOSE COIL PERFORMANCE SPECIFICATION

Unit Tag	Quantity	Coil Type	Air Flow (scfm)	Function
DX-1	1	BDX (DX)	12600	Select

Input Data

General		Air Side		Fluid Side	
Application:	Cooling	Altitude (ft.):	0	Refrigerant:	R-410a
Tube Diameter:	1/2"	Air Flow (scfm):	12600	Suction Temp.(°F):	48.0
Tube Wall Thickness:	0.016"	Face Velocity (ft/min):	448	No. Distributors:	2
Casing Material:	Galvanized Steel	EAT-DB (°F):	80.0	Capacity Split:	50-50
Fin Material:	Aluminum	EAT-WB (°F):	67.0	Ref. Vol. (ft.³):	1.12
Fin Thickness:	0.006"	Max. APD (in. w.g):	3.00		
Fin Height:	37.50"	Req. LAT-WB (°F):	n/a		
Fin Length:	108"	Req. TMBH:	303		
Connection Material:	Copper	Air Flow Direction	Horizontal		
Connection Type:	Sweat				
Dry Weight (lbs.):	220.9				

Note: Coil is not coated.

Output Data

General		Air Side Performance		Fluid Side Performance	
Rows:	3	LAT-DB (°F):	63.47	RPD (PSI):	7.5
FPI:	10	LAT-WB (°F):	59.59		
No. of Circuits:	15	TMBH:	303.9		
Suction:	1-5/8"	SMBH:	231.0		
Liquid:	1-3/8" and 1-3/8"	APD (in. w.g):	0.24		
Distributor(s):	1117-7-5/16-6(ASC), 1117-8-1/4-10				
Coil Dll Version:	7.7M				

DX Note: Auxiliary side connectors for hot gas bypass are provided for one circuit only.

Note(s): Ratings are for coils manufactured by: Johnson Controls, Inc., 507 E. Michigan St., Milwaukee WI 53202

All ratings are based on entering sub-cooled liquid refrigerant temperature of 110°F. This is required in the text of the standard, not the certification program.

BDX Tube Spacing: 1.25" x 1.08"

This coil is not certified by AHRI 410. This coil is rated in accordance with the AHRI Forced-Circulation Air-Cooling and Air-Heating Coils Certification program which is based on AHRI Standard 410. Certified units may be found in the AHRI Directory at www.ahridirectory.org.

Project Name: Marquette County Health Dept
Printed: 2/20/2024 at 16:13
Unit Folder: DX1

Contract No.:
DX-1Performance
Page 1 of 1

MECHANICAL EQUIPMENT

ACCU-1:

YORK MODEL YC300C00A2GLD5, 25 TON, SPLIT SYSTEM R-410A AIR CONDITIONER, 2-PIPE, TWO STAGE COOLING, 300 MBH TOTAL COOLING CAPACITY @ 89 F OAT AND 48 F SST. 208-3-60, 99.9 MCA, 150 MFS.

50" HEIGHT, 59" LENGTH, 64" WIDTH, 945 LBS. STANDARD EQUIPMENT AND ACCESSORIES: HACR CIRCUIT BREAKER / DISCONNECT, PHASE MONITOR, COIL GUARD, LOW AMBIENT CONTROL, SMART EQUIPMENT CONTROLLER WITH GATEWAY TO BACnet MS/TP (PROGRAMMABLE TO MODBUS OR N2) MODULATION OPTION - FACTORY INSTALLED RAWAL VALVE AND OIL SEPARATOR - 2 PIPE. FACTORY START-UP.

DX-1:
YORK MODEL BDX (DX) COIL, 3-ROW, 10 FPI, 12,600 CFM, 0.24" APD, @ 80.0F EAT DB / 67 F EAT WB, 303.9 MBH TOTAL COOLING, 231.0 MBH SENSIBLE COOLING.

MECHANICAL SPECIFICATIONS

DIVISION 23 - MECHANICAL

PART 1 GENERAL MECHANICAL PROVISIONS

1.1 GENERAL

THE WORK IN THIS DIVISION CONSISTS OF FURNISHING ALL LABOR AND MATERIALS, ACCESSORIES, EQUIPMENT, TRANSPORTATION, SUPERVISION, START-UP SERVICES, INSTRUCTIONS, PERMITS AND INCIDENTALS NECESSARY TO COMPLETE INSTALLATION AND SUCCESSFULLY TEST, START-UP AND OPERATE, IN A PRACTICAL AND EFFICIENT MANOR, ALL MECHANICAL WORK AND SYSTEMS INDICATED ON THE DRAWINGS AND DESCRIBED IN THE DRAWINGS AND SPECIFICATIONS. THE WORK SHALL ALSO INCLUDE ANY ITEMS WHICH, WHILE NOT SPECIFICALLY INCLUDED IN THESE SPECIFICATIONS OR DRAWINGS, ARE REASONABLE AND ACCEPTED TRADE PRACTICE OR NECESSARY FOR THE PROPER COMPLETION OF THIS SYSTEM.

DRAWING PLANS, SCHEMATICS AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF PIPING SYSTEMS.

1.2 CODES, ORDINANCES, PERMITS, FEES OR ASSESSMENTS

ALL WORK AND MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 MICHIGAN MECHANICAL CODE, 2018 MICHIGAN PLUMBING CODE, 2015 MICHIGAN BUILDING CODE AND 2017 NATIONAL ELECTRIC CODE.

ALL LABOR, MATERIALS AND EQUIPMENT SHALL BE GUARANTEED BY THE CONTRACTOR AND/OR WARRANTED BY THE MANUFACTURER FOR ONE (1) CALENDAR YEAR AFTER DATE OF FINAL ACCEPTANCE, EXCEPT WHERE SPECIFIC, LONGER PERIODS ARE SPECIFIED. MAKE ALL NECESSARY ALTERATIONS, REPAIRS, ADJUSTMENTS AND REPLACEMENTS DURING GUARANTEE PERIOD AS DIRECTED BY ENGINEER TO COMPLY WITH DRAWINGS AND SPECIFICATIONS. SUCH WORK SHALL BE AT NO COST TO THE OWNER.

PART 2 BASIC MATERIALS AND METHODS

THE CONTRACTOR SHALL FURNISH ALL LABOR AND MATERIALS REQUIRED FOR THE WORK AND AS REQUIRED TO MAKE COMPLETE SYSTEMS. MATERIALS SHALL BE NEW, OF FIRST-CLASS QUALITY AND SHALL BE FURNISHED COMPLETE INCLUDING DELIVERY, ERECTION, FINISH AND CONNECTIONS. ALL PRODUCTS SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.

EXPANSION, CONTRACTION, VIBRATION: PIPING, DUCTWORK AND OTHER EQUIPMENT SUBJECT TO SHOCK, VIBRATION OR EXPANSION AND CONTRACTION ARE TO BE INSTALL IN SUCH A MANNER THAT SUCH EQUIPMENT WILL NOT BE SUBJECT TO UNDUE STRAINS OR VIBRATIONS; EITHER SELF-IMPOSED BY REMOTE PARTS OF SAME OR OTHER INSTALLATIONS.

OPERATING AND MAINTENANCE INSTRUCTIONS: BEFORE OWNER ACCEPTANCE OF THE WORK, PROVIDE O&M MANUALS AND VERBAL INSTRUCTIONS TO THE OWNER'S OPERATING PERSONNEL REGARDING THE INSTALLED SYSTEMS.

FURNISH TO THE OWNER TWO INDEXED OPERATING AND MAINTENANCE MANUALS FOR MECHANICAL WORK CONSISTING OF THE FOLLOWING:

1. COMPLETE INSTRUCTION MANUALS, INCLUDING A DESCRIPTION OF OPERATION FOR EACH PIECE OF EQUIPMENT.
2. COMPLETE MAINTENANCE INFORMATION, INCLUDING WHEN AND WHERE TO LUBRICATE, TYPE OF LUBRICANT, WHEN TO CHANGE FILTERS, ETC.
3. WIRING DIAGRAMS.
4. TEMPERATURE CONTROL WIRING DIAGRAMS.
5. MANUFACTURER'S LITERATURE ON ALL EQUIPMENT AND SYSTEMS.
6. SHOP DRAWINGS FOR EACH PIECE OF EQUIPMENT.
7. AS-BUILT DRAWINGS.
8. TAB BALANCING REPORTS.
9. FACTORY START UP SHEETS.

SHOP DRAWINGS: SHOP DRAWINGS SHALL BE SUBMITTED FOR THE ENGINEER'S REVIEW.

REFRIGERANT PIPING SHALL BE TYPE ASTM B88 ACR L COPPER TUBING, WITH BRAZED JOINTS. PURGE WITH NITGROGEN WHILE BRAZING. COMPLY WITH ASHRAE 15 "SAFETY CODE FOR REFRIGERATION SYSTEMS" AND ASME B31.5 "REFRIGERATION PIPING AND HEAT TRANSFER COMPONENTS".

INSULATE SUCTION PIPING WITH 1" ARMAFLEX WITH ADHESIVE AND GLUED JOINTS. PROVIDE PROTECTIVE UV PAINT AT LOCATIONS EXPOSED TO SUNLIGHT.

THE MECHANICAL CONTRACTOR SHALL NEGOTIATE A CONTRACT WITH A QUALIFIED AND CERTIFIED MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL OR NATIONAL ENVIRONMENTAL BALANCING BUREAU TO COMPLETELY BALANCE AND TEST ALL SYSTEMS WHICH INCLUDES ALL HEATING, VENTILATING AND AIR-CONDITIONING SYSTEMS AND ASSOCIATED EQUIPMENT AND COMPONENTS. AL REQUIRED EQUIPMENT AND WORK NECESSARY FOR THE COMPLETE BALANCING AND TESTING OF THE SYSTEMS SHALL BE PERFORMED BY THE ABOVE TESTING AGENCY. THIS AGENCY SHALL BE A MEMBER IN GOOD STANDING OF THE ASSOCIATED AIR BALANCE COUNCIL OR NATIONAL ENVIRONMENTAL BALANCING BUREAU AND SHALL SUBMIT A PROJECT CERTIFICATION GUARANTEE. BALANCE AHU-1 TO 12,600 CFM TOTAL AND 2200 CFM MIN OA.

INTEGRATE NEW CONDENSING UNIT AND DX COIL CONTROLS WITH EXISTING JOHNSON CONTROL BUILDING MANAGEMENT SYSTEM.
CONTACT TIM MULROY @ JCI. timothy.m.mulroy@jci.com

Air System Sizing Summary for AHU-1

(In Alternative: Default Alternative)

Project: 5130 Marquette Health Dept — 02/20/2024
Prepared by: Rhoades Engineering — 10:33 AM

Air System Information

Air System Name	AHU-1	Number of zones	3
Equipment Class	SPLT AHU	Floor Area	25778.5 sqft
Air System Type	VVT	Location	Marquette County Ap, MI, USA

Sizing Calculation Information

Calculation Months	Jan to Dec	Zone CFM Sizing	Peak zone sensible load
Sizing Data	Calculated	Space CFM Sizing	Individual peak space loads

Central Cooling Coil Sizing Data

Total coil load	25.3	Tons	Peak coil load occurs at	July 16:00
Total coil load	303.3	MBH	OA DB / WB	83.8 / 68.0 F
Sensible coil load	249.3	MBH	Entering DB / WB	76.1 / 62.6 F
Coil CFM at peak load	12604	CFM	Leaving DB / WB	57.1 / 54.2 F
Sum of peak zone CFM	12671	CFM	Resulting RH	47 %
Sensible heat ratio	0.822		Design supply temp.	58.0 F
CFM/Ton	498.7		Zone T-stat Check	3 of 3 OK
sqft/Ton	1019.9		Max zone temperature deviation	0.0 F
BTU/(hr sqft)	11.8			
Water flow @ 10.0 F rise	N/A			

Central Heating Coil Sizing Data

Max coil load	368.3	MBH	Load occurs at	Design Heating
Coil CFM at Design Heating	12604	CFM	BTU/(hr sqft)	14.3
Max coil CFM	12604	CFM	Ent. DB / Lvg DB	57.3 / 85.7 F
Water flow @ 20.0 F drop	N/A			

Supply Fan Sizing Data

Design CFM	12604	CFM	Fan motor BHP	6.90 BHP
Design CFM occurs at	July 17:00		Fan motor kW	5.48 kW
Design CFM/sqft	0.49	CFM/sqft	Fan total static	2.00 in wg

Outdoor Ventilation Air Data

Design airflow CFM	2191	CFM	CFM/person	17.00 CFM/person
CFM/sqft	0.09	CFM/sqft		

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REC # 5130

Keynotes

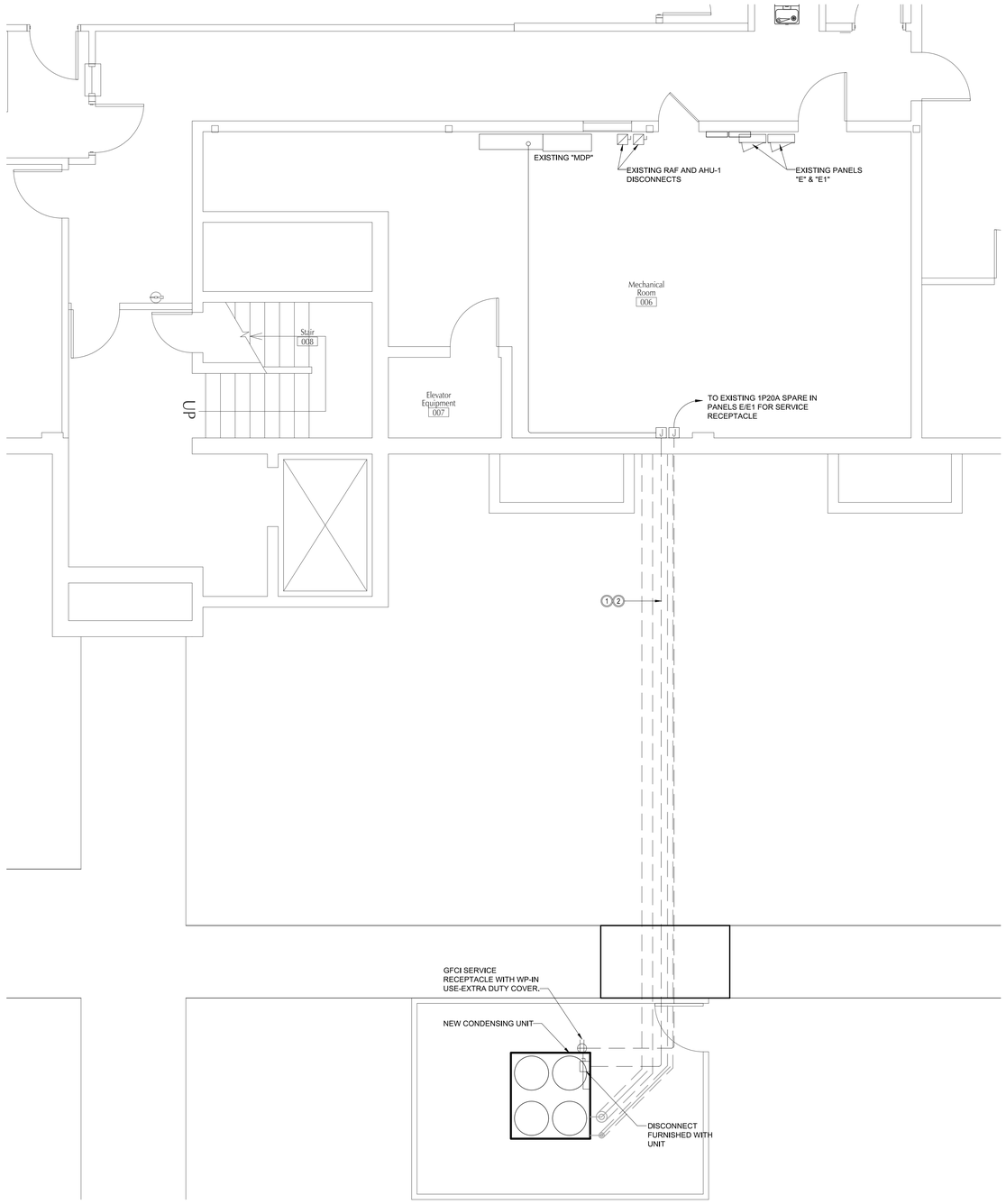
General Notes

County of Marquette
Health Department
Condensing Unit Replacement

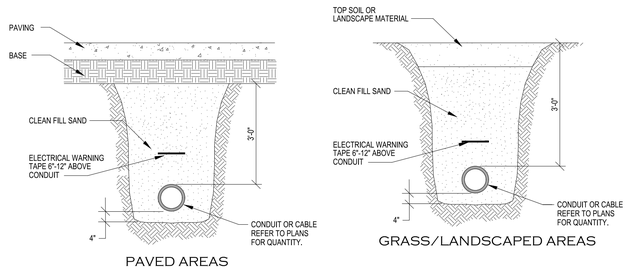
Mechanical Schedules

ISSUED FOR: For Construction — 3-19-2024

NORTHERN DESIGN WORKS
M600
PROJECT NO. 2402
420 RAIL STREET - NEGAUNEE, MI 49866 906-475-6616



Power Plan
SCALE: 1/4" = 1'-0"



3 E-100 TRENCH DETAIL
N.T.S.

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REC # 5130

Keynotes

1. NEW UNDERGROUND SHALL BE COORDINATED WITH TRENCHING FOR NEW MECHANICAL LINE SETS.
2. INSTALL WARNING TAPE ON ALL BURIED ELECTRICAL LINES.

General Notes

1. ELECTRICAL TRADES SHALL COORDINATE ALL DEMOLITION WORK AND PROJECT PHASING WITH ALL TRADES AND OWNER PRIOR TO COMMENCEMENT OF ANY WC
2. ELECTRICAL TRADES SHALL MAINTAIN WORK AREA AND SITE IN A NEAT AND ORDERLY STATE. DISPOSE OF CONSTRUCTION DEBRIS ON A DAILY BASIS.
3. ALL CUTTING, PATCHING AND ASSOCIATED COSTS SHALL BE THE RESPONSIBILIT THE INSTALLING CONTRACTOR OR SUBCONTRACTOR. ACTUAL PATCHING AND FINISHING OF SURFACES SHALL BE PERFORMED BY TRADESMEN QUALIFIED AND LICENSED FOR THE SPECIFIC WORK TO BE PERFORMED. THIS CONTRACTOR SH COORDINATE THIS WORK WITH THE OWNER AND ARCHITECTURAL TRADES.
4. THESE DRAWINGS DO NOT SHOW ALL CONDITIONS AND SHOW ONLY GENERAL ARRANGEMENT OF SYSTEMS AND EQUIPMENT. ELECTRICAL CONTRACTOR SHAL FIELD VERIFY CONDITIONS & LOCATION PRIOR TO COMMENCEMENT OF ANY WOF
5. ALL DEVICES SHALL BE LABELED WITH CIRCUIT NUMBER IN BLACK LETTERS ON CLEAR VINYL LABEL ON DEVICE FACE PLATE.

County of Marquette Health Department Condensing Unit Replacement

POWER PLAN

ISSUED FOR: For Construction 3-19-2024

NORTHERN DESIGN WORKS
E100
PROJECT NO. 2402
420 RAIL STREET - NEGAUNEE, MI 49866 906-475-6616

ELECTRICAL SPECIFICATIONS

SECTION 16000 - GENERAL PROVISIONS

PART 1 - GENERAL

1.1 Codes, Standards, Permits

A. The electrical installation shall comply with all laws applying to electrical installations in effect and with the regulation of the National Electrical Code and local codes. The electrical contractor shall be responsible for the obtaining of all necessary permits and inspections and shall include the cost of all such in Proposal. After completion of the work, the Contractor shall furnish the Owner a certificate of final inspection and approval from the Inspection Bureau having jurisdiction.

1.3 Identification and Instructions

A. Each distribution and lighting panel shall be equipped with a typewritten directory accurately indicating rooms and/or equipment being served. Where modifying existing update directory in this manner.

B. All light and power panels, motor starters, remote control stations, etc., shall be identified with engraved nameplates. Nameplates shall be 3/4", 5-ply lamacoid with 1/4" white letters on a black background. "Dymo" or tape markers are not acceptable.

C. Warning tape shall be run above all underground feeders. Tape shall be of bright colored vinyl with continuos print.

1.4 Raceways and Fittings

A. All wiring shall be concealed in finished areas of building. Exposed wiring will be permitted only in electric rooms, heating equipment rooms and overhead in rooms without finished ceilings. Where conduits must be run exposed in finished areas, location of the runs must be approved by the Architect/Owner.

B. Rigid, hot-dipped galvanized conduit bearing the U.L. label of approval and manufactured in accordance with A.S.A. Specification C80.1 shall be used for exposed exterior applications, rigid non-metalic conduit shall be used for all underground applications.

C. Electrical metallic tubing, MC cable and NM cable may be used for branch circuit wiring and for wiring of auxiliary systems. MC and NM cable shall not be used as feeders or used underground. NM cable shall not be used where exposed. See N.E.C. articles 330, 334 and 338.

D. All conduit and electrical metallic tubing shall be securely supported at intervals not exceeding 8'. Straps shall be of one hole malleable type. Single conduit runs supported from ceiling shall be supported with rod hangers securely anchored to structure. Groups of conduit shall be supported with rod hangers and galvanized racks.

E. The use of perforated straps, wire, etc., for supporting conduit is prohibited. Conduit shall not be suspended from or fastened to work of other mechanical trades. Conduit shall be 6" clear of "hot" lines (100°F or above) and is not to be installed directly on heated surfaces.

F. Connectors shall be insulated throat galvanized steel compression type for joining EMT. Cast "Set Screw" type connectors shall not be allowed on this project. Steel "Set Screw" type connectors shall be allowed.

1.5 Conductors

A. The minimum size conductor permitted shall be #12 THHN copper unless otherwise noted. All wire and cable shall be new and shall be delivered to project in unbroken and undamaged cartons and reels.

B. Joints will be permitted only in junction and outlet boxes. All joints shall be firmly bonded together and taped or shall be made with mechanical connectors as follows:

* "Sta-Kon" Connectors manufactured by Thomas & Betts.
* "Scotchlox Spring" Connectors manufactured by 3M.

C. Aluminum conductors shall not be allowed on this project.

D. Feeders and branch circuit conductors throughout the system shall be color coded as follows:

* Phase A: Black
* Phase B: Red
* Phase C: Blue

1.6 Installation Methods

A. Cutting and Patching: The Electrical Contractor shall do all cutting and patching necessary for the installation of electrical work. All such cutting and patching shall be done with the approval and under the supervision of the Architect.

B. No cutting or patching shall impair the strength or function of work being cut, i.e., structural members shall not be weakened and holes through the exterior walls and ground floor shall be waterproofed.

1.7 Housekeeping and Cleanup

A. The Electrical Contractor shall periodically remove from the site all debris and rubbish accumulating as a result of the electrical installation. Upon completion of the project, he shall dispose of all debris and rubbish and shall leave manholes and electrical equipment rooms broom clean. The interiors of all cabinets, pull boxes, and equipment enclosures shall be free of any debris.

1.8 Wiring Devices

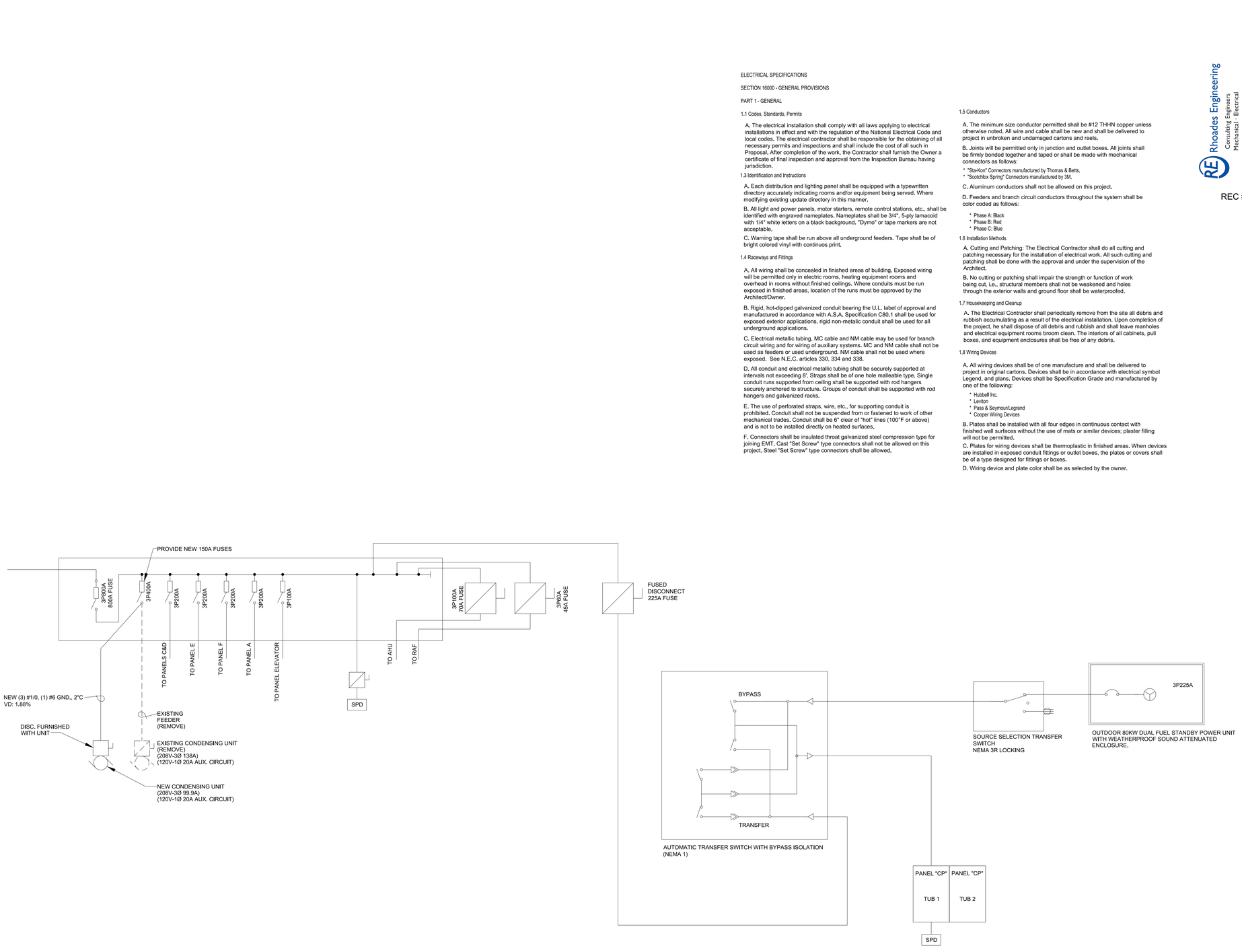
A. All wiring devices shall be of one manufacture and shall be delivered to project in original cartons. Devices shall be in accordance with electrical symbol Legend, and plans. Devices shall be Specification Grade and manufactured by one of the following:

* Hubbell Inc.
* Leviton
* Pass & Seymour/Legrand
* Cooper Wiring Devices

B. Plates shall be installed with all four edges in continuous contact with finished wall surfaces without the use of mats or similar devices; plaster filling will not be permitted.

C. Plates for wiring devices shall be thermoplastic in finished areas. When devices are installed in exposed conduit fittings or outlet boxes, the plates or covers shall be of a type designed for fittings or boxes.

D. Wiring device and plate color shall be as selected by the owner.



1 E101 ONE LINE DIAGRAM

SCALE: N.T.S.

NOTES:

1. ALL CONDUCTORS ON DIAGRAM ARE COPPER UNLESS SPECIFICALLY NOTED WITH (AL) FOR ALUMINUM.
2. REFER TO POWER PLAN FOR GEAR CONFIGURATION INTENT.
3. (L) INDICATED BREAKER LOCK
4. ALL EQUIPMENT BY CONTRACTOR UNLESS SPECIFICALLY CALLED OUT BY UTILITY OR OWNER.
5. ALL DISTRIBUTION EQUIPMENT AND EQUIPMENT FEEDS SHALL BE IN CONDUIT.

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DIAGRAM AND SPECIFICATIONS

ISSUED FOR: For Construction 3-19-2024

NORTHERN DESIGN WORKS

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E101