ELECTRICAL LEGEND:

FURNISH AND INSTALL CONDUIT AND EQUIPMENT, QUANTITY AND SIZE OF CABLES SHALL BE AS INDICATED ON THE CONTRACT DRAWINGS.

EXISTING CONDUIT AND EQUIPMENT TO REMAIN AS INDICATED ON THE CONTRACT DRAWINGS.

FURNISH AND INSTALL UNDERGROUND CONDUIT AS INDICATED ON THE CONTRACT DRAWINGS.

M — REVENUE GRADE UTILITY METER.

X / Y — FUSIBLE SAFETY SWITCH.
X - INDICATES SWITCH AMPERE RATING
Y - INDICATES FUSE AMPERE RATING

DELTA PRIMARY / WYE SECONDARY TRANSFORMER.

X — NON-FUSIBLE TYPE SAFETY SWITCH.
X - INDICATES SWITCH AMPERE RATING

X / Y — CIRCUIT BREAKER.
X - INDICATES AMPERE TRIP SETTING
Y - INDICATES AMPERE FRAME SIZE

AUTOMATIC TRANSFER SWITCH.

G — GENERATOR.

K — KEY-INTERLOCKING MECHANISM.

X — MOTOR.
X - INDICATES HORSEPOWER RATING

480/277V PANELBOARD.

208/120V PANELBOARD.

CONTINUATION.

XXX#XX — HOMERUN CIRCUIT
XXX#XX CIRCUIT DESIGNATION
CIRCUIT NUMBER
PANELBOARD NAME

XXX#XX — HOMERUN WITH FOUR (4) CIRCUITS
XXX#XX CIRCUIT DESIGNATION
CIRCUIT NUMBERS
PANELBOARD NAME

X — WALL MOUNTED 125V, 20A NON-LOCKING TYPE DUPLEX RECEPTACLE.
GFI - DENOTES SELF-TEST GFCI TYPE RECEPTACLE
WP - DENOTES LISTED WEATHER-RESISTANT RECEPTACLE IN WEATHERPROOF ENCLOSURE

WALL MOUNTED 125V, 20A QUADRUPLEX RECEPTACLE.

X / Y — DRAWING CALLOUT
X - DENOTES PART PLAN NUMBER
Y - DENOTES DRAWING SHEET NUMBER

POKE-THRU DEVICE. REFER TO DETAIL 6 ON DRAWING E-502 FOR CONDUIT INSTALLATION REQUIREMENTS.

FINAL MECHANICAL EQUIPMENT CONNECTION. COORDINATE WITH EQUIPMENT MANUFACTURER FOR EXACT REQUIREMENTS.

NON-FUSIBLE TYPE DISCONNECT SWITCH; SIZE AS NOTED ON PLANS.

FUSIBLE TYPE DISCONNECT SWITCH; SIZE AS NOTED ON PLANS.

MD — MOTORIZED DAMPER.

VFD — VARIABLE FREQUENCY DRIVE. REFER TO MECHANICAL CONTRACT DRAWINGS FOR SPECIFICATIONS.

MOTOR CONTROL PANEL.

PULL BOX; SIZE AS NOTED ON PLANS.

HARDWIRED CONNECTION. REFER TO POWER PLANS FOR EQUIPMENT/CONNECTION INFORMATION.

$_{HP}$ — HORSEPOWER RATED SWITCH.

DATA OUTLET; FURNISH AND INSTALL 3/4" EMPTY CONDUIT STUB-UP FROM DEVICE TO ABOVE DROPPED CEILING WITH PULL STRING. REFER TO TELECOMMUNICATION CONTRACT DRAWINGS FOR EXACT REQUIREMENTS.

T — FLOOR MOUNTED DRY TYPE TRANSFORMER.

CEILING MOUNTED JUNCTION BOX.

G — EQUIPMENT GROUND TERMINAL BAR WITHIN SWITCHBOARD/PANELBOARD.

SV — SOLENOID VALVE.

LD — LEAK DETECTION.

ELECTRICAL GENERAL NOTES:

1. THE CONTRACT DRAWINGS ARE DIAGRAMMATIC IN NATURE AND NOT EVERY DETAIL OR EXACT LOCATION OF EQUIPMENT AND/OR CONDUIT IS SHOWN. VERIFY ALL CONDITIONS AND DIMENSIONS IN THE FIELD BEFORE COMMENCING ANY FABRICATION, ORDERING ANY MATERIAL OR PERFORMING ANY WORK. NOTIFY THE ENGINEER OF ANY CONDITIONS OR DIMENSIONS, WHICH WOULD AFFECT THE PERFORMANCE OF WORK IN ACCORDANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS.

2. UON, USE THE FOLLOWING RACEWAYS FOR INDOOR INSTALLATIONS:
   2.1. EXPOSED: IMC / RMC
   2.2. CONCEALED: EMT (MC CABLE WHERE PERMISSIBLE ACCORDING TO SPEC SECTION 3.06B)
   2.3. CONNECTION TO VIBRATING EQUIPMENT: FMC; EXCEPT IN WET OR DAMP LOCATIONS, USE LFMC
   2.4. DAMP OR WET LOCATIONS: IMC / RMC

3. UON, USE THE FOLLOWING RACEWAYS FOR OUTDOOR INSTALLATIONS, UON:
   3.1. EXPOSED: IMC / RMC
   3.2. CONCEALED: IMC / RMC
   3.3. UNDERGROUND, BELOW SLAB: RNC - SCHEDULE 40 PVC
   3.4. UNDERGROUND, ALL OTHER LOCATIONS: RNC - SCHEDULE 80 PVC
   3.5. CONNECTION TO VIBRATING EQUIPMENT: LFMC

4. UON, ALL INDOOR AND OUTDOOR WIRING SHALL BE 600V, 1/C ALUMINUM TYPE "THHN/THWN" WIRES.

5. UON, ALL PULL BOXES, JUNCTION BOXES AND ENCLOSURES FOR ELECTRICAL EQUIPMENT FOR ALL OUTDOOR AND NON-CLIMATE CONTROLLED INDOOR ENVIRONMENT SHALL BE NEMA TYPE 3R.

6. LIGHT LINE WORK INDICATES EXISTING ELECTRICAL MATERIALS AND EQUIPMENT TO REMAIN. MATERIALS AND EQUIPMENT, EXISTING OR TO BE FURNISHED AND/OR INSTALLED UNDER THIS CONTRACT, BY OTHER DISCIPLINES ARE ALSO SHOWN IN LIGHT LINES. HEAVY LINE WORK INDICATES ELECTRICAL MATERIALS AND EQUIPMENT TO BE FURNISHED AND/OR INSTALLED OR EXISTING ELECTRICAL INSTALLATION TO BE MODIFIED, ADJUSTED AND OR REINSTALLED AS SHOWN ON THE CONTRACT DRAWINGS.

7. MAINTAIN THE INTEGRITY OF ALL CIRCUITS IN SERVICE THAT MAY BE AFFECTED BY THIS WORK.

8. IDENTIFY ALL SOURCES OF POWER AND DE-ENERGIZE REQUIRED CIRCUITS BEFORE COMMENCEMENT OF WORK.

9. FOR EACH RACEWAY, PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE WITH A GREEN COLOR OUTER JACKET/INSULATION.

10. UON, ALL WIRING SHALL BE INSTALLED IN APPROVED RACEWAYS.

11. FURNISH AND INSTALL ALL NECESSARY MATERIAL IN ORDER TO PROVIDE A COMPLETE SYSTEM READY FOR OPERATION, ACCORDING TO CONTRACT DOCUMENTS AND APPLICABLE CODES.

12. UON, ALL ITEMS TO BE SECURED SHALL BE FASTENED TO STEEL BY THREADED BEAM CLAMPS WITH LOCKING NUTS. ALL FASTENING HARDWARE SHALL BE STAINLESS STEEL AND SHALL INCLUDE SHAKE PROOF (EXTERNAL STAR) LOCK WASHERS. ALL BOLTS SHALL HAVE LOCK WASHERS ELASTIC STOP NUTS IN ADDITION TO REGULAR NUTS. SCREWS SHALL BE TAMPERPROOF AND BOLT ENDS SHALL BE PEENED.

13. FURNISH AND INSTALL A PERMANENTLY AFFIXED LABEL ON ELECTRICAL EQUIPMENT. SERVICE EQUIPMENT SHALL BE LEGIBLY MARKED WITH THE MAXIMUM AVAILABLE FAULT CURRENT. PROVIDE TYPED CIRCUIT DIRECTORIES FOR PANELBOARDS. ALL LABELS ON ELECTRICAL EQUIPMENT SHALL INDICATE THE SOURCE OF SUPPLY.

14. FOR ALL JUNCTION BOXES AND ENCLOSURES INSTALLED IN DAMP OR WET LOCATIONS, CONDUITS SHALL ENTER ONLY THROUGH THE BOTTOM OR SIDES OF THE JUNCTION BOX OR ENCLOSURE. TOP CONDUIT ENTRIES SHALL NOT BE PERMITTED. ALL CONDUIT CONNECTIONS SHALL BE MOISTURE TIGHT. USE MOISTURE TIGHT HUBS FOR ALL CONDUIT ENTRANCES INTO EQUIPMENT ENCLOSURES.

15. COORDINATE ALL ELECTRICAL WORK WITH OTHER TRADES.

16. UON, ALL EXISTING ELECTRICAL INSTALLATIONS SHALL REMAIN.

17. GROUND ALL METALLIC ENCLOSURES PER CONTRACT SPECIFICATIONS.

18. ALL CONDUITS SHALL CONTAIN AN INSULATED GROUND WIRE BONDED IN ALL ENCLOSURES AND SIZED IN ACCORDANCE WITH NEC REQUIREMENTS.

19. UON, FURNISH AND INSTALL WIRING, CONDUIT, AND NECESSARY EQUIPMENT/DEVICES AS REQUIRED TO ENSURE A COMPLETE AND FULLY OPERATIONAL HVAC SYSTEM. COMPLY WITH THE REQUIREMENTS DESCRIBED AND SHOWN ON THE MECHANICAL DRAWINGS AND SPECIFICATIONS.

20. AFTER COMPLETION OF WORK, SUBMIT REPRODUCIBLE AS-BUILT DRAWINGS TO THE ENGINEER.

21. ALL 15KV RATED CABLE TERMINATIONS AT UTILITY RISER POLE OR AT LIVE FRONT EQUIPMENT SHALL BE OUTDOOR TYPE STRESS CONES. ALL 15KV RATED CABLE TERMINATIONS AT DEAD FRONT EQUIPMENT SHALL BE LOAD BREAK TYPE.

22. ALL CONDUIT TERMINATIONS INTO NON-THREADED BOXES/ENCLOSURES SHALL BE BONDED TO THE GROUND WIRE/CONDUCTOR INSTALLED IN THAT CONDUIT/RACEWAY WITH A PROPERLY SIZED BONDING JUMPER/WIRE. USE BONDING BUSHINGS WITH LAY-IN LUGS FOR ALL CONDUIT TERMINATIONS.

23. ALL OUTDOOR CONDUIT TERMINATIONS INTO NON-THREADED BOXES/ENCLOSURES SHALL BE MADE USING NEMA 4X CONDUIT HUBS WITH GROUNDING BUSHINGS/LAY-IN LUGS.

24. EACH WIRE/CABLE SHALL BE LABELED WITHIN 6 INCHES OF ALL TERMINATION POINTS. LABELS SHALL LIST PANEL NAME, CIRCUIT & PHASE.

25. ALL 3 PHASE CIRCUITS SHALL BE COLOR CODED BROWN/ORANGE/YELLOW/GRAY (480/277V), BLACK/RED/BLUE/WHITE (208/120V).

26. FURNISH AND INSTALL TELEPHONE, NETWORK, SECURITY AND OTHER LOW-VOLTAGE EQUIPMENT BACK-BOXES & EMPTY CONDUIT SYSTEMS FOR LOW-VOLTAGE WIRING AND CABLING. (UON, WIRING & CABLING IS UNDER A SEPARATE CONTRACT.) LOCATION AND SIZE OF CONDUIT SHALL BE AS SPECIFIED ON THE DRAWINGS OR AS REQUIRED. THE MANNER OF INSTALLING CONDUIT SHALL BE THE SAME AS SPECIFIED HEREIN FOR LIGHT AND POWER WIRING SYSTEMS AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE IT CONSULTANT AND OTHER TELECOMMUNICATION SYSTEMS VENDORS.

ABBREVIATIONS:

'	FEET
"	INCHES
&	AND
°C	DEGREES CELSIUS
# / NO.	NUMBER
1/C	ONE CONDUCTOR
3/C	THREE CONDUCTOR
4/C	FOUR CONDUCTOR
A, AMP	AMPERES
AAP	AISLE ACCESS PANEL
ACUR	AIR CURTAIN
AF	AMPERE FRAME SIZE
AL	ALUMINUM
AS/RS	AUTOMATIC SUPPLY / RETRIEVAL SYSTEM
AT	AMPERE TRIP SETTING
ATS	AUTOMATIC TRANSFER SWITCH
BIL	BASIC INSULATION LEVEL
BMS	BUILDING MANAGEMENT SYSTEM
C	CONDUIT
CU	COPPER
DSF	DESTRATIFICATION FAN
DWG	DRAWING
EM	EMERGENCY
EQ	EQUIPMENT
ERFH	ELECTRIC RADIANT FLOOR HEATING
G, GND	GROUND
GEC	GROUNDING ELECTRODE CONDUCTOR
HP	HORSEPOWER
HV	HEATING & VENTILATION
HVAC	HEATING, VENTILATION, AIR-CONDITIONING
HWAT	HOT WATER TEMPERATURE MAINTENANCE SYSTEM
HWUH	HOT WATER UNIT HEATER
HZ	HERTZ
LFMC	LIQUIDTIGHT FLEXIBLE METAL CONDUIT
LS	LIFE SAFETY
LSI	LONG-TIME, SHORT-TIME, & INSTANTANEOUS PICKUP
LSIG	LONG-TIME, SHORT-TIME, INSTANTANEOUS PICKUP, & GROUND FAULT
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CONTROL PANEL
MLO	MAIN LUGS ONLY
MH	MOUNTING HEIGHT
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NICET	NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES
NRTL	NATIONAL RECOGNIZED TESTING LABORATORY
NTS	NOT TO SCALE
O&R	ORANGE AND ROCKLAND UTILITY
P	POLE
PH	PHASE
RTAC	ROOFTOP AIR CONDITIONING UNIT
SRM	STORAGE RETRIEVAL MACHINE
SWBD	SWITCHBOARD
TF	TRANSFER FAN
TXF	TOILET EXHAUST FAN
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UON	UNLESS OTHERWISE NOTED
V	VOLTS
VAV	VARIABLE AIR VOLUME
VRC	VERTICAL RECIPROCATING CONVEYOR
W	WIRE
XFMR	TRANSFORMER

ELECTRICAL DRAWING LIST

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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SUFFERN, NEW YORK

KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

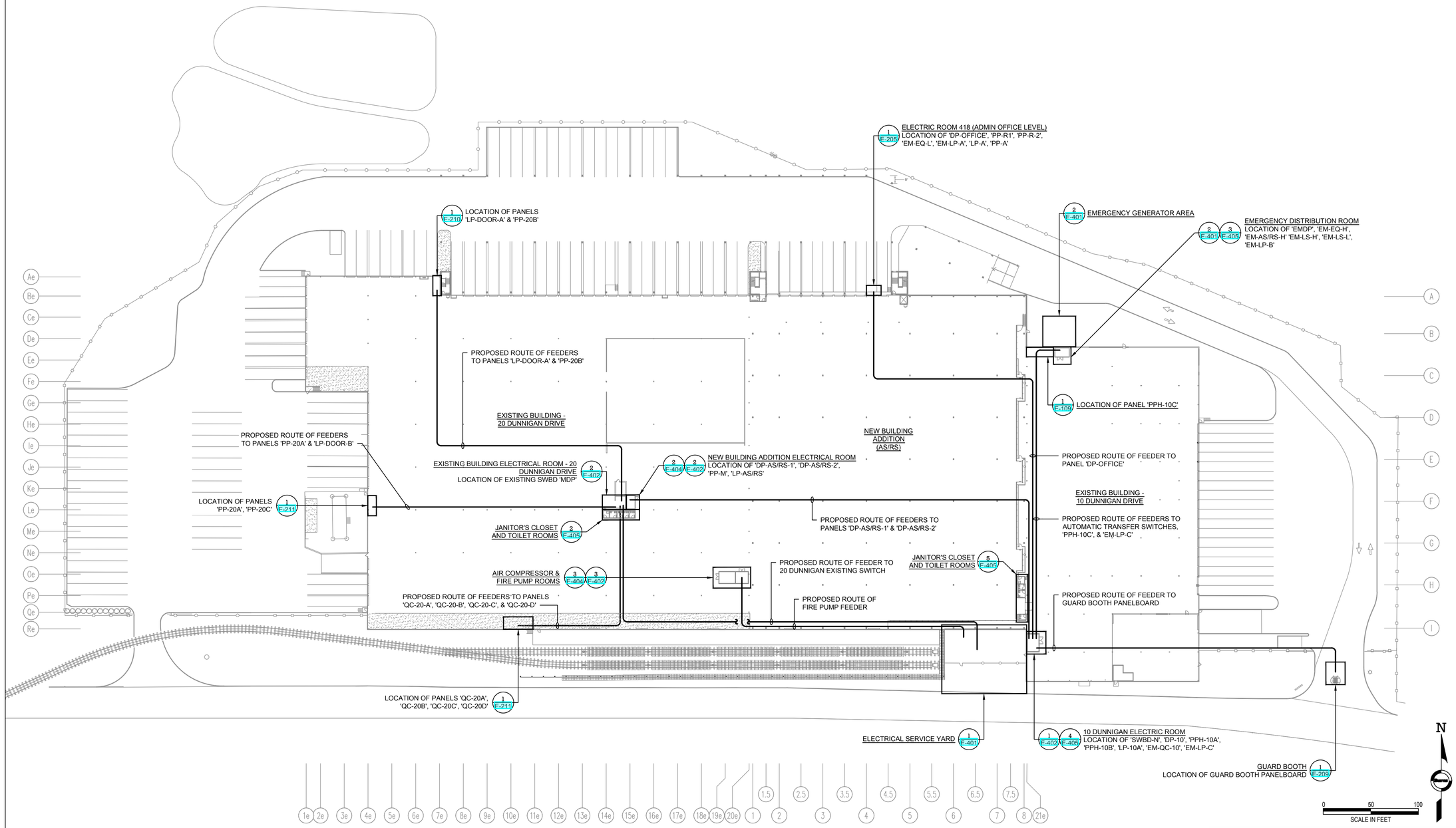
DRAWN BY : M.DIMATTIA
CHECKED BY : B.NEMCHEK
APPROVED BY : J.MIZRAHI
DATE : 09/10/21
SCALE : AS NOTED

DRAWING TITLE :
ELECTRICAL LEGEND, GENERAL NOTES, ABBREVIATIONS, & DRAWING LIST

DWG NUMBER :
E-001

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO E-600 SERIES CONTRACT DRAWINGS FOR PANEL SCHEDULES.



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KEY PLAN

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	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

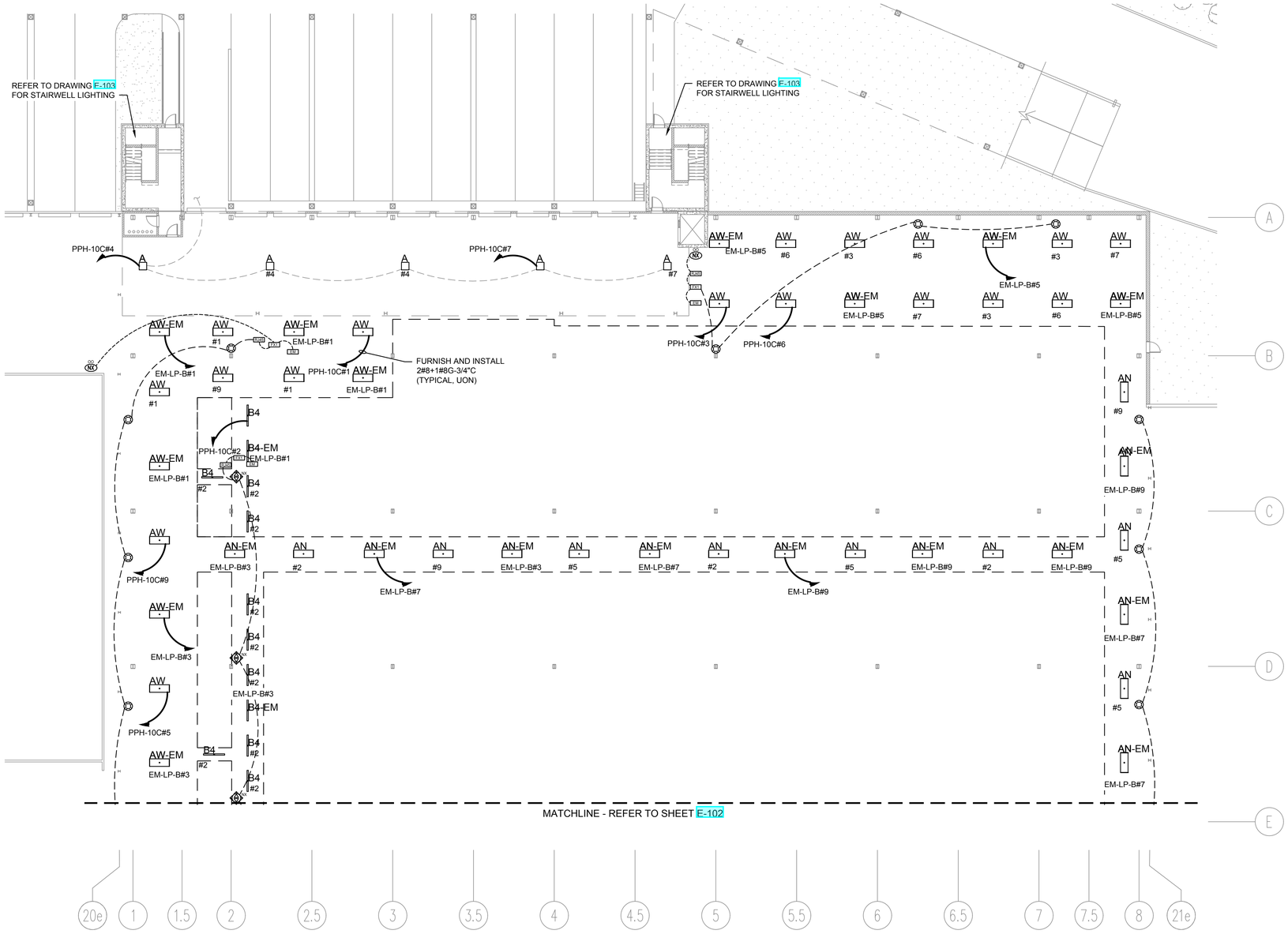
DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	1" = 50'

DRAWING TITLE :

ELECTRICAL OVERALL KEY PLAN

DWG NUMBER :

E-002



1 / E-101 ELECTRICAL LIGHTING PLAN - WAREHOUSE LEVEL (NORTH)

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

0 16 32

SCALE IN FEET

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO CONTRACT DRAWING E-607 FOR LIGHTING FIXTURE SCHEDULE.
4. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY, LOCATION, AND SPECIFICATIONS OF LIGHTING FIXTURES.
5. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LIGHTING CONTROL SYSTEM SPECIFICATIONS, DEVICE LAYOUT, AND QUANTITY OF CONTROL DEVICES.
6. ALL LIGHTING FIXTURES LOCATED ON NORTH WAREHOUSE LEVEL AS SHOWN ON THIS DRAWING SHALL BE FED FROM PANEL 'PPH-10C' UNLESS OTHERWISE NOTED.

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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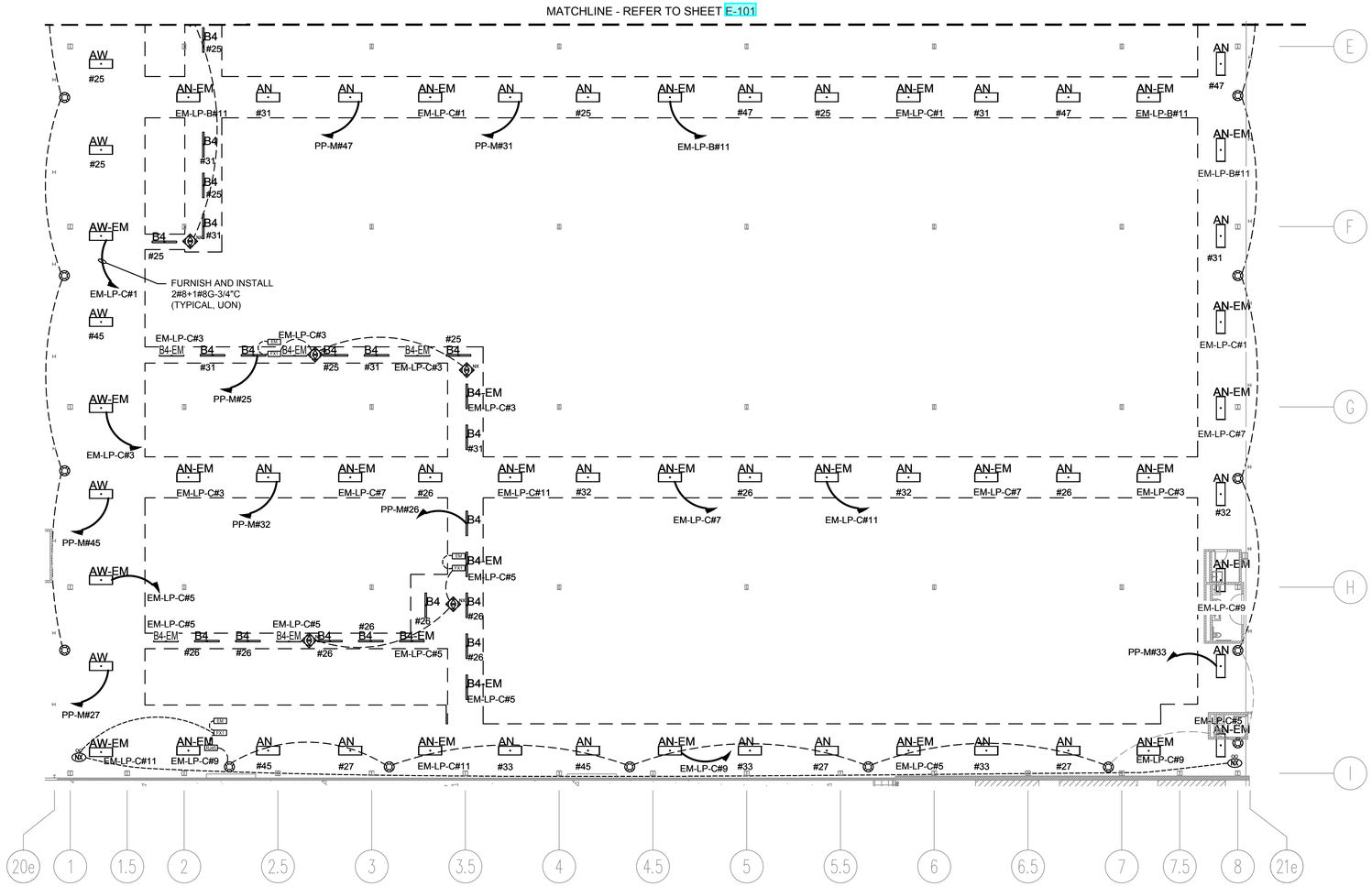
KEY PLAN — AREA OF WORK

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :
ELECTRICAL LIGHTING PLAN - ASRS WAREHOUSE (NORTH)

DWG NUMBER :
E-101



1 / E-102 ELECTRICAL LIGHTING PLAN - WAREHOUSE LEVEL (SOUTH)

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

0 16 32

SCALE IN FEET

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO CONTRACT DRAWING E-607 FOR LIGHTING FIXTURE SCHEDULE.
4. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY, LOCATION, AND SPECIFICATIONS OF LIGHTING FIXTURES.
5. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LIGHTING CONTROL SYSTEM SPECIFICATIONS, DEVICE LAYOUT, AND QUANTITY OF CONTROL DEVICES.
6. ALL LIGHTING FIXTURES LOCATED ON SOUTH WAREHOUSE LEVEL AS SHOWN ON THIS DRAWING SHALL BE FED FROM PANEL 'PP-M' UNLESS OTHERWISE NOTED.

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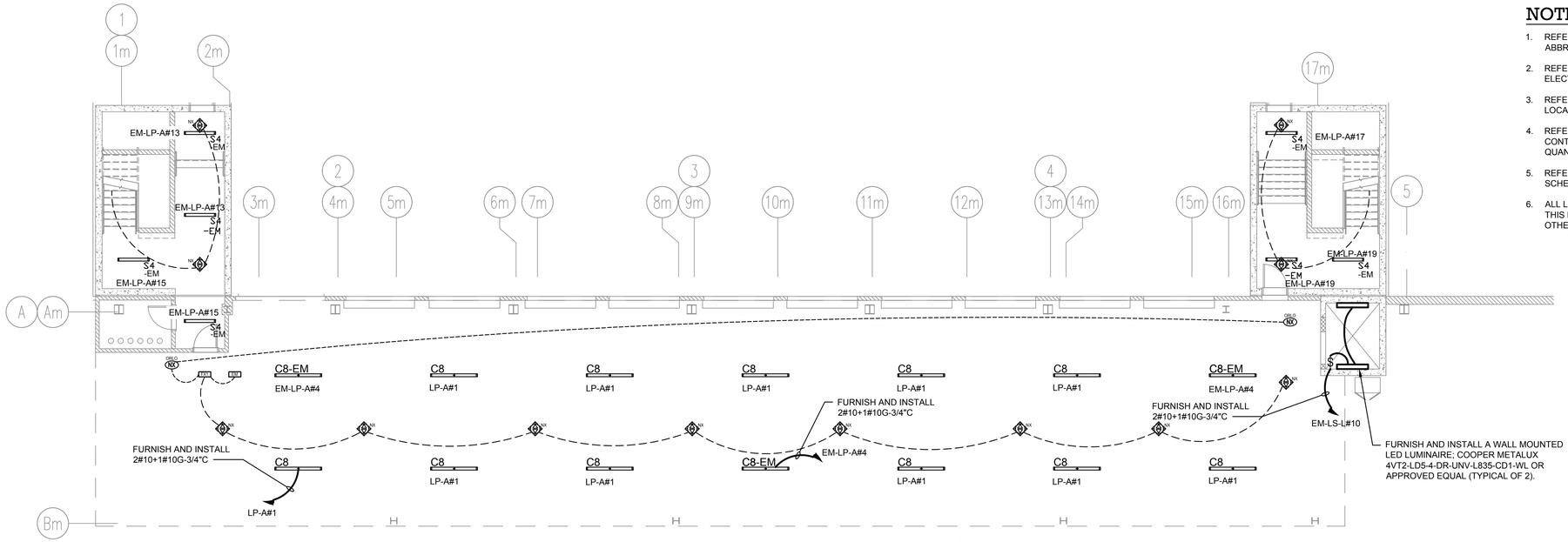
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :
ELECTRICAL LIGHTING PLAN - ASRS WAREHOUSE (SOUTH)

DWG NUMBER :
E-102

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.



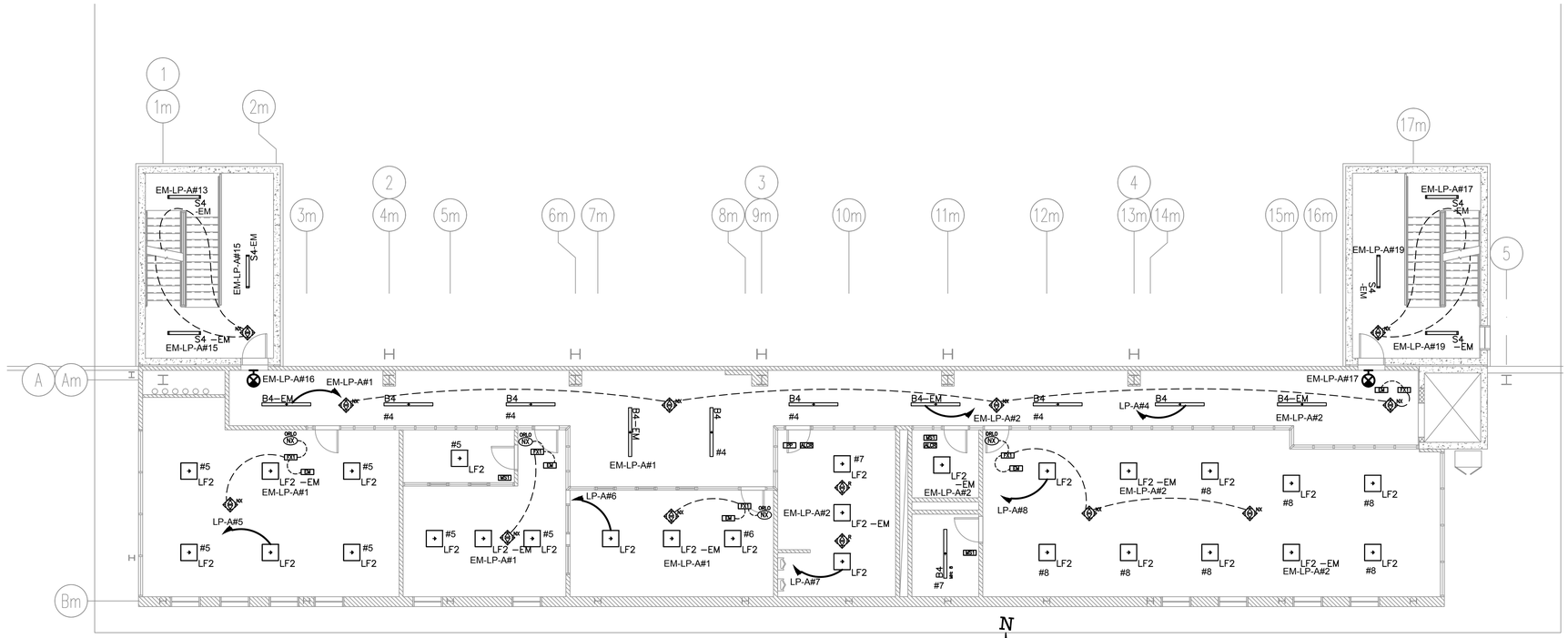
1 E-103 **ELECTRICAL LIGHTING PLAN - PART WAREHOUSE**

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

0 8 16

SCALE IN FEET

N



2 E-103 **ELECTRICAL LIGHTING PLAN - 1ST MEZZANINE**

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

0 8 16

SCALE IN FEET

N

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702 AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY, LOCATION, AND SPECIFICATIONS OF LIGHTING FIXTURES.
4. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LIGHTING CONTROL SYSTEM SPECIFICATIONS, DEVICE LAYOUT, AND QUANTITY OF CONTROL DEVICES.
5. REFER TO CONTRACT DRAWING E-607 FOR LIGHTING FIXTURE SCHEDULE
6. ALL LIGHTING FIXTURES LOCATED ON 1ST MEZZANINE AS SHOWN ON THIS DRAWING SHALL BE FED FROM PANEL 'LP-A' UNLESS OTHERWISE NOTED.

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KEY PLAN

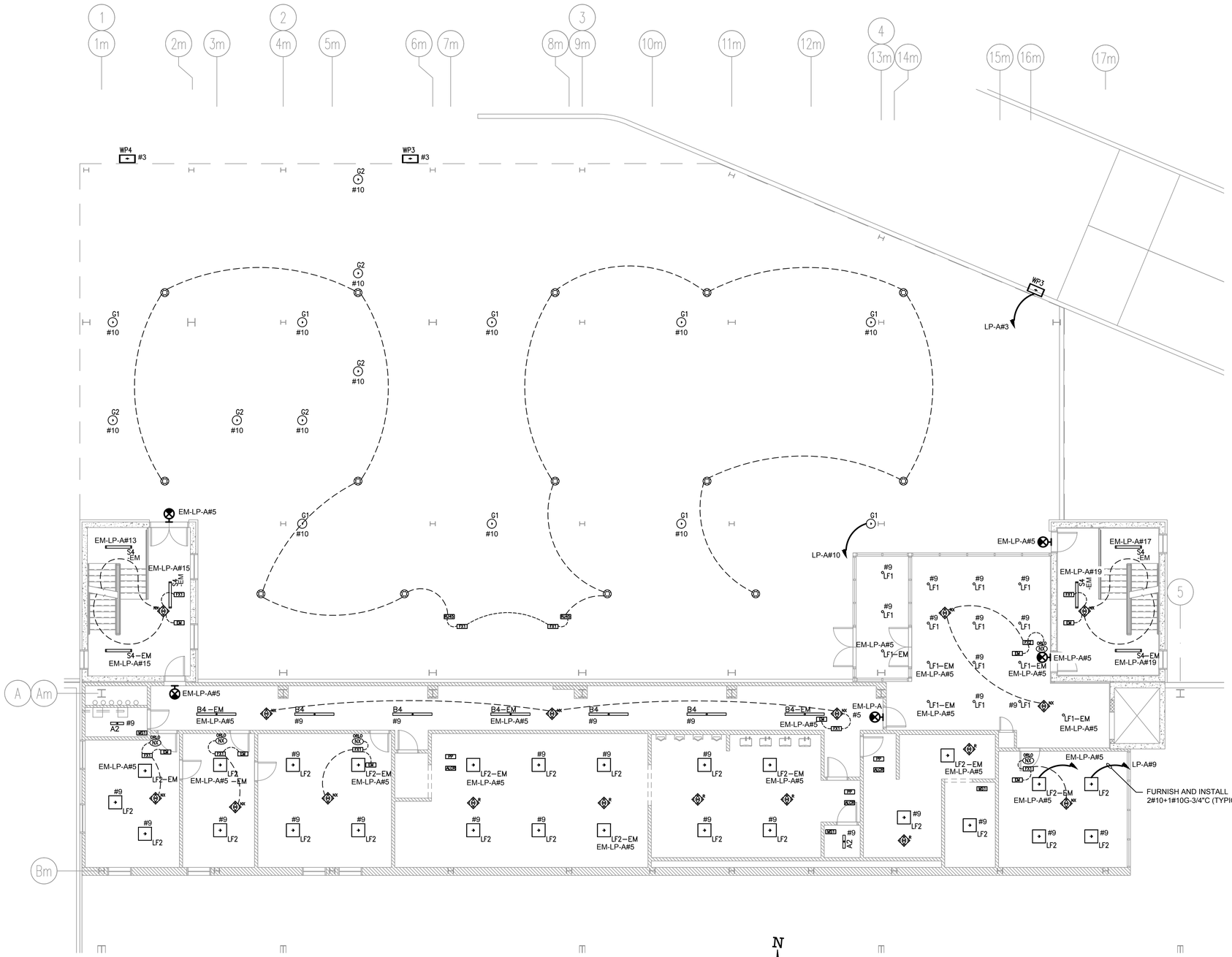
REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :
ELECTRICAL LIGHTING PLAN - PART WAREHOUSE & 1ST MEZZ.

DWG NUMBER :
E-103

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.



NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
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3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY, LOCATION, AND SPECIFICATIONS OF LIGHTING FIXTURES.
4. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LIGHTING CONTROL SYSTEM SPECIFICATIONS, DEVICE LAYOUT, AND QUANTITY OF CONTROL DEVICES.
5. REFER TO CONTRACT DRAWING E-607 FOR LIGHTING FIXTURE SCHEDULE
6. ALL LIGHTING FIXTURES LOCATED ON 2ND MEZZANINE AS SHOWN ON THIS DRAWING SHALL BE FED FROM PANEL 'LP-A' UNLESS OTHERWISE NOTED.

1 E-104 ELECTRICAL LIGHTING PLAN - 2ND MEZZANINE

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

0 8 16

SCALE IN FEET

N

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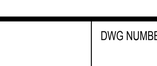
KEY PLAN



REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

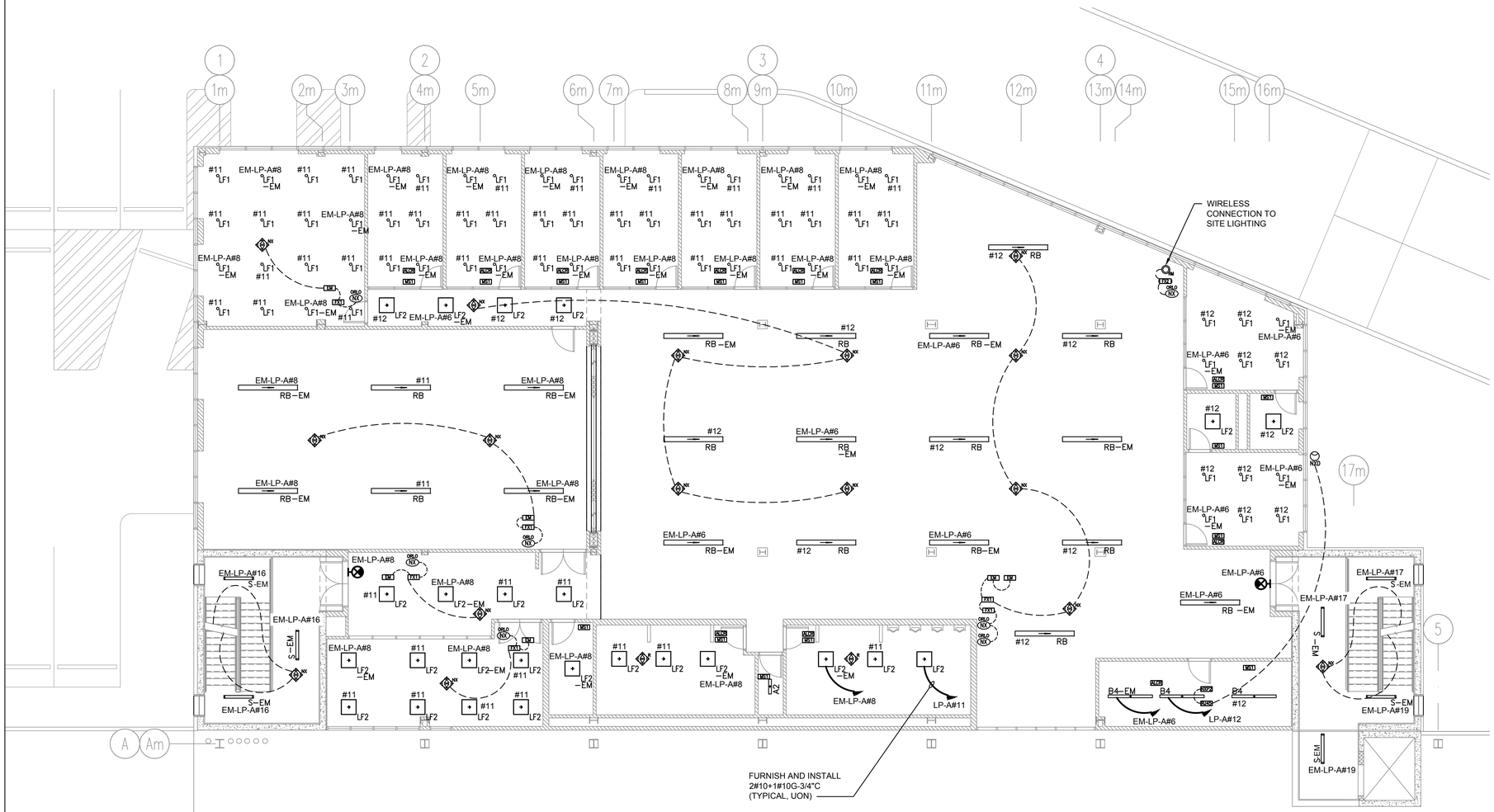
DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :
ELECTRICAL LIGHTING PLAN - 2ND MEZZANINE

DWG NUMBER :
E-104

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702 AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY, LOCATION, AND SPECIFICATIONS OF LIGHTING FIXTURES.
4. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LIGHTING CONTROL SYSTEM SPECIFICATIONS, DEVICE LAYOUT, AND QUANTITY OF CONTROL DEVICES.
5. REFER TO CONTRACT DRAWING E-607 FOR LIGHTING FIXTURE SCHEDULE
6. ALL LIGHTING FIXTURES LOCATED IN ADMIN OFFICE AS SHOWN ON THIS DRAWING SHALL BE FED FROM PANEL 'LP-A' UNLESS OTHERWISE NOTED.



1 E-105 ELECTRICAL LIGHTING PLAN - ADMIN OFFICE

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

0 8 16

SCALE IN FEET

N

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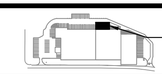

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DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

ELECTRICAL LIGHTING PLAN - ADMIN OFFICE

DWG NUMBER :

E-105

1 E-106 ELECTRICAL LIGHTING PLAN - PARKING DECK (WEST)

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

0 16 32

SCALE IN FEET

2 E-106 ELECTRICAL LIGHTING PLAN - PARKING DECK (EAST)

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

0 16 32

SCALE IN FEET

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702 AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
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5. REFER TO CONTRACT DRAWING E-607 FOR LIGHTING FIXTURE SCHEDULE
6. ALL LIGHTING FIXTURES LOCATED IN PARKING DECK AS SHOWN ON THIS DRAWING SHALL BE FED FROM PANEL 'LP-A' UNLESS OTHERWISE NOTED.

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CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

ELECTRICAL LIGHTING PLAN - PARKING DECK

DWG NUMBER :

E-106

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

NOTES:

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3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY, LOCATION, AND SPECIFICATIONS OF LIGHTING FIXTURES.
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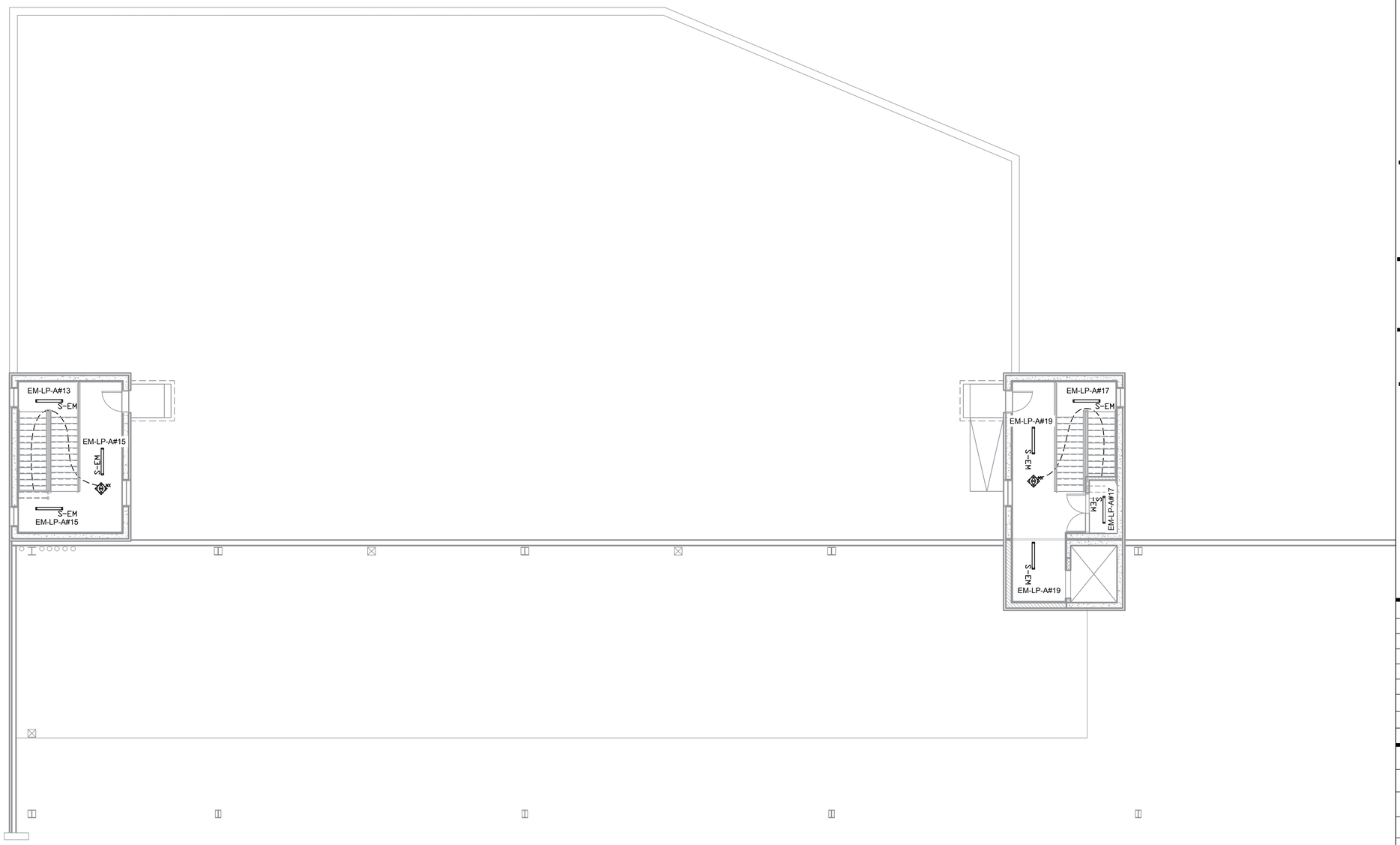
5. REFER TO CONTRACT DRAWING E-607 FOR LIGHTING FIXTURE SCHEDULE



1 / E-107 ELECTRICAL LIGHTING PLAN - ADMIN ROOF

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

0 8 16

SCALE IN FEET

N

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	ISSUED FOR BID	08/30/2022

DRAWN BY :

CHECKED BY :

APPROVED BY :

DATE :

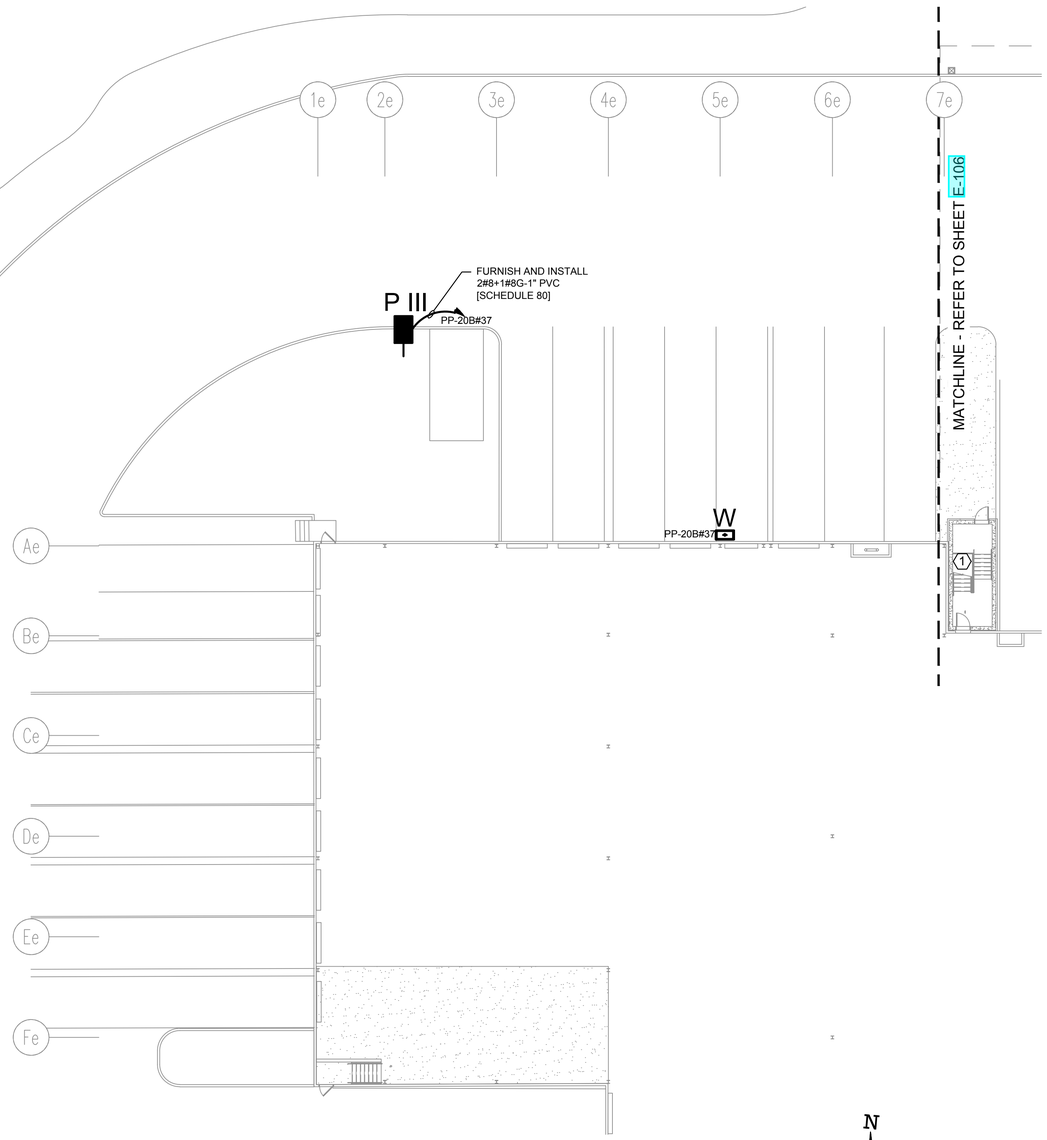
SCALE :

DRAWING TITLE :

ELECTRICAL LIGHTING PLAN - ADMIN ROOF

DWG NUMBER :

E-107



1 E-108 ELECTRICAL SITE LIGHTING PLAN - 20 DUNNIGAN (NORTH)

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

0 16 32

SCALE IN FEET

N

KEY NOTES:

1. REFER TO PART PLANS 2, 3 AND 4 ON THIS DRAWING FOR STAIR A ELECTRICAL LIGHTING PLANS.

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO CONTRACT DRAWING E-607 FOR LIGHTING FIXTURE SCHEDULE.
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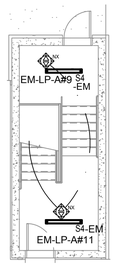


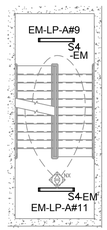
2 E-108 ELECTRICAL LIGHTING PLAN - STAIR A - WAREHOUSE LEVEL

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

0 8 16

SCALE IN FEET

N



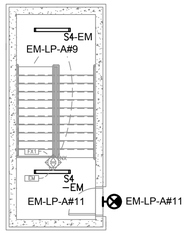
3 E-108 ELECTRICAL LIGHTING PLAN - STAIR A - 1ST MEZZANINE

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

0 8 16

SCALE IN FEET

N



4 E-108 ELECTRICAL LIGHTING PLAN - STAIR A - 2ND MEZZANINE

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

0 8 16

SCALE IN FEET

N

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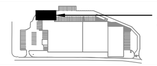

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DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

ELECTRICAL SITE LIGHTING PLAN - 20 DUNNIGAN (NORTH)

DWG NUMBER :

E-108

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
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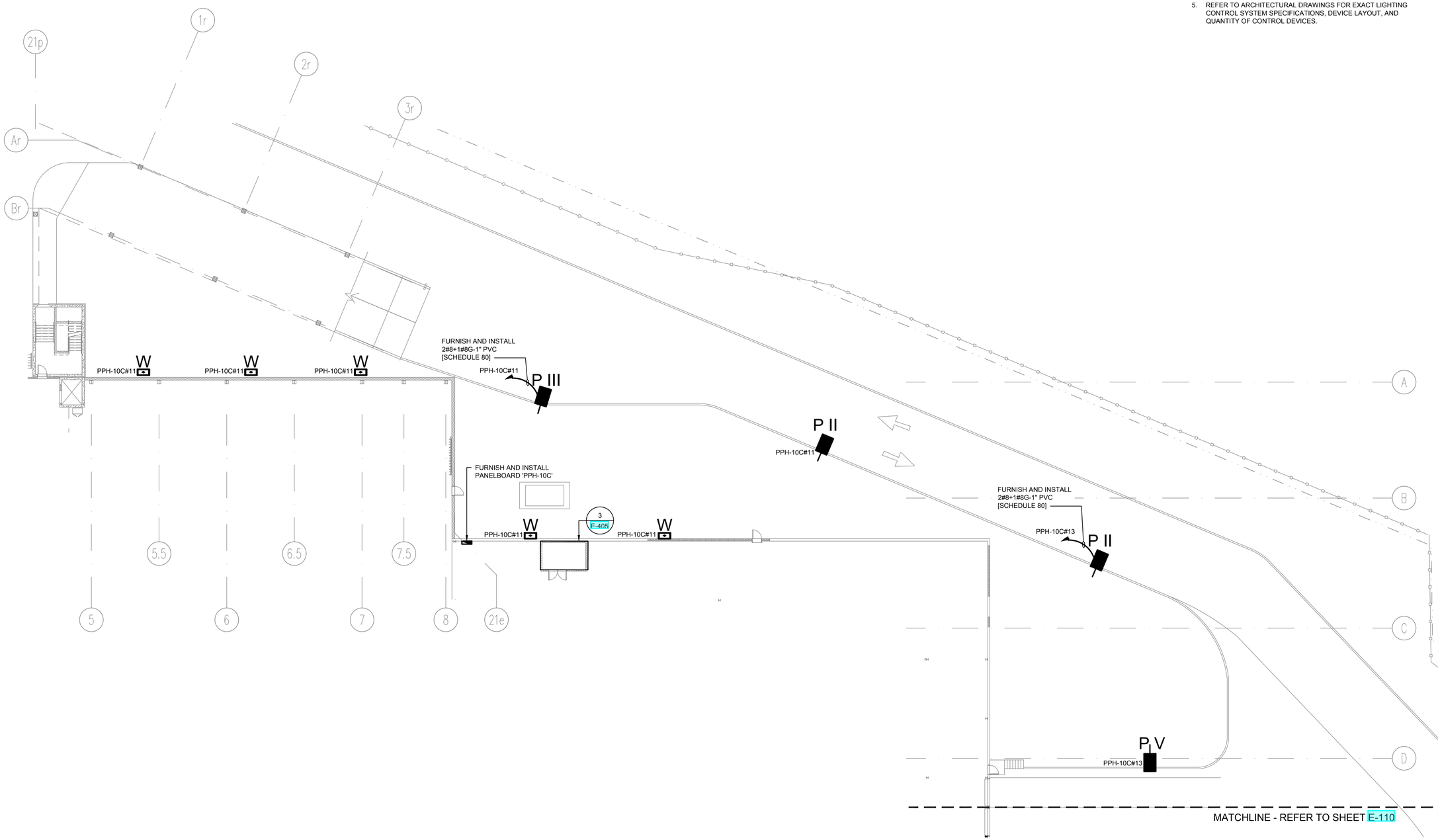

1 E-109 ELECTRICAL SITE LIGHTING PLAN - 10 DUNNIGAN (NORTH)

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

0 16 32

SCALE IN FEET

N

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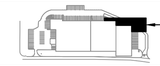
KEY PLAN



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CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

ELECTRICAL SITE LIGHTING PLAN - 10 DUNNIGAN (NORTH)

DWG NUMBER :

E-109

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
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5. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LIGHTING CONTROL SYSTEM SPECIFICATIONS, DEVICE LAYOUT, AND QUANTITY OF CONTROL DEVICES.

MATCHLINE - REFER TO SHEET E-109

W PPH-10A#31

W PPH-10A#31

W PPH-10A#31

W PPH-10A#31

W PPH-10A#31

P V PPH-10A#31

FURNISH AND INSTALL 2#8+1#8G-1" PVC [SCHEDULE 80]

PPH-10A#29 P IV

PPH-10A#29 P IV

FURNISH AND INSTALL 2#8+1#8G-1" PVC [SCHEDULE 80]

E F G H I

5 E-405

4 E-405

PPH-10A#31 W PPH-10A#31 W

6 6.5 7 7.5 8 21e

N

1 E-110 ELECTRICAL SITE LIGHTING PLAN - 10 DUNNIGAN (SOUTH)

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

0 16 32

SCALE IN FEET

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KEY PLAN

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CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

ELECTRICAL SITE LIGHTING PLAN - 10 DUNNIGAN (SOUTH)

DWG NUMBER :

E-110

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
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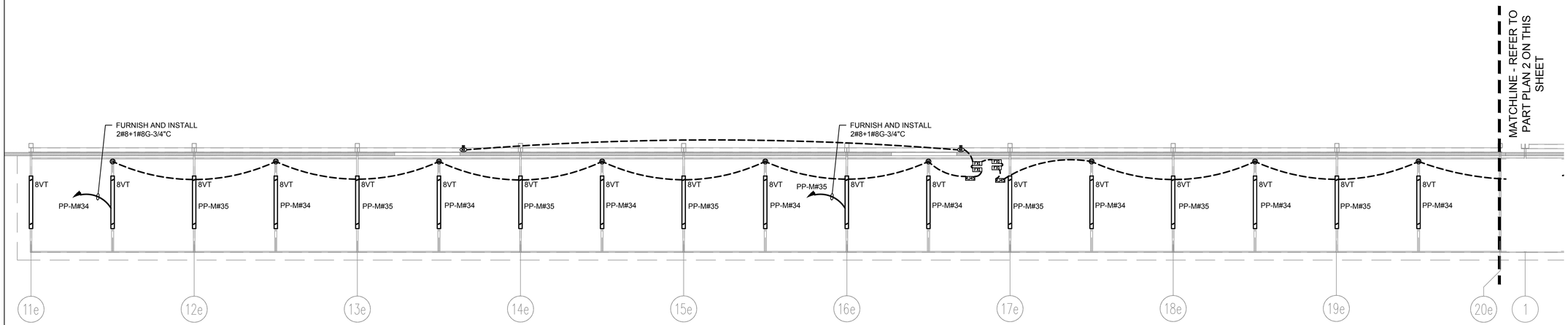
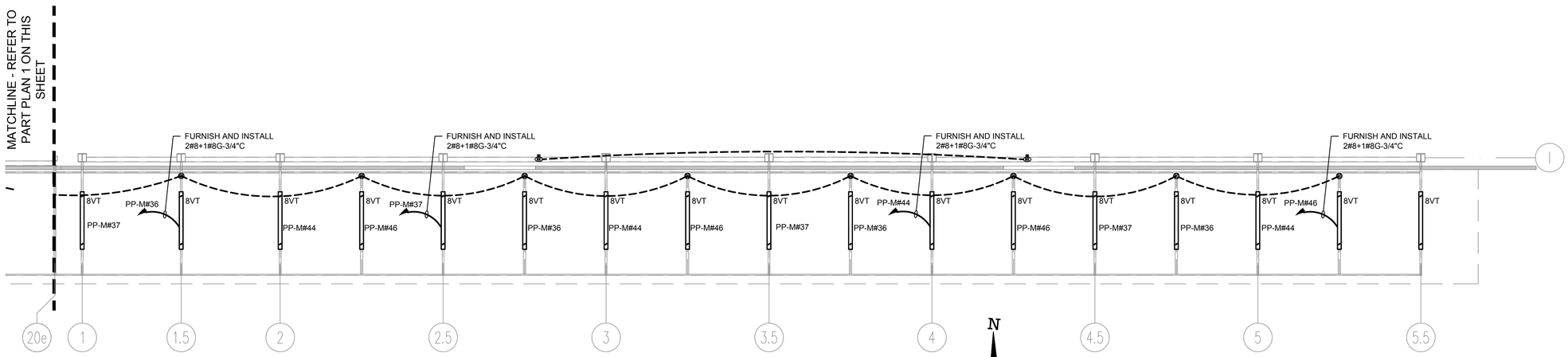


1 E-111 **ELECTRICAL LIGHTING PLAN - PART CANOPY**
SCALE: 1/8" = 1'-0"
0 8 16
SCALE IN FEET

N



2 E-111 **ELECTRICAL LIGHTING PLAN - PART CANOPY**
SCALE: 1/8" = 1'-0"

N

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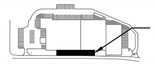

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DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :
ELECTRICAL LIGHTING PLAN - CANOPY

DWG NUMBER :
E-111

AS/RS SYSTEM LEGEND

SYMBOL	DESCRIPTION
Ⓐ	SRM
Ⓖ	VRC
Ⓑ	MCP
Ⓕ	CONTROL PANEL
Ⓗ	MAINTENANCE RECEPTACLES
①	DATA CONNECTION

NOTE: REFER TO AS/RS MANUFACTURER DRAWINGS FOR EXACT POWER REQUIREMENTS AND LOCATIONS OF AS/RS MACHINES AND EQUIPMENT

NOTES:

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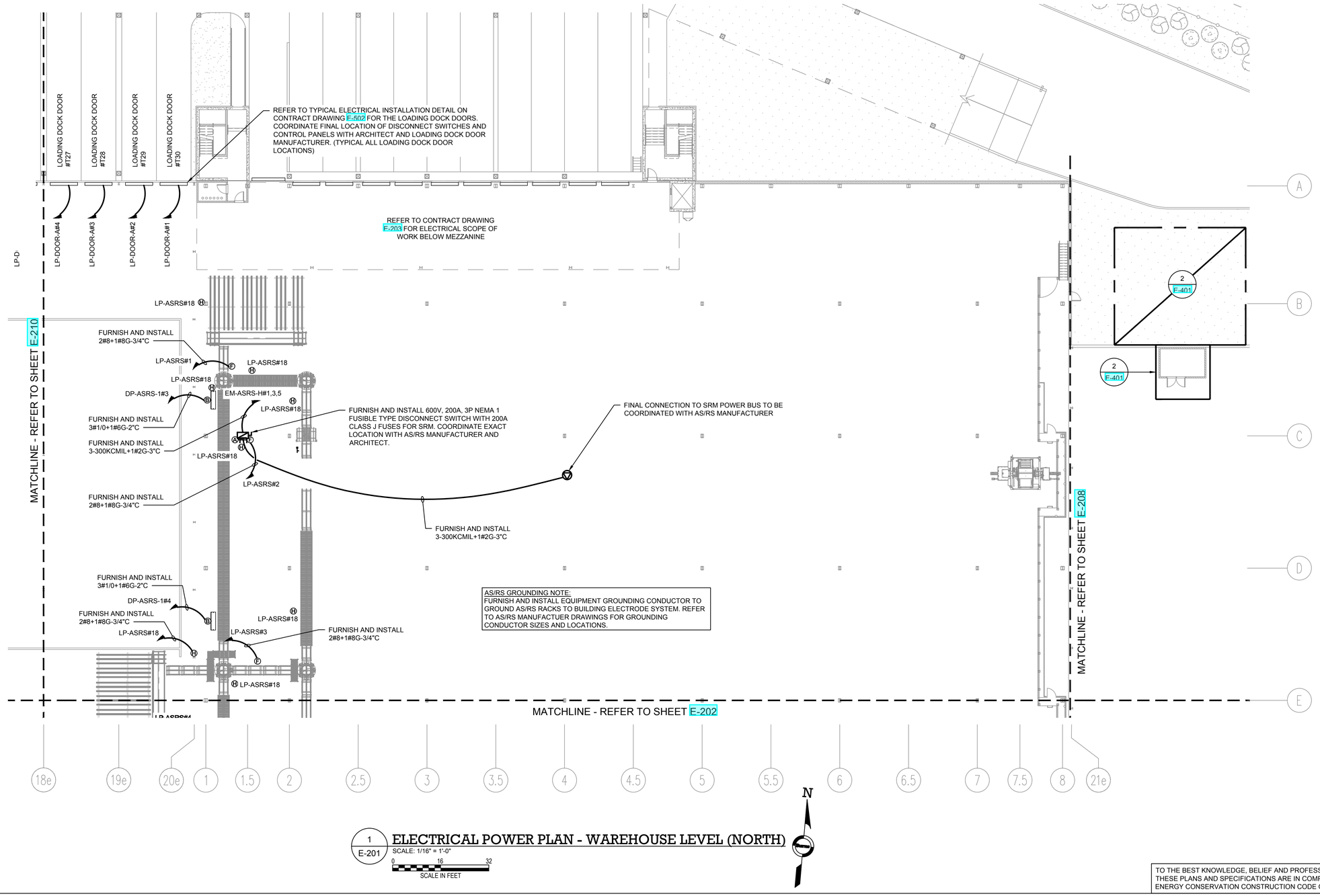
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY AND LOCATIONS OF RECEPTACLES AND DATA OUTLETS.
4. REFER TO AS/RS MANUFACTURER DRAWINGS FOR EXACT REQUIREMENTS OF AS/RS EQUIPMENT.



1 / E-201 ELECTRICAL POWER PLAN - WAREHOUSE LEVEL (NORTH)

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

0 16 32

SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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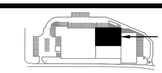

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

ELECTRICAL POWER PLAN - WAREHOUSE LEVEL (NORTH)

DWG NUMBER :

E-201

AS/RS SYSTEM LEGEND

SYMBOL	DESCRIPTION
Ⓐ	SRM
Ⓖ	VRC
Ⓑ	MCP
Ⓕ	CONTROL PANEL
Ⓗ	MAINTENANCE RECEPTACLES
①	DATA CONNECTION

NOTE: REFER TO AS/RS MANUFACTURER DRAWINGS FOR EXACT POWER REQUIREMENTS AND LOCATIONS OF AS/RS MACHINES AND EQUIPMENT

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
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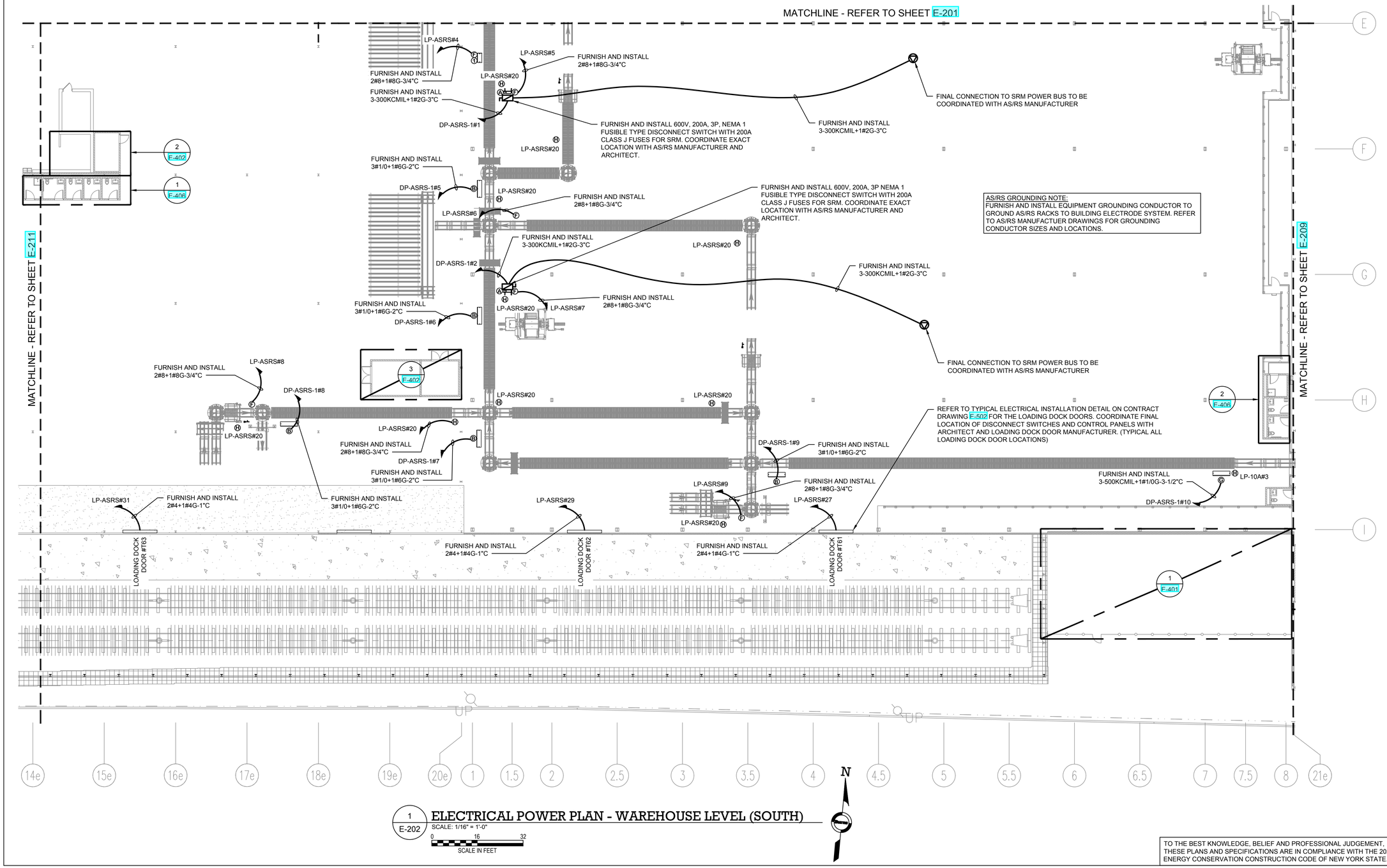
4. REFER TO AS/RS MANUFACTURER DRAWINGS FOR EXACT REQUIREMENTS OF AS/RS EQUIPMENT.



1 E-202 ELECTRICAL POWER PLAN - WAREHOUSE LEVEL (SOUTH)

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

0 16 32

SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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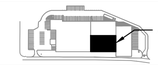
KEY PLAN



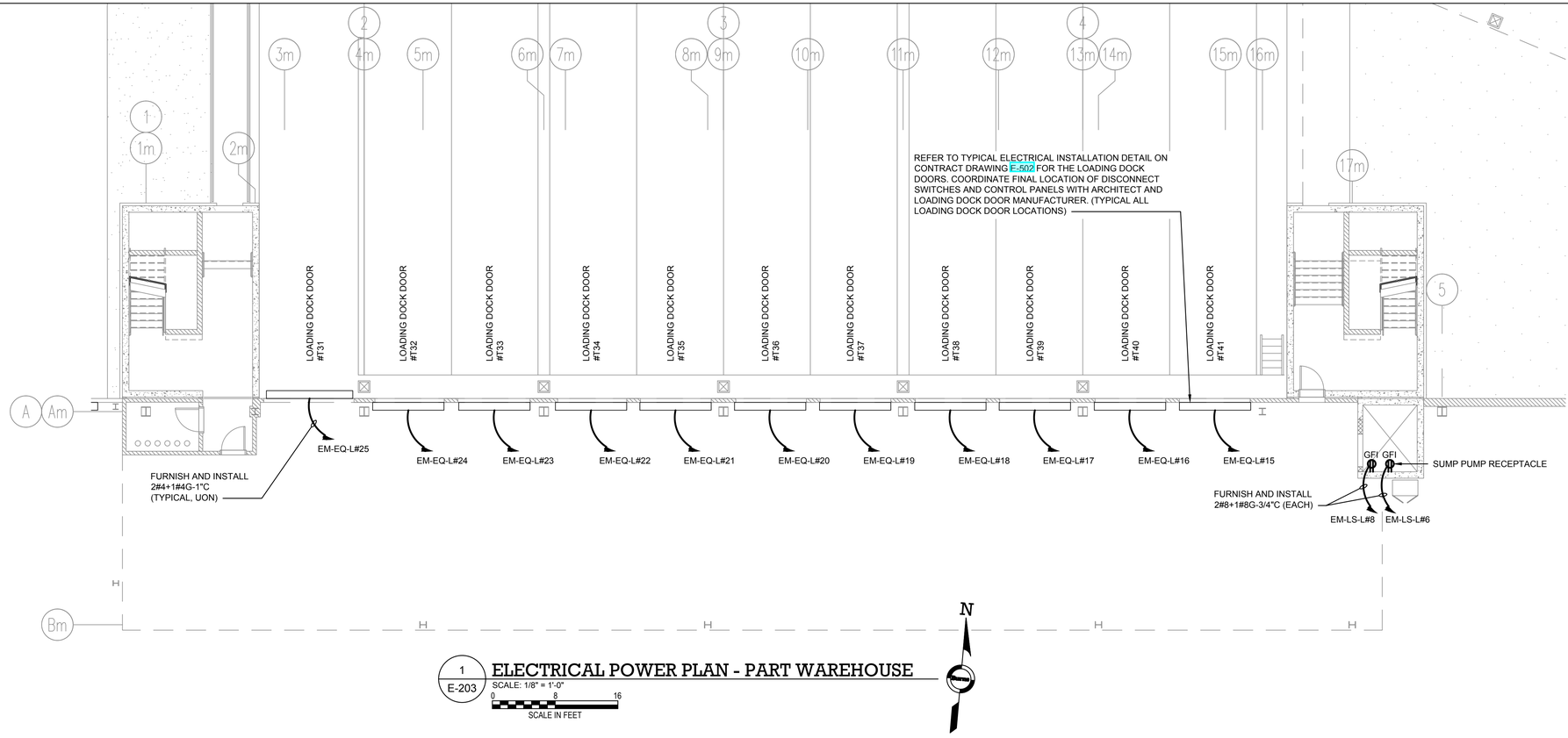
AREA OF WORK

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :
ELECTRICAL POWER PLAN - WAREHOUSE LEVEL (SOUTH)

DWG NUMBER :
E-202

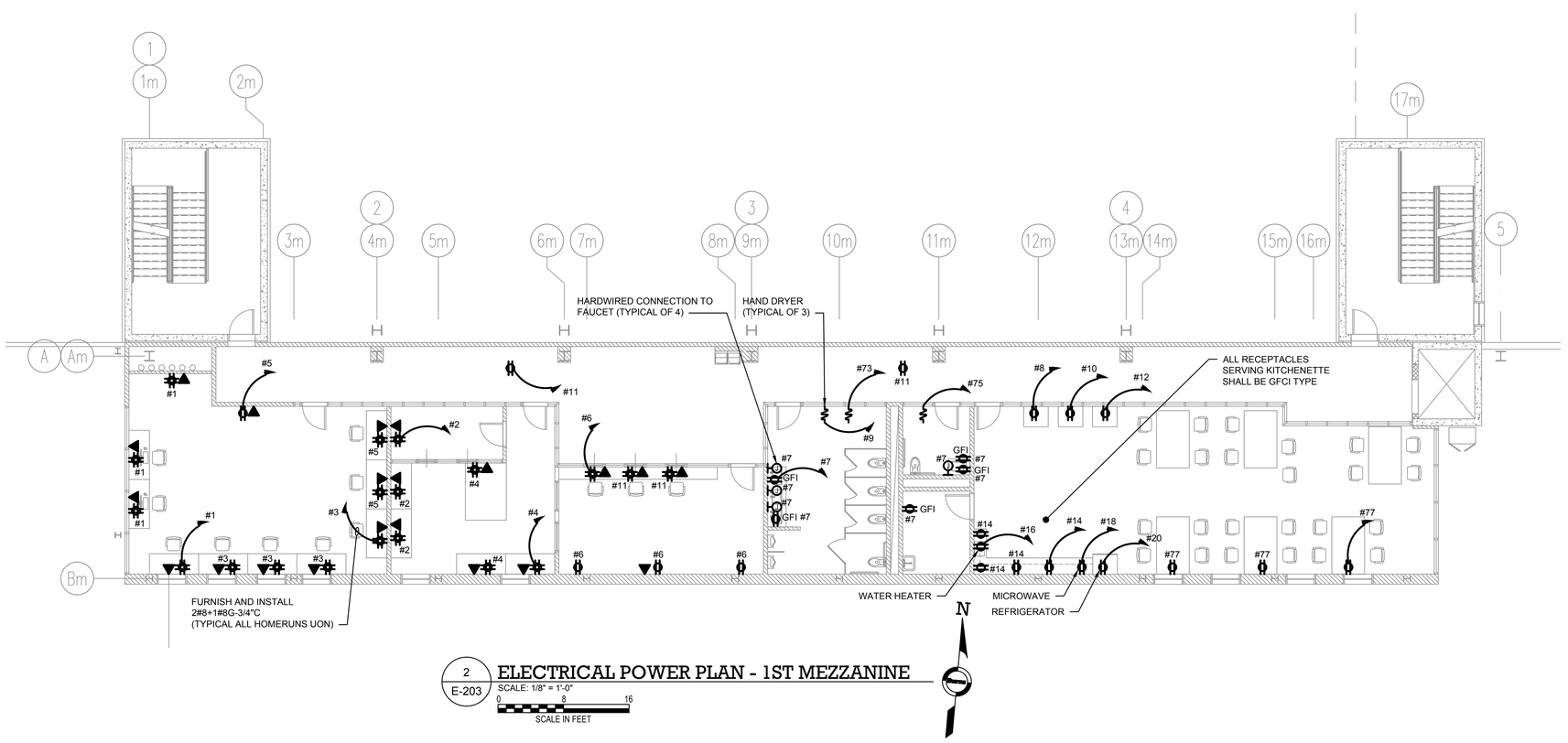


1 E-203 ELECTRICAL POWER PLAN - PART WAREHOUSE

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

0 8 16

SCALE IN FEET



2 E-203 ELECTRICAL POWER PLAN - 1ST MEZZANINE

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

0 8 16

SCALE IN FEET

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY AND LOCATIONS OF RECEPTACLES AND DATA OUTLETS.
4. ALL RECEPTACLES AND EQUIPMENT LOCATED ON 1ST MEZZANINE AS SHOWN ON THIS DRAWING SHALL BE FED FROM PANEL 'PP-A' UNLESS OTHERWISE NOTED.

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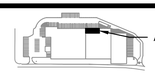
KEY PLAN



REV	DESCRIPTION	DATE
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	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

ELECTRICAL POWER PLAN - PART WAREHOUSE & 1ST MEZZ.

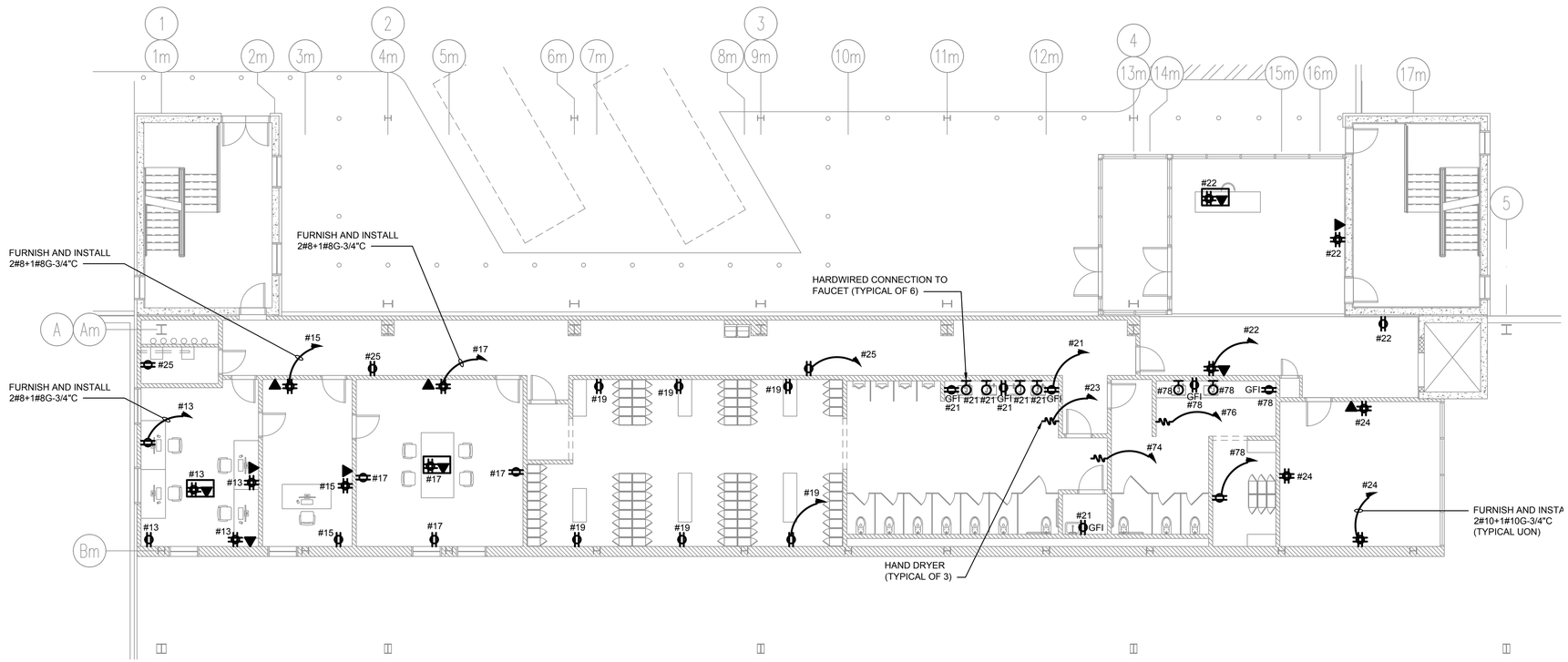
DWG NUMBER :

E-203

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY AND LOCATIONS OF RECEPTACLES AND DATA OUTLETS.
4. ALL RECEPTACLES AND EQUIPMENT SHOWN ON THIS DRAWING SHALL BE FED FROM PANEL 'PP-A' UNLESS OTHERWISE NOTED.



1 / E-204 ELECTRICAL POWER PLAN - 2ND MEZZANINE

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

0 8 16

SCALE IN FEET

N

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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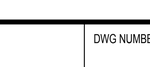
KEY PLAN



AREA OF WORK

REV	DESCRIPTION	DATE
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	ISSUED FOR BID	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

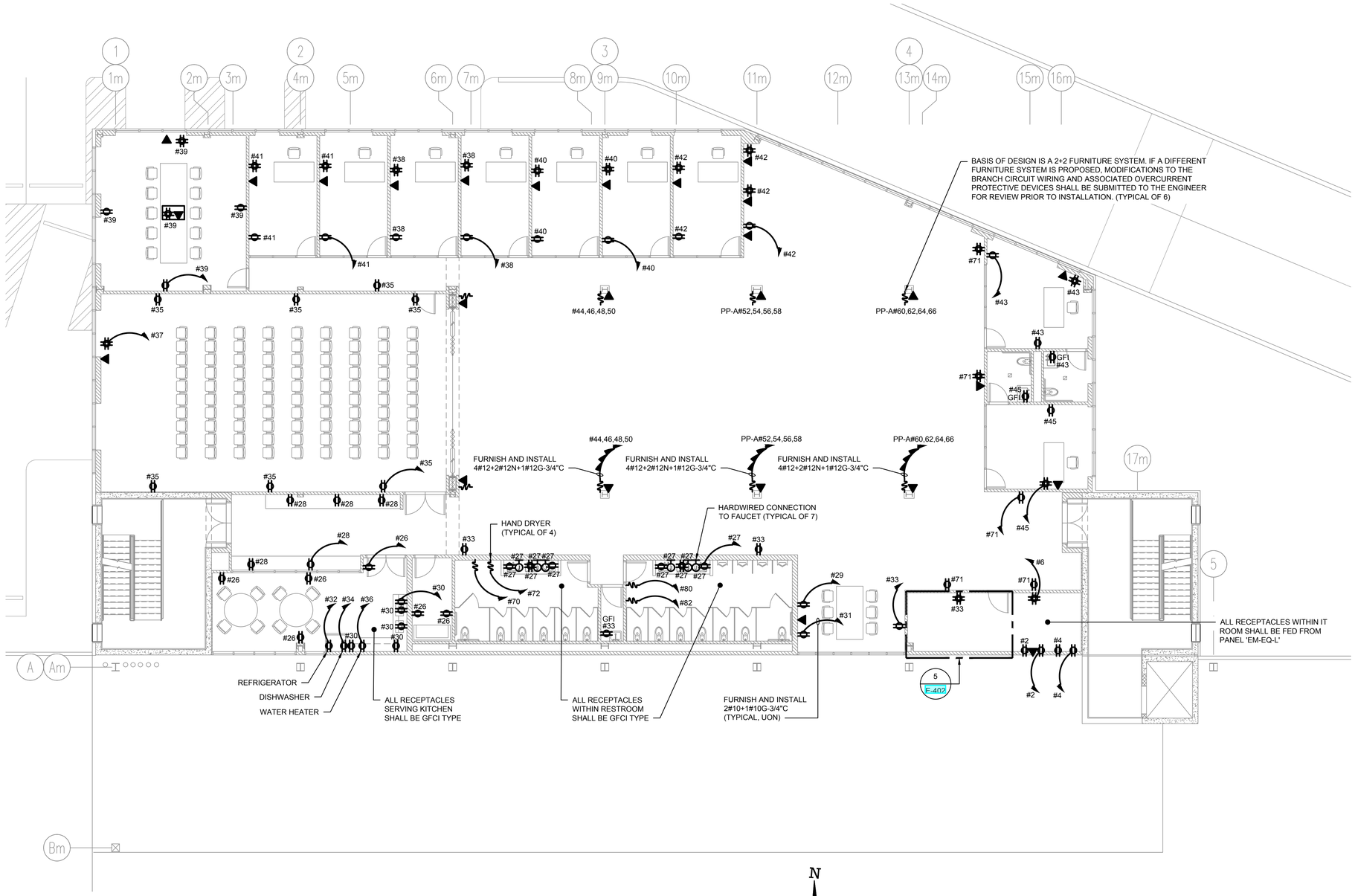
ELECTRICAL POWER PLAN - 2ND MEZZANINE

DWG NUMBER :

E-204

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS AND ELECTRICAL REQUIREMENTS OF EQUIPMENT.
3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY AND LOCATIONS OF RECEPTACLES AND DATA OUTLETS.
4. ALL RECEPTACLES AND EQUIPMENT SHOWN ON THIS DRAWING SHALL BE FED FROM PANEL 'PP-A' UNLESS OTHERWISE NOTED.



1 E-205 **ELECTRICAL POWER PLAN - ADMIN OFFICE**

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

0 8 16

SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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KEY PLAN — AREA OF WORK

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

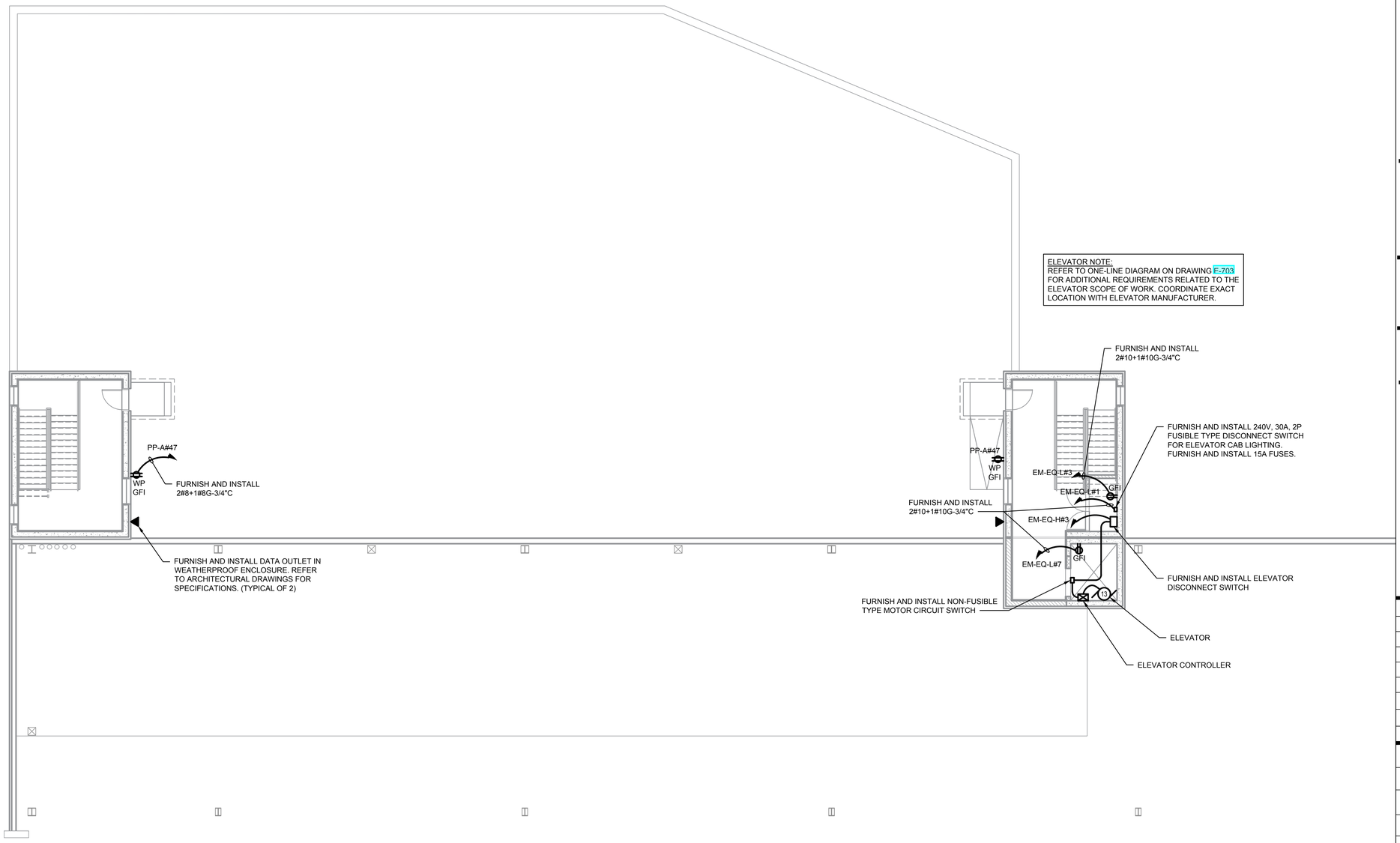
DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :
ELECTRICAL POWER PLAN - ADMIN OFFICE

DWG NUMBER :
E-205

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY AND LOCATIONS OF RECEPTACLES AND DATA OUTLETS.



1 / E-207 ELECTRICAL POWER PLAN - ADMIN ROOF

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

0 16 32

SCALE IN FEET

N

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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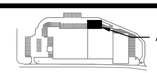
SUFFERN, NEW YORK

KEY PLAN



REV	DESCRIPTION	DATE
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	ISSUED FOR BID	08/30/2022

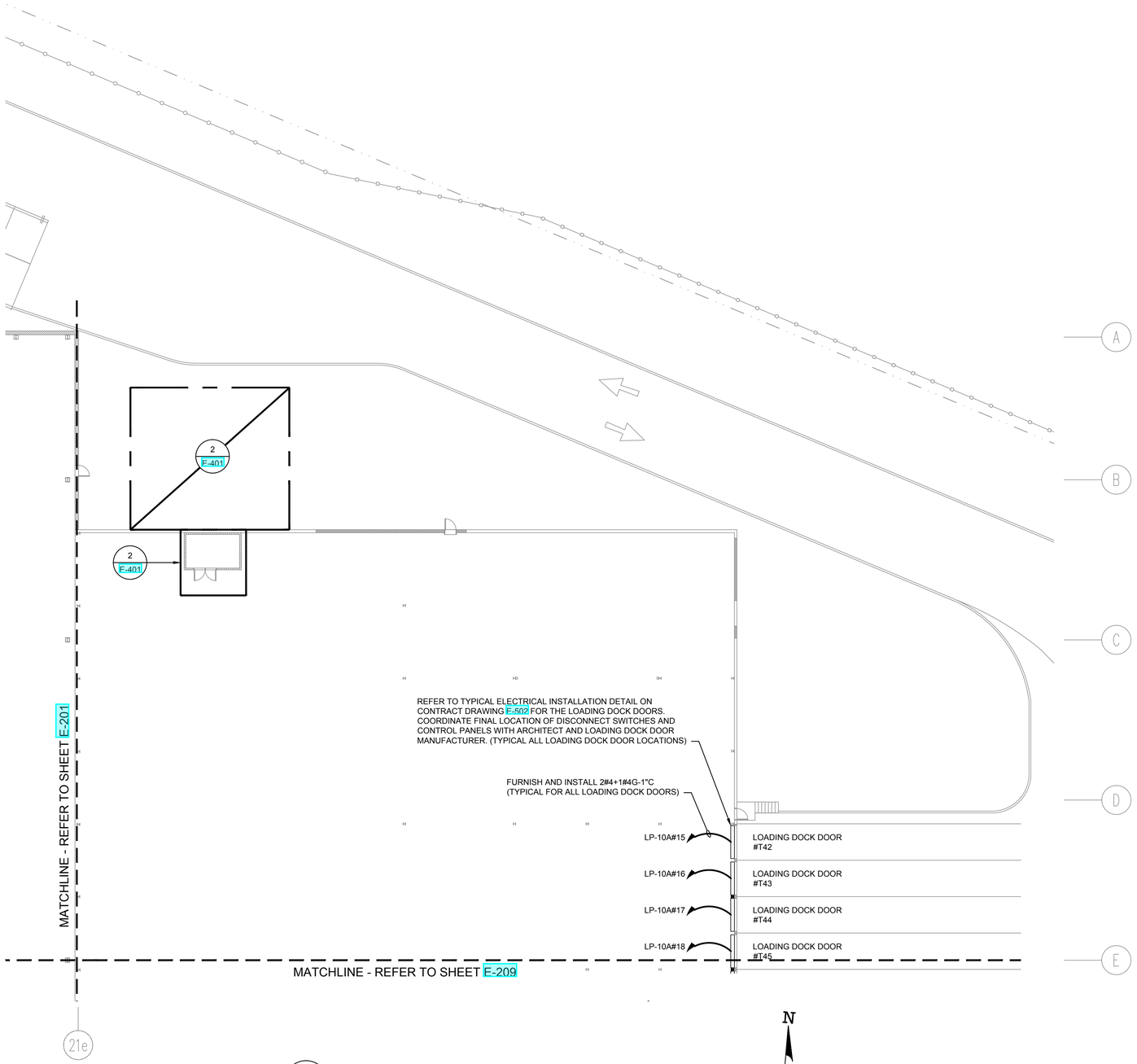
DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :
ELECTRICAL POWER PLAN - ADMIN ROOF

DWG NUMBER :
E-207

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY AND LOCATIONS OF RECEPTACLES AND DATA OUTLETS.
4. REFER TO AS/RS MANUFACTURER DRAWINGS FOR EXACT REQUIREMENTS OF AS/RS EQUIPMENT.



1 / E-208 ELECTRICAL POWER PLAN - 10 DUNNIGAN (NORTH)

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

0 16 32

SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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SUFFERN, NEW YORK

KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

ELECTRICAL POWER PLAN - 10 DUNNIGAN (NORTH)

DWG NUMBER :

E-208

AS/RS SYSTEM LEGEND

SYMBOL	DESCRIPTION
(A)	SRM
(G)	VRC
(B)	MCP
(F)	CONTROL PANEL
(H)	MAINTENANCE RECEPTACLES
(1)	DATA CONNECTION

NOTE: REFER TO AS/RS MANUFACTURER DRAWINGS FOR EXACT POWER REQUIREMENTS AND LOCATIONS OF AS/RS MACHINES AND EQUIPMENT

NOTES:

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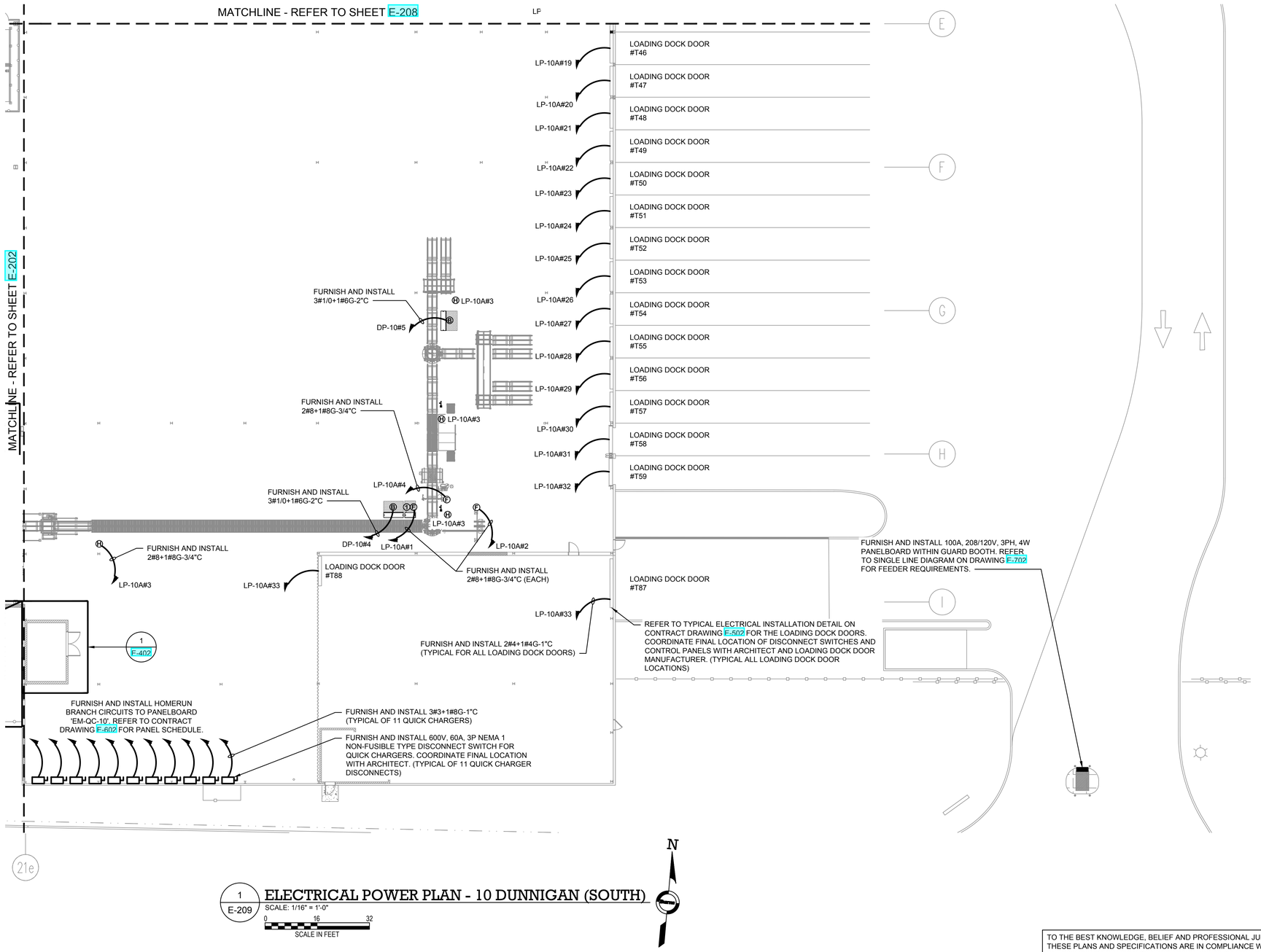

1 / E-209 ELECTRICAL POWER PLAN - 10 DUNNIGAN (SOUTH)

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

0 16 32

SCALE IN FEET

N

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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SUFFERN, NEW YORK

KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
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DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

ELECTRICAL POWER PLAN - 10 DUNNIGAN (SOUTH)

DWG NUMBER :

E-209

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
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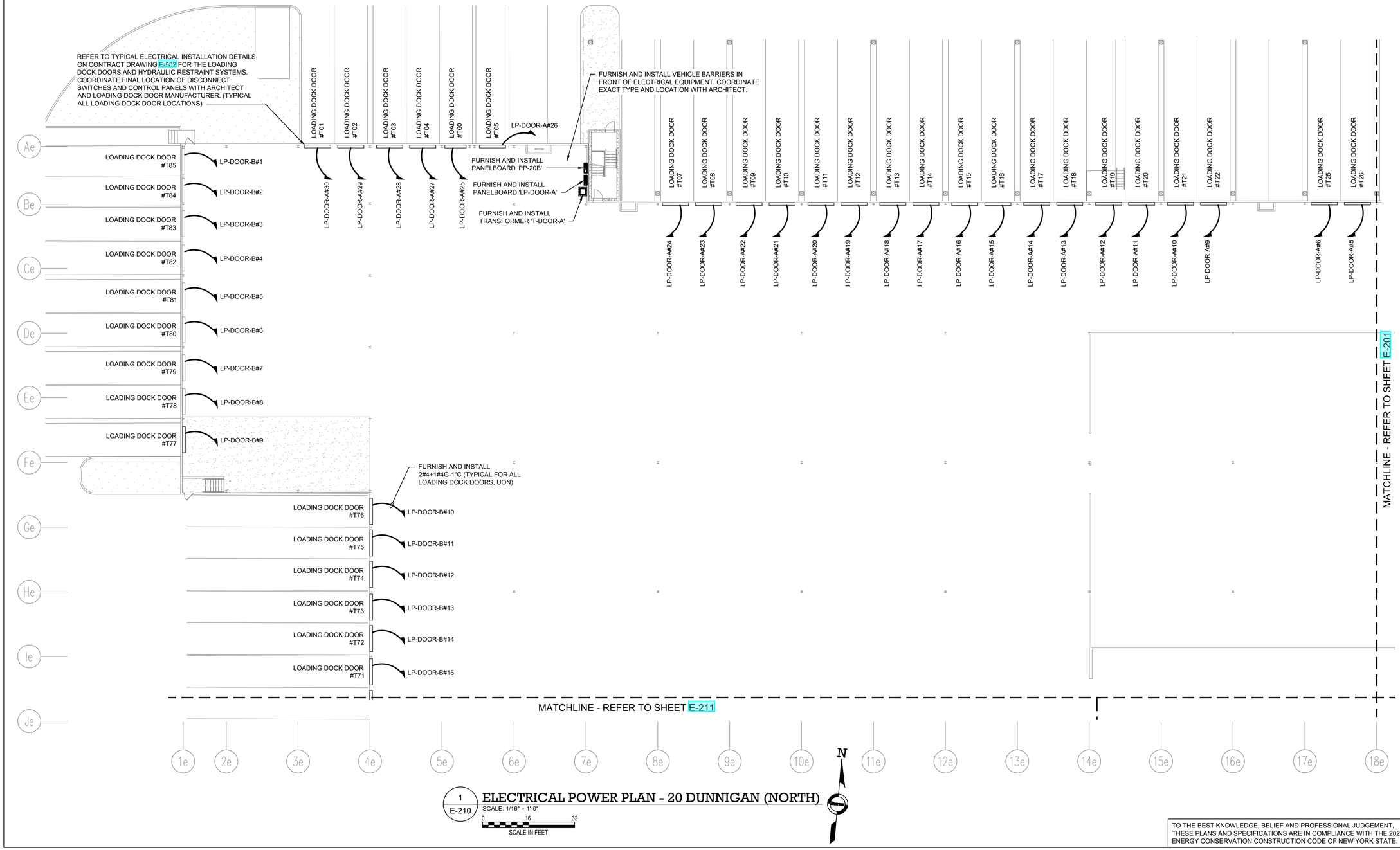

1 / E-210 ELECTRICAL POWER PLAN - 20 DUNNIGAN (NORTH)

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

0 16 32

SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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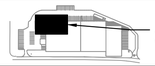
20 DUNNIGAN DRIVE
SUFFERN, NEW YORK

KEY PLAN



REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

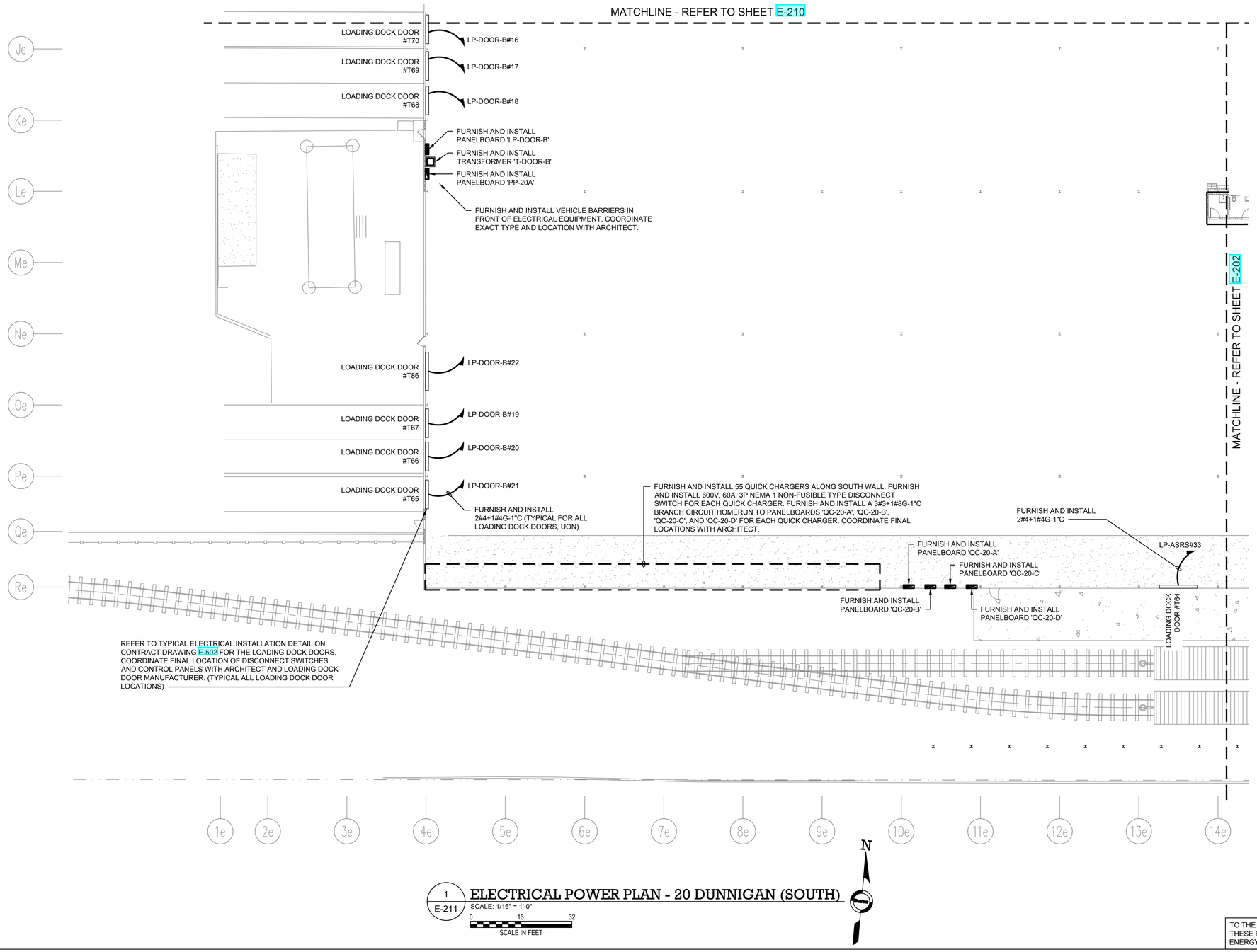
DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :
ELECTRICAL POWER PLAN - 20 DUNNIGAN (NORTH)

DWG NUMBER :
E-210

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY AND LOCATIONS OF RECEPTACLES AND DATA OUTLETS.
4. REFER TO AS/RS MANUFACTURER DRAWINGS FOR EXACT REQUIREMENTS OF AS/RS EQUIPMENT.



1 / E-211 ELECTRICAL POWER PLAN - 20 DUNNIGAN (SOUTH)

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

0 16 32

SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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SUFFERN, NEW YORK

KEY PLAN

REV	DESCRIPTION	DATE
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DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

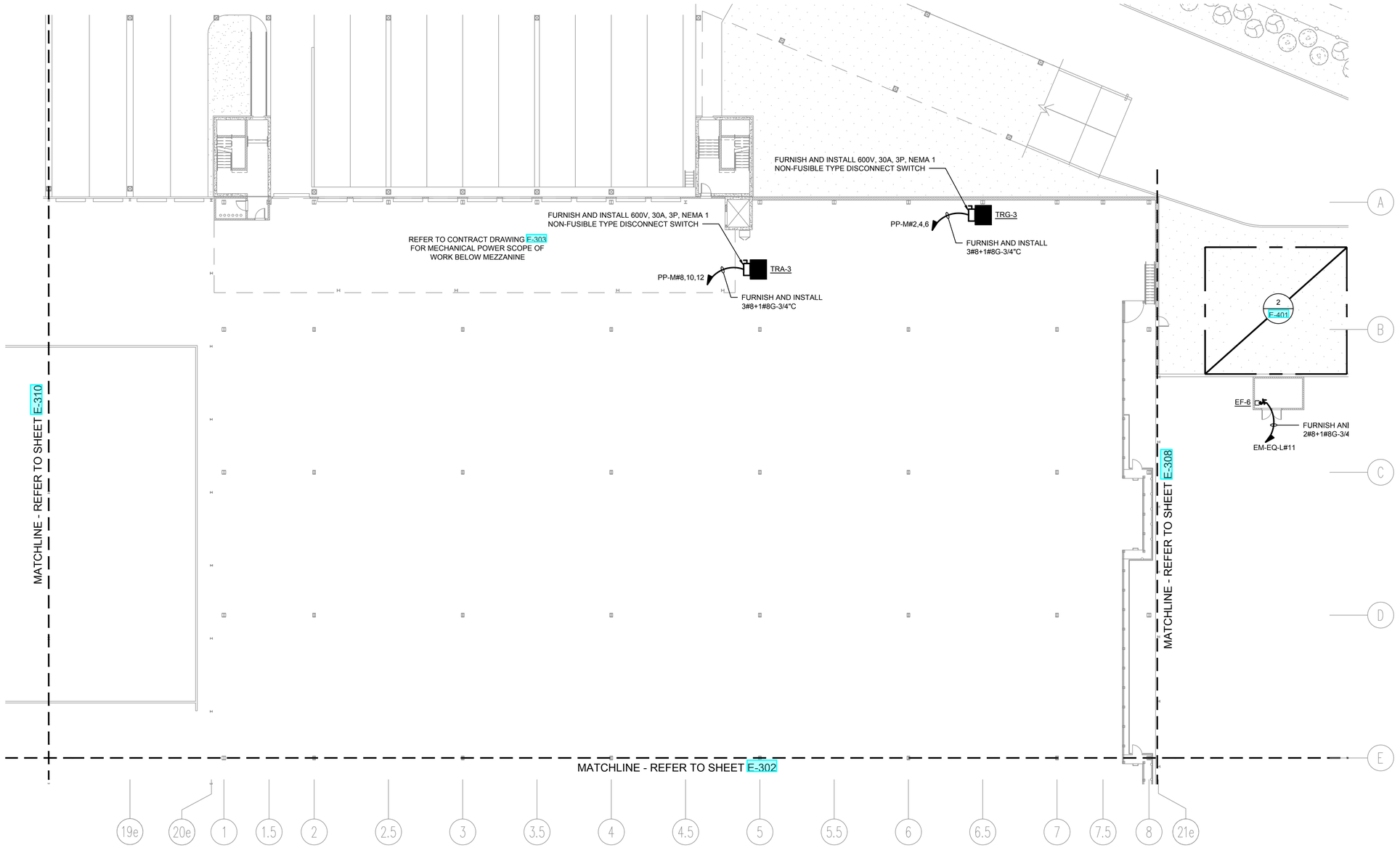
ELECTRICAL POWER PLAN - 20 DUNNIGAN (SOUTH)

DWG NUMBER :

E-211

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO MECHANICAL CONTRACT DRAWINGS FOR EXACT LOCATION AND REQUIREMENTS OF MECHANICAL EQUIPMENT.



1 / E-301 MECHANICAL POWER PLAN - WAREHOUSE LEVEL (NORTH)

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

0 16 32

SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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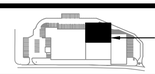
KEY PLAN



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DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

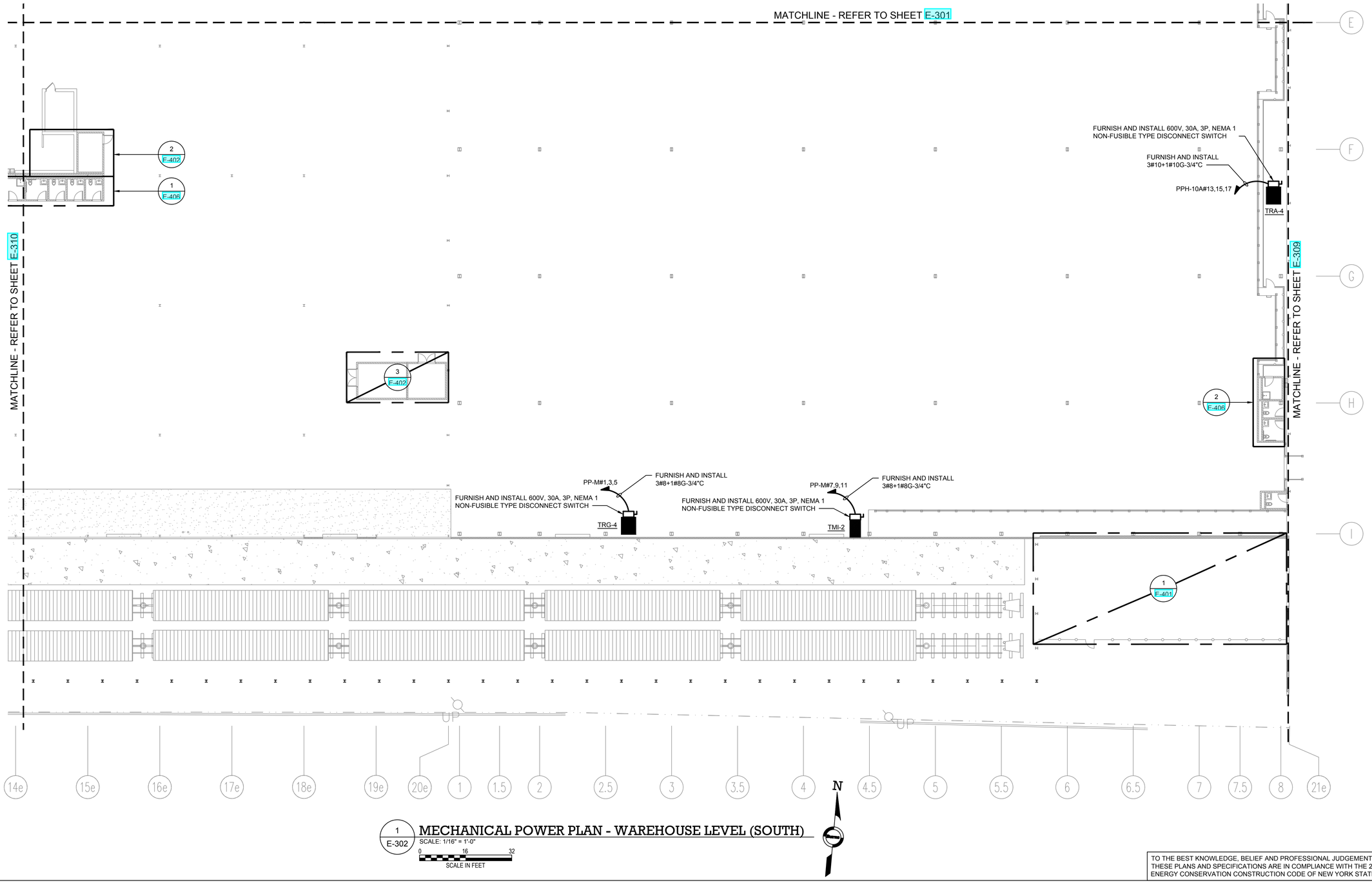
MECHANICAL POWER PLAN - WAREHOUSE LEVEL (NORTH)

DWG NUMBER :

E-301

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO MECHANICAL CONTRACT DRAWINGS FOR EXACT LOCATION AND REQUIREMENTS OF MECHANICAL EQUIPMENT.



1 E-302 MECHANICAL POWER PLAN - WAREHOUSE LEVEL (SOUTH)

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

0 16 32

SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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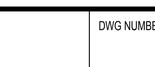
KEY PLAN



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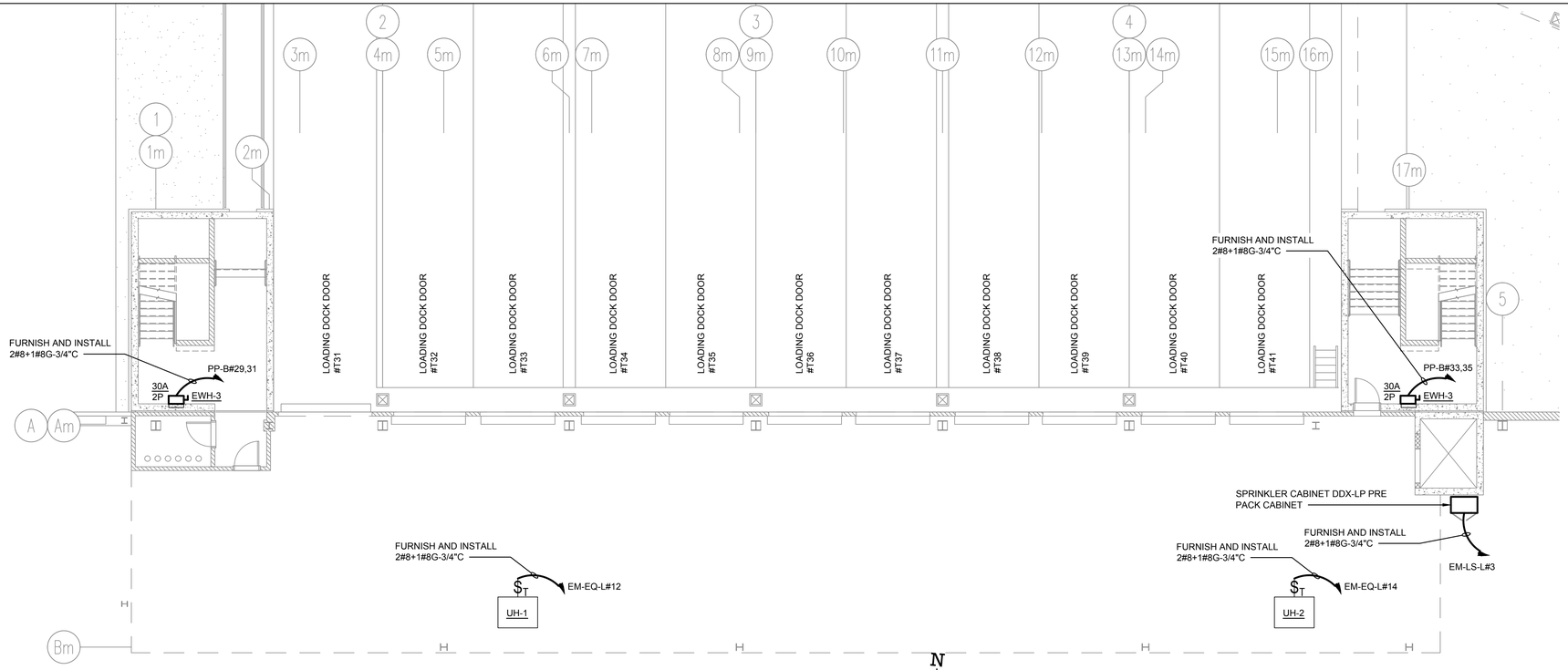
DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

MECHANICAL POWER PLAN - WAREHOUSE LEVEL (SOUTH)

DWG NUMBER :

E-302

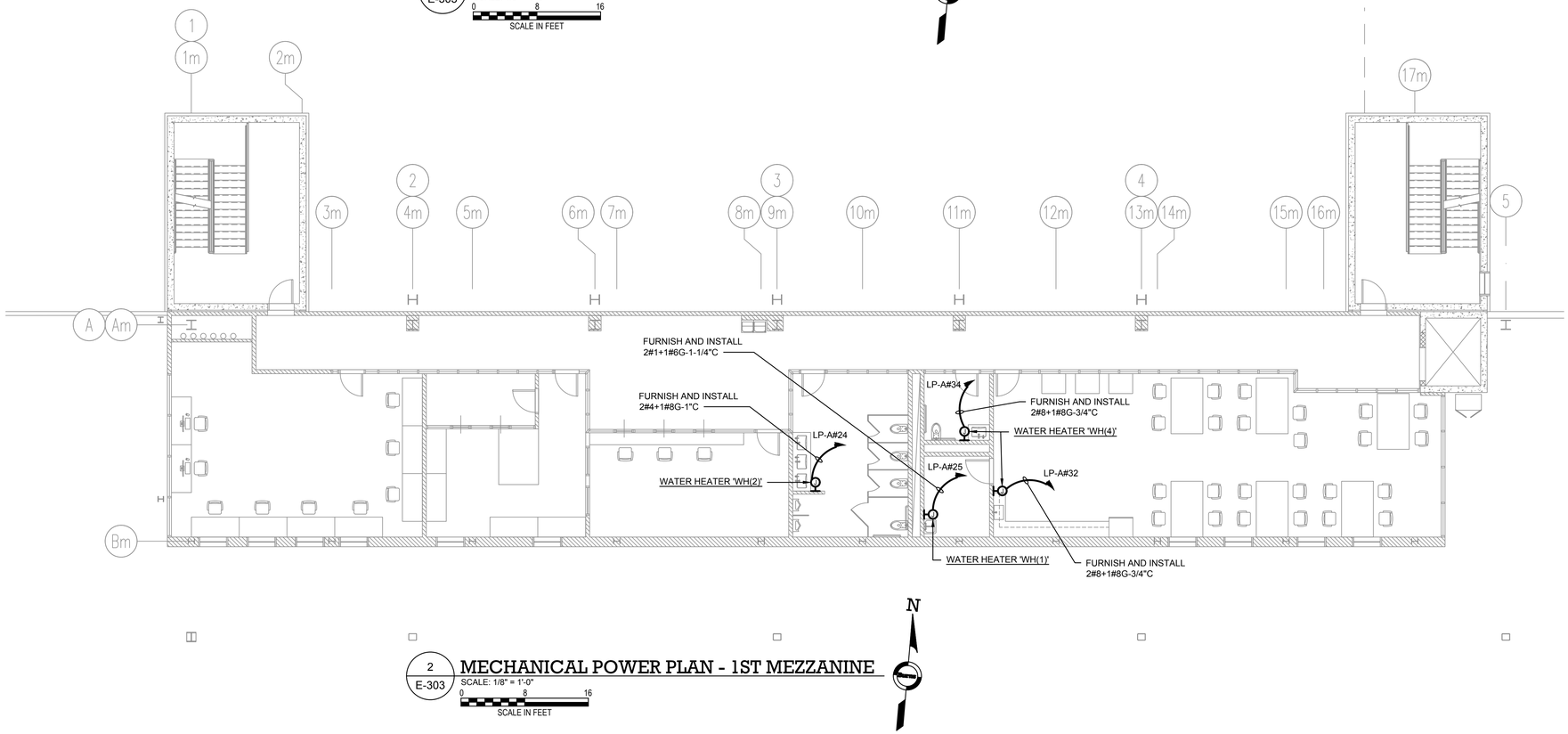


1 E-303 MECHANICAL POWER PLAN - PART WAREHOUSE

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

0 8 16

SCALE IN FEET



2 E-303 MECHANICAL POWER PLAN - 1ST MEZZANINE

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

0 8 16

SCALE IN FEET

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO MECHANICAL CONTRACT DRAWINGS FOR EXACT LOCATION AND REQUIREMENTS OF MECHANICAL EQUIPMENT.

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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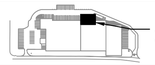
KEY PLAN



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	ISSUED FOR BID	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

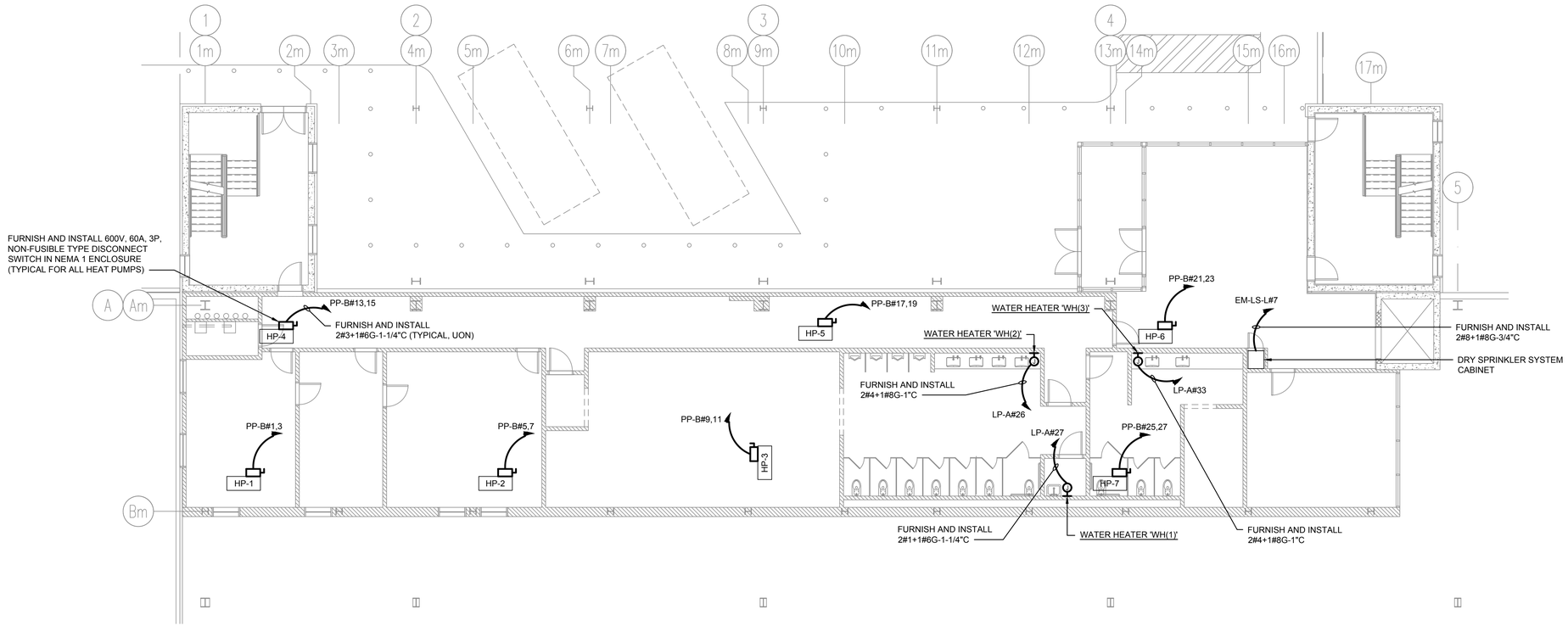
MECHANICAL POWER PLAN - PART WAREHOUSE & 1ST MEZZ.

DWG NUMBER :

E-303

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. ALL MECHANICAL UNITS SHOWN ON THIS PLAN ON LOCATED ON THE ROOF OF THE 2ND FLOOR MEZZANINE. REFER TO MECHANICAL CONTRACT DRAWINGS FOR EXACT LOCATION AND REQUIREMENTS OF MECHANICAL EQUIPMENT.



1 / E-304 MECHANICAL POWER PLAN - 2ND MEZZANINE

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

0 8 16

SCALE IN FEET

N

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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Tel 212-687-8282

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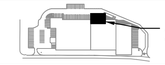
SUFFERN, NEW YORK

KEY PLAN



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	ISSUED FOR BID	10/15/2021
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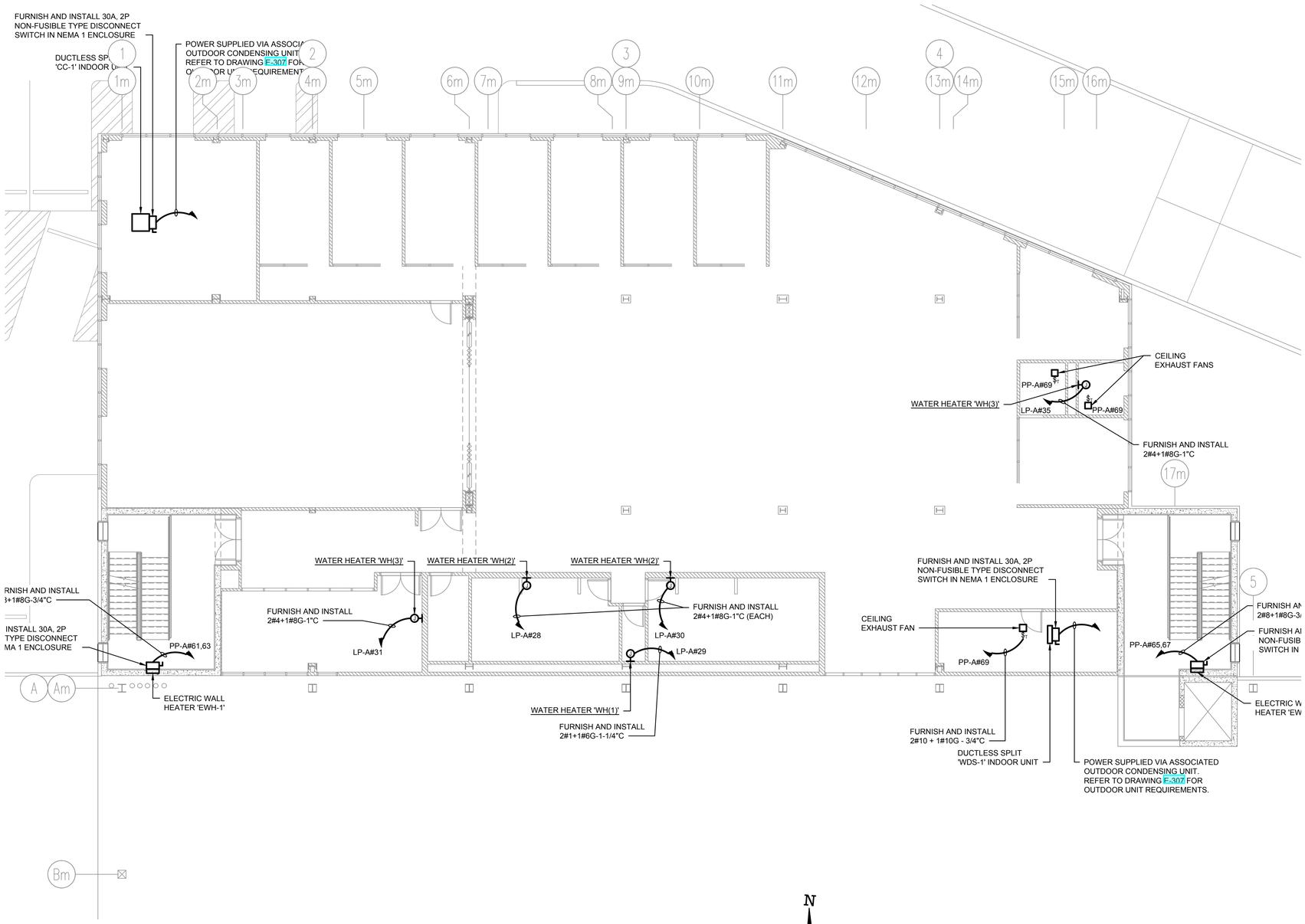
DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

MECHANICAL POWER PLAN - 2ND MEZZANINE

DWG NUMBER :

E-304



1 E-305 MECHANICAL POWER PLAN - ADMIN OFFICE

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

0 8 16

SCALE IN FEET

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS AND ELECTRICAL REQUIREMENTS OF EQUIPMENT.
3. REFER TO MECHANICAL CONTRACT DRAWINGS FOR EXACT LOCATION AND REQUIREMENTS OF MECHANICAL EQUIPMENT.

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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MANHATTAN BEER DISTRIBUTORS
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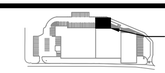
SUFFERN, NEW YORK

KEY PLAN



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DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

MECHANICAL POWER PLAN - ADMIN OFFICE

DWG NUMBER :

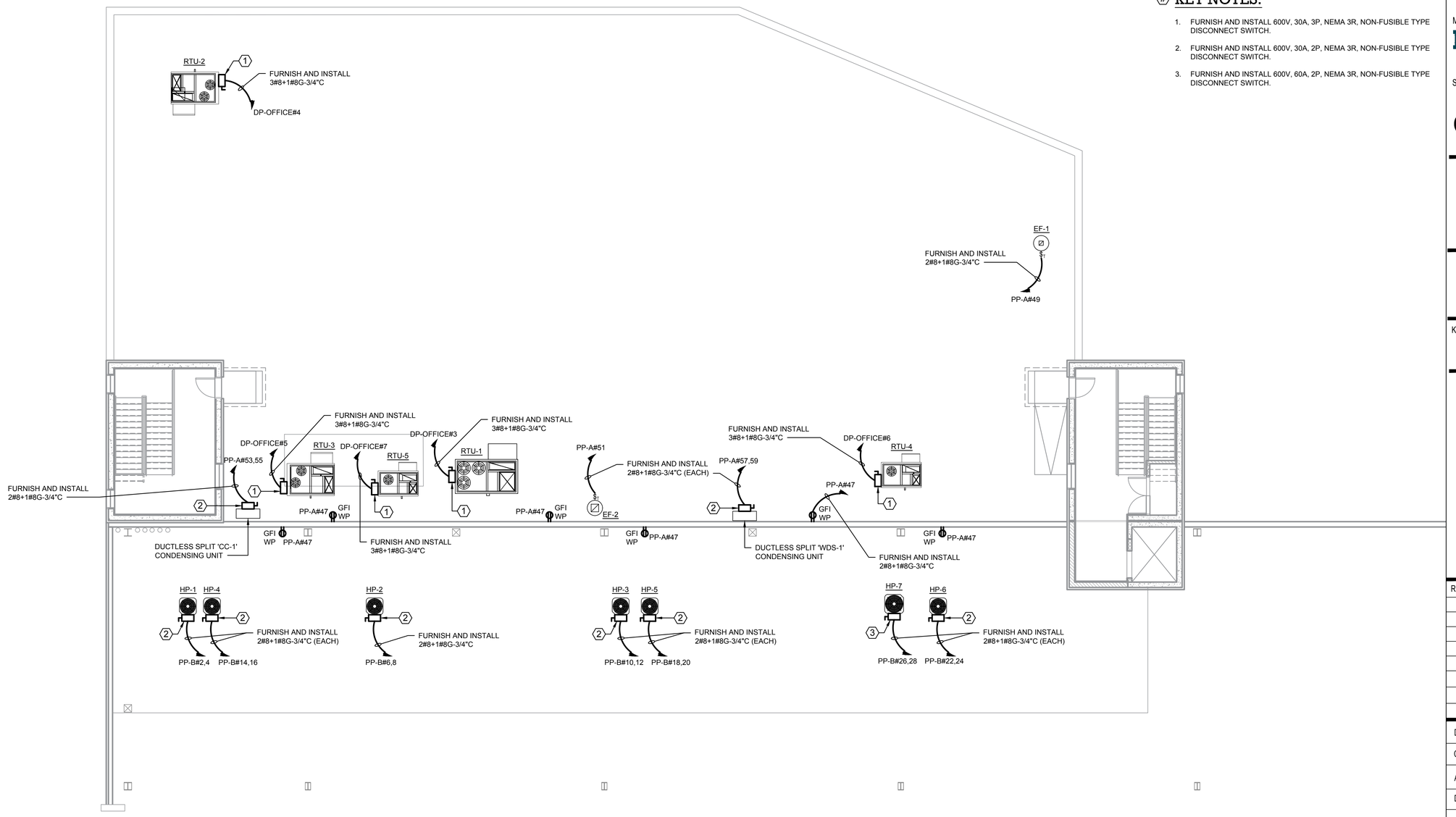
E-305

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO MECHANICAL CONTRACT DRAWINGS FOR EXACT LOCATION AND REQUIREMENTS OF MECHANICAL EQUIPMENT.

(#) KEY NOTES:

1. FURNISH AND INSTALL 600V, 30A, 3P, NEMA 3R, NON-FUSIBLE TYPE DISCONNECT SWITCH.
2. FURNISH AND INSTALL 600V, 30A, 2P, NEMA 3R, NON-FUSIBLE TYPE DISCONNECT SWITCH.
3. FURNISH AND INSTALL 600V, 60A, 2P, NEMA 3R, NON-FUSIBLE TYPE DISCONNECT SWITCH.



1 E-307 MECHANICAL POWER PLAN - ADMIN ROOF

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

0 16 32

SCALE IN FEET

N

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

ARCHITECT

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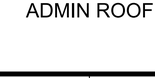
KEY PLAN



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DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

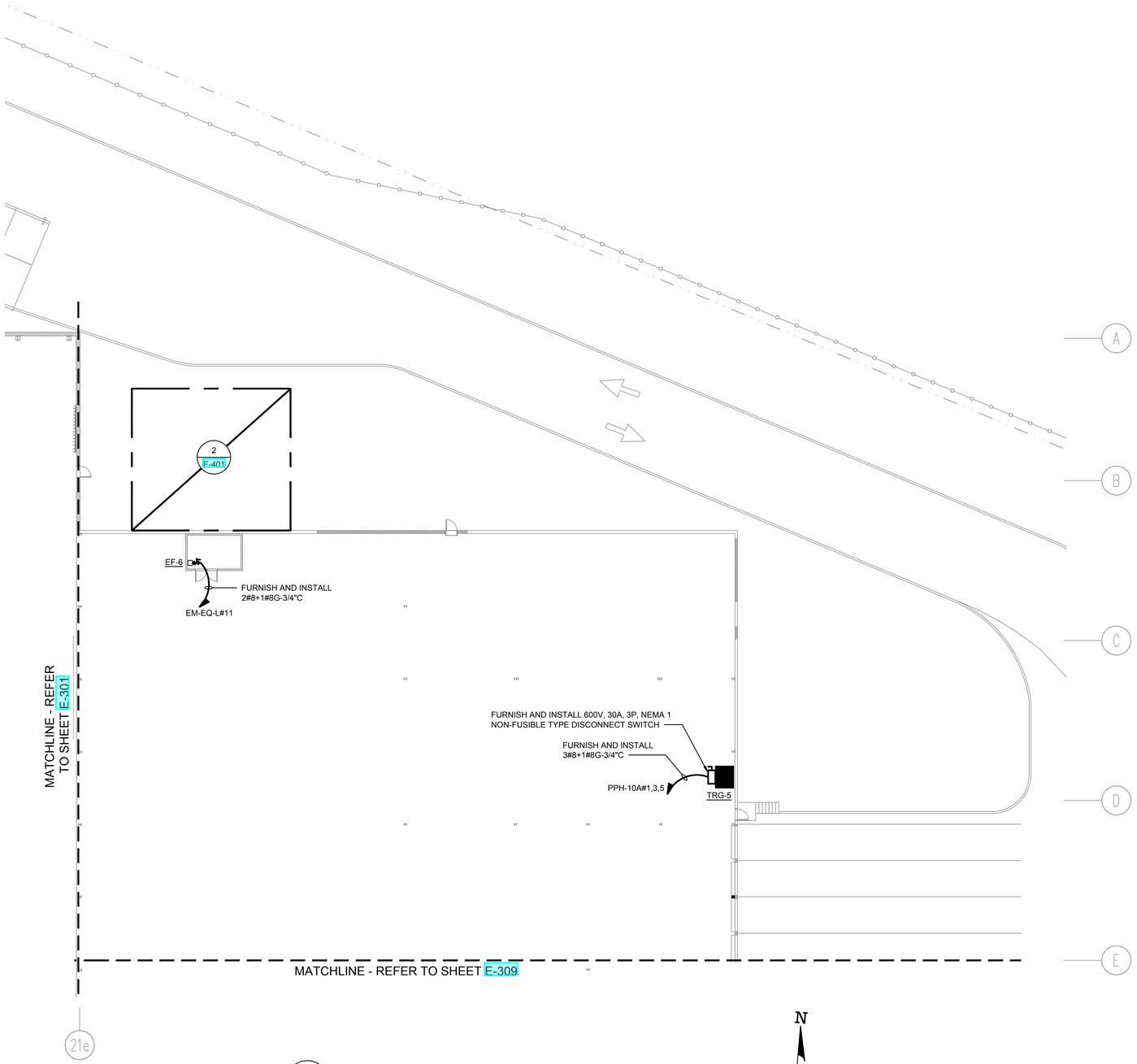
MECHANICAL POWER PLAN - ADMIN ROOF

DWG NUMBER :

E-307

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO MECHANICAL CONTRACT DRAWINGS FOR EXACT LOCATION AND REQUIREMENTS OF MECHANICAL EQUIPMENT.



1 / E-308 MECHANICAL POWER PLAN - 10 DUNNIGAN (NORTH)
SCALE: 1/16" = 1'-0"
0 16 32
SCALE IN FEET

N

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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KEY PLAN


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CHECKED BY :	B.NEMCHEK
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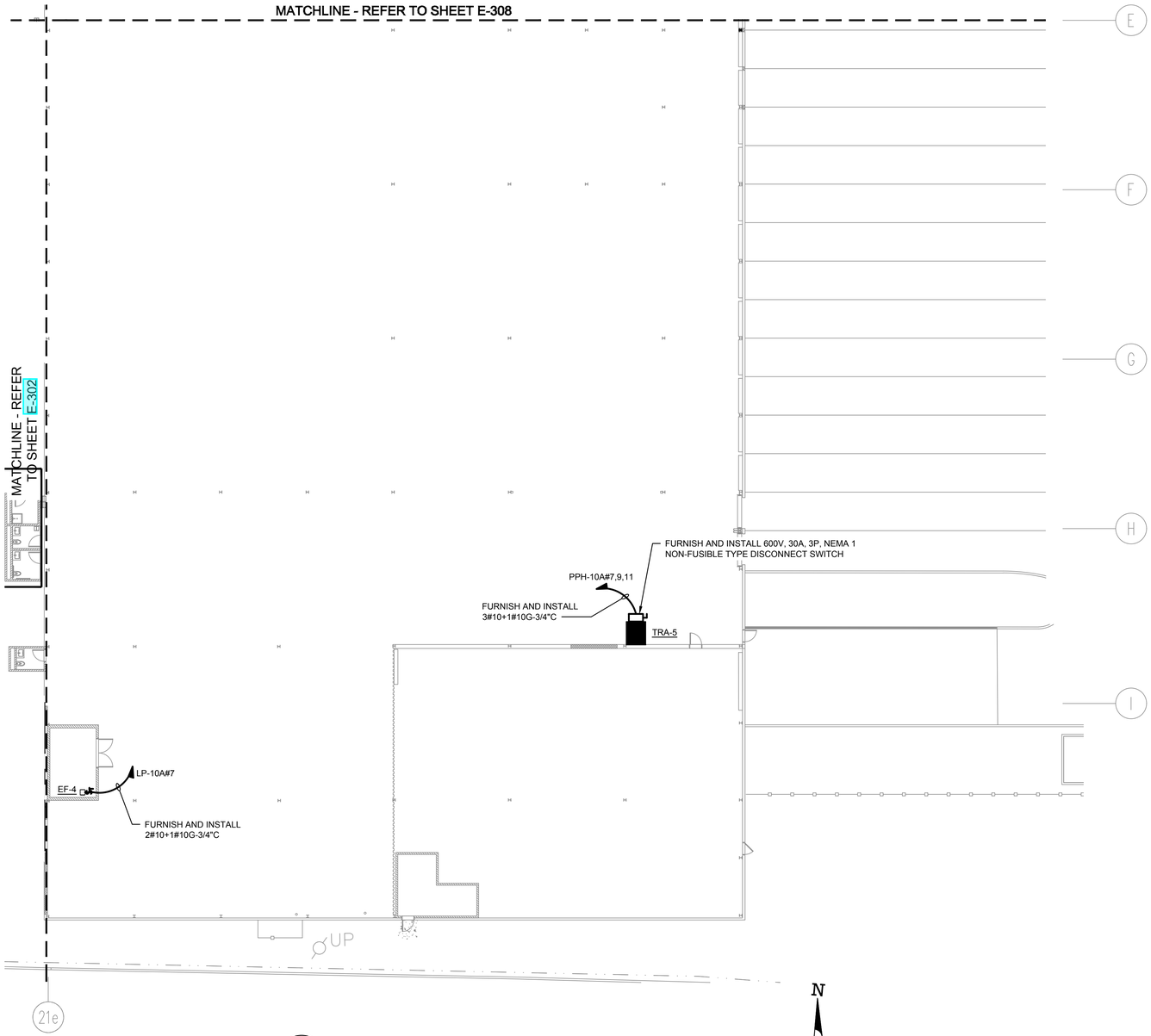
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :
MECHANICAL POWER PLAN - 10 DUNNIGAN (NORTH)

DWG NUMBER :
E-308

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO MECHANICAL CONTRACT DRAWINGS FOR EXACT LOCATION AND REQUIREMENTS OF MECHANICAL EQUIPMENT.



1 / E-309 MECHANICAL POWER PLAN - 10 DUNNIGAN (SOUTH)

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

0 16 32

SCALE IN FEET

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SUFFERN, NEW YORK

KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

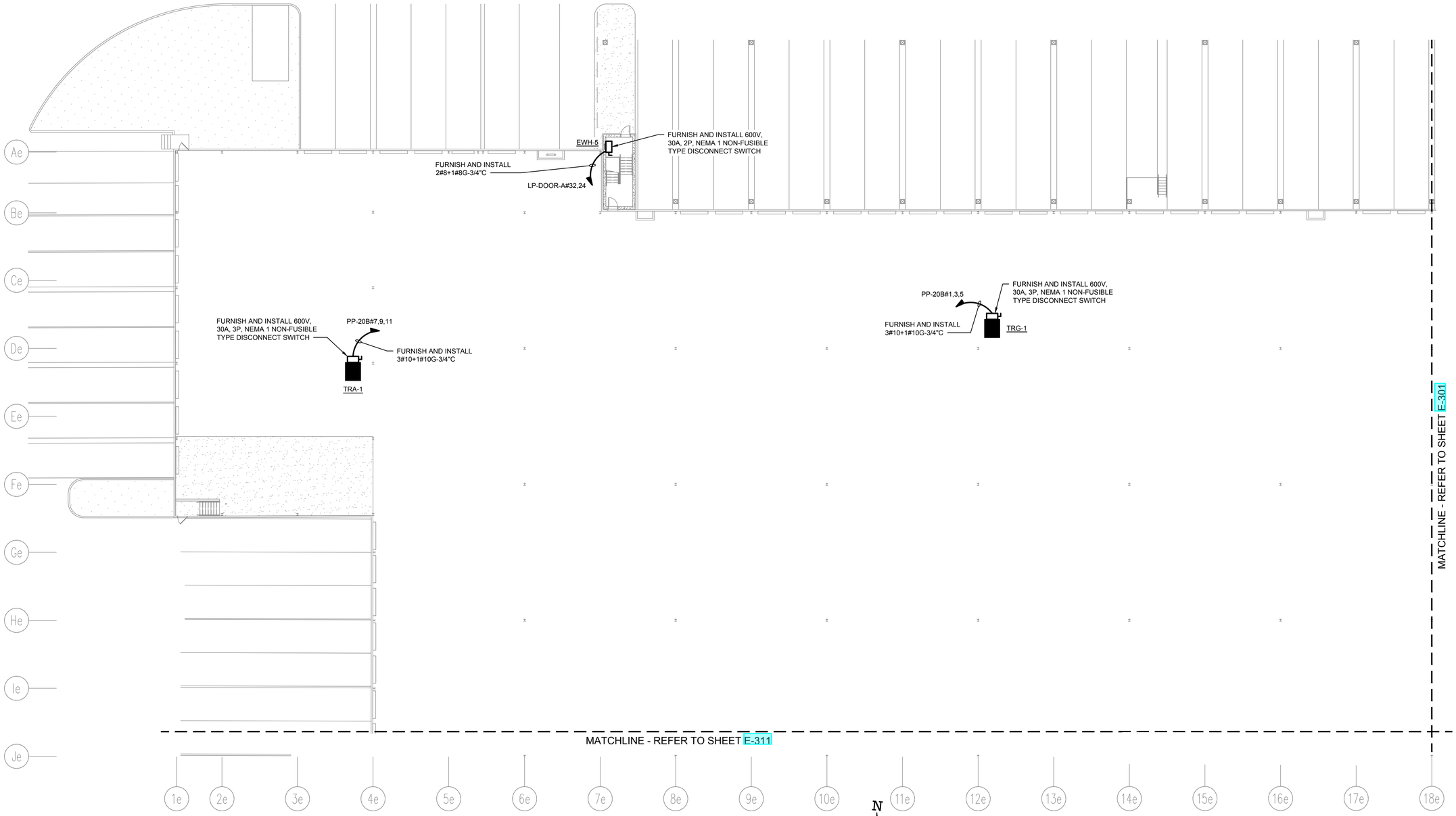
MECHANICAL POWER PLAN - 10 DUNNIGAN (SOUTH)

DWG NUMBER :

E-309

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO MECHANICAL CONTRACT DRAWINGS FOR EXACT LOCATION AND REQUIREMENTS OF MECHANICAL EQUIPMENT.



1 / E-310 MECHANICAL POWER PLAN - 20 DUNNIGAN (NORTH)
SCALE: 1/16" = 1'-0"
0 16 32
SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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SUFFERN, NEW YORK

KEY PLAN
AREA OF WORK

REV	DESCRIPTION	DATE
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	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

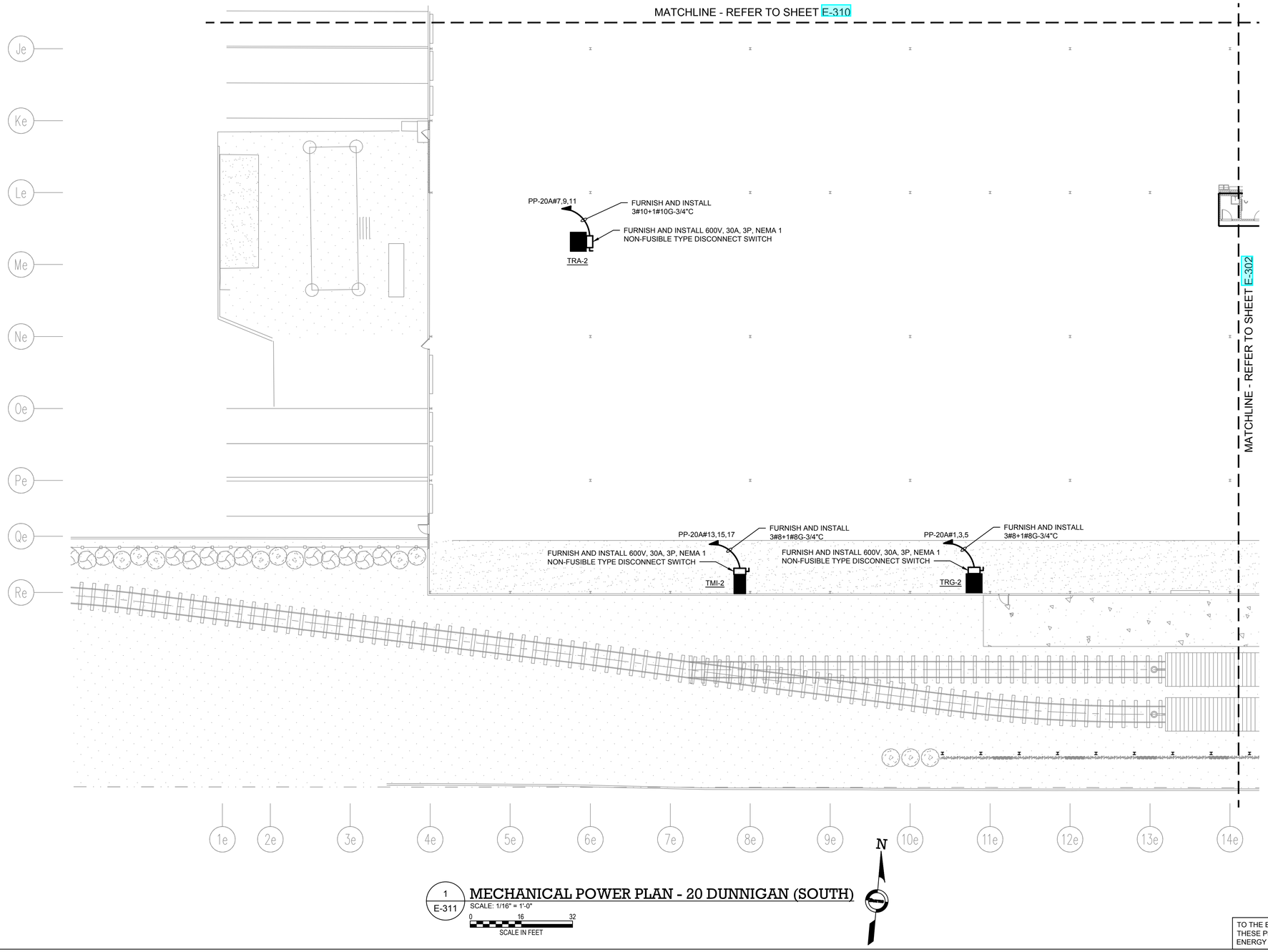
DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :
MECHANICAL POWER PLAN - 20 DUNNIGAN (NORTH)

DWG NUMBER :
E-310

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO MECHANICAL CONTRACT DRAWINGS FOR EXACT LOCATION AND REQUIREMENTS OF MECHANICAL EQUIPMENT.



1 / E-311 MECHANICAL POWER PLAN - 20 DUNNIGAN (SOUTH)

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

0 16 32

SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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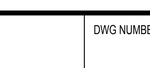
KEY PLAN



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DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

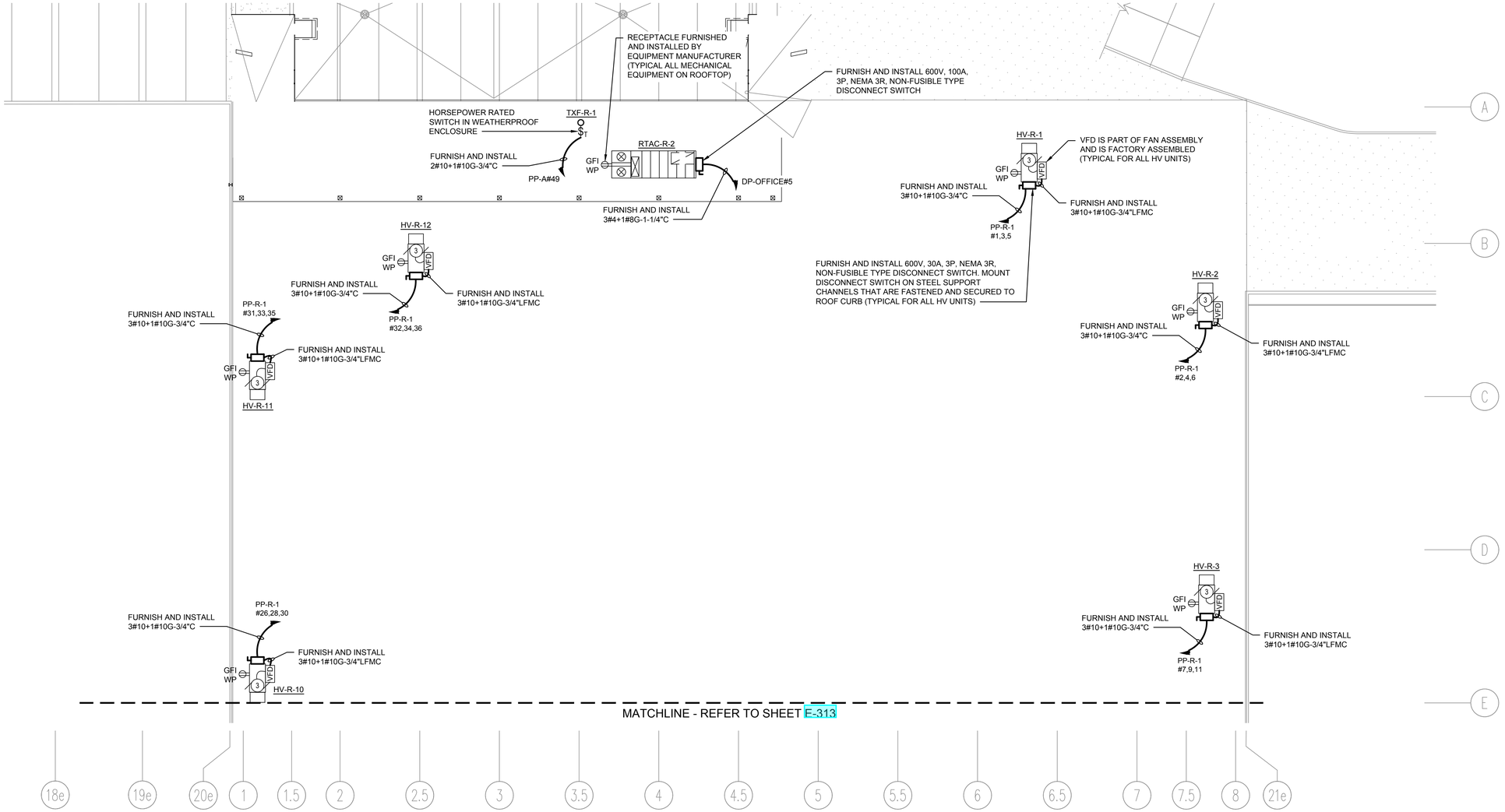
MECHANICAL POWER PLAN - 20 DUNNIGAN (SOUTH)

DWG NUMBER :

E-311

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO MECHANICAL CONTRACT DRAWINGS FOR EXACT LOCATION AND REQUIREMENTS OF MECHANICAL EQUIPMENT.



1 / E-312 MECHANICAL POWER PLAN - WAREHOUSE ROOF (NORTH)

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

0 16 32

SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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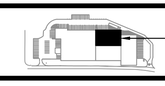
KEY PLAN



REV	DESCRIPTION	DATE
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	ISSUED FOR PROGRESS	01/18/2022

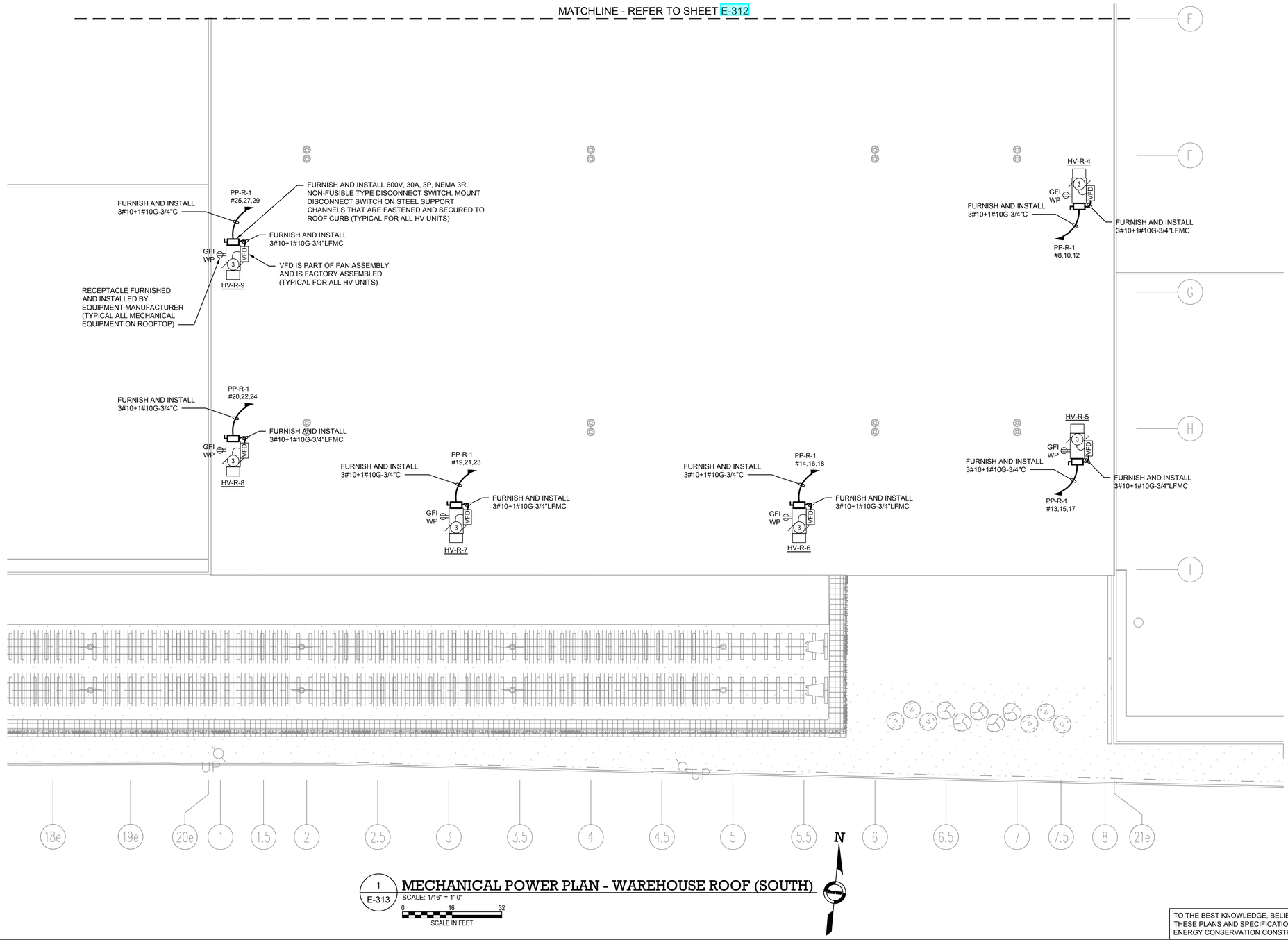
DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :
MECHANICAL POWER PLAN - WAREHOUSE ROOF (NORTH)

DWG NUMBER :
E-312

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO MECHANICAL CONTRACT DRAWINGS FOR EXACT LOCATION AND REQUIREMENTS OF MECHANICAL EQUIPMENT.



1 / E-313 MECHANICAL POWER PLAN - WAREHOUSE ROOF (SOUTH)

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

0 16 32

SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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SUFFERN, NEW YORK

KEY PLAN

AREA OF WORK

REV	DESCRIPTION	DATE
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DATE :	09/10/21
SCALE :	AS NOTED

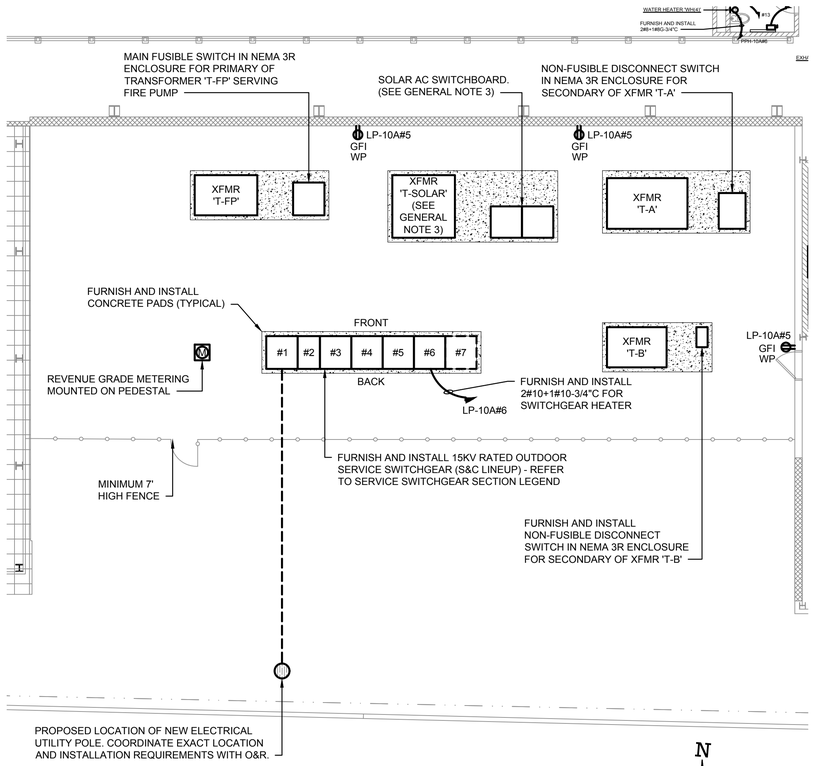
DRAWING TITLE :
MECHANICAL POWER PLAN - WAREHOUSE ROOF (SOUTH)

DWG NUMBER :
E-313

SERVICE SWITCHGEAR SECTION LEGEND	
BAY	BAY DESCRIPTION
#1	INCOMING SERVICE SECTION
#2	DEDICATED FIRE PUMP SECTION
#3	MAIN FUSIBLE SWITCH FOR EXISTING BUILDING - 20 DUNNIGAN DRIVE
#4	MAIN FUSIBLE SWITCH FOR PHOTOVOLTAIC SYSTEM
#5	MAIN FUSIBLE SWITCH FOR BUILDING ADDITION
#6	MAIN FUSIBLE SWITCH FOR EXISTING BUILDING - 10 DUNNIGAN DRIVE
#7	SPACE FOR MAIN FUSIBLE SWITCH FOR FUTURE LOADS

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702 AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS AND ELECTRICAL REQUIREMENTS OF EQUIPMENT.
3. REFER TO THE PHOTOVOLTAIC SYSTEM CONSTRUCTION DRAWINGS FOR FEEDER AND EQUIPMENT REQUIREMENTS.
4. REFER TO CONTRACT DRAWING E-403 FOR PROPOSED ELECTRICAL CONDUIT PATHWAYS AND GROUNDING REQUIREMENTS.
5. ALL UNDERGROUND CONDUIT SHALL HAVE A MINIMUM 2" OF SLURRY CONCRETE AND SHALL BE A MINIMUM 36" FROM FINISHED GRADE.
6. REFER TO CONTRACT DRAWING E-904 FOR MEDIUM VOLTAGE SWITCHGEAR SPECIFICATIONS.

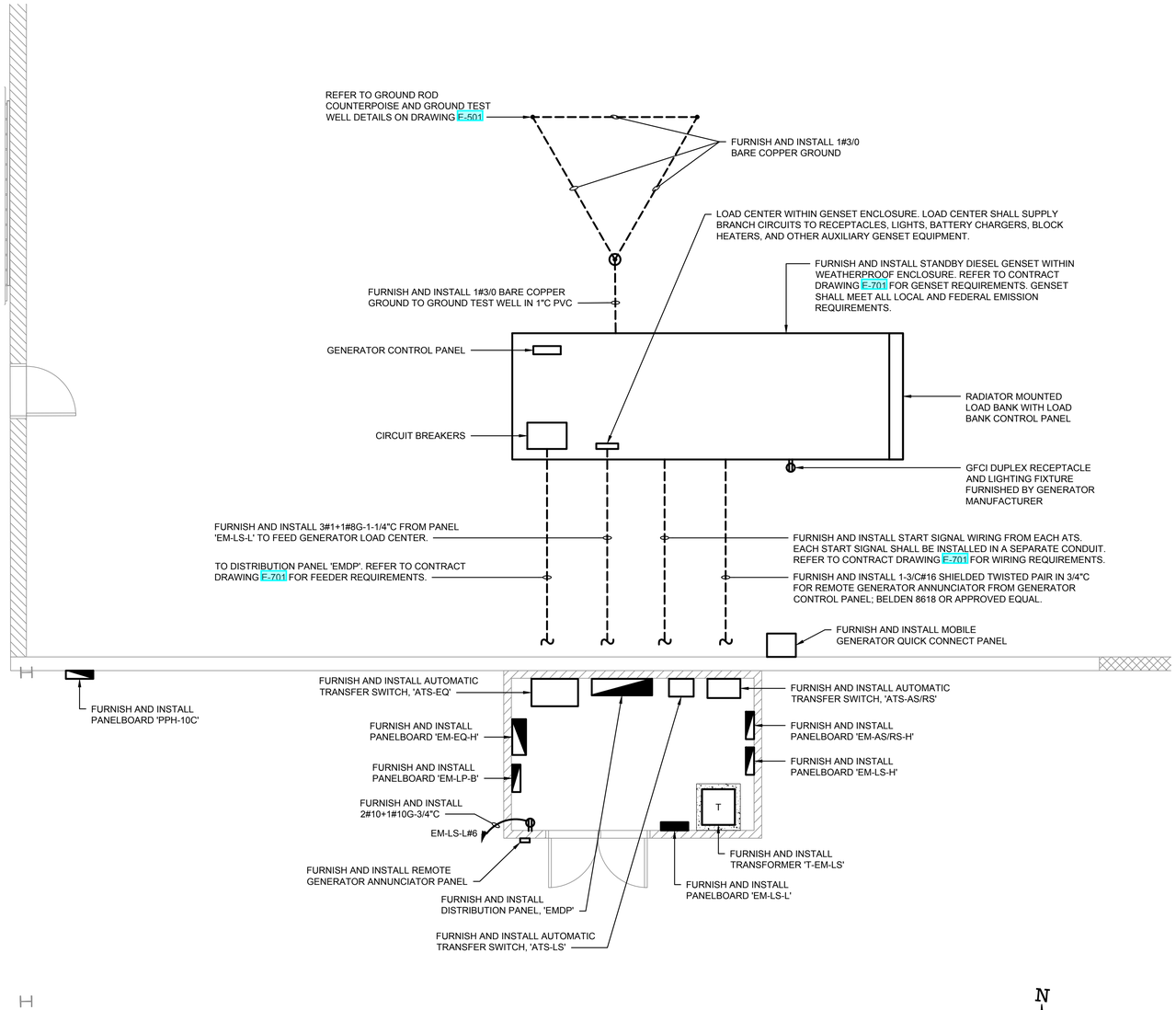


1 / E-401 ELECTRICAL SERVICE AREA - INSTALLATIONS

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

0 8 16

SCALE IN FEET



2 / E-401 EMERGENCY STANDBY GENERATOR & DISTRIBUTION ROOM - INSTALLATIONS

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

0 4 8

SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
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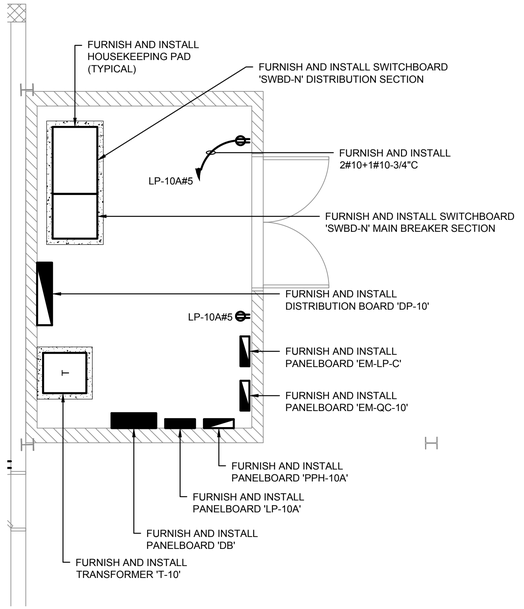
DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

ELECTRICAL SERVICE & GENERATOR AREAS - INSTALLATIONS

DWG NUMBER :

E-401

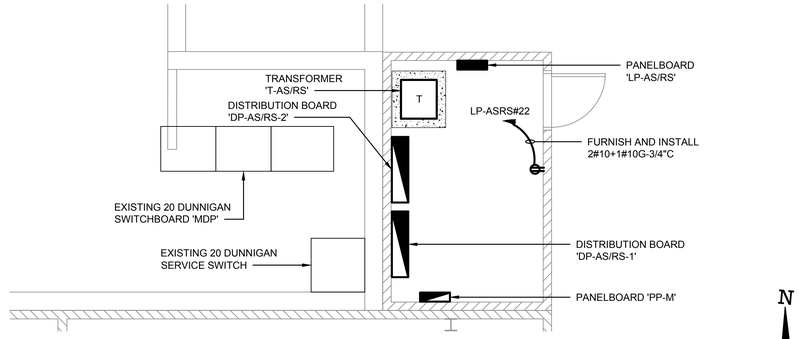


1 E-402 **AS/RS SWITCHBOARD ROOM & 10 DUNNIGAN SERVICE ROOM PART PLANS**

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

0 4 8

SCALE IN FEET

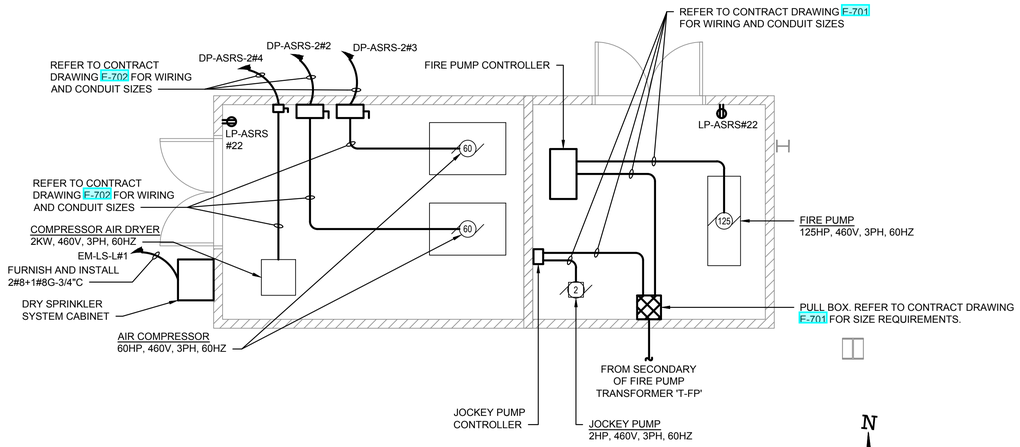


2 E-402 **EXISTING AND NEW ELECTRICAL SERVICE ROOMS - 20 DUNNIGAN DRIVE**

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

0 4 8

SCALE IN FEET

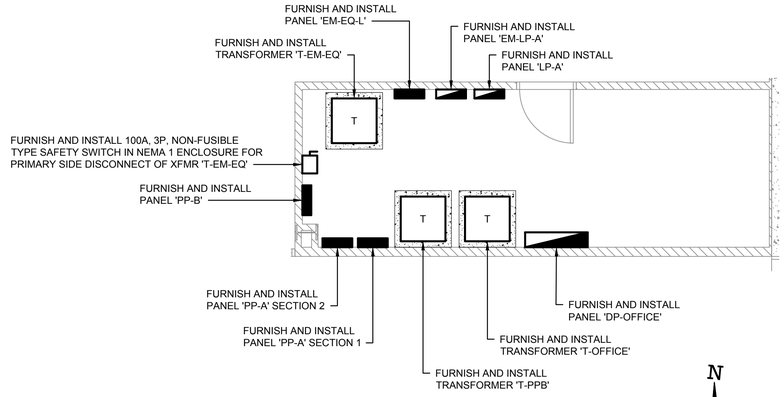


3 E-402 **AIR COMPRESSOR & FIRE PUMP ROOM PART PLANS - INSTALLATIONS**

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

0 4 8

SCALE IN FEET



5 E-402 **ADMIN ELECTRICAL ROOM PART PLAN - INSTALLATIONS**

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

0 4 8

SCALE IN FEET

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS AND ELECTRICAL REQUIREMENTS OF EQUIPMENT.
3. REFER TO CONTRACT DRAWINGS E-905 AND E-906 FOR LOW VOLTAGE SWITCHBOARD SPECIFICATIONS.

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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SUFFERN, NEW YORK

KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
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	ISSUED FOR BID	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

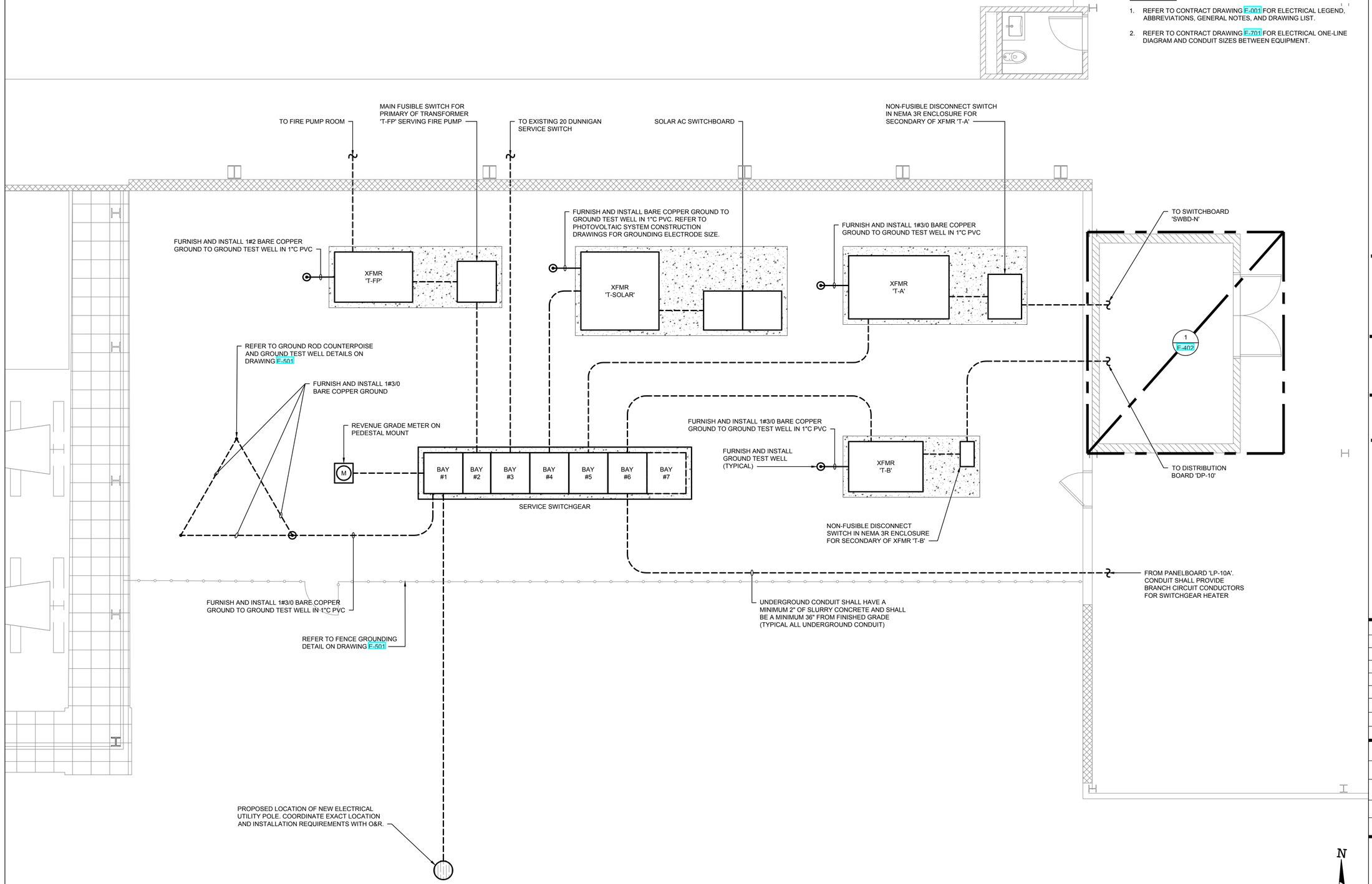
ELECTRICAL ROOM PART PLANS - INSTALLATIONS

DWG NUMBER :

E-402

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWING E-701 FOR ELECTRICAL ONE-LINE DIAGRAM AND CONDUIT SIZES BETWEEN EQUIPMENT.



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DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	1/4"=1'-0"

DRAWING TITLE :

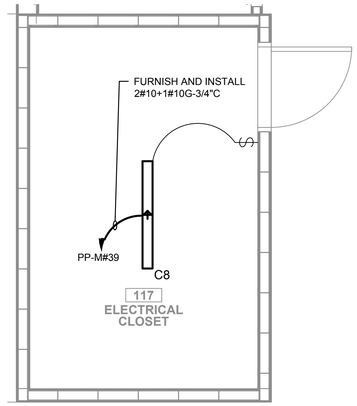
ELECTRICAL SERVICE YARD - CONDUIT & GROUNDING PLAN

DWG NUMBER :

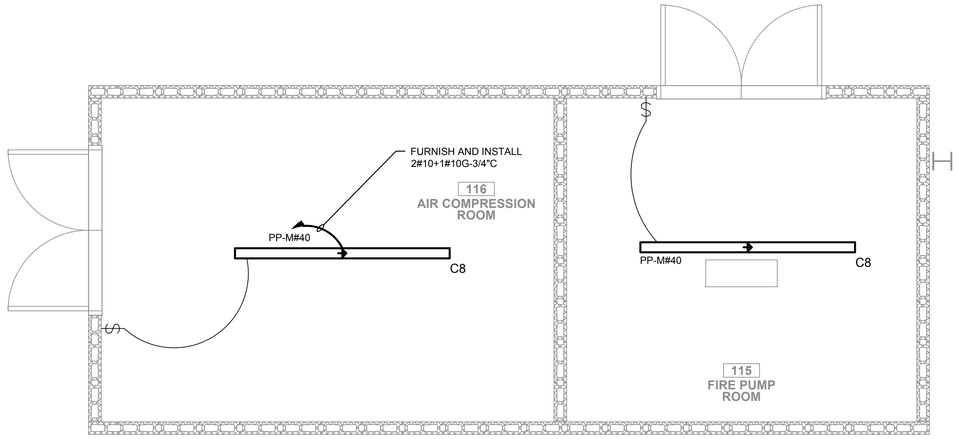
E-403

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO CONTRACT DRAWING E-607 FOR LIGHTING FIXTURE SCHEDULE.
4. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY, LOCATION, AND SPECIFICATIONS OF LIGHTING FIXTURES.
5. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LIGHTING CONTROL SYSTEM SPECIFICATIONS, DEVICE LAYOUT, AND QUANTITY OF CONTROL DEVICES.



2 / E-404 ELECTRICAL LIGHTING PART PLAN - 20 DUNNIGAN NEW BUILDING ADDITION ELECTRICAL ROOM
SCALE: 3/8" = 1'-0"



3 / E-404 ELECTRICAL LIGHTING PART PLAN - 20 DUNNIGAN AIR COMPRESSION & FIRE PUMP ROOMS
SCALE: 3/8" = 1'-0"

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DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

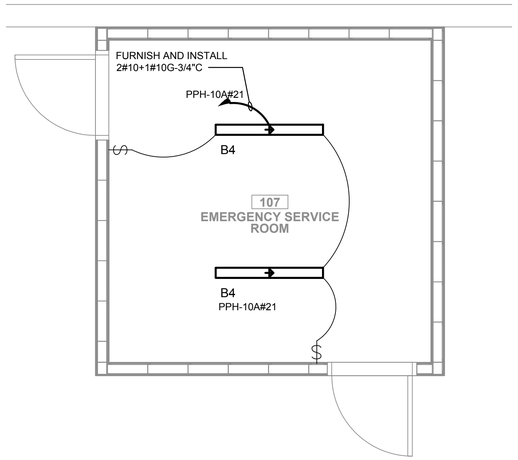
DRAWING TITLE :
ELECTRICAL LIGHTING PART PLANS - AUXILIARY ROOMS SHEET 1 OF 2

DWG NUMBER :
E-404

N

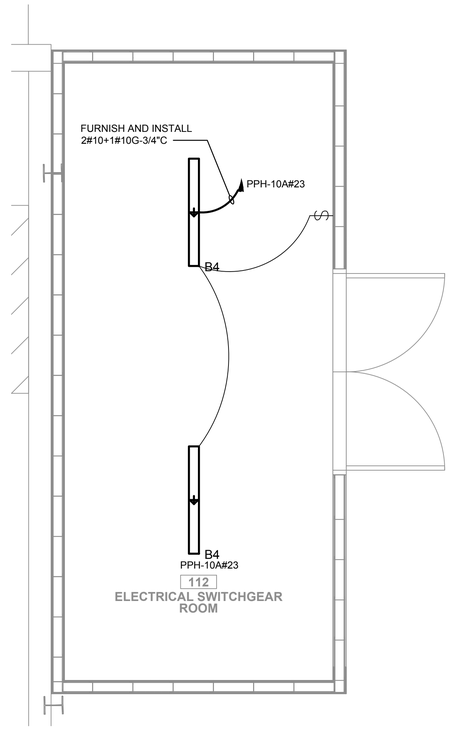
0 2 4
SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.



3 E-405 ELECTRICAL LIGHTING PART PLAN - 10 DUNNIGAN EMERGENCY DISTRIBUTION ROOM

SCALE: 3/8" = 1'-0"



4 E-405 ELECTRICAL LIGHTING PART PLAN - 10 DUNNIGAN ELECTRIC ROOM

SCALE: 3/8" = 1'-0"

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. REFER TO CONTRACT DRAWING E-607 FOR LIGHTING FIXTURE SCHEDULE.
4. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT QUANTITY, LOCATION, AND SPECIFICATIONS OF LIGHTING FIXTURES.
5. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LIGHTING CONTROL SYSTEM SPECIFICATIONS, DEVICE LAYOUT, AND QUANTITY OF CONTROL DEVICES.

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SUFFERN, NEW YORK

KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

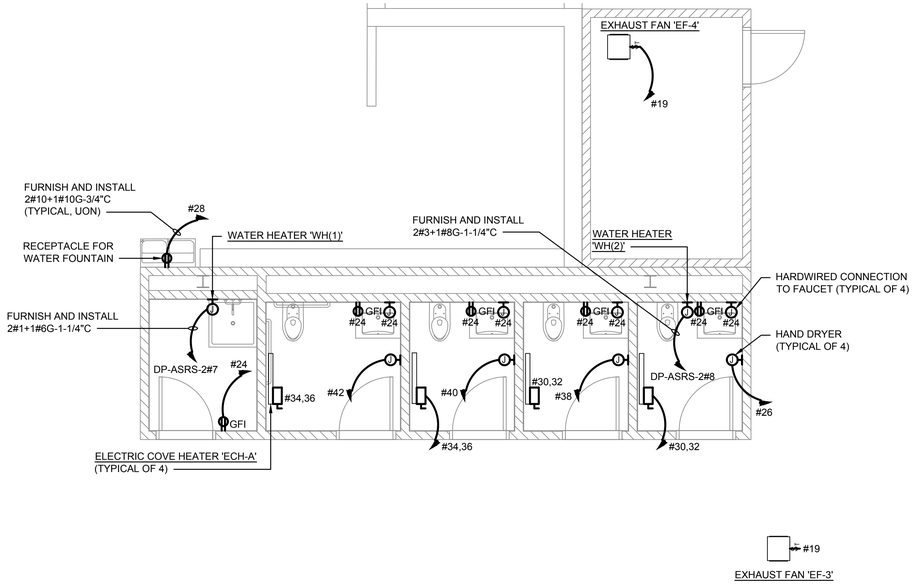
DRAWING TITLE :
ELECTRICAL LIGHTING PART PLANS - AUXILIARY ROOMS SHEET 2 OF 2

DWG NUMBER :
E-405

N

0 2 4
SCALE IN FEET

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

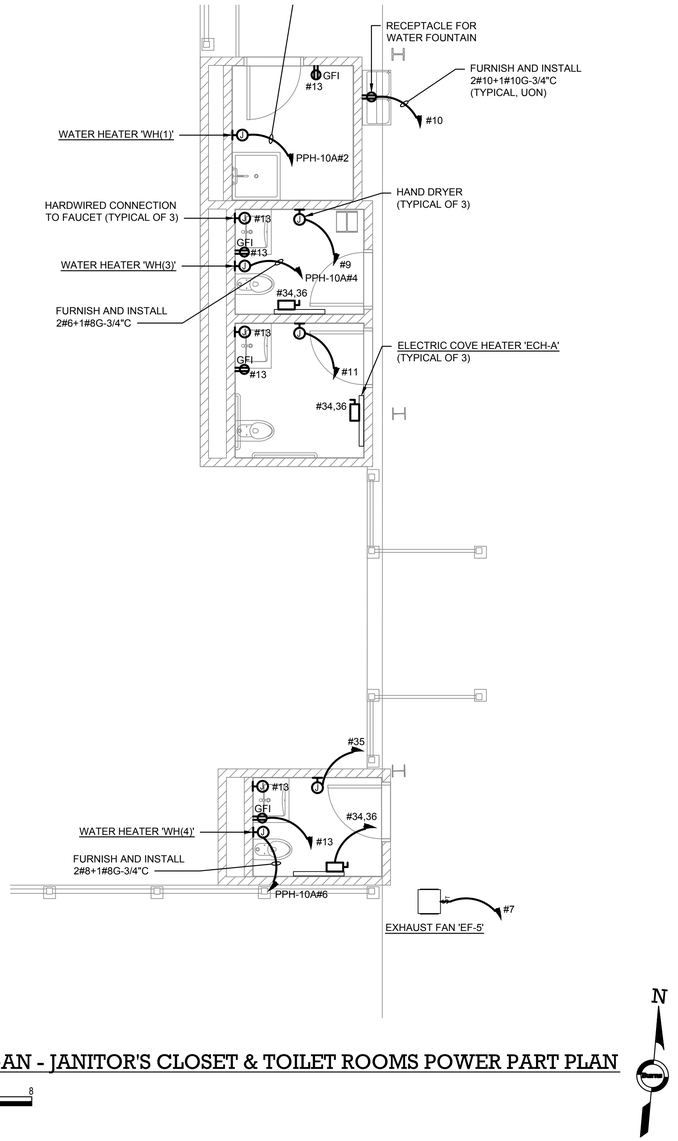


1 E-406 **20 DUNNIGAN - JANITOR'S CLOSET & TOILET ROOMS POWER PART PLAN**

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

0 4 8

SCALE IN FEET



2 E-406 **10 DUNNIGAN - JANITOR'S CLOSET & TOILET ROOMS POWER PART PLAN**

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

0 4 8

SCALE IN FEET

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702 AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS AND ELECTRICAL REQUIREMENTS OF EQUIPMENT.
3. ALL BRANCH CIRCUIT HOMERUNS SHOWN IN 10 DUNNIGAN JANITOR'S CLOSET & TOILET ROOMS SHALL BE FED FROM PANEL 'LP-10A'.
3. ALL BRANCH CIRCUIT HOMERUNS SHOWN IN 20 DUNNIGAN JANITOR'S CLOSET & TOILET ROOMS SHALL BE FED FROM PANEL 'LP-ASRS'.
4. REFER TO ARCHITECTURAL CONTRACT DRAWINGS FOR EXACT LOCATION OF RECEPTACLES.
5. REFER TO MECHANICAL AND PLUMBING CONTRACT DRAWINGS FOR EXACT LOCATION OF MECHANICAL AND PLUMBING EQUIPMENT.

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APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :

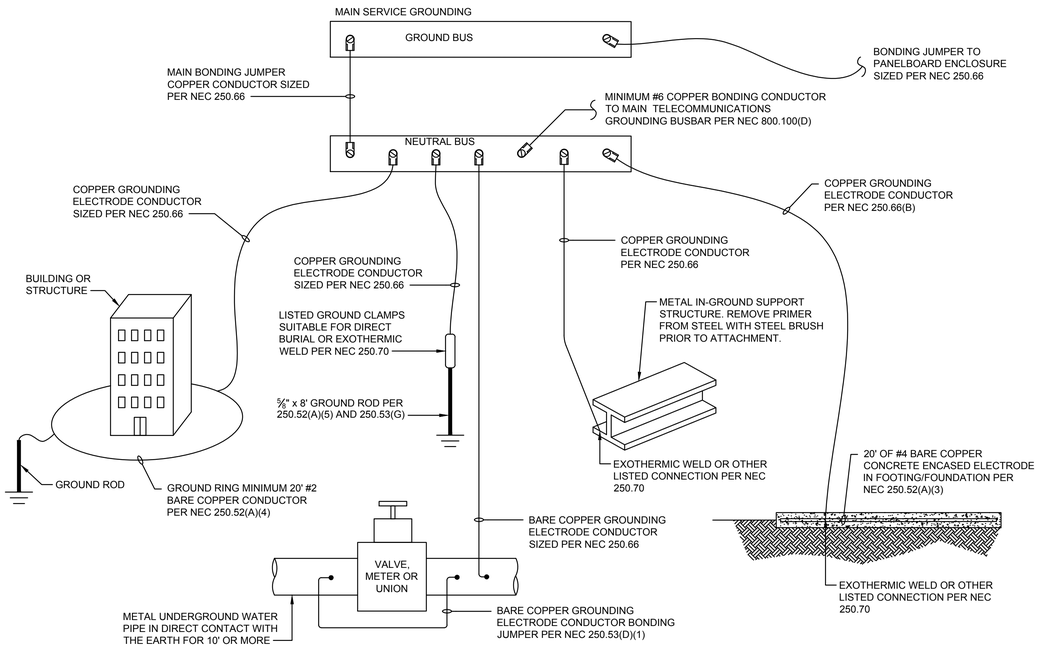
ELECTRICAL POWER PART PLAN - JANITOR'S CLOSET & TOILET ROOMS

DWG NUMBER :

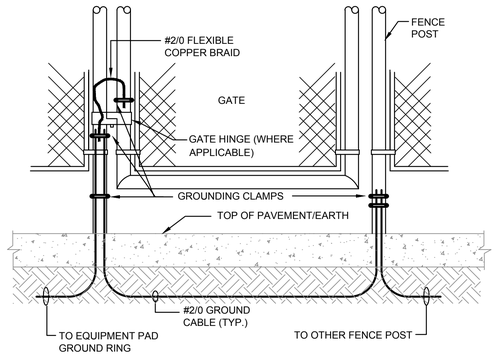
E-406

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

NOTE:
ALL GROUNDING ELECTRODES THAT ARE PRESENT SHALL BE BONDED TOGETHER TO FORM THE GROUNDING ELECTRODE SYSTEM. WHERE NONE OF THESE GROUNDING ELECTRODES EXIST, ONE OR MORE OF THE GROUNDING ELECTRODES SHALL BE INSTALLED. FURTHERMORE, IF THE ONLY ELECTRODE AVAILABLE IS THE WATER PIPE, A SUPPLEMENTAL ELECTRODE IS REQUIRED.



1 / E501 GROUNDING ELECTRODE SYSTEM DETAIL

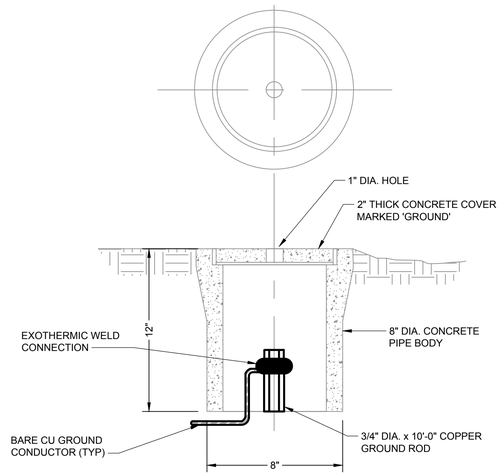


NOTES
1. CONTRACTOR TO COORDINATE FENCE LOCATION AND INSTALLATION WITH ARCHITECT.

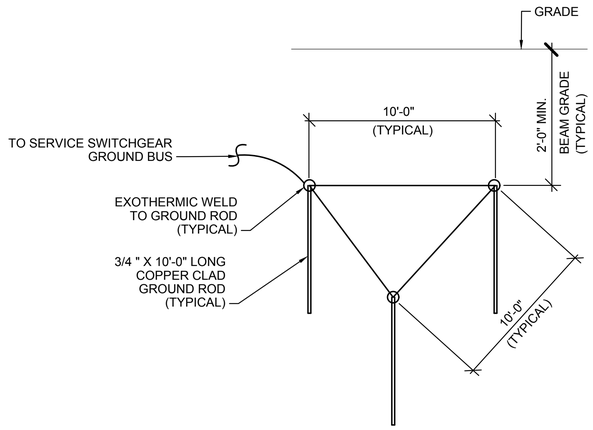
2 / E501 FENCE GROUNDING DETAIL

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.



3 / E501 GROUND TEST WELL INSTALLATION DETAIL



4 / E501 GROUND ROD COUNTERPOISE INSTALLATION DETAIL

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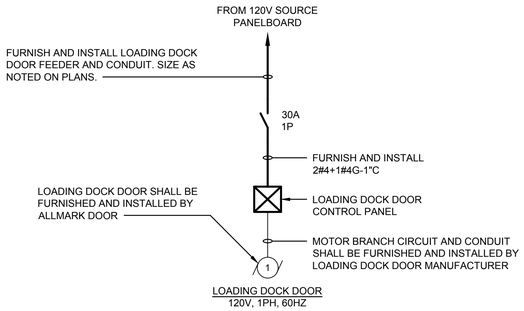
DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	N.T.S.

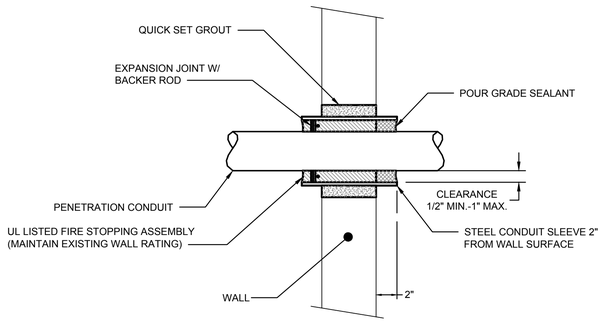
DRAWING TITLE :
ELECTRICAL GROUNDING DETAILS

DWG NUMBER :
E-501

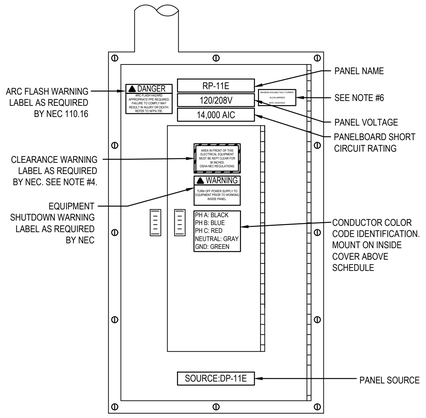


NOTE:
1. RETAIN THE SERVICES OF ALLMARK DOOR [DONALD MARKHAM - DONALD.MARKHAM@ALLMARKDOORS.COM; 908-342-7187] FOR INSTALLATION AND TESTING OF LOADING DOCK DOOR SYSTEMS.
2. AT EACH LOADING DOCK DOOR LOCATION, THERE SHALL BE AN OVERHEAD DOOR MOTOR.

1 E502 LOADING DOCK DOOR - TYPICAL ELECTRICAL INSTALLATION

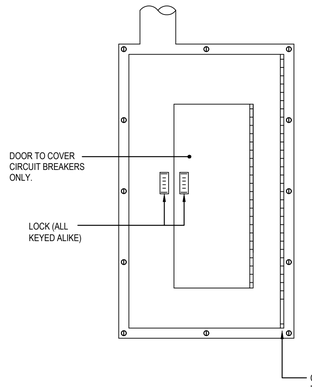


2 E502 WALL PENETRATION AND FIRE STOPPING DETAIL



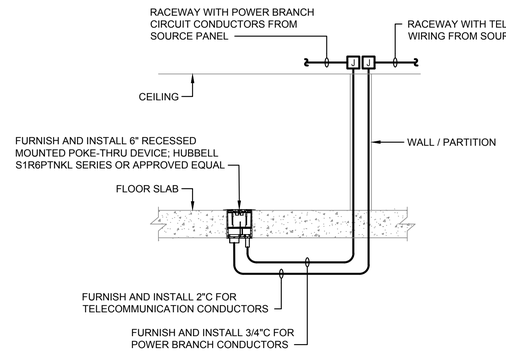
NOTES:
1. ALL NEW PANELS FURNISHED AND INSTALLED UNDER THIS CONTRACT SHALL BE PROVIDED WITH ALL IDENTIFICATION, AND WARNING LABELS AS SHOWN IN THIS DETAIL.
2. ALL HAZARD MARKINGS SHALL COMPLY WITH THE REQUIREMENTS OF NEC SECTION 110.21(B)
3. ALL EXISTING PANELS MODIFIED IN THIS CONTRACT SHALL BE PROVIDED WITH PANELBOARD IDENTIFICATION AND WARNING LABELS AS SHOWN IN THIS DETAIL IF NOT ALREADY COMPLIANT.
4. ELECTRICAL CONTRACTOR TO PROVIDE NOTATION OF CLEARANCE REQUIREMENTS IN ACCORDANCE WITH NEC TABLE 110.26(A)(1) BASED ON CONDITION OF EQUIPMENT INSTALLATION.
5. ELECTRICAL CONTRACTOR SHALL PROVIDE TYPEWRITTEN PANEL SCHEDULE FOR ALL NEW PANELBOARDS AND EXISTING PANELBOARDS THAT ARE TO BE MODIFIED UNDER THIS CONTRACT REFLECTING AS-BUILT CIRCUITRY AS PER NEC SECTION 408.
6. ALL SERVICE RATED EQUIPMENT SHALL BE PROVIDED WITH INFORMATIONAL LAMECOID TAG INDICATING THE AVAILABLE FAULT CURRENT AT THE FEEDERS INCOMING TO THE EQUIPMENT. COORDINATE WITH LOCAL UTILITY FOR FAULT CURRENT DATA.

3 E502 PANEL IDENTIFICATION & WARNING LABELING DETAIL



NOTES:
1. ALL NEW PANELS FURNISHED AND INSTALLED UNDER THIS CONTRACT SHALL BE PROVIDED WITH THE CONSTRUCTION AS SHOWN IN THIS DETAIL.
2. PROVIDE PANEL IDENTIFICATION AND LABELING AS INDICATED ELSEWHERE IN CONSTRUCTION DOCUMENTS.

4 E502 DOOR IN DOOR COVER DETAIL



NOTES:
1. POKE-THRU DEVICE SHALL MATCH FIRE RATING OF FLOOR SLAB.
2. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT SPECIFICATIONS AND QUANTITY OF WIRING DEVICES INSTALLED INSIDE EACH POKE-THRU DEVICE.
3. ALL CONDUIT SHALL BE ROUTED IN CEILING OF FLOOR BELOW AND SUPPORTED TO CEILING SLAB.
4. EXACT LOCATION OF CONDUIT PENETRATIONS SHALL BE COORDINATED WITH ARCHITECT AND STRUCTURAL ENGINEER.

5 E502 RECESSED MOUNTED POKE-THRU DEVICE WIRING DETAIL

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.

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CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	N.T.S.

DRAWING TITLE :
ELECTRICAL DETAILS

DWG NUMBER :
E-502

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SERVICE SWITCHBOARD DESIGNATION : **PRIMARY SERVICE SWITCHGEAR**

VOLTAGE: **13200V** | NEUTRAL: **100%** | BUS RATING: **600 A**
PHASE/WIRE: **3Ø, 4W** | MIN. K.A.I.C. SYM: **14 K.A.I.C.** | MAIN LUGS ONLY: **600 A**
REMARKS:

FEEDER SWITCH NO.	SW. SIZE	SW. TYPE	FUSE	FUSE TYPE	LOAD DESCRIPTION	CONNECTED LOAD (kVA)	QUANTITY OF FEEDERS (SETS)	FEEDER (EACH SET) PHASE LEGS NO.	PHASE LEGS SIZE	NEUTRAL NO.	NEUTRAL SIZE	GROUND NO.	GROUND SIZE	INSULATION TYPE	CONDUIT SIZE	REMARKS
2	-	-	-	-	FIRE PUMP CONNECTION	129.70	REFER TO DRAWING E-701 FOR FEEDER REQUIREMENTS									
3	600A	-	150A	E	EXISTING 20 DUNNIGAN SERVICE SWITCH	2646.36	REFER TO DRAWING E-701 FOR FEEDER REQUIREMENTS									
4	600A	-	80A	E	PHOTOVOLTAIC SYSTEM CONNECTION	-	REFER TO PHOTOVOLTAIC SYSTEM DRAWINGS FOR FEEDER REQUIREMENTS									
5	600A	-	150A	E	SWITCHBOARD 'SWBD-N' VIA XFMR 'T-A'	1987.25	REFER TO DRAWING E-701 FOR FEEDER REQUIREMENTS									
6	600A	-	40A	E	PANEL 'DP-10' VIA XFMR 'T-B'	169.92	REFER TO DRAWING E-701 FOR FEEDER REQUIREMENTS									
7	-	-	-	-	FUTURE SWITCH	-										

PRIMARY SERVICE CALCULATIONS

LOAD TYPE	CONNECTED LOAD		DEMAND LOAD		
LIGHTING	50.7	kW	63.4	kW	(125%)
LIGHTING+RECEPT in Guestrooms	0.0	kW	0.0	kW	
LARGEST MOTOR	309.4	kW	386.8	kW	(125%)
OTHER MOTORS	983.1	kW	983.1	kW	(100%)
RECEPTACLES	60.2	kW	35.1	kW	(> 10kW,50%)
CONTINUOUS	164.2	kW	205.3	kW	(125%)
HEATING	10.7	kW	10.7	kW	(100%)
NONCONTINUOUS	812.5	kW	812.5	kW	(100%)
KITCHEN EQPT (COMMERCIAL)	0.0	kW	0.0	kW	(65.0%)
DIVERSE/NONCOINCIDENTAL	2542.4	kW	1271.2	kW	(50.0%)

TOTAL CONNECTED LOAD =	4933.2 kW
TOTAL DEMAND LOAD =	3768.0 kW
PERCENT SPARE CAPACITY =	30 %
MINIMUM BALANCED 3-PHASE FEEDER W/ SPARE CAPACITY=	214.3 A

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. ALL 277/480V AND 120/208V FEEDERS AND BRANCH CIRCUIT CONDUCTORS SHALL BE ALUMINUM. CONTRACTOR SHALL PERFORM VOLTAGE DROP CALCULATIONS FOR ALL BRANCH CIRCUITS AND APPROPRIATELY SIZE CONDUCTORS AND ASSOCIATED CONDUITS BASED ON THE 2017 NATIONAL ELECTRIC CODE.
4. ALUMINUM CONDUCTORS SHALL BE UL LISTED AND COMPLY WITH ASTM B800, ASTM B801, UL 486C, AND ANSI H35.2-2017. INSTALLATION OF ALUMINUM CONDUCTORS SHALL BE INSTALLED IN COMPLIANCE WITH ANSI/NECA/AA 104-2012.
5. ALL SPLICES, TERMINATIONS, TAPS, AND CONDUCTOR CONNECTORS SHALL BE COMPATIBLE WITH CONDUCTOR MATERIAL. USE OXIDE INHIBITOR IN EACH SPLICE, TERMINATION, AND TAP FOR ALUMINUM CONDUCTORS.

DISTRIBUTION BOARD DESIGNATION : **SWBD-N** — TOTAL CONNECTED LOAD: **1898.2 KW**

VOLTAGE: **480Y/277 V** | NEUTRAL: **100%** | BUS RATING: **3000 A** | TOTAL DEMAND LOAD: **1639.2 KW**
PHASE/WIRE: **3Ø, 4W** | MIN. K.A.I.C. SYM: **65 K.A.I.C.** | MAIN CIRCUIT BREAKER: **3000 A**
REMARKS:

CIRCUIT BREAKER NO.	FRAME	RATING/ POLES	TYPE	LOAD DESCRIPTION	CONNECTED LOAD (kVA)	QUANTITY OF FEEDERS (SETS)	FEEDER (EACH SET) PHASE LEGS NO.	PHASE LEGS SIZE	NEUTRAL NO.	NEUTRAL SIZE	GROUND NO.	GROUND SIZE	INSULATION TYPE	CONDUIT SIZE	REMARKS
1	225A	225A/3P		PANEL 'EM-LS-H' VIA 'ATS-LS'	23.44	REFER TO DRAWING E-701 FOR FEEDER REQUIREMENTS									
2	800A	800A/3P		PANEL 'EM-EQ-H' VIA 'ATS-EQ'	432.80	REFER TO DRAWING E-701 FOR FEEDER REQUIREMENTS									
3	400A	400A/3P		PANEL 'EM-AS/RS-H' VIA 'ATS-AS/RS'	141.34	REFER TO DRAWING E-701 FOR FEEDER REQUIREMENTS									
4	1200A	1200A/3P		DISTRIBUTION PANELBOARD 'DP-AS/RS-1'	604.83	REFER TO DRAWING E-701 FOR FEEDER REQUIREMENTS									
5	1200A	800A/3P		DISTRIBUTION PANELBOARD 'DP-AS/RS-2'	279.09	REFER TO DRAWING E-701 FOR FEEDER REQUIREMENTS									
6	800A	800A/3P		PANEL 'DP-OFFICE'	416.67	REFER TO DRAWING E-701 FOR FEEDER REQUIREMENTS									

DISTRIBUTION BOARD DESIGNATION : **EMDP** — TOTAL CONNECTED LOAD: **597.6 KW**

VOLTAGE: **480Y/277 V** | NEUTRAL: **100%** | BUS RATING: **1200 A** | TOTAL DEMAND LOAD: **446.6 KW**
PHASE/WIRE: **3Ø, 4W** | MIN. K.A.I.C. SYM: **65 K.A.I.C.** | MAIN CIRCUIT BREAKER: **1200 A**
REMARKS:

CIRCUIT BREAKER NO.	FRAME	RATING/ POLES	TYPE	LOAD DESCRIPTION	CONNECTED LOAD (kVA)	QUANTITY OF FEEDERS (SETS)	FEEDER (EACH SET) PHASE LEGS NO.	PHASE LEGS SIZE	NEUTRAL NO.	NEUTRAL SIZE	GROUND NO.	GROUND SIZE	INSULATION TYPE	CONDUIT SIZE	REMARKS
1	225A	225A/3P		PANEL 'EM-LS-H' VIA 'ATS-LS'	23.44	REFER TO DRAWING E-701 FOR FEEDER REQUIREMENTS									
2	800A	800A/3P		PANEL 'EM-EQ-H' VIA 'ATS-EQ'	432.80	REFER TO DRAWING E-701 FOR FEEDER REQUIREMENTS									
3	400A	400A/3P		PANEL 'EM-AS/RS-H' VIA 'ATS-AS/RS'	141.34	REFER TO DRAWING E-701 FOR FEEDER REQUIREMENTS									
4	-	-		SPACE & PROVISIONS	-	-									

DISTRIBUTION BOARD DESIGNATION : **EM-EQ-H** — TOTAL CONNECTED LOAD: **432.8 KW**

VOLTAGE: **480Y/277 V** | NEUTRAL: **100%** | BUS RATING: **800 A** | TOTAL DEMAND LOAD: **242.0 KW**
PHASE/WIRE: **3Ø, 4W** | MIN. K.A.I.C. SYM: **65 K.A.I.C.** | MAIN CIRCUIT BREAKER: **600 A**
REMARKS:

CIRCUIT BREAKER NO.	FRAME	RATING/ POLES	TYPE	LOAD DESCRIPTION	CONNECTED LOAD (kVA)	QUANTITY OF FEEDERS (SETS)	FEEDER (EACH SET) PHASE LEGS NO.	PHASE LEGS SIZE	NEUTRAL NO.	NEUTRAL SIZE	GROUND NO.	GROUND SIZE	INSULATION TYPE	CONDUIT SIZE	REMARKS
1	-	-		SPACE & PROVISIONS	-	-									
2	400A	400A/3P		PANEL 'EM-QC-10'	393.24	REFER TO DRAWING E-703 FOR FEEDER REQUIREMENTS									
3	100A	60A/3P		ELEVATOR DISCONNECT	17.46	REFER TO DRAWING E-703 FOR FEEDER REQUIREMENTS									
4	-	-		SPACE & PROVISIONS	-	-									
5	-	-		SPACE & PROVISIONS	-	-									
6	-	-		SPACE & PROVISIONS	-	-									
7	150A	150A/3P		PANEL 'EM-EQ-L' VIA XFMR 'T-EM-EQ'	22.10	REFER TO DRAWING E-703 FOR FEEDER REQUIREMENTS									
8	-	-		SPACE & PROVISIONS	-	-									
9	-	-		SPACE & PROVISIONS	-	-									
10	-	-		SPACE & PROVISIONS	-	-									
11	-	-		SPACE & PROVISIONS	-	-									

DISTRIBUTION BOARD DESIGNATION : **DP-ASRS-1** — TOTAL CONNECTED LOAD: **604.8 KW**

VOLTAGE: **480Y/277 V** | NEUTRAL: **100%** | BUS RATING: **1200 A** | TOTAL DEMAND LOAD: **604.8 KW**
PHASE/WIRE: **3Ø, 4W** | MIN. K.A.I.C. SYM: **35 K.A.I.C.** | MAIN CIRCUIT BREAKER: **1200 A**
REMARKS:

CIRCUIT BREAKER NO.	FRAME	RATING/ POLES	TYPE	LOAD DESCRIPTION	LOAD (kVA)	QUANTITY OF FEEDERS (SETS)	FEEDER (EACH SET) PHASE LEGS NO.	PHASE LEGS SIZE	NEUTRAL NO.	NEUTRAL SIZE	GROUND NO.	GROUND SIZE	INSULATION TYPE	CONDUIT SIZE	REMARKS
1	200A	200A/3P		AS/RS SRM #2	141.34	REFER TO DRAWING E-202 FOR FEEDER REQUIREMENTS									
2	200A	200A/3P		AS/RS SRM #3	141.34	REFER TO DRAWING E-202 FOR FEEDER REQUIREMENTS									
3	100A	100A/3P		AS/RS MCP #1	20.78	REFER TO DRAWING E-201 FOR FEEDER REQUIREMENTS									
4	100A	100A/3P		AS/RS MCP #2	20.78	REFER TO DRAWING E-201 FOR FEEDER REQUIREMENTS									
5	100A	100A/3P		AS/RS MCP #3	20.78	REFER TO DRAWING E-202 FOR FEEDER REQUIREMENTS									
6	100A	100A/3P		AS/RS MCP #4	20.78	REFER TO DRAWING E-202 FOR FEEDER REQUIREMENTS									
7	100A	100A/3P		AS/RS MCP #5	20.78	REFER TO DRAWING E-202 FOR FEEDER REQUIREMENTS									
8	100A	100A/3P		AS/RS MCP #6	20.78	REFER TO DRAWING E-202 FOR FEEDER REQUIREMENTS									
9	100A	100A/3P		AS/RS MCP #7	20.78	REFER TO DRAWING E-202 FOR FEEDER REQUIREMENTS									
10	250A	250A/3P		AS/RS VRC	176.67	REFER TO DRAWING E-202 FOR FEEDER REQUIREMENTS									
11	-	-		SPACE & PROVISIONS	-	-									
12	-	-		SPACE & PROVISIONS	-	-									
13	-	-		SPACE & PROVISIONS	-	-									
14	-	-		SPACE & PROVISIONS	-	-									

DISTRIBUTION BOARD DESIGNATION : **DP-ASRS-2** — TOTAL CONNECTED LOAD: **279.1 KW**

VOLTAGE: **480Y/277 V** | NEUTRAL: **100%** | BUS RATING: **800 A** | TOTAL DEMAND LOAD: **199.3 KW**
PHASE/WIRE: **3Ø, 4W** | MIN. K.A.I.C. SYM: **35 K.A.I.C.** | MAIN CIRCUIT BREAKER: **800 A**
REMARKS:

CIRCUIT BREAKER NO.	FRAME	RATING/ POLES	TYPE	LOAD DESCRIPTION	LOAD (kVA)	QUANTITY OF FEEDERS (SETS)	FEEDER (EACH SET) PHASE LEGS NO.	PHASE LEGS SIZE	NEUTRAL NO.	NEUTRAL SIZE	GROUND NO.	GROUND SIZE	INSULATION TYPE	CONDUIT SIZE	REMARKS
1	100A	90A/3P		PANEL 'LP-AS/RS' VIA XFMR 'T-AS/RS'	29.04	REFER TO DRAWING E-702 FOR FEEDER REQUIREMENTS									
2	150A	125A/3P		AIR COMPRESSOR (60HP)	72.50	REFER TO DRAWING E-702 FOR FEEDER REQUIREMENTS									
3	150A	125A/3P		AIR COMPRESSOR (60HP) - STANDBY	72.50	REFER TO DRAWING E-702 FOR FEEDER REQUIREMENTS									
4	100A	20A/3P		AIR COMPRESSOR DRYER	2.50	REFER TO DRAWING E-702 FOR FEEDER REQUIREMENTS									
5	100A	90A/3P		PANEL 'LP-DOOR-A' VIA XFMR 'T-DOOR-A'	41.63	REFER TO DRAWING E-702 FOR FEEDER REQUIREMENTS									
6	150A	150A/3P		PANEL 'PP-M'	32.38	REFER TO DRAWING E-702 FOR FEEDER REQUIREMENTS									
7	100A	80A/1P		WATER HEATER 'WH(1)'	17.45	REFER TO DRAWING E-406 FOR BRANCH CIRCUIT REQUIREMENTS									
8	100A	60A/1P		WATER HEATER 'WH(2)'	11.10	REFER TO DRAWING E-406 FOR BRANCH CIRCUIT REQUIREMENTS									
9	-	-		SPACE & PROVISIONS	-	-									
10	-	-		SPACE & PROVISIONS	-	-									

DISTRIBUTION BOARD DESIGNATION : **DP-10** — TOTAL CONNECTED LOAD: **169.9 KW**

VOLTAGE: **480Y/277 V** | NEUTRAL: **100%** | BUS RATING: **800 A** | TOTAL DEMAND LOAD: **172.2 KW**
PHASE/WIRE: **3Ø, 4W** | MIN. K.A.I.C. SYM: **25 K.A.I.C.** | MAIN CIRCUIT BREAKER: **800 A**
REMARKS:

CIRCUIT BREAKER NO.	FRAME	RATING/ POLES	TYPE	LOAD DESCRIPTION	CONNECTED LOAD (kVA)	QUANTITY OF FEEDERS (SETS)	FEEDER (EACH SET) PHASE LEGS NO.	PHASE LEGS SIZE	NEUTRAL NO.	NEUTRAL SIZE	GROUND NO.	GROUND SIZE	INSULATION TYPE	CONDUIT SIZE	REMARKS
1	225A	200A/3P		PANELBOARD 'PPH-10A'	51.07	REFER TO DRAWING E-702 FOR FEEDER REQUIREMENTS									
2	-	-		SPACE & PROVISIONS	0.00	-									
3	400A	300A/3P		PANELBOARD 'DB' VIA XFMR 'T-10'	68.92	REFER TO DRAWING E-702 FOR FEEDER REQUIREMENTS									
4	100A	100A/3P		AS/RS MCP #9	20.78	REFER TO DRAWING E-209 FOR FEEDER REQUIREMENTS									
5	100A	100A/3P		AS/RS MCP #10	20.78	REFER TO DRAWING E-209 FOR FEEDER REQUIREMENTS									
6	225A	200A/3P		PANELBOARD 'PPH-10C'	8.36	REFER TO DRAWING E-702 FOR FEEDER REQUIREMENTS									
7	-	-		SPACE & PROVISIONS	-	-									
8	-	-		SPACE & PROVISIONS	-	-									

DISTRIBUTION BOARD DESIGNATION : **DB** — TOTAL CONNECTED LOAD: **68.9 KW**

VOLTAGE: **208Y/120 V** | NEUTRAL: **100%** | BUS RATING: **800 A** | TOTAL DEMAND LOAD: **68.9 KW**
PHASE/WIRE: **3Ø, 4W** | MIN. K.A.I.C. SYM: **22 K.A.I.C.** | MAIN CIRCUIT BREAKER: **600 A**
REMARKS:

CIRCUIT BREAKER NO.	FRAME	RATING/ POLES	TYPE	LOAD DESCRIPTION	CONNECTED LOAD (kVA)	QUANTITY OF FEEDERS (SETS)	FEEDER (EACH SET) PHASE LEGS NO.	PHASE LEGS SIZE	NEUTRAL NO.	NEUTRAL SIZE	GROUND NO.	GROUND SIZE	INSULATION TYPE	CONDUIT SIZE	REMARKS
1	150A	150A/3P		PANELBOARD 'LP-10A'	40.10	REFER TO DRAWING E-702 FOR FEEDER REQUIREMENTS									
2	100A	100A/3P		GUARD BOOTH PANELBOARD	28.82	REFER TO DRAWING E-702 FOR FEEDER REQUIREMENTS									
3	-	-		SPACE & PROVISIONS	-	-									
4	-	-		SPACE & PROVISIONS	-	-									
5	-	-		SPACE & PROVISIONS	-	-									
6	-	-		SPACE & PROVISIONS	-	-									

DISTRIBUTION BOARD DESIGNATION : **DP-OFFICE** — TOTAL CONNECTED LOAD: **416.7 KW**

VOLTAGE: **480Y/277 V** | NEUTRAL: **100%** | BUS RATING: **800 A** | TOTAL DEMAND LOAD: **396.7 KW**
PHASE/WIRE: **3Ø, 4W** | MIN. K.A.I.C. SYM: **25 K.A.I.C.** | MAIN CIRCUIT BREAKER: **800 A**
LOCATION: ADMIN OFFICE ELECTRICAL ROOM

CIRCUIT BREAKER NO.	FRAME	RATING/ POLES	TYPE	LOAD DESCRIPTION	CONNECTED LOAD (kVA)	QUANTITY OF FEEDERS (SETS)	FEEDER (EACH SET) PHASE LEGS NO.	PHASE LEGS SIZE	NEUTRAL NO.	NEUTRAL SIZE	GROUND NO.	GROUND SIZE	INSULATION TYPE	CONDUIT SIZE	REMARKS
1	225A	225A/3P		PANELBOARD 'PP-A' VIA XFMR 'T-OFFICE'	95.48	REFER TO DRAWING E-702 FOR FEEDER REQUIREMENTS									
2	400A	300A/3P		PANELBOARD 'LP-A'	139.13	REFER TO DRAWING E-702 FOR FEEDER REQUIREMENTS									
3	100A	30A/3P		ROOFTOP UNIT 'RTU-1'	21.62	REFER TO DRAWING E-307 FOR FEEDER REQUIREMENTS									
4	100A	25A/3P		ROOFTOP UNIT 'RTU-2'	15.80	REFER TO DRAWING E-307 FOR FEEDER REQUIREMENTS									
5	100A	25A/3P		ROOFTOP UNIT 'RTU-3'	15.80	REFER TO DRAWING E-307 FOR FEEDER REQUIREMENTS									
6	100A	15A/3P		ROOFTOP UNIT 'RTU-4'	10.81	REFER TO DRAWING E-307 FOR FEEDER REQUIREMENTS									
7	100A	15A/3P		ROOFTOP UNIT 'RTU-5'	10.81	REFER TO DRAWING E-307 FOR FEEDER REQUIREMENTS									
8	225A	225A/3P		PANELBOARD 'PP-B' VIA XFMR 'T-B'	107.24	REFER TO DRAWING E-702 FOR FEEDER REQUIREMENTS									
9	-	-		SPACE & PROVISIONS	-	-									
10	-	-		SPACE & PROVISIONS	-	-									

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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MANHATTAN BEER DISTRIBUTORS
20 DUNNIGAN DRIVE
SUFFERN, NEW YORK

KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID/CONSTRUCTION	02/16/2022

DRAWN BY : M.DIMATTIA
CHECKED BY : B.NEMCHEK
APPROVED BY : J.MIZRAHI
DATE : 09/10/21
SCALE : N.T.S.

DRAWING TITLE :
ELECTRICAL PANEL SCHEDULES SHEET 1 OF 6

DWG NUMBER :
E-601

PANEL DESIGNATION: **EM-EQ-L**

LOCATION: ADMIN OFFICE ELECTRICAL ROOM

REMARKS: * FURNISH AND INSTALL GFCI TYPE CIRCUIT BREAKER

SERVICE:	208Y/120 V 3 PHASE, 4 WIRE
MAIN BUS RATING:	225 AMPS
MAIN CIRCUIT BREAKER:	150 AMPS
SCC RATING (SYM.):	10 k A.I.C.
MOUNTING:	SURFACE MOUNTED
NEUTRAL BUS:	100%
GROUNDING:	EQUIPMENT GROUND BUS: YES; ISOLATED GROUND BUS: NO

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
ELEVATOR CAB LIGHTING	20A	1	2000			2	20A	IT ROOM RECEPTACLES
ELEVATOR MACHINERY SPACE RECEPT	20A	3		1680		4	20A	IT ROOM RECEPTACLES
ELEVATOR MACHINERY SPACE LIGHTS	20A	5			1700	6	20A	IT ROOM RECEPTACLES
ELEVATOR HOISTWAY RECEPT	20A	7	180			8	20A	SPARE
ELEVATOR HOISTWAY LIGHTS	20A	9		200		10	20A	SPARE
EMERGENCY ROOM EXHAUST 'EF-6'	20A	11			1028	12	20A	UNIT HEATER 'UH-1'
SPARE	20A	13	528			14	20A	UNIT HEATER 'UH-2'
LOADING DOCK DOOR T41	35A	15		2688		16	35A	LOADING DOCK DOOR T40
LOADING DOCK DOOR T39	35A	17			2688	18	35A	LOADING DOCK DOOR T38
LOADING DOCK DOOR T37	35A	19	2688			20	35A	LOADING DOCK DOOR T36
LOADING DOCK DOOR T35	35A	21		2688		22	35A	LOADING DOCK DOOR T34
LOADING DOCK DOOR T33	35A	23			2688	24	35A	LOADING DOCK DOOR T32
LOADING DOCK DOOR T31	35A	25	1344			26	20A	SPARE
SPARE	20A	27		0		28	20A	SPARE
SPARE	20A	29			0	30	20A	SPARE
SPARE	20A	31	0			32	20A	SPARE
SPARE	20A	33		0		34	20A	SPARE
SPARE	20A	35			0	36	20A	SPARE
SPARE	20A	37	0			38	20A	SPARE
SPARE	20A	39		0		40	20A	SPARE
SPARE	20A	41			0	42	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			6.74	7.26	8.10			
TOTAL CONNECTED LOAD			22.10 KVA			61.3 A		
TOTAL DEMAND LOAD			23.58 KVA			65.4 A		

PANEL DESIGNATION: **EM-ASRS-H**

LOCATION: EMERGENCY ELECTRICAL ROOM

REMARKS:

SERVICE:	480Y/277 V 3 PHASE, 4 WIRE
MAIN BUS RATING:	400 AMPS
MAIN CIRCUIT BREAKER:	400 AMPS
SCC RATING (SYM.):	65 k A.I.C.
MOUNTING:	SURFACE MOUNTED
NEUTRAL BUS:	100%
GROUNDING:	EQUIPMENT GROUND BUS: YES; ISOLATED GROUND BUS: NO

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
SRM#1	200A	1	47112			2	20A	SPARE
		3		47112		4	20A	SPARE
		5			47112	6	20A	SPARE
SPARE	20A	7	0			8	20A	SPARE
SPARE	20A	9		0		10	20A	SPARE
SPARE	20A	11			0	12	20A	SPARE
SPARE	20A	13	0			14	20A	SPARE
SPARE	20A	15		0		16	20A	SPARE
SPARE	20A	17			0	18	20A	SPARE
SPACE & PROVISIONS	-	19	0			20	-	SPACE & PROVISIONS
SPACE & PROVISIONS	-	21		0		22	-	SPACE & PROVISIONS
SPACE & PROVISIONS	-	23			0	24	-	SPACE & PROVISIONS
SPACE & PROVISIONS	-	25	0			26	-	SPACE & PROVISIONS
SPACE & PROVISIONS	-	27		0		28	-	SPACE & PROVISIONS
SPACE & PROVISIONS	-	29			0	30	-	SPACE & PROVISIONS
TOTAL CONNECTED LOAD PER PHASE (kVA)			47.11	47.11	47.11			
TOTAL CONNECTED LOAD			141.34 KVA			170.0 A		
TOTAL DEMAND LOAD			176.67 KVA			212.5 A		

PANEL DESIGNATION: **EM-QC-10**

LOCATION: 10 DUNNIGAN ELECTRICAL ROOM

REMARKS:

SERVICE:	480Y/277 V 3 PHASE, 4 WIRE
MAIN BUS RATING:	400 AMPS
MAIN CIRCUIT BREAKER:	400 AMPS
SCC RATING (SYM.):	14 k A.I.C.
MOUNTING:	SURFACE MOUNTED
NEUTRAL BUS:	100%
GROUNDING:	EQUIPMENT GROUND BUS: YES; ISOLATED GROUND BUS: NO

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
QUICK CHARGER #1	60A	1	23833			2	60A	QUICK CHARGER #2
		3		23833		4		
		5			23833	6		
QUICK CHARGER #3	60A	7	23833			8	60A	QUICK CHARGER #4
		9		23833		10		
		11			23833	12		
QUICK CHARGER #5	60A	13	23833			14	60A	QUICK CHARGER #6
		15		23833		16		
		17			23833	18		
QUICK CHARGER #7	60A	19	23833			20	60A	QUICK CHARGER #8
		21		23833		22		
		23			23833	24		
QUICK CHARGER #9	60A	25	23833			26	60A	QUICK CHARGER #10
		27		23833		28		
		29			23833	30		
QUICK CHARGER #11	60A	31	11917			32	20A	SPARE
		33		11917		34	20A	SPARE
		35			11917	36	20A	SPARE
SPARE	20A	37	0			38	20A	SPARE
SPARE	20A	39		0		40	20A	SPARE
SPARE	20A	41			0	42	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			131.08	131.08	131.08			
TOTAL CONNECTED LOAD			393.24 KVA			473.0 A		
TOTAL DEMAND LOAD			196.62 KVA			236.5 A		

NOTE: ONLY 50% OF THE QUICK CHARGERS SHALL BE UTILIZED AT ANY GIVEN TIME.

PANEL DESIGNATION: **PP-M**

LOCATION: AS/RS ELECTRICAL ROOM

REMARKS:

SERVICE:	480Y/277 V 3 PHASE, 4 WIRE
MAIN BUS RATING:	225 AMPS
MAIN LUGS ONLY:	150 AMPS
SCC RATING (SYM.):	35 k A.I.C.
MOUNTING:	SURFACE MOUNTED
NEUTRAL BUS:	100%
GROUNDING:	EQUIPMENT GROUND BUS: YES; ISOLATED GROUND BUS: NO

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
THERMOCYCLER 'TRG-4'	15A	1	4212			2	15A	THERMOCYCLER 'TRG-3'
		3		4212		4		
		5			4212	6		
THERMOCYCLER 'TMI-2'	15A	7	2688			8	15A	THERMOCYCLER 'TRA-3'
		9		2688		10		
		11			2688	12		
SPARE	20A	13	0			14	20A	SPARE
SPARE	20A	15		0		16	20A	SPARE
SPARE	20A	17			0	18	20A	SPARE
SPARE	20A	19	0			20	20A	SPARE
SPARE	20A	21		0		22	20A	SPARE
SPARE	20A	23			0	24	20A	SPARE
ASRS SOUTHLIGHTING	20A	25	1988			26	20A	ASRS SOUTHLIGHTING
ASRS SOUTHLIGHTING	20A	27		920		28	20A	SPARE
SPARE	20A	29			0	30	20A	SPARE
ASRS SOUTHLIGHTING	20A	31	1975			32	20A	ASRS SOUTHLIGHTING
ASRS SOUTHLIGHTING	20A	33		1973		34	20A	CANOPY LIGHTING
CANOPY LIGHTING	20A	35			1404	36	20A	CANOPY LIGHTING
CANOPY LIGHTING	20A	37	518			38	20A	JANITOR'S CLOSET 120 AND TOILET 121 LIGHTING
NEW BUILDING ELECTRIC ROOM LIGHTING	20A	39		120		40	20A	AIR COMPRESSION AND FIRE PUMP LIGHTING
SPARE	20A	41			0	42	20A	SPARE
SPARE	20A	43	468			44	20A	CANOPY LIGHTING
ASRS SOUTHLIGHTING	20A	45		1388		46	20A	CANOPY LIGHTING
ASRS SOUTHLIGHTING	20A	47			920	48	20A	SPARE
SPARE	20A	49	0			50	20A	SPARE
SPARE	20A	51		0		52	20A	SPARE
SPARE	20A	53			0	54	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			11.85	11.30	9.22			
TOTAL CONNECTED LOAD			32.38 KVA			38.9 A		
TOTAL DEMAND LOAD			35.29 KVA			42.5 A		

PANEL DESIGNATION: **LP-ASRS**

LOCATION: AS/RS ELECTRICAL ROOM

REMARKS: * FURNISH AND INSTALL GFCI TYPE CIRCUIT BREAKER

SERVICE:	208Y/120 V 3 PHASE, 4 WIRE
MAIN BUS RATING:	225 AMPS
MAIN CIRCUIT BREAKER:	150 AMPS
SCC RATING (SYM.):	10 k A.I.C.
MOUNTING:	SURFACE MOUNTED
NEUTRAL BUS:	100%
GROUNDING:	EQUIPMENT GROUND BUS: YES; ISOLATED GROUND BUS: NO

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
AAP #1	20A	1	1200			2	20A	PLC #1
AAP #2	20A	3		1200		4	20A	PLC #2
AAP #3	20A	5			1200	6	20A	PLC #3
PROFILE CHECK #1	20A	7	1200			8	20A	NETWORK PANEL
PROFILE CHECK #2	20A	9		1200		10	20A	PRINT AND APPLY #1
PROFILE CHECK #3	20A	11			1200	12	20A	PRINT AND APPLY #2
OVERHEAD MONITOR #1	20A	13	1200			14	20A	PRINT AND APPLY #3
OVERHEAD MONITOR #2	20A	15		1200		16	20A	PRINT AND APPLY #4
OVERHEAD MONITOR #3	20A	17			2040	18	20A	AS/RS MAINTENANCE RECEPTACLES
EXHAUST FAN 'EF-3' & 'EF-4'	20A	19	1273			20	20A	AS/RS MAINTENANCE RECEPTACLES
SPARE	20A	21		540		22	20A	ELECT. & MECH. ROOM RECEPTACLES
SPARE	20A	23			900	24	20A	RESTROOM RECEPTACLES
SPARE	20A	25	1500			26	20A	HAND DRYER
LOADING DOCK DOOR T61	20A	27		1944		28	20A	* WATER FOUNTAIN
LOADING DOCK DOOR T62	20A	29			2023	30	20A	TWO (2) ELECTRIC COVE HEATERS 'ECH-A'
LOADING DOCK DOOR T63	20A	31	2023			32		
LOADING DOCK DOOR T64	20A	33		2023		34	20A	TWO (2) ELECTRIC COVE HEATERS 'ECH-A'
SPARE	20A	35			679	36		
SPARE	20A	37	1500			38	20A	HAND DRYER
SPARE	20A	39		1500		40	20A	HAND DRYER
SPARE	20A	41			1500	42	20A	HAND DRYER
TOTAL CONNECTED LOAD PER PHASE (kVA)			9.90	9.61	9.54			
TOTAL CONNECTED LOAD			29.04 KVA			80.6 A		
TOTAL DEMAND LOAD			27.97 KVA			77.6 A		

PANEL DESIGNATION: **LP-DOOR-A**

LOCATION:

REMARKS:

SERVICE:	208Y/120 V 3 PHASE, 4 WIRE
MAIN BUS RATING:	225 AMPS
MAIN CIRCUIT BREAKER:	150 AMPS
SCC RATING (SYM.):	10 k A.I.C.
MOUNTING:	SURFACE MOUNTED
NEUTRAL BUS:	100%
GROUNDING:	EQUIPMENT GROUND BUS: YES; ISOLATED GROUND BUS: NO

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
LOADING DOCK DOOR T30	35A	1	2688			2	35A	LOADING DOCK DOOR T29
LOADING DOCK DOOR T28	35A	3		2688		4	35A	LOADING DOCK DOOR T27
LOADING DOCK DOOR T26	35A	5			2688	6	35A	LOADING DOCK DOOR T25
SPARE	20A	7	0			8	20A	SPARE
LOADING DOCK DOOR T22	35A	9		2688		10	35A	LOADING DOCK DOOR T21
LOADING DOCK DOOR T20	35A	11			2688	12	35A	LOADING DOCK DOOR T19
LOADING DOCK DOOR T18	35A	13	2688			14	35A	LOADING DOCK DOOR T17
LOADING DOCK DOOR T16	35A	15		2688		16	35A	LOADING DOCK DOOR T15
LOADING DOCK DOOR T14	35A	17			2688	18	35A	LOADING DOCK DOOR T13
LOADING DOCK DOOR T12	35A	19	2688			20	35A	LOADING DOCK DOOR T11
LOADING DOCK DOOR T10	35A	21		2688		22	35A	LOADING DOCK DOOR T09
LOADING DOCK DOOR T08	35A	23			2688	24	35A	LOADING DOCK DOOR T07
LOADING DOCK DOOR T60	35A	25	2688			26	35A	LOADING DOCK DOOR T05
LOADING DOCK DOOR T04	35A	27		2688		28	35A	LOADING DOCK DOOR T03
LOADING DOCK DOOR T02	35A	29			2688	30	35A	LOADING DOCK DOOR T01
SPARE	20A	31	2000			32	25A	ELECTRIC WALL HEATER 'EWH-5'
SPARE	20A	33		2000		34		
SPARE	20A	35			0	36	20A	SPARE
SPARE	20A	37	0			38	20A	SPARE
SPARE	20A	39		0		40	20A	SPARE
SPARE	20A	41			0	42	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			12.75	15.44	13.44			
TOTAL CONNECTED LOAD			41.63 KVA			115.6 A		
TOTAL DEMAND LOAD			34.11 KVA			94.7 A		

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. ALL 277/480V AND 120/208V FEEDERS AND BRANCH CIRCUIT CONDUCTORS SHALL BE ALUMINUM. CONTRACTOR SHALL PERFORM VOLTAGE DROP CALCULATIONS FOR ALL BRANCH CIRCUITS AND APPROPRIATELY SIZE CONDUCTORS AND ASSOCIATED CONDUITS BASED ON THE 2017 NATIONAL ELECTRIC CODE.
4. ALUMINUM CONDUCTORS SHALL BE UL LISTED AND COMPLY WITH ASTM B800, ASTM B801, UL 486C, AND ANSI H35.2-2017. INSTALLATION OF ALUMINUM CONDUCTORS SHALL BE INSTALLED IN COMPLIANCE WITH ANSI/NECA/AA 104-2012.
5. ALL SPLICES, TERMINATIONS, TAPS, AND CONDUCTOR CONNECTORS SHALL BE COMPATIBLE WITH CONDUCTOR MATERIAL. USE OXIDE INHIBITOR IN EACH SPLICE, TERMINATION, AND TAP FOR ALUMINUM CONDUCTORS.

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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MANHATTAN BEER DISTRIBUTORS
20 DUNNIGAN DRIVE
SUFFERN, NEW YORK

KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID/CONSTRUCTION	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	N.T.S.

DRAWING TITLE :
ELECTRICAL PANEL SCHEDULES SHEET 2 OF 6

DWG NUMBER :
E-602

PPH-10A

LOCATION: 10 DUNNIGAN ELECTRICAL ROOM
SERVICE: **480Y/277 V 3 PHASE, 4 WIRE**
MAIN BUS RATING: **225 AMPS**
MAIN LUGS ONLY: **200 AMPS**
SCC RATING (SYM.): **22 k A.I.C.**
MOUNTING: **SURFACE MOUNTED**
NEUTRAL BUS: **100%**
GROUNDING: EQUIPMENT GROUND BUS: **YES**, ISOLATED GROUND BUS: **NO**
REMARKS:

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
THERMOCYCLER 'TRG-5'	15A	1	19556			2	80A	WATER HEATER 'WH(1)'
		3		10406		4	40A	WATER HEATER 'WH(3)'
		5			7606	6	25A	WATER HEATER 'WH(4)'
THERMOCYCLER 'TRA-5'	15A	7	2106			8	20A	SPARE
		9		2106		10	20A	SPARE
		11			2106	12	20A	SPARE
THERMOCYCLER 'TRA-4'	15A	13	2106			14	20A	SPARE
		15		2106		16	20A	SPARE
		17			2106	18	20A	SPARE
SPARE	20A	19	0			20	20A	SPARE
EMERGENCY DISTRIBUTION ROOM LIGHTING	20A	21		54		22	20A	SPARE
10 DUNNIGAN ELECTRIC ROOM LIGHTING	20A	23			54	24	20A	SPARE
SPARE	20A	25	0			26	20A	SPARE
JANITOR'S CLOSET 122 AND TOILET 123 LIGHTING	20A	27		50		28	20A	SPARE
10 DUNNIGAN SOUTH SITE LIGHTING	20A	29			330	30	20A	SPARE
10 DUNNIGAN SOUTH SITE LIGHTING	20A	31	375			32	20A	SPARE
SPARE	20A	33		0		34	20A	SPARE
SPARE	20A	35			0	36	20A	SPARE
SPARE	20A	37	0			38	20A	SPARE
SPARE	20A	39		0		40	20A	SPARE
SPARE	20A	41			0	42	20A	SPARE

TOTAL CONNECTED LOAD PER PHASE (kVA)	24.14	14.72	12.20
TOTAL CONNECTED LOAD	51.07 KVA		61.4 A
TOTAL DEMAND LOAD	51.28 KVA		61.7 A

PPH-10C

LOCATION: 10 DUNNIGAN - NORTH SIDE
SERVICE: **480Y/277 V 3 PHASE, 4 WIRE**
MAIN BUS RATING: **225 AMPS**
MAIN CIRCUIT BREAKER: **200 AMPS**
SCC RATING (SYM.): **18 k A.I.C.**
MOUNTING: **SURFACE MOUNTED**
NEUTRAL BUS: **100%**
GROUNDING: EQUIPMENT GROUND BUS: **YES**, ISOLATED GROUND BUS: **NO**
REMARKS:

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
NORTH ASRS LIGHTING	20A	1	1799			2	20A	NORTH ASRS LIGHTING
NORTH ASRS LIGHTING	20A	3		1840		4	20A	NORTH ASRS LIGHTING
NORTH ASRS LIGHTING	20A	5			2070	6	20A	NORTH ASRS LIGHTING
NORTH ASRS LIGHTING	20A	7	920			8	20A	SPARE
NORTH ASRS LIGHTING	20A	9		920		10	20A	SPARE
10 DUNNIGAN NORTH SITE LIGHTING	20A	11			480	12	20A	SPARE
10 DUNNIGAN NORTH SITE LIGHTING	20A	13	330			14	20A	SPARE
SPARE	20A	15		0		16	20A	SPARE
SPARE	20A	17			0	18	20A	SPARE
SPARE	20A	19	0			20	20A	SPARE
SPARE	20A	21		0		22	20A	SPARE
SPARE	20A	23			0	24	20A	SPARE
SPARE	20A	25	0			26	20A	SPARE
SPARE	20A	27		0		28	20A	SPARE
SPARE	20A	29			0	30	20A	SPARE
SPARE	20A	31	0			32	20A	SPARE
SPARE	20A	33		0		34	20A	SPARE
SPARE	20A	35			0	36	20A	SPARE
SPARE	20A	37	0			38	20A	SPARE
SPARE	20A	39		0		40	20A	SPARE
SPARE	20A	41			0	42	20A	SPARE

TOTAL CONNECTED LOAD PER PHASE (kVA)	3.05	2.76	2.55
TOTAL CONNECTED LOAD	8.36 KVA		10.1 A
TOTAL DEMAND LOAD	10.45 KVA		12.6 A

PP-A

LOCATION: ADMIN OFFICE ELECTRICAL ROOM
SERVICE: **208Y/120 V 3 PHASE, 4 WIRE**
MAIN BUS RATING: **400 AMPS**
MAIN CIRCUIT BREAKER: **400 AMPS**
SCC RATING (SYM.): **10 k A.I.C.**
MOUNTING: **SURFACE MOUNTED**
NEUTRAL BUS: **100%**
GROUNDING: EQUIPMENT GROUND BUS: **YES**, ISOLATED GROUND BUS: **NO**
REMARKS: * FURNISH AND INSTALL GFCI TYPE CIRCUIT BREAKER.

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
MEZZ 1 - OPERATIONS OFFICE RECEPTACLES	20A	1	2520			2	20A	MEZZ 1 - OPERATIONS OFFICE RECEPTACLES
MEZZ 1 - OPERATIONS OFFICE RECEPTACLES	20A	3		2520		4	20A	MEZZ 1 - OPERATIONS OFFICE RECEPTACLES
MEZZ 1 - OPERATIONS OFFICE RECEPTACLES	20A	5			1800	6	20A	MEZZ 1 - DELIVERY ROOM RECEPTACLES
MEZZ 1 - RESTROOM RECEPTACLES	20A	7	2400			8	20A	* MEZZ 1 - VENDING MACHINE
MEZZ 1 - HAND DRYER	20A	9		3000		10	20A	* MEZZ 1 - VENDING MACHINE
MEZZ 1 - CORRIDOR & DELIVERY RECEPTACLES	20A	11			2580	12	20A	* MEZZ 1 - VENDING MACHINE
MEZZ 2 - MANAGERIAL OFFICE RECEPTACLES	20A	13	2340			14	20A	MEZZ 1 - BREAKROOM RECEPTACLES
MEZZ 2 - MANAGERIAL OFFICE RECEPTACLES	20A	15		900		16	20A	SPARE
MEZZ 2 - CONFERENCE ROOM RECETPACLES	20A	17			2760	18	20A	MEZZ 1 - MICROWAVE
MEZZ 2 - MEN'S LOCKER ROOM RECEPTACLES	20A	19	2580			20	20A	MEZZ 1 - REFRIGERATOR
MEZZ 2 - MEN'S RESTROOM RECEPTACLES	20A	21		1800		22	20A	MEZZ 2 - RECEPTION RECEPTACLES
MEZZ 2 - HAND DRYER	20A	23			2580	24	20A	MEZZ 2 - OFFICE RECEPTACLES
MEZZ 2 - CORRIDOR RECEPTACLES	20A	25	1620			26	20A	ADMIN OFFICE - PANTRY & LACTATION RECEPT.
ADMIN OFFICE - RESTROOM RECTEPTACLES	20A	27		2340		28	20A	ADMIN OFFICE - CATERING HALL RECEPTACLES
ADMIN OFFICE - COPIER	20A	29			2400	30	20A	ADMIN OFFICE - KITCHEN RECEPTACLES
ADMIN OFFICE - COPIER	20A	31	3000			32	20A	ADMIN OFFICE - REFRIGERATOR
ADMIN OFFICE - STORAGE, COPIER RECEPT	20A	33		2220		34	20A	ADMIN OFFICE - DISHWASHER
ADMIN OFFICE - PRESENTATION HALL RECEPT	20A	35			1260	36	20A	SPARE
ADMIN OFFICE - PRESENTATION HALL RECEPT	20A	37	1440			38	20A	ADMIN OFFICE - OFFICE 3 & 4 RECEPTACLES
ADMIN OFFICE - CONFERENCE RECEPTACLES	20A	39		2340		40	20A	ADMIN OFFICE - OFFICE 5 & 6 RECEPTACLES
ADMIN OFFICE - OFFICE 1 & 2 RECEPTACLES	20A	41			2520	42	20A	ADMIN OFFICE - OFFICE C RECEPTACLES
GSM OFFICE #1 RECEPTACLES	20A	43	1800			44	20A	ADMIN CENTER - FURNITURE SYSTEM
GSM OFFICE #2 RECEPTACLES	20A	45		1800		46	20A	ADMIN CENTER - FURNITURE SYSTEM
ADMIN ROOF RECEPTACLES	20A	47			2520	48	20A	ADMIN CENTER - FURNITURE SYSTEM
EXHAUST FAN 'EF-1'	15A	49	1776			50	20A	ADMIN CENTER - FURNITURE SYSTEM
EXHAUST FAN 'EF-2'	20A	51		3000		52	20A	ADMIN CENTER - FURNITURE SYSTEM
DUCTLESS SPLIT SYSTEM 'CC-1'	20A	53			2890	54	20A	ADMIN CENTER - FURNITURE SYSTEM
		55	2890			56	20A	ADMIN CENTER - FURNITURE SYSTEM
DUCTLESS SPLIT SYSTEM 'WDS-1'	15A	57		2276		58	20A	ADMIN CENTER - FURNITURE SYSTEM
		59			2276	60	20A	ADMIN CENTER - FURNITURE SYSTEM
ELECTRIC WALL HEATER 'EWH-1'	25A	61	3080			62	20A	ADMIN CENTER - FURNITURE SYSTEM
		63		3080		64	20A	ADMIN CENTER - FURNITURE SYSTEM
ELECTRIC WALL HEATER 'EWH-2'	25A	65			3080	66	20A	ADMIN CENTER - FURNITURE SYSTEM
		67	3700			68	20A	* ELECTRIC RADIANT FLOOR HEAT 'ERFH-4'
ADMIN LEVEL CEILING EXHAUST FANS	20A	69		1554		70	20A	ADMIN OFFICE - HAND DRYER
ADMIN CENTER - RECEPTACLES	20A	71			2760	72	20A	ADMIN OFFICE - HAND DRYER
MEZZ 1 - HAND DRYER	20A	73	3000			74	20A	MEZZ 2 - HAND DRYER
MEZZ 1 - HAND DRYER	20A	75		3000		76	20A	MEZZ 2 - HAND DRYER
MEZZ 2 - BREAKROOM RECEPTACLES	20A	77			1080	78	20A	MEZZ 2 - WOMEN'S RESTROOM RECEPTACLES
SPARE	20A	79	1500			80	20A	ADMIN OFFICE - HAND DRYER
SPARE	20A	81		1500		82	20A	ADMIN OFFICE - HAND DRYER
SPARE	20A	83			0	84	20A	SPARE

TOTAL CONNECTED LOAD PER PHASE (kVA)	33.65	31.33	30.51
TOTAL CONNECTED LOAD	95.48 KVA		265.0 A
TOTAL DEMAND LOAD	73.93 KVA		205.2 A

LP-10A

LOCATION: 10 DUNNIGAN ELECTRICAL ROOM
SERVICE: **208Y/120 V 3 PHASE, 4 WIRE**
MAIN BUS RATING: **225 AMPS**
MAIN CIRCUIT BREAKER: **150 AMPS**
SCC RATING (SYM.): **10 k A.I.C.**
MOUNTING: **SURFACE MOUNTED**
NEUTRAL BUS: **100%**
GROUNDING: EQUIPMENT GROUND BUS: **YES**, ISOLATED GROUND BUS: **NO**
REMARKS: * FURNISH AND INSTALL GFCI TYPE CIRCUIT BREAKER

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
AS/RS CONTROL PANEL	20A	1	1200			2	20A	AS/RS CONTROL PANEL
AS/RS MAINTENANCE RECEPTACLES	20A	3		1500		4	20A	AS/RS CONTROL PANEL
ELECTRICAL ROOM RECEPTACLES	20A	5			2400	6	20A	SWITCHGEAR HEATER
EXHAUST FAN 'EF-4' & 'EF-5'	20A	7	343			8	20A	SPARE
HAND DRYER	20A	9		2100		10	20A	* WATER FOUNTAIN
HAND DRYER	20A	11			1500	12	20A	SPARE
RESTROOM RECEPTACLES	20A	13	2064			14	35A	LOADING DOCK DOOR T88
LOADING DOCK DOOR T42	35A	15		2688		16	35A	LOADING DOCK DOOR T43
LOADING DOCK DOOR T44	35A	17			2688	18	35A	LOADING DOCK DOOR T45
LOADING DOCK DOOR T46	35A	19	2688			20	35A	LOADING DOCK DOOR T47
LOADING DOCK DOOR T48	35A	21		2688		22	35A	LOADING DOCK DOOR T49
LOADING DOCK DOOR T50	35A	23			2688	24	35A	LOADING DOCK DOOR T51
LOADING DOCK DOOR T52	35A	25	2688			26	35A	LOADING DOCK DOOR T53
LOADING DOCK DOOR T54	35A	27		2688		28	35A	LOADING DOCK DOOR T55
LOADING DOCK DOOR T56	35A	29			2688	30	35A	LOADING DOCK DOOR T57
LOADING DOCK DOOR T58	35A	31	2688			32	35A	LOADING DOCK DOOR T59
LOADING DOCK DOOR T60	35A	33		2324		34	20A	THREE (3) ELECTRIC COVE HEATERS 'ECH-A'
HAND DRYER	20A	35			2480	36		
SPARE	20A	37	0			38	20A	SPARE
SPARE	20A	39		0		40	20A	SPARE
SPARE	20A	41			0	42	20A	SPARE

TOTAL CONNECTED LOAD PER PHASE (kVA)	11.67	13.99	14.44
TOTAL CONNECTED LOAD	40.10 KVA		111.3 A
TOTAL DEMAND LOAD	40.10 KVA		111.3 A

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
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3. ALL 277/480V AND 120/208V FEEDERS AND BRANCH CIRCUIT CONDUCTORS SHALL BE ALUMINUM. CONTRACTOR SHALL PERFORM VOLTAGE DROP CALCULATIONS FOR ALL BRANCH CIRCUITS AND APPROPRIATELY SIZE CONDUCTORS AND ASSOCIATED CONDUITS BASED ON THE 2017 NATIONAL ELECTRIC CODE.
4. ALUMINUM CONDUCTORS SHALL BE UL LISTED AND COMPLY WITH ASTM B800, ASTM B801, UL 486C, AND ANSI H35.2-2017. INSTALLATION OF ALUMINUM CONDUCTORS SHALL BE INSTALLED IN COMPLIANCE WITH ANSI/NECA/AA 104-2012.
5. ALL SPLICES, TERMINATIONS, TAPS, AND CONDUCTOR CONNECTORS SHALL BE COMPATIBLE WITH CONDUCTOR MATERIAL. USE OXIDE INHIBITOR IN EACH SPLICE, TERMINATION, AND TAP FOR ALUMINUM CONDUCTORS.

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MANHATTAN BEER DISTRIBUTORS
20 DUNNIGAN DRIVE
SUFFERN, NEW YORK

KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID/CONSTRUCTION	02/16/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	N.T.S.

DRAWING TITLE :
ELECTRICAL PANEL SCHEDULES SHEET 3 OF 6

DWG NUMBER :
E-603

QC-20-A

LOCATION: 20 DUNNIGAN QUICK CHARGERS | **REMARKS:**

SERVICE: **480Y/277 V 3 PHASE, 4 WIRE** | MAIN BUS RATING: **400 AMPS** | MAIN CIRCUIT BREAKER: **400 AMPS** | SCC RATING (SYM.): **14 k A.I.C.** | MOUNTING: **SURFACE MOUNTED** | NEUTRAL BUS: **100%** | GROUNDING: EQUIPMENT GROUND BUS: **YES**, ISOLATED GROUND BUS: **NO**

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
		1	23833			2		
QUICK CHARGER #1	60A	3		23833		4	60A	QUICK CHARGER #2
		5			23833	6		
		7	23833			8		
QUICK CHARGER #3	60A	9		23833		10	60A	QUICK CHARGER #4
		11			23833	12		
		13	23833			14		
QUICK CHARGER #5	60A	15		23833		16	60A	QUICK CHARGER #6
		17			23833	18		
		19	23833			20		
QUICK CHARGER #7	60A	21		23833		22	60A	QUICK CHARGER #8
		23			23833	24		
		25	23833			26		
QUICK CHARGER #9	60A	27		23833		28	60A	QUICK CHARGER #10
		29			23833	30		
		31	23833			32		
QUICK CHARGER #11	60A	33		23833		34	60A	QUICK CHARGER #12
		35			23833	36		
		37	23833			38		
QUICK CHARGER #13	60A	39		23833		40	60A	QUICK CHARGER #14
		41			23833	42		
TOTAL CONNECTED LOAD PER PHASE (kVA)			166.83	166.83	166.83			
TOTAL CONNECTED LOAD			500.49 KVA			602.0 A		
TOTAL DEMAND LOAD			250.25 KVA			301.0 A		

NOTE: ONLY 50% OF THE QUICK CHARGERS SHALL BE UTILIZED AT ANY GIVEN TIME.

QC-20-D

LOCATION: 20 DUNNIGAN QUICK CHARGERS | **REMARKS:**

SERVICE: **480Y/277 V 3 PHASE, 4 WIRE** | MAIN BUS RATING: **400 AMPS** | MAIN CIRCUIT BREAKER: **400 AMPS** | SCC RATING (SYM.): **14 k A.I.C.** | MOUNTING: **SURFACE MOUNTED** | NEUTRAL BUS: **100%** | GROUNDING: EQUIPMENT GROUND BUS: **YES**, ISOLATED GROUND BUS: **NO**

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
		1	23833			2		
QUICK CHARGER #43	60A	3		23833		4	60A	QUICK CHARGER #44
		5			23833	6		
		7	23833			8		
QUICK CHARGER #45	60A	9		23833		10	60A	QUICK CHARGER #46
		11			23833	12		
		13	23833			14		
QUICK CHARGER #47	60A	15		23833		16	60A	QUICK CHARGER #48
		17			23833	18		
		19	23833			20		
QUICK CHARGER #49	60A	21		23833		22	60A	QUICK CHARGER #50
		23			23833	24		
		25	23833			26		
QUICK CHARGER #51	60A	27		23833		28	60A	QUICK CHARGER #52
		29			23833	30		
		31	23833			32		
QUICK CHARGER #53	60A	33		23833		34	60A	QUICK CHARGER #54
		35			23833	36		
QUICK CHARGER #55	60A	37	11917			38	20A	SPARE
		39		11917		40	20A	SPARE
		41			11917	42	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			154.91	154.91	154.91			
TOTAL CONNECTED LOAD			464.74 KVA			559.0 A		
TOTAL DEMAND LOAD			232.37 KVA			279.5 A		

NOTE: ONLY 50% OF THE QUICK CHARGERS SHALL BE UTILIZED AT ANY GIVEN TIME.

QC-20-B

LOCATION: 20 DUNNIGAN QUICK CHARGERS | **REMARKS:**

SERVICE: **480Y/277 V 3 PHASE, 4 WIRE** | MAIN BUS RATING: **400 AMPS** | MAIN CIRCUIT BREAKER: **400 AMPS** | SCC RATING (SYM.): **14 k A.I.C.** | MOUNTING: **SURFACE MOUNTED** | NEUTRAL BUS: **100%** | GROUNDING: EQUIPMENT GROUND BUS: **YES**, ISOLATED GROUND BUS: **NO**

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
		1	23833			2		
QUICK CHARGER #15	60A	3		23833		4	60A	QUICK CHARGER #16
		5			23833	6		
		7	23833			8		
QUICK CHARGER #17	60A	9		23833		10	60A	QUICK CHARGER #18
		11			23833	12		
		13	23833			14		
QUICK CHARGER #19	60A	15		23833		16	60A	QUICK CHARGER #20
		17			23833	18		
		19	23833			20		
QUICK CHARGER #21	60A	21		23833		22	60A	QUICK CHARGER #22
		23			23833	24		
		25	23833			26		
QUICK CHARGER #23	60A	27		23833		28	60A	QUICK CHARGER #24
		29			23833	30		
		31	23833			32		
QUICK CHARGER #25	60A	33		23833		34	60A	QUICK CHARGER #26
		35			23833	36		
		37	23833			38		
QUICK CHARGER #27	60A	39		23833		40	60A	QUICK CHARGER #28
		41			23833	42		
TOTAL CONNECTED LOAD PER PHASE (kVA)			166.83	166.83	166.83			
TOTAL CONNECTED LOAD			500.49 KVA			602.0 A		
TOTAL DEMAND LOAD			250.25 KVA			301.0 A		

NOTE: ONLY 50% OF THE QUICK CHARGERS SHALL BE UTILIZED AT ANY GIVEN TIME.

PP-20A

LOCATION: 20 DUNNIGAN | **REMARKS:**

SERVICE: **480Y/277 V 3 PHASE, 4 WIRE** | MAIN BUS RATING: **400 AMPS** | MAIN CIRCUIT BREAKER: **400 AMPS** | SCC RATING (SYM.): **22 k A.I.C.** | MOUNTING: **SURFACE MOUNTED** | NEUTRAL BUS: **100%** | GROUNDING: EQUIPMENT GROUND BUS: **YES**, ISOLATED GROUND BUS: **NO**

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
		1	2117			2		
THERMOCYCLER 'TRG-2'	15A	3		2136		4	60A	PANEL 'LP-DOOR-B' VIA XFMR 'T-DOOR-B'
		5			2130	6		
		7	2106			8	20A	SPARE
THERMOCYCLER 'TRA-2'	15A	9		2106		10	20A	SPARE
		11			2106	12	20A	SPARE
		13	582			14	20A	SPARE
THERMOCYCLER 'TMI-2'	15A	15		582		16	20A	SPARE
		17			582	18	20A	SPARE
SPARE	20A	19	0			20	20A	SPARE
SPARE	20A	21		0		22	20A	SPARE
SPARE	20A	23			0	24	20A	SPARE
SPARE	20A	25	0			26	20A	SPARE
SPARE	20A	27		0		28	20A	SPARE
SPARE	20A	29			0	30	20A	SPARE
SPARE	20A	31	0			32	20A	SPARE
SPARE	20A	33		0		34	20A	SPARE
SPARE	20A	35			0	36	20A	SPARE
SPARE	20A	37	0			38	20A	SPARE
SPARE	20A	39		0		40	20A	SPARE
SPARE	20A	41			0	42	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			4.81	4.82	4.82			
TOTAL CONNECTED LOAD			14.45 KVA			17.4 A		
TOTAL DEMAND LOAD			14.43 KVA			17.4 A		

PP-20B

LOCATION: 20 DUNNIGAN | **REMARKS:**

SERVICE: **480Y/277 V 3 PHASE, 4 WIRE** | MAIN BUS RATING: **400 AMPS** | MAIN CIRCUIT BREAKER: **400 AMPS** | SCC RATING (SYM.): **22 k A.I.C.** | MOUNTING: **SURFACE MOUNTED** | NEUTRAL BUS: **100%** | GROUNDING: EQUIPMENT GROUND BUS: **YES**, ISOLATED GROUND BUS: **NO**

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
		1	2106			2	20A	SPARE
THERMOCYCLER 'TRG-1'	20A	3		2106		4	20A	SPARE
		5			2106	6	20A	SPARE
		7	2106			8	20A	SPARE
THERMOCYCLER 'TRA-1'	20A	9		2106		10	20A	SPARE
		11			2106	12	20A	SPARE
SPARE	20A	13	0			14	20A	SPARE
SPARE	20A	15		0		16	20A	SPARE
SPARE	20A	17			0	18	20A	SPARE
SPARE	20A	19	0			20	20A	SPARE
SPARE	20A	21		0		22	20A	SPARE
SPARE	20A	23			0	24	20A	SPARE
SPARE	20A	25	0			26	20A	SPARE
SPARE	20A	27		0		28	20A	SPARE
SPARE	20A	29			0	30	20A	SPARE
SPARE	20A	31	0			32	20A	SPARE
SPARE	20A	33		0		34	20A	SPARE
SPARE	20A	35			0	36	20A	SPARE
20 DUNNIGAN SITE LIGHTING	20A	37	195			38	20A	SPARE
PARKING DECK UNDERSIDE WEST LIGHTING	20A	39		540		40	20A	SPARE
SPARE	20A	41			0	42	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			4.41	4.75	4.21			
TOTAL CONNECTED LOAD			13.37 KVA			16.1 A		
TOTAL DEMAND LOAD			13.56 KVA			16.3 A		

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. ALL 277/480V AND 120/208V FEEDERS AND BRANCH CIRCUIT CONDUCTORS SHALL BE ALUMINUM. CONTRACTOR SHALL PERFORM VOLTAGE DROP CALCULATIONS FOR ALL BRANCH CIRCUITS AND APPROPRIATELY SIZE CONDUCTORS AND ASSOCIATED CONDUITS BASED ON THE 2017 NATIONAL ELECTRIC CODE.
4. ALUMINUM CONDUCTORS SHALL BE UL LISTED AND COMPLY WITH ASTM B800, ASTM B801, UL 486C, AND ANSI H35.2-2017. INSTALLATION OF ALUMINUM CONDUCTORS SHALL BE INSTALLED IN COMPLIANCE WITH ANSI/NECA/AA 104-2012.
5. ALL SPLICES, TERMINATIONS, TAPS, AND CONDUCTOR CONNECTORS SHALL BE COMPATIBLE WITH CONDUCTOR MATERIAL. USE OXIDE INHIBITOR IN EACH SPLICE, TERMINATION, AND TAP FOR ALUMINUM CONDUCTORS.

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MANHATTAN BEER DISTRIBUTORS
20 DUNNIGAN DRIVE
SUFFERN, NEW YORK

KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID/CONSTRUCTION	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	N.T.S.

DRAWING TITLE :
ELECTRICAL PANEL SCHEDULES SHEET 4 OF 6

DWG NUMBER :
E-604

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

PANEL DESIGNATION: LP-DOOR-B

LOCATION:

SERVICE: 208Y/120 V 3 PHASE, 4 WIRE
MAIN BUS RATING: 100 AMPS
MAIN CIRCUIT BREAKER: 100 AMPS
SCC RATING (SYM.): 10 k A.I.C.
MOUNTING: SURFACE MOUNTED

REMARKS:

NEUTRAL BUS: 100%
GROUNDING: EQUIPMENT GROUND BUS: YES; ISOLATED GROUND BUS: NO

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
LOADING DOCK DOOR T85	20A	1	2688			2	20A	LOADING DOCK DOOR T84
LOADING DOCK DOOR T83	20A	3		2688		4	20A	LOADING DOCK DOOR T82
LOADING DOCK DOOR T81	20A	5			2688	6	20A	LOADING DOCK DOOR T80
LOADING DOCK DOOR T79	20A	7	2688			8	20A	LOADING DOCK DOOR T78
LOADING DOCK DOOR T77	20A	9		2688		10	20A	LOADING DOCK DOOR T76
LOADING DOCK DOOR T75	20A	11			2688	12	20A	LOADING DOCK DOOR T74
LOADING DOCK DOOR T73	20A	13	2688			14	20A	LOADING DOCK DOOR T72
LOADING DOCK DOOR T71	20A	15		2688		16	20A	LOADING DOCK DOOR T70
LOADING DOCK DOOR T69	20A	17			2688	18	20A	LOADING DOCK DOOR T68
LOADING DOCK DOOR T67	20A	19	2688			20	20A	LOADING DOCK DOOR T66
LOADING DOCK DOOR T65	20A	21		2688		22	20A	LOADING DOCK DOOR T86
SPARE	20A	23			0	24	20A	SPARE
SPARE	20A	25	0			26	20A	SPARE
SPARE	20A	27		0		28	20A	SPARE
SPARE	20A	29			0	30	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			10.75	10.75	8.06			
TOTAL CONNECTED LOAD			29.57 KVA			82.1 A		
TOTAL DEMAND LOAD			23.65 KVA			65.7 A		

PANEL DESIGNATION: PP-B

LOCATION: ADMIN OFFICE ELECTRICAL ROOM

SERVICE: 208Y/120 V 3 PHASE, 4 WIRE
MAIN BUS RATING: 400 AMPS
MAIN CIRCUIT BREAKER: 400 AMPS
SCC RATING (SYM.): 10 k A.I.C.
MOUNTING: SURFACE MOUNTED

REMARKS:

NEUTRAL BUS: 100%
GROUNDING: EQUIPMENT GROUND BUS: YES; ISOLATED GROUND BUS: NO

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
HEAT PUMP 'HP-1' WITH HEATER	50A	1	6854			2	25A	HEAT PUMP 'HP-1' OUTDOOR UNIT
		3		6854		4		
HEAT PUMP 'HP-2' WITH HEATER	50A	5			6854	6	25A	HEAT PUMP 'HP-2' OUTDOOR UNIT
		7	6854			8		
HEAT PUMP 'HP-3' WITH HEATER	50A	9		6854		10	25A	HEAT PUMP 'HP-3' OUTDOOR UNIT
		11			6854	12		
HEAT PUMP 'HP-4' WITH HEATER	50A	13	7020			14	30A	HEAT PUMP 'HP-4' OUTDOOR UNIT
		15		7020		16		
HEAT PUMP 'HP-5' WITH HEATER	50A	17			7020	18	30A	HEAT PUMP 'HP-5' OUTDOOR UNIT
		19	7020			20		
HEAT PUMP 'HP-6' WITH HEATER	50A	21		7020		22	30A	HEAT PUMP 'HP-6' OUTDOOR UNIT
		23			7020	24		
HEAT PUMP 'HP-7' WITH HEATER	50A	25	7998			26	40A	HEAT PUMP 'HP-7' OUTDOOR UNIT
		27		7998		28		
ELECTRIC WALL HEATER	25A	29			2000	30	20A	SPARE
		31	2000			32	20A	SPARE
ELECTRIC WALL HEATER	25A	33		2000		34	20A	SPARE
		35			2000	36	20A	SPARE
SPARE	20A	37	0			38	20A	SPARE
SPARE	20A	39		0		40	20A	SPARE
SPARE	20A	41			0	42	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			37.74	37.74	31.75			
TOTAL CONNECTED LOAD			107.24 KVA			297.7 A		
TOTAL DEMAND LOAD			107.24 KVA			297.7 A		

PANEL DESIGNATION: EM-LS-H

LOCATION: EMERGENCY ELECTRICAL ROOM

SERVICE: 480Y/277 V 3 PHASE, 4 WIRE
MAIN BUS RATING: 225 AMPS
MAIN CIRCUIT BREAKER: 225 AMPS
SCC RATING (SYM.): 65 k A.I.C.
MOUNTING: SURFACE MOUNTED

REMARKS:

NEUTRAL BUS: 100%
GROUNDING: EQUIPMENT GROUND BUS: YES; ISOLATED GROUND BUS: NO

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
PANELBOARD 'EM-LP-A'	60A	1	6626			2	60A	PANELBOARD 'EM-LS-L' VIA XFMR 'T-EM-LS'
		3		4115		4		
		5			1821	6		
PANELBOARD 'EM-LP-B'	60A	7	1867			8	20A	SPARE
		9		1867		10	20A	SPARE
		11			1840	12	20A	SPARE
PANELBOARD 'EM-LP-C'	60A	13	1840			14	20A	SPARE
		15		1718		16	20A	SPARE
		17			1745	18	20A	SPARE
SPARE	20A	19	0			20	20A	SPARE
SPARE	20A	21		0		22	20A	SPARE
SPARE	20A	23			0	24	20A	SPARE
SPARE	20A	25	0			26	20A	SPARE
SPARE	20A	27		0		28	20A	SPARE
SPARE	20A	29			0	30	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			10.33	7.70	5.41			
TOTAL CONNECTED LOAD			23.44 KVA			28.2 A		
TOTAL DEMAND LOAD			27.87 KVA			33.5 A		

PANEL DESIGNATION: EM-LP-A

LOCATION: ADMIN OFFICE ELECTRICAL ROOM

SERVICE: 480Y/277 V 3 PHASE, 4 WIRE
MAIN BUS RATING: 100 AMPS
NON-FUSED MAIN SWITCH: 60 AMPS
SCC RATING (SYM.): 18 k A.I.C.
MOUNTING: SURFACE MOUNTED

REMARKS:

NEUTRAL BUS: 100%
GROUNDING: EQUIPMENT GROUND BUS: YES; ISOLATED GROUND BUS: NO

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
1ST MEZZANINE EMERGENCY LIGHTING	20A	1	241			2	20A	1ST MEZZANINE EMERGENCY LIGHTING
SPARE	20A	3		120		4	20A	PARRIAL WAREHOUSE EMERGENCY LIGHTING
2ND MEZZANINE EMERGENCY LIGHTING	20A	5			1231	6	20A	ADMIN OFFICE EMERGENCY LIGHTING
SPARE	20A	7	990			8	20A	ADMIN OFFICE EMERGENCY LIGHTING
EGRESS STAIR A EMERGENCY LIGHTING	20A	9		123		10	20A	SPARE
EGRESS STAIR A EMERGENCY LIGHTING	20A	11			123	12	20A	SPARE
EGRESS STAIR B EMERGENCY LIGHTING	20A	13	205			14	20A	SPARE
EGRESS STAIR B EMERGENCY LIGHTING	20A	15		1024		16	20A	SPARE
EGRESS STAIR C EMERGENCY LIGHTING	20A	17			287	18	20A	SPARE
EGRESS STAIR C EMERGENCY LIGHTING	20A	19	410			20	20A	SPARE
SPARE	20A	21		0		22	20A	SPARE
SPARE	20A	23			0	24	20A	SPARE
SPARE	20A	25	0			26	20A	SPARE
SPARE	20A	27		0		28	20A	SPARE
SPARE	20A	29			0	30	20A	SPARE
SPARE	20A	31	0			32	20A	SPARE
SPARE	20A	33		0		34	20A	SPARE
SPARE	20A	35			0	36	20A	SPARE
SPARE	20A	37	0			38	20A	SPARE
SPARE	20A	39		0		40	20A	SPARE
SPARE	20A	41			0	42	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			1.85	1.27	1.64			
TOTAL CONNECTED LOAD			4.75 KVA			5.7 A		
TOTAL DEMAND LOAD			5.94 KVA			7.1 A		

PANEL DESIGNATION: EM-LS-L

LOCATION: EMERGENCY ELECTRICAL ROOM

SERVICE: 208Y/120 V 3 PHASE, 4 WIRE
MAIN BUS RATING: 100 AMPS
MAIN FUSES: 100 AMPS
SCC RATING (SYM.): 10 k A.I.C.
MOUNTING: SURFACE MOUNTED

REMARKS:

NEUTRAL BUS: 100%
GROUNDING: EQUIPMENT GROUND BUS: YES; ISOLATED GROUND BUS: NO

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
SPRINKLER CABINET COMPRESSOR ROOM	20A	1	3600			2	40A	GENERATOR LOAD CENTER
EXHAUST FAN 'EF-4'	20A	3		2748		4		
SPARE	20A	5			180	6	20A	GFCI ELEVATOR PIT
SPRINKLER CABINET MEZZ	20A	7	1180			8	20A	GFCI RECEPETACLE FOR ELEV SUMP PUMP
SPARE	20A	9		100		10	20A	ELEVATOR PIT LIGHT
SPARE	20A	11			0	12	20A	SPARE
SPARE	20A	13	0			14	20A	SPARE
SPARE	20A	15		0		16	20A	SPARE
SPARE	20A	17			0	18	20A	SPARE
SPARE	20A	19	0			20	20A	SPARE
SPARE	20A	21		0		22	20A	SPARE
SPARE	20A	23			0	24	20A	SPARE
SPARE	20A	25	0			26	20A	SPARE
SPARE	20A	27		0		28	20A	SPARE
SPARE	20A	29			0	30	20A	SPARE
SPARE	20A	31	0			32	20A	SPARE
SPARE	20A	33		0		34	20A	SPARE
SPARE	20A	35			0	36	20A	SPARE
SPARE	20A	37	0			38	20A	SPARE
SPARE	20A	39		0		40	20A	SPARE
SPARE	20A	41			0	42	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			4.78	2.85	0.18			
TOTAL CONNECTED LOAD			7.81 KVA			21.7 A		
TOTAL DEMAND LOAD			8.33 KVA			23.1 A		

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. ALL 277/480V AND 120/208V FEEDERS AND BRANCH CIRCUIT CONDUCTORS SHALL BE ALUMINUM. CONTRACTOR SHALL PERFORM VOLTAGE DROP CALCULATIONS FOR ALL BRANCH CIRCUITS AND APPROPRIATELY SIZE CONDUCTORS AND ASSOCIATED CONDUITS BASED ON THE 2017 NATIONAL ELECTRIC CODE.
4. ALUMINUM CONDUCTORS SHALL BE UL LISTED AND COMPLY WITH ASTM B800, ASTM B801, UL 486C, AND ANSI H35.2-2017. INSTALLATION OF ALUMINUM CONDUCTORS SHALL BE INSTALLED IN COMPLIANCE WITH ANSI/NECA/AA 104-2012.
5. ALL SPLICES, TERMINATIONS, TAPS, AND CONDUCTOR CONNECTORS SHALL BE COMPATIBLE WITH CONDUCTOR MATERIAL. USE OXIDE INHIBITOR IN EACH SPLICE, TERMINATION, AND TAP FOR ALUMINUM CONDUCTORS.

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MANHATTAN BEER DISTRIBUTORS
20 DUNNIGAN DRIVE
SUFFERN, NEW YORK

KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID/CONSTRUCTION	08/30/2022

DRAWN BY : M.DIMATTIA
CHECKED BY : B.NEMCHEK
APPROVED BY : J.MIZRAHI
DATE : 09/10/21
SCALE : N.T.S.

DRAWING TITLE :
ELECTRICAL PANEL SCHEDULES SHEET 5 OF 6

DWG NUMBER :
E-605

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

PANEL DESIGNATION: **LP-A**

LOCATION: ADMIN OFFICE ELECTRICAL ROOM

REMARKS:

SERVICE:	480Y/277 V 3 PHASE, 4 WIRE
MAIN BUS RATING:	400 AMPS
MAIN CIRCUIT BREAKER:	300 AMPS
SCC RATING (SYM.):	10 k A.I.C.
MOUNTING:	SURFACE MOUNTED
NEUTRAL BUS:	100%
GROUNDING:	EQUIPMENT GROUND BUS: YES; ISOLATED GROUND BUS: NO

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
PARTIAL WAREHOUSE UNDERSIDE LIGHTING	20A	1	440			2	20A	SPARE
2ND MEZZANINE PARK DECK LIGHTING	20A	3		573		4	20A	1ST MEZZANINE CORRIDOR LIGHTING
1ST MEZZANINE OPERATIONS OFFICES LIGHTING	20A	5			190	6	20A	1ST MEZZANINE DELIVERY ROOM LIGHTING
1ST MEZZANINE CLOSET AND TOILET LIGHTING	20A	7	209			8	20A	1ST MEZZANINE BREAK ROOM LIGHTING
2ND MEZZANINE LIGHTING	20A	9		1633		10	20A	2ND MEZZANINE PARK DECK LIGHTING
ADMIN LEVEL LIGHTING	20A	11			2622	12	20A	ADMIN LEVEL LIGHTING
SPARE	20A	13	0			14	20A	SPARE
SPARE	20A	15		0		16	20A	SPARE
SPARE	20A	17			0	18	20A	SPARE
SPARE	20A	19	0			20	20A	SPARE
SPARE	20A	21		483		22	20A	PARKING DECK UNDERSIDE EAST LIGHTING
PARKING DECK UNDERSIDE EAST LIGTHING	20A	23			11379	24	50A	1ST MEZZ. WATER HEATER 'WH(2)'
1ST MEZZ. WATER HEATER 'WH(1)'	80A	25	28530			26	50A	2ND MEZZ. WATER HEATER 'WH(2)'
2ND MEZZ. WATER HEATER 'WH(1)'	80A	27		28530		28	50A	ADMIN WATER HEATER 'WH(2)'
ADMIN WATER HEATER 'WH(1)'	80A	29			28530	30	50A	ADMIN WATER HEATER 'WH(2)'
ADMIN WATER HEATER 'WH(3)'	40A	31	13850			32	25A	1ST MEZZ. WATER HEATER 'WH(4)'
2ND MEZZ. WATER HEATER 'WH(3)'	40A	33		13850		34	25A	1ST MEZZ. WATER HEATER 'WH(4)'
ADMIN WATER HEATER 'WH(3)'	40A	35			8310	36	20A	SPARE
SPARE	20A	37	0			38	20A	SPARE
SPARE	20A	39		0		40	20A	SPARE
SPARE	20A	41			0	42	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			43.03	45.07	51.03			
TOTAL CONNECTED LOAD			139.13 KVA			167.3 A		
TOTAL DEMAND LOAD			140.74 KVA			169.3 A		

PANEL DESIGNATION: **EM-LP-B**

LOCATION: EMERGENCY ELECTRICAL ROOM

REMARKS:

SERVICE:	480Y/277 V 3 PHASE, 4 WIRE
MAIN BUS RATING:	100 AMPS
MAIN CIRCUIT BREAKER:	60 AMPS
SCC RATING (SYM.):	18 k A.I.C.
MOUNTING:	SURFACE MOUNTED
NEUTRAL BUS:	100%
GROUNDING:	EQUIPMENT GROUND BUS: YES; ISOLATED GROUND BUS: NO

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
NORTH ASRS EMERGENCY LIGHTING	20A	1	947			2	20A	SPARE
NORTH ASRS EMERGENCY LIGHTING	20A	3		947		4	20A	SPARE
NORTH ASRS EMERGENCY LIGHTING	20A	5			920	6	20A	SPARE
NORTH ASRS EMERGENCY LIGHTING	20A	7	920			8	20A	SPARE
NORTH ASRS EMERGENCY LIGHTING	20A	9		920		10	20A	SPARE
SOUTH ASRS EMERGENCY LIGHTING	20A	11			920	12	20A	SPARE
SPARE	20A	13	0			14	20A	SPARE
SPARE	20A	15		0		16	20A	SPARE
SPARE	20A	17			0	18	20A	SPARE
SPARE	20A	19	0			20	20A	SPARE
SPARE	20A	21		0		22	20A	SPARE
SPARE	20A	23			0	24	20A	SPARE
SPARE	20A	25	0			26	20A	SPARE
SPARE	20A	27		0		28	20A	SPARE
SPARE	20A	29			0	30	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			1.87	1.87	1.84			
TOTAL CONNECTED LOAD			5.57 KVA			6.7 A		
MINIMUM FEEDER SIZE PER ARTICLE 220			6.97 KVA			8.4 A		

PANEL DESIGNATION: **EM-LP-C**

LOCATION: 10 DUNNIGAN ELECTRICAL ROOM

REMARKS:

SERVICE:	480Y/277 V 3 PHASE, 4 WIRE
MAIN BUS RATING:	100 AMPS
MAIN CIRCUIT BREAKER:	60 AMPS
SCC RATING (SYM.):	18 k A.I.C.
MOUNTING:	SURFACE MOUNTED
NEUTRAL BUS:	100%
GROUNDING:	EQUIPMENT GROUND BUS: YES; ISOLATED GROUND BUS: NO

SERVICE TO:	TRIP	NO.	A	B	C	NO.	TRIP	SERVICE TO:
SOUTH ASRS EMERGENCY LIGHTING	20A	1	920			2	20A	SPARE
SOUTH ASRS EMERGENCY LIGHTING	20A	3		798		4	20A	SPARE
SOUTH ASRS EMERGENCY LIGHTING	20A	5			825	6	20A	SPARE
SOUTH ASRS EMERGENCY LIGHTING	20A	7	920			8	20A	SPARE
SOUTH ASRS EMERGENCY LIGHTING	20A	9		920		10	20A	SPARE
SOUTH ASRS EMERGENCY LIGHTING	20A	11			920	12	20A	SPARE
SPARE	20A	13	0			14	20A	SPARE
SPARE	20A	15		0		16	20A	SPARE
SPARE	20A	17			0	18	20A	SPARE
SPARE	20A	19	0			20	20A	SPARE
SPARE	20A	21		0		22	20A	SPARE
SPARE	20A	23			0	24	20A	SPARE
SPARE	20A	25	0			26	20A	SPARE
SPARE	20A	27		0		28	20A	SPARE
SPARE	20A	29			0	30	20A	SPARE
TOTAL CONNECTED LOAD PER PHASE (kVA)			1.84	1.72	1.75			
TOTAL CONNECTED LOAD			5.30 KVA			6.4 A		
MINIMUM FEEDER SIZE PER ARTICLE 220			6.63 KVA			8.0 A		

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWINGS E-701, E-702, AND E-703 FOR ELECTRICAL ONE-LINE DIAGRAMS.
3. ALL 277/480V AND 120/208V FEEDERS AND BRANCH CIRCUIT CONDUCTORS SHALL BE ALUMINUM. CONTRACTOR SHALL PERFORM VOLTAGE DROP CALCULATIONS FOR ALL BRANCH CIRCUITS AND APPROPRIATELY SIZE CONDUCTORS AND ASSOCIATED CONDUITS BASED ON THE 2017 NATIONAL ELECTRIC CODE.
4. ALUMINUM CONDUCTORS SHALL BE UL LISTED AND COMPLY WITH ASTM B800, ASTM B801, UL 486C, AND ANSI H35.2-2017. INSTALLATION OF ALUMINUM CONDUCTORS SHALL BE INSTALLED IN COMPLIANCE WITH ANSI/NECA/AA 104-2012.
5. ALL SPLICES, TERMINATIONS, TAPS, AND CONDUCTOR CONNECTORS SHALL BE COMPATIBLE WITH CONDUCTOR MATERIAL. USE OXIDE INHIBITOR IN EACH SPLICE, TERMINATION, AND TAP FOR ALUMINUM CONDUCTORS.

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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MANHATTAN BEER DISTRIBUTORS
20 DUNNIGAN DRIVE
SUFFERN, NEW YORK

KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID/CONSTRUCTION	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	N.T.S.

DRAWING TITLE :
ELECTRICAL PANEL SCHEDULES SHEET 6 OF 6

DWG NUMBER :
E-606

LIGHTING CONTROL LEGEND:

- CEILING MOUNTED OCCUPANCY SENSOR
- EMERGENCY LIGHTING LOAD CONTROLLER
- SINGLE INTERFACE ROOM LIGHTING CONTROLLER
- ON/OFF DIGITAL SWITCH STATION
- LIGHTING CONTROLS NETWORK ADAPTER
- HIGH BAY OCCUPANCY SENSOR
- AUTOMATIC LOAD RELAY
- WALL SWITCH SENSOR
- LOW VOLTAGE INFRARED & ULTRASONIC CEILING SENSOR
- ON/RAISE/LOWER/OFF DIGITAL SWITCH STATION
- POWER PACK
- DUAL INTERFACE ROOM LIGHTING CONTROLLER
- 16 RELAY LIGHTING CONTROL PANEL
- DAYLIGHT SENSOR ONDOOR
- RADIO MODULE

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	VOLTAGE	MAX WATTAGE
8VT	RAIL CANOPY LIGHTS	277V	117W
A2	PARKING DECK LED LIGHT	277V	23W
A	HIGH BAY LED	277V	230W
AN	HIGH BAY LED	277V	230W
AN-EM	SAME AS ABOVE, BUT BRANCH CIRCUIT IS FED FROM EMERGENCY POWER SOURCE		
AW	HIGH BAY LED	277V	230W
AW-EM	SAME AS ABOVE, BUT BRANCH CIRCUIT IS FED FROM EMERGENCY POWER SOURCE		
B4	4' LED MULTIPURPOSE LINEAR	277V	27W
B4-EM	SAME AS ABOVE, BUT BRANCH CIRCUIT IS FED FROM EMERGENCY POWER SOURCE		
C8	8' LED MULTIPURPOSE LINEAR	277V	40W
C8-EM	SAME AS ABOVE, BUT BRANCH CIRCUIT IS FED FROM EMERGENCY POWER SOURCE		
LF1	3" LED DOWNLIGHT	277V	12W
LF1-EM	SAME AS ABOVE, BUT BRANCH CIRCUIT IS FED FROM EMERGENCY POWER SOURCE		
LF2	2'x2' LED FLAT PANEL	277V	19W
LF2-EM	SAME AS ABOVE, BUT BRANCH CIRCUIT IS FED FROM EMERGENCY POWER SOURCE		
P II	AREA / SITE LIGHT	277V	165W
P III	AREA / SITE LIGHT	277V	165W
P IV	AREA / SITE LIGHT	277V	165W
P V	AREA / SITE LIGHT	277V	165W
RB	REVERIE LOW BAY LIGHT	277V	165W
RB-EM	SAME AS ABOVE, BUT BRANCH CIRCUIT IS FED FROM EMERGENCY POWER SOURCE		
S4	LED STAIRWELL LIGHT	277V	41W
S4-EM	SAME AS ABOVE, BUT BRANCH CIRCUIT IS FED FROM EMERGENCY POWER SOURCE		
W	EXTERIOR LED WALLPACK	277V	30W
WP3	EXTERIOR LED WALLPACK	277V	137W
WP4	EXTERIOR LED WALLPACK	277V	137W
G1	PARKING GARAGE SURFACE MOUNTED CEILING FIXTURE	277V	49W
G2	PARKING GARAGE SURFACE MOUNTED CEILING FIXTURE	277V	94W

NOTES:

1. REFER TO ARCHITECTURAL DRAWINGS FOR MANUFACTURER MAKE AND MODEL, MOUNTING DETAILS, TRIM STYLE, AND OPTIONAL ACCESSORIES.

NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO ARCHITECTURAL DRAWINGS FOR LIGHTING FIXTURE LOCATIONS AND SPECIFICATIONS.
3. REFER TO ARCHITECTURAL DRAWINGS FOR LIGHTING CONTROL DETAILS AND SPECIFICATIONS.

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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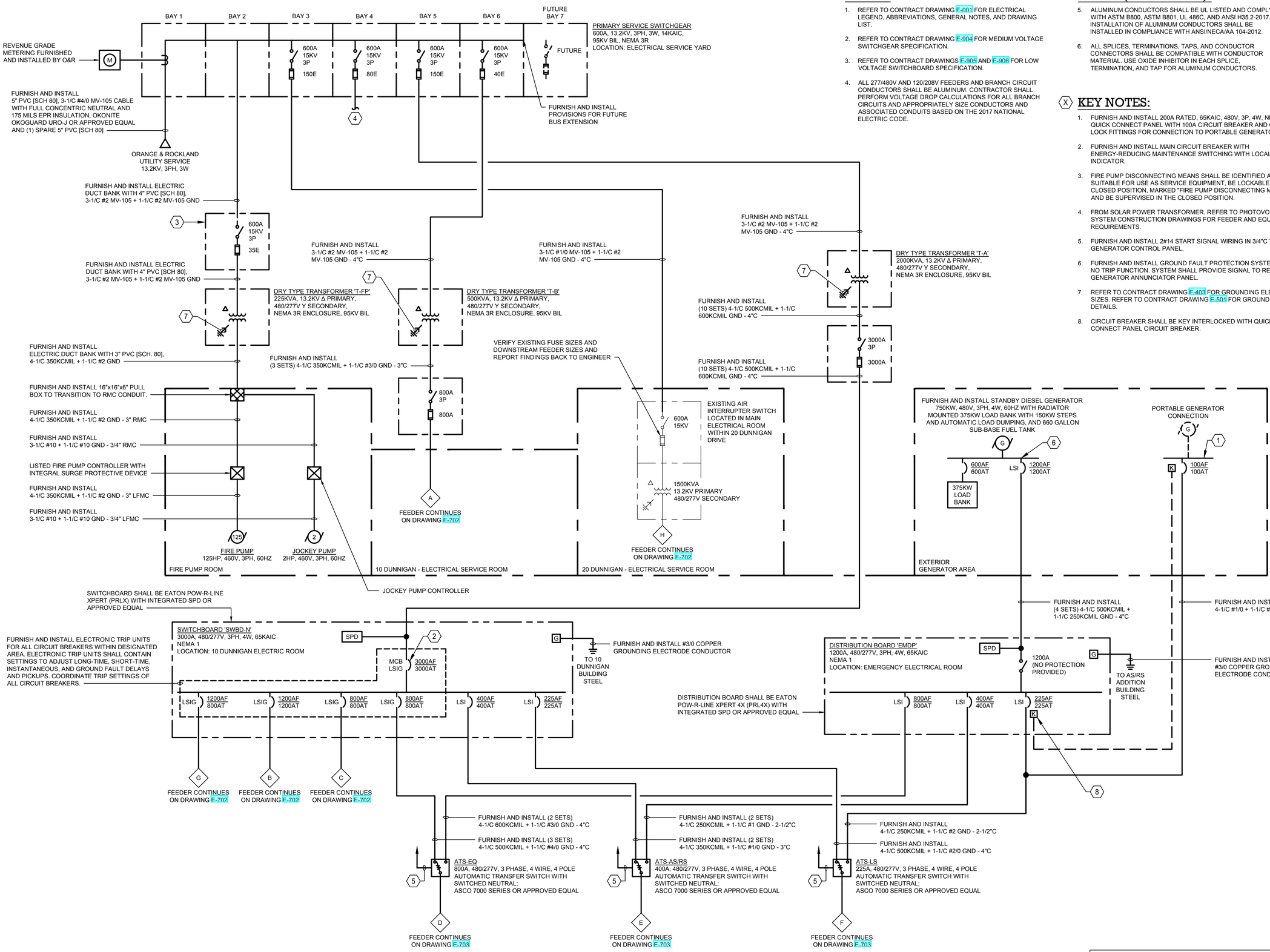
KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	AS NOTED

DRAWING TITLE :
LIGHTING FIXTURE SCHEDULE & LIGHTING CONTROLS LEGEND

DWG NUMBER :
E-607



NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
2. REFER TO CONTRACT DRAWING E-904 FOR MEDIUM VOLTAGE SWITCHGEAR SPECIFICATION.
3. REFER TO CONTRACT DRAWINGS E-905 AND E-906 FOR LOW VOLTAGE SWITCHBOARD SPECIFICATION.
4. ALL 277/480V AND 120/208V FEEDERS AND BRANCH CIRCUIT CONDUCTORS SHALL BE ALUMINUM. CONTRACTOR SHALL PERFORM VOLTAGE DROP CALCULATIONS FOR ALL BRANCH CIRCUITS AND APPROPRIATELY SIZE CONDUCTORS AND ASSOCIATED CONDUITS BASED ON THE 2017 NATIONAL ELECTRIC CODE.

NOTES (CONTINUED):

5. ALUMINUM CONDUCTORS SHALL BE UL LISTED AND COMPLY WITH ASTM B800, ASTM B801, UL 486C, AND ANSI H35.2-2017. INSTALLATION OF ALUMINUM CONDUCTORS SHALL BE INSTALLED IN COMPLIANCE WITH ANSI/NECA/AA 104-2012.
6. ALL SPLICES, TERMINATIONS, TAPS, AND CONDUCTOR CONNECTORS SHALL BE COMPATIBLE WITH CONDUCTOR MATERIAL. USE OXIDE INHIBITOR IN EACH SPLICE, TERMINATION, AND TAP FOR ALUMINUM CONDUCTORS.

(X) KEY NOTES:

1. FURNISH AND INSTALL 200A RATED, 65KAIC, 480V, 3P, 4W, NEMA 3R, QUICK CONNECT PANEL WITH 100A CIRCUIT BREAKER AND CAM LOCK FITTINGS FOR CONNECTION TO PORTABLE GENERATOR.
2. FURNISH AND INSTALL MAIN CIRCUIT BREAKER WITH ENERGY-REDUCING MAINTENANCE SWITCHING WITH LOCAL STATUS INDICATOR.
3. FIRE PUMP DISCONNECTING MEANS SHALL BE IDENTIFIED AS SUITABLE FOR USE AS SERVICE EQUIPMENT, BE LOCKABLE IN THE CLOSED POSITION, MARKED "FIRE PUMP DISCONNECTING MEANS", AND BE SUPERVISED IN THE CLOSED POSITION.
4. FROM SOLAR POWER TRANSFORMER. REFER TO PHOTOVOLTAIC SYSTEM CONSTRUCTION DRAWINGS FOR FEEDER AND EQUIPMENT REQUIREMENTS.
5. FURNISH AND INSTALL 2#14 START SIGNAL WIRING IN 3/4"C TO GENERATOR CONTROL PANEL.
6. FURNISH AND INSTALL GROUND FAULT PROTECTION SYSTEM WITH NO TRIP FUNCTION. SYSTEM SHALL PROVIDE SIGNAL TO REMOTE GENERATOR ANNUNCIATOR PANEL.
7. REFER TO CONTRACT DRAWING E-403 FOR GROUNDING ELECTRODE SIZES. REFER TO CONTRACT DRAWING E-501 FOR GROUNDING DETAILS.
8. CIRCUIT BREAKER SHALL BE KEY INTERLOCKED WITH QUICK CONNECT PANEL CIRCUIT BREAKER.

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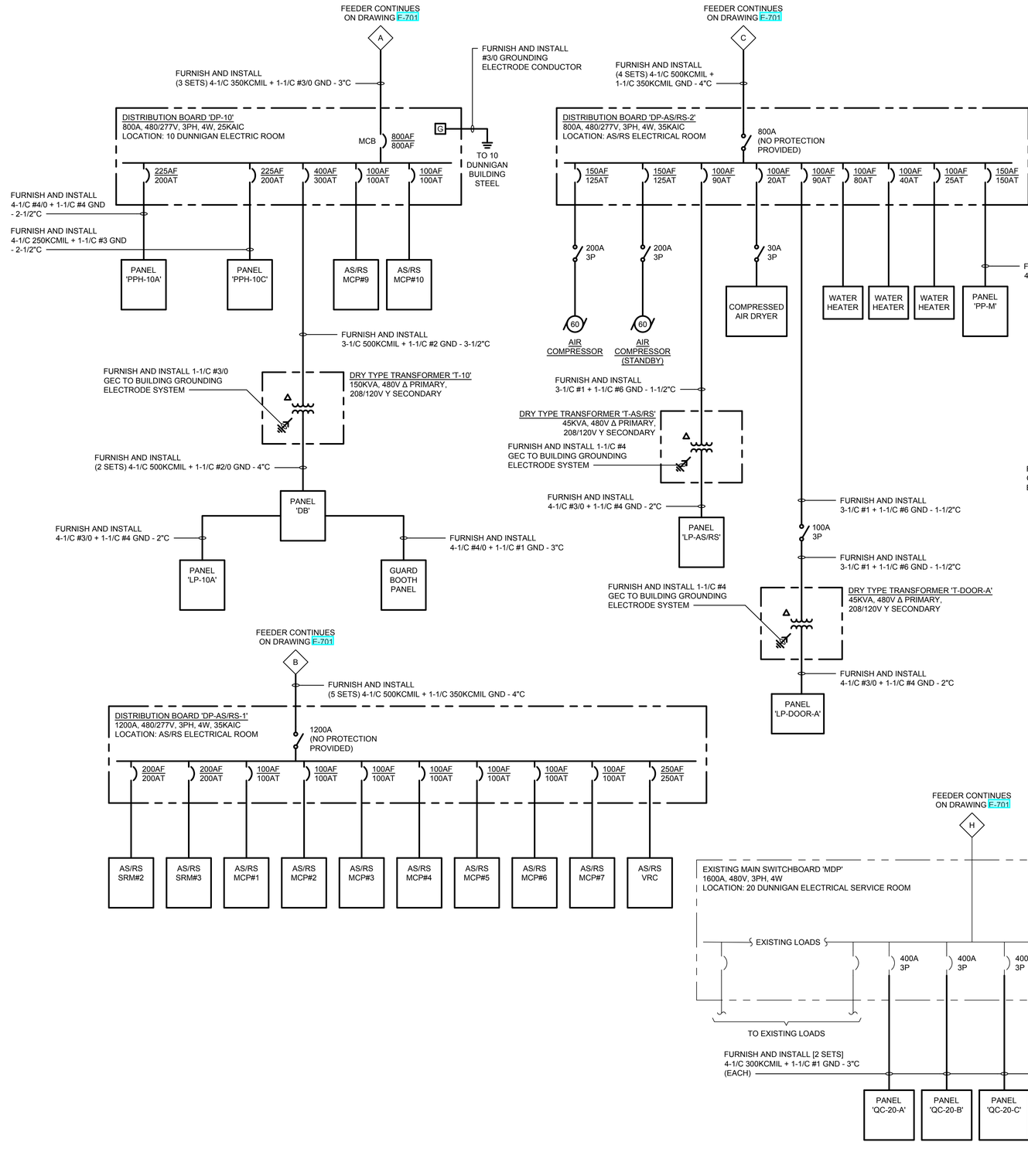
REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID CONSTRUCTION	02/28/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	N.T.S.

DRAWING TITLE :
ELECTRICAL ONE-LINE DIAGRAM - SHEET 1 OF 3

DWG NUMBER :
E-701



NOTES:

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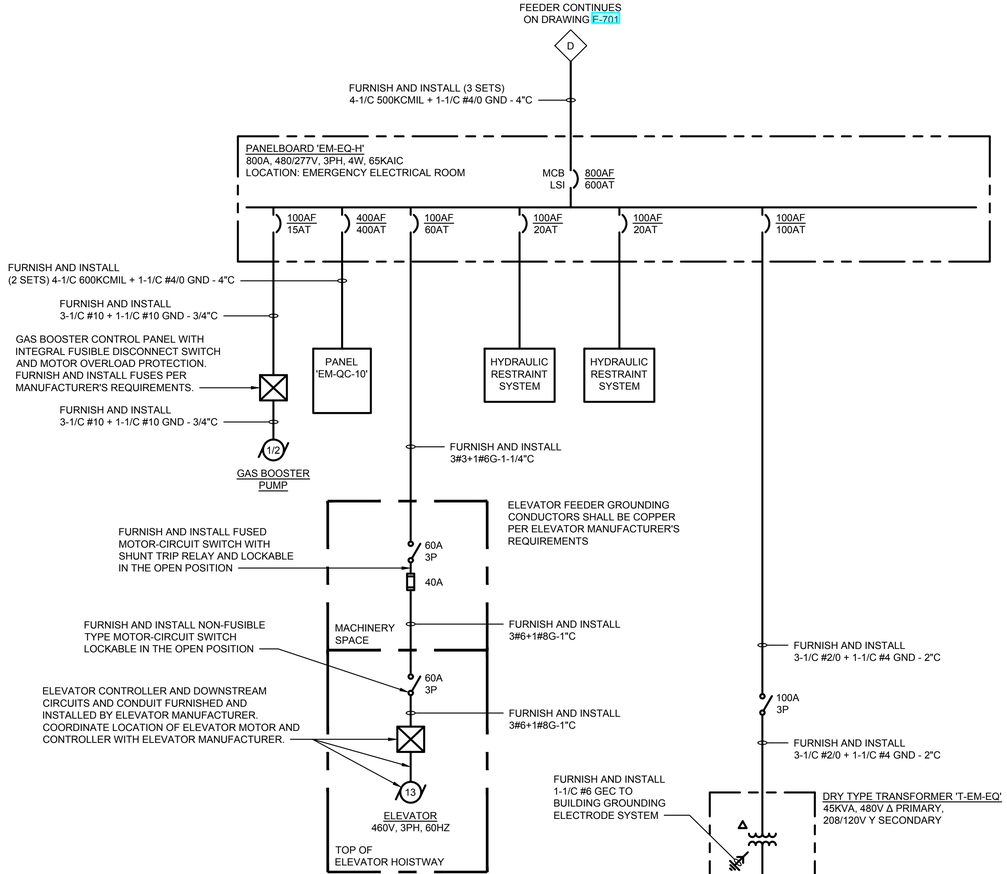
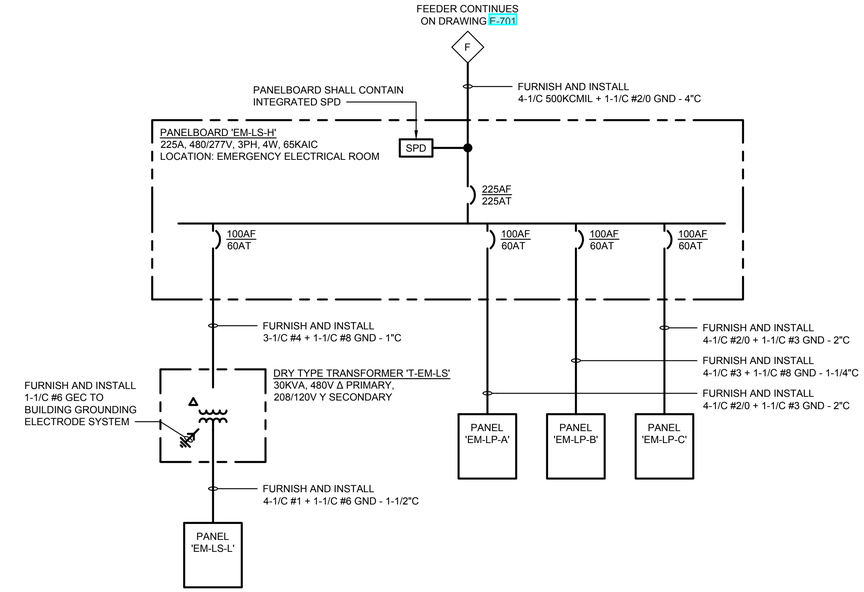
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID/CONSTRUCTION	08/30/2022

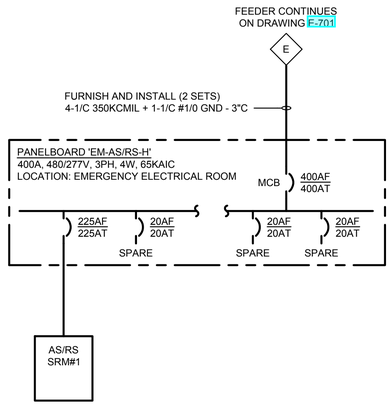
DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	N.T.S.

DRAWING TITLE :
ELECTRICAL ONE-LINE DIAGRAM - SHEET 2 OF 3

DWG NUMBER :
E-702







NOTES:

1. REFER TO CONTRACT DRAWING E-001 FOR ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES, AND DRAWING LIST.
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REV	DESCRIPTION	DATE
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	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID/CONSTRUCTION	08/16/2022

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APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	N.T.S.

DRAWING TITLE :
ELECTRICAL ONE-LINE DIAGRAM - SHEET 3 OF 3

DWG NUMBER :
E-703

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

ELECTRICAL SPECIFICATIONS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. ALL WORK SHALL COMPLY WITH REQUIREMENTS OF THE 2017 NATIONAL ELECTRICAL CODE, THE 2020 BUILDING CODE OF NEW YORK STATE, BUILDING MANAGEMENT AND ALL AUTHORITIES HAVING JURISDICTION (AHJ). APPLICABLE NATIONAL, STATE AND LOCAL CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK SHALL BE INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS.

B. IF A CONFLICT OCCURS IN THE SPECIFICATIONS AND/OR ON THE DRAWINGS, THE MORE STRINGENT SITUATION SHALL APPLY.

C. ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE OF THIS WORK. FINAL ACCEPTANCE SHALL BE DEFINED AS THE TIME AT WHICH THE ELECTRICAL WORK IS TAKEN OVER AND ACCEPTED BY THE OWNER. ENGAGE THE SERVICES OF VARIOUS MANUFACTURERS SUPPLYING THE EQUIPMENT FOR THE PROPER STARTUP, OPERATION AND TRAINING OF ALL SYSTEMS INSTALLED. INSTRUCT THE OWNERS PERSONNEL IN THE PROPER OPERATION AND SERVICING OF THE EQUIPMENT.

D. ELECTRICAL CONTRACTOR SHALL VISIT AND EXAMINE CAREFULLY THE EXISTING AREAS AFFECTED BY THIS WORK TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND WITH DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THE WORK. CONTRACTOR SHALL PERFORM THIS, PRIOR TO SUBMITTING HIS PROPOSAL. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN UNDERTAKEN.

E. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF WORK. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF ALL DEVICES INCLUDING DIMENSIONS AND ELEVATIONS. WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID CONFLICTS.

F. ALTHOUGH NOT SPECIFICALLY MENTIONED HEREIN OR SHOWN ON THE DRAWINGS, ANY EQUIPMENT, MATERIALS, ACCESSORIES, OR LABOR REQUIRED FOR PROPER AND COMPLETE INSTALLATION OF THE ELECTRICAL WORK SHALL BE FURNISHED AND INSTALLED AS PART OF THE ORIGINAL BID.

G. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE LATEST COPY OF THE BUILDING RULES AND REGULATIONS TO DETERMINE THE EXTENT OF PREMIUM TIME WORK REQUIRED. BASE BUILDING SYSTEM INTERRUPTIONS ARE TO BE PERFORMED OUTSIDE OF NORMAL BUSINESS HOURS. COORDINATE WITH BUILDING OWNER FOR ANY SERVICE INTERRUPTION OF EXISTING SYSTEMS AND GIVE NOTICE AS REQUIRED BY BUILDING RULES AND REGULATIONS.

H. ANY DAMAGE TO EXISTING PARTITIONS, FLOORS, CEILINGS OR ANY PART OF THE BUILDING OR EQUIPMENT HOUSED THEREIN CAUSED BY THE WORK OF THE CONTRACTOR SHALL BE REPAIRED AT NO ADDITIONAL EXPENSE TO THE OWNER.

I. ALL NEW MATERIALS REQUIRED SHALL CONFORM WITH THE STANDARDS OF UNDERWRITERS LABORATORIES, INC. (UL) IN EVERY CASE WHERE SUCH A STANDARD EXISTS.

J. DURING THE PROJECT DURATION, THE BUILDING MANAGEMENT OFFICE AND ITS DESIGNATED REPRESENTATIVE SHALL BE ABLE TO INSPECT THE WORK IN PROGRESS. ANY WORK WHICH THE BUILDING MANAGEMENT DEEMS UNACCEPTABLE SHALL BE REMOVED AND REPLACED AT THE EXPENSE OF CONTRACTOR/TENANT.

K. ALL EQUIPMENT INSTALLED OR CONNECTED INTO THE BUILDING RISERS, SYSTEMS AND INFRASTRUCTURE SHALL BE APPROVED IN ADVANCE BY THE BUILDING PRIOR TO INSTALLATION.

1.02 SCOPE OF WORK

A. PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY FOR COMPLETE, SAFE INSTALLATION OF ALL ELECTRICAL WORK. THE SCOPE OF WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:

1. INSTALLATION OF LIGHTING FIXTURES AND LAMPS INCLUDING EXIT AND EMERGENCY LIGHTING.
2. INSTALLATION OF WALL SWITCHES, RECEPTACLES, VOICE/DATA OUTLETS, ETC.
3. INSTALLATION OF NEW RACEWAY AND CONDUCTORS FOR LIGHTING AND POWER.
4. ADDITION OR MODIFICATION OF EXISTING ELECTRICAL DISTRIBUTION EQUIPMENT.
5. INSTALLATION OF MECHANICAL EQUIPMENT FEEDERS AND FINAL CONNECTIONS TO MECHANICAL EQUIPMENT.
6. GROUNDING OF ALL EQUIPMENT AS REQUIRED BY CODE AND AS SPECIFIED.
7. MODIFICATION OF EXISTING FIRE ALARM SYSTEM.
8. TEMPORARY LIGHTING AND POWER DURING CONSTRUCTION.
9. CUTTING, CHANNELING, CORING, AND CHASING REQUIRED TO ACCOMMODATE ELECTRIC INSTALLATION AND ROUGH PATCHING.
10. MAINTENANCE AND PROPER OPERATION OF EXISTING BASE BUILDING SYSTEMS WITHIN THE CONTRACT AREA IN ACCORDANCE WITH THE REQUIREMENTS OF BUILDING MANAGEMENT.
11. PROVISION OF SECURITY SYSTEM INFRASTRUCTURE AS DETAILED.
12. PROVISION OF AUDIO VISUAL SYSTEM INFRASTRUCTURE AS DETAILED.
13. RECEIPT AND INSTALLATION OF DEVICES, EQUIPMENT, SYSTEMS, SUPPLIED BY OTHERS AS DETAILED.
14. COORDINATION WITH OTHER TRADES.
15. COMMISSIONING
16. GROUND TESTING RESULTS.
17. SHORT-CIRCUIT, SELECTIVE COORDINATION AND ARC-FLASH HAZARD ANALYSIS.

1.03 SUBSTITUTIONS

A. NO SUBSTITUTE MATERIAL OR MANUFACTURER OF EQUIPMENT SHALL BE PERMITTED WITHOUT A FORMAL WRITTEN SUBMITTAL TO THE ENGINEER WHICH INCLUDES ALL DIMENSIONAL, PERFORMANCE AND MATERIAL SPECIFICATIONS. ANY CHANGES IN LAYOUT, MECHANICAL CHARACTERISTICS, STRUCTURAL REQUIREMENTS, OR DESIGN DUE TO THE USE OF A SUBSTITUTION SHALL BE SUBMITTED TO THE ENGINEER AS PART OF THIS PROPOSAL. THE CONTRACTOR TAKES FULL RESPONSIBILITY FOR THE SUBSTITUTION AND ALL CHANGES RESULTING FROM SUBSTITUTION. ALL ITEMS SHALL BE SUBMITTED FOR REVIEW IN CONJUNCTION WITH THE SUBMITTAL OF THE ALTERNATE. ANY SUBSTITUTION MUST BE SUBMITTED WITH AN EXPLANATION WHY SUBSTITUTION IS BEING UTILIZED. IF THE SUBSTITUTED ITEM DEVIATES FROM THE SPECIFIED ITEM, THOSE DEVIATIONS ARE TO BE IDENTIFIED ON A LINE BY LINE BASIS. IF THE SUBSTITUTION IS BEING UTILIZED FOR FINANCIAL REASONS, THE ASSOCIATED CREDIT MUST BE SIMULTANEOUSLY SUBMITTED.

B. ALL SUBSTITUTED EQUIPMENT SHALL CONFORM TO SPACE REQUIREMENTS AND PERFORMANCE REQUIREMENTS SHOWN ON CONTRACT DOCUMENTS.

C. CONTRACTOR SHALL SUBMIT BID BASED ON SPECIFIED ITEMS AND SHALL SUPPLY AS AN ALTERNATE PRICE ANY SUBSTITUTIONS.

D. ALL EQUIPMENT SHALL BE APPROVED FOR USE IN THE STATE OF NEW YORK.

1.04 SHOP DRAWINGS

A. SHOP DRAWINGS SUBMISSION SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:

1. DISTRIBUTION EQUIPMENT (PANELS, SAFETY SWITCHES, ETC.).
2. OVERCURRENT PROTECTIVE DEVICES (FUSES AND BREAKERS).
3. LIGHTING FIXTURES.
4. WIRING DEVICES.
5. FIRE ALARM EQUIPMENT, WIRING SCHEMATIC AND SEQUENCE OF OPERATION.
6. COORDINATION DRAWINGS OF ELECTRIC CLOSET LAYOUTS INCLUDING ELEVATIONS AND MOUNTING DETAILS OF PANELBOARDS, TRANSFORMERS, ETC.
7. FLOOR BOXES/ POKE THRU DEVICES.
8. GROUNDING EQUIPMENT/DEVICES.
9. CONDUIT, RACEWAYS, WIREWAYS.
10. WIRING.
11. LIGHTING CONTROL SYSTEMS.
12. TESTING AND COMMISSIONING SCHEDULE.
13. SCALED FIELD DRAWINGS.
14. TRANSFORMERS.
15. GENERATORS.
16. AUTOMATIC TRANSFER SWITCHES.
17. SHORT-CIRCUIT COORDINATION, ARC-FLASH HAZARD ANALYSIS.

B. PROVIDE A MINIMUM OF THREE (3) COPIES OF 8-1/2"x 11" SUBMISSIONS AND TWO (2) SETS OF ALL DRAWINGS.

C. CHANGES MADE TO SHOP DRAWINGS BY THE CONSULTANT WILL NOT AFFECT THE CONTRACT PRICE.

1.05 QUALITY ASSURANCE

A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.

B. COMPLY WITH NFPA 70.

1.06 COORDINATION

A. COORDINATE CHASES, SLOTS, INSERTS, SLEEVES, AND OPENINGS WITH GENERAL CONSTRUCTION WORK AND ARRANGE IN BUILDING STRUCTURE DURING PROGRESS OF CONSTRUCTION TO FACILITATE THE ELECTRICAL INSTALLATIONS THAT FOLLOW.

1. SET INSERTS AND SLEEVES IN POURED-IN-PLACE CONCRETE, MASONRY WORK, AND OTHER STRUCTURAL COMPONENTS AS THEY ARE CONSTRUCTED.

B. SEQUENCE, COORDINATE, AND INTEGRATE INSTALLING ELECTRICAL MATERIALS AND EQUIPMENT FOR EFFICIENT FLOW OF THE WORK. COORDINATE INSTALLING LARGE EQUIPMENT REQUIRING POSITIONING BEFORE CLOSING IN THE BUILDING.

C. COORDINATE ELECTRICAL SERVICE CONNECTIONS TO COMPONENTS FURNISHED BY UTILITY COMPANIES.

1. COORDINATE INSTALLATION AND CONNECTION OF EXTERIOR UNDERGROUND AND OVERHEAD UTILITIES AND SERVICES, INCLUDING PROVISION FOR ELECTRICITY-METERING COMPONENTS.
2. COMPLY WITH REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION AND OF UTILITY COMPANY PROVIDING ELECTRICAL POWER AND OTHER SERVICES.

D. COORDINATE LOCATION OF ACCESS PANELS AND DOORS FOR ELECTRICAL ITEMS THAT ARE CONCEALED BY FINISHED SURFACES. ACCESS DOORS AND PANELS ARE SPECIFIED IN A SEPARATE DIVISION OF THE SPECIFICATIONS.

E. WHERE ELECTRICAL IDENTIFICATION DEVICES ARE APPLIED TO FIELD-FINISHED SURFACES, COORDINATE INSTALLATION OF IDENTIFICATION DEVICES WITH COMPLETION OF FINISHED SURFACE.

F. WHERE ELECTRICAL IDENTIFICATION MARKINGS AND DEVICES WILL BE CONCEALED BY ACOUSTICAL CEILINGS AND SIMILAR FINISHES, COORDINATE INSTALLATION OF THESE ITEMS BEFORE CEILING INSTALLATION.

1.07 AS-BUILT DRAWINGS

A. CONTRACTOR SHALL MAINTAIN RECORD DRAWING PRINTS ON JOB SITE AND RECORD, AT TIME OF OCCURRENCE, DEVIATIONS FROM CONTRACT DOCUMENTS.

B. AT THE COMPLETION OF WORK AND BEFORE FINAL ACCEPTANCE, PROVIDE AS-BUILT DRAWINGS OF THE INSTALLATION, IN AUTO-CAD 2013 OR NEWER.

C. INCORPORATE ALL CHANGES AND DEVIATIONS FROM BID DRAWINGS, UTILIZING NORMAL RECOGNIZED DRAFTING PROCEDURES THAT MATCH THE ORIGINAL DRAFTING METHODOLOGY. AS-BUILT DRAWINGS SHALL INDICATE ACTUAL LOCATIONS OF ALL EQUIPMENT.

D. ALL MAIN BRANCH CONDUIT RUNS, JUNCTION BOX LOCATIONS, CONDUIT RUNS FOR ALL FLOOR OUTLETS, ETC., MUST BE REFLECTED ON THE DRAWINGS.

E. CLEARLY INDICATE THE WORDS “AS-BUILT” IN THE TITLE BLOCK COLUMN OF THE DRAWINGS AS WELL AS THE ELECTRICAL CONTRACTOR'S NAME AND ADDRESS.

F. SUBMIT A SINGLE (1) PRINT TO CONSULTANT FOR REVIEW. WHEN FOUND ACCEPTABLE BY THE CONSULTANT, SUBMIT THREE (3) SETS OF PRINTS TOGETHER WITH THE CAD DISK FOR PRESENTATION TO THE OWNER.

1.08 OPERATION AND MAINTENANCE MANUALS

A. PROVIDE 2 (TWO) SETS OF OPERATION AND MAINTENANCE MANUALS SUBMITTED IN HARD COVER 3-RING BINDERS. INCLUDE THE FOLLOWING INFORMATION IN THE OPERATIONS AND MAINTENANCE MANUALS:

1. NAMES AND ADDRESS OF LOCAL SUPPLIERS FOR THE ITEMS INCLUDED.
2. TECHNICAL DATA, PRODUCT DATA, SUPPLEMENTED BY BULLETINS, COMPONENT ILLUSTRATIONS, EXPLODED VIEWS, TECHNICAL DESCRIPTIONS OF ITEMS, AND PARTS LISTS. ADVERTISING OR SALES LITERATURE IS NOT ACCEPTABLE.
3. THE CONSULTANTS REVIEWED SHOP DRAWINGS.
4. CERTIFICATE(S) OF ACCEPTANCE FROM THE AUTHORITIES INSPECTION DEPARTMENT.
5. VERIFICATION REPORTS AND CERTIFICATE(S) FOR ANY NEW FIRE ALARM COMPONENTS OR TIE-INS AND ANY BASE BUILDING TIE-INS FOR MISCELLANEOUS SYSTEMS (I.E. SECURITY, LIGHTING CONTROL, DIGITAL METERING).
6. WRITTEN GUARANTEE.
7. LIST OF EACH LUMINAIRE TYPE IDENTIFYING TYPE OF LAMP, WATTAGE AND MANUFACTURER'S CONTACT INFO.
8. COORDINATION STUDY.

B. REVIEW INFORMATION PROVIDED IN THE MAINTENANCE INSTRUCTIONS AND MANUALS WITH THE TENANT'S OPERATING PERSONNEL AND LANDLORD'S OPERATING PERSONNEL WHERE BASE BUILDING SYSTEMS ARE REVISED, TO ENSURE A COMPLETE UNDERSTANDING OF THE ELECTRICAL EQUIPMENT AND SYSTEMS AND THEIR OPERATION.

1.09 MATERIALS AND EQUIPMENT

A. ALL MATERIALS AND EQUIPMENT SHALL BE NEW, CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY AND MANUFACTURED TO THE STANDARDS SPECIFIED.

B. WHERE THERE IS NO ALTERNATIVE TO SUPPLYING EQUIPMENT WHICH IS NOT NRTL CERTIFIED, OBTAIN SPECIAL APPROVAL FROM THE LOCAL ELECTRICAL SAFETY AUTHORITY.

1.10 INSURANCE

A. PROVIDE AND MAINTAIN INSURANCE TO PROTECT THE LANDLORD, TENANT AND TRADES FROM ALL POSSIBLE CLAIMS. SUBMIT WITH BID FOR AN AMOUNT ACCEPTABLE TO LANDLORD AND TENANT.

1.11 CONTRACT DOCUMENTS

A. THE DRAWINGS FOR THE ELECTRICAL WORK ARE DIAGRAMMATIC PERFORMANCE DRAWINGS ONLY, INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE THE GENERAL ARRANGEMENT AND APPROXIMATE SIZE AND LOCATION OF ELECTRICAL EQUIPMENT. THE DRAWINGS DO NOT INTEND TO SHOW ARCHITECTURAL, INTERIOR DESIGN, MECHANICAL, STRUCTURAL OR BASE BUILDING DETAILS. BE RESPONSIBLE FOR A THOROUGH KNOWLEDGE OF SAME BEFORE PROCEEDING WITH THE WORK.

B. DO NOT SCALE OR MEASURE DRAWINGS, BUT OBTAIN INFORMATION REGARDING ACCURATE DIMENSIONS FROM THE DIMENSIONS SHOWN ON THE DESIGN CONSULTANT/ARCHITECT'S DRAWINGS, OR BY SITE MEASUREMENTS.

C. ANY DISCREPANCIES BETWEEN DRAWINGS AND/OR SPECIFICATIONS AND EXISTING CONDITIONS, MUST BE REFERRED TO THE DESIGN CONSULTANT/ARCHITECT BEFORE ANY WORK AFFECTED IS BEGUN.

D. COOPERATE AND COORDINATE WITH OTHER CONTRACTORS IN LAYING OUT OF WORK SO AS NOT TO CONFLICT WITH THE WORK OF OTHER CONTRACTORS. CARRY OUT WORK PROMPTLY AS PER CONSTRUCTION SCHEDULE AND COORDINATE WITH WORK OF OTHER CONTRACTORS.

E. MAKE, AT NO ADDITIONAL COST, ANY CHANGES OR ADDITIONS TO MATERIALS AND EQUIPMENT NECESSARY TO ACCOMMODATE STRUCTURAL CONDITIONS (OFFSETS AROUND BEAMS, COLUMN, ETC.)

1.12 INTENT

A. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS THAT THE CONTRACTOR PROVIDES COMPLETE AND OPERATIONAL SYSTEMS AS REQUIRED. WHERE DIFFERENCES OCCUR, THE MAXIMUM CONDITION SHALL GOVERN.

B. ANY MISCELLANEOUS ITEMS, HARDWARE, DEVICES, WIRING, ETC., NOT SPECIFICALLY DESCRIBED, BUT REQUIRED FOR THE OPERATION OF THE SYSTEM, MUST BE PROVIDED AND INCLUDED AS PART OF THE BID.

1.13 LOCATIONS OF OUTLETS

A. REFER TO DESIGN CONSULTANT'S/ARCHITECT'S DRAWINGS FOR EXACT LOCATIONS OF ALL LIGHTING FIXTURES AND WIRING DEVICES.

B. CHANGE LOCATION OF OUTLETS AT NO COST OR CREDIT, PROVIDING DISTANCE DOES NOT EXCEED (10'-0") AND INFORMATION IS GIVEN PRIOR TO INSTALLATION.

C. ALL OUTLETS TO BE MARKED ON JOB SITE FOR APPROVAL BY DESIGN CONSULTANT/ARCHITECT PRIOR TO INSTALLATION.

1.14 PLYWOOD

A. ALL SURFACE MOUNTED ELECTRICAL DISTRIBUTION EQUIPMENT SHALL BE MOUNTED ON PLYWOOD BACKBOARDS. PROVIDE ALL PLYWOOD BACKBOARDS REQUIRED FOR THE WORK OF THIS DIVISION. PLYWOOD BACKBOARDS SHALL BE 3/4" THICK, OF HIGHEST QUALITY FIRE RETARDANT FIR. PRIME AND PAINT BACKBOARDS WITH FIRE RETARDANT PAINT COLOR AS SELECTED BY THE DESIGN CONSULTANT/ARCHITECT.

1.15 ACCESS DOORS

A. WHEREVER ANY BASE BUILDING EQUIPMENT REQUIRES ACCESSIBILITY, MAINTENANCE OR ADJUSTMENT, PROVIDE ACCESS DOORS APPROVED BY DESIGN CONSULTANT/ARCHITECT AND OWNER. ARRANGE FOR ITS INSTALLATION BY THE DIVISION IN WHOSE WORK IT OCCURS.

1.16 DRY WALL CEILINGS

A. IN ALL DRYWALL CEILING AREAS, DIVISION 26 IS TO REMOVE AND RELOCATE ALL EXISTING JUNCTION BOXES TO ACCESSIBLE CEILING SPACE.

B. PROVIDE ACCESS PANELS FOR ALL NEW AND EXISTING DEVICES AS REQUIRED.

1.17 TRENCHING/CHASING

A. BEFORE TRENCHING/CHASING FLOOR SLAB OR STRUCTURAL WALLS, X-RAY SLABS OR WALLS AND HAVE THE LOCATIONS APPROVED BY THE OWNER IN WRITING.

B. ANY EXISTING BUILDING SERVICE DAMAGED BY TRENCHING/CHASING SHALL BE REPAIRED IMMEDIATELY AT NO COST TO OWNER.

1.18 NOISE AND VIBRATION

A. ELECTRICAL EQUIPMENT IS TO OPERATE WITHOUT OBJECTIONABLE NOISE OR VIBRATION. IF, IN THE OPINION OF THE OWNER, ARCHITECT OR CONSULTANT, THE EQUIPMENT OPERATES WITH EXCESSIVE NOISE OR VIBRATION, THEN THE EQUIPMENT MUST BE REPLACED OR NOISE OR VIBRATION ELIMINATED.

B. CONNECTIONS TO NOISE-PRODUCING AND VIBRATING EQUIPMENT MUST BE MADE WITH LIQUID-TIGHT FLEXIBLE CONDUIT AND ASSOCIATED CONNECTORS. THIS INCLUDES TRANSFORMERS, DIMMING EQUIPMENT RACKS, AND MOTORS. USE A MINIMUM OF 3 FT OF FLEXIBLE CABLE WITH SLACK AT EACH DEVICE.

C. VIBRATION ISOLATORS ARE TO BE PROVIDED WHERE INDICATED OR REQUIRED. TRANSFORMERS TO BE ISOLATED FROM THE STRUCTURE, WITH SPRING AND RUBBER ISOLATORS WHEN WALL MOUNTED OR SUSPENDED AND 1/2" HIGH DENSITY NEOPRENE SANDWICH PADS (TYPE MWP) WHEN FLOOR MOUNTED.

1.19 OWNER'S EQUIPMENT

A. WHERE SPECIFIED, INSTALL ALL EQUIPMENT PROVIDED BY THE OWNER. RECEIVE, STORE AND INSTALL EQUIPMENT AND ACCEPT FULL RESPONSIBILITY FOR ITS CORRECT OPERATION. PROVIDE CONDUIT, WIRE, BOXES, SWITCHES, OUTLETS, DEVICES, FLEX CONNECTIONS, ETC., AS REQUIRED.

1.20 INTERRUPTION OF SERVICES

A. INTERRUPTION OF ELECTRICAL SERVICE TO ANY PART OF THE BUILDING SHALL OCCUR ONLY BY PRE-ARRANGEMENT WITH AND AT TIMES SUITABLE TO THE OWNER.

B. INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS; ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED.

1.21 VALUATION OF CHANGES

A. PROVIDE COMPLETE BREAKDOWN OF MATERIAL, LABOR, OVERHEAD, PROFIT, ETC., WHEN SUBMITTING QUOTATIONS FOR CHANGE NOTICES ON THIS PROJECT.

B. THE HOURLY LABOR RATE SHALL BE INCLUSIVE OF ALL CHARGES FOR SUPERVISION, VARIABLE LABOR FACTORS, HAND TOOLS, PAYROLL BURDENS, HEIGHT FACTORS, WARRANTIES, STORAGE, RENTALS, ADDITIONAL BONDING, PARKING, CLEAN-UP, AS-BUILT DRAWINGS, HOISTING, FREIGHT AND DELIVERY, BUT EXCLUSIVE OF OVERHEAD AND PROFIT.

1.22 ENGINEERS FINAL INSPECTION

A. FINAL INSPECTION IS IMPERATIVE. PRIOR TO CLOSING OF CEILINGS, THIS CONTRACTOR SHALL CONTACT THE ENGINEER OF RECORD AND THE OWNER'S REPRESENTATIVE TO PERFORM A FINAL INSPECTION. WHEN CEILING TILES HAVE BEEN INSTALLED IT WILL BE NECESSARY FOR THE CONTRACTOR TO REMOVE PORTIONS FOR INSPECTION.

1.23 COMPLETION OF CONTRACT

A. ALL EQUIPMENT MUST BE CLEANED AND TESTED BEFORE FINAL ACCEPTANCE BY THE CONSULTANT.

B. DEFECTS AND DEFICIENCIES WHICH ORIGINATE OR BECOME EVIDENT DURING THE WARRANTY PERIOD MUST BE REPAIRED OR REPLACED, AT NO COST.

C. REPLACE, AT NO COST, ALL INCANDESCENT LAMPS BURNED-OUT DURING A THIRTY (30) DAY PERIOD AND ALL BURNED-OUT FLUORESCENT AND HID LAMPS FOR A PERIOD OF NINETY (90) DAYS AFTER DATE OF ISSUANCE OF CERTIFICATE OF “SUBSTANTIAL PERFORMANCE” FOR THE CONTRACT FOR THE WORK.

D. IF, DURING THE WARRANTY PERIOD, TRANSFORMERS, BALLASTS OR OTHER NOISE AND VIBRATION PRODUCING EQUIPMENT ARE CONSIDERED BY THE CONSULTANT TO EXCEED ACCEPTABLE STANDARDS, THEN THESE MUST BE REPLACED WITHOUT DELAY OR ADDITIONAL COST TO THE OWNER. ALL WORK RELATING TO THE REPLACEMENT OF DEFECTIVE ITEMS, MUST BE CARRIED OUT AFTER NORMAL WORKING HOURS AND AT A TIME WHICH IS ACCEPTABLE TO THE TENANT.

1.24 DEMOLITION

A. REFER TO DEMOLITION CONSTRUCTION DRAWING PACKAGE DATED 05/11/2021 FOR DEMOLITION SCOPE OF WORK.

1.25 WORK IN NEW AND RENOVATED AREAS

A. WHEN DELETING AND/OR MAKING SAFE EXISTING ELECTRICAL WORK, ENSURE THAT IT INCLUDES REMOVAL OF ALL DISCONNECTED WIRING BACK TO THE ASSOCIATED PANELBOARD OR DISTRIBUTION EQUIPMENT.

B. DISCONNECT AND REMOVE EXISTING LUMINAIRES, DEVICES, OUTLETS, ETC., WHICH ARE NOT TO BE REUSED. SUCH ITEMS SHALL BE CARTONED AND TURNED OVER TO THE OWNER AT A PLACE DESIGNATED BY THE OWNER. CUT BACK AND CAP UNUSED RACEWAY AND OUTLETS AND REMOVE UNUSED WIRING BACK TO PANELBOARD IN AN APPROVED MANNER. REMOVE ALL REDUNDANT COMMUNICATIONS CABLES BACK TO HUB ROOMS AND/OR TELEPHONE RISER ROOMS.

C. ENSURE THAT ALL EXISTING EQUIPMENT WHICH IS TO BE REUSED AND/OR RELOCATED IS THOROUGHLY INSPECTED AND REFURBISHED TO ENSURE CORRECT OPERATION WHEN PUT BACK INTO SERVICE AND MEETS THE LOCAL ELECTRICAL SAFETY AUTHORITY'S APPROVAL. OUTLET BOXES AND WIRING AND/OR CONDUITS WHICH ARE CORRODED OR DAMAGED ARE TO BE REPLACED.

D. ALL EXISTING ELECTRICAL EQUIPMENT WHICH IS NO LONGER REQUIRED SHALL BE REMOVED AND DISPOSED OF PROPERLY OFF SITE.

E. WHERE EXISTING OUTLET BOXES ARE REMOVED FROM EXISTING UNDERFLOOR DUCTS, PLUG AND CAP EXISTING HOLES FLUSH WITH FLOOR USING APPROVED FITTINGS. REMOVE ALL REDUNDANT WIRE AND CABLE BACK TO SERVICE.

F. BE RESPONSIBLE AND PAY FOR ANY DAMAGE TO THE BASE BUILDING INCURRED BY WORK OF THIS DIVISION, OR REPAIR TO THE SATISFACTION OF THE CONSULTANT.

G. CARRY OUT THE WORK WITH A MINIMUM OF NOISE, DUST AND DISTURBANCE.

H. PROVIDE TOOLS AND CLEAN UP EQUIPMENT. OBTAIN THE LANDLORD'S PERMISSION FOR THE USE OF ELECTRICAL, ELEVATOR, PLUMBING OR DRAINAGE OUTLETS.

I. PROVIDE DAILY CLEAN UP AND PROPER DISPOSAL OF DEBRIS GENERATED BY DAILY OPERATIONS. ON COMPLETION OF THE WORK, ALL TOOLS, SURPLUS MATERIALS AND WASTE MATERIALS SHALL BE REMOVED AND THE PREMISES LEFT IN A CLEAN AND PERFECT CONDITION.

J. REMOVE AND REROUTE EXISTING CONDUITS WHICH ARE TO REMAIN IN “FINISHED” AREAS WHICH ARE TO BE EXPOSED.

K. CONDUITS WHICH ARE TO BE CUT BACK ARE TO TERMINATE IN A JUNCTION BOX.

L. CLEAN LUMINAIRE REFLECTORS AND LENSES, LAMPS AND OTHER SURFACES THAT HAVE BEEN EXPOSED TO CONSTRUCTION DUST AND DIRT. CLEAN THE INSIDES AND OUTSIDES OF PANELBOARDS, SPLITTERS AND OTHER ELECTRICAL EQUIPMENT, AND COMPLETELY REMOVE ALL DEBRIS AND TOOLS FROM THE PROJECT.

1.26 SHORT CIRCUIT, SELECTIVE COORDINATION AND ARC-FLASH ANALYSIS

A. SHORT-CIRCUIT ANALYSIS SHALL BE SUBMITTED PRIOR TO SUBMITTING THE ELECTRIC EQUIPMENT SHOP DRAWINGS FOR REVIEW AND APPROVAL. SELECTIVE COORDINATION AND ARC FLASH ANALYSIS SHALL BE SUBMITTED AFTER APPROVAL OF ELECTRICAL DISTRIBUTION EQUIPMENT.

B. SUBMIT A SHORT CIRCUIT ANALYSIS AS FOLLOWS:

1. UTILIZE COMPUTER SOFTWARE PROGRAMS CERTIFYING COMPLIANCE WITH IEEE 399. MANUAL CALCULATIONS ARE NOT ACCEPTABLE.
2. OBTAIN AVAILABLE FAULT CURRENT AND UTILITY IMPEDANCE FROM UTILITY COMPANY.
3. OBTAIN AND TABULATE ALL ELECTRICAL PROTECTION DATA FOR ALL THE EQUIPMENT.
4. OBTAIN FEEDER LENGTHS AND RATINGS FOR ALL NEW AND EXISTING FEEDERS.
5. PERFORM A SHORT CIRCUIT ANALYSIS TO DETERMINE SHORT CIRCUIT CURRENT AND GROUND FAULT CURRENT LEVELS AT EACH PIECE OF EQUIPMENT IN THE DISTRIBUTION SYSTEM, HAVING OBTAINED THE AVAILABLE SHORT CIRCUIT CURRENT AND IMPEDANCE OF UTILITY SERVICE ENTRANCE FROM THE LOCAL ELECTRICAL SUPPLY AUTHORITY.
6. PERFORM ANALYSIS FOR EACH SYSTEM SCENARIO.
7. GENERATE AN EQUIPMENT EVALUATION REPORT FOR ALL ELECTRICAL EQUIPMENT AND OVERCURRENT PROTECTIVE DEVICES COMPARING CALCULATED AVAILABLE FAULT CURRENTS TO EQUIPMENT WITHSTAND RATINGS.

C. SUBMIT A DEVICE COORDINATION STUDY CONSISTING OF THE FOLLOWING:

1. A SET OF TIME CURRENT CURVE CHARACTERISTICS OF ALL PROTECTIVE DEVICES ASSOCIATED WITH THE LIFE SAFETY SYSTEM PLOTTED ON LOG/LOG GRAPH PAPER WITH CORRESPONDING SHORT CIRCUIT CURRENT LEVELS.
2. TIME CURRENT DAMAGE CURVES FOR ALL TRANSFORMERS, MOTORS, AND CABLES.
3. PROVIDE A COMPLETE SCHEDULE OF ALL MAIN PROTECTIVE RELAYS, FUSES AND OTHER PROTECTIVE DEVICE LISTING DEVICE LOCATIONS, MANUFACTURER, MODEL NUMBER, SIZE, RANGE, SETTING, ETC.
4. GENERATE APPROPRIATE SETTINGS FOR ALL RELAYS AND PROTECTIVE DEVICES FROM THE LEVEL OF THE LOCAL ELECTRICAL SUPPLY AUTHORITY FEEDER PROTECTIVE DEVICES TO ALL DOWNSTREAM DEVICES.
5. THE COMPLETE STUDY WILL ILLUSTRATE AND ENSURE THAT THE SETTINGS AND SIZES OF ALL PROTECTIVE DEVICES FOR EACH VOLTAGE LEVEL HAVE BEEN CHOSEN TO ENSURE MAXIMUM OR OPTIMAL PROTECTION AND COORDINATION DURING ELECTRICAL FAULT OR OVERLOAD CONDITIONS.

D. PERFORM AN ARC-FLASH HAZARD ANALYSIS IN ACCORDANCE WITH IEEE 1584 EQUATIONS AS PRESENTED IN NFPA 70E.

1. CALCULATE THE FLASH PROTECTION BOUNDARY AND THE INCIDENT ENERGY AT EACH PIECE OF ELECTRICAL EQUIPMENT.
2. CALCULATIONS MUST BE PERFORMED FOR ALL SYSTEM SCENARIOS AND GREATEST INCIDENT ENERGY SHALL BE REPORTED.
3. WHERE 'DANGEROUS' INCIDENT ENERGY LEVELS EXIST, MAKE RECOMMENDATIONS TO REDUCE ENERGY LEVELS.
4. PROVIDE ARC-FLASH LABELS FOR EACH PIECE OF ELECTRICAL EQUIPMENT. LABEL SHALL INCLUDE AT A MINIMUM:
   a. LOCATION
   b. NOMINAL VOLTAGE
   c. FLASH PROTECTION BOUNDARY
   d. HAZARD RISK CATEGORY
   e. INCIDENT ENERGY
   f. WORKING DISTANCE

E. ENTIRE REPORT SHALL BE PERFORMED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED, WHO SHALL SIGN AND SEAL THE STUDY.

F. ELECTRICAL CONTRACTOR AND EQUIPMENT MANUFACTURER SHALL PERFORM FIELD ADJUSTMENT OF PROTECTIVE DEVICE SETTINGS IN ACCORDANCE WITH THE APPROVED COORDINATION STUDY.

G. ENSURE CIRCUIT PROTECTIVE DEVICES SUCH AS OVERCURRENT TRIPS, RELAYS, CIRCUIT BREAKERS AND FUSES ARE INSTALLED TO VALUES AND SETTINGS SO AS TO PROVIDE PROTECTION BY MEANS OF OPENING THE CLOSEST DEVICE TO THE FAULT.

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

ARCHITECT

di Domenico + Partners LLP

Architecture
Landscape Architecture
Planning

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Long Island City, New York

1.27 UNIT PRICES

A. SUBMIT THE FOLLOWING LIST OF UNIT PRICES:

1. LIGHT FIXTURES -FOR EACH TYPE SPECIFIED ON DRAWINGS ($/FIXTURE).
2. RECEPTACLES - ADD/DEDUCT PRICE FOR EACH TYPE SPECIFIED ON DRAWINGS ($/RECEPTACLE).
3. DATA/TELEPHONE OUTLET -ADD/DEDUCT PRICE FOR WALL MOUNTED TELEPHONE OUTLET WITH 1" CONDUIT STUBBED INTO HUNG CEILING ($/OUTLET).
4. RACEWAYS - ALL SIZES ON PROJECT ($/LIN FT), CONDUCTORS ($/LIN FT), MC CABLE ($/LIN FT)
5. FIRE ALARM DEVICES.
6. ELECTRICAL PANELS - ALL TYPES INDICATED ON DRAWINGS.
7. TRANSFORMERS - ALL RATINGS INDICATED ON DRAWINGS.

PART 2 PRODUCT/APPLICATION

2.01 RACEWAYS

A. EMT: ANSI C80.3, ZINC-COATED STEEL, WITH SET-SCREW OR COMPRESSION FITTINGS.

B. FMC: ZINC-COATED STEEL.

C. RMC: ANSI C80.1, HOT-DIPPED GALVANIZED STEEL WITH THREADED FITTINGS.

D. IMC: ANSI C80.6, ZINC-COATED STEEL, WITH THREADED FITTINGS.

E. LFMC: ZINC-COATED STEEL WITH SUNLIGHT-RESISTANT AND MINERAL-OIL-RESISTANT PLASTIC JACKET.

F. RACEWAY FITTINGS: SPECIFICALLY DESIGNED FOR THE RACEWAY TYPE WITH WHICH USED.

G. ELECTRIC METALLIC TUBING SHALL BE INDUSTRY STANDARD THIN WALL CONDUIT, HOT DIPPED GALVANIZED STEEL (3/4" MIN, 4" MAX).

H. THE FLEXIBLE METALLIC CONDUIT SHALL BE OF THE GROUNDING TYPE. IT SHALL CONSIST OF GALVANIZED STEEL TAPE FORMED INTO AN INDUSTRY STANDARD INTERLOCKING COIL (3/4" MIN).

I. RIGID METAL CONDUIT SHALL BE INDUSTRY STANDARD STEEL CONDUIT (3/4" MIN, 4" MAX.

J. THREADED FITTINGS SHALL BE USED WITH RIGID CONDUIT. DOUBLE SET SCREW OR COMPRESSION FITTINGS SHALL BE USED WITH EMT.

2.02 WIRE AND CABLE

A. CONDUCTORS, NO. 12 AWG AND SMALLER: SOLID ALUMINUM.

B. CONDUCTORS, LARGER THAN NO. 12 AWG: STRANDED ALUMINUM.

C. INSULATION: THERMOPLASTIC, RATED AT 75 DEG C MINIMUM.

D. ALL CONDUCTORS SHALL BE SOFT 98% MINIMUM CONDUCTIVITY PROPERLY ALUMINUM, TYPE THHN/THWN INSULATED RATED AT 600V, UNLESS OTHERWISE NOTED.

E. REFER TO SECTION 3.09 FOR COLOR-CODING OF ALL WIRING.

2.03 SUPPORTING DEVICES

A. MATERIAL: COLD-FORMED STEEL, WITH CORROSION-RESISTANT COATING ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.

B. METAL ITEMS FOR USE OUTDOORS OR IN DAMP LOCATIONS: HOT-DIP GALVANIZED STEEL.

C. SLOTTED-STEEL CHANNEL SUPPORTS: FLANGE EDGES TURNED TOWARD WEB AND 9/16-INCH DIAMETER SLOTTED HOLES AT A MAXIMUM OF 2 INCHES O.C., IN WEBS.

D. SLOTTED-STEEL CHANNEL SUPPORTS: COMPLY WITH DIVISION 5 SECTION "METAL FABRICATIONS" FOR SLOTTED CHANNEL FRAMING.

1. CHANNEL THICKNESS: SELECTED TO SUIT STRUCTURAL LOADING.
2. FITTINGS AND ACCESSORIES: PRODUCTS OF THE SAME MANUFACTURER AS CHANNEL SUPPORTS.

E. NONMETALLIC CHANNEL AND ANGLE SYSTEMS: STRUCTURAL-GRADE, FACTORY-FORMED, GLASS-FIBER-RESIN CHANNELS AND ANGLES WITH 9/16-INCH- DIAMETER HOLES AT A MAXIMUM OF 8 INCHES O.C., IN AT LEAST ONE SURFACE.

1. FITTINGS AND ACCESSORIES: PRODUCTS OF THE SAME MANUFACTURER AS CHANNELS AND ANGLES.
2. FITTINGS AND ACCESSORY MATERIALS: SAME AS CHANNELS AND ANGLES, EXCEPT METAL ITEMS MAY BE STAINLESS STEEL.

F. RACEWAY AND CABLE SUPPORTS: MANUFACTURED CLEVIS HANGERS, RISER CLAMPS, STRAPS, THREADED C-CLAMPS WITH RETAINERS, CEILING TRAPEZE HANGERS, WALL BRACKETS, AND SPRING-STEEL CLAMPS OR CLICK-TYPE HANGERS.

G. PIPE SLEEVES: ASTM A 53, TYPE E, GRADE A, SCHEDULE 40, GALVANIZED STEEL, PLAIN ENDS.

H. CABLE SUPPORTS FOR VERTICAL CONDUIT: FACTORY-FABRICATED ASSEMBLY CONSISTING OF THREADED BODY AND INSULATING WEDGING PLUG FOR NONARMORED ELECTRICAL CABLES IN RISER CONDUITS. PLUGS HAVE NUMBER AND SIZE OF CONDUCTOR GRIPPING HOLES AS REQUIRED TO SUIT INDIVIDUAL RISERS. BODY CONSTRUCTED OF MALLEABLE-IRON CASTING WITH HOT-DIP GALVANIZED FINISH.

I. EXPANSION ANCHORS: CARBON-STEEL WEDGE OR SLEEVE TYPE.

J. TOGGLE BOLTS: ALL-STEEL SPRINGHEAD TYPE.

K. POWDER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL

L. PROVIDE ALL STEEL SUPPORTING MEMBERS, HANGERS, BRACKETS OR OTHER SPECIAL DETAILS REQUIRED AND NECESSARY AS PER CODE.

M. EXCEPT FOR BRANCH CIRCUITRY INSTALL ALL CONDUIT IN HUNG CEILING SPACE ON ACCEPTABLE HANGERS AND INSERTS. CONDUIT OR MC CABLE FOR BRANCH CIRCUITRY SHALL BE SUPPORTED BY CLAMPS OR PIPE STRAPS SECURED TO THE CEILING SUPPORT SYSTEM (BLACK IRON - NYC), FROM STRUCTURAL MEMBERS OR FROM THE DECK. SUPPORT FROM CEILING TEES, CROSS TEES OR SUPPORT WIRES IS PROHIBITED.

N. SPACING OF SUPPORTS SHALL BE PER THE NEC.

O. INSERTS ARE TO BE OF A LEAD SHIELD TYPE.

P. HANGERS MUST NOT BE WELDED TO STRUCTURAL STEEL MEMBERS AND BURNING OF HOLES IN STRUCTURAL STEEL IS PROHIBITED.

Q. SLEEVES ARE TO BE OF A TYPE SUITABLE FOR THE APPLICATION AND BE SEALED AND MADE WATERTIGHT. SLEEVES THROUGH CONCRETE SHALL BE SCHEDULE 40 STEEL PIPE, SIZED FOR FREE PASSAGE OF CONDUIT AND INSTALLED FLUSH WITH UNDERSIZE OF CONCRETE SLAB AND EXTEND 4" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.

2.04 PULLBOXES, JUNCTION BOXES AND OUTLET BOXES

A. PULLBOXES, JUNCTION BOXES AND OUTLET BOXES SHALL BE MANUFACTURED FROM GALVANIZED INDUSTRY STANDARD GAUGE SHEET STEEL.

B. PROVIDE PULL BOXES AND JUNCTION BOXES IN LONG STRAIGHT RUNS OF RACEWAY TO ASSURE THAT CABLES ARE NOT DAMAGED WHEN THEY ARE PULLED, TO FULFILL REQUIREMENTS AS TO THE NUMBER OF BENDS PERMITTED IN RACEWAY BETWEEN CABLE ACCESS POINTS, THE ACCESSIBILITY OF CABLE JOINTS AND SPLICES, AND THE APPLICATION OF CABLE SUPPORTS.

C. PULLBOXES AND JUNCTION BOXES SHALL BE SIZED SO THAT THE MINIMUM BENDING RADIUS CRITERIA SPECIFIED FOR THE WIRES AND CABLE ARE MAINTAINED.

D. SWITCH RECEPTACLE AND WALL OUTLET BOXES SHALL BE A NOMINAL 4" SQUARE, 1-1/2" OR 2-1/8" DEEP AS REQUIRED BY CODE WITH A RAISED COVER, UNLESS OTHERWISE INDICATED ON THE DRAWING.

E. PROVIDE BLANK COVERPLATES FOR BOXES WITHOUT WIRING DEVICES.

F. DO NOT INSTALL OUTLET BOXES BACK TO BACK IN PARTITIONS. STAGGER TO PREVENT SOUND TRANSFER.

G. TWO OR MORE OUTLET BOXES THAT OCCUR AT THE SAME LOCATION SHALL BE GANGED TOGETHER IN THE SAME COVERPLATE UNLESS OTHERWISE NOTED.

H. LIGHTING FIXTURE BOXES SHALL BE 4" OCTAGON TYPE, DEPTH AS REQUIRED WITH 3/8" FIXTURE STUD. FOR SUSPENDED CEILING WORK, PROVIDE A 4" OCTAGON BOX WITH REMOVABLE BACKPLATE WHERE REQUIRED.

I. PULL/JUNCTION BOX BARRIERS SHALL BE PROVIDED WHERE REQUIRED BY CODE.

J. INSTALL JUNCTION AND PULL BOXES IN INCONSPICUOUS LOCATIONS.

K. A MINIMUM OF ONE PULL BOX SHALL BE INSTALLED FOR EVERY 100 FT OF CONDUITS. (NOTE: EACH 90 DEGREE BEND SHALL EQUATE TO 30' LENGTH OF CONDUIT).

L. NO MORE THAN TWO (2) 90 DEGREE BENDS SHALL BE INSTALLED BETWEEN ANY TWO ADJACENT PULL BOXES.

M. ALL EQUIPMENT, DEVICE BOXES, JUNCTION BOXES, PULL BOXES AND OUTLET BOXES SHALL BE INSTALLED SO AS TO ALLOW ACCESS TO THE BOX.

N. OUTLET BOXES SHALL BE PROVIDED FOR ALL LOW VOLTAGE DEVICES (I.E. TELEPHONE/DATA, SECURITY, FIRE ALARM, ETC.). COORDINATE BOX SIZE AND DEPTH WITH RESPECTIVE VENDOR.

2.05 WIRING DEVICES

A. WIRING DEVICES SHALL BE SPECIFICATION GRADE, DECORATIVE STYLE, UNLESS OTHERWISE NOTED.

B. DEVICES GANGED TOGETHER IN MULTI-GANG BOX SHALL BE MOUNTED UNDER A SINGLE COVERPLATE.

C. LINE VOLTAGE SWITCHES SHALL BE 120/277 VOLTS, RATED AT 20 AMPERES, QUIET OPERATION ROCKER TYPE, DECORA STYLE.

D. RECEPTACLES

1. PROVIDE SPECIFICATION GRADE 20A. 120 VOLT, "U" GROUND RECEPTACLES, WITH MATCHING COVERPLATES. RECEPTACLES SHALL BE OF THE "DECORATOR STYLE".
2. REFER TO NOTES AND DETAILS FOR SPECIALITY RECEPTACLE COLORS.
3. RECEPTACLES TO HAVE CIRCUIT NUMBER IDENTIFIED ON THE WALL PLATE AND FURTHER IDENTIFIED WITH THE EXACT LOCATION LISTED IN THE PANEL DIRECTORY.
4. RECEPTACLES INSTALLED OUTDOORS SHALL BE GFCI TYPE AND PROVIDED WITH WEATHERPROOF WHILE-IN-USE COVER PASS AND SEYMOUR WIUCED SERIES OR APPROVED EQUAL.

2.06 SUPPORTS AND FASTENINGS

A. PROVIDE ALL STEEL SUPPORTING MEMBERS, HANGERS, BRACKETS OR OTHER SPECIAL DETAILS REQUIRED AND NECESSARY AS PER CODE.

B. EXCEPT FOR BRANCH CIRCUITRY INSTALL ALL CONDUIT IN HUNG CEILING SPACE ON ACCEPTABLE HANGERS AND INSERTS. CONDUIT OR MC CABLE FOR BRANCH CIRCUITRY SHALL BE SUPPORTED BY CLAMPS OR PIPE STRAPS SECURED TO THE CEILING SUPPORT SYSTEM (BLACK IRON), FROM STRUCTURAL MEMBERS OR FROM THE DECK. SUPPORT FROM CEILING TEES, CROSS TEES OR SUPPORT WIRES IS PROHIBITED.

C. SPACING OF SUPPORTS SHALL BE PER THE NEC.

D. INSERTS ARE TO BE OF A LEAD SHIELD TYPE.

E. HANGERS MUST NOT BE WELDED TO STRUCTURAL STEEL MEMBERS AND BURNING OF HOLES IN STRUCTURAL STEEL IS PROHIBITED.

F. SLEEVES ARE TO BE OF A TYPE SUITABLE FOR THE APPLICATION AND BE SEALED AND MADE WATERTIGHT. SLEEVES THROUGH CONCRETE SHALL BE SCHEDULE 40 STEEL PIPE, SIZED FOR FREE PASSAGE OF CONDUIT AND INSTALLED FLUSH WITH UNDERSIZE OF CONCRETE SLAB AND EXTEND 4" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.

2.07 DISCONNECT SWITCHES

A. INDOOR DISCONNECT SWITCHES SHALL BE "QUICK-MAKE, QUICK-BREAK," HEAVY DUTY TYPE IN NEMA 1 ENCLOSURES. PROVIDE ALL FUSES WHERE NOTED.

B. OUTDOOR DISCONNECT SWITCHES SHALL BE SIMILAR TO INDOOR, EXCEPT LISTED FOR OUTDOOR APPLICATIONS (NEMA 3R OR 4, AS REQUIRED).

C. FUSED DISCONNECT SWITCHES SHALL BE PROVIDED WITH FUSE CLIPS TO ACCEPT SPECIFIED FUSES.

2.08 FUSES

A. FUSES SHALL BE CURRENT LIMITING TYPE WITH A UL LISTED INTERRUPTING CAPACITY OF 200,000 RMS, UON.

B. FUSES RATED 600 AMPS AND BELOW SHALL BE CURRENT-LIMITING, DUAL-ELEMENT, TIME-DELAY UL CLASS RK-1 FOR NON-MOTOR CIRCUITS AND UL CLASS RK-5 FOR MOTOR CIRCUITS.

C. ALL FUSES SHALL BE OF THE SAME MANUFACTURER.

2.09 CIRCUIT BREAKERS

A. FOR PANELBOARD APPLICATIONS, CIRCUIT BREAKERS SHALL BE BOLTED TO THE PANELBOARD BUS BARS. WHERE CIRCUIT BREAKERS ARE INSTALLED IN EXISTING PANELBOARD BREAKERS SHALL BE OF THE SAME MANUFACTURER AND INTERRUPTING RATING. BREAKERS SHALL BE COMPATIBLE WITH EXISTING PANELBOARD.

B. CIRCUIT BREAKERS SHALL BE "THERMAL MAGNETIC" TYPE, QUICK-MAKE, QUICK-BREAK, TRIP-FREE WITH NON-WELDING CONTACTS COMPENSATED FOR AMBIENT TEMPERATURES AND SHALL HAVE A MINIMUM SHORT CIRCUIT RATING OF 10,000 AMPERES SYMMETRICAL FOR 120/280V PANELS AND 14,000 AMPERES SYMMETRICAL FOR 277/480V PANELS OR HIGHER WHERE NOTED. CIRCUIT BREAKERS SHALL BE FULLY RATED. SERIES RATING IS NOT ACCEPTABLE.

C. MULTI-WIRE BRANCH CIRCUITS SUPPLYING POWER TO MORE THAN ONE DEVICE OR EQUIPMENT SHALL BE PROVIDED WITH A MEANS TO DISCONNECT SIMULTANEOUSLY ALL UNGROUNDED CONDUCTORS AT THE PANELBOARD WHERE THE BRANCH CIRCUIT ORIGINATES. CONTRACTOR SHALL COORDINATE WITH LOCAL AHJ THE MEANS REQUIRED TO MEET NEC SECTION 210.4(B). CONTRACTOR SHALL REMOVE AND REPLACE ALL EXISTING CIRCUIT BREAKERS THAT CAN NOT BE RETROFITTED WITH TIE BARS AS REQUIRED TO COMPLY WITH REQUIREMENT.

D. TANDEM BREAKERS SHALL NOT BE UTILIZED.

E. PROVIDE BREAKER LOCKS FOR ALL NEW AND EXISTING BREAKERS SERVING EXIT LIGHTS, EMERGENCY LIGHTING AND EMERGENCY BATTERY PACKS.

F. WHERE INDICATED TO BE LSI TYPE, CIRCUIT BREAKERS SHALL BE SOLID-STATE ELECTRONIC TRIP WITH FIELD-ADJUSTABLE LONG-TIME AND SHORT-TIME PICKUP LEVELS, LONG-TIME AND SHORT-TIME TIME ADJUSTMENTS, INSTANTANEOUS TRIP. PROVIDE ADJUSTABLE GROUND FAULT PICKUP AND TIME DELAY WHERE INDICATED.

2.10 PANELBOARDS

A. PANELBOARD BOXES SHALL BE MADE OF SHEET STEEL "BENT-UP" OR RIVETED OR BOLTED TOGETHER WITH EXTERIOR ANGLE IRON FRAME. BOX SHALL BE OF SUFFICIENT SIZE TO ALLOW A GUTTER AT LEAST 6" IN WIDTH ENTIRELY SURROUNDING EACH SECTION OF BOARD. PANELBOARDS SHALL BE SURFACE OR FLUSH TYPE AS NOTED ON THE DRAWINGS. PANEL BOX AND COVER SHALL BE GIVEN TWO COATS OF GRAY ENAMEL PAINT.

B. PROVIDE CODE GAUGE STEEL DOORS FOR ALL PANELBOARD BOXES. FRONT COVER SHALL BE A "DOOR WITHIN A DOOR" TYPE. THE OUTER DOOR (TRIM) SHALL ALLOW ACCESS TO ENTIRE PANELBOARD BOX INCLUDING GUTTER SPACES. OUTER DOOR (TRIM) SHALL BE ATTACHED DIRECTLY TO BOX BY A FULL LENGTH PIANO HINGE. THE INNER DOOR SHALL ALLOW ACCESS TO CIRCUIT BREAKERS ONLY. PROVIDE LOCK AND SET OF KEYS FOR INNER DOOR PER PANELBOARD.

C. PANEL BUS BARS SHALL BE COPPER PROPORTIONED FOR A CURRENT DENSITY OF 1000 AMPERES PER SQUARE INCH OF CROSS-SECTIONAL AREA. PROVIDE A COPPER EQUIPMENT GROUND BAR IN EACH PANEL, AND A COPPER ISOLATED GROUND BAR IN NOTED PANELS.

D. PANELS SHALL BE PROVIDED WITH NEUTRAL BARS SIZED AT 200% OF THE PHASE BUS BARS.

E. ALL MAIN BREAKERS SHALL BE SEPARATELY MOUNTED ON TOP OR BOTTOM OF PANEL TO SUIT CABLE ENTRY. BRANCH MOUNTING IS NOT ACCEPTABLE.

F. ALL FLOOR MOUNTED DISTRIBUTION EQUIPMENT, INCLUDING PANELBOARDS AND/OR DISTRIBUTION PANELBOARDS SHALL BE INSTALLED ON A 4" HIGH CONCRETE BASE TO EXTEND 2" ON ALL SIDES WITH CHAMFERED CORNERS. ALL CONCRETE WORK TO BE INCLUDED, IN THIS DIVISION.

G. A TYPEWRITTEN LIST OF CIRCUITS SHOWING CLEARLY THE LOADS SUPPLIED BY EACH CIRCUIT SHALL BE INSTALLED ON THE INSIDE OF EACH PANEL BOARD DOOR. THIS LIST SHALL BE MOUNTED IN A STEEL FRAME UNDER A PLASTIC WINDOW, EACH PANEL SHALL BE EXTERNALLY TAGGED WITH PERMANENT LAMACOID PLATE INDICATING PANEL DESIGNATION AND VOLTAGE. PANEL DIRECTORY SHALL BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLING IN PANELBOARD. LOAD DESCRIPTION SHALL INCLUDE COLUMN GRID LINES, ROOM NUMBERS, OR OTHER INFORMATION TO CLEARLY DISTINGUISH LOAD LOCATION.

H. PHASE LEGS OF ALL PANELS SHALL BE BALANCED AT SUPPLY POINT TO WITHIN 10% AFTER ALL CIRCUITS ARE WIRED AND LOADS CONNECTED.

I. ALL PANELBOARDS SHALL HAVE A MINIMUM SHORT CIRCUIT RATING AS INDICATED ON DRAWINGS. EQUIPMENT SHALL BE FULLY RATED. SERIES RATING IS NOT ACCEPTABLE.

2.11 LOW VOLTAGE TRANSFORMERS

A. THREE PHASE TRANSFORMERS SHALL BE 480 VOLT DELTA PRIMARY AND 208/120 VOLT WYE SECONDARY IN A NEMA 1 VENTILATED ENCLOSURE, UNLESS OTHERWISE NOTED. TRANSFORMERS SHALL HAVE A MINIMUM OF TWO 2-1/2% FULL CAPACITY PRIMARY TAPS ABOVE AND FOUR 2-1/2% FULL CAPACITY PRIMARY TAPS BELOW NORMAL PRIMARY VOLTAGE. ADJUST SECONDARY VOLTAGE TO BE 208/120 WHEN INSTALLED.

B. TRANSFORMERS 15KVA AND ABOVE SHALL BE 115 DEGREE CENTIGRADE TEMPERATURE RISE ABOVE 40 DEGREES CENTIGRADE AMBIENT BASED UPON A 220°C INSULATION SYSTEM.

C. TRANSFORMERS SHALL BE PROVIDED WITH COPPER WINDINGS.

D. TRANSFORMERS NOTED AS FLOOR MOUNTED SHALL BE INSTALLED WITH VIBRATION ISOLATION.

E. TRANSFORMERS SHALL COMPLY WITH DEPARTMENT OF ENERGY 2016 ENERGY EFFICIENT REQUIREMENTS.

2.12 LIGHTING FIXTURES

A. ALL LIGHTING FIXTURE MOUNTING HARDWARE SHALL MATCH AND BE COORDINATED WITH THE NEW CEILING SYSTEM TYPE. ALL FIXTURES SHALL BE EQUIPPED WITH "EARTHQUAKE" CLIPS. ALL LIGHTING FIXTURES SHALL BE INSTALLED WITH SEISMIC BRACING AS INDICATED ON ARCHITECTURAL CEILING DETAILS.

B. ALL FIXTURES SHALL BE FREE OF LIGHT LEAKS BELOW CEILING.

C. REFER TO ARCHITECTURAL DRAWINGS FOR ALL LIGHTING FIXTURE SPECIFICATIONS.

D. ALL FIXTURES SHALL BE COMPLETE WITH NEW LAMPS, BALLASTS, DRIVERS, ACCESSORIES AND MOUNTING APPURTENANCES.

E. ALL LIGHT FIXTURES SHALL BE U.L. APPROVED.

F. CONTRACTOR SHALL AIM AND ADJUST ALL LIGHT FIXTURES IN PRESENCE OF LIGHTING CONSULTANT.

2.13 GROUNDING

A. PROVIDE SUPPLEMENTARY GROUND BONDING WHERE METALLIC CONDUITS TERMINATE AT METAL CLAD EQUIPMENT (OR AT THE METAL PULL BOX OF EQUIPMENT) FOR WHICH A GROUND BUS IS SPECIFIED WITH A BUSHING OF THE GROUNDING TYPE CONNECTED INDIVIDUALLY TO GROUND BUS.

B. GROUND ALL EQUIPMENT IN ACCORDANCE WITH LATEST EDITION OF THE NATIONAL ELECTRICAL CODE. PROVIDE SEPARATE GREEN INSULATED GROUND CONDUCTOR IN EVERY CONDUIT TO ALL DEVICES, LIGHTING FIXTURES AND FEEDERS (PANELBOARDS, DISCONNECT SWITCHES, ETC.).

C. ALL GROUND WIRES SHALL BE SUITABLY PROTECTED FROM MECHANICAL INJURY.

D. SPECIALTY GROUNDING AS DETAILED ON THE DESIGN DRAWINGS OR REQUESTED AS ELECTRICAL CONTRACTOR SCOPE BY OTHER CONSULTANTS DOCUMENTS.

E. BOND EACH RGS CONDUIT TERMINATION USING A PROPERLY SIZED GROUND WIRE BONDED TO THE GROUND WIRE INSTALLED IN THAT CONDUIT.

2.14 SELF-POWERED EXIT SIGNS

A. FURNISH AND INSTALL SELF-POWERED EXIT SIGNS COMPLETE WITH INTEGRAL BATTERY/CHARGER CAPABLE OF OPERATING THE SIGN FOR 90 MINUTES IN THE EVENT OF A POWER FAILURE.

B. UNIT SHALL HAVE SEALED NICKEL CADMIUM BATTERY, LED ILLUMINATORS, TEST BUTTON AND INDICATING LIGHT.

C. BATTERY/CHARGER PACK SHALL BE MOUNTED ABOVE THE SIGN. CEILING MOUNTED SIGNS SHALL BE ARRANGED SO THAT THE PACK IS RECESSED ABOVE THE CEILING. WALL MOUNTED SIGNS SHALL HAVE CONCEALED BATTERY PACKS.

D. EDGE LIT PANEL SHALL HAVE "EXIT" IN RED LETTERING, 6" HIGH OR 8" HIGH IN PLACES OF ASSEMBLY OR WHERE REQUIRED BY CODE.

E. EXIT SIGNS SHALL MATCH BUILDING STANDARD OR BE MANUFACTURED BY ATLITE, ENCORE, LIGHT ALARMS, OR APPROVED EQUAL.

F. SINGLE FACE AND DOUBLE FACE EXIT SIGNS SHALL BE PROVIDED WITH MYLAR BACKING.

G. EXIT SIGN SHALL BE UL LISTED AND SHALL MEET THE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.

2.15 MOTORS AND APPARATUS FURNISHED BY OTHERS

A. INSTALL ALL WIRING IN CONDUITS. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH 18" TO 24" OF FLEXIBLE CONDUIT FROM END OF CONDUIT TO MOTOR TERMINAL BOX.

B. PROVIDE CONNECTIONS TO ALL "EXISTING TO BE RELOCATED" AS WELL AS NEW MOTORS, CONTROLLERS, DISCONNECTS, ACTUATING AND CONTROL DEVICES. CONDUCTORS TO MOTORS TO BE THE SAME AS TO CONTROLLERS EXCEPT AS NOTED.

C. MOTORS, CONTROLLERS, ACTUATING AND CONTROL DEVICES WILL BE SUPPLIED UNDER SECTIONS OF WORK EXCEPT AS NOTED.

D. ACCEPT DELIVERY OF CONTROLLERS, OR RELOCATE EXISTING CONTROLLERS, ERECT ON WALLS OR ABOVE CEILING AS INDICATED AND WIRE UNDER THIS SECTION EXCEPT AS NOTED.

E. WIRE ALL MOTOR AND ACTUATING DEVICES SUPPLIED AND INSTALLED UNDER OTHER SECTIONS OF WORK EXCEPT AS NOTED.

F. FURNISH DISCONNECT SWITCHES UNDER THIS SECTIONS OF WORK EXCEPT AS NOTED.

G. LEAVE MOTOR, CONTROL AND ACTUATING EQUIPMENT READY FOR OPERATION.

H. ASCERTAIN EXACT LOCATIONS OF CONTROLLERS AND CONTROL SERVICES PRIOR TO INSTALLATION AND PULLING WIRING.

I. COORDINATE WITH ALL OTHER TRADES AND PROVIDE ALL WIRING, CONDUIT, JUNCTION BOXES, DISCONNECTS, CONNECTIONS AND TERMINATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER WIRING AND NECESSARY ELECTRICAL ADJUSTMENTS AS REQUIRED BY THE EQUIPMENT SPECIFICATION.

J. UNLESS OTHERWISE NOTED, ALL STARTERS AND CONTROL WIRING TO BE PROVIDED BY DIVISION 23. DIVISION 26 TO RECEIVE, INSTALL STARTERS AND PROVIDE ALL LINE-SIDE AND LOAD-SIDE POWER WIRING AND REQUIRED ISOLATING DISCONNECT SWITCHES.

K. CONFIRM ELECTRICAL REQUIREMENTS AND EXACT LOCATIONS OF ALL MECHANICAL EQUIPMENT WITH DIVISION 23 PRIOR TO INSTALLATION

2.16 CUTTING AND PATCHING

A. ALL CUTTING AND PATCHING REQUIRED TO THE EXISTING BUILDING STRUCTURE FOR THE WORK SHALL BE INCLUDED UNDER THIS CONTRACT AND BE ACCEPTABLE TO THE OWNER. OBTAIN WRITTEN APPROVAL FROM OWNER BEFORE ANY CUTTING IS CARRIED OUT.

B. WHERE CONDUITS PASS THROUGH FIRE RATED WALLS OR FLOORS, PROVIDE FIRE STOPPING MATERIAL LISTED WITH, AND BEAR LABEL OF CSA AND ULC, AND MAINTAIN SAME FIRE RATING OF BUILDING COMPONENT PENETRATION.

2.17 BALANCING AND METERING

A. MEASURE PHASE CURRENT TO PANELBOARDS WITH NORMAL LOADS OPERATING AT TIME OF ACCEPTANCE. ADJUST BRANCH CIRCUIT CONNECTIONS AS REQUIRED TO OBTAIN BEST BALANCE OF CURRENT BETWEEN PHASES AND SUBMIT A REPORT FOR INSERTION INTO MANUALS.

B. METER ALL POWER CIRCUIT FEEDERS. IF GROUND RESISTANCE ON ANY CIRCUIT IS LESS THAN THAT REQUIRED BY NEC OR OTHER GOVERNING REGULATIONS, SUCH CIRCUITS ARE TO BE CONSIDERED DEFECTIVE AND MUST BE REPLACED.

2.18 ELECTRICAL IDENTIFICATION

A. IDENTIFICATION DEVICES: A SINGLE TYPE OF IDENTIFICATION PRODUCT FOR EACH APPLICATION CATEGORY. USE COLORS PRESCRIBED BY ANSI A13.1, NFPA 70, AND THESE SPECIFICATIONS.

B. RACEWAY AND CABLE LABELS: COMPLY WITH ANSI A13.1, TABLE 3, FOR MINIMUM SIZE OF LETTERS FOR LEGEND AND MINIMUM LENGTH OF COLOR FIELD FOR EACH RACEWAY AND CABLE SIZE.

1. TYPE: PRETENSIONED, WRAPAROUND PLASTIC SLEEVES. FLEXIBLE, PREPRINTED, COLOR-CODED, ACRYLIC BAND SIZED TO SUIT THE DIAMETER OF THE ITEM IT IDENTIFIES.
2. TYPE: PREPRINTED, FLEXIBLE, SELF-ADHESIVE, VINYL. LEGEND IS OVERLAMINATED WITH A CLEAR, WEATHER- AND CHEMICAL-RESISTANT COATING.
3. COLOR: BLACK LETTERS ON ORANGE BACKGROUND.
4. LEGEND: INDICATES VOLTAGE.

C. COLORED ADHESIVE MARKING TAPE FOR RACEWAYS, WIRES, AND CABLES: SELF-ADHESIVE VINYL TAPE, NOT LESS THAN 1 INCH WIDE BY 3 MILS THICK.

D. UNDERGROUND WARNING TAPE: PERMANENT, BRIGHT-COLORED, CONTINUOUS-PRINTED, VINYL TAPE WITH THE FOLLOWING FEATURES:

1. NOT LESS THAN 6 INCHES WIDE BY 4 MILS THICK (150 MM WIDE BY 0.102 MM THICK).
2. COMPOUNDED FOR PERMANENT DIRECT-BURIAL SERVICE.
3. EMBEDDED CONTINUOUS METALLIC STRIP OR CORE.
4. PRINTED LEGEND THAT INDICATES TYPE OF UNDERGROUND LINE.

E. TAPE MARKERS FOR WIRE: VINYL OR VINYL-CLOTH, SELF-ADHESIVE, WRAPAROUND TYPE WITH PREPRINTED NUMBERS AND LETTERS.

F. COLOR-CODING CABLE TIES: TYPE 6/6 NYLON, SELF-LOCKING TYPE. COLORS TO SUIT CODING SCHEME.

G. ENGRAVED-PLASTIC LABELS, SIGNS, AND INSTRUCTION PLATES: ENGRAVING STOCK, MELAMINE PLASTIC LAMINATE PUNCHED OR DRILLED FOR MECHANICAL FASTENERS 1/16-INCH (1.6-MM) MINIMUM THICKNESS FOR SIGNS UP TO 20 SQ. IN. (129 SQ. CM) AND 1/8-INCH (3.2-MM) MINIMUM THICKNESS FOR LARGER SIZES. ENGRAVED LEGEND IN BLACK LETTERS ON WHITE BACKGROUND.

H. INTERIOR WARNING AND CAUTION SIGNS: COMPLY WITH 29 CFR, CHAPTER XVII, PART 1910.145. PREPRINTED, ALUMINUM, BAKED-ENAMEL-FINISH SIGNS, PUNCHED OR DRILLED FOR MECHANICAL FASTENERS, WITH COLORS, LEGEND, AND SIZE APPROPRIATE TO THE APPLICATION.

I. EXTERIOR WARNING AND CAUTION SIGNS: COMPLY WITH 29 CFR, CHAPTER XVII, PART 1910.145. WEATHER-RESISTANT, NON-FADING, PREPRINTED, CELLULOSE-ACETATE BUTYRATE SIGNS WITH 0.0396-INCH (1-MM), GALVANIZED-STEEL BACKING, WITH COLORS, LEGEND, AND SIZE APPROPRIATE TO THE APPLICATION. 1/4-INCH (6-MM) GROMMETS IN CORNERS FOR MOUNTING.

J. FASTENERS FOR NAMEPLATES AND SIGNS: SELF-TAPPING, STAINLESS-STEEL SCREWS OR NO. 10/32 STAINLESS-STEEL MACHINE SCREWS WITH NUTS AND FLAT AND LOCK WASHERS.

2.19 EQUIPMENT FOR UTILITY COMPANY'S ELECTRICITY METERING

A. CURRENT-TRANSFORMER CABINETS: COMPLY WITH REQUIREMENTS OF ELECTRICAL POWER UTILITY COMPANY.

B. METER SOCKETS: COMPLY WITH REQUIREMENTS OF ELECTRICAL POWER UTILITY COMPANY.

2.20 CONCRETE BASES

A. CONCRETE FORMS AND REINFORCEMENT MATERIALS: AS SPECIFIED IN OTHER SECTIONS OF THIS SPECIFICATION.

B. CONCRETE: 6" HIGH AS SPECIFIED IN OTHER SECTIONS OF THIS SPECIFICATION.

2.21 TOUCHUP PAINT

A. FOR EQUIPMENT: EQUIPMENT MANUFACTURER'S PAINT SELECTED TO MATCH INSTALLED EQUIPMENT FINISH.

B. GALVANIZED SURFACES: ZINC-RICH PAINT RECOMMENDED BY ITEM MANUFACTURER.

2.22 ACCEPTABLE MANUFACTURERS:

A. RECEPTACLES: PASS & SEYMOUR, LEVITON, OR HUBBELL

B. LIGHT SWITCHES: WATTSTOPPER, NLIGHT, OR LUTRON

C. DIMMER SWITCHES: WATTSTOPPER, NLIGHT, OR LUTRON

D. OCCUPANCY SENSORS: WATTSTOPPER, NLIGHT, OR LUTRON

E. RACEWAYS: NATIONAL WIRE PRODUCTS, TRIANGLE, OR REPUBLIC

F. WIRE/CABLE: SOUTHWIRE, GENERAL CABLE, OR CERRO

G. METAL CLAD CABLE: AFC, SOUTHWIRE, OR STABILOY

H. FITTINGS, COUPLINGS, BUSHINGS, CONNECTORS: OZ GEDNEY, BURNDY, NEPCO, OR THOMAS AND BETTS

I. DISCONNECT SWITCHES: EATON, GE, SQUARE D, OR SIEMENS

J. FUSES: BUSSMAN, MERSEN, OR LITTLEFUSE

K. CIRCUIT BREAKERS: EATON, GE, SQUARE D OR SIEMENS. MATCH BUILDING STANDARD

L. PANELBOARDS: EATON, SQUARE D OR SIEMENS.

M. TRANSFORMERS: HAMMOND POWER SOLUTIONS, EATON, SQUARE D, OR SIEMENS.

N. LAMPS: GE, SYLVANIA, OR PHILLIPS

O. BALLASTS: OSRAM SYLVANIA, ESB, OR UNIVERSAL

P. FLOOR BOXES POKE-THRU'S: WIREMOLD, HUBBELL, OR FSR

Q. WIREWAYS: HUBBELL OR WIREMOLD

R. TIME CLOCKS: TORK, INTERMATIC, OR APPROVED EQUAL

S. RELAY CONTROLS: WATTSTOPPER, LUTRON, TORK, OR APPROVED EQUAL

TO THE BEST KNOWLEDGE, BELIEF

PART 3 EXECUTION

3.01 GENERAL

A. PERFORM THE WORK AT SUCH TIME AND IN SUCH MANNER AS TO MINIMIZE INTERFERENCE WITH BUILDING'S NORMAL OPERATION. NOTIFY BUILDING MANAGEMENT REPRESENTATIVES IN ADVANCE EACH TIME A SERVICE OUTAGE OR INTERRUPTION WILL BE REQUIRED FOR THE PERFORMANCE OF SOME PHASE OF THE WORK. SCHEDULE SUCH SERVICE OUTAGE OR INTERRUPTION, ONLY AFTER HAVING RECEIVED APPROVAL OF DATE, HOUR, AND TIME INTERVAL REQUIRED THEREOF. SCHEDULE OF WORK AS DIRECTED SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE.

B. OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE RESISTANCE RATED WALLS, PARTITIONS, FLOORS, OR CEILINGS SHALL BE FIRE STOPPED USING APPROVED METHODS. SEALANT SHALL BE RATED FOR 3 HOURS. TELECOMMUNICATION CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING FIRE STOPPING IN 'IT' CONDUITS/SLEEVES/PENETRATIONS AFTER 'IT' WIRES ARE PULLED.

C. PROVIDE 277/480 VOLT DANGER LABELING AT ALL EQUIPMENT AND JUNCTION/PULL BOXES PER CODE.

D. MAINTAIN GROUND CONTINUITY THROUGHOUT ALL SYSTEMS.

E. MAINTAIN CONTINUITY AND PROTECT ALL EXISTING CIRCUITS TO REMAIN SERVING EQUIPMENT WITHIN EXISTING TO REMAIN AREAS. CONTRACTOR SHALL BE RESPONSIBLE TO TRACE ALL EXISTING CIRCUITS TO REMAIN ORIGINATING FROM PANELBOARDS, AND SUBMIT FINDINGS TO ENGINEER FOR CLARIFICATION PRIOR TO THE START OF ANY PANELBOARD WORK. WHENEVER IT IS REQUIRED THAT AN EXISTING CIRCUIT BE MODIFIED, REVISED, DISCONNECTED OR REMOVED IT SHALL BE UNDERSTOOD THAT THE CIRCUIT SHALL BE RECONNECTED AND SERVICE RE-ESTABLISHED IN THE REMAINING PORTION OF THE CIRCUIT AFFECTED BY THE ALTERNATION.

F. PRIOR TO ANY CHASING, CHOPPING, OR CORE DRILLING BEING PERFORMED, THE CONTRACTOR SHALL FIELD INVESTIGATE CONDITIONS AND COORDINATE WITH ALL APPROPRIATE TRADES TO ENSURE THAT WORK WILL BE IN HARMONY WITH OTHER WORK AND NOT AFFECTED ANY EXISTING BUILDING SYSTEMS. X-RAY SLABS IF REQUIRED. THIS WORK MUST BE APPROVED BY BUILDING MANAGEMENT PRIOR TO PROCEEDING. ALL CORING/CHASING WILL BE DONE ON OVERTIME.

G. FOR TEMPORARY POWER, FURNISH AND INSTALL WIRING FOR ADEQUATE LIGHT AND SMALL TOOLS POWER FOR THE PROJECT. THIS SHALL INCLUDE STRINGERS, LAMPS, OUTLETS, BREAKERS, AND FUSING, AS IT IS NECESSARY. ALL TEMPORARY WIRING SHALL BE REMOVED FROM SPACE AT COMPLETION OF PROJECT.

H. FURNISH AND INSTALL A MINIMUM 1" EMPTY CONDUIT FOR ALL WALL MOUNTED LOW VOLTAGE EQUIPMENT JUNCTION BOXES. CONDUIT SHALL BE STUBBED 6" ABOVE HUNG CEILING AND TURNED TOWARDS TERMINATION CLOSET ABOVE ACCESSIBLE CEILING AREA.

I. COORDINATE WITH THE BUILDING OWNER FOR ANY SERVICE INTERRUPTION OF EXISTING SYSTEMS AND GIVE NOTICE AS REQUIRED BY BUILDING RULES AND REGULATIONS OR A MINIMUM OF TEN (10) BUSINESS DAYS PRIOR TO ANY WORK, WHICHEVER IS MORE STRINGENT. CONTRACTOR IS TO PERFORM WORK ON PREMIUM TIME SO AS TO NOT DISTURB NORMAL BUSINESS OPERATION.

J. WHEN USING TEMPORARY LIGHTING, THE CONTRACTOR SHALL CLEARLY LABEL PANELS AND BREAKERS USED FOR LIGHTING. LOCATION OF PANELS TO BE SHOWN ON FLOOR PLAN POSTED AT ENTRANCE TO WORK AREA. PROPER TEMPORARY LIGHTING AND POWER MUST BE INSTALLED AND MAINTAINED IN ALL WORK AREAS. CONNECTIONS TO EXISTING STAIRWELL AND EXIT LIGHT SYSTEMS ARE NOT PERMITTED.

K. THE CONTRACTOR SHALL CUT BACK TO THE FLOOR, WALL OR CEILING, REMOVE WIRING AND PLUG BOTH ENDS OF CONCEALED CONDUITS MADE OBSOLETE BY THIS ALTERATION. EXPOSED CONDUITS, WIREWAYS, OUTLET BOXES, PULL BOXES, HANGERS, ETC. MADE OBSOLETE BY THE ALTERATION WORK SHALL BE REMOVED, UNLESS OTHERWISE NOTED.

L. IT IS POSSIBLE THAT THERE WILL BE CERTAIN REMOVALS AND RELOCATIONS OF THE EXISTING ELECTRICAL INSTALLATION NECESSARY FOR THE SATISFACTORY PERFORMANCE OF THE WORK. THESE CHANGES CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS, BUT MUST BE CONSIDERED BY THE CONTRACTOR WHILE REVIEWING THE EXISTING CONDITIONS AT THE SITE AND PREPARING THE PROPOSAL.

3.02 ELECTRICAL EQUIPMENT INSTALLATION

A. HEADROOM MAINTENANCE: IF MOUNTING HEIGHTS OR OTHER LOCATION CRITERIA ARE NOT INDICATED, ARRANGE AND INSTALL COMPONENTS AND EQUIPMENT TO PROVIDE THE MAXIMUM POSSIBLE HEADROOM.

B. MATERIALS AND COMPONENTS: INSTALL LEVEL, PLUMB, AND PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS, UNLESS OTHERWISE INDICATED.

C. EQUIPMENT: INSTALL TO FACILITATE SERVICE, MAINTENANCE, AND REPAIR OR REPLACEMENT OF COMPONENTS. CONNECT FOR EASE OF DISCONNECTING, WITH MINIMUM INTERFERENCE WITH OTHER INSTALLATIONS.

D. RIGHT OF WAY: GIVE TO RACEWAYS AND PIPING SYSTEMS INSTALLED AT A REQUIRED SLOPE.

E. PROVIDE CONCRETE BASE FOR ALL FLOOR-MOUNTED ELECTRICAL EQUIPMENT.

3.03 RACEWAY APPLICATION

A. USE THE FOLLOWING RACEWAYS FOR INDOOR INSTALLATIONS:

1. EXPOSED: RMC.
2. CONCEALED: EMT (MC CABLE WHERE PERMISSIBLE ACCORDING TO SECTION 3.06B).
3. CONNECTION TO VIBRATING EQUIPMENT: FMC; EXCEPT IN WET OR DAMP LOCATIONS, USE LFMC.
4. DAMP OR WET LOCATIONS: IMC/RMC.
5. BOXES AND ENCLOSURES: NEMA 250, TYPE 1, UNLESS OTHERWISE INDICATED.

B. USE THE FOLLOWING RACEWAYS FOR OUTDOOR INSTALLATIONS:

1. EXPOSED: IMC/RMC.
2. CONCEALED: IMC/RMC.
3. UNDERGROUND, BELOW SLAB: RNC - SCHEDULE 40 PVC.
4. UNDERGROUND, ALL OTHER LOCATIONS: RNC - SCHEDULE 80 PVC.
5. CONNECTION TO VIBRATING EQUIPMENT: LFMC.
6. BOXES AND ENCLOSURES: NEMA 250, TYPE 3R OR TYPE 4.

3.04 RACEWAY AND CABLE INSTALLATION

A. CONCEAL RACEWAYS AND CABLES, UNLESS OTHERWISE INDICATED, WITHIN FINISHED WALLS, CEILINGS, AND FLOORS.

B. INSTALL RACEWAYS AND CABLES AT LEAST 6 INCHES (150 MM) AWAY FROM PARALLEL RUNS OF FLUES AND STEAM OR HOT-WATER PIPES. LOCATE HORIZONTAL RACEWAY RUNS ABOVE WATER AND STEAM PIPING.

C. USE TEMPORARY RACEWAY CAPS TO PREVENT FOREIGN MATTER FROM ENTERING.

D. MAKE CONDUIT BENDS AND OFFSETS SO ID IS NOT REDUCED. KEEP LEGS OF BENDS IN THE SAME PLANE AND STRAIGHT LEGS OF OFFSETS PARALLEL, UNLESS OTHERWISE INDICATED.

E. USE RACEWAY AND CABLE FITTINGS COMPATIBLE WITH RACEWAYS AND CABLES AND SUITABLE FOR USE AND LOCATION.

F. INSTALL RACEWAYS EMBEDDED IN SLABS IN MIDDLE THIRD OF SLAB THICKNESS WHERE PRACTICAL, AND LEAVE AT LEAST 1-INCH CONCRETE COVER. OBTAIN STRUCTURAL ENGINEER'S APPROVAL PRIOR TO INSTALLATION.

1. SECURE RACEWAYS TO REINFORCING RODS TO PREVENT SAGGING OR SHIFTING DURING CONCRETE PLACEMENT.
2. SPACE RACEWAYS LATERALLY TO PREVENT VOIDS IN CONCRETE.
3. INSTALL CONDUIT LARGER THAN 1-INCH TRADE SIZE (DN27) PARALLEL TO OR AT RIGHT ANGLES TO MAIN REINFORCEMENT. WHERE CONDUIT IS AT RIGHT ANGLES TO REINFORCEMENT, PLACE CONDUIT CLOSE TO SLAB SUPPORT.
4. TRANSITION FROM SCHEDULE 40 NONMETALLIC TUBING TO SCHEDULE 80 NONMETALLIC CONDUIT, RIGID STEEL CONDUIT, OR IMC BEFORE RISING ABOVE FLOOR.
5. MAKE BENDS IN EXPOSED PARALLEL OR BANKED RUNS FROM SAME CENTERLINE TO MAKE BENDS PARALLEL. USE FACTORY ELBOWS ONLY WHERE ELBOWS CAN BE INSTALLED PARALLEL; OTHERWISE, PROVIDE FIELD BENDS FOR EXPOSED PARALLEL RACEWAYS.

G. INSTALL PULL WIRES IN EMPTY RACEWAYS. USE NO. 14 AWG ZINC-COATED STEEL OR MONOFILAMENT PLASTIC LINE WITH NOT LESS THAN 200-LB TENSILE STRENGTH. LEAVE AT LEAST 12 INCHES OF SLACK AT EACH END OF THE PULL WIRE.

H. INSTALL TELEPHONE AND SIGNAL SYSTEM RACEWAYS, 2-INCH TRADE SIZE AND SMALLER, IN MAXIMUM LENGTHS OF 100 FEET AND WITH A MAXIMUM OF TWO 90-DEGREE BENDS OR EQUIVALENT. SEPARATE LENGTHS WITH PULL OR JUNCTION BOXES WHERE NECESSARY TO COMPLY WITH THESE REQUIREMENTS, IN ADDITION TO REQUIREMENTS ABOVE.

I. CONNECT MOTORS AND EQUIPMENT SUBJECT TO VIBRATION, NOISE TRANSMISSION, OR MOVEMENT WITH A MAXIMUM OF 72-INCH (1830-MM) FLEXIBLE CONDUIT. INSTALL LFMC IN WET OR DAMP LOCATIONS. INSTALL SEPARATE GROUND CONDUCTOR ACROSS FLEXIBLE CONNECTIONS.

J. SET FLOOR BOXES LEVEL AND TRIM AFTER INSTALLATION TO FIT FLUSH TO FINISHED FLOOR SURFACE.

3.05 WIRING METHODS FOR POWER, LIGHTING, AND CONTROL CIRCUITS

A. FEEDERS: TYPE THHN/THWN INSULATED CONDUCTORS IN RACEWAY

B. UNDERGROUND FEEDERS AND BRANCH CIRCUITS: TYPE XHHW OR SINGLE-WIRE, TYPE UF INSULATED CONDUCTORS IN RACEWAY..

C. BRANCH CIRCUITS: TYPE THW OR THHN/THWN INSULATED CONDUCTORS IN RACEWAY WHERE EXPOSED. METAL-CLAD CABLE SHALL BE PERMITTED WHERE PERMITTED BY AUTHORITIES HAVING JURISDICTION. METAL-CLAD CABLE SHALL NOT BE INSTALLED WITHIN ELECTRIC CLOSETS OR DIRECTLY INTO PANELBOARDS. METAL-CLAD CABLE TO BE RESTRICTED TO ABOVE RECESSED CEILINGS, INSIDE WALLS, AND WITHIN 10FT OF EXPOSED LIGHTING FIXTURES.

D. REMOTE-CONTROL SIGNALING AND POWER-LIMITED CIRCUITS: TYPE THHN/THWN INSULATED CONDUCTORS IN RACEWAY FOR CLASSES 1, 2, AND 3, UNLESS OTHERWISE INDICATED.

E. MULTI-WIRE BRANCH CIRCUITS SHALL BE PROVIDED WITH A MEANS TO DISCONNECT SIMULTANEOUSLY ALL UNGROUNDED CONDUCTORS AT THE PANELBOARD WHERE THE BRANCH CIRCUIT ORIGINATES.

3.06 WIRING INSTALLATION

A. ALL CONDUCTORS SHALL BE RUN IN CONDUIT. [SEE WIRE AND CABLE SECTION 3.06B FOR ALTERNATE PRICING TO UTILIZE MC CABLE WHERE PERMISSIBLE.]

B. METAL CLAD (TYPE MC) FOR CONCEALED BRANCH CIRCUITRY IN OFFICE SPACES ONLY MAY BE USED WHEN APPROVED BY BUILDING MANAGEMENT AND WHERE PERMITTED BY CODE. RMC SHALL BE USED OUTSIDE OFFICE SPACES AND IN BUILDING CLOSETS. METAL CLAD (TYPE MC) SHALL NOT BE INSTALLED INTO PANELBOARDS.

C. WIRE CONNECTORS AND SPLICES: UNITS OF SIZE, AMPACITY RATING, MATERIAL, TYPE, AND CLASS SUITABLE FOR SERVICE INDICATED.

D. THE MINIMUM WIRE SIZE FOR BRANCH CIRCUITS SHALL BE NO. 12 AWG EXCEPT 120 VOLT CIRCUITS OVER 100' IN LENGTH SHALL BE NO. 10 AWG. CONTRACTOR SHALL PERFORM VOLTAGE DROP CALCULATIONS BASED ON FIELD CONDITIONS AND REPORT BACK TO THE ENGINEER ANY BRANCH CIRCUITS THAT REQUIRE TO BE UPSIZED TO ACCOMMODATE VOLTAGE DROP.

E. THE TOTAL VOLTAGE DROP ACROSS THE COMBINATION OF FEEDERS AND BRANCH CIRCUITS SHALL NOT EXCEED 5 PERCENT PER THE ENERGY CONSERVATION CODE OF NEW YORK STATE SECTION C405.9.

F. TAG ALL FEEDERS IN ALL PULL BOXES, GUTTER SPACES, AND WIREWAYS THROUGH WHICH THEY PASS.

G. TERMINATE STRANDED CONDUCTORS NO. 8 AWG AND LARGER, AT SWITCHBOARDS, TRANSFORMERS, UPS SYSTEMS WITH COMPRESSION TYPE CONNECTORS. TERMINATE WITH MECHANICAL LUGS AT PANELBOARDS.

H. JOIN OR TAP STRANDED CONDUCTORS (NO. 6 AWG AND LARGER) WITH PRESSURE INDENT TYPE CONNECTORS BURNDY, NEPCO, OR O.Z./GEDNEY WITH COMPOSITION INSULATING COVERS.

I. SPLICES IN BRANCH WIRING (NO. 8 AWG AND SMALLER) SHALL BE TWISTED AND MADE MECHANICALLY TIGHT; THEN SECURED WITH PIGTAIL CONNECTORS, CRIMP TYPE CONNECTORS SHALL NOT BE USED. UTILIZE UL LISTED, "SILICON FILLED" PIGTAIL CONNECTORS WHERE LOCATED IN WET ENVIRONMENTS OR OUTDOORS.

J. SUPPORT CONDUCTORS IN VERTICAL RACEWAYS IN ACCORDANCE WITH THE NEC BASED ON CONDUCTOR SIZE AND VERTICAL DISTANCE.

K. WALL MOUNTED DEVICES SHALL BE FED VERTICALLY. HORIZONTAL RUNS THROUGH PARTITIONS SHALL NOT BE PERMITTED, EXCEPT IN LOW HEIGHT PARTITIONS OR WHERE NOTED ON DRAWINGS

L. CONNECT OUTLET AND COMPONENT CONNECTIONS TO WIRING SYSTEMS AND TO GROUND. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS, ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A.

M. FOR ALL SIZES OF CONDUIT LARGER THAN 1-1/2", USE STANDARD ELBOW.

N. CONDUIT SHALL BE SECURELY FASTENED IN PLACE AND HANGERS, SUPPORTS OR FASTENINGS SHALL BE PROVIDED AT EACH ELBOW AND AT EACH END OF EACH STRAIGHT RUN TERMINATED AT A BOX OR CABINET.

O. PROVIDE EXPANSION FITTINGS IN EACH CONDUIT RUN WHEREVER IT CROSSES AN EXPANSION JOINT AND WHEREVER THE CONDUIT LENGTH EXCEEDS 200 FEET WITH A CHANGE IN DIRECTION.

P. UNLESS OTHERWISE INDICATED OR SPECIFIED, ALL WIRING SHALL BE INSTALLED CONCEALED.

Q. FEEDERS AND BRANCH CIRCUITRY ABOVE HUNG CEILING AND IN PARTITIONS SHALL BE RUN IN ELECTRICAL METALLIC TUBING (EMT) UNLESS OTHERWISE NOTED. FINAL CONNECTIONS TO MOTORS, LIGHT FIXTURES, TRANSFORMERS, AND EQUIPMENT SUBJECT TO VIBRATION WILL BE DONE WITH FLEXIBLE METALLIC CONDUIT (GREENFIELD). LENGTH SHALL NOT EXCEED 6 FEET.

R. ALL CONDUIT IN MECHANICAL ROOMS, ELECTRICAL CLOSETS AND WHERE CONCEALED IN CONCRETE OR INSTALLED OUTDOORS SHALL BE RIGID THREADED REGARDLESS OF SIZE.

S. ALL CONDUITS INSTALLED IN CONCRETE OR OUTDOORS SHALL BE PROVIDED WITH WEATHERPROOF CONNECTORS.

T. ALL METAL CONDUIT TERMINATING IN A METAL ENCLOSURE SHALL HAVE AN INSULATED BUSHING. PROVIDE "GROUNDING" TYPE BUSHING WHERE REQUIRED.

U. INSTALL CONDUITS TO CONSERVE HEADROOM, PARALLEL AND PERPENDICULAR TO BUILDING LINES. DO NOT CLIP CONDUITS TO CEILING HANGER

V. WALL COMMUNICATIONS CONDUIT SHALL BE REAMED AND INSTALLED COMPLETE WITH INSULATED BUSHINGS AT EACH END.

3.07 ELECTRICAL SUPPORTING DEVICE APPLICATION

A. DAMP LOCATIONS AND OUTDOORS: HOT-DIP GALVANIZED MATERIALS OR NONMETALLIC, U-CHANNEL SYSTEM COMPONENTS.

B. DRY LOCATIONS: STEEL MATERIALS.

C. SUPPORT CLAMPS FOR PVC RACEWAYS: CLICK-TYPE CLAMP SYSTEM.

D. SELECTION OF SUPPORTS: COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.

E. STRENGTH OF SUPPORTS: ADEQUATE TO CARRY PRESENT AND FUTURE LOADS, TIMES A SAFETY FACTOR OF AT LEAST FOUR; MINIMUM OF 200-LB (90-KG) DESIGN LOAD.

3.08 SUPPORT INSTALLATION

A. INSTALL SUPPORT DEVICES TO SECURELY AND PERMANENTLY FASTEN AND SUPPORT ELECTRICAL COMPONENTS.

B. INSTALL INDIVIDUAL AND MULTIPLE RACEWAY HANGERS AND RISER CLAMPS TO SUPPORT RACEWAYS. PROVIDE U-BOLTS, CLAMPS, ATTACHMENTS, AND OTHER HARDWARE NECESSARY FOR HANGER ASSEMBLIES AND FOR SECURING HANGER RODS AND CONDUITS.

C. SUPPORT PARALLEL RUNS OF HORIZONTAL RACEWAYS TOGETHER ON TRAPEZE- OR BRACKET-TYPE HANGERS.

D. SIZE SUPPORTS FOR MULTIPLE RACEWAY INSTALLATIONS SO CAPACITY CAN BE INCREASED BY A 25 PERCENT MINIMUM IN THE FUTURE.

E. SUPPORT INDIVIDUAL HORIZONTAL RACEWAYS WITH SEPARATE, MALLEABLE-IRON PIPE HANGERS OR CLAMPS.

F. INSTALL 1/4-INCH- (6-MM-) DIAMETER OR LARGER THREADED STEEL HANGER RODS, UNLESS OTHERWISE INDICATED.

G. SPRING-STEEL FASTENERS SPECIFICALLY DESIGNED FOR SUPPORTING SINGLE CONDUITS OR TUBING MAY BE USED INSTEAD OF MALLEABLE-IRON HANGERS FOR 1-1/2-INCH (38-MM) AND SMALLER RACEWAYS SERVING LIGHTING AND RECEPTACLE BRANCH CIRCUITS ABOVE SUSPENDED CEILINGS AND FOR FASTENING RACEWAYS TO SLOTTED CHANNEL AND ANGLE SUPPORTS.

H. ARRANGE SUPPORTS IN VERTICAL RUNS SO THE WEIGHT OF RACEWAYS AND ENCLOSED CONDUCTORS IS CARRIED ENTIRELY BY RACEWAY SUPPORTS, WITH NO WEIGHT LOAD ON RACEWAY TERMINALS.

I. SIMULTANEOUSLY INSTALL VERTICAL CONDUCTOR SUPPORTS WITH CONDUCTORS.

J. SEPARATELY SUPPORT CAST BOXES THAT ARE THREADED TO RACEWAYS AND USED FOR FIXTURE SUPPORT. SUPPORT SHEET-METAL BOXES DIRECTLY FROM THE BUILDING STRUCTURE OR BY BAR HANGERS. IF BAR HANGERS ARE USED, ATTACH BAR TO RACEWAYS ON OPPOSITE SIDES OF THE BOX AND SUPPORT THE RACEWAY WITH AN APPROVED FASTENER NOT MORE THAN 12 INCHES FROM THE BOX.

K. INSTALL METAL CHANNEL RACKS FOR MOUNTING CABINETS, PANELBOARDS, DISCONNECT SWITCHES, CONTROL ENCLOSURES, PULL AND JUNCTION BOXES, TRANSFORMERS, AND OTHER DEVICES UNLESS COMPONENTS ARE MOUNTED DIRECTLY TO STRUCTURAL ELEMENTS OF ADEQUATE STRENGTH.

L. INSTALL SLEEVES FOR CABLE AND RACEWAY PENETRATIONS OF CONCRETE SLABS AND WALLS UNLESS CORE-DRILLED HOLES ARE USED. INSTALL SLEEVES FOR CABLE AND RACEWAY PENETRATIONS OF MASONRY AND FIRE-RATED GYPSUM WALLS AND OF ALL OTHER FIRE-RATED FLOOR AND WALL ASSEMBLIES. INSTALL SLEEVES DURING ERECTION OF CONCRETE AND MASONRY WALLS.

M. SECURELY FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTS TO THE BUILDING STRUCTURE, UNLESS OTHERWISE INDICATED. PERFORM FASTENING ACCORDING TO THE FOLLOWING UNLESS OTHER FASTENING METHODS ARE INDICATED:

1. WOOD: FASTEN WITH WOOD SCREWS OR SCREW-TYPE NAILS.
2. MASONRY: TOGGLE BOLTS ON HOLLOW MASONRY UNITS AND EXPANSION BOLTS ON SOLID MASONRY UNITS.
3. NEW CONCRETE: CONCRETE INSERTS WITH MACHINE SCREWS AND BOLTS.
4. EXISTING CONCRETE: EXPANSION BOLTS.
5. INSTEAD OF EXPANSION BOLTS, THREADED STUDS DRIVEN BY A POWDER CHARGE AND PROVIDED WITH LOCK WASHERS MAY BE USED IN EXISTING CONCRETE.
6. STEEL: WELDED THREADED STUDS OR SPRING-TENSION CLAMPS ON STEEL.
   a. FIELD WELDING: COMPLY WITH AWS D1.1.
7. WELDING TO STEEL STRUCTURE MAY BE USED ONLY FOR THREADED STUDS, NOT FOR CONDUITS, PIPE STRAPS, OR OTHER ITEMS.
8. LIGHT STEEL: SHEET-METAL SCREWS.
9. FASTENERS: SELECT SO THE LOAD APPLIED TO EACH FASTENER DOES NOT EXCEED 25 PERCENT OF ITS PROOF-TEST LOAD.
10. NO TAPCON TYPE SELF THREADING SCREWS SHALL BE ALLOWED INTO MASONRY OR CONCRETE.

3.09 IDENTIFICATION MATERIALS AND DEVICES

A. INSTALL AT LOCATIONS FOR MOST CONVENIENT VIEWING WITHOUT INTERFERENCE WITH OPERATION AND MAINTENANCE OF EQUIPMENT.

B. COORDINATE NAMES, ABBREVIATIONS, COLORS, AND OTHER DESIGNATIONS USED FOR ELECTRICAL IDENTIFICATION WITH CORRESPONDING DESIGNATIONS INDICATED IN THE CONTRACT DOCUMENTS OR REQUIRED BY CODES AND STANDARDS. USE CONSISTENT DESIGNATIONS THROUGHOUT PROJECT.

C. SELF-ADHESIVE IDENTIFICATION PRODUCTS: CLEAN SURFACES BEFORE APPLYING.

D. IDENTIFY RACEWAYS AND CABLES WITH COLOR BANDING AS FOLLOWS:

1. BANDS: PRETENSIONED, SNAP-AROUND, COLORED PLASTIC SLEEVES OR COLORED ADHESIVE MARKING TAPE. MAKE EACH COLOR BAND 2 INCHES (51 MM) WIDE, COMPLETELY ENCIRCLING CONDUIT, AND PLACE ADJACENT BANDS OF TWO-COLOR MARKINGS IN CONTACT, SIDE BY SIDE.
2. BAND LOCATIONS: AT CHANGES IN DIRECTION, AT PENETRATIONS OF WALLS AND FLOORS, AT 50-FOOT (15-M) MAXIMUM INTERVALS IN STRAIGHT RUNS, AND AT 25-FOOT (8-M) MAXIMUM INTERVALS IN CONGESTED AREAS.
3. COLORS: AS FOLLOWS:
   a. FIRE ALARM SYSTEM: RED.
   b. SECURITY SYSTEM: BLUE AND YELLOW.
   c. TELECOMMUNICATION SYSTEM: GREEN AND YELLOW.

E. TAG AND LABEL CIRCUITS DESIGNATED TO BE EXTENDED IN THE FUTURE. IDENTIFY SOURCE AND CIRCUIT NUMBERS IN EACH CABINET, PULL AND JUNCTION BOX, AND OUTLET BOX. COLOR-CODING MAY BE USED FOR VOLTAGE AND PHASE IDENTIFICATION.

F. INSTALL CONTINUOUS UNDERGROUND PLASTIC MARKERS DURING TRENCH BACKFILLING, FOR EXTERIOR UNDERGROUND POWER, CONTROL, SIGNAL, AND COMMUNICATION LINES LOCATED DIRECTLY ABOVE POWER AND COMMUNICATION LINES. LOCATE 6 TO 8 INCHES BELOW FINISHED GRADE. IF WIDTH OF MULTIPLE LINES INSTALLED IN A COMMON TRENCH OR CONCRETE ENVELOPE DOES NOT EXCEED 16 INCHES, OVERALL, USE A SINGLE LINE MARKER.

G. COLOR-CODE 208/120-V SYSTEM SECONDARY SERVICE, FEEDER, AND BRANCH-CIRCUIT CONDUCTORS THROUGHOUT THE SECONDARY ELECTRICAL SYSTEM SHALL BE SIMILAR TO (MATCHING BUILDING STANDARDS):

1. PHASE A: BLACK.
2. PHASE B: RED.
3. PHASE C: BLUE.
4. NEUTRAL: WHITE
5. GROUND: GREEN

H. COLOR-CODE 480/277-V SYSTEM SECONDARY SERVICE, FEEDER, AND BRANCH-CIRCUIT CONDUCTORS THROUGHOUT THE SECONDARY ELECTRICAL SYSTEM SHALL BE SIMILAR TO (MATCHING BUILDING STANDARDS):

1. PHASE A: YELLOW.
2. PHASE B: BROWN.
3. PHASE C: ORANGE.
4. NEUTRAL: GRAY OR WHITE WITH A COLORED STRIPE (NOT GREEN),
5. GROUND: GREEN

I. INSTALL WARNING, CAUTION, AND INSTRUCTION SIGNS WHERE REQUIRED TO COMPLY WITH 29 CFR, CHAPTER XVII, PART 1910.145, AND WHERE NEEDED TO ENSURE SAFE OPERATION AND MAINTENANCE OF ELECTRICAL SYSTEMS AND OF ITEMS TO WHICH THEY CONNECT. INSTALL ENGRAVED PLASTIC-LAMINATED INSTRUCTION SIGNS WITH APPROVED LEGEND WHERE INSTRUCTIONS ARE NEEDED FOR SYSTEM OR EQUIPMENT OPERATION. INSTALL METAL-BACKED BUTYRATE SIGNS FOR OUTDOOR ITEMS.

J. INSTALL ENGRAVED-LAMINATED EMERGENCY-OPERATING SIGNS WITH WHITE LETTERS ON RED BACKGROUND WITH MINIMUM 3/8-INCH- (9-MM-) HIGH LETTERING FOR EMERGENCY INSTRUCTIONS ON POWER TRANSFER, LOAD SHEDDING, AND OTHER EMERGENCY OPERATIONS.

K. INSTALL PRE-PRINTED LABEL MAXIMUM 6" FROM TERMINATION OF ALL WIRE; LISTING PHASE, PANEL, AND CIRCUIT NUMBER.

3.10 UTILITY COMPANY ELECTRICITY-METERING EQUIPMENT

A. INSTALL EQUIPMENT ACCORDING TO UTILITY COMPANY'S WRITTEN REQUIREMENTS. PROVIDE GROUNDING AND EMPTY CONDUITS AS REQUIRED BY UTILITY COMPANY.

3.11 FIRESTOPPING

A. APPLY FIRESTOPPING TO CABLE AND RACEWAY PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES TO ACHIEVE FIRE-RESISTANCE RATING OF THE ASSEMBLY. FIRESTOPPING MATERIALS AND INSTALLATION REQUIREMENTS ARE SPECIFIED IN DIVISION 7 SECTION "FIRESTOPPING."

3.12 CONCRETE BASES

A. CONSTRUCT CONCRETE BASES OF DIMENSIONS INDICATED, BUT NOT LESS THAN 4 INCHES (100 MM) LARGER, IN BOTH DIRECTIONS, THAN SUPPORTED UNIT. FOLLOW SUPPORTED EQUIPMENT MANUFACTURER'S ANCHORAGE RECOMMENDATIONS AND SETTING TEMPLATES FOR ANCHOR-BOLT AND TIE LOCATIONS, UNLESS OTHERWISE INDICATED. USE 3000-PSI (20.7-MPA), 28-DAY COMPRESSIVE-STRENGTH CONCRETE AND REINFORCEMENT AS SPECIFIED A SEPARATE DIVISION OF THE SPECIFICATIONS.

B. INSTALL ALL TRANSFORMERS ON CONCRETE PADS.

3.13 SURGE PROTECTION DEVICES

A. INSTALL SPD'S WITH CONDUCTORS BETWEEN SUPPRESSOR AND POINTS OF ATTACHMENT AS SHORT AND STRAIGHT AS POSSIBLE, AND ADJUST CIRCUIT-BREAKER POSITIONS TO ACHIEVE SHORTEST AND STRAIGHTEST LEADS. DO NOT SPLICE AND EXTEND SPD LEADS UNLESS SPECIFICALLY PERMITTED BY MANUFACTURER. DO NOT EXCEED MANUFACTURER'S LEAD LENGTH.

3.14 DEMOLITION

A. REFER TO DEMOLITION CONSTRUCTION DRAWING PACKAGE DATED 05/11/2021 FOR DEMOLITION SCOPE OF WORK.

3.15 CUTTING AND PATCHING

A. CUT, CHANNEL, CHASE, AND DRILL FLOORS, WALLS, PARTITIONS, CEILINGS, AND OTHER SURFACES REQUIRED TO PERMIT ELECTRICAL INSTALLATIONS. PERFORM CUTTING BY SKILLED MECHANICS OF TRADES INVOLVED.

B. REPAIR AND REFINISH DISTURBED FINISH MATERIALS AND OTHER SURFACES TO MATCH ADJACENT UNDISTURBED SURFACES. INSTALL NEW FIREPROOFING WHERE EXISTING FIRESTOPPING HAS BEEN DISTURBED. REPAIR AND REFINISH MATERIALS AND OTHER SURFACES BY SKILLED MECHANICS OF TRADES INVOLVED.

3.16 REFINISHING AND TOUCHUP PAINTING

A. REFINISH AND TOUCH UP PAINT. PAINT MATERIALS AND APPLICATION REQUIREMENTS ARE SPECIFIED A SEPARATE DIVISION OF THE SPECIFICATIONS

1. CLEAN DAMAGED AND DISTURBED AREAS AND APPLY PRIMER, INTERMEDIATE, AND FINISH COATS TO SUIT THE DEGREE OF DAMAGE AT EACH LOCATION.
2. FOLLOW PAINT MANUFACTURER'S WRITTEN INSTRUCTIONS FOR SURFACE PREPARATION AND FOR TIMING AND APPLICATION OF SUCCESSIVE COATS.
3. REPAIR DAMAGE TO GALVANIZED FINISHES WITH ZINC-RICH PAINT RECOMMENDED BY MANUFACTURER.
4. REPAIR DAMAGE TO PVC OR PAINT FINISHES WITH MATCHING TOUCHUP COATING RECOMMENDED BY MANUFACTURER.

3.17 CLEANING AND PROTECTION

A. ON COMPLETION OF INSTALLATION, INCLUDING OUTLETS, FITTINGS, AND DEVICES, INSPECT EXPOSED FINISH. REMOVE BURRS, DIRT, PAINT SPOTS, AND CONSTRUCTION DEBRIS.

B. PROTECT EQUIPMENT AND INSTALLATIONS AND MAINTAIN CONDITIONS TO ENSURE THAT COATINGS, FINISHES, AND CABINETS ARE WITHOUT DAMAGE OR DETERIORATION AT TIME OF SUBSTANTIAL COMPLETION.

3.18 IDENTIFICATION OF EQUIPMENT

A. ALL PANELBOARDS, CONTROL PANELS, AND CABINETS SPECIFIED HEREIN SHALL BE CLEARLY IDENTIFIED WITH THE EQUIPMENT DESIGNATION AND VOLTAGE RATING. IDENTIFICATION SHALL BE BY WHITE ON BLACK PLASTIC NAMEPLATE WITH 1/2" MINIMUM LETTERING ATTACHED BY SCREWS.

B. ALL PANELBOARDS, SPECIFIED HEREIN SHALL BE PROVIDED WITH A MEANS OF IDENTIFICATION OF THE MULTI-WIRE BRANCH CIRCUIT COLOR CODE IDENTIFICATION SYSTEM INSTALLED PER THE REQUIREMENTS OF NEC ARTICLE 210.5. REFER TO SPECIFICATION SECTION 2.03.E FOR COLOR CODING DESIGNATIONS.

C. JUNCTION BOXES, SPLICE BOXES, ETC., SHALL BE IDENTIFIED WITH PANEL AND CIRCUIT NUMBERS, FOR CIRCUITS CONTAINED THEREIN. FACEPLATE OF SWITCHES FOR EQUIPMENT SUCH AS MOTORIZED SCREENS, ETC., SHALL BE IDENTIFIED WITH THE NAME OF THE DEVICE CONTROLLED. IDENTIFICATION SHALL BE BY INDELIBLE MARKER IN CONCEALED LOCATIONS AND ADHESIVE ('P' TOUCH TYPE) LABELS IN EXPOSED LOCATIONS. EMERGENCY DEVICES SHALL BE IDENTIFIED IN RED.

D. CLEARLY LABEL ALL EXPOSED CONDUIT, PULL BOXES, JUNCTION BOXES, ETC TO INDICATE THE NATURE OF THE SERVICE.

E. EMPTY CONDUITS SHALL BE IDENTIFIED WITH TAGS AT BOTH ENDS INDICATING THE LOCATION OF TERMINATION OF THE OPPOSITE END.

F. FIRE ALARM SYSTEM JUNCTION BOXES SHALL BE PAINTED FIRE DEPARTMENT RED. APPROVED IDENTIFICATION CARDS SHALL BE FURNISHED ADJACENT TO ALL CON

AS DESCRIBED ABOVE AND/OR DETAILED ON THE ENGINEERING DRAWINGS.

J. PROVIDE TYPEWRITTEN DIRECTORIES FOR NEW AND EXISTING PANELS. CONFIRM EXISTING IDENTIFICATION AND CORRECT WHERE NECESSARY.

3.19 EXISTING EQUIPMENT REFURBISHMENT:

A. WHERE PANELBOARDS, SWITCHES, CIRCUIT BREAKERS, TRANSFORMERS, ETC. ARE EXISTING TO BE REUSED THE CONTRACTOR SHALL CLEAN AND REFURBISH THE EQUIPMENT. THIS SHALL INCLUDE TIGHTENING ALL CONNECTIONS, REPLACING DEFECTIVE MECHANISMS, EXERCISING MECHANISMS AND PROVIDING ANY MISCELLANEOUS COMPONENTS SO THE EQUIPMENT IS IN FIRST CLASS WORKING ORDER.

B. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO FIELD SURVEY ALL EXISTING BASE BUILDING RECEPTACLE, LIGHTING AND EQUIPMENT CIRCUITS WHICH ARE EXISTING TO REMAIN. PROVIDE AS BUILT SURVEY PRIOR TO THE START OF ANY WORK AND SUBMIT TO ENGINEER FOR RECORD. CIRCUITS SHALL REMAIN IN EXISTING PANELS OR WHEN PANELBOARDS ARE REPLACED, RE-TERMINATED IN NEW PANELBOARD.

3.20 ELECTRICAL FURNITURE SYSTEMS

A. THE ELECTRIFIED FURNITURE VENDOR WILL SUPPLY ALL RECEPTACLES, FURNITURE TASK LIGHTING FIXTURES, WIRING HARNESSES, CONNECTORS AND FITTINGS TO THE ELECTRICAL CONTRACTOR FOR THE COMPLETE WIRING INSTALLATION. ALL WIRING AND COMPONENTS SHALL BE INSTALLED AS DIRECTED BY VENDOR. ELECTRICAL CONTRACTOR SHALL FURNISH AN 18" MAXIMUM LIQUID TIGHT FLEXIBLE CONDUIT CONNECTIONS WITH REQUIRED PHASE CONDUCTORS, NEUTRAL CONDUCTORS AND GROUND CONDUCTORS AS INDICATED FROM WALL OR FLOOR OUTLET.

B. THE FURNITURE VENDOR SHALL CHALK THE FURNITURE SYSTEM OUTLINE ON THE FLOOR FOR COORDINATION OF POWER AND COMMUNICATION IN-FEED LOCATIONS. IN-FEED LOCATIONS INDICATED ON PLAN DOCUMENTS ARE FOR CLARITY PURPOSES. IN-FEED LOCATIONS AND QUANTITY SHALL BE APPROVED IN FIELD BY ARCHITECT AND FURNITURE SYSTEM VENDOR PRIOR TO INSTALLATION.

C. FURNITURE SYSTEM CIRCUITRY DESIGN IS DEVELOPED BASED UPON A "2+2" WIRING CONFIGURATION. CONTRACTOR SHALL CIRCUIT 2 PHASE CONDUCTORS, WITH A NEUTRAL FOR CIRCUITS "1&2" AND 2 PHASE CONDUCTORS, WITH A NEUTRAL FOR CIRCUITS "3&4". BOTH PAIRS OF CIRCUITS SHALL BE PROVIDED WITH A GROUND CONDUCTOR. CONTRACTOR SHALL INSTALL 8#10 AWG CONDUCTORS TO EACH FURNITURE SYSTEM INFEED.

D. MULT-FIWIRE BRANCH CIRCUITS SUPPLYING POWER TO PERMANENTLY CONNECTED FREESTANDING PARTITIONS (ELECTRIFIED FURNITURE SYSTEMS) SHALL BE PROVIDED WITH A MEANS TO DISCONNECT SIMULTANEOUSLY ALL UNGROUNDED CONDUCTORS AT THE PANELBOARD WHERE THE BRANCH CIRCUIT ORIGINATES. CONTRACTOR SHALL COORDINATE WITH LOCAL AHJ THE MEANS REQUIRED TO MEET NEC SECTIONS 605.7.

3.21 LIFE SAFETY TESTING

A. AFTER COMPLETION OF THE PROJECT, PERFORM A TEST OF THE EMERGENCY EGRESS LIGHTING SYSTEM. TEST SHALL BE PERFORMED AFTER DARK (AT LEAST 1 HOUR AFTER SUNSET); SIMULATE POWER FAILURE ON ALL LIGHTING CIRCUITS. TAKE LIGHT LEVEL READINGS ALONG PATHS OF EGRESS AT FLOOR LEVEL UTILIZING A FOOT CANDLE METER; RECORD READINGS ON A REDUCED SCALE (1/16"=1'-0") FLOOR PLAN. READINGS SHALL BE TAKEN ALONG THE ENTIRE EGRESS PATH, AND THE AVERAGE, MINIMUM, AND MAX TO MIN RATIO SHALL BE RECORDED. SUBMIT SEALED AND SIGNED COPY OF THE FLOOR PLAN READINGS TO THE ENGINEER.

3.22 WARNING LABELS

A. SWITCHBOARDS, PANELBOARDS AND ASSOCIATED EQUIPMENT (UPS, ETC.) THAT WILL REQUIRE ADJUSTMENT, SERVICING, INSPECTION, OR MAINTENANCE WHILE ENERGIZED SHALL BE FIELD MARKED INDICATING VOLTAGE AND WARNING QUALIFIED PERSONS OF POTENTIAL ELECTRIC ARC-FLASH HAZARDS PER NEC SECTION 110.16 AND NFPA 70E. REFER TO SECTION 1.26 FOR ADDITIONAL INFORMATION ON FLASH HAZARD ANALYSIS.

B. SERVICE EQUIPMENT SHLL BE FIELD MARKED INDICATING THE MAXIMUM AVAILABLE FAULT CURRENT IN ACCORDANCE WITH NEC 110.24 (A). CONTRACTOR IS RESPONSIBLE FOR OBTAINING CORRECT VALUES FROM THE UTILITY COMPANY.

3.23 PROTECTION

A. CONTRACTOR SHALL BE RESPONSIBLE FOR WORK AND EQUIPMENT UNTIL FINALLY INSPECTED, TESTED AND ACCEPTED. MATERIALS AND EQUIPMENT SHALL BE CAREFULLY STORED WHICH ARE NOT IMMEDIATELY INSTALLED AFTER DELIVERY TO SITE. CLOSE EXPOSED PARTS OF THE WORK WITH TEMPORARY COVERS, OR PLUGS DURING CONSTRUCTION, TO PREVENT ENTRY OF MOISTURE OR OBSTRUCTING MATERIALS.

B. PROTECT THE WORK AND MATERIAL OF OTHERS FROM DAMAGE INSTALLED AS PART OF THIS CONTRACT. RESTORE ANY WORK DAMAGED AND BE RESPONSIBLE FOR ALL CURRENT WORK AND ASSOCIATED COSTS.

3.24 FIELD QUALITY CONTROL

A. INSPECT INSTALLED COMPONENTS FOR DAMAGE AND FAULTY WORK, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. RACEWAYS.
2. BUILDING WIRE AND CONNECTORS.
3. SUPPORTING DEVICES FOR ELECTRICAL COMPONENTS.
4. ELECTRICAL IDENTIFICATION.
5. ELECTRICITY-METERING COMPONENTS.
6. CONCRETE BASES.
7. ELECTRICAL DEMOLITION.
8. CUTTING AND PATCHING FOR ELECTRICAL CONSTRUCTION.
9. TOUCHUP PAINTING.
10. PANELBOARDS.
11. SWITCHBOARDS.
12. AUTOMATIC TRANSFER SWITCHES.

B. TEST OWNER'S ELECTRICITY-METERING INSTALLATION FOR PROPER OPERATION, ACCURACY, AND USABILITY OF OUTPUT DATA.

1. CONNECT A LOAD OF KNOWN KW RATING, 1.5 KW MINIMUM, TO A CIRCUIT SUPPLIED BY THE METERED FEEDER.
2. TURN OFF CIRCUITS SUPPLIED BY THE METERED FEEDER AND SECURE THEM IN THE "OFF" CONDITION.
3. RUN THE TEST LOAD CONTINUOUSLY FOR EIGHT HOURS, MINIMUM, OR LONGER TO OBTAIN A MEASURABLE METER INDICATION. USE A TEST LOAD PLACEMENT AND SETTING THAT ENSURE CONTINUOUS, SAFE OPERATION.
4. CHECK AND RECORD METER READING AT END OF TEST PERIOD AND COMPARE WITH ACTUAL ELECTRICITY USED BASED ON TEST LOAD RATING, DURATION OF TEST, AND SAMPLE MEASUREMENTS OF SUPPLY VOLTAGE AT THE TEST LOAD CONNECTION. RECORD TEST RESULTS.
5. REPAIR OR REPLACE MALFUNCTIONING METERING EQUIPMENT OR CORRECT TEST SETUP; THEN RETEST. REPEAT FOR EACH METER IN INSTALLATION UNTIL PROPER OPERATION OF ENTIRE SYSTEM IS VERIFIED.
6. WITH LOADS APPLIED FOR MINIMUM 20 MINUTES PERFORM AN INFRARED TEST ON EACH WIRE/CABLE CONNECTION POINT AND RECORD RESULTS. PROVIDE AN INFRARED PHOTO ALONGSIDE A NORMAL COLOR PHOTO IN REPORT. SUBMIT TEST REPORT TO OWNER.

3.25 EXTRA MATERIALS:

A. IN ADDITION TO ALL MATERIALS AND INSTALLATION COMPONENTS INDICATED ON THE DRAWINGS, ELECTRICAL CONTRACTOR SHALL PROVIDE THE FOLLOWING (INCLUSIVE OF ALL MATERIAL AND LABOR ASSOCIATED WITH INSTALL):

1. TWENTY-FIVE (25) DUPLEX RECEPTACLES
2. FIVE (5) CEILING MOUNTED OCCUPANCY/VACANCY SENSORS
3. TWELVE (12) 20 AMPERE, 1-POLE BRANCH CIRCUITS CONSISTING OF 100' OF 3#12 IN 3/4" CONDUIT.

3.26 COMMISSIONING:

A. ELECTRICAL SYSTEMS TO BE COMMISSIONED:

1. LIGHTING CONTROL SYSTEM
2. OCCUPANCY/VACANCY SENSORS
3. LIGHTING CONTROL DEVICES

B. ELECTRICAL CONTRACTOR SHALL ASSIST OWNER SELECTED COMMISSIONING AGENT WITH THE COMMISSIONING OF THE LIGHTING CONTROL SYSTEM FOR COMPLIANCE ALL APPLICABLE CODE REQUIREMENTS (I.E. ENERGY CODE, ELECTRICAL CODE, ETC.).

C. ELECTRICAL CONTRACTOR SHALL INCLUDE IN THEIR BASE BID, THE SERVICES OF THE LIGHTING CONTROL SYSTEM AND SENSOR SYSTEM MANUFACTURER'S REPRESENTATIVES TO ATTEND AND ASSIST IN THE FINAL COMMISSIONING OF THE SYSTEMS.

D. COMMISSIONING SHALL ENSURE THAT ALL CONTROL HARDWARE AND SOFTWARE ARE CALIBRATED, ADJUSTED, PROGRAMMED AND IN PROPER WORKING CONDITION IN ACCORDANCE WITH CONSTRUCTION DOCUMENTS AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.

E. COORDINATE ALL WORK ASSOCIATED WITH THE FUNDAMENTAL COMMISSIONING ACTIVITIES, INCLUDING:

1. ATTEND ALL COMMISSIONING MEETINGS WITH ASSOCIATED SUB-CONTRACTORS AND MANUFACTURER'S REPRESENTATIVES THAT ARE REQUIRED TO COMPLETE THE COMMISSIONING OF THE EQUIPMENT PROVIDED.
2. PERFORM AND DOCUMENT TESTING OUTLINED IN THE COMMISSIONING AUTHORITY PROCEDURES.
3. WORK CLOSELY WITH THE COMMISSIONING AUTHORITY IN IDENTIFYING ALL OPERATING, MAINTENANCE, FAILURE MODES THAT MUST BE DEMONSTRATED AS PART OF THE COMMISSIONING PROCESS.
4. COMPLETE PRE-STARTUP AND STARTUP ON ALL INSTALLED EQUIPMENT PRIOR TO ALL COMMISSIONING ACTIVITIES.
5. COORDINATE, SCHEDULE, AND COMPLETE COMMISSIONING TASKS WITH THE COMMISSIONING AUTHORITY. THE ELECTRICAL CONTRACTOR SHALL BE MADE READILY AVAILABLE FOR OPERATING AND TESTING ALL EQUIPMENT TO BE COMMISSIONED.
6. PROVIDE MANUFACTURER ACCEPTABLE TESTING DOCUMENTATION (STARTUP MANUALS) PRIOR TO START OF COMMISSIONING TESTING PROCEDURES.
7. RESPONSIBLE FOR ALL COSTS FOR TESTING, INCLUDING PRE-TESTING DUE TO DEFICIENCIES/NON-COMPLIANCE WITH TESTING/SPECIFICATIONS.
8. RESPONSIBLE TO SUPPLY AND CONNECT ALL TESTING EQUIPMENT REQUIRED FOR ANY PART OF THE COMMISSIONING PROCESS (I.E. LOAD BANKS, CABLES, INFRARED SCANNING, TEMPORARY COOLING MEANS, ETC.).

F. SYSTEM REVIEW SHALL INCLUDE THAT ALL SENSORS, SWITCHES, PROGRAMMED SCHEDULE CONTROLS, PHOTOSENSORS OR DAYLIGHT CONTROLS MEET THE FOLLOWING REQUIREMENTS:

1. COMMISSIONING AGENT SHALL CONFIRM PLACEMENT, SENSITIVITY AND TIME OUT ADJUSTMENTS FOR OCCUPANT SENSORS YIELD ACCEPTABLE PERFORMANCE.
2. COMMISSIONING AGENT SHALL CONFIRM THAT TIME SWITCHES AND PROGRAMMABLE SCHEDULE CONTROLS ARE PROGRAMMED TO TURN OFF LIGHTING
3. COMMISSIONING AGENT SHALL CONFIRM THAT THE PLACEMENT AND SENSITIVITY ADJUSTMENTS FOR PHOTOSENSOR CONTROLS REDUCE ELECTRIC LIGHT BASED ON THE AMOUNT OF USABLE DAYLIGHT IN THE SPACE AS SPECIFIED.

G. ELECTRICAL CONTRACTOR SHALL PRETEST ALL SYSTEMS AND DEVICES AND SHALL SUBMIT A COMPLETION CERTIFICATE FROM THE MANUFACTURER'S REPRESENTATIVE, ON MANUFACTURER'S LETTERHEAD, THAT ALL SYSTEMS ARE OPERATIONAL AND PERFORM TO CONTRACT DOCUMENT SPECIFICATIONS. MANUFACTURER'S CERTIFICATE SHALL BE DELIVERED TO GENERAL CONTRACTOR/ CONSTRUCTION MANAGER, TENANT, AND ENGINEER A MINIMUM OF FIVE (5) DAYS PRIOR TO TENANT MOVE IN.

H. COMMISSIONING OF LIGHTING CONTROL SYSTEM (PROGRAMMABLE SYSTEM CONTROLS, OCCUPANT SENSORS, PHOTOSENSORS, AND DAYLIGHT CONTROLS) SHALL BE READY FOR COMMISSIONING AGENT NO FEWER THAN TEN (10) WORKING DAYS PRIOR TO OWNER TURN-OVER.

MEDIUM VOLTAGE TRANSFORMERS

1. GENERAL

1.1. SCOPE

A. THIS SECTION DEFINES DRY-TYPE, ENCLOSED AND VENTILATED MEDIUM VOLTAGE (POWER) TRANSFORMERS AS INDICATED.

B. TRANSFORMERS SHALL BE DESIGNED, CONSTRUCTED AND RATED IN ACCORDANCE WITH UL, NEMA AND IEEE/ANSI STANDARDS.

C. TRANSFORMERS SHALL BE DESIGNED, CONSTRUCTED AND RATED (WHERE APPLICABLE) IN ACCORDANCE WITH U.S. DEPARTMENT OF ENERGY, ENERGY CONSERVATION PROGRAM FOR COMMERCIAL EQUIPMENT; DISTRIBUTION TRANSFORMERS ENERGY CONSERVATION STANDARDS.

C.1. DOE 2016 - DOE 10 CFR PART 431 EFFICIENCY STANDARDS; PUBLISHED IN THE FEDERAL REGISTER ON APRIL 18, 2013.

1.2. RELATED DOCUMENTS

A. DRAWING AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION

1.3 REFERENCES

A. IEEE C57.12.01 - GENERAL REQUIREMENTS FOR DISTRIBUTION, POWER AND REGULATING TRANSFORMERS

B. ANSI C57.12.28 - SWITCHGEAR AND TRANSFORMERS, PAD-MOUNTED EQUIPMENT - ENCLOSURE INTEGRITY

C. ANSI C57.12.50 - REQUIREMENTS FOR VENTILATED DRY-TYPE DISTRIBUTION TRANSFORMERS, 1-500 KVA SINGLE-PHASE AND 15-500 KVA THREE-PHASE, WITH HIGH VOLTAGE 601-34,500 VOLTS, LOW VOLTAGE 120-600 VOLTS

D. ANSI C57.12.51 - REQUIREMENTS FOR VENTILATED DRY-TYPE POWER TRANSFORMERS, 501 KVA AND

E. LARGER THREE-PHASE, WITH HIGH VOLTAGE 601-34,500 VOLTS, LOW VOLTAGE 208Y/120-4160 VOLTS

F. ANSI C57.12.55 - CONFORMANCE STANDARD FOR TRANSFORMERS - DRY-TYPE TRANSFORMERS USED IN UNIT

G. INSTALLATIONS, INCLUDING UNIT SUBSTATIONS

H. IEEE C57.12.56 - STANDARD TEST PROCEDURE FOR THERMAL EVALUATION OF INSULATION SYSTEMS FOR

I. VENTILATED DRY-TYPE POWER AND DISTRIBUTION TRANSFORMERS

J. IEEE C57.12.58 - GUIDE FOR CONDUCTING A TRANSIENT VOLTAGE ANALYSIS OF A DRY-TYPE TRANSFORMER

K. COIL

L. IEEE C57.12.59 - GUIDE FOR DRY-TYPE TRANSFORMER THROUGH-FAULT CURRENT DURATION

M. IEEE C57.12.70 - TERMINAL MARKINGS AND CONNECTIONS FOR DISTRIBUTION AND POWER TRANSFORMERS

N. IEEE C57.12.80 - STANDARD TERMINOLOGY FOR POWER AND DISTRIBUTION TRANSFORMERS

O. IEEE C57.12.91 STANDARD TEST CODE FOR DRY-TYPE DISTRIBUTION AND POWER TRANSFORMERS,

P. IEEE C57.94 - RECOMMENDED PRACTICE FOR INSTALLATION, APPLICATION, OPERATION, AND MAINTENANCE OF DRY-TYPE GENERAL PURPOSE DISTRIBUTION AND POWER TRANSFORMERS

Q. IEEE C57.96 - GUIDE FOR LOADING DRY-TYPE DISTRIBUTION AND POWER TRANSFORMERS (ANSI).

R. IEEE C57.105 - GUIDE FOR APPLICATION OF TRANSFORMER CONNECTIONS IN THREE-PHASE DISTRIBUTION SYSTEMS

S. C57.110 FOR NON-LINEAR LOADS AND C57.18.10 FOR RECTIFIER DUTY IF SPECIFIED

T. IEEE C57.124 - RECOMMENDED PRACTICE FOR THE DETECTION OF PARTIAL DISCHARGES AND THE MEASUREMENT OF APPARENT CHARGE IN DRY-TYPE TRANSFORMERS

U. CSA-C88 - POWER TRANSFORMERS AND REACTORS

V. UL 1562 TRANSFORMERS, DISTRIBUTION, DRY-TYPE - OVER 600 VOLTS

W. DOE 2016 - DOE 10 CFR PART 431 EFFICIENCY STANDARDS; PUBLISHED IN THE FEDERAL REGISTER ON APRIL 18, 2013

X. NEMA 210 - SECONDARY UNIT SUBSTATIONS

Y. NEMA TR-27 - COMMERCIAL, INSTITUTIONAL AND INDUSTRIAL DRY-TYPE TRANSFORMERS

1.4 TESTING & QUALITY CONTROL

A. PRODUCTION TESTS: EACH UNIT ACCORDING TO:

- CSA C9 & C22.2 NO. 47
- UL 1562
- DOE 10 CFR PART 431 SUB PART K

B. TEST EACH MODEL DESIGN AND SUBMIT REPORT ON REQUEST

C. STANDARD PRODUCTION TESTS TO INCLUDE:

- APPLIED POTENTIAL TEST
- INDUCED VOLTAGE TEST
- IMPEDANCE VOLTAGE AND LOAD LOSS TEST
- VOLTAGE RATIO TEST
- NO LOAD AND EXCITATION CURRENT TEST

D. ADDITIONAL TYPE TEST SHOULD BE MADE AVAILABLE ON REQUEST INCLUDE:

- SHORT CIRCUIT TEST
- BIL - BASIC IMPULSE INSULATION LEVEL TEST
- PARTIAL DISCHARGE TEST
- SOUND LEVEL TEST
- TEMPERATURE RISE TEST

1.5 SUBMITALS

A. SUBMIT SHOP DRAWING AND PRODUCT DATA FOR APPROVAL AND FINAL DOCUMENTATION IN THE QUANTITIES LISTED ACCORDING TO THE CONDITIONS OF THE CONTRACT.

A.1. CUSTOMER NAME. CUSTOMER LOCATION AND CUSTOMER ORDER NUMBER SHALL IDENTIFY ALL TRANSMITTALS.

B. PRODUCT DATA INCLUDING KVA RATING, TEMPERATURE RISE, DETAILED ENCLOSURE DIMENSIONS, PRIMARY & SECONDARY NOMINAL VOLTAGES, PRIMARY VOLTAGE TAPS, NO LOAD & FULL LOAD LOSSES, IMPEDANCES, UNIT WEIGHT, WARRANTY; EFFICIENCY (WHERE APPLICABLE) PER DOE 10 CFR PART 431 EFFICIENCY STANDARDS; PUBLISHED IN THE FEDERAL REGISTER ON APRIL 18, 2013.

B.1. SUBMIT MANUFACTURER'S INSTALLATION INSTRUCTIONS.

B.2. UNITS DESTINED FOR THE US BUILT AFTER JANUARY 1ST, 2016, MUST MEET THE NEW DOE 10 CFR PART 431 EFFICIENCY STANDARDS; PUBLISHED IN THE FEDERAL REGISTER ON APRIL 18, 2013 EFFECTIVE AS OF JANUARY 1ST, 2016.

1.6 STORAGE AND HANDLING

A. STORE AND HANDLE IN STRICT COMPLIANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. PROTECT FROM POTENTIAL DAMAGE FROM WEATHER AND CONSTRUCTION OPERATIONS. STORE SO CONDENSATION WILL NOT FORM ON OR IN THE TRANSFORMER HOUSING AND IF NECESSARY, APPLY TEMPORARY HEAT WHERE REQUIRED TO OBTAIN SUITABLE SERVICE CONDITIONS.

B. HANDLE TRANSFORMER USING PROPER EQUIPMENT FOR LIFTING AND HANDLING, USE WHEN NECESSARY LIFTING EYE AND/OR BRACKETS PROVIDED FOR THAT PURPOSE.

1.7 WARRANTY

A. THE TRANSFORMER SHALL CARRY A 1 YEAR LIMITED WARRANTY.

2. PRODUCTS

2.1. GENERAL CONSTRUCTION:

A. TRANSFORMER CORE SHALL BE MANUFACTURED FROM QUALITY NON-AGING, COLD ROLLED, FULLY PROCESSED SILICON STEEL LAMINATIONS. CORES ARE TO BE PRECISELY CUT TO CLOSE TOLERANCES TO ELIMINATE BURRS AND IMPROVE PERFORMANCE. CORES ARE TO BE CAREFULLY ASSEMBLED AND RIGIDLY HELD SECURE WITH STRUCTURAL STEEL CLAMPS TO MINIMIZE GAPS. GLASS RESIN I BEAMS SHALL BE USED AS BLOCKING COIL SUPPORTS FOR SUPERIOR RESISTANCE TO AXIAL SHORT CIRCUIT FORCES. PRIMARY AND SECONDARY TERMINATIONS TO BE MOUNTED ON SEPARATE INSULATED SUPPORTS.

B. COILS SHALL BE DESIGNED FOR PROPER VENTILATION USING COPPER CONDUCTORS WITH INSULATED COIL SUPPORTS. COILS SHALL BE DISC WOUND ABOVE 5 KV.

C. 220^{O}C INSULATION SYSTEMS BASED ON NOMEX® PAPER (OR EQUIVALENT) SHALL PROVIDE LONG OPERATING LIFE AND QUIET OPERATION. THE COMPLETE CORE AND COIL ASSEMBLY SHALL BE VACUUM PRESSURE IMPREGNATED WITH A POLYESTER VARNISH AND OVEN CURED TO MAKE THE ASSEMBLY HIGHLY RESISTANT TO MOISTURE, DUST, AND OTHER INDUSTRIAL CONTAMINANTS. INSULATION SYSTEM SHALL BE FIRE RESISTANT AND SELF EXTINGUISHING.

2.2 VOLTAGE AND KVA REQUIREMENTS:

A. PRIMARY VOLTAGE: 13800 VOLTS

B. PRIMARY VOLTAGE BASIC IMPULSE LEVEL (BIL) RATING: 95KV

C. SECONDARY VOLTAGE: 480Y/277 VOLTS

D. SECONDARY VOLTAGE BASIC IMPULSE LEVEL (BIL) RATING: 10KV

E. KVA RATING: AS NOTED ON CONSTRUCTION DRAWINGS.

F. SYSTEM FREQUENCY: 60 HERTZ

2.3 KEY REQUIREMENTS:

A. STANDARD IMPEDANCE AT 60HZ:

A.1. 225 TO 300 KVA 3% - 6%

A.2. 500 KVA 4% - 7%

A.3. 750 - 5000 KVA 4.5% - 8%

B. EFFICIENCIES: (WHERE APPLICABLE)

B.1. EFFICIENCIES WILL MEET LEVELS DEFINED (WHERE APPLICABLE) IN DOE 10 CFR PART 431 IN EFFECT ON JANUARY 1ST, 2016.

B.2. EFFICIENCIES AT 50% OF RATED LOAD ON UNITS HAVING A PRIMARY VOLTAGE BIL RATING GREATER THAN 20KV.

B.3. EFFICIENCIES ARE CALCULATED UNDER A LINEAR LOAD PROFILE.

B.4. EFFICIENCIES, NO-LOAD LOSSES, LOAD LOSSES AND IMPEDANCE VALUES WILL BE CALCULATED AT TEMPERATURE REFERENCE OF 75°C AT UNITY POWER FACTOR (UPF).

B.5. REFER TO THE DOE 10 CFR PART 431 ENERGY EFFICIENCY STANDARDS FOR PRODUCT EXEMPTION CRITERIA.

2.4 BASIC REQUIREMENTS:

A. INSULATION CLASS: 220°C SYSTEM

B. TEMPERATURE RISE: AVERAGE WINDING RISE BY RESISTANCE SHALL NOT EXCEED 150 °C IN AN AVERAGE 30°C AND A MAXIMUM 40°C AMBIENT.

C. TAPS: 2 X 2.5% FCAN AND 2 X 2.5% FCBN

D. THREE-PHASE, COMMON CORE CONSTRUCTION. CONVECTION AIR COOLED.

E. IMPREGNATION: VACUUM PRESSURE IMPREGNATED (VPI) POLYESTER RESIN.

F. EXCITATION CURRENT: 3% OF FULL LOAD CURRENT RATING (MAX.)

G. SOUND LEVEL TO MEET IEEE C57.12.01

H. ENCLOSURE: VENTILATED NEMA 3R.

I. ENCLOSURE FINISH: ANSI 61 GREY SUITABLE FOR UL50 OUTDOOR APPLICATIONS.

J. ANTI-VIBRATION PADS/ISOLATORS SHALL BE USED BETWEEN THE TRANSFORMER CORE AND COIL AND THE ENCLOSURE.

K. UL LISTED.

OPTIONS:

- AN ELECTROSTATIC SHIELD SHALL BE PROVIDED.
- RODENT AND INSECT SCREENS ON VENTILATION OPENINGS.
- ROLLING AND SKIDDING BASE: 4 DIRECTIONS.
- PROVISION FOR LIFTING AND JACKING.

2.5 ACCEPTABLE PRODUCT AND MANUFACTURER:

A. MGM TRANSFORMER COMPANY

B. HAMMOND POWER SOLUTIONS INC.

C. SCHNEIDER ELECTRIC.

D. EATON.

E. SUBSTITUTIONS ARE PERMITTED, SUBJECT TO MEETING ALL REQUIREMENTS OF THIS SPECIFICATION AND ALSO HAVING WRITTEN APPROVAL BY ENGINEERING 10 DAYS PRIOR TO BID CLOSING.

EXECUTION

2.6 INSTALLATION

A. THE INSTALLING CONTRACTOR SHALL INSTALL THE DRY-TYPE MEDIUM VOLTAGE (POWER) TRANSFORMER PER THE MANUFACTURER'S RECOMMENDED INSTALLATION PRACTICES AS FOUND IN THE INSTALLATION, OPERATION, AND MAINTENANCE MANUAL AND COMPLY WITH ALL APPLICABLE CODES.

B. MAKE SURE THAT THE TRANSFORMER IS LEVEL.

C. THE TRANSFORMER SHALL BE MOUNTED ON A CONCRETE PAD UNLESS OTHERWISE INDICATED.

D. CHECK FOR DAMAGE AND LOOSE CONNECTIONS.

E. MOUNT TRANSFORMER ON SUITABLE ISOLATION PAD TO MINIMIZE VIBRATIONS.

F. COORDINATE ALL WORK IN THIS SECTION WITH ALL WORK OF OTHER SECTIONS.

G. TAKE INFRARED PICTURE TO VERIFY CONNECTIONS ACCURACY OR DEFICIENCIES.

H. PRIOR TO ENERGIZING TRANSFORMER, VERIFY SECONDARY VOLTAGES AND IF NECESSARY ADJUST SECONDARY TAPS.

I. REPORT ON THE COMMISSIONING OF THE TRANSFORMER SHALL INCLUDE:

I.1. PRIMARY & SECONDARY VOLTAGES

I.2. PRIMARY & SECONDARY THDI & THDV

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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KEY PLAN

REV	DESCRIPTION	DATE

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APPROVED BY :	J.MIZRAHI
DATE :	12/02/21
SCALE :	N.T.S.

DRAWING TITLE :
ELECTRICAL SPECIFICATIONS
SHEET 4 OF 4

DWG NUMBER :
E-904

ORANGE & ROCKLAND PRIMARY METERING SWITCHGEAR
DETAILED SPECIFICAITON
MANUAL OUTDOOR SWITCHGEAR

1. GENERAL

1.1 THE METAL-ENCLOSED SWITCHGEAR IS BASED OFF THE S&C ELECTRIC METAL ENCLOSED SWITCHGEAR DESIGN CONFORMING TO ORANGE & ROCKLAND'S PRIMARY METERING SWITCHGEAR SPECIFICATION DATED 10/1/2004

1.2 DRAWINGS

(1) THE METAL-ENCLOSED SWITCHGEAR ASSEMBLY SHALL BE IN ACCORDANCE WITH THE PLANS AND DRAWINGS.

(2) THE MANUFACTURER SHALL FURNISH, WITH EACH METAL-ENCLOSED SWITCHGEAR ASSEMBLY, A SET OF DRAWINGS COMPLETE WITH A BILL OF MATERIAL AND SHOWING: TYPICAL FRONT VIEWS AND OPEN SIDE VIEWS FOR EACH BAY AS WELL AS TYPICAL COMPONENTS, THEIR POSITIONS, AND AVAILABLE SPACE FOR CABLE TERMINATION; AN ANCHOR BOLT PLAN WITH DIMENSIONS; A ONE-LINE DIAGRAM; AND APPROPRIATE WIRING DIAGRAMS.

(3) THE MANUFACTURER SHALL FURNISH A COMPREHENSIVE INSTRUCTION MANUAL COVERING INSTALLATION OF THE SWITCHGEAR ASSEMBLY AND OPERATION OF THE VARIOUS COMPONENTS.

1.3 THE METAL-ENCLOSED SWITCHGEAR ASSEMBLY SHALL CONSIST OF OUTDOOR SELF-SUPPORTING BAYS, CONTAINING INTERRUPTER SWITCHES AND POWER FUSES IN FEEDER BAYS WITH THE NECESSARY ACCESSORY COMPONENTS, ALL COMLETELY FACTORY-ASSEMBLED AND OPERATIONALLY CHECKED.

(1) SWITCHGEAR SHALL BE IN CONFORMANCE WITH ORANGE AND ROCKLAND REQUIREMENTS
(2) SWITCHGEAR SHALL BE PROVIDED WITH MOUNTING PROVISIONS FOR ORANGE & ROCKLAND SUPPLIED POTENTIAL AND CURRENT TRANSFORMERS.
(3) BAY 1 (ENTRANCE BAY) IS ORANGE AND ROCKLAND'S METERING BAY.
(4) BAY 2 SHALL BE BUS TAP BAY TO FEED FIRE PUMP TRANSFORMER
(5) BAY 3 THRU BAY 6 SHALL BE OUTGOING FUSED FEEDER BAYS CONTAINING S&C SMU-20 FUSES
(6) INCOMING AND OUTGOING TERMINAL PAD HEIGHTS SHALL BE AT LEAST 24" FROM THE FLOOR
(7) CONTROL POWER FOR HEATERS TO BE SUPPLIED FROM AN EXTERNAL SOURCE SUPPLIED BY THE CUSTOMER
(8) SWITCHGEAR SHALL BE SUPPLIED WITH ANSI CATEGORY A FEATURES

1.4 RATINGS

(1) THE RATINGS FOR THE INTEGRATED SWITCHGEAR ASSEMBLY SHALL BE AS DESIGNATED BELOW.

KV, NOMINAL	13.8
KV, MAXIMUM	15.5
KV, BIL	95
MAIN BUS CONTINUOUS, AMPERES	600
SHORT-CIRCUIT RATINGS	
AMPERES, RMS SYMMETRICAL	14,000
MVA THREE-PHASE SYMMETRICAL AT RATED NOMINAL VOLTAGE	335

THE MOMENTARY AND DUTY-CYCLE FAULT-CLOSING RATINGS OF SWITCHES, MOMENTARY RATING OF BUS, AND INTERRUPTING RATINGS OF FUSES SHALL EQUAL OR EXCEED THE SHORTCIRCUIT RATINGS OF THE METAL-ENCLOSED SWITCHGEAR.

1.5 CERTIFICATION OF RATINGS

(1) THE MANUFACTURER OF THE METAL-ENCLOSED SWITCHGEAR SHALL BE COMPLETELY AND SOLELY RESPONSIBLE FOR THE PERFORMANCE OF THE BASIC SWITCH AND FUSE COMPONENTS AS WELL AS THE COMPLETE INTEGRATED ASSEMBLY AS RATED.

(2) THE MANUFACTURER SHALL FURNISH, UPON REQUEST, CERTIFICATION OF RATINGS OF THE BASIC SWITCH AND FUSE COMPONENTS AND/OR THE INTEGRATED METAL-ENCLOSED SWITCHGEAR ASSEMBLY CONSISTING OF THE SWITCH AND FUSE COMPONENTS IN COMBINATION WITH THE ENCLOSURE(S).

(3) THE INTEGRATED SWITCHGEAR ASSEMBLY SHALL HAVE A BIL RATING ESTABLISHED BY TEST ON SWITCHGEAR OF THE TYPE AND KIND TO BE FURNISHED UNDER THIS SPECIFICATION. CERTIFIED TEST ABSTRACTS ESTABLISHING SUCH RATINGS SHALL BE FURNISHED UPON REQUEST.

1.6 COMPLIANCE WITH STANDARDS & CODES

THE METAL-ENCLOSED SWITCHGEAR SHALL CONFORM TO OR EXCEED THE APPLICABLE REQUIREMENTS OF THE FOLLOWING STANDARDS AND CODES:

(1) ANSI C37.20.3 (METAL-ENCLOSED INTERRUPTER SWITCHGEAR).

(2) THE APPLICABLE PORTIONS OF ARTICLE 490 IN THE NATIONAL ELECTRICAL CODE, INCLUDING ARTICLE 490_21(E), WHICH SPECIFIES THAT THE INTERRUPTER SWITCHES IN COMBINATION WITH POWER FUSES SHALL SAFELY WITHSTAND THE EFFECTS OF CLOSING, CARRYING, AND INTERRUPTING ALL POSSIBLE CURRENTS UP TO THE ASSIGNED MAXIMUM SHORT-CIRCUIT RATING.

(3) THE SWITCHGEAR MANUFACTURER SHALL PROVIDE ENCLOSURES THAT HAVE BEEN PROVEN BY UNDERWRITERS LABORATORIES, INC. TO BE IN COMPLIANCE WITH THE CATEGORY A ENCLOSURE TEST REQUIREMENTS IN ACCORDANCE WITH CONFORMANCE STANDARD ANSI C37.57. CATEGORY A ENCLOSURES ARE INTENDED TO PROVIDE A DEGREE OF PROTECTION AGAINST CONTACT WITH ENCLOSED EQUIPMENT IN GROUND LEVEL INSTALLATIONS SUBJECT TO DELIBERATE UNAUTHORIZED ACTS BY MEMBERS OF THE UNSUPERVISED GENERAL PUBLIC. CATEGORY A ENCLOSURES REQUIRE THE ADDITION OF PADLOCKABLE COVERS FOR WINDOWS AND ACCESSORIES SUCH AS AMMETERS, VOLTMETERS, KILOWATT-HOUR METERS, ETC.

2. CONSTRUCTION

2.1 TO ENSURE A COMPLETELY COORDINATED DESIGN, THE METAL-ENCLOSED SWITCHGEAR SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE MINIMUM CONSTRUCTION SPECIFICATIONS OF THE FUSE AND/OR SWITCH MANUFACTURER TO PROVIDE ADEQUATE ELECTRICAL CLEARANCES AND ADEQUATE SPACE FOR FUSE HANDLING.

2.2 ENCLOSURE CONSTRUCTION

(1) IN ESTABLISHING THE REQUIREMENTS FOR THE ENCLOSURE DESIGN, CONSIDERATION SHALL BE GIVEN TO ALL RELEVANT FACTORS SUCH AS CONTROLLED ACCESS; TAMPER RESISTANCE; CORROSION RESISTANCE; PROTECTION FROM INGRESS OF RODENTS, INSECTS, AND WEEDS; AND THE POSSIBILITY OF ARCING FAULTS WITHIN THE ENCLOSURE.
(2) THE ENCLOSURE OF EACH BAY SHALL BE UNITIZED MONOCOQUE CONSTRUCTION TO MAXIMIZE STRENGTH, MINIMIZE WEIGHT, AND INHIBIT CORROSION.
(3) THE MATERIAL FOR ALL EXTERNAL SIDES OF THE ENCLOSURE AND THE ROOF SHALL BE 11-GAUGE HOT-ROLLED, PICKLED AND OILED STEEL SHEET.
(4) EACH BAY CONTAINING HIGH-VOLTAGE COMPONENTS SHALL BE A COMPLETE UNIT IN ITSELF, WITH FULL SIDE SHEETS RESULTING IN DOUBLE-WALL CONSTRUCTION BETWEEN BAYS. TO GUARD AGAINST UNAUTHORIZED OR INADVERTENT ENTRY, SIDE AND REAR SHEETS AND THE TOP SHALL NOT BE EXTERNALLY BOLTED.
(5) THE BASE SHALL BE A CONTINUOUS STEEL CHANNEL OF A THICKER GAUGE MATERIAL THAN USED FOR THE ENCLOSURE AND SHALL EXTEND COMPLETELY AROUND ALL FOUR SIDES OF EACH BAY.
(6) ACCESS TO THE INTERIOR OF THE ENCLOSURE SHALL BE FROM THE FRONT ONLY, ALLOWING PLACEMENT OF THE METAL-ENCLOSED SWITCHGEAR ASSEMBLY TIGHT AGAINST A WALL OR BACK-TO-BACK TO MINIMIZE FLOOR-SPACE REQUIREMENTS.
(7) TO GUARD AGAINST UNAUTHORIZED OR INADVERTENT ENTRY, THERE SHALL BE NO ACCESS TO HIGH VOLTAGE THROUGH SIDE OR REAR SHEETS OF THE METAL-ENCLOSED SWITCHGEAR ASSEMBLY; AND NO ACCESS TO HIGH VOLTAGE BY MEANS OF EXTERNALLY REMOVABLE PANELS.
(8) TO GUARD AGAINST CORROSION, ALL HARDWARE (INCLUDING DOOR FITTINGS, FASTENERS, ETC.), ALL OPERATING-MECHANISM PARTS, AND OTHER PARTS SUBJECT TO ABRASIVE ACTION FROM MECHANICAL MOTION SHALL BE OF EITHER NONFERROUS MATERIALS, OR GALVANIZED OR ZINC-NICKEL-PLATED MATERIALS. CADMIUM-PLATED FERROUS PARTS SHALL NOT BE USED.
(9) EXTERNALLY ACCESSIBLE HARDWARE SHALL NOT BE USED FOR SUPPORT OF HIGH-VOLTAGE COMPONENTS OR SWITCH-OPERATING MECHANISMS WITHIN THE SWITCHGEAR.

2.3 DOOR CONSTRUCTION

(1) DOORS SHALL BE CONSTRUCTED OF 11_GAUGE HOT-ROLLED, PICKLED AND OILED STEEL SHEET.
(2) DOORS SHALL HAVE 90_DEGREE FLANGES AND SHALL OVERLAP WITH THE DOOR OPENINGS. FOR STRENGTH AND RIGIDITY, AND TO MINIMIZE EXPOSURE, THE DOOR FLANGES SHALL BE WELDED AT THE CORNERS AND SHALL BE FORMED (AT THE TOP AND BOTH SIDES AS A MINIMUM) WITH A DOUBLE BEND SO THAT THE SHEARED-EDGE FLANGES AT THE TOP AND BOTH SIDES FOLD BACK PARALLEL TO THE INSIDE OF THE DOOR.
(3) EACH DOOR SHALL BE EQUIPPED WITH A DOOR HANDLE. THE DOOR HANDLE SHALL BE PADLOCKABLE AND, ON OUTDOOR GEAR, SHALL INCORPORATE A HOOD TO PROTECT THE PADLOCK SHACKLE FROM TAMPERING.
(4) IN CONSIDERATION OF CONTROLLED ACCESS, TAMPER RESISTANCE, AND ARCING FAULTS, EACH DOOR OVER 40 INCHES IN HEIGHT SHALL HAVE A MINIMUM OF THREE CONCEALED, INTERLOCKING, HIGH-STRENGTH LATCHES. DOORS 40 INCHES IN HEIGHT OR LESS SHALL HAVE A MINIMUM OF TWO SUCH LATCHES.
(5) DOORS PROVIDING ACCESS TO INTERRUPTER SWITCHES OR INTERRUPTER SWITCHES WITH POWER FUSES SHALL BE PROVIDED WITH A WIDE-VIEW WINDOW, CONSTRUCTED OF AN IMPACT-RESISTANT MATERIAL, TO FACILITATE CHECKING OF SWITCH POSITION WITHOUT OPENING THE DOOR.
(6) DOORS PROVIDING ACCESS TO FUSES OR FUSED VOLTAGE TRANSFORMERS SHALL HAVE PROVISIONS TO STORE SPARE FUSE UNITS, REFILL UNITS, OR INTERRUPTING MODULES.

2.4 ACCESS CONTROL

ACCESS CONTROL SHALL BE PROVIDED AS FOLLOWS:

(1) DOORS PROVIDING ACCESS TO INTERRUPTER SWITCHES WITH FUSES SHALL BE MECHANICALLY INTERLOCKED TO GUARD AGAINST:
(a) OPENING THE DOOR IF THE INTERRUPTER SWITCH ON THE SOURCE SIDE OF THE FUSE IS CLOSED, AND
(b) CLOSING THE INTERRUPTER SWITCH IF THE DOOR IS OPEN.
(2) DOORS PROVIDING ACCESS TO INTERRUPTER SWITCHES ONLY, WHICH ARE OPERATED BY STORED-ENERGY TYPE SWITCH OPERATORS, SHALL BE MECHANICALLY OR KEY INTERLOCKED TO GUARD AGAINST OPERATING THE INTERRUPTER SWITCH IF THE DOOR IS OPEN.
(3) DOORS AND HINGED-BOLTED PANELS PROVIDING ACCESS TO HIGH-VOLTAGE COMPONENTS SHALL BE PROVIDED WITH FLUSH-MOUNTED KEY-OPERATED SNAPLOCKS AND SHALL HAVE PROVISIONS FOR PADLOCKING.

2.5 INTERNAL PROTECTIVE SCREENS

(1) IN ADDITION TO THE ENCLOSURE DOOR, EACH BAY OR COMPARTMENT THEREOF CONTAINING HIGH-VOLTAGE COMPONENTS SHALL BE PROVIDED WITH AN INTERNAL PROTECTIVE SCREEN, BOLTED CLOSED, TO GUARD AGAINST INADVERTENT ENTRY TO BAYS CONTAINING THESE COMPONENTS WHEN THE ENCLOSURE DOOR IS OPEN.

(2) EACH BAY CONTAINING A CONTROL-POWER TRANSFORMER CAPABLE OF 5 KVA OR GREATER OUTPUT SHALL BE PROVIDED WITH AN INTERNAL PROTECTIVE SCREEN, BOLTED CLOSED, TO GUARD AGAINST INADVERTENT CONTACT WITH THE PRIMARY FUSE WHEN THE ENCLOSURE DOOR IS OPEN. IN SUCH CASES, THE SCREEN SHALL ALSO BE INTERLOCKED TO ENSURE THAT THE SECONDARY LOAD HAS BEEN DISCONNECTED PRIOR TO REMOVAL OF THESE FUSES.

2.6 INSULATORS

THE INTERRUPTER-SWITCH AND FUSE-MOUNTING INSULATORS, MAIN-BUS SUPPORT INSULATORS, INSULATED OPERATING SHAFTS, AND (IF APPLICABLE) PUSH RODS SHALL BE OF A CYCLOALIPHATIC EPOXY RESIN SYSTEM WITH CHARACTERISTICS AND RESTRICTIONS AS FOLLOWS:

(1) OPERATING EXPERIENCE OF AT LEAST 15 YEARS UNDER SIMILAR CONDITIONS.
(2) ADEQUATE LEAKAGE DISTANCE ESTABLISHED BY TEST PER IEC PUBLICATION 507, FIRST EDITION, 1975.
(3) ADEQUATE STRENGTH FOR SHORT-CIRCUIT STRESS ESTABLISHED BY TEST.
(4) CONFORMANCE WITH APPLICABLE ANSI STANDARDS.
(5) HOMOGENEITY OF THE CYCLOALIPHATIC EPOXY RESIN THROUGHOUT EACH INSULATOR TO PROVIDE MAXIMUM RESISTANCE TO POWER ARCS. ABLATION DUE TO HIGH TEMPERATURES FROM POWER ARCS SHALL CONTINUOUSLY EXPOSE MORE MATERIAL OF THE SAME COMPOSITION AND PROPERTIES SO THAT NO CHANGE IN MECHANICAL OR ELECTRICAL CHARACTERISTICS TAKES PLACE BECAUSE OF ARC-INDUCED ABLATION. FURTHERMORE, ANY SURFACE DAMAGE TO INSULATORS DURING INSTALLATION OR MAINTENANCE OF SWITCHGEAR SHALL EXPOSE MATERIAL OF THE SAME COMPOSITION AND PROPERTIES SO THAT INSULATORS WITH MINOR SURFACE DAMAGE NEED NOT BE REPLACED.

2.7 BUS

2.7.1 HIGH-VOLTAGE MAIN BUS

(1) BUS AND INTERCONNECTIONS SHALL CONSIST OF COPPER BAR CA110, SQUARE EDGE, HARD TEMPER PER ASTM B187. BOLTED COPPER-TO-COPPER CONNECTIONS SHALL HAVE SILVERED INTERFACES AND SHALL BE MADE WITH 1/2"--3 STAINLESS_STEEL BOLTS WITH TWO BRASS FLAT WASHERS PER BOLT, ONE UNDER THE BOLT HEAD AND ONE UNDER THE NUT, AND WITH A STAINLESS-STEEL SPLIT LOCKWASHER BETWEEN THE FLAT WASHER AND THE NUT. THESE BOLTS SHALL BE TIGHTENED TO 35 FOOT-POUNDS TORQUE.

2.7.2 GROUND BUS

(1) THE GROUND BUS SHALL CONSIST OF COPPER BAR CA110, SQUARE EDGE, HARD TEMPER PER ASTM B187. BOLTED COPPER-TO-COPPER CONNECTIONS SHALL HAVE SILVERED INTERFACES AND SHALL BE MADE WITH 1/2"--13 STAINLESS-STEEL BOLTS WITH TWO BRASS FLAT WASHERS PER BOLT, ONE UNDER THE BOLT HEAD AND ONE UNDER THE NUT, AND WITH A STAINLESS-STEEL SPLIT LOCKWASHER BETWEEN THE FLAT WASHER AND THE NUT.

2.8 LOW-VOLTAGE COMPONENTS

(1) ALL LOW-VOLTAGE COMPONENTS, SWITCH OPERATORS (EXCEPT THOSE INTEGRALLY MOUNTED IN THE SWITCHGEAR STILE), SOURCE-TRANSFER CONTROLS, METERS, INSTRUMENTS, AND RELAYS, SHALL BE LOCATED IN GROUNDED, METAL-ENCLOSED COMPARTMENTS SEPARATE FROM HIGH VOLTAGE TO PROVIDE ISOLATION AND SHALL BE ARRANGED TO ALLOW COMPLETE ACCESSIBILITY FOR OPERATION WITHOUT EXPOSURE TO HIGH VOLTAGE.
(2) SPACE HEATERS SHALL BE PROVIDED IN ALL BAYS, SHALL HAVE A GROUNDED, PERFORATED, GALVANIZED STEEL GUARD.
(3) TO PROVIDE ISOLATION FROM HIGH VOLTAGE, LOW-VOLTAGE WIRING, EXCEPT FOR SHORT LENGTHS SUCH AS AT TERMINAL BLOCKS OR AT SECONDARIES OF SENSING DEVICES, SHALL BE IN GROUNDED CONDUIT, CABLE TRAYS, OR RACEWAYS.

2.9 CABLE-TERMINATION SPACE

TO FACILITATE CABLE PULLING AND INSTALLATION OF CABLE TERMINATORS, PROVISIONS SHALL BE MADE FOR:

(1) FULL FRONT ACCESS FOR POSITIONING AND REMOVAL OF CABLE PULLING SHEAVES.
(2) FREE ACCESS WITHOUT INTERFERENCE FROM NONREMOVABLE STRUCTURAL MEMBERS OR FROM MECHANICAL LINKAGES BETWEEN THE INTERRUPTER-SWITCH BLADES AND OPERATING MECHANISM.

3. FINISH AND FEATURES

3.2 OUTDOOR SWITCHGEAR

3.2.1 OUTDOOR FINISH

(1) THE ENCLOSURE FINISH SHALL CONFORM TO OR EXCEED THE APPLICABLE REQUIREMENTS OF ANSI C57.12.28.
(2) DURING FABRICATION, THE AREAS OF STRUCTURAL PARTS WHICH MAY LATER BECOME INACCESSIBLE, SUCH AS FOLDED EDGES AND OVERLAPPING MEMBERS, SHALL BE GIVEN AN IRON-OXIDE ZINC-CHROMATE ANTICORROSION PRIMER TO ENSURE THAT ALL SURFACES ARE PROTECTED.
(3) FULL COVERAGE AT JOINTS AND BLIND AREAS SHALL BE ACHIEVED BY PROCESSING ENCLOSURES INDEPENDENTLY OF COMPONENTS SUCH AS DOORS AND ROOFS BEFORE ASSEMBLY INTO THE UNITIZED STRUCTURES.
(4) TO REMOVE OILS AND DIRT, TO FORM A CHEMICALLY AND ANODICALLY NEUTRAL CONVERSION COATING TO IMPROVE THE FINISH-TO-METAL BOND, AND TO RETARD UNDERFILM PROPAGATION OF CORROSION, ALL SURFACES SHALL UNDERGO A THOROUGH PRETREATMENT PROCESS COMPRISED OF A FULLY AUTOMATED SYSTEM OF CLEANING, RINSING, PHOSPHATIZING, SEALING, DRYING, AND COOLING BEFORE ANY PROTECTIVE COATINGS ARE APPLIED. BY UTILIZING AN AUTOMATED PRETREATMENT PROCESS, THE ENCLOSURE WILL RECEIVE A HIGHLY CONSISTENT THOROUGH TREATMENT, ELIMINATING FLUCTUATIONS IN REACTION TIME, REACTION TEMPERATURE, AND CHEMICAL CONCENTRATIONS.
(5) AFTER PRETREATMENT, PROTECTIVE COATINGS SHALL BE APPLIED THAT SHALL HELP RESIST CORROSION AND PROTECT THE STEEL ENCLOSURE. TO ESTABLISH THE CAPABILITY TO RESIST CORROSION AND PROTECT THE ENCLOSURE, REPRESENTATIVE TEST SPECIMENS COATED BY THE ENCLOSURE MANUFACTURER'S FINISHING SYSTEM SHALL SATISFACTORILY PASS THE FOLLOWING TESTS:

(a) 4000 HOURS OF EXPOSURE TO SALT-SPRAY TESTING PER ASTM B 117 WITH:
(i) UNDERFILM CORROSION NOT TO EXTEND MORE THAN 1/32" FROM THE SCRIBE AS EVALUATED PER ASTM D 1654, PROCEDURE A, METHOD 2 (SCRAPING); AND
(ii) LOSS OF ADHESION FROM BARE METAL NOT TO EXTEND MORE THAN 1/8" FROM THE SCRIBE.
(b) 1000 HOURS OF HUMIDITY TESTING PER ASTM D 4585 WITH NO BLISTERING AS EVALUATED PER ASTM D 714.
(c) 500 HOURS OF ULTRAVIOLET ACCELERATED WEATHERING TESTING PER ASTM G 53 USING LAMP UVB-313 WITH NO CHALKING AS EVALUATED PER ASTM D 659, AND NO MORE THAN A 10% REDUCTION OF PAINT GLOSS AS EVALUATED PER ASTM D 523.
(d) CROSSHATCH ADHESION TESTING PER ASTM D 3359 METHOD B WITH NO LOSS OF PAINT.
(e) 160-INCH-POUND IMPACT ADHESION TESTING PER ASTM D 2794 WITH NO PAINT CHIPPING OR CRACKING.
(f) OIL RESISTANCE TESTING CONSISTING OF A 72-HOUR IMMERSION BATH IN MINERAL OIL WITH NO SHIFT IN COLOR, NO STREAKING, NO BLISTERING, AND NO LOSS OF HARDNESS.
(g) 3000 CYCLES OF ABRASION TESTING PER ASTM 4060 WITH NO PENETRATION TO THE SUBSTRATE.

CERTIFIED TEST ABSTRACTS SUBSTANTIATING THE ABOVE CAPABILITIES SHALL BE FURNISHED UPON REQUEST.

(6) A HEAVY COAT OF INSULATING "NO-DRIP" COMPOUND SHALL BE APPLIED TO THE INSIDE SURFACE OF THE ROOF STRUCTURE TO PREVENT CONDENSATION OF MOISTURE THEREON.
(7) AFTER THE ENCLOSURES ARE COMPLETELY ASSEMBLED AND THE COMPONENTS (SWITCHES, FUSES, BUS, ETC.) ARE INSTALLED, THE FINISH SHALL BE INSPECTED FOR SCUFFS AND SCRATCHES. BLEMISHES SHALL BE TOUCHED UP TO RESTORE THE PROTECTIVE INTEGRITY OF THE FINISH.
(8) TOUCH-UP MATERIALS -- WITH COMPLETE INSTRUCTIONS -- SHALL BE INCLUDED WITH EACH SHIPMENT OF METAL-ENCLOSED SWITCHGEAR FOR TOUCH-UP IN THE FIELD.
(9) THE FINISH SHALL BE OLIVE GREEN, MUNSELL 7GY3.29/1.5.

3.2.2 OUTDOOR FEATURES

(1) ENCLOSURE VENTILATION

(a) VENTILATION OPENINGS SHALL BE PROVIDED AT THE TOP AND BOTTOM ON THE FRONT AND REAR OF EACH BAY.
(b) VENTS SHALL BE RAIN-RESISTANT AND CORROSION-RESISTANT.
(c) EACH VENT SHALL HAVE AN INSIDE SCREEN AND BAFFLE TO EXCLUDE INSECTS AND TO PROTECT AGAINST INSERTION OF FOREIGN OBJECTS.
(d) IN CONSIDERATION OF EXCEPTIONALLY HIGH CONCENTRATIONS OF AIRBORNE DUST, EXTERNALLY ACCESSIBLE GLASS-FIBER FILTERS SHALL BE PROVIDED.

(2) LIFTING EYES SHALL BE REMOVABLE. SOCKETS FOR LIFTING EYES SHALL BE BLIND-TAPPED.

(3) GASKETING AND SEALING

(a) DOOR OPENINGS AND OPENINGS FOR HINGED BOLTED PANELS (AND BOLTED PANELS PROVIDING ACCESS TO LOW-VOLTAGE COMPONENTS) SHALL HAVE RESILIENT COMPRESSION GASKETING TO PREVENT WATER FROM ENTERING THE ENCLOSURE.
(b) GASKET SEALS SHALL BE PROVIDED AT THE TOP AND SIDE EDGES OF ADJOINING BAYS TO PREVENT WATER ENTRY BETWEEN THE DOUBLE WALLS.
(c) THE TOP AND BOTH SIDES OF BUS OPENINGS BETWEEN BAYS SHALL BE COVERED WITH CHANNEL GASKETS AS AN ADDITIONAL PROTECTION AGAINST ENTRANCE OF WATER OR EXTERNAL LABYRINTHINE METAL RAINSHIELDS SHALL BE PROVIDED OVER ENCLOSURE ROOF FLANGES BETWEEN ADJACENT BAYS.
(d) ROOFS SHALL BE WEATHER-SEALED IN PLACE WITH A SUITABLE SEALANT.

4. BASIC COMPONENTS

4.1 INTERRUPTER SWITCHES

(1) INTERRUPTER SWITCHES SHALL HAVE A ONE-TIME OR TWO-TIME DUTY-CYCLE FAULT-CLOSING RATING EQUAL TO OR EXCEEDING THE SHORT-CIRCUIT RATING OF THE SWITCHGEAR. THESE RATINGS DEFINE THE ABILITY TO CLOSE THE INTERRUPTER SWITCH EITHER ALONE (UNFUSED) OR IN COMBINATION WITH THE APPROPRIATE FUSE, ONCE OR TWICE (AS APPLICABLE) AGAINST A THREE-PHASE FAULT WITH ASYMMETRICAL CURRENT IN AT LEAST ONE PHASE EQUAL TO THE RATED VALUE, WITH THE SWITCH REMAINING OPERABLE AND ABLE TO CARRY AND INTERRUPT RATED CURRENT. TESTS SUBSTANTIATING THESE RATINGS SHALL BE PERFORMED AT MAXIMUM VOLTAGE. CERTIFIED TEST ABSTRACTS ESTABLISHING SUCH RATINGS SHALL BE FURNISHED UPON REQUEST.

(2) INTERRUPTER SWITCHES INTENDED FOR MANUAL OPERATION SHALL BE OPERATED BY MEANS OF AN EXTERNALLY OPERABLE, NONREMOVABLE HANDLE. THE HANDLE SHALL HAVE PROVISIONS FOR PADLOCKING IN BOTH THE OPEN AND CLOSED POSITIONS. INTERRUPTER SWITCHES INTENDED FOR POWER OPERATION SHALL BE OPERATED BY MEANS OF A SWITCH OPERATOR EXPRESSLY DESIGNED TO BE COMPATIBLE WITH THE INTERRUPTER SWITCH.

(3) INTERRUPTER SWITCHES SHALL UTILIZE A QUICK-MAKE QUICK-BREAK MECHANISM INSTALLED BY THE SWITCH MANUFACTURER, WHICH SHALL SWIFTLY AND POSITIVELY OPEN AND CLOSE THE INTERRUPTER SWITCH INDEPENDENT OF THE SWITCH-HANDLE OR SWITCH OPERATOR OPERATING SPEED.
(a) FOR MANUALLY OPERATED INTERRUPTER SWITCHES, AND FOR INTERRUPTER SWITCHES OPERATED BY DIRECT MOTOR DRIVE SWITCH OPERATORS, THE QUICK-MAKE QUICK-BREAK MECHANISM SHALL BE INTEGRALLY MOUNTED TO THE SWITCH FRAME.
(b) FOR INTERRUPTER SWITCHES OPERATED BY STORED-ENERGY SWITCH OPERATORS, THE QUICK-MAKE QUICK-BREAK MECHANISM SHALL BE AN INTEGRAL PART OF THE SWITCH OPERATOR.

(4) INTERRUPTER SWITCHES SHALL BE COMPLETELY ASSEMBLED AND ADJUSTED BY THE SWITCH MANUFACTURER ON A SINGLE RIGID MOUNTING FRAME. THE FRAME SHALL BE OF WELDED STEEL CONSTRUCTION SUCH THAT THE FRAME INTERCEPTS THE LEAKAGE PATH WHICH PARALLELS THE OPEN GAP OF THE INTERRUPTER SWITCH, TO POSITIVELY ISOLATE THE LOAD CIRCUIT WHEN THE INTERRUPTER SWITCH IS IN THE OPEN POSITION.

(5) INTERRUPTER SWITCHES SHALL BE PROVIDED WITH A SINGLE BLADE PER PHASE FOR CIRCUIT CLOSING INCLUDING FAULT CLOSING, CONTINUOUS CURRENT CARRYING, AND CIRCUIT INTERRUPTING. SPRING-LOADED AUXILIARY BLADES SHALL NOT BE PERMITTED.

(6) CIRCUIT INTERRUPTION SHALL BE ACCOMPLISHED BY USE OF AN INTERRUPTER WHICH IS POSITIVELY AND INHERENTLY SEQUENCED WITH THE BLADE POSITION. CIRCUIT INTERRUPTION SHALL TAKE PLACE COMPLETELY WITHIN THE INTERRUPTER, WITH NO EXTERNAL ARC OR FLAME. ANY EXHAUST SHALL BE VENTED IN A CONTROLLED MANNER THROUGH A LABYRINTHINE MUFFLER OR A DEIONIZING VENT.

(7) INTERRUPTER SWITCHES SHALL HAVE A READILY VISIBLE OPEN GAP WHEN IN THE OPEN POSITION TO ALLOW POSITIVE VERIFICATION OF SWITCH POSITION.

(8) TERMINALS ON INTERRUPTER SWITCHES TO WHICH CABLE WILL BE TERMINATED SHALL BE EQUIPPED WITH GROUNDING PROVISIONS. GROUNDING PROVISIONS SHALL ALSO BE PROVIDED ON THE GROUND BUS IN SUCH BAYS.

(9) TERMINALS ON INTERRUPTER SWITCHES RATED 1200 AMPERES AND, FOR ENTRANCE-BAY APPLICATIONS ONLY, TERMINALS ON INTERRUPTER SWITCHES THAT ARE USED IN CONJUNCTION WITH FUSES RATED 600 AMPERES OR GREATER SHALL BE EQUIPPED WITH PROVISIONS FOR TWO CABLES PER PHASE.

4.2 FUSES

4.2.1 SOLID-MATERIAL POWER FUSES

(1) SOLID-MATERIAL POWER FUSES SHALL BE OF THE SOLID-MATERIAL TYPE AND SHALL UTILIZE REFILL-UNIT-AND-HOLDER OR FUSE-UNIT-AND-END-FITTING CONSTRUCTION. THE REFILL UNIT OR FUSE UNIT SHALL BE READILY REPLACEABLE.

(2) FOR SWITCHGEAR RATED UP THROUGH 270 MVA AT 4.16 KV, 600 MVA AT 13.8 KV, 860 MVA AT 25 KV, AND 1000 MVA AT 34.5 KV, MOUNTINGS FOR SOLID-MATERIAL POWER FUSES SHALL BE DISCONNECT STYLE. NON-DISCONNECT STYLE MOUNTINGS FOR POWER FUSES SHALL BE USED ONLY WHERE HIGHER RATINGS ARE REQUIRED.

(3) FUSIBLE ELEMENTS SHALL BE NONAGING AND NONDAMAGEABLE SO THAT IT IS UNNECESSARY TO REPLACE UNBLOWN COMPANION FUSES FOLLOWING A FUSE OPERATION.

(4) FUSIBLE ELEMENTS FOR REFILL UNITS OR FUSE UNITS, RATED 10 AMPERES OR LARGER, SHALL BE HELICALLY COILED TO AVOID MECHANICAL DAMAGE DUE TO STRESSES FROM CURRENT SURGES.

(5) FUSIBLE ELEMENTS THAT CARRY CONTINUOUS CURRENT SHALL BE SUPPORTED IN AIR TO HELP PREVENT DAMAGE FROM CURRENT SURGES.

(6) SOLID-MATERIAL POWER FUSES SHALL HAVE MELTING TIME-CURRENT CHARACTERISTICS THAT ARE PERMANENTLY ACCURATE WITH A MAXIMUM TOTAL TOLERANCE OF 10% IN TERMS OF CURRENT. TIME-CURRENT CHARACTERISTICS SHALL BE AVAILABLE WHICH PERMIT COORDINATION WITH PROTECTIVE RELAYS, AUTOMATIC CIRCUIT RECLOSERS, AND OTHER FUSES.

(7) SOLID-MATERIAL POWER FUSES SHALL BE CAPABLE OF DETECTING AND INTERRUPTING ALL FAULTS WHETHER LARGE, MEDIUM, OR SMALL (DOWN TO MINIMUM MELTING CURRENT), UNDER ALL REALISTIC CONDITIONS OF CIRCUITRY, WITH LINE-TO-LINE OR LINE-TO-GROUND VOLTAGE ACROSS THE POWER FUSES, AND SHALL BE CAPABLE OF HANDLING THE FULL RANGE OF TRANSIENT RECOVERY VOLTAGE SEVERITY ASSOCIATED WITH THESE FAULTS.

(8) ALL ARCING ACCOMPANYING POWER FUSE OPERATION SHALL BE CONTAINED WITHIN THE FUSE, AND ANY ARC PRODUCTS AND GASES EVOLVED DURING FUSE OPERATION SHALL BE VENTED THROUGH EXHAUST CONTROL DEVICES THAT SHALL EFFECTIVELY CONTROL FUSE EXHAUST.

(9) SOLID-MATERIAL POWER FUSES SHALL BE EQUIPPED WITH A BLOWN-FUSE INDICATOR THAT SHALL PROVIDE VISIBLE EVIDENCE OF FUSE OPERATION WHILE INSTALLED IN THE FUSE MOUNTING.

(10) SOLID-MATERIAL POWER FUSES IN FEEDER BAYS SHALL BE EQUIPPED WITH GROUNDING PROVISIONS ON THE LOAD SIDE OF EACH FUSE AND ON THE ENCLOSURE GROUND BUS.

5. LABELING

5.1 WARNING SIGNS

(1) ALL EXTERNAL DOORS AND HINGED BOLTED PANELS PROVIDING ACCESS TO HIGH VOLTAGE SHALL BE PROVIDED WITH "CAUTION -- HIGH VOLTAGE -- KEEP OUT" SIGNS.

(2) ALL INTERNAL PROTECTIVE SCREENS PROVIDING ACCESS TO HIGH VOLTAGE SHALL BE PROVIDED WITH "DANGER -- HIGH VOLTAGE -- KEEP OUT __ QUALIFIED PERSONS ONLY" SIGNS.

(3) ALL INTERNAL PROTECTIVE SCREENS PROVIDING ACCESS TO INTERRUPTER SWITCHES SHALL BE PROVIDED WITH WARNING SIGNS INDICATING THAT "SWITCH BLADES MAY BE ENERGIZED IN ANY POSITION."

(4) ALL INTERNAL PROTECTIVE SCREENS PROVIDING ACCESS TO FUSES SHALL BE PROVIDED WITH WARNING SIGNS INDICATING THAT "FUSES MAY BE ENERGIZED IN ANY POSITION."

5.2 RATING NAMEPLATES

(1) THE INTEGRATED SWITCHGEAR ASSEMBLY SHALL BE PROVIDED WITH AN EXTERNAL NAMEPLATE INDICATING THE MANUFACTURER'S DRAWING NUMBER AND THE FOLLOWING: VOLTAGE RATINGS (KV, NOMINAL; KV, MAXIMUM; KV, BIL); MAIN BUS CONTINUOUS RATING (AMPERES); SHORT-CIRCUIT RATINGS (AMPERES, RMS SYMMETRICAL A

SWITCHBOARDS - LOW VOLTAGE

PART 1 GENERAL

1.01 SCOPE

A. THE CONTRACTOR SHALL FURNISH AND INSTALL, WHERE INDICATED, A FREE-STANDING, DEAD-FRONT TYPE LOW VOLTAGE DISTRIBUTION SWITCHBOARD, UTILIZING GROUP MOUNTED CIRCUIT PROTECTIVE DEVICES AS SPECIFIED HEREIN, AND AS SHOWN ON THE CONTRACT DRAWINGS.

1.02 REFERENCES

A. THE LOW VOLTAGE DISTRIBUTION SWITCHBOARDS AND ALL COMPONENTS SHALL BE DESIGNED, MANUFACTURED AND TESTED IN ACCORDANCE WITH THE LATEST APPLICABLE FOLLOWING STANDARDS:

1. UL STANDARD 891 - SWITCHBOARDS
2. UL STANDARD 50 - ENCLOSURES FOR ELECTRICAL EQUIPMENT
3. NEMA PB-2 SWITCHBOARDS
4. UL STANDARD 489 - CIRCUIT BREAKERS
5. UL STANDARD 1449 - SURGE PROTECTIVE DEVICES
6. UL STANDARD 508 - INDUSTRIAL CONTROL EQUIPMENT

1.03 SUBMITTALS - FOR REVIEW/APPROVAL

A. THE FOLLOWING INFORMATION SHALL BE SUBMITTED TO THE ENGINEER:

1. FRONT VIEW AND PLAN VIEW OF THE ASSEMBLY
2. FLOOR PLAN
3. TOP VIEW
4. SINGLE LINE DIAGRAMS
5. SCHEMATIC DIAGRAM
6. NAMEPLATE SCHEDULE
7. COMPONENT LIST
8. CONDUIT SPACE LOCATIONS WITHIN THE ASSEMBLY
9. ASSEMBLY RATINGS INCLUDING:
   a. SHORT-CIRCUIT RATING
   b. VOLTAGE
   c. CONTINUOUS CURRENT RATING
10. MAJOR COMPONENT RATINGS INCLUDING:
    a. VOLTAGE
    b. CONTINUOUS CURRENT RATING
    c. INTERRUPTING RATINGS
11. CABLE TERMINAL SIZES
12. PRODUCT DATA SHEETS

B. WHERE APPLICABLE, THE FOLLOWING ADDITIONAL INFORMATION SHALL BE SUBMITTED TO THE ENGINEER:

1. BUSWAY CONNECTION
2. CONNECTION DETAILS, COMPOSITE FRONT VIEW, AND PLAN VIEW OF CLOSE-COUPLED ASSEMBLIES
3. KEY INTERLOCK SCHEME DRAWING AND SEQUENCE OF OPERATIONS
4. AUTOMATIC TRANSFER SCHEME SEQUENCE OF OPERATION
5. MIMIC BUS SIZE AND COLOR

1.04 SUBMITTALS - FOR CONSTRUCTION

A. THE FOLLOWING INFORMATION SHALL BE SUBMITTED FOR RECORD PURPOSES:

1. FINAL AS-BUILT DRAWINGS AND INFORMATION FOR ITEMS LISTED IN PARAGRAPH 1.03, AND SHALL INCORPORATE ALL CHANGES MADE DURING THE MANUFACTURING PROCESS
2. WIRING DIAGRAMS
3. CERTIFIED PRODUCTION TEST REPORTS
4. INSTALLATION INFORMATION
5. SEISMIC CERTIFICATION WITH EQUIPMENT ANCHORAGE DETAILS AND CENTER OF GRAVITY AS SPECIFIED
6. COORDINATION DRAWINGS IF REQUIRED: FLOOR PLANS, DRAWN TO SCALE, SHOWING DIMENSIONED LAYOUT ON WHICH THE FOLLOWING ITEMS ARE SHOWN AND COORDINATED WITH EACH OTHER, USING INPUT FROM INSTALLERS OF THE ITEMS INVOLVED:
   a. REQUIRED WORKING CLEARANCES AND REQUIRED AREA ABOVE AND AROUND SWITCHBOARD.
   b. SHOW SWITCHBOARD LAYOUT AND RELATIONSHIPS BETWEEN ELECTRICAL COMPONENTS AND ADJACENT STRUCTURAL AND MECHANICAL ELEMENTS.

1.05 QUALIFICATIONS

A. THE MANUFACTURER OF THE ASSEMBLY SHALL BE THE MANUFACTURER OF THE MAJOR COMPONENTS WITHIN THE ASSEMBLY.

B. FOR THE EQUIPMENT SPECIFIED HEREIN, THE MANUFACTURER SHALL BE ISO 9001 OR 9002 CERTIFIED.

C. THE SWITCHBOARD MANUFACTURER SHALL HAVE THE ENVIRONMENT CERTIFICATION ISO 14001.

D. THE MANUFACTURER OF THIS EQUIPMENT SHALL HAVE PRODUCED SIMILAR ELECTRICAL EQUIPMENT FOR A MINIMUM PERIOD OF TWENTY (20) YEARS. WHEN REQUESTED BY THE ENGINEER, AN ACCEPTABLE LIST OF INSTALLATIONS WITH SIMILAR EQUIPMENT SHALL BE PROVIDED DEMONSTRATING COMPLIANCE WITH THIS REQUIREMENT.

E. WHERE NOTED IN THE CONTRACT DOCUMENTS PROVIDE SEISMIC QUALIFIED EQUIPMENT.

1.06 REGULATORY REQUIREMENTS

A. THE LOW-VOLTAGE SWITCHBOARD SHALL BE UL LABELED.

1.07 DELIVERY, STORAGE AND HANDLING

A. EQUIPMENT SHALL BE HANDLED AND STORED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. ONE (1) COPY OF THESE INSTRUCTIONS SHALL BE INCLUDED WITH THE EQUIPMENT AT TIME OF SHIPMENT.

1.08 OPERATION AND MAINTENANCE MANUALS

A. EQUIPMENT OPERATION AND MAINTENANCE MANUALS SHALL BE PROVIDED WITH EACH ASSEMBLY SHIPPED AND SHALL INCLUDE INSTRUCTION LEAFLETS, INSTRUCTION BULLETINS AND RENEWAL PARTS LISTS WHERE APPLICABLE, FOR THE COMPLETE ASSEMBLY AND EACH MAJOR COMPONENT.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. EATON

B. SCHNEIDER ELECTRIC

C. SIEMENS

THE LISTING OF SPECIFIC MANUFACTURERS ABOVE DOES NOT IMPLY ACCEPTANCE OF THEIR PRODUCTS THAT DO NOT MEET THE SPECIFIED RATINGS, FEATURES AND FUNCTIONS. MANUFACTURERS LISTED ABOVE ARE NOT RELIEVED FROM MEETING THESE SPECIFICATIONS IN THEIR ENTIRETY. PRODUCTS IN COMPLIANCE WITH THE SPECIFICATION AND MANUFACTURED BY OTHERS NOT NAMED WILL BE CONSIDERED ONLY IF PRE-APPROVED BY THE ENGINEER TEN (10) DAYS PRIOR TO BID DATE.

THE SWITCHBOARD SHALL BE EQUAL TO EATON TYPE POW-R-LINE XPERT UTILIZING THE COMPONENTS HEREIN SPECIFIED AND AS SHOWN ON THE DRAWINGS.

2.02 RATINGS

A. THE ASSEMBLY SHALL BE RATED TO WITHSTAND MECHANICAL FORCES EXERTED DURING SHORT-CIRCUIT CONDITIONS WHEN CONNECTED DIRECTLY TO A POWER SOURCE HAVING AVAILABLE FAULT CURRENT OF 65,000 AMPERES SYMMETRICAL AT RATED VOLTAGE OR AS SHOWN ON THE CONTRACT DOCUMENTS.

B. BUS VOLTAGE AND CURRENT RATING TO BE AS INDICATED ON THE CONTRACT DOCUMENTS.

2.03 CONSTRUCTION

A. SWITCHBOARD SHALL CONSIST OF THE REQUIRED NUMBER OF VERTICAL SECTIONS BOLTED TOGETHER TO FORM A RIGID ASSEMBLY. THE SIDES AND REAR SHALL BE COVERED WITH REMOVABLE BOLT-ON COVERS. ALL EDGES OF FRONT COVERS OR HINGED FRONT PANELS SHALL BE FORMED. PROVIDE ADEQUATE VENTILATION WITHIN THE ENCLOSURE.

B. ALL SECTIONS OF THE SWITCHBOARD SHALL BE FRONT AND REAR ALIGNED WITH DEPTH(S) SHOWN ON THE DRAWINGS.

C. THE ASSEMBLY SHALL BE PROVIDED WITH ADEQUATE LIFTING MEANS.

D. THE SWITCHBOARD SHALL BE SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT WHERE INDICATED ON CONTRACT DOCUMENTS AND BE LABELED IN ACCORDANCE WITH UL REQUIREMENTS.

2.04 BUS

A. ALL BUS BARS SHALL BE TIN-PLATED COPPER. MAIN HORIZONTAL BUS BARS SHALL BE MOUNTED WITH ALL THREE PHASES ARRANGED IN THE SAME VERTICAL PLANE. BUS SIZING SHALL BE BASED ON NEMA STANDARD TEMPERATURE RISE CRITERIA.

B. PROVIDE A FULL CAPACITY NEUTRAL BUS WHERE A NEUTRAL BUS IS INDICATED ON THE DRAWINGS.

C. A 1/4 X 2-INCH COPPER GROUND BUS (MINIMUM) SHALL BE FURNISHED FIRMLY SECURED TO EACH VERTICAL SECTION STRUCTURE AND SHALL EXTEND THE ENTIRE LENGTH OF THE SWITCHBOARD.

D. ALL HARDWARE USED ON CONDUCTORS SHALL BE HIGH-TENSILE STRENGTH AND ZINC-PLATED. ALL BUS JOINTS SHALL BE PROVIDED WITH CONICAL SPRING-TYPE WASHERS.

E. ALL BUSSING SHALL BE FULLY-RATED FOR THE ENTIRE LENGTH OF THE SWITCHBOARD LINEUP. TAPERED BUS IS NOT ACCEPTABLE.

2.05 WIRING/TERMINATIONS

A. SMALL WIRING, NECESSARY FUSE BLOCKS AND TERMINAL BLOCKS WITHIN THE SWITCHBOARD SHALL BE FURNISHED AS REQUIRED. CONTROL COMPONENTS MOUNTED WITHIN THE ASSEMBLY, SUCH AS FUSE BLOCKS, RELAYS, PUSHBUTTONS, SWITCHES, ETC., SHALL BE SUITABLY MARKED FOR IDENTIFICATION CORRESPONDING TO APPROPRIATE DESIGNATIONS ON MANUFACTURER'S WIRING DIAGRAMS.

B. MECHANICAL-TYPE TERMINALS SHALL BE PROVIDED FOR ALL LINE AND LOAD TERMINATIONS. TERMINALS SHALL BE SUITABLE FOR COPPER OR ALUMINUM CONDUCTORS RATED PER 75 DEGREES C FOR THE SIZE AS SHOWN ON THE DRAWINGS. 90 DEGREES C CONDUCTOR IS PERMISSIBLE BUT MUST BE SIZED IN ACCORDANCE WITH 75 DEGREES C RATED CONDUCTOR TABLES.

C. LUGS SHALL BE PROVIDED IN THE INCOMING LINE SECTION FOR CONNECTION OF THE MAIN GROUNDING CONDUCTOR. ADDITIONAL LUGS FOR CONNECTION OF OTHER GROUNDING CONDUCTORS SHALL BE PROVIDED AS INDICATED ON THE DRAWINGS.

D. ALL CONTROL WIRE SHALL BE TYPE SIS, BUNDLED AND SECURED WITH NYLON TIES. INSULATED LOCKING SPADE TERMINALS SHALL BE PROVIDED FOR ALL CONTROL CONNECTIONS, EXCEPT WHERE SADDLE TYPE TERMINALS ARE PROVIDED INTEGRAL TO A DEVICE. ALL CURRENT TRANSFORMER SECONDARY LEADS SHALL FIRST BE CONNECTED TO CONVENIENTLY ACCESSIBLE SHORT-CIRCUIT TERMINAL BLOCKS BEFORE CONNECTING TO ANY OTHER DEVICE. ALL GROUPS OF CONTROL WIRES LEAVING THE SWITCHBOARD SHALL BE PROVIDED WITH TERMINAL BLOCKS WITH SUITABLE NUMBERING STRIPS. PROVIDE WIRE MARKERS AT EACH END OF ALL CONTROL WIRING.

2.06 MAIN AND TIE PROTECTIVE DEVICES

A. INSULATED CASE MAIN AND TIE PROTECTIVE DEVICES

1. PROTECTIVE DEVICES SHALL BE FIXED MOUNTED OR DRAW-OUT INSULATED CASE LOW-VOLTAGE CIRCUIT BREAKERS, POWER DEFENSE RF OR APPROVED EQUAL. ALL BREAKERS SHALL BE UL LISTED FOR CONTINUOUS APPLICATION IN THEIR INTENDED ENCLOSURES FOR 100% OF THEIR CONTINUOUS AMPERE RATING.
2. MAIN AND TIE BREAKERS SHALL BE TRUE TWO-STEP STORED ENERGY DEVICES AND SHALL BE ELECTRONICALLY OPERATED UNLESS OTHERWISE INDICATED ON CONTRACT DOCUMENTS.
3. ALL MAIN AND TIE CIRCUIT BREAKERS SHALL HAVE A MINIMUM SYMMETRICAL INTERRUPTING CAPACITY OF 65,000 AMPERES. MAIN AND TIE CIRCUIT BREAKERS SHALL HAVE 3 CYCLE SHORT-TIME WITHSTAND RATINGS.
4. ALL MAIN AND TIE INSULATED CASE CIRCUIT BREAKERS SHALL BE UL489 LISTED.
5. ALL INSULATED CASE CIRCUIT BREAKERS SHALL HAVE A NAMEPLATE CLEARLY MARKING ANY ELECTRICAL ACCESSORIES THAT ARE MOUNTED IN THE BREAKER AT THE TIME OF SALE. THE ACCESSORY SHALL HAVE A LABEL THAT WILL INDICATE ITS FUNCTION AND VOLTAGE. ALL ACCESSORIES SHALL BE MODULAR, PLUG AND LOCK TYPE, AND UL LISTED FOR EASY FIELD INSTALLATION.
6. THE BREAKER CONTROL INTERFACE SHALL HAVE COLOR-CODED VISUAL INDICATORS TO INDICATE CONTACT OPEN OR CLOSED POSITIONS AS WELL AS MECHANISM CHARGED AND DISCHARGED POSITIONS. MANUAL CONTROL PUSHBUTTONS ON THE BREAKER FACE SHALL BE PROVIDED FOR OPENING AND CLOSING THE BREAKER. THE POWER CIRCUIT BREAKER SHALL HAVE A "POSITIVE ON" FEATURE. THE BREAKER FLAG WILL READ "CLOSED" IF THE CONTACTS ARE WELDED AND THE BREAKER IS ATTEMPTED TO BE TRIPPED OR OPENED.
7. EACH INSULATED CASE CIRCUIT BREAKER SHALL BE EQUIPPED WITH A TRUE RMS SENSING, SOLID-STATE TRIPPING SYSTEM CONSISTING OF AT LEAST THREE CURRENT SENSORS MICROPROCESSOR-BASED TRIP DEVICE AND TRIP ACTUATOR. THE TRIP UNIT SHALL USE MICROPROCESSOR-BASED TECHNOLOGY TO PROVIDE THE BASIC ADJUSTABLE TIME-CURRENT PROTECTION.
8. PROVIDE TRIP UNITS WITH INTEGRAL ARC FLASH REDUCTION MODE (ARMS) FOR 1200A FRAME AND ABOVE TO MEET NEC ARTICLE 240.87. THE USE OF ZSI TO SATISFY NEC 240.87 DOES NOT MEET THE INTENT OF THESE SPECIFICATIONS AND WILL NOT BE ACCEPTABLE AS A SUBSTITUTION.
9. SYSTEM COORDINATION SHALL BE PROVIDED BY ADJUSTING ROTARY SWITCHES FOR THE FOLLOWING MICROPROCESSOR-BASED TIME-CURRENT CURVE SHAPING ADJUSTMENTS:
   a. ADJUSTABLE LONG-DELAY PICK-UP SETTING WITH MINIMUM OF 10 SETTINGS
   b. ADJUSTABLE LONG-DELAY TIME - 0.5 TO 24 SECONDS
   c. ADJUSTABLE SHORT-DELAY PICK-UP SETTING - 1.5X TO MAX ALLOWABLE BY FRAME
   d. ADJUSTABLE SHORT-DELAY TIME 0.0 SEC UP TO 0.5 SEC DEPENDING ON FRAME WITH SELECTABLE FLAT OR I2T CURVE SHAPING
   e. ADJUSTABLE INSTANTANEOUS SETTING 2X TO MAX ALLOWABLE BY FRAME
   f. WHERE INDICATED, ADJUSTABLE GROUND FAULT CURRENT PICKUP (0.2 - 1.0 X IN IN 0.10X INCREMENTS) AND TIME (0.1 - 1.0 SEC IN 0.10SEC INCREMENTS), WITH SELECTABLE FLAT OR I²T CURVE SHAPING. PROVIDE SWITCH SELECTABLE OPTIONS FOR GF OFF, GF ALARM, OR GF TRIP.

2.07 FEEDER PROTECTIVE DEVICES

A. ALL FEEDER PROTECTIVE DEVICES SHALL BE EATON TYPE POWER DEFENSE OR APPROVED EQUAL MOLDED CASE CIRCUIT BREAKERS WITH INVERSE TIME TRIPPING CHARACTERISTICS.

B. CIRCUIT BREAKERS SHALL BE OPERATED BY A TOGGLE-TYPE HANDLE AND SHALL HAVE A QUICK-MAKE, QUICK-BREAK OVER-CENTER SWITCHING MECHANISM THAT IS MECHANICALLY TRIP-FREE. AUTOMATIC TRIPPING OF THE BREAKER SHALL BE CLEARLY INDICATED BY THE HANDLE POSITION. CONTACTS SHALL BE NON-WELDING SILVER ALLOY AND ARC EXTINCTION SHALL BE ACCOMPLISHED BY MEANS OF DE-ION ARC CHUTES. A PUSH-TO-TRIP BUTTON ON THE FRONT OF THE CIRCUIT BREAKER SHALL PROVIDE A LOCAL MANUAL MEANS TO EXERCISE THE TRIP MECHANISM.

C. CIRCUIT BREAKERS SHALL HAVE A MINIMUM SYMMETRICAL INTERRUPTING CAPACITY AS INDICATED ON THE CONTRACT DOCUMENTS.

D. CIRCUIT BREAKERS TO BE EITHER DRAW-OUT OR FIXED MOUNTED, AS INDICATED ON CONTRACT DOCUMENTS

E. CIRCUIT BREAKERS SHALL HAVE MICROPROCESSOR-BASED RMS SENSING TRIP UNITS AS SPECIFIED BELOW:

1. ALL MOLDED CASE CIRCUIT BREAKERS SHALL BE EQUIPPED WITH A TRUE RMS SENSING, SOLID-STATE TRIPPING SYSTEM CONSISTING OF AT LEAST THREE CURRENT SENSORS MICROPROCESSOR-BASED TRIP DEVICE AND TRIP ACTUATOR. THE TRIP UNIT SHALL USE MICROPROCESSOR-BASED TECHNOLOGY TO PROVIDE THE BASIC ADJUSTABLE TIME-CURRENT PROTECTION.
2. PROVIDE TRIP UNITS WITH INTEGRAL ARC FLASH REDUCTION MODE FOR 1200A FRAME AND ABOVE. THE USE OF ZONE SELECTIVE INTERLOCKING TO EMULATE THIS FEATURE DOES NOT MEET THE INTENT OF THESE SPECIFICATIONS AND WILL NOT BE ALLOWED.
3. SYSTEM COORDINATION SHALL BE PROVIDED BY ADJUSTING ROTARY SWITCHES FOR THE FOLLOWING MICROPROCESSOR-BASED TIME-CURRENT CURVE SHAPING ADJUSTMENTS:
   a. ADJUSTABLE LONG-DELAY PICK-UP SETTING WITH MINIMUM OF 10 SETTINGS
   b. ADJUSTABLE LONG-DELAY TIME - 0.5 TO 24 SECONDS
   c. ADJUSTABLE SHORT-DELAY PICK-UP SETTING - 1.5X TO MAX ALLOWABLE BY FRAME
   d. ADJUSTABLE SHORT-DELAY TIME 0.0 SEC UP TO 0.5 SEC DEPENDING ON FRAME WITH SELECTABLE FLAT OR I2T CURVE SHAPING
   e. ADJUSTABLE INSTANTANEOUS SETTING 2X TO MAX ALLOWABLE BY FRAME
   f. WHERE INDICATED, ADJUSTABLE GROUND FAULT CURRENT PICKUP (0.2 - 1.0 X IN IN 0.10X INCREMENTS) AND TIME (0.1 - 1.0 SEC IN 0.10SEC INCREMENTS), WITH SELECTABLE FLAT OR I²T CURVE SHAPING. PROVIDE SWITCH SELECTABLE OPTIONS FOR GF OFF, GF ALARM, OR GF TRIP.
4. WHERE INDICATED PROVIDE 100% RATED UL LISTED CIRCUIT BREAKERS.
5. TRIP UNITS SHALL BE CAPABLE OF METERING PHASE, NEUTRAL, AND GROUND CURRENT WITH AN ACCURACY OF +/- 2.0% OF THE READING.
6. TRIP UNITS SHALL HAVE AN INTEGRAL, HIGH RESOLUTION LIQUID-CRYSTAL DISPLAY (LCD) CAPABLE OF DISPLAYING THE TRIP UNIT PROGRAMMING, STATUS, AND MONITORING INFORMATION INCLUDING BAR GRAPH DISPLAY.
7. TRIP UNITS SHALL INCLUDE EMBEDDED MODBUS RTU COMMUNICATION CAPABILITY. BREAKER STATUS AND ALL MONITORED PARAMETERS SHALL BE AVAILABLE.
8. TRIP UNITS SHALL COLLECT AND STORE PERTINENT INFORMATION TO THE TRIP UNIT AND CIRCUIT BREAKER HEALTH AND EVENT HISTORY. THE TRIP UNIT SHALL ALSO INCLUDE DIAGNOSTIC FEATURES TO ALLOW THE USER TO INVESTIGATE EVENTS AND DYNAMICALLY MONITOR THE HEALTH OF THE TRIP UNIT AND THE BREAKER.
   a. NUMBER OF OPERATIONS (LOAD AND NO-LOAD)
   b. NUMBER OF TRIPS (OVERLOAD TRIPS, SHORT CIRCUIT TRIPS)
   c. RUN TIME
   d. BREAKER AMBIENT TEMPERATURE.
   e. BREAKER REMAINING LIFE - THE TRIP UNIT SHALL UTILIZE AN ALGORITHM THAT APPLIES A WEIGHTED VALUE TO MONITORED INFORMATION TO DETERMINE THE REMAINING LIFE OF THE BREAKER. THE REMAINING LIFE OF THE BREAKER SHALL BE DISPLAYED OR COMMUNICATED IN CALCULATED PERCENTAGE OF LIFE REMAINING.
   f. ALL BREAKER HEALTH INFORMATION SHALL BE ACCESSIBLE VIA MICRO-USB PORT ON FRONT OF TRIP UNIT AND VIA EMBEDDED COMMUNICATIONS
9. TRIP UNIT SHALL PERFORM A WAVEFORM CAPTURE ON TRIP, ALARM, OR USER-INITIATED EVENTS.
   a. ANY BREAKER TRIP EVENT SHALL CAPTURE A 10-CYCLE WAVEFORM. THE TRIP UNIT SHALL STORE THE MOST RECENT TRIP EVENT WAVEFORM.
   b. ANY ALARM EVENT OR USER-INITIATED WAVEFORMS SHALL CAPTURE A 1-CYCLE WAVEFORM.
   c. WAVEFORM EVENTS SHALL CAPTURE AND STORE ALL PHASE, NEUTRAL AND GROUND CURRENTS.

2.08 ACCESSORIES

A. PROVIDE SHUNT TRIPS, BELL ALARMS AND AUXILIARY SWITCHES AS SHOWN ON THE CONTRACT DRAWINGS.

2.09 MISCELLANEOUS DEVICES

A. KEY INTERLOCKS SHALL BE PROVIDED AS INDICATED ON THE DRAWINGS.

B. CONTROL POWER TRANSFORMERS WITH PRIMARY AND SECONDARY PROTECTION SHALL BE PROVIDED, AS INDICATED ON THE DRAWINGS, OR AS REQUIRED FOR PROPER OPERATION OF THE EQUIPMENT.

C. FOR OUTDOOR (NEMA 3R) INSTALLATIONS, EACH SECTION OF THE SWITCHBOARD SHALL BE PROVIDED WITH A THERMOSTATICALLY CONTROLLED SPACE HEATER. POWER FOR THE SPACE HEATERS SHALL BE OBTAINED FROM A SOURCE AS INDICATED ON THE DRAWINGS.

2.10 SURGE PROTECTIVE DEVICE

A. SPD SHALL COMPLY WITH ANSI/UL 1449 4TH EDITION OR LATER LISTING BY UNDERWRITERS LABORATORIES (UL).

B. SERVICE ENTRANCE LOCATED SPDS SHALL BE TESTED AND DEMONSTRATE SUITABILITY FOR APPLICATION WITHIN ANSI/IEEE C62.41 CATEGORY C ENVIRONMENTS.

C. THE SPD SHALL BE OF THE SAME MANUFACTURER AS THE SWITCHBOARD.

D. THE SPD SHALL BE FACTORY INSTALLED INTEGRAL TO THE SWITCHBOARD BY THE ORIGINAL EQUIPMENT MANUFACTURER.

E. LOCATE THE SPD ON THE LOAD SIDE OF THE MAIN DISCONNECT DEVICE, AS CLOSE AS POSSIBLE TO THE PHASE CONDUCTORS AND THE GROUND/NEUTRAL BAR.

F. THE SPD SHALL BE CONNECTED THROUGH A DISCONNECT (30A CIRCUIT BREAKER). THE DISCONNECT SHALL BE LOCATED WITHIN IMMEDIATE PROXIMITY TO THE SPD.

G. ALL MONITORING AND DIAGNOSTIC FEATURES SHALL BE VISIBLE FROM THE FRONT OF THE EQUIPMENT.

H. MAINTENANCE FREE DESIGN - THE SPD SHALL BE MAINTENANCE FREE AND SHALL NOT REQUIRE ANY USER INTERVENTION THROUGHOUT ITS LIFE. SPDS CONTAINING ITEMS SUCH AS REPLACEABLE SINGLE-MODE MODULES, REPLACEABLE FUSES, OR REPLACEABLE BATTERIES SHALL NOT BE ACCEPTED. SPDS REQUIRING ANY MAINTENANCE OF ANY SORT SUCH AS PERIODIC TIGHTENING OF CONNECTIONS SHALL NOT BE ACCEPTED. SPDS REQUIRING USER INTERVENTION TO TEST THE UNIT VIA A DIAGNOSTIC TEST KIT OR SIMILAR DEVICE SHALL NOT BE ACCEPTED.

I. BALANCED SUPPRESSION PLATFORM - THE SURGE CURRENT SHALL BE EQUALLY DISTRIBUTED TO ALL MOV COMPONENTS TO ENSURE EQUAL STRESSING AND MAXIMUM PERFORMANCE. THE SURGE SUPPRESSION PLATFORM MUST PROVIDE EQUAL IMPEDANCE PATHS TO EACH MATCHED MOV. DESIGNS INCORPORATING REPLACEABLE SPD MODULES SHALL NOT BE ACCEPTED.

J. ELECTRICAL NOISE FILTER - EACH TYPE 2 UNIT SHALL INCLUDE A HIGH-PERFORMANCE EMI/RFI NOISE REJECTION FILTER. NOISE ATTENUATION FOR ELECTRIC LINE NOISE SHALL BE UP TO 50 DB FROM 10 KHZ TO 100 MHZ USING THE MIL-STD-220A INSERTION LOSS TEST METHOD. PRODUCTS UNABLE ABLE TO MEET THIS SPECIFICATION SHALL NOT BE ACCEPTED.

K. TYPE 2 UNITS WITH FILTERING SHALL CONFORM TO UL 1283 5TH EDITION

L. TYPE 1 UNITS SHALL NOT CONTAIN FILTERING OR HAVE A UL 1283 5TH EDITION LISTING.

M. INTERNAL CONNECTIONS - NO PLUG-IN COMPONENT MODULES OR PRINTED CIRCUIT BOARDS SHALL BE USED AS SURGE CURRENT CONDUCTORS. ALL INTERNAL COMPONENTS SHALL BE SOLDERED, HARDWIRED WITH CONNECTIONS UTILIZING LOW IMPEDANCE CONDUCTORS.

N. MONITORING DIAGNOSTICS - EACH SPD SHALL PROVIDE THE FOLLOWING INTEGRAL MONITORING OPTIONS:

1. PROTECTION STATUS INDICATORS - EACH UNIT SHALL HAVE A GREEN / RED SOLID-STATE INDICATOR LIGHT THAT REPORTS THE STATUS OF THE PROTECTION ON EACH PHASE.
2. FOR WYE CONFIGURED UNITS, THE INDICATOR LIGHTS MUST REPORT THE STATUS OF ALL PROTECTION ELEMENTS AND CIRCUITRY IN THE L-N AND L-G MODES. WYE CONFIGURED UNITS SHALL ALSO CONTAIN AN ADDITIONAL GREEN / RED SOLID-STATE INDICATOR LIGHT THAT REPORTS THE STATUS OF THE PROTECTION ELEMENTS AND CIRCUITRY IN THE N-G MODE. SPDS THAT INDICATE ONLY THE STATUS OF THE L-N AND L-G MODES SHALL NOT BE ACCEPTED.
3. FOR DELTA CONFIGURED UNITS, THE INDICATOR LIGHTS MUST REPORT THE STATUS OF ALL PROTECTION ELEMENTS AND CIRCUITRY IN THE L-G AND L-L MODES
4. THE ABSENCE OF A GREEN LIGHT AND THE PRESENCE OF A RED LIGHT SHALL INDICATE THAT DAMAGE HAS OCCURRED ON THE RESPECTIVE PHASE OR MODE. ALL PROTECTION STATUS INDICATORS MUST INDICATE THE ACTUAL STATUS OF THE PROTECTION ON EACH PHASE OR MODE. IF POWER IS REMOVED FROM ANY ONE PHASE, THE INDICATOR LIGHTS MUST CONTINUE TO INDICATE THE STATUS OF THE PROTECTION ON ALL OTHER PHASES AND PROTECTION MODES. DIAGNOSTICS PACKAGES THAT SIMPLY INDICATE WHETHER POWER IS PRESENT ON A PARTICULAR PHASE SHALL NOT BE ACCEPTED.
5. REMOTE STATUS MONITOR - THE SPD MUST INCLUDE FORM C DRY CONTACTS (ONE NO AND ONE NC) FOR REMOTE ANNUNCIATION OF ITS STATUS. BOTH THE NO AND NC CONTACTS SHALL CHANGE STATE UNDER ANY FAULT CONDITION.
6. AUDIBLE ALARM AND SILENCE BUTTON - THE SPD SHALL CONTAIN AN AUDIBLE ALARM THAT WILL BE ACTIVATED UNDER ANY FAULT CONDITION. THERE SHALL ALSO BE AN AUDIBLE ALARM SILENCE BUTTON USED TO SILENCE THE AUDIBLE ALARM AFTER IT HAS BEEN ACTIVATED.

O. ELECTRICAL REQUIREMENTS:

1. UNIT OPERATING VOLTAGE - REFER TO DRAWINGS FOR OPERATING VOLTAGE AND UNIT CONFIGURATION.
2. MAXIMUM CONTINUOUS OPERATING VOLTAGE (MCOV) - THE MCOV SHALL NOT BE LESS THAN 115% OF THE NOMINAL SYSTEM OPERATING VOLTAGE.
3. THE SUPPRESSION SYSTEM SHALL INCORPORATE THERMALLY PROTECTED METAL-OXIDE VARISTORS (MOVS) AS THE CORE SURGE SUPPRESSION COMPONENT FOR THE SERVICE ENTRANCE AND ALL OTHER DISTRIBUTION LEVELS. THE SYSTEM SHALL NOT UTILIZE SILICON AVALANCHE DIODES, SELENIUM CELLS, AIR GAPS, OR OTHER COMPONENTS THAT MAY CROWBAR THE SYSTEM VOLTAGE LEADING TO SYSTEM UPSET OR CREATE ANY ENVIRONMENTAL HAZARDS. END OF LIFE MODE TO BE OPEN CIRCUIT. UNIT WITH END OF LIFE SHORT-CIRCUIT MODE ARE NOT ACCEPTABLE.
4. UNIT SHALL OPERATE WITHOUT THE NEED FOR AN EXTERNAL OVERCURRENT PROTECTION DEVICE (OCPD) AND BE LISTED BY UL AS SUCH. UNIT MUST NOT REQUIRE EXTERNAL OCPD OR REPLACEABLE INTERNAL OCPD FOR THE UL LISTING.
5. PROTECTION MODES - THE SPD MUST PROTECT ALL MODES OF THE ELECTRICAL SYSTEM BEING UTILIZED. THE REQUIRED PROTECTION MODES ARE INDICATED BY BULLETS IN THE FOLLOWING TABLE:

	PROTECTION MODES			
CONFIGURATION	L-N	L-G	L-L	N-G
WYE	●	●	●	●
DELTA	N/A	●	●	N/A
SINGLE SPLIT PHASE	●	●	●	●
HIGH LEG DELTA	●	●	●	●

6. NOMINAL DISCHARGE CURRENT (I_N) - ALL SPDS APPLIED TO THE DISTRIBUTION SYSTEM SHALL HAVE A 20KA I_N RATING REGARDLESS OF THEIR SPD TYPE (INCLUDES TYPES 1 AND 2) OR OPERATING VOLTAGE. SPDS HAVING AN I_N LESS THAN 20KA SHALL BE REJECTED.
7. ANSI/UL 1449 4TH EDITION VOLTAGE PROTECTION RATING (VPR) - THE MAXIMUM ANSI/UL 1449 4TH EDITION VPR FOR THE DEVICE SHALL NOT EXCEED THE FOLLOWING:

MODES	208Y/120	480Y/277	600Y/347
L-N; L-G; N-G	700	1200	1500
L-L	1200	2000	3000

2.11 DATA AGGREGATION PROCESSOR

A. PROVIDE A PROCESSOR AND HMI THAT IS TO BE FACTORY-INSTALLED WITHIN THE SWITCHBOARD THAT GENERATES A USER INTERFACE FOR VISUALIZING AND INTERACTING WITH THE TRIP UNITS AND METERS.

B. THE DASHBOARD SOFTWARE SHALL RUN ON A DEDICATED PROCESSOR INSTALLED IN THE SWITCHBOARD OR PANELBOARD. THE PROCESSOR WILL CONTROL ACCESS TO THE ELECTRONIC DEVICES CONNECTED TO IT. THE PROCESSOR SHALL BE THE POWER XPERT DASHBOARD LITE PROCESSOR OR APPROVED EQUAL. THERE SHALL BE A POWER XPERT DASHBOARD LITE PROCESSOR DEDICATED FOR EACH SWITCHBOARD OR PANELBOARD. EACH PROCESSOR SHALL OFFER MONITORING AND CONTROL FOR THE ASSEMBLY TO WHICH IT IS INTERFACED.

C. THE HMI USED WITH THE DASHBOARD SHALL BE EQUIVALENT TO 7" EATON PXDB-HMI-07.

1. THE HMI SHALL SUPPORT INTUITIVE MULTI-TOUCH FUNCTIONALITY PERMITTING USER TO PINCH, ZOOM, SCROLL AND SWIPE.

D. THE HMI SHALL BE MOUNTED IN A CONTROL COMPARTMENT AT A CONVENIENT VIEWING HEIGHT.

E. THE HMI SHALL BE MOUNTED IN AN ENCLOSURE MOUNTED ON THE WALL AND WIRED BY THE CONTRACTOR. THE ENCLOSURE SHALL INCLUDE A DISCONNECT AND POWER SUPPLY TO POWER THE HMI. THE ENCLOSURE SHALL BE LOCATED NEAR THE EQUIPMENT BUT OUTSIDE THE ARC FLASH BOUNDARY.

F. THE HMI SHALL USE ETHERNET CAT6 AS PHYSICAL MEDIA TO COMMUNICATE WITH THE POWER XPERT DASHBOARD PROCESSOR LOCATED IN THE ASSEMBLY EITHER DIRECTLY OR VIA AN ETHERNET SWITCH.

G. SECURITY

1. LOCAL VIEWING OF THE DASHBOARD ON THE HMI SHALL NOT REQUIRE A LOGIN. ALL OTHER ACCESS WILL REQUIRE A USERNAME AND PASSWORD SUBJECT TO CONFIGURABLE PASSWORD RULES.
2. THE DASHBOARD SHALL SUPPORT MULTIPLE SECURITY LEVELS THAT CAN BE ASSIGNED AS ROLES TO SIMPLIFY CREATING USER ACCOUNTS. ROLE-BASED ACCESS CONTROL (RBAC) SHALL BE USED TO CREATE THE SET OF USERS AND ROLE-BASED PERMISSIONS. A COMPREHENSIVE SET OF PASSWORD MANAGEMENT FEATURES SHALL BE AVAILABLE TO ALLOW COMPLIANCE WITH SECURITY POLICIES IN EFFECT AT THE SITE.
3. CONTROL ACCESS POINTS SHALL BE STRICTLY CONTROLLED THROUGH PAIRING OF THE HMI, WITH THE PROCESSOR. ADDITIONAL SECURITY SHALL BE PROVIDED BY LIMITING ACCESS TO THE COMMUNICATION PORTS BY AUTHORIZED TRUSTED HOSTS' IP ADDRESSES
4. SSL ENCRYPTION SHALL BE AVAILABLE TO ENSURE THAT INFORMATION AND PASSWORDS EXCHANGED WITH THE DASHBOARD CANNOT BE INT

2.12 ENCLOSURES

A. NEMA 1 ENCLOSURE

2.13 NAMEPLATES

A. ENGRAVED NAMEPLATES, MOUNTED ON THE FACE OF THE ASSEMBLY, SHALL BE FURNISHED FOR ALL MAIN AND FEEDER CIRCUITS AS INDICATED ON THE DRAWINGS. NAMEPLATES SHALL BE LAMINATED PLASTIC, BLACK CHARACTERS ON WHITE BACKGROUND. CHARACTERS SHALL BE 3/16-INCH HIGH, MINIMUM. NAMEPLATES SHALL GIVE ITEM DESIGNATION AND CIRCUIT NUMBER AS WELL AS FRAME AMPERE SIZE AND APPROPRIATE TRIP RATING. FURNISH MASTER NAMEPLATE GIVING SWITCHBOARD DESIGNATION, VOLTAGE AMPERE RATING, SHORT-CIRCUIT RATING, MANUFACTURER'S NAME, GENERAL ORDER NUMBER, AND ITEM NUMBER.

B. CONTROL COMPONENTS MOUNTED WITHIN THE ASSEMBLY, SUCH AS FUSE BLOCKS, RELAYS, PUSHBUTTONS, SWITCHES, ETC., SHALL BE SUITABLY MARKED FOR IDENTIFICATION CORRESPONDING TO APPROPRIATE DESIGNATIONS ON MANUFACTURER'S WIRING DIAGRAMS.

2.14 FINISH

A. ALL EXTERIOR AND INTERIOR STEEL SURFACES OF THE SWITCHBOARD SHALL BE PROPERLY CLEANED AND PROVIDED WITH A RUST-INHIBITING PHOSPHATIZED COATING. COLOR AND FINISH OF THE SWITCHBOARD SHALL BE ANSI 61 LIGHT GRAY.

PART 3 EXECUTION

3.01 FACTORY TESTING

A. THE FOLLOWING STANDARD FACTORY TESTS SHALL BE PERFORMED ON THE EQUIPMENT PROVIDED UNDER THIS SECTION. ALL TESTS SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF ANSI AND NEMA STANDARDS.

1. THE SWITCHBOARD SHALL BE COMPLETELY ASSEMBLED, WIRED, ADJUSTED, AND TESTED AT THE FACTORY. AFTER ASSEMBLY, THE COMPLETE SWITCHBOARD WILL BE TESTED FOR OPERATION UNDER SIMULATED SERVICE CONDITIONS TO ENSURE THE ACCURACY OF THE WIRING AND THE FUNCTIONING OF ALL EQUIPMENT. THE MAIN CIRCUITS SHALL BE GIVEN A DIELECTRIC TEST OF 2200 VOLTS FOR ONE (1) MINUTE BETWEEN LIVE PARTS AND GROUND, AND BETWEEN OPPOSITE POLARITIES. THE WIRING AND CONTROL CIRCUITS SHALL BE GIVEN A DIELECTRIC TEST OF 1500 VOLTS FOR ONE (1) MINUTE BETWEEN LIVE PARTS AND GROUND

B. THE MANUFACTURER SHALL PROVIDE THREE (3) CERTIFIED COPIES OF FACTORY TEST REPORTS.

C. FACTORY TO CONNECT AND SETUP ETHERNET GATEWAYS AND/OR DATA AGGREGATION PROCESSORS (SUCH AS EATON PXG900 OR POWER XPERT DASHBOARD LITE) INCLUDED IN SWITCHBOARD ASSEMBLIES. FACTORY TESTING SHOULD ALSO INCLUDE CONFIRMATION THAT THE PROCESSOR AND DISPLAY COMMUNICATE WITH EACH OTHER AND THAT EVERY DEVICE CONNECTED TO THE PROCESSOR IS COMMUNICATING WITH THE PROCESSOR. ADDRESSES FOR THE COMMUNICATING DEVICES IN THESE NETWORKS WILL BE INDICATED ON FACTORY SUPPLIED COMMUNICATION DRAWINGS.

3.02 TRAINING

A. THE CONTRACTOR SHALL PROVIDE A TRAINING SESSION FOR UP TO FIVE (5) OWNER'S REPRESENTATIVES FOR 3 NORMAL WORKDAYS AT A JOB SITE LOCATION DETERMINED BY THE OWNER.

B. A MANUFACTURER'S QUALIFIED REPRESENTATIVE SHALL CONDUCT THE TRAINING SESSION. THE TRAINING PROGRAM SHALL CONSIST OF INSTRUCTION ON OPERATION OF THE ASSEMBLY, CIRCUIT BREAKERS, FUSED SWITCHES, AND MAJOR COMPONENTS WITHIN THE ASSEMBLY.

3.03 INSTALLATION

A. THE CONTRACTORS SHALL INSTALL ALL EQUIPMENT PER THE MANUFACTURER'S INSTRUCTIONS, CONTRACT DRAWINGS AND NATIONAL ELECTRICAL CODE.

B. THE ASSEMBLY SHALL BE PROVIDED WITH ADEQUATE LIFTING MEANS AND SHALL BE CAPABLE OF BEING MOVED INTO INSTALLATION POSITION AND BOLTED DIRECTLY TO CONTRACTOR SUPPLIED FLOOR SILLS TO BE SET LEVEL IN CONCRETE PER MANUFACTURER'S RECOMMENDATIONS. ALL NECESSARY HARDWARE TO SECURE THE ASSEMBLY IN PLACE SHALL BE PROVIDED BY THE CONTRACTOR.

3.04 FIELD ADJUSTMENTS

A. THE CONTRACTOR SHALL PERFORM FIELD ADJUSTMENTS OF THE PROTECTIVE DEVICES AS REQUIRED TO PLACE THE EQUIPMENT IN FINAL OPERATING CONDITION. THE SETTINGS SHALL BE IN ACCORDANCE WITH THE APPROVED SHORT-CIRCUIT STUDY, PROTECTIVE DEVICE EVALUATION STUDY AND PROTECTIVE DEVICE COORDINATION STUDY.

B. NECESSARY FIELD SETTINGS OF DEVICES, ADJUSTMENTS AND MINOR MODIFICATIONS TO EQUIPMENT TO ACCOMPLISH CONFORMANCE WITH AN APPROVED SHORT CIRCUIT AND PROTECTIVE DEVICE COORDINATION STUDY SHALL BE CARRIED OUT BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
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SWITCHBOARD SPECIFICATION
SHEET 2 OF 2

DWG NUMBER :

E-907