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G&A
9801 Renner Boulevard
Lenexa, KS 66219
913.492.0400
www.gbat.com
MO Certificate of Authority # 000133

LANDSCAPE ARCHITECTURE
LAND3 Studio, LLC
317 SE Main
Lee's Summit, MO 64633
www.land3studio.com
MO Certificate of Authority # 200801860

LANDSCAPE ARCHITECTURE
Hoerr Schaudt Landscape Architects
2100 Central Street, Suite 01C
Kansas City, MO 64108
816.510.0438
www.hoerschaudt.com
MO Certificate of Authority #201904038

MEP ENGINEERING
HENDERSON ENGINEERS, Inc.
8345 Lenexa Drive
Lenexa, KS 66214
913.742.5000
www.hel-eng.com
Missouri Certificate of Authority # 000556

ARCHITECTURE
INKLE + WILLIAMS Architecture
8787 Renner Boulevard, Suite 100
Lenexa, KS 66219
913.498.1550
www.inklevilliams.com
Missouri Certificate of Authority #FD0453304

PROJECT:

Paragon Star Soccer Complex

Soccer Complex & Associated Improvements
1401 NW View High Dr, Lee's Summit, MO 64081
PLAYING FIELD CONSTRUCTION - ISSUE FOR BID

ISSUE:

1	REVISION 1	09.02.2022
2	FIELD DISPLAYS	11.15.2022
3	OWNER UPDATES	11.15.2022
4	REVISION 4	01.23.2023
5	REVISION 7	02.02.2023

PROFESSIONAL SEAL:



ELECTRICAL ONE-LINE DIAGRAM (ELEC SERV. #2)

JOB NO: 1197 SCALE: N/A
DATE: 02.16.2022 DRAWN BY: MAP

SHEET NO:

E-301

ELECTRICAL SERVICE 2 ELECTRICAL SERVICE LOAD SUMMARY			
SERVICE OCCUPANCY TYPE:	B	SERVICE DESCRIPTION:	
SERVICE SQUARE FOOTAGE:	0	480Y/277V, 3PH	
LOAD DESCRIPTION	Connected KVA	Demand FACTOR	Demand KVA
HVAC - SUMMER	0.00	100%	0.00
HVAC - WINTER	0.00	0%	0.00
LIGHTING	0.00	125%	0.00
RECEPTACLES	0.00	100%/50%	0.00
SUPPLEMENTAL ELECTRIC HEAT	0.00	100%	0.00
MISCELLANEOUS EQUIPMENT	49.42	100%	49.42
SIGNAGE	2.40	125%	3.00
EXTERIOR LIGHTING	196.29	125%	245.37
TOTAL LOAD	248.12	KVA	297.79
TOTAL AMPACITY	298.44	AMPS	358.18
SERVICE AMPACITY	400	AMPS	400.00
SPARE CAPACITY		AMPS	42

PANELBOARD: W1 (NEW)		FED FROM:		ELECTRICAL SERVICE #2		LINE-SIDE LUGS: MECHANICAL							
BUS AMPS: 250A		AIC RATING:		FCA +10% MINIMUM, FULLY RATED		EQUIPMENT GROUND BUS							
MAIN SIZE/TYPE: MLO		MOUNTING:		SURFACE									
VOLTS/PHASE: 480Y/277V, 3PH, 4W		SERVES:		WEST ENTRANCE									
SECTION: 1		LOCATION:		WEST ENTRANCE									
CKT NO.	DESCRIPTION	VOLTAMPS/PHASE			WIRE NO.	BKR AMP	P	BKR WIRE NO.	VOLTAMPS/PHASE			DESCRIPTION	CKT NO.
1		A	B	C				A	B	C			2
3	POLE P1 (FIELD 1)		6,197		8	40	3	1					4
5				6,197				1					6
7		6,197						1					8
9	POLE P2 (FIELD 1)		6,197		8	40	3	1					10
11				6,197				1					12
13		6,197						1					14
15	POLE P3 (FIELD 1)		6,197		4	40	3	1					16
17	WEST LTS			6,197				1					18
19		5,602						1					20
21	POLE P3 (FIELD 2)		5,602		6	30	3	1					22
23	EAST LTS			5,602				1					24
25		6,197						1					26
27	POLE P4 (FIELD 1)		6,197		6	40	3	1					28
29	WEST LTS			6,197				1					30
31		5,602						1					32
33	POLE P4 (FIELD 2)		5,602		6	30	3	1					34
35	EAST LTS			5,602				1					36
37		14,400						1					38
39	FIELD 1 - LARGE DISPLAY		14,400		1	125	3	1					40
41				1,424				1					42
SUBTOTAL		50,392	50,392	37,416							SUBTOTAL		
TOTAL PHASE A - VA		50,392	LOAD		CONN VA	DF	LOAD		CONN VA	DF			
AMPS		182	COOLING [C]			1.00	REFRIG [R]			1.00			
TOTAL PHASE B - VA		50,392	HEATING [H]			0	SIGNAGE [S]			1.25			
AMPS		182	LIGHTING [L]		107.976	1.25	KITCHEN [K]			1.00			
TOTAL PHASE C - VA		37,416	RECEPTACLES [R]		1.0/1.5	1.00	EXISTING [E]			1.00			
AMPS		135	MOTORS [M]			1.00	LRG MOTOR			1.25			
TOTAL PNLBD - VA		138,200	SUPP HEAT [U]			1.00	SHOW WIND [W]			1.25			
AMPS		166	MISC EQUIP [Z]		30,224	1.00	LTG TRACK			1.00			
TOTAL DEMAND												165,194 VA	
												199 A	

PANELBOARD: W2 (NEW)		FED FROM:		ELECTRICAL SERVICE #2		LINE-SIDE LUGS: MECHANICAL							
BUS AMPS: 250A		AIC RATING:		FCA +10% MINIMUM, FULLY RATED		EQUIPMENT GROUND BUS							
MAIN SIZE/TYPE: MLO		MOUNTING:		SURFACE									
VOLTS/PHASE: 480Y/277V, 3PH, 4W		SERVES:		WEST ENTRANCE									
SECTION: 1		LOCATION:		WEST ENTRANCE									
CKT NO.	DESCRIPTION	VOLTAMPS/PHASE			WIRE NO.	BKR AMP	P	BKR WIRE NO.	VOLTAMPS/PHASE			DESCRIPTION	CKT NO.
1		A	B	C				A	B	C			2
3	POLE P11 (FIELD 5)	4,562	4,562		10	30	3	2	20	10	1,300	1,300	4
5				4,562				2	20	10	1,400	1,400	6
7		4,562						1			1,400		8
9	POLE P12 (FIELD 5)		4,562		8	30	3	2	70	4	9,600	9,600	10
11				4,562				2					12
13		4,562						1					14
15	POLE P13 (FIELD 5)		4,562		6	30	3	1					16
17	WEST LTS			4,562				1					18
19		4,562						1					20
21	POLE P13 (FIELD 6)		4,562		6	30	3	1					22
23	EAST LTS			4,562				1					24
25		4,562						1					26
27	POLE P14 (FIELD 5)		4,562		6	30	3	1					28
29	WEST LTS			4,562				1					30
31		4,562						1					32
33	POLE P14 (FIELD 6)		4,562		6	30	3	1					34
35	EAST LTS			4,562				1					36
37	POLE SIGNS ACCESSORY	800			10	20	1	1					38
39	MONUMENT SIGN - NW		1,200		10	20	1	1					40
41	MONUMENT SIGN - W		1,200		10	20	1	1					42
SUBTOTAL		28,172	28,572	28,572							SUBTOTAL		
TOTAL PHASE A - VA		30,872	LOAD		CONN VA	DF	LOAD		CONN VA	DF			
AMPS		111	COOLING [C]			1.00	REFRIG [R]			1.00			
TOTAL PHASE B - VA		39,472	HEATING [H]			0	SIGNAGE [S]			1.25			
AMPS		142	LIGHTING [L]		88,316	1.25	KITCHEN [K]			2,400			
TOTAL PHASE C - VA		39,572	RECEPTACLES [R]			1.0/1.5	EXISTING [E]			1.00			
AMPS		143	MOTORS [M]			1.00	LRG MOTOR			1.25			
TOTAL PNLBD - VA		109,916	SUPP HEAT [U]			1.00	SHOW WIND [W]			1.25			
AMPS		132	MISC EQUIP [Z]		19,200	1.00	LTG TRACK			1.00			
TOTAL DEMAND												132,595 VA	
												159 A	

NOTE:
UTILITY TRANSFORMER:
1000KVA, SECONDARY 480Y/277V, MIN Z=5.75%, PAD MOUNT
AVAILABLE FAULT CURRENT AT SECONDARY IS:
50,000
UTILITY COMPANY: EVERGY
UTILITY CONTACT: JENNY CASEY, (816) 347-4334, CONTACTED ON 01/26/20
FAULT CURRENT SOURCE: UTILITY CONTACT

ONLINE DIAGRAM GENERAL NOTES:

- REFER TO SHEETS E0-0 FOR ADDITIONAL GENERAL NOTES.
- CIRCUIT BREAKERS DENOTED WITH 'AFM' SHALL BE ADJUSTABLE TRIP TYPE BREAKER COMPATIBLE WITH ARC FLASH MITIGATION SYSTEM. INCLUDE SYSTEM INFORMATION AND DEVICE SETTINGS IN OPERATIONS AND MAINTENANCE MANUAL UPON COMPLETION OF PROJECT.
- F# INDICATES FAULT POINT. REFER TO SHORT CIRCUIT TABLE ON E301 FOR AVAILABLE FAULT CURRENT AND CUMULATIVE VOLTAGE DROP AT FAULT POINTS.
- ALL EQUIPMENT IS NEMA 3R, U.N.O.
- ELECTRICAL CONTRACTOR SHALL PROVIDE ALL MOUNTING ACCESSORIES AS REQUIRED FOR PROPER INSTALLATION AND SHALL FIELD COORDINATE SERVICE ENTRANCE LOCATION WITH UTILITY COMPANY.

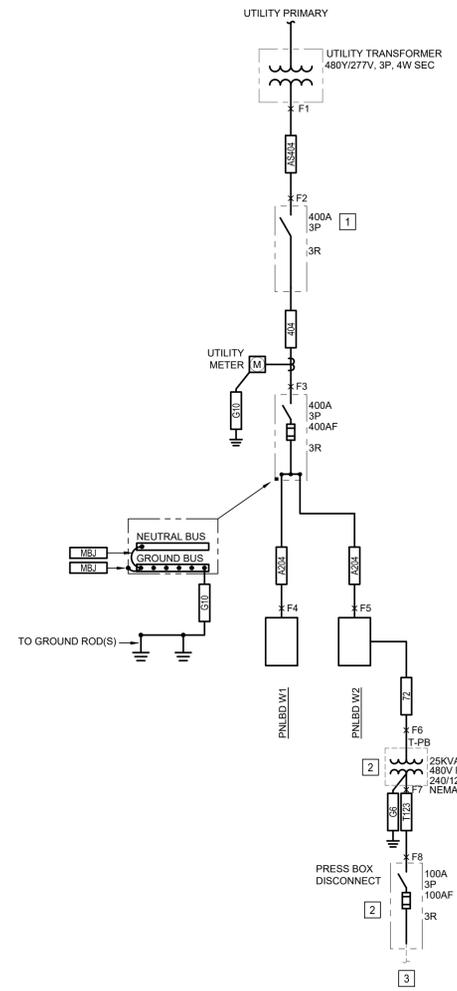
ONLINE DIAGRAM KEYED NOTES:

- PARAGON ELECTRICAL SERVICE #2. PROVIDE PERMANENT WEATHER PROOF LABEL WITH "ELECTRICAL SERVICE #2". ELECTRICAL CONTRACTOR SHALL PROVIDE SAME LABEL ON MSB WITH LABEL "ELECTRICAL SERVICE #1". REFER TO SHEET E300.
- ELECTRICAL CONTRACTOR SHALL FIELD VERIFY TRANSFORMER AND PRESS BOX DISCONNECT LOCATION AND PROVIDE ALL MOUNTING ACCESSORIES, OR CONCRETE PAD, AS REQUIRED FOR PROPER INSTALLATION.
- ELECTRICAL CONTRACTOR SHALL PROVIDE SINGLE POINT ELECTRICAL CONNECTION TO PRESS BOX PER MANUFACTURER REQUIREMENTS.

FEEDER SCHEDULE:

SIZES ARE BASED ON COPPER (CU) THHN/THWN-2 INSULATION, UNO. NUMBER DESIGNATIONS PRECEDED BY "A" INDICATE THAT THE SIZE IS BASED ON ALUMINUM (AL) WIRE. AL CONDUCTOR SIZES ARE BASED ON XHHW-2 INSULATION, UNO. ALL CONDUCTOR SIZES ARE BASED ON 75 DEG C RATED TERMINATIONS, UNO. CONDUIT SIZES SHOWN ARE APPROPRIATE FOR SCHEDULE 40 PVC, EMT, GRS, IMC AND RMC, ADJUST SIZE AS NEEDED FOR OTHER RACEWAY TYPES. FOR ANY OTHER CONDITIONS MODIFY SIZES PER CODE. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

- A204 200A, (4)-350kcmil, (1)#2G, 2-1/2" C
- AS404 400A, (1)4" C, 2-SETS OF (4)-350kcmil
- 72 70A, (2)#4, (1)#6 G, 1-1/2" C
- T123 125A, (3)#1, (1)#6 SSBJ, 1-1/4" C
- 404 400A, (4)-500kcmil, (1)#1G, 4" C
- G6 GND, #6 COPPER GROUND, 3/4" C
- G10 GND, #10 COPPER GROUND, 3/4" C



1 ELECTRICAL SERVICE #2 ELECTRICAL ONE-LINE DIAGRAM NTS

Short-Circuit and Voltage Drop Calculations

Distances are for calculation purposes only and shall not be used for contractor takeoffs nor bidding - Contractor shall notify Engineer of any field condition that results in a change of 10% or greater circuit distance

The following calculations are based on the "Point-to-Point" method where:
 $ISC_{(3)} = ISC_{(1)} \times M_{(1)}$ $M = 1/(1+f)$ Feeder: $f_{(30)} = \frac{1.732 \times L \times I_{sc}}{100,000 \times KVA}$ XFMR: $f_{(30)} = \frac{I^2(\%R \times V_p \times 1.73 \times \%Z)}{100,000 \times KVA}$ $ISC_{(30)} = V_p \times M \times I_{sc}$ $V_s = \frac{I^2(\%R \times V_p \times \%Z)}{100,000 \times KVA}$

VOLTAGE DROP (30):
 $\%VD = ((R \times \cos(\arccos(pf)) + X \times \sin(\arccos(pf))) \times L \times I \times 1.73) / E$
 VOLTAGE DROP (120):
 $\%VD = ((R \times \cos(\arccos(pf)) + X \times \sin(\arccos(pf))) \times 2 \times L \times I \times 1) / E$

$\%VDCUM =$ Cumulative Voltage Drop from Fault Point 1 to Fault Point #
 $R =$ resistance in ohms per LF
 $X =$ reactance in ohms per LF

Fault Point (FP)	Bus/Feeder 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	L-L Voltage (E)	Circuit Length (L)	Load Power Factor (pf)	Circuit Load (Amperage)	Conductor			Transformer			f	M	Fault Current (amps)	Voltage Drop (%VD)	Cumulative Voltage Drop (%VD)	Fault Point (FP)		
														Resistance (R)	Reactance (X)	Arccos (pf) (Radians)	Type	Degree Rise	kVA							New Xfmr Z	Existing Xfmr Z
1	Utility Service Point			50,000			The connected full load motor amps (includes compressors) on the system																			1	
2	400A NON-FUSED DISCONNECT	1	3	50,000	M	AL	2 Sets) of 350 kcmil	15484	--	480	40	0.9	358	0.000063	0.000050	0.451027						0.233	0.81	40,550	-0.20%	-0.20%	2
3	400A FUSED DISCONNECT	2	3	40,550	M	CU	1 Set(s) of 500 kcmil	22185	--	480	10	0.9	358	0.000029	0.000048	0.451027						0.066	0.94	38,041	-0.06%	-0.26%	3
4	WI	3	3	38,041	M	AL	1 Set(s) of 350 kcmil	15484	--																		

