

City of Tombstone

P.O. Box 339 * 613 E. Allen Street Tombstone, Arizona 85638

Phone (520) 457-2202 TTP: 1-800-367-8939 Fax (520) 457-3516

E-mail: cityhall@cityoftombstone.com

REQUEST FOR PROPOSAL

SENIOR CENTER ELECTRICAL IMPROVEMENTS RFP #01-17

Requested February 27, 2017

Please deliver all submittal materials no later than 2:00 PM on Friday, March 17, 2017 to the address below:

City of Tombstone Attention: City Clerk 613 E. Allen Street PO Box 339 Tombstone, AZ 85638

SENIOR CENTER ELECTRICAL IMPROVEMENTS RFP #01-17

CITY OF TOMBSTONE, ARIZONA

1. INTRODUCTION

The City of Tombstone (City) is actively seeking proposals from qualified bidders, hereinafter referred to as the (Contractor), to provide electrical improvements as shown on the attached engineered design plans and specifications "Attachment B". Services shall be provided to the City of Tombstone Senior Center located at 507 E. Toughnut Street Tombstone AZ 85638, and shall be in full accordance with the National Electrical Code and APS Construction Standards, engineered design plans and specifications, and terms and conditions contained in this Request for Proposal (RFP).

2. SCOPE OF SERVICES

The scope of work includes the execution and installation of all equipment and materials as shown on the engineered design plans and specifications "Attachment B". The contractor shall provide all materials and labor. Installation of all equipment and materials and execution of work is expected to begin upon successful Contractor selection. The contract may be amended at a later date to include additional related services if deemed necessary by the City.

All work shall meet the requirements of the National Electrical Code, Arizona Public Service Construction Standards, Engineered Design Plans and Specifications. Work is generally completed in public spaces and around multiple existing utilities and will require pedestrian traffic control and BLUE STAKE coordination.

- A. Contractor shall indicate the estimated time for completion of the project
- B. Contractor shall provide all equipment, tools, materials and labor
- C. Contractor is responsible for cleanup and removal of all construction debris daily
- D. Contractor is responsible for the demolition and removal of existing equipment and materials as agreed to by the owner
- E. Contractor shall notify the City of all discrepancies related to the work involved
- F. Contractor is responsible for contacting BLUE STAKE to mark any nearby underground utilities before commencing work
- G. Contractor shall be responsible for scheduling inspections with the City Building Official and APS
- H. The contractor shall be responsible for the coordination, cost and scheduling with the power authority (APS) for the service side of the meter

- I. Contractor shall provide 2-year workmanship and materials warranty
- J. Contractor shall meet the City of Tombstone insurance and indemnification requirements
- K. The City of Tombstone reserves the right to accept any or all proposals, or reject all proposals

3. INFORMATION

A site visit will be conducted at 507 E. Toughnut Street, Tombstone, AZ 85638 on Wednesday March 8, 2017 at 10:00 AM.

Complete the RFP "ACKNOWLEDGEMENT OF RECEIPT – ATTACHMENT A" and submit no later than March 10, 2017.

Any questions regarding this RFP should be made no later than **Friday, March 10, 2017** in writing to: Debbie Hankerd, Senior Center Director, E-mail: cityhall@cityoftombstone.com or Fax: 520-457-3516. If required, a written addendum will be issued.

4. PROPOSAL REQUIREMENTS

Each proposal must include the following information:

A. COVER LETTER

Briefly state the Proposer's understanding of the services to be rendered, and make a positive commitment to perform according to the requirements listed in this RFP. A representative who is authorized to contractually bind the Contractor shall sign the cover letter.

B. REFERENCES

Provide at least three (3) references for similar work that has been performed by the firm. Include contact person's name, organization, phone number and email address.

C. ITEMIZED COST BREAKDOWN

Provide a detailed description of the materials, labor and total cost for the services requested including all applicable fees, taxes and delivery charges.

5. <u>SUBMITTAL AND EVALUATION OF PROPOSALS</u>

REQUIRED PROPOSALS: Five (5) hard copies of each component of the submittal shall be delivered in a sealed envelope to the **City of Tombstone**, **613 E. Allen Street**, **PO Box 339**,

Tombstone, AZ 85638 by 2:00 PM on March 17, 2017. All envelopes and materials should be clearly marked "SEALED BID - RFP #01-17 — SENIOR CENTER ELECTRICAL IMPROVEMENTS". Any proposals received after the due date will not be considered. The proposals will be publicly opened at City of Tombstone, 613 E. Allen Street, PO Box 339, Tombstone, AZ 85638 at 2:15 PM on March 17, 2017.

A. **RFP FORMAT:** All RFP material must be legible on standard 8 ½ x 11 papers. The RFP must be limited in format and length to fourteen (14) pages maximum count. All foldout sheets, up to a maximum of 11"x17" (2) sheets will be counted as two (2) pages and shall be labeled as such. A certificate of insurance as outlined in General Conditions Item B shall be included.

Material excluded from the fourteen (14) pages maximum count include and shall be limited to:

Front Cover (blank on back side)
Submittal Cover Letter (one page maximum)
Table of Contents (one page maximum)
Divider Pages (blank except for title information)
Certificate(s) of Insurance
Back Cover (blank on one side)

Proposing firms must indicate receipt of all addenda to this RFP, if any.

- B. **EVALUATION CRITERIA:** Proposals will be reviewed by the City's evaluation committee based on the overall responsiveness to the criteria set forth in Item 4 and 5 and on the total costs of deliverable services and materials.
- C. **SELECTION:** The successful firm will be selected based on the overall responsiveness to the criteria set forth in Item 4 and 5, qualifications of the contractor and on the total costs of deliverable services and materials. Final selection will be determined by approval of the Mayor and Council. The City of Tombstone reserves the right to accept any or all proposals, or reject all proposals.

Calendar of Events:

RFP Posted: February 27, 2017

Site Visit: March 8, 2017

Deadline to Submit Questions: March 10, 2017

Responses to Questions: March 13, 2017

Submission of RFP: March 17, 2017 by 2:15 PM

6. GENERAL CONDITIONS

A. **CONFLICT OF INTEREST:** The successful firm shall disclose any potential conflicts of interest it may have with the City of Tombstone, and shall address and resolve any individual matters involving a conflict in advance of appointment. Such conflicts shall be disclosed as part of the RFP submission.

- B. **INSURANCE AND INDEMNIFICATION:** The selected firm must maintain professional, general, automobile and employee liability insurance in addition to workers' compensation insurance in the minimum amount of \$1,000,000.00 per occurrence and \$2,000,000.00 aggregate and name the City of Tombstone as an additional insured. Additionally, the selected firm must state in its RFP that it shall indemnify and hold harmless the City of Tombstone from any claims arising out of any work or services provided by the firm including, but not limited to, claims by any federal, state or county agency that there is, or may be, a violation of a law or regulation.
- C. **DATA COMPILATION:** The selected firm shall take all steps necessary to safeguard any data, files, reports, surveys, drawings or other information from loss, destruction or erasure. Any costs or expenses of replacing or damages resulting from the loss of such data shall be borne by the contractor when such loss or damage occurred through its negligence. The selected firm shall retain all data, files, reports, drawings or other information and shall provide a copy the same to the Clerk of the City of Tombstone within 60 days of the date such data, file, report, survey, drawing or other information is created.
- D. **FEDERAL AND STATE LAWS:** The selected firm shall include in its RFP that is shall be solely responsible for obtaining all permits and complying with all other federal or state laws, regulations or requirements governing a municipalities' water system.
- E. **CANCELLATION**: City Code Section 1-18-4F states "The purchasing agent under subsections 1-18-2A, B, C and D of this chapter and the mayor and council under subsection 1-18-2E of this chapter shall have the authority to reject any and all bids and parts of all bids and re-advertise or re-solicit bids. (Ord. 3-1989, 4-17-1989)"

Total Project Cost:	
Company Name:	
Authorized Bidder:	
It is agreed by the above signed proposer that the signature and submission of represents the proposer's acceptance of all terms, conditions, and requirements o specifications and, if awarded, the proposal will represent the agreement between	f the proposal
The proposer agrees that the cost of any work performed, materials furnished a this RFP and all information provided is true and correct.	re included in
End	

The signer of the Bid must declare that the Bid is in all respects fair and in good faith without collusion or fraud and that the signer of the Bid has the authority to bind the principal proponent.

ATTACHMENT A

ACKNOWLEDGEMENT OF RECEIPT OF RFP #01-17 – SENIOR CENTER ELECTRICAL IMPROVEMENTS ACKNOWLEDGEMENT OF RECEIPT FORM

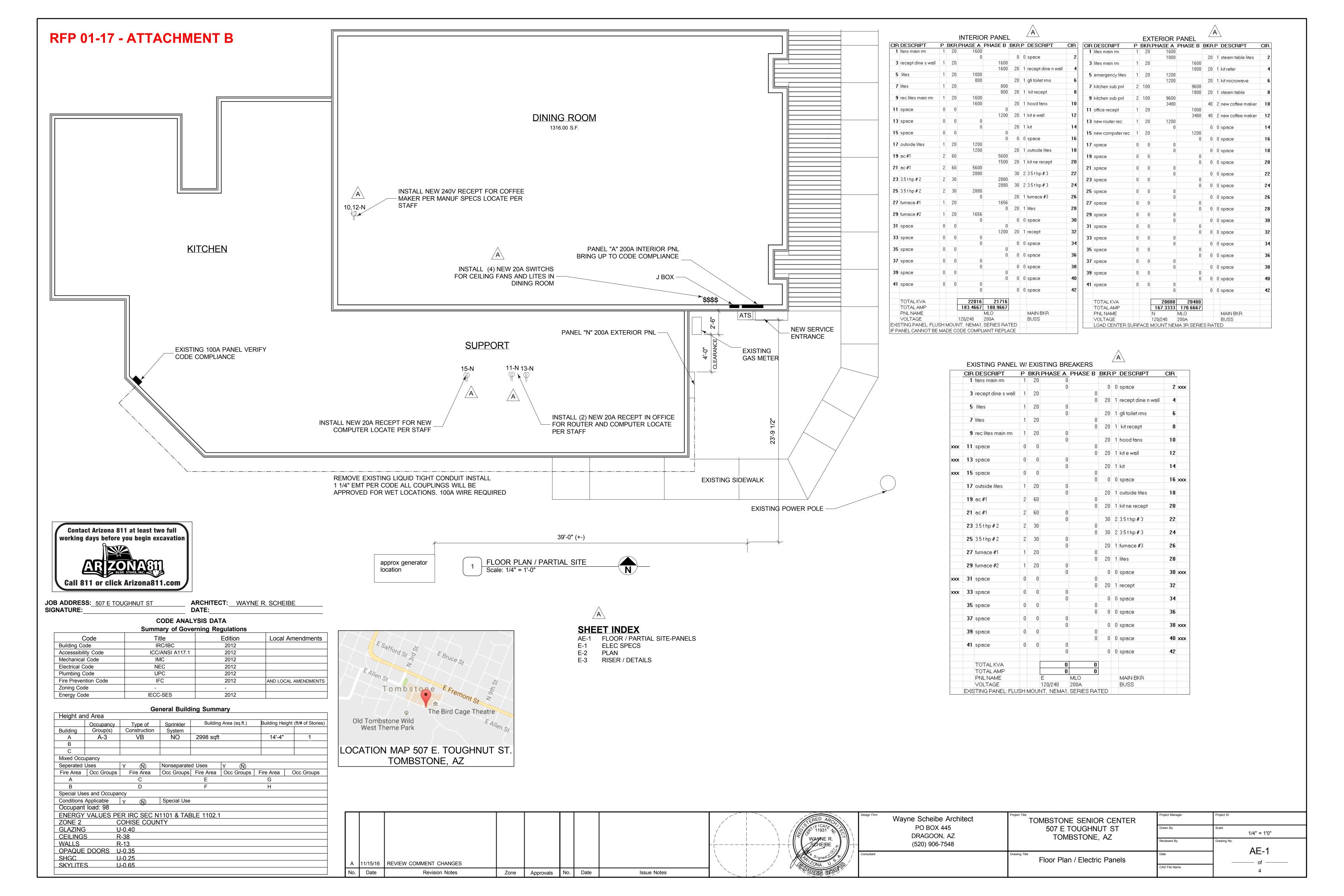
In acknowledgement of receipt of this Request for Proposal, the undersigned agrees that he/she has received a complete copy, beginning with the Title Page and ending with Attachment B.

This Acknowledgement of Receipt should be signed and returned to the Senior Center Director no later than 5:00 PM on March 10, 2017. Only Vendors who elect to return this form completed with the intention of submitting a proposal will receive copies of all Vendor written questions and the CITIES written responses to those questions, as well as RFP amendments, if any are issued.

COMPANY NAME:	
REPRESENTED BY:	
TITLE:	PHONE NO.:
E-MAIL:	
ADDRESS:	
CITY:	STATE: ZIP CODE:
SIGNATURE:	DATE:

This name and address will be used for all correspondence related to the Request for Proposal and be used when distributing the written responses to questions and any RFP amendments. Written responses to questions and any RFP amendments will also be available on the CITY website at www.cityoftombstone.com. Return this form to the Senior Center Director:

Debbie Hankerd, Senior Center Director, PO Box 339 Tombstone, AZ 85638 Fax: 520-457-3516, E-mail: cityhall@cityoftombstone.com



EMERGENCY (STAND-BY) ENGINE-GENERATOR

PART 1 GENERAL

1.1 GENERAL

- A. THIS SECTION VALID ONLY WHEN CONSIDERED IN TOTAL WITH ELECTRICAL SPECIFICATIONS AND ALL OTHER CONTRACT DOCUMENTS. CROSS REFERENCES ARE FOR CONVENIENCE AND THEIR INCLUSION IN OR OMISSION FROM ANY PARTICULAR SECTION IN NO WAY LIMITS SCOPE OF PARTICULAR SECTION OR INTENT OF ANY CONTRACT
- PROVIDE ALL LABOR, MATERIALS, EQUIPMENT AND SERVICES TO PERFORM ALL OPERATIONS REQUIRED FOR THE COMPLETE INSTALLATION AND RELATED WORK AS REQUIRED IN ALL CONTRACT

1.2 SCOPE AND GENERAL REQUIREMENTS

FURNISH AND INSTALL A COMPLETE ENGINE-GENERATOR, FUEL SYSTEM, TRANSFER SWITCH AND ALARM PANEL SYSTEM AS SPECIFIED HEREIN AND AS INDICATED.

B. THE SYSTEM SHALL CONSIST OF:

- B. THE STATE OF STATE OF THE FIND OCIDE TO DIESEL GENERATOR IN WEATHER PROTECTIVE ENCLOSURE TO
- PRODUCE EMERGENCY (STANDBY) ELECTRIC POWER. 2. AN AUTOMATIC TRANSFER SYSTEM THAT PROVIDES STARTUP, LOAD
- TRANSFER AND AUTOMATIC RETRANSFER AND SHUTDOWN. REMOTE ANNUNCIATOR PANEL TO INDICATE STATUS OF GENERATOR AND LOW FUEL.
- C. THE ENGINE-GENERATOR SYSTEM SHALL BE RATED FOR OPERATION AT THE ALTITUDE AND AMBIENT TEMPERATURE OF THE ACTUAL JOBSITE LOCATION. MANUFACTURERS STANDARD DERATING VALUES SHALL BE USED WHEN SELECTING THE ENGINE-GENERATOR SYSTEM TO PROVIDE CAPACITY AT LEAST THAT AS INDICATED.
- FOR INSTALLATIONS IN THE TUCSON/COCHISE COUNTY METRO AREA USE ALTITUDE OF 2600° AND 120° F AMBIENT TEMPERATURE.
- FOR INSTALLATIONS OUTSIDE OF TUCSON/COCHISE COUNTY METRO AREA USE ACTUAL SITE ALTITUDE AND MAXIMUM SUMMER TEMPERATURES; OR VALUES AS INDICATED, WHICHEVER IS GREATER.

1.3 SUBMITTALS

- SUBMIT PRODUCT DATA AND SHOP DRAWINGS ELECTRICAL SPECIFICATIONS FOR COMPLETE AUTOMATIC EMERGENCY POWER
- FOR ANY ONE ENGINE RATED 325HP OR LARGER, SUBMIT DOCUMENTS FOR REVIEW BY COCHISE CO. AIR QUALITY BOARD SHOWING ALL DETAILS OF THE INSTALLATION. COMPLY WITH ALL REQUIREMENTS AND REGULATIONS OF THE REVIEWING AUTHORITY. FOR ENGINES RATED LESS THAN 325HP INFORM THE COCHISE CO. AIR QUALITY BOARD OF THE INSTALLATION BY LETTER AND CONFORM WITH ANY OTHER REGULATORY AUTHORITY SUBMITTAL REQUIREMENTS.

PART 2 PRODUCTS

2.1 GENERAL

A. THE ENGINE-GENERATOR AND ACCESSORIES SHALL BE AS MANUFACTURED BY CATERPILLAR, DETROIT DIESEL, GENERAC, KOHLER OR ONAN.

2.2 ENGINE

- A. WATER COOLED, TWO OR FOUR CYCLE, NATURALLY ASPIRATED OR MODEL USED SHALL BE A PRODUCT INTENDED FOR STATIONARY INDUSTRIAL USE.
- B. THE ENGINE SPEED SHALL BE GOVERNED BY AN ISOCHROUNOUS ELECTRONIC GOVERNING SYSTEM.
- LIQUID COOLED ENGINE SHALL HAVE A CLOSED RECOVERY PRESSURIZED SYSTEM, WITH OVERFLOW RESERVOIR AND A PRELUBRICATED, SELF-SEALING WATER PUMP

D. THE ENGINE SHALL BE EQUIPPED AS FOLLOWS:

- ENGINE BLOCK HEATER, THERMOSTATICALLY CONTROLLED, 208V,
- SINGLE PHASE POWER SOURCE UNLESS OTHERWISE INDICATED. EXHAUST SILENCER - CRITICAL GRADE
- LUBE OIL FILTER
- FUEL FILTER REPLACEABLE CARTRIDGE TYPE AIR CLEANER
- HIGH COOLANT TEMPERATURE AUTOMATIC SHUTDOWN
- LOW COOLANT LEVEL AUTOMATIC SHUTDOWN OVERSPEED SENSING AND AUTOMATIC SHUTDOWN
- LOW OIL PRESSURE AUTOMATIC SHUTDOWN
- BATTERY CHARGER AND ALTERNATOR 11. 120 VOLT BATTERY CHARGER, TRICKLE CHARGER

2.3 GENERATOR

- A. THE ALTERNATOR SHALL BE SALIENT-POLE, BRUSHLESS, 12-LEAD RECONNECTABLE, SELF-VENTILATED OF DRIP-PROOF CONSTRUCTION WITH AMORTISSEUR ROTOR WINDINGS AND SKEWED STATOR FOR SMOOTH VOLTAGE WAVEFORM. THE INSULATION SHALL MEET THE NEMA STANDARD (MG1-22.40 AND 16.40) FOR CLASS H AND BE INSULATED WITH EPOXY VARNISH TO BE FUNGUS RESISTANT PER MIL 1-24092. TEMPERATURE RISE OF THE ROTOR AND STATOR SHALL BE LIMITED TO NEMA CLASS F RATINGS. THE EXCITATION SYSTEM SHALL BE OF BRUSHLESS CONSTRUCTION CONTROLLED BY A SOLID-STATE VOLTAGE REGULATOR CAPABLE OF MAINTAINING VOLTAGE WITHIN +/- 2% AT ANY CONSTANT LOAD FROM 0% TO 100% OF RATING. THE REGULATOR SHALL BE ISOLATED TO PREVENT TRACKING WHEN CONNECTED TO SCR LOADS, AND PROVIDE INDIVIDUAL ADJUSTMENTS FOR VOLTAGE RANGE, STABILITY AND VOLTS-PER-HERTZ OPERATION; AND BE PROTECTED FROM THE ENVIRONMENT BY CONFORMAL COATING.
- B. UPON ONE-STEP APPLICATION OF ANY LOAD UP TO 100% OF THE RATED LOAD AT 0.8 POWER FACTOR, THE VOLTAGE DIP SHALL NOT EXCEED 20% AND SHALL RECOVER TO +/- 2% OF RATED VOLTAGE WITHIN ONE SECOND.

- C. THE GENERATOR SHALL BE CAPABLE OF SUSTAINING AT LEAST 250% OF RATED CURRENT FOR AT LEAST 10 SECONDS UNDER A THREE-PHASE SYMMETRICAL SHORT BY INHERENT DESIGN OR BY THE USE OF A CURRENT
- D. A RESETTABLE LINE CURRENT SENSING CIRCUIT BREAKER WITH INVERSE TIME VERSUS CURRENT RESPONSE SHALL BE PROVIDED WHICH PROTECTS THE GENERATOR FROM DAMAGE DUE TO ITS OWN HIGH CURRENT CAPABILITY. THIS CIRCUIT BREAKER SHALL NOT TRIP WITHIN THE 10 SECONDS SPECIFIED ABOVE TO ALLOW SELECTIVE TRIPPING OF DOWN-STREAM FUSES OR CIRCUIT BREAKERS UNDER A FAULT CONDITION. THIS CIRCUIT BREAKER SHALL NOT AUTOMATICALLY RESET PREVENTING RESTORATION OF VOLTAGE IF MAINTENANCE IS BEING PERFORMED. FIELD CURRENT-SENSING BREAKER WILL NOT BE ACCEPTABLE.
- E. THE GENERATOR SHALL HAVE A MAINTENANCE FREE-BEARING AND SHALL BE DIRECTLY CONNECTED TO THE FLYWHEEL HOUSING WITH A SEMI-FLEXIBLE COUPLING BETWEEN THE ROTOR AND THE FLYWHEEL.

2.4 CONTROLLER

A. PROVIDE A GENERATOR SET MOUNTED CONTROLLER CAPABLE OF FACING LEFT, RIGHT OR REAR. MOUNT CONTROLLER IN REAR FACING POSITION UNLESS OTHERWISE INDICATED.

B. THE CONTROLLER SHALL HAVE VIBRATION ISOLATED MOUNTING.

- C. THE MICROPROCESSOR CONTROL BOARD SHALL BE MOISTURE PROOF AND CAPABLE OF OPERATION FROM -40°C TO 85°C. RELAYS WILL ONLY BE ACCEPTABLE IN HIGH-CURRENT CIRCUITS.
- D. CIRCUITRY SHALL BE OF PLUG-IN DESIGN FOR QUICK REPLACEMENT. CONTROLLER SHALL BE EQUIPPED TO ACCEPT A PLUG-IN DEVICE CAPABLE OF ALLOWING MAINTENANCE PERSONNEL TO TEST CONTROLLER PERFORMANCE WITHOUT OPERATING THE ENGINE.

E. THE CONTROLLER SHALL INCLUDE:

1. FUSED DC CIRCUIT.

- 2. COMPLETE TWO-WIRE START/STOP CONTROL WHICH SHALL OPERATE ON CLOSURE OF A REMOTE CONTACT.
- 3. SPEED SENSING AND A SECOND INDEPENDENT STARTER MOTOR DISENGAGEMENT SYSTEMS SHALL PROTECT AGAINST STARTER ENGAGEMENT WITH A MOVING FLYWHEEL. BATTERY CHARGING VOLTAGE WILL NOT BE ACCEPTABLE FOR THIS PURPOSE. 4. THE STARTING SYSTEM SHALL BE DESIGNED FOR RESTARTING IN THE
- EVENT OF A FALSE ENGINE START, BY PERMITTING THE ENGINE TO COMPLETELY STOP AND THEN RE-ENGAGE THE STARTER. 5. CRANKING CYCLER WITH 15-SECOND ON AND OFF CRANKING PERIODS.
- 6. OVERCRANK PROTECTION DESIGNED TO OPEN THE CRANKING CIRCUIT AFTER 75 SECONDS IF THE ENGINE FAILS TO START. 7. CIRCUITRY TO SHUT DOWN THE ENGINE WHEN SIGNAL FOR HIGH COOLANT
- TEMPERATURE, LOW COOLANT LEVEL, LOW OIL PRESSURE, OR OVERSPEED ARE RECEIVED. 8. ENGINE COOLDOWN TIMER FACTORY SET AT 5 MINUTES TO PERMIT UNLOADED RUNNING OF THE ENGINE-GENERATOR SET AFTER TRANSFER OF
- THE LOAD TO NORMAL 9. THREE POSITION (AUTOMATIC-OFF-TEST) SELECTOR SWITCH. IN THE TEST POSITION, THE ENGINE SHALL START AND RUN REGARDLESS OF THE POSITION OF THE REMOTE STARTING CONTACTS. IN THE AUTOMATIC POSITION, THE ENGINE SHALL START WHEN CONTACTS IN THE REMOTE CONTROL CIRCUIT CLOSE AND STOP 5 MINUTES AFTER THOSE CONTACTS OPEN. IN THE OFF POSITION, THE ENGINE SHALL NOT START EVEN THOUGH
- THE REMOTE START CONTACTS CLOSE. THIS POSITION SHALL ALSO PROVIDE FOR IMMEDIATE SHUTDOWN IN CASE OF AN EMERGENCY. RESET OF ANY FAULT SHALL ALSO BE ACCOMPLISHED PUTTING THE SWITCH TO THE OFF POSITION.

10. INDICATOR LIGHTS TO SIGNAL:

NOT-IN AUTO (FLASHING RED) OVERCRANK (RED) EMERGENCY STOP (RED) HIGH ENGINE TEMPERATURE (RED) OVERSPEED (RED) LOW OIL PRESSURE (RED) BATTERY MALFUNCTION (RED) LOW BATTERY VOLTAGE (RED)

LOW FUEL (RED) AUXILIARY PREALARM (YELLOW) AUXILIARY FAULT (RED) SYSTEM READY (GREEN) PREALARM HIGH ENGINE TEMPERATURE (YELLOW) PREALARM LOW OIL PRESSURE (YELLOW) LOW COOLANT TEMPERATURE (RED) 11. TEST BUTTON FOR INDICATING LIGHTS. 12. ALARM HORN WITH SILENCER SWITCH PER NFPA 110.

13. TERMINALS SHALL BE PROVIDED FOR EACH SIGNAL LIGHT NOTED ABOVE,

PLUS ADDITIONAL TERMINALS FOR COMMON FAULT AND COMMON

2.5 INSTRUMENT PANEL

PREALARM.

A. PROVIDE AND INSTRUMENT PANEL WHICH SHALL INCLUDE:

VOLTMETER, 3.5-INCH, +/- 2% ACCURACY. AMMETER, 3.5-INCH, +/- 2% ACCURACY. VOLTMETER-AMMETER PHASE SELECTOR SWITCH. DIRECT READING POINTER-TYPE FREQUENCY METER, 3.5-INCH, 0.5% ACCURACY, 45 TO 65 HZ SCALE. PANEL ILLUMINATING LIGHTS. BATTERY CHARGING VOLTMETER COOLANT TEMPERATURE GAUGE. OIL PRESSURE GAUGE. RUNNING TIME METER.

2.6 ELECTRICAL RATINGS

VOLTAGE ADJUST RHEOSTAT

A. THREE PHASE, 208Y/120 VOLT OR 480Y/277 VOLT, FOUR WIRE. EXACT RATINGS AS SHOWN ON THE DRAWINGS.

2.7 WEATHER PROTECTIVE HOUSING

A. OUTDOOR WEATHER-PROTECTIVE HOUSING, FACTORY ASSEMBLED TO ENGINE-GENERATOR SET BASE AND RADIATOR COWLING. HOUSING SHALL PROVIDE AMPLE AIRFLOW FOR GENERATOR SET OPERATION. THE HOUSING SHALL HAVE HINGED SIDE-ACCESS DOORS AND REAR CONTROL DOOR. ALL DOORS SHALL BE LOCKABLE. ALL SHEET METAL

SHALL BE PRIMED FOR CORROSION PROTECTION AND FINISH PAINTED WITH THE MANUFACTURER'S STANDARD COLOR.

2.8 REMOTE ANNUNCIATOR PANEL

LOW FUEL

- A. THE REMOTE ANNUNCIATOR PANEL IN THE BUILDING SHALL INCLUDE THE FOLLOWING EQUIPMENT:
- LOW OIL PRESSURE INDICATOR LIGHT
- HIGH ENGINE TEMPERATURE INDICATOR LIGHT OVERCRANK INDICATOR LIGHT OVERSPEED INDICATOR LIGHT
- RPM SENSOR LOSS INDICATOR LIGHT TEST AND RESET SWITCH
- REMOTE START AND TRANSFER SWITCH WHICH SIMULATES POWER FATLURE
- FUEL TANK LEAK DETECTION ALARM.

2.9 AUTOMATIC LOAD TRANSFER SYSTEM

- A. PROVIDE AN AUTOMATIC TRANSFER SWITCH WITH SOLID STATE LOGIC TO PERFORM THE AUTOMATIC LOAD TRANSFER FUNCTIONS. EXACT MOUNTING STYLE (NEMA 1 OR NEMA 3R ENCLOSED OR OPEN FOR MOUNTING IN SWITCHBOARD SECTION) SHALL BE AS INDICATED. ASCO, KOHLER, ONAN, CUTLER-HAMMER AND GE-ZENITH ARE APPROVED.
- B. ELECTRICAL RATINGS (VOLTAGE, PHASE, NUMBER OF POLES, AMPERE RATING AND SHORT CIRCUIT WITHSTAND RATING) SHALL BE AS INDICATED. WHEN A MANUFACTURER'S PRODUCT LINE DOES NOT HAVE A PRODUCT RATED EXACTLY AS INDICATED PROVIDE HIGHER RATED EQUIPMENT TO SATISFY THE MINIMUM REQUIREMENTS STATED. IN THE EVENT THAT SUCH HIGHER RATED EQUIPMENT REQUIRES GREATER PHYSICAL SPACE THAN THE SPECIFIED EQUIPMENT THE RESULTING LAYOUT CHANGES SHALL BE INDICATED AT THE TIME OF THE SHOP DRAWING SUBMITTAL. NO ADDITIONAL COSTS SHALL RESULT FROM SUCH CHANGES.
- C. THE CONTROLLER SHALL SENSE LINE FAILURE, AUTOMATICALLY AND TRANSFER LOAD THROUGH U.L. LISTED INTERLOCKED CONTACTOR OR CIRCUIT BREAKER.
- D. UPON RETURN OF PRIME POWER, THE CONTROLLER SHALL TRANSFER THE ELECTRIC LOAD BACK TO THE MAIN LINES AND SHUTDOWN THE STANDBY SYSTEM.
- THE CONTROLLER SHALL EXERCISE THE STANDBY SYSTEM, AUTOMATICALLY, EVERY SEVEN DAYS. FIELD SELECTABLE LOAD OR NO-LOAD EXERCISING.
- F. THE CONTROLLER SHALL PROVIDE MANUAL START-RUN-TRANSFER-SHUTDOWN FOR TESTING AND MAINTENANCE.
- G. THE CRANKING LIMITER SHALL BE PART OF THE CONTROLLER SYSTEM FOR OVERALL UNIT PROTECTION.
- H. AN ALARM CIRCUIT SHALL BE STANDARD IN THE CONTROLLER.
- CONTROL LOGIC SYSTEM SHALL BE OF SOLID STATE AND DESIGNED FOR A HIGH LEVEL OF IMMUNITY TO POWER LINE SURGES AND TRANSIENTS, DEMONSTRATED BY TEST TO IEEE STANDARD 587-1980.

PART 3 EXECUTION

- A. UNIT SHALL BE MOUNTED CONCRETE PAD ON GRADE. CONCRETE PADS SHALL HAVE STEEL REBAR REINFORCEMENT AND SHALL BE AT LEAST 8 INCHES THICK, 4 INCHES ABOVE GRADE. PROVIDE SPRING ISOLATORS BETWEEN ENGINE-GENERATOR AND CONCRETE PAD.
- ENGINE EXHAUST SHALL BE VERTICAL UNLESS OTHERWISE INDICATED. WHEN HORIZONTAL EXHAUST DISCHARGE IS INDICATED OR REOUIRED DIRECT EXHAUST AWAY FROM BUILDING AIR INTAKES.
- C. INSTALLATION SHALL BE IN COMPLIANCE WITH ALL REQUIREMENTS SET FORTH IN ELECTRICAL SPECIFICATIONS.
- INSTALLATION OF ENGINE-GENERATOR, AUTOMATIC TRANSFER SWITCH AND RELATED EQUIPMENT SHALL BE IN ACCORDANCE WITH THE EOUIPMENT MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS. PROVIDE ALL REQUIRED FIELD ASSEMBLY AND

3.2 TESTS

- A. A QUALIFIED FACTORY REPRESENTATIVE SHALL ASSIST THE CONTRACTOR WITH THE FIELD CHECK-OUT, STARTUP AND TEST. FIELD TESTS SHALL INCLUDE THE FOLLOWING:
- DEMONSTRATE PROPER OPERATION OF ALL SYSTEMS.
- SIMULATE POWER FAILURE AND DEMONSTRATE COMPLETE AUTOMATIC START, LOAD, UNLOAD, BYPASS AND STOP SEQUENCE. CONDUCT FOUR HOUR LOAD RUN UTILIZING PORTABLE LOAD BANKS AS FOLLOWS:
- UNLOADED ONE HALF HOUR
- 1/2 LOAD ONE HALF HOUR 3/4 LOAD - ONE HALF HOUR
- 4/4 LOAD TWO AND ONE HALF HOURS
- CONTRACTOR SHALL SUBMIT CERTIFIED TRUE COPIES OF FIELD TEST RESULTS. RECORD ENGINE TEMPERATURE, OIL PRESSURE AND OTHER PERTINENT GAUGE READINGS AT 15 MINUTE INTERVALS.
- MONITOR ENGINE GAUGES THROUGHOUT THE DURATION OF THE TESTING AND SHUT DOWN ENGINE IF ABNORMAL READINGS OCCUR. IF FOR ANY REASON THE TEST IS INTERRUPTED, THE TEST SHALL BE REPEATED FOR FULL FOUR HOURS.
- D. DEFECTS REVEALED BY TESTING SHALL BE PROMPTLY RECTIFIED.

ELECTRICAL SPECIFICATIONS

- 1. ENTIRE ELECTRICAL INSTALLATION SHALL COMPLY WITH 2011 EDITION OF NFPA-70, NATIONAL ELECTRICAL CODE (NEC) AS ADOPTED BY AUTHORITY HAVING JURISDICTION AND ALL LOCAL CODES AND ORDINANCES PERTAINING TO ELECTRICAL AND LIGHTING INSTALLATION. MATERIALS AND EQUIPMENT SHALL BE LISTED IN ACCORDANCE WITH THE REQUIREMENTS OF NEC ARTICLE 110.3.
- 2. CONTRACTOR SHALL APPLY FOR AND OBTAIN PERMITS FOR THE ELECTRICAL WORK.
- 3. UNLESS INDICATED OTHERWISE, ALL WIRING FOR POWER, SHALL BE INSTALLED CONCEALED IN APPROVED RACEWAY. RACEWAYS SHALL BE IN ACCORDANCE WITH NEC REQUIREMENTS EXCEPT AS NOTED BELOW:
- A. RIGID NON-METALLIC CONDUIT (PVC SCHEDULE 40 OR SCHEDULE 80) SHALL BE USED ONLY FOR UNDERGROUND CIRCUITS. DO NOT USE ABOVE GRADE INSIDE OR OUTSIDE BUILDING OR EXPOSED.
- B. EMT SHALL BE USED IN STUD AND FURRED SPACES, IN ATTIC SPACES AND EXPOSED ABOVE 4'-0" A.F.F. WHEN EXPOSED WIRING IS PERMITTED. C. USE RIGID METALLIC CONDUIT OR IMC IN CONCRETE OR MASONRY AND WHERE CONDUITS RUN EXPOSED BELOW 4'-0" A.F.F. ALL METALLIC RACEWAYS INSTALLED IN CONCRETE OR BELOW GRADE SHALL BE TAPE WRAPPED TO
- PREVENT CORROSION. D. SUPPORT ALL CONDUITS AT 5'-0" INTERVALS AND WITHIN 18" OF BOX OR TERMINATION.
- DO NOT USE CONDULET FITTINGS IN SIZES OVER 1-1/4". EXPOSED RACEWAYS ARE PERMITTED IN UNFINISHED SPACES OR WHERE
- SPECIFICALLY APPROVED BY ARCHITECT G. PROVIDE FLEXIBLE METALLIC CONDUIT (LIQUID TIGHT WHEN INSTALLED OUTDOORS OR IN WET LOCATIONS) FOR MOTORS, A/C UNITS, MACHINERY WHICH MUST BE MOVED FOR ADJUSTMENT AND TRANSFORMERS. FLEX CONDUIT SHALL BE USED IN LENGTHS NOT TO EXCEED 3'-0". USE CLAMP TYPE CONNECTORS FOR FLEX - NO SCREW-IN TYPES.
- H. DO NOT USE ELECTRICAL NON-METALLIC TUBING FOR ANY PART OF THE RACEWAY SYSTEM.
- 4. PROVIDE A GREEN INSULATED COPPER EQUIPMENT GROUNDING CONDUCTOR IN ALL LINE VOLTAGE RUNS (BRANCH CIRCUITS AND FEEDERS). SIZE IN ACCORDANCE WITH NFPA-70, 2011 EDITION, TABLE 250.122 OR AS INDICATED, WHICHEVER IS LARGER. GROUND WIRE SHALL BE PROVIDED WHETHER OR NOT INDICATED ON THE DRAWINGS.

5. CONDUCTORS:

- A. UNLESS OTHERWISE INDICATED, CONDUCTORS SHALL BE COPPER, MINIMUM SIZE NO. 12 AWG WITH "THHN" OR "THWN" OR "THWN-2" INSULATION FOR SIZES NO. 12 THROUGH 1 AWG AND "THHN" OR "THWN", "THWN-2", "XHHW" OR "XHHW-2" INSULATION FOR NO. 1/0 AWG AND LARGER.
- B. PROVIDE LARGER CONDUCTORS WHEN INDICATED. C. WHEN INDICATED (AL) ON DRAWINGS, ALUMINUM CONDUCTORS EQUAL TO ALCAN STABILOY COMPACT STRANDED AA-8000 SERIES ALLOY SHALL BE USED. LUGS FOR ALUMINUM CONDUCTORS SHALL BE LISTED AL/CU TYPE. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS WITH A LISTED JOINT COMPOUND AND TIGHTEN WITH TORQUE WRENCH TO MANUFACTURER'S

6. COLOR CODE ALL CONDUCTORS:

RECOMMENDED VALUES.

- A. 120/240V SINGLE PHASE SYSTEM: NEUTRAL WHITE, PHASE A BLACK,
- PHASE B RED, GROUND GREEN. B. USE COLORED CONDUCTOR INSULATION FOR SIZES 12 - 6 AWG. USE COLORED TAPE FOR CONDUCTORS SIZES 4 AWG AND LARGER.
- 7. DISTRIBUTION AND CONTROL EQUIPMENT SHALL BE EATON, GENERAL ELECTRIC, SCHNEIDER ELECTRIC OR SIEMENS, OF THE TYPE AND RATINGS INDICATED. EQUIPMENT SHALL BE SUITABLE FOR INTENDED USE SUCH AS WEATHERPROOF WHEN INSTALLED OUTDOORS.
- A. PANELBOARDS SHALL HAVE PERMANENT CIRCUIT NUMBERING (NOT DECALS), VERTICAL MAIN BREAKERS OR HORIZONTAL MAIN BREAKERS OF A LARGER FRAME SIZE THAN THE BRANCH BREAKERS, METAL DIRECTORY FRAMES AND GROUND BARS BONDED TO THE BOX. WHEN INDICATED, PROVIDE INSULATED/ISOLATED GROUND BAR IN ADDITION TO GROUND BAR BONDED TO BOX. ALL BUSSES COPPER. PROVIDE A "CAUTION -- SERIES RATED SYSTEM" NAMEPLATE ON INTERIOR OF PANEL DEAD FRONT WHEN SERIES TESTED SHORT
- CIRCUIT RATING OF THE PANELBOARD IS USED. B. SWITCHBOARDS SHALL BE FRONT ACCESSIBLE CONSTRUCTION, UNLESS OTHERWISE INDICATED, WITH PANEL MOUNTED FEEDER DEVICES. PROVIDE MAXIMUM VERTICAL BUSSING IN ALL SECTIONS, PREPARED FOR FUTURE ADDITIONS. ALL BUSSES COPPER, INCLUDING GROUND. CIRCUIT PROTECTIVE DEVICES SHALL BE OF THE TYPE AND RATINGS INDICATED.
- C. MOTOR STARTERS, INDIVIDUAL AND IN MOTOR CONTROL CENTERS, SHALL BE NEMA RATED. UNLESS OTHERWISE INDICATED PROVIDE H-0-A SELECTOR SWITCH, RED AND GREEN PILOT LIGHTS (EXTENDED LIFE TYPE WITH TRANSFORMERS) AND FUSED CONTROL POWER TRANSFORMER FOR EACH STARTER. WHEN MOTOR CONTROL CENTERS ARE INDICATED, UNITS SHALL BE NEMA STYLE, WITH INSULATED COPPER BUSSES AND CLASS 1B CONTROL WIRING.
- D. SAFETY SWITCHES SHALL BE RATED 100,000 AIC MINIMUM AND SHALL HAVE CLASS R FUSE CLIPS WHENEVER CLASS R FUSES ARE INDICATED. PROVIDE SWITCHES OF PROPER CURRENT AND VOLTAGE RATING FOR CIRCUIT WHERE
- 8. PROVIDE IDENTIFICATION NAMEPLATES FOR ALL CONTROL SWITCHES FOR HVAC AND OTHER EQUIPMENT AND ON EACH PANEL, DISCONNECT, STARTER, TIME SWITCH, ETC. NAMEPLATES SHALL BE ENGRAVED LAMINATED BAKELITE, SCREWED OR RIVETED TO EQUIPMENT. DO NOT USE STAMPED METAL NAMEPLATES OR DYMO TAPE.
- CONDITION. THE MANUFACTURER AND CATALOG NUMBERS SPECIFIED HEREIN AND ON THE DRAWINGS ARE TO ESTABLISH DESIGN, STYLE, AND LEVEL OF QUALITY. EQUAL PRODUCTS OF OTHER MANUFACTURERS ARE ACCEPTABLE. 10. SUBMIT SHOP DRAWINGS (FIVE COPIES MIN.) FOR THE FOLLOWING PRODUCTS:

9. ALL MATERIALS FURNISHED BY THIS CONTRACTOR SHALL BE NEW AND IN FIRST CLASS

- LIGHTING FIXTURES, PANELBOARDS, SWITCHBOARDS, MOTOR CONTROL, SAFETY SWITCHES, WIRING DEVICES AND COVER PLATES. SHOP DRAWINGS SHALL BE 8.5 x 11" PAPER SIZE OR SHALL BE THE SAME SIZE AS THE BID/CONSTRUCTION
- 11. FURNISH ALL MANUFACTURER'S INSTALLATION AND OPERATING INSTRUCTIONS FOR ELECTRIC EQUIPMENT TO OWNER. ASSEMBLE ALL IN 3-RING BINDER.
- 12. VERIFY EXACT ELECTRICAL REQUIREMENTS OF EQUIPMENT FURNISHED BY OTHERS AND COMPLY WITH THOSE REQUIREMENTS AT NO ADDITIONAL COST TO OWNER.
- 13. THIS CONTRACT SHALL INCLUDE ALL CONTINGENCIES WHICH MAY ARISE AND MAY BE REQUIRED BY ALTERATION AND DEMOLITION WORK. THIS TO INCLUDE ALL REMOVAL, RELOCATION AND REWORKING OF EXISTING ELECTRICAL OUTLETS, CONDUIT, WIRING, AND EQUIPMENT AND ANY NECESSARY SPLICING OR EXTENSION OF EXISTING CONDUIT AND WIRING SYSTEMS.

- 14. THE ELECTRICAL CONTRACTOR SHALL FULLY GUARANTEE THE ELECTRICAL INSTALLATION FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER AGAINST ALL EVIDENCE OF IMPERFECT WORKMANSHIP OR FAILURE OR MALFUNCTION OF MATERIALS AND EQUIPMENT. WORK FOUND TO BE DEFECTIVE WITHIN THIS PERIOD SHALL BE REPLACED PROMPTLY WITHOUT COST.
- 15. AT COMPLETION OF ELECTRICAL INSTALLATION PROVIDE OWNER WITH ACCURATE "AS BUILT" DRAWINGS INDICATING ALL VARIATIONS FROM CONTRACT DRAWINGS AND A LETTER TO THE OWNER'S REPRESENTATIVE STATING PROJECT FULLY COMPLIES WITH ALL CONTRACT DOCUMENTS AND IF NOT, HOW INSTALLATION WAS ACCOMPLISHED. ALL CHANGES SHALL BE SUBJECT TO OWNER'S REPRESENTATIVE'S AND ENGINEER'S APPROVAL

ELECTRICAL SYMBOLS

JUNCTION BOX.

TOGGLE SWITCHES - SINGLE POLE, DOUBLE POLE, 3-WAY AND 4-WAY.

QUADRAPLEX RECEPTACLE. (2-GANG BOX WITH 2 DUPLEX RECEPTACLES.)

CIRCUIT RUN IN CEILING OR WALL CIRCUIT RUN IN OR UNDER FLOOR. CIRCUIT RUN TO PANEL, OR AS NOTED.

DUPLEX CONVENIENCE RECEPTACLE.

GROUND EXTEND AND CONNECT TO APPROVED GROUND. STUB-OUT CONDUIT TO LOCATION AS INDICATED. (IF NOT INDICATED STUB TO

ABOVE ACCESSIBLE CEILING INSIDE BUILDING OR UNDERGROUND IF OUTSIDE OF BUILDING.) DENOTES NEUTRAL, CIRCUIT, SWITCHED OR TRAVELER AND ISOLATED GROUND CONDUCTORS. WHEN NO TICK MARKS SHOWN PROVIDE TWO #12 AWG

CONDUCTORS IN 1/2-INCH CONDUIT.

BARE COPPER. CONTROL WIRING AS REQUIRED.

EXISTING DEVICE

GND GROUND NEW DEVICE AS SHOWN.

NOT IN CONTRACT. NOT TO SCALE.

REMOVE. UNO UNLESS NOTED OTHERWISE. WEATHERPROOF

Engineered Design Group CONSULTING MECHANICAL-ELECTRICAL-PLUMBING REFRIGERATION & FIRE PROTECTION ENGINEERS EDG_PROJECT # 954 N. ALVERNON WAY, TUCSON AZ. 85711 PH.(520)881-8896, FAX:(520)881-5647 Web Site: www.edg-ce.com

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EDG PROJECT #

954 N. ALVERNON WAY, TUCSON AZ. 85711
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						 JEROME E.	(520) 906-7548		-	Reviewed By	Drawing No.
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