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Date	Description
05-17-24	ISSUE FOR PERMIT, PRICING, AND CONSTRUCTION

Seal / Signature

Project Name

Woodlands Township - Office Renovation

Project Number

02.9171.000

Description

ELECTRICAL SPECIFICATIONS

Scale

E7.02

B.	The commissioning provider (Commissioning authority) shall be responsible for leading the entire construction team through the commissioning process including, but not limited to, conducting the commissioning kick-off meeting, preparing the commissioning plan, preparing pre-functional checklists, preparing functional test scripts, participation in functional testing and preparation of required documentation and reports.																																																														
1.2	RESPONSIBILITIES																																																														
A.	Subcontractors and vendors shall prepare and submit to Commissioning Agent proposed Startup procedures to demonstrate proper installation of systems, according to these specifications and checklists prepared by Commissioning authority.																																																														
B.	Electrical contractor shall provide a letter certifying the installed lighting controls meet documented performance criteria specified in the commissioning plan within 90 days of substantial completion.																																																														
1.3	COMMISSIONING PLAN																																																														
A.	Commissioning Process tasks and activities:																																																														
	<ol style="list-style-type: none"><li>Commissioning kick-off meeting: Conducted by commissioning authority and attended by construction team and design team.</li><li>Pre-functional checklists: Prepared by the commissioning authority and filled out by subcontractors performing the work that is applicable.</li><li>Site visits to review installation of applicable systems and progress of checklist documentation performed and reported by commissioning authority.</li><li>Functional testing: Commissioning authority shall conduct functional testing with assistance of applicable subcontractors and document successful results as well as deficiencies (issues). Functional performance testing shall demonstrate the installation and operation of components, systems, and system-to-system interfacing in accordance with plans and specifications.</li><li>Preliminary commissioning report: Commissioning authority shall issue a preliminary commissioning report to the owner that has results of the first round of functional testing including deficiencies discovered.</li><li>Systems manual: Commissioning authority shall compile the systems manual using submittal data provided by the general contractor and applicable subcontractors.</li><li>Final commissioning report: Commissioning authority shall issue final commissioning report documenting the entire process and final results of functional testing. Report shall include final testing and balancing report.</li></ol>																																																														
B.	Electrical System Equipment to be tested																																																														
	<ol style="list-style-type: none"><li>Occupancy sensors.</li><li>Time switch controls</li><li>Daylighting controls.</li><li>Electrical Service and Distribution System.</li></ol>																																																														
C.	Testing functions and conditions																																																														
	<ol style="list-style-type: none"><li>Daylighting control devices<ol style="list-style-type: none"><li>Verify the devices have been calibrated, properly located and adjusted.</li><li>Loads adjust to light level set points in response to daylight.</li><li>Location of calibration equipment is accessible to authorized personnel only.</li></ol></li><li>Time switches<ol style="list-style-type: none"><li>Verify schedule, time, date and programming is accurate.</li><li>Verify override time limit is set, battery is installed and switch operates the lights that are specified in the design documents.</li><li>All specified lights can be turned on and off by area control switch.</li><li>Manual override switch allows only the lights in the space where the switch is located turn on or remain on until next scheduled shut off.</li></ol></li><li>Occupant sensors<ol style="list-style-type: none"><li>Certify the sensor has been located and aimed in accordance with manufacturer recommendations.</li><li>For projects with fewer than seven sensors, each sensor shall be tested.</li><li>For projects with more than seven occupant sensors, testing shall be done for each unique combination of sensor type and space geometry. Where multiples of each combination are provided not less than 10 percent shall be tested.</li><li>Verify correct operation of status indicators.</li><li>Controlled lights turn off or down to the permitted level with in the required time.</li><li>For auto-on sensor, the lights turn-on to the permitted level when an occupant enters space.</li><li>Verify the lights are not incorrectly turned-on by movement in adjacent areas or by HVAC operation.</li></ol></li><li>Electrical Service and Distribution System<ol style="list-style-type: none"><li>Document the ground resistance testing performed by contractors.</li><li>Document electrical subcontractor has adjusted breakers to setting recommended by coordination study.</li><li>Document that any required infrared studies are performed.</li><li>Document testing of transformer insulation and voltage drop.</li><li>Document any other testing requirements have been fulfilled as required within specifications.</li></ol></li></ol>																																																														
D.	Performance criteria																																																														
	<ol style="list-style-type: none"><li>Daylighting controls shall maintain specified light levels within 5% of design.</li><li>All time switches shall be accurate to time on cellular network devices.</li></ol>																																																														
PART 2 - PRODUCTS																																																															
2.1	NO PRODUCTS SUPPLIED																																																														
PART 3 - EXECUTION																																																															
3.1	GENERAL																																																														
A.	This Division has startup responsibilities and are required to complete sub-systems so COMPLETE SYSTEMS are fully functional. Insuring they meet design requirements of Contract Documents. Commissioning procedures and testing do not relieve or lessen this responsibility or shift this responsibility, in whole or in part, to Commissioning Agent or Owner.																																																														
B.	Coordinate with other Sub-Contractors and equipment vendors to set aside adequate time to address Pre-Functional Checklists, Functional Performance Tests, Operations & Maintenance Manual creation, Owner Training, and associated coordination meetings.																																																														
3.2	WORK PRIOR TO COMMISSIONING																																																														
A.	Complete all phases of the work so the systems can be started, adjusted, balanced and otherwise tested.																																																														
B.	Assist Commissioning Agent with all information pertaining to actual equipment and installation as required complete the full commissioning scope.																																																														
C.	Contractor shall prepare startup procedures to demonstrate compliance with pre-functional checklists, and coordinate scheduling for completion of these checklists.																																																														
3.3	PARTICIPATION IN COMMISSIONING																																																														
A.	Attend meetings related to the Commissioning Process; arrange for attendance by personnel and vendors directly involved in the project, prior to testing of their systems.																																																														
3.4	WORK TO RESOLVE DEFICIENCIES																																																														
A.	Complete corrective work in a timely manner to allow expeditious completion of Commissioning Process. If deadlines pass without resolution of identified problems, Owner reserves the right to obtain supplementary services and/or equipment to resolve the problem. Costs thus incurred will be Contractor's responsibility.																																																														
3.5	PRE-FUNCTIONAL CHECKLISTS (PFC)																																																														
A.	Contractor shall complete Pre-Functional Checklists to validate compliance with Contract Documents installation and start-up requirements, for this Division's systems.																																																														
3.6	FUNCTIONAL PERFORMANCE TESTING (FPT)																																																														
A.	Contractor, in cooperation with Commissioning Agent, shall conduct Functional Performance Testing to validate compliance with Contract Documents.																																																														
3.7	TRAINING																																																														
A.	Contractor shall be responsible for training coordination and scheduling, and ultimately to ensure that training is completed.																																																														
3.8	OPERATIONS & MAINTENANCE MANUALS																																																														
A.	Contractor shall compile and prepare documentation for equipment and systems specified in this Division, and shall deliver documentation to Contractor for inclusion in Operation & Maintenance Manuals, in accordance with requirements of Division 01, prior to training Owner personnel.																																																														
3.9	DOCUMENTATION																																																														
A.	Commissioning authority shall provide documentation of process as follows:																																																														
	<ol style="list-style-type: none"><li>Preliminary commissioning report including test procedures, results of testing, itemization of deficiencies, deferred tests and climatic conditions required for performance of deferred tests. Preliminary commissioning report shall be issued to owner to demonstrate the first pass of testing has occurred and to demonstrate compliance with applicable codes.</li><li>Final commissioning report shall include the final test and balance report, final results of functional testing, disposition of deficiencies discovered during testing, including the details of corrective measures used and functional testing procedures used for repeatability of testing in the future.</li></ol>																																																														
SECTION 26 08 36																																																															
LIGHTING CONTROLS (STAND-ALONE)																																																															
PART 1 - GENERAL																																																															
1.1	SCOPE																																																														
A.	Electrical contractor shall provide a complete lighting control system that controls all interior and exterior lighting fixtures, including emergency fixtures. All lighting controls shall be stand-alone, and shall not have any communication with adjacent spaces. It is the contractor's responsibility to provide a complete and functional system, including, but not limited to all room controllers, switch packs, power packs, occupancy sensors, low voltage control stations, emergency bypass controllers, low voltage control cable, even if not specifically called out on the plans.																																																														
1.2	SUMMARY																																																														
A.	Section Includes:																																																														
	<ol style="list-style-type: none"><li>Digital Occupancy and Daylighting Sensor Control</li><li>Control Intent – Control Intent includes, but is not limited to:<ol style="list-style-type: none"><li>Defaults and initial calibration settings for such items as time delay, sensitivity, fade rates, etc.</li><li>Initial sensor and switching zones</li><li>Initial time switch settings</li><li>Task lighting and receptacle controls</li><li>Emergency Lighting control</li></ol></li></ol>																																																														
1.3	REFERENCES																																																														
A.	ICC (IECC) - International Energy Conservation Code.																																																														
B.	NFPA 70 - National Electrical Code.																																																														
C.	UL 924 - Emergency Lighting and Power Equipment.																																																														
1.4	SYSTEM DESCRIPTION & OPERATION																																																														
A.	The Lighting Control system as defined under this section covers the following equipment:																																																														
1.	Room Controllers – Self-configuring and field-configurable, one, two or three relays controllers, 0-10 volt control for drivers (if applicable).																																																														
2.	Low Voltage Occupancy/Vacancy Sensors – Self-configuring or field-configurable, Low Voltage, calibrated occupancy sensors, Dual technology or PIR as described by this specification.																																																														
3.	Low Voltage On/Off Switches – Self-configuring or field-configurable, Low Voltage pushbutton switches, that may contain one, two, three, or four control zone capability per device.																																																														
4.	Configuration Tools – Handheld remote for room configuration provides two-way infrared (IR) communications to digital devices and allows complete configuration and reconfiguration of the device / room from up to 30 feet away. Unit to have, at a minimum, simple pushbutton interface and allow send/receive of room variables and occupancy/vacancy/photoeye/light sensor settings.																																																														
5.	Emergency Lighting Control Unit (ELCU) – allows a standard lighting control device to control emergency lighting in conjunction with normal lighting in any area within a building. Under loss of normal power, the ELCU shall bypass any control device and ensure fixtures are enabled at 100% light output. Comply with UL 924 and UL 1008 as applicable for each instance. Comply with 26 51 19.																																																														
1.5	SUBMITTALS																																																														
A.	Shop Drawings:																																																														
	<ol style="list-style-type: none"><li>Composite wiring and/or schematic riser diagram of each control circuit as proposed to be installed (standard diagrams will not be accepted).</li></ol>																																																														
1.6	WARRANTY																																																														
A.	Provide a five year complete manufacturer's warranty on all products to be free of manufacturers' defects.																																																														
PART 2 - PRODUCTS																																																															
2.1	ACCEPTABLE MANUFACTURERS																																																														
A.	WattStopper																																																														
B.	Cooper/ILC/Greengate																																																														
C.	Sensorworx																																																														
2.2	ALL OCCUPANCY SENSORS (CEILING OR WALL SWITCH)																																																														
A.	Passive infrared sensors shall utilize Processing protocols to respond only to those signals caused by human motion.																																																														
B.	Passive infrared sensors shall provide high immunity to false triggering from RFI (hand-held radios) and EMI (electrical noise on the line).																																																														
C.	Dual technology sensors shall consist of passive infrared and ultrasonic technologies for occupancy detection. Products that react to noise or ambient sound shall not be considered.																																																														
D.	Where specified, sensor shall have an internal additional isolated relay with Normally Open, Normally Closed and Common outputs for use with HVAC control, Data Logging and other control options. Sensors utilizing separate components or specially modified units to achieve this function are not acceptable.																																																														
E.	All devices shall be hard wired. No wireless devices shall be permitted.																																																														
2.3	WALL-SWITCH OCCUPANCY SENSOR																																																														
A.	Manual-ON, Automatic-OFF dual technology (passive infrared and ultrasonic) wall switch occupancy sensor. Furnish the Company's model which suits the electrical system parameters, and accommodates the square-foot coverage and wattage requirement for each area (and type of lighting) controlled.																																																														
B.	Wall switch sensors shall accommodate loads from 0 to 800 watts at 120 volts; 0 to 1200 watts at 277 volts and shall have 180' coverage capability.																																																														
C.	Where specified, wall switch sensors shall provide a field selectable option to convert sensor operation from automatic-ON to manual-ON.																																																														
2.4	WALL OR CEILING MOUNTED OCCUPANCY SENSOR SYSTEM																																																														
A.	Ceiling mounted (to suit installation) passive infrared (PIR), ultrasonic or dual technology digital (passive infrared and ultrasonic) occupancy sensor, provide the Company's system which accommodates the square-foot coverage requirements for each area controlled, utilizing room controllers, occupancy sensors and accessories which suit the lighting and electrical system parameters. Passive infrared only sensors shall not be used for classroom applications.																																																														
2.5	WALL SWITCHES																																																														
A.	Low voltage momentary pushbutton switches in 1, 2, 3, 4, 5 and 6 button configuration; available in white, light almond, ivory, grey and black; compatible with wall plates with decorator opening. Wall switches shall include the following features:																																																														
	<ol style="list-style-type: none"><li>Removable buttons for field replacement with engraved buttons and/or alternate color buttons. Button replacement may be completed without removing the switch from the wall.</li><li>Configuration LED on each switch that blinks to indicate data transmission.</li></ol>																																																														
B.	RJ-45 ports, or other manufacturer provided wiring method, for connection of devices on a common system.																																																														
C.	Plug and play technology. Devices in the same room may be interconnected together and operate in default mode without any programming. Devices in a common space may be connected together, in a manner to be described and installed by the manufacturer's installation guidelines and requirements.																																																														
2.6	ROOM CONTROLLERS																																																														
A.	Room Controllers automatically bind the room loads to the connected devices in the space without commissioning or the use of any tools. Room Controllers shall be provided to match the room lighting load and control requirements. The controllers shall be simple to install and may contain dip switches, potentiometers, or other easily adjustable field devices to allow for easy modification. All shall include the following features:																																																														
	<ol style="list-style-type: none"><li>Automatic room configuration to the most energy-efficient sequence of operation based upon the devices in the room.</li><li>Simple replacement - Using the default automatic configuration capabilities, a room controller may be replaced with an off-the-shelf unit without requiring any configuration or setup.</li><li>Plenum rated</li><li>Dual voltage (120/277 VAC, 60 Hz)</li></ol>																																																														
B.	On/Off/Dimming enhanced Room Controllers shall include:																																																														
	<ol style="list-style-type: none"><li>One, two or three relay configuration</li><li>RJ-45 local ports or other manufacturer provided wiring connection methods for connection to other devices on the same system</li><li>One 0-10 volt analog output per relay for control of compatible ballasts and LED drivers.</li></ol>																																																														
2.7	EMERGENCY LIGHTING																																																														
A.	Emergency Lighting Control Unit - A UL 924 listed device that monitors a switched circuit providing normal lighting to an area. The unit provides normal ON/OFF control of emergency lighting along with the normal lighting. Upon normal power failure the emergency lighting circuit will close, forcing the emergency lighting ON until normal power is restored. Features include:																																																														
B.	Include fire alarm interface with all UL 924 and UL 1008 devices.																																																														
2.8	POWER PACKS																																																														
2.9	INSTALLATION																																																														
A.	Contractor must arrange virtual or phone meeting with the manufacturer before project rough-in to ensure the hardware, cabling, and overall system requirements are understood and met.																																																														
B.	Test all devices to ensure proper communication.																																																														
C.	Tighten all panel Class I conductors from both circuit breaker and to loads to torque ratings as marked on enclosure UL label.																																																														
D.	All Class II cabling shall enter enclosures from within low-voltage wiring areas and shall remain within those areas. No Class I conductors shall enter a low-voltage area.																																																														
E.	Run separate neutrals for any phase dimmed branch load circuit. Different types of dimming loads shall have separate neutral.																																																														
F.	Contractor shall provide to the manufacturer all quantities for system including but not limited to relays, room controllers, relay panels, plug load controllers, switches, sensors and wire lengths and configurations for device cable at least 1 week before bid.																																																														
G.	Provide J-hooks for supporting all low-voltage cabling at a spacing not to exceed 5 ft. between hooks.																																																														
H.	The lighting control system must function within the guidelines stated in the lighting control sequence of operation notes, details, matrices, and narratives on the plans.																																																														
2.10	COMMISSIONING																																																														
A.	Upon completion of the installation, the system shall be commissioned by a commissioning agent representative who will verify a complete fully functional system is installed as required by plans and specifications.																																																														
SECTION 26 27 26																																																															
WIRING DEVICES																																																															
PART 1 - GENERAL																																																															
1.1	SCOPE																																																														
A.	The types of wiring devices required include:																																																														
	<ol style="list-style-type: none"><li>Switches</li><li>Receptacles</li><li>Occupancy Sensors</li><li>Digital Timer Switches</li><li>Coverplates</li></ol>																																																														
1.2	QUALITY ASSURANCE																																																														
A.	All wiring devices shall comply with NEMA WD 1 and NEMA WD 6 as well as FS W-C-596 and FS W-S-896 as applicable.																																																														
B.	All switches shall comply with UL 20 as applicable.																																																														
C.	All receptacles shall comply with UL 498 as applicable.																																																														
D.	All GFCI receptacles shall comply with UL 943.																																																														
E.	All USB charging receptacles shall comply with UL 1310.																																																														
F.	All AFCI receptacles shall comply with UL 1699.																																																														
1.3	ACCEPTABLE MANUFACTURERS																																																														
A.	Hubbell																																																														
B.	Leviton																																																														
C.	Pass & Seymour																																																														
1.4	SUBMITTALS																																																														
A.	Shop drawings shall include but not be limited to:																																																														
	<ol style="list-style-type: none"><li>Cut sheets of all devices indicating NEMA configuration, rating, materials, color, and all accessories.</li><li>Cut sheets of all coverplates indicating materials, color and any engraving specified on drawing or in the specifications.</li></ol>																																																														
PART 2 - PRODUCTS																																																															
2.1	MATERIALS AND COMPONENTS																																																														
A.	GENERAL																																																														
	<ol style="list-style-type: none"><li>Architect reserves the right to select wiring device styles and colors to match wall finish.</li></ol>																																																														
2.2	SWITCHES																																																														
A.	Provide specification grade White decoara style rocker switches where indicated on the Drawings. Provide "Red" switches for switching emergency lighting circuits where switching is indicated. Coordinate exact locations with architect.																																																														
	<ol style="list-style-type: none"><li>Wall switches shall be 20 amp, 120-277 volt and shall be Hubbell Decorator Series, Leviton, Decora or Pass &amp; Seymour Decorator, as follows: <table><tr><th>ROCKER/DECORATOR SWITCHES</th><th>HUBBELL</th><th>LEVITON</th><th>P&amp;S</th></tr><tr><td>SINGLE POLE</td><td>DS120</td><td>5621-2</td><td>2621</td></tr><tr><td>DOUBLE POLE</td><td>DS220</td><td>5622-2</td><td>2622</td></tr><tr><td>THREE WAY</td><td>DS320</td><td>5623-2</td><td>2623</td></tr><tr><td>FOUR WAY</td><td>DS420</td><td>5624-2</td><td>2624</td></tr><tr><td>MOMENTARY CONTACT</td><td>HBL1557</td><td>1257</td><td>1225</td></tr><tr><td>THREE POSITION, TWO CIRCUIT MAINTAINED CONTACT</td><td>HBL1385</td><td>1285</td><td></td></tr><tr><td>KEY TYPE LOCKABLE BARREL KEY OR CORBIN STYLE</td><td>HBL1221-RKL</td><td>1221-2KL</td><td>PS20A01-KL</td></tr><tr><td>PROVIDE WITH EXTRA KEYS</td><td>HBL1209RKL</td><td>2KL</td><td>4609</td></tr><tr><td>DISCONNECT SWITCH / INSTA HOT</td><td>HBL7810DS</td><td>MS303-DSS</td><td>7803</td></tr></table></li></ol>			ROCKER/DECORATOR SWITCHES	HUBBELL	LEVITON	P&S	SINGLE POLE	DS120	5621-2	2621	DOUBLE POLE	DS220	5622-2	2622	THREE WAY	DS320	5623-2	2623	FOUR WAY	DS420	5624-2	2624	MOMENTARY CONTACT	HBL1557	1257	1225	THREE POSITION, TWO CIRCUIT MAINTAINED CONTACT	HBL1385	1285		KEY TYPE LOCKABLE BARREL KEY OR CORBIN STYLE	HBL1221-RKL	1221-2KL	PS20A01-KL	PROVIDE WITH EXTRA KEYS	HBL1209RKL	2KL	4609	DISCONNECT SWITCH / INSTA HOT	HBL7810DS	MS303-DSS	7803																				
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2.3	RECEPTACLES																																																														
A.	Provide specification grade, Decora type White receptacles where indicated on the drawings. Provide "Red" receptacles for receptacles on emergency power. Coordinate exact location with architect.																																																														
	<ol style="list-style-type: none"><li>Receptacles shall be Hubbell, Leviton, or Pass &amp; Seymour as follows: <table><tr><th>DECORATOR / DECORA RECEPTACLES</th><th>HUBBELL</th><th>LEVITON</th><th>P&amp;S</th></tr><tr><td>DECORATOR DUPLEX 20A, 125V NEMA 5-15R SELF GROUNDING</td><td>DR20</td><td>16362</td><td>26342</td></tr><tr><td>DECORATOR SIMPLEX 20A, 125V NEMA 5-15R SELF GROUNDING</td><td>---</td><td>1635</td><td>26361</td></tr><tr><td>ISOLATED GROUND DUPLEX 20A, 125V ORANGE NEMA 5-20R</td><td>IG20DRx</td><td>16362-IG</td><td>IG26362</td></tr><tr><td>CLOCK HANGER 15A-125V BROWN WITH STAINLESS STEEL</td><td>HBL5235</td><td>5361-CH</td><td>S3733-S5</td></tr><tr><td>PLATE WITH HANGER</td><td></td><td></td><td></td></tr><tr><td>GFCI DUPLEX 20A, 125V SELF TESTING, FEED THRU CAPABLE, TAMPER RESISTANT FOR LOCATIONS REQUIRING TAMPER RESISTANT INSTALLATION OR AS INDICATED ON DRAWINGS</td><td>GFRST20</td><td>GFR2</td><td>2097TR</td></tr><tr><td>GFCI DUPLEX 20A, 125V SELF TESTING, FEED THRU CAPABLE, TAMPER/WEATHER RESISTANT FOR INSTALLATION IN DAMP/WET LOCATION OR AS INDICATED ON THE DRAWINGS</td><td>GFTWRST20</td><td>GFWR2</td><td>2097TRWR</td></tr><tr><td>TAMPER RESISTANT DUPLEX 20A, 125V NEMA 5-20R</td><td>DR20WHTR</td><td>16362-SG</td><td>TR26362</td></tr><tr><td>SURGE PROTECTION 20A, 125V DUPLEX, BLUE NEMA 5-20R WITH AUDIBLE ALARM</td><td>HBL5362SA</td><td>7380-W</td><td>5362SP</td></tr><tr><td>USB CHARGER TYPE DUPLEX 20A, 125V TAMPER RESISTANT, DUAL USB TYPE A PORTS MIN. OF 5A USB OUTPUT, TAMPER RESISTANT</td><td>USB20ASx 5A OUTPUT</td><td>T5832* 3.6A OUTPUT</td><td>2097TRUSB4* 2.1A C.</td></tr><tr><td>PLUG LOAD CONTROLLED RECEPTACLES 20A, 125V TAMPER RESISTANT WITH TWO CONTROLLED FACE</td><td>DR20C2WHTR</td><td>16352-2PW</td><td>TR26362C2W</td></tr><tr><td>PLUG LOAD CONTROLLED RECEPTACLES 20A, 125V TAMPER RESISTANT WITH ONE CONTROLLED FACE</td><td>DR20C1WHTR</td><td>16352-1PW</td><td>TR26362C1W</td></tr><tr><td>ARC FAULT CIRCUIT INTERRUPTER RECEPTACLES</td><td>AF20TRW</td><td>AFTR2-W</td><td>AF202TRW</td></tr><tr><td>GROUND FAULT CIRCUIT INTERRUPTER / ARC FAULT DUAL FUNCTION</td><td>AFGF20TR</td><td>AGTR2-W</td><td>AFGF202TR</td></tr></table></li></ol>			DECORATOR / DECORA RECEPTACLES	HUBBELL	LEVITON	P&S	DECORATOR DUPLEX 20A, 125V NEMA 5-15R SELF GROUNDING	DR20	16362	26342	DECORATOR SIMPLEX 20A, 125V NEMA 5-15R SELF GROUNDING	---	1635	26361	ISOLATED GROUND DUPLEX 20A, 125V ORANGE NEMA 5-20R	IG20DRx	16362-IG	IG26362	CLOCK HANGER 15A-125V BROWN WITH STAINLESS STEEL	HBL5235	5361-CH	S3733-S5	PLATE WITH HANGER				GFCI DUPLEX 20A, 125V SELF TESTING, FEED THRU CAPABLE, TAMPER RESISTANT FOR LOCATIONS REQUIRING TAMPER RESISTANT INSTALLATION OR AS INDICATED ON DRAWINGS	GFRST20	GFR2	2097TR	GFCI DUPLEX 20A, 125V SELF TESTING, FEED THRU CAPABLE, TAMPER/WEATHER RESISTANT FOR INSTALLATION IN DAMP/WET LOCATION OR AS INDICATED ON THE DRAWINGS	GFTWRST20	GFWR2	2097TRWR	TAMPER RESISTANT DUPLEX 20A, 125V NEMA 5-20R	DR20WHTR	16362-SG	TR26362	SURGE PROTECTION 20A, 125V DUPLEX, BLUE NEMA 5-20R WITH AUDIBLE ALARM	HBL5362SA	7380-W	5362SP	USB CHARGER TYPE DUPLEX 20A, 125V TAMPER RESISTANT, DUAL USB TYPE A PORTS MIN. OF 5A USB OUTPUT, TAMPER RESISTANT	USB20ASx 5A OUTPUT	T5832* 3.6A OUTPUT	2097TRUSB4* 2.1A C.	PLUG LOAD CONTROLLED RECEPTACLES 20A, 125V TAMPER RESISTANT WITH TWO CONTROLLED FACE	DR20C2WHTR	16352-2PW	TR26362C2W	PLUG LOAD CONTROLLED RECEPTACLES 20A, 125V TAMPER RESISTANT WITH ONE CONTROLLED FACE	DR20C1WHTR	16352-1PW	TR26362C1W	ARC FAULT CIRCUIT INTERRUPTER RECEPTACLES	AF20TRW	AFTR2-W	AF202TRW	GROUND FAULT CIRCUIT INTERRUPTER / ARC FAULT DUAL FUNCTION	AFGF20TR	AGTR2-W	AFGF202TR
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2.4	COVERPLATES																																																														
A.	Coverplates shall be smooth nylon and 302/304 smooth stainless steel in kitchen and coffee bar areas.																																																														
B.	Stainless steel device plates shall be provided at locations with tile or stone walls.																																																														
PART 3 - EXECUTION																																																															
3.1	INSTALLATION (REFER TO 26 05 33 FOR OUTLET BOX SPECIFICATIONS)																																																														
A.	Wall switches shall be set in a suitable steel box and shall be installed on the strike side of the door as finally hung, whether so indicated on the Drawings or not.																																																														
B.	Receptacles shall be installed in a suitable steel box.																																																														
C.	Provide multi-gang device covers at locations where devices gang together.																																																														
D.	Device locations are indicated schematically on the drawings along with the type and mounting height. Final locations and mounting heights shall be coordinated with the Architect on the jobsite, and with shop drawings of equipment, including equipment to be furnished and installed by the Owner. Devices installed in walls covered with vinyl, fabric wallpaper or other special finishes shall be coordinated and verified with the Architect on the job site.																																																														
E.	All 15 amp and 20 amp receptacles shall be tamper-resistant type.																																																														
F.	All 20A, 120V receptacles in food service areas shall be GFCI.																																																														
G.	Provide ARC fault circuit interrupters (AFCI) as required to comply with article 210.12 of NFPA 70. This shall include but not be limited to dwelling units and dormitories. AFCI breakers may be used.																																																														
SECTION 26 28 16																																																															
SAFETY AND DISCONNECT SWITCHES																																																															
PART 1 - GENERAL																																																															
1.1	STANDARDS																																																														
A.	Products shall be designed, manufactured, tested and installed in compliance with applicable standards.																																																														
	<ol style="list-style-type: none"><li>NEMA KS1 - Enclosed switches</li><li>Federal specification W-S-865C-Heavy duty switches</li></ol>																																																														
1.2	ACCEPTABLE MANUFACTURERS																																																														
A.	Provide one of the following manufacturers:																																																														
	<ol style="list-style-type: none"><li>General Electric Company/ABB</li><li>Square D Company</li><li>Siemens</li><li>Eaton</li></ol>																																																														
PART 2 - PRODUCTS																																																															
2.1	GENERAL																																																														
A.	Furnish and install heavy duty type safety switches with the number of switched poles as indicated on the plans and specifications. All safety switches shall be NEMA Heavy Duty Type HD, and Underwriters Laboratories listed.																																																														
2.2	MATERIALS AND COMPONENTS																																																														
A.	Switch Interior																																																														
	<ol style="list-style-type: none"><li>All switches shall have switch blades that are fully visible in the "OFF" position when the door is open. Switches shall have removable arc suppressor where necessary, to permit easy access to line side lugs. Lugs shall be front removable and UL listed for 60°C and 75°C copper or aluminum cables. All switches blades and contacts shall be plated copper. Adjust fuse block to accept Class J fuses.</li></ol>																																																														
B.	Switch Mechanism																																																														
	<ol style="list-style-type: none"><li>Switches shall have a quick-make and quick-break operating handle and mechanism, which shall be an integral part of the box, not the cover. Padlocking provisions shall be provided for locking in the "OFF" position with at least three padlocks. Switches shall have a dual cover interlock to prevent unauthorized opening of the switch door when the handle is in the "ON" position, and to prevent closing of the switch mechanism with the door open. A means shall be provided to permit authorized personnel to release the interlock for inspection purposes. Handle position shall indicate if switch is "ON" or "OFF".</li></ol>																																																														
C.	Enclosures																																																														
	<ol style="list-style-type: none"><li>Indoor switches shall be furnished in NEMA 1 enclosures.</li><li>Outdoor switches, switches located in wet areas or sprinkled areas shall be furnished in NEMA 3R enclosures.</li><li>Switches installed in wet areas such as cooling tower areas shall be NEMA 4X stainless steel or fiberglass reinforced polyester.</li><li>Switches installed in kitchens shall be stainless steel.</li><li>Switches installed in areas of a corrosive nature and subjected to salt air shall be NEMA 4X stainless steel or fiberglass reinforced polyester.</li></ol>																																																														
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