ELECTRICAL DESIGN CRITERIA AND ADDITIONAL PROJECT REQUIREMENTS

1. General:
   - A. Entire Installation Shall Comply With All Local And State Codes And Other Authorities Having Jurisdiction.
2. Applicable Codes And References:
   - A. International Building Code (IBC), 2012 Edition
   - B. National Electric Code (NEC), 2017 Edition
3. Seismic:
   - A. All Support Systems (Supports, Hangers, Anchors, Guides, Bracing, Fasteners, Welds, Etc.) For Equipment And Systems Installed Or Revised As Part Of This Contract Shall Be Designed, Selected And Installed By The Contractor To Resist All Seismic, Wind And Gravity Loads. The Codes Listed Under The "Design Criteria" Section Of These Documents Have Specific Requirements Concerning The Application Of These Loads As Well As Other Design Requirements. Under Certain Conditions, The Applicable Codes Require These Loads, Or A Combination Of These Loads, Be Considered As "Coincidental". The Contractor Shall Also Be Responsible For Confirming That The Component Of The Building Structure Where These Support Systems Are Attached Is Able To Resist The Design Loads Transferred To This Building Component. The Contractor Is To Provide Seismic Design Drawings And Details From A Seismic Engineer. The Drawings Are To Be Signed And Sealed.

ELECTRICAL GENERAL NOTES

1. General:
   - A. Electrical Wiring
     1) In General, Branch Circuit Wiring Is Not Shown On The Plan Drawings. Numerals Adjacent To Symbols For Lighting Fixtures, Receptacles, Motors, Appliances, Etc. Indicate The Panelboard And Circuit Number To Which The Item Is To Be Connected. Provide Branch Circuit Wiring For All Items Shown In Accordance With These General Notes And The Electrical Specifications.
     2) Lower Case Letters Adjacent To Lighting Fixture Symbols And Light Switch Symbols Indicate The Switching Arrangement Of Lighting Fixtures. Lower Case Letters May Not Be Shown Where Light Switches Only Control The Lighting Fixtures Within The Same Room Or Area.
     3) Lighting Branch Circuit Wiring, Where Shown, Is Intended To Show Specific Routing Requirements.
     4) Connect Emergency Lighting Fixtures To The Line (Unswitched) Side Of The Lighting Circuit Serving That Area. Connect Emergency Lighting Units Serving Outdoor Areas To Outdoor Lighting Circuits.
     5) Mechanical Equipment (Motors, HVAC Equipment, Etc.) Is Shown On Electrical Plan Drawings For Approximate Location Only. Refer To Mechanical Plans For Exact Locations.
     6) All 1 Pole, 15 And 20 Ampere Branch Circuits Serving Receptacles Or Lighting Shall Be 2 Wire Circuits Providing An Individual Neutral Conductor For Each Ungrounded (Hot) Circuit Conductor. Do Not Share Neutral Conductors.
     7) The Minimum Branch Circuit Wiring Size Shall Be 2#12, #12G Unless Specifically Noted Otherwise.
   - B. Wiring Methods
     1) General
        - a. In Finished Areas, Conceal All Wiring In Building Walls, Floors, And Above Finished Ceilings. Wiring May Be Run Exposed In Mechanical/Electrical Equipment Rooms, Electrical Closets, Utility Rooms And Unfinished Basements. No Wiring Shall Be Installed Exposed On The Outside Surfaces Of The Building(s).
        - b. Final Connections To Mechanical Equipment, Lighting Fixtures, Motors, Transformers, Instruments, And Control Devices Shall Be Flexible Conduit.

     2) Indoors (Unclassified)

a. In Dry Walls / Above Ceilings:	EMT Conduit (Type MC Metal Clad Cable May Be Used For 15 And 20 Amp, 1 Pole Branch Circuits)
b. In Concrete Walls / Floors:	RGS Conduit
c. Final Connections:	Flexible Metal Conduit (Liquid-Tight Flexible Conduit In Damp Or Wet Areas)
d. Exposed:	EMT Conduit With Steel Screw Fittings

     3) On Roofs
        - a. EMT With Rain Tight Steel Fittings On Supports Minimum 4" Above Roof. Installation Shall Not Interfere With Roof Integrity.
   - C. Equipment Grounding
     1) Insulated (Green) Equipment Ground Wires Shall Be Provided In All Feeders And Branch Circuits. Utilizing The Conduit As The Grounding Path Is Not Acceptable.
   - D. Electrical Equipment Enclosures Shall Be Provided As Listed Below Unless Noted Otherwise.
     1) Indoors Unclassified Areas — NEMA 1
     2) Indoors Classified 'Damp' — NEMA 1
     3) Outdoors — NEMA 3R
     4) Indoors Classified 'Wet' — NEMA 4
   - E. Electrical Terminations (Lugs, Terminals, Etc.) On All Equipment Shall Be Rated For Use With [illegible] Conductor.
   - F. In Accordance With The NEC Article 110.16, All Switchboards (Each Section), Panelboards, Enclosed Breakers/Switches, Transfer Switches, Transformers, Motor Starters, Contactors, Industrial Control Panels, Meter Socket Enclosures, And Motor Control Centers Shall Be Field Marked To Warn Qualified Persons Of Potential Electric Arc Flash Hazards. The Marking Shall Be Located So As To Be Clearly Visible To Qualified Persons Before Examination, Adjustment, Servicing, Or Maintenance Of The Equipment.
   - G. Lighting And Power Panels
     1) Panels Shall Be Factory Assembled, Thermal Magnetic Circuit Breaker Type, Trip Free, With Trip Settings And Number Of Poles As Indicated On The Drawings. Two And Three Pole Circuit Breakers Shall Be Of The Common Trip Type. Bussing Shall Be Copper And Arranged For Sequence Phasing.
        - a. For Renovations, Expansions, Alterations, Etc., New Panels Shall Be Same Manufacturer As Existing Panels.
     2) Panels Shall Be Of Dead Front Construction With Single Door And Hinged Cover And Code-Gauge Galvanized Steel Back Box, With Lock And Key. A Typewritten Circuit Identification Directory, Indicating The Use Of Each Branch Circuit And Designating Spare Circuits, Shall Be Furnished On The Inside Of The Panel. Handwritten Directories Are Not Acceptable.
     3) Circuit Breakers Shall Be The Bolt-In Type And Be Arranged Using Double Row Construction. Panelboards Shall Be Fully Rated. Series Rated Breakers Are Not Acceptable. AIC / SCCR Ratings Shall Be Coordinated In Field Based On Available Fault Current.
   - H. Modification To Existing Panels
     1) Furnish Labor And Material To Provide Circuit Breakers And Necessary Bus Details To Provide Additional Circuit Breakers In Existing Spaces. Breakers Shall Have Trip Rating And Number Of Poles As Indicated Or Required. Other Breaker Characteristics Shall Match Existing.
     2) Re-Assign Circuits To Re-Phase Panel As Required By New Work. Update Panel Directory To Accurately Reflect Changes.
   - I. Panelboard Load Balancing
     1) Balance Loads On Each Phase Of All Panelboards So That Phase Currents Are Within 20% Of Each Other, Or As Accepted By The AHJ.
   - J. Raceways
     1) Electric Metallic Tubing (EMT): Hot Dipped Galvanized, Mild Steel Tube, Exterior Coated And Corrosion Resistant Interior Coating, As Manufactured By Allied, Republic, Wheatland, Or Equal.
     2) Flexible Metal Conduit: Hot Dipped Galvanized, Single Strip Interlocked Construction As Manufactured By Electri-Flex Company, Or Equal.
     3) Metal Clad Cable: Type MC, Copper Conductors, 600 Volt Thermoplastic Insulation, 90 Degree, Galvanized Interlocked Steel Strip Armor, With Insulated Ground Conductor.
     4) Minimum Raceway Size Shall Be 3/4" Trade Size.
     5) Provide Raceways Complete With Boxes, Fittings And Accessories.
     6) Any Exposed Raceways Shall Be True, Plumb, And Run Parallel With, Or At Right Angles To, Walls.
     7) Provide Clearance With Water Piping. Minimum 3 In. From Pipe Cover At Crossings And 6 In. For Parallel Runs. Horizontal Raceways Shall Be Run Above Water Piping.
     8) For Empty Raceways Over 10 Ft. Long Provide Fish Or Pull Wire, Galvanized Or Nylon Rope.
   - K. Wire, Cable, And Terminations
     1) Provide Wire And Cable Complete With Accessories. Size Reference Shall Be American Wire Gauge (AWG) Except As Noted.
     2) Conductors Shall Be Copper, ASTM Standard Solid (No. 10 And Smaller) And Stranded (No. 8 And Larger).
     3) Insulation Shall Meet ASTM And ICEA Standards. Voltage Rating Shall Be Minimum 600 Volt.
        - a. Indoor Dry Locations: Heat-Resistant Thermoplastic, Type THHN.
        - b. Moist Or Wet Locations: Thermoplastic 600 Volt Code Type THWN.
        - c. Underground Or In Slab: Cross-Linked Polyethylene Insulation, Type XHHW.

PARTIAL SYMBOLS & ABBREVIATIONS

Identifier	Description
XXX/XX	Equipment Type Equipment Number
#	Kitchen Equipment Tag
	Duplex Receptacle 20A, 120V - 18" AFF
GFI	Ground Fault Interrupting Receptacle, 20A, 120V - 18" AFF
GFI	Ground Fault Interrupting, Mounted High Or Above Counter Duplex Receptacle, 20A, 120V
	Mounted High Or Above Counter Duplex Receptacle, 20A, 120V
	Double Duplex (Quad) Receptacle, 20A, 120V - 18" AFF
	Special Receptacle As Noted On Plan
	Flush Mounted Floor Box With Power, Data And Voice Outlets
	Special Receptacle As Noted On Plan
J	Junction Box, Wall Or Ceiling Mtd
	Panel Board, Flush Or Surface Mtd
	Unfused Safety Switch - Sized Per Equipment Requirements
S	AC General Use Snap Switch, 20A, 120-277 VAC - 48" AFF
S3	Three-Way Switch, 20A, 120-277 VAC - 48" AFF
SD	Dimmer Switch, 20A, 120-277 VAC - 48" AFF
	Ceiling Mounted Dual Technology Occupancy Sensor
	Exit Sign, Wall Or Ceiling Mounted, Shaded Area Denotes Lighted Face, Chevrons As Shown On Plans
	Shading Indicates That Fixture Includes An Emergency Ballast
or	Panel Board, Flush Or Surface Mtd
F	Manual Pull Station
	Strobe Only
F	Horn/Strobe
SD ER	Smoke Detector (ER Indicates Elevator Recall)
R	Heat Detector, Combination Fixed Temperature And Rate Of Rise
194 H	Heat Detector, Fixed Temperature (135°F Standard Or As Shown)
FACP	Fire Alarm Control Panel
FARA	Fire Alarm Remote Annunciator Panel
ANS	Ansul System Control Panel
SDD	Duct Mounted Smoke Detector W/ Addressable Control Relay & Remote Indicator

Identifier	Description
AFF	Above Finished Floor
FACP	Fire Alarm Control Panel
GFI, GFCI	Ground Fault Circuit Interrupter
JB, J	Junction Box
NEC	National Electrical Code
P	Panel
WP	Weatherproof
XFMR	Transformer

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