Historic Preservation Services
Community Development & Neighborhood Services
281 North College Avenue
P.O. Box 580
Fort Collins, CO 80522.0580

970.224.6078
preservation@fcgov.com
fcgov.com/historicpreservation

CERTIFICATE OF APPROPRIATENESS – Minor Alteration
ISSUED: May 6, 2024
EXPIRATION: May 6, 2025

City of Fort Collins
c/o Kathryn Black, Winn-Marion Companies
7151 S. Blackhawk St.
Centennial, CO 80112

Dear Property Owner:

This letter provides you with certification that proposed work to your designated Fort Collins landmark property, the Power Plant, Art Deco Fountain, Rock Garden, Waterway, Pool, and Grotto at 450 N. College Ave. (401 N. College Ave.) has been approved by the City's Historic Preservation Division (HPD) because the proposed work appears to be routine in nature with minimal effects to the historic resource, and meets the requirements of Chapter 14, Article IV of the Fort Collins Municipal Code.

The alterations reviewed include:

- Installation of new EV charging station in the west parking lot

Notice of the approved application has been provided to building and zoning staff to facilitate the processing of any permits that are needed for the work. Please note that work beyond that indicated in your permit application/correspondence requires additional approval.

If the approved work is not completed prior to the expiration date noted above, you may apply for an extension by contacting staff at least 30 days prior to expiration. Extensions may be granted for up to 12 additional months, based on a satisfactory staff review of the extension request.

If you have any questions regarding this approval, or if I may be of any assistance, please do not hesitate to contact me. I can be reached at yjones@fcgov.com or at (970) 224-6045.

Sincerely,

Yani Jones
Historic Preservation Planner

GENERAL NOTES

1.1.1 PROJECT NOTES:

1.1.2 THIS ELECTRIC VEHICLE CHARGING SYSTEM SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 625. ALL MANUFACTURERS'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTIONS (AHJ) APPLICABLE CODES.

1.1.3 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND ELECTRIC VEHICLE CHARGING SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION

1.1.4 ALL ELECTRICAL MATERIALS, DEVICES, FITTINGS, AND ASSOCIATED EQUIPMENT SHALL BE LISTED. FOR SUCH USE THE ELECTRIC VEHICLE SUPPLY EQUIPMENT SHALL COMPLY WITH NEC 625.15

1.2.1 SCOPE OF WORK:

1.2.2 PRIME CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND SPECIFICATIONS OF THE VEHICLE CHARGING SYSTEM RETROFIT. PRIME CONTRACTOR WILL BE RESPONSIBLE FOR COLLECTING EXISTING ONSITE REQUIREMENTS TO DESIGN, SPECIFY, AND INSTALL VEHICLE CHARGING SYSTEM DETAILED IN THIS DOCUMENT.

1.3.1 GENERAL REQUIREMENTS

1.3.2 OVERCURRENT PROTECTION. FOR FEEDERS AND BRANCH CIRCUITS SUPPLYING ELECTRIC VEHICLE SUPPLY EQUIPMENT SHALL BE SIZED PER NEC 625.40

1.3.3 DISCONNECTING MEANS. PER NEC 625.42 ELECTRIC VEHICLE SUPPLY EQUIPMENT RATED MORE THAN 60 AMPERES OR MORE THAN 150 VOLTS TO GROUND, THE DISCONNECTING MEANS SHALL BE PROVIDED AND INSTALLED IN A READILY ACCESSIBLE LOCATION. THE DISCONNECTING MEANS SHALL BE LOCKABLE OPEN IN ACCORDANCE WITH 110.25. LOCATION PER NEC625.50

1.3.4 THE ELECTRIC VEHICLE SUPPLY EQUIPMENT SHALL BE LOCATED FOR DIRECT ELECTRICAL COUPLING OF THE EV CONNECTOR (CONDUCTIVE OR INDUCTIVE) TO THE ELECTRIC VEHICLE. UNLESS SPECIFICALLY LISTED AND MARKED FOR THE LOCATION, THE COUPLING MEANS OF THE ELECTRIC VEHICLE SUPPLY EQUIPMENT SHALL BE STORED OR LOCATED AT A HEIGHT OF NOT LESS THAN 450 MM (18 IN.) ABOVE THE FLOOR LEVEL FOR INDOOR LOCATIONS AND 600 MM (24 IN.) ABOVE THE GRADE LEVEL FOR OUTDOOR LOCATIONS.

1.3.5 VENTILATION. THE VENTILATION REQUIREMENT FOR CHARGING AN ELECTRIC VEHICLE IN AN INDOOR ENCLOSED SPACE SHALL COMPLY NEC 625.52

1.3.6. PRIOR TO BEGINNING ANY WORK, THE CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS FROM THE AUTHORITIES HAVING JURISDICTION. THE CONTRACTOR SHALL COORDINATE AND OBTAIN APPROVALS FROM ALL RESPECTIVE UTILITY COMPANIES AS REQUIRED FOR A COMPLETE AND OPERATING INSTALLATION. PROVIDE ALL LABOR AND MATERIALS FOR A COMPLETE INSTALLATION. WORK SHALL BE EXECUTED BY EXPERIENCED ELECTRICIANS WHO ARE LICENSED IN THE JURISDICTION WHERE THE PROJECT IS LOCATED.

1.3.7. PROVIDE ALL MATERIALS AND LABOR AS REQUIRED TO ACHIEVE A COMPLETE AND OPERATING SYSTEM ALL EQUIPMENT SHALL BE NEW, "UL" LISTED, AND LABELED.

1.3.8. THE LOCATION OF UNDERGROUND FACILITIES SHOWN ON THE PLANS ARE BASED ON AVAILABLE DOCUMENTATION PROVIDED. IT SHALL BE THE CONTRACTOR'S FULL RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES AND TO PERFORM UTILITY LOCATING SERVICES TO LOCATE THEIR FACILITIES A MINIMUM OF 48 HOURS PRIOR TO STARTING CONSTRUCTION. NO ADDITIONAL COMPENSATION SHALL BE PAID TO THE CONTRACTOR FOR DAMAGE AND REPAIR TO THESE FACILITIES CAUSED BY THEIR WORK FORCE.

1.3.9. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING AROUND OR NEAR UTILITIES. THE CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO FALL PROTECTION, CONFINED SPACE, ELECTRICAL SAFETY, AND TRENCHING & EXCAVATION.

1.3.10. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.

1.3.11. ALL DIMENSIONS, GRADES, AND UTILITY LOCATIONS SHOWN ON THESE PLANS WERE BASED ON AVAILABLE DOCUMENTATION PROVIDED. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY PROJECT MANAGER IF ANY DISCREPANCIES EXIST PRIOR TO PROCEEDING WITH

1.3.12. CONSTRUCTION FOR NECESSARY CHANGES. NO EXTRA COMPENSATION SHALL BE PAID TO THE CONTRACTOR FOR WORK HAVING TO BE REDONE DUE TO INFORMATION SHOWN INCORRECTLY ON THESE PLANS IF SUCH NOTIFICATION HAS NOT BEEN GIVEN.

1.3.13. THE CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE THEMSELVES WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH ALL CONTRACT DOCUMENTS, FIELD DOCUMENTS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.

1.3.14. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND CITY ORDINANCES. THE CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THEIR WORK.

1.3.15. ALL WORK CARRIED OUT SHALL COMPLY WITH APPLICABLE NATIONAL, MUNICIPAL AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND REGULATIONS.UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT.

1.3.16. APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATION ON THE DRAWINGS.

1.3.17. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC REPRESENTATION ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT SHALL MAINTAIN THE MINIMUM REQUIRED CODE AND MANUFACTURER CLEARANCES. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.

1.3.18. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE ENGINEER PRIOR TO PROCEEDING.

1.3.19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS AND ANY BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.

1.3.20. THE CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.

1.3.21. CONSTRUCTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMAN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE.

1.3.22. THE CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE OWNER/CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.

1.3.23. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.

1.3.24. ONLY ITEMS SPECIFICALLY CALLED OUT TO BE REMOVED OR DEMOLISHED SHALL BE AFFECTED. ANY ITEMS INCLUDING, BUT NOT LIMITED TO, CURBS, PAVEMENT, UTILITY ITEMS, LANDSCAPING, ETC. SHALL REMAIN AND BE PROTECTED THROUGHOUT CONSTRUCTION. CONTRACTOR IS RESPONSIBLE TO REPAIR OR REPLACE ANY AFFECTED ITEMS AT OWNERS DISCRETION.

1.3.25. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION AND PROVIDE EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION IN COMPLIANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIREMENTS. PROVIDE ALL REQUIRED SILT FENCING, CONSTRUCTION FENCING, STRAW BALES, STORM DRAIN CATCH BASIN INSERTS (SOCKS), ENTRANCE ROCKING, AND ANY OTHER REQUIRED ELEMENTS PRIOR TO COMMENCEMENT OF CONSTRUCTION AND/OR CLEARING THE SITE.

1.3.26. THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE-APPROVED BY THE LOCAL JURISDICTION.

1.3.27. THE CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.

1.3.28. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.

1.3.29. THE CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF APPROVED PLANS WITH ALL REVISIONS, ADDENDA, MANUFACTURERS EQUIPMENT INSTALLATION INSTRUCTIONS AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.

1.3.30. THE CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2-A OT 2-A:10-B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.

1.3.31. ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.

1.3.32. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE OWNER AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.

1.3.33. THE CONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS-BUILT REDLINES TO THE OWNER UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.

1.3.34. THE CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.

1.3.35. THE CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.

1.3.36. SOUNDS ORIGINATING FROM THE CONSTRUCTION SITE, INCLUDING BUT NOT LIMITED TO SOUND FROM CONSTRUCTION EQUIPMENT, POWER TOOLS AND HAMMERING, ARE PROHIBITED BETWEEN THE HOURS OF 10:00 P.M. TO 7:00 A.M. ON WEEKDAYS AND 10:00 P.M. TO 9:00 A.M. ON WEEKENDS.

1.3.37. PENETRATIONS OF ALL FIRE RATED WALLS OR CEILINGS SHALL BE FIRE RATED IN ACCORDANCE WITH ALL LOCAL AND NATIONAL CODES.

1.3.38. PROVIDE RIVETED ON ENGRAVED PLASTIC NAMEPLATES (RED WITH WHITE LETTERS) FOR ALL MAJOR ELECTRICAL EQUIPMENT.

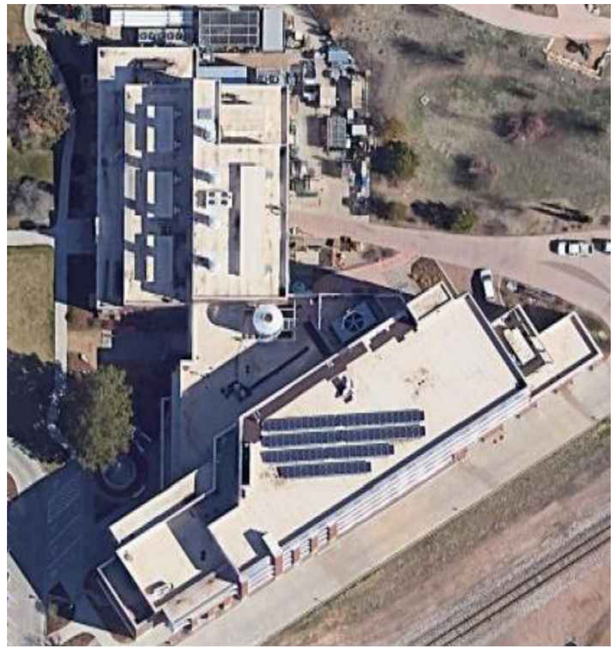
1.3.39. ALL DEVICES MOUNTED BACK TO BACK ON THE FIRE RATED WALL SHALL BE MOUNTED WITH 24" MINIMUM HORIZONTAL OFFSET.

SYMBOL LEGEND

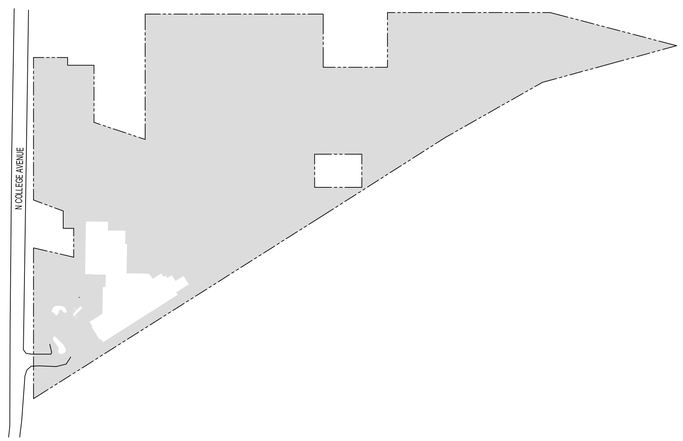
- PROPERTY LINE
- CONDUIT
- CLEAR GROUND SPACE
- POLE WITH SIGN
- NORTH INDICATOR
- DETAIL INDICATOR (02 / A-102)
- 2 SHEET KEYNOTE INDICATOR
- ID3 CONDUCTOR AND CONDUIT SCHEDULE INDICATOR

DISCLAIMER: PLEASE NOTE THAT THE ABBREVIATIONS, ANNOTATIONS, AND SYMBOLS LISTED ARE INTENDED TO ILLUSTRATE THOSE THAT ARE COMMONLY USED; NOT ALL ARE NECESSARILY UTILIZED WITHIN THIS SET OF DRAWINGS.

NEW EV SYSTEM
CSU - XCHARGE
430 N COLLEGE AVENUE, FORT COLLINS, CO 80524
APN: 9712219901



01 AERIAL PHOTO
SCALE: NOT TO SCALE



02 PLAT MAP
SCALE: NOT TO SCALE

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
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R-001	RESOURCE DOCUMENT

PROJECT INFORMATION

OWNER
NAME: COLORADO STATE UNIVERSITY
PHONE: (970)491-4792
E-MAIL: KIRK.EVANS@COLOSTATE.EDU

PROJECT MANAGER
NAME:
PHONE:

CONTRACTOR
NAME: WINN-MARION BARBER, LLC
PHONE: 9708001584
E-MAIL: IANTRUJILLO@WINN-MARION.COM

AUTHORITIES HAVING JURISDICTION
BUILDING: FORT COLLINS CITY
ZONING: FORT COLLINS CITY
UTILITY:

APPLICABLE CODES & STANDARDS
BUILDING: IBC 2021
ELECTRICAL: NEC 2023
FIRE: IFC 2021

SCOPE OF WORK
SYSTEM SIZE: (1) XCHARGE NET ZERO 40A, 33.2KW EV CHARGER (LEVEL 3)

Winn-Marion Companies

CONTRACTOR
WINN-MARION BARBER, LLC
PHONE: 9708001584
ADDRESS: 7151 S BLACKHAWK ST, SUITE #900, CENTENNIAL, CO 80112
LIC. NO.: EC.0102312

REVISION / RELEASE

NO.	DESCRIPTION	DATE

PROJECT

NEW EV SYSTEM
CSU
XCHARGE
430 N COLLEGE AVENUE,
FORT COLLINS, CO 80524
APN: 9712219901

COLORADO LICENSED MICHAEL A. NEGRETE PE.0055723 PROFESSIONAL ENGINEER

sealed 02may2024 mike@h2dc.com
H2DC PLLC CO CoA#: 2020156890
ELECTRICAL ONLY
- NOT AN AS-BUILT DRAWING SET -

PAPER SIZE: 36" x 24" (ARCH D)

SHEET TITLE: COVER PAGE

DATE: 04.17.2024
DESIGN BY: H.M.
CHECKED BY: L.A.
SHEET NUMBER: T-001.00
(SHEET 1)

ELECTRICAL NOTES

2 GENERAL
2.1.1. CONDITIONS
2.1.2 FURNISH AND INSTALL A COMPLETELY WIRED AND OPERATIONAL ELECTRICAL SYSTEM AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.
2.2.1. CODES, REGULATIONS, AND STANDARDS
2.2.2 THE FOLLOWING INDUSTRY STANDARDS, SPECIFICATIONS, AND CODES ARE MINIMUM REQUIREMENTS:

- THE NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA) STANDARDS.
- THE NATIONAL ELECTRICAL CODE (NEC), INCLUDING LOCAL AMENDMENTS.
- UNDERWRITER LABORATORIES (UL) INCORPORATED STANDARDS.
- NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
- AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).

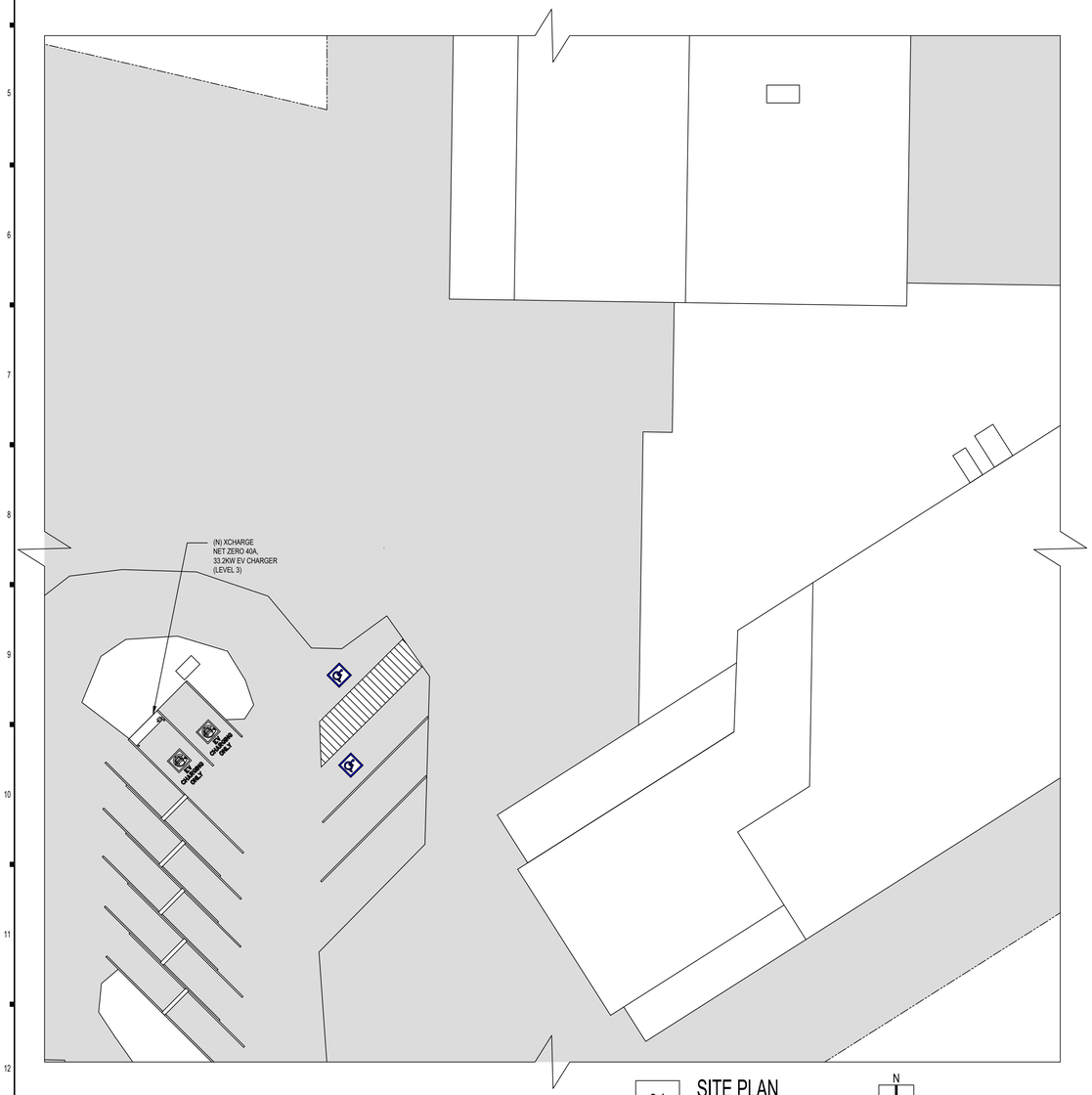
2.3.1. INSPECTION OF SITE
2.3.2. PRIOR TO SUBMITTING A BID FOR ELECTRICAL WORK, THE CONTRACTOR SHALL VISIT THE SITE OF THE PROPOSED CONSTRUCTION AND SHALL THOROUGHLY ACQUAINT HIMSELF WITH EXISTING UTILITIES, AND WORKING CONDITIONS TO BE ENCOUNTERED, ETC. ALLOWANCE WILL NOT BE MADE FOR NONCOMPLIANCE WITH THIS CONDITION AFTER BIDDING.
2.4.1. STORAGE AND HANDLING OF MATERIAL
2.4.2. DELIVER MATERIALS AND EQUIPMENT TO THE PROJECT IN THE MANUFACTURER'S ORIGINAL,UNOPENED, LABELED CONTAINERS. PROTECT AGAINST MOISTURE, TAMPERING, OR DAMAGE FROM IMPROPER HANDLING OR STORAGE. CONTRACTOR SHALL PROTECT AND BE RESPONSIBLE FOR ANY DAMAGE TO WORK OR MATERIALS UNTIL FINAL ACCEPTANCE BY THE OWNER, AND SHALL MAKE GOOD WITHOUT COST TO THE OWNER, ANY DAMAGE OR LOSS THAT MAY OCCUR DURING THIS PERIOD.
2.4.3. ARRANGE FOR TIMELY DELIVERY OF MATERIALS AND EQUIPMENT TO THE JOB SITE IN ORDER TO MINIMIZE THE LENGTH OF TIME BETWEEN DELIVERY AND INSTALLATION. 3. COVER AND PROTECT ANY MATERIAL WHICH MAY BE AFFECTED BY THE WEATHER WHILE IN TRANSIT OR STORED AT THE PROJECT SITE. ANY MATERIAL FOUND DEFECTIVE OR NOT INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS MAY BE REJECTED BY THE ENGINEER.
2.5.1. DRAWINGS
2.5.2 THE DRAWINGS INDICATE THE GENERAL ARRANGEMENT AND LOCATIONS OF THE ELECTRICAL WORK. DATA PRESENTED ON THESE DRAWINGS IS AS ACCURATE AS PLANNING CAN DETERMINE, FIELD VERIFICATION OF ALL DIMENSIONS, LOCATIONS, LEVELS, ETC., TO SUIT FIELD CONDITIONS IS REQUIRED. REVIEW ALL ARCHITECTURAL, CIVIL AND STRUCTURAL DRAWINGS AND ADJUST ALL WORK TO MEET THE REQUIREMENTS OF ACTUAL FIELD CONDITIONS. DISCREPANCIES BETWEEN DIFFERENT PLANS, OR BETWEEN DRAWINGS AND SPECIFICATIONS, OR REGULATIONS AND CODES GOVERNING THE INSTALLATION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING. IF DISCREPANCIES ARE NOT REPORTED, THE CONTRACTOR SHALL BID THE GREATER QUANTITY OR BETTER QUALITY, AND APPROPRIATE DJUSTMENTS WILL BE MADE AFTER CONTRACT AWARD. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD MEASURE AND CONFIRM MOUNTING HEIGHTS AND LOCATION OF ELECTRICAL EQUIPMENT. DO NOT SCALE DISTANCES OFF THE ELECTRICAL DRAWINGS, USE ACTUAL FIELD VERIFIED DIMENSIONS.
2.6.1. EXCAVATION, CUTTING, AND FITTING
2.6.2. PERFORM THE EXCAVATION, CUTTING, FITTING, REPAIRING, AND FINISHING OF THE WORK NECESSARY FOR THE INSTALLATION OF THE EQUIPMENT OF THIS SECTION. HOWEVER, NO CUTTING OF THE WORK OF OTHER TRADES OR OF ANY STRUCTURAL MEMBERS SHALL BE DONE WITHOUT THE CONSENT OF THE OWNER.
3 PRODUCTS AND EXECUTION
3.1.1. MATERIALS
3.1.2ALL MATERIALS SHALL BE NEW AND OF QUALITY AS SPECIFIED ON THE PLANS OR SPECIFICATIONS AND MUST CARRY THE UNDERWRITER'S LABORATORIES APPROVAL COVERING THE PURPOSE FOR WHICH THEY ARE USED, IN ADDITION TO MEETING ALL REQUIREMENTS OF THE CURRENT APPLICABLE CODES AND REGULATIONS.
3.2.1. CONDUIT
3.2.2. RACEWAYS: UNLESS NOTED OTHERWISE, ALL EXPOSED CONDUIT SHALL BE R.G.S., SCHEDULE 80 AND CONVERTED 6" BELOW FINISHED GRADE TO BE PVC, SCHEDULE 40. PROVIDE WEATHER PROOF FLEX CONNECTIONS WHERE REQUIRED. CONTRACTOR SHALL PROVIDE JUNCTION AND/OR PULL BOXES WHERE SHOWN ON THE DRAWINGS, OR AS REQUIRED, WHETHER SHOWN ON THE DRAWINGS OR NOT, AND SIZED PER NEC. PROVIDE NON-METALLIC ENCLOSURE WITH OPEN BOTTOM AND GASKETED COVER MANUFACTURED BY QUAZITE OR EQUIVALENT WITH DRIVE-OVER COVER ABLE TO WITHSTAND OCCASIONAL NON-DELIBERATE LIGHT VEHICULAR TRAFFIC. LABEL COVER TO SUIT INSTALLATION (I.E."POWER" "COMMUNICATIONS", "LIGHTING",ETC.) AND INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
3.2.3. ALL WIRING SHALL BE INSTALLED IN CONDUIT. ALL CONDUIT SHALL BE MINIMUM OF 3/4".
3.2.4. CONTRACTOR SHALL PLUG AND CAP EACH END OF SPARE AND EMPTY CONDUITS AND PROVIDE TWO SEPARATE PULL STRINGS - 200 LBS TEST POLYETHYLENE CORD. ALL CONDUIT BENDS SHALL BE A MINIMUM OF 3 FT. RADIUS. RGS CONDUITS WHEN SPECIFIED, SHALL MEET UL-6 FOR GALVANIZED STEEL. AL FITTINGS SHALL BE SUITABLE FOR USE WITH THREADED RIGID CONDUIT. COAT ALL THREADS WITH 'BRITE ZINC' OR 'GOLD GALV'.
3.2.5. OUTLET BOXES SHALL BE CAST ALLOY WITH THREADED HUBS IN WET/DAMP LOCATIONS AND SPECIAL ENCLOSURES FOR OTHER CLASSIFIED AREAS.
3.2.6. PROVIDE METAL CONDUIT AND TUBING MANUFACTURED BY ONE OF THE FOLLOWING: ALFLEXCORPORATION; ANAMET INCORPORATED, ANACONDA METAL HOSE; ANIXTED BROTHERS INCORPORATED; CAROL CABLE COMPANY INCORPORATED; ELECTRIC-FLEX COMPANY; GRINNELL COMPANY, ALLIED TUBE AND CONDUIT DIVISION; MONOGRAM COMPANY, AFC; REPUBLIC CONDUIT; OR WHEATLAND TUBECOMPANY.
3.2.7. PROVIDE NONMETALLIC CONDUIT AND TUBING MANUFACTURED BY ONE OF THE FOLLOWING: ANAMET INCORPORATED, ANACONDA METAL HOSE; CANTEX INDUSTRIES, HARSCO CORPORATION; CONDUX INTERNATIONAL, ELECTRICAL PRODUCTS; HUBBELL INCORPORATED,RACO, INCORPORATED; THOMAS & BETTS CORPORATION, CARLON ELECTRICAL PRODUCTS; OR O-Z/GEDNEY, UNIT OF GENERAL SIGNAL.
3.2.8. PROVIDE CONDUIT BODIES AND FITTINGS MANUFACTURED BY ONE OF THE FOLLOWING:CROUSE-HINDS, DIVISION OF COOPER INDUSTRIES; EMERSON ELECTRIC COMPANY, APPLETON ELECTRIC COMPANY; HUBBELL INCORPORATED, KILLARK ELECTRIC MANUFACTURING COMPANY;THOMAS & BETTS CORPORATION, CARLON ELECTRICAL PRODUCTS; OR O-Z/GEDNEY, UNIT OF GENERAL SIGNAL.
3.2.9. PROVIDE METAL WIREWAYS MANUFACTURED BY ONE OF THE FOLLOWING: HOFFMAN ENGINEERING COMPANY; KEYSTONE/REES, INCORPORATED; OR SQUARED D COMPANY.
3.2.10. PROVIDE BOXES, ENCLOSURES, AND CABINETS MANUFACTURED BY ONE OF THE FOLLOWING:CROUSE-HINDS, DIVISION OF COOPER INDUSTRIES; HOFFMAN ENGINEERING COMPANY, FEDERAL-HOFFMAN INCORPORATED; HUBBELL INCORPORATED, RACO INCORPORATED; THOMAS & BETTS, CARLON ELECTRICAL PRODUCTS; O-Z/GEDNEY, UNIT OF GENERAL SIGNAL; ROBROY INDUSTRIES INCORPORATED, ELECTRICAL DIVISION; OR SCOTT FETZER COMPANY, ADALET-PLM.
3.2.11. EXPOSED CONDUITS SHALL BE RGS BELOW 10 FEET AND CAN BE EMT ABOVE 10 FEET. THREADED COUPLINGS ON RGS AND STEEL, COMPRESSION ON EMT.
3.3.1. OUTLET, PULL, AND JUNCTION BOXES
3.3.2. EACH SWITCH, LIGHT. RECEPTACLE OR OTHER OUTLET SHALL BE PROVIDED WITH A CODE GAUGE, GALVANIZED STEEL OUTLET BOX. JUNCTION AND PULL BOXES SHALL BE CODE GAUGE, GALVANIZED STEEL. OUTLET BOXES SHALL BE OF THE ONE PIECE, KNOCKOUT TYPE, IN GENERAL 4" SQUARE WITH PLASTER RING. PLASTER RINGS SHALL BE SET TO PROVIDE NOT MORE THAN 1/8" FROM WALL SURFACE TO RING. IN NO CASE SHALL PLASTER RING PROJECT BEYOND SURFACE OF WALL. SINGLE GANG RINGS SIMILAR TO STEEL CITY 52050 SHALL BE USED FOR 4" BOXES IN UNFINISHED BRICK NUMBER 180 BOXES MAY BE USED FOR UNFINISHED MASONRY FLUSH WALL OUTLETS. CENTER ALL OUTLET BOXES IN BLOCK COURSE.
3.3.3. BOXES INSTALLED IN POURED CEMENT FLOORS SHALL BE FLUSH TYPE CAST IRON OR STEEL WITH WATERTIGHT GASKETED COVERS. WHERE BOXES ARE INSTALLED IN FLOORS WITH TILE OR CARPET FLOOR COVERING, COVERS SHALL BE OF THE RECESSED TYPE TO ACCOMMODATE THE FLOOR COVERING.
3.3.4. ALL JUNCTION BOXES TO BE CAST METAL TYPE FD OR TYPE FS ONLY.
3.4.1. SWITCHBOARDS
3.4.2. PROVIDE SWITCHBOARDS MANUFACTURED IN ACCORDANCE WITH ARTICLE 408 OF THE LATEST NATIONAL ELECTRICAL CODE AND APPLICABLE PORTIONS OF THE NEMA PB2, UL 891 AND NFPA 70, THE NATIONAL ELECTRICAL CODE.
3.4.3. CONSTRUCTION: INTEGRATED SWITCHBOARD SHALL BE OF THE MODULAR TYPE CONSTRUCTION, CONSTRUCTED IN ACCORDANCE WITH THE LATEST NEMA PB-2 AND UL 891STANDARDS, WITH THE REQUIRED NUMBER OF VERTICAL SECTIONS BOLTED TOGETHER TO FORM ONE METAL ENCLOSED RIGID INTEGRATED SWITCHBOARD. THE SIDES, TOP AND REAR SHALL BE COVERED WITH REMOVABLE SCREW-ON CODE GAUGE STEEL PLATES. INTEGRATED SWITCHBOARD SHALL INCLUDE ALL PROTECTIVE DEVICES AND EQUIPMENT AS LISTED ON DRAWINGS WITH NECESSARY INTERCONNECTIONS, INSTRUMENTATION AND CONTROL WIRING. ALL GROUPS OF CONTROL WIRES LEAVING THE INTEGRATED SWITCHBOARD SHALL BE PROVIDED WITH TERMINAL BLOCKS WITH SUITABLE NUMBERING STRIPS. SERVICE ENTRANCE INTEGRATED SWITCHBOARD SHALL BE SUITABLE ONLY FOR USE AS SERVICE EQUIPMENT AND BE LABELED IN ACCORDANCE WITH UL REQUIREMENTS. SYSTEM VOLTAGE, AMPERAGE AND INTERRUPTING CAPACITY SHALL BE AS INDICATED ON THE DRAWINGS. ENCLOSURE CONSTRUCTION SHALL BE AS NOTED ON PLANS.
3.4.4. BUS: THE BUS SHALL BE OF SUFFICIENT SIZE TO LIMIT THE TEMPERATURE RISE TO 65 DEGREE C, BASED ON UL TESTS (1000A/SQ-IN FOR COPPER) AND SHALL BE FULLY RATED THE ENTIRE LENGTH OF THE INTEGRATED SWITCHBOARD. THE BUS SHALL BE BRACED AND SUPPORTED TO WITHSTAND MECHANICAL FORCES EXERTED DURING A SHORT CIRCUIT FROM A POWER SOURCE HAVING THE AVAILABLE SHORT CIRCUIT CURRENT AS INDICATED ON THE DRAWINGS. PROVIDE A FULL CAPACITY NEUTRAL WHERE A NEUTRAL IS INDICATED ON THE DRAWINGS. THE THROUGH BUS ON THE END SECTION SHALL BE EXTENDED AND PRE-DRILLED TO ALLOW THE ADDITION OF FUTURE SECTIONS. GROUND BUS AND GROUNDING CONDUCTOR LUG SHALL BE FURNISHED. GROUND BUS SHALL EXTEND THE ENTIRE LENGTH OF THE SWITCHBOARD AND SHALL BE FIRMLY SECURED TO EACH VERTICAL SECTION. BUS MATERIAL SHALL BE SILVER-PLATED COPPER.
3.4.5. INCOMING UNDERGROUND SERVICE: TO ISOLATE INCOMING UNDERGROUND SERVICE CONDUCTORS, AN UNDERGROUND CABLE PULL OR AUXILIARY SECTION SHALL BE USED WHEN SHOWN ON THE DRAWINGS. THIS SECTION SHALL BE OF THE BUSSED TYPE AND SHALL BE SEALABLE PER LOCAL UTILITY REQUIREMENTS, WHEN REQUIRED.
3.4.6.SERVICE SECTION: THE SERVICE SECTION SHALL BE DESIGNED FOR THE SYSTEM PARAMETERS INDICATED AND SHALL HAVE A METERING COMPARTMENT PER UTILITY REQUIREMENTS] AS INDICATED AND SHALL HAVE A MAIN PROTECTIVE DEVICE INDICATED.
3.4.7. UTILITY METERING: THE UTILITY METERING SECTION SHALL BE BUILT IN ACCORDANCE WITH REQUIREMENTS AND CODES OF THE LOCAL UTILITY.]
3.4.8. DISTRIBUTION SECTIONS: PANEL-MOUNTED, FRONT ACCESSIBLE INDIVIDUAL SECTIONS SHALL BE FRONT ACCESSIBLE. NOT LESS THAN 20" DEEP AND THE REAR OF ALL SECTIONS SHALL ALIGN. INCOMING LINE TERMINATION. MAIN DEVICE CONNECTION AND ALL BOLTS USED TO JOIN CURRENT-CARRYING PARTS SHALL BE INSTALLED SO AS TO PERMIT SERVICING FROM THE FRONT ONLY SO THAT NO REAR ACCESS IS REQUIRED. THE BRANCH DEVICES SHALL BE FRONT REMOVABLE, AND PANEL MOUNTED WITH LINE AND LOAD SIDE CONNECTIONS FRONT ACCESSIBLE. THE INTERIOR SHALL BE CAPABLE OF ACCEPTING PANEL MOUNTED MOLDED CASE CIRCUIT BREAKERS OR FUSIBLE SWITCHES UP TO 1200 AMP RATING. CONSTRUCTION SHALL BE SIEMENS S8 TYPE, OR APPROVED EQUAL.
3.4.9. FINISH: THE COMPLETE SWITCHBOARD SHALL BE PHOSPHATIZED AND FINISHED WITH ANSI 61 LIGHT GRAY POLYESTER POWDER PAINT.
3.4.10. MARKINGS: EACH SWITCHBOARD SECTION SHALL HAVE A LABEL PERMANENTLY AFFIXED TO IT, LISTING THE FOLLOWING INFORMATION: NAME OF MANUFACTURER, SYSTEM VOLTAGE, AMPACITY, TYPE, MANUFACTURER'S SHOP ORDER NUMBER AND DATE. EACH SECTION OF SWITCHBOARD SHALL BEAR A UL LISTING MARK, WHERE QUALIFIED AND A SHORT CIRCUIT RATING LABEL.FRONT, SIDE, REAR AND TOP OF EACH SWITCHBOARD SECTION WILL HAVE A DANGER LABEL IN ACCORDANCE WITH NEMA STANDARD PB-2.
3.5.1. PANEL BOARDS
3.5.2. PROVIDE PANELBOARDS MANUFACTURED IN ACCORDANCE WITH ARTICLE 408 OF THE LATEST NATIONAL ELECTRICAL CODE AND APPLICABLE PORTIONS OF THE NEMA PB1, UL50, UL 67 AND NFPA 70, THE NATIONAL ELECTRICAL CODE.
3.5.3. PANELBOARDS SHALL BE ENCLOSED DEAD FRONT SAFETY TYPE WITH FEATURES AND RATINGS AS SCHEDULED ON DRAWINGS. ALL BUS BARS SHALL BE RECTANGULAR SOLID COPPER. A 'PROVISION' CIRCUIT DESCRIPTION WHERE SHOWN IN PANEL SCHEDULES, DESIGNATES SPACE FOR FUTURE PROTECTIVE DEVICES AND SHALL INCLUDE BUS AND SUPPORT. PANELS KNOWN AS "LOAD CENTERS" ARE UNACCEPTABLE.
3.5.4. MOLDED CASE CIRCUIT BREAKERS SHALL BE AS SCHEDULED ON THE DRAWINGS AND SPECIFIED IN THIS DIVISION. ALL BREAKERS SHALL BE BOLT ON TYPE.
3.5.5. ALL BOLTED CONNECTIONS SHALL BE TORQUED IN ACCORDANCE WITH MANUFACTURERS STANDARDS. RETORQUE ALL CONNECTIONS ONE MONTH AFTER INITIAL TORQUE.
3.5.6. INSTALL CABINETS SO THAT CENTER OF THE TOP BREAKER DOES NOT EXCEED 6'-6" ABOVE THE FINISHED FLOOR.
3.5.7. ELECTRICAL CONTRACTOR SHALL ARRANGE CIRCUITS AS NEAR AS POSSIBLE TO CIRCUIT NUMBERS ON THE DRAWINGS. AT COMPLETION OF JOB, ELECTRICAL CONTRACTOR SHALL TAKE CURRENT READING CHECKS OF RESPECTIVE PHASES. A MINIMUM OF CIRCUIT CONNECTIONS SHALL BE REARRANGED TO BALANCE, AS CLOSELY AS POSSIBLE, THE LOAD IN THE PANEL. ENTRIES ON DIRECTORY CARDS SHALL BE TYPED, COMPLETE AND ACCURATE.
3.5.8. MANUFACTURER SHALL BE SQUARE D, SIEMENS, OR EATON CUTLER-HAMMER.
3.6.1. METERED COMMERCIAL PEDESTAL
3.6.2. ACCEPTABLE MANUFACTURER: MILBANK OR APPROVED EQUAL AMPACITY: AS NOTED ON PLANS VOLTAGE: AS NOTED ON PLANS SCCR RTATING: AS NOTED ON PLANS
3.6.3. THE PEDESTAL SHALL BE OF TYPE 3R RAINPROOF CONSTRUCTION AND SHALL BE UL LISTED. EXTERNAL CONSTRUCTION SHALL COMPLY WITH UL50 REQUIREMENTS AND SHALL BE OF G90 GALVANIZED STEEL WITH LIGHT GREEN #14672 FEDERAL SPECIFICATION 595 POLYURETHANE INDUSTRIAL GRADE POWDER PAINT OF 1.7 MIL MINIMUM THICKNESS (UNLESS OTHERWISE SPECIFIED). ALUMINUM AND STAINLESS STEEL ARE OTHER FACTORY OPTIONS AVAILABLE. INTERNAL CONSTRUCTION SHALL BE G90 GALVANIZED STEEL AND 1.7 MIL MINIMUM THICKNESS POLYURETHANE INDUSTRIAL GRADE POWDER COAT PAINTED OR BARE ALUMINUM. NO FASTENERS EXCEPT SEALING SCREWS SHALL BE REMOVABLE BY EXTERNAL ACCESS. HINGES SHALL BE STAINLESS STEEL AND OF THE CONTINUOUS PIANO HINGE TYPE.
3.6.4. THE PEDESTAL MOUNTING BOLTS SHALL NOT BE EXTERNALLY ACCESSIBLE. THE PEDESTAL SHALL BE OFFERED WITH AN OPTIONAL BASE DESIGNED TO BE EMBEDDED IN CONCRETE IN PLACE OF ANCHOR BOLTS. EITHER PEDESTAL MOUNTING BASE OR ANCHOR BOLT KIT IS REQUIRED FOR INSTALLATION.
3.6.5. THE SERVICE PEDESTAL MUST HAVE THREE SEPARATE ISOLATED SECTIONS FOR METERING EQUIPMENT, UTILITY TERMINATION AND CUSTOMER EQUIPMENT.
3.6.6. THE METERING SECTION MUST BE PAD-LOCKABLE AND SEALABLE AND HAVE A HINGED SWING BACK HOOD WITH AN INTEGRAL HINGED POLYCARBONATE SEALABLE WINDOW FOR ACCESS TO DEMAND METERS. AN EXTERNAL NAMEPLATE SHALL BE PERMANENTLY ATTACHED TO THE HOOD. A STAINLESS-STEEL HANDLE SHALL BE PROVIDED ON THE FRONT EXTERIOR OF THE HOOD. METER SOCKET TYPE SHALL MEET THE REQUIREMENTS OF THE SERVING UTILITY.
3.6.7. THE UTILITY TERMINATION SECTION MUST BE PAD-LOCKABLE AND SEALABLE AND SHALL HAVE A STAINLESS-STEEL HANDLE PROVIDED ON A LIFT-OFF COVER. SUFFICIENT CLEARANCE SHALL BE PROVIDED FOR A 4-INCH DIAMETER CONDUIT FOR UTILITY CABLES ENTRANCE. UTILITY LANDING LUGS SHALL ACCOMMODATE #6 - 350 KCMIL CONDUCTORS.
3.6.8. THE CUSTOMER COMPARTMENT DOOR TO BE HINGED ON THE LEFT-HAND SIDE. A STAINLESS PAD-LOCKABLE HASP PROVIDED TO SECURE CUSTOMER COMPARTMENT. A DOOR KEEPER PROVIDED TO KEEP THE DOOR IN AN OPEN POSITION. A PRINT POCKET ON THE INSIDE OF THE DOOR SHALL HOLD ALL WIRING SCHEMATICS, CIRCUIT DIRECTORIES AND INSTRUCTIONS IN A CLEAR, WEATHERPROOF SLEEVE. REQUIRED LABELING SHALL BE LOCATED ON THE INSIDE OF THE CUSTOMER DOOR. DISTRIBUTION AND CONTROL EQUIPMENT SHALL BE BEHIND AN INTERNAL DEAD-FRONT DOOR WITH A QUARTER-TURN SECURING LATCH AND BE HINGED TO OPEN MORE THAN 90 DEGREES. THE DEADFRONT DOOR SHALL BE HINGED ON THE SAME SIDE AS THE CUSTOMER
SECTION DOOR. ALL DISTRIBUTION AND CONTROL EQUIPMENT SHALL BE FACTORY WIRED USING 600 VOLT WIRE SIZED TO UL REQUIREMENTS.
3.6.9. THE PROVIDED DOCUMENTATION SHALL LIST CIRCUIT BREAKER COMBINATIONS AND THOSE TO BE USED FOR DE-RATED OPERATION FOR SERIES RATINGS.
3.7.1. TRANSFORMERS
3.7.2. ACCEPTABLE MANUFACTURER: EATON OR APPROVED EQUAL DRY TYPE,
INDOOR/OUTDOOR, CONVECTION-COOLED, TRANSFORMER CHARACTERISTICS AS FOLLOWS:
1. RATING & VOLTAGES: AS INDICATED ON DRAWINGS
2. IMPEDANCE AT 115C: STANDARD
3. PRIMARY AND SECONDARY COIL MATERIAL: COPPER
4. CORE MATERIAL: HIGH-GRADE, NON-AGING, SILICON ELECTRICAL STEEL
5. ANGULAR DISPLACEMENT: SECONDARY LAGGING PRIMARY BY 30 (IEC: DY1)
6. VOLTAGE TAPS: 2 - 2½% FCAN, 2 - 2½% FCBN, SILVER PLATED. TAPS TO BE
BOLTED-LINK TYPE AND LOCATED AT FRONT OF COILS FOR ACCESSIBILITY
7. INSULATION CLASS: 220°C
8. TEMPERATURE RISE: 150°C
9. PROVIDE MEANS FOR SECURING ALL CONDUCTORS WITHIN ENCLOSURE.
10. EFFICIENCY: 97.89% MINIMUM PER DOE 2016 EFFECIENCY LEVELS (CFR TITLE 10)
11. ENCLOSURE: MINIMUM NEMA 3R OR 4X TO SUIT ENVIRONMENT.
12. SOUND LEVEL: PER NEMA ST-20 (2014)
13. CONDUCTOR ENTRY: SIDE.
14. PROVIDE ANTI-VIBRATION PADS OR ISOLATORS BETWEEN THE CORE/COIL AND ENCLOSURE.
15. PROVIDE VIBRATION ISOLATORS FOR ALL TRANSFORMERS.
3.8.1. CONDUCTORS AND CABLES
3.8.2. WIRING - ALL CONDUCTORS SHALL BE EQUAL TO OR BETTER THAN MINIMUM #12 AWG FOR POWER, #14 AWG FOR CONTROL WITH 98% CONDUCTIVITY STRANDED COPPER WITH TYPE (THWN-2) INSULATION, 600V, COLOR CODED. PROVIDE 75 DEGREE RATED CONDUCTORS FOR AMPACITES ABOVE 100 AMPS AND 60 DEGREE RATED CONDUCTORS FOR AMPACITIES OF 100 AMPS OR LESS. PROVIDE SOLID OR STRANDED FOR #10 AWG AND SMALLER, STRANDED FOR #8 AWG AND LARGER U.N.O.
3.8.3. WIRE SIZE OF BRANCH CIRCUITS SHALL BE ADJUSTED TO COMPENSATE FOR VOLTAGE DROP BASED UPON ACTUAL CONDUIT ROUTING. CONTRACTOR SHALL MAINTAIN VOLTAGE DROP AS RECOMMENDED BY NEC (NOT TO EXCEED 3%).
3.8.4. PROVIDE A SEPARATE NEUTRAL FOR EACH BRANCH CIRCUIT, FEEDER, ETC. NEUTRALS ARE NOT PERMITTED TO BE SHARED.
3.8.5. CONNECTORS FOR POWER CONDUCTORS: CONTRACTOR SHALL USE PRESSURE TYPE INSULATED TWIST-ON CONNECTORS FOR #10 AWG AND SMALLER. USE SOLDERLESS MECHANICAL TERMINAL LUGS FOR #8 AWG AND LARGER.
3.8.6. ALL CONNECTIONS SHALL BE MADE WITH A PROTECTIVE COATING OF AN ANTI-OXIDE COMPOUND SUCH AS "NO-OXIDE A" BY DEARBORNE CHEMICAL CO. COAT ALL WIRE SURFACES BEFORE CONNECTING. EXPOSED COPPER SURFACE, INCLUDING GROUND BARS, SHALL BE TREATED - NO SUBSTITUTIONS.
3.8.7. MC CABLE IS NOT PERMITTED.
3.8.8. CONDUCTOR COLOR CODES:

- GROUND WIRES: GREEN, GREEN WITH A YELLOW STRIPE, OR BARE COPPER
- NEUTRAL WIRES: WHITE OR GRAY
- SINGLE PHASE LIVE WIRES: BLACK (OR RED FOR A SECOND "HOT" WIRE)
- 208 VAC, 3-PHASE: BLACK, RED AND BLUE
- 480 VAC, 3-PHASE: BROWN, ORANGE, YELLOW

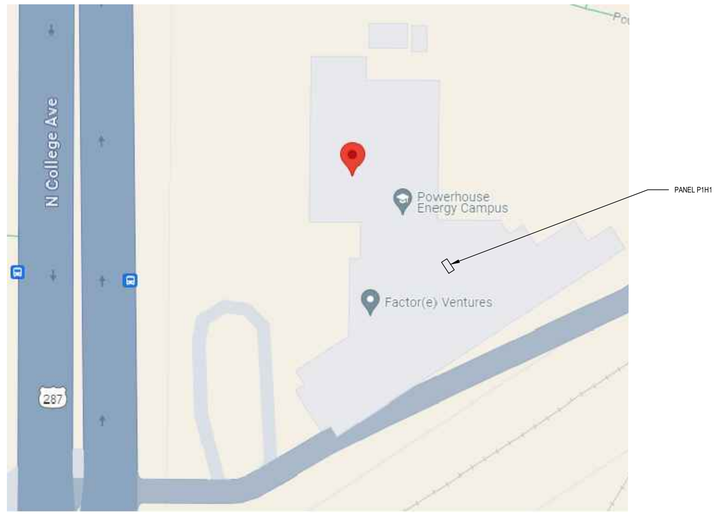
3.8.1. PROVIDE WIRE AND CABLE MANUFACTURED BY ONE OF THE FOLLOWING: AMERICAN INSULATED WIRE CORPORATION; NEXANS; CERROWIRE; SOUTHWIRE; OR ENCORE WIRE.
3.8.2. PROVIDE CONNECTORS MANUFACTURED BY ONE OF THE FOLLOWING: AMP
INCORPORATED; GENERAL SIGNAL, O-Z/GEDNEY UNIT; SQUARE D COMPANY, ANDERSON; ILSCO; OR BURNDY.
3.9.1 ALUMINUM CONDUCTOR REQUIREMENTS
3.9.2. ALUMINUM CONDUCTOR GRADE SHALL BE MINIMUM AA-8000 OR NEWEST
ALUMINUM CONDUCTOR SPECIFICATION BEING USED BY THE INDUSTRY.
3.9.3. THE CONTRACTOR SHALL ABIDE BY ALL ARTICLES RELATED TO ALUMINUM CONDUCTORS IN THE LATEST ISSUE OF THE NEC.
3.9.4. ALUMINUM CONDUCTORS SHALL ONLY BE TERMINATED USING ALUMINUM RATED CONNECTIONS. CONTRACTOR SHALL VERIFY TERMINATIONS ON EACH DEVICE OR EQUIPMENT BEFORE START OF WORK FOR RATED ALUMINUM CONNECTORS.
3.9.5. THE CONTRACTOR SHALL ABIDE BY ALL ALUMINUM WIRING INSTALLATION STANDARDS AS REQUIRED BY THE NEIS (NATIONAL ELECTRICAL INSTALLATION STANDARDS) PUBLISHED BY THE NECA (NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION). THE CONTRACTOR SHALL ABIDE BY ALL STANDARDS IN THE NECA/AA-2006, WHICH DEFINES MINIMUM STANDARDS OF QUALITY AND WORKMANSHIP. A SUMMARY OF SOME OF THE REQUIREMENTS FOLLOW:
A. TERMINATE WITH COMPRESSION CONNECTORS, NO RING CUTS OF THE
INSULATION, CRIMP ONLY WITH A CRIMP TOOL AND THE CORRECT DIE AS REQUIRED BY THE MANUFACTURER.
B. ALL CONDUCTORS TO RECEIVE ANTI-OXIDATIVE COATING DURING INSTALLATION.
C. TERMINATING WITH SET SCREW CONNECTOR, THE SCREW SHALL BE TIGHTENED USING ONLY A TORQUE WRENCH.
D. NECA/AA RECOMMENDS BELLVILLE WASHERS WHEN CONNECTING ALUMINUM CONDUCTORS TO COPPER BUS BARS. ABIDE BY ALL NECA/AA RECOMMENDATIONS.
E. DO NOT USE PIN CONNECTORS (WIRE ADAPTERS) UNLESS ABSOLUTELY
NECESSARY. USE ALL / ANY OTHER OPTIONS, AND IF REQUIRED, PROVE TO ENGINEER BEFORE INSTALLING. IF USED, FOLLOW UL GUIDE FOR WIRE CONNECTORS (ZMOW), AND PROVIDE THE SPECIAL TOOLS REQUIRED BY THE MANUFACTURER. DIE-LESS CRIMPERS WILL NOT BE ACCEPTED.
4 WIRING DEVICES
4.1.1. GENERAL
4.1.2. WALL SWITCHES SHALL BE SPECIFICATION GRADE AC SILENT TYPE SWITCHES, 20A, 120/277 VOLT.
4.1.3. RECEPTACLES SHALL BE SPECIFICATION GRADE, DUPLEX TYPE, NEMA 5-20R, 20 AMPERE, 120 VOLT GROUNDED TYPE. SPECIAL APPLICATION RECEPTACLES SHALL BE INDICATED ON PLANS. MOUNT WITH THE GROUND DOWN.
4.1.4. DEVICE PLATES SHALL BE EQUAL TO SIERRA SMOOTH-LINE PLASTIC WALL PLATES. COLOR SHALL BE WHITE, UNLESS OTHERWISE NOTED.
4.2.1. SAFETY SWITCHES
4.2.2. ALL DISCONNECT SWITCHES SHALL BE HEAVY-DUTY CONSTRUCTION WITH LOCKABLE HANDLES SIZED AS NOTED ON THE DRAWINGS. PROVIDE NEMA ENCLOSURE AS REQUIRED BY CODE AND AMBIENT CONDITIONS. ALL FUSIBLE SWITCHES SHALL BE PROVIDED WITH DUAL ELEMENT FUSES SIZED PER THE EQUIPMENT MANUFACTURER'S RECOMMENDATION.
4.3.1. FUSES
4.3.2. FUSED SHALL BE DUAL ELEMENT, TIME DELAY CURRENT LIMITING. CONTRACTOR SHALL COORDINATE FUSE SIZES WITH EQUIPMENT MANUFACTURER'S REQUIREMENTS AND PER THE NEC.
4.3.3. PROVIDE FUSES MANUFACTURED FROM ONE OF THE FOLLOWING: COOPER BUSSMAN, INCORPORATED; EAGLE ELECTRIC MANUFACTURING COMPANY INCORPORATED, COOPER INDUSTRIES INCORPORATED; FERRAZ SHAWMUT INCORPORATED.
4.4.1. ELECTRICAL IDENTIFICATION
4.4.2. PROVIDE ENGRAVED PHENOLIC PLASTIC NAMEPLATES FOR ALL MAJOR ELECTRICAL EQUIPMENT (INCLUDED BUT NOT LIMITED TO TRANSFORMERS, DISCONNECT SWITCH, SWITCHBOARD, PANELBOARD, CHARGING CABINET, CHARGE POST, OVER-CURRENT PROTECTION DEVICE IN MAIN SWITCHBOARD, ETC.) AND ON EQUIPMENT AS DIRECTED BY OWNER.
4.4.3. PROVIDE ALL FEEDERS AND BRANCH CIRCUIT WIRING WITH COLOR CODED (SEE CONDUCTORS AND CABLES) VINYL TAPE WRAPPED A MINIMUM OF 1.5 TIMES AROUND CIRCUMFERENCE OF JACKET/SHIELDING TO DESIGNATE PHASE.
4.4.4. COLOR CODING OF CONDUCTORS SHALL BE PER THE NEC AND OWNERS
REQUIREMENTS.
4.4.5. CONTRACTOR SHALL PLACE TWO LENGTHS OF WARNING TAPE AT A DEPTH OF 12"BELOW GROUND AND DIRECTLY ABOVE ELECTRICAL SERVICE CONDUITS. CAUTIONS TAPE TO READ "CAUTION BURIED ELECTRIC".
4.5.1. SYSTEM GROUNDING AND BONDING
4.5.2. GROUNDING AND BONDING SHALL COMPLY WITH REQUIREMENTS OF NEC ARTICLE 250. ALL EXPOSED NONCURRENT CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, METALLIC RACEWAY SYSTEMS, METALLIC CABLE ARMOR, GROUNDING CONDUCTOR OF NONMETALLIC SHEATHED CABLES, GROUNDING CONDUCTOR IN NONMETALLIC RACEWAYS, AND GROUNDED CONDUCTORS OF THE WIRING SYSTEM SHALL BE GROUNDED.
4.5.3. A GROUND BUS SEPARATE FROM THE NEUTRAL BUS SHALL BE PROVIDED IN ALL SWITCHBOARDS AND PANELBOARDS. GROUND BUS SHALL BE RETORQUED (CHECKED) PRIOR TO ENERGIZING EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.
4.5.4. GROUND BUSES AND NEUTRAL BUSES IN ALL DISTRIBUTION PANELS, SWITCHBOARDS, PANELBOARDS, AND THOSE PROVIDED IN ANY EQUIPMENT SHALL BE ISOLATED EXCEPT WHERE REQUIRED TO BE CONNECTED AS SPECIFIED ABOVE FOR THE SERVICE ENTRANCE AND IN TRANSFORMER TERMINAL COMPARTMENTS.
4.5.5. WHEN INDICATED ON THE DRAWINGS, EQUIPMENT GROUNDING CONDUCTORS SHALL BE EXTENDED FROM THE GROUND BUS IN THE DISTRIBUTION EQUIPMENT TO THE RECEPTACLE, FIXTURE OR DEVICE LUGS WHERE THEY ARE PROVIDED. WHERE LUGS ARE NOT PROVIDED, EQUIPMENT GROUNDING CONDUCTORS SHALL BE CONNECTED TO EQUIPMENT ENCLOSURES. THE CONNEC

GENERAL NOTES

1. FIELD VERIFY ALL MEASUREMENTS
2. ITEMS BELOW MAY NOT BE ON THIS PAGE



01 SITE PLAN
1/16" = 1'
0 8' 16'
N W E S



02 VICINITY MAP
SCALE: NOT TO SCALE
N W E S

Winn-Marion Companies

CONTRACTOR

WINN-MARION BARBER, LLC

PHONE: 9708001584

ADDRESS: 7151 S BLACKHAWK ST, SUITE #900, CENTENNIAL, CO 80112

LIC. NO.: EC.0102312

REVISION / RELEASE

NO.	DESCRIPTION	DATE

PROJECT

NEW EV SYSTEM

CSU
XCHARGE

430 N COLLEGE AVENUE,
FORT COLLINS, CO 80524
APN: 9712219901

COLORADO LICENSED
MICHAEL A. HEDGPETH
PE.0055723
PROFESSIONAL ENGINEER

sealed 02may2024 mike@h2dc.com
H2DC PLLC CO CoA#: 2020156890
ELECTRICAL ONLY
- NOT AN AS-BUILT DRAWING SET -

PAPER SIZE: 36" x 24" (ARCH D)

SHEET TITLE:
SITE PLAN

DATE: 04.17.2024
DESIGN BY: H.M.
CHECKED BY: L.A.
SHEET NUMBER:
A-101.00
(SHEET 3)

KEYED NOTES:

1. EVCS NOT REGULATED BY SECTION 11B-812 (SEE 01/A-103 FOR DETAIL)
2. EVCS SIGN (SEE 02/A-103 AND 03/A-103 FOR DETAIL)
3. (N) XCHARGE NET ZERO 40A, 33.2KW EV CHARGER (LEVEL 3) (SEE 01/A-104 FOR DETAIL)
4. BOLARDS (SEE 02/A-104 FOR DETAIL)
5. (E) PANEL P1H1
6. (N) AC DISCONNECT 480V
7. (E) MAIN SWITCHGEAR 1600A
8. (E) MAIN SWITCHGEAR 2500A

ADA REQUIREMENTS

ELEMENT	ADA/ABA 2004 ANSI A117.1 2003
NUMBER OF SPACES	4% OF PARKING SPACES, OR 1 FOR EVERY 25 SPACES, IN ANY GIVEN LOT, BE DESIGNATED AS ACCESSIBLE; 1 OUT OF EVERY 6 SPACES SHOULD BE VAN ACCESSIBLE
PARKING STALL	8X18 FEET FOR A CAR AND 11X18 FEET FOR A VAN
ACCESSIBLE ROUTE SLOPE / CROSS SLOPE	MAXIMUM 1:20 (5%) RUNNING SLOPE AND 1:48 (2%) CROSS SLOPE. ACCESSIBLE VEHICLE SPACES 1:48 (2%) IN ALL DIRECTIONS AND 90-INCH CLEARANCE FOR VANS
REACH RANGE	BETWEEN 15 AND 48 INCHES FRONT AND SIDE TO ALLOW REACH TO ALL OPERABLE PARTS FROM A WHEELCHAIR
ACCESSIBLE CONTROLS	OPERABLE WITH ONE HAND AND NOT REQUIRING GRASPING, PINCHING, OR TWISTING OF THE WRIST OR FORCE MORE THAN 5 LBS. EXCEPTION: GAS PUMPS
ACCESSIBLE RAMPS	A RAMP OR CURB-CUT MUST BE ACCESSIBLE TO ALLOW FOR OPERATION OF CHARGING STATION
FACILITY ACCESSIBILITY	MUST BE CONNECTED BY A MINIMUM OF 50-INCH-WIDE ACCESSIBLE ROUTE IN PROXIMITY (NOT NECESSARILY ADJACENT) TO THE ENTRANCE OF THE BUILDING
SIDE ACCESS AISLE	SIDE ACCESS AISLE OF 60 INCHES WIDE TO ALLOW SPACE FOR WHEELCHAIR AND EQUIPMENT IN AND OUT OF SPACE
OTHER CONSIDERATIONS	ENSURE THAT BOLLARDS, WHEEL STOPS, OR CURB DO NOT OBSTRUCT USE OF CHARGING STATION

GENERAL NOTES

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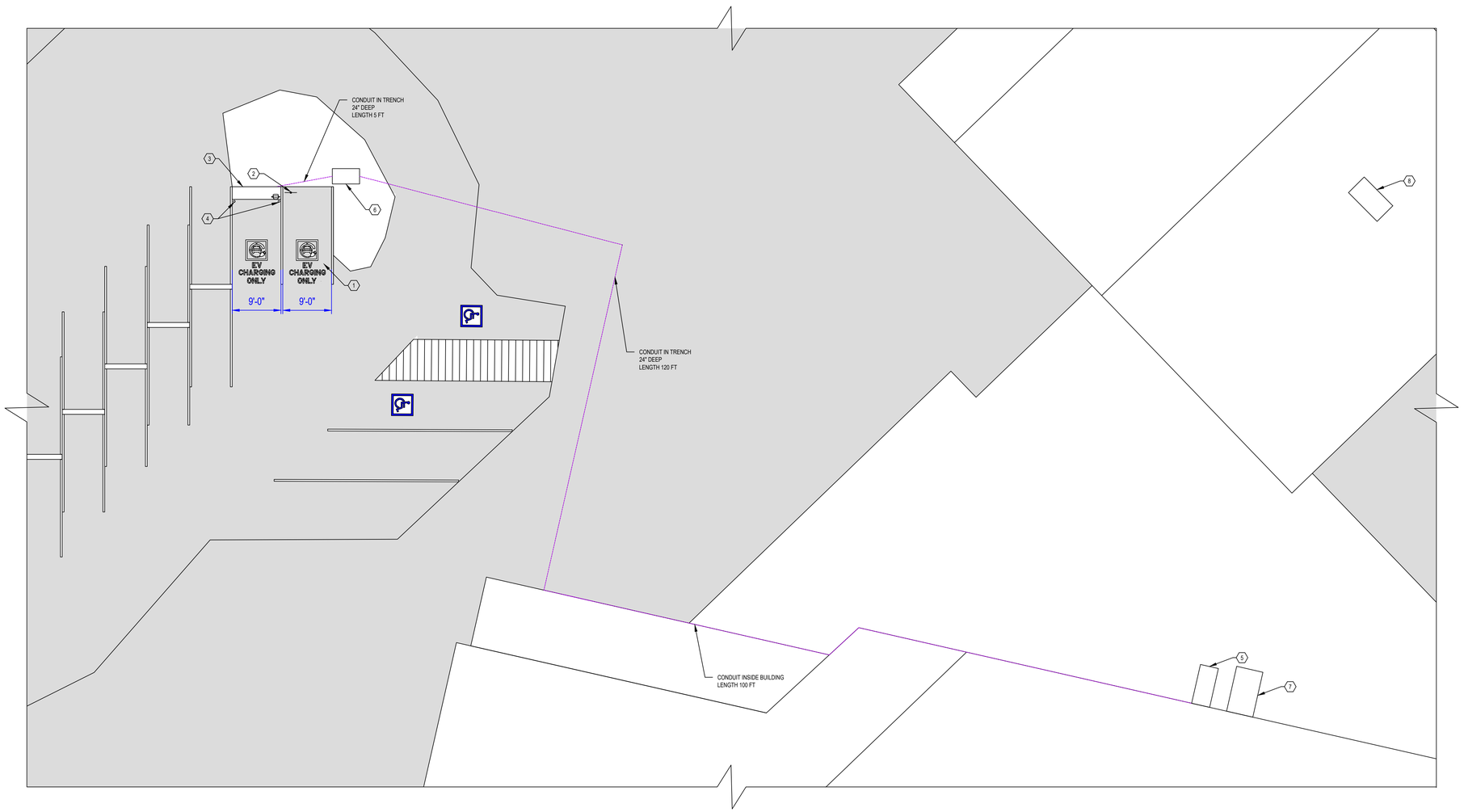

01 ELECTRICAL PLAN

3/32" = 1'-0"

0 5'-4" 10'-7 7/8"

Winn-Marion Companies

CONTRACTOR

WINN-MARION BARBER, LLC

PHONE: 9708001584

ADDRESS: 7151 S BLACKHAWK ST, SUITE #900, CENTENNIAL, CO 80112

LIC. NO.: EC.0102312

REVISION / RELEASE

NO.	DESCRIPTION	DATE

PROJECT

NEW EV SYSTEM

CSU
XCHARGE

430 N COLLEGE AVENUE,
FORT COLLINS, CO 80524
APN: 9712219901

COLORADO LICENSED MICHAEL A. MARRIOTT PE.0055723 PROFESSIONAL ENGINEER

sealed 02may2024 mike@h2dc.com
H2DC PLLC CO CoA#: 2020156890
ELECTRICAL ONLY
- NOT AN AS-BUILT DRAWING SET -

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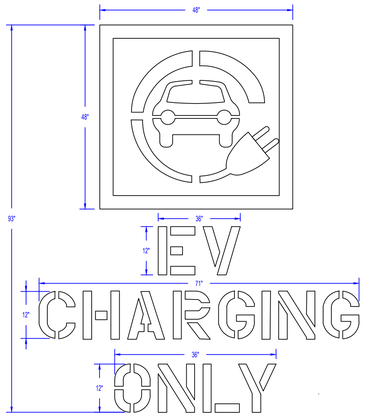


DETAIL NOTES:

1. USE ON ALL STANDARD AND VAN ACCESSIBLE STALLS WHERE APPLICABLE.
2. EVCS VEHICLE SPACES SHALL PROVIDE SURFACE MARKING STATION "EV CHARGING ONLY" IN LETTER 12" HIGH MINIMUM. THE CENTERLINE OF THE TEXT SHALL BE A MAXIMUM OF 6 INCHES FROM THE CENTER LINE OF THE VEHICLE SPACE AND ITS LOWER CORNER AT, OR LOWER SIDE ALIGNED WITH, THE END OF THE PARKING SPACE LENGTH.
3. BOTTOM OF STENCIL TO BE PLACED AT THE LEADING EDGE OF THE PROPOSED PARKING STALL.
4. STENCIL TO FIT WITHIN DIMENSIONS AS SHOWN.
5. PROVIDE 4 1/2" SPACING BETWEEN STENCILS.
6. PAVEMENT MARKING TO BE PAINTED WHITE.
7. PAINT SHALL BE WATERBORNE OR SOLVENT BORNE, COLORS AS SHOWN OR SPECIFIED HEREIN. PAVEMENT MARKING PAINTS SHALL COMPLY WITH APPLICABLE STATE AND LOCAL LAWS ENACTED TO ENSURE COMPLIANCE WITH FEDERAL CLEAN AIR STANDARDS. PAINT MATERIALS SHALL CONFORM TO THE RESTRICTIONS OF THE LOCAL AIR POLLUTION CONTROL DISTRICT.
8. WATERBORNE PAINT: PAINTS SHALL CONFORM TO FS TT-P-1952.
9. SOLVENT BORNE PAINT: PAINT SHALL CONFORM TO FS A-A-2886 OR AASHTO M248. PAINT SHALL BE NON_BLEEDING, QUICK_DRYING, AND ALKYD PETROLEUM BASE PAINT SUITABLE FOR TRAFFIC_BEARING SURFACE AND BE MIXED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS BEFORE APPLICATION.

01 STENCIL DETAILS

SCALE: NOT TO SCALE

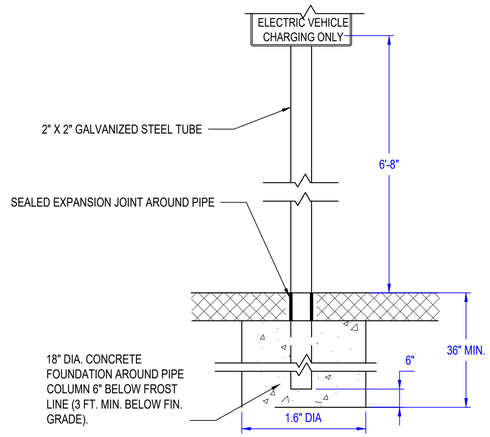
NOTE:
EVCS SIGN FOR REFERENCE ONLY. IT MAY BE DIFFERENT.

SIGN 1
ELECTRIC VEHICLE CHARGING STATION SIGN
18"x24" or 12"x18"

02 EVSC SIGN DETAIS

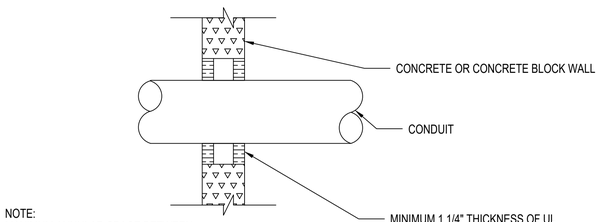
SCALE: NOT TO SCALE

NOTES:
1. CONTRACTOR SHALL VERIFY SIGN WITH LOCAL AND ADA REQUIREMENTS AND SPECIFICATIONS BEFORE INSTALLATION. LOCAL JURISDICTION SIGN REQUIREMENTS SHALL TAKE PRECEDENCE OVER THIS DETAIL.
2. SIGNS SHALL BE LOCATED SO THAT THEY CANNOT BE OBSCURED BY A VEHICLE PARKED IN THE SPACE.
3. SIGN TO BE PROVIDED AT ALL ACCESSIBLE PARKING SPACES AS PER ADA REGULATIONS.



03 SIGNS POLE DETAILS

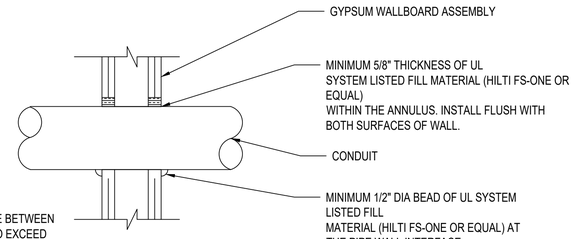
SCALE: NOT TO SCALE



NOTE:
MAXIMUM ANNULAR SPACE BETWEEN PIPE AND OPENING NOT TO EXCEED 3/4". USE UL LISTED FIRE BLOCKING SYSTEM W-L-1054 OR EQUAL FOR 2-HOUR FIRE RATING.

04 FIREWALL PENETRATION THRU CONCRETE WALL DETAILS

SCALE: NOT TO SCALE



NOTE:
MAXIMUM ANNULAR SPACE BETWEEN PIPE AND OPENING NOT TO EXCEED 3/4". USE UL LISTED FIRE BLOCKING SYSTEM W-L-1001 OR EQUAL FOR 2-HOUR FIRE RATING.

05 FIREWALL PENETRATION THRU GYPSUM BOARD DETAILS

SCALE: NOT TO SCALE

Winn-Marion Companies

CONTRACTOR

WINN-MARION BARBER, LLC

PHONE: 9708001584

ADDRESS: 7151 S BLACKHAWK ST, SUITE #900, CENTENNIAL, CO 80112

LIC. NO.: EC.0102312

REVISION / RELEASE

NO.	DESCRIPTION	DATE

PROJECT

NEW EV SYSTEM

CSU
XCHARGE

430 N COLLEGE AVENUE,
FORT COLLINS, CO 80524
APN: 9712219901

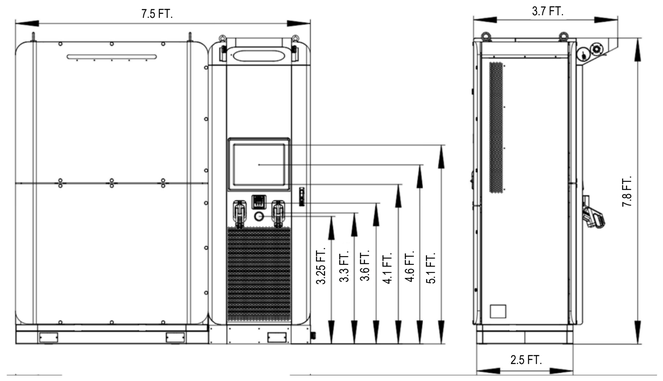
COLORADO LICENSED
MICHAEL A. MCGUIRE
PE.0055723
PROFESSIONAL ENGINEER

sealed 02may2024 mike@h2dc.com
H2DC PLLC CO CoA#: 2020156890
ELECTRICAL ONLY
- NOT AN AS-BUILT DRAWING SET -

PAPER SIZE: 36" x 24" (ARCH D)

SHEET TITLE:
CONSTRUCTION DETAILS

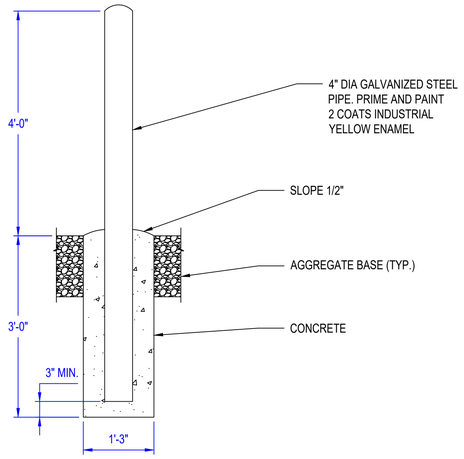
DATE: 04.17.2024
DESIGN BY: H.M.
CHECKED BY: L.A.
SHEET NUMBER:
A-103.00
(SHEET 5)



01 EV CHARGING STATION DETAILS

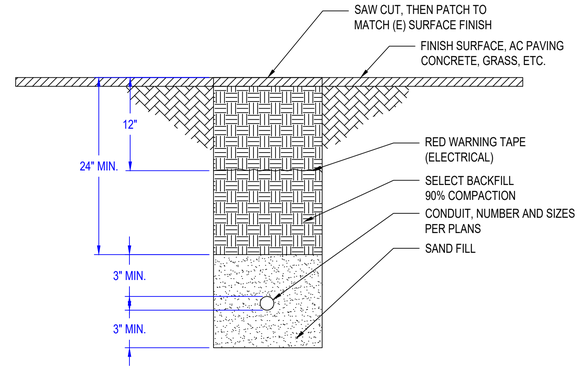
SCALE: NOT TO SCALE

NOTE: BOLLARD IS INTENDED TO PROVIDE A BARRIER TO EV EQUIPMENT; HOWEVER, IT IS NOT DESIGNED TO WITHSTAND VEHICLE IMPACT LOAD WITHOUT STRUCTURAL/SOIL FAILURE. BOLLARD AND FOUNDATION SHALL BE REPLACED IF VEHICLE IMPACT CAUSES DEFLECTION AT FOUNDATION OR YIELDING OF THE STEEL PIPE. VECTOR ENGINEERING IS NOT RESPONSIBLE FOR ANY DAMAGE RESULTING FROM BOLLARD FAILURE.



02 BOLLARDS DETAILS

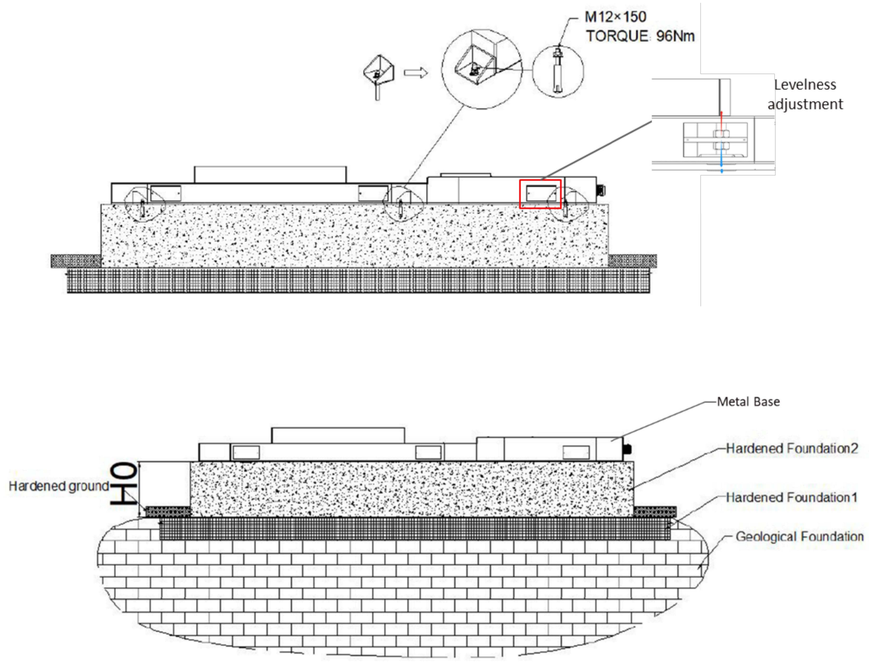
SCALE: NOT TO SCALE



NOTE:
WIDTH OF TRENCH WILL BE DETERMINED BY THE SIZE OF CONDUITS, NUMBER OF CONDUITS, AND CONFIGURATION.

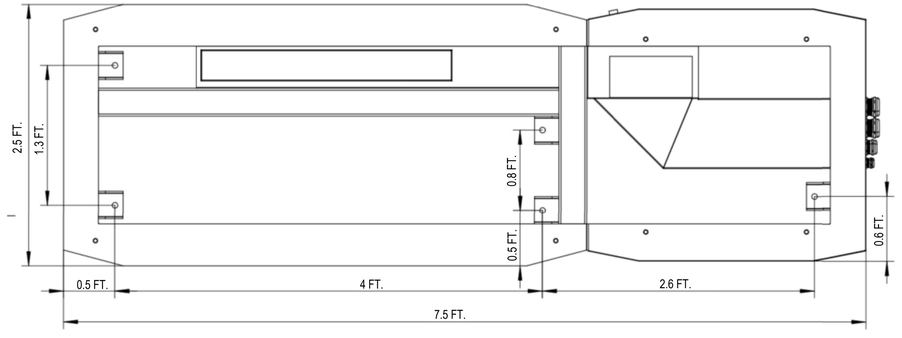
03 CONDUIT TRENCH DETAILS

SCALE: NOT TO SCALE



04 FOUNDATION DETAILS

SCALE: NOT TO SCALE



05 METAL BASE INSTALLATION

SCALE: NOT TO SCALE

Winn-Marion Companies

CONTRACTOR

WINN-MARION BARBER, LLC

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APN: 9712219901

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(SHEET 1)

CONDUCTOR AND CONDUIT SCHEDULE W/ELECTRICAL CALCULATIONS

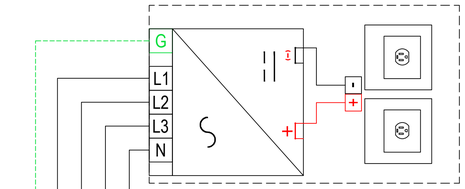
ID	TYPICAL	CONDUCTOR	CONDUIT	CURRENT-CARRYING CONDUCTORS IN CONDUIT	OCPD	EGC	TEMP. CORR. FACTOR	CONDUIT FILL FACTOR	CONT. CURRENT	MAX. CURRENT (125%)	BASE AMP.	DERATED AMP.	TERM. TEMP. RATING	AMP. @ TERMINAL	LENGTH	VOLTAGE DROP
1	1	6 AWG THHN, COPPER	1" DIA PVC-40	3+N	50A	10 AWG THHN, COPPER	0.91 (35.3° C)	0.8	40A	50A	75A	54.6A	75°C	55A	5 FT.	0.044%
2	1	6 AWG THHN, COPPER	1" DIA PVC-40	3+N	50A	10 AWG THHN, COPPER	0.91 (35.3° C)	0.8	40A	50A	75A	54.6A	75°C	55A	220 FT.	1.95%

BILL OF MATERIALS

CATEGORY	MAKE	MODEL NUMBER	REF	QTY	UNIT	QTY/UNIT	DESCRIPTION
EV CHARGE	XCHARGE	NET ZERO 40A	EV1	1	PIECE	1	XCHARGE NET ZERO, 40A, 33.2KW LEVEL 3 CHARGER
DISCONNECT	SQUARE D	VH362RB	SW1	1	PIECE	1	SQUARE D VH362RB, FUSED, 3-POLE, 60A, 600VAC OR EQUIVALENT
WIRING		GEN-10-AWG-THHN-CU-GR	WR1-2	130	FEET	1	10 AWG THHN, COPPER, GREEN (GROUND)
WIRING		GEN-6-AWG-THHN-CU-BR	WR1-2	130	FEET	1	6 AWG THHN, COPPER, BROWN (LINE 1)
WIRING		GEN-6-AWG-THHN-CU-OR	WR1-2	130	FEET	1	6 AWG THHN, COPPER, ORANGE (LINE 2)
WIRING		GEN-6-AWG-THHN-CU-YEL	WR1-2	130	FEET	1	6 AWG THHN, COPPER, YELLOW (LINE 3)
WIRING		GEN-6-AWG-THHN-CU-GRY	WR1-2	130	FEET	1	6 AWG THHN, COPPER, GRAY (NEUTRAL)
WIREWAY		GEN-PVC-40-1" DIA	WW1-2	225	FEET	1	PVC-40 CONDUIT, 1" DIA
OCPD	GENERIC MANUFACTURER	GEN-CB-50A-3P-480VAC	CB1	1	PIECE	1	CIRCUIT BREAKER, 50A, 3 POLE, 480VAC
OCPD	GENERIC MANUFACTURER	GEN-FU-50A-480VAC	F1-3	3	PIECE	1	FUSES, 50A, 480VAC

OCPDS

REF.	QTY.	RATED CURRENT	MAX VOLTAGE
CB1	1	50A/3P	480VAC
F1-3	3	50A	480VAC



XCHARGE NET ZERO
40A, 33.2 kW
DUAL-PORT
(LEVEL 3)

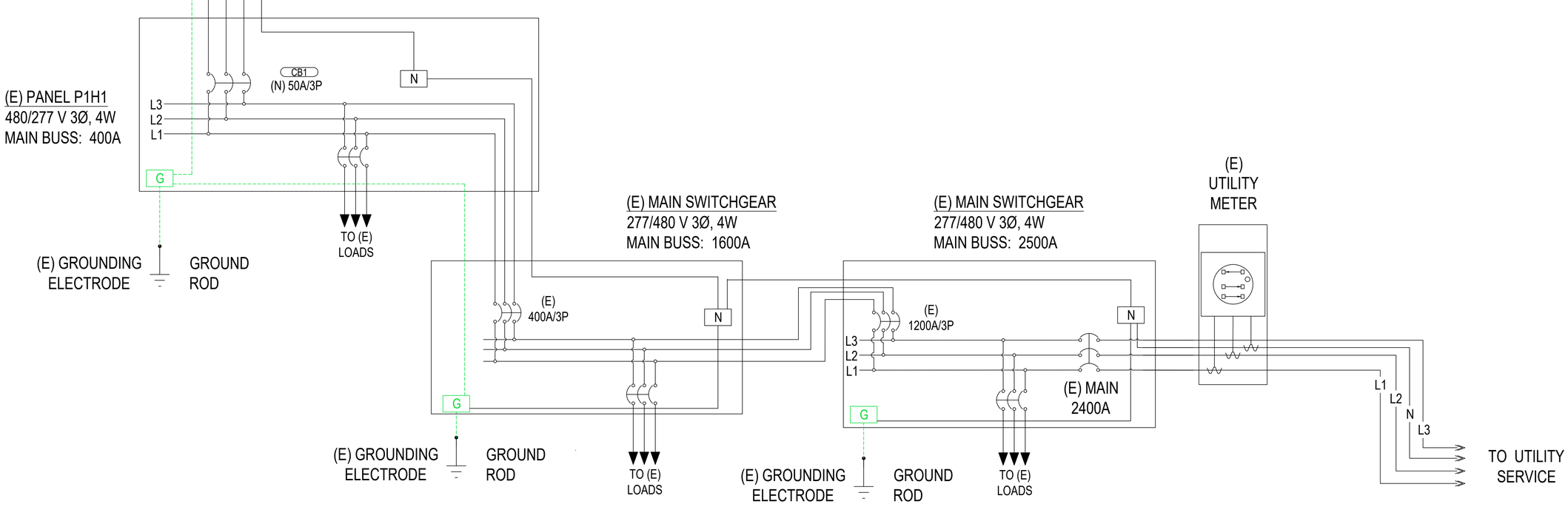
1

NOTE: THE TOTAL MAX OUTPUT OF CHARGER SHALL BE LIMITED TO 33.2KW

AC DISCONNECT
60A
F1-3
50A
FUSES

2

NOTE: HISTORICAL PEAK DEMAND PROVIDED BY DEVELOPER IS 600 KW= 722A 3P, X 1.25 SAFETY FACTOR = 900A BREAKER, 1500A MARGIN. THE ADDITION OF THE PROPOSED 1 X 50A OCPD EV CHARGERS @ 480V IS ACCEPTABLE.



Winn-Marion Companies

CONTRACTOR

WINN-MARION BARBER, LLC

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LIC. NO.: EC.0102312

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NO.	DESCRIPTION	DATE

PROJECT

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CSU
XCHARGE

430 N COLLEGE AVENUE,
FORT COLLINS, CO 80524
APN: 9712219901

COLORADO LICENSED MICHAEL A. MEDVIRE PE.0055723 PROFESSIONAL ENGINEER

sealed 02may2024 mike@h2dc.com
H2DC PLLC CO CoA#: 2020156890
ELECTRICAL ONLY
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PAPER SIZE: 36" x 24" (ARCH D)

SHEET TITLE: LINE DIAGRAM

DATE: 04.17.2024
DESIGN BY: H.M.
CHECKED BY: L.A.
SHEET NUMBER: E-601.00
(SHEET 7)

PANELBOARD NO: EXISTING 'PANEL P1H1'

SECTION: 1 OF 1
MOUNTING: SURFACE
POLES: 42
LOCATION: INDOOR
ENCLOSURE: NEMA 1

VOLTAGE: 480/277V
PHASE: 3
WIRE: 4
GROUND BUS: YES

BUS: 400A
MAIN: MLO TYPE
MIN. AIC: SEE ONE LINE

NEW LOADS IN BOLD

CKT NO.	DESCRIPTION	LOAD (VA) LTS	REC	MECH	MISC	CIRCUIT BREAKER AMPS	POLES				CIRCUIT BREAKER AMPS	POLES	LOAD (VA) LTS	REC	MECH	MISC	DESCRIPTION	CKT NO
1					2560			A								1920		2
3					2560				B							1920		4
5					2560					C						1920		6
7					2560			A								2560		8
9					2560				B		50A	3				11066	**XCHARGE NET ZERO**	10
11					2560					C						11066		12
13					2560			A								11066		14
15					2560				B							7680		16
17					2560					C						7680		18
19					2560			A								7680		20
21					2560				B							3840		22
23					2560					C						3840		24
25					3840			A								3840		26
27					3840				B									28
29					3840					C								30
31					3840			A								12800		32
33					3840				B							12800		34
35					3840					C						12800		36
37					16000			A								5760		38
39					16000				B							5760		40
41					16000					C						5760		42

PANELBOARD NO: EXISTING 'PANEL P1H1'

SUBTOTAL CONNECTED KVA	0.0	0.0	0.0	101.8	0.0	0.0	0.0	131.8	SUBTOTAL CONNECTED KVA
					0.0	0.0	0.0	233.5	TOTAL CONNECTED KVA

PHASE BALANCE

	LTS	REC	MECH	MISC	TOTAL	% DIF
PHASE A CONNECTED KVA	0.0	0.0	0.0	79.5	79.5	2.2
PHASE B CONNECTED KVA	0.0	0.0	0.0	77.0	77.0	-1.1
PHASE C CONNECTED KVA	0.0	0.0	0.0	77.0	77.0	-1.1
AVERAGE PHASE CONNECTED KVA					77.8	

Note:
1. The Electrical Contractor must verify the existing breakers that are not in used. And check the loads that can be combined in 1 breaker to provide room for adding SWTCH Level 2 EV Chargers.

NEC LOAD SUMMARY & FEEDER CALCULATION

LTS	REC	MECH	MISC	SUBTOT	SPARE	TOTAL	
0.0	0.0	0.0	233.5	233.5	0		CONNECTED KVA
1.0	#1	1.0	1.00		%		DEMAND FACTOR
0.0	0.0	0.0	233.5	233.5	0.0	233.5	DEMAND KVA
						280.9	DEMAND AMPS
1.25	1.0	1.0	1.25		1.0		CONTINUOUS / NON-CONTINUOUS FACTOR
						351	MIN. BREAKER AMPS

Winn-Marion Companies

CONTRACTOR
WINN-MARION BARBER, LLC
PHONE: 9708001584
ADDRESS: 7151 S BLACKHAWK ST, SUITE #900, CENTENNIAL, CO 80112
LIC. NO.: EC.0102312

REVISION / RELEASE

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PROJECT
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CSU
XCHARGE
430 N COLLEGE AVENUE,
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APN: 9712219901

COLORADO LICENSED MICHAEL A. MCGUIRE PE.0055723 PROFESSIONAL ENGINEER

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SHEET TITLE: DESIGN TABLES

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(SHEET 8)

XCHARGE

Datasheet

Net Zero Series

PRODUCT OVERVIEW

XCHARGE Net Zero Series Product integrates Energy-storage-system (ESS), which uses Li-ion batteries as energy storage devices. ESS with its local or remote EMS management system enables optimized energy supply and demands among grid, batteries and EVs, which is significantly applicated in peak and valley power consumption as well as lack of grid power capacity. The integration with ESS demonstrates its advantages in high-Charging -Power with less input. XCHARGE ESS compact charger is with thin-wall design and suitable for parking station, commercial center and EV experience center. Modular design provides high

stability, easy and simple operation possibility so that it can achieve flexible deployment and uniformed service. Automatic recognition of connector plug-in and automatic charging scheduling function make it user-friendly and improve charging efficiency.

PRODUCT FEATURES

- Compact Design
  - Small footprint, thin-walled design, easy layout in parking area, high stability, easy and simple to operate, low noise, adapt for installation requirements of more parking stations.
- High Power Output with Less Input
  - Charging power can be modularly extended to 44kW + 150kW (energy storage modules), which provides higher output than most of other superchargers on the market when input power is very limited; and power can be intelligent distributed among charging connectors accrding to the actual demands of charging vehicles.
- Charging Experience Upgrade
  - Automatic recognition of charger connector plug-in, automatic charging scheduling, integrated LED system indication Battery capacity, improve experience and increase efficiency of charging while reducing charging time of single vehicle.
- Flexible Extension
  - Support energy-storage module extension, achieve 2 x 233kWh Battery Capacity, intelligent power module distribution, energy utilization with high efficiency, easy operation
- Battery-to-Grid Function (in development)
  - NZS is integrated with bidirectional ACDC power modules with 22kW/unit. Battery can realize to supply energy to Grid with bidirectional modules when Grid needs.

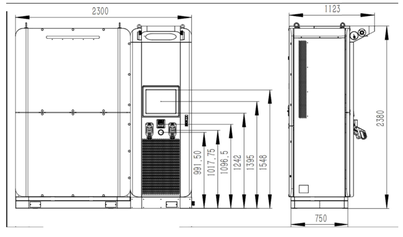
APPLICATION SCENARIO

TECHNICAL SPECIFICATION

Battery Integrated DC Fast Charger

Basic Parameter	Product Specification	Type	DC charging station
		Dimension	2.3m*0.8m*2.35m (w*d*h)
		Installation	Floor type
		Material	Industrial Grade Alloy
		Color	White weather-resistant coating
		Weight	3200kg(1*ESS) / 5800kg(2*ESS)
	Energy-storage-system	Battery Capacity	233kWh / 2*233kWh
		Usable Energy (SAT)	208 kWh/2*208 kWh
		Max. recharge Power	22kW/44kW
		Battery charging Rate	≤0.5C
		Battery discharge Rate	≤1C
		Battery Efficiency	≥94.5% under nominal situation
		IP Ranking	IP65
	Charging system	Connectors	2
		Charging power	DC Max.150kW +22kW/44kW=172kW/194kW
		Power distribution	2 connectors intelligent distribution
		Cable	200A, 5m, CCS1
		Efficiency	≥96.5%
	Meter	AC side	AC meter
		DC side	2-access DC meter
	Cooling system	Battery cooling	Liquid-cooled
		Power modules	Air-cooled
		Cable cooling	Air-cooled
	User Interface	Display size	19 Inch
	Payment System	RFID, credit card	
	Connectivity	GSM & LTE & LAN	
	Communication	OCPP 1.6J	
Environment parameter	Site Use	Indoor/Outdoor	
	Ambient temperature	-25℃-55℃ (over 45℃ derating)	
	Humidity	≤95%，No condensation	
	Altitude	≤2000m	
	Noise Emission	≤75dB under nominal situation	
	EMC Emission	Class B	
	Medium	No explosive hazardous, No toxic & harmful gases.	

	Interference	Without strong vibration and shock, no strong electromagnetic interference
Input, Output	Input Voltage	3Phase 480VAC +/- 15%
	Max Current	65A
	Suggested Breaker for Max Power	80A, 3P
	Input Frequency	60Hz±10%
	Output Voltage Range	150VDC-1000VDC
	Constant-power voltage output range	300VDC-1000VDC
	Max power output	150kW + 44kW
	Max Current output	200A CCS1 continuously
	Output to Grid (in development)	22kVA/44kVA rated power
Safety	Ip ranking	IP54
	Safety protection	Input protection, Overcurrent protection, Lightning protection, Over-temperature protection, output over-voltage protection. fan protection, short circuit protection, Emergency button, Flood protection, Ground protection, Dumping protection, Smoke protection
Standard	Battery Cell	UL1642(cell), UL1973(Battery Pack), UL9450a(Battery Pack)
	System level	UL2202, UL2231-1, UL1741, IEEE1547, FCC



Adaptive Power Capability Overview

The NZS comes with the ability to adjust power output in accordance with a sites power availability. The function allows a unit to be work with lower power sites, without any hardware changes, as well as the ability to revert/change power output post install should power availability increase through a site's lifespan. The function can be set using the included XCharge backend, or via firmware tool during commissioning/servicing. The below table highlights the various power levels that can be set for the units, as well as the needed panel hardware to support safe and reliable operation.

Max Power Out (kW)	Current Draw (A)	Breaker Sizing (A)	Battery Recharge Time (Hours)
194	65	80	5
180	50	60	8
170	25	30	11
160	15	20	23

XCHARGE

SAFE CHARIN CE be TÜV NORD c US

Winn-Marion Companies

CONTRACTOR

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Colorado State University
Powerhouse Energy Campus
430