

EV CHARGING STATION INSTALLATION

1735 NORTH BISHOP AVE
ROLLA, MO 65401

SCOPE OF WORK

INSTALL (2) DCFC, NEW ELECTRICAL POLE, UTILITY TRANFORMER & ELECTRICAL EQUIPMENTS.

APPLICABLE CODES

WORK PERFORMED UNDER THIS CONTRACT SHALL, AT A MINIMUM, BE IN CONFORMANCE WITH APPLICABLE NATIONAL, STATE AND LOCAL CODES HAVING JURISDICTION. EQUIPMENT FURNISHED AND ASSOCIATED INSTALLATION WORK PERFORMED UNDER THIS CONTRACT SHALL BE IN STRICT COMPLIANCE WITH CURRENT APPLICABLE CODES ADOPTED BY THE LOCAL AHJ, INCLUDING ANY AMENDMENTS AND STANDARDS AS SET FORTH BY THE FOLLOWING:

- 2018 INTERNATIONAL BUILDING CODE (IBC)
- 2015 INTERNATIONAL EXISTING BUILDING CODE (IEBC)
- 2009 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
- NATIONAL ELECTRICAL CODE 2017 (NEC)

WHERE THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THE REFERENCED CODES, STANDARDS, ETC., THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE. WHERE CONFLICTS BETWEEN VARIOUS CODES, ORDINANCES, RULES, AND REGULATIONS EXIST, COMPLY WITH THE MOST STRINGENT. PROMPTLY BRING ALL CONFLICTS OBSERVED BETWEEN CODES, ORDINANCES, RULES, REGULATIONS, REFERENCED STANDARDS, AND THESE DOCUMENTS TO THE ATTENTION OF THE ENGINEER FOR FINAL RESOLUTION. CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY VIOLATION OF THE LAW.

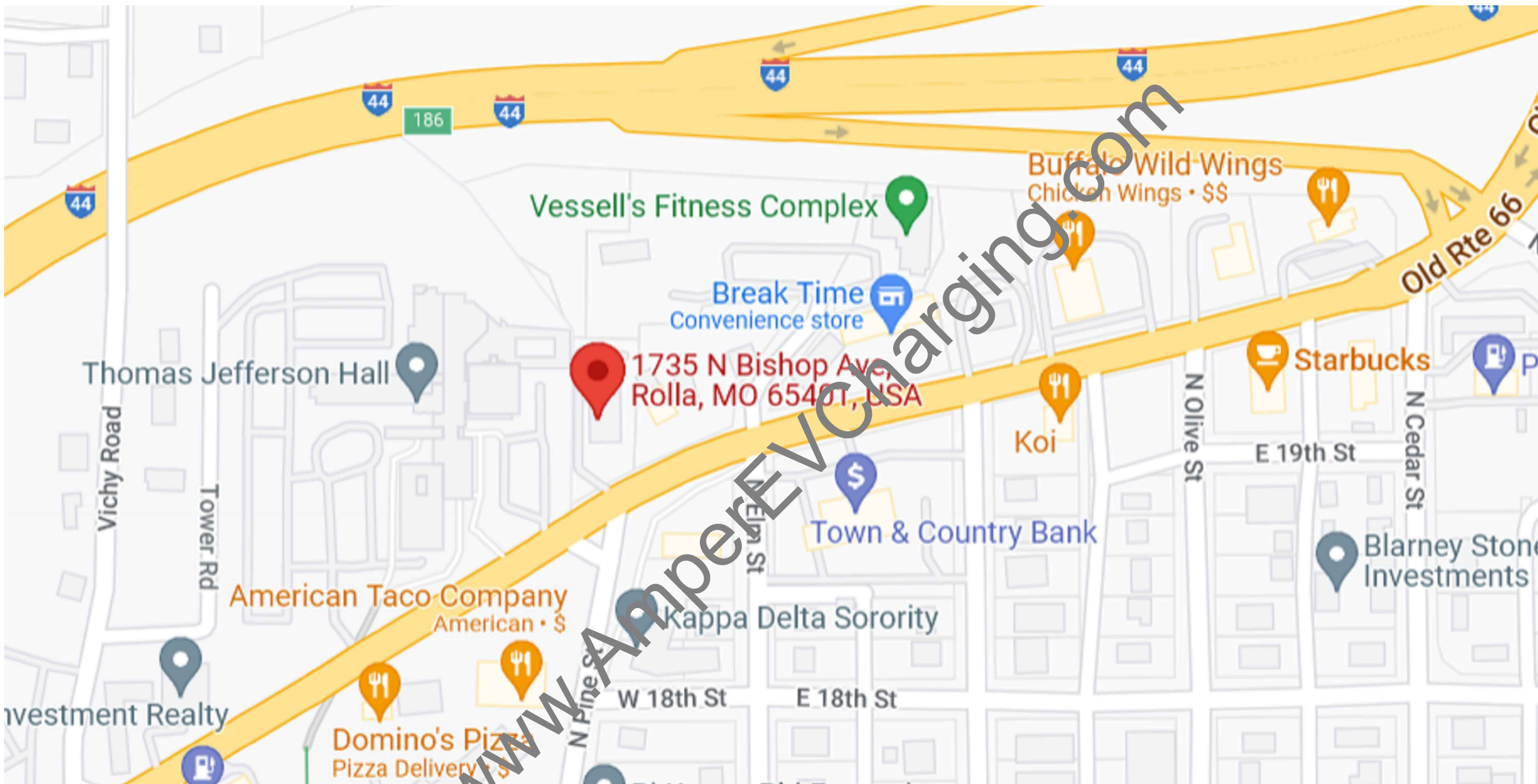
UNDERGROUND UTILITIES



CALL AT LEAST TWO WORKING
DAYS BEFORE YOU DIG

EXISTING UNDERGROUND FACILITIES ARE SHOWN ON THESE PLANS FROM RECORD INFORMATION AND ARE INFORMATION ONLY. OTHER UNDERGROUND FACILITIES NOT SHOWN ON THE PLANS MAY EXIST. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL EXISTING UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY A ONE-CALL SERVICE CENTER, TOLL FREE AT 811, NO LESS TWO DAYS PRIOR TO ANY EXCAVATION.

VICINITY MAP



SATELLITE VIEW



SHEET INDEX

DRAWING SUBMITTALS STATUS

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EV05	INSTALLATION DETAILS SHEET 1	●
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LEGEND	
UPDATED DRAWING ISSUE	●
UNCHANGED	○
DRAWING REMOVED FROM SUBMITTAL	X

SEAL & SIGNATURE:



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REV	DATE	DESCRIPTION
0	01/31/2023	ISSUED FOR APPROVAL

CLIENT:



ADDRESS:
185 INDUSTRIAL PKWY,
BRANCHBURG, NJ 08876
PHONE:
908-801-6890

PROJECT:

**EVCS
INSTALLATION**

ADDRESS:
1735 NORTH BISHOP AVE
ROLLA, MO 65401

AMPER PROJECT NUMBER:

1626

SHEET SIZE:
24X36

DESIGNED BY:
AC

DRAWN BY:
IB

CHECKED BY:
DEE

SHEET TITLE:

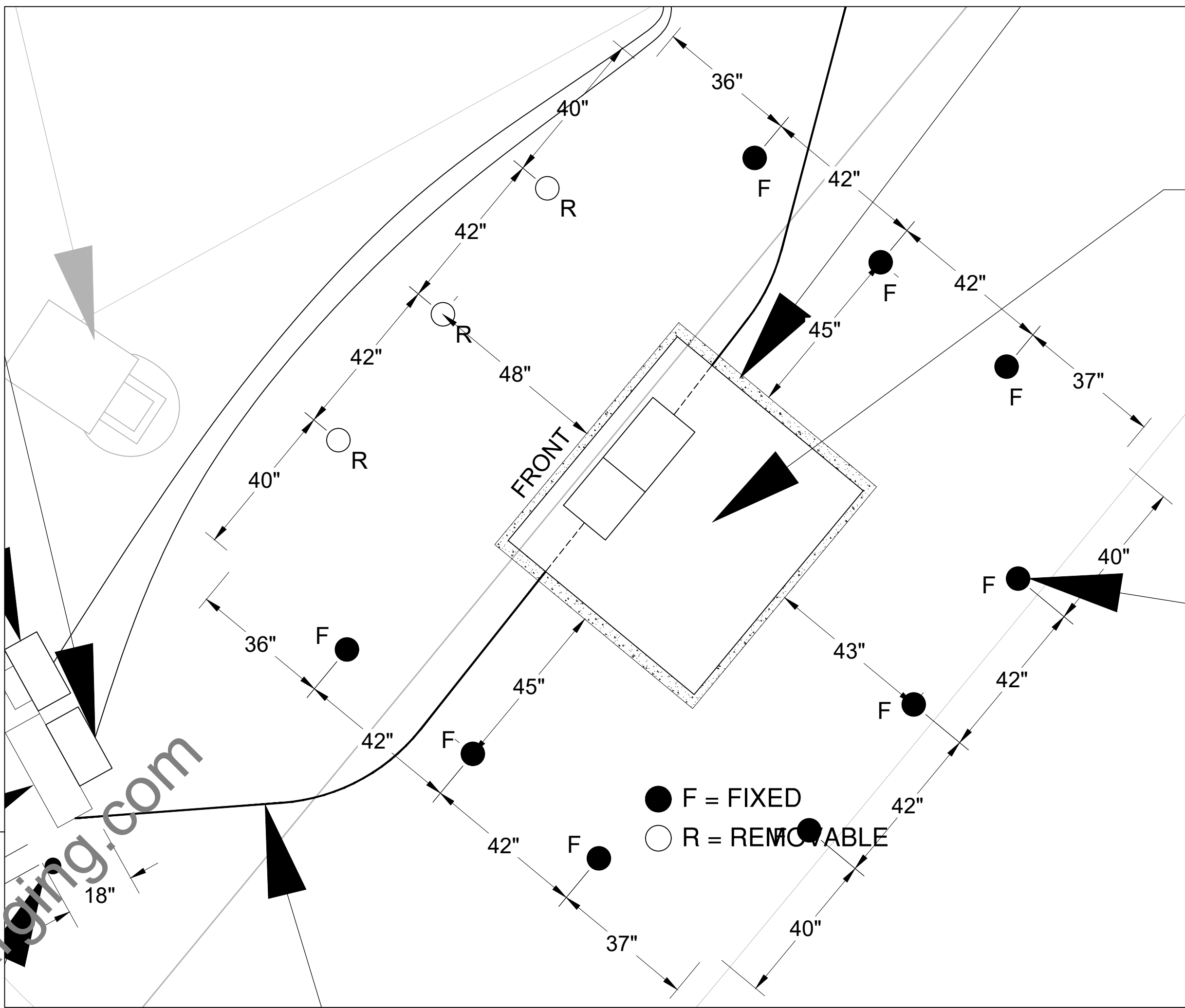
COVER SHEET

SHEET NO:

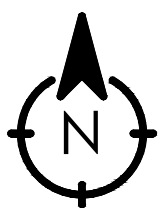
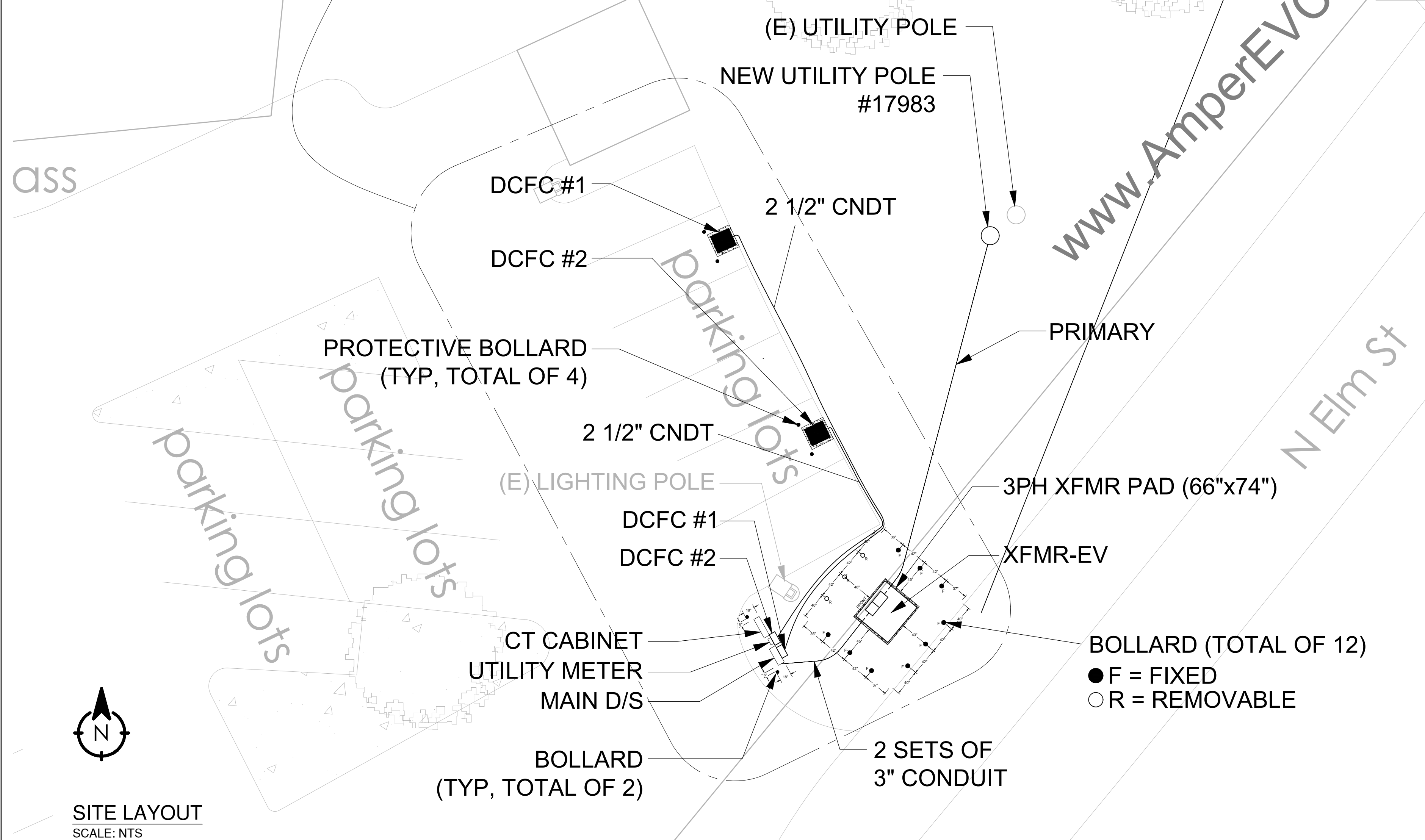
EV01



STREET VIEW

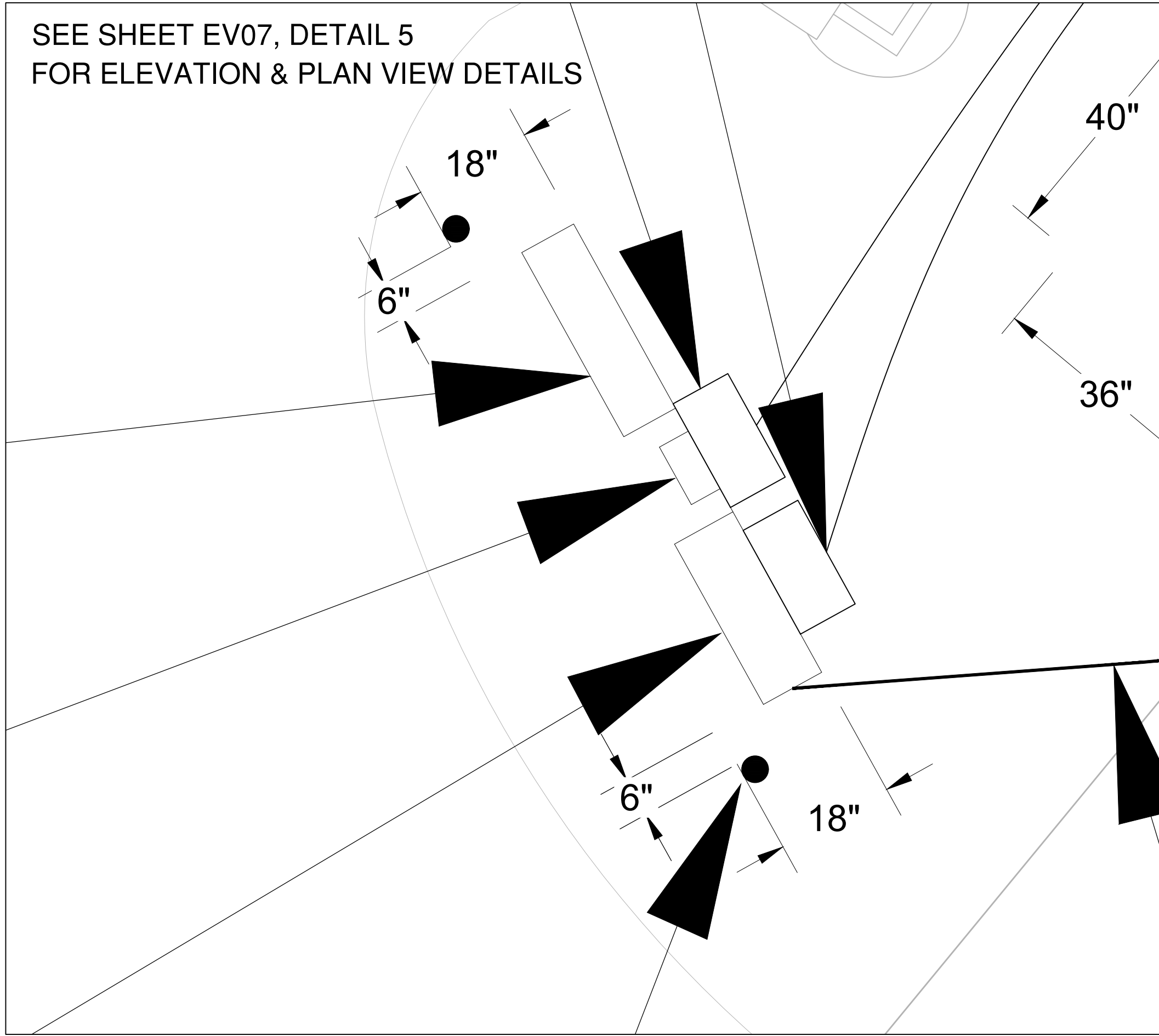


XFMR PAD ENLARGED VIEW
SCALE: 1/2" = 1'-0"



SITE LAYOUT
SCALE: NTS

SEE SHEET EV07, DETAIL 5
FOR ELEVATION & PLAN VIEW DETAILS



ELECTRICAL EQUIPMENT ENLARGED VIEW
SCALE: 3/4" = 1'-0"

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1735 NORTH BISHOP AVE
ROLLA, MO 65401

AMPER PROJECT NUMBER: 1626	DRAWN BY: IB
SHEET SIZE: 24X36	CHECKED BY: DEE
DESIGNED BY: AC	

SHEET TITLE:
SITE LAYOUT

SHEET NO:
EV03

ELECTRICAL LOAD CALCULATION

A) BASED ON THE PRODUCT SPECIFICATION (SEE SHEET EV09 DETAIL 3):

INPUT VOLTAGE : 480VAC (3P+N+PE)
FLA/BREAKER RATING : 160A / 200A
POWER FACTOR : >0.98
POWER : 120KW

B) CALCULATING TOTAL MAXIMUM DEMAND (KVA):

- i. DCFC #1 = 120KW x P.F
DEMAND LOAD (KVA) = 120 x 0.98 = 117.6KVA x 125% = 147KVA
- ii. DCFC #2 = 120KW x P.F
DEMAND LOAD (KVA) = 120 x 0.98 = 117.6KVA x 125% = 147KVA
- iii. DCFC #3 (FUTURE LOAD) = 120 x 0.98 = 117.6KVA x 125% 147KVA

TOTAL MAXIMUM DEMAND LOAD (KVA) = 147 x 3 = 441KVA

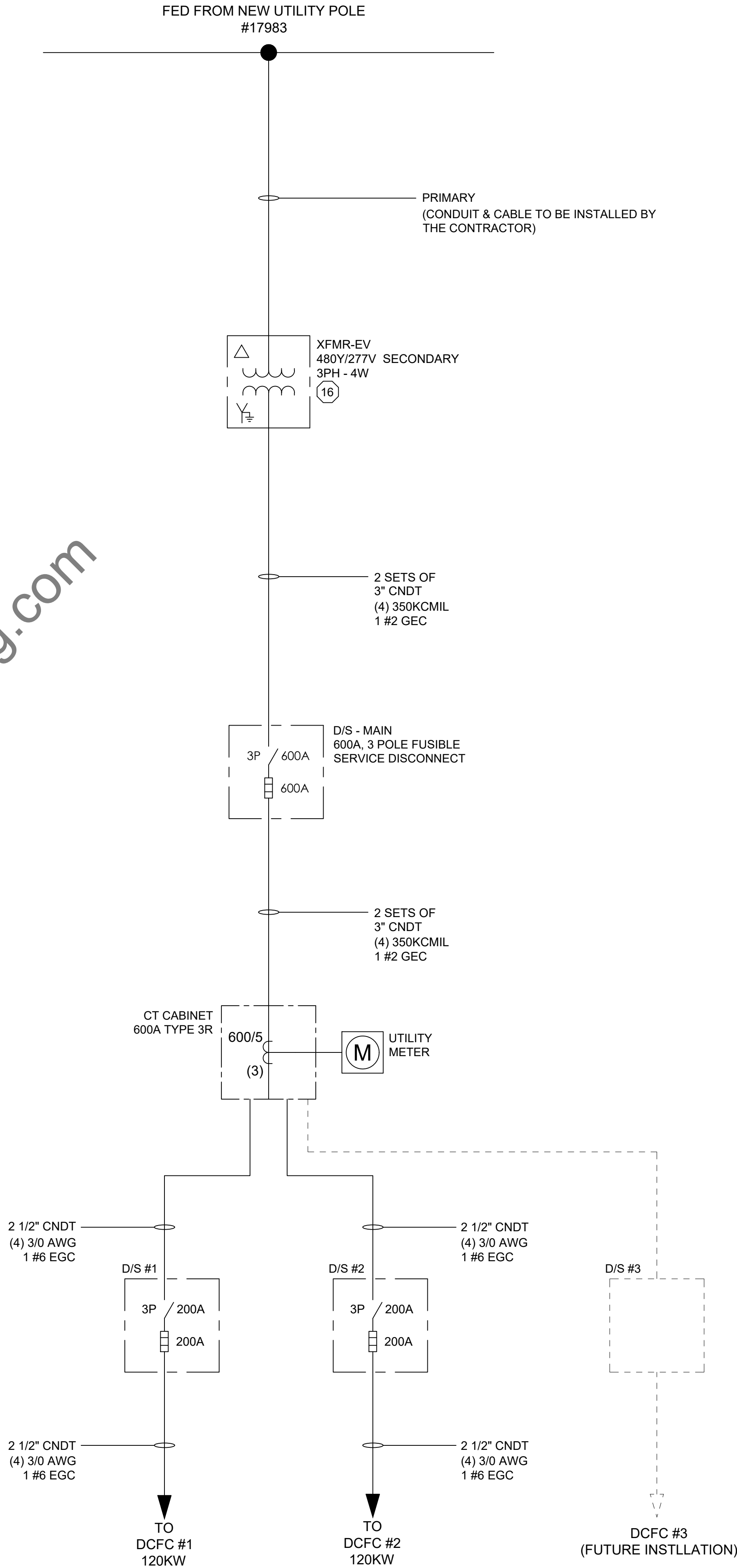
C) CALCULATING TOTAL MAXIMUM DEMAND LOAD (AMP):

$I = 441 / (1.732 \times 0.48)$
I = 530A

MINIMUM SERVICE SIZE : 600A

KEY NOTES:

- 1 ALL ELECTRICAL WORK AND RELATED ACTIVITIES PERFORMED ON-SITE SHALL BE DONE IN ACCORDANCE WITH NATIONAL ELECTRIC CODE (NEC) STANDARDS BEING ENFORCED BY ALL APPLICABLE JURISDICTIONAL REQUIREMENTS AT THE TIME OF CONSTRUCTION.
- 2 UTILITY EQUIPMENT INSTALLATIONS AND PREP WORK SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY ENGINEER AT TIME OF PRECONSTRUCTION MEETING TO ENSURE ACCURACY OF INSTALLATIONS.
- 3 CONDUIT PATHS ARE REPRESENTATIVE ONLY. EXACT CONDUIT PLACEMENT TO BE DETERMINED ON SITE BASED ON FIELD CONDITIONS.
- 4 A NATIONALLY RECOGNIZED TESTING LABORATORY SHALL LIST ALL EQUIPMENT IN COMPLIANCE WITH NEC ARTICLE 110.3
- 5 ALL EXTERIOR EQUIPMENT SHALL BE RAIN TIGHT AND APPROVED FOR USE IN WET CONDITIONS.
- 6 ALL CONDUCTORS TO BE THHN COPPER
- 7 ALL CONDUCTORS AND CABLES SHALL BE PROVIDED WITH STRAIN RELIEF UPON ENTRY INTO ENCLOSURES
- 8 EACH UNGROUNDED CONDUCTOR SHALL BE IDENTIFIED BY PHASE AND SYSTEM PER NEC 210.5
- 9 ALL METALLIC COMPONENTS SHALL BE GROUNDED VIA ELECTRIC GROUNDING CONDUCTORS.
- 10 ALL UNDERGROUND CONDUIT TO BE UL RATED, MINIMUM 24" DEEP.
- 11 WIRING FOR ELECTRICAL VEHICLE CHARGING STATIONS TO BE INSTALLED PER MANUFACTURER'S DIRECTIONS AND SPECIFICATIONS.
- 12 CONTRACTOR TO ENSURE THAT ALL FEEDERS, CONDUITS, CONDUCTORS, OCPD, TRANSFORMERS, ELECTRICAL PANELS AND OTHER ELECTRICAL EQUIPMENT IS SIZED TO COMPLY WITH CURRENT NEC AND LOCAL AHJ CODES.
- 13 CONTRACTOR IS RESPONSIBLE TO VERIFY DESIGN, ENGINEERING ASSUMPTIONS AND EXISTING FIELD CONDITIONS. REPORT ANY INSUFFICIENCIES TO ENGINEER OF RECORD PRIOR TO ANY WORK BEING PERFORMED.
- 14 ELECTRICAL EQUIPEMENT PROVIDING POWER TO DCFC MUST BE IN COMPLIANCE WITH NEC 625.43, READILY ACCESSIBLE LOCATION. THE DISCONNECTING MEANS SHALL BE LOCKABLE OPEN IN ACCORDANCE WITH 110.25.
- 15 GROUNDING INSTALLATION AS PER NEC ART. 250.
- 16 CONTRACTOR TO VERIFY XFMR-EV PHASE VECTORS, CONNECTION AND SECONDARY VOLTAGE PRIOR TO CONSTRUCTION.



SINGLE LINE DIAGRAM

PROFESSIONAL ENGINEERING:



SEAL & SIGNATURE:



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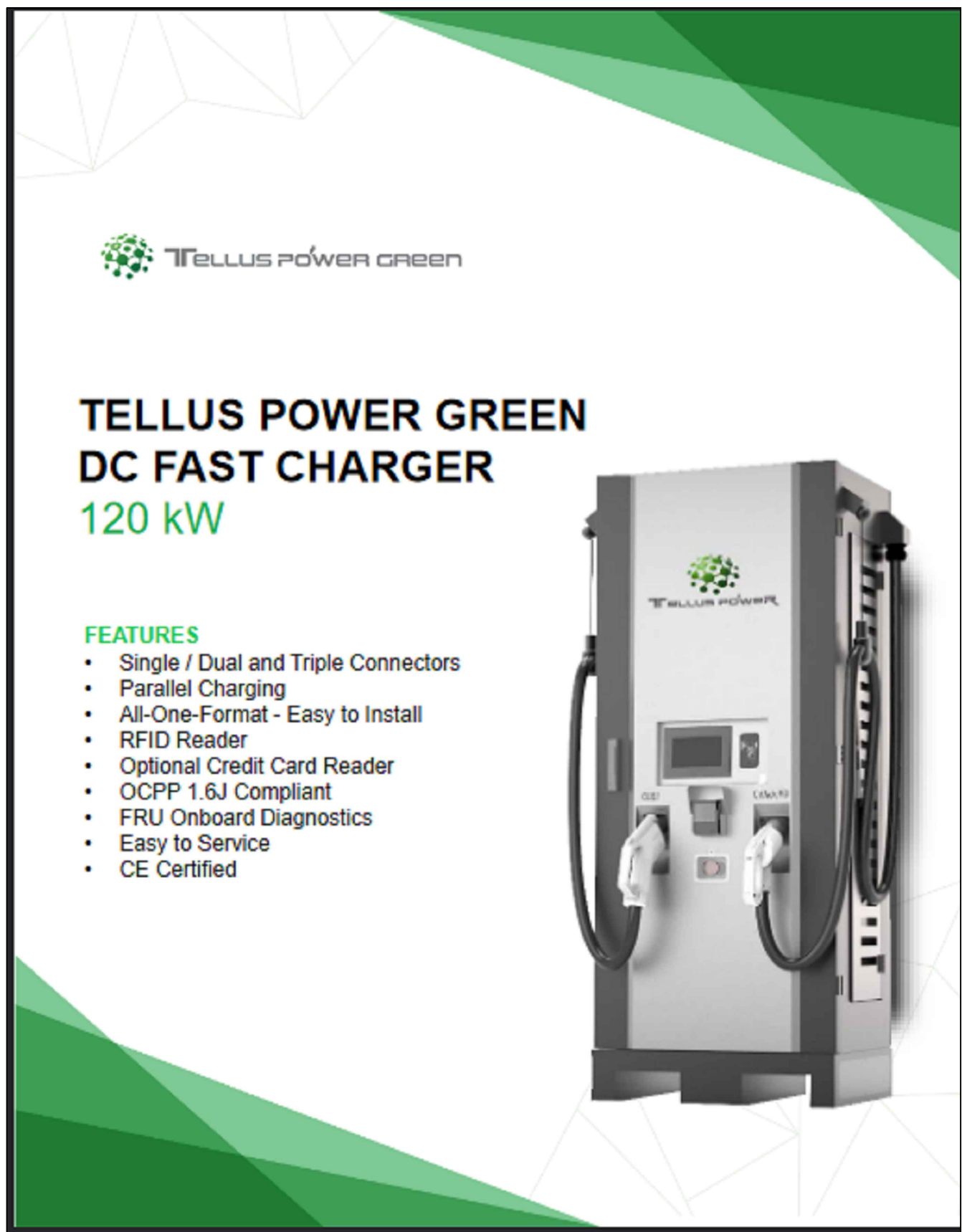
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SHEET SIZE:
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DRAWN BY:
IB
DESIGNED BY:
AC
CHECKED BY:
DEE

SHEET TITLE:
**SINGLE LINE DIAGRAM &
LOAD CALCULATION**

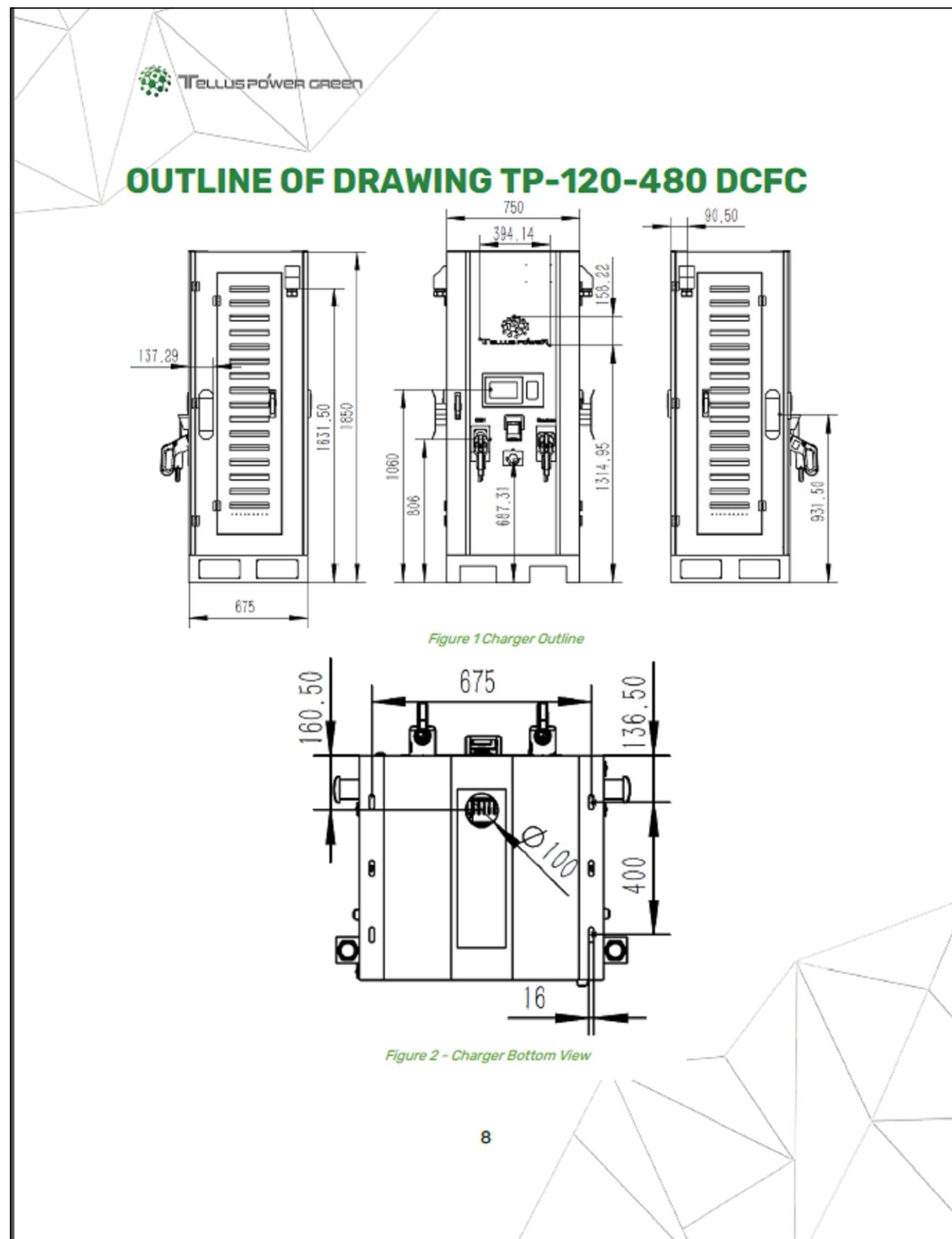
SHEET NO:
EV04



1 DCFC OVERVIEW
SCALE: NTS

Tellus Power Green TP-120-480 Specifications		
Product Number	TP4-120-480	TP5-120-480
Input	480VAC (3P+N+PE)	
Frequency	60Hz	
Output Voltage	150-750VDC	150-1000VDC
Output current	0 to 200A	
PLA Breaker Rating	150A @ 200A	
Connectors	CCS1 CCS1 and CCS1 CCS1 & CHAdeMO	
Cyclic Charge Mode	CCS1 - 200 A CHAdeMO - 125 A	
Parallel Charge Mode (Optional)	60 kW per Port	
Efficiency	≥94% at nominal output power	
Power factor	≥0.98	
Operating Temperature	-22°F to 131°F (-30°C to 55°C)	
Altitude	< 6600' (2000m)	
Working Storage Humidity	≤ 95% RH ≤ 99% RH (Non-condensing)	
Weight	840 lbs (380kg)	
Display	7" LCD with touch screen	
Access Control	RFID: ISO14443A/B Credit Card Reader - Optional	
Dimensions (L x D x H)	29" x 35.5" x 72"	
Protective Class	NEMA 3S, IP50	
Power Electronics Cooling	Air Cooling	
Charging Protocol Standards	Mode 4 - IEC 61851 150-10118, DIN 70121 Mode 4 - CHAdeMO 0.9, 1.0	
Length of charging cable	16ft (5m)	
Interface protocol	OCPP 1.6J	
Communication	Ethernet, 4G/Wi-Fi	
Insulation (Input-output)	≥2.5 kV	
Electrical Safety: GFCI	RCD 20 mA Type A	
Electrical Safety: Surge Protection	20 kA	
Electrical Safety: General	Over Voltage, Under Voltage, Over Current, Missing Ground	
Electrical Safety: Output Short	Output power disabled when output is short circuited	
Electrical Safety: Temperature	Temperature Sensors @ Charge Coupler and Power Electronics	
Emergency Stop	Emergency Stop Button Disables Output Power	
Regulatory Compliance	UL-2202 EMC: EN 61000-6-1/EN 61007 EN 61000-6-3/EN 61010/AC 2012	

2 PRODUCT SPECIFICATION
SCALE: NTS



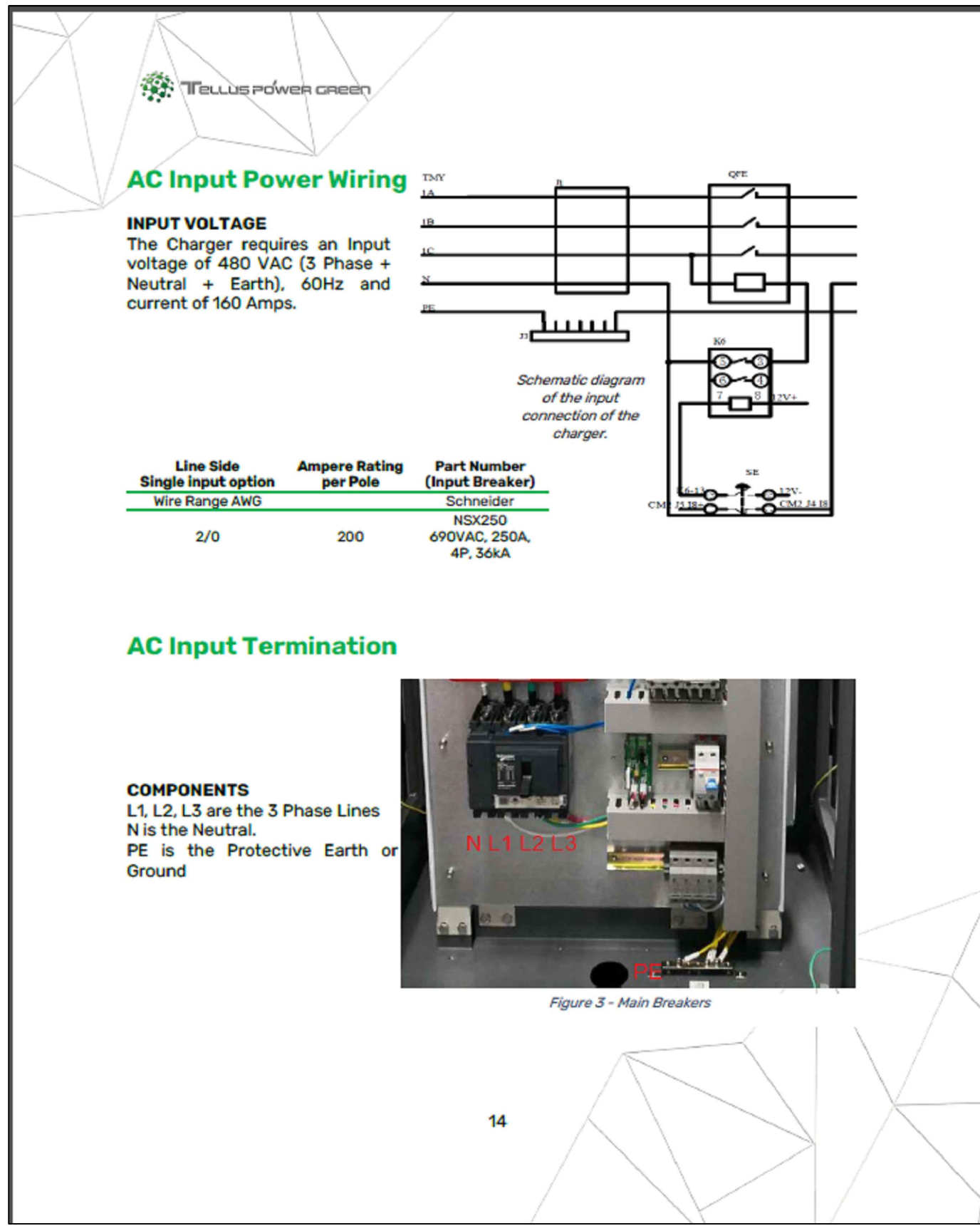
3 DCFC DIMENSIONS
SCALE: NTS

Product data sheet Characteristics	
H366NR Safety switch, heavy duty, fusible, 600A, 4 wire, 3 poles, 1 neutral, 500hp, 600VAC/DC, Type 3R	
Main	Single Throw Safety Switch
Product	Heavy duty
Duty Rating	Heavy application
Disconnect Type	Fusible disconnect
Factory Installed Neutral	Neutral (factory installed)
Phase	3 phase
Number of Poles	3
Current Rating	600 A
Voltage Rating	600 V AC/DC
Enclosure Rating	NEMA 3R galvanized steel
Motor power hp	150 hp at 480 V AC 50-60 Hz for 3 phase motors 400 hp at 480 V AC 50-60 Hz for 3 phase motors 200 hp at 480 V AC 50-60 Hz for 3 phase motors 500 hp at 600 V AC 50-60 Hz for 3 phase motors 50 hp at 200 V DC 50 hp at 600 V DC
Complementary	
Short Circuit Current Rating	10 kA-H or K 200 kA-R or J
Fuse type	H or K R or J
Mounting Type	Surface
Electrical Connection	Lugs
Wiring configuration	4-wire (3PH + N)
Wire Size	AWG 3/0...500 kcmil copper or aluminium
Tightening torque	375 lbf in (42.37 N.m) (AWG 3/0...500 kcmil)
Depth	10.13 in (257.30 mm)
Width	27.88 in (708.15 mm)
Height	50.31 in (1277.87 mm)
Net Weight	201.06 lb (US) (91.2 kg)
Environment	
Certifications	UL listed file E2875
Ordering and shipping details	
Category	00054-H8HJ SW NEMAR 400-1200A
Discount Schedule	DE1
GTIN	78501195525
Returnability	Yes
Country of origin	US

4 600A FUSIBLE DISCONNECT
SCALE: NTS

Product specifications	
Eaton DH364NRK	
Catalog Number: DH364NRK	
Eaton Enhanced visible blade single-throw safety switch, 200 A, NEMA 3R, Painted galvanized steel, Class K, Fusible with neutral, Three-pole, Four-wire, 600 V, Max Hp: 50, 50/ 125, 150 hp (L/3PH @480, 600 V), #6-250 kcmil Cu/Al	
General specifications	
Product Name	Catalog Number Eaton enhanced visible blade fusible safety switch DH364NRK
	UPC 782113208837
Product Length/Depth	Product Height 30 in 9.5 in
Product Width	Product Weight 18 in 52 lb
Warranty	Certifications Eaton Selling Policy 25-000, one (1) year UL Listed from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.

5 200A FUSIBLE DISCONNECT
SCALE: NTS



6 DCFC WIRING & TERMINATION
SCALE: NTS

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DESIGNED BY: AC	CHECKED BY: DEE

SHEET TITLE:
DATA SHEETS

SHEET NO:
EV09