GENERAL ELECTRICAL NOTES:

1. CONTRACTOR SHALL CONFORM TO ALL LOCAL, STATE, AND APPLICABLE CODES2017 NEC, 2017 IBC, NFPA, ETC., AND ALL OTHER LOCAL CODES AND AMENDMENTS WHERE THERE ARE CONFLICTS BETWEEN CODES, STANDARDS, DRAWINGS AND SPECIFICATIONS ARISE, THE MORE STRINGENT SHALL APPLY.

2. ALL DRAWINGS AND SPECIFICATIONS (INCLUDING ARCHITECTURAL, MECHANICAL, PLUMBING, ETC) ARE DEVELOPED TO BE AN INCLUSIVE SET. ANY CONFLICTS WITHIN SHALL BE BROUGHT TO THE DESIGN'S TEAM ATTENTION. CONTRACTOR SHALL NOT MAKE ANY CHANGES TO THE DESIGN OR CONTRACT WITHOUT WRITTEN CONSENT FROM THE OWNER.

3. WORK SHALL BE INSTALLED IN A WORKMANLIKE FASHION. ALL EQUIPMENT AND MATERIALS SHALL BE NEW, FREE OF DEFECTS.

4. MAINTAIN THE CONSTRUCTION PREMISES IN A NEAT AND ORDERLY CONDITION. CONTRACTOR SHALL PROTECT THEIR WORK AGAINST WEATHER, THEFT, AND DAMAGE. ANY WORK DAMAGED BY FAILURE TO PROVIDE PROTECTION REQUIRED, SHALL BE REMOVED AND REPLACED WITH NEW WORK AT THE CONTRACTOR'S EXPENSE.

5. ALL PRODUCTS SHALL COMPLY WITH 25/50 FLAME AND SMOKE HAZARD RATINGS PER ASTM E-84, NFPA 255 AND UL 723.

6. ELECTRICAL DRAWINGS ARE SCHEMATIC IN NATURE, APPROXIMATE LOCATIONS OF EQUIPMENT AND CONDUIT ARE SHOWN. THE ELECTRICAL CONTRACTOR SHALL LAYOUT ALL EQUIPMENT ROOMS TO MAKE ENSURE PROPER CLEARANCES REQUIRED BY THE NEC, PRIOR TO ORDERING OF EQUIPMENT. EXACT LOCATION OF ALL EQUIPMENT SHALL BE VERIFIED IN THE FIELD.

7. SUBSTITUTIONS SHALL BE EVALUATED AND APPROVED BY OWNER AND ENGINEER PRIOR TO CONTRACTOR TO BEGINNING WORK. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE AMONG TRADES AND FULLY COORDINATE. ANY COSTS RESULTING FROM SUBSTITUTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

8. CONDUIT PENETRATIONS BETWEEN NON-CONDITIONED AND CONDITIONED SPACES SHALL BE SEALED TO ELIMINATE MOISTURE MITIGATION, SUCH AS BETWEEN INSIDE AND OUTSIDE BUILDINGS, NON-CONDITIONED BOILER ROOMS, INTO REFRIGERATORS / FREEZERS, ETC.

9. CITY NOTE : ELECTRICAL MATERIAL AND EQUIPMENT: NO ELECTRICAL MATERIALS, APPARATUS, DEVICES, APPLIANCES, FIXTURES, OR EQUIPMENT SHALL BE SOLD OR INSTALLED IN THE CITY UNLESS THEY ARE IN CONFORMANCE WITH THE PROVISIONS OF THIS CODE, THE LAWS OF THE STATE OF TEXAS AND ANY APPLICABLE RULES AND REGULATIONS ISSUED UNDER THE AUTHORITY OF THE STATE STATUTES. THE MAKER'S NAME, TRADEMARK, OR OTHER IDENTIFICATION SYMBOL SHALL BE PLACED ON ALL ELECTRICAL MATERIALS, APPARATUS, DEVICES, APPLIANCES, FIXTURES, AND EQUIPMENT USED OR INSTALLED UNDER THE PROVISIONS OF THIS CODE. ALL ELECTRICAL MATERIALS AND EQUIPMENT SHALL BE LISTED AND LABELED FOR THE INTENDED USE AND SHALL BE INCLUDED IN A LIST PUBLISHED BY AN APPROVED AGENCY.

ELECTRICAL EQUIPMENT

1. ALL PACKAGED EQUIPMENT SHALL BE INDEPENDENTLY THIRD PARTY LABELED AS A SYSTEM FOR ITS INTENDED USE BY A (UL) IN ACCORDANCE WITH OSHA FEDERAL REGULATIONS, AS WELL AS NFPA PAMPHLET NO. 70, AND THE NATIONAL ELECTRICAL CODE (NEC).
2. ALL SYSTEMS SHALL BE A COMPLETE AND OPERABLE SYSTEM PROVIDE THE NECESSARY ADAPTORS, FITTINGS, DEVICES, ETC. PROVIDE COMPLETE WITH BASES, ISOLATORS, SUPPORTS AND OTHER REQUIRED ACCESSORIES.
3. THE CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES FOR ELECTRICAL REQUIREMENTS OF ALL EQUIPMENT AND DEVICES AS REQUIRED FOR PROPER FUNCTIONING SYSTEM.
4. CONTRACTOR SHALL COORDINATE THE REQUIREMENT OF HOUSEKEEPING PADS WITH GENERAL CONTRACTOR. ALL ELECTRICAL EQUIPMENT SHALL BE PROVIDED WITH A 4" HOUSEKEEPING PAD THAT EXTENDS A MINIMUM OF 4" ALL THE WAY AROUND THE EQUIPMENT.

LABELING

1. PROVIDE PERMANENTLY ADHERED PHENOLIC NAMEPLATES FOR ALL EQUIPMENT (PANEL BOARDS, SWITCHBOARDS, STARTERS, DISCONNECTS, BUSSED GUTTERS, ETC.) WITH BLACK PLATES AND WHITE 3/8" HIGH LETTERS. GUTTER SHALL LIST AMPERAGE AND VOLTAGE
2. PROVIDE LABELING ON ALL DEVICE OUTLETS AND SWITCH COVERS INCLUDING THE PANEL NAME AND CIRCUIT NUMBER. LABELS SHALL BE CLEAR PLASTIC LABELS AND BLACK LETTERING.
3. CONDUCTORS IN PANELBOARDS SHALL BE LABELED WITH CIRCUIT NUMBER LABELS.

CUTTING AND PATCHING

1. CUTTING SHALL BE IN A NEAT AND WORKMANLIKE MANNER. COORDINATE WITH OTHER TRADES PRIOR TO COMMENCING WORK. PATCH AND FINISH TO MATCH ADJACENT AREAS.

CONDUCTORS

1. CONDUCTORS SHALL HAVE CONTINUOUS INSULATION COLOR, AS LISTED BELOW. CONDUCTORS SHALL BE SOFT ANNEALED COPPER INSULATED FOR 600 VOLTS UNLESS SPECIFICALLY INDICATED OTHERWISE.

	208/120 VOLT SYSTEM	240 VOLT SYSTEM	480/277 VOLT SYSTEM
PHASE A	BLACK	BLACK	BROWN
PHASE B	RED	RED	ORANGE
PHASE C	BLUE		YELLOW
NEUTRAL	WHITE	WHITE	WHITE
GROUND	GREEN	GREEN	GREEN

2. INSULATION TYPE SHALL BE TYPE THW FOR WIRE SIZES #8 AWG AND LARGER AND THWN FOR #10 AWG AND SMALLER. ALL EXTERIOR CONDUCTORS SHALL BE XHHW TYPE
3. PROVIDE #12 CONDUCTORS, UNLESS OTHERWISE INDICATED. CONTROL CONDUCTORS SHALL BE #14 MINIMUM FOR NEC CLASS 1 AND #16 FOR NEC CLASS 11. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED. CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID.
4. WIRE JOINT OR SPLICES IN SWITCHBOARDS OR PANELBOARDS ARE NOT ALLOWED, NOR ARE SPLICE FOR ANY DISTRIBUTION FEEDERS. SPLICES ONLY ALLOWED FOR DROPS TO DEVICES. FORM AND TIE ALL WIRING WITHIN BOARDS.

RACEWAYS

1. WIRE RUNS SHALL BE ACCORDING TO CODE IN INTERMEDIATE METAL CONDUIT (IMC) OR ELECTRICAL METALLIC TUBING (EMT) CABLING UNLESS OTHERWISE SPECIFICALLY STATED HEREIN. CONDUIT SHALL BE A MINIMUM OF 3/4" UNLESS OTHERWISE NOTED. CONDUIT IN EXPOSED LOCATIONS SHALL NOT BE ACCEPTABLE UNLESS OTHERWISE NOTES, REFER TO ARCHITECT.
2. RIGID, THREADED, GALVANIZED, HEAVY WALL TYPE CONDUIT SHALL BE UTILIZED IN EXTERIOR WALLS, AREAS EXPOSED TO THE WEATHER OR OTHER DAMP/WET LOCATIONS.
3. UTILIZE SCHEDULE 40 PVC CONDUIT WITH GROUND WIRE FOR UNDERGROUND APPLICATIONS. PVC CONDUIT SHALL NOT BE RUN IN OR ABOVE FLOOR SLAB. PVC CONDUIT SHALL TERMINATE BELOW FLOOR SLAB WITH RIGID, THREADED METAL CONDUIT ADAPTER. ALL CONDUIT ABOVE SLAB SHALL BE METAL AND SHALL BE CONCEALED IN WALLS, FLOORS AND CEILINGS WHEREVER POSSIBLE. PROVIDE RIGHT ANGLE TURNS USING FITTINGS OR SYMMETRICAL BENDS. SUPPORT CONDUITS WITHIN 1' OF ALL CHANGES IN DIRECTION.
4. MC MAY BE UTILIZED FOR EXISTING WALL SITUATIONS, 6' FOR LIGHTING WHIPS, OR WHERE APPROVED BY OWNER.
5. CONNECTIONS TO MOTORS AND OTHER EQUIPMENT SUBJECT TO VIBRATION AND IN AREAS SUBJECT TO MOISTURE SHALL UTILIZE LIQUID TIGHT METAL CONDUIT.
6. HORIZONTAL PORTIONS OF CONDUIT EXPOSED ON THE ROOF AND FEEDING EQUIPMENT SHALL NOT BE MORE THAN 5'-0" IN LENGTH.
7. LUBRICATION AND SEALANT IS REQUIRED ON OUTDOOR AND UNDERGROUND THREADED METAL JOINTS.
8. COORDINATE CONDUIT RUNS PRIOR TO ROUGH IN WITH OTHER TRADES AND AVOID INTERFERENCE.
9. USE WATERTIGHT JOINTS WITH BURIED AND CONCRETE ENCASED CONDUIT. ALL BURIED CONDUITS OUTSIDE OF BUILDINGS SHALL HAVE A MINIMUM OF 24" OF COVER. METAL CONDUITS BURIED IN EARTH SHALL BE PAINTED WITH TWO COATS OF HEAVY ASPHALTUM PAINT.
10. EXPOSED CONDUITS IN OPEN CEILING PUBLIC AREAS SHALL BE PAINTED TO MEET ARCHITECTURAL SPECIFICATION AND COLOR.

BOXES

1. INSTALL PULL AND JUNCTION BOXES WHERE REQUIRED FOR CHANGES IN DIRECTION, AT JUNCTION POINTS TO FACILITATE WIRE PULLING, AND WHERE SHOWN ON THE DRAWINGS. BOX SIZES SHALL BE IN ACCORDANCE WITH NEC UNLESS LARGER BOXES ARE NOTED.
2. FOR INTERIOR CONCEALED LOCATIONS - USE SHEET STEEL BOXES, ZINC COATED OR CADMIUM PLATED.
3. WALL BOX SIZES SHALL BE MINIMUM 4" SQUARE X 2-1/2" DEEP. FIXTURE OUTLETS IN CEILING SHALL BE MINIMUM 4" OCTAGONAL X 1-1/2" DEEP (4-11/16" OCTAGONAL X 2-1/2" DEEP WHERE REQUIRED TO ACCOMMODATE LARGER CONDUIT OR LARGER NUMBER OF WIRES). GANG BOXES SHALL BE ONE PIECE MINIMUM 2-1/8" DEEP.
4. PROVIDE FLUSH MOUNT BOXES IN ALL FINISHED WALLS, INSTALL THE PLASTER RINGS IN DRYWALLED WALLS AND RAISED COVERS AS REQUIRED IN WALLS WITH OTHER FINISHES SO THAT THE COVER PLATES FIT TIGHTLY AGAINST BOXES OR RINGS. 3/16" MAXIMUM GAPS ARE ALLOWED FOR NONCOMBUSTIBLE WALLS. SUPPORT ALL BOXES TO MAINTAIN PROPER ALIGNMENT AND RIGIDITY. PRIOR TO THE INSTALLATION OR WIRING OR DEVICES, CLEAN BOXES OF ALL FOREIGN MATTER.

DEVICES

1. PROVIDE TOTALLY ENCLOSED, SPECIFICATION GRADE, 20 AMPERE, 120/277 VOLT QUIET A/C GENERAL USE SWITCHES MANUFACTURED BY HUBBELL OR OTHER APPROVED MANUFACTURER.
2. PROVIDE SPECIFICATION GRADE NEMA CONFIGURATION 5-20R DUPLEX 125-VOLT GROUNDING TYPE RECEPTACLES UNLESS OTHERWISE NOTED ON THE DRAWINGS. MANUFACTURED BY HUBBELL OR OTHER APPROVED MANUFACTURER.
3. LIGHTING SWITCHES SHALL BE MOUNTED WITHIN 6" OF DOOR JAM ON STRIKE SIDE UNLESS APPROVED OTHERWISE.
4. LOCATE RECEPTACLES APPROXIMATELY 1'-6" ABOVE THE FINISHED FLOOR ELEVATION OR NEAREST BLOCK COURSE (WITHIN ADA REQUIREMENTS), UNLESS OTHERWISE NOTED. THE LONG DIMENSION OF THE RECEPTACLE SHALL BE VERTICAL. ALL DEVICES SHALL BE FLUSH MOUNTED U.N.O. GROUND PIN SHALL BE MOUNTED UP (OR NEUTRAL UP IF HORIZONTALLY INSTALLED)
5. RECEPTACLES IN KITCHEN AREAS, BATHROOMS, AND RECEPTACLES WITHIN 6' OF SINKS SHALL BE GFCI TYPE (NOT WIRED IN SERIES, SEE NOTE 6). ALL DEVICES INSTALLED OUTDOORS SHALL BE WEATHERPROOF AND GFCI PROTECTED.
6. CONTRACTOR TO PROVIDE "PIG TAIL" SPLICES TO ALL RECEPTACLE DEVICES (DO NOT WIRE IN SERIES THRU THE DEVICE) - SEE DETAILS.

SAFETY SWITCHES

1. PROVIDE DISCONNECT SWITCHES FOR ALL EQUIPMENT, WHERE REQUIRED BY CODE, AND THEY SHALL BE OF THE SAME MANUFACTURER. MANUFACTURER SHALL BE SQUARE D, SIEMENS, G.E., OR CUTLER-HAMMER.
2. SAFETY SWITCHES SHALL BE THE ENCLOSED HEAVY-DUTY TYPE WITH QUICK-MAKE, QUICK-BREAK MECHANISM AND EXTERNAL PAD LOCKABLE OPERATING HANDLE.
3. SAFETY SWITCHES SHALL BE RATED FOR 240 OR 600 VOLTS AS APPLICABLE. THEY SHALL BE HORSEPOWER RATED WHEN USED IN MOTOR CIRCUITS. SAFETY SWITCHES SHALL BE FUSIBLE OR NONFUSIBLE 2, 3 OR 4 POLE AS INDICATED ON THE DRAWINGS. SAFETY SWITCHES SHALL BE SINGLE THROW, UNO. ENCLOSURES SHALL BE NEMA 1 INDOORS AND NEMA 3R OUTDOORS (U.N.O.).
4. MOUNT THE SAFETY SWITCHES SECURELY BETWEEN 3' - 6' LEVELS ABOVE THE FLOOR UNLESS OTHERWISE NOTED IN THE DRAWINGS. SWITCHES ON BLOCK WALLS SHALL BE PROVIDED WITH AND MOUNTED ON A 3/4" PLYWOOD BACKBOARD, WHERE LOCATED INDOORS.
5. THE CONTRACTOR SHALL FURNISH A COMPLETE SET OF FUSES FOR ALL FUSIBLE SWITCHES, PLUS FUSIBLE EQUIPMENT FURNISHED BY OTHER TRADES. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, THE FUSES SHALL BE OF THE FOLLOWING TYPE:
   - o FUSES 601 TO 6000 AMPS SHALL BE UL CLASS RK5. TRADE TYPE SHALL BE KRP-C AS MANUFACTURED BY THE BUSSMANN COMPANY.
   - o FUSES 1/10 TO 600 AMPS SHALL BE UL CLASS RK1. TRADE TYPE SHALL BE LOW PEAK LPS-RK (600V) AND LPN-RK (250C) AS MANUFACTURED BY BUSSMANN COMPANY.
   - o ALL OTHER FUSES SHALL BE DUAL ELEMENT CURRENT LIMITING TYPE WITH 200,000 AMPERES SYMMETRICAL INTERRUPTING CAPACITY.

DISTRIBUTION PANELS

1. DISTRIBUTION PANELS SHALL BE DEAD FRONT TYPE WITH CIRCUIT BREAKERS, COMPRISED OF FUSES AND HEAVY-DUTY SWITCHES OF SIZE AND NUMBER INDICATED ON THE PANELS. PANELS SHALL BE MANUFACTURED AS A COMPLETE UNIT. ALL BUSS BARS SHALL BE RECTANGULAR AND MADE OF SOLID COPPER. ALL LUGS SHALL BE UL APPROVED CU/AL TYPE. VERTICAL BUSSING SHALL BE EXTENDED THE FULL LENGTH OF THE PANEL.
2. ALL PANELS SHALL BE CAPABLE OF ACCEPTING SWITCH SIZES UP TO AND INCLUDING 600 AMPS.
3. DISTRIBUTION PANELS SHALL BE G.E., SQUARE "D", OR SIEMENS.
4. INSTALL PANELS SUCH THAT HANDLE FOR THE TOP SWITCH DOES NOT EXCEED 6'-6" ABOVE FINISHED FLOOR PER NEC.
5. SURFACE-MOUNTED PANELS SHALL BE MOUNTED ON UNISTRUT RAILS. FLOOR-MOUNTED PANELS SHALL BE MOUNTED ON A 4" HIGH CONCRETE PAD.
6. ALL BOLTED CONNECTIONS SHALL BE TORQUED IN ACCORDANCE WITH MANUFACTURER'S STANDARDS. RE-TORQUE CONNECTIONS ONE MONTH OR MORE AFTER INITIAL TORQUE. TORQUE RECORDS SHALL BE HANDED TO OWNER AT SUBSTANTIAL COMPLETION.

PANELBOARDS

1. PANELBOARDS SHALL BE MANUFACTURED BY SQ.D., G.E., EATON OR APPROVED EQUAL, ENCLOSED DEAD FRONT SAFETY DOOR IN DOOR TYPE WITH FEATURES AND RATINGS AS SCHEDULED ON DRAWINGS. ALL BUS BARS SHALL BE RECTANGULAR SOLID COPPER. SPACE, WHERE SHOWN IN PANEL SCHEDULES, DESIGNATES SPACE FOR FUTURE PROTECTIVE DEVICES AND SHALL INCLUDE BUS AND SUPPORT. LOAD CENTERS SHALL NOT BE ALLOWED. MANUFACTURER SHALL BE SQUARE D, SIEMENS, GE OR CUTLER-HAMMER. PANELS WILL BE SIMILAR OR EQUAL TO NQ/NF BOARDS NOT LOAD CENTERS (UNLESS SPECIFIED)
2. ALL BREAKERS SHALL BE BOLT ON TYPE, AND SHALL BE TORQUED IN ACCORDANCE WITH MANUFACTURERS STANDARDS. RE-TORQUE ALL CONNECTIONS ONE MONTH AFTER INITIAL TORQUE.
3. INSTALL CABINETS SO THAT CENTER OF THE TOP BREAKER DOES NOT EXCEED 6'-6" ABOVE THE FINISHED FLOOR PER NEC. PROVIDE (3) SPARE 1" CONDUITS INTO ACCESSIBLE CEILING.
4. ELECTRICAL CONTRACTOR SHALL FOLLOW DRAWING CIRCUIT NUMBERS AS NEAR AS POSSIBLE. PRIOR TO SUBSTANTIAL COMPLETION, ELECTRICAL CONTRACTOR SHALL TAKE CURRENT READING CHECKS OF RESPECTIVE PHASES AND SUBMIT TO ENGINEER FOR APPROVAL.
5. CIRCUIT DESCRIPTIONS (PANEL CARDS) SHALL BE TYPED AND ACCURATE TO FIELD CONDITIONS. ROOM NAMES SHALL MATCH FINAL INSTALLED ROOM NAMES IF DIFFERENT FROM PLANS.
6. AVAILABLE FAULT CURRENT LABELING. IN LIEU OF THE MAXIMUM AVAILABLE FAULT CURRENT MARKING AS REQUIRED BY 110.24, A PERMANENTLY AFFIXED LABEL SHALL BE APPLIED WITH THE AVAILABLE FAULT CURRENT AT THE TIME OF INSTALLATION AND CALCULATION. THE LABEL SHALL BE 2" X 3" IN SIZE AND SHALL BE BLUE LETTERING ON A CONTRASTING BACKGROUND. THIS LABEL SHALL ALSO INCLUDE THE DATE OF THE CALCULATION.

TRANSFORMERS

1. DRY TYPE TRANSFORMERS SHALL BE MANUFACTURED BY SQ.D, GE, OR APPROVED EQUAL HAVING (2)2.5% TAPS ABOVE AND (4)2.5% TAPS BELOW THE RATING OF THE TRANSFORMER. THEY SHALL HAVE COPPER WINDINGS, A BONDING JUMPER BETWEEN THE SECONDARY NEUTRAL AND THE METAL CASE. TRANSFORMERS SHALL HAVE R CLASS INSULATION OF UL 220 DEGREE RATING AND 115 DEGREE RISE.

GROUNDING

1. GROUND ALL EQUIPMENT PER NEC.
2. GROUND EACH OUTSIDE LIGHTING STANDARD SEPARATELY WITH ONE GROUND ROD AND A #6 GROUND WIRE.
3. ALL CONDUITS SHALL CONTAIN A CODE SIZED GROUND WIRE SIZE PER NEC IN ADDITION TO THE CONDUCTORS SHOWN ON THE PLANS. WHERE CIRCUIT CONDUCTORS ARE INCREASED IN SIZE THE GROUND WIRE SIZE SHALL BE INCREASED PROPORTIONALLY.

STARTUP AND INSTRUCTIONS

1. AFTER INSTALLATION, CHECK ALL EQUIPMENT, AND PERFORM START UP IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. NOTIFY ENGINEER OF ALL START-UP. ALL EQUIPMENT SHALL BE ONE AND OPERATIONAL AT COMPLETION OF PROJECT.
2. TESTS SHALL INCLUDE THE FOLLOWING:
   - o MEASURE THE LOAD ON EACH PHASE OF THE MAIN SERVICE AND EACH PHASE OF EVERY FEEDER UNDER FULL LOAD CONDITIONS
   - o MEASURE THE NO-LOAD AND FULL-LOAD VOLTAGES (PHASE TO PHASE, PHASE TO NEUTRAL AND PHASE TO GROUND FOR EACH PHASE OF EACH SERVICE, OF EACH SEPARATELY DERIVED SYSTEM, AND AT EACH PANELBOARD OR TRANSFORMER).
   - o MEASURE THE GROUND RESISTANCE OF THE MAIN SERVICE GROUNDING ELECTRODE AND THE GROUND RESISTANCE OF EACH SEPARATELY DERIVED SYSTEM'S GROUNDING ELECTRODE.
   - o MAKE INSULATION RESISTANCE TESTS ON ALL DRY TYPE TRANSFORMERS AND MOTORS.
3. CLEAN ALL ELECTRICAL EQUIPMENT AND FIXTURES PRIOR TO PROJECT COMPLETION.
4. PROVIDE OWNER TRAINING AND DEMONSTRATION OF ALL ELECTRICAL SYSTEMS AND EQUIPMENT.
5. INSTRUCT OWNER ON PROPER OPERATION AND PREVENTATIVE MAINTENANCE OF SYSTEM. SUBMIT OPERATING AND MAINTENANCE MANUAL ON ALL EQUIPMENT AND SYSTEMS.

MISCELLANEOUS

1. ALL GENERATOR TRANSFER DEVICES (GTD'S), IF APPLICABLE, ARE TO BE MOUNTED ABOVE ACCESSIBLE CEILINGS AT A LEVEL WHICH CAN BE REACHED WITHOUT A LIFT (UNDER 15').
2. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING 120V POWER TO ALL LOW VOLTAGE TRANSFORMERS (PROVIDED BY THE PLUMBING CONTRACTOR), FOR AUTOMATIC FLUSH VALVES, TO EITHER THE CIRCUIT NOTED ON THE PLANS OR THE NEAREST RECEPTACLE CIRCUIT.

WARRANTY

1. FULLY WARRANT ALL MATERIALS, EQUIPMENT AND WORKMANSHIP FOR ONE (1) YEAR FROM DATE OF ACCEPTANCE OR AS REQUIRED IN SPECIFICATIONS. EXTEND ALL MANUFACTURER'S WARRANTIES TO OWNER, INCLUDING ALL EXTENDED WARRANTIES.
2. REPAIR OR REPLACE WITHOUT CHARGE TO THE OWNER ALL ITEMS FOUND DEFECTIVE DURING THE WARRANTY PERIOD. IN THE CASE OF REPLACEMENT OR REPAIR DUE TO FAILURE WITHIN THE WARRANTY PERIOD, THE WARRANTY ON THAT PORTION OF THE WORK SHALL BE EXTENDED FOR A MINIMUM PERIOD OF ONE (1) YEAR FROM THE DATE OF SUCH REPLACEMENT OR REPAIR.

SYMBOL LEGEND

Symbol	Description
	DARK LINES DENOTES NEW WORK. (CIRCUITING, EQUIPMENT, ETC.)
	SHADED LINES DENOTES EXISTING WORK. (CIRCUITING, EQUIPMENT, ETC.)
XXXXXXXXXXXXXXX	SHADED LINES WITH "X" ON ONELINE DENOTES EXISTING TO BE REMOVED. (CIRCUITING, EQUIPMENT, ETC.)
	DARK DASHED LINES ON DEMO PLANS DENOTES EXISTING TO BE REMOVED. (CIRCUITING, EQUIPMENT, ETC.)
	CIRCUIT CONCEALED IN WALL OR CEILING
	CIRCUIT CAST IN CONCRETE, BELOW SLAB, OR UNDER RAISED FLOOR
3LA-2,4,6	HOMERUN TO PANEL BREAKER. PANEL AND CIRCUIT INDICATED. SEE PANEL SCHEDULE FOR WIRING AND ADDITIONAL REQUIREMENTS. 3#12 (H), 3#12 (N), 1#12 (G), 3/4" C (UNLESS OTHERWISE NOTED) EACH CIRCUIT SHALL HAVE ITS OWN NEUTRAL.

COVER PLATES FOR RECEPTACLES, SWITCHES, AND DATA SHALL BE SS-302 (UON)

Symbol	Description
	SIMPLEX RECEPTACLE
	DUPLEX RECEPTACLE - NEMA 5-20R UOI - DECORA STYLE
	QUADRUPLEX RECEPTACLE - DECORA STYLE
+42 CT	HEIGHT IN INCHES ABOVE FINISHED FLOOR TO THE CENTERLINE OF DEVICE.DECORA STYLE. CT = COUNTER TOP HEIGHT (CONTRACTOR SHALL VERIFY PRIOR TO ROUGH IN).
WP	WEATHERPROOF RECEPTACLE
USB	NEMA 5-20R USB CHARGER DUPLEX RECEPTACLE, MOUNTED 18" AFF (UON) PROVIDE DEVICE SIMILAR TO HUBBELL #USB20AC5W WITH 5 AMP, 5 VOLT USB OUTPUT PROVIDE WITH STAINLESS STEEL COVERPLATE AND CIRCUIT NUMBER
G or (1)	GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE - DECORA STYLE
	SPECIAL RECEPTACLE - VERIFY NEMA CONFIGURATION
$	DECORA STYLE SWITCH: SINGLE-POLE
$ 3	DECORA STYLE SWITCH: THREE-WAY
$ 4	DECORA STYLE SWITCH: FOUR-WAY
$ VS OS	WALL MOUNTED SELF ADJUSTING DUAL TECHNOLOGY OCCUPANCY/VACANCY SENSOR WITH MANUAL CONTROL, BLINDERS, AND A NEUTRAL, REFER TO DETAILS FOR MORE INFORMATION, OTHERWISE BID LEVITON OSSMT-MDW, OR APPROVED EQUAL BY ENGINEER. REFER TO ARCHITECT FOR FINISH COLOR.
VS / VS	CEILING MOUNTED VACANCY W/ DAYLIGHT SENSOR WITH BUILT IN DAYLIGHT SENSOR. REFER TO DETAILS FOR SELECTIONS OTHERWISE BID LEVITON O4C20-MDW FOR 2,000 SQ.FT. COVERAGE; OR APPROVED EQUAL BY ENGINEER. REFER TO ARCHITECT FOR FINISH.
KP1	LUTRON 5-BUTTON CONTROLLER WITH RAISE LOWER MODEL #QSWS2-5BRLI-WH-NST AND LUTRON 2-BUTTON CONTROLLER WITH RAISE LOWER #QSWS2-2BRLI-WH-NST.
XX	DATA WALL OUTLET. XX = QUANTITY OF CAT 6 CABLES
	FLOOR DATA OUTLET ON FLUSH WATERTIGHT FLOOR BOX. REFER TO DETAILS FOR MORE INFORMATION. IF NONE PROVIDED BID AN FSR COMBO FLOOR BOX.
J	JUNCTION BOX
J BAS	JUNCTION BOX FOR BUILDING AUTOMATION SYSTEM DEVICE INTERFACE. EXACT LOCATION AND MOUNTING. TO BE FIELD COORDINATED WITH DIVISION 25.
J SC	JUNCTION BOX FOR BMCS SECURITY DEVICE INTERFACE. EXACT LOCATION AND MOUNTING TO BE FIELD COORDINATED WITH DIVISION 25.
J FA	JUNCTION BOX FOR FIRE ALARM DEVICE. REFER TO DIVISION 28 FOR EXACT LOCATION AND MOUNTING.
	SERVICE SWITCHBOARD AND/OR SWITCHGEAR. (U.O.I.)
	POWER DISTRIBUTION PANEL (U.O.I.)
	PANELBOARD (XX = PANEL NAME) REFER TO PANEL SCHEDULES FOR MORE INFORMATION.
	BUS DUCT RISER (FEEDER AND/OR PLUG-IN BUS)
	4"x1/4"x20" TMGB GROUND BAR SIMILAR TO CHATWORTH 40153-020 WITH STAND OFF BRACKETS, INSULATORS, STAINLESS STEEL BOLTS.
TTB	4'x8' FIRE RETARDANT TELEPHONE BOARD.
	MOTOR
	FUSED OR NON-FUSED DISCONNECT SWITCH
3P-30/NF NEMA '0'	3Ø COMBINATION MOTOR CONTROLLER / FUSED OR NON-FUSED DISCONNECT SWITCH
$	1Ø COMBINATION MOTOR RATED SWITCH WITH OVERLOAD PROTECTION.
CB	ENCLOSED CIRCUIT BREAKER IN NEMA 1 ENCLOSURE AND/ OR BUS PLUG
	EXIT SIGN - SINGLE FACE.
	EXIT SIGN - SINGLE FACE WITH DIRECTIONAL ARROWS.
	EXIT SIGN - DOUBLE FACE WITH DIRECTIONAL ARROWS.
	CIRCUIT BREAKER
	FUSE
	DRAW-OUT CIRCUIT BREAKER DEVICE
	SINGLE-POLE, SINGLE-THROW SWITCH
	AUTOMATIC TRANSFER SWITCH
T	POWER TRANSFORMER
K	KIRK-KEY INTERLOCK
GI	GROUND FAULT FOR INDICATION ONLY DEVICE
ST	SHUNT-TRIP BREAKER
M	ELECTRIC SERVICE METER

ELECTRICAL ABBREVIATIONS

1PH	SINGLE-PHASE
3PH	THREE-PHASE
4W	FOUR-WIRE
A/C UNIT	AIR CONDITIONING UNIT
A/E	ARCHITECT/ENGINEER
AC	ALTERNATING CURRENT OR ARMORED CABLE
AF	AMPERE FRAME OR AMP FUSE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AIC	AMPERE INTERRUPTING CAPACITY
AMP	AMPERE
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
BFF	BELOW FINISH FLOOR
BFG	BELOW FINISH GRADE
BRKR	BREAKER
C	CONDUIT
CCTV	CLOSED CIRCUIT TELEVISION
cd	CANDELA
CD	CONSTRUCTION DOCUMENTS
CF	CONTRACTOR FURNISHED
CF/CI	CONTRACTOR FURNISHED/CONTRACTOR INSTALLED
CF/OI	CONTRACTOR FURNISHED/OWNER INSTALLED
CKT	CIRCUIT
CKT BRKR	CIRCUIT BREAKER
CLG	CEILING
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CPT	CONTROL POWER TRANSFORMER
CRI	COLOR RENDERING INDEX
CT	CURRENT TRANSFORMER
CU	COPPER
CU FT	CUBIC FEET
dB	DECIBEL
DC	DIRECT CURRENT
DCP	DIMMER CONTROL PANEL
DEMO	DEMOLITION
DDC	DIRECT DIGITAL CONTROL PANEL
DISC	DISCONNECT
DPDT	DOUBLE POLE, DOUBLE THROW
DPST	DOUBLE POLE, SINGLE THROW
DRSW	DOOR SWITCH
DS	DISCONNECT SWITCH
DWG	DRAWING
EF	EXHAUST FAN
ELEC	ELECTRIC OR ELECTRICAL
EMER	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EPO	EMERGENCY POWER OFF
EDF	ELECTRIC DRINKING FOUNTAIN
EWH	ELECTRIC WATER HEATER
EXST	EXISTING
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FC	FOOTCANDLE
FLA	FULL LOAD AMPS
FMC	FLEXIBLE METALLIC CONDUIT
FT	FEET OR FOOT
FU SW	FUSED SWITCH
FVNR	FULL VOLTAGE NON-REVERSING
G OR GND	GROUND OR GENERATOR
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HZ	HERTZ
IMC	INTERMEDIATE METAL CONDUIT
IR	INFRARED
IWH	INSTANTANEOUS WATER HEATER
J-BOX	JUNCTION BOX

KV	KILOVOLT
KVA	KILOVOLT AMPERE
KVAH	KILOVOLT AMPERE PER HOUR
KVAR	KILOVOLT AMPERE REACTIVE
KW	KILOWATT
KWH	KILOWATT HOUR
LED	LIGHT EMITTING DIODE
LF	LINEAR FEET (FOOT)
LM	LUMEN
LRA	LOCKED ROTOR AMPS
LTG	LIGHTING
LTNG	LIGHTNING
LV	LOW VOLTAGE
MC	METAL-CLAD
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MECH	MECHANICAL
MIN	MINIMUM
MOCP	MAXIMUM OVERCURRENT PROTECTION
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTS	MANUAL TRANSFER SWITCH
NA	NOT APPLICABLE
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NSL	NON SWITCHED HOT LEG
NTS	NOT TO SCALE
P	POLE OR PHASE
PA	PUBLIC ADDRESS
PB	PULL BOX, OR PUSHBUTTON
PED	PEDESTAL
PEND	PENDANT
PF	POWER FACTOR
PH	PHASE
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE (PLASTIC)
PWR	POWER
RCP	REFLECTED CEILING PLAN
RECPT	RECEPTACLE
RGS	RIGID GALVANIZED STEEL
REQD	REQUIRED
SD	SMOKE DETECTOR
SF	SQUARE FOOT (FEET)
SPEC	SPECIFICATION
SPST	SINGLE POLE, SINGLE THROW
SURF	SURFACE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TC	TIME CLOCK
TEL	TELEPHONE
TP	TWISTED PAIR
TPS	TWISTED PAIR SHIELDED
TTB	TELEPHONE TERMINAL BOARD
TYP	TYPICAL
UGND	UNDERGROUND
UL	UNDERWRITERS LABORATORY
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLT
VA	VOLT AMPERE
VAR	VOLT AMPERE REACTIVE
VFD	VARIABLE FREQUENCY DRIVE
W	WATT
WP	WEATHERPROOF
XFER	TRANSFER
XFMR	TRANSFORMER

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ISSUES AND REVISIONS

NO	DATE	DESCRIPTION
	07-22-2019	ISSUED FOR PERMIT
	08-16-2019	ISSUED FOR BID
1	08-26-2019	ADDENDUM 2

STATE OF TEXAS
DAVIA ANN GERNAND
109903
LICENSED
PROFESSIONAL ENGINEER
26 AUG 2019

GH SCHOOL
4724 N MAIN STREET

SHEET TITLE
SCHEDULES NOTES & LEGEND

SHEET NUMBER
E101

PROJECT # 19.02

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