

FIRE ALARM SYMBOLS	
	FIRE ALARM CONTROL PANEL
	NOTIFICATION EXTENDER PANEL
	REMOTE FIRE ALARM ANNUNCIATION PANEL
	MANUAL PULL STATION
	TAMPER SWITCH
	FLOW SWITCH
	SMOKE DETECTOR - PHOTOELECTRIC
	IN-DUCT SMOKE DETECTOR
	HEAT DETECTOR
DEVICES ARE WALL MOUNTED (UNO), C = CEILING MOUNTED CANDELA RATING (AS INDICATED)	
	FIRE ALARM HORN/STROBE
	FIRE ALARM HORN ONLY
	FIRE ALARM STROBE ONLY
	FIRE ALARM SPEAKER/STORBE
	FIRE ALARM SPEAKER ONLY
	KNOX BOX
	ADDRESSABLE MONITOR MODULE
	ADDRESSABLE RELAY MODULE
	POST INDICATOR VALVE
1. ALL VISUAL NOTIFICATION APPLIANCES THAT ARE WALL MOUNTED ARE TO BE MOUNTED WITH ENTIRE LENS ABOVE +80" AFF AND BELOW +90" AFF. 2. MOUNT FACP, NAC, FAA AT +60" AFF.	

TELE/COMM SYMBOLS	
	TELE/DATA OUTLET, +18" AFF (UNO)
	FLOOR MOUNTED DATA OUTLET
	CEILING MOUNTED SPEAKER
	WALL MOUNTED SPEAKER
	VOLUME CONTROLLER, +46" AFF (UNO)
	CEILING TV OUTLET
	TV OUTLET, +18" AFF (UNO)
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SECURITY SYMBOLS	
	CARD READER, +46" AFF (UNO)
	CCTV CAMERA
	MOTION SENSOR
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LIGHTING SYMBOLS	
	2'X4' GRID MOUNT LIGHT
	*W/ EMERGENCY BATTERY
	2'X2' GRID MOUNT LIGHT
	*W/ EMERGENCY BATTERY
	4' SURFACE WRAP
	*W/ EMERGENCY BATTERY
	STRIP LIGHT (LENGTH AS SHOWN)
	*W/ EMERGENCY BATTERY
	LINEAR PENDANT MOUNT (LENGTH AS SHOWN)
•	RECESSED CAN LIGHT
•	*W/ EMERGENCY BATTERY
	ROUND SURFACE LIGHT
	PENDANT LIGHT
	WALL LIGHT (LENGTH AS SHOWN)
	*W/ EMERGENCY BATTERY
	TRACK LIGHT (LENGTH AS SHOWN)
	POLE MOUNTED AREA LIGHT
	WALL MOUNTED LIGHT
	*W/ EMERGENCY BATTERY
	'BUG EYE' EGRESS LIGHT
	COMBO EXIT SIGN & EGRESS LIGHT
	SINGLE FACE, WALL MOUNTED EXIT SIGN
	DUAL FACE, WALL MOUNTED EXIT SIGN
	SINGLE FACE, CEILING MOUNTED EXIT SIGN
	DOUBLE FACE, CEILING MOUNTED EXIT SIGN
	ARROW INDICATED CHEVRON MARKERS
1. 'X' INDICATED LIGHT FIXTURE CALL OUT. SEE LIGHT FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION. 2. EXIT SIGNS TO BE CENTERED ABOVE DOORS OR OPENINGS WITH EXIT SIGN CENTER MOUNTED 12" ABOVE TOP OF DOOR.	

DEVICES & EQUIPMENT	
	SIMPLEX RECEPTACLE, +18" AFF (UNO)
	DUPLEX RECEPTACLE, +18" AFF (UNO)
	DUPLEX REC. (HALF SWITCHED), +18" (UNO)
	GFCI - DUPLEX RECEPTACLE, +18" (UNO)
	DOUBLE DUPLEX RECEPTACLE, +18" AFF (UNO)
	GFCI - DOUBLE DUPLEX REC., +18" (UNO)
	SPECIAL CONNECTION, +18" AFF (UNO)
	DUPLEX FLOOR RECEPTACLE
	DOUBLE DUPLEX FLOOR RECEPTACLE
	SINGLE SWITCH, +46" AFF (UNO)
	DIMMER SWITCH, +46" AFF (UNO)
	3-WAY SWITCH, +46" AFF (UNO)
	4-WAY SWITCH, +46" AFF (UNO)
	LOW VOLTAGE MOMENTARY SWITCH, +46" AFF (UNO)
	LOW VOLTAGE SWITCH, +46" AFF (UNO)
	SWITCH MOUNTED OCCUPANCY SENSOR, +46" AFF
	SWITCH MOUNTED VACANCY SENSOR, +46" AFF
	CEILING MOUNTED OCCUPANCY SENSOR
	CEILING MOUNTED VACANCY SENSOR
	TIME CLOCK
	PHOTOCELL
	DRY-TYPE TRANSFORMER
	ELECTRICAL ENCLOSURE
	ELECTRICAL PANEL, SURFACE MOUNTED
	ELECTRICAL PANEL, FLUSH MOUNTED
	FUSED SAFETY SWITCH
	NON-FUSED SAFETY SWITCH
	SWITCH RATING (AMP/POLES/NEMA RATING)
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ONE-LINE SYMBOLS	
	PAD MOUNTED TRANSFORMER
	ELECTRICAL PANEL
	CIRCUIT BREAKER
	GROUND CONNECTION
	CONDUCTOR CALL OUT
	ELECTRICAL METER
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DRAFTING SYMBOLS	
	KEYED NOTE CALL OUT
	CONDUIT STUB-UP
	CONDUIT STUB-DOWN
	CONDUIT STUB (CAP, MARK, INSTALL PULL LINE)
	EQUIPMENT CALL OUT
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CIRCUITING LEGEND	
NEW LINE TYPE	_____
EXISTING LINE TYPE	-----
DEMOLITION LINE TYPE	- - - - -
FUTURE LINE TYPE	- . - . - . -
UNDERGROUND LINE TYPE	_____
**WIRE SIZE SHALL BE MINIMUM #12 AWG COPPER UNLESS NOTED OTHERWISE. PROVIDE APPROPRIATELY SIZED EQUIPMENT GROUNDING CONDUCTOR WITH ALL CIRCUITS. WIRE SIZE SHALL NOT BE LESS THAN CORRESPONDING CIRCUIT BREAKER RATING AS REQUIRED BY NEC.	

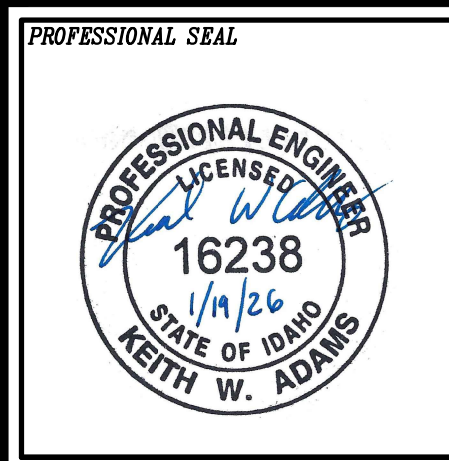
COMMON ABBREVIATIONS	
A	AMPERE
AC	ABOVE COUNTER (MAX +46" TOP OF DEVICE)
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AF	AMP FRAME
AIC	AMPERE INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUAGE
AL	ALUMINUM
AT	AMP TRIP
BKR	BREAKER
BLDG	BUILDING
C	CEILING
CT	CURRENT TRANSFORMER
CU	COPPER
dB	DECIBEL
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EM	EMERGENCY
EMT	ELECTRICAL METALLIC CONDUIT
EPO	EMERGENCY POWER OFF
F	FUSE
FA	FIRE ALARM
FLA	FULL LOAD AMPS
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GF I	GROUND FAULT INTERRUPTER
GFEP	GROUND FAULT EQUIPMENT PROTECTION
GND	GROUND
GRC	GALVANIZED RIGID CONDUIT
IG	ISOLATED GROUND
IMC	INTERMEDIATE METALLIC CONDUIT
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLT-AMPERES
KVAR	KILOVOLT-AMPERES REACTIVE
LTG	LIGHTING
LRA	LOCKED ROTOR AMPS
MC	METAL CLAD CONDUIT
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MI	MINERAL INSULATED
MLO	MAIN LUG ONLY
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
P	POLE
PT	POTENTIAL TRANSFORMER
REC	RECEPTACLE
RMC	RIGID METALLIC CONDUIT
RTU	ROOF TOP UNIT
SP	SPARE
ST	SHUNT TRIP
TTB	TELEPHONE TERMINAL BOARD
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
V	VOLT
WP	WEATHER PROOF
XFMR	TRANSFORMER
%Z	PERCENT IMPEDANCE

PROJECT ELECTRICAL GENERAL NOTES	
1.	ALL WORK TO BE COMPLETED PER THE LATEST ADDITION OF NATIONAL ELECTRICAL CODE (NEC) ADOPTED BY THE AHJ AND ALL LOCAL CODES AND RESTRICTIONS.
2.	CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL REQUIRED PERMITS, TESTS AND INSPECTIONS THAT MAY BE REQUIRED DURING CONSTRUCTION.
3.	THIS DOCUMENT SET IS TO BE CONSIDERED THE CONSTRUCTION DOCUMENTS INCLUDING ALL DRAWINGS, DETAILS, SCHEDULES AND SPECIFICATIONS. ANY DISCREPANCIES OR ISSUES SHOULD BE IMMEDIATELY BROUGHT TO THE ENGINEERS ATTENTION FOR CLARIFICATION.
4.	ALL MATERIALS PROVIDED AND INSTALLED SHALL BE UL LISTED AND SHALL BE NEW UNLESS OTHERWISE NOTED.
5.	ALL DEVICES, EQUIPMENT, CONDUIT, ETC. SHALL BE FLUSH MOUNTED OR CONCEALED IN WALL UNLESS OTHERWISE NOTED.
6.	ELECTRICAL CONTRACTOR TO COORDINATE WITH OTHER TRADES TO AVOID INSTALLATION CONFLICTS PRIOR TO ROUGH-IN.
7.	HACR RATED BREAKERS SHALL BE PROVIDED FOR ALL HVAC EQUIPMENT.
8.	ALL BRANCH CIRCUITS AND FEEDER CIRCUITS ARE TO BE PROVIDED WITH SEPARATE APPROPRIATELY SIZED GROUNDING CONDUCTOR.
9.	ALL WIRE IS SIZED BASED ON 75°C COPPER. COMPACT ALUMINUM IS APPROVED FOR ALL BRANCH AND FEEDER CIRCUITS OVER 100A (UNLESS COPPER IS REQUIRED BY EQUIPMENT MANUFACTURE, VERIFICATION IS THE RESPONSIBILITY OF THE CONTRACTOR). IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO UPSIZE CONDUIT AND CONDUCTORS AND VERIFY TERMINATION REQUIREMENTS AS REQUIRED IF ALUMINUM IS USED.

ELECTRICAL SHEET INDEX	
E000	ELECTRICAL COVER SHEET
E100	ELECTRICAL SITE PLAN
E200	LIGHTING PLAN
E201	MECHANICAL POWER PLAN
E202	POWER PLAN
E203	SPECIAL SYSTEMS PLAN
E204	ROOF POWER PLAN
E300	ONE-LINE DIAGRAM
E301	ELECTRICAL SCHEDULES
E400	ELECTRICAL SPECIFICATIONS
E401	ELECTRICAL SPECIFICATIONS
E402	ELECTRICAL SPECIFICATIONS



DATE	01/19/26								
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ADP ARCHITECTS

ARCHITECTURE & REAL ESTATE PLANNING

GLENN WALKER, AIA

1891 N. WILDWOOD ST.

BOISE, IDAHO 83713

OFFICE: 208-353-0734

gwalker@adp Boise.com

PROJECT NAME

NEW FACILITY FOR:

MIDDLETON INDUSTRIAL PARK

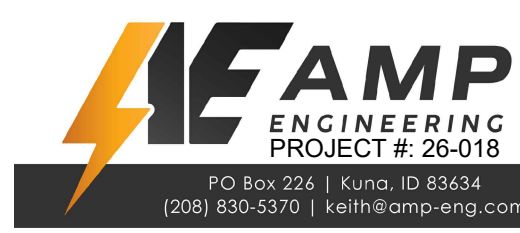
LOT 100

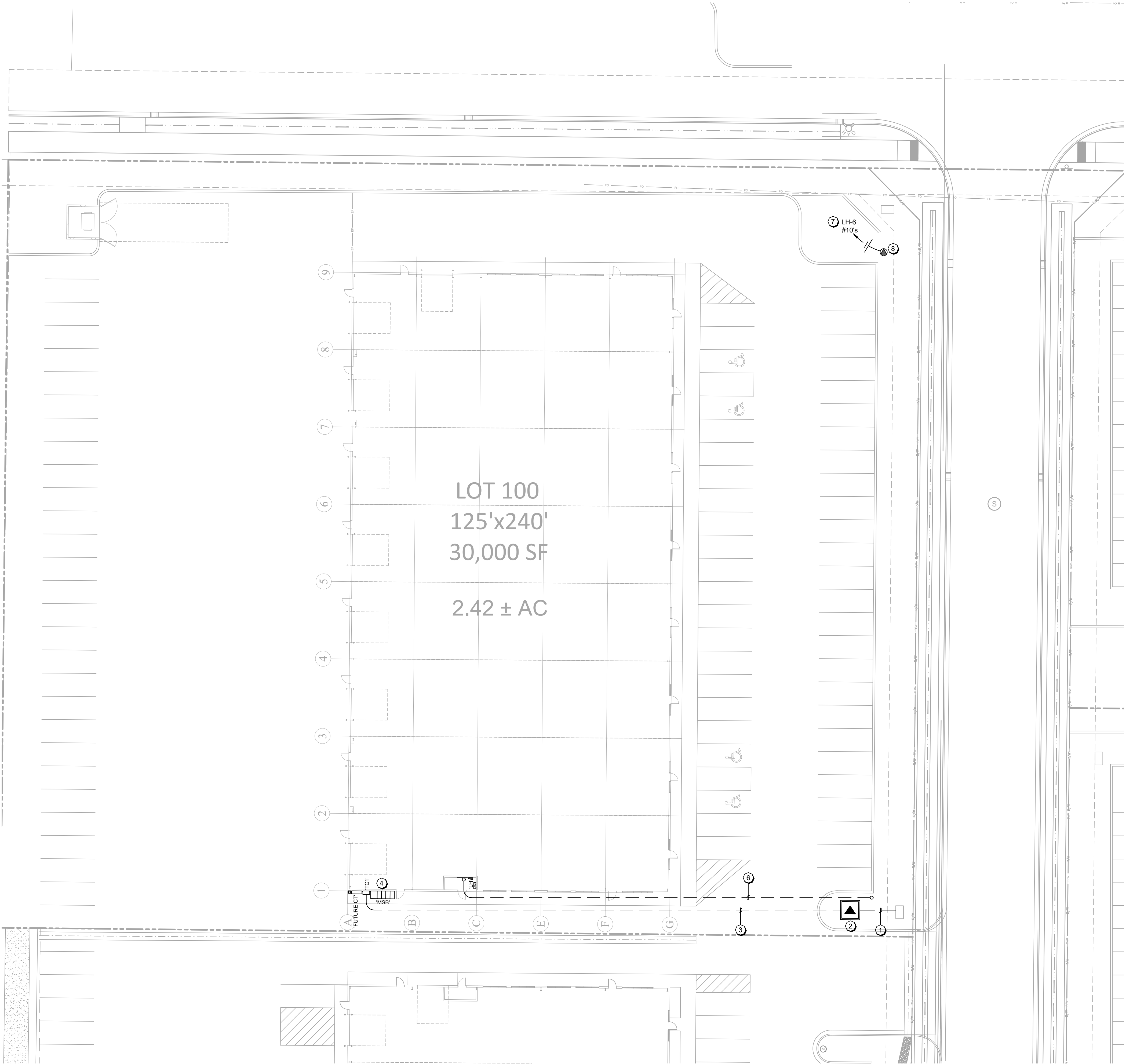
MIDDLETON, IDAHO 83644

ELECTRICAL COVER SHEET

JOB NO:	24116
DATE:	1/19/26
DRAWN BY:	KWA

SHEET NUMBER
E000





1 ELECTRICAL SITE PLAN
1" = 20'-0"

GENERAL NOTES:

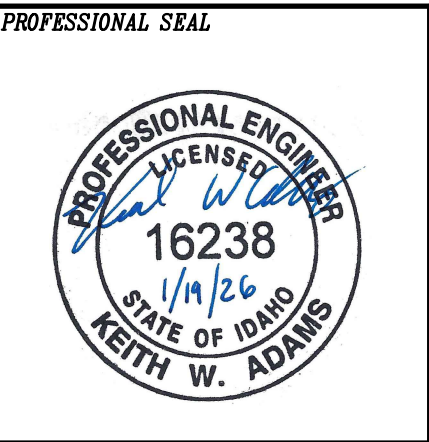
- EQUIPMENT LAYOUT ON THIS SHEET IS SUBJECT TO CHANGE. CONTRACTOR TO COORDINATE ALL UTILITY INSTALLATIONS WITH LOCAL UTILITY COMPANIES PRIOR TO ANY WORK BEING STARTED. VERIFY LOCATIONS OF UTILITY TRENCHES AND EQUIPMENT AND COORDINATE WITH OTHER SITE FEATURES AND EQUIPMENT TO VERIFY ANY CONFLICTS.
- ALL CONDUITS TO BE INSTALLED A MINIMUM OF 24" BELOW FINISHED GRADE. ALL PRIMARY AND SECONDARY CONDUITS TO BE INSTALLED PER LOCAL UTILITY COMPANY REQUIREMENTS.
- CONTRACTOR TO COORDINATE ALL SITE WORK WITH CIVIL AND ARCHITECTURAL SITE PLANS PRIOR TO STARTING ANY WORK.
- ALL EMPTY CONDUITS SHALL BE PROVIDED WITH PULL LINE AND BE LABELED ON BOTH ENDS FOR FUTURE USE.
- ALL UNDERGROUND CONDUIT IS TO BE ELECTRICAL SCHEDULE 40 RIGID PVC WITH TRANSITIONS TO SCHEDULE 80 ABOVE GROUND. PROVIDE GALVANIZED STEEL SLEEVE WHEN PASSING THROUGH FOUNDATION WALLS OR CONCRETE FLOORS. ALL STEEL CONDUIT THROUGH CONCRETE IS TO BE WRAPPED OR PVC COATED.
- WIRE SIZE SHALL BE MINIMUM #12 AWG COPPER UNLESS NOTED OTHERWISE. PROVIDE APPROPRIATELY SIZED EQUIPMENT GROUNDING CONDUCTOR WITH ALL CIRCUITS. WIRE SIZE SHALL NOT BE LESS THAN CORRESPONDING CIRCUIT BREAKER RATING AS REQUIRED BY NEC.

KEYED NOTES:

- NEW UNDERGROUND PRIMARY BY **IDAHO POWER COMPANY**. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY PRIOR TO INSTALLATION.
- NEW PAD MOUNTED TRANSFORMER AND PAD BY **IDAHO POWER COMPANY**. CONTRACTOR TO COORDINATE LOCATION WITH IDAHO POWER COMPANY PRIOR TO ROUGH-IN AND MUST VERIFY AND MAINTAIN ALL REQUIRED CLEARANCES.
- NEW UNDERGROUND SECONDARY TRENCHING, CONDUIT, BACKFILL, ETC. TO BE BY CONTRACTOR PER **IDAHO POWER** REQUIREMENTS. CONDUCTORS BY IDAHO POWER COMPANY. COORDINATE INSTALLATION REQUIREMENTS AND CONDUIT SIZE WITH IDAHO POWER COMPANY PRIOR TO ROUGH-IN. ALL BENDS ARE TO BE FACTORY LONG SWEEP TYPE.
- NEW EXTERIOR BUILDING MOUNTED METERED PACK 'MSB', TERMINATION CABINET 'TC1', & FUTURE C.T. CABINET. SEE ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.
- NOT USED.
- FURNISH AND INSTALL (1) 4" CONDUIT WITH PULL STRING FOR TELE/COMM AND (1) 2" CONDUIT WITH PULL STRING FOR CATV. COORDINATE INSTALLATION REQUIREMENTS WITH LOCAL TELE/COMM AND CATV COMPANIES PRIOR TO ROUGH-IN AND ROUTE TO CLOSEST TELE/DATA UTILITY LOCATION. ALL BENDS ARE TO BE FACTORY LONG SWEEP TYPE. CONDUITS TO BE INSTALLED TO PINTO LANE FOR UTILITY, CAP AND LABEL CONDUITS.
- ROUTE CIRCUIT THROUGH EXTERIOR LIGHTING CONTACTOR FOR CONTROL.
- CONNECTION TO MONUMENT SIGN. COORDINATE LOCATION AND CONNECTION REQUIREMENTS WITH SIGN INSTALLER PRIOR TO ROUGH-IN.



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ADP ARCHITECTS
ARCHITECTURE & REAL ESTATE PLANNING
GLENN WALKER, AIA
1891 N. WILDWOOD ST.
BOISE, IDAHO 83713
OFFICE: 208-853-0734
gwalker@adpboise.com

PROJECT NAME
NEW FACILITY FOR:
MIDDLETON INDUSTRIAL PARK
LOT 100
MIDDLETON, IDAHO 83644

JOB NO:	24116
DATE:	1/19/26
DRAWN BY:	KWA

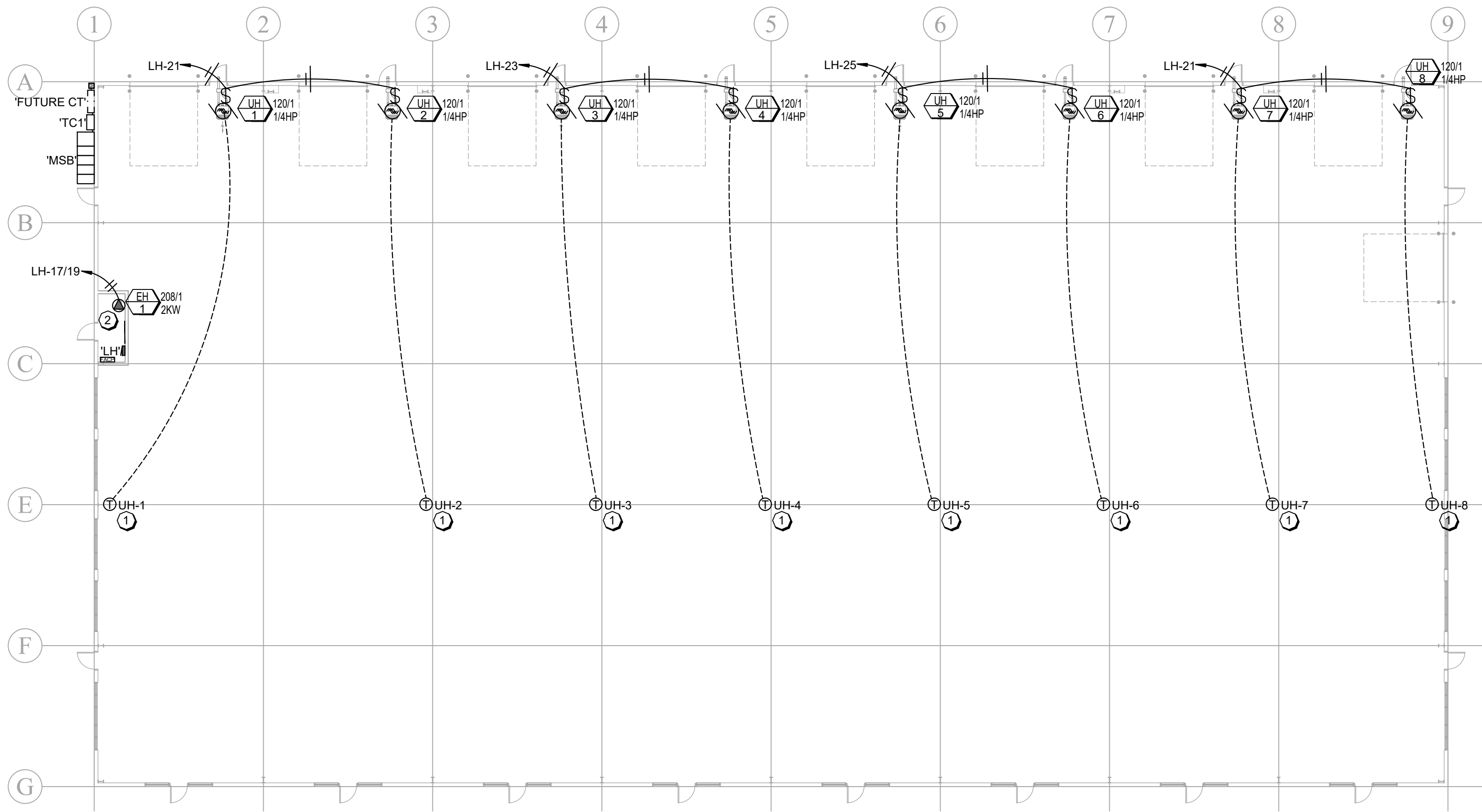
SHEET NUMBER
E100





1. FURNISH AND INSTALL EXTERIOR LIGHTING CONTACTOR, TIME CLOCK AND EXTERIOR PHOTOCELL FOR CONTROL OF EXTERIOR LIGHTING AND SIGNAGE. SEE DETAIL ON DETAIL SHEETS.
2. ROUTE CIRCUIT THROUGH EXTERIOR LIGHTING CONTACTOR FOR CONTROL.
3. PROVIDE UNSWITCHED CONDUCTOR AHEAD OF ANY DELAYS OR CONTROLS TO PROVIDE CONTINUOUS POWER TO EMERGENCY BATTERY PACKS.

SHEET NUMBER
E200



1 MECHANICAL POWER PLAN
1/16" = 1'-0"

GENERAL NOTES:

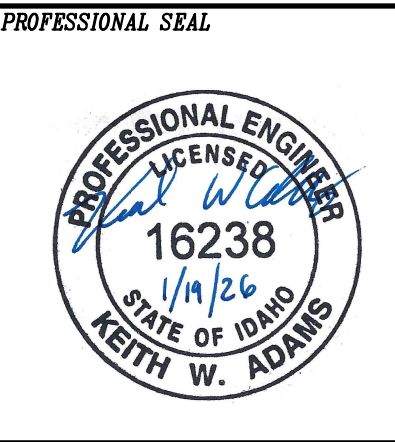
- COORDINATE ALL WORK ON PLUMBING AND MECHANICAL SYSTEMS WITH PLUMBING AND MECHANICAL CONTRACTORS PRIOR TO ROUGH-IN. NOTIFY ENGINEER IMMEDIATELY IF ANY CHANGES TO EQUIPMENT OR LAYOUT ARE FOUND.
- ALL BREAKERS SUPPLYING HVAC EQUIPMENT ARE TO BE HACR RATED.
- THERMAL OVERLOAD TO BE SUPPLIED FOR ALL EQUIPMENT IF NOT FACTORY INSTALLED. COORDINATE REQUIREMENTS WITH EQUIPMENT SUPPLIER.
- WIRE SIZE SHALL BE MINIMUM #12 AWG COPPER UNLESS NOTED OTHERWISE. PROVIDE APPROPRIATELY SIZED EQUIPMENT GROUNDING CONDUCTOR WITH ALL CIRCUITS. WIRE SIZE SHALL NOT BE LESS THAN CORRESPONDING CIRCUIT BREAKER RATING AS REQUIRED BY NEC.

KEYED NOTES:

- CONTRACTOR TO INSTALL BACK BOX AND CONDUIT TO ABOVE ACCESSIBLE CEILING FOR T-STAT. COORDINATE CONNECTIONS AND CONDUCTOR REQUIREMENTS WITH MECHANICAL CONTRACTOR.
- CONNECTION TO 208V/2P, 2KW ELECTRIC WALL HEATER.



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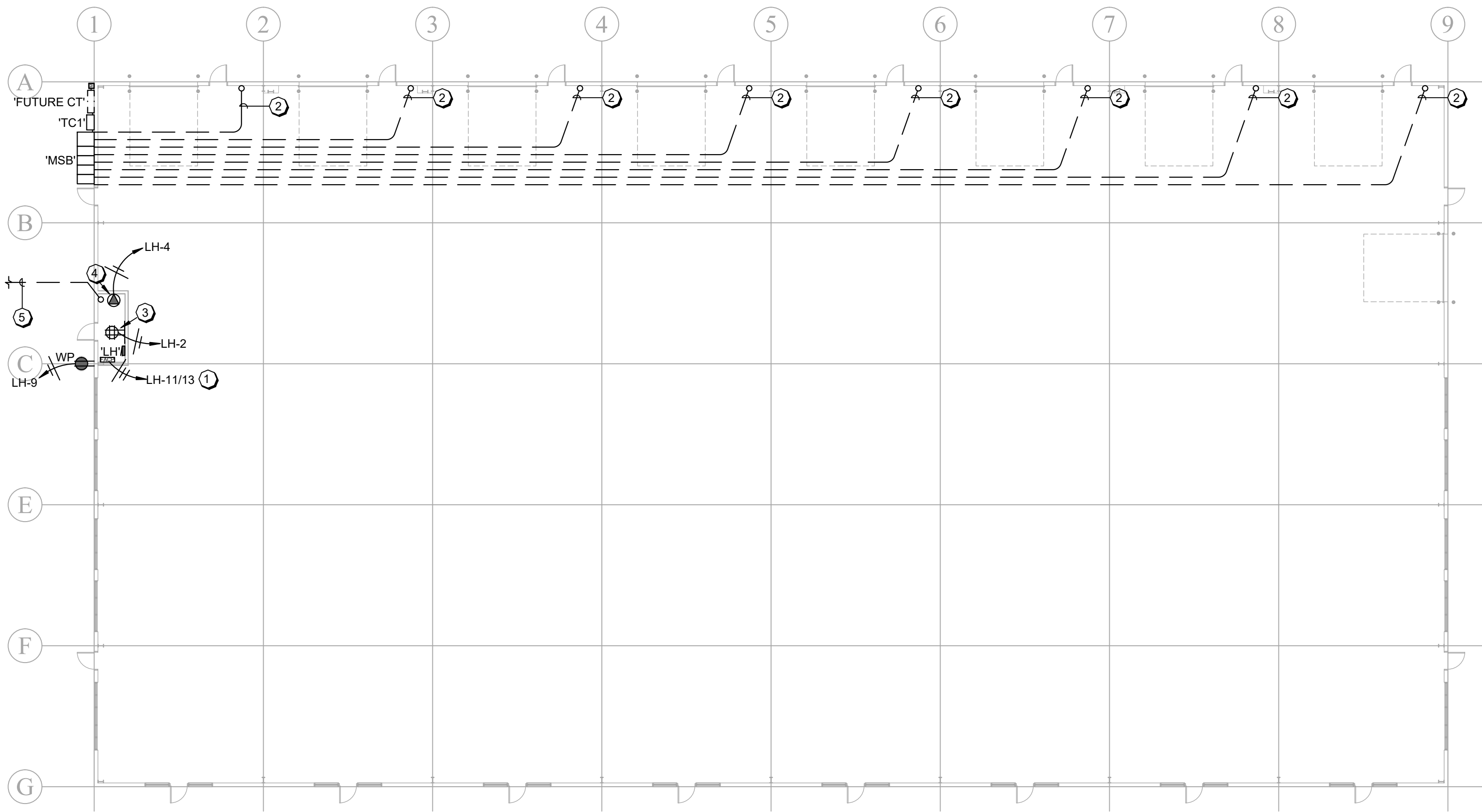
ADP ARCHITECTS
ARCHITECTURE & REAL ESTATE PLANNING
GLENN WALKER, AIA
1891 N. WILDWOOD ST.
BOISE, IDAHO 83713
OFFICE: 208-853-0734
gwalker@adpboise.com

PROJECT NAME
NEW FACILITY FOR:
MIDDLETON INDUSTRIAL PARK
LOT 100
MIDDLETON, IDAHO 83644
MECHANICAL POWER PLAN

JOB NO:	24116
DATE:	1/19/26
DRAWN BY:	KWA

SHEET NUMBER
E201





1 POWER PLAN
1/16" = 1'-0"

GENERAL NOTES:

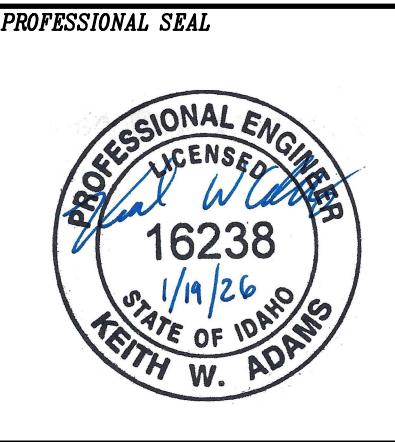
- COORDINATE ALL LOCATIONS AND POWER REQUIREMENTS WITH OWNER PRIOR TO ROUGH-IN AND FINAL COVER.
- WIRE SIZE SHALL BE MINIMUM #12 AWG COPPER UNLESS NOTED OTHERWISE. PROVIDE APPROPRIATELY SIZED EQUIPMENT GROUNDING CONDUCTOR WITH ALL CIRCUITS. WIRE SIZE SHALL NOT BE LESS THAN CORRESPONDING CIRCUIT BREAKER RATING AS REQUIRED BY NEC.

KEYED NOTES:

- PROVIDE 120V POWER FOR FACP IN RISER ROOM. PROVIDE 120V FIRE BELL IN RISER ROOM. FIRE ALARM SYSTEM SHALL BE DESIGN BUILD BY ELECTRICAL CONTRACTOR. FIRE ALARM SYSTEM SHALL BE FULL FUNCTIONING SYSTEM PER CITY CODE MINIMUM, INCLUDED WITH ALL PROGRAMMING, START-UP, AND TESTING.
- STUB UNDERGROUND EMPTY CONDUIT WITH PULL STRING FROM METER PACK TO EACH TENANT AREA. SEE E300 ONE-LINE DIAGRAM FOR SIZING.
- RECEPTACLE MOUNTED AT TELEPHONE BOARD. RECEPTACLE TO BE HUBBELL SPIKE SHIELD BLUE IN COLOR.
- IRRIGATION CONTROLLER CONNECTION, COORDINATE WITH LANDSCAPING PRIOR TO ROUGH IN.
- STUB 1-1/2" PVC CONDUIT TO LANDSCAPE AREA FOR IRRIGATION CONTROL WIRES, CAP BOTH ENDS AND LABEL. COORDINATE WITH LANDSCAPE CONTRACTOR PRIOR TO ROUGH-IN.



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ADP ARCHITECTS
ARCHITECTURE & REAL ESTATE PLANNING
GLENN WALKER, AIA
1891 N. WILDWOOD ST.
BOISE, IDAHO 83713
OFFICE: 208-853-0734
gwalker@adpboise.com

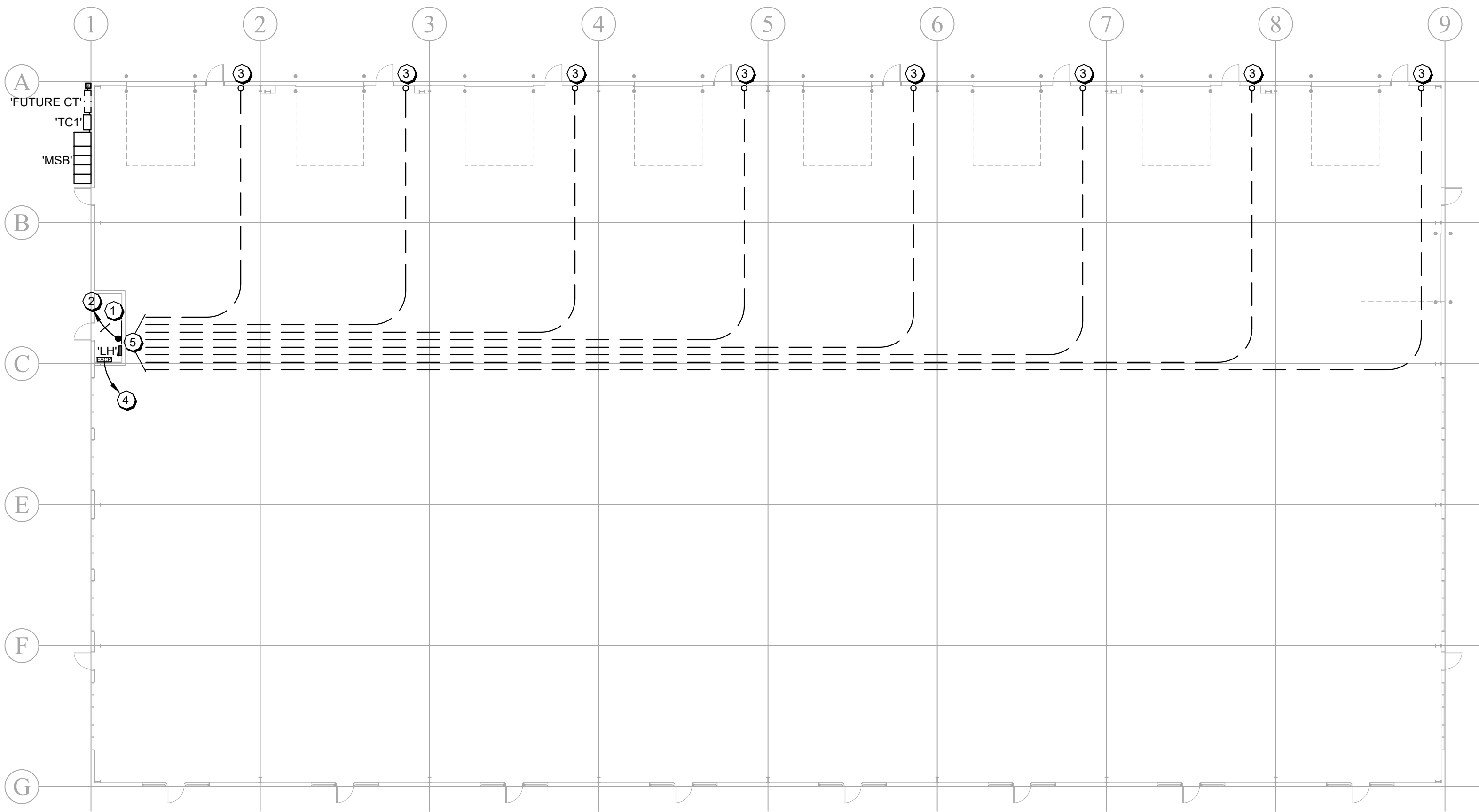
PROJECT NAME
NEW FACILITY FOR:
MIDDLETON INDUSTRIAL PARK
LOT 100
MIDDLETON, IDAHO 83644

POWER PLAN

JOB NO: 24116
DATE: 1/19/26
DRAWN BY: KWA

SHEET NUMBER
E202





GENERAL NOTES:

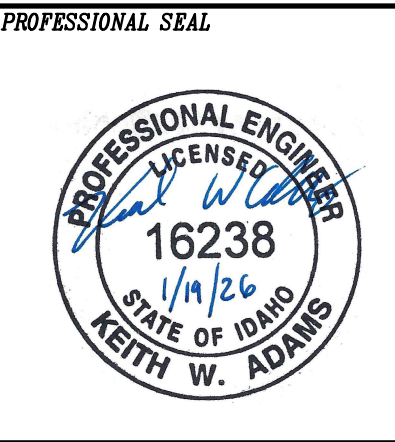
- A. COORDINATE ALL LOCATIONS OF DATA EQUIPMENT AND OUTLETS WITH OWNER PRIOR TO ROUGH-IN AND FINAL COVER.

KEYED NOTES:

- FURNISH AND INSTALL 3/4" FIRE RATED PLYWOOD BACK BOARD FOR MOUNTING OF TELEPHONE EQUIPMENT. SEE DETAIL ON SHEET E300.
- INSTALL (1) #6 GROUND AND GROUND TERMINAL AT TELEPHONE BOARD. BOND GROUND CONDUCTOR TO INTERSYSTEM BONDING TERMINAL AT SERVICE PER NEC 250.94.
- STUB UNDERGROUND (1) 2" EMPTY CONDUIT WITH PULL STRING FROM MAIN TELE/COMM BOARD TO EACH TENANT AREA. SEE E300 FOR DETAILS.
- PROVIDE AND INSTALL TWO DEDICATED PHONE LINES FROM FACP IN RISER ROOM TO MAIN TELEPHONE BACK BOARD. FIRE ALARM SYSTEM SHALL BE DESIGN BUILD BY ELECTRICAL CONTRACTOR. FIRE ALARM SYSTEM SHALL BE FULL FUNCTIONING SYSTEM PER CITY CODE MINIMUM, INCLUDED WITH ALL PROGRAMMING, START-UP, AND TESTING.
- CONTINUE CONDUITS TO ABOVE TELE/DATA BACK BOARD, SEE DETAIL ON E300 SHEET FOR ADDITIONAL INFORMATION.



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GLENN WALKER, AIA
1891 N. WILDWOOD ST.
BOISE, IDAHO 83713
OFFICE: 208-853-0734
gwalker@adpboise.com

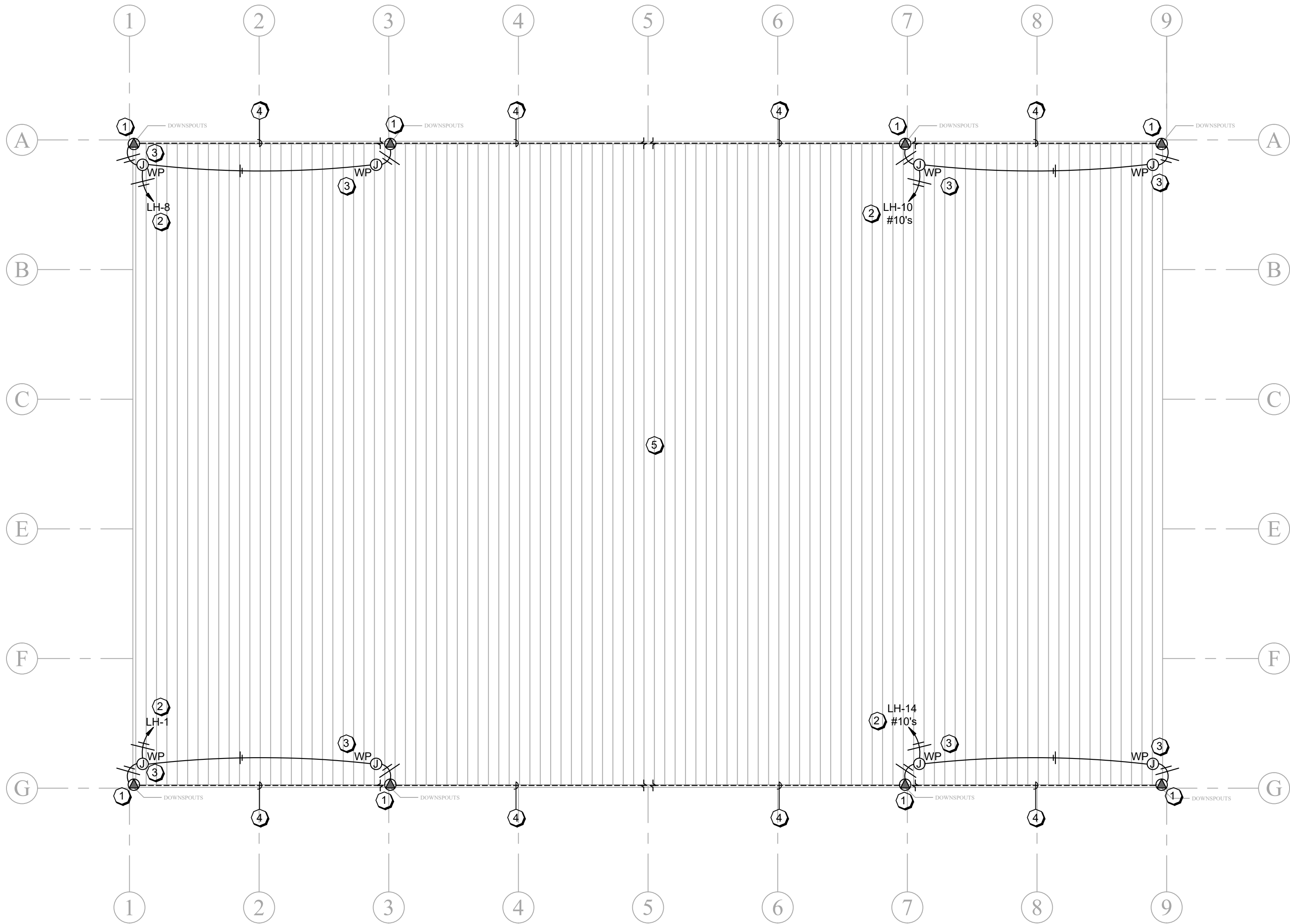
PROJECT NAME
NEW FACILITY FOR:
MIDDLETON INDUSTRIAL PARK
LOT 100
MIDDLETON, IDAHO 83644
SPECIAL SYSTEMS PLAN

JOB NO:	24116
DATE:	1/19/26
DRAWN BY:	KWA

SHEET NUMBER
E203

1 ROOF POWER PLAN

1/16" = 1'-0"

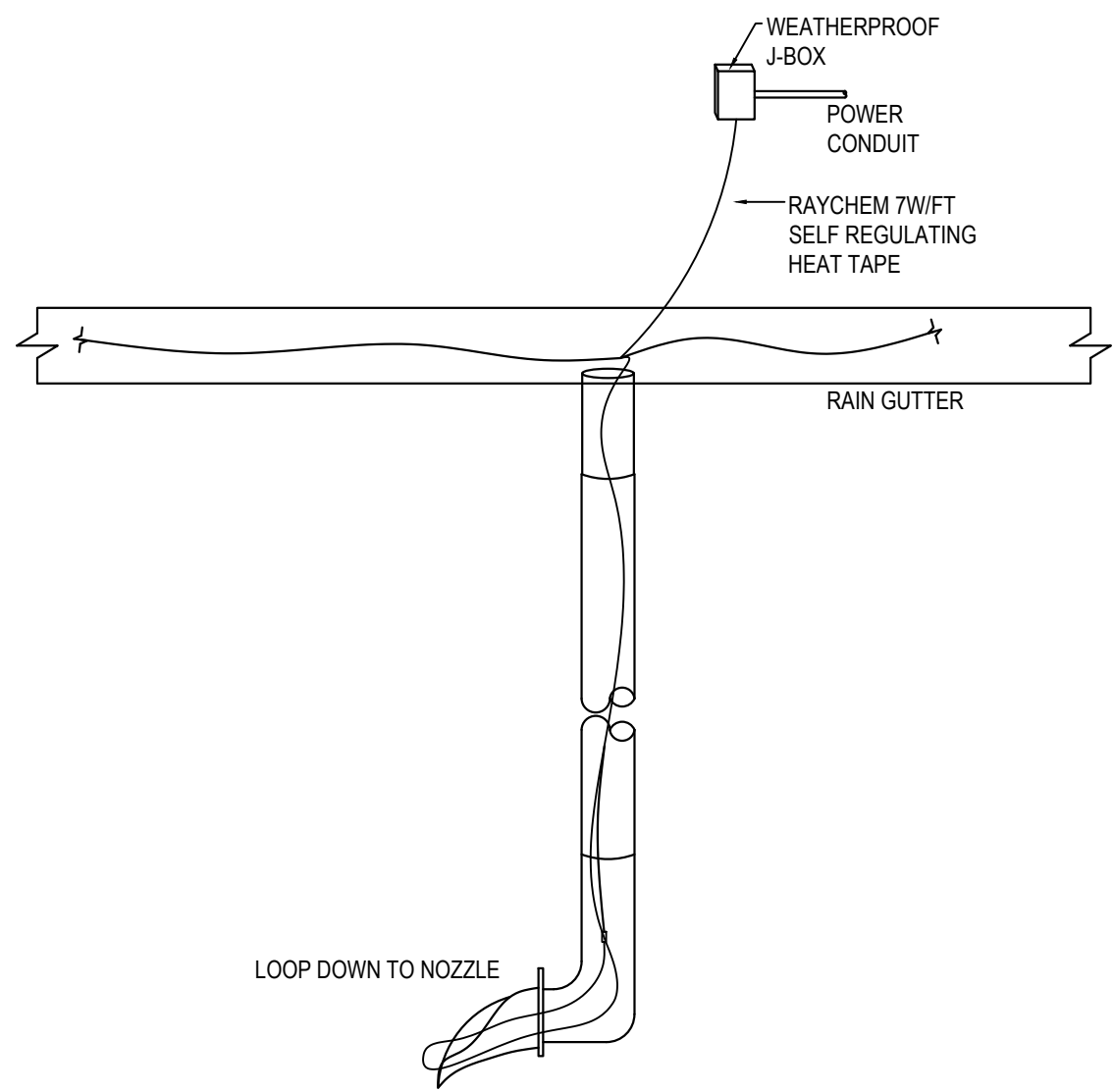


GENERAL NOTES:

- WIRE SIZE SHALL BE MINIMUM #12 AWG COPPER UNLESS NOTED OTHERWISE. PROVIDE APPROPRIATELY SIZED EQUIPMENT GROUNDING CONDUCTOR WITH ALL CIRCUITS. WIRE SIZE SHALL NOT BE LESS THAN CORRESPONDING CIRCUIT BREAKER RATING AS REQUIRED BY NEC.
- ALL CONDUIT ROUTED ON THE ROOF SHALL BE HELD OFF ROOF AS REQUIRED BY NEC OR ALL CONDUCTOR AMPACITIES SHALL BE DERATED AS REQUIRED.
- COORDINATE ALL LOCATIONS OF ROOF MOUNTED EQUIPMENT WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.
- ALL BREAKERS FEEDING HVAC EQUIPMENT SHALL HACR RATED.

KEYED NOTES:

- FURNISH AND INSTALL HEAT TRACE AROUND ROOF GUTTER AND DOWN SPOUT DRAIN. SEE DETAIL ON THIS SHEET FOR ADDITIONAL INFORMATION.
- BREAKER TO BE CLASS 'B' GFEP FOR EQUIPMENT PROTECTION.
- FURNISH AND INSTALL WEATHER PROOF JUNCTION, MOUNT TO SIDE OF BUILDING UNDER EVE. COORDINATE WITH ARCHITECTURAL.
- FURNISH AND INSTALL HEAT TRACE IN ROOF GUTTER.
- ALL HEAT TRACE MATERIAL AND LABOR SHALL BE SEPARATED INTO ALTERNATE #1 ELECTRICAL COST.

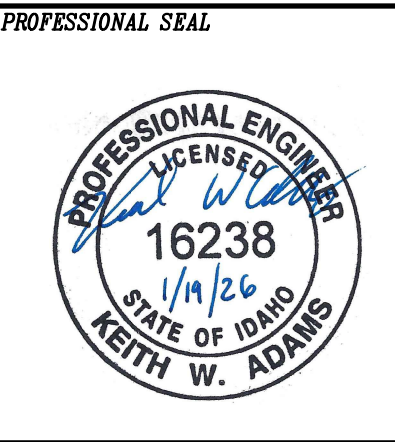


ROOF DRAIN HEAT TRACE DETAIL

SCALE: NTS



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1891 N. WILDWOOD ST.
BOISE, IDAHO 83713
OFFICE: 208-853-0734
gwalker@adp Boise.com

PROJECT NAME
NEW FACILITY FOR:
MIDDLETON INDUSTRIAL PARK
LOT 100
MIDDLETON, IDAHO 83644

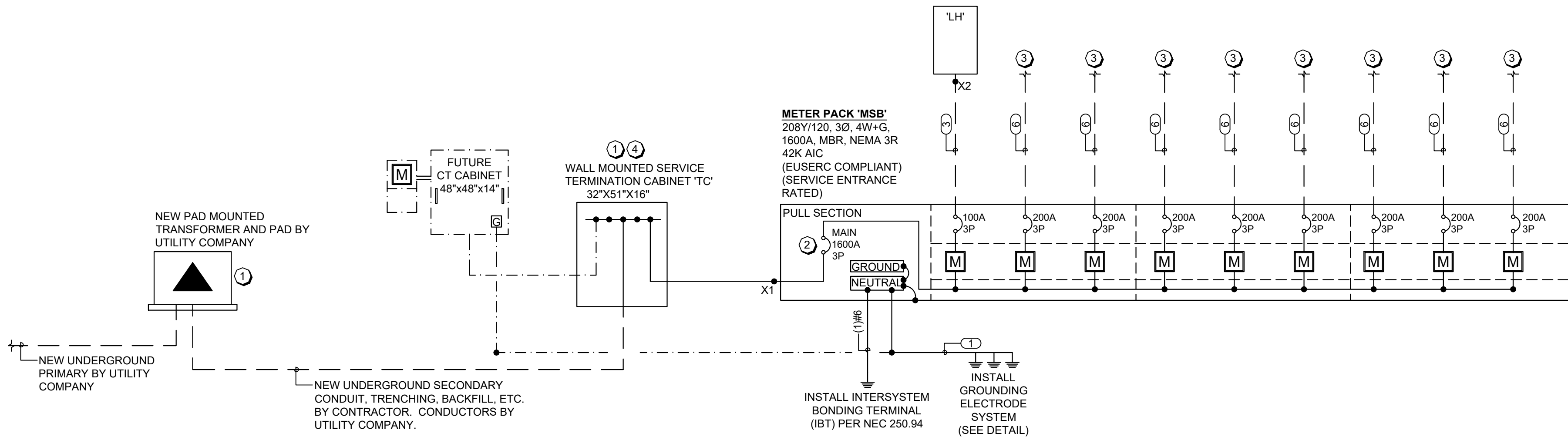
ROOF POWER PLAN

JOB NO: 24116
DATE: 1/19/26
DRAWN BY: KWA

SHEET NUMBER
E204

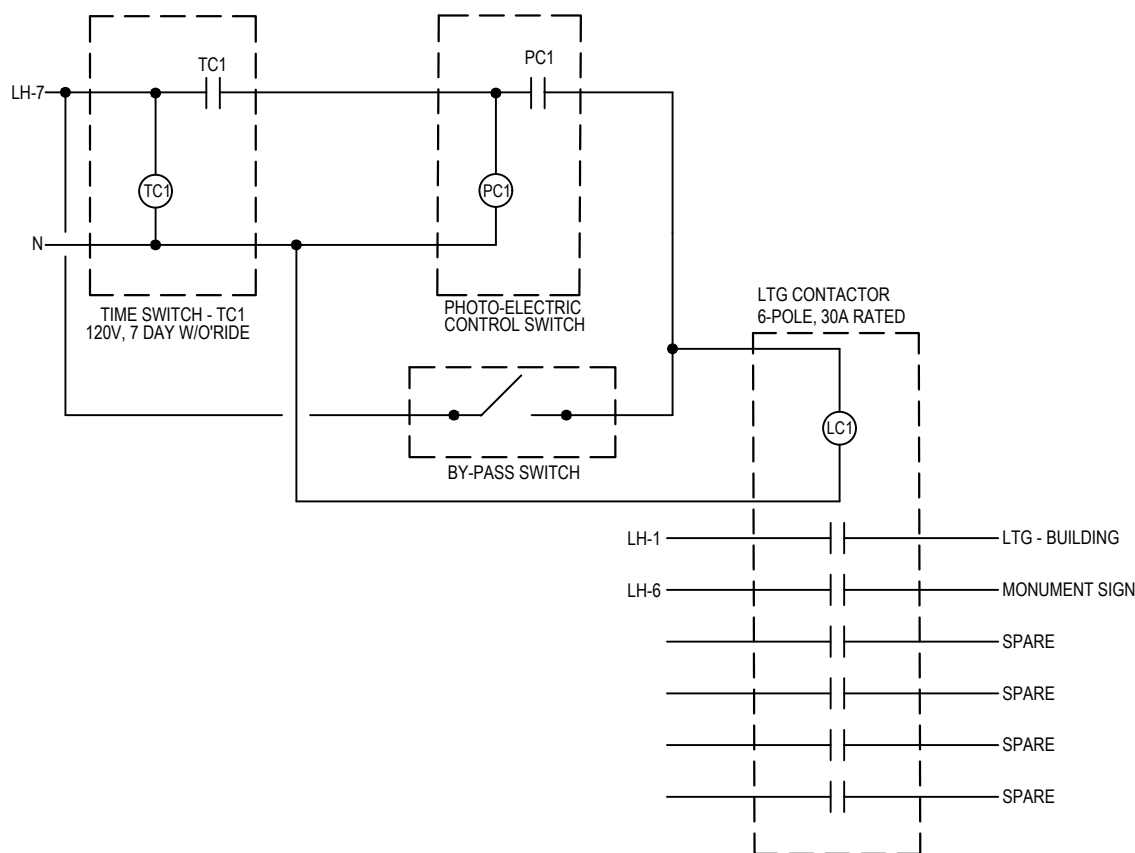
FAULT CURRENT CALCULATIONS			
POINT #	LOCATION	EST. DISTANCE (FT.)	AVAILABLE FAULT CURRENT (A)
X1	SERVICE ENTRANCE	~185	38,367
X2	PANEL 'LH'	~40	12,320
NOTES: AVAILABLE FAULT CURRENT AT UTILITY XFMR SECONDARY BASED ON AN ESTIMATED 750KVA XFMR WITH 2.4% IMPEDANCE AND (6) RUNS OF #400 ALUMINUM CONDUCTORS IN PVC CONDUIT. CONTRACTOR TO VERIFY ACTUAL EQUIPMENT TO BE INSTALLED WITH UTILITY COMPANY PRIOR TO ORDERING ELECTRICAL GEAR. IF ANY ITEMS DO NOT MATCH ABOVE ASSUMPTIONS, NOTIFY ENGINEER IMMEDIATELY FOR UPDATED FAULT CURRENT CALCULATIONS.			

3-PHASE FEEDER SCHEDULE						
TAG	OCPD RATING	NO. OF CONDUITS	CONDUIT SIZE	NO. OF CONDUCTORS	CONDUCTOR SIZE	GROUND SIZE
1	N/A	1 (PVC)	3/4"	1	N/A	#3/0 AWG
2	70A	1	1-1/4"	3+G	#6 AWG	#8 AWG
3	100A	1	1-1/2"	4+G	#2 AWG	#8 AWG
4	125A	1	1-1/2"	3+G	#1 AWG	#6 AWG
5	150A	1	2"	4+G	#1/0 AWG	#6 AWG
6	200A	1	2-1/2"	NA	NA	NA
NOTE: WIRE SIZING BASED ON 75°C COPPER CONDUCTORS WITH NOT MORE THAN (3) CURRENT-CARRYING CONDUCTORS IN RACEWAY AND AMBIENT TEMPERATURE OF 30°C.						



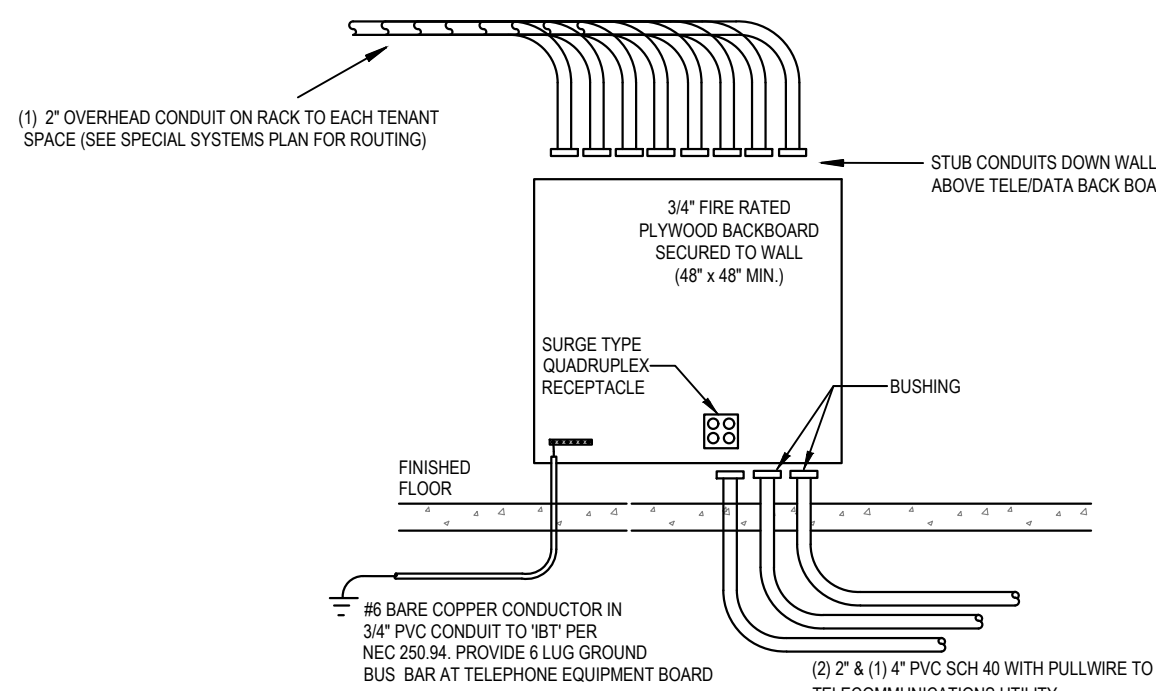
ONE-LINE DIAGRAM

SCALE: NTS

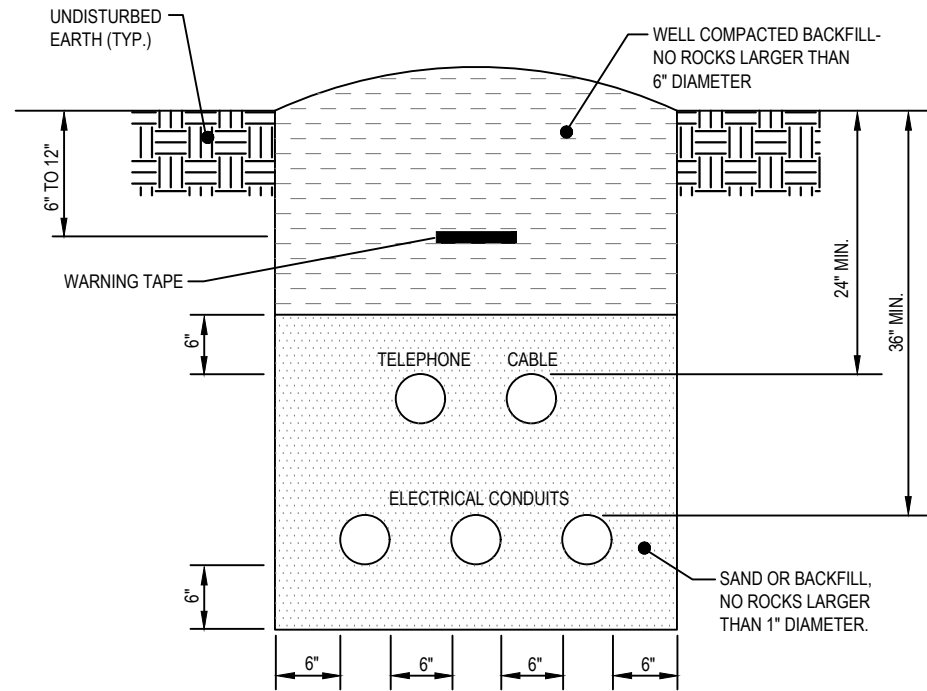


EXTERIOR LIGHTING CONTACTOR DETAIL

SCALE: NTS

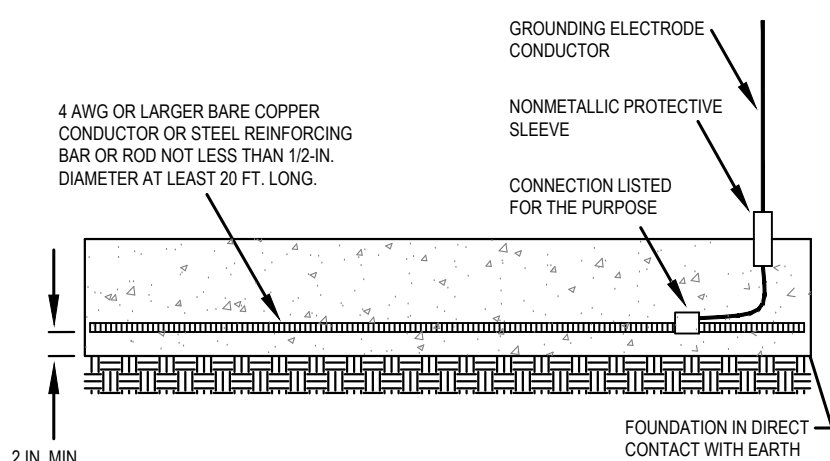


MAIN BUILDING TELE/COMM BACK BOARD DETAIL



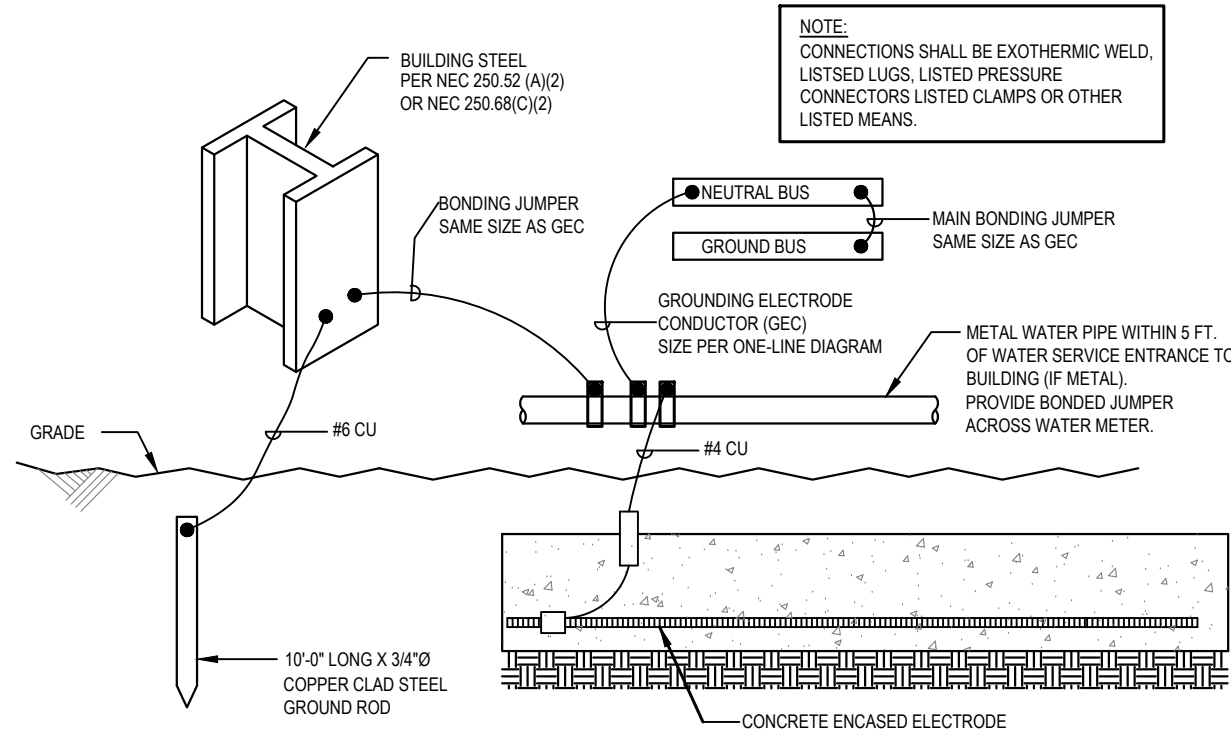
ELECTRICAL TRENCH DETAIL

SCALE: NTS



CONCRETE ENCASED ELECTRODE DETAIL

SCALE: NTS



GROUNDING ELECTRODE SYSTEM DETAIL

SCALE: NTS

GENERAL NOTES:

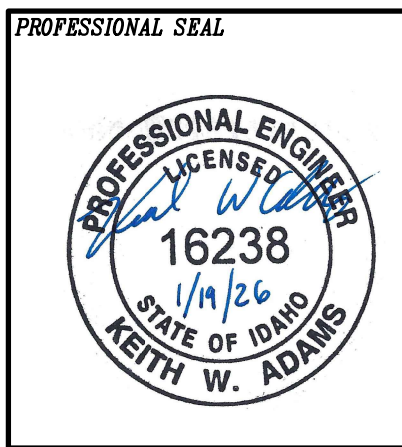
- SERIES RATED COMBINATIONS SHALL BE UL LISTED AND LABELED PER NEC 110.22.
- ELECTRICAL EQUIPMENT SHALL BE FIELD OR FACTORY MARKED TO WARN OF POTENTIAL ARC-FLASH HAZARDS PER NEC 110.16.
- SERVICE EQUIPMENT SHALL BE MARKED WITH AVAILABLE FAULT CURRENT PER NEC 110.24.
- CONTRACTOR TO MAINTAIN ALL WORKING CLEARANCES AROUND ELECTRICAL EQUIPMENT PER NEC 110.26. ANY CONFLICTS THAT ARISE ARE TO BE REPORTED IMMEDIATELY TO THE ENGINEER FOR REVIEW
- ALL GROUNDING ELECTRODES THAT ARE PRESENT AT EACH BUILDING OR STRUCTURE SERVED SHALL BE BONDED TOGETHER TO FORM THE GROUNDING ELECTRODE SYSTEM PER NEC 250.50.

KEYED NOTES:

- COORDINATE WITH IDAHO POWER COMPANY PRIOR TO STARTING ANY WORK.
- MAIN BREAKER TO BE FULLY ADJUSTABLE LSI TYPE WITH ELECTRONIC TRIP AND ARC FLASH REDUCTION MAINTENANCE MODE SWITCH PER NEC 240.87.
- STUB EMPTY UNDERGROUND CONDUIT WITH PULL STRING TO FUTURE TENANT SPACE. SEE SHEET E202 FOR ROUTING. CAP AND MARK AS REQUIRED FOR FUTURE USE.
- TYPE-LWTE WALL MOUNTED NEMA 3R, THREE PHASE, 600V, TERMINATION ENCLOSURE.



NO.	REVISIONS	DATE
1	ISSUE FOR PERMIT	01/19/26



ADP ARCHITECTS
ARCHITECTURE & REAL ESTATE PLANNING
GLENN WALKER, AIA
1891 N. WILDWOOD ST.
BOISE, IDAHO 83713
OFFICE: 208-853-0734
gwalker@adp Boise.com

PROPERTY VALUE
NEW FACILITY FOR:
MIDDLETON INDUSTRIAL PARK
LOT 100
MIDDLETON, IDAHO 83644
ONE-LINE DIAGRAM

JOB NO:	24116
DATE:	1/19/26
DRAWN BY:	KWA

SHEET NUMBER
E300





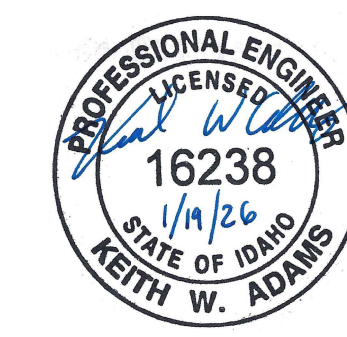
4EAMP
ENGINEERING
PROJECT #: 26-018
PO Box 226 | Kuna, ID 83634
(208) 830-5370 | keith@amp-eng.co

 **COMcheck Software Version 4.1.5.5**
Interior Lighting Compliance Certificate

Kurt W. Carlson
Signature

COMcheck Software Version 4.1.5.5
Exterior Lighting Compliance Certificate

		Total Tradable Proposed Watts =	1732
Exterior Lighting PASSES: Design 78% better than code			
Exterior Lighting Compliance Statement			
Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed exterior lighting systems have been designed to meet the 2018 IECC requirements in COMcheck Version 4.1.5.5 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.			
KEITH ADAMS, PE			01-19-2026
Name - Title	Signature		Date

[illegible]

ADP ARCHITECTS
ARCHITECTURE & REAL ESTATE PLANNING
GLENN WALKER, AIA
1891 N. WILLOWOOD ST.
BOISE, IDAHO 83713
OFFICE: 208-353-0734
gwalker@adpboise.com

NEW FACILITY FOR:
MIDDLETON INDUSTRIAL PARK
LOT 100
MIDDLETON, IDAHO 83644

JOB NO:	24116
DATE:	1/19/26
DRAWN BY:	KWA

SHEET NUMBER

E301

4EAMP
ENGINEERING
PROJECT #: 26-018
PO Box 226 | Kuna, ID 83634
(208) 830-5370 | keith@amp-eng.com

3. Install unshared neutral conductors on line and load side or dimmers according to manufacturers' device, listing conditions in the written instructions.
- G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.
- H. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.
- 3.2 FIELD QUALITY CONTROL**
- A. Tests for Receptacles:
1. Line Voltage: Acceptable range is 105 to 132 V.
 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 5. Using the test plug, verify that the device and its outlet box are securely mounted.
- B. Wiring device will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION 262726

SECTION 265119 - LED INTERIOR LIGHTING

PART 1 - GENERAL

1.1 ACTION SUBMITTALS

- A. Product Data: For each type of product.
1. Manufacturers' Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
2. Testing Agency Certified Data: For indicated luminaires, photometric data certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.

1.2 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale and coordinated with each other, using input from installers of the items involved.
- B. Seismic Qualification Data: For luminaires, accessories, and components, from manufacturer.
- C. Product Certificates: For each type of luminaire.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.4 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: Five year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
1. Label shall include the following label characteristics:
 - a. "USE ONLY" and include specific lamp type.
 - b. Lamp diameter, shape, size, wattage, and coating.
 - c. CCT and CRI.
 2. Recessed luminaires shall comply with NEMA LE 4.

2.2 MATERIALS

- A. Metal Parts:
1. Free of burrs and sharp corners and edges.
 2. Sheet metal components shall be steel unless otherwise indicated.
 3. Form and support to prevent warping and sagging.
- B. Steel:
1. ASTM A36/A36M for carbon structural steel.
 2. ASTM A568/A568M for sheet steel.
- C. Stainless Steel:
1. Manufacturer's standard grade.
 2. Manufacturer's standard type, ASTM A240/A240M.
- D. Galvanized Steel: ASTM A653/A653M.
- E. Aluminum: ASTM B209.

2.3 METAL FINISHES

- A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

2.4 LUMINAIRE SUPPORT

- A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.
- B. Single-Stein Hangers: 1/2-inch (13-mm) steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.
- C. Wires: ASTM A641/A641M, Class 3, soft temper, zinc-coated steel, 12 gage.
- D. Rod Hangers: 1/4-inch minimum diameter, cadmium-plated, threaded steel rod.
- E. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1.
- B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
- C. Install lamps in each luminaire.
- D. Supports:
1. Sized and rated for luminaire weight.
 2. Able to maintain luminaire position after cleaning and relamping.
 3. Provide support for luminaire without causing deflection of ceiling or wall.
 4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.

3.2 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 200553 "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
 2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.
- B. Luminaire will be considered defective if it does not pass operation tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION 265119

SECTION 265213 - EMERGENCY AND EXIT LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Emergency lighting units.
 2. Exit signs.
 3. Luminaire supports.

1.2 DEFINITIONS

- A. Emergency Lighting Unit: A lighting unit with integral or remote emergency battery powered supply and the means for controlling and charging the battery and unit operation.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of emergency lighting unit, exit sign, and emergency lighting support, arranged by designation.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, coordinated with each other, using input from installers of the items involved.
- B. Product Certificates: For each type of luminaire.
- C. Seismic Qualification Data: Certificates, for luminaires, accessories, and components, from manufacturer.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.6 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Two year(s) from date of Substantial Completion.
- B. Special Warranty for Emergency Lighting Batteries: Manufacturer's standard form in which manufacturer of battery-powered emergency lighting unit agrees to repair or replace components of rechargeable batteries that fail in materials or workmanship within specified warranty period.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified and the luminaire will be fully operational during and after the seismic event[.]"

2.2 GENERAL REQUIREMENTS FOR EMERGENCY LIGHTING

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. NRTL Compliance: Fabricate and label emergency lighting units, exit signs, and batteries to comply with UL 924.
- C. Comply with NFPA 70 and NFPA 101.
- D. Comply with NEMA LE 4 for recessed luminaires.
- E. Comply with UL 1598 for recessed luminaires.
- F. Internal Type: Emergency Power Unit: Self-contained, modular, battery-inverter unit, factory mounted within luminaire body and compatible with LED driver.
1. Emergency Connection: Operate continuously at an output listed upon loss of normal power. Connect unswitched circuit to battery-inverter unit and switched circuit to fixture ballast.
 2. Test Push-Button and Indicator Light: Visible and accessible without opening fixture or entering ceiling space.
 - a. Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - b. Indicator Light: LED indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 3. Battery: Sealed, maintenance-free, nickel-cadmium or lithium phosphate type.
 4. Charger: Fully automatic, solid-state, constant-current type with sealed power transfer relay.
 5. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.
- G. External Type: Self-contained, modular, battery-inverter unit, suitable for powering one or more lamps, remote mounted from luminaire.
1. Emergency Connection: Operate LED lamp continuously. Connect unswitched circuit to battery-inverter unit and switched circuit to luminaire driver.
 2. Nightlight Connection: Operate lamp in a remote fixture continuously.
 3. Battery: Sealed, maintenance-free, nickel-cadmium or lithium phosphate type.
 4. Charger: Fully automatic, solid-state, constant-current type.
 5. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 6. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 7. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.

2.3 EMERGENCY LIGHTING

- A. General Requirements for Emergency Lighting Units: Self-contained units.
- B. Emergency Luminaires:
1. Emergency Luminaires: as indicated on Light Fixture Schedule, with the following additional features:
 - a. Internal or External emergency power unit as noted on fixture schedule.
 - b. Rated for installation in damp locations, and for sealed and gasketed fixtures in wet locations as required.
 2. Emergency Lighting Unit:
 1. Emergency Lighting Unit: as indicated on Light Fixture Schedule.
 2. Wall with universal junction box adaptor.
 3. UV stable thermoplastic housing.
 4. LED lamp heads.
 5. Internal emergency power unit.

2.4 EXIT SIGNS

- A. Internally Lighted Signs:
1. Lamps for AC Operation: LEDs; 50,000 hours minimum rated lamp life.
 2. Self-Powered Exit Signs (Battery Type): Internal emergency power unit.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1.
- B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.

3.2 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
1. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.
 2. Luminaire will be considered defective if it does not pass operation tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION 265213

SECTION 265619 - LED EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Exterior solid-state luminaires that are designed for and exclusively use LED lamp technology.
 2. Luminaire supports.
 3. Luminaire-mounted photoelectric relays.

1.2 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color rendering index.
- C. Lumen: Measured output of lamp and luminaire, or both.
- D. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of luminaire.
- B. Shop Drawings: For nonstandard or custom luminaires.
1. Include plans, elevations, sections, and mounting and attachment details.
 2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 3. Include diagrams for power, signal, and control wiring.
- C. Delegated-Design Submittal: For luminaire supports.
1. Include design calculations for luminaire supports and seismic restraints.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Plans, drawn to scale and coordinated.
- B. Seismic Qualification Data: For luminaires, accessories, and components, from manufacturer.
- C. Product Certificates: For each type of the following:
1. Luminaire.
 2. Photoelectric relay.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.
1. Provide a list of all lamp types used on Project. Use ANSI and manufacturers' codes.
 2. Provide a list of all photoelectric relay types used on Project. Use manufacturers' codes.

1.6 FIELD CONDITIONS

- A. Mark locations of exterior luminaires for approval by Architect prior to the start of luminaire installation.

1.7 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
1. Warranty Period: 2 year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2.2 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. NRTL Compliance: Luminaires shall be listed and labeled for indicated class and division of hazard by an NRTL.
- C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
- D. UL Compliance: Comply with UL 1598 and listed for wet location.
- E. Lamp base complying with ANSI C81.61 or IEC 60861-1.
- F. CRI of minimum 70. CCT as listed on the fixture schedule.
- G. L70 lamp life minimum of 50,000 hours.
- H. Lamps dimmable from 100 percent to 10 percent of maximum light output.

2.3 LUMINAIRE TYPES

- A. As noted on the fixture schedule.

2.4 MATERIALS

- A. Metal Parts: Free of burrs and sharp corners and edges.
- B. Sheet Metal Components: Stainless steel. Form and support to prevent warping and sagging.
- C. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses.
- D. Housings:
1. Rigidly formed, weather- and light-tight enclosure that will not warp, sag, or deform in use.
 2. Provide filter/breather for enclosed luminaires.

2.5 FINISHES

- A. Variations in Finishes: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

- B. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

- A. Comply with NECA 1.
- B. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.
- C. Install lamps in each luminaire if not provided with the luminaire.
- D. Fasten luminaire to structural support.
- E. Supports:
1. Sized and rated for luminaire weight.
 2. Able to maintain luminaire position after cleaning and relamping.
 3. Support luminaires without causing deflection of finished surface.
 4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.
- F. Wall-Mounted Luminaire Support:
1. Attached per manufacturers recommendations.
- G. Wiring Method: Install cables in raceways. Conceal raceways and cables.
- H. Install luminaires level, plumb, and square with finished grade unless otherwise indicated.
- I. Coordinate layout and installation of luminaires with other construction.
- J. Adjust luminaires that require field adjustment or aiming. Include adjustment of photoelectric device to prevent false operation of relay by artificial light sources, favoring a north orientation.

3.2 INSTALLATION OF INDIVIDUAL GROUND-MOUNTED LUMINAIRES

- A. Aim as indicated on Drawings.
- B. Install on concrete base with top 30 inches above finished grade or surface at luminaire location. Cast conduit into base, and finish by troweling and rubbing smooth.

3.3 CORROSION PREVENTION

- A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.
- B. Steel Conducts: Comply with Section 260533 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch (0.254-mm) thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.4 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

- A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.
- B. Perform the following tests and inspections:
1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
 2. Verify operation of photoelectric controls.
- C. Illumination Tests:
1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
- D. Luminaire will be considered defective if it does not pass tests and inspections.

3.6 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain luminaires and photocell relays.

END OF SECTION 265619

SECTION 271513 - COMMUNICATIONS COPPER HORIZONTAL CABLING

PART 1 - GENERAL

1.1 COPPER HORIZONTAL CABLING DESCRIPTION

- A. Horizontal cabling system shall provide interconnections between Distributor A, Distributor B, or Distributor C, and the equipment outlet, otherwise known as "Cabling Subsystem 1," in the telecommunications cabling system structure. Cabling system consists of horizontal cables, intermediate and main cross-connections, mechanical terminations, and patch cords or jumpers used for horizontal-to-horizontal cross-connection.
1. TIA-568-C.1 requires that a minimum of two equipment outlets be installed for each work area.
 2. Horizontal cabling shall contain no more than one transition point or consolidation point between the horizontal cross-connect and the telecommunications equipment outlet.
- C. Bridged taps and splices shall not be installed in the horizontal cabling.
- B. A work area is approximately 100 sq. ft. (9.3 sq. m), and includes the components that extend from the equipment outlets to the station equipment.
- C. The maximum allowable horizontal cable length is 295 feet. This maximum allowable length does not include an allowance for the length of 16 feet to the workstation equipment or in the horizontal cross-connect.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance data.
- B. Hardware and Firmware Operational Documentation:
1. Software operating and upgrade manuals.
 2. Program Software Backup: On USB media.
 3. Device address list.
 4. Printout of software application and graphic screens.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1.6 COORDINATION

- A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA-568-C.1, when tested according to test procedures of this standard.
- B. Telecommunications Pathways and Spaces: Comply with TIA-569-D.
- C. Grounding: Comply with TIA-607-B.

2.2 GENERAL CABLE CHARACTERISTICS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with the applicable standard and NFPA 70 for the following types:
1. Communications, Plenum Rated: Type CMP complying with UL 1685.
 2. Communications, Non-plenum: Type CMR complying with UL 1666.
- B. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency:
1. Flame-Spread Index: 25 or less.
 2. Smoke-Developed Index: 50 or less.
- C. RoHS compliant.

2.3 CATEGORY 6 TWISTED PAIR CABLE

- A. Description: Four-pair, balanced-twisted pair cable [with internal spine,] certified to meet transmission characteristics of Category 6 cable at frequencies up to 250MHz.

- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. 3M.
 2. AMP NETCONNECT; a TE Connectivity Ltd. company.
 3. Belden CDT Networking Division/NORDX.
 4. Ber-Tek Leviton; a Nexans/Leviton alliance.
 5. CommScope, Inc.
 6. Superior Essex Inc.
 7. SYSTIMAX Solutions; a CommScope Inc. brand.

- C. Standard: Comply with NEMA WC 66/ICEA S-116-732 and TIA-568-C.2 for Category 6 cables.

- D. Conductors: 100-ohm, 23 AWG solid copper.

- E. Shielding/Screening: Unshielded twisted pairs (UTP).

- F. Jacket: Blue thermoplastic.

2.4 TWISTED PAIR CABLE HARDWARE

- A. Description: Hardware designed to connect, splice, and terminate twisted pair copper communications cable.
- B. General Requirements for Twisted Pair Cable Hardware:
1. Comply with the performance requirements of Category 6.
 2. Comply with TIA-568-C.2, IDC type, with modules designed for punch-down caps or tools.
 3. Cables shall be terminated with connecting hardware of same category or higher.
- C. Source Limitations: Obtain twisted pair cable hardware from single source from single manufacturer.
- D. Connecting Blocks:
1. 110-style IDC for Category 6.
 2. Provide blocks for the number of cables terminated on the block, including plugs and jacks where indicated.
- E. Cross-Connect: Modular array of connecting blocks arranged to terminate building cables and permit interconnection between cables.
1. Number of Terminals per Field: One for each conductor in assigned cables.
- F. Patch Panel: Modular panels housing numbered jack units with IDC-type connectors at each jack location for permanent termination of pair groups of installed cables.
1. Features:
- a. Universal T568A and T568B wiring labels.
 - b. Labeling areas adjacent to conductors.
 - c. Replaceable connectors.
 - d. 24 or 48 ports.

2. Construction: 16-gauge steel and mountable on 19-inch (483 mm) equipment racks.
3. Number of Jacks per Field: One for each four-pair cable indicated.

G. Plugs and Plug Assemblies:

1. Male, eight position; color-coded modular telecommunications connector designed for termination of a single four-pair, 100-ohm, unshielded or shielded twisted pair cable.
2. Standard: Comply with TIA-568-C.2.

H. Jacks and Jack Assemblies:

1. Female, eight position; modular, fixed telecommunications connector designed for termination of a single four-pair, 100-ohm, unshielded or shielded twisted pair cable.
 2. Designed to snap-in to a patch panel or faceplate.
 3. Standard: Comply with TIA-568-C.2.
- I. Faceplate:
1. Six port, vertical single gage faceplates designed to mount to single gage wall boxes.
 2. Plastic Faceplate: High-impact plastic. Coordinate color with Section 262726 "Wiring Devices."
 3. Metal Faceplate: Stainless steel, complying with requirements in Section 262726 "Wiring Devices."
 4. For use with snap-in jacks accommodating any combination of twisted pair, optical fiber, and coaxial work area cords.
 - a. Flush mounting jacks, positioning the cord at a 45-degree angle.

J. Legend:

1. Machine printed, in the field, using adhesive-tape label.
2. Snap-in, clear-label covers and machine-printed paper inserts.

2.5 GROUNDING

- A. Comply with requirements in Section 270526 "Grounding and Bonding for Communications Systems" for grounding conductors and connectors.
- B. Comply with TIA-607-B.

PART 3 - EXECUTION

3.1 INSTALLATION OF TWISTED-PAIR HORIZONTAL CABLES

- A. Comply with NECA 1 and NECA/BICSI 568.
- B. Wiring Method: Install cables in raceways and cable trays, except within consoles, cabinets, desks, and counters. Conceal raceway and cables, except in unfinished spaces.
1. Install plenum cable in environmental air spaces, including plenum ceilings.
- C. Wiring within Enclosures: Bundle, lace, and train cables within enclosures. Connect to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools. Install conductors parallel with or at right angles to sides and back of enclosure.
- D. General Requirements for Cabling:
1. Comply with TIA-568-C.1.
 2. Comply with BICSI's Information Transport Systems Installation Methods Manual, Ch. 5, "Copper Structured Cabling Systems," "Cable Termination Practices" Section.
 3. Install 110-style IDC termination hardware unless otherwise indicated.
 4. Do not untwist twisted pair cables more than 1/2 inch from the point of termination to maintain cable geometry.
 5. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connections, and patch panels.
 6. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 7. Install lacing bars to restrain cables, prevent straining connections, and prevent bending cables to smaller radii than minimums recommended by manufacturer.
 8. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI Information Transport Systems Installation Methods Manual, Ch. 5, "Copper Structured Cabling Systems," "Cable Termination Practices" Section. Use lacing bars and distribution spools.
 9. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation, and replace it with new cable.
 10. Pulling Cable: Comply with BICSI Information Transport Systems Installation Methods Manual, Ch. 5, "Copper Structured Cabling Systems," "Pulling and Installing Cable" Section. Monitor cable pull tensions.

- E. Group connecting hardware for cables into separate logical fields.
- F. Separation from EMI Sources:

1. Comply with recommendations from BICSI's "Telecommunications Distribution Methods Manual" and TIA-569-D for separating unshielded copper communication cable from potential EMI sources, including electrical power lines and equipment.

3.2 FIRESTOPPING

- A. Comply with requirements in Section 078413 "Penetration Firestopping."
- B. Comply with TIA-607-B and NECA/BICSI-607.
- C. Comply with "Firestopping Systems" Article in BICSI's "Telecommunications Distribution Methods Manual."