

## **ELECTRICAL SPECIFICATIONS**

- 1. SUBMITTAL OF BID INDICATES CONTRACTOR IS COGNIZANT OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THIS CONTRACT.
- 2. CONTRACTOR SHALL PERFORM ALL VERIFICATION
  OBSERVATION TESTS, AND EXAMINATION WORK PRIOR
  TO THE ORDERING OF THE ELECTRICAL EQUIPMENT AND
  THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL
  ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE
  ARCHITECT LISTING ALL MALFUNCTIONS, FAULTY
  EQUIPMENT AND DISCREPANCIES.
- HEIGHTS SHALL BE VERIFIED WITH OWNER PRIOR TO INSTALLATION.
- THESE PLANS ARE DIAGRAMMATIC ONLY, FOLLOW AS CLOSELY AS POSSIBLE.
- EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANELBOARD, PULLBOX, J-BOX, SWITCH BOX, ETC., IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT (O.S.H.A.)
- 6. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.
- 7. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT. MATERIALS SHALL BE LISTED AND APPROVED BY UNDERWRITER'S LABORATORY AND SHALL BEAR THE INSPECTION LABEL "J" WHERE SUBJECT TO SUCH APPROVAL. MATERIALS SHALL MEET WITH APPROVAL OF THE DIVISION OF INDUSTRIAL SAFETY AND ALL GOVERNING BODIES HAVING JURISDICTION. MATERIALS SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA & NBFU
- 8. CONTRACTOR SHALL CARRY OUT HIS WORK IN ACCORDANCE WITH ALL GOVERNING STATE, COUNTY AND LOCAL CODES AND O.S.H.A.
- 9. CONTRACTOR SHALL SECURE ALL NECESSARY BUILDING PERMITS
- 10. COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER THE DATE OF JOB ACCEPTANCE BY OWNER. ANY WORK, MATERIAL OR EQUIPMENT FOUND TO BE FAULTY DURING THAT PERIOD SHALL BE CORRECTED AT ONCE, UPON WRITTEN NOTIFICATION, AT THE EXPENSE OF THE CONTRACTOR.
- 11. ALL CONDUIT ONLY (C.O.) SHALL HAVE A PULL WIRE OR ROPE.
- 12. PROVIDE PROJECT MANAGER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS, AND CIRCUITS.
- 13. ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC. SHALL BE TURNED OVER TO OWNER AT JOB COMPLETION.
- 14. USE T-TAP CONNECTIONS ON ALL MULTI-CIRCUITS WITH COMMON NEUTRAL CONDUCTOR FOR LIGHTING FIXTURE.
- 15. ALL CONDUCTORS SHALL BE COPPER.
- 16. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C.
- 17. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES AND DRAWINGS.
- 18. PATCH, REPAIR AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.
- 19. IN DRILLING HOLES INTO CONCRETE WHETHER FOR

- FASTENING OR ANCHORING PURPOSES, OR PENETRATIONS THROUGH THE FLOOR FOR CONDUIT RUNS, PIPE RUNS, ETC., IT MUST BE CLEARLY UNDERSTOOD THAT TENDONS AND/OR REINFORCING STEEL WILL NOT BE DRILLED INTO, CUT OR DAMAGED UNDER ANY CIRCUMSTANCES.
- 20. LOCATION OF TENDONS AND/OR REINFORCING STEEL ARE NOT DEFINITELY KNOWN AND THEREFORE MUST BE SEARCHED FOR BY APPROPRIATE METHODS AND EQUIPMENT VIA X-RAY OR OTHER DEVICES THAT CAN ACCURATELY LOCATE THE REINFORCING AND/OR STEEL TENDONS.
- 21. PENETRATIONS IN FIRE RATED WALLS SHALL BE FIRE STOPPED IN ACCORDANCE WITH IBC SECTION 714.
- 22. RECEPTACLES SHALL BE 20 AMPERE, 125 VOLT A.C., WHITE AS REQUIRED BY THE ARCHITECT OR APPROVED EQUAL.
- 23. WALL SWITCHES SHALL BE SINGLE-POLE, HUBBELL #1201 OR EQUIVALENT, WHITE AS REQUIRED BY THE ARCHITECT.
- 24. PLASTIC PLATES FOR ALL SWITCHES, RECEPTACLES, TELEPHONE AND BLANKED OUTLETS, SHALL HAVE ENGRAVED LETTERING WHERE INDICATED ON THE DRAWINGS. WEATHERPROOF RECEPTACLES SHALL HAVE RACO #800, 1/2" RAISED WORK COVERS.
- 25. WIRE AND CABLE CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM, NO BX OR ROMEX CABLE IS PERMITTED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
- 26. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2.
- 27. GROUND RODS SHALL BE COPPER CLAD STEEL, 5/8" ROUND AND 10' LONG. COPPERWELD OR APPROVED EQUAL.
- 28. METER SOCKET AMPERES, VOLTAGE, NUMBER OF PHASES SHALL BE AS NOTED ON THE DRAWINGS.
  MANUFACTURED BY SQUARE D COMPANY OR APPROVED EQUAL.
- 29. ALL MATERIALS SHALL BE U.L. LISTED.
- 30. CONDUIT:
  - a. RIGID CONDUIT SHALL BE U.L. LABEL GALVANIZED ZINC COATED WITH ZINC INTERIOR AND SHALL BE USED WHEN INSTALLED IN OR UNDER CONCRETE SLABS, IN CONTACT WITH THE EARTH, UNDER PUBLIC ROADWAYS, IN MASONRY WALLS OR EXPOSED ON BUILDING EXTERIOR RIGID CONDUIT IN CONTACT WITH EARTH SHALL BE 1/2 LAPPED WRAPPED WITH HUNTS WRAP PROCESS NO. 3.
  - b. ELECTRICAL METALLIC TUBING SHALL HAVE U.L. LABEL, FITTINGS SHALL BE GLAND RING COMPRESSION TYPE. EMT SHALL BE USED ONLY FOR INTERIOR RUNS.
  - c. FLEXIBLE METALLIC CONDUIT SHALL HAVE U.L. LISTED LABEL AND MAY BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE "JAKE" OR "SQUEEZE" TYPE, SEAL TIGHT FLEXIBLE CONDUIT. ALL CONDUIT IN EXCESS OF SIX FEET IN LENGTH SHALL HAVE FULL SIZE GROUND WIRE.
  - d. ALL UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 40 (UNLESS NOTED OTHERWISE) AT A MINIMUM DEPTH OF 24" BELOW GRADE.
- 31. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.
- 32. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO PROJECT MANAGER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDAMAGED CONDITION.
- 33. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY FOR CONNECTION OF TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOKUP COSTS TO BE PAID BY CONTRACTOR.

## **GENERAL ELECTRICAL NOTES**

- 1. THE ELECTRICAL INSTALLATION WORK SHALL COMPLY WITH ALL LOCAL, STATE AND NATIONAL CODES, LAWS AND ORDINANCES APPLICABLE TO ELECTRICAL WORK.
- 2. ELECTRICAL CONTRACTOR SHALL VISIT JOB SITE AND VERIFY EXISTING CONDITIONS BEFORE BIDDING AND SHALL INCLUDE IN HIS BID THE NECESSARY COSTS TO CONSTRUCT THIS PROJECT IN ACCORDANCE WITH INTENT OF THE ELECTRICAL DRAWINGS, SPECIFICATIONS, AND ALL APPLICABLE CODES.
- 3. ALL MATERIAL AND EQUIPMENT FURNISHED AND INSTALLED UNDER THIS CONTRACT SHALL BE NEW, FREE FROM DEFECTS AND SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE BY OWNER OR HIS REPRESENTATIVE. SHOULD ANY TROUBLE DEVELOP DURING THIS PERIOD DUE TO FAULTY WORKMANSHIP, MATERIAL OR EQUIPMENT, THE CONTRACTOR SHALL FURNISH ALL NECESSARY MATERIAL AND LABOR TO CORRECT THE TROUBLE WITHOUT COST TO THE OWNER.
- 4. ALL WORK TO BE EXECUTED IN WORKMANLIKE MANNER AND SHALL PRESENT A NEAT MECHANICAL APPEARANCE WHEN COMPLETED.
- 5. ALL ELECTRICAL MATERIALS AND EQUIPMENT SHALL BE LISTED BY UNDERWRITER'S LABORATORIES.
- 6. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING RELATED TO ELECTRICAL WORK, UNLESS NOTED OTHERWISE AND COORDINATED WITH THE GENERAL CONTRACTOR.
- 7. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL WORK WITH CIVIL AND ARCHITECTURAL PLANS. THE REQUIREMENTS OF ALL EQUIPMENT ACTUALLY BEING INSTALLED SHALL BE VERIFIED PRIOR TO INSTALLING THE ELECTRICAL WORK.
- 8. ALL BRANCH CIRCUIT CONDUCTORS SHALL BE COPPER TYPE "THWN" #12, & #10 SOLID, #8 AND LARGER STRANDED.
- 9. ON COMPLETION OF THE WORK, THE INSTALLATION SHALL BE FREE FROM GROUNDS AND SHORT CIRCUITS.
- 10. ELECTRICAL CONTRACTOR SHALL FURNISH AS-BUILT DRAWINGS TO THE ARCHITECT AND CUSTOMER UPON COMPLETION OF THE JOB.
- 11. ELECTRICAL WORK SHALL INCLUDE ALL LABOR,
  MATERIALS AND EQUIPMENT REQUIRED, INCLUDING
  BUT NOT LIMITED, TO COMPLETE ELECTRICAL SYSTEMS
  POWER AND LIGHTING, TELEPHONE CONDUIT SYSTEM,
  SIGNAL SYSTEMS, PANEL BOARD(S), CONTROL WIRING,
  GROUNDING, CONDUIT ONLY SYSTEMS, ETC., AS
  INDICATED ON ELECTRICAL DRAWINGS AND/OR
  REQUIRED BY GOVERNING CODES.
- 12. RACEWAYS SHALL BE: RIGID STEEL CONDUIT: HOT DIP GALVANIZED HEAVY WALL AS MANUFACTURED BY REPUBLIC, TRIANGLE OR EQUAL, RIGID POLYVINYL CHLORIDE CONDUIT (PVC); HEAVY WALLS SCHEDULE 40 AS MANUFACTURED BY CARLON ELECTRICAL, VISQEEN OR EQUAL. ELECTRICAL METALLIC TUBING (EMT): ZINC-COATED THIN WALL AS MANUFACTURED BY TRIANGLE, REPUBLIC OR EQUAL.
- 13. FUSE TYPE SHALL BE BUSSMANN OR EQUAL FUSE.
- 14. PROVIDE ENGRAVED PLASTIC LABELS TO IDENTIFY ALL PANEL BOARDS, XFMRS., DISTRIBUTION PANELS, DISCONNECT SWITCHES, AND TRANSFER SWITCHES. LABELS SHALL READ IN THIS FASHION "A" 208Y/120V 3~, 4W, 225A, CKT. BKR OR FUSES TYPE AND SIZES.
- 15. E.C. SHALL VERIFY AND TEST GROUND TO SOURCE TO A MAXIMUM OF 5 OHMS. IF THE GROUND TEST DOES NOT ACHIEVE THE 5 OHMS OR LESS, E.C. SHALL BE RESPONSIBLE FOR PROVIDING THE NECESSARY CONDUCTORS AND GROUND RODS TO ACHIEVE 5 OHMS MAXIMUM.
- 16. BEFORE SUBMITTING BID, VERIFY EXISTING SITE CONDITIONS, ELECTRICAL SERVICE REQUIREMENTS AND THE EXACT SERVING UTILITY POINTS OF CONNECTION.

- 17. THE ELECTRICAL CONTRACTOR (E.C.) SHALL FURNISH AND PAY FOR ALL PERMITS AND RELATED FEES.
- 18. UNLESS SPECIFICALLY NOTED OTHERWISE, ALL ELECTRICAL MATERIALS, EQUIPMENT AND WORK, SHOWN ON THESE PLANS ARE TO BE PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
- 19. E.C. SHALL FURNISH AND INSTALL ALL SWITCHES, CONDUITS, WIRES, BOXES, LIGHT FIXTURES (INCLUDING LAMPS), SERVICE DEVICES, RECEPTACLES, SWITCHBOARDS AND PANEL BOARDS, ETC. REQUIRED FOR A COMPLETE AND OPERATING ELECTRICAL SYSTEM.
- 20. SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONAL/LOCATION INFORMATION RELATING TO THE ELECTRICAL DRAWINGS.
- 21. ELECTRICAL CONTRACTOR SHALL VERIFY VOLTAGES AND HORSEPOWER RATINGS OF ALL MECHANICAL EQUIPMENT.
- 22. PRIOR TO INSTALLING ANY ELECTRICAL WORK, THE ELECTRICAL CONTRACTOR SHALL VERIFY EXACT LOCATIONS AND REQUIREMENTS ON THE JOB AND BY REFERENCE TO ARCHITECTURE, MECHANICAL AND EQUIPMENT SUPPLIERS DRAWINGS. SHOULD THERE BE ANY QUESTION OR PROBLEM CONCERNING THE NECESSARY PROVISIONS TO BE MADE, PROPER DIRECTIONS SHALL BE OBTAINED BEFORE PROCEEDING WITH ANY WORK.
- 23. OUTLET AND JUNCTION BOXES SHALL BE SIZED PER CODE FOR THE QUANTITY OF WIRES THEY CONTAIN. SEE ARTICLE 370 OF N.E.C. PROVIDE ADDITIONAL BOXES AND EXTENSION RINGS AS REQUIRED.
- 24. ELECTRICAL CONTRACTOR SHALL COMPLY WITH CABLE BENDING RADIUS REQUIREMENTS PER CABLE MANUFACTURERS' S SPECIFICATION.
- 25. CONDUIT LAYOUTS SHOWN ON THE PLANS ARE DIAGRAMMATIC, NOT INDICATING THE ROUTING REQUIRED. THE CONTRACTOR SHALL ROUTE CONDUITS AS REQUIRED BY THE CONDITIONS OF INSTALLATION.
- 26. ALL EQUIPMENT PROVIDED BY THE ELECTRICAL CONTRACTOR SHALL BE LISTED AND LABELED BY A NATIONALLY-RECOGNIZED TESTING AGENCY, ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION, FOR THE CONDITIONS OF THE INSTALLATION.
- 27. PLANS MAY INDICATE THE NUMBER OF PHASE NEUTRAL, AND GROUND CONDUCTORS WHERE MORE THAN THREE CONDUCTORS ARE TO BE INSTALLED IN A CONDUIT (THREE OR LESS CONDUCTORS ARE NOT SHOWN). ADDITIONAL CONDUCTORS REQUIRED FOR CONTROL SHALL BE INCLUDED EVEN IF NOT EXPLICITLY SHOWN
- 28. WHERE SIZE IS NOT SHOWN ON THE DRAWINGS, CIRCUITS SHALL CONSIST OF #12 PHASE AND GROUNDED (NEUTRAL CONDUCTORS) AND A #12 CU GROUND IN A 3/4" CONDUIT.
- 29. UNLESS SPECIFICALLY NOTED OTHERWISE, THE ELECTRICAL CONTRACTOR SHALL MAKE FINAL CONNECTIONS TO ALL UTILIZATION EQUIPMENT SHOWN ON THE DRAWINGS. VERIFY THE TYPE OF FINAL CONNECTION AND PROVIDE APPROPRIATE WIRING METHOD.
- 30. PRIOR TO TRENCHING IN ANY AREA THE CONTRACTOR SHALL CONTACT ELECTRICAL, COMMUNICATIONS/DATA, CABLE T.V., GAS, AND WATER UTILITY PROVIDERS (BLUE STAKE) AND HAVE ALL UTILITIES IN THE AREA IDENTIFIED. IN ADDITION, THE CONTRACTOR SHALL OBTAIN THE SERVICES OF A SUBCONTRACTOR SPECIALIZING IN THE LOCATION OF UNDERGROUND STRUCTURES TO IDENTIFY AND OBSTACLES IN THE PATH OF TRENCHING (PRIOR TO COMMENCING WORK). DAMAGE TO ANY UNDERGROUND STRUCTURES SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE PROJECT.
- 31. UTILITY COORDINATION
  - a. THE CONTRACTOR SHALL SUBMIT A COMPLETE SET OF DRAWINGS TO ELECTRICAL AND TELCO UTILITIES WITHIN ONE WEEK OF NOTICE TO PROCEED.

- b. THE CONTRACTOR SHALL NOT TRENCH OR INSTALL CONDUITS (ON THE UTILITY OR LOAD SIDE) TO THE S.E.S, THE UTILITY TRANSFORMER (PRIMARY OR SECONDARY), OR TO THE UTILITY CONNECTION POINT BEFORE RECEIVING A FINAL DESIGN FROM THE UTILITY.
- c. THE CONTRACTOR SHALL NOT INSTALL EQUIPMENT PADS FOR THE SES OR ANY UTILITY EQUIPMENT (TRANSFORMERS, SWITCHING CABINETS, ETC.) PRIOR TO RECEIPT OF FINAL PLANS FROM THE UTILITY.
- d. THE CONTRACTOR SHALL NOT BE COMPENSATED FOR ADDITIONAL WORK REQUIRED TO MEET THE REQUIREMENTS OF THE UTILITY WHICH IS THE RESULT OF PROCEEDING PRIOR TO RECEIPT OF A FINAL UTILITY DESIGN.
- 32. SERIES RATING NOTES:TO ENSURE THAT EACH PROTECTIVE DEVICE WHICH IS DEPENDENT ON ANOTHER DEVICE WILL INTERRUPT THE AVAILABLE SHORT CIRCUIT AT THE LOCATION WHERE IT IS INSTALLED, IT MUST MEET THE FOLLOWING REQUIREMENTS:
  - a. SWITCHBOARD COMPONENTS, INCLUDING OVER CURRENT PROTECTIVE DEVICES, SHALL BE FULLY RATED FOR THE AVAILABLE FAULT CURRENT SHOWN.
  - b. PROVIDE IDENTIFICATION AT THE ENCLOSURE OF PANEL BOARDS WHERE BREAKERS ARE APPLIED IN SERIES COMBINATION, STATING: "CAUTION SERIES RATED SYSTEM. \_\_\_\_\_ AMPERES. IDENTIFIED REPLACEMENT COMPONENTS REQUIRED." CONTRACTOR TO FILL IN BLANK WITH AVAILABLE FAULT CURRENT AS SHOWN ON THE SINGLE-LINE DIAGRAM.
  - c. PER NEC ARTICLE 110-22 (2005), PROVIDE IDENTIFICATION AT EACH DISCONNECTING MEANS FEEDING DOWNSTREAM DEVICES APPLIED IN SERIES COMBINATION, STATING: "CAUTION SERIES COMBINATION SYSTEM RATED \_\_\_\_\_AMPERES. IDENTIFIED REPLACEMENT COMPONENT REQUIRED." CONTRACTOR TO FILL IN BLANK WITH AVAILABLE FAULT CURRENT AS SHOWN ON THE SINGLE-LINE DIAGRAM.
  - d. AIC RATING SHOWN AT PANEL BOARDS IS MINIMUM RATING FOR OVERCURRENT PROTECTIVE DEVICES. EACH DEVICE SHALL BE FULLY-RATED OR SERIES RATED WITH UPSTREAM DEVICE AT AFC AS SHOWN ON THE SINGLE-LINE DIAGRAM.
  - e. NO DESIGN CHANGES MAY BE MADE TO THE SYSTEM WITHOUT THE PRIOR APPROVAL OF THE DESIGN ELECTRICAL ENGINEER AND THE ELECTRICAL INSPECTOR.
  - f. THE TOTAL MOTOR LOAD CONNECTED BETWEEN SERIES RATED DEVICES DOES NOT EXCEED 1% OF THE INTERRUPTING RATING OF THE DOWNSTREAM DEVICE.

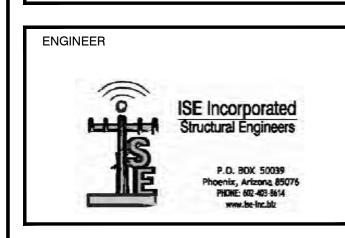


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PROJE	ECT NO:	TUC SUMMERHAVEN				
DRAWI	N BY:	M.G.				
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REV	DATE	DESCRIPTION	BY
Α	11/27/17	ISSUED FOR REVIEW	M.G.
В	06/27/18	CLIENT COMMENTS	CGS
С	09/10/18	CLIENT COMMENTS	M.G.
D	10/31/18	ISSUED FOR REVIEW	M.G.
E	02/25/19	ISSUED FOR REVIEW	M.G.

FOR REVIEW
ONLY NOT
FOR
CONSTRUCTION

TUC SUMMERHAVEN

SEC. 36 T.11S. R.15E. MT. LEMMON, AZ 85619 PIMA COUNTY

SHEET TITLE

**ELECTRICAL NOTES** 

SHEET NUMBER