



GENERATORS & MOBILE POWER PRODUCTS
SALES · RENTALS · SERVICE & PARTS

24/7
EMERGENCY
SERVICE

1.800.485.8068
WOLVERINEPOWER.COM

QUOTE #: 21-1063-MEMYa

10/12/2021

SUBJECT: Generator System Quote: **MTA Rides to Wellness**

Attn: Corwin Matthews

Wolverine Power Systems is pleased to submit the following proposal for your consideration and approval.

BILL OF MATERIALS:

Quantity 1 - Generac Industrial gaseous engine-driven generator, turbocharged/aftercooled 6 cylinder 14.2L engine

- Stationary Emergency-Standby rated
- **175 kW Rating, wired for 277/480 VAC three phase, 60 Hz, Permanent Magnet Excitation**
- **Standard Weather Enclosure, Steel, Industrial Grey Finish – 79.9 dBA @ 23ft, 100% loaded**
- UL2200 and EPA Certified
- **Power Zone Digital Control Panel**
 - Meets NFPA 99 and 110 requirements
 - 7" Resistive Color Touchscreen
 - Built-in Wi-Fi, Bluetooth, and Webserver
 - Auto/Manual/Off key switch, Alarm Indication, Not in Auto Indication, audible alarm, emergency stop switch
 - Dual Core Digital Microprocessor
 - RS485, Ethernet and CANbus ports
 - All engine sensors are 4-20ma for minimal interference
 - Sensors: Oil Pressure, optional Oil Temp, Coolant Temp and Level, Fuel Level/Pressure (where applicable), Engine Speed, DC Battery Voltage, Run-time Hours, Generator Voltages, Amps, Frequency, Power, Power Factor
 - Alarm Status: Low or High AC Voltage, Low or High Battery Voltage, Low or High Frequency, Pre-low or Low Oil Pressure, Pre-high or High Oil Temp (optional), Low Water Level and Temp, Pre-high or High Engine Temp, High, Low, and Critical-low Fuel Level/Pressure (where applicable), Overcrank, Over and Under Speed, Unit Not in Automatic
 - Programmable I/O
 - Built-in PLC for special applications
 - Engine function monitoring and control:
 - Full range standby operation; programmable auto crank, Emergency Stop, Auto-Off-Manual
 - Isochronous Governor
 - 3 Phase RMS Voltage Sensing
 - Service reminders, trending, fault history (alarm log)
 - I2T function for full generator protection
 - 2-wire start controls for any 2-wire transfer switch
- **21 Light Annunciator – Surface/Flush Mount**
- **Remote Emergency Stop Switch, Break-Glass, shipped loose**
- **Natural Gas fuel system**
- **225 AH, 1155 CCA Group 8D Batteries, with rack, installed**
- **Battery Charger, 10 Amp, NFPA 110 compliant, installed**
- **Coolant Heater, 1500W, 120VAC, forced-circulation type**
- **3 Owner's Manuals**
- **120V GFCI and 240V Outlet**
- **Flex Fuel Line**
- **225 Amp, Primary MLCB, 80% rated thermal-magnetic**

This quotation and supporting materials contain confidential and proprietary business information of Wolverine Power Systems and Generac Power Systems. These materials may be printed or photocopied for use in evaluating the proposed project but are not to be shared with other parties outside of your organization.



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- **225 Amp, Secondary MLCB, 80% rated thermal-magnetic**
- **Standard 2-Year Limited Warranty**
- **SG0175KG20142S18PPYYE**

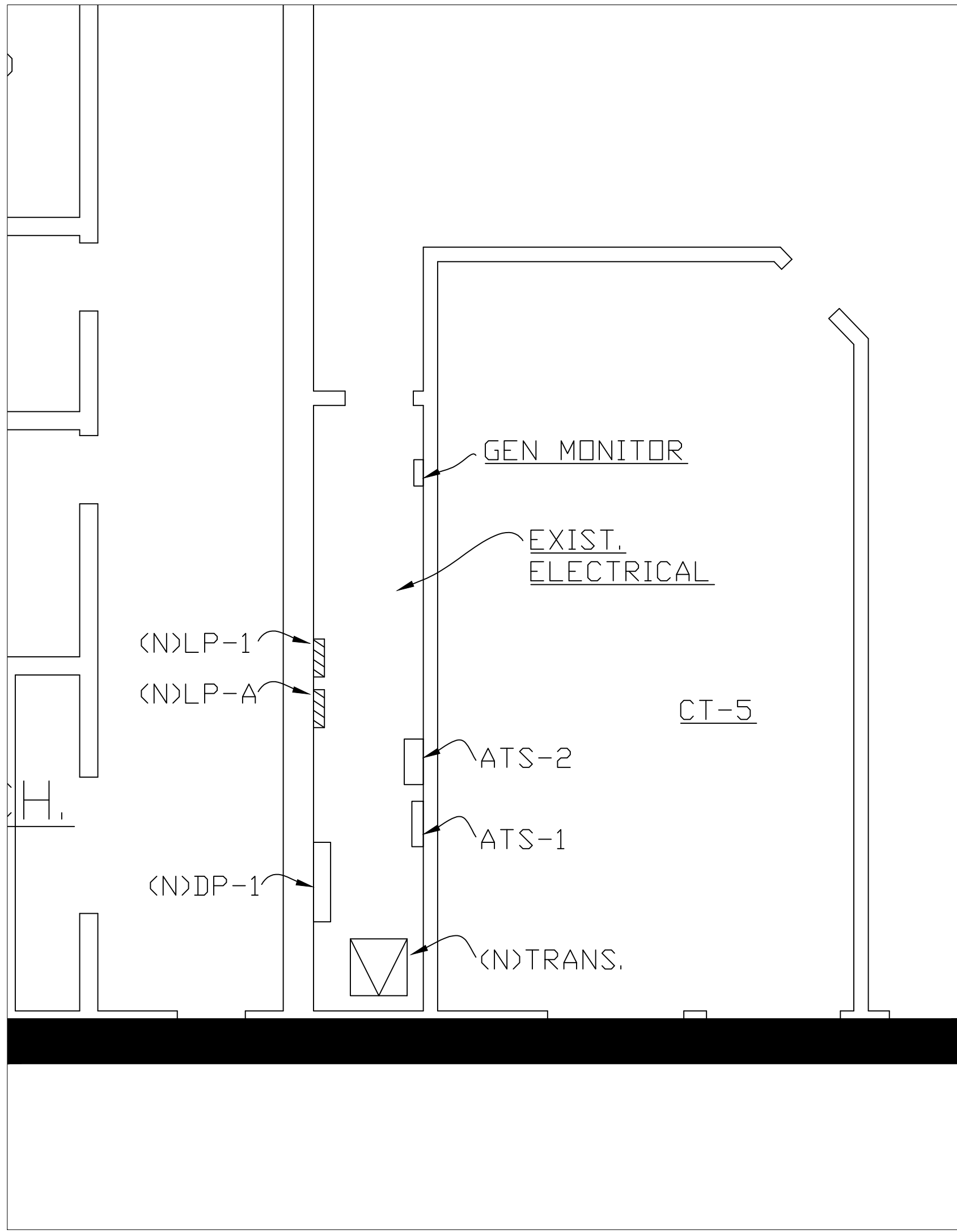
Quantity 2 – Generac Open Transition Automatic Transfer Switch - TX SERIES

- **300 Amp, 3 pole, 277/480 VAC three phase, 60 Hz, with 2-Wire Start Circuit**
- **Double Set of Form C Auxiliary Contacts**
- **UL Listed 1008 by ETL**
- **NEMA 1 Enclosure**
- **3 Owner's Manuals**
- **35KA Contactor Withstand and Closing Rating**
- **Non Service Entrance Rated**
- **Time Delay Neutral**
- **Standard two year basic warranty**
- **TX611DN0300K3AN**

SCOPE OF WORK:

1. Freight charges, to one destination within the state of Michigan. Offloading by others
2. Start-up / testing of equipment and training by a Factory Trained & Certified Technician during normal business hours.
 - **Normal business hours are M-F 8:00AM to 4:30PM.** After hours Startups are available an additional charge may apply.
 - Training session will be provided upon day of start up by Wolverine Power Systems Technician. If training cannot be completed on day of startup an additional charge may apply.

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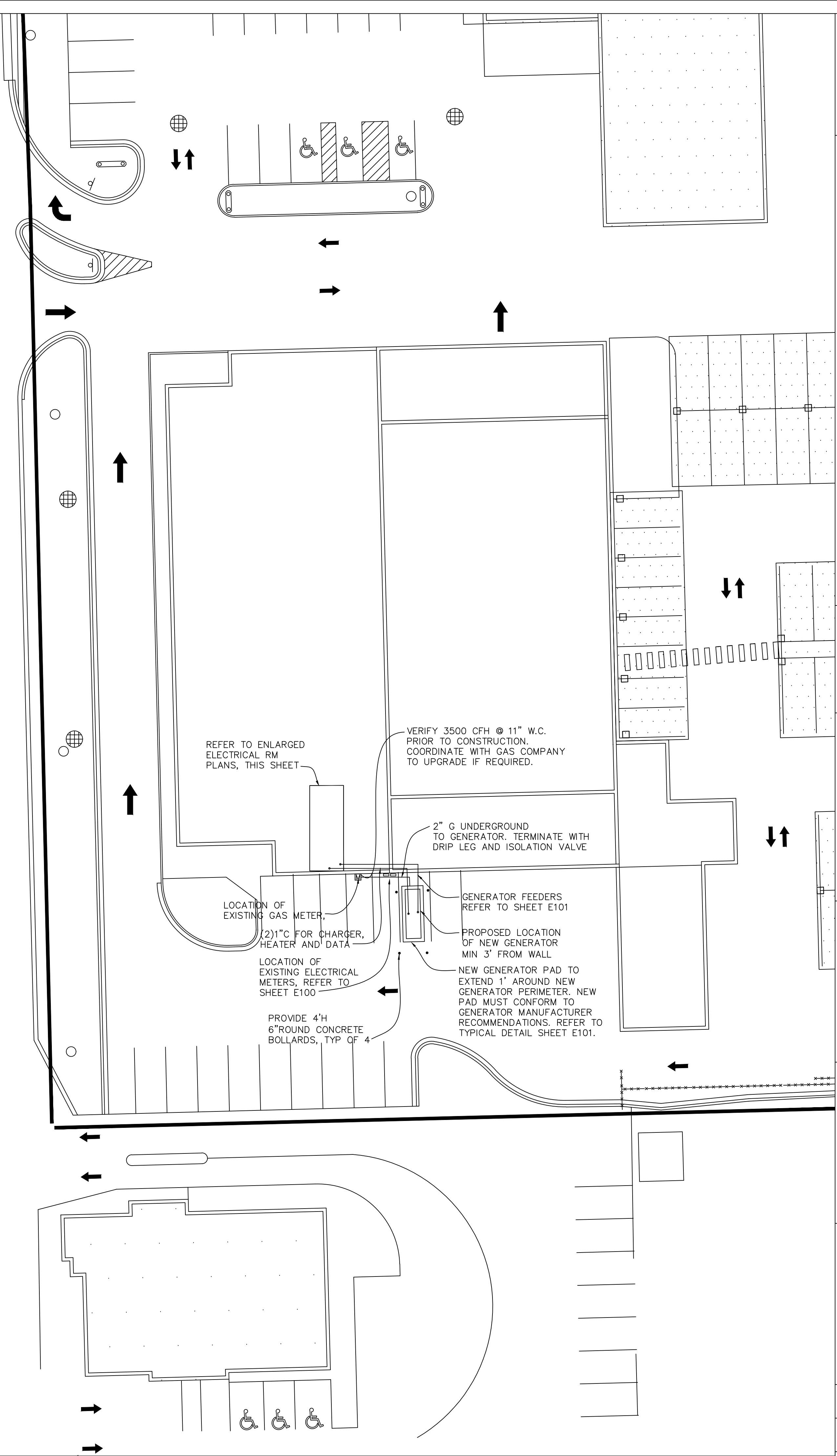
ENLARGED ELECTRICAL RM

SCALE: 1/16"=1'-0"



ELECTRICAL SITE PLAN

SCALE: 1/64"=1'-0"



Dates / Issuances
100% Review Set 1/04/2022
100% (R)Review Set 1/11/2022

Drawing Name
ELECTRICAL ROOM LAYOUT
AND SITE PLAN

**FSA Engineering, LLC
CONSULTING
ENGINEERS**

3449 Breeze Pointe Ct
Linden, MI 48451
810-394-1379 T
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fsa-engineering.com

Project Name
NEW GENERATOR
INSTALLATION PROJECT AT
MTA TRANSPORTATION CENTER
DORT HIGHWAY
FLINT MI

Client / Owner
MTA
MASS TRANSPORTATION
AUTHORITY
1401 S. DORT HWY.
FLINT, MI 48503

Seal

Drawn / Checked
NA / FAA

Project Number
2022-01

Sheet Number
E-200

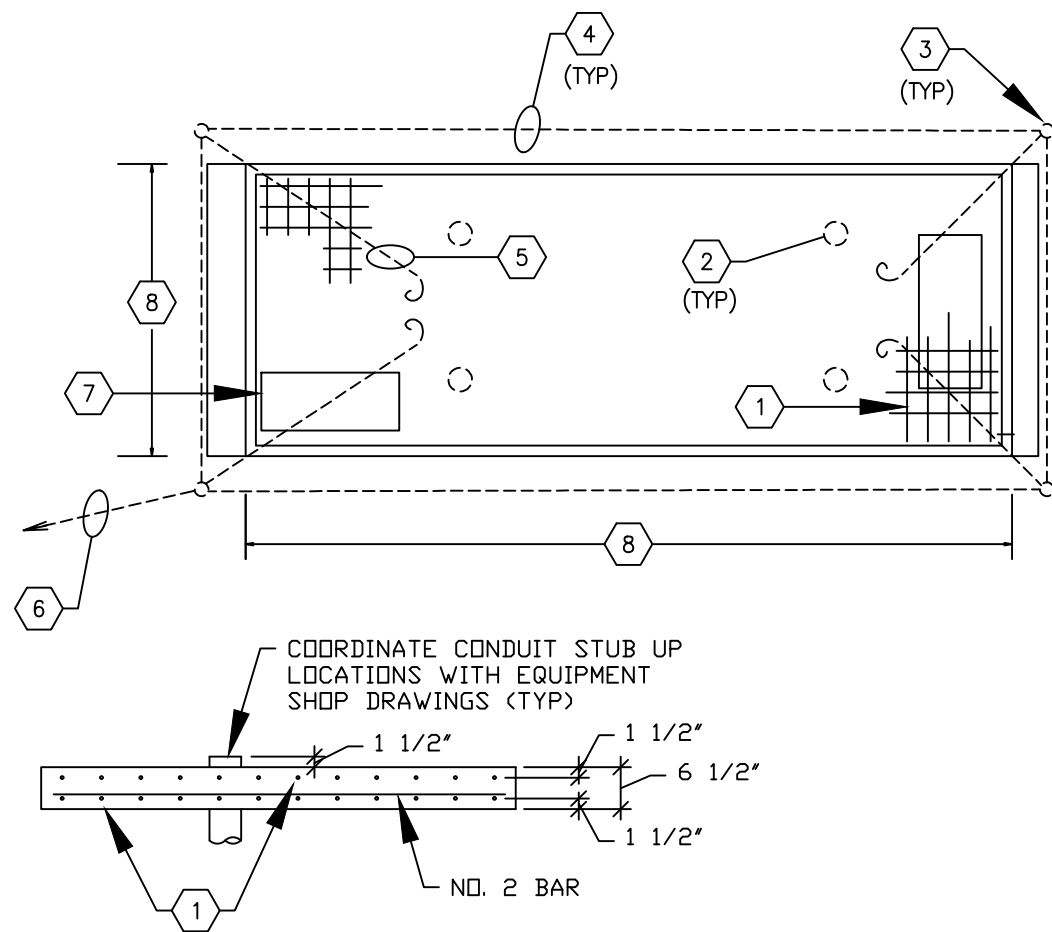
ONE LINE DIAGRAM-NEW WORK

NO SCALE

FEEDER (AMPS)	COND. SIZE	FEEDER AND CONDUIT SIZES	
		3 WIRE WITH GROUND	4 WIRE WITH GROUND
30	10	3/4"C, 3#10 & 1#10 GRD.	3/4"C, 4#10 & 1#10 GRD.
50	8	3/4"C, 3#8 & 1#10 GRD.	3/4"C, 4#8 & 1#10 GRD.
60	6	1"C, 3#6 & 1#10 GRD.	1"C, 4#6 & 1#10 GRD.
100	3	1 1/4"C, 3#3 & 1#8 GRD.	1 1/4"C, 4#3 & 1#8 GRD.
125	1	1 1/2"C, 3#1 & 1#6 GRD.	1 1/2"C, 4#1 & 1#6 GRD.
150	1/2	1 1/2"C, 3#1/0 & 1#6 GRD.	1 1/2"C, 4#1/0 & 1#6 GRD.
175	2/0	1 1/2"C, 3#2/0 & 1#6 GRD.	1 1/2"C, 4#2/0 & 1#6 GRD.
200	3/0	2"C, 3#3/0 & 1#6 GRD.	2"C, 4#3/0 & 1#6 GRD.
225	4/0	2"C, 3#4/0 & 1#4 GRD.	2"C, 4#4/0 & 1#4 GRD.
250	1-250	2 1/2"C, 3#250 & 1#4 GRD.	2 1/2"C, 4#250 & 1#4 GRD.
500	2-250	(2) 2 1/2"C, 3#250 & 1#2 GRD.	(2) 3"C, 4#250 & 1#2 GRD.
600	2-350	(2) 3"C, 3#350 & 1#1 GRD.	(2) 3"C, 4#350 & 1#1 GRD.
800	2-600	(2) 3"C, 3#600 & 1#2/0 GRD.	(2) 3 1/2"C, 4#600 & 1#2/0 GRD.
1000	4-250	(4) 2 1/2"C, 3#250 & 1#2/0 GRD.	(4) 3"C, 4#250 & 1#2/0 GRD.
1200	3-600	(3) 3"C, 3#600 & 1#3/0 GRD.	(3) 3 1/2"C, 4#600 & 1#3/0 GRD.
1600	4-600	(4) 4"C, 3#600 & 1#4/0 GRD.	(4) 4"C, 4#600 & 1#4/0 GRD.
2000	5-600	(5) 4"C, 3#600 & 1#4/0 GRD.	(5) 4"C, 4#600 & 1#4/0 GRD.
3000	7-750	(7) 4"C, 3#750 & 1#2/0 GRD.	(7) 4"C, 4#750 & 1#2/0 GRD.

NEW WORK NOTES

1. NEW PANEL DP-1 TO REPLACE EXISTING PANEL, REFER TO SHEET E200 ENLARGED PLAN FOR NEW PROPOSED LOCATION.
2. NEW PANEL DP-1 TO REPLACE EXISTING PANEL IN PLACE. RECONNECT ALL EXISTING LIVE CIRCUITS, EXTEND CONDUIT AND WIRING AS REQUIRED, PROVIDE UPDATED PANEL SCHEDULE.
3. EXISTING PANEL AND FEEDER TO BE CONNECTED TO NEW PANEL DP-1, EXTEND CONDUIT AND WIRING AS REQUIRED.
4. EXISTING SWITCH ON THIS FEEDER IS BEING REMOVED, EXTEND CIRCUIT TO NEW PANEL DP-1, REFER TO SHEET E100 FOR ADDITIONAL INFORMATION, EXTEND CONDUIT AND WIRING AS REQUIRED.
5. EXISTING 3Ø CIRCUIT FEEDING EXISTING LOAD, EXTEND CIRCUIT TO NEW PANEL DP-1, REFER TO SHEET E100 FOR ADDITIONAL INFORMATION, EXTEND CONDUIT AND WIRING AS REQUIRED.
6. NEW GENERATOR 175KW 480V 3Ø NATURAL GAS IS BEING PROVIDED BY OWNER AND INSTALLED BY ELECTRICAL CONTRACTOR, ATS-1,2 SHALBE PROVIDED BY ELECTRICAL CONTRACTOR.
7. INCOMING 240V 1Ø 600A FEEDER TO BE EXTENDED AS REQUIRED TO NEW ATS-1 LOCATION, PROVIDE NEW CONDUIT AND WIRING AS REQUIRED.



TYPICAL SERVICE EQUIPMENT CONCRETE PAD SECTION DETAIL

NO SCALE

GENERAL NOTES

1. EQUIPMENT DIMENSIONS INDICATED ARE BASED ON TYPICAL EQUIPMENT DIMENSIONS. PRIOR TO INSTALLATION OR PAD CONSTRUCTION ELECTRICAL CONTRACTOR SHALL SUBMIT FOR APPROVAL A DIMENSIONED PAD LAYOUT DRAWING BASED ON EQUIPMENT SHOP DRAWING DIMENSIONS. SUBMIT PAD LAYOUT DRAWING AS A SHOP DRAWING.
2. VERIFY CONDUIT STUB UP LOCATIONS WITH EQUIPMENT SHOP DRAWINGS PRIOR TO INSTALLATION.
3. SWEEPS MUST BE RIGID STEEL, A MINIMUM 36" RADIUS BEND.
4. CONCRETE PADS SHALL UTILIZE CONCENTRATION 6 BAGS OF CEMENT PER YARD, COORDINATE ALL WORK WITH ARCHITECTURAL AND STRUCTURAL TRADES.

KEYED NOTES

- 1 #4 RE-STEEL, 2 LAYERS (TYPICAL)
- 2 SUPPORT ROD UNDER GENERATOR RAILS.
- 3 10'-0" LONG x 5/8" DIAMETER COPPER GROUND ROD.
- 4 #4/0 COPPER GROUND CABLE TO INTERCONNECT GROUND RODS.
- 5 #4/0 COPPER GROUND CABLE TO EQUIPMENT FOR GROUNDING.
- 6 #4/0 COPPER GROUND CABLE TO CONNECT TO ADJACENT SERVICE TRANSFORMER GROUNDING SYSTEM.
- 7 CONFIRM EXACT CONDUIT STUB UP LOCATION(S) WITH GENERATOR MANUFACTURER SHOP DRAWINGS PRIOR TO ROUGH-IN.
- 8 CONFIRM EXACT GENERATOR SIZE AND ASSOCIATED CONCRETE PAD WITH GENERATOR MANUFACTURER PRIOR TO ROUGH IN.

GENERATOR PAD DETAIL

SCALE: N.T.S.

Panel Designation: LP-A					Main Voltage: 480		P-P Voltage: 480	
Panel Location: ELECTRICAL RIA					Bussing: 10GA		N Voltage: 277	
Fed From POWER COMPANY FEEDER					Ground Bus: 10GA		Phase: 3	
Feeder Size: SEE ONLINE DIAGRAM					Arounding: SURFACE		Wire: 4	
					Neutral: 100%		Min SC Interlocking Rating: 4k	
Remarks	Light Load	Heat'g Load	Cont'd Load	max Load	CA 150°C	CRF 150°C	Load	Heat'g Load
							Interlock Load	Remarks
PSU #2				35	13	4	50	PSU #1
					7	8		
					7	8		
PSU #35				35	11	10	100	CCT MAIN OFFICE + LOBBY
					11	10		
					13	14		
PSU #4				15	15	14	15	SOUTH LEAD WALL FIBER
					17	18		SPARE
					19	20		SPARE
UNNAMED				20	21	22	20	SPARE
					23	24		SPARE
SPARE				20	23	24	20	SPARE
SPARE				20	25	26	20	SPARE
SPARE				20	27	28	20	SPARE
SPARE				20	29	30	20	SPARE
SPARE				20	31	32	20	SPARE
SPARE				20	33	34	20	SPARE
SPARE				20	35	36	20	SPARE
SPARE				20	37	38	20	SPARE
SPARE				20	39	X	40	SPARE
SPARE				20	41	42	20	SPARE

Load Description	Connected Load				Demand Factor	Demanded Load				Total
	OA	OB	OC	Total		OA	OB	OC	Total	
G Lighting & Continuous Load (Volt-Amperes)	0	0	0	0	1.00	0	0	0	0	
100VA Receptacle Load (Volt-Amperes)	0	0	0	0	1.00 (Per 100VA)	0	0	0	0	
Non-Continuous Load (Volt-Amperes)	0	0	0	0	0.50 (Per 100VA)	0	0	0	0	
Continuous Load (Volt-Amperes)	0	0	0	0	1.00	0	0	0	0	
Non-Continuous Load (Volt-Amperes)	0	0	0	0	0.50	0	0	0	0	
Total Demand (VA)	0.00	0.00	0.00	0.00	100% of Total Connected Load	0.00	0.00	0.00	0.00	
Total Amperes (Amperes)	0.00	0.00	0.00	0.00	+ (100VA) load plus other loads per NEC Article 220.42	0.00	0.00	0.00	0.00	
Minimum Breaker Rating (Amps)	0	0	0	0		0	0	0	0	

Receptacle Demand Factor per Article 220.42 of the National Electric Code.

[illegible]

Dates / Issuances

100% Review Set	1/04/2022
100% (R)Review Set	1/11/2022

Drawing Name

ELECTRICAL ROOM ONE-LINE DIAGRAM-NEW WORK

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FLINT, MI 48503

Seal

Drawn / Checker:

Project Number

2022-01

Sheet Number

E-101

Drawing Name

ELECTRICAL ROOM ONE-LINE
DIAGRAM-DEMOLITION

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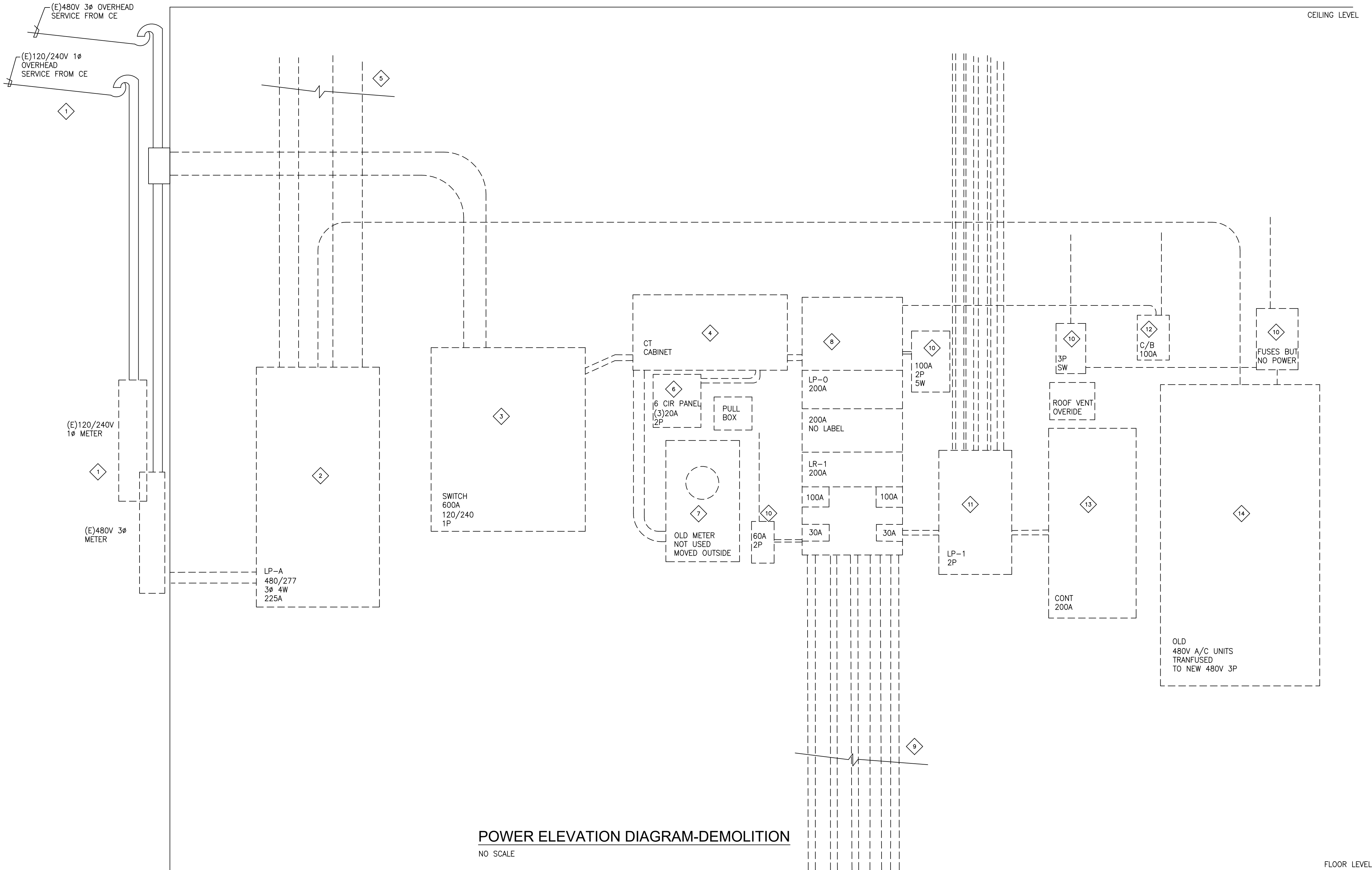
NA / FAA

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Sheet Number

E-100



◆ DEMO NOTES	◆ DEMO NOTES	DEMO NOTES
<div>1. EXISTING OVERHEAD ELECTRICAL SERVICES TO REMAIN. ELECTRICAL CONTRACTOR TO COORDINATE SHUT DOWN WITH POWER COMPANY AND OWNER 72 HRS PRIOR TO ANY SHUT DOWN. CONTRACTOR SHALL PROVIDE TEMPERARY GENERATOR FOR CRITIAL EQUIPMENT THAT CANNOT BE TURNED OFF. COORDINATE EXACT EQUIPMENT AND SIZE OF GENERATOR REQUIRED WITH OWNER.</div> <div>2. EXISTING SURFACE MOUNTED PANELBOARD 225A 480/277V 3Ø 4W TO BE REMOVED COMPLETE. PANELBOARD CONTAINS 225A MB WITH (7) 3P BREAKERS FEEDING RTU'S. REFER TO SHEET E200 FOR NEW PANEL LOCATION. EXTEND CONDUIT AND WIRING. REFER TO PANEL SCHEDULE SHEET.</div> <div>3. EXISTING SURFACE MAIN DISCONNECT SWITCH FOR THE SINGLE PHASE SERVICE TO BE REMOVED COMPLETE ALONG WITH ASSOCIATED PRIMARY FEEDERS.</div> <div>4. EXISTING SURFACE CT CABINET FOR THE SINGLE PHASE SERVICE TO BE REMOVED COMPLETE ALONG WITH ASSOCIATED FEEDERS.</div>	<div>5. EXISTING CONDUIT FEEDING EXISTING RTU'S AND OTHER LOADS TO REMAIN. PROTECT EXISTING WIRING FOR CONNECTION TO NEW PANEL, EXTEND WIRING AS REQUIRED.</div> <div>6. EXISTING SINGLE PHASE 120/240V PANEL TO BE REMOVED COMPLETE. EXTEND CONDUIT AND WIRING OF LIVE CIRCUITS TO NEW PANEL. REFER TO NEW WORK PLANS</div> <div>7. EXISTING METER TO BE REMOVED COMPLETE. ALONG WITH ALL ASSOCIATED CONDUIT AND WIRING.</div> <div>8. EXISTING 600A 120/240V 1Ø 3W MAIN DISTRIBUTION PANEL TO BE REMOVED COMPLETE. REFER TO NEW WORK PLAN FOR NEW PANEL LOCATION.</div> <div>9. EXISTING CONDUIT FEEDING EXISTING SINGLE PHASE PANELS TO REMAIN. PROTECT EXISTING WIRING FOR CONNECTION TO NEW PANEL, EXTEND WIRING TO NEW PANEL LOCATION AS REQUIRED.</div> <div>10. EXISTING SWITCH TO BE REMOVED COMPLETE. PROTECT EXISTING LOAD WIRING FOR CONNECTION TO NEW PANEL, EXTEND WIRING TO NEW PANEL LOCATION AS REQUIRED.</div>	<div>11. EXISTING PANEL LP-1 120/240V 1Ø 3W 40CIR TO BE REMOVED AND REPLACED IN PLACE WITH NEW. RECONNECT ALL EXISTING ACTIVE WIRING TO NEW PANEL. REFER TO NEW WORK PLANS.</div> <div>12. EXISTING CIRCUIT BREAKER TO BE REMOVED COMPLETE. PROTECT EXISTING LOAD WIRING FOR CONNECTION TO NEW PANEL, EXTEND WIRING TO NEW PANEL LOCATION AS REQUIRED.</div> <div>13. EXISTING CABINET WITH CONTACTOR TO BE RELOCATED. REFER TO NEW WORK PLAN FOR NEW LOCATION. EXTEND CONDUIT AND WIRING AS REQUIRED.</div> <div>14. EXISTING ORIGINAL 480V 3Ø ELECTRICAL SERVICE PANELBOARD TO BE REMOVED COMPLETE.</div>

ELECTRICAL – GENERAL REQUIREMENTS

GENERAL:
CONTRACTOR SHALL FURNISH ALL MATERIALS AND LABOR AS INDICATED ON THE PLANS AND AS REQUIRED FOR A COMPLETE LIGHTING AND POWER SYSTEM.

EXAMINATION OF PREMISES:
CONTRACTOR SHALL VISIT THE JOB SITE AND BE AWARE OF CONDITIONS UNDER WHICH HE MUST WORK.

PERMIT AND FEES:
CONTRACTOR SHALL OBTAIN ALL PERMITS AND PAY ALL FEES.

CODES:
ALL WORK SHALL BE EXECUTED AND INSPECTED IN ACCORDANCE WITH THE LATEST APPROVED EDITION OF THE NATIONAL ELECTRIC CODE, THE CODES OF O.S.H.A., BARRIER FREE, A.D.A. AND ALL LOCAL AUTHORITIES HAVING JURISDICTION.

UTILITY COMPANY REQUIREMENTS
COMPLY WITH CONSTRUCTION STANDARDS AND RULES OF LOCAL UTILITY COMPANIES.

CONTRACTOR SHALL CONTACT UTILITY COMPANIES AND VERIFY ALL SERVICE REQUIREMENTS, INCLUDE IN BASE BID, ALL UTILITY COMPANY CHARGES.

GROUNDING:
CABINETS, MOTOR FRAMES, STARTERS, CONDUIT SYSTEMS, PANELS, ETC., SHALL BE GROUNDED IN ACCORDANCE WITH THE LATEST N.E.C. AND LOCAL CODES. PROVIDE SERVICE GROUND AND GROUND MAT AT PAD MOUNTED TRANSFORMER.

MATERIALS:
MATERIAL SHALL BE NEW AND BEAR THE U.L. LABEL OR LISTING, WHEREVER STANDARDS HAVE BEEN ESTABLISHED.

AS-BUILT DRAWINGS:
CONTRACTOR SHALL PREPARE AND MAINTAIN ACCURATE RECORD DRAWINGS OF ALL UNDERGROUND AND CONCEALED WORK AND SHALL SUBMIT THESE DRAWINGS TO THE OWNER UPON FINAL ACCEPTANCE OF THE WORK OR UPON THE OWNERS REQUEST.

DRAWINGS AND MEASUREMENTS:
THE DRAWINGS ARE PARTLY DIAGRAMMATIC AND ARE NOT INTENDED TO BE SCALED FOR ROUGH-IN MEASUREMENTS NOR TO SERVE AS SHOP DRAWINGS. FIELD MEASUREMENTS NECESSARY FOR ORDERING MATERIALS AND FITTING THE INSTALLATION TO THE BUILDING CONSTRUCTION AND ARRANGEMENT SHALL BE TAKEN BY THIS CONTRACTOR.

SHOP DRAWINGS:
COMPLETE SHOP DRAWINGS FOR ALL ELECTRICAL WORK SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW BEFORE FABRICATION OF THE WORK. FIVE (5) COPIES OF THE SHOP DRAWINGS SHALL BE SUBMITTED ON ALL ITEMS OF ELECTRICAL EQUIPMENT, PANELS, LIGHT FIXTURES, SPECIALTIES, ETC.

CLEANING AND FINISHING:
AFTER ALL TESTS HAVE BEEN MADE, THE CONTRACTOR SHALL CAREFULLY MAKE A THOROUGH INSPECTION OF THE ENTIRE INSTALLATION AND HAVE THE ENTIRE WORK THOROUGHLY CLEANED, ALL RUBBISH REMOVED, AND LEAVE ALL WORK SATISFACTORY TO THE ARCHITECT AND THE OWNER.

COORDINATION WITH OTHER WORK:
CONSULT THE PLANS COVERING THE WORK FOR THE VARIOUS OTHER TRADES, THE FIELD LAYOUTS OF THE CONTRACTORS FOR THESE TRADES, AND THEIR SHOP DRAWINGS. THE CONTRACTOR SHALL BE AWARE AND RESPONSIBLE IN LAYING OUT THE ELECTRICAL WORK.

DAMAGE TO OTHER WORK:
THE ELECTRICAL CONTRACTOR WILL BE HELD RESPONSIBLE FOR DAMAGES TO WORK CAUSED BY HIS WORK OR THROUGH THE NEGLIGENCE OF HIS WORKMEN. ALL PATCHING AND REPAIRING OF DAMAGED WORK SHALL BE DONE BY THE GENERAL CONTRACTOR, BUT THE COST OF SAME SHALL BE PAID BY THE CONTRACTOR RESPONSIBLE FOR THE DAMAGE.

TESTING:
AFTER ALL ELECTRICAL WORK HAS BEEN COMPLETED, THE CONTRACTOR SHALL DEMONSTRATE TO THE ARCHITECT OR ENGINEER THAT THE ENTIRE INSTALLATION IS IN WORKING ORDER. ANY DEFECTIVE WORK OR EQUIPMENT, OR ANY WORK THAT IS NOT IN COMPLIANCE WITH THE SPECIFICATIONS, SHALL BE PROMPTLY CORRECTED BY THE CONTRACTOR.

CUTTING AND PATCHING:
CUTTING, CORE DRILLING, INSERTS AND CONDUIT OR CABLE SLEEVES AND PATCHING REQUIRED IN THE GENERAL CONSTRUCTION FOR COMPLETION OF THE WORK, SPECIFIED HEREIN, SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

CONDUIT SLEEVES:
PROVIDE CONDUIT SLEEVES WHERE CONDUIT PASS THRU FLOORS, WALLS, ETC. AS REQUIRED.

ALL VOIDS BETWEEN SLEEVES OR HOLES AND CONDUITS PASSING THRU SHALL BE FIRE-STOPPED. SPECSEAL 100 FIRE STOP SEALENT OR EQUAL.

EXCAVATION AND BACK FILLING:
ALL EXCAVATING, TRENCHING AND BACK FILLING TO INSTALL ELECTRICAL WORK SHALL BE BY THE ELECTRICAL CONTRACTOR.

MOUNTING HEIGHTS:
LIGHTING SWITCHES 4'-0" TO CENTERLINE
RECEPTACLES 1'-6" TO BOTTOM
TELEPHONE/DATA 1'-6" TO BOTTOM
LIGHTING/RECEPTACLES PANELS 6'-6" TO TOP
MOTOR STARTERS/DISCONNECTS 5'-6" TO TOP

CERTIFICATE OF APPROVAL

WHEN THE JOB IS COMPLETED, THE CONTRACTOR SHALL PROVIDE THE ARCHITECT WITH CERTIFICATE OF APPROVAL FROM THE LOCAL ELECTRICAL INSPECTION AUTHORITY. THE CONTRACTOR SHALL GIVE THE OWNER A WRITTEN GUARANTEE THAT HE WILL MAKE GOOD, AT HIS OWN EXPENSE, ANY DEFECTS IN MATERIALS OR WORKMANSHIP WHICH MAY DEVELOP WITHIN (1) ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.

ELECTRICAL – BASIC MATERIALS

WIRING:
FEEDERS SHALL BE TYPE "THWN" OR "XHHW". BRANCH CIRCUIT WIRING SHALL BE TYPE "THWN/THHN", #12 MINIMUM. ALL WIRE SHALL BE COPPER, HAVE 600 VOLT INSULATION AND BE INSTALLED IN CONDUIT.

GROUNDING:
CABINETS, MOTOR FRAMES, STARTERS, CONDUIT SYSTEMS, PANELS, ETC., SHALL BE GROUNDED IN ACCORDANCE WITH THE LATEST N.E.C. AND LOCAL CODES.

PROVIDE SEPARATE GROUND WIRE IN ALL CONDUITS SERVING ALL PANELS, LIGHTING, MOTORS, AND RECEPTACLES.

PROVIDE GROUND RODS AT SERVICE ENTRANCE (3-3/4"x10' LG.) AND CONNECT TO COLD WATER SERVICE. USE #3/Ø CU. GRD. CONDUCTOR

CONDUIT:
CONDUIT SHALL BE MC, THINWALL (EMT) R.G.S. OR PVC CONDUIT INSTALLED IN OR UNDER FLOOR SHALL BE 3/4" MINIMUM, R.G.S. OR PVC. CONDUIT INSTALLED IN FINISHED AREAS SHALL BE CONCEALED.

FLEXIBLE METAL CONDUIT WITH GROUND WIRE SHALL BE USED FOR FINAL CONNECTION TO LIGHTING FIXTURES, MOTORS, ETC., 1/2" MINIMUM.

MC CABLE MAY BE USED IN PARTITION WALL OR ABOVE ACCESSIBLE CEILINGS.

NO PVC CONDUIT WILL BE ALLOWED IN BUILDING. ALL CONDUITS TURNING UP FROM UNDERGROUND SHALL BE STEEL ELLS.

SWITCHES:
SWITCHES SHALL BE 20A., 120/277V., 1 POLE, 3 AND 4 WAY AS INDICATED IVORY FINISH, HUBBELL #1221-1 SERIES, COOPER WIRING DEVICES, OR LEVITON.

RECEPTACLES:
RECEPTACLES SHALL BE DUPLEX GROUNDING TYPE 20A., 125V., IVORY FINISH, HUBBELL #5362-1 OR EQUAL. SPECIAL PURPOSE RECEPTACLES 30A., 40A., 50A., 2P. OR 3P., ETC., SHALL BE SPECIFICATION GRADE, HUBBELL, COOPER WIRING DEVICES, OR LEVITON.

GFI RECEPTACLES SHALL BE DUPLEX GROUNDING TYPE 20A., 125V., HUBBELL #ØF5362-1, COOPER WIRING DEVICES, OR LEVITON.

WEATHERPROOF GFI RECEPTACLES SHALL HAVE POLYCARBONATE WEATHERPROOF COVER. THE ENCLOSURE SHALL HAVE CORD PORTS CAPABLE OF ALLOWING AN ELECTRICAL CORD TO PASS THROUGH WHEN COVER IS CLOSED, TAYMAC # 20310 OR EQUAL.

MOTOR STARTERS:
SINGLE PHASE MOTOR STARTERS SHALL HAVE MANUAL TOGGLE SWITCH WITH THERMAL OVERLOADS, SURFACE MOUNTED WITH PILOT LIGHT, SQUARE D, CLASS 2510, CUTLER HAMMER, G.E., OR SIEMENS I.T.E.

SINGLE PHASE MOTOR STARTERS WITH AUTO-OFF-HAND SPDT SELECTOR SWITCH, SHALL BE FLUSH MOUNTED WITH PILOT LIGHT, SQUARE D CLASS 2510-FF71P CUTLER HAMMER, G.E. OR SIEMENS I.T.E.

THREE PHASE MOTOR STARTERS SHALL BE MAGNETIC TYPE, WITH FUSED CONTROL TRANSFORMER WITH 3 OVERLOADS, HAND-OFF AUTO SWITCH, AUXILIARY CONTACTS AND PILOT LIGHT AS REQUIRED, SQUARE D, CLASS 8536, CUTLER HAMMER, G.E., OR SIEMENS I.T.E.

COMBINATION THREE PHASE MOTOR STARTERS SHALL BE THE SAME AS ABOVE EXCEPT WITH FUSED DISCONNECT AND CLASS R FUSES.

DISCONNECT SWITCHES:
DISCONNECT SWITCHES SHALL BE HEAVY DUTY, 250V OR 480V, FUSED OR NON-FUSED AS INDICATED, IN A NEMA 1 ENCLOSURE. DISCONNECT SWITCHES INSTALLED OUTDOORS SHALL BE IN A NEMA 3R ENCLOSURE. SQUARE D, CUTLER HAMMER, G.E., OR SIEMENS I.T.E.

FUSES:
601 AMPERE AND LARGER SHALL BE PROTECTED BY CURRENT LIMITING BUSSMANN HI-CAP TIME DELAY FUSES KRP-C, 250 OR 480 VOLTS.

0 TO 600 AMPERE SHALL BE PROTECTED BY CURRENT LIMITING BUSSMAN LOW-PEAK DUAL ELEMENT FUSES LPN/LPS, 250 OR 480 VOLTS.

DISTRIBUTION PANEL:
DISTRIBUTION PANEL SHALL BE 240/120V, 1 PHASE, 3 WIRE BREAKER E TYPE, CLASS 1 CONSTRUCTION, BRACED FOR 65,000 A.I.C., SERVICE ENTRANCE LABELED, WITH PROVISIONS FOR UTILITY COMPANY C/T'S, SQUARE D, CUTLER HAMMER, G.E. OR SIEMENS I.T.E.

TRANSFORMER:
TRANSFORMER SHALL BE SIZED AS SHOWN ON PLANS , NEMA 1, CLASS 1 CONSTRUCTION, BRACED FOR 65,000 A.I.C., SQUARE D, CUTLER HAMMER, G.E. OR SIEMENS I.T.E.

RECEPTACLE PANEL:
PANELS SHALL BE 120/240V, 1 PHASE, 3 WIRE, WITH BOLT-ON CIRCUIT BREAKERS, RATED 10,000 A.I.C. SWITCH DUTY RATED, 20" WIDE CABINET MINIMUM. SQUARE D "NQØD," CUTLER HAMMER, G.E. OR SIEMENS I.T.E. PROVIDE TYPEWRITTEN DIRECTORY INDICATING EACH ITEM SERVED.

NAMEPLATES:
PROVIDE NAMEPLATES ON EACH INDIVIDUAL SAFETY SWITCH, CONTROL STATION, PANEL BOARD, MOTOR STARTER, ETC. NAMEPLATES SHALL BE WHITE LAMINATED PLASTIC WITH BLACK ENGRAVED LETTERS AND A SELF-ADHESIVE BACK.

GENERATOR AND ATS'S

NEW 175KW 480V 3Ø 4W NATURAL GAS TYPE GENERATOR IS BEING PROVIDED BY OWNER. ELECTRICAL CONTRACTOR TO RECEIVE, AND PROVIDE ALL REQUIRED MATERIA L AND LABOR, ETC., FOR A COMPLETE INSTALLATION.

NEW (2) ATS'S AS SHOWN ON PLANS SHALL BE PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR.

MISCELLANEOUS ELECTRICAL

DEMOLITION:
ALL ELECTRICAL DEMOLITION WORK SHALL INCLUDE REMOVING AND/OR RELOCATION OF EXISTING PANELS, LIGHTING FIXTURES, RECEPTACLES, WIRE, CONDUIT, BOXES, ETC., AS INDICATED ON THE DRAWINGS AND SHALL BE BY THE ELECTRICAL TRADE THAT WOULD NORMALLY INSTALL THIS WORK.

REMOVE ALL CONDUIT, WIRE, HANGERS, CLAMPS, ETC., THAT ARE NOT BEING REUSED, UNLESS CONCEALED ABOVE CEILINGS OR IN WALLS, WHICH MAY BE ABANDONED AND LEFT IN PLACE.

REMOVE ALL WIRE IN EXISTING CONCEALED ABANDONED CONDUITS. EXISTING CONCEALED CONDUITS (IF APPLICABLE) MAY BE REUSED FOR NEW WIRING.

ALL EXISTING PANELS SHALL REMAIN IN THEIR EXISTING LOCATIONS, UNLESS OTHERWISE NOTED.

REMOVE EXISTING WIRING DEVICES, PULL ALL WIRES OUT AND INSTALL A BLANK STAINLESS STEEL COVER PLATE OVER THE EXISTING OUTLET.

ALL MATERIALS THAT ARE REMOVED, LIGHTING FIXTURES, WIRING DEVICES, CONDUIT, WIRE, ETC., SHALL BECOME THE PROPERTY OF THE CONTRACTOR, UNLESS OTHERWISE NOTED ON THE DRAWINGS.

ELECTRICAL LEGEND

	HOME RUN TO PANEL INDICATED. 2#12&1#12 GND 3/4"C, U.N.O.
	CONDUIT CONCEALED IN WALL OR ABOVE CEILING
	CONDUIT IN FLOOR SLAB OR IN CABINETRY
	DATA CONDUIT IN FLOOR SLAB OR IN CABINETRY - 1"C U.N.O.
	EXISTING ELECTRICAL DEVICE TO REMAIN
	CIRCUIT BREAKER PANELBOARD (VOLTAGE AS INDICATED)
	SWITCHBOARD (VOLTAGE AND SIZE AS INDICATED)
	DUPLEX RECEPTACLE 20A-1 PHASE-120V 18" AFF, UNO.
	DOT INDICATES REC MOUNTED 6" ABOVE COUNTER, UNO.
	RECEPTACLE- 20A-1 PHASE-2Ø8V NEMA R6-2Ø
	DUPLEX RECEPTACLE-GROUND FAULT INTERRUPTER TYPE-2ØA-1 PHASE-120V.
	COMBINATION DUPLEX RECEPTACLE AND USB OUTLET TYPE-2ØA-1 PHASE-120V.
	QUADRUPLEX OUTLET-2ØA-1 PHASE 120V
	COMBINATION POWER/DATA POKE THRU FLOOR BOX
	MANUAL MOTOR STARTER W/ P/L AND HAND-OFF-AUTO SWITCH
	MOTOR STARTER OR CONTROLLER
	COMBINATION MOTOR STARTER & DISCONNECT SW. W/ P/L AND HAND-OFF-AUTO SWITCH
	DISCONNECT SWITCH-F INDICATES FUSED
	MOTOR-SIZE AS INDICATED
	JUNCTION BOX
	FRACTIONAL HP 2 POLE MOTORIZED SWITCH

NOTE: NOT ALL SYMBOLS SHOWN ON ELECTRICAL LEGEND ARE SHOWN ON ELECTRICAL PLANS

GENERAL ELECTRICAL NOTES

- ELECTRICAL WORK SHALL COMPLY WITH LATEST NATIONAL ELECTRICAL CODE, LIFE SAFETY CODE AND APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
- ELECTRICAL EQUIPMENT AND WIRING SHALL BE NEW AND SHALL BE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR, UNLESS OTHERWISE NOTED.
- WIRING SHALL BE IN CONDUIT. CONDUIT SHALL BE 3/4" MIN. CONDUITS IN FINISHED AREAS SHALL BE CONCEALED.
- NEW WIRES SHALL BE TYPE THHN. MINIMUM SIZE SHALL BE #12 AWG, UNLESS OTHERWISE NOTED.
- RECEPTACLE CIRCUITS SHALL HAVE A DEDICATED NEUTRAL.
- NO METAL CLAD FLEXIBLE WIRING SHALL BE USED EXCEPT FROM JUNCTION BOX TO FIXTURES AND SHALL NOT EXCEED 6 FEET IN LENGTH.
- FINAL CONNECTIONS TO EQUIPMENT, FURNISHED AND INSTALLED BY OTHERS, SHALL BE PROVIDED BY THIS CONTRACTOR.
- VERIFY LOCATION OF LIGHTING FIXTURES, MECHANICAL EQUIPMENT IN CEILING, SPEAKERS AND POWER OUTLETS ETC, WITH DESIGN PROFESSIONAL PRIOR TO ROUGH-IN.
- VERIFY AND COORDINATE WITH ARCHITECTURAL DRAWINGS EXACT LOCATION AND MOUNTING HEIGHTS OF POWER AND DATA OUTLETS.
- CIRCUIT BREAKER ARRANGEMENT INDICATED ON THE ELECTRICAL RISER DIAGRAM DOES NOT NECESSARILY CORRESPOND TO THE ACTUAL BREAKER ARRANGEMENT OR PANEL PHASING. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO BALANCE THE LOADS ON THE PANEL AT THE TIME OF INSTALLATION. EVERY ATTEMPT SHOULD BE MADE TO GROUP SIMILAR LOADS AND LOCATE ALL SPARES AND SPACES AT THE BOTTOM OF THE PANEL.
- PROVIDE A TYPEWRITTEN DIRECTORY IN THE PANEL DOOR, ACCURATELY INDICATING ROOMS AND EQUIPMENT BEING SERVED. CONTRACTOR SHOULD MAKE EVERY ATTEMPT TO IDENTIFY ALL CIRCUITS.
- RECEPTACLES THAT ARE TO BE GFI PROTECTED ARE TO BE GFI TYPE RECEPTACLES WIRED FOR INDIVIDUAL OUTLET.

ELECTRICAL ABBREVIATIONS

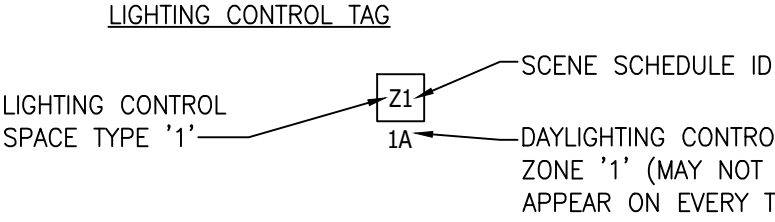
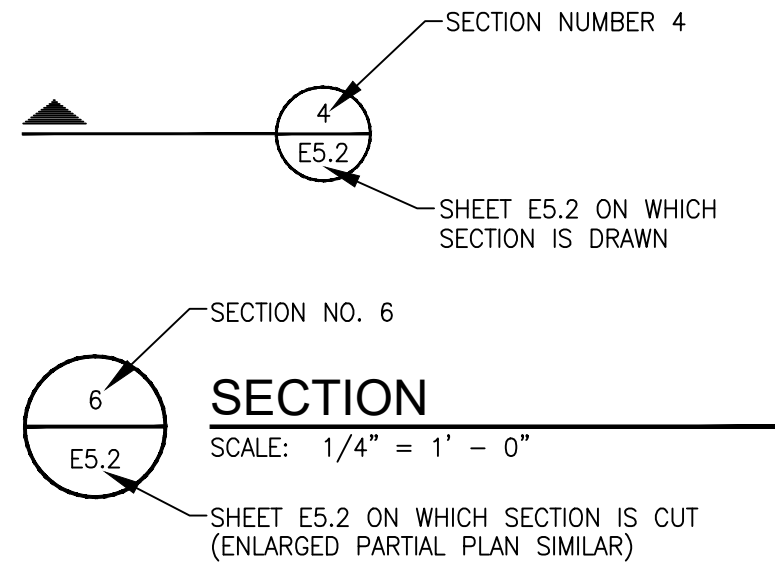
ABBREV.	DESCRIPTION
AF	AMP FUSE
AFF	ABOVE FINISHED FLOOR
AIC	AVAILABLE INTERRUPTING CURRENT (AMPS)
ATS	AUTOMATIC TRANSFER SWITCH
CB	CIRCUIT BREAKER
(E)	EXISTING ELECTRICAL EQUIPMENT OR WORK
EMT	ELECTRICAL METALLIC TUBING
EWC	ELECTRIC WATER COOLER
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPS
G/GRD	GROUND
GFI	GROUND FAULT INTERRUPTER
HOA	HAND-OFF-AUTO
IG	ISOLATED GROUND
LP	LIGHTING PANEL
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MLO	MAIN LUG ONLY
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NF	NON-FUSIBLE
NIC	NOT IN CONTRACT
P	POLE
(R)	RELOCATED EXISTING ELECTRICAL EQUIPMENT
(RR)	REMOVE AND REINSTALL
RMC	RIGID METALLIC CONDUIT
RP	RECEPTACLE PANEL
TBB	TELEPHONE BACKBOARD
TYP.	TYPICAL
WG	WIRE GUARD
WP	WEATHERPROOF

DRAWING INDEX

SHEET #	DESCRIPTION
E000	ELECTRICAL GENERAL INFORMATION
E100	ELECTRICAL ROOM ONE-LINE DIAGRAM-DEMOLITION
E101	ELECTRICAL ROOM ONE-LINE DIAGRAM-NEW WORK
E200	SITE PLAN AND ENLARGE ELECTRICAL ROOM PLAN

DRAWING NOTATION

SYMBOL	DESCRIPTION
	LIGHTING FIXTURE TAG
	CONSTRUCTION KEY NOTE NUMBER 1
	DEMOLITION KEY NOTE NUMBER 1
	FEEDER SIZE TAG (REFER TO FEEDER SCHEDULE ON THIS SHEET)
	EQUIPMENT DESIGNATION. (I.E. EXHAUST FAN NUMBER 1)
	EXISTING DEVICES OR EQUIPMENT
	NEW OR MODIFIED DEVICES OR EQUIPMENT
	NEW OR MODIFIED UNDERGROUND WIRING
	EXISTING SYSTEM COMPONENT TO BE REMOVED



APPLICABLE CODES AND REGULATIONS

YEAR	CODE
2015	MICHIGAN BUILDING CODE
2015	MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS
2017	MICHIGAN ELECTRICAL CODE RULES PART 8
2017	NATIONAL ELECTRICAL CODE (NFPA 70)
2012	LIFE SAFETY CODE (NFPA 101)
2012	FIRE SAFETY CODE (NFPA 72)

Dates / Issuances
100% Review Set 1/04/2022
100% (R)Review Set 1/11/2022

Drawing Name

ELECTRICAL GENERAL INFORMATION

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Project Name

**NEW GENERATOR
INSTALLATION PROJECT AT
MTA TRANSPORTATION CENTER
DORT HIGHWAY
FLINT MI**

Client / Owner

**MTA
MASS TRANSPORTATION
AUTHORITY
1401 S. DORT HWY.
FLINT, MI 48503**

Seal

Drawn / Checked

NA / FAA

Project Number

2022-01

Sheet Number

E-000