Muscogee Nation Electric Vehicle Charging Station

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2021 Tribal Energy Webinar Series

Electric Vehicles: Opportunities and Challenges

THE MUSCOGEE NATION

Overview

Installed in Okmulgee, Oklahoma the Capital of the Muscogee Reservation

Funded by the VW Settlement

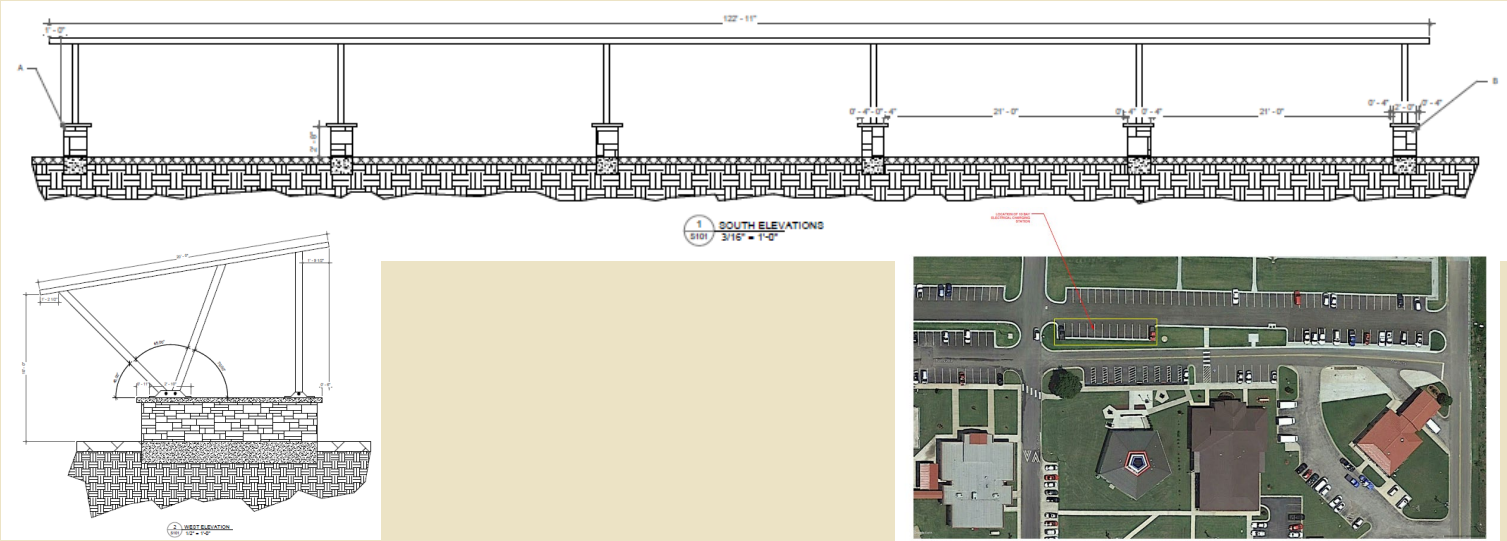
Designed by Muscogee Nation Tribal Construction

Total Project Cost: $169,742.00

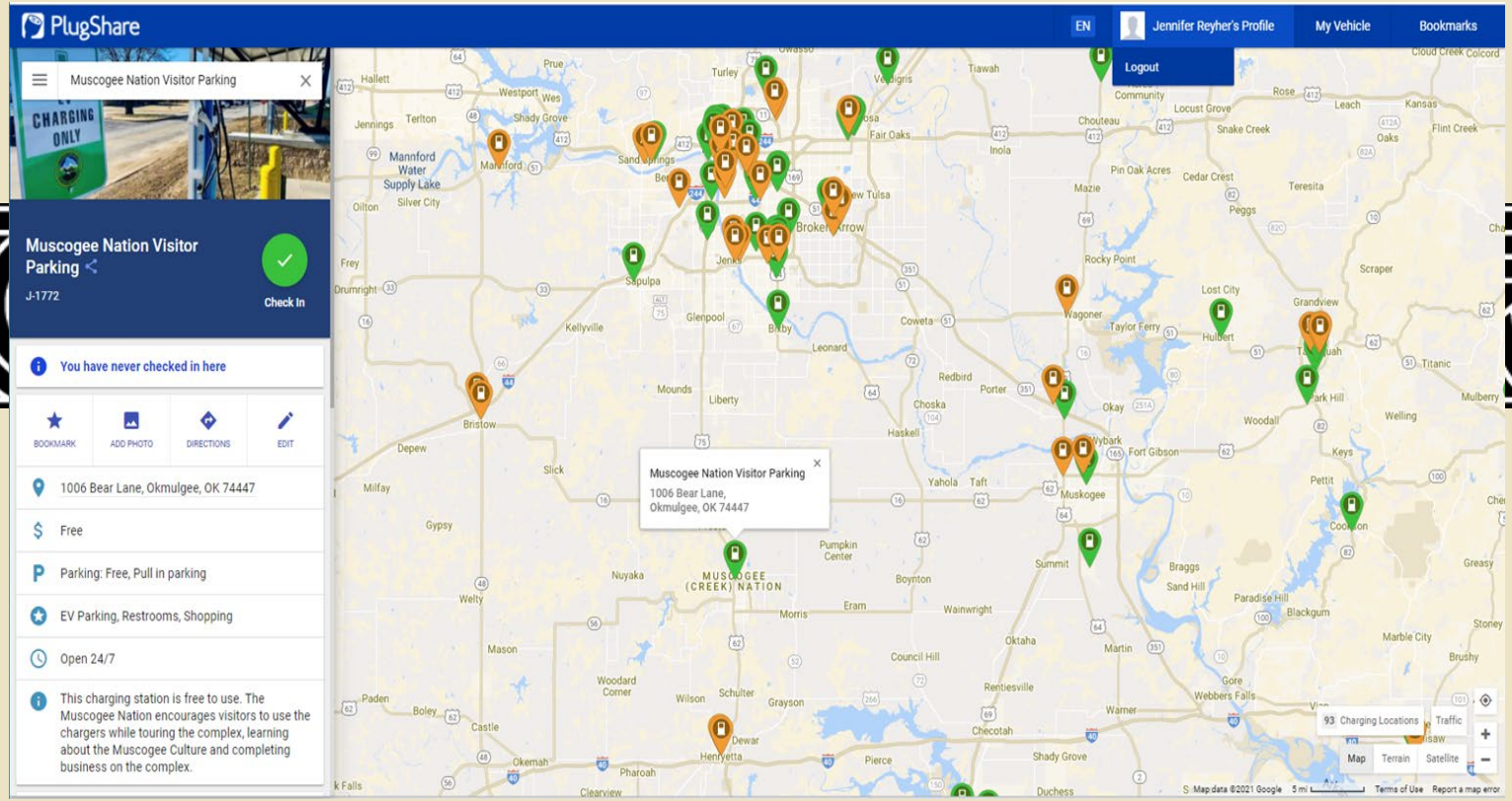
Planning and Design

Site Selection Considerations:

- Existing Infrastructure (Concrete, Electrical)
- Purpose (General Public, Employees, Fleet)
- Existing Charging Locations (Plugshare.com)



Supporting EV Infrastructure

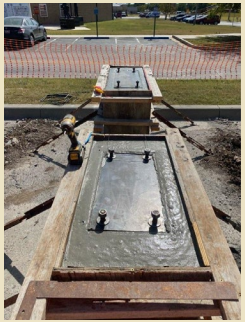


Construction Process

Start Date: Sept. 2020

Ribbon Cutting: April 2021






EV Charging Station

Five (5) Level 2 Chargers

- Three Dual Arm, Two Single Arm

Considerations

- How long will people use chargers
- Available electrical
- Cost of Electricity
- Operation and Maintenance
- Cost of Charging Station

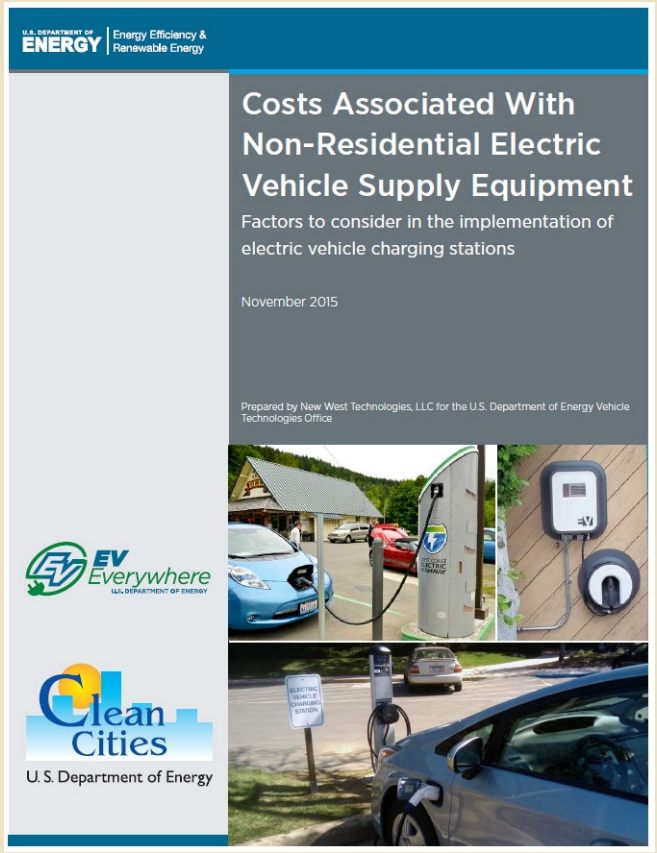
AC Level 2 30A / 40A
SINGLE or DUAL PORT CHARGING STATION
(PEDESTAL)

MODEL	DUAL PORT 30A	DUAL PORT 40A
MODEL Number	EVP-2002-30-P-0001	EVP-2002-40-P-0001
PRODUCT Number	L2P-30-240-15-001	L2P-40-240-15-001
Power per Port	7.2 kW (240VAC @ 30A)	9.6 kW (240VAC @ 40A)
ELECTRICAL SERVICE		
Power	240/208 VAC, 30A Load with 40A Branch Circuit Per Port	240/208 VAC, 40A Load with 50A Branch Circuit per Port
Service Panel	40A Breakers per Port (No GFCI)	50A Breakers per Port (No GFCI)
Service Wiring	3-Wire (L1, L2, Earth Ground)	
FUNCTIONAL INTERFACES		
Connector Type	SAE J1772	
Charging Protocol	SAE J1772	
Standard Cable Length	25 ft	
Cable Retractor	Optional (Cable 18 ft w/ Cable Management)	
LCD Display	500 Nits, 7" Color, 800 x 480, UV Protected	
Card Reader	ISO 14443 Type A & B, ISO 18092 NFC	
SAFETY AND CONNECTIVITY		
Ground Fault Detection	20 mA	
Plug-Out Detection	SAE J1772	
Power Measurement (opt)	Accuracy: 1% - 5%	
Power Report Interval	Every 15 minute on the hour	
Wireless	2.4 GHz Wi-Fi (802.11 b/g/n)	
Wide Area Network	4G Modem	
Communication Protocols	OCPP 1.5 and 1.6 Compliant	
SAFETY AND OPERATION		
Enclosure Rating	NEMA 3R	
Regulatory Compliance	ETL Certified for USA and cUL Certified for Canada; Complies with UL 2594, UL 2231-1, UL 2231-2, and NEC Article 625, EMC: FCC Part 15 Class A	
Operating Temperature	-30°C to +60°C (-22°F to 140°F)	
Storage Temperature	-50°C to +80°C (-58°F to 176°F)	
Humidity	95% Non-Condensing	

- SINGLE or DUAL PORT, 30A or 40A, LEVEL 2
- CHARGING PROTOCOL: SAE J1772
- 7.2 KW or 9.6 KW PER PORT
- 25 FT or 18 FT with CABLE RETRACTOR
- 7" COLOR SCREEN – STANDARD
- UL COMPLIANT – ETL CERTIFIED
- OPTIONS:
  - CABLE RETRACTOR

FRANCIS
EV CHARGING

Costs



Level 2, Single Port Scenarios	Annual Electricity Consumption & Cost	Installation Cost Amortized Over 10yrs/kWh & cost/yr.*	Assumptions
Workplace charging • 2 light-duty vehicles • Each charging 3hrs/day • 5 days/week	• 10,296 kWh/yr • $1,030/yr	$0.006-$0.123/kWh $60-$1,270/yr	• EVSE Type: Level 2 240 VAC • EVSE Amperage: (30A) • Vehicle Power Acceptance Rate: 6.6kW • 20 miles added range/hr. of charging • Electricity Cost: $0.10/kWh • Installation Cost: $600-$12,700
Public charging • 1 light-duty vehicles • Each charging 5hrs/day • 4 days/week	• 6,864 kWh/yr • $686/yr	$0.009-$0.185/kWh $60-$1,270/yr	
Fleet charging • 2 medium-duty vehicles • Each charging 5hrs/night • 5 days/week	• 17,160 kWh/yr • $1,716/yr	$0.003-$0.074/kWh $60-$1,270/yr	

https://afdc.energy.gov/files/u/publication/evse_cost_report_2015.pdf

Costs

Electrical- $24,970
Structure-$107,184
Charging Stations- $36,078
Sod- $1,510
Total- $169,742

Health Benefits

These benefits include the reduction of premature mortality, chronic bronchitis, asthma attacks, non-fatal heart attacks, and other health problems.

EPA, Environmental Protection Agency, 15 Sept. 2015, cfpub.epa.gov/quantifier/index.cfm?action=results.quantify.

Earth Day Ribbon Cutting

Adoption and Support

The MCN chargers have dispensed 709.6 kWh YTD. The Alternative Fuels Database uses .32 kWh per mile for their estimates which would be 3.125 miles per kWh. Using that as a reference you could conservatively say that the charging station has provided 2,217 miles of electric driving so far this year. (709.6 kWh x 3.125 miles/kWh = 2,217 miles driven)

Matthew Ellis, Francis Energy

START-TIME	CHARGE END	DURATION	kWh USED
2021-07-09 1	2021-07-09 1	0:08:50	0.8
2021-07-03 1	2021-07-03 1	0:31:55	3
2021-07-01 2	2021-07-01 2	0:09:33	0.88
2021-06-26 1	2021-06-26 1	0:36:36	3.49
2021-06-18 1	2021-06-18 1	1:22:25	11.73
2021-06-04 0	2021-06-04 1	4:10:58	13.88
2021-06-03 0	2021-06-03 1	4:38:20	15.27
2021-06-02 1	2021-06-02 1	0:27:09	3.66
2021-06-02 0	2021-06-02 1	8:18:34	23.95
2021-06-01 1	2021-06-01 1	0:41:36	2.17
2021-06-01 0	2021-06-01 1	4:15:06	14.05
2021-05-31 0	2021-05-31 0	0:11:09	1.07
2021-05-29 1	2021-05-29 2	5:22:50	43.53
2021-05-28 1	2021-05-28 1	1:32:58	5
2021-05-28 0	2021-05-28 1	3:11:38	10.68
2021-05-27 1	2021-05-27 1	3:25:43	11.3
2021-05-27 0	2021-05-27 1	2:03:39	16.35
2021-05-27 0	2021-05-27 1	3:17:47	19.8
2021-05-26 0	2021-05-26 1	3:56:09	12.95
2021-05-25 1	2021-05-25 1	0:42:11	2.2
2021-05-25 0	2021-05-25 1	4:09:03	13.62

Thank you!

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