GENERAL ELECTRICAL SPECIFICATION

1. THE FOLLOWING ARE ABBREVIATED SPECIFICATIONS. ALL ITEMS NECESSARY FOR A COMPLETE AND OPERABLE JOB (TO THE SATISFACTION OF OWNER) WHETHER SHOWN OR IMPLIED SHALL BE HELD AS THE RESPONSIBILITY OF THE CONTRACTOR
2. IMPORTANT NOTE: "CONTRACTOR" REFERENCED IN THESE SPECIFICATIONS SHALL INDICATE WORK BY ELECTRICAL CONTRACTOR OR ANY OF HIS CONTRACTORS UNLESS NOTED OTHERWISE.
3. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT ONLY. COORDINATE INSTALLATION WITH OTHER TRADES TO VERIFY THE ACTUAL SPACE CONDITIONS THAT ARE TO BE MAINTAINED. NO ADDITIONAL PAYMENT WILL BE APPROVED FOR FAILURE TO COMPLY.
4. ALL SYMBOLS AND ABBREVIATIONS USED ON THE DRAWINGS ARE CONSIDERED CONSTRUCTION STANDARDS. IF THE CONTRACTOR HAS QUESTIONS REGARDING THEIR EXACT MEANING, THE ENGINEER SHALL BE NOTIFIED FOR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
5. CONTRACTOR SHALL NOT SCALE ELECTRICAL DRAWINGS. REFER TO SITE PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT AND CONFIRM WITH CONSTRUCTION MANAGER ANY SIZES AND LOCATIONS WHEN NEEDED.
6. CONTRACTOR'S SCOPE OF WORK SHALL INCLUDE ALL ITEMS DEFINED IN THE CONTRACT DOCUMENTS. THE CONTRACT DOCUMENTS INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING: THE CONTRACT, SPECIFICATIONS, AND CONSTRUCTION DRAWINGS. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIAL, AND EQUIPMENT NECESSARY TO INSTALL ALL ELECTRICAL EQUIPMENT, CONDUIT, WIRING ETC. AS SHOWN OR IMPLIED ON THE DRAWINGS AND TO PROVIDE A COMPLETE OPERATIVE SYSTEM TO THE SATISFACTION OF OWNER.
7. CONTRACTOR SHALL PROVIDE ON-SITE SUPERVISION AT ALL TIMES WHILE THE WORK IS BEING PERFORMED AND SHALL DIRECT ALL WORK, USING HIS BEST SKILL AND ATTENTION. HE SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, PROCEDURES AND SEQUENCES FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
8. INSTALLATION OF ALL ELECTRICAL EQUIPMENT, DEVICES, CONDUITS, ETC. MUST BE COORDINATED WITH ALL OTHER TRADES. COORDINATE SHUTDOWN TIMES AND WORKING HOURS WITH BUILDING OWNER, INCLUDING OFF HOURS, WEEKEND, AND HOLIDAY WORK AS REQUIRED.
9. ANY DISCREPANCIES FOUND WITHIN THE CONTRACT DOCUMENTS SHALL BE REPORTED TO THE OWNER IN WRITING PRIOR TO THE AWARD OF THE CONTRACT AND AN ADDENDUM WILL BE ISSUED TO COVER SAME.
10. GUARANTEE - CONTRACTOR SHALL FURNISH OWNER WITH A WRITTEN GUARANTEE TO PROMPTLY REMEDY ALL DEFECTS OF WORK OR MATERIALS WITHOUT CHARGE FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE AND INSPECTION.
11. MATERIALS - ALL MATERIALS AND EQUIPMENT SHALL BE NEW, IN ORIGINAL CONTAINERS/WRAPPINGS, SHALL BE SPECIFICATION GRADE, AND LABELED OR LISTED BY U.L. OR AN ACCREDITED TESTING ORGANIZATION AS REQUIRED BY LOCAL INSPECTORS.
12. CONTRACTOR SHALL PROVIDE ADEQUATE AND REQUIRED LIABILITY INSURANCE FOR PROTECTION AGAINST PUBLIC LOSS AND ANY/ALL PROPERTY DAMAGE FOR THE DURATION OF WORK
13. ALL EQUIPMENT SHALL BE DESIGNED TO OPERATE ON VOLTAGE AND PHASE SPECIFIED. CONTRACTOR FURNISHING EQUIPMENT OTHER THAN INDICATED SHALL BE RESPONSIBLE FOR ANY CHANGES IN CONDUCTORS, RACEWAYS, SWITCHES, MAIN FEEDERS, AND APPURTENANCES AND PAY ALL ASSOCIATED COSTS. REQUIREMENTS FOR ANY INCREASE IN CAPACITIES SHALL BE REVIEWED BY ENGINEER.
14. CONTRACTOR SHALL CONFIRM WITH LOCAL UTILITY COMPANY ANY/ALL REQUIREMENTS SUCH AS THE: LUG SIZE RESTRICTIONS, CONDUIT ENTRY, SIZE OF TRANSFORMERS, SCHEDULED DOWNTIME FOR THE OWNERS' CONFIRMATION, ETC. ANY/ALL CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER, PRIOR TO BEGINNING ANY WORK.
15. ANY METAL SHAVINGS FROM SITE WORK SHALL BE CLEANED FROM ALL SURFACES WHERE OXIDIZED OR CONDUCTIVE METAL SHAVINGS MAY CAUSE RUST, ELECTRICAL SHORT CIRCUITS, OR OTHER DAMAGES.

LICENSES, CERTIFICATIONS OF INSPECTION

1. CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFICATION OF ALL GOVERNING AGENCIES THAT REQUIRE SITE INSPECTION OF THE WORK AND/OR SIMPLY NOTIFICATION. THE CONTRACTOR SHALL OBTAIN AND PAY FOR PERMITS, LICENSES AND INSPECTIONS NECESSARY FOR PERFORMANCE OF THE WORK.
2. CONTRACTOR AND ALL OF HIS CONTRACTORS THAT PERFORM ANY WORK ON THIS PROJECT SHALL BE CURRENTLY LICENSED BY ALL AGENCIES WHICH GOVERN OVER THE LAND(S) ON WHICH CONSTRUCTION IS TO TAKE PLACE. CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS AS REQUIRED, ALL COSTS SHALL BE BORNE BY CONTRACTOR.
3. THE CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS, LICENSES AND INSPECTIONS INCIDENTAL TO WORK UNDER THIS CONTRACT. WHEN THE WORK IS COMPLETED, THE REQUIRED CERTIFICATES OF APPROVAL SHALL BE FURNISHED TO THE BUILDING OWNER. CONTRACTOR MUST BE LICENSED IN THE STATE, COUNTY AND CITY OF THE PROJECT SITE.

CODES AND ORDINANCES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH LATEST EDITION OF NEC AND ALL APPLICABLE CODES AND ORDINANCES, INCLUDING SUCH AS PERTAIN TO THE SAFETY AND HEALTH RELATIONS. CODES AND ORDINANCES SHALL TAKE PRECEDENCE OVER THE DRAWINGS AND SPECIFICATIONS ONLY IN CASE OF CONFLICT AND SHALL INCLUDE BUT NOT BE LIMITED TO:
   - A. UL - UNDERWRITERS LABORATORIES
   - B. NEC - NATIONAL ELECTRICAL CODE
   - C. NEMA - NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
   - D. OSHA - OCCUPATIONAL SAFETY AND HEALTH ACT
   - E. SBC - STANDARD BUILDING CODE
   - F. NFPA - NATIONAL FIRE CODES

POST CONSTRUCTION AND PROJECT CLOSEOUT DOCUMENTATION

1. AS-BUILT REQUIREMENTS: DO NOT USE RECORD DOCUMENTS FOR CONSTRUCTION PURPOSES. TO PROTECT RECORD DOCUMENTS FROM DETERIORATION AND LOSS, STORE IN A SECURE, FIRE-RESISTANT LOCATION. PROVIDE ACCESS TO RECORD DOCUMENTS FOR THE OWNER'S REFERENCE DURING NORMAL WORKING HOURS. MAINTAIN A CLEAN, UNDAMAGED SET OF BLUE OR BLACK LINE PRINTS OF CONTRACT DRAWINGS AND SHOP DRAWINGS. MARK THE SET TO SHOW THE ACTUAL INSTALLATION WHERE THE INSTALLATION VARIES SUBSTANTIALLY FROM THE WORK AS ORIGINALLY SHOWN. MARK DRAWINGS THAT ARE MOST CAPABLE OF SHOWING CONDITIONS FULLY AND ACCURATELY. WHERE SHOP DRAWINGS ARE USED, RECORD A CROSS-REFERENCE AT THE CORRESPONDING LOCATION ON THE CONTRACT DRAWINGS. GIVE PARTICULAR ATTENTION TO CONCEALED ELEMENTS THAT WOULD BE DIFFICULT TO MEASURE AND RECORD AT A LATER DATE. MARK RECORD SETS WITH RED ERASABLE PENCIL. USE OTHER COLORS TO DISTINGUISH BETWEEN VARIATIONS IN SEPARATE CATEGORIES OF THE WORK. MARK NEW INFORMATION THAT IS IMPORTANT TO THE OWNER BUT WAS NOT SHOWN ON THE CONTRACT DRAWINGS, DETAILS OR SHOP DRAWINGS. NOTE RELATED CHANGE ORDER NUMBERS WHERE APPLICABLE. NOTE RELATED RECORD DRAWING INFORMATION AND PRODUCT DATA. UPON COMPLETION OF THE WORK, SUBMIT ONE (1) COMPLETE SET OF RECORD DOCUMENTS TO THE CONSTRUCTION MANAGER FOR THE OWNER'S RECORDS. CONTRACTOR SHALL SUBMIT AS-BUILT SET OF PLANS TO THE ENGINEER WITHIN 7 DAYS OF COMPLETION OF CONSTRUCTION.

EXISTING CONDITIONS AND DEMOLITION

1. ALL ELECTRICAL DEMOLITION WORK, INCLUDING MATERIAL REMOVAL FROM THE SITE, SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR. BEFORE PROCEEDING WITH THE DEMOLITION WORK, THE CONTRACTOR SHALL OBTAIN FROM THE BUILDING OWNER A LIST OF ANY REMOVED ITEMS TO BE SALVAGED. ALL OTHER REMOVED MATERIALS AND EQUIPMENT SHALL BE PROPERLY DISCARDED OFF THE PREMISES.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING PROPERTY RESULTING FROM THE CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL REMOVE ALL DEBRIS FROM THE SITE AT THE COMPLETION OF WORK.
3. EXISTING UTILITIES AND CONDITIONS ARE SHOWN FROM FIELD DATA AND EXISTING DOCUMENTS AND ARE NOT NECESSARILY COMPLETE OR ACCURATE. ALL FIELD CONDITIONS SHALL BE VERIFIED BY CONTRACTOR BEFORE START OF CONSTRUCTION.
4. CONTRACTOR SHALL BE RESPONSIBLE TO LOCATE, EXPOSE, AND DETERMINE IF CONFLICTS EXIST WITH THE PROPOSED IMPROVEMENTS. CONTRACTOR SHALL NOTIFY THE OWNER IN ORDER TO RESOLVE ANY CONFLICTS. EXISTING ELECTRICAL CONDUIT, WIRING, ETC. DAMAGED DURING RENOVATION SHALL BE REPLACED IN LIKE KIND AND CHARACTER, AND AT THE EXISTING UTILITY LINES, DRAIN OR FIELD TILE DAMAGED SHALL BE REPAIRED OR REPLACED, AS NEEDED, IN LIKE KIND AND CHARACTER. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING CONDUITS, CONTROL WIRING, ETC., WHETHER SHOWN HEREON OR NOT, AND TO PROTECT THEM FROM DAMAGE. THE CONTRACTOR SHALL BEAR ALL EXPENSES FOR REPAIR OR REPLACEMENT OF PROPERTY DAMAGED IN CONJUNCTION WITH THE EXECUTION OF WORK.
5. THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONFLICTS OR DISCREPANCIES IN THE CONTRACT DOCUMENTS OR FIELD CONDITIONS PRIOR TO EXECUTING THE WORK IN QUESTION. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER IF DETAILS ARE CONSIDERED UNSOUND, UNSAFE, NOT WATERPROOF, OR NOT WITHIN CUSTOMARY TRADE PRACTICE. IF WORK IS PERFORMED, IT WILL BE ASSUMED THAT THERE IS NO OBJECTION TO THE DETAIL. DETAILS ARE INTENDED TO SHOW THE END RESULT OF THE DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB CONDITIONS, AND SHALL BE INCLUDED AS PART OF THE WORK.
6. SITE VISIT - CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING HIS WORK. NO EXTRAS WILL BE PERMITTED FOR LACK OF KNOWLEDGE OF EXISTING CONDITIONS. QUANTITIES OF MATERIALS SHALL BE PER CONTRACTOR'S MEASUREMENTS.

BASIC ELECTRICAL MATERIALS AND METHODS

1. WHERE STRUCTURAL OPENINGS ARE NOT AVAILABLE, THE CONTRACTOR SHALL CORE DRILL OR CUT CHASES IN WALLS AND FLOORS AS REQUIRED. ALL NEW OPENINGS SHALL BE COORDINATED WITH THE ENGINEER. ALL PENETRATIONS OF THE BUILDING WALLS, CEILING AND FLOORS, THE CONTRACTOR SHALL SEAL WITH QUALITY CAULK, FIRE RATED AND WATERTIGHT, SUBMITTED FOR APPROVAL BY THE OWNER.
2. TRASH REMOVAL: CONTRACTOR SHALL REMOVE ALL TRASH CREATED BY HIMSELF OR HIS CONTRACTORS DUE TO DEMOLITION OR CONSTRUCTION. THE CONTRACTOR SHALL ALSO REMOVE TRASH CREATED BY OTHER CONTRACTORS INCLUDING CABLE REELS, CARDBOARD BOXES AND PACKING. PROMPTLY CLEAN-UP ALL SOILING, DEBRIS AND OTHER UNSIGHTLY OR HAZARDOUS CONDITIONS, CAUSED BY WORK OR DELIVERIES UNDER THIS CONTRACT, FROM THE BUILDING GROUNDS, ENTRIES, CORRIDORS, STAIRWAYS, ELEVATORS OR OTHER PUBLIC AREAS. ALL SHALL BE REMOVED FROM THE SITE IN A TIMELY FASHION TO A LEGAL DISPOSAL FACILITY.
3. SIGNAGE: CONTRACTOR SHALL MAINTAIN SECURITY AROUND PERIMETER OF CONSTRUCTION SITE DURING ALL HOURS BY INSTALLING A TEMPORARY RIBBON FOR INTERIOR WORK TO IDENTIFY CONSTRUCTION AREAS AS REQUIRED. SIGNAGE SHALL BE POSTED WITH NOTIFICATIONS OF "NO TRESPASSING" AND "CONSTRUCTION AREA".
4. CHECK ACCURACY OF ALL DIMENSIONS IN THE FIELD. UNLESS SPECIFICALLY NOTED, DO NOT FABRICATE ANY MATERIALS OFF SITE, NOR DO ANY CONSTRUCTION UNTIL THE ACCURACY OF DRAWING DIMENSIONS HAVE BEEN VERIFIED AGAINST ACTUAL FIELD DIMENSIONS.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY CUTTING, SUBSEQUENT PATCHING, AND REQUIRED FLASHING FOR ALL ITEMS NECESSARY FOR ELECTRICAL PART OF THE CONTRACT. PATCH, PAINT, AND REPAIR ANY AREA DAMAGED TO THE SATISFACTION OF THE BUILDING OWNER.
6. THE EXACT LOCATIONS OF ALL ELECTRICAL DEVICES, EQUIPMENT AND CONDUIT, AS SHOWN ON THE DRAWING, IS APPROXIMATE. WHEN NOT SHOWN IN DETAIL, THE EXACT LOCATION OR ROUTING SHALL BE DETERMINED BY THE CONTRACTOR, SUBJECT TO THE APPROVAL OF OWNER.
7. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BLOCKING, BACKING, FRAMING, HANGERS OR OTHER SUPPORT FOR THE MOUNTING AND SUPPORT OF ALL ITEMS REQUIRING THE SAME AS REQUIRED BY N.E.C.
8. TRENCHING AND BACK FILL: CONTRACTOR SHALL PROVIDE FOR ALL UNDERGROUND INSTALLED CONDUIT AND/OR CABLES INCLUDING EXCAVATION AND BACKFILLING AND COMPACTION.
9. WHEN DIRECTIONAL BORING IS REQUIRED, CONTRACTOR SHALL INSTALL A LOOSE TONING WIRE WITHIN INSTALLED CONDUIT TO ALLOW FOR IDENTIFICATION OF UNDERGROUND CONDUITS.
10. ALL BOLTS SHALL BE STAINLESS STEEL.
11. FOR UNDERGROUND RACEWAYS, PROVIDE ADDITIONAL SLACK IN CONDUCTORS AND CONDUIT EXPANSION JOINTS IN ORDER TO ALLOW FOR EARTH MOVEMENT FROM SETTLEMENT, FROST, ETC. IN ORDER TO PREVENT DAMAGE TO THE CONDUCTORS OR TO THE EQUIPMENT CONNECTED TO THE RACEWAYS PER THE NEC.

ELECTRICAL EQUIPMENT

1. ALL EQUIPMENT SHALL BE DESIGNED TO OPERATE ON VOLTAGE AND PHASE SPECIFIED. CONTRACTOR FURNISHING EQUIPMENT OTHER THAN INDICATED SHALL BE RESPONSIBLE FOR ANY CHANGES IN CONDUCTORS, RACEWAYS, SWITCHES, MAIN FEEDERS, AND APPURTENANCES AND PAY ALL ASSOCIATED COSTS. REQUIREMENTS FOR ANY INCREASE IN CAPACITIES SHALL BE REVIEWED BY ENGINEER.
2. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED, LISTED, OR CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY ACCREDITED BY THE UNITED STATES OCCUPATIONAL SAFETY HEALTH ADMINISTRATION.

FIRESTOPPING AND SEALING ELECTRICAL PENETRATIONS

1. CONTRACTOR SHALL FURNISH AND INSTALL FIRESTOPPING FOR SEALING AROUND ELECTRICAL PENETRATIONS THROUGH FIRE OR SMOKE BARRIERS, AND FLOORS.
2. PROVIDE SHOP DRAWINGS OF EACH CONDITION REQUIRING PENETRATION SEALS AND THE PROPOSED UL SYSTEMS MATERIALS, ANCHORAGE, METHODS OF INSTALLATION, AND ACTUAL ADJACENT CONSTRUCTION. SUBMITTAL PACKAGE SHALL ALSO INCLUDE A COPY OF THE UL ILLUSTRATION OF EACH PROPOSED SYSTEM INDICATING MANUFACTURER APPROVED MODIFICATIONS (IF APPLICABLE) AND THE MANUFACTURER'S SPECIFICATIONS, RECOMMENDATIONS, INSTALLATION INSTRUCTIONS, AND MAINTENANCE INSTRUCTIONS.
3. FIRESTOPPING MATERIALS SHALL BE INTUMESCENT SAFETY BARRIERS DESIGNED TO BLOCK THE SPREAD OF FIRE AND SMOKE THROUGH PENETRATIONS CREATED BY ELECTRICAL INSTALLATIONS IN FIRE RATED WALLS AND FLOORS. MATERIALS SHALL BE FLAME, TOXIC FUME, AND WATER RESISTANT AND SHALL HAVE A MINIMUM 3 HOUR FIRE RATING. FIRE RATING SHALL BE DEFINED BY TESTS CONDUCTED BY ASTM, UL OR OTHER TESTING AND INSPECTION AGENCIES ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.
4. PROVIDE MATERIALS BY THE FOLLOWING MANUFACTURERS TO SUIT THE APPLICATION: SPECIFIED TECHNOLOGIES, INC (STI), SOMERVILLE, NJ; TREMCO, INC., BEACHWOOD, OH; OR 3M INC., MINNEAPOLIS, MN

FAULT CURRENT, COORDINATION STUDY, AND ARC FLASH

1. REFER TO SHEET E-201 FOR FAULT CURRENT CALCULATIONS. CONTRACTOR SHALL MARK ON ALL EQUIPMENT AS REQUIRED PER NEC
2. REFER TO SHEET E-301 FOR ARC FLASH LABEL DETAILS. CONTRACTOR SHALL LABEL ALL EQUIPMENT AS REQUIRED PER NEC

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

1. ALL RACEWAYS AND EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH THE N.E.C. AND ANY LOCAL CODES.
2. ALL CONDUITS SHALL CONTAIN A CODE SIZE GROUNDING CONDUCTOR.
3. EQUIPMENT GROUNDING CONDUCTORS SHALL BE INSULATED WITH GREEN-COLORED INSULATION.
4. GROUNDING ELECTRODE CONDUCTORS SHALL BE STRANDED CABLE.
5. MATERIALS AND CONNECTION COMPONENTS FOR GROUNDING AND BONDING SHALL BE MANUFACTURED BY ERICO, THOMAS & BETTS, OR BURNDY.
6. GROUND-FAULT PROTECTION OF EQUIPMENT SHALL BE PROVIDED FOR SERVICE DISCONNECTS RATED 1000A OR MORE. THE GROUND-FAULT PROTECTION SYSTEM SHALL BE PERFORMANCE TESTED WHEN FIRST INSTALLED ON SITE AND PRIOR TO EQUIPMENT ENERGIZATION PER NEC 230.95. THE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH INSTRUCTIONS THAT SHALL BE PROVIDED WITH THE EQUIPMENT. A WRITTEN RECORD OF THIS TEST SHALL BE MADE AND SHALL BE AVAILABLE TO THE AUTHORITY HAVING JURISDICTION.
7. ALL HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
8. FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
9. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUND BAR AND BOLTED ON THE BACK SIDE. INSTALL BLACK HEAT-SHRINKING TUBE, ON ALL GROUND TERMINATIONS. THE INTENT IS TO WEATHERPROOF THE COMPRESSION CONNECTION.
10. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).
11. ALL GROUNDING HARDWARE SUPPLIED AND INSTALLED BY CONTRACTOR.

ELECTRICAL IDENTIFICATION

1. PROVIDE NAMEPLATES FOR ALL MAJOR ELECTRICAL EQUIPMENT AND ON EQUIPMENT AS DIRECTED BY OWNER.
2. PROVIDE ALL FEEDERS AND BRANCH CIRCUIT WIRING WITH COLOR CODED VINYL TAPE WRAPPED A MINIMUM OF 1.5 TIMES AROUND CIRCUMFERENCE OF JACKET/SHIELDING TO DESIGNATE PHASE.
3. COLOR CODING OF CONDUCTORS SHALL BE PER NEC REQUIREMENTS.
4. 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"

CONDUCTORS AND CABLES

1. WIRING - ALL CONDUCTORS SHALL BE EQUAL TO OR BETTER THAN MINIMUM #12 AWG FOR POWER, #14 AWG FOR CONTROL WITH 98% CONDUCTIVITY STRANDED COPPER, 600V, COLOR CODED, UNLESS NOTED ALUMINUM (AL). REFER TO "ALUMINUM CONDUCTOR REQUIREMENTS" THIS SHEET. PROVIDE 75°C RATED CONDUCTORS FOR AMPACITIES ABOVE 100A AND 60°C RATED CONDUCTORS FOR AMPACITIES OF 100 AMPS OR LESS. PROVIDE SOLID OR STRANDED FOR #10 AWG AND SMALLER, STRANDED FOR #8 AWG AND LARGER. UNLESS NOTED OTHERWISE ON DRAWINGS.
2. 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 N.E.C. (NOT TO EXCEED 3%).
3. PROVIDE A SEPARATE NEUTRAL FOR EACH BRANCH CIRCUIT, FEEDER, ETC. NEUTRALS ARE NOT PERMITTED TO BE SHARED.
4. CONNECTORS FOR POWER CONDUCTORS: CONTRACTOR SHALL USE PRESSURE TYPE INSULATED TWIST-ON CONNECTORS FOR NO. 10 AWG AND SMALLER. USE SOLDERLESS MECHANICAL TERMINAL LUGS FOR NO. 8 AWG AND LARGER.
5. 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 SURFACES, INCLUDING GROUND BARS, SHALL BE TREATED - NO SUBSTITUTIONS.
6. CABLES - MC CABLE IS NOT PERMITTED.
7. PROVIDE WIRE AND CABLE MANUFACTURED BY ONE OF THE FOLLOWING: AMERICAN INSULATED WIRE CORPORATION; NEXANS; CERROWIRE; SOUTHWIRE; OR ENCORE WIRE.
8. PROVIDE CONNECTORS MANUFACTURED BY ONE OF THE FOLLOWING: AMP INCORPORATED; GENERAL SIGNAL, O-Z/GEDNEY UNIT; SQUARE D COMPANY, ANDERSON; ILSCO; OR BURNDY

ALUMINUM CONDUCTOR REQUIREMENTS

1. ALUMINUM CONDUCTOR GRADE SHALL BE MINIMUM AA-8000 OR THE NEWEST ALUMINUM CONDUCTOR SPECIFICATION BEING USED BY THE INDUSTRY.
2. THE CONTRACTOR SHALL ABIDE BY ALL ARTICLES RELATED TO ALUMINUM CONDUCTORS IN THE LATEST ISSUE OF THE NEC.
3. 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.
4. ALL ALUMINUM (AI) CONDUCTORS TO RECEIVE ANTI-OXIDATIVE COATING DURING INSTALLATION. ALL OTHER CONDUCTORS ARE COPPER UNLESS NOTED OTHERWISE.
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 A SET SCREW CONNECTOR, THE SCREW SHALL BE TIGHTENED USING ONLY A TORQUE WRENCH.
   - D. NECA / AA RECOMMENDS BELLVILLLE WASHERS WHEN CONNECTING ALUMINUM CONNECTORS 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.

RACEWAY AND BOXES

1. RACEWAYS: UNLESS NOTED OTHERWISE, ALL EXPOSED CONDUIT SHALL BE I.M.C. AND COVERED 6" BELOW FINISHED GRADE TO BE PVC, HDPE, OR LFNC. SEE NOTES A & B BELOW. PROVIDE WEATHERPROOF 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 N.E.C. 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.
   - A. OUTDOOR:
     - ABOVE GRADE: I.M.C.
     - BELOW GRADE: SCH 40 PVC, SCH 40 HDPE, OR NON-METALLIC FLEXIBLE CONDUIT LISTED FOR DIRECT BURIAL. ALL UNDERGROUND CONDUIT SHALL BE 90°C WET RATED AND INSTALLED BELOW GRADE PER NEC. VERIFY APPROVED USE OF HDPE WITH AHJ PRIOR TO ROUGH-IN AND INSTALL PER NEC & MFR RECOMMENDATIONS.
     - BELOW GRADE (V3 POST AND COMMUNICATION LINES ONLY): DURALINE SMOOTH-COR FLEX, DURALINE SMOOTHWALL. ALL DURALINE CONDUIT SHALL BE INSTALLED BELOW GRADE PER NEC. VERIFY APPROVED USE OF HDPE WITH AHJ PRIOR TO ROUGH-IN AND INSTALL PER NEC & MFR RECOMMENDATIONS.
   - B. PARKING GARAGES:
     - IMC: 8'-0" OR LESS ABOVE GRADE OR PARKING GARAGE FLOOR LEVEL
     - EMT: 8'-0" MINIMUM ABOVE PARKING GARAGE FLOOR LEVEL AND WHERE NOT SUBJECT TO DAMAGE. CONTRACTOR SHALL VERIFY WITH ELECTRICAL INSPECTOR IF EMT IS APPROVED AT THIS PROJECT PRIOR TO ROUGH-IN.
2. ALL WIRING SHALL BE INSTALLED IN CONDUIT. ALL CONDUIT SHALL BE A MINIMUM OF 3/4".
3. CONTRACTOR SHALL PLUG AND CAP EACH END OF SPARE AND EMPTY CONDUITS AND PROVIDE TWO SEPARATE PULL STRINGS - 200 LBS TEST POLYETHYLENE CORD. CONTRACTOR SHALL PROVIDE MANUFACTURED LONG RADIUS BENDS FOR ALL CONDUITS. RGS CONDUITS WHEN SPECIFIED, SHALL MEET UL-6 FOR GALVANIZED STEEL. ALL FITTINGS SHALL BE SUITABLE FOR USE WITH THREADED RIGID CONDUIT. COAT ALL THREADS WITH 'BRITE ZINC' OR 'GOLD GALV'.
4. OUTLET BOXES SHALL BE CAST ALLOY WITH THREADED HUBS IN WET/DAMP LOCATIONS AND SPECIAL ENCLOSURES FOR OTHER CLASSIFIED AREAS.
5. PROVIDE METAL CONDUIT AND TUBING MANUFACTURED BY ONE OF THE FOLLOWING: ALFLEX CORPORATION; ANAMET INCORPORATED, ANACONDA METAL HOSE; ANIXTER BROTHERS INCORPORATED; CAROL CABLE COMPANY INCORPORATED; ELECTRI-FLEX COMPANY; GRINNELL COMPANY, ALLIED TUBE AND CONDUIT DIVISION; MONOGRAM COMPANY, AFC; REPUBLIC CONDUIT; OR WHEATLAND TUBE COMPANY.
6. 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.
7. 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.
8. PROVIDE METAL WIREWAYS MANUFACTURED BY ONE OF THE FOLLOWING: HOFFMAN ENGINEERING COMPANY; KEYSTONE/REES, INCORPORATED; OR SQUARE D COMPANY.
9. 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.

SAFETY SWITCHES

1. ALL DISCONNECT SWITCHES SHALL BE HEAVY-DUTY CONSTRUCTION WITH LOCKABLE HANDLES SIZED AS NOTED ON THE DRAWINGS AND/OR RISER DIAGRAM. PROVIDE NEMA ENCLOSURE AS REQUIRED BY EXPOSURE TYPE. ALL FUSIBLE SWITCHES SHALL BE PROVIDED WITH DUAL ELEMENT FUSES SIZED PER THE EQUIPMENT MANUFACTURER'S RECOMMENDATION.

FUSES

1. FUSES SHALL BE DUAL ELEMENT, TIME DELAY CURRENT LIMITING. CONTRACTOR SHALL COORDINATE FUSE SIZES WITH EQUIPMENT MANUFACTURER'S REQUIREMENTS AND PER THE N.E.C. PROVIDE FUSES MANUFACTURED FROM ONE OF THE FOLLOWING: COOPER BUSSMAN, INCORPORATED; EAGLE ELECTRIC MANUFACTURING COMPANY INCORPORATED, COOPER INDUSTRIES INCORPORATED; FERRAZ SHAWMUT INCORPORATED.

ELECTRICAL APPROVAL

APPROVED Date 11/01/2023

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TESLA
3500 DEER CREEK RD.
PALO ALTO, CA 94304
(650) 681-5000

GPD GROUP
Professional Corporation
520 South Main Street, Suite 2531
Akron, OH 44311
330.572.2100 Fax 330.572.2101

REV.	DATE	DESCRIPTION
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GPD Group, Professional Corporation
Texas Registration No. 16477

STATE OF TEXAS
STEVEN P. SCHAUB
114023
LICENSED PROFESSIONAL ENGINEER
09/21/23

TESLA SUPERCHARGER STATION
807- 1/2 EAST STASSNEY LANE
(TESLA SUPERCHARGER) AUSTIN, TX 78745

ELECTRICAL GENERAL NOTES

PROJECT MANAGER	DESIGNER
IM	MAM

JOB NO.
2023241.48

E-001

Drawing Name: O:\2023\2023241\48 - TRT 403157 - Austin, TX - Stassney\dwg\2023241.48 - TRT 403157 - Austin, TX - Stassney - S&S.dwg
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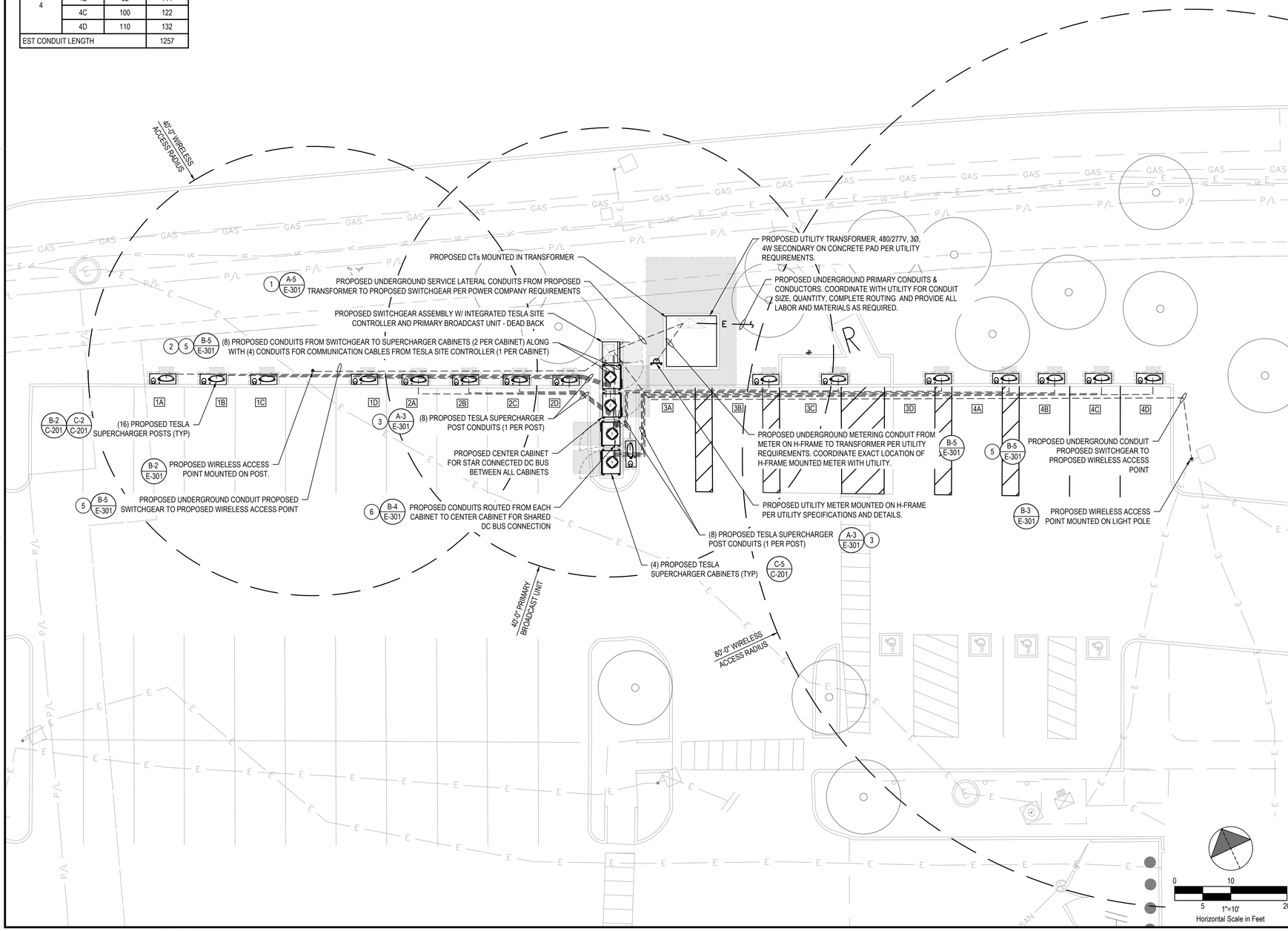
DC CHARGING POST LENGTHS			
CABINET	POST	LF	***EST***
1	1A	82	104
	1B	73	95
	1C	63	85
	1D	45	67
2	2A	38	60
	2B	29	51
	2C	20	42
	2D	11	33
3	3A	7	29
	3B	36	58
	3C	48	70
	3D	67	89
4	4A	84	106
	4B	92	114
	4C	100	122
	4D	110	132
EST CONDUIT LENGTH			1257

AC CHARGING CABINET LENGTHS			
CIRCUIT	CABINET	LF	**EST**
1	1	3	19
2	2	8	24
3	3	13	29
4	4	18	34
TOTAL LENGTH OF AC WIRE			848
TOTAL LENGTH OF GND Cu WIRE			212

SEE SHEET E-201 FOR FEEDER SCHEDULE
TOTAL LENGTH OF AC WIRE
SUM OF EST LENGTH x 8 WIRES PER CABINET
TOTAL LENGTH OF GND Cu
SUM OF EST LENGTHS x (2) SETS

UTILITY SERVICE LENGTHS		
UTILITY TRANSFORMER TO SWITCHGEAR	LF	*EST*
	15	37
TOTAL LENGTH OF WIRE PER CONDUIT		148
NUMBER OF WIRE FILLED CONDUIT		6
TOTAL LENGTH OF WIRE		888

*AC UTILITY SERVICE CONDUCTORS
22 FT IS ADDED TO THE HORIZONTAL RUN TO ACCOUNT FOR BURIED DEPTH
**AC CONDUCTORS
16 FT IS ADDED TO THE HORIZONTAL RUN LENGTH TO ACCOUNT FOR THE VERTICAL RUN.
***DC CONDUCTORS
22 FT IS ADDED TO THE HORIZONTAL RUN LENGTH TO ACCOUNT FOR VERTICAL RUN



GENERAL SHEET NOTES

1. "(#)" DENOTES FEEDER REFERENCE. REFER TO SHEET E-201 FOR FEEDER/CIRCUIT SCHEDULE.
2. CONTRACTOR SHALL REFER TO CIVIL SHEETS FOR EXISTING LANDSCAPING TO REMAIN AND PROPOSED LANDSCAPING.
3. CONTRACTOR SHALL HAND DIG AROUND ALL EXISTING UTILITIES.
4. CONDUIT ELBOWS SHALL BE SIZED PER NEC. CONTRACTOR SHALL VERIFY MANUFACTURER ALLOWABLE FILL AND MINIMUM CONDUCTOR BENDING RADIUS. SEE FEEDER SCHEDULE FOR CONDUIT & CONDUCTOR SPECIFICATIONS.
5. ALL CONDUITS ACCESSIBLE TO THE PUBLIC OR WHICH CAN BE DAMAGED SHALL BE RIGID GALVANIZED STEEL.
6. PROPERTY LINE AND RIGHT-OF-WAY BOUNDARIES ARE SHOWN FOR REFERENCE ONLY. REFER TO SURVEY BY OTHERS FOR EXACT LOCATION.
7. UTILITY EQUIPMENT INSTALLATIONS AND PREP WORK SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY ENGINEER TO ENSURE ACCURACY OF INSTALLATION.
8. ALL PROPOSED CONDUITS MUST MEET MINIMUM DEPTH REQUIREMENTS AS OUTLINED IN TRENCH DETAILS, AS WELL AS MAINTAIN A MINIMUM OF 18" VERTICAL AND 12" HORIZONTAL CLEARANCE OF ALL OBSTRUCTIONS INCLUDING (BUT NOT LIMITED TO) STORM PIPES, SANITARY PIPES, WATER LINES AND OTHER UNDERGROUND UTILITIES.
9. FOR TRAFFIC CONTROL PROCEDURES (IF APPLICABLE), SEE TRAFFIC CONTROL NOTES ON SHEET C-003.
10. THE EXACT ROUTING PATH AND CONDUCTOR RUN LENGTHS SHALL BE DETERMINED BY CONTRACTOR IN FIELD BASED ON PHYSICAL MEASUREMENTS. CONTRACTOR SHALL ORDER CONDUCTORS BASED ON FIELD MEASUREMENTS (MUST BE APPROVED BY TESLA PROJECT MANAGER).
11. THE CONDUIT ROUTING SHOWN IS DIAGRAMMATICAL ONLY, CONTRACTOR SHALL FIELD VERIFY EXACT ROUTING PRIOR TO LAYING CONDUIT.

ELECTRICAL SCOPE OF WORK RESPONSIBILITIES

SCOPE	BY UTILITY	BY CONTRACTOR
PROVIDE & INSTALL PRIMARY SIDE OVERHEAD CONDUCTORS	X	
PROVIDE PRIMARY SIDE TRENCHING/BORING		X
PROVIDE & INSTALL PRIMARY SIDE CONDUITS W/ PULLWIRE		X
PROVIDE & INSTALL PRIMARY SIDE CONDUCTORS	X	
PROVIDE & INSTALL UTILITY POLE (RISER BY CONTRACTOR)	X	
PROVIDE & INSTALL UTILITY TRANSFORMER PAD		X
PROVIDE UTILITY TRANSFORMER	X	
INSTALL UTILITY TRANSFORMER	X	
INSTALL CONNECTIONS AND UTILITY TRANSFORMER (PRIMARY)	X	
INSTALL CONNECTIONS AT UTILITY TRANSFORMER (SECONDARY)	X	
PROVIDE METER PEDESTAL		X
INSTALL METER PEDESTAL		X
PROVIDE METER BASE		X
INSTALL METER BASE		X
PROVIDE METER	X	
INSTALL METER	X	
PROVIDE CTs	X	
INSTALL CTs (INSIDE TRANSFORMER)	X	
PROVIDE SECONDARY SIDE TRENCHING		X
PROVIDE & INSTALL SECONDARY SIDE CONDUITS W/ PULLWIRE		X
PROVIDE & INSTALL SECONDARY SIDE CONDUCTORS		X
PROVIDE ROAD CUTS / ROAD BORES		X
PROVIDE & INSTALL PAVEMENT REPLACEMENT		X

NOTE: SCOPE SHOWN ABOVE WAS PROVIDED BY AUSTIN ENERGY. FIELD VERIFY PRIOR TO CONSTRUCTION.

UTILITY COMPANY CONTACT
AUSTIN ENERGY CONTACT: RAY MARTINEZ (512) 505-7643

ELECTRICAL APPROVAL
CITY OF AUSTIN APPROVED
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LICENSED
PROFESSIONAL ENGINEER
09/21/23

TESLA SUPERCHARGER STATION
807- 1/2 EAST STASSNEY LANE
(TESLA SUPERCHARGER) AUSTIN, TX 78745

ELECTRICAL SITE PLAN

PROJECT MANAGER	DESIGNER
IM	MAM

JOB NO.
2023241.48

E-101

Drawing Name: O:\2023\2023241\48 - TRT 403157 - Austin, TX - Stassney\dwg\2023241.48 - TRT 403157 - Austin, TX - Stassney - SS5.dwg
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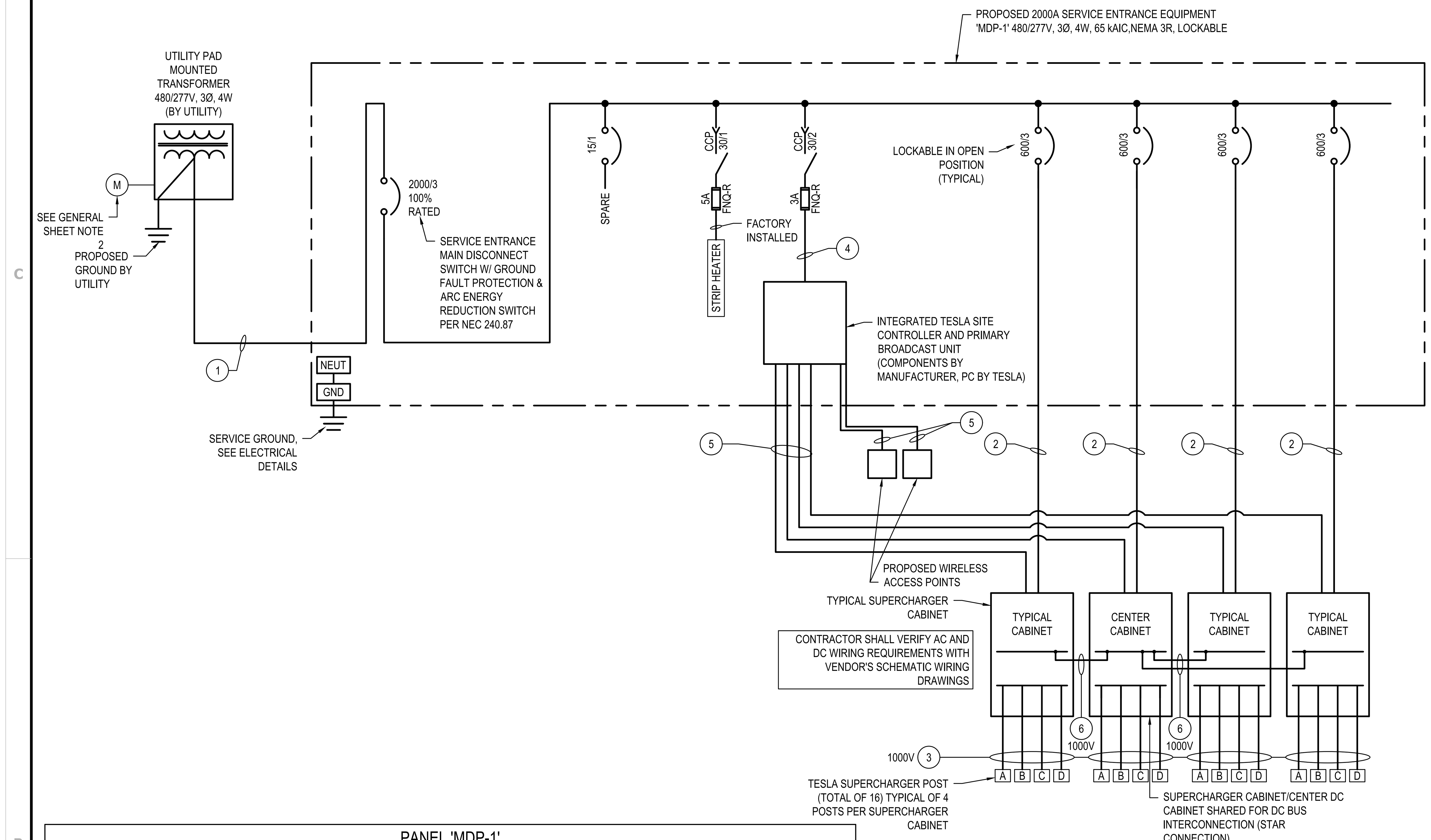

PANEL 'MDP-1'

STATUS:	NEW	VOLTAGE:	480/ 277V 3Ø 4W		RATED FAULT CURRENT:	65 kAIC
LOCATION:	OUTDOOR	MAINS RATING (AMPS):	2000 100% RATED		RATING TYPE:	FULLY RATED
SUPPLY:	UTILITY XFMR	BUS RATING (AMPS):	2000 100% RATED		MOUNTING:	PAD
ENCLOSURE:	NEMA 3R	MAINS:	MCB		SERVICE ENTRANCE RATED:	YES
					ISOLATED GROUND BAR:	NO

CKT #	DESCRIPTION	LOAD	AMPS/POLES	A	B	C	AMPS/POLES	LOAD	DESCRIPTION	CKT #
	TOTAL PER PHASE (kVA)									
1	TESLA SUPERCHARGER CABINET	129.00	600/3	258.00			600/3	129.00	TESLA SUPERCHARGER CABINET	2
3		129.00			258.00			129.00		4
5		129.00				258.00		129.00		6
7	TESLA SUPERCHARGER CABINET	129.00	600/3	258.00			600/3	129.00	TESLA SUPERCHARGER CABINET	8
9		129.00			258.00			129.00		10
11		129.00				258.00		129.00		12
13	SPACE	0.00		0.00				0.00	SPACE	14
15		0.00			0.00			0.00		16
17		0.00				0.00		0.00		18
19	SPACE	0.00		0.00				0.00	SPACE	20
21		0.00			0.00			0.00		22
23		0.00				0.00		0.00		24
25	SPACE	0.00		0.00				0.00	SPACE	26
27		0.00			0.00			0.00		28
29		0.00				0.00		0.00		30
31	SPACE	0.00		0.00				0.00	SPACE	32
33		0.00			0.00			0.00		34
35		0.00				0.00		0.00		36
37	SPARE	0.00	15/1	0.00				0.00	SPACE	38
39	TESLA SITE CONTROLLER	0.10	30/2		0.10			0.00	SPACE	40
41		0.10				0.40	30/1	0.30	STRIP HEATER	42
			TOTAL kVA	516.00	516.10	516.40	TOTAL CONN kVA	1548.50		
			TOTAL AMPS	1862.82	1863.18	1864.26	TOTAL CONN AMPS	1862.56		
			% UNBALANCE	0.0%	0.0%	0.0%				

PANEL BOARD NOTES

1. CIRCUITS SHALL BE REARRANGED AS REQUIRED TO MAINTAIN THE MOST BALANCED LOADS ON EACH PHASE WITHIN EACH PANEL. PROVIDE TYPED PANEL DIRECTORY MOUNTED PER MANUFACTURERS RECOMMENDATIONS WITH SERVICE EQUIPMENT.
2. OCPD FOR POWER CABINETS ARE CALCULATED AS FOLLOWS: 465A AC INPUT TO CABINET x 1.25 = 581.25A ⇨ 600A BRANCH REQUIRED
3. CONTRACTOR SHALL COORDINATE WITH THE POWER COMPANY TO DETERMINE MAXIMUM SHORT CIRCUIT AMPS (SCA), AND PROVIDE CALCULATIONS IN ORDER TO PROVIDE PROPERLY RATED EQUIPMENT. PROVIDE LABELS ON ELECTRICAL EQUIPMENT PER NEC 110.16 AND LOCAL JURISDICTION REQUIREMENTS.
4. PER NEC 230.42(A)(1) EXCEPTION 2: THE SUM OF THE TOTAL CONNECTED LOADS (NON-CONTINUOUS LOAD PLUS THE CONTINUOUS LOAD) TERMINATE IN AN OVERCURRENT DEVICE WHERE BOTH THE OVERCURRENT DEVICE AND ITS ASSEMBLY ARE LISTED FOR OPERATION AT 100% OF THEIR RATING, SIZED PER CONNECTED LOAD.

AVAILABLE FAULT CURRENT (AMPS)	
1	34,043
2	33,498
3	32,518

NOTE: FAULT CURRENT CALCULATIONS PERFORMED USING UTILITY PROVIDED VALUES FOR AN ASSUMED 1500KVA TRANSFORMER.

ELECTRICAL APPROVAL
CITY OF AUSTIN APPROVED Date 11/01/2023 FOUNDED 1839
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BREAKER SETTINGS

USE	SIZE	LONG TIME PICKUP	LONG TIME DELAY	SHORT TIME PICKUP	SHORT TIME DELAY	INST	GROUND FAULT PICKUP	GROUND FAULT DELAY
MCB - ABB E2.2 BKR	2000A	1.0 (2,000A)	40 (I^2T ON)	2.5	0.2 (I^2T OFF)	15	0.5	0.4 (I^2T OFF)
MCB - SQUARE D NW BKR	2000A	1.0 (2,000A)	8	1.5	0.2 (I^2T OFF)	15	J	0.4 (I^2T OFF)
BRANCH CIRCUIT - ABB	600A	MAX (600A)	X	X	X	MIN (3,000A)	X	X
BRANCH CIRCUIT - SQUARE D	600A	X	X	X	X	2	X	X

NOTE: CONTRACTOR SHALL VERIFY BREAKER MAKE/MODEL AND SET PER THE ABOVE TABLE. NOTIFY TESLA IMMEDIATELY OF ANY DISCREPANCIES.

TESLA SUPERCHARGER CABINET AND POST ELECTRICAL SPECS

CHARGE POST MODEL	AC INPUT VOLTAGE TO CABINET	kVA INPUT TO CABINET	AC INPUT CURRENT TO CABINET	DC OUTPUT VOLTAGE TO CHARGE POST	DC OUTPUT CURRENT TO CHARGE POST	DC SHARED BUS CURRENT	SHORT CIRCUIT CURRENT RATING
V3	380V - 480V	387kVA	465A	0V - 500V	350A	640A	85 kAIC
V4	380V - 480V	387kVA	465A	0V - 500V	615A	640A	85 kAIC

GENERAL SHEET NOTES

1. NEUTRAL MUST BE INCLUDED FOR PROPER OPERATION OF TESLA SUPERCHARGERS.
2. PROPOSED UTILITY CTs SHALL BE LOCATED IN UTILITY APPROVED CT COMPARTMENTS MOUNTED IN TRANSFORMER. PROPOSED METER SHALL BE MOUNTED ON PAD MOUNTED H-FRAME PER UTILITY SPECIFICATIONS.
3. ALL CONDUIT FURNISHED AND INSTALLED BY CONTRACTOR.
4. ALL WIRING FURNISHED BY TESLA AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. SEE ELECTRICAL SITE PLAN FOR UTILITY/CONTRACTOR SCOPE OF WORK.
5. THE TESLA PROVIDED SUPERCHARGER CABINETS AND SUPERCHARGER POSTS USED ON THIS PROJECT COMPLY WITH THE FOLLOWING STANDARDS:
   - TUV CERTIFIED TO UL 2202
6. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED, LISTED, OR CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY ACCREDITED BY THE UNITED STATES OCCUPATIONAL SAFETY HEALTH ADMINISTRATION.
7. REFER TO THIS SHEET FOR FAULT CURRENT CALCULATIONS. CONTRACTOR SHALL MARK ON ALL EQUIPMENT AS REQUIRED PER N.E.C.
8. REFER TO SHEET E-301 FOR ARC FLASH LABEL DETAILS. CONTRACTOR SHALL LABEL ALL EQUIPMENT AS REQUIRED PER N.E.C.

FEEDER / CIRCUIT SCHEDULE

NO	CONFIGURATION
1	(6) SETS OF 4" CONDUIT EACH WITH (3) 600 MCM Al (1) 600 MCM Al NEUT
2	(2) SETS OF 4" CONDUIT EACH WITH (3) 500 MCM Al (1) 500 MCM Al NEUT (1) #1 AWG Cu GND OR #2/0 AWG Al GND
3	FOR V3 POST*: (1) SET IN 4" CONDUIT (DURALINE SMOOTH-COR IS ACCEPTABLE**) WITH (4) 350 MCM Al (TWO +, TWO -) (1) #2/0 AWG Al GND OR #1 AWG Cu GND (1) 1000V, CLASS 1, COMM CABLE WITH (1) 1.25" SPARE (DURALINE SMOOTHWALL IS ACCEPTABLE**) OR: FOR V4 POST*: (1) SET IN 4" CONDUIT (HDPE 90°C CONDUIT IS ACCEPTABLE) WITH (4) 600 MCM Al (TWO +, TWO -) (1) #2/0 AWG Cu GND (1) 1.25" CONDUIT (DURALINE SMOOTHWALL IS ACCEPTABLE**) WITH (1) 1000V, CLASS 1, COMM CABLE (2) #8 AWG Cu (LVDC) - 6' MIN COIL AT EACH END *CONTRACTOR SHALL COORDINATE WITH TESLA FOR CHARGE POST CONFIGURATION TO USE. **SEE DETAIL ON SHEET E-301 FOR DURALINE TO PVC TRANSITION AND ADDITIONAL NOTES
4	FACTORY INSTALLED WIRING
5	OUTDOOR RATED/SHIELDED CAT5e OR CAT6 COMMUNICATION CABLE IN 1" CONDUIT.
6	(2) SETS OF 3" CONDUIT EACH WITH (2) 600 MCM Al (ONE +, ONE -) (1) #3/0 AWG Al DC MID (1) #1/0 AWG Cu GND (1) #3/0 AWG Al DC MID DISC. 36" LONG IN EA. CABINET, NOT ROUTED IN CONDUIT

NOTES:
1. ALL AC CONDUCTORS SHALL BE XHHW-2, 600V RATED, U.N.O.
2. ALL DC CONDUCTORS SHALL BE XHHW-2, 1000V RATED, U.N.O..
3. SEE "RACEWAY AND BOXES" NOTES ON SHEET E-001 FOR CONDUIT USE TYPES FOR ABOVE AND BELOW GRADE APPLICATIONS
4. DURALINE PRODUCT WILL BE USED FOR V3 "DC-POST" CONDUIT RUN ONLY.
5. FOR APPROVED COPPER/ALUMINUM EQUIPMENT GROUNDING CONDUCTOR EQUIVALENTS, SEE TABLE BELOW. ALL ALUMINUM EQUIPMENT GROUND CONDUCTORS SHALL BE TERMINATED IN OUTDOOR ENCLOSURES LISTED AND IDENTIFIED FOR THE ENVIRONMENT PER NEC 2020, ARTICLE 250.64(A)(2)

MINIMUM EQUIPMENT GROUNDING CONDUCTOR SIZE

AMPERE RATING OR SETTING OF OCPD IN CIRCUIT AHEAD OF EQUIPMENT	COPPER SIZE	ALUMINUM SIZE
15	12	12
20	12	10
60	10	8
100	8	6
200	6	4
300	4	2
400	3	1
500	2	1/0
600	1	2/0
800	1/0	3/0
1000	2/0	4/0
1200	3/0	250
1600	4/0	350
2000	250	400
2500	350	600
3000	400	600
4000	500	750

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TESLA SUPERCHARGER STATION
807- 1/2 EAST STASSNEY LANE
(TESLA SUPERCHARGER) AUSTIN, TX 78745

SINGLE LINE DIAGRAM & PANEL SCHEDULE

PROJECT MANAGER	DESIGNER
IM	MAM

JOB NO.
2023241.48

E-201

Drawing Name: O:\2023\2023241\48 - TRT 403157 - Austin, TX - Stassney\dwg\2023241.48 - TRT 403157 - Austin, TX - Stassney - S&S.dwg
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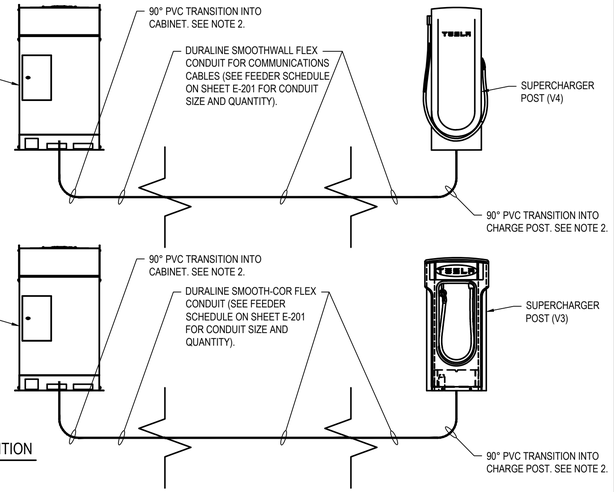

NOTES

1. DURALINE FLEX CONDUIT HAS BEEN CERTIFIED AS A CRITICAL COMPONENT OF THE SUPERCHARGER POST BY TUV. TESTING REPORTS SHOWING HOW THIS PRODUCT MEETS UL STANDARDS ARE AVAILABLE UPON REQUEST. PRODUCT WILL BE USED FOR "DC-POST" CONDUIT RUN ONLY.
2. DURALINE FLEX CONDUITS REQUIRE THE USE OF 90° PVC TRANSITIONS AT EACH END AND/OR HARD BENDS. CONTRACTOR TO SUPPLY PVC TRANSITIONS TO TESLA EQUIPMENT.

C-1 DURALINE TO PVC TRANSITION

N.T.S

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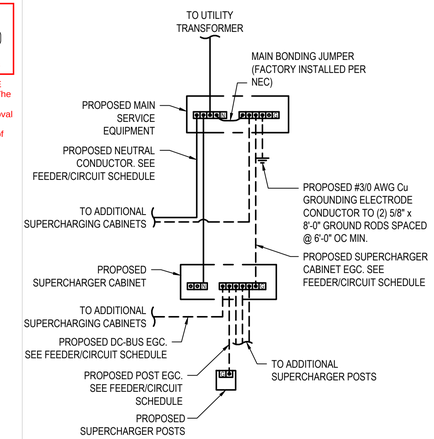


C-5 TYPICAL GROUNDING DIAGRAM

N.T.S.

DANGER

NO SAFE PPE EXISTS

ENERGIZED WORK PROHIBITED

FLASH PROTECTION		SHOCK PROTECTION	
Incident Energy at	18 in	Shock risk when cover is removed	480 VAC
Min. Arc Rating:	117.4 cal/cm^2		
Arc Flash Boundary:	317 in		
Glove Class:	00	Limited Approach	42 in
DO NOT WORK ON LIVE!		Restricted Approach	12 in

Bus: INCOMING SECTION-MAIN Prot: MaxTripTime @2.0s

INCOMING UTILITY SECTION

WARNING

Arc Flash and Shock Risk

Appropriate PPE Required

FLASH PROTECTION		SHOCK PROTECTION	
Incident Energy at	18 in	Shock risk when cover is removed	480 VAC
Min. Arc Rating:	3.43 cal/cm^2		
Arc Flash Boundary:	35 in		
Glove Class:	00	Limited Approach	42 in
		Restricted Approach	12 in

Bus: CHARGING CABINETS Prot: 600A BREAKER

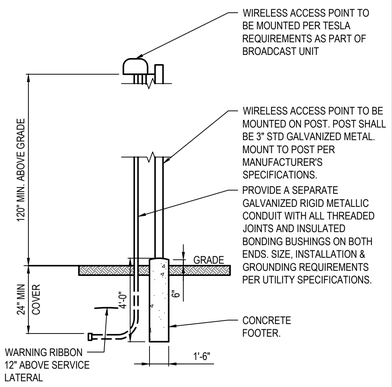
CHARGING CABINETS

NOTES:

1. FOR ANY QUESTIONS OR CLARIFICATIONS REGARDING LABELS, CONTACT TESLA.
2. ARC FLASH INCIDENT ENERGY ANALYSIS COMPLETED PER NFPA 70E 2018.
3. ARC FLASH CALCULATIONS PER IEEE 1584, 2018.
4. LABELS SHALL BE PRINTED WITH PERMANENT INK ON WEATHERPROOF LABELS WITH SELF STICKING ADHESIVE.
5. INSTALL LABELS PER NEC SECTION 110.16.
6. FOR EACH SWITCHGEAR SECTION, CONTRACTOR SHALL PROVIDE (1) APPLICABLE LABEL ON EXTERIOR DOOR AND (1) APPLICABLE LABEL ON INTERIOR FRONT FACING SECTION. CONTRACTOR SHALL FIELD VERIFY SPECIFIC LOCATION FOR LABEL PLACEMENT(S).
7. CONTRACTOR SHALL PROVIDE LABELS WITH ANY ADDITIONAL INFORMATION AS REQUIRED BY LOCAL JURISDICTION, STATE AND FEDERAL CODES AND LAWS.

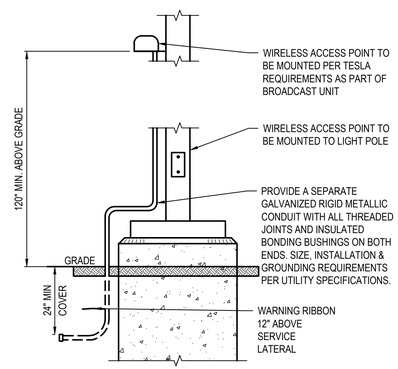
A-1 ARC FLASH LABELS

N.T.S.



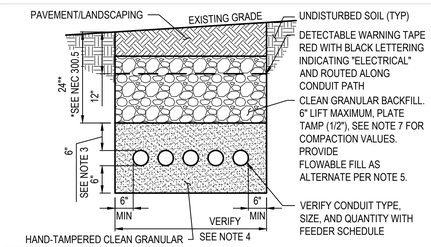
B-2 WIRELESS ACCESS POINT ON POST

N.T.S



B-3 WIRELESS ACCESS POINT

N.T.S



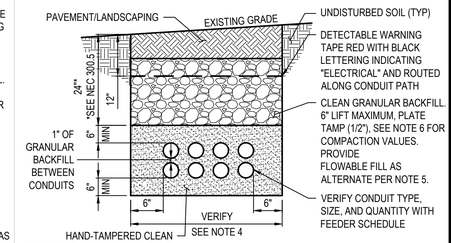
*CONTRACTOR TO VERIFY IF LOCAL JURISDICTION HAS SPECIAL REQUIREMENTS PRIOR TO CONSTRUCTION.

1. ANY EXCAVATION LEFT OPEN SHOULD BE SECURELY FENCED OFF. ALL TRENCHING SHALL BE ACCORDING TO THE LATEST OSHA STANDARDS.
2. ANY PAVEMENT DAMAGE DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR TO PRE-CONSTRUCTION CONDITIONS OR BETTER.
3. CONTRACTOR SHALL INSTALL CONDUITS BELOW LOCAL FROST LINE. SHOULD FIELD CONDITIONS VARY, CONTRACTOR SHALL COORDINATE WITH TESLA CONTACT LISTED ON C-001.
4. VERIFY WIDTH OF TRENCH REQUIRED. REFER TO SITE ELECTRICAL DRAWING FOR APPROXIMATE ROUTING.
5. THE CONTRACTOR SHALL FURNISH FLOWABLE FILL WITH A 28 DAY COMPRESSIVE STRENGTH RANGING FROM 50 PSI TO 100 PSI PER THE STATE DEPARTMENT OF TRANSPORTATION'S CONSTRUCTION AND MATERIAL SPECIFICATIONS, CURRENT EDITION, LATEST REVISION.
6. DC BUS CONDUITS ARE NOT TO BE STACKED UNDER ANY CIRCUMSTANCES.
7. BACKFILL SHALL BE COMPACTED AND TESTED PER ASTM D4253 AND D4254 TO 80% RELATIVE DENSITY IN PAVEMENT AREAS AND 70% RELATIVE DENSITY IN LANDSCAPING AREAS.

B-4 DC BUS CIRCUIT TRENCH**

N.T.S.

**IF DIRECT BURIAL METHOD IS DESIRED, PLEASE REFERENCE DIRECT BURIAL NOTES, THIS SHEET.



*CONTRACTOR TO VERIFY IF LOCAL JURISDICTION HAS SPECIAL REQUIREMENTS PRIOR TO CONSTRUCTION.

1. ANY EXCAVATION LEFT OPEN SHOULD BE SECURELY FENCED OFF.
2. ANY PAVEMENT DAMAGE DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR TO PRECONSTRUCTION CONDITIONS OR BETTER.
3. CONTRACTOR SHALL INSTALL CONDUITS BELOW LOCAL FROST LINE. SHOULD FIELD CONDITIONS VARY, CONTRACTOR SHALL COORDINATE WITH CONTACT ENGINEER LISTED ON SHEET C-001.
4. VERIFY WIDTH OF TRENCH REQUIRED. REFER TO SITE ELECTRICAL DRAWING ON SHEET E-101 FOR ROUTING.
5. THE CONTRACTOR SHALL FURNISH FLOWABLE FILL WITH A 28 DAY COMPRESSIVE STRENGTH RANGING FROM 50 PSI TO 100 PSI PER THE STATE DEPARTMENT OF TRANSPORTATION'S CONSTRUCTION AND MATERIAL SPECIFICATIONS, CURRENT EDITION, LATEST REVISION.
6. BACKFILL SHALL BE COMPACTED AND TESTED PER ASTM D4253 AND D4254 TO 80% RELATIVE DENSITY IN PAVEMENT AREAS AND 70% RELATIVE DENSITY IN LANDSCAPING AREAS.

B-5 TYPICAL FEEDER TRENCH**

N.T.S.

**IF DIRECT BURIAL METHOD IS DESIRED, PLEASE REFERENCE DIRECT BURIAL NOTES, THIS SHEET.

1. CONTRACTOR SHALL CONFIRM INSTALLATION METHOD WITH OWNER. FOR DIRECT BURY CONDUCTOR INSTALLATION, CONTRACTOR SHALL COMPLY WITH THE FOLLOWING ADDITIONAL REQUIREMENTS:

1.1. VERTICAL TRANSITIONS SHALL CONSIST OF RIGID 90 DEGREE SWEEPS AND CONDUIT SLEEVE THROUGH FOUNDATIONS.

1.2. CONTRACTOR SHALL PROVIDE 6" OF SAND OR FINE COURSE MATERIAL ON ALL SIDES OF CABLE.

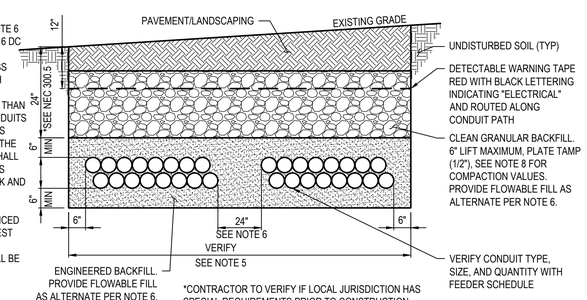
1.3. WHEN CROSSING UNDERGROUND UTILITIES, CONTRACTOR TO VERY ALL INSTALLATION REQUIREMENTS WITH OWNER.

A-2 DIRECT BURIAL NOTES

N.T.S.

NOTES

1. DUCT BANK DESIGNED AND CERTIFIED BY TESLA, SEE NOTE 6 FOR ADDITIONAL INFORMATION. TRENCHES WITH UP TO 16 DC POST CONDUITS MAY BE INSTALLED WITH NO CONDUIT SPACING. ENGINEERED BACKFILL WITH A RHO VALUE LESS THAN 100 MUST BE USED FOR BACKFILL. TRENCHES WITH MORE THAN 16 DC POST CONDUITS MUST INCLUDE A 24" SEPARATION BETWEEN CONDUIT GROUPS OF NOT MORE THAN 16 CONDUITS. GROUPINGS OF 4 OR FEWER DC POST CONDUITS MAY BE INSTALLED WITHOUT ENGINEERED BACKFILL. THIS CONDUIT CONFIGURATION HAS NOT BEEN REVIEWED BY THE STAMPING PARTY. THEREFORE, THE STAMPING PARTY SHALL NOT BE HELD LIABLE FOR ITS USE. ANY RELIANCE ON THIS DETAIL SHALL BE AT THE RELYING PARTY(IES)'S OWN RISK AND HEREBY WAIVES ANY AND ALL CLAIM(S) RELATED TO THE EXISTENCE OF THE STAMP OR OTHERWISE.
2. ANY EXCAVATION LEFT OPEN SHOULD BE SECURELY FENCED OFF. ALL TRENCHING SHALL BE ACCORDING TO THE LATEST OSHA STANDARDS.
3. ANY PAVEMENT DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR TO PRE-CONSTRUCTION CONDITIONS OR BETTER.
4. CONTRACTOR SHALL PROVIDE ADDITIONAL SLACK IN CONDUCTORS AND CONDUIT EXPANSION JOINTS IN ORDER TO ALLOW FOR EARTH MOVEMENT FROM SETTLEMENT, FROST, ETC. IN ORDER TO PREVENT DAMAGE TO THE CONDUCTORS OR TO THE EQUIPMENT CONNECTED TO THE TRENCH PER THE NEC. SHOULD FIELD CONDITIONS VARY OR CONFLICTS OCCUR, CONTRACTOR SHALL COORDINATE WITH TESLA CONTACT LISTED ON SHEET C-001.
5. FIELD VERIFY WIDTH OF TRENCH REQUIRED. REFER TO SITE ELECTRICAL DRAWING FOR ROUTING.
6. CONTRACTOR SHALL FURNISH FLOWABLE FILL WITH A 28 DAY COMPRESSIVE STRENGTH RANGING FROM 50 PSI TO 100 PSI PER THE STATE DEPARTMENT OF TRANSPORTATION'S CONSTRUCTION AND MATERIAL SPECIFICATIONS, CURRENT EDITION, LATEST REVISION.
7. THIS DETAIL REQUIRED FOR USE WITH 350MCM Al DC CONDUCTORS ONLY. WHEN INSTALLING LARGER DC CONDUCTORS, USE REQUIREMENTS DETAILED IN TYPICAL TRENCH DETAIL, THIS SHEET.



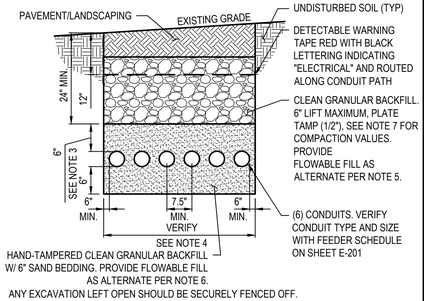
*CONTRACTOR TO VERIFY IF LOCAL JURISDICTION HAS SPECIAL REQUIREMENTS PRIOR TO CONSTRUCTION.

8. BACKFILL SHALL BE COMPACTED AND TESTED PER ASTM D4253 AND D4254 TO 80% RELATIVE DENSITY IN PAVEMENT AREAS AND 70% RELATIVE DENSITY IN LANDSCAPING AREAS.

A-3 DC POST CONDUIT TRENCH**

N.T.S.

**IF DIRECT BURIAL METHOD IS DESIRED, PLEASE REFERENCE DIRECT BURIAL NOTES, THIS SHEET.



1. ANY EXCAVATION LEFT OPEN SHOULD BE SECURELY FENCED OFF.
2. ANY PAVEMENT DAMAGE DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR TO PRECONSTRUCTION CONDITIONS OR BETTER.
3. CONTRACTOR SHALL INSTALL CONDUITS BELOW LOCAL FROST LINE. SHOULD FIELD CONDITIONS VARY, CONTRACTOR SHALL COORDINATE WITH CONTACT ENGINEER LISTED ON SHEET C-001.
4. VERIFY WIDTH OF TRENCH REQUIRED. REFER TO SITE ELECTRICAL DRAWING ON SHEET E-101 FOR ROUTING.
5. VERIFY ALL REQUIREMENTS WITH POWER COMPANY
6. THE CONTRACTOR SHALL FURNISH FLOWABLE FILL WITH A 28 DAY COMPRESSIVE STRENGTH RANGING FROM 50 PSI TO 100 PSI PER THE STATE DEPARTMENT OF TRANSPORTATION'S CONSTRUCTION AND MATERIAL SPECIFICATIONS, CURRENT EDITION, LATEST REVISION.
7. BACKFILL SHALL BE COMPACTED AND TESTED PER ASTM D4253 AND D4254 TO 80% RELATIVE DENSITY IN PAVEMENT AREAS AND 70% RELATIVE DENSITY IN LANDSCAPING AREAS.

A-5 SECONDARY FEEDER TRENCH

N.T.S.

TESLA
3500 DEER CREEK RD.
PALO ALTO, CA 94304
(650) 681-5000

GPD GROUP
Professional Corporation
520 South Main Street, Suite 2531
Akron, OH 44311
330.572.2100 Fax 330.572.2101

REV.	DATE	DESCRIPTION
A	08/15/2023	ISSUED FOR 50% REVIEW
B	09/07/2023	ISSUED FOR 90% REVIEW
0	09/21/2023	ISSUED FOR SIGN & SEAL

GPD Group, Professional Corporation
Texas Registration No. 16477

STATE OF TEXAS
STEVEN P. SCHAUB
114023
LICENSED
PROFESSIONAL ENGINEER
09/21/23

TESLA SUPERCHARGER STATION
807- 1/2 EAST STASSNEY LANE
(TESLA SUPERCHARGER) AUSTIN, TX 78745

ELECTRICAL DETAILS

PROJECT MANAGER	DESIGNER
IM	MAM

JOB NO.
2023241.48

E-301

Drawing Name: O:\2023\2023241\48 - TRT 403157 - Austin, TX - Stassney\dwg\2023241.48 - TRT 403157 - Austin, TX - Stassney- S&S.dwg
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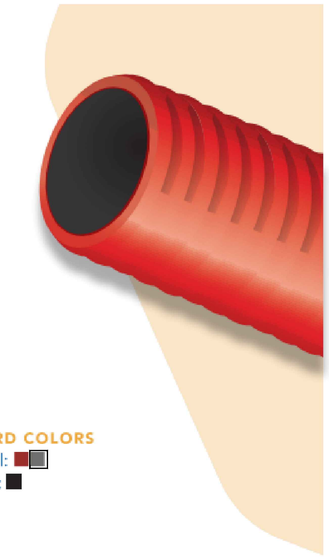
SPECIALTY

SMOOTH-COR FLEX

- Flexible: Reduces/eliminates the need for sweeps and bends
- Crush resistant: Equivalent to Schedule 40 PVC
- Lightweight: Easier installation, 40% lighter than PVC
- Compatibility: Easily adapts to other conduit materials
- Glueless coupling: Safe, quick assembly
- Gasketed: Air and watertight
- Low COF: Longer cable pulls with lower cable stress



INSTALLATION TYPES
Underground
Direct Bury
Concrete Encasement

SIZE RANGE AVAILABLE
2.0"
3.0"
4.0"

STANDARD COLORS
Outer Wall:
Inner Wall:

FEATURES

STANDARD

DETAILS Manufactured from flexible HDPE (High Density Polyethylene)

SPECIFICATIONS All Smooth-Cor Flex dimensions meet or exceed one or more of the following: ASTM D-3350, ASTM D-638, ASTM D-792, ASTM D-1238, ASTM D-1693

CONDUIT MARKINGS Permanent marking along conduit includes: material, relevant standards, production info, and sequential feet or meter markings.

CO-EXTRUDED LINING Corrugated exterior with a smooth, co-extruded inner layer

PRE-INSTALLED TAPE Factory pre-installed Bull-Line™ 1200lb Pull Tape comes standard in Smooth-Cor Flex on steel reels. Smooth-Cor Flex coils are only available as empty.

OPTIONS

PACKAGING Available on steel reels or 250' coils

COIL PACKAGING FOR SMOOTH-COR FLEX

SIZE	LENGTH	WEIGHT/COIL (LBS)	COILS/PALLET	PALLETS/TRUCK	QTY/TRUCK-LOAD	RED PART #	GREY PART #
2"	250'	55	3	26	19,500	20000670	20004695
3"	250'	108	3	20	15,000	20000671	20004696
4"	250'	142	3	9	6,750	20000672	20004732

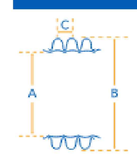
REEL PACKAGING FOR SMOOTH-COR FLEX

SIZE	LENGTH	REEL SIZE	RED PART #	GREY PART #
2"	3,500	96 x 45	20005462	20005607
3"	1,850	96 x 45	20005463	20005608
4"	900	96 x 45	20005464	20005609

TECHNICAL SPECIFICATIONS FOR SMOOTH-COR FLEX

LENGTH	250' COILS	
Pipe Stiffness	ASTM D 2412	2" 75 LBS/IN/IN 3" 88 LBS/IN/IN 4" 116 LBS/IN/IN
Impact Resistance per Falling Tup	ASTM D 2444	45-50 FT-LB @ 72 degrees 40 FT-LB @ 32 degrees
Coupler Water & Air Tight	ASTM D 3212	10 psi

TECHNICAL SPECIFICATIONS FOR SMOOTH-COR FLEX



PRODUCT	DUAL WALL	A I.D.	B O.D.	C TOTAL WIDTH	INNER WALL THICKNESS	OUTER WALL THICKNESS
	2"	2.045" 51.943mm	2.495" 63.373mm	0.325" 8.255mm	0.020" ± 0.010" 0.508mm ± 0.254mm	0.023"± 0.007" 0.584mm ± 0.178mm
	3"	2.950" 74.930mm	3.510" 89.154mm	0.360" 9.144mm	0.027" ± 0.010" 0.686mm ± 0.254mm	0.033"± 0.007" 0.838mm ± 0.178mm
	4"	3.980" 101.092mm	4.730" 120.142mm	0.650" 16.510mm	0.027" ± 0.010" 0.686mm ± 0.254mm	0.033"± 0.007" 0.838mm ± 0.178mm

MATERIAL DESIGNATION

TEST METHOD	DESCRIPTION	VALUES
ASTM D 3350	HDPE Resin Cell Classification	334480 C or E
ASTM D 638	Tensile strength at yield	3000 PSI Min
ASTM D 638	% Ultimate Elongation Value	400 Min
ASTM D 792	Density g/cm3	0.941 - 0.959
ASTM D 1238	Melt Index, g/10 min Condition E	0.5 Max
ASTM D 1693	ESCR Condition B, F10	96 hrs.

ELECTRICAL APPROVAL
CITY OF AUSTIN APPROVED
This stamp serves as a means of electrical approval and does not include other disciplines.

ALL ELECTRICAL SHALL BE IN ACCORDANCE WITH CITY OF AUSTIN ELECTRICAL CODES The granting of a permit for, approval of these plans shall not be construed to be a permit for, or approval of, any violation of the previsions of the currently adopted electrical code or any other ordinances of the City of Austin.

dura·line +1 800 847 7661 WWW.DURALINE.COM TL9000 9001
orbia Advancing life together
DL.SMOOTH-COR-FLEX.4.2022

TESLA
3500 DEER CREEK RD.
PALO ALTO, CA 94304
(650) 681-5000

REV.	DATE	DESCRIPTION
A	08/15/2023	ISSUED FOR 50% REVIEW
B	09/07/2023	ISSUED FOR 90% REVIEW
0	09/21/2023	ISSUED FOR SIGN & SEAL

FOR REFERENCE ONLY

TESLA SUPERCHARGER STATION
807- 1/2 EAST STASSNEY LANE
(TESLA SUPERCHARGER) AUSTIN, TX 78745

DURALINE SPECIFCATIONS

PROJECT MANAGER	DESIGNER
IM	MAM

JOB NO.
2023241.48

E-401

Drawing Name: O:\2023\2023241\48 - TRT 403157 - Austin, TX - Stassney\dwg\2023241.48 - TRT 403157 - Austin, TX - Stassney - S&S.dwg
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STANDARD

SMOOTHWALL

- Manufactured from flexible HDPE, makes gradual bends without special equipment
- Continuous lengths reduce joining costs
- Excellent low temperature properties, allows installation in cold climates
- Outstanding long term cable protection from shifting ground, rock and root impingement
- Provides a permanent pathway, simpifies future cable repairs or replacement

INSTALLATION TYPES	SIZE RANGE AVAILABLE			WALL TYPES	
Aerial	1/2"	2"	6"	SDR 9	SCH 40
Subdivided Conduit	3/4"	2 1/2"	8"	SDR 11	SCH 80
Plow	1"	3"	10"	SDR 13.5	SIDR 9
Trench	1 1/4"	4"	12"	SDR 15.5	SIDR 11
Directional Bore	1 1/2"	5"		SDR 17	
Tray					
Direct Burial					

STANDARD COLORS

or custom colors with optional stripes

FEATURES

STANDARD

MATERIAL Manufactured from flexible HDPE (High Density Polyethylene)

SPECIFICATIONS All Smoothwall conduit dimensions meet or exceed one or more of the following: ASTM F-2160, ASTM D-3350, ASTM D-3485, NEMA TC-7, UL 651A, UL 1990, Bellcore GR-356

CONDUIT MARKINGS Permanent marking along conduit includes: material, relevant standards, production info, and sequential feet or meter markings. Custom options available.

OPTIONS

CO-EXTRUDED LINING SILICORE® ULF (Ultra-Low Friction) is co-extruded inside the HDPE wall creating a slick, permanent, interior lining. With a coefficient of friction 60% lower than standard HDPE conduit without the aid of wet lubricants, SILICORE® ULF exhibits no loss in performance over time or in extreme temperature conditions.

PRE-INSTALLED TAPE Factory pre-installed Bull-Line™ Pull Tape with EVEN-LOAD™ ensures extra slack at any access point throughout the reel. Available 500lb–6,000lb tensile strength or locatable.

PRE-INSTALLED CABLE Cable can be factory pre-installed in conduit

UV PROTECTANT Available for UV exposure applications (Aerial, Lashed, or External Tray)

SMOOTHWALL (SIDR) TECHNICAL SPECIFICATIONS

	WALL TYPE	AVG OD (IN)	MIN WALL (IN)	WALL TOLERANCE +	MIN ID (IN)	WEIGHT (LB/FT)	BEND RADIUS SUP (IN)	BEND RADIUS UNSUP (IN)	SWPS (LB)
1/2"	SIDR 9	0.780	0.069	0.020	0.622	0.072	8	16	445
	SIDR 11.5	0.762	0.060	0.022	0.622	0.063	8	16	390
3/4"	SIDR 9	1.026	0.092	0.020	0.824	0.122	10	20	760
	SIDR 11.5	0.986	0.072	0.020	0.824	0.096	10	20	597
1"	SIDR 9	1.298	0.117	0.020	1.049	0.192	13	26	1,471
	SIDR 11.5	1.246	0.091	0.020	1.049	0.150	13	26	891
1 1/4"	SIDR 9	1.701	0.153	0.020	1.380	0.324	17	34	1,652
	SIDR 11.5	1.635	0.120	0.020	1.380	0.253	17	34	1,549
1 1/2"	SIDR 11.5	1.908	0.140	0.020	1.610	0.341	19	38	2,123
2"	SIDR 9	2.553	0.230	0.028	2.067	0.729	24	48	4,535
	SIDR 11.5	2.447	0.180	0.022	2.067	0.558	24	48	3,468
2 1/2"	SIDR 11.5	2.919	0.215	0.026	2.469	0.792	29	58	4,934
3"	SIDR 11.5	3.627	0.267	0.032	3.068	1.225	39	78	7,627
4"	SIDR 11.5	4.768	0.350	0.042	4.026	2.111	50	100	13,119
6"	SIDR 11.5	7.175	0.527	0.063	6.065	4.782	73	146	29,750

SMOOTHWALL SIDR NOTES:

1. Bend Radius
   - ½" through 2 ½" — Supported Bend Radius 10 times the OD — Unsupported Bend Radius 20 times the OD
   - 3" through 6" — Supported Bend Radius 11 times the OD — Unsupported Bend Radius 22 times the OD
   - 8" through 16" — Supported Bend Radius 18 times the OD — Unsupported Bend Radius 27 times the OD
2. During cable placement, large sweeping bends are recommended over tighter bends. Pre-formed sweeps are recommended for conduit sizes 8" through 16" diameters.
3. SWPS (Safe Working Pull Strength) is calculated using a 25% safety factor with the minimum resin tensile strength of 3,000 psi, the average OD and average wall thickness.
4. Internal or external ribs are in addition to the average wall and for determining OD and ID dimensions. The average rib height to be added is 0.020"
5. Add 0.016 #/ft for ribbed products 1 1/2" and less. For 2" and larger, add 0.025 #/ft

ELECTRICAL APPROVAL
CITY OF AUSTIN APPROVED
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DL.SMOOTHWALL.3.2023

TESLA
3500 DEER CREEK RD.
PALO ALTO, CA 94304
(650) 681-5000

REV.	DATE	DESCRIPTION
A	08/15/2023	ISSUED FOR 50% REVIEW
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807- 1/2 EAST STASSNEY LANE
(TESLA SUPERCHARGER) AUSTIN, TX 78745

DURALINE SPECIFCATIONS

PROJECT MANAGER	DESIGNER
IM	MAM

JOB NO.
2023241.48

E-402

Drawing Name: Q:\2023\2023241\48 - TRT 403157 - Austin, TX - Stassney\dwg\2023241.48 - TRT 403157 - Austin, TX - Stassney - SS5.dwg
September 21, 2023 11:51 AM - RVinegard