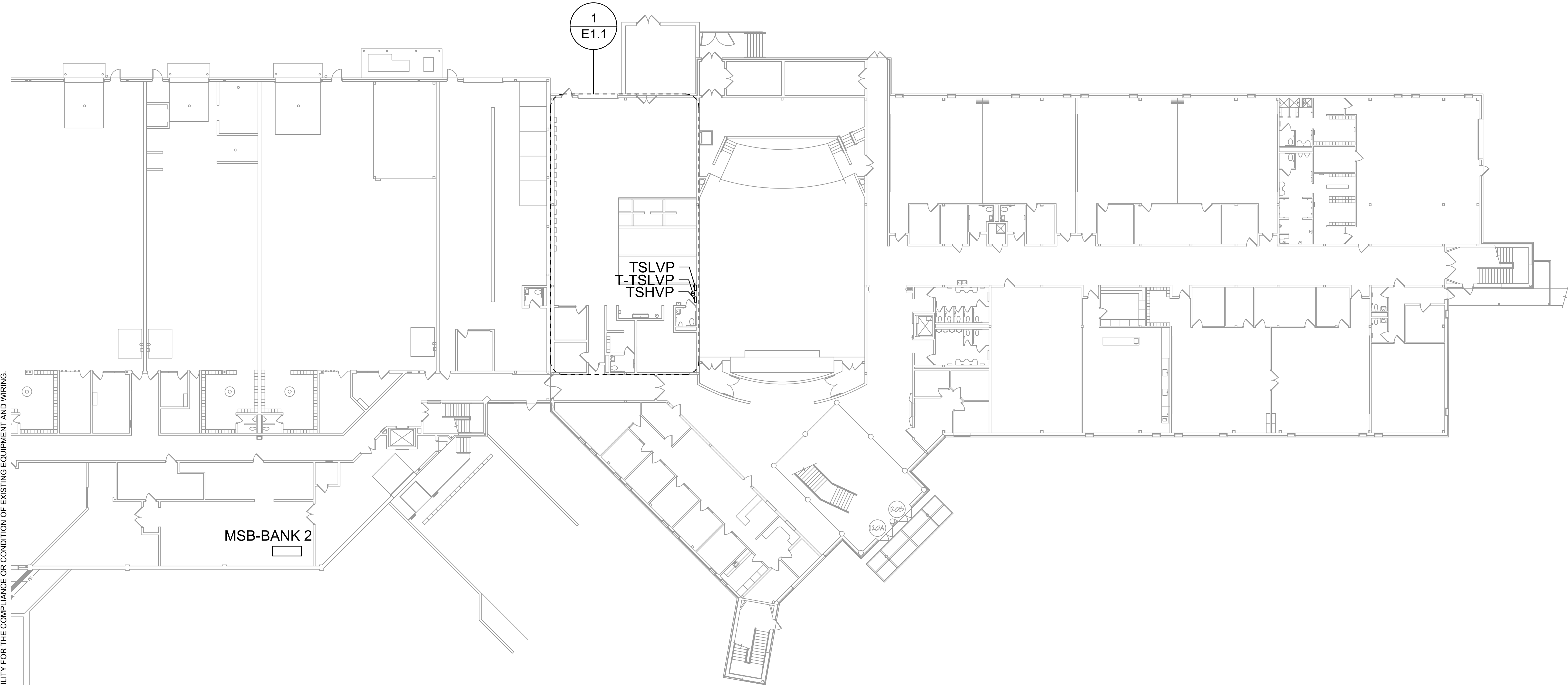


C:\Users\rtm\OneDrive\RTM\Engineering\Consultants\LLC\Baker Tech DBL ELEC Job 2023\Project Files\RTM 10 DRAWINGS OF AUTOCAD\021-E1.0-ELECTRICAL-FLOOR-PLAN.dwg - RTM - Plot Time: Mar 19, 2023 - 1:50pm - By: msk-mcflms
 THESE DRAWINGS AND ANY INFORMATION CONTAINED HEREIN ARE THE PROPERTY OF RTM ENGINEERING CONSULTANTS, LLC. NO PART OF THESE DRAWINGS ARE TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF RTM ENGINEERING CONSULTANTS, LLC. RTM ACCEPTS NO RESPONSIBILITY OR LIABILITY FOR THE COMPLIANCE OR CONDITION OF EXISTING EQUIPMENT AND WIRING.



1
E1.0 ELECTRICAL FLOOR PLAN
 SCALE: 1/16" = 1'-0"

DRAWING INDEX	
E1.0	ELECTRICAL FLOOR PLAN
E1.1	ELECTRICAL ENLARGED FLOOR PLAN
E3.0	ELECTRICAL DETAILS
E3.1	ELECTRICAL PANEL SCHEDULES
E4.0	ELECTRICAL SPECIFICATIONS AND LEGEND



SCOPE OF WORK

PROJECT CONSISTS OF THE INSTALLATION OF A TRAINING ROOM FOR ELECTRICAL ENGINEERING STUDENTS. SCOPE TO INCLUDE NEW RECEPTACLES FOR POWERING WORK AREAS AND ELECTRICAL DISTRIBUTION EQUIPMENT CONNECTED TO EXISTING SWITCHBOARDS. SEE SINGLE LINE AND NOTES FOR MORE INFORMATION.

GENERAL NOTES - OVERALL PROJECT

A. RTM DRAWINGS INDICATE DESIGN INTENT AND REQUIRED OUTCOMES. IF CONDITIONS ARISE IN THE FIELD THAT REQUIRE DEVIATIONS FROM THE DRAWINGS IT IS ASSUMED THAT THE CONTRACTOR WILL DETERMINE THE APPROPRIATE DEVIATION WITH APPROVAL FROM THE OWNER. RTM IS AVAILABLE TO ASSIST WHEN REQUIRED IF ISSUES ARISE.

GENERAL NOTES - POWER

- A. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CONDUIT/CABLE ROUTING. COORDINATE ROUTING WITH ALL OTHER TRADES AND BUILDING CONDITIONS.
- B. SEE SINGLE LINE DIAGRAM FOR FEEDER WIRE AND CONDUIT SIZE. ALL CIRCUITS NOT SIZED ON DRAWING SHALL BE INSTALLED TO MEET MINIMUM SIZE REQUIRED BY NEC.
- C. PROVIDE MOTOR STARTERS FOR EQUIPMENT AS INDICATED ON DRAWINGS. COORDINATE ANY INTERLOCKING WIRING WITH HVAC CONTRACTOR AND PROVIDE WIRING, COILS, AND AUXILIARY CONTACTS AS NECESSARY. SIZE ALL CIRCUITS FOR ACTUAL EQUIPMENT TO BE CONNECTED.
- D. ALL PANELS AND DISCONNECTS LOCATED OUTDOORS SHALL BE LABELED NEMA 3R.
- E. ROOF MOUNTED AND OUTDOOR EQUIPMENT SHALL HAVE 120V RECEPTACLE MOUNTED WITH 2X OF EACH PIECE. RECEPTACLES SHALL BE IN WEATHER PROOF BOX AND HAVE GFCI PROTECTION.
- F. FOR ITEMS FURNISHED BY OTHER TRADES, ELECTRICAL CONTRACTOR TO FULLY COORDINATE BREAKER AND WIRE SIZES WITH ACTUAL EQUIPMENT BEING CONNECTED PRIOR TO ROUGH-IN, OR INSTALLATION. THE SIZES ON PANEL SCHEDULES REFER TO BASIS OF DESIGN SELECTIONS, AND ACTUAL ITEMS MAY DEVIATE FROM BASIS OF DESIGN. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO CONFIRM REQUIRED WIRE AND BREAKER SIZES WITH THE CONTRACTOR FURNISHING THE EQUIPMENT.
- G. REFER TO ARCHITECT'S PLANS AND ELEVATIONS FOR ALL DEVICE MOUNTING HEIGHTS.
- H. CONTRACTOR TO PROVIDE GROUNDING AND BONDING AS REQUIRED FOR ELECTRICAL SYSTEMS. GROUNDING AND BONDING IS CONSIDERED MEANS AND METHOD OF CONSTRUCTION AND SHOULD BE COMPLETED BY THE ELECTRICAL CONTRACTOR IN ACCORDANCE WITH NEC 250.
- I. GFCI DEVICES MUST BE INSTALLED IN ACCESSIBLE LOCATIONS AND NOT PLACED BEHIND EQUIPMENT.

McGill Smith Punshon, Inc.
 3700 Park 42 Drive Suite 190B
 Cincinnati, Ohio 45241-2097
 Tel. 513-759-0004 • Fax 513-563-7099
Engineers • Architects • Surveyors
Planners • Landscape Architects

Drawn By **WMM** Project Mgr. **PRS**

CAD File
X-Ref File

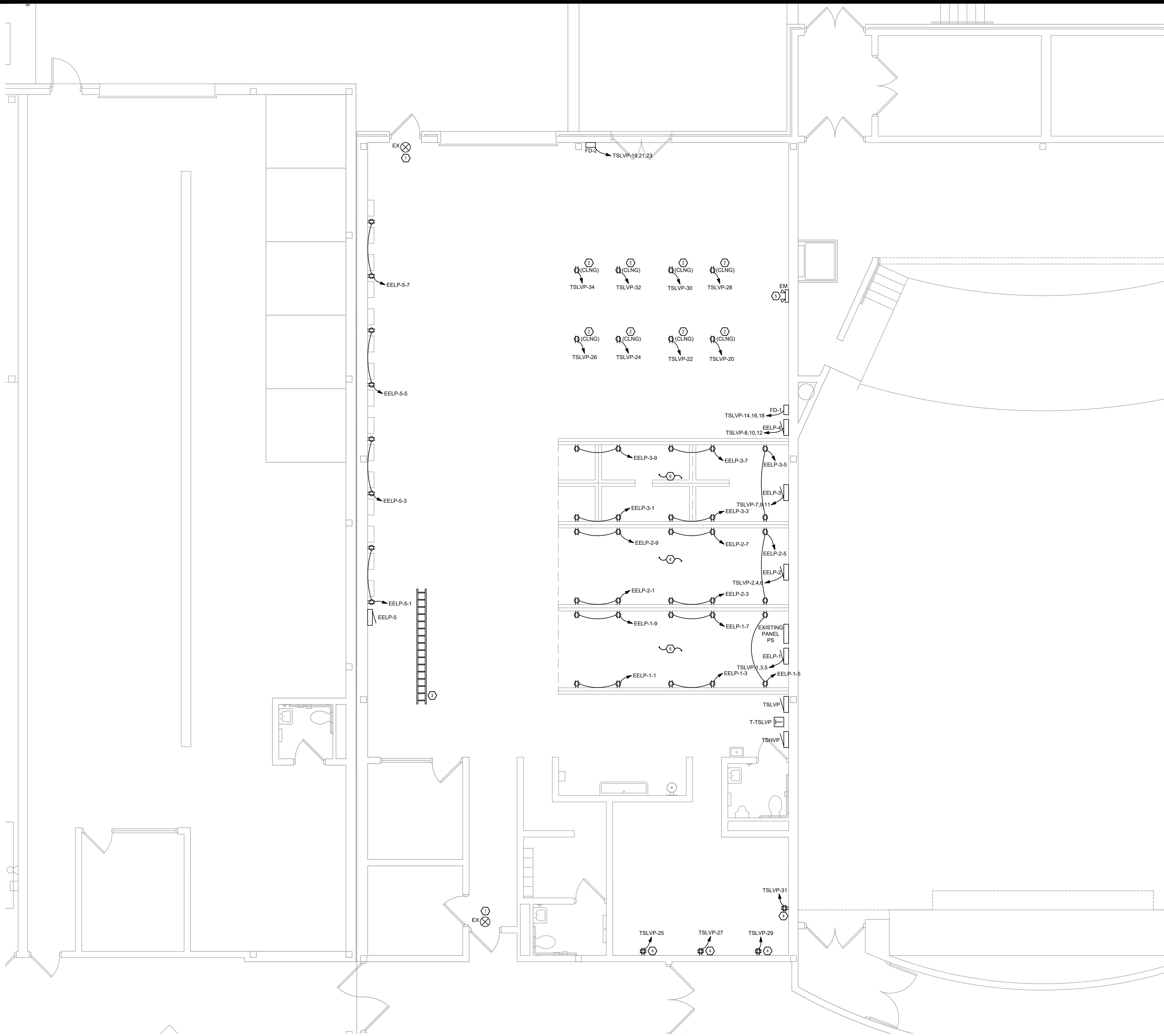
Issue/Revision	Revision Number	Date
FOR BID		03/19/2026

© COPYRIGHT 2005, MCGILL SMITH PUNSHON, INC.

RENOVATIONS AND ADDITION TO
**BUTLER TECH AND CAREER
 DEVELOPMENT SCHOOLS**
 3603 HAMILTON-MIDDLETOWN ROAD
 HAMILTON, OHIO 45011

Sheet Title	ELECTRICAL FLOOR PLAN
Project No.	26.EB0416.1021
Scale	AS NOTED
Sheet No.	E1.0
File No.	

C:\Users\rtm\OneDrive\RTM\Engineering\Consultants\LLC\Baker\Tech\DR\Elect\Lab\2023\Project\Plan\RTM\10\26.EB0416.1021\07\AUTOCAD\WEE-ART.dwg - Model - Rtd - Date/Time: Mar 19, 2025 - 12:24pm - By: mls-mem
 THESE DRAWINGS AND SPECIFICATIONS ARE NOT TO BE USED FOR CONSTRUCTION OR FOR ANY OTHER PURPOSE WITHOUT THE WRITTEN PERMISSION OF RTM ENGINEERING CONSULTANTS, LLC. RTM ENGINEERING CONSULTANTS, LLC ACCEPTS NO RESPONSIBILITY OR LIABILITY FOR THE COMPLIANCE OR CONDITION OF EXISTING EQUIPMENT AND WIRING.



1 ELECTRICAL ENLARGED FLOOR PLAN
 E1.1 SCALE: 1/4" = 1'-0"

SCOPE OF WORK

PROJECT CONSISTS OF THE INSTALLATION OF A TRAINING ROOM FOR ELECTRICAL ENGINEERING STUDENTS. SCOPE TO INCLUDE NEW RECEPTACLES FOR POWERING WORK AREAS AND ELECTRICAL DISTRIBUTION EQUIPMENT CONNECTED TO EXISTING SWITCHBOARDS. SEE SINGLE LINE AND NOTES FOR MORE INFORMATION.

GENERAL NOTES - OVERALL PROJECT

A. RTM DRAWINGS INDICATE DESIGN INTENT AND REQUIRED OUTCOMES. IF CONDITIONS ARISE IN THE FIELD THAT REQUIRE DEVIATIONS FROM THE DRAWINGS IT IS ASSUMED THAT THE CONTRACTOR WILL DETERMINE THE APPROPRIATE DEVIATION WITH APPROVAL FROM THE OWNER. RTM IS AVAILABLE TO ASSIST WHEN REQUIRED IF ISSUES ARISE.

GENERAL NOTES - POWER

- A. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CONDUIT/CABLE ROUTING. COORDINATE ROUTING WITH ALL OTHER TRADES AND BUILDING CONDITIONS.
- B. SEE SINGLE LINE DIAGRAM FOR FEEDER WIRE AND CONDUIT SIZE. ALL CIRCUITS NOT SIZED ON DRAWING SHALL BE INSTALLED TO MEET MINIMUM SIZE REQUIRED BY NEC.
- C. PROVIDE MOTOR STARTERS FOR EQUIPMENT AS INDICATED ON DRAWINGS. COORDINATE ANY INTERLOCKING WIRING WITH HVAC CONTRACTOR AND PROVIDE WIRING, COILS, AND AUXILIARY CONTACTS AS NECESSARY. SIZE ALL CIRCUITS FOR ACTUAL EQUIPMENT TO BE CONNECTED.
- D. ALL PANELS AND DISCONNECTS LOCATED OUTDOORS SHALL BE LABELED NEMA 3R.
- E. ROOF MOUNTED AND OUTDOOR EQUIPMENT SHALL HAVE 120V RECEPTACLE MOUNTED WITHIN 2' OF EACH PIECE. RECEPTACLES SHALL BE IN WEATHER PROOF BOX AND HAVE GFCI PROTECTION.
- F. FOR ITEMS FURNISHED BY OTHER TRADES, ELECTRICAL CONTRACTOR TO FULLY COORDINATE BREAKER AND WIRE SIZES WITH ACTUAL EQUIPMENT BEING CONNECTED PRIOR TO ROUGH-IN, OR INSTALLATION. THE SIZES ON PANEL SCHEDULES REFER TO BASIS OF DESIGN SELECTIONS, AND ACTUAL ITEMS MAY DEVIATE FROM BASIS OF DESIGN. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO CONFIRM REQUIRED WIRE AND BREAKER SIZES WITH THE CONTRACTOR FURNISHING THE EQUIPMENT.
- G. REFER TO ARCHITECT'S PLANS AND ELEVATIONS FOR ALL DEVICE MOUNTING HEIGHTS.
- H. CONTRACTOR TO PROVIDE GROUNDING AND BONDING AS REQUIRED FOR ELECTRICAL SYSTEMS. GROUNDING AND BONDING IS CONSIDERED MEANS AND METHOD OF CONSTRUCTION AND SHOULD BE COMPLETED BY THE ELECTRICAL CONTRACTOR IN ACCORDANCE WITH NEC 250.
- I. GFCI DEVICES MUST BE INSTALLED IN ACCESSIBLE LOCATIONS AND NOT PLACED BEHIND EQUIPMENT.

KEYED SHEET NOTES

- 1. REPLACE EXISTING EXIT SIGN WITH NEW LIKE KIND. NO LOAD WILL BE ADDED.
- 2. INSTALL RECEPTACLES IN THE CEILING FOR OWNER SUPPLIED AND INSTALLED CORD REELS. COORDINATE LOCATION WITH OWNER PRIOR TO INSTALL.
- 3. SUPPLY AND INSTALL 12" OF CABLE TRAY. COORDINATE LOCATION WITH OWNER PRIOR TO INSTALL. SEE DETAIL 2 ON SHEET E2.0 FOR CABLE TRAY INFORMATION.
- 4. FIELD VERIFY LOCATION OF QUAD. COORDINATE LOCATION WITH OWNER PRIOR TO INSTALL.
- 5. REPLACE EXISTING EMERGENCY LIGHT WITH NEW LIKE KIND. NO LOAD WILL BE ADDED.
- 6. PROVIDE RED RECEPTACLES FOR THESE DEVICES INDICATING THEY WILL BE CONSTANTLY LIVE. SEE DETAIL 1 ON SHEET E2.0 FOR ELEVATION VIEW AND MORE INFORMATION.

McGill Smith Punshon, Inc.
 3700 Park 42 Drive Suite 190B
 Cincinnati, Ohio 45241-2097
 Tel. 513-759-0004 • Fax 513-563-7099
Engineers • Architects • Surveyors
Planners • Landscape Architects

Drawn By **WMM** Project Mgr. **PRS**

CAD File
X-Ref File

Issue/Revision	Revision Number	Date
FOR BID		03/19/2026

© COPYRIGHT 2005, MCGILL SMITH PUNSHON, INC.

RENOVATIONS AND ADDITION TO
**BUTLER TECH AND CAREER
 DEVELOPMENT SCHOOLS**
 3603 HAMILTON-MIDDLETOWN ROAD
 HAMILTON, OHIO 45011

Sheet Title	ELECTRICAL ENLARGED FLOOR PLAN
Project No.	26.EB0416.1021
Scale	AS NOTED
Sheet No.	E1.1
File No.	

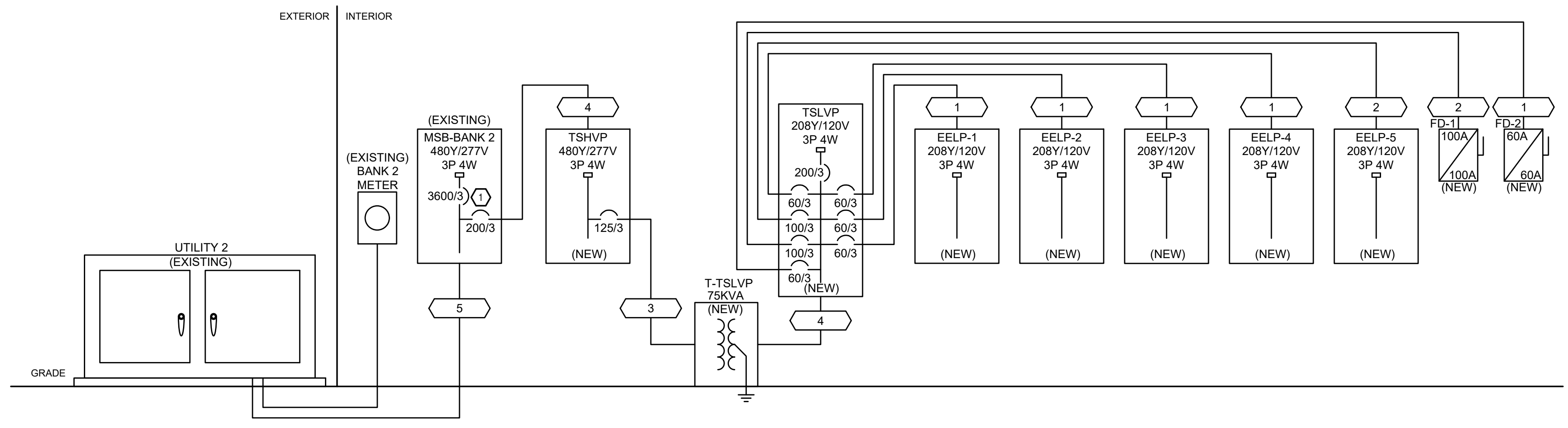
515 Monmouth Street, Suite 201
 Newport, KY 41071 (859) 261-0580

C:\Users\rtm\OneDrive\RTM\Engineering\Consultants\LLC\Baker_Beth_DBE_Elect_Lab_2023\Project_Plan\0101-01-0-ELECTRICAL-SINGLE-LINE.dwg - RTM - Plot Date/Time: Mar 19, 2024 - 12:10pm - By: mls@rtm.com
 THESE DRAWINGS AND ANY INFORMATION CONTAINED HEREIN ARE THE PROPERTY OF RTM ENGINEERING CONSULTANTS, LLC. NO PART OF THESE DRAWINGS OR ANY INFORMATION CONTAINED HEREIN IS TO BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT THE WRITTEN PERMISSION OF RTM ENGINEERING CONSULTANTS, LLC. RTM ACCEPTS NO RESPONSIBILITY OR LIABILITY FOR THE COMPLIANCE OR CONDITION OF EXISTING EQUIPMENT AND WIRING.

MSB-BANK 2									
ROOM		VOLTS 480Y/277V 3P 4W		AIC T.B.D.					
MOUNTING FLOOR		BUS AMPS 4000		MAIN BKR 3600					
FED FROM UTILITY 2		NEUTRAL 100%		LUGS STANDARD					
NOTE * = LOAD CALCULATED IN METERED DEMAND									
CKT #	BREAKER TRIP/POLES	CIRCUIT DESCRIPTION	LOAD KVA			FEEDER RACEWAY AND CONDUCTORS			
			A	B	C				
1	200/3	* = EXISTING LOAD	0	0	0	-			
2	200/3	* = EXISTING LOAD	0	0	0	-			
3	200/3	* = EXISTING LOAD	0	0	0	-			
4	200/3	* = EXISTING LOAD	0	0	0	-			
5	200/3	PANEL TSHVP	21.4	22.1	21	2-1/2" C, 3#250kcmil AL, #250kcmil AL N, #4 AL G			
6	100/3	* = EXISTING LOAD	0	0	0	-			
7	100/3	* = EXISTING LOAD	0	0	0	-			
8	100/3	* = EXISTING LOAD	0	0	0	-			
9	600/3	* = EXISTING LOAD	0	0	0	-			
10	-/3	INCOMING SECONDARY	0	0	0	-			
11	-/3	INCOMING SECONDARY	0	0	0	-			
12	2500/3	SWITCHBOARD PDT	352	352	352	(8)4" C, 3#600kcmil AL, #600kcmil AL N, #600kcmil AL G			
13	-/3	* = EXISTING LOAD	0	0	0	-			
14	-/3	* = EXISTING LOAD	0	0	0	-			
15	-/3	* = EXISTING LOAD	0	0	0	-			
16	-/3	* = EXISTING LOAD	0	0	0	-			
17	-/3	* = EXISTING LOAD	0	0	0	-			
18	-/3	SPARE	0	0	0	-			
19	-/3	* = EXISTING LOAD	0	0	0	-			
20	-/3	* = EXISTING LOAD	0	0	0	-			
21	-/3	* = EXISTING LOAD	0	0	0	-			
22	-/3	SPARE	0	0	0	-			
23	200/3	* = EXISTING LOAD	0	0	0	-			
24	200/3	* = EXISTING LOAD	0	0	0	-			
TOTAL CONNECTED KVA BY PHASE			518	519	518				
RECEPTACLES			11.2	10.6	10.6	(50%>10)			
NONCONTINUOUS			1,100	1,100	1,100	(100%)			
FUTURE DEMAND			7.21	7.21	7.21	(125%)			
METERED DEMAND			435	543	543	(125%)			
TOTAL LOAD					1,660				
BALANCED 3-PHASE LOAD					2,000 A				

TSHVP											
ROOM		VOLTS 480Y/277V 3P 4W		AIC T.B.D.							
MOUNTING SURFACE		BUS AMPS 200		MAIN BKR MLO							
FED FROM MSB-BANK 2		NEUTRAL 100%		LUGS STANDARD							
NOTE											
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION
3	20/1	0	SPACE	b 4	20/1	0	SPACE				
5	20/1	0	SPACE	c 6	20/1	0	SPACE				
7	20/1	0	SPACE	d 8	20/1	0	SPACE				
9	20/1	0	SPACE	e 10	20/1	0	SPACE				
11	20/1	0	SPACE	f 12	20/1	0	SPACE				
13	20/1	0	SPACE	g 14	20/1	0	SPACE				
15	20/1	0	SPACE	h 16	20/1	0	SPACE				
17	20/1	0	SPACE	i 18	20/1	0	SPACE				
19	20/1	0	SPACE	j 20	20/1	0	SPACE				
21	20/1	0	SPACE	k 22	20/1	0	SPACE				
23	20/1	0	SPACE	l 24	20/1	0	SPACE				
25	20/1	0	SPACE	m 26	20/1	0	SPACE				
27	20/1	0	SPACE	n 28	20/1	0	SPACE				
29	20/1	0	SPACE	o 30	20/1	0	SPACE				
31	20/1	0	SPACE	p 32	20/1	0	SPACE				
33	20/1	0	SPACE	q 34	20/1	0	SPACE				
35	20/1	0	SPACE	r 36	20/1	0	SPACE				
37	20/1	0	SPACE	s 38	125/3	64.5	XFMR T-TSLVP				
39	20/1	0	SPACE	t 40	0	0					
41	20/1	0	SPACE	u 42	0	0					
RECEPTACLES			11.2	10.6	10.6	(50%>10)	NONCONTINUOUS	46.1	46.1	(100%)	
FUTURE DEMAND					7.21	7.21					
TOTAL LOAD						63.9					
BALANCED 3-PHASE LOAD						76.9 A					
PHASE A						99.5%					
PHASE B						103%					
PHASE C						97.8%					

TSLVP											
ROOM		VOLTS 208Y/120V 3P 4W		AIC T.B.D.							
MOUNTING SURFACE		BUS AMPS 225		MAIN BKR MLO							
FED FROM T-TSLVP		NEUTRAL 100%		LUGS STANDARD							
NOTE											
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION
3	60/3	1.8	PANEL EELP-3	b 4	60/3	0	PANEL EELP-4				
5	60/3	1.8	PANEL EELP-3	c 6	60/3	0	PANEL EELP-4				
7	60/3	1.8	PANEL EELP-3	d 8	60/3	0	PANEL EELP-4				
9	60/3	1.8	PANEL EELP-3	e 10	60/3	0	PANEL EELP-4				
11	60/3	1.8	PANEL EELP-3	f 12	60/3	0	PANEL EELP-4				
13	100/3	1.44	PANEL EELP-5	g 14	100/3	28.8	BREAKER FD-1				
15	100/3	1.44	PANEL EELP-5	h 16	100/3	28.8	BREAKER FD-1				
17	100/3	1.44	PANEL EELP-5	i 18	100/3	28.8	BREAKER FD-1				
19	60/3	17.3	BREAKER FD-2	j 20	20/1	0.36	RECEPTACLE				
21	60/3	17.3	BREAKER FD-2	k 22	20/1	0.36	RECEPTACLE				
23	60/3	17.3	BREAKER FD-2	l 24	20/1	0.36	RECEPTACLE				
25	20/1	0.36	RECEPTACLE	m 26	20/1	0.36	RECEPTACLE				
27	20/1	0.36	RECEPTACLE	n 28	20/1	0.36	RECEPTACLE				
29	20/1	0.36	RECEPTACLE	o 30	20/1	0.36	RECEPTACLE				
31	20/1	0.36	RECEPTACLE	p 32	20/1	0.36	RECEPTACLE				
33	20/1	0	SPACE	q 34	20/1	0.36	RECEPTACLE				
35	20/1	0	SPACE	r 36	20/1	0	SPACE				
37	20/1	0	SPACE	s 38	20/1	0	SPACE				
39	20/1	0	SPACE	t 40	20/1	0	SPACE				
41	20/1	0	SPACE	u 42	20/1	0	SPACE				
RECEPTACLES			11.2	10.6	10.6	(50%>10)	NONCONTINUOUS	46.1	46.1	(100%)	
FUTURE DEMAND					7.21	7.21					
TOTAL LOAD						63.9					
BALANCED 3-PHASE LOAD						177 A					
PHASE A						104%					
PHASE B						101%					
PHASE C						94.4%					



ID	CONDUIT AND FEEDER
1	1" 3#6 CU #6 CU N, #10 CU G
2	1-1/4" 3#1 AL, #1 AL N, #6 AL G
3	1-1/2" 3#20 AL, #4 AL G
4	2-1/2" 3#250kcmil AL, #250kcmil AL N, #4 AL G
5	(12)4" 3#500kcmil AL, #500kcmil AL N

SIZING METHOD: COMPACT AL 75°C 100A AND ABOVE, CU 75°C BELOW 100A

SCOPE OF WORK
 PROJECT CONSISTS OF THE INSTALLATION OF A TRAINING ROOM FOR ELECTRICAL ENGINEERING STUDENTS. SCOPE TO INCLUDE NEW RECEPTACLES FOR POWERING WORK AREAS AND ELECTRICAL DISTRIBUTION EQUIPMENT CONNECTED TO EXISTING SWITCHBOARDS. SEE SINGLE LINE AND NOTES FOR MORE INFORMATION.

GENERAL NOTES - OVERALL PROJECT

- RTM DRAWINGS INDICATE DESIGN INTENT AND REQUIRED OUTCOMES. IF CONDITIONS ARISE IN THE FIELD THAT REQUIRE DEVIATIONS FROM THE DRAWINGS IT IS ASSUMED THAT THE CONTRACTOR WILL DETERMINE THE APPROPRIATE DEVIATION WITH APPROVAL FROM THE OWNER. RTM IS AVAILABLE TO ASSIST WHEN REQUIRED IF ISSUES ARISE.

GENERAL NOTES-SINGLE LINE DIAGRAM

- ALL BREAKERS SHALL BE RATED TO WITHSTAND THE AVAILABLE FAULT CURRENT AT THEIR LOCATION. WHERE SERIES-RATED COMBINATIONS ARE USED IN ACCORDANCE WITH NEC 240.86 AND (D) THE CONTRACTOR AND/OR HIS EQUIPMENT SUPPLIER MUST PROVIDE APPROPRIATE DOCUMENTATION AND LABELING.
- WHERE BREAKERS WITH ADJUSTABLE SETTINGS ARE FURNISHED TO THE PROJECT, THE MANUFACTURER'S REP SHALL IDENTIFY AND PROVIDE THE APPROPRIATE SETTINGS TO THE ELECTRICAL CONTRACTOR FOR HIS USE IN INSTALLATION.
- PANEL SCHEDULES INDICATE BREAKER SIZE ONLY. PROVIDE AFCI/GFCI PROTECTION AS REQUIRED BY NEC. COORDINATE FINAL BREAKER SIZES/TYPES FOR ITEMS FURNISHED BY OTHERS WITH SHOP DRAWINGS OR PRODUCT INFORMATION FOR ACTUAL EQUIPMENT BEING CONNECTED.
- ELECTRICAL CONTRACTOR SHALL NOT ORDER OR PURCHASE ANY MATERIALS OR EQUIPMENT UNTIL PERMIT DRAWINGS HAVE BEEN APPROVED BY AHJ.
- PROVIDE SELECTIVE COORDINATION FOR EMERGENCY SYSTEM OVERCURRENT PROTECTION DEVICES IN ACCORDANCE WITH NEC 700.27.
- PROVIDE GROUND-FAULT PROTECTION FOR EQUIPMENT IN ACCORDANCE WITH NEC 240.13 AND NEC 230.95.
- OVERCURRENT PROTECTION DEVICES SUPPLYING TRANSFORMERS WHICH ARE NOT LOCATED WITHIN SIGHT OF THEIR OVERCURRENT PROTECTION SHALL BE LOCKABLE AND THE TRANSFORMER SHALL BE FIELD MARKED WITH THE LOCATION OF THE OVERCURRENT PROTECTION DEVICE.
- CONTRACTOR TO PROVIDE GROUNDING AND BONDING AS REQUIRED FOR ELECTRICAL SYSTEMS. GROUNDING AND BONDING IS CONSIDERED MEANS AND METHODS OF CONSTRUCTION, AND SHOULD BE COMPLETED BY THE ELECTRICAL CONTRACTOR IN ACCORDANCE WITH NEC 250.

KEYED SHEET NOTES

- INSTALL NEW OVERCURRENT PROTECTIVE DEVICE (SWITCH) AS SHOWN, IF NOT AVAILABLE, IN EXISTING SPARE SPACE IN EXISTING SWITCHBOARD, IF A SUITABLE OVERCURRENT PROTECTIVE DEVICE (SWITCH) IS AVAILABLE IN EXISTING SWITCHBOARD THIS MAY BE USED, VERIFY TYPE AND SIZE REQUIRED PRIOR TO ORDERING.

McGill Smith Punshon, Inc.
 3700 Park 42 Drive Suite 190B
 Cincinnati, Ohio 45241-2097
 Tel. 513-759-0004 • Fax 513-563-7099

Engineers • Architects • Surveyors
 Planners • Landscape Architects

Drawn By **WMM** Project Mgr. **PRS**

CAD File
 X-Ref File

Issue/Revision	Revision Number	Date
FOR BID		03/19/2026

© COPYRIGHT 2005, MCGILL SMITH PUNSHON, INC.

RENOVATIONS AND ADDITION TO
BUTLER TECH AND CAREER DEVELOPMENT SCHOOLS
 3603 HAMILTON-MIDDLETOWN ROAD
 HAMILTON, OHIO 45011

Sheet Title
ELECTRICAL SINGLE LINE DIAGRAM

Project No. **26.EB0416.1021**

Scale **AS NOTED**

Sheet No. **E3.0**

File No.

515 Monmouth Street, Suite 201
 Newport, KY 41071 (859) 261-0580

C:\Users\rtm\Documents\RTM\Engineering\Consultants\LLC\Baker\Tech\DR\Elect\Lab\2023\Project\Tech\RTM\10\REVIEWS\07_AUGUST\01-E4.0-ELECTRICAL-SPECIFICATIONS.dwg - RTM - Proj. Only - 12/11/2023 - 12:11pm - By: rtm - m.e.r. - m.f.s.
 THESE SPECIFICATIONS HAVE BEEN PREPARED TO DEMONSTRATE COMPLIANCE WITH APPLICABLE CODES AND ARE INTENDED TO PROVIDE THE AUTHORITIES HAVING JURISDICTION WITH INFORMATION TO DETERMINE CODE COMPLIANCE. THE INSTALLING CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE ACCURACY OF THE INFORMATION PROVIDED AND FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS. THE CONSULTANT ASSUMES NO LIABILITY FOR THE COMPLIANCE OR CONDITION OF EXISTING EQUIPMENT AND WIRING.



McGill Smith Punshon, Inc.
 3700 Park 42 Drive Suite 190B
 Cincinnati, Ohio 45241-2097

Tel. 513-759-0004 • Fax 513-563-7099

Engineers • Architects • Surveyors
 Planners • Landscape Architects

Drawn By **WMM** Project Mgr. **PRS**

CAD File
 X-Ref File

Issue/Revision	Revision Number	Date
FOR BID		03/19/2026

© COPYRIGHT 2005, MCGILL SMITH PUNSHON, INC.

**RENOVATIONS AND ADDITION TO
 BUTLER TECH AND CAREER
 DEVELOPMENT SCHOOLS**
 3603 HAMILTON-MIDDLETOWN ROAD
 HAMILTON, OHIO 45011

ELECTRICAL LEGEND

*SEE LIGHT FIXTURE SCHEDULE FOR FIXTURE TYPES.

<p> \$ SINGLE POLE LIGHT SWITCH \$₃ THREE WAY LIGHT SWITCH \$₄ FOUR WAY LIGHT SWITCH \$_D DIMMER SWITCH \$_{FS} FAN SPEED CONTROL ⊙DT OCC SENSOR - CEILING - DUAL TECHNOLOGY ⊙PFR OCC SENSOR - CEILING - PASSIVE INFRARED ⊙DT OCC SENSOR - WALL - DUAL TECHNOLOGY ⊙PFR OCC SENSOR - WALL - PASSIVE INFRARED ⊙ OCC SENSOR POWER PACK ⊙ OCC SENSOR POWER PACK - 2 CKT ⊙ DUPLEX RECEPTACLE ⊙ DUPLEX RECEPTACLE W/USB JACKS ⊙ COUNTER HEIGHT DUPLEX RECEPTACLE ⊙ QUAD RECEPTACLE ⊙ COUNTER HEIGHT QUAD RECEPTACLE (CLNG) CEILING (SHOW WINDOW) RECEPTACLE GFCI DUPLEX RECEPTACLE WITH GFCI PROTECTION GFCI COUNTER HEIGHT DUPLEX RECEPTACLE WITH GFCI PROTECTION ⊙ SPLIT-WIRED (SWITCHED) RECEPTACLE W/P WEATHER PROOF RECEPTACLE WITH GFCI PROTECTION DW, GFCI DISHWASHER RECEPTACLE WITH GFCI PROTECTION DISP GARBAGE DISPOSAL MV MICROWAVE RECEPTACLE FRIG REFRIGERATOR RECEPTACLE RANGE RANGE - 208-240V/1-PHASE 50 AMP RECEPTACLE WASH GFCI WASHER RECEPTACLE WITH GFCI PROTECTION DRYER DRYER - 208-240V/1-PHASE 30 AMP RECEPTACLE W/B STACKED WASHER/DRYER - 208-240V/1-PHASE 30 AMP RECEPTACLE ⊙ DUPLEX - MONUMENT FLOOR BOX ⊙ DUPLEX - RECESSED FLOOR BOX ⊙ PANELBOARD W/ BUS (MCB OR MLO) - SINGLE LINE DIAGRAM ⊙ TRANSFORMER - SINGLE LINE DIAGRAM ⊙ TRANSFORMER W/ GROUND - SINGLE LINE DIAGRAM ⊙ PADMOUNT TRANSFORMER - SINGLE LINE DIAGRAM ⊙ AUTOMATIC TRANSFER SWITCH (ATS) - SINGLE LINE DIAGRAM ⊙ STANDBY/EMERGENCY GENERATOR - SINGLE LINE DIAGRAM ⊙ * METER BASE - SINGLE LINE DIAGRAM ⊙ FUSED DISCONNECT - SINGLE LINE DIAGRAM ⊙ * CT CABINET - SINGLE LINE DIAGRAM </p>	<p> L5-20R LOCKING 125V/20 AMP - RECEPTACLE L6-20R LOCKING 250V/20 AMP (1-PHASE) - RECEPTACLE L5-30R LOCKING 125V/30 AMP - RECEPTACLE L6-30R LOCKING 250V/20 AMP (1-PHASE) - RECEPTACLE PF FURNITURE POWER POLE - RECEPTACLE RFF FURNITURE RECESSED FLOOR FEED WFF FURNITURE WALL FEED ⊙ RECESSED FLOOR BOX - MULTI-SERVICE (POWER/DATA) ⊙ RECESSED FLOOR BOX - MULTI-SERVICE W/AV ⊙ RECESSED MULTI-SERVICE POKE THRU ⊙ SPECIAL CONNECTION ⊙ SIMPLEX RECEPTACLE ⊙ EQUIPMENT CONNECTION ⊙ MANUAL MOTOR STARTER ⊙ NON-FUSED DISCONNECT ⊙ FUSED DISCONNECT ⊙ FUSED DISCONNECT W/MAGNETIC MOTOR STARTER ⊙ JUNCTION BOX HNE HOME NETWORK ENCLOSURE ⊙ SECURITY CAMERA ⊙ DATA LOCATION (RING & STRING, U.N.O) ⊙ VOICE DROP - LOCATION ⊙ VOICE/DATA DROP - LOCATION ⊙ CABLE TV (COAX) - LOCATION ⊙ CARD READER ⊙ DOOR RELEASE - ACCESS CONTROL ⊙ DOOR STRIKE - ACCESS CONTROL ⊙ MAG-LOCK - ACCESS CONTROL ⊙ POSITION SWITCH ⊙ PROXY READER ⊙ REQUEST TO EXIT SWITCH ⊙ WIRELESS INTERNET ACCESS POINT ⊙ DOOR HOLD - FIRE ALARM ⊙ DUCT SMOKE DETECTOR FABP FIRE ALARM BOOSTER PANEL FACP FIRE ALARM CONTROL PANEL FARA FIRE ALARM REMOTE ANNUNCIATOR ⊙ SPRINKLER FLOW SWITCH ⊙ HEAT DETECTOR - FIRE ALARM ⊙ HORN - FIRE ALARM ⊙ HORNSTROBE - FIRE ALARM ⊙ POST INDICATOR VALVE - (PIV) PRE-A PRE-ACTION PANEL ⊙ PRESSURE SWITCH ⊙ PULL STATION - FIRE ALARM ⊙ SMOKE DAMPER ⊙ SMOKE DETECTOR ⊙ COMBINATION SMOKE/CO2 DETECTOR ⊙ SPEAKER - FIRE ALARM ⊙ SPEAKER/STROBE - FIRE ALARM ⊙ STROBE - FIRE ALARM </p>	<p> 23. Devices a. Legrand or GE with matching coverplates. b. Provide specification grade wiring devices, in types, characteristics, grades, colors, and electrical ratings for applications indicated, which are UL-listed and which comply with NEMA WD1 and other applicable UL and NEMA standards. Verify color selections with architect. Provide device plates to match device colors. </p> <p> 25. Service entrance and distribution equipment a. Electrical contractor must submit drawings for permit and receive approval prior to ordering equipment. No allowances will be made for equipment changes that occur prior to receipt of approved plans. </p> <p> 26. Transformers a. Dry type transformers - 15kva to 500 kVA - 600 volts or less, single and three-phase. b. All applicable material shall conform to NEMA standards. All applicable material shall bear UL labels. c. Transformers shall be ventilated type, single and/or three-phase, 60 hertz, dry type, air cooled, two winding, insulated, high efficiency, low sound level, as listed on the drawings. Provide transformers of same manufacturer as switchboards and panelboards. d. Coils shall utilize an underwriters' laboratory approved, 220 (C) insulation system and the average temperature rise shall not exceed 115°C above a 40°C maximum ambient. All units shall have NEMA standard taps, 2:2 1/2% AN and 4:2 1/2% BN. e. Cores shall be manufactured with a high grade, non-aging silicon steel stacked without gaps and firmly clamped. The core and coil assembly shall be mounted on vibration pads and bolted to the enclosure. The enclosure for separately mounted transformers shall be provided with lifting eyes or brackets nema-3r outdoor. To prevent access to live parts. Top of case temperatures shall not exceed UL acceptable levels. f. Terminate primary and secondary conductor with compression connectors. Grounding to be per NEC. g. Verify incoming voltage to transformer and set taps at the voltage level. h. Provide lockable breakers for feeders supplying transformers that are not located within site of the over-current protection. Transformers shall be field marked with the location of the over-current protection device. </p> <p> 27. Disconnects and Fused Switches a. Heavy duty type, horsepower rated with interlocking cover. NEMA 1 typical. Outdoor and wet location switches shall be raintight type NEMA 3R. All switches shall be lockable. Fuses in circuits rated at 600 amperes or less shall be UL class RK1 dual-element, time-delay, current limiting fuses. Fuses in circuits rated at 601 amperes or larger shall be UL class 1 time-delay, current limiting fuses. </p> <p> 28. Nameplates a. Provide permanent nameplate labeling on all disconnects. Include load served, voltage, phase, horsepower, fuse size and type. </p> <p> 29. Grounding and bonding for electrical systems and equipment a. Provide grounding and bonding for electrical service in accordance with NEC article 250. b. All major parts not carrying current, including but not limited to, secondary feeder circuit, equipment and panelboard enclosures, pull and junction boxes, shall be properly grounded. </p> <p> 31. Panelboards a. Provide branch circuit panelboard(s) as shown on the drawings and as specified herein. Panelboards shall have bolted, thermal and magnetic breakers with main lugs only or main breakers as required. Panelboards shall be Square D or GE by ABB, and be enclosed in NEMA 1 type housing unless noted otherwise. Enclosures shall be complete with a hinged door, cylinder lock, and a neatly typed directory under plastic cover in each panel door. All multiple pole breakers shall have a common trip handle. All panels and breakers shall be rated to withstand available fault current. </p>
---	---	---

ABBREVIATIONS:

#	Number	HP	Heat Pump
Hz	Hertz	HZ	Hertz
IG	Isolated Ground	IG	Isolated Ground
IMC	Intermediate Metal Conduit	IMC	Intermediate Metal Conduit
KVA	Kilovolt-Amperes	KVA	Kilovolt-Amperes
LFMC	Liquid Tight Metal Conduit	LFMC	Liquid Tight Metal Conduit
LTG	Lighting	LTG	Lighting
LRA	Locked Rotor Amperes	LRA	Locked Rotor Amperes
MC	Metal Clad Cable	MC	Metal Clad Cable
MCB	Main Circuit Breaker	MCB	Main Circuit Breaker
MCC	Motor Control Center	MCC	Motor Control Center
MLO	Main Lug Only	MLO	Main Lug Only
NC	Normally Closed	NC	Normally Closed
NEC	National Electrical Code	NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association	NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association	NFPA	National Fire Protection Association
NL	Night Lighting (Egress Illumination)	NL	Night Lighting (Egress Illumination)
NO	Normally Open	NO	Normally Open
NTS	Not To Scale	NTS	Not To Scale
P	Pole	P	Pole
PB	Push Button or Panic Button or Pull Box	PB	Push Button or Panic Button or Pull Box
PWR	Power	PWR	Power
QTY	Quantity	QTY	Quantity
REQ	Required	REQ	Required
RMC	Rigid Metal Conduit	RMC	Rigid Metal Conduit
RNC	Rigid Non-Metallic Conduit	RNC	Rigid Non-Metallic Conduit
RTU	Roof Top Unit	RTU	Roof Top Unit
ST	Shunt Trip	ST	Shunt Trip
SW	Switch	SW	Switch
TSTAT	Thermostat	TSTAT	Thermostat
TYP	Typical	TYP	Typical
UG	Underground	UG	Underground
UL	Underwriters Laboratory	UL	Underwriters Laboratory
UNO	Unless Noted Otherwise	UNO	Unless Noted Otherwise
V	Volt	V	Volt
VA	Volts-peres	VA	Volts-peres
W	Watt or Wire	W	Watt or Wire
WP	Weather Proof	WP	Weather Proof
XPMR	Transformer	XPMR	Transformer

EXAMPLES:

SWITCH GROUP
FUNCTION
FIXTURE TYPE (SEE SCHEDULE)
SWITCH
PANEL-CIRCUIT
WEATHER PROOF
PANEL NAME AND CIRCUIT NUMBER
GROUND FAULT PROTECTED
ISOLATED GROUND

NOTE: ALL ITEMS MAY NOT BE USED.

ELECTRICAL SPECIFICATIONS

- General Demolition
 - Refer to architectural drawings, general notes, instructions to bidders, general conditions, supplementary general conditions, base building specifications and drawings, shop drawing manuals and submittal plans, except as noted herein, which apply in all respects to this section. The contractor shall visit the site and familiarize himself with all existing conditions prior to bidding the work.
- Use of Drawings And Specifications
 - RTM drawings and specifications are intended to convey design intent only. All means and methods sequences, techniques, and procedures of construction as well as any associated safety precautions and programs, and all incidental and temporary devices required to construct the project, and to provide a complete and fully operational electrical system are the responsibility of the electrical contractor.
- Standards
 - Materials equipment and materials shall conform with appropriate provisions of NEC, ASTM, UL, ETL, NEMA, ANSI, as applicable to each individual unit or assembly.
- Codes
 - All work shall be performed in strict accordance with all applicable state and local codes and ordinances. In case of conflict between the drawings/specifications and the codes and ordinances, the highest standard shall apply. The electrical contractor shall satisfy code requirements as a minimum standard without any extra cost to owner.
- Permits and Fees
 - The electrical contractor shall procure and pay for all permits, fees and inspections necessary to complete the electrical work.
- Warranty
 - The electrical contractor shall unconditionally warrant all work to be free of defects in material and workmanship for a period of one (1) year from the date of final acceptance, and will repair or replace any defective work promptly and without charge and restore any other existing work damaged in the course of repairing defective materials and workmanship.
- Site Examination
 - The electrical contractor shall thoroughly examine all areas of work where equipment will be installed and shall report any condition that, in his opinion, prevents the proper installation of the electrical work prior to bid. He shall also examine the drawings and specifications of other branches of work making reference to them for details of new or existing building conditions.
 - All work shall be done at times convenient to the owner and only during normal working hours, unless specified otherwise.
 - Electrical contractor shall take his own measurements and be responsible for them.
 - Access panels are not shown on drawings. During site examination, contractor shall identify all areas where access panels are required, and report to general contractor. Designation of who furnishes and who installs access panels must be coordinated with general contractor prior to starting work.
- Contractor Coordination
 - If questions concerning design intent arise during coordination, RTM can assist where appropriate.
 - The architectural drawings shall take precedence over all other drawings. Do not scale distances off the electrical drawings; use actual building dimensions.
- Submittals
 - Products installed by the electrical contractor and provided by others must be submitted for review prior to purchasing. Products shall not be selected based on permit drawings without express permission - products shall be selected based on construction drawings.
- Record Drawing
 - The electrical contractor shall be responsible for creating record drawings where required. Drawings shall be produced in AutoCAD 2004 format or later.
- Shop Drawings

- Submit to the architect pdf file copies of complete & certified shop drawings, descriptive data, performance data & ratings, diagrams and specifications on all specified equipment, including accessories, and materials for review.
 - The make, model number, type, finish & accessories of all equipment and materials shall be reviewed & approved by the electrical contractor & general contractor prior to submitting to the architect for their review & approval.
 - Review of shop drawings does not relieve the electrical contractor/vendor from compliance with the requirements of the contract drawings, specifications & applicable codes.
- Testing
 - All electrical systems shall be tested for proper operation. Balance all branch circuit loads between the phases of the system to within 10% of the highest phase load in each panelboard.
 - Mechanical Equipment
 - All final connections to mechanical equipment shall be done by the electrical contractor.
 - Demolition
 - The electrical contractor shall be responsible for deenergizing circuits in demolition areas to insure a safe condition. Electrical devices and associated wiring located within the demolition area that will no longer be used shall be removed and properly disposed of at contractor's expense unless otherwise noted.
 - Power Outages
 - The electrical contractor shall schedule all electrical system(s) outages with the general contractor and owner at least 24 hours in advance. Unless approved otherwise all outages shall occur between 11:00pm and 5:00am.
 - Grounding and Bonding
 - Contractor to provide grounding and bonding as required for electrical systems. Grounding and bonding is considered means and methods of construction, and should be completed by the electrical contractor in accordance with NEC 250.
 - Materials
 - Provide all new material and equipment unless noted otherwise. All equipment shall be UL approved and labeled, or other approved testing organization which has acceptance by the local jurisdiction, for the purpose for which they are used, in addition to meeting all requirements of the current applicable codes and regulations. No substitution to materials specified will be allowed unless approved by the owner.
 - Electrical contractor shall not order or purchase any materials or equipment until permit drawings have been approved. No allowances will be made for any changes that occur if permit drawings have not been approved prior to ordering.
 - Cutting and Fitting
 - Perform cutting, coring, fitting, repairing and finishing of the work necessary for the installation of the equipment of this section. However, no cutting of the work of other trades or of any structural member shall be done without the consent of the owner. Property fill, seal, fireproof, and waterproof all openings, sleeves, and holes in slabs, walls, and casework.
 - Wiring Methods
 - Provide code approved wiring methods for branch circuiting indoors, such as EMT conduit for mechanical equipment, lighting, and power.
 - The minimum size of conduit shall be 3/4" unless otherwise noted. Conduit connectors shall be UL listed and labeled, with compression or set screw fittings.
 - Rigid conduit shall be hot dipped galvanized.
 - Where raceways are installed for others to use, or for future use, provide nylon pull string.
 - Penetrations through fire rated construction shall be sealed using 3M fire barrier caulk, Nelson Electric Flameseal & T&B Flamesafe or other approved method.
 - Conductors and Terminations
 - Branch conductors shall be copper, feeders as indicated on riser diagram. Conductors shall be insulated for 600v number 12 AWG minimum. Provide wires and cables as indicated listed and suitable for temperature, conditions, and location where installed.

Sheet Title
 ELECTRICAL SPECIFICATIONS AND LEGEND

Project No. 26.EB0416.1021

Scale AS NOTED

Sheet No. **E4.0**

File No.



515 Manhouth Street, Suite 201
 Newport, KY 41071 (859)-261-0580