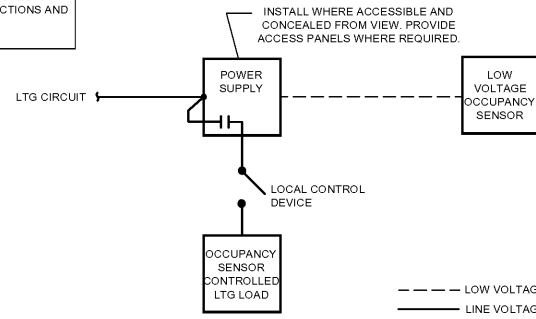


- SEQUENCE OF OPERATION:**
- UPON OCCUPANCY OF SPACE, POWER SUPPLY SHALL ENABLE LIGHTING ZONE TO BE CONTROLLED VIA LOCAL CONTROL DEVICE.
 - LOCAL CONTROL DEVICE SHALL BE CAPABLE OF CONTROLLING ALL LIGHTING AT THE SAME TIME.
 - IF MOTION IS NOT DETECTED WITHIN SPECIFIED TIME DELAY ALL CONNECTED LIGHTS SHALL TURN OFF.
 - FOR MORE INFORMATION REGARDING MODEL NUMBERS, TIME DELAYS, COVERAGE PATTERNS, ETC. REFER TO PLAN NOTES ON LIGHTING PLAN.

THIS CONTROL DIAGRAM IS FOR GENERAL INTENT AND USES WATSTOPPER REQUIREMENTS AS THE BASIS-OF-DESIGN MANUFACTURER. DIAGRAMS MAY BE DIFFERENT FOR ALLOWED EQUIVALENT MANUFACTURERS. REFER TO FINAL APPROVED MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WIRING DIAGRAMS FOR INSTALLATION.



BACK OF HOUSE LIGHTING CONTROL DETAIL S25

CONTRACTOR SHALL OBTAIN THE FOLLOWING INFORMATION AND REPORT VALUES TO THE ENGINEER FOR ANALYSIS PRIOR TO BEGINNING CONSTRUCTION & PURCHASING ANY MATERIALS:

- FEEDER CONDUCTORS - OBTAIN CONDUCTOR MATERIAL (AL OR CU), LENGTH, CONDUIT SIZE AND CONDUIT TYPE.
- AIC RATING AT EACH EXISTING PANEL.
- LOCATION OF TENANT'S UTILITY METER AND SERVICE DISCONNECT.
- TYPE OF SERVICE DISCONNECT OVERCURRENT DEVICE (FUSE OR CIRCUIT BREAKER), AMPERE RATING OF THE DEVICE AND AIC RATING OF THE DEVICE.
- PROVIDE A SKETCH OF THE ONE-LINE SHOWING THE PATH FROM THE UTILITY TRANSFORMER TO THE TENANT SPACE, ALONG WITH FEEDER AND SERVICE CONDUCTOR SIZES AS NOTED ABOVE.
- NOTE LOCATIONS OF THE LANDLORD DISTRIBUTION EQUIPMENT ON THE KEY PLAN.

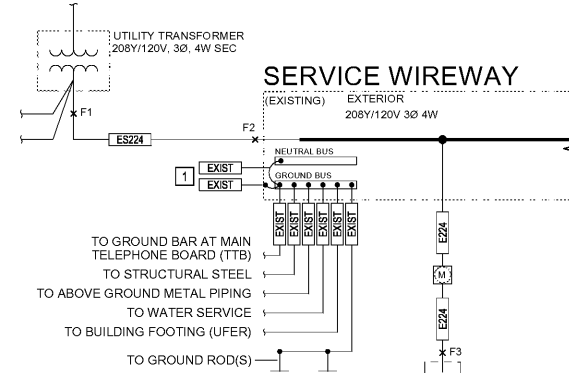
CIRCUIT SCHEDULE:

ALL CONDUCTOR SIZES ARE BASED ON 75 DEG C RATED TERMINATION AND COPPER CONDUCTORS WITH TYPE THHN/THWN-2 INSULATION. WHERE ALUMINUM CONDUCTORS ARE ALLOWED PER SPECIFICATIONS AND FOR TERMINATION OR INSULATION TYPES RATED LESS THAN 75 DEG C, MODIFY SIZES ACCORDING TO NFPA 70.

- ES224 225A, (4)#4/0, 1-1/2" C
- E224 225A, (4)#4/0, (1)#4G, 1-1/2" C

ONE-LINE KEYED NOTES:

- CONTRACTOR TO VERIFY THIS IS POINT OF SERVICE ENTRANCE AND NEUTRAL AND GROUND ARE BONDED TOGETHER AND TO THE GROUNDING ELECTRODE SYSTEM.



UTILITY TRANSFORMER:
 SIZE: 75 KVA
 IMPEDANCE: 2 1/2 Z
 VOLTS: 208Y/120V
 MOUNTED: POLE MOUNT
 AVAILABLE FAULT CURRENT AT SECONDARY IS: 9,900 A
 UTILITY COMPANY: MLGW
 UTILITY CONTACT NAME: KARYN SWILLEY
 UTILITY CONTACT NUMBER: (901) 729-1111
 UTILITY CONTACTED ON: 1/22/2018
 FAULT CURRENT SOURCE: ACCORDING TO THE UTILITY COMPANY, THE FAULT CURRENT SHALL NOT EXCEED 9,900 A.

GENERAL ONE-LINE NOTES:

- INFORMATION SHOWN ON TENANT DRAWINGS IS INTENDED TO INDICATE MINIMUM REQUIREMENTS TO MEET THE NEEDS OF THE TENANT. VERIFY EXISTING CONDITIONS, UTILITIES AND OTHER PROVISIONS BY OTHERS PER TENANT LEASE AGREEMENT PRIOR TO BEGINNING CONSTRUCTION.
- "EXISTING" CONDITIONS SHOW REFLECT AS-BUILT DRAWINGS.
- REFER TO TENANT LEASE AGREEMENT FOR ADDITIONAL INFORMATION ON ELECTRICAL SERVICE REQUIREMENTS. ANY MODIFICATIONS REQUIRED TO PROVIDE CAPACITY PROVIDED IS THE RESPONSIBILITY OF THE LANDLORD AND WILL BE PERFORMED UNDER SEPARATE CONTRACT/PERMIT.
- OBTAIN A COPY AND REVIEW LANDLORD'S LATEST EDITION OF THEIR TENANT DESIGN AND CONSTRUCTION CRITERIA AND COMPLY WITH ALL REQUIREMENTS. WHERE CONFLICTS OCCUR BETWEEN THE CRITERIA DOCUMENTS AND THE CONSTRUCTION DOCUMENTS, THE MOST STRINGENT REQUIREMENT WILL GOVERN.
- ALL CONDUCTOR LENGTHS PROVIDED IN THESE DESIGN DOCUMENTS ARE INTENDED SOLELY FOR USE IN THE DESIGN CALCULATIONS BY THE DESIGN PROFESSIONAL UNLESS SPECIFICALLY NOTED OTHERWISE IN THE DOCUMENTS. THEY SHALL NOT BE USED BY CONTRACTORS IN BIDDING OR CONSTRUCTING THE PROJECT. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MATERIAL QUANTITIES REQUIRED TO BID AND CONSTRUCT THE COMPLETE PROJECT.
- "F# REFERS TO FAULT POINT # AS DETERMINED IN THE "SHORT CIRCUIT AND VOLTAGE DROP CALCULATIONS" TABLE, DETAIL A01 OF THIS SHEET.
- "V" IN FEEDER TAG INDICATES FEEDER SIZES HAVE BEEN INCREASED FOR VOLTAGE DROP. REFER TO CIRCUIT SCHEDULE FOR FEEDER SIZES.
- PROVIDE COMPLETE TYPED WRITTEN IDENTIFICATION DIRECTORY CARD FOR ALL MAIN AND BRANCH CIRCUITS IN EVERY PANELBOARD DOOR.

PANELBOARD: A (EXISTING)		FED FROM: SERVICE WIREWAY		EQUIPMENT GROUND BUS				
BUS AMPS: 225A		AIC RATING: EXISTING		SERVES: SPRINT				
MAIN SIZE/TYPE: 250A MCB		MOUNTING SURFACE:		LOCATION: OPEN OFFICE, ROOM#105				
VOLTS/PHASE: 208Y/120V, 3PH, 4W		SECTION: 1						
CKT NO.	DESCRIPTION	VOLTS	AMPS	WIRE NO.	BKR NO.	WIRE NO.	DESCRIPTION	CKT NO.
HT.NB 1	RCPT-PLUGMOLD A	540		12	20	11	20	12
HT.NB 3	RCPT-PLUGMOLD B	540		12	20	11	20	12
HT.NB 5	RCPT-PLUGMOLD C	540		12	20	11	20	12
NB 7	RCPT-OPEN OFFICE	720		12	20	11	20	12
NB 9	RCPT-OPEN OFFICE DESK	180		12	20	11	20	12
NB 11	RCPT-ACROWAVE	500		12	20	11	20	12
GF.NB 13	RCPT-REFRIGERATOR	900		12	20	11	20	12
GF.NB 15	RCPT-WATER COOLER	500		12	20	11	20	12
NB 17	RCPT-RR 'RIP' TS	404		12	20	11	20	12
NB 19	RCPT-SAFE	180		12	20	11	20	12
NB 21	RCPT-SCREEN	500		12	20	11	20	12
NB 23	RCPT-CORRIDOR	180		12	20	11	20	12
NB 25	RCPT-WALL DISPLAYS N	900		12	20	11	20	12
NB 27	RCPT-WALL DISPLAYS S	1 080		12	20	11	20	12
NB 29	RCPT-EXIT CORRIDOR	360		12	20	11	20	12
NB 31	RCPT-NSC DEVICE	180		12	20	11	15	12
NB 33	RCPT-OFFICE DESK	360		12	20	11	2	15
NB 35	RCPT-RTU & DAMPERS	560		12	20	11		
NB 37	RTU-1	4 444		8	50	3	3	10
NB 39	RTU-2	4 444		8	50	3	3	10
41	SUBTOTAL	7 784	7 604	6 968			6 256	7 215
TOTAL PHASE A - VA		14 030						
AMPS		117						
TOTAL PHASE B - VA		14 819						
AMPS		123						
TOTAL PHASE C - VA		13 448						
AMPS		112						
TOTAL PANELBOARD VA		42 297						
AMPS		117						

PANELBOARD NOTES:
 GF - GFCI TYPE CIRCUIT BREAKER C# - VIALTG CONTACTOR #
 EM - EMERG LGT HANDLE-ON CLAMP HT - PROVIDE HANDLE-TYPE NEC
 NB - PROVIDE NEW BKR IN EXSTG PANEL
 SIGN/DISPLAY - SIGNAGE & DISPLAY CASE

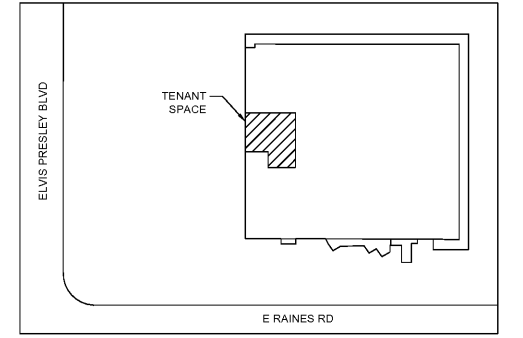
TENANT ELECTRICAL SERVICE LOAD SUMMARY

TENANT OCCUPANCY TYPE: M SERVICE DESCRIPTION: 208Y/120V, 3PH

TENANT SQUARE FOOTAGE: 2,725

LOAD DESCRIPTION	Connected KVA	Demand FACTOR	Demand KVA
HVAC - SUMMER	10.38	100%	10.38
HVAC - WINTER	10.38	100%	0.00
LIGHTING (PER NEC-220)	8.18	125%	10.22
RECEPTACLES	8.10	100%/50%	8.10
MOTOR LOADS	8.70	100%	8.70
LARGEST MOTOR LOAD	2.81	125%	3.51
MISCELLANEOUS EQUIPMENT	9.74	100%	9.74
DISPLAY CASE/SIGNAGE	1.20	125%	1.50
SHOW WINDOW / TRACK LIGHTING	0.18	PER NEC	0.23
TOTAL LOAD	59.69	KVA	52.37
TOTAL AMPACITY	166.58	AMPS	145.36
SERVICE AMPACITY	200	AMPS	200.00
SPARE CAPACITY		AMPS	55

ELECTRICAL ONE-LINE DIAGRAM N01



SITE KEY PLAN F01

Short-Circuit and Voltage Drop Calculations

Distances are for calculation purposes only and shall not be used for... takeoffs... engineering of any field condition that results in a change of 10% or greater circuit distance.

The following calculations are based on the "Point-by-Point" method...
 $ISC_{(3)} = ISC_{(1)} \times M_{(3)}$
 $ISC_{(1)} =$ short circuit current at fault point 1
 $ISC_{(3)} =$ short circuit current at fault point 2

$M_{(3)} = \frac{1}{1 + \left(\frac{Z_{F1} + Z_{F2}}{Z_{F1}} \right)^2}$

Feeder: $I_{sc(3)} = 1.732 \times L \times I_{sc}$
 Feeder: $I_{sc(3)} = 2 \times L \times I_{sc}$

XFMR: $I_{sc(3)} = \frac{I_{sc} \times V_p \times 1.73 \times \%Z}{100,000 \times KVA}$
 XFMR: $I_{sc(3)} = \frac{I_{sc} \times V_p \times \%Z}{100,000 \times KVA}$

$I_{sc(3)} = \frac{V_p \times I_{sc} \times M_{(3)}}{V_b}$

VOLTAGE DROP (3Ø):
 $\%VD = ((R \times \cos(\arccos(pf)) + X \times \sin(\arccos(pf))) \times L \times I \times 1.73) / E$
 VOLTAGE DROP (1Ø):
 $\%VD = ((R \times \cos(\arccos(pf)) + X \times \sin(\arccos(pf))) \times 2 \times L \times I) / E$

$\%VD \text{ CUM} =$ Cumulative Voltage Drop from Fault Point 1 to Fault Point #
 R = resistance in ohms per LF
 X = reactances in ohms per LF

Feeder (F#)	Busway Description	Source (Fault Point)	Phase	Source Isc (amps)	Conduit Type/TX	Material	Feeder Quantity of Parallel Sets and Bus/Phase & Neutral Size	Conductor 'C' Value	Busway 'C' Value	Voltage (E)	Circuit Length (L)	Load Power Factor (pf)	Circuit Load (Amperage)	Resistance (R)	Conductor Reactance (X)	Arccos (pf) (Radians)	Degree Rise	kVA	Existing Xlnr Z	Secondary Voltage	Tap Setting	f	M	Fault Current (amps)	Voltage Drop (%VD)	Cumulative Voltage Drop (%VD)	Fault Point (FP#)	
1	Service Point	9,900 at the secondary of the utility transformer																									1	
2	Land Wireway	60 The connected full load motor amps (includes compressors) on the system																									2	
3	Panelboard "A"		1	10260	NM	CU	1) Set(s) of 140 AWG	16673	--	208	80	0.9	200	0.000062	0.000041	0.451027	--						0.410	0.71	7277	-0.98%	-0.98%	2
4	RTU-1		3	5514	NM	CU	1) Set(s) of 350 kcmil	22737	--	208	120	0.9	119	0.000038	0.000040	0.451027	--						0.320	0.78	5614	-0.61%	-1.60%	3
5	RTU-2		3	5514	NM	CU	1) Set(s) of 61AWG	1559	--	208	75	0.85	37	0.000780	0.000052	0.554811	--						2.209	0.31	1718	-1.60%	-3.19%	4
6	RTU-2		3	5514	NM	CU	1) Set(s) of 101AWG	981	--	208	34	0.85	23	0.001200	0.000050	0.554811	--						1.591	0.39	2128	-0.68%	-2.28%	5

PANEL BOARD SCHEDULES A01



2000 SHAWNEE MISSION PARKWAY
 STE 100 MISSION WOODS, KS 66205
 TEL 816 502 1500 FAX 816 842 1878

Sprint
 #1641 WHITEHAVEN PLAZA
 4088 ELVIS PRESLEY BLVD.
 SUITE 104
 MEMPHIS, TENNESSEE 38116

HENDERSON ENGINEERS
 8345 LENEXA DRIVE, SUITE 300
 LENEXA, KS 66214
 TEL (913) 742-5000 FAX (913) 742-5001
 WWW.HENDERSONENGINEERS.COM
 1850001011
 TN. CORPORATE NUMBER: 3847

ELECTRICAL RISER, SCHEDULES AND DETAILS

E-4