Date:	January 22, 2024
To:	Tom Burroughs
Company:	McHenry County, Illinois
Address:	2200 N. Seminary Ave. Woodstock, IL 60098
From:	Andrew Baglini, Joe Juzwiak, PE (Walker Consultants) and Spencer Craig, PE, Matt O'Brien, EIT (Eriksson Engineering)
Project Name:	McHenry County EV Planning – **Final Report**
Project Number:	31-009683.00

Dear Mr. Burroughs:

Walker Consultants and Eriksson Engineering are pleased to submit for your review this final report for EV Planning Services in McHenry County, Illinois.

Introduction and Background

McHenry County, Illinois, is a 610-square mile, mostly exurban and rural county in northeastern Illinois, located along the border with Wisconsin. The county seat, Woodstock, is located approximately 50 miles northwest of Chicago. The Facilities Management department of the County ("County") engaged Walker Consultants ("Walker") and Eriksson Engineering Associates, LTD ("EEA") to perform an analysis of potential electric fleet vehicle charging at six County-owned facilities. The County is looking to begin to transition the internal combustion engine ("ICE") vehicle fleet to electric ("EV"), when and where possible, and have asked Walker and EEA to examine infrastructure and electric facility load requirements at the potential charging sites.

EEA, a subcontractor to Walker, provided a separate memo identifying areas of improvement for civil site design where new charging infrastructure could be installed. The memo and overall conceptual layouts are found in the Appendix of this document.

County Owned Building Sites

The County owns six buildings that have been identified for possible fleet vehicle charging installations. The County stated that a variety of fleet vehicle types (sedan, small SUV, pick-up truck) would potentially utilize the charging stations, particularly initially, as fleet vehicles are gradually replaced. At least in the near term, the charging stations would be for fleet vehicle charging only and not made available for use by the public.

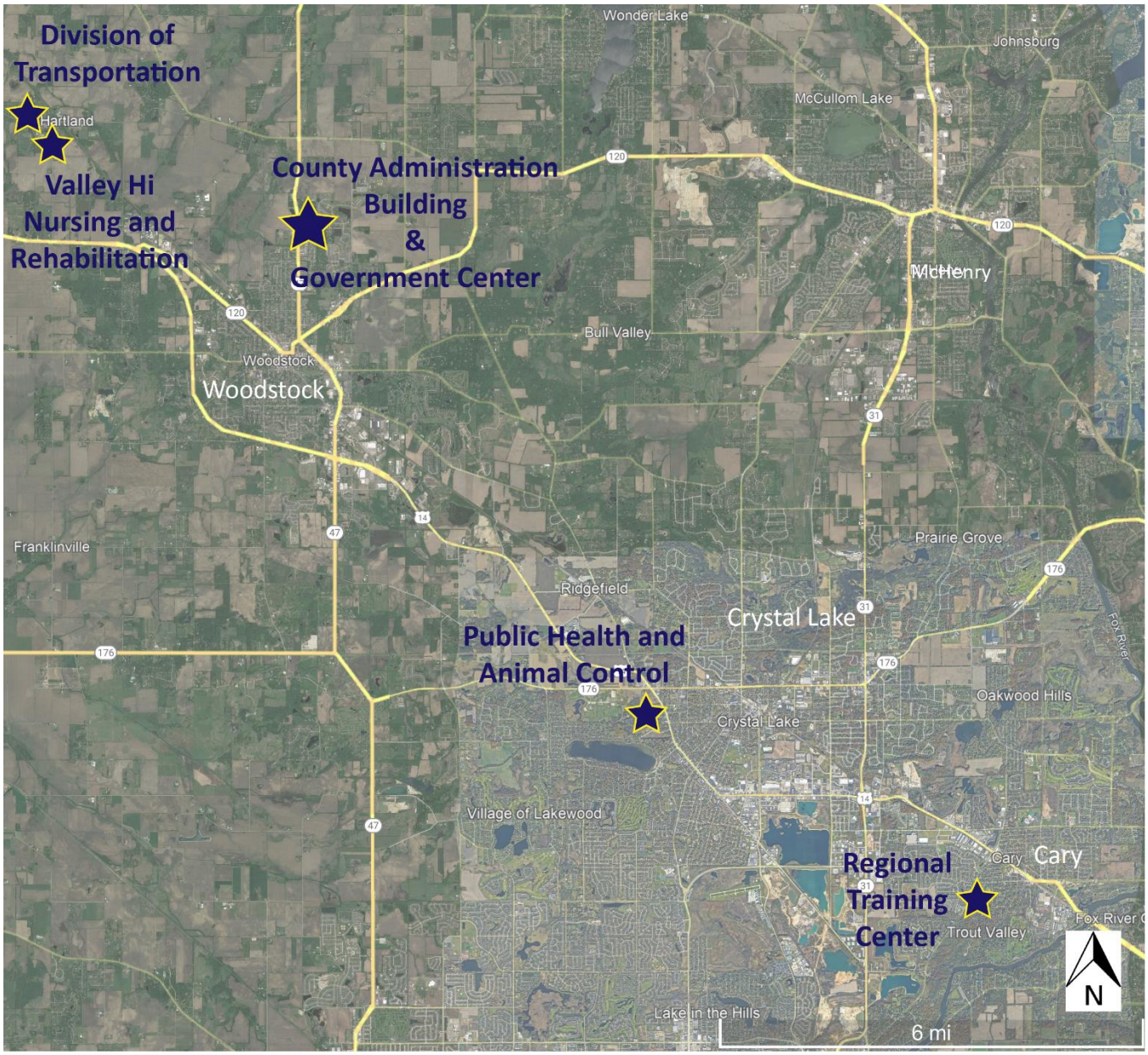
The following County buildings are being considered for EV charging infrastructure, listed in order based on the County's initial thoughts around the priority of the sites:

- McHenry County Administration Building, 667 Ware Road, Woodstock
- McHenry County Government Center, 2200 N. Seminary Avenue, Woodstock
- McHenry County Division of Transportation ("DOT"), 16111 Nelson Road, Woodstock
- Valley Hi Nursing and Rehabilitation for McHenry County, 2406 Hartland Road, Woodstock
- Crystal Lake Public Health and Animal Control, 100 N. Virginia Street, Crystal Lake

- McHenry County Regional Training Center, 655 Village Hall Drive, Cary

These locations are highlighted in **Figure 1**.

Figure 1. McHenry County-Owned Facilities Considered for EV Fleet Charging Infrastructure



Source: Google Earth, Walker Consultants

All six buildings provide a mixture of services, with most administrative services occurring at the Administration and Government Center buildings, located across the street from one another, in Woodstock. The County's primary transportation and highway services are located at the Division of Transportation site approximately five driving miles north and west of the Administration and Government Center buildings. In discussions with the County, the surface parking areas at these three locations **(County Administration Building, Government Center,**

and Division of Transportation) have been identified as the primary and initial EV fleet charging sites, with an introduction as follows.

Please note: For a general-purpose electrical layout of the three priority sites highlighted in this section, please see report attachments for proposed conduit routing and new electrical infrastructure.

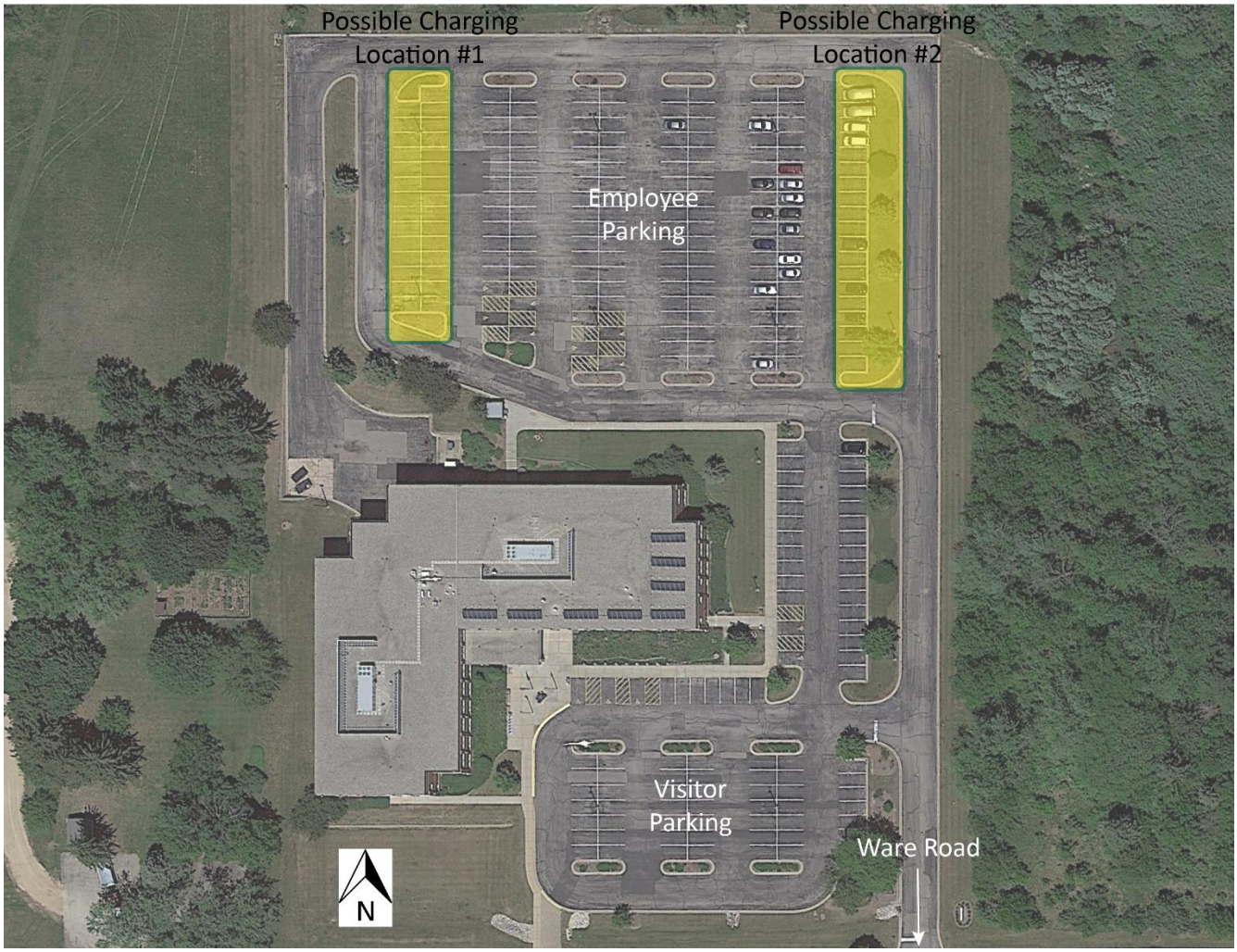
Electric Fleet Charging Priority Sites

County Administration Building

The first primary fleet charging site identified by the County is the surface parking area immediately north of the Administration Building. The County Administration Building is the primary home of administrative office and leadership functions for the County, housing departments including the County Board, County Administration, Facilities Management, County Clerk, Human Resources, Planning & Development, Purchasing, and Finance. Three surface lots surround the building and the largest of the three, on the north side of the building, has been identified as the priority fleet vehicle charging location among all County-owned buildings. EV charging infrastructure in this location would allow employees from across departments to utilize the charging stations during visits to the Administration Building, particularly during multi-hour meetings or seminars. Chargers located here also reinforce to County residents and stakeholders that the County is committed to reducing greenhouse gas emissions and being good stewards of the environment, with climate resiliency being prioritized through new and improved fleet transportation technologies.

An aerial image of the Administration Building, and potential charging station locations, is show on the following page in Figure 2. Currently two locations are shown but the intent is to choose either the far eastern or the western areas of the lot, as highlighted below in yellow, for the County to compare the costs between the two locations. The electrical feed from the building would be supplied from the electrical room and a trench would be needed to route to the selected location. For both locations, if a utility feed is selected (likely drawn from Ware Road) all of the electrical panels and transformers would be located outside in weatherproof enclosures, adjacent to the chargers.

Figure 2. County Administration Building – Possible EV Charging Station Locations



Source: Google Earth, Walker Consultants

Government Center

The second primary fleet charging site identified by the County is the Government Center complex, located immediately south of the Administration Building across Ware Road. The complex houses several County operations including the Courthouse, Sheriff's Office, Corrections Facility, and Circuit Clerk. A few potential charging sites have been identified by the County here, primarily in the main surface parking lot just east of the building. Like the Administration Building, the primary charging locations are located at the outer edges of the lot, adjacent to parkways and grassy areas, to leave sufficient space for the charging stations and to minimize interference with the existing lot striping and layout.

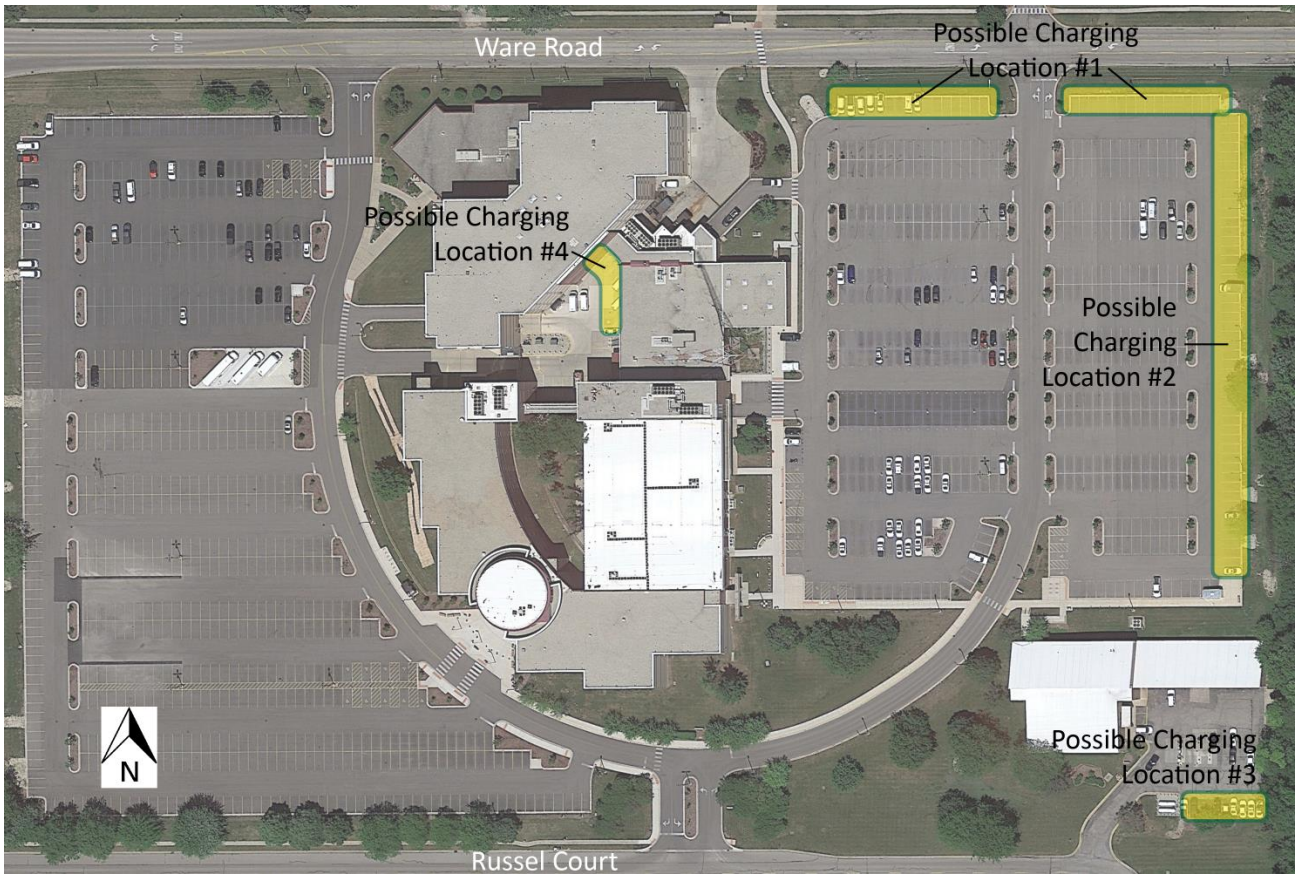
Other potential locations at Government Center include the southeast corner of the site at Building A, which houses the Health Department, County Coroner, and the Sherriff's service garage, and in the center of the complex in the main building's loading dock area. The potential charging locations are highlighted in yellow in **Figure 3**.

Walker was unable to access all electrical rooms with County staff; further investigation is needed to determine if power can be drawn from any other location.

The Utility feed would most likely come from Ware Road, at the northeastern corner of the eastern parking lot. If a utility feed is selected all of the electrical panels and transformers would be located outside in weatherproof enclosures.

With the large number of functions and departments that the Government Center serves, in addition to its proximity to the Administration Building, the complex is a prime location to host EV charging stations. At this site, individual departments could each use their own set of chargers, or the chargers could be shared among departments and utilized via a reservation system. Alternatively, the charging stations could be used on a first-come, first-serve basis depending on location and availability.

Figure 3. Government Center – Possible EV Charging Station Locations



Source: Google Earth, Walker Consultants

Division of Transportation

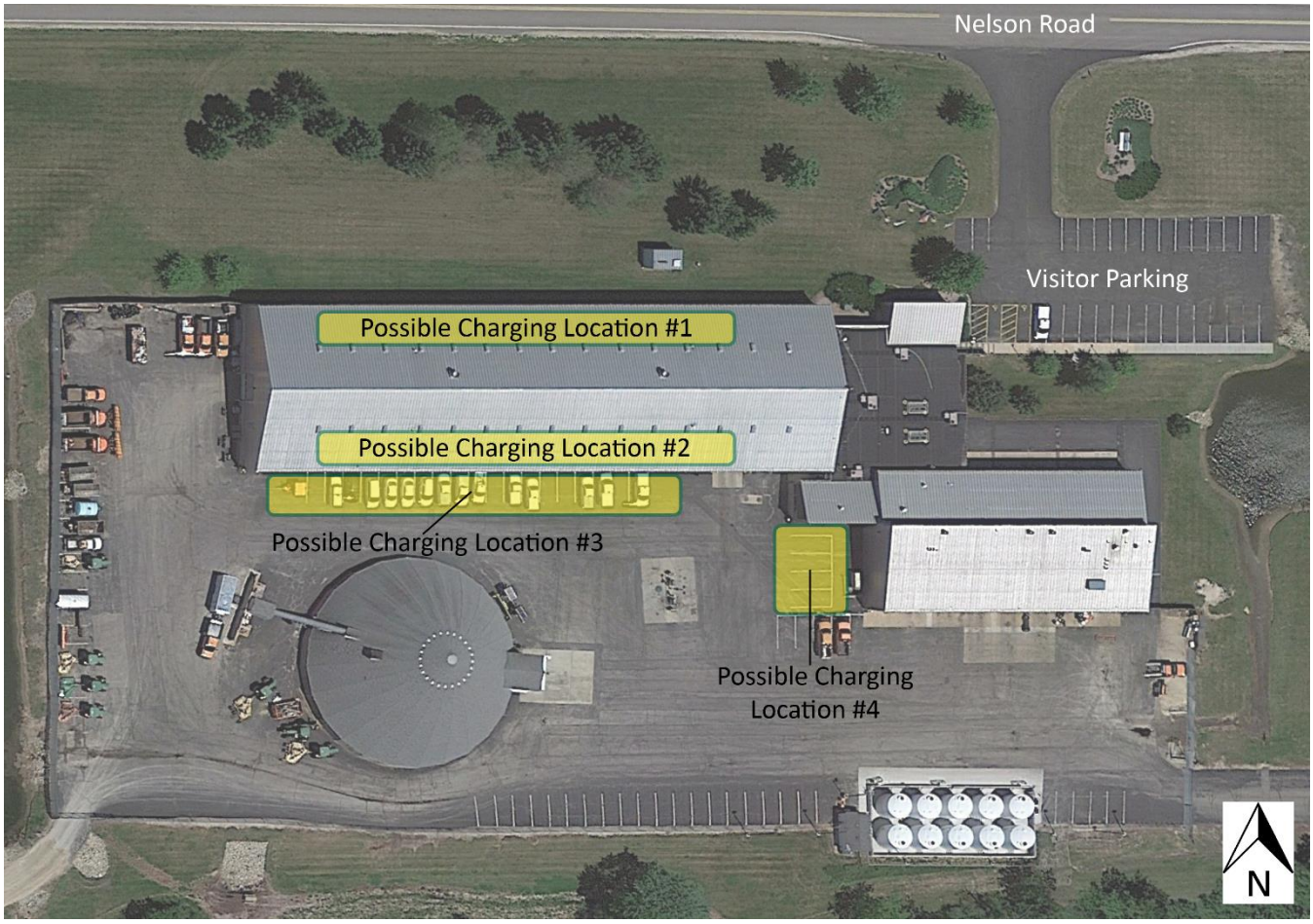
Located five miles northwest of the Administration Building and Government Center, on Nelson Road, is the County's Division of Transportation ("DOT") building. Much of the County's large road equipment is stored here including equipment used for road maintenance, construction, and snow removal; the County's salt storage

facility is also located here. The heavy equipment is stored both outdoors, as well as indoors in the large garage just west of the main offices.

Some of the County's larger pick-up trucks and vans will likely be charging at the DOT facility. For this reason, providing some amount of EV charging at the DOT facility has merit, given its role as a hub for County road infrastructure and transportation operations. The building's central location within the County would also allow vehicles charging at this location to reach destinations throughout the County on a single charge and allow the location to serve as a hub of sorts for switching out vehicles that need to be charged.

Four possible charging locations have been identified at the DOT building, as shown in **Figure 4**. Location #1 and 2, in areas along the northern and southern walls, are located inside of the facility garage. Vehicles would pull into the garage to access the charging stations located here. Locations #3 and 4 would be located in the parking lot, along the outer wall of the facility. The power from the building feed would come from the electrical room, however the power from the utility feed would likely come from Nelson Road.

Figure 4. Division of Transportation – Possible EV Charging Station Locations



Source: Google Earth, Walker Consultants

Placing the charging stations along the outer walls of the buildings would allow for the usage of electrical infrastructure and would cause the least disruption possible to existing parking lot striping and functionality.

Electrical Conceptual Design and Cost

Analysis Methodology

This section of the analysis focuses on the feasibility of using the existing available building power to supply new EV charging stations at the noted locations versus constructing an entirely new electrical power feed. During the project process, the County selected potential locations at each building to compare costs and design particulars. In addition to examining the power capacity at the priority EV charging sites themselves, Walker also reviewed the available power capacity of Crystal Lake Public Health, Valley Hi Nursing and Rehabilitation Center, and the McHenry County Regional Training Center, but focused on conceptual costs for the three priority sites.

For each site, Walker reviewed the available electrical drawings and performed a site visit to review if the existing service to the buildings matches the information on the provided drawings. Additionally, the last years' worth of electricity bills were analyzed to determine the maximum power each facility consumed in the past year. With this information, Walker was able to determine the approximate available electrical capacity at each building.

Walker's EV Task Force actively researches the latest trends in the electric vehicle space. Electric vehicles today are in the infancy of their development. We anticipate many new EV's will be coming online in the next five years. It is assumed that the battery technology will advance along with the operation of EV charging systems. For example, eight companies are experimenting with induction (wireless) charging. There are also experiments installing induction charging within public streets that will actively charge as the vehicle moves done the road. Many of the vehicles on the road today are sedans and have settled into a typical range and battery size using current technology. Pickup trucks and utility trucks EV's are currently in their infancy of evolution where they are just beginning to hit the market. The methodology used in this analysis utilizes current EV industry technologies to provide a framework to minimize the initial costs of infrastructure.

Charging Technology

EV Chargers

There are currently three readily available types of electric vehicle chargers, as shown in the following table.

Figure 5. Types of EV Chargers

Charger Type	Maximum Power Output	Typical Use	Typical Circuit Type	Typical Charging Rate	Typical Time for Full Charge
AC Level 1	Up to 1.92 kW	Residential (plugs into standard 120 V outlet)	120 V, 20A	2-5 miles per hour of charge	±20 hours
AC Level 2	Up to 19.2 kW	Residential/Commercial/Fleet	240 V, 40 A-100 A	10-40 miles per hour of charge	±8 hours
DC Fast Charging	Up to 400 kW	Commercial/Highway/Fleet	480 V AC input, DC output	>100 miles per hour of charge	<1 hour

Source: Walker Consultants

EV chargers can add substantial load to the electrical infrastructure. The selection of power capacity is dependent on the type of vehicle to be charged, miles traveled, the time the vehicle has available to charge, and the amount of power available.

EV On-Board Charger

Every EV has an onboard battery charger. The charger can accept AC Level 1 or Level 2 voltage while DC fast chargers supply DC voltage. The vehicle battery charger has a maximum rate power it can accept which may range from 1.4 kW up to 19.2 kW. The external charger communicates with the on- board charger to match the power needed. For example, an EV rated for 11.5 kW can connect to a charger that can supply 19.2 kW, but the battery can only receive 11.5 kW maximum power.

Current EV battery capacity ranges from six (6) kWh for PHEVs to 200 kWh in the larger fully electric vehicles. Therefore, basically to charge a 100-kWh battery from a charger supplying 10 kW of power would take 10 hours to charge. The current design trend for EV battery charger power acceptance is 11 kW.

Automatic Load Management System

Automatic Load Management Systems (ALMS) are used to allow multiple chargers to share a circuit or panel, and automatically alternate or adjust power at each charger. However, this technology does not allow for the installation of charging stations from a mix of manufacturers on the same circuit or panel. For example, Tesla and Blink chargers (two major providers of EV charging stations) can be installed on the same property, but a Telsa charger cannot communicate with a Blink charger and the energy reporting systems cannot be combined.

The following table provides a simplified example of how an ALMS could share power between three identical EV's. All three vehicles could accept the full 7.2 kW. If one vehicle connects to the charger it would receive full power. If all three vehicles connect to the chargers at the same time, the chargers will reduce the power to approximately one-third to each vehicle. If one of the vehicles stops charging before the other EV's, then the power is transferred to the remaining two vehicles.

Figure 6. Example of EV Automatic Load Management Sharing

	Max Charger Rating (kW)	Cars Actively Charging	kW per Vehicle	Approx. Range Added/Hr (Miles)
Initial	7.2	1	7.2	21
		2	3.6	10.8
		3	2.4	7.2

Source: Walker Consultants

Basis of Design

Fleet electric vehicles have a defined pattern for operation and charging. Typically, these vehicles operate during one or two shifts (Monday through Friday) and largely remain parked overnight and on weekends. The County is currently investigating different models of vehicles to replace its existing fleet vehicles, from PHEV's, to plug-in, fully battery electric EV's. Without knowing specifically what vehicles will be purchased by the County and considering the dynamic nature of the EV industry, the basis of design for the charging infrastructure in this study is based on plug-in battery operated EV's.

The County provided an Excel spreadsheet ("2025-2045 Non-Sheriff Vehicle Plan") for planning purposes to forecast converting their existing ICE fleet to electric vehicles. Walker based the conceptual electrical study from vehicle miles traveled data provided in this spreadsheet, and split the potential new EV's into two categories:

- Sedans (including Small SUV/Minivan)
- Trucks

This information was based off the EV Replacement Schedule included in the same Excel spreadsheet. Walker assumed similar-sized EVs would be purchased where not noted.

The breakdown of these vehicles is provided in **Figure 7** below.

Figure 7. McHenry County EV Replacement Schedule – Projected Vehicle Type

	Recommended for EV		Eligible for EV		All Potential EVs	
Sedan	48%	14	17%	9	28%	23
Small SUV/Minivan	41%	12	15%	8	25%	20
Truck	10%	3	67%	35	47%	38
Total	**100%**	**29**	**100%**	**52**	**100%**	**81**

Source: McHenry County Fleet Vehicle Information

Combined, the two classes of potential electric vehicles (both sedans and trucks) travel approximately 50 miles per day on average (assuming a four-day work week, accounting for days vehicles are not used and holidays).

The operation of the County fleet assumes the vehicles will operate an average of 10 hours per shift and park overnight for 12 hours. This 12-hour idle time was used to determine the available time to recharge the vehicle on a typical day. It should be noted that there may be vehicles that operate more than one shift or less than one shift per day.

Figure 8. Electric Vehicle Rated Battery Size and Range

EV Class	Average Battery Size (kWh)	Average Range	Average Miles Traveled	Miles per kW of Charge
Sedan/Small SUV/Minivan	92	279	51	3.8
Truck	155	340	47	1.9

Source: Walker Consultants

Current EV's have generally have a range from 279 to 340 miles. Data summarized in **Figure 8** shows the fleet travels approximately 50 miles per day and sits unused for approximately 12 hours a day. If the vehicles are plugged in each night, the EV's only need to be recharged to supply the required 50 miles, rather than the full EV range of 279 to 340 miles.

Charging System Operation

The conceptual scenario for the charging system will not use 100% of the capacity of each charger. Installing infrastructure for a full capacity charging system to charge every vehicle at 11 kW will add unnecessary cost.

The average miles traveled for a County fleet vehicle whether it is a truck or a small vehicle is 50 miles per operating day and will remain parked for 12 hours. A truck traveling 50-100 miles would need five to eight hours to replenish miles traveled on a 7.2 kW charger if plugged in each night. The smaller vehicles would only need about three to five hours to recharge under the same scenario. Using the 7.2 kW charger would also leave room for future developments should the vehicle battery range increase and/or the battery size increase. If the vehicles are traveling more than 100 miles a day, then the option of utilizing DC fast charging would be recommended on a public charger.

Using ALMS, the power can be distributed between two vehicles at one charger or, alternatively, at the panel level and be distributed around the local facility. The ALMS can limit the service size if a more aggressive approach to charging is considered. For example, providing infrastructure for a 7.2 kW charger and plan to use 3.6 kW if all the vehicles are plugged and charging, but as the vehicles approach full charge the power can be increased to the remaining chargers. This strategy can further reduce the incoming power feed cost.

Electrical Infrastructure

Two options exist for the source of power; first is to draw the power from the existing buildings, and second is to obtain the power from new utility service feeds.

Building Power

Walker performed site visits to all six potential EV fleet charging locations and reviewed the electrical drawings to determine the available power capacity of each building. **Figure 9** represents the approximate number of EV chargers that can be installed under two scenarios without the use of an ALMS: the first scenario is using the basis of design of 7.2 kW; the second scenario is using the largest level 2 chargers at 19.2 kW.

Figure 9. Projected Available Power and Maximum Quantity of Chargers

Locations	Available kW	Quantity of Chargers Based on Charger Capacity	
		7.2 kW	19.2 kW
Administration Building	816	79	29
Government Center	1,074	104	39
Division of Transportation	418	40	15
Valley Hi Nursing and Rehabilitation	1,170	113	42
Crystal Lake Public Health and Animal Control	109	10	3
Regional Training Center	1,399	136	51

Source: Walker Consultants, ComEd

Utility Feed

Should the County elect not to feed the EV systems from the buildings, power may be obtained from a new utility service. The utility company costs are highly conceptual in nature at this time, as information the utility providers are willing to provide in this stage of planning are limited. Walker was able to obtain preliminary costs for one site (Administration Building) from the utility. The utility provider has not provided any additional cost information at this stage of the study. Walker extrapolated the provided costs to the other two sites to in order to provide conceptual estimates of costs.

Building power is likely fed from high voltage utility lines. Walker assumes the utility lines feed a high voltage switch which, in-turn supply power to a transformer to step the voltage down to 240 or 208 volts. After the transformer, a series of panels or disconnects would be installed and feed the individual EV charging stations.

Opinion of Probable Cost

Walker's opinion of probable cost is conceptual for the purposes of this analysis. The opinion of probable cost in **Figure 10** on the following page provides a high-level framework for the installation costs for either obtaining power from the buildings or bringing in a separate utility service. In general, the cost for the utility feed is high due to the additional equipment needed from the utility along with the extrapolated estimated costs that were provided from the utility provider. The opinion of probable cost covers the capital costs for the new infrastructure (including the charging station units themselves), not operational and on-going maintenance costs. Operational costs will vary depending on size and scope of project. Electrical and civil design fees are also not included in the costs presented here. Design fees can vary depending on the number of sites, quantity of chargers, and whether power is obtained from the utility or building.

Each location is broken down for the cost of the individual installation area to choose from, with a lump sum utility cost listed and a civil cost listed, as shown in **Figure 10. Please note that civil-related costs (provided by EEA) are in addition to either the building-supplied costs, or the utility-supplied costs, depending on which option is chosen.** Please also note that if the utility-supplied option is chosen, an additional approximately $120,000 in new utility infrastructure will be required for build-out.

Figure 10. Opinion of Probable Cost – Summary

Location	Quantity of EV's	Building Supplied	Utility Supplied	Civil-Related Costs (EEA)	Comments
Administration Building					
Location 1	30	$ 408,204.00	$ 472,082.00	$ 37,086.50	30 spaces on west side
Location 2	18	$ 279,818.00	$ 350,589.00	$ 36,712.50	18 spaces on east side
New Utility Infrastructure			$ 120,000.00		
Government Center					
Location 1	18	$ 358,372.89	$ 267,810.39	$ 76,340.00	18 spaces west of entry, 16 spaces east of entry
Location 2	24	$ 470,783.09	$ 346,726.84	$ 63,778.00	24 spaces north of mid point, 24 spaces south of mid point
Location 3	8	$ 134,330.35	$ 300,380.00	N/A	
Location 4	7	$ 91,238.70	$ 708,883.00	N/A	
New Utility Infrastructure			$ 120,000.00		
Division of Transportation					
Location 1	22	$ 441,774.00	$ 569,136.00	-	22 spaces north side, inside of barn. Civil cost excluded due to interior location.
Location 2	22	$ 441,777.00	$ 569,139.00	-	22 spaces south side, inside of barn. Civil cost excluded due to interior location.
Location 3	19	$ 422,802.00	$ 541,188.00	$ 14,245.00	19 spaces south side, outside of barn
Location 4	4	$ 44,257.00	$ 245,133.00	N/A	4 spaces if east side of parking lot used
New Utility Infrastructure			$ 120,000.00		

Source: Walker Consultants, Eriksson Engineering Associates

Facility Safety

Key safety considerations should be reviewed for security of the EV charging stations. Stations should be equipped with cord management to keep the cords off the ground to prevent any trip and fall hazards. Additionally, Walker recommends not using curb stops which introduce a potential for trip and falls since the user will be walking to/from and around the vehicle. Walker does, however, recommend installing bollards to protect the charging stations from vehicle damage, but still allow customer and maintenance access.

The EV stations should be located in well illuminated areas. Once the locations are selected lighting should be evaluated to ensure adequate illumination around the units. Consider 24-hour surveillance for the safety of the users and to help reduce any potential for vandalism. Lighting and camera upgrades are not included in the cost estimates provided in this analysis.

Potential EV Infrastructure Funding Opportunities

Walker reviewed potential federal and state funding opportunities for EV charging infrastructure. This section identifies funding opportunities and cost models for EV fleet charging infrastructure at the County.

Walker can provide funding source selection review and grant writing services on an hourly fee basis; however, we would not be able to guarantee finding an applicable grant or guarantee successfully being awarded a desired grant.

State of Illinois Funding Opportunities

The State of Illinois has set a goal of having one million registered EVs in the state by 2030. Between 2019 and 2021, the State passed several pieces of legislation that accelerate the adoption of EVs, including Rebuild Illinois and the Climate and Equitable Jobs Act. The Illinois Environmental Protection Agency (IEPA) is administering most of the funding opportunities for EVs and EV charging equipment. Some of these programs have been authorized by the State General Assembly but have yet to be implemented. The Department of Commerce and Economic Opportunity (DCEO) is administering programs focused on manufacturing EVs and the associated parts and equipment. The Illinois Department of Transportation (IDOT) is working on EV Infrastructure planning efforts, including implementing the NEVI (National Electric Vehicle Infrastructure Program) program to establish an interconnected public EV charging network.

Driving a Cleaner Illinois (Illinois Environmental Protection Agency)

Driving a Cleaner Illinois is the Illinois Environmental Protection Agency's (IEPA) grant program developed to distribute funding for various types of diesel emission reduction projects. The Driving a Cleaner Illinois Program includes grants from the following funding sources:

- *The Volkswagen (VW) Mitigation Trust Fund*, which was established by the VW Settlement reached as a result of the company's Clean Air Act violations. Illinois' initial allocation of funds was approximately $108 million. The funds are to be used for projects that reduce emissions of nitrogen oxides (NO_X) in Illinois.
- *Congestion Mitigation and Air Quality Improvement (CMAQ) Funds*. CMAQ is a Federal Highway Administration funding source that provides funds to state and local governments for transportation programs or projects that reduce congestion and improve air quality in areas that do not meet or need to maintain compliance with federal air quality standards.
- *Diesel Emission Reduction Act (DERA) Funds*, which is a U.S. Environmental Protection Agency funding source to enable participating states to support grant, rebate, and loan programs to achieve significant reductions in diesel emissions. This funding is provided on a federal fiscal year basis.

Recently funded projects from the Driving a Cleaner Illinois program have included the purchase of new electric buses and EV charging units. The most recent funding opportunity (closed in December 2022) was for the purchase and installation of light-duty electric vehicle charging stations at publicly accessible locations through the VW Fund. As of 2023, there is one open Notice of Funding Opportunity (NOFOs) for the VW program to fund electric school buses. However, it is likely that additional NOFOs will be released in the future for these programs.

The County falls within Priority Area 1:

- Priority Area 1: Cook, DuPage, Kane, Lake, McHenry, and Will counties, Oswego Township in Kendall County and Aux Sable and Goose Lake townships in Grundy County.
- Priority Area 2: Madison, Monroe, and St. Clair counties.
- Priority Area 3: Champaign, DeKalb, LaSalle, McLean, Peoria, Sangamon, and Winnebago counties.

Illinois Transportation Electrification Infrastructure Projects (Illinois Environmental Protection Agency)

According to the Alternative Fuels Data Center, Illinois Environmental Protection Agency (IEPA) will provide transportation electrification grants of $70 million for, but not limited to, electric vehicle charging infrastructure. The IEPA will prioritize investments in medium- and heavy-duty vehicle charging, and electrification of public transit, fleets, and school buses. This $70 million was allocated from the Building Illinois Bond fund to IEPA through State of Illinois Public Act 101-0029.

Federal Funding Opportunities

In addition to State funding opportunities, there are also federal funding opportunities that the County could consider. Discretionary federal grants tend to be competitive given the number of jurisdictions that the funding must cover, and programs are often oversubscribed. Recent legislation has increased federal investment in EVs and EV charging infrastructure including the Bipartisan Infrastructure Law and Inflation Reduction Act. Several of the federal funding opportunities included in this section are geared toward EV infrastructure that would support medium or heavy-duty charging, such as transit or fleet vehicles. Other opportunities are geared toward larger multi-modal improvement projects or transportation technology projects, of which EV charging could be a component.

30C Alternative Fuel Infrastructure Tax Credit (Internal Revenue Service)

The Alternative Fuel Infrastructure Tax Credit was renewed for 2023 through the Inflation Reduction Act (IRA) of 2022. The tax credit is available for the cost of installing alternative fueling equipment in commercial and residential environments.

Commercial EV charging stations are eligible for a federal tax credit of 30 percent of the cost (or 6 percent in the case of property subject to depreciation), not to exceed $100,000. Permitting and inspection fees are not included in covered expenses.

Qualified fueling equipment must be installed within census tracts that meet at least one of the following requirements:

- The census tract is not an urban area;
- A population census tract where the poverty rate is at least 20%; or
- Metropolitan and non-metropolitan area census tract where the median family income is less than 80% of the state medium family income level.

Eligible projects must also meet apprenticeships and prevailing wage requirements. Equipment must be installed between January 1, 2023 and December 31, 2032.

Diesel Emissions Reduction Act (DERA) National Grants (Environmental Protection Agency)

This federal funding program is a discretionary grant program for projects that achieve significant reductions in diesel emissions. Eligible diesel vehicles, marine engines, locomotive and nonroad engines, equipment of vehicles

such as those used in construction, handling of cargo, agriculture, mining or energy production. Eligible diesel emission reduction solutions include verified retrofit technologies such as exhaust after-treatment technologies, engine upgrades, and cleaner fuels and additives, verified idle reduction technologies, verified aerodynamic technologies, verified low rolling resistance tires, certified engine replacements and conversions, and certified vehicle or equipment replacement. An eligible project would be to replace a diesel vehicle with an electric vehicle.

For the last funding cycle in 2021, there was approximately $46 million in DERA funds available. EPA Region 5 (including Illinois) was allocated $6.4 million in funding and the maximum funding per application request was $3 million. The required local match varies based on type of equipment. Eligible applicants include regional, states, local or tribal agencies/consortia of port authorities with jurisdiction over transportation or air quality.

Rebuilding America Infrastructure with Sustainability and Equity (Department of Transportation)

The Rebuilding America Infrastructure with Sustainability and Equity (RAISE) program is a federal funding program that provides discretionary grants for road, rail, transit, and port projects that have a significant local or regional impact and improve transportation infrastructure. Both planning and capital projects are eligible through RAISE. Previous names for this grant program are Better Utilizing Investments to Leverage Development (BUILD) and Transportation Investment Generating Economic Recovery (TIGER). RAISE allows project sponsors at the State and local levels to obtain funding for multi-modal, multi-jurisdictional projects that are more difficult to support through traditional Department of Transportation programs.

RAISE is a highly competitive grant program that typically funds large-scale multi-modal projects. RAISE grants have been offered every year since 2010. Since program inception, the US DOT has received more than 11,336 applications requesting more than $198 billion for transportation projects across the county, while only $12.1 billion in funds have been dedicated.

There is currently between $2.275 billion-$2.299 billion available for the FY 2023 RAISE grant program. Half of funded projects will be in rural areas and half will be in urban areas. At least $15 million in funding is guaranteed to go toward projects located in Areas of Persistent Poverty (APP) or Historically Disadvantaged Communities (HDC). The program requires a minimum 20 percent local match, but if the project is located in an APP or HDC, this requirement does not apply.

In past funding cycles, electric vehicle charging stations or electric vehicles have been a component of a larger multi-modal project. For example, electric vehicle charging has been a component of a multimodal transit center, of a corridor improvement project, of expanded transit service, or of a transit fleet electrification effort. If the County were to apply for a RAISE grant in future funding cycles, Walker recommends that electric vehicle charging should be one component of a large multi-modal initiative.

Conclusion

The County is planning on transitioning their current fleet of internal combustion vehicles to electric vehicles. The transition will require the County to provide infrastructure to support electric charging of the fleet vehicles. Two feasible options exist to provide power for the new charging stations. One option is to draw power from the existing buildings and the other option is to construct a new utility feed.

A conceptual review of the six facilities show that additional EV chargers can be added to each building. The quantity of chargers depends on the size of charger to be installed; however, each building has existing electrical capacity to add some chargers.

The County provided a prioritized framework with potential locations to add EV spaces to the Administration Building, the Government Center, and the Division of Transportation facilities. Figure 9 shows the maximum number of stations that can be provided for each building assuming all the units are charging at once.

The EV industry is in its infancy and continuing to evolve with better battery technology and charging station advancements. EV's can accept a range of power to charge their batteries, anywhere from 1.4 kW to 19.2 kW depending on the vehicle. On average, most battery electric vehicles in the last two model years can accept an average of 11 kW which is up from 3-7 kW in previous generations. Charging stations can provide power up to 19.2 kW to charge EV batteries.

There are many options for fleet vehicles from PHEV's, which are vehicles that run on battery power and internal combustion, and total battery-operated plug-in vehicles. The framework of this study focuses on battery-operated plug-in vehicles. The PHEV's can be plugged in to a Level 2 charging system and would free up power for other vehicles on the system due to the short amount of time needed to charge.

Fleet vehicles are operational mostly during one shift for eight to ten hours and are parked for twelve or more hours. Internal combustion engines would refuel either every few days, every week or at some other interval. A paradigm shift for EV's is that each vehicle can be plugged in to replenish the charge of the battery overnight. The data from the County's fleet operations show that the vehicles travel an average of 50 miles a day. The assumption for the Basis of Design is to provide enough power to replenish the miles driven for the majority of vehicles by using 100 miles per day.

Level 1 charging stations do not have the ability to be managed or controlled individually. Level 1 chargers can provide two miles of charge for every hour for a truck and up to eight miles per hour of charge for a sedan/SUV. However, this charge may not be sufficient for vehicles traveling an average of 50-100 miles a day to maintain the full state of charge from the battery.

Level 2 chargers can provide up to 19.2 kW of power to the vehicle. However, providing entirely 19.2 kW chargers is costly for the electrical infrastructure and since all vehicles cannot accept this amount of power the electrical infrastructure would not be fully utilized.

Walker's recommendation is to have the vehicles plugged in every night to a 7.2 kW charger. This takes advantage of the idle time the vehicles experience while they are sitting parked overnight to replenish the 100 miles traveled the previous day. Using the 100-mile range with a 7.2 kW charger, sedans resupply the miles in approximately five hours, and trucks would take about nine hours under high-use conditions. It is expected that all cars may not be

charged each night, PHEV's may be using a space, and/or every vehicle would not drive 100 miles per day leaving capacity to sufficiently replenish the remaining miles needed in vehicles.

The opinion of probable cost for installation of the requested spaces at each of the three priority facilities currently is based on one charger per parking space. This table is a tool to assist in determining the ideal locations for the chargers based on the limitations of the building service. Once the system is designed, it is expected that specific costs may be reduced and overall estimated costs refined as the number of vehicles and the size of the chargers is better defined, more accurate utility provider costs are received, and locations of equipment power supplies are identified. Using the existing building infrastructure can, currently, meet the estimated EV charging needs.

Sincerely,

WALKER CONSULTANTS

Andrew Baglini
Co-Project Manager
Parking and Mobility Consultant

Joe Juzwiak, PE
Co-Project Manager
MEP Department Head

Attachment: Conceptual Electrical Sketches

Appendix – Eriksson Engineering Associates (EEA) Civil Conceptual Cost Narrative and Estimate

Memorandum

TO: Andrew Baglini; Walker Consultants (WC)

FROM: Matt O'Brien, Spencer Craig (EEA)

DATE: September 14, 2023, *REVISED October 12, 2023, REVISED January 22, 2024*

RE: Conceptual Cost Estimate Narrative

PROJECT DESCRIPTION

McHenry County is planning the transition of their existing vehicle fleet to an Electrical Vehicle (EV) fleet. To understand conceptually the engineering services, construction scope, and budgets needed to complete this transition, they contracted Walker Parking to assess a plan for the staged installation of electric vehicle charging stations in fourteen (14) locations at six (6) sites throughout the county.

As Walker Parking's sub-consultant, Eriksson Engineering Associates (EEA) supported the assessment by completing the following:

1. Search various databases, GIS applications, and other record documents to gather historical information relevant to the sites and locations in question
2. Review the existing site conditions at the various county property locations
3. Identify potential site conditions that might have an impact on site engineering and construction
4. Provide a list of investigations needed as part of a future due diligence process
5. List the regulatory agencies that will be involved in reviewing and permitting the projects
6. Provide conceptual exhibits and Engineer's Opinions of Probable Construction Cost (EOPC) related to development of the locations relative to civil engineering scope

SITE LOCATIONS

Although the county is considering EV charging stations at six (6) sites, this assessment was limited to the study of five (5) locations within three (3) prioritized sites; McHenry County Administration Building (Admin), McHenry County Government Center (MCGC), and McHenry County Department of Transportation (McDOT).

FUTURE DUE DILIGENCE STUDIES

Prior to initiating preparation of construction drawings topographic surveys, including private underground locating services, of the project areas are recommended.

SITE RELATED FINDINGS and EOPCs

The on-site observations focused on site-specific construction elements that would be needed in order to install the EV charging stations at the locations preferred by the county. Site work considered included pavement removal and replacement, curb and gutter removal and replacement, sidewalk removal and replacement, protective bollards, parking striping, and turf restoration. Items such as earthwork haul-off, re-grading required to meet ADA compliance, electrical scope, or scope internal to existing buildings was not considered by EEA.

It should be noted that, if a pavement rehabilitation project is planned for any of the sites, installation of the EV charging stations, and associated utility infrastructure should be considered a part of such project. Doing so will have the advantage of eliminating the costs associated with saw-cutting, removing, and replacing pavement.

McHenry County Administration Building (Admin)
Refer to Exhibit CSK-01 for a visual depiction of the conceptual scope of work required.
The site development scope elements specific to this site included the following:

- Area 1
    - Concrete pavement removal and replacement near the northwest corner of the building for conduit installation

    - The existing ADA parking spaces are not compliant with the ADA code. If deemed necessary by the county, full-depth removal of existing pavement, re-grading of the sub-grade, installation of new pavement, removal and replacement of sidewalk to install ADA ramps would be required to create a compliant route to the building. This scope was not included in the EEA EOPC.
- Area 2
    - The existing ADA parking spaces are not compliant with the ADA code. If deemed necessary by the county, full-depth removal of existing pavement, re-grading of the sub-grade, installation of new pavement, removal and replacement of sidewalk to install ADA ramps would be required to create a compliant route to the building. This scope was not included in the EEA EOPC.

McHenry County Government Center (MCGC)
Refer to Exhibit CSK-02 for a visual depiction of the conceptual scope of work required.
The site development scope elements specific to this site included the following:

- Area 1
    - Pavement removal and replacement across the main driveway access to Ware Road will be required, which will require additional sequencing and coordination to maintain access during construction.
- Area 2
    - If electrical conduit is routed behind (east of) the easternmost parking spaces, tree removal and replacement might be required. Replacement of erosion control rip-rap will also be necessary. This scope was not included in the EEA EOPC.

McHenry County Department of Transportation (McDOT)
Refer to Exhibit CSK-03 for a visual depiction of the conceptual scope of work required.
The site development scope elements specific to this site included the following:

- Bollards will be required to protect the charging stations mounted to the exterior wall of the maintenance building. This scope was not included in the EEA EOPC.
- The scope of work within the maintenance building was not included in the EEA EOPC.

SITE RELATED REGULATORY APPROVALS and PERMITTING

The permits and processes described below apply to all sites and are related only to civil engineering scope elements.

Municipalities

The Engineering Departments representing the municipalities in which the sites are located will review the engineering drawings for compliance with the village development codes and available utilities. The municipalities' review will also include involvement of the fire department, police department, and public works department. The municipal review is usually one of the first reviews to be conducted after drawings have been completed. Based on our experience, this portion of the review process will likely take approximately 30-45 days.

McHenry County
Similar to the local municipality, the Planning and Engineering Departments of the county will review the engineering drawings for compliance with the county development codes. The county review can likely take place concurrently with the municipal review. Based on our experience, this portion of the review process will likely take approximately 30-45 days.

ADA Compliance
EEA reviewed the potential applicability of ADA regulations to the proposed installation of EV Charging Stations for county fleet vehicles.

Based upon a review of the Americans with Disabilities Act Guidelines and the U.S. Access Board's Design Recommendations for Accessible Electric Vehicle Charging Stations, we have compiled some key considerations for the accessible design of electrical vehicle charging stations. It is important to note the difference between "must" and "should" as not every design recommendation is governed by the Americans with Disabilities Act, Architectural Barriers Act, or Section 508 of the Rehabilitation Act.

As discussed during our site observations, it is unclear as to whether these requirements apply to ALL EV charging stations or only publicly available charging stations. We have yet to locate documents that address this definitively. That said, there is a section below that addresses Fleet Vehicle situations.

We have also contacted the Capital Development Board (CDB) which is the entity that interprets the Illinois Accessibility Code and received a response to use the U.S. Access Board's technical assistance document:

Matt,

The Illinois Accessibility Code does not have any requirements for EV Charging Spaces. We recommend that you follow the guidance from the Access Board.

The authority to issue Illinois Accessibility Code interpretations is project specific based on the information provided and is granted to the Capital Development Board by the Illinois Environmental Barriers Act. It does not relieve the project from conformance with the 2010 Americans with Disabilities Act or other applicable codes.

Sincerely,

Capital Development Board
Building a Better Illinois

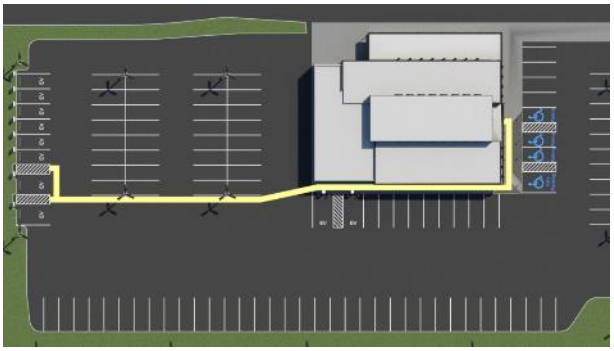
FELICIA BURTON
Accessibility Specialist
401 S. Spring, 3rd Floor
Office Phone: 217-782-8530
Felicia.Burton@Illinois.gov

Design Recommendations

- 11’ x 20’ Charging Space with 5’ Access Aisle
- Clear floor or ground space at the same level as the vehicle charging space and positioned for an unobstructed side reach.
  EEA NOTES: Further coordination with the authorities having jurisdiction will be needed at the time the project is issued for permit.

EV Charging Station Location within a Site

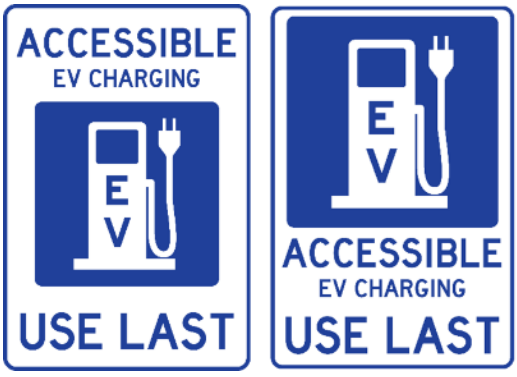
- An EV charging station must connect to an accessible route that leads to an accessible entrance of the building or facilities on the same site. Additionally, the accessible EV chargers should be on the shortest accessible route to the accessible entrance relative to other chargers at the same charging station.
  EEA NOTE: The first sentence implies via use of the term “must” that a standard space needs to be connected to an accessible route. The second sentence is specific to accessible EV chargers, but uses the term “should”.
- Some large sites may have multiple EV charging station locations, and an accessible route should be provided at each location.



- If EV chargers must be installed on a curb, such as at on-street parking, place them as close to the edge of the face of the curb as possible and no farther than 10 inches away from the face of the curb.

Fleet Vehicle Accessibility Requirements

- Under the ABA, fleet EV charging stations at facilities designed, built, altered, or leased with federal funds for charging organizations' vehicles must be accessible.
  EEA NOTE: Is there a distinction between federal and state funds relative to this item?
- Under §203.9 of the ADA Standards, entities subject to Title II or Title III of the ADA may be eligible for an exception for EV charging stations provided at a commercial facility for charging fleet vehicles under the employee work area exception if charging stations are used only by employees for charging company/fleet vehicles. However, it is recommended that at least one EV charger have accessible mobility features to accommodate employees with disabilities because the employer may be required to provide an accessible EV charger if requested by an employee as a reasonable accommodation.
  EEA NOTE: Further clarification is needed to determine what is defined as a commercial facility?
- The "use last" model would require more EV charging spaces be designed with accessible mobility features, but would not require that the charging spaces be reserved exclusively for people with disability placards. People without disability placards could use accessible EV charging spaces when all others are occupied, resulting in greater use of available chargers. This would allow mobility device users to have more options to find a charging space with the ideal design for their EV, and alternative charging spaces to use if a charger is broken or obscured. Having alternatives is extremely important, especially if the next accessible charging station is very far away.



Key considerations when adding EV chargers with accessible mobility features to existing parking facilities

- Can the chargers be connected by a compliant accessible route to the accessible entrance of the building or facility?
- Is the slope and cross slope of the vehicle charging space less than 1:48? Can the floor or ground surface be altered to achieve slopes less than 1:48?
- Is there sufficient space for an 11-foot-wide, 20-foot-long vehicle space and 5-foot-wide access aisle?
- Can the chargers be placed at the same level as the vehicle charging space? Will existing curbs and landscaping need to be removed or altered to place chargers at the same level as the vehicle charging space?
- Can a clear floor or ground space positioned for a parallel approach with an unobstructed side reach be provided?
- Is the clear floor or ground space firm, stable, and slip resistant?
- If EV chargers must be mounted on a curb, are operable parts of the chargers still within an unobstructed side reach and no farther than 10 inches and no higher than 48 inches above the clear floor or ground space?
- What existing site constraints are there, and would locating chargers elsewhere on the site make them more accessible?

Engineer's Opinion of Probable Costs - Civil Work Only

McHenry County EV Fleet Transition Study - Admin Building Area 1

McHenry County, Illinois
January 22, 2024

ERIKSSON ENGINEERING ASSOCIATES, LTD.

Division A - Site Demolition					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Sawcut, Full Depth.	LF	630	$8.00	$5,040.00
	Bituminous Pavement Removal (Full)	SY	190	$20.00	$3,800.00
	Concrete Pavement Removal (7")	SY	30	$50.00	$1,500.00
	Concrete Curb & Gutter Removal	LF	80	$30.00	$2,400.00
	Subtotal				**$12,740.00**

Division B - Earthwork and SESC					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Seeding (Turf)	SY	190	$2.50	$475.00
	Inlet Baskets	EA	2	$250.00	$500.00
	Subtotal				**$975.00**

Division C - Site Pavement Improvements					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Bituminous Pavement Section	SY	190	$40.00	$7,600.00
	Concrete Pavement Section	SY	20	$150.00	$3,000.00
	Concrete Sidewalk	SY	10	$100.00	$1,000.00
	B6.12 Curb & Gutter	LF	80	$30.00	$2,400.00
	Bollards	EA	4	$1,000.00	$4,000.00
	Paint Striping, 4"	LS	1	$2,000.00	$2,000.00
	Subtotal				**$20,000.00**

	Total Costs from Above	$33,715.00
	10% Contingency	$3,371.50
	Opinion of Total Construction Costs	**$37,086.50**

Engineer's Opinion of Probable Costs - Civil Work Only

McHenry County EV Fleet Transition Study - Admin Building Area 2

McHenry County, Illinois
January 22, 2024

ERIKSSON ENGINEERING ASSOCIATES, LTD.

Division A - Site Demolition					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Sawcut, Full Depth.	LF	800	$8.00	$6,400.00
	Bituminous Pavement Removal (Full)	SY	260	$20.00	$5,200.00
	Concrete Curb & Gutter Removal	LF	60	$30.00	$1,800.00
	Subtotal				**$13,400.00**

Division B - Earthwork and SESC					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Seeding (Turf)	SY	270	$2.50	$675.00
	Inlet Baskets	EA	2	$250.00	$500.00
	Subtotal				**$1,175.00**

Division C - Site Pavement Improvements					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Bituminous Pavement Section	SY	260	$40.00	$10,400.00
	B6.12 Curb & Gutter	LF	80	$30.00	$2,400.00
	Bollards	EA	4	$1,000.00	$4,000.00
	Paint Striping, 4"	LS	1	$2,000.00	$2,000.00
	Subtotal				**$18,800.00**

	Total Costs from Above	$33,375.00
	10% Contingency	$3,337.50
	Opinion of Total Construction Costs	**$36,712.50**

Engineer's Opinion of Probable Costs - Civil Work Only

McHenry County EV Fleet Transition Study - MCGC Area 1

McHenry County, Illinois
January 22, 2024

ERIKSSON ENGINEERING ASSOCIATES, LTD.

Division A - Site Demolition					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Sawcut, Full Depth.	LF	1150	$8.00	$9,200.00
	Bituminous Pavement Removal (Full)	SY	440	$20.00	$8,800.00
	Concrete Pavement Removal (Full Depth)	SY	50	$50.00	$2,500.00
	Concrete Curb & Gutter Removal	LF	60	$30.00	$1,800.00
	Subtotal				**$22,300.00**

Division B - Earthwork and SESC					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Seeding (Turf)	SY	500	$2.50	$1,250.00
	Inlet Protection	EA	9	$250.00	$2,250.00
	Subtotal				**$3,500.00**

Division C - Site Pavement Improvements					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Bituminous Pavement Section	SY	440	$40.00	$17,600.00
	Concrete Sidewalk	SY	50	$100.00	$5,000.00
	B6.12 Curb & Gutter	LF	100	$100.00	$10,000.00
	Bollards	EA	8	$1,000.00	$8,000.00
	Paint Striping, 4"	LS	1	$5,000.00	$3,000.00
	Subtotal				**$43,600.00**

	Total Costs from Above	**$69,400.00**
	10% Contingency	$6,940.00
	Opinion of Total Construction Costs	**$76,340.00**

Engineer's Opinion of Probable Costs - Civil Work Only

McHenry County EV Fleet Transition Study - MCGC Area 2

McHenry County, Illinois
January 22, 2024

ERIKSSON ENGINEERING ASSOCIATES, LTD.

Division A - Site Demolition					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Sawcut, Full Depth.	LF	860	$8.00	$6,880.00
	Bituminous Pavement Removal (Full)	SY	270	$20.00	$5,400.00
	Concrete Pavement Removal (Full Depth)	SY	50	$50.00	$2,500.00
	Concrete Curb & Gutter Removal	LF	80	$30.00	$2,400.00
	Subtotal				**$17,180.00**

Division B - Earthwork and SESC					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Seeding (Turf)	SY	1000	$2.50	$2,500.00
	Inlet Protection	EA	6	$250.00	$1,500.00
	Subtotal				**$4,000.00**

Division C - Site Pavement Improvements					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Bituminous Pavement Section	SY	270	$40.00	$10,800.00
	Concrete Sidewalk	SY	50	$100.00	$5,000.00
	B6.12 Curb & Gutter	LF	100	$100.00	$10,000.00
	Bollards	EA	8	$1,000.00	$8,000.00
	Paint Striping, 4"	LS	1	$5,000.00	$3,000.00
	Subtotal				**$36,800.00**

	Total Costs from Above	**$57,980.00**
	10% Contingency	$5,798.00
	Opinion of Total Construction Costs	**$63,778.00**

Engineer's Opinion of Probable Costs - Civil Work Only

McHenry County EV Fleet Transition Study - McDOT

McHenry County, Illinois
January 22, 2024

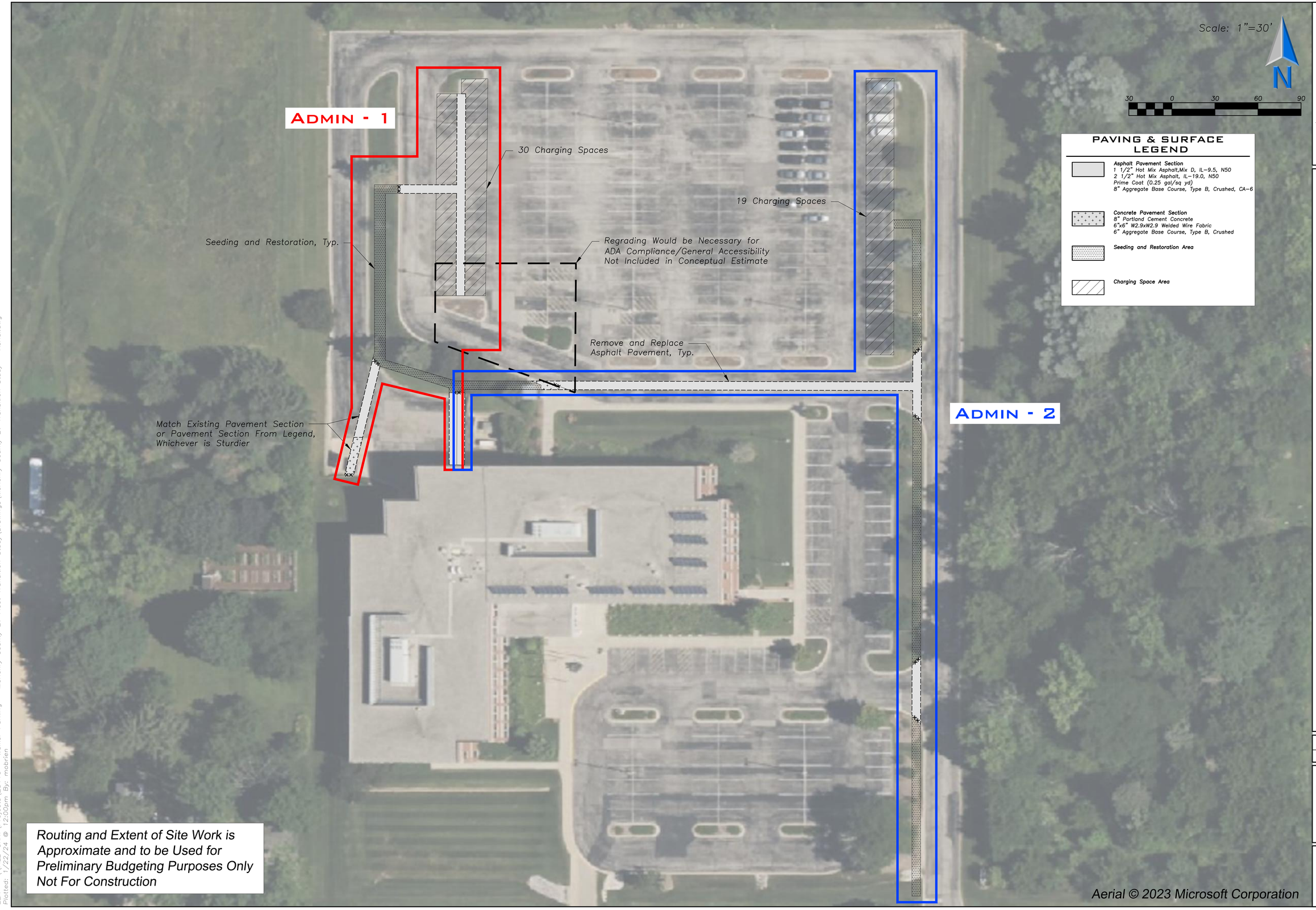
ERIKSSON ENGINEERING ASSOCIATES, LTD.

Division A - Site Demolition					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Sawcut, Full Depth.	LF	250	$5.00	$1,250.00
	Bituminous Pavement Removal (Full)	SY	80	$20.00	$1,600.00
	Subtotal				**$2,850.00**

Division B - Earthwork and SESC					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Seeding (Turf)	SY	160	$2.50	$400.00
	Subtotal				**$400.00**

Division C - Site Pavement Improvements					
Item	Description	Unit	Quantity	Unit Price	Extended Price
	Bituminous Pavement Section	SY	80	$40.00	$3,200.00
	Bollards	EA	4	$1,000.00	$4,000.00
	Paint Striping, 4"	LS	1	$2,500.00	$2,500.00
	Subtotal				**$9,700.00**

	Total Costs from Above	$12,950.00
	10% Contingency	$1,295.00
	Opinion of Total Construction Costs	**$14,245.00**



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N

30 0 30 60 90

PAVING & SURFACE LEGEND

Asphalt Pavement Section
1 1/2" Hot Mix Asphalt,Mix D, IL-9.5, N50
2 1/2" Hot Mix Asphalt, IL-19.0, N50
Prime Coat (0.25 gal/sq yd)
8" Aggregate Base Course, Type B, Crushed, CA-6

Concrete Pavement Section
8" Portland Cement Concrete
6"x6" W2.9xW2.9 Welded Wire Fabric
6" Aggregate Base Course, Type B, Crushed

Seeding and Restoration Area

Charging Space Area

ERIKSSON ENGINEERING ASSOCIATES, LTD.
145 COMMERCE DRIVE, SUITE A
GRAYSLAKE, ILLINOIS 60030
PHONE (847) 223-4804
FAX (847) 223-4864
EMAIL INFO@EEA-LTD.COM
PROFESSIONAL DESIGN FIRM
LICENSE NO. 184-003220
EXPIRES: 04/30/2025

McHENRY COUNTY FLEET EV TRANSITION STUDY

McHENRY COUNTY, ILLINOIS

Design By:	Checked By:	Date:
MRO	SC	01/22/24

Sheet Title:

EV CHARGING CONCEPT ADMIN

Sheet No:

CSK-01

EEA – \\FILE-GRAY\Projects\23110 – Walker Parking – McHenry County EV Fleet Transition Study\Drawings\McHenry County EV Transition Study – Aerial.dwg
Plotted: 1/22/24 @ 12:00pm By: mobrien

Scale: 1"=30'

30 0 30 60 90

18 Charging Spaces

16 Charging Spaces

MCGC - 1

24 Charging Spaces

MCGC - 2

Seeding and Restoration, Typ.

Remove and Replace
Concrete Sidewalk,
Sawcut to Nearest Joints

Remove and Replace
Asphalt Pavement, Typ.

Match Existing Pavement Section
or Pavement Section From Legend,
Whichever is Sturdier

PAVING & SURFACE LEGEND

Asphalt Pavement Section
1 1/2" Hot Mix Asphalt,Mix D, IL-9.5, N50
2 1/2" Hot Mix Asphalt, IL-19.0, N50
Prime Coat (0.25 gal/sq yd)
8" Aggregate Base Course, Type B, Crushed, CA-6

Concrete Sidewalk Section
5" Portland Cement Concrete
6"x6" W1.4xW1.4 Welded Wire Fabric
2" Aggregate Base Course, Type B, Crushed

Seeding and Restoration Area

Charging Space Area

Routing and Extent of Site Work is Approximate and to be Used for Preliminary Budgeting Purposes Only Not For Construction

ERIKSSON ENGINEERING ASSOCIATES, LTD.
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McHENRY COUNTY FLEET EV TRANSITION STUDY

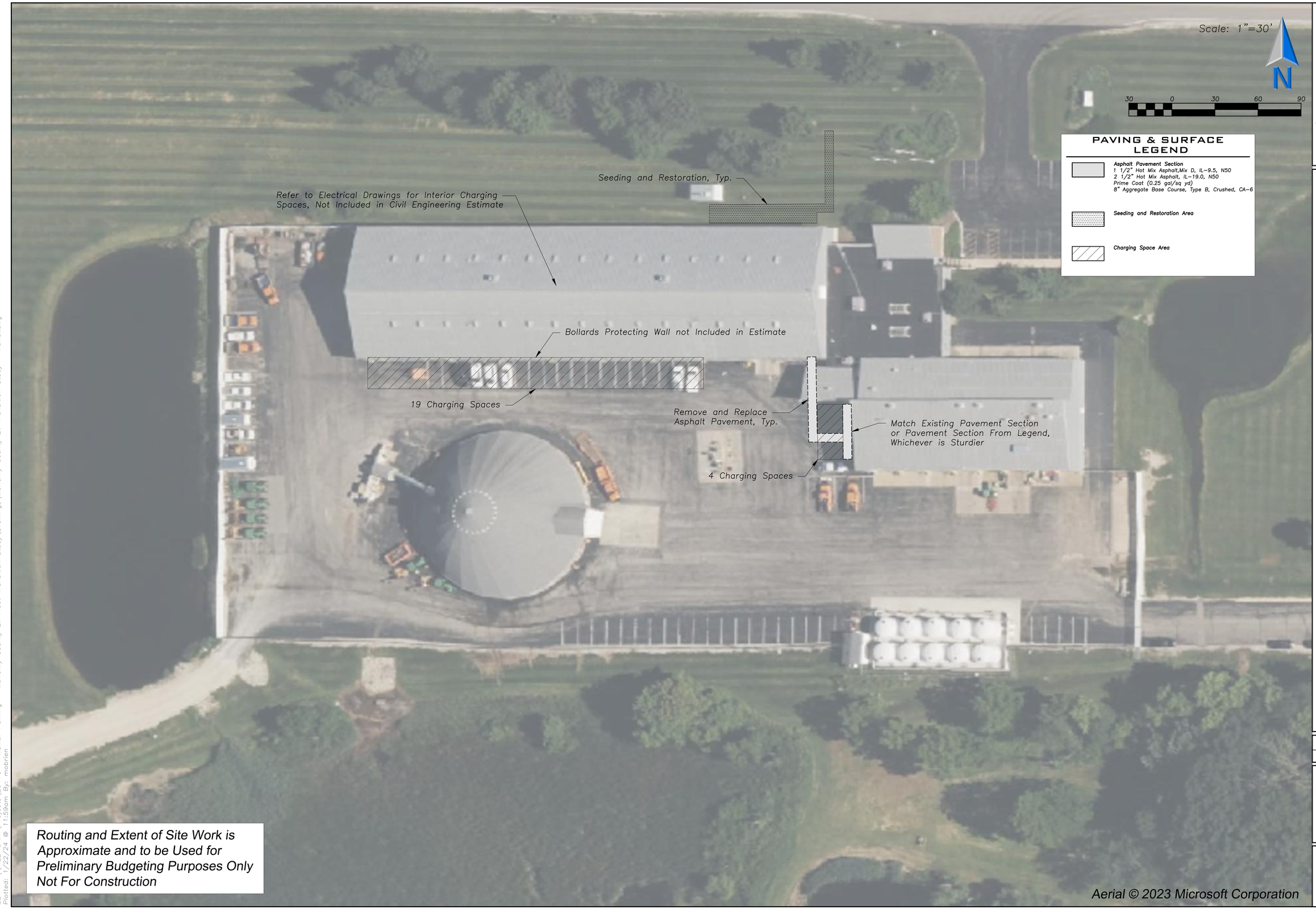
McHENRY COUNTY, ILLINOIS

Design By:	Checked By:	Date:
MRO	SC	01/22/24

Sheet Title:
EV CHARGING CONCEPT MCGC

Sheet No:
CSK-02

EEA – \\FILE-GRAY\Projects\23110 – Walker Parking – McHenry County EV Fleet Transition Study\Drawings\McHenry County EV Transition Study – Aerial.dwg
Plotted: 1/22/24 @ 11:59am By: mobrien



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McHENRY COUNTY FLEET EV TRANSITION STUDY

McHENRY COUNTY, ILLINOIS

Design By:	Checked By:	Date:
MRO	SC	01/22/24

Sheet Title:

EV CHARGING CONCEPT MCDOT

Sheet No:

CSK-03

EEA – \\FILE-GRAY\Projects\23110 – Walker Parking – McHenry County EV Fleet Transition Study\Drawings\McHenry County EV Transition Study – Aerial.dwg
Plotted: 1/22/24 @ 11:59am By: mobrien