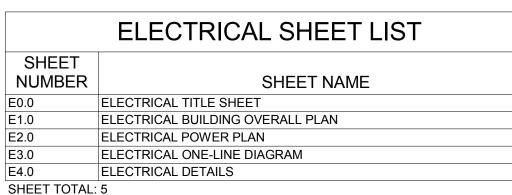
# SOUTHWEST TRANSIT EV CHARGING STATION ADDITION

ELECTRICAL SHEET LIST					
SHEET NUMBER	SHEET NAME				
E0.0	ELECTRICAL TITLE SHEET				
E1.0	ELECTRICAL BUILDING OVERALL PLAN				
E2.0	ELECTRICAL POWER PLAN				
E3.0	ELECTRICAL ONE-LINE DIAGRAM				
E4.0	ELECTRICAL DETAILS				
SHEET TOTAL: 5					



W 62nd St.  Leighton's Garage & Autor goarr shop &	
Southwest Transit (m) Leonard L Stinich.	
Chilet Rd	
nadian chief Rul Paws Deegy Daycare	Dayto

**ELECTRICAL ABBREVIATIONS** 

MOMENTARY CONTACT OR MECHANICAL CONTRACTOR

MOTOR CONTROL CENTER

MCB MAIN CIRCUIT BREAKER

A, AMP AMPERES

ABOVE GRADE

AUDIBLE ALARM

ABOVE COUNTER

ADOVE GOOMTER	WOO WOTON CONTINUE CENTER			The state of the s	11000	37 //2					
	MH MAN HOLE					N TO A TO	6.				
	MLO MAIN LUG ONLY				Paws D	oggy Daycare					
	MMFO MULTI MODE FIBER OPTIC				51 M						
	MRS MOTOR RATED SWITCH				100	1					
AFF ABOVE FINISHED FLOOR	MSB MAIN SWITCHBOARD										
AHU AIR HANDLING UNIT	MT EMPTY										
AL ALUMINUM	MTR MOTOR										
ANT ANTENNA	N NEUTRAL										
ATS AUTOMATIC TRANSFER SWITCH	NC NORMALLY CLOSED										
AV AUDIO VISUAL	NEC NATIONAL ELECTRICAL CODE			ELECTRIC	CAL SY	MBOLS LEC	GEND				
AWG AMERICAN WIRE GUAGE	NIC NOT IN CONTRACT										
BAS BUILDING AUTOMATION SYSTEM	NO NORMALLY OPEN	SYMBOL DESIGNATIONS	MTG	SYMBOL DESIGNATIONS	MTG	SYMBOL	DESIGNATIONS	MTG	SYMBOL	DESIGNATIONS	MTG
BFC BELOW FINISHED CEILING	NTS NOT TO SCALE		HT		HT			HT `			HT
BPS BOLTED PRESSURE SWITCH	OC ON CENTER	SYMBOL SCHEDULE NOTES		POWER			ONE LINE AND RISER			ONE LINE AND RISER	
C CONDUIT OR CONTROLLED RECEPT	PB PULL BOX OR PUSHBUTTON										
CAB CABINET	PE PNEUMATIC ELECTRIC	A. THESE SYMBOLS COMPRISE A STANDARD LIST, NOT ALL SYMBOLS	MAY	BRANCH CIRCUIT PANEL	VERIFY	J ID V.	UTILITY SERVICE: EQUIPMENT ID			FEEDER DESCRIPTION: SEE ELECTRICAL ONE LINE SHEET FOR SC	CHEDIII E
CB CIRCUIT BREAKER	PF POWER FACTOR	APPEAR ON THESE DRAWINGS.	-	EQUIPMENT CABINET	VERIFY	v, Ø, W	VOLTAGE, PHASE, 3 OR 4 WIRE		XX	SEE ELECTRICAL ONE LINE SHEET FOR SO	SHEDOLL
CCTV CLOSED CIRCUIT TV	PH PHASE	B. MOUNTING HEIGHTS INDICATED ARE STANDARD. DIMENSIONAL NU		TRANSFORMER	VERIFY	ID	ENGINE GENERATOR:			MOTOR OVERLOAD PROTECTION DEVICE	
	PNL PANEL	INDICATED AT DEVICES SHALL OVERRIDE THESE STANDARDS. MOU HEIGHTS ARE TO THE CENTER OF THE DEVICE, UNLESS NOTED OTI		MOTOR OR MOTOR CONNECTION	VERIFY	KW/KVA V, Ø, W	EQUIPMENT ID		<del>-</del> ~>		
	PRI PRIMARY	C. MOUNTING HEIGHTS INDICATED ARE FOR STUD WALL CONSTRUCT	ION.	MOTOR CONTROLLER, STARTER OR VFD	VERIFY	PF PF	KW/KVA RATING OF GENERATOR VOLTAGE, PHASE, 3 OR 4 WIRE, POWER FACTOR		. ,		
COMM COMMUNICATIONS	PT POTENTIAL TRANSFORMER	WHEN BLOCK OR BRICK CONSTRUCTION IS USED, ADJUST MOUNTI		L⊠ COMBINATION STARTER & DISCONNECT SWITCH	VERIFY	XX	600 VOLT MOLDED CASE CIRCUIT BREAKER:		U <sub>ID</sub>	POTENTIAL TRANSFORMER:	
CT CURRENT TRANSFORMER	R RACEWAY	HEIGHTS TO ALIGN DEVICE PLATES WITH RUNNING JOINT.		└☑ FUSED DISCONNECT SWITCH	VERIFY		AF = AMP FRAME, AT = AMP TRIP XX = OPTIONS TO BE PROVIDED, MAY BE BLANK		TR:XX	TR = TURNS RATIO	
	RECEPT RECEPTACLE	D. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.	-	DISCONNECT SWITCH	VERIFY	AF/AT	, , , , , , , , , , , , , , , , , , ,		<u>'   '</u>		
	REFG REFRIGERATOR			\$ <sup>MR</sup> MOTOR RATED TOGGLE	VERIFY	XX XX	600 VOLT INSULATED CASE CIRCUIT BREAKER: AF = AMP FRAME. AT = AMP TRIP		D (	CURRENT TRANSFORMER: TR = TURNS RATIO	
	RTU ROOF TOP UNIT	GENERAL		MANUAL MOTOR STARTER SWITCH WITH THERMAL	VERIFY	AF/AT	XX = OPTIONS TO BE PROVIDED, MAY BE BLANK		TR:XX	III - TORNOTATIO	
DED DEDICATED				OVERLOAD		XX	DISCONNECT SWITCH:		1	GROUND CONNECTION	
	SEC SECONDARY	HEAVY DASHED LINE WEIGHT INDICATES EXISTING ITEM TO BE REMOVED.		⇔ DUPLEX RECEPTACLE - WALL/CEILING MOUNT	18"		AS = AMP SWITCH			CROCKE CONNECTION	
	SGB SERVICE GROUND BAR	EXISTING TENTO BETEINOVED.		● ● EMERGENCY DUPLEX RECEPTACLE - WALL/CEILING	18"	AS	XX = OPTIONS TO BE PROVIDED, MAY BE BLANK				
	SMFO SINGLE MODE FIBER OPTIC	LIGHT SOLID LINE WEIGHT INDICATES EXISTING ITEM TO REMAIN.	-	IVIOUNI		XX	FUSE:		+   ,   ,   , –	BATTERY	
	SPKR SPEAKER	TILIVITO NEIVIAIN.		⇔ SPLIT DUPLEX RECEPTACLE - WALL/CEILING MOUNT	18"		AF = AMP FUSE XX = OPTIONS TO BE PROVIDED, MAY BE BLANK		<u> </u>	-	
	STP SHIELDED TWISTED PAIR	HEAVY SOLID LINE WEIGHT INDICATES NEW ITEM OR NEW LOCATION.		EMERGENCY SPLIT DUPLEX RECEPTACLE -	18"	AF VV					
	SUB SUBSTATION			WALL/CEILING MOUNT		XX X	FUSED DISCONNECT SWITCH: AS = AMP SWITCH, AF = AMP FUSE		ŅŌ	CONTACTOR - NORMALLY OPEN	
	SW SWITCH	R REMOVE EXISTING ITEM		→ → SIMPLEX RECEPTACLE - WALL/CEILING MOUNT	18"	AS/AF	XX = OPTIONS TO BE PROVIDED, MAY BE BLANK		$\dashv\vdash$		
ENCL ENCLOSURE	SWBD SWITCHBOARD	RL REMOVE EXISTING ITEM AND RELOCATE AS INDICATED		EMERGENCY SIMPLEX RECEPTACLE - WALL/CEILING	18"		TRANSFORMER:			CONTACTOR - NORMALLY CLOSED	
	TEL TELEPHONE	X EXISTING ITEM TO REMAIN		MOUNT		ID KVA	EQUIPMENT ID KVA RATING OF TRANSFORMER		NC I.	CONTACTOR - NORWALL I CLOSED	
	TELCOM TELECOMMUNICATIONS	NL NEW LOCATION FOR RELOCATED ITEM		⊕ ⊕ QUADPLEX RECEPTACLE - WALL/CEILING MOUNT	18"	] \ \rangle \ \rangle \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	PRIMARY VOLTAGE		<del>-  </del>		
	TGB TELECOMMUNICATIONS GROUND BAR	NOTES & TAGS		EMERGENCY QUADPLEX RECEPTACLE - WALL/CEILING  MOUNT	3 18"	=	SECONDARY VOLTAGE			METER:	
F FUSE OR FUSED	TMGB TELECOMMUNICATIONS MAIN GROUND BAR	110120 & 17.00		MOUNT		ID KVA	TRANSFORMER WITH SPECIAL CORE: EQUIPMENT ID		(M)(A)(V)	M = WATTHOUR METER, A = AMMETER, V =	= VOLI METER
	TR TAMPER RESISTANT	XX ## EQUIPMENT IDENTIFICATION TAG - SEE EQUIPMENT SCHI	IEDULES	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	18"		KVA RATING OF TRANSFORMER PRIMARY VOLTAGE				
	TSTAT THERMOSTAT			## GFI RECEPTACLE, DUPLEX/QUADPLEX - CEILING MOUN		<u> </u>	SECONDARY VOLTAGE			LINEWORK:	
	TYP TYPICAL	XXX-X FEEDER SIZE TAG - SEE POWER RISER SCHEDULE		○告 ○毎 GFI RECEPTACLE, DUPLEX/QUADPLEX - CONTROLLED - CEILING MOUNT	-	ID	PANELBOARD:			— EQUIPMENT ENCLOSURE LINE	
	UC UNDER COUNTER	#> KEYNOTE				[	EQUIPMENT ID VOLTAGE, PHASE, 3 OR 4 WIRE, AMP RATING	_		SWITCHGEAR BUS LINE	
FO FIBER OPTIC	UF UNDER FLOOR			C ⊕ C ⊕ DUPLEX RECEPTACLE - CONTROLLED - WALL/CEILING MOUNT	18"		MCB OR MLO SPACES AVAILABLE		V/ // // // // /A		
FSD FIRE-SMOKE DAMPER	UG UNDER GROUND	RACEWAYS	-		4.5"	A MCB SPACES	CALCULATED FAULT CURRENT			BUSWAY	
FV FILM VIEWER	UH UNIT HEATER	CONDUIT CONCEALED IN CEILING OR WALLS		GFI DEAD FRONT DEVICE, NORMAL/EMERGENCY - WALL MOUNT	18"	KAIC		-		— NEW WORK	
G, GND GROUND	UNO UNLESS NOTED OTHERWISE	CONDUIT CONCEALED IN THE FLOOR OR BELOW		SPECIAL PURPOSE RECEPTACLE - WALL/CEILING	18"	<u> </u>	TRANSFER CAUTOU			EXISTING WORK	
GC GENERAL CONTRACTOR	USB UNIVERSAL SERIAL BUS	CONDUIT EXPOSED ON THE CEILING OR WALLS		SPECIAL PURPOSE RECEPTABLE - WALL/CEILING MOUNT	10		TRANSFER SWITCH: EQUIPMENT ID			DEMO WORK	
GFEP GROUND FAULT EQUIPMENT PROTECTION	UTP UNSHIELDED TWISTED PAIR	CONDUIT EXPOSED ON THE CEILING OR WALLS  CONDUIT BURIED UNDERGROUND (# = DEPTH)		EMEDGENCY SPECIAL DURDOSE DECERTACLE	12"	$\frac{1}{1}$ $\frac{3}{2}$ $\frac{3}{2}$ , W	VOLTAGE, PHASE, 3 OR 4 WIRE, AMP RATING OPEN/CLOSED/DELAYED				
GFI, GFCI GROUND FAULT CIRCUIT INTERRUPTER	V VOLT OR VOLTAGE	#\ CONDOIT BURIED UNDERGROUND (# - DEF ITI)		EMERGENCY SPECIAL PURPOSE RECEPTACLE - WALL/CEILING MOUNT	10	\	CALCULATED FAULT CURRENT			FUTURE WORK	
HH HAND HOLE	VA VOLT-AMP	CONDUIT WITH BEND DOWN		FLOOR BOX - DEVICES AS INDICATED		KAIC					
HOA HAND OFF AUTO	VAC VOLTS ALTERNATING CURRENT	CONDUIT WITH BEND UP		POWER POLE - DEVICES AS INDICATED	VERIFY	1					
IG ISOLATED GROUND	VDC VOLTS DIRECT CURRENT	CONDUIT WITH BUSHED END		ODOLIND DEEEDENOE DUO. AO NOTED. MALLIOSIUNO		ID HP	MOTOR: EQUIPMENT ID				
	W WATT, WIRE OR WALL PHONE	CONDUIT WITH BREAK OR CONTINUATION		G- G GROUND REFERENCE BUS - AS NOTED - WALL/CEILING		\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	HORSEPOWER, PHASE				
JBOX JUNCTION BOX	WATT, WIRE OR WALL THORL	ODOUTHOMEDIN				1					
101	WAP WIRELESS ACCESS POINT	CIRCUIT HOME RUN - L1 INDICATES PANEL					MULTIFUNCTION RFI AY				
KV KILOVOLT	,	L1 INDICATES PANEL - NUMBER	-			M M M	MULTIFUNCTION RELAY: NUMBERS INDICATE ANSI DEVICE NUMBERS				
KV KILOVOLT	WAP WIRELESS ACCESS POINT	L1 INDICATES PANEL				M M M MF	MULTIFUNCTION RELAY: NUMBERS INDICATE ANSI DEVICE NUMBERS				

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REPORT WAS I	PREPARED BY ME DIRECT						
DULY LICENSE	AND THAT I AM A D PROFESSIONAL DER THE LAWS OF						
THE STATE OF							
	7×14						
Signature Name Jiun Yih	Kam, P.E.						
Date 9/23/24 Registration Nur	mber _51923						
REVISIONS							
No. Date 09/23/2024	Description CD ISSUE						
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COPY. THE BA LONG ON A FU DRAWING SCA	R ABOVE IS 1" LL SIZE SHEET. LES APPLY TO						
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EXISTING 750 KW UTILITY TRANSFORMER

1" = 20'-0"

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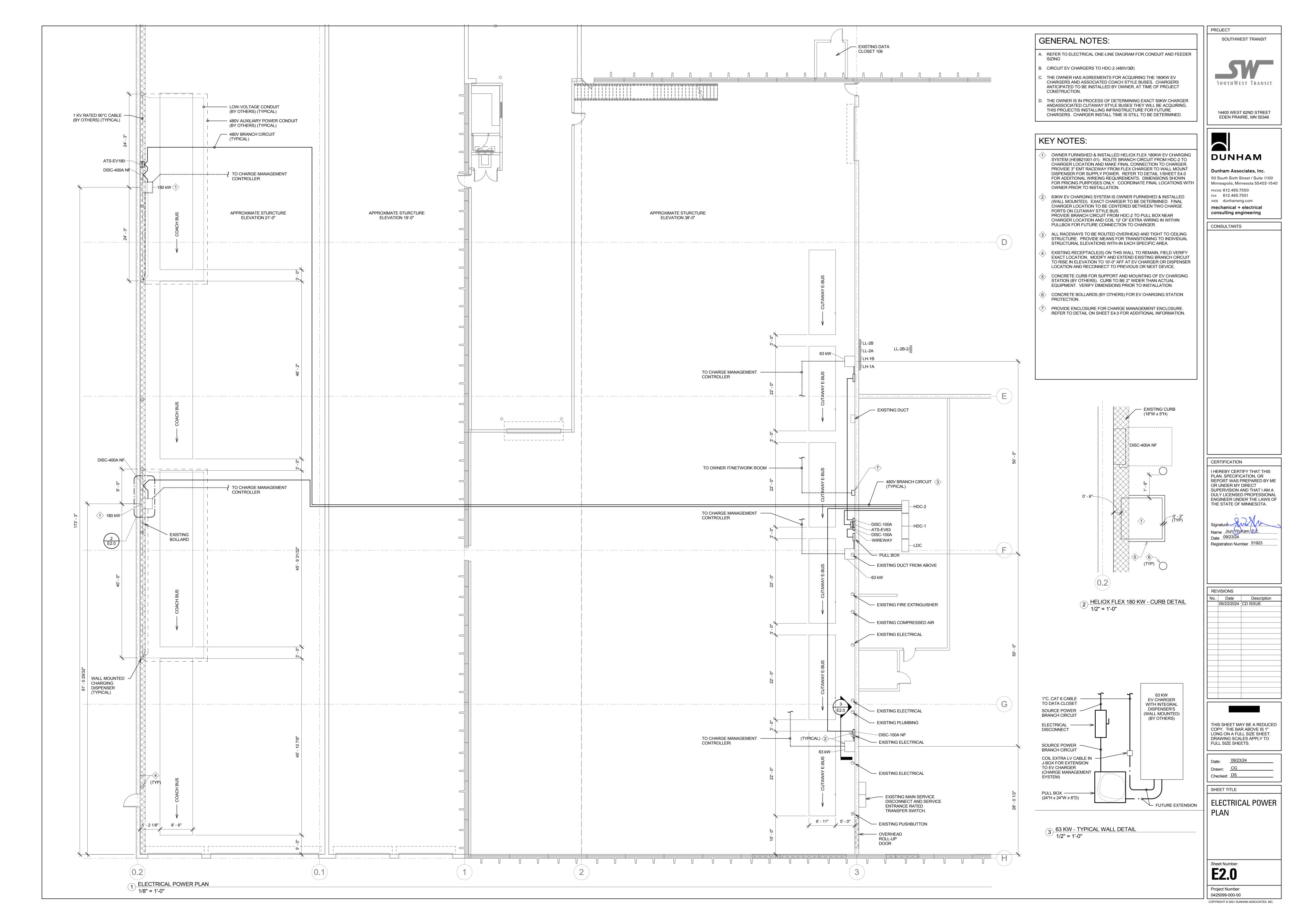
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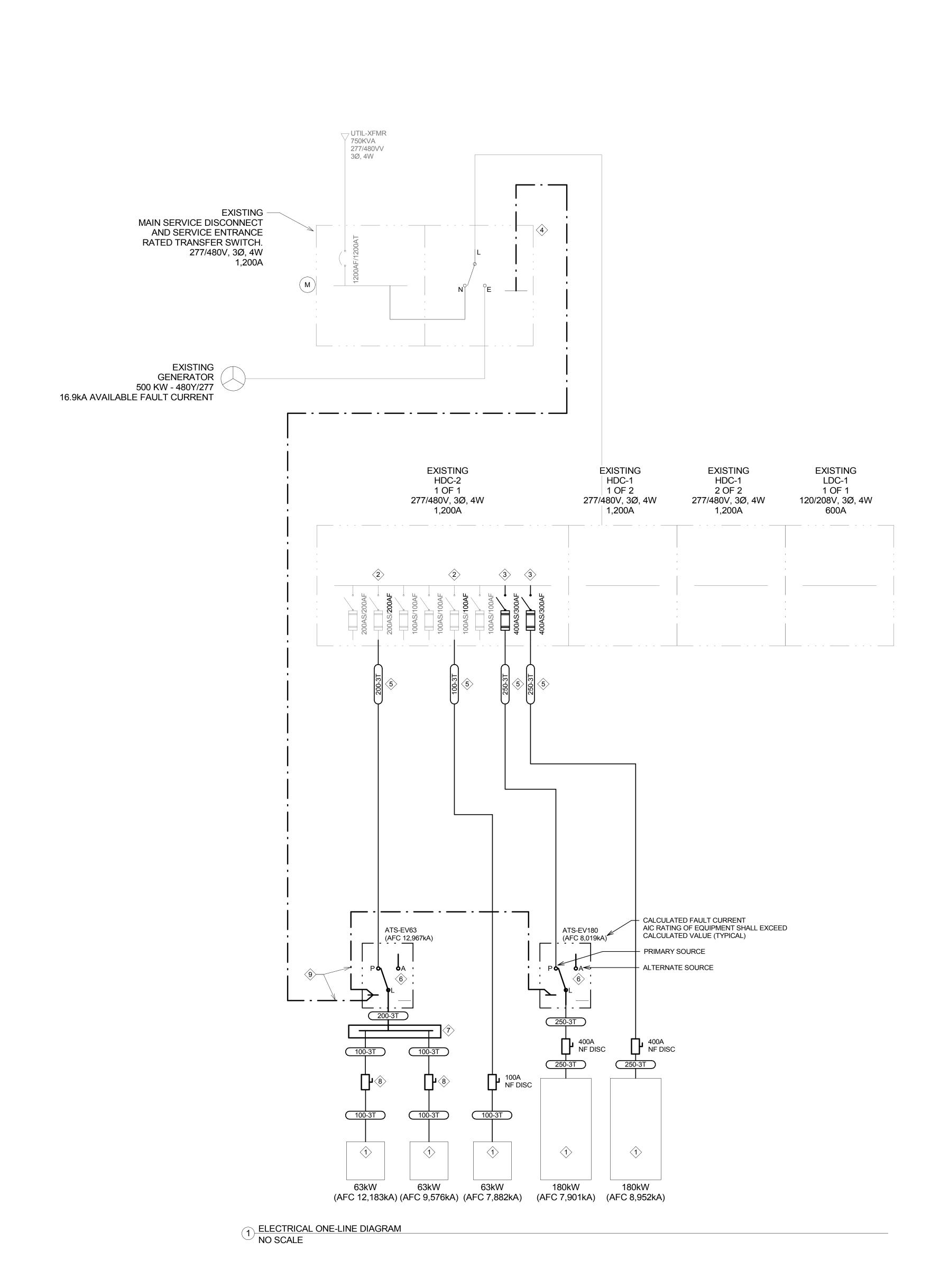
ELECTRICAL BUILDING OVERALL PLAN

E1.0

Project Number: 0425099-000-00

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TRANS	FER S\	WITCH	SCHEDUL	.E					
ATS NAME	VOLTAGE	SIZE	SWITCH TYPE	TRANSFER POLES	TRANSITION	MOUNTING	ACCESS	OPTIONS	NOTES
ATS-EV63	480 V	300 A	AUTOMATIC	3	OPEN	WALL	FRONT	LSR	1
ATS-EV180	480 V	300 A	AUTOMATIC	3	OPEN	WALL	FRONT	LSR	1

TRANSFER SWITCH OPTIONS: BI - BYPASS ISOLATION

DO - DRAW OUT IPM - IN-PHASE MONITOR ECC - ELEVATOR CONTROL CONTACTS LSR - LOAD SHED RELAY ECM - ETHERNET COMMUNICATIONS MODULE

ESR - ELEVATOR/ESCALATOR PRE-TRANSFER ON - OVERSIZED NEUTRAL PM - POWER MANAGER RA - REMOTE ANNUNCIATOR SCM - SERIAL COMMUNICATION MODULE

MDR - MOTOR DISCONNECT RELAY SMDR - SEQUENTIAL MOTOR DISCONNECT RELAY GENERAL NOTES

A. SEE RISER DIAGRAM FOR CALCULATED AVAILABLE FAULT CURRENT. TRANSFER SWITCH SHALL HAVE HIGHER SHORT-CIRCUIT CURRENT RATING THAN CALCULATED VALUE SHOWN ON RISER DIAGRAM.

ELECTRICAL NOTES: . PROVIDE NEMA 3R ENCLOSURE WITH INTERNAL STRIP HEATER.

FEEDER SCHEDULE					
<u> </u>					
FEEDER	FEEDER DESCRIPTION	CONDUIT	NOTES		
			4		
100-3T	1-1/4"C, 3#3 + #8 G	EMT	1		
100-3T 200-3T	1-1/4"C, 3#3 + #8 G 2"C, 3#3/0 + #6 G	EMT EMT	1		

SINGLE PHASE -3 THREE PHASE

SE SERVICE ENTRANCE SECONDARY (LV TRANSFORMER) SIZED FOR VOLTAGE DROP

PVC UNDERGROUND ALUMINUM

ADDED NEUTRAL THREE WIRE ONLY, NO NEUTRAL

**GENERAL NOTES:** 

A. NOMENCLATURE DEFAULTS WITH A SINGLE NEUTRAL AND A GROUND.

I. FEEDER SIZE INCREASED DUE TO UNKNOWN CHARGER MANUFACTURE AND EXACT CHARGER TO BE FURNISHED BY OWNER.

MEZZ XFMR

MDS LINEUP PHOTO

EXISTING HDC-2

#### KEY NOTES:

- OWNER FURNISHED AND INSTALLED EV CHARGER. CONTRACTOR TO MAKE FINAL CONNECTIONS.
- 2 PROVIDE NEW FUSES IN EXISTING SWITCH.
- 3 PROVIDE 400AS/300AF SWITCH IN EXISTING SWITCHBOARD.
- 4 EXISTING TRANSFER SWITCH IS ZENITH/STATES ELECTRIC. INCLUDE COSTS FOR ANY REQUIRED PROGRAMMING/EQUIPMENT MODIFICATIONS TO SEND TRANSFER SIGNAL TO ATS-EV50 AND ATS-EV180
- 5 ALL FEEDERS SHALL BE ROUTED OVERHEAD, TIGHT TO CEILING STRUCTURE TO MAINTAIN MAXIMUM CLEARANCES (TYPICAL).
- 6 ALTERNATE BUS TO BE OPEN/NOT CONNECTED FOR LOAD SHEDDING DURING GENERATOR OPERATION.
- 7 PROVIDE 8"x8"x48" WIREWAY.

#### 8 PROVIDE 100A FUSED SWITCH AND SIZE FUSES PER EV CHARGER MANUFACTURES RECOMMENDATION.

PROVIDE 3/4"C, 2#12 CABLING TO RECEIVE SIGNAL FROM SERVICE ENTRANCE ATS TO ATS-EV50 AND ATS-EV180.

### GENERATOR OPERATION SEQUENCE

UPON GENERATOR STARTING AND SERVICE ENTRANCE TRANSFER SWITCH SWITCHING TO ALTERNATE SOURCE, TRANSFER SWITCH SHALL SEND SIGNAL TO ATS-EV50 AND ATS-EV180 THAT THE BUILDING IS OPERATING ON ALTERNATE POWER SOURCE.

- UPON RECEIVING SIGNAL THAT BUILDING IS OPERATING ON ALTERNATE POWER SOURCE, ATS-EV50 AND ATS-EV180 SHALL TRANSFER TO ALTERNATE SOURCE (LOAD SHED MODE).
- AFTER UTILITY POWER IS RESTORED AND SERVICE ENTRANCE ATS HAS TRANSFERED BACK TO PRIMARY POWER SOURCE, ALTERNATE SOURCE SIGNAL IS LOST, AND ATS-EV50 AND ATS-EV180 SHALL TRANSFER BACK AUTOMATICALLY TO PRIMARY SOURCE.

LOCATION FOR NEW 400A FUSED SWITCH. EXISTING SWITCHBOARD SECTION MANUFACTURED BY EMI. —

HDC FRONT PHOTO

## ELECTRICAL LOAD CALCULATION

SWT BLDG MAX DEMAND PER OWNERS LOAD STUDY: DEMAND FACTOR PER NEC 220.87: DESIGN MAXIMUM DEMAND: ADDED EV CHARGER LOAD:	221.00KW 1.25% 276.25KW 510KW
TOTAL BUILDING DESIGN LOAD:	786.25KW

BUILDING SERVICE SIZE: TOTAL BUILDING DESIGN:

BUILDING SERVICE SPARE CAPACITY:

Project Number: 0425099-000-00

1200A 946A

254A

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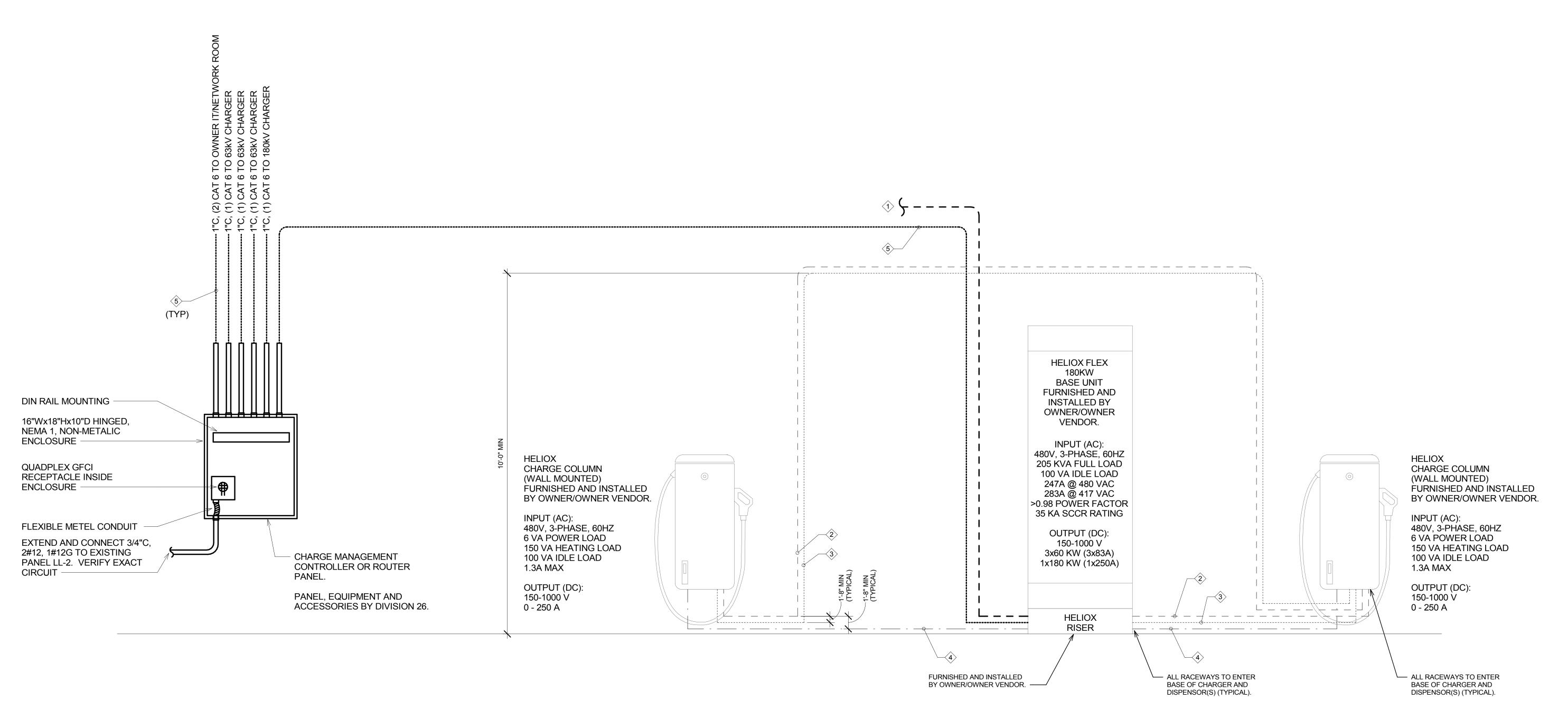
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SHEET TITLE

ELECTRICAL ONE-LINE DIAGRAM

**E3.0** 



	FEEDER SCHEDULE (PER 180kW SYSTEM)							
TAG	FROM	ТО	CONDUIT/CABLE SPECIFICATIONS	NOTES				
1>	CUSTOMER FEEDER BREAKER	180KW FLEX BASE STATION	SEE ONE-LINE DIAGRAM	TERMINATE WITH M10 GALVANIZED CLASS 8.8 NARROW CABLE LUGS IN HELIOX CABINET (1.75" MAX WIDTH). FURNISHED AND INSTALLED BY DIVISION 26.				
<u>(2)</u>	180KW FLEX BASE STATION OR CHARGE COLUMN	CHARGE COLUMN	<ul> <li>1" CONDUIT</li> <li>480VAC, 3-PHASE + GROUND</li> <li>600V RATED 90°C CABLE</li> <li>#12 AWG CU THWN</li> </ul>	AC AUXILARY POWER FURNISHED AND INSTALLED BY OTHER (EV CHARGER INSTALLER).				
3>	180KW FLEX BASE STATION OR CHARGE COLUMN	CHARGE COLUMN	<ul> <li>2" CONDUIT</li> <li>DOOR INTERLOCK: 2#18 AWG</li> <li>E-STOP: 2#18 AWG</li> <li>CAN: #22 AWG 2-WIRE TWISTED SHIELDED PAIR WITH 120 OHM CHARACTERISTIC IMPEDANCE</li> <li>EITHERNET: CAT 6 S/FTP CABLE</li> </ul>	RIGID METAL CONDUIT OR SEPARATE FROM AC AND DC POWER CONDUITS BY 20" MINIMUM. TOTAL DISTANCE LIMITED TO 250 METERS FROM BASE STATION TO LAST CHARGE COLUMN WITH SINGLE RUNS LIMITED TO 100 METERS. FURNISHED AND INSTALLED BY OTHER (EV CHARGER INSTALLER).				
4>	180KW FLEX BASE STATION	CHARGE COLUMN	<ul> <li>3" CONDUIT</li> <li>1 KV RATED 90°C CABLE</li> <li>(2 SETS) 3/0</li> </ul>	GROUND CABLE TERMINATE WITH M10 GALVANIZED CLASS 8.8 NARROW CABLE LUGS (0.98" MAX WIDTH). FURNISHED AND INSTALLED BY OTHER (EV CHARGER INSTALLER).				
<u>\$</u>	180KW FLEX BASE STATION	DATA CLOSET 106 (CUSTOMER CHARGE MANAGEMENT SYSTEM)	<ul> <li>1" CONDUIT</li> <li>CAT 6 SHIELDED CABLE</li> </ul>	CONNECTION TO CUSTOMER CHARGE MANAGEMENT SYSTEM. FURNISHED AND INSTALLED BY DIVISION 26.				

- 1. ALL COPPER CONDUCTORS SHALL BE USED.
- 2. ALL CONDUCTORS UL LISTED AND RATED FOR 90°C AND WET LOCATIONS. FLEXIBLE CABLE RECOMMENDED FOR AC AND DC CABLE.
- 3. COMMUNCATION AND CONTROL CABLE DAISY CHAIN TERMINATIONS SHALL FOLLOW ORDER OF DC POWER TERMINCATION (DC OUTPUT 1 FIRST, DC OUTPUT 2 SECOND, DC OUTPUT 3 THIRD IN DAISY CHAIN).
- 4. SEAL ALL CONDUIT ENDS WITH APPROVED PRODUCTS COMPATIBLE WITH CABLE JACKETING. (SUGGESTED PRODUCTS: AQUASTOP 2100, POLYWATER AFT)

1 HE100 - HELIOX FLEX 180KW - BASE UNIT NO SCALE

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SHEET TITLE

ELECTRICAL DETAILS

**E4.0** 

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