

C. Remote Annunciator Panel: In addition, a remote annunciator panel shall be provided. Remote annunciator to be recessed mounted where shown on Drawings. Provide all associated cables for proper operation of the remote indicator panel. Provide a 3/4" conduit from the generator to the remote annunciator for remote annunciator wiring. Remote annunciator shall indicate all alarm and trouble signals required by the generator mounted indicator panel, in addition to the following:

1. Alarm Horn and silencing switch per NFPA 110.
2. Lamp test switch.
3. Two spare panel lamps.

D. Load Connection Kit. Provide an additional set of lugs on the output side of the Generator breaker to allow connection for a temporary load bank, for load bank testing of the generator.

E. Additional Features: Cyclic cranking per NFPA-110, High-Engine-Temp, safety shutdown and lamp (red), Run-Off/reset-(engine start), Remote Start/Stop Button.

F. Warranty: The complete electrical power system (generator set, controls and associated switches, switchgear and accessories), as provided by the single-source manufacturer, shall be warranted by said manufacturer against defects in materials and workmanship for a period of one year from the date of system start-up. Said coverage shall include parts, labor, travel expenses, and labor to remove/re-install said equipment. A 5 year warranty shall be offered as an add-alternate over the base bid.

G. Delivery, Factory Startup, Documentation and Training and Job-Site Testing:

1. Provide factory standard test reports for the generator shipped to the job-site. Provide 5 copies of factory installation, operation and parts manual. Photocopies are not acceptable.
2. Off loading and Installation of generator at the job-site by the Generator vendor.
3. Factory representative at job site for start-up and training of Owner's personnel, minimum 2 days (20 hours).
4. Provide a 4-hour 100% load-bank test prior to building full load (transfer and accept load) test. Provide building full load tests in the presence of Owner or his authorized representatives.
5. Provide all required and necessary fluid and oil (coolant, lubricant, etc...). Provide fuel for testing and training. Provide a full tank of fuel after completion of testing and training.

H. Houskeeping Pad: Provide a 6" concrete housekeeping pad for the Generator.

I. Approved manufacturers: Cummins, Caterpillar, Taylor Power Systems, Kohler, Generac.

**26 36 23 AUTOMATIC TRANSFER SWITCHES:**

A. General: Provide an Automatic Transfer Switch, 3 phase, 3-pole, 4 wire, rated at 400A (minimum), braced for 35,000 AIC. Automatic transfer switch to be provided with voltage and frequency sensors and field adjustable timers for automatic operation of the transfer switch. Transfer switch to initiate "start" and "stop" signals to the Generator. Transfer switch to be provided with break-before-make (open transition) contacts for the phase conductors and a solid neutral. Provide signage at Generator. Note that generator is not a separately derived source (ground and neutral are not bonded at the Generator).

B. Voltage and Frequency Sensors: Provide voltage and frequency sensors to detect failure of Normal side voltage supply and to monitor the Emergency side voltage. Transfer timers to emergency (DROPOUT) to begin when Normal power is below 85% of nominal voltage or more than 0.5 Hz above or below nominal frequency of 60.0 Hz (below 59.5 Hz or above 60.5 Hz). Transfer timers to normal (PICKUP) to begin when Normal power returns to 95% of nominal voltage and within 0.1 HZ of nominal frequency. EMERGENCY FAIL condition is when the Emergency side voltage is less than 65% of nominal voltage or more than 1.5 Hz above or below nominal frequency.

C. Timers: Provide timers to transfer from Normal to Emergency, to transfer from Emergency to Normal and to schedule automatic testing (exercise) of the Generator.

1. Transfer from Normal to Emergency: DROPOUT timer to be field adjustable, from 1 second to 600 seconds, set by Contractor to 15 seconds. Switch to transfer to Emergency power when Normal power is outside of acceptable DROPOUT voltage or frequency for greater than the timed interval.
2. Transfer from Emergency back to Normal: PICKUP timer to be field adjustable, from 1 minute to 60 minutes, set by Contractor to 15 minutes. Switch to transfer from Emergency power back to Normal when Normal power has returned and is stable for greater than the timed interval. PICKUP timer shall be reset if Normal power is outside of acceptable PICKUP frequency or voltage, to re-start the timer when Normal power returns to within the PICKUP values of voltage and frequency. If Emergency power should fail during the re-transfer to Normal timing interval (EMERGENCY FAIL condition when Normal power is available above the DROPOUT limit), the transfer switch shall immediately re-transfer to Normal power.
3. Cool Down: Cool Down timer shall be field adjustable from 1 minute to 59 minutes, set by the Contractor to 15 minutes. Cool down time to allow the Generator to run unloaded (after re-transfer to Normal) for the cool-down interval prior to sending signal to the Generator to "stop". If Normal power voltage or frequency falls outside of the DROPOUT values during the cool-down interval, the transfer switch shall immediately transfer to Emergency power and cool-down timer shall be re-set. After Normal power voltage and frequency returns to within PICKUP values, the "Transfer to Normal" timer shall begin.
4. Exercise: Exercise timer to allow Generator to start, to run unloaded for a specific time interval, and to stop after the cool-down interval. Exercise timer to be field adjustable from once per day to once per year, to be set by Contractor to once per week (Fridays). Exercise timer to allow Generator to start up at a specific time of day, field adjustable in 15 minute intervals, set by Contractor to 3:00 in the afternoon. Exercise timer to allow an interval of generator exercise, field adjustable from 1 minute to four hours, set by Contractor to 5 minutes. After the end of the exercise timer interval, the generator shall cool down for the length of time set by the cool down timer. Exercise timer to utilize a calendar that allows the timer to adjust to daylight savings time. If, during the Exercise timer interval, Normal power is outside of acceptable limits for PICKUP, the transfer switch shall immediately transfer to Emergency power, and after Normal power voltage and frequency returns to within PICKUP values, the "Transfer to Normal" timer shall begin.

**26 50 00 LIGHTING:**

Provide lighting fixtures as indicated in the LIGHTING FIXTURE SCHEDULE on the Drawings.

**28 31 00 FIRE DETECTION AND ALARM SYSTEM:**

A. General: The fire alarm system shall be designed by a NICET level III fire alarm system designer employed by the fire alarm system installer, as appropriate for the occupancy types indicated on the Drawings and shall conform to the additional requirements stated herein. Fire alarm contractor shall be responsible for obtaining City of Sugar Land Fire Marshall approval for design, calculations and system approval. Fire alarm system design shall conform to the requirements of UL 72, 2011. Shop Drawings of the fire alarm system design and proposed components shall be submitted to the Engineer for review purposes only. Shop Drawings of the fire alarm system design and proposed components shall be submitted to the Engineer for review purposes only.

B. Fire alarm design drawings, shop drawings and fire alarm O&M manuals must be submitted to Texas Department of Aging and Disability Services (DADS) to comply with DADS licensing requirements. Upon substantial completion, a DADS representative will survey the installed fire alarm system and is required to be provided with specific documentation to demonstrate compliance with DADS licensing requirements. Refer to plan note entitled "TEXAS DEPARTMENT OF AGING AND DISABILITY SERVICES (DADS) LICENSING CONSIDERATIONS" on sheet E0.04 for additional requirements.

C. Shop Drawings of the fire alarm system design and proposed components shall be submitted to the Engineer for review purposes only.

D. Fire alarm system to be provided with an autodialer to dial to a UL remote station. Fire alarm system shall be fully digital type, UL 864 9th edition listed. Detection shall be automatic type throughout, as well as provided with pull stations at the building exits. Fire alarm system to be horn type audio announcement with strobe type visual announcement. Where more than one strobe is visible from any location, strobes shall be synchronized. Fire alarm wiring shall be fully supervised type except that for any device controlled by a relay or actuated by a relay, the relay shall be located within 6' of the device controlled or monitored. Remote power supplies shall be integral to the system and UL 864 listed. All associated components of the fire alarm system shall be listed for operation with the fire alarm system. The main Fire Alarm Control Panel shall be located in the main office location where indicated on the Drawings. Each (14)-bed "pod" shall be provided with (2) remote annunciators. An additional remote annunciator shall be provided in the office area indicated. In each pod, the first remote annunciator shall be provided at the indicated attended station and the second remote annunciator shall be provided in another location as required by the fire marshal. A fire event in one pod shall cause the fire alarm devices in that pod only and in the shared kitchen to announce and a fire event in the kitchen shall cause the fire alarm devices in the kitchen and in both pods that are adjacent to that kitchen to announce.

E. Refer to general notes on the Plan drawings for occupancy requirements. Verify zoning requirements with the Owner and provide accordingly. All penetrations through fire rated floors and walls shall be sealed with approved fire-sating material.

**OPTIMUM CARE  
SUGAR LAND, TEXAS  
GENERAL NOTES (APPLY TO ALL ELECTRICAL SHEETS):**

G1 All circuit numbers shown are for reference only. Field verify actual circuit numbers req'd and adjust accordingly. Provide type-written directories reflecting actual circuit numbers used, with field revised/ relocated circuits clearly indicated. Directories shall include date and project description, example : 2014 NEW BLDG.

G2 Each circuit is shown with an individual homerun. Contractor may elect to combine two or more circuits in one common conduit and with common neutral where allowed, subject to requirements of National Electrical Code Article 310.15(B)(3). Circuits with high content of harmonic currents, such as equipment with non-linear electronic power supplies such as computers, copiers, printers, etc may not use common. Note: Ampacities of conductors shall be reduced if more than three current carrying conductors are installed in a raceway. See National Electrical Code Article 310.15(B)(3)(a) "Adjustment Factors". Conductors shall be derated if 4 or more wires are installed in one conduit (see related note "G3" on temperature limitation of conductor ampacity). Typical examples for 20-amp circuits are shown below:

No. of current carrying conductors carrying conductors	% of values in Tables as adjusted for temperature if necessary	Wire size, 4 or more wires in one conduit 60C wire (e.g. : TV)	Wire size, 4 or more wires in one conduit 75C wire (e.g. : THWN)	Wire size, 4 or more wires in one conduit 90C wire (e.g. : THHN)
4 thru 6	80%	#10	#12	#12
7 thru 9	70%	#10	#10	#12
10 thru 20	50%	#8	#8	#10
21 thru 30	45%	#6	#8	#8
31 thru 40	40%	#6	#8	#8
41 and above	35%	#4	#6	#6

G3 Temperature Limitations on Conductor Ampacity: The ampacity of a conductor shall be selected based on the National Electrical Code Articles 310.15(B)(16) and 110.14(C)(1) and 110.14(C)(2). The temperature limitations noted in 110.14(C)(1) and 110.14(C)(2) may be paraphrased as follows:

- (A) Circuits rated 100 amp or less:  
Use 60-degree C rated conductors only. 75-degree C and 90-degree C conductor may be used but only at 60-degree C ampacity.  
Exceptions: higher temperature cable are allowed provided the equipment is listed and identified for use with the higher rated conductors.
- (B) Circuits rated more than 100 amp or conductor larger than #1 AWG:  
Use 75-degree C rated conductors only. 90-degree C conductor may be used but only at 75-degree C ampacity.  
Exceptions: higher temperature cable are allowed provided the equipment is listed and identified for use with the higher rated conductors.

G4 Wires Oversized to Alleviate Voltage Drop: Where oversized wires are used to alleviate voltage drop, Contractor to provide reducer lugs and/or splices in junction boxes located near the equipment as required to terminate wires in equipment.

G5 All conduit and wire must be concealed from view. Exposed conduit runs are not acceptable, exceptions are the Storage Garage, Mechanical Mezzanine, the Laundry Room Electrical Panel home runs and the Telecomm Closet. Where run exposed, conduits shall be routed parallel and perpendicular to the major building lines and bends and offsets in parallel runs shall be installed in a neat and workmanlike manner.

G6 All wall mounted electrical power, electrical control and communication devices (light switches, receptacles, telephone, data etc.) shall be mounted flush with the wall unless noted otherwise. Switches, disconnects, power receptacles and tele/data receptacles mounted in the mechanical mezzanine need not be flush mounted. Field verify receptacle mounting requirements with the Owner and/or the Architect, mount all vertically oriented duplex power outlets with the "u" ground terminal on top, unless noted otherwise or as required by the Owner and/or the Architect. Mount all horizontally oriented duplex power outlets with the neutral terminal on top.

G7 All outlets on dedicated circuits (marked "DED" or "D" on plans) shall be properly identified by using distinctive color devices (gray). Cover plates for all outlets shall be marked with circuit number(s) used. Cover plates for equipment that is identified on the plans shall be marked with the loads served. Example : Ckt # LA-1 Copy Machine.

G8 Electrical Equipment Dimension Assumptions: Electrical equipment layout is based on Square D and/or Siemens. Equipment by other manufacturers such as GE may have larger dimensions. It is the responsibility of the Contractor to provide equipment with similar dimensions that will fit in the space noted.

**GENERAL NOTES (continued):**

G9 Verify location of all wall mounted and floor mounted outlets (power & communication) with the Owner and/or the Architect prior to rough-in. The Owner reserves the right to move any outlets 5 feet in any direction prior to rough-in. All receptacles within 6 feet of any wet area (example : sink, dishwasher, etc.) shall be provided with ground fault circuit interrupter (GFCI) protection, whether specifically indicated or not on drawings. Mounting heights of all outlets (receptacles, switches, telephone, data, etc.) in areas with countertop shall be verified with Owner/Architect prior to rough-in. In general, all outlets shown at countertop areas are to be mounted above the countertop except outlets serving under-counter equipment such as disposers, undercounter dishwasher, undercounter refrigerators etc. Refer to Architectural interior elevations for additional information. All weatherproof/wet location and/or outdoor receptacles shall have "weatherproof-in-use" covers (NEC Article 406.8(B)). Provide Raco Bell Rayntite II covers or equal.

G10 Location of Switches/starters for Equipment Specified Under Division 23, Division 22 and Other Divisions: Location of disconnect switches, starters, control stations, etc. are shown diagrammatically on the Division 26 Drawings. Contractor shall install such devices in compliance with National Electrical Code required clearance requirements. All such devices shall be readily accessible after the equipment is installed in place and shall satisfy code clearance requirements. **Remove and re-install devices that are inaccessible or with inadequate code clearance.** Coordinate installation with actual equipment delivered to the job-site and with requirements specified in other Divisions.

G11 Wire and Disconnecting Means Sizing for Equipment Specified Under Division 22 and Division 23: Overcurrent devices, disconnect switches, conduit/wire sizes shown on the Division 26 Drawings have been selected based on equipment specified under Division 22 and Division 23. Contractor shall field verify ratings of actual equipment delivered to the jobsite and revise electrical distribution components as required to match that equipment. For outdoor pad-mounted air conditioning Equipment, Contractor shall connect the equipment to the in-sight disconnecting means by way of underground rigid conduit feeder stubbed up near equipment connection point. In-sight disconnecting means for air conditioning equipment to be outdoor NEMA 3R safety disconnect switch(es), fused or non-fused as indicated on the Drawings. Extend from underground conduit stub to equipment connection point with Liquidtight Flexible Metallic Conduit (trade name: Sealtite), length of Sealtite to be 5 feet. Sealtite longer than 5 feet is not allowed.

G12 Estimated Loads: Information and data on specialty equipment may not be available during the design process and some loads have been necessarily estimated. Such estimated loads are indicated as (EST.) on plans, riser diagrams and/or panel schedules. Contractor shall bid the project using the estimated feeder/breaker/switches shown on drawings. However, the Contractor is responsible for confirmation and verification of all such estimated loads with the appropriate vendors/suppliers. All shop drawings submitted by the Contractor shall include certification that the Contractor has confirmed/verified any estimated loads shown on the drawings. Contractor will not be due any additional compensation for his failure to verify the estimated loads shown on drawings. Provide credit to the Owner if actual loads are smaller than estimated loads, credit shall be given for size reduction on feeder/ breaker/ switches. Example of equipment loads that are typically estimated: special copy machine, laundry equipment, etc.

G13 Exhaust Fans: Where exhaust fans are indicated as interlocked with other equipment that has been specified under Division 23, Contractor shall provide all required relays, conduit/control wires etc. as required for a complete and operating system. Coordinate interlock requirements with the sub-contractor providing the Division 23 specified equipment.

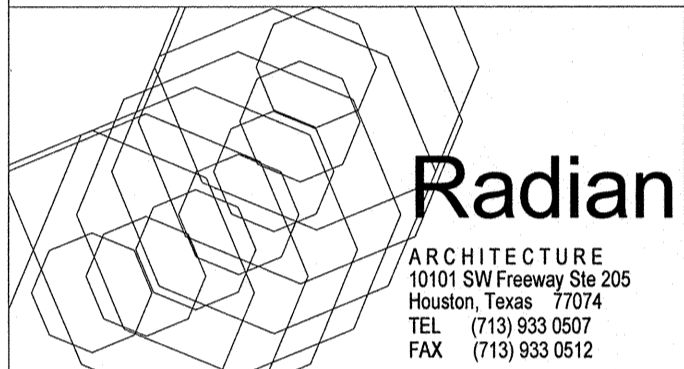
G14 Provide a house keeping concrete pad (minimum 4" high) for all floor mounted electrical equipment. Provide all required and necessary galvanized unistrut support for all indoor/outdoor electrical equipment.

G15 Fire Rated Wall: Do not install device boxes or telephone, data outlets etc. back-to-back in fire/smoke partitions or within the same space enclosed by two adjacent studs. Restriction also applies to all corridor walls.

G16 Sleeves Thru Rated Walls: Provide fire rated sleeves thru rated walls for all low voltage and line voltage (120V) wiring. Provide sleeves as required for routing wirings from all outlet locations back to control panels/terminal boards, panels, junction boxes etc. Coordinate sleeve sizing requirements with communication systems contractor(s). Note : For all low voltage outlet devices including telephone, data, security, fire alarm, A/V, etc, the Contractor shall provide outlet back box with single-gang plaster ring. 3/4" conduit stubbed to mechanical mezzanine space and telecomm coverplate. In addition, Contractor shall provide all required and necessary sleeves through all rated walls/floors from accessible ceiling back to control panels/terminal boards, panels, junction boxes etc.

REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL PHASING INFORMATION.

**OPTIMUM CARE  
SUGAR LAND, TEXAS**



**Revision Schedule**

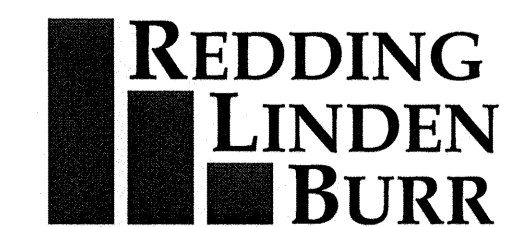
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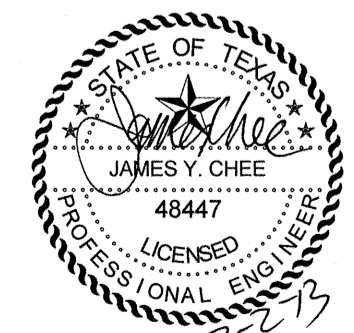
**ELECTRICAL SPECIFICATIONS**

Sheet No.

**E0.03**



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TEXAS REGISTERED ENGINEERING FIRM P- 3113