MECHANICAL AND ELECTRICAL SPECIFICATIONS

011100 - GENERAL REQUIREMENTS

- A. THE WORK INCLUDES FURNISHING OF LABOR, EQUIPMENT, AND MATERIALS, AND THE PERFORMANCE OF OPERATIONS PERTINENT TO THE WORK DESCRIBED.
- B. OBTAIN AND PAY FOR PERMITS, FEES AND INSPECTIONS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION.
- C. ELECTRICAL EQUIPMENT, MATERIALS AND DEVICES PROVIDED OR INSTALLED AS WORK OF THIS PROJECT SHALL BEAR UL LABEL. OR IF UL LABEL IS NOT AVAILABLE. THE ITEM SHALL BE TESTED AND LABELED BY A QUALIFIED TESTING AGENCY, ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND IN ACCORDANCE WITH NFPA 70. PROVIDE TESTING, IF REQUIRED, WITHOUT ADDITION TO THE CONTRACT SUM.
- D. MATERIALS AND EQUIPMENT SHALL BE NEW.
- E. THE WORK AND EQUIPMENT PROVIDED SHALL BE FULLY WARRANTED UNDER THE GENERAL PROJECT WARRANTY. DURING THE CORRECTION PERIOD, CORRECT ANY WORK FOUND TO BE NOT IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, BY PROMPTLY REPAIRING OR COMPLETELY REPLACING WORK REQUIRING CORRECTION AT NO ADDITION TO THE CONTRACT SUM EXCEPT AS OTHERWISE REQUIRED IN GENERAL CONDITIONS, THE CORRECTION PERIOD IS ONE YEAR AFTER THE DATE OF SUBSTANTIAL COMPLETION.
- PRODUCTS SPECIFIED BY NAMING ONE OR MORE MANUFACTURERS, OR MODEL NAME OR CATALOG REFERENCE NUMBER, ESTABLISH A STANDARD OF QUALITY, OPTIONS TO BE INCLUDED, AND PERFORMANCE.
- WHERE OTHER ACCEPTABLE MANUFACTURERS ARE NAMED, CONTRACTOR MAY PROVIDE PRODUCTS OF THOSE NAMED MANUFACTURERS ONLY. WHICH MEET THE SPECIFICATIONS.
- 2. WHERE SPECIFICATION PERMITS "EQUAL" PRODUCTS, WITHOUT NAMING OTHER ACCEPTABLE MANUFACTURERS, CONTRACTOR MAY USE PRODUCTS OF ANY MANUFACTURER, WHICH MEET THE SPECIFICATIONS.
- G. TEMPORARY STORAGE: MAINTAIN UPON PREMISES. WHERE DIRECTED. A STORAGE AREA. AND BE RESPONSIBLE FOR CONTENTS WITHIN THIS AREA.
- H. PROTECTION: CONTROL DUST RESULTING FROM CONSTRUCTION WORK TO PREVENT ITS SPREAD BEYOND THE IMMEDIATE WORK AREA, AND TO AVOID CREATION OF A NUISANCE. PREVENT DAMAGE AND SOILING OF WORK. REPAIR DAMAGE OR SOILING OR REPLACE MATERIALS OR WORK DAMAGED, AT NO ADDITION TO THE CONTRACT SUM.
- PROMPTLY NOTIFY THE ARCHITECT IF MATERIALS SUSPECTED OF CONTAINING SOME HAZARD ARE ENCOUNTERED. DO NOT PERFORM ANY WORK THAT COULD DISTURB THE SUSPECTED MATERIAL UNTIL WRITTEN INSTRUCTIONS HAVE BEEN RECEIVED.
- J. EQUIPMENT, CONSTRUCTION AND INSTALLATION SHALL MEET REQUIREMENTS OF LOCAL, STATE AND FEDERAL GOVERNING CODES.
- K. SUBMIT SHOP DRAWINGS AND/OR PRODUCT DATA FOR EACH ITEM OF EQUIPMENT OR MATERIAL TO BE USED.
- .. SUBMIT REQUIRED CERTIFICATES OF APPROVAL FROM APPROVED INSPECTION AGENCIES AND AUTHORITIES HAVING JURISDICTION. CERTIFICATES OF APPROVAL SHALL BE RECEIVED BY THE ARCHITECT PRIOR TO FINAL ACCEPTANCE OF THE WORK.
- M. SUBMIT PROJECT RECORD DOCUMENTS INCLUDING, BUT NOT LIMITED TO:
- 1. ONE SET OF CONTRACT DOCUMENTS NEATLY MARKED IN RED INK TO RECORD ACTUAL REVISIONS TO THE WORK AS CONSTRUCTED
- 2. OPERATION AND MAINTENANCE DATA, INCLUDING:
- a. SIGNIFICANT DESIGN CRITERIA
- b. LIST OF EQUIPMENT, INCLUDING OPERATING WEIGHT.
- c. PARTS LISTS AND RECOMMENDED SPARE PARTS LISTS.
- d. OPERATING INSTRUCTIONS.
- e. MAINTENANCE INSTRUCTIONS
- f. SHOP DRAWINGS AND PRODUCT DATA.
- g. AIR AND WATER BALANCE REPORTS.
- h. CERTIFICATES. WARRANTIES. AND GUARANTEES.
- i. TEST REPORTS.

22 0000 - PLUMBING, GENERAL

- A. GENERAL AND DEMOLITION DESCRIPTION: SEE 23 0000, HVAC.
- B. MATERIALS AND METHODS: SEE 23 0500, BASIC MATERIALS AND METHODS.
- C. POTABLE WATER SYSTEM COMPONENTS INTENDED TO DISPENSE WATER FOR HUMAN CONSUMPTION, INCLUDING PIPE AND JOINING MATERIALS, SHALL COMPLY WITH THE FOLLOWING:
- 1. A WEIGHTED AVERAGE LEAD CONTENT OF NOT MORE THAN 0.25 PERCENT AS DETERMINED BY NSF/ANSI 372.
- 2. NSF/ANSI 61.
- D. ACCEPTANCE PRODUCT MARKING: NSF®-61 AND NSF®-372 (OR NSF®-61-G) OR OTHER ACCEPTED CERTIFIER MARKS DEMONSTRATING THIRD PARTY CERTIFICATION WITH THESE REQUIREMENTS.
- E. $\,$ PIPE SHALL BE CERTIFIED BY THE MANUFACTURER TO MEET REFERENCED STANDARDS AND SHALL BEAR A LABEL, DIRECTLY ON THE PIPE. INDICATING COMPLIANCE.

22 0800 - PLUMBING INSULATION

A. PIPING INSULATION

- FIBERGLASS, 4-LB. DENSITY, K VALUE OF 0.23 AT 75 DEGREES F MEAN TEMPERATURE, WITH FACTORY APPLIED FIRE RETARDANT VAPOR BARRIER ALL SERVICE JACKET (ASJ). TAPE JOINTS WITH PRESSURE-SENSITIVE TAPE MATCHING JACKET. INSULATION SHALL BE CONTINUOUS THROUGH HANGERS AND PENETRATIONS FOR COLD PIPING.
- 2. THICKNESS SHALL BE AS FOLLOWS:
- a. DOMESTIC WATER PIPING: 1.0 INCH

22 1000 - BUILDING SERVICES: PLUMBING PIPING

A. VALVES:

1. WATER SHUTOFF: NPS 2 (DN 50) AND SMALLER: BALL VALVES; 600 PSI CWP, TWO-PIECE SILICON BRONZE ALLOY BODY, FULL PORT, BLOWOUT-PROOF STEM, PTFE SEATS, STAINLESS-STEEL BALL AND STEM. EXTENSION HANDLE FOR USE IN INSULATED PIPING, THREADED OR SOLDERED ENDS, NIBCO T-685-66-LF OR S-685-66-LF.

B. DOMESTIC WATER PIPING

1. DOMESTIC WATER

- COPPER TUBING ASTM B 88, TYPE L ABOVEGROUND, TYPE K UNDERGROUND.
- 2. FITTINGS: SOLDER JOINT CAST BRASS ASME B16.18 OR WROUGHT COPPER ANSI B16.22.
- C. PIPING TESTS: PRESSURE TEST PIPING SYSTEMS WITH FOLLOWING PRESSURES FOR FOUR HOURS WITH NO LOSS OF PRESSURE:

WATER

TEST PRESSURE MEDIUM **SERVICE**

125 PSI

23 0000 - HEATING, VENTILATION AND AIR CONDITIONING, HVAC

- A. PROVIDE HVAC SYSTEMS, MATERIALS, AND EQUIPMENT AS SPECIFIED AND INDICATED ON THE DRAWINGS.
- B. PIPE SHALL BE CERTIFIED BY THE MANUFACTURER TO MEET REFERENCED STANDARDS AND SHALL BEAR A LABEL, DIRECTLY ON THE PIPE, INDICATING COMPLIANCE.

C. DEMOLITION

- 1. PERFORM REMOVAL WORK NEATLY WITH THE LEAST POSSIBLE DISTURBANCE TO THE BUILDING AND OCCUPANTS.
- 2. REMOVE DEMOLITION DEBRIS FROM THE WORK AREA AND CLEAN THE WORK AREA ON A DAILY
- 3. PROVIDE TEMPORARY BARRIERS, DANGER SIGNALS, AND APPURTENANCES FOR PROTECTION OF PERSONNEL AND EQUIPMENT DURING REMOVAL OPERATIONS.
- 4. DEMOLISH, REMOVE, DEMOUNT, AND DISCONNECT INACTIVE AND OBSOLETE PIPING, FITTINGS AND SPECIALTIES, EQUIPMENT, DUCTWORK, CONTROLS, FIXTURES, AND INSULATION
- 5. REMOVE ANCHORS, BOLTS, AND FASTENERS ASSOCIATED WITH PIPING, DUCTWORK AND EQUIPMENT TO BE REMOVED.
- 6. PIPING AND DUCTS EMBEDDED IN FLOORS, AND MASONRY WALLS MAY BE ABANDONED IN PLACE IF THEY DO NOT INTERFERE WITH NEW INSTALLATIONS. CUT MATERIALS BACK TO AT LEAST ONE INCH WITHIN FINISHED SURFACE. DRAIN AND CAP PIPING SERVICES ABANDONED BEHIND FINISHED SURFACES.
- 7. PATCH AND REPAIR SURFACES DAMAGED DURING DEMOLITION WORK WITH MATERIALS AND FINISHES THAT MATCH EXISTING ADJACENT SURFACES.

23 0500 - BASIC MATERIALS AND METHODS

A. PIPE JOINTING MATERIALS:

- 1. PIPE JOINTING MATERIALS FOR SOLDERED JOINTS:
- a. SOLDER: FREE OF LEAD, ANTIMONY AND ZINC. NO SOLDER CONTAINING LEAD IS PERMITTED.
- b. FLUX: MEETING THE REQUIREMENTS OF NSF 61.
- 2. PIPE JOINTING MATERIALS FOR THREADED JOINTS:
- a. POLYTRETRAFLUOROETHYLENE (PTFE) PIPE THREAD TAPE. "TEFLON".
- b. PIPE CEMENT AND OIL COMPOUND: LITHARGE AND GLYCERINE.

23 7000 - HVAC EQUIPMENT

A. ELECTRIC PROPELLER UNIT HEATERS:

1. INSTALL UNITS AS SCHEDULED AND DETAILED ON THE DRAWINGS.

26 0000 - ELECTRICAL

A. PROVIDE ELECTRICAL SYSTEMS, MATERIALS, AND EQUIPMENT AS SPECIFIED AND INDICATED ON THE DRAWINGS.

26 0055 - DEMOLITION

A. DEMOLITION REQUIREMENTS

- 1. LOCATE, IDENTIFY, AND PROTECT MECHANICAL AND ELECTRICAL SERVICES PASSING THROUGH DEMOLITION AREA AND SERVING OTHER AREAS OUTSIDE THE DEMOLITION LIMITS. MAINTAIN SERVICES TO AREAS OUTSIDE DEMOLITION LIMITS. WHEN SERVICES MUST BE INTERRUPTED, INSTALL TEMPORARY SERVICES FOR AFFECTED AREAS.
- 2. COORDINATE REQUIRED OUTAGES OF SERVICES WITH THE OWNER.
- 3. PERFORM REMOVAL OF WORK NEATLY WITH THE LEAST POSSIBLE DISTURBANCE TO THE BUILDING AND OCCUPANTS.
- 4. REMOVE DEMOLITION DEBRIS FROM THE WORK AREA AND CLEAN THE WORK AREA ON A DAILY
- 5. PROVIDE TEMPORARY BARRIERS, DANGER SIGNALS, AND APPURTENANCES REQUIRED FOR PROTECTION OF USERS AND PERSONNEL.
- 6. DISCONNECT, DEMOUNT, DEMOLISH, AND REMOVE INACTIVE AND OBSOLETE CONDUIT, WIRING, EQUIPMENT, AND DEVICES.
- 7. REMOVE ANCHORS, BOLTS, AND FASTENERS ASSOCIATED WITH REMOVED ELECTRICAL ITEMS.
- 8. CONDUITS EMBEDDED IN FLOORS, AND MASONRY WALLS MAY BE ABANDONED IN PLACE IF THEY DO NOT INTERFERE WITH NEW INSTALLATIONS. CUT MATERIALS BACK TO AT LEAST ONE INCH WITHIN FINISHED SURFACE. CAP CONDUITS ABANDONED BEHIND FINISHED SURFACES.
- 9. PATCH AND REPAIR SURFACES DAMAGED DURING DEMOLITION WORK WITH MATERIALS AND FINISHES THAT MATCH EXISTING ADJACENT SURFACES.

26 0500 - BASIC ELECTRICAL MATERIALS AND METHODS

A. DESIGN REQUIREMENTS

- 1. PROPOSED PRODUCTS SHALL COMPLY WITH CHARACTERISTICS OF THE BASIS-OF-DESIGN PRODUCT, INCLUDING RATINGS, DIMENSIONS, AND OTHER CHARACTERISTICS RELATED TO FUNCTIONAL FIT, ACCESS, OR CONNECTIVITY.
- 2. THE CONTRACT DRAWINGS ARE GENERALLY DIAGRAMMATIC, AND DO NOT INDICATE ALL FITTINGS OR OFFSETS IN CONDUIT, OR ALL JUNCTION AND PULL BOXES, ACCESS PANELS, OR OTHER SPECIALTIES REQUIRED.
- a. INSTALL CONDUIT EXPOSED TO VIEW PARALLEL WITH THE LINES OF THE BUILDING AND AS CLOSE TO WALLS, COLUMNS, AND CEILINGS AS MAY BE PRACTICAL, MAINTAINING ADEQUATE CLEARANCE FOR ACCESS AT PARTS REQUIRING SERVICING.
- b. INSTALL CONDUIT A SUFFICIENT DISTANCE FROM OTHER WORK TO PERMIT A CLEARANCE OF NOT LESS THAN 0.5 INCH BETWEEN ITS FINISHED COVERING AND ADJACENT WORK.
- c. NO CONDUIT SHALL CROSS BELOW THE HEAD OF A WINDOW OR DOOR.
- d. PULL BOXES AND OTHER APPURTENANCES, WHICH REQUIRE OPERATION OR MAINTENANCE, SHALL BE EASILY ACCESSIBLE. DO NOT CUT OR FORM HANDHOLES FOR OPERATION OR MAINTENANCE OF PLUG-IN OR HARDWIRED DEVICES THROUGH WALLS OR CEILINGS.

B. GROUNDING AND BONDING

- 1. GROUND CONDUCTOR, UNLESS SPECIFICALLY NOTED OTHERWISE, SHALL BE COPPER, 98 PERCENT CONDUCTIVITY, SOLID FOR NO. 10 AND SMALLER AND STRANDED FOR NO. 8 AND LARGER.
- 2. PROVIDE THE COMPLETE GROUNDING OF CONDUIT SYSTEMS, ELECTRICAL EQUIPMENT CONDUCTOR AND EQUIPMENT ENCLOSURES, MOTORS, AND NEUTRAL CONDUCTORS IN ACCORDANCE WITH APPLICABLE CODES. GROUNDED PHASE AND NEUTRAL CONDUCTORS SHALL BE CONTINUOUSLY IDENTIFIED. CONTINUITY OF METAL RACEWAYS SHALL BE INSURED BY DOUBLE LOCKNUTS.
- 3. GROUND SYSTEM CONNECTIONS, WHICH ARE BENEATH THE FLOOR AND IN A CONCEALED OR INACCESSIBLE LOCATION, SHALL BE BRAZED OR WELDED. BRAZING AND WELDING SHALL BE
- 4. EQUIPMENT GROUNDING: PROVIDE INSULATED EQUIPMENT GROUNDING CONDUCTORS WITH FEEDERS AND BRANCH CIRCUITS.
- 5. GROUNDING SYSTEM TEST: ENSURE THAT GROUNDING SYSTEM IS CONTINUOUS AND THAT RESISTANCE TO GROUND IS NOT MORE THAN 10 OHMS.

26 1000 - WIRING METHODS

A. WIRES AND CABLES

1. CONDUCTORS: UL LISTED AND NEMA WC 70 COMPLIANT; COPPER, 98 PERCENT CONDUCTIVITY, SUITABLE FOR 600-VOLT DUTY; RATED 90-DEGREE CELSIUS TEMPERATURE FOR WET/DRY APPLICATIONS: THHN/THWN-2 INSULATION, SOLID FOR NO. 10 AND SMALLER COMPLYING WITH ASTM B 3, AND STRANDED FOR NO. 8 AND LARGER COMPLYING WITH ASTM B 8

2. METAL-CLAD CABLE:

- a. CABLE: UL 83 AND UL 1569 LISTED; 600-VOLT, SINGLE- OR MULTI-CIRCUIT TYPE MC CABLE, MULTI-CONDUCTOR WITH GROUND CONDUCTOR; STEEL INTERLOCKED ARMOR.
- b. CONDUCTORS: SOLID COPPER NO. 10 AND SMALLER, AND STRANDED COPPER NO. 8 AND LARGER; CONFORMING TO ASTM B 3 OR B 8.
- c. CONDUCTOR INSULATION: TYPE THHN/THWN INSULATED SINGLE CONDUCTORS INCLUDING GROUND CONDUCTOR.
- d. FITTINGS: UL 514B LISTED, STEEL OR MALLEABLE IRON FITTINGS, EQUAL TO KONKORE/ATKORE INTERNATIONAL
- PROVIDE WIRE AND CABLE INDICATED IN ACCORDANCE WITH NATIONAL, STATE, AND LOCAL ELECTRICAL CODES.
- 4. SPLICING SHALL BE DONE IN OUTLET BOXES AND JUNCTION BOXES AND NOT IN CONDUIT.
- 5. WIRING IN HIGH AMBIENT TEMPERATURE AREAS SHALL BE OF TYPES REQUIRED BY NFPA 70.
- 6. INSTALLING MC CABLE
- a. INSTALL IN COMPLIANCE WITH NFPA 70.
- b. LOCATIONS: CONCEALED ABOVE ACCESSIBLE CEILINGS, IN DRYWALL PARTITIONS, OR WITHIN CASEWORK. DO NOT INSTALL IN MASONRY PARTITIONS OR MASONRY WALLS.
- c. CABLE LARGER THAN NO. 8 SHALL NOT BE PERMITTED.

. CONDUITS

- 1. INTERMEDIATE STEEL CONDUIT (IMC) WITH FULL THREADED HUB FITTINGS: UL 1242 AND ANSI C80.6.
- 2. ELECTRICAL METALLIC TUBING (EMT) WITH CONCRETE- OR RAIN-TIGHT, COMPRESSION TYPE COUPLINGS: UL 797 AND ANSI C80.3.
- 3. WEATHERPROOF EXPANSION FITTINGS: WITH BONDING JUMPERS, EQUAL TO O-Z/GEDNEY TYPES AX AND TX.
- 4. PROVIDE COMPLETE. SEPARATE, AND INDEPENDENT RACEWAY SYSTEM FOR EACH OF THE VARIOUS WIRING SYSTEMS INCLUDING. BUT NOT LIMITED TO, THE FOLLOWING:
- a. LIGHTING
- b. POWER
- c. EXIT AND EMERGENCY LIGHTING SYSTEM
- d. FIRE ALARM SYSTEM
- 5. WIRE RACEWAY SYSTEMS COMPLETELY, EXCEPT WHERE OTHERWISE INDICATED, AS SHOWN ON DRAWINGS AND AS REQUIRED FOR SATISFACTORY OPERATION OF EACH SYSTEM.
- 6. TYPES AND LOCATIONS OF CONDUITS:
- a. IMC WITH SCREW JOINT COUPLINGS: WIRING TO EXTERIOR.
- b. EMT: SIZES 4 INCHES AND SMALLER, EXCEPT AS NOTED ABOVE.



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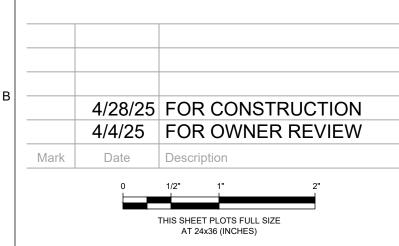


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AS SHOWN

Sheet Title SPECIFICATIONS

ME100

- PROTECT THE CONDUCTORS WITH AN INSULATING BUSHING. PROVIDE LOCKNUTS BOTH INSIDE AND OUTSIDE THE ENCLOSURE. WHERE CONDUIT IS STUBBED UP TO ABOVE CEILINGS FOR FUTURE WIRING, CLOSE ENDS WITH BUSHINGS. 8. SIZES: a. DO NOT USE CONDUIT SMALLER THAN 0.75 INCHES.
- b. FEEDER CONDUITS SHALL BE AS LARGE AS INDICATED, OR AS REQUIRED BY NFPA 70 (WHICHEVER IS LARGER). DO NOT INSTALL MORE THAN ONE FEEDER IN A SINGLE CONDUIT

7. WHERE CONDUIT IS CONNECTED TO A CABINET, JUNCTION BOX, PULL BOX, OR AUXILIARY GUTTER

- c. CONDUIT SIZES SHOWN ON DRAWINGS ARE BASED ON TYPE THHN/THWN-2 WIRE
- 9. GROUND CONDUITS AS REQUIRED BY NFPA 70.
- 10. WHERE CONDUITS PASS THROUGH BUILDING EXPANSION JOINTS, AND WHEREVER RELATIVE MOVEMENT COULD OCCUR BETWEEN ADJACENT SLABS, EQUIP WITH WEATHERPROOF EXPANSION FITTINGS AND BONDING JUMPERS.
- 11.RUN CONDUITS CONCEALED IN NEW CONSTRUCTION EXCEPT WHERE CONNECTING TO SURFACE-MOUNTED CABINETS AND EQUIPMENT, CONDUITS SHALL BE EXPOSED IN ELECTRICAL AND MECHANICAL EQUIPMENT SPACES. INSTALL CONDUIT ABOVE SUSPENDED CEILINGS AND WITHIN WALLS AND PARTITIONS.
- 12.PROVIDE CONDUIT SUPPORTS, HANGERS, CHANNELS, BEAM CLAMPS, AND APPURTENANCES REQUIRED FOR THE WORK.

C. BOXES

- 1. OUTLET, SWITCH, AND JUNCTION BOXES: SHERARDIZED OR GALVANIZED STAMPED; CAST-STEEL OR 26 4000 DISTRIBUTION CAST-ALUMINUM WHERE REQUIRED FOR WEATHER-EXPOSED LOCATIONS.
- 2. JUNCTION AND PULL BOXES IN FEEDER CONDUIT RUNS: GALVANIZED, OF SIZE REQUIRED FOR CONDUIT ARRANGEMENT AND NOT LESS THAN THE SIZE REQUIRED BY NFPA 70, AND FURNISHED WITH SCREWED COVERS.
- 3. PROVIDE BOX AT EACH OUTLET, SWITCH, AND APPURTENANCE. EACH BOX SHALL BE OF A TYPE SUITABLE FOR THE DUTY INTENDED AND SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- a. WHERE CONDUIT IS WEATHER-EXPOSED, PROVIDE CAST-STEEL OR -ALUMINUM BOXES
- BOXES IN METAL STUD WALLS OR PARTITIONS SHALL BE SECURELY SUPPORTED BY METAL CHANNELS SPANNING BETWEEN TWO STUDS AND ATTACHED TO SAME
- 5. OUTLET BOXES USED FOR SUPPORTING LIGHTING FIXTURES: PROVIDE WITH MALLEABLE IRON FIXTURE STUDS OF "NO-BOLT" TYPE, SECURED BY LOCKNUT. PROVIDE STRUCTURAL CHANNEL SUPPORTS FOR BOXES OCCURRING IN CEILINGS. OUTLETS IN CEILINGS DIRECTLY ON BOTTOM OF JOISTS SHALL BE SUPPORTED INDEPENDENT OF CEILING CONSTRUCTION. OUTLETS IN SUSPENDED CEILINGS SHALL NOT BE SUPPORTED FROM CEILING CONSTRUCTION. SPECIAL SUPPORTS FOR BOXES SHALL BE AS DIRECTED AND APPROVED BY THE ARCHITECT.
- 6. BOXES SHALL BE PROVIDED WITH APPROPRIATE COVERS

D. WIRING DEVICES

- 1. ACCEPTABLE MANUFACTURERS: PASS & SEYMOUR/LEGRAND; LEVITON MANUFACTURING CO.; HUBBELL/BRYANT ELECTRIC: EATON/COOPER WIRING DEVICES.
- 2. SWITCHES: EQUAL TO PASS & SEYMOUR PS20AC1 (SINGLE POLE), PS20AC3 (3-WAY), PS20AC4 (4-WAY).
- 3. RECEPTACLES: EQUAL TO PASS & SEYMOUR PS5362 (NEMA 5 20R) WITH BRASS MOUNTING STRAP, TR5362 (NEMA 5-20R, TAMPER-RESISTANT) AND 2097 (NEMA 5-20R, GFCI)
- 4. DEVICE COLOR: WHITE. CONFIRM WITH ARCHITECT.
- 5. DEVICE PLATES: EQUAL TO PASS & SEYMOUR, TYPE 302 STAINLESS STEEL, SS SERIES. CONFIRM WITH ARCHITECT
- 6. INSTALL DEVICES IN COMPLETE COMPLIANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- 7. GROUP ADJACENT DEVICES UNDER SINGLE MULTI-GANG WALL PLATE.
- E. INSTALLATION OF PRODUCTS AND EQUIPMENT
- 1. MANUFACTURER'S INSTRUCTIONS: EXCEPT AS MODIFIED BY DRAWINGS OR SPECIFICATIONS, INSTALL PRODUCTS AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS APPLICABLE TO THE PROJECT CONDITIONS.
- a. IMMEDIATELY NOTIFY ARCHITECT IF A DIFFERENCE OR DISCREPANCY IS FOUND BETWEEN MANUFACTURER'S INSTRUCTIONS AND THE DRAWINGS OR SPECIFICATIONS.
- F. PENETRATION OF WATERPROOF CONSTRUCTION: COORDINATE THE WORK TO MINIMIZE PENETRATION OF WATERPROOF CONSTRUCTION, INCLUDING ROOFS, EXTERIOR WALLS AND INTERIOR WATERPROOF CONSTRUCTION. WHERE SUCH PENETRATIONS ARE NECESSARY, PROVIDE NECESSARY CURBS, SLEEVES, SHIELDS, FLASHINGS, FITTINGS AND CAULKING TO MAKE THE PENETRATIONS ABSOLUTELY WATERTIGHT.
- G. PENETRATION OF FIRE-RATED CONSTRUCTION: AREAS IN AND AROUND CONDUITS PASSING THROUGH FIRE-RATED, FIRE-RESISTANT OR FIRE-STOPPED WALLS, CEILINGS, PARTITIONS AND FLOORS SHALL BE SEALED WITH A FIRE RESISTIVE MATERIAL. PROVIDE SYSTEMS OR DEVICES LISTED AND LABELED BY A RATING AGENCY, AND CONFORMING TO THE CONSTRUCTION TYPE, PENETRANT TYPE, ANNULAR SPACE REQUIREMENTS AND FIRE RATING INVOLVED IN EACH SEPARATE INSTANCE. THE SYSTEM SHALL BE SYMMETRICAL FOR WALL APPLICATIONS. SYSTEMS OR DEVICES SHALL BE ASBESTOS-FREE.

H. TESTS

- 1. DURING THE PROGRESS OF THE WORK AND AFTER COMPLETION, TEST THE BRANCH CIRCUITS AND DISTRIBUTION SYSTEM, AND THE LOW VOLTAGE ALARM AND SIGNAL SYSTEMS.
- 2. RESULTS OF THE TESTS SHALL SHOW THAT THE WIRING MEETS THE REQUIREMENTS OF THIS SPECIFICATION. SHOULD ANY TEST INDICATE DEFECT IN MATERIALS OR WORKMANSHIP, IMMEDIATELY REPAIR, OR REPLACE WITH NEW, THE FAULTY INSTALLATION, AND RETEST THE AFFECTED PORTIONS OF THE WORK.
- 3. FURNISH EQUIPMENT AND INSTRUMENTS NECESSARY FOR TESTING.

- 4. TESTS SHALL DEMONSTRATE THE FOLLOWING
- a. LIGHTING, POWER, AND CONTROL CIRCUITS ARE CONTINUOUS AND FREE FROM SHORT CIRCUITS AND UNSPECIFIED GROUNDS.
- b. THE RESISTANCE TO GROUND OF EACH NON-GROUNDED CIRCUIT IS NOT LESS THAN ONE
- c. CIRCUITS ARE PROPERLY CONNECTED IN ACCORDANCE WITH THE APPLICABLE WIRING DIAGRAMS.
- d. DEMONSTRATE THE FUNCTIONING OF EACH CONTROL DEVICE. AND VERIFY OPERATION OF EACH LIGHTING AND POWER CIRCUIT.
- 5. MAKE VOLTAGE BUILT-UP TESTS WITH A VOLTAGE SUFFICIENT TO DETERMINE THAT NO SHORT CIRCUITS EXIST.
- 6. IMMEDIATELY REPAIR DEFECTS AND RETEST UNTIL SYSTEMS ARE OPERATING CORRECTLY.
- 7. SUBMIT TEST REPORTS.
- CLEANING, PAINTING AND FINISHES:
- 1. CLEAN SURFACES PRIOR TO APPLICATION OF ADHESIVES, COATINGS, PAINT, OR OTHER FINISHES.
- 2. PROTECT FINISHES AND RESTORE ANY DAMAGED FINISHES TO THEIR ORIGINAL CONDITION.
- 3. REMOVE CONSTRUCTION MARKINGS AND WRITING FROM EXPOSED EQUIPMENT. CONDUIT AND BUILDING SURFACES.

A. PANELBOARDS

- 1. CIRCUIT BREAKERS: UL 489: VOLTAGE. CONTINUOUS-CURRENT RATING. AND INTERRUPTING RATING AS INDICATED ON THE DRAWINGS; BOLT ON.
 - a. THERMAL-MAGNETIC, MOLDED-CASE TYPE WITH TRIP RATING PERMANENTLY INDICATED ON THE BREAKER.
- 2. FRAME AND MOUNT CIRCUIT DIRECTORY INDICATING TYPE AND LOCATION OF EQUIPMENT ON EACH
- a. UPDATE DIRECTORY TO INDICATE INSTALLED CIRCUIT LOADS.
- 3. PROVIDE IDENTIFICATION NAMEPLATE FOR EACH PANELBOARD AND ASSOCIATED COMPONENTS LOCATED ON FRONT OF PANELBOARD.

B. CLEANING

- CLEAN INTERIOR AND EXTERIOR OF EQUIPMENT.
- 2. REFINISH PAINTED SURFACES DAMAGED DURING CONSTRUCTION TO MATCH ENCLOSURE.

26 5000 - LIGHTING

A. LAMPS, LED TYPE:

- 1. ENGINEERED MODULE CONTAINING QUANTITY AND WATTAGE OF LIGHT-EMITTING DIODES TO ACHIEVE MANUFACTURER'S DEFINED LIGHT OUTPUT, OPTIC DISTRIBUTION, AND HEAT DISSIPATION REQUIREMENTS.
- 2. PERFORMANCE CRITERIA SHALL INCLUDE COLOR TEMPERATURE AND MINIMUM COLOR-RENDERING INDEX: 4000 K AND 85 CRI, UNLESS OTHERWISE INDICATED; AND NOMINAL LUMEN OUTPUT AND WATTAGE AS SCHEDULED.
- B. LED DRIVERS: EQUAL TO SIGNIFY/ADVANCE, OSRAM SYLVANIA, UNIVERSAL LIGHTING TECHNOLOGIES, LUTRON, OR ELDOLED.
- DRIVERS SHALL OPERATE 120-VOLT OR 277-VOLT, 60-HZ INPUT POWER SOURCE AND SUITABLE FOR POWERING 12-VOLT OR 24-VOLT LED LAMP SOURCES INSTALLED WITH FIXTURE.
- 2. DIMMABLE DRIVERS SHALL BE CONTROLLED BY CLASS 2 LOW-VOLTAGE 0- TO 10-VOLT DC CONTROLLER.
- 3. PERFORMANCE CRITERIA SHALL INCLUDE CLASS A SOUND RATING, POWER FACTOR GREATER THAN 0.90. TOTAL HARMONIC DISTORTION OF INPUT CURRENT EQUAL TO OR LESS THAN 20 PERCENT. AND FCC COMPLIANCE FOR EMI/RFI.
- C. FIXTURES SHALL BE COMPLETE WITH SOCKETS, CASINGS, FITTINGS, HOLDERS, SHADES, GLASSWARE, LAMPS, AND APPURTENANCES, WIRED AND COMPLETELY ASSEMBLED
- D. EXIT SIGNS: MEET THE ENERGY STAR PROGRAM REQUIREMENTS TO OPERATE ON 5 W OR LESS INPUT POWER PER FACE. COMPLY WITH UL 924. SIGN COLORS AND LETTERING SIZE SHALL COMPLY WITH AUTHORITIES HAVING JURISDICTION.
- E. EMERGENCY LIGHTING UNITS: SELF-CONTAINED UNITS. COMPLY WITH UL 924.
- F. EMERGENCY LED POWER SUPPLY UNIT: INTERNAL TYPE: SELF-CONTAINED, MODULAR, BATTERY-INVERTER UNIT FACTORY MOUNTED WITHIN FIXTURE BODY. COMPLY WITH UL 924.

G. LIGHTING FIXTURE INSTALLATION

- 1. PROVIDE A COMPLETE LIGHTING FIXTURE FOR EVERY OUTLET INDICATED ON THE DRAWINGS SO THAT EVERY OUTLET SHALL BE PROPERLY PROVIDED WITH A SUITABLE FIXTURE OF TYPE SPECIFIED, OF WATTAGE INDICATED.
- 2. FIXTURE WIRE SHALL BEAR UL LABEL. FIXTURE WIRING FOR FIXTURES AND BRANCH CIRCUIT WIRING IN FIXTURE CHANNELS SHALL BE TYPE THHN.
- 3. EACH FIXTURE SHALL BE COMPLETELY EQUIPPED WITH LAMPS OF THE SIZE, TYPE, WATTAGE, AND SHAPE INDICATED AND SPECIFIED. LAMPS SHALL BE OF THE PROPER VOLTAGE FOR THE BUILDING.
- 4. PROVIDE FIXTURES IN THE QUANTITIES, SIZES, AND TYPES INDICATED ON DRAWINGS.

H. LIGHTING FIXTURE SUPPORT

- SUPPORT FROM BUILDING STRUCTURE: PROVIDE FASTENERS APPROPRIATE TO THE SUPPORTING SUBSTRATE, WITH NUMBER 10 WIRE, JACK CHAIN, OR RODS.
- 2. IN SUSPENDED PLASTER AND DRYWALL CEILINGS, FIXTURES MAY BE SUPPORTED FROM THE SUSPENDED CEILING CONSTRUCTION
- 3. RECESSED FIXTURES IN SUSPENDED ACOUSTICAL CEILINGS: COORDINATE FIXTURE INSTALLATION WITH CEILING INSTALLER. ENSURE THAT CEILING SUPPORTS ARE LOCATED TO CLEAR FIXTURES. FIXTURES SHALL BE SUPPORTED FROM BUILDING STRUCTURE. PROVIDE 2 SUPPORTS FOR EACH INDIVIDUAL FIXTURE, ON AT EACH END OF FIXTURE

4. WHERE IT IS NECESSARY FOR A FIXTURE TO BE INSTALLED DIRECTLY BELOW AN AIR DUCT OR OTHER OBSTRUCTION, INSTALL TWO HANGER RODS, ONE ON EACH SIDE OF THE DUCT, BOLTED TO A CHANNEL OR ANGLE SUSPENDED FROM THE HANGERS UNDER THE DUCT. AND SUPPORT THE FIXTURES FROM THE SUSPENDED CHANNEL OR ANGLE.

I. LIGHTING CONTROLS SYSTEM

- 1. COMPLETE, NON-NETWORKED DIGITAL LIGHTING CONTROLS SYSTEM WITH EQUIPMENT NECESSARY FOR PROPER OPERATION AND PROGRAM OF LIGHTING CONTROL SYSTEM INCLUDING 0-10V DIMMING RELAY CONTROLLERS, CONTROL STATIONS, SENSORS, AND OTHER INTERFACES.
- 2. BASIS-OF-DESIGN SYSTEM: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE BASIS-OF-DESIGN SYSTEM BY HUBBELL (NX SERIES) OR COMPARABLE SYSTEM(S) BY ACUITY BRANDS (NLIGHT ARP SERIES), WATTSTOPPER (DLM SERIES), LUTRON (ENERGI SAVR NODE SERIES). EATON CONTROLS (GREENGATE SERIES).
- 3. SYSTEM COMPONENTS SHALL BE UL LISTED AND LABELED FOR THEIR INTENDED APPLICATION.
- 4. NON-NETWORKED LIGHTING RELAY ROOM CONTROLLERS (0-10V DIMMING RELAY CONTROLLERS). PROVIDE WITH DRY CONTACT INPUT FOR FIRE ALARM SYSTEM OVERRIDE.
- 5. LIGHTING CONTROL STATIONS (LOW-VOLTAGE DIGITAL WALL SWITCHES): LOW-VOLTAGE, FIELD-PROGRAMMABLE DIGITAL WALL SWITCH DEVICE WITH BUTTON CONFIGURATIONS AND FUNCTIONS AS SHOWN ON THE DRAWINGS.

6. SENSOR DEVICES:

- a. OCCUPANCY SENSORS: WIRED, DUAL-TECHNOLOGY, COMBINATION ULTRASONIC/PASSIVE INFRARED DETECTOR. INDEPENDENTLY ADJUSTABLE FOR INSTALLED CONDITIONS. CEILING MOUNTED, 360-DEGREE, MINIMUM 2000 SQUARE FEET COVERAGE.
- b. SENSOR POWER PACKS: WHERE REQUIRED FOR POWER CONNECTION TO SENSORS.
- 7. CONDUCTORS AND CABLES: AS REQUIRED PER MANUFACTURER'S REQUIREMENTS FOR A COMPLETE SYSTEM, PLENUM RATED. INSTALL LIGHTING CONTROL LOW VOLTAGE CABLING IN CONDUIT IN AREAS WITH EXPOSED CEILINGS.
- 8. DEVICE PROGRAMMING REQUIREMENTS: PERFORMED BY A FACTORY CERTIFIED FIELD SERVICE ENGINEER. REFER TO LIGHTING CONTROLS DIAGRAMS ON THE DRAWINGS.

9. INSTALLATION:

- a. INSTALL DEVICES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, PROGRAMMED TO MEET THE CONTROL INTENT.
- b. MANUFACTURER'S FACTORY CERTIFIED FIELD SERVICE ENGINEER SHALL PERFORM START-UP SERVICE, INCLUDING PHYSICAL INSPECTION OF LIGHTING CONTROL SYSTEM AND CONNECTED WIRING AND FINAL ADJUSTMENTS TO MEET SPECIFIED PERFORMANCE REQUIREMENTS.
- c. ROOM CONTROLLERS SHALL BE WALL MOUNTED IN EXPOSED CEILING SPACE AS INDICATED ON DRAWINGS.
- d. PROVIDE A SINGLE COVER PLATE WHERE TWO OR MORE LIGHTING CONTROL STATIONS ARE GROUPED TOGETHER IN ONE BOX.
- 10. TESTING: PROVIDE SERVICES FROM FACTORY CERTIFIED FIELD SERVICE ENGINEER TO TEST AND INSPECT COMPONENTS, ASSEMBLIES, AND EQUIPMENT INSTALLATIONS, INCLUDING CONNECTIONS. TO ENSURE PROPER SYSTEM INSTALLATION AND OPERATION.

28 1000 - FIRE DETECTION AND ALARM SYSTEM

- A. EXISTING FIRE ALARM PANEL IS MANUFACTURED BY SIEMENS.
 - 1. NEW COMPONENTS SHALL MATCH EXISTING EQUIPMENT.
- B. ALARM INITIATING AND NOTIFICATION DEVICES
- 1. DISCONNECTION OF ANY SINGLE ALARM INITIATING DEVICE SHALL CAUSE A TROUBLE SIGNAL AT THE FIRE ALARM CONTROL PANEL, BUT SHALL NOT INHIBIT OPERATION OF ANY OTHER INITIATING DEVICES.
- 2. MANUAL PULL STATIONS: FABRICATED OF METAL OR PLASTIC, AND FINISHED IN RED WITH MOLDED. RAISED LETTER OPERATING INSTRUCTIONS OF CONTRASTING COLOR
- 3. SMOKE DETECTOR: UL 268A LISTED, PHOTOELECTRIC TYPE.
- 4. VISIBLE ALARM DEVICES: SYNCHRONIZED XENON STROBE LIGHTS LISTED UNDER UL 1971 WITH CLEAR OR NOMINAL WHITE POLYCARBONATE LENS. MOUNT LENS ON AN ALUMINUM FACEPLATE. THE WORD "FIRE" IS ENGRAVED IN MINIMUM 1-INCH HIGH LETTERS ON A REMOVABLE SLEEVE ON THE LENS.

5. AUDIBLE ALARM DEVICES

- a. HORNS: ELECTRIC-VIBRATING-POLARIZED TYPE, 24-V DC. HORNS SHALL PRODUCE A MINIMUM SOUND-PRESSURE LEVEL OF 90 DB, 10 FEET (3 M) FROM THE HORN.
- b. COMBINATION HORN/STROBE UNITS: HORN AND VISIBLE ALARM DEVICE AS SPECIFIED ABOVE, MOUNTED IN A FIRE RETARDANT, HIGH-IMPACT, WHITE POLYCARBONATE HOUSING SUITABLE FOR FLUSH OR SURFACE MOUNTING.

C. NOTIFICATION APPLIANCE CIRCUIT (NAC) PANEL

- 1. ENCLOSURE: STEEL, WITH LOCKABLE FRONT PANEL ALLOWING ACCESS TO INTERIOR COMPONENTS. SURFACE-MOUNTED.
- 2. FUNCTIONS: CONTAINS CIRCUITS TO MONITOR AND CHARGE BATTERIES, CONTROL AND SUPERVISE 4 CLASS B APPLIANCE CIRCUITS, AND MONITOR TWO CONTROLLING INPUTS FROM EXTERNAL SOURCES.
- a. CONFIGURABLE TO OPERATE AT ANY ONE OF THREE SIGNALING RATES, OR TO FOLLOWING THE MAIN PANELS NOTIFICATION APPLIANCE CIRCUIT.
- b. TROUBLE CONTACT WITH 16-SECOND DELAY.



Wiss, Janney, Elstner Associates, Inc. 2941 Fairview Park Drive, Suite 300 Falls Church, VA 22042 703.641.4601 tel www.wje.com

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Consultants

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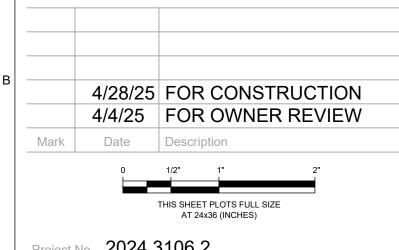
Mechanical & Electrical Engineers

GERVASE HALL INTERIOR DEMOLITION 3779 LIBRARY WALK

WASHINGTON, DC 20057

GU Project ID: 2-J06-12

Georgetown University 3700 O Street NW Washington, DC 20057



2024.3106.2

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D. SYSTEM FIELD WIRING 1. NON-POWER-LIMITED CIRCUITS: SOLID-COPPER CONDUCTORS WITH 600-V RATED, 75 DEG C, COLOR-CODED INSULATION. a. LOW-VOLTAGE CIRCUITS: NO. 16 AWG, MINIMUM. b. LINE-VOLTAGE CIRCUITS: NO. 12 AWG, MINIMUM. 2. POWER-LIMITED CIRCUITS: NFPA 70, TYPES FPL, FPLR, OR FPLP, AS RECOMMENDED BY MANUFACTURER. 3. WIRING SYSTEM: CLASS B IN ACCORDANCE WITH NFPA 72. 4. TYPE MC FIRE ALARM CABLE: EQUAL TO AFC CABLE SYSTEMS FPLP METAL-CLAD, MULTI-CONDUCTOR, FIRE ALARM AND CONTROL CABLE. E. PROVIDE WIRING, CONDUIT, AND OUTLET BOXES REQUIRED FOR THE COMPLETE SYSTEM, IN ACCORDANCE WITH SYSTEM MANUFACTURER'S INSTRUCTIONS AND WITH ELECTRICAL REQUIREMENTS SPECIFIED FOR WIRING, CONDUIT, AND BOXES. PROVIDE 12 INCHES OF SLACK AT EACH OUTLET. F. INSTALL WIRING IN CONDUIT OR TYPE MC FIRE ALARM CABLE. G. FINAL CONNECTIONS BETWEEN EQUIPMENT AND THE WIRING SYSTEM SHALL BE MADE UNDER THE DIRECTION AND SUPERVISION OF THE QUALIFIED SUPPLIER. H. AS MINIMUM REQUIREMENTS, THE SYSTEM SHALL BE TESTED TO SHOW THAT: 1. CIRCUITS ARE CONTINUOUS AND FREE FROM SHORT CIRCUITS. 2. CIRCUITS ARE FREE FROM UNSPECIFIED GROUNDS. Wiss, Janney, Elstner Associates, Inc. 3. RESISTANCE TO GROUND OF NON-GROUNDED CIRCUITS IS NOT LESS THAN ONE MEGOHM. 2941 Fairview Park Drive, Suite 300 Falls Church, VA 22042 4. CIRCUITS ARE PROPERLY CONNECTED IN ACCORDANCE WITH THE APPLICABLE WIRING DIAGRAMS. 703.641.4601 tel www.wje.com 5. EACH DETECTOR OPERATES CORRECTLY. Atlanta | Austin | Boston | Chicago | Cleveland | Dallas | Denver | Detroit 6. DETECTORS ARE CORRECTLY LOCATED AND SUFFICIENT IN NUMBER. Doylestown | Honolulu | Houston | Indianapolis | London | Los Angeles Milwaukee | Minneapolis | New Haven | Northbrook (HQ) | New York END OF MECHANICAL AND ELECTRICAL SPECIFICATIONS Pittsburgh | Philadelphia | Portland | Princeton | Raleigh | San Antonio San Diego | San Francisco | Seattle | South Florida | Washington, DC Consultants 11155 Red Run Boulevard, Suite 310 Mechanical & Electrical Engineers Baltimore, Maryland 21117 tel 410-265-6100 GERVASE HALL INTERIOR DEMOLITION 3779 LIBRARY WALK WASHINGTON, DC 20057 GU Project ID: 2-J06-12 Georgetown University 3700 O Street NW Washington, DC 20057 4/28/25 FOR CONSTRUCTION 4/4/25 FOR OWNER REVIEW Mark Date Description THIS SHEET PLOTS FULL SIZE AT 24x36 (INCHES) Project No. 2024.3106.2 4/28/25 DHC Drawn Checked KAH AS SHOWN Sheet Title SPECIFICATIONS ME102