

ELECTRICAL SPECIFICATIONS

26 50 00 – LIGHTING FIXTURES

- A. SUBMITTALS: SUBMIT PRODUCT DATA FOR APPROVAL.
- B. MATERIALS:
- 1. LUMINAIRES: PROVIDE AND INSTALL ALL LIGHTING EQUIPMENT OR APPROVED EQUAL AS SHOWN ON THE DRAWINGS AND DESCRIBED IN THE "FIXTURE SCHEDULE". PROVIDE LIGHTING EQUIPMENT COMPLETE, WIRED, ASSEMBLED, WITH PROPER FLANGES, MOUNTING SUPPORTS, HARDWARE, ETC. ALL LIGHTING EQUIPMENT INSTALLED IN LAY-IN TYPE CEILINGS SHALL BE PROVIDED WITH SAFETY CHAINS, CAPABLE OF SUPPORTING 200 POUNDS, SECURELY FASTENED TO THE LIGHT FIXTURE AND THE BUILDING STRUCTURE SO THAT NO PART OF THE FIXTURE WILL DROP BELOW A HEIGHT OF 7'-6" ABOVE THE FLOOR IN THE EVENT OF A CEILING SUSPENSION SYSTEM FAILURE.
  - 2. LED DRIVERS: PROVIDE UL LISTED POWER SUPPLY AS RECOMMENDED BY THE LED FIXTURE MANUFACTURER FOR OPERATION OF THE SPECIFIED LED LAMPS. POWER SUPPLY SHALL BE INTEGRAL TO THE LUMINAIRE UNLESS OTHERWISE NOTED ON THE PLANS. POWER SUPPLY SHALL OPERATE AT THE SUPPLY VOLTAGE INDICATED ON THE PLANS AND SHALL BE LISTED FOR STARTING AND OPERATING THE LAMPS AT 75F AVERAGE INDOOR TEMPERATURE.
  - 3. LED DIMMING DRIVERS: PROVIDE UL LISTED 0-10V DIMMING DRIVER AS RECOMMENDED BY THE LED FIXTURE MANUFACTURER FOR OPERATION OF THE SPECIFIED LED LAMPS, FULLY COMPATIBLE WITH THE DIMMING SYSTEM OR DIMMING SWITCH CONTROLLING THE FIXTURE. DRIVER SHALL BE INTEGRAL TO THE FIXTURE AND CAPABLE OF DIMMING THE LUMINAIRE TO 1% OUTPUT MINIMUM UNLESS OTHERWISE SCHEDULED ON THE PLANS. OSRAM "OPTOTRONIC" SERIES OR EQUAL. POWER SUPPLY SHALL BE DUAL VOLTAGE (120/277V) WHERE AVAILABLE AND OPERATE AT THE SUPPLY VOLTAGE INDICATED ON THE PLANS.
  - 4. LED LAMPS: UNLESS OTHERWISE SCHEDULED ON THE PLANS, PROVIDE NOMINAL 4000 K, WITH MINIMUM 90CRI AND A MINIMUM L70 LAMP LIFE OF 50,000 HOURS.
- C. INSTALLATION:
- 1. PENDANT LUMINARIES SHALL BE INSTALLED PLUMB AND LEVEL.
  - 2. INSTALL RECESSED LUMINAIRES TO PERMIT REMOVAL FROM BELOW.
  - 3. SUPPORT LUMINARIES IN SUSPENDED CEILINGS FROM STRUCTURE ABOVE USING A MINIMUM OF (4) ANCHORS IN ACCORDANCE WITH SECTION 26 05 29.
  - 4. TEST OPERATION OF ALL EMERGENCY LIGHTS BY SIMULATING A POWER OUTAGE FOR 90 MINUTES. CONFIRM THAT ALL EMERGENCY LIGHTING IS OPERATIONAL AND MEETS THE REQUIREMENTS OF NEC 700.12(A). CORRECT ALL DEFICIENCIES PRIOR TO SUBSTANTIAL COMPLETION.

27 10 00 – STRUCTURED CABLING

- A. SUMMARY: THIS SECTION INCLUDES REQUIREMENTS FOR THE DESIGN AND INSTALLATION OF THE TELECOMMUNICATIONS CABLING SYSTEM IN THE AREA OF WORK INCLUDING COMMUNICATIONS CABLE, PATCH PANELS, TELECOMMUNICATIONS JACKS, RACEWAYS, ETC. AS REQUIRED FOR A COMPLETE AND FUNCTIONAL TELECOMMUNICATIONS CABLING SYSTEM. QUALITY ASSURANCE: ALL PRODUCTS SHALL BE OF THE COMMSCOPE SYSTIMAX STRUCTURED CABLING SYSTEM. THE INSTALLER SHALL BE A COMPANY SPECIALIZING IN PERFORMING THIS TYPE OF WORK WITH A MINIMUM 3 YEARS DOCUMENTED EXPERIENCE AND MANUFACTURER'S CERTIFICATION TO INSTALL THE PRODUCT. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS: TIA/EIA 568-B.1-3, TIA/EIA 569\_A, AND TIA/EIA 607.
- B. SUBMITTALS: SUBMIT PRODUCT DATA FOR APPROVAL.
- C. MATERIALS:
- 1. UTP TELECOMMUNICATION CABLE: PLENUM-RATED CL2P, CATEGORY 6A, 4 PAIR, 23 AWG, SOLID COPPER CONDUCTOR TELECOMMUNICATIONS CABLE. SYSTIMAX 360 GIGASPEED X10D" 760107268.
  - 2. UTP TELECOMMUNICATIONS JACK: RJ-45, CATEGORY 6A, T568A/B, 8P8C, SINGLE, GRAY FINISH, TELECOMMUNICATIONS JACK WITH SINGLE-GANG FACEPLATES WITH FINISH TO MATCH OTHER WIRING DEVICES. SYSTIMAX "GIGASPEED XL" MGS400-270.
  - 3. UTP MODULAR PATCH PANEL: HIGH DENSITY, CATEGORY 6A MODULAR PATCH PANEL (48-PORT) WITH HORIZONTAL CABLE MANAGEMENT. SYSTIMAX # 760060921
  - 4. PATCH CABLES – ALL PATCH CABLES SHALL BE FACTORY MANUFACTURED. PROVIDE 7-FOOT CATEGORY 6A PATCH CABLES WITH BLUE JACKET FOR INSTALLATION BETWEEN NETWORK EQUIPMENT IN THE RACK AND DEDICATED DATA PORTS IN THE TELECOMMUNICATIONS PATCH PANELS. PROVIDE ONE PATCH CABLE FOR EACH DATA JACK IN ALL THE TELECOMMUNICATIONS OUTLETS, PLUS 25% ADDITIONAL CABLES FOR FUTURE EXPANSION OR REPLACEMENT CABLES.
  - 5. CABLE SUPPORT: ALL CABLES NOT INSTALLED IN CONDUIT SHALL BE SUPPORTED USING J-HOOKS, CADDY CABLECAT SERIES OR APPROVED EQUAL, WITH A MINIMUM J-HOOK SIZE EQUIVALENT TO CADDY #CAT32 OR APPROVED EQUAL. SIZE ALL J-HOOKS TO SUPPORT THE QUANTITY OF CABLES INSTALLED, PLUS A MINIMUM OF 25% SPARE CAPACITY.
- D. INSTALLATION:
- 1. UNLESS OTHERWISE NOTED, ALL CABLES SHALL BE INSTALLED IN CONDUIT FROM THE TELECOMMUNICATIONS JACK TO THE SPACE ABOVE THE ACCESSIBLE CEILING AND IN CONDUIT THROUGH INACCESSIBLE AREAS. SUPPORT CABLES INSTALLED IN CEILING SPACES WITH J-HOOKS ANCHORED TO THE ROOF STRUCTURE. MAXIMUM SPACING BETWEEN SUPPORTS SHALL BE 4 FEET, MAXIMUM NUMBER OF CABLES ON EACH SUPPORT SHALL BE 25. CABLES SHALL BE ROUTED A MINIMUM OF 5 INCHES FROM POWER LINES 2 KVA OR LESS, 12 INCHES FROM FLUORESCENT OR HID BALLASTS, 36 INCHES FROM POWER LINES 5 KVA OR GREATER, 40 INCHES FROM TRANSFORMERS AND MOTORS. STORE A MAXIMUM OF 12 INCHES OF SLACK CABLE AT EACH OUTLET AND A MINIMUM OF 10 FEET OF SLACK CABLE AT EACH RACK. CABLE JACKET SHALL BE MAINTAINED TO WITHIN .5 INCH OF JACK AND TWISTS SHALL BE

MAINTAINED TO WITHIN .25 INCH OF TERMINATION POINT. COMPLY WITH CABLE MANUFACTURERS MAXIMUM PULLING TENSION AND MINIMUM BEND RADIUS REQUIREMENTS. DO NOT STRETCH, STRESS, TIGHTLY COIL, BEND OR CRIMP CABLES. CABLES SHALL BE ROUTED SO THAT CABLE LENGTHS DO NOT EXCEED 90 METERS PER ANSI/TIA/EIA REQUIREMENTS. PERFORM END-TO-END TESTS OF EACH CABLE AFTER INSTALLATION AND TERMINATION TO SHOW COMPLIANCE WITH ANSI/TIA/EIA REQUIREMENTS.

- 2. EACH UTP CABLE SHALL BE TESTED FOR COMPLIANCE WITH TIA/EIA 568-B.1 AND TIA/EIA 568B.2 CATEGORY 6A STANDARDS AFTER INSTALLATION USING A FLUKE #DTX OR APPROVED EQUAL TESTER.

27 40 00 – AUDIO-VISIO SYSTEMS

- A. SUMMARY: CONTRACTOR SHALL INSTALL, CONFIGURE AND PROGRAM OFCI EQUIPMENT. SEE PLANS FOR LOCATIONS OF EQUIPMENT, RACEWAY INFORMATION, TERMINATIONS REQUIRED, AND OTHER WORK. CONTRACTOR SHALL COORDINATE DEVICE LOCATIONS, RACEWAY SIZES, CABLING REQUIREMENTS, AND EQUIPMENT REQUIREMENTS FOR A COMPLETE AND OPERABLE INSTALLATION.
- B. QUALIFICATIONS: AUDIO-VISIO INTEGRATOR MUST HAVE THE EXTRON CONTROL SPECIALIST CERTIFICATION. INTEGRATOR SHALL BE ABLE TO PROVIDE REFERENCES FOR (3) SIMILAR PROJECTS OF SIZE AND SCOPE UPON REQUEST.
- C. SCOPE OF WORK: SEE SCOPE OF WORK PROVIDED BY OWNER.
- D. EQUIPMENT LIST: SEE EQUIPMENT LIST PROVIDED BY OWNER.

28 10 00 – ACCESS CONTROL SYSTEM

- A. SUMMARY: THIS SECTION INCLUDES AN EXTENSION OF THE CAMPUS-WIDE ACCESS CONTROL SYSTEM TO INCLUDE NEW CONTROLLED DOORS AS PART OF THIS PROJECT. THE CONTRACTOR SHALL HOLD CURRENT CERTIFICATION BY THE ACCESS CONTROL SYSTEM MANUFACTURER, OR BE AN APPROVED VENDOR. THE CONTRACTOR SHALL COORDINATE TO PROVIDE CONTROL OF DOOR HARDWARE SPECIFIED AND INSTALLED UNDER DIVISION 8. PROVIDE ALL COMPONENTS AND PROGRAMMING REQUIRED TO ADD CONTROL OF THE DOORS SHOWN TO THE EXISTING SYSTEM. ADDITION OF USERS AND ISSUING OF CREDENTIALS SHALL BE BY UAA.
- B. SUBMITTALS: SUBMIT PRODUCT DATA FOR APPROVAL.
- C. MATERIALS:
- 1. MANUFACTURER: EXISTING SYSTEM IS 'MILLENNIUM' ACCESS CONTROL SYSTEM. ALL COMPONENTS SHALL BE EITHER PROVIDED BY MILLENNIUM OR APPROVED FOR USE IN THEIR SYSTEM. PROVIDE ALL TRIM PLATES, ENCLOSURES, BATTERIES, ETC., FOR A COMPLETE AND OPERABLE SYSTEM. MAJOR SYSTEM COMPONENTS ARE LISTED BELOW, BUT THIS SHALL NOT BE CONSIDERED AN EXHAUSTIVE LIST.
  - 2. SITE CONTROLLER: EXISTING.
  - 3. MAGNETIC STRIPE CARD READER: MILLENNIUM # 051-101443.
  - 4. NETWORK INTERFACE MODULE: MILLENNIUM # PS1-100212-001.
  - 5. DOOR CONTROLLER DEVICE: MILLENNIUM # 041-100992.
  - 6. COMPOSITE ACCESS CONTROL CABLE: WEST PENN # AC251822B OR APPROVED EQUAL.
  - 7. POWER SUPPLY: MILLENNIUM # PS2-510068.

28 31 00 – ADDRESSABLE FIRE ALARM AND SMOKE DETECTION SYSTEMS

- A. SUMMARY: THIS SECTION INCLUDES CONTRACTOR DESIGNED AND INSTALLED EXTENSION OF THE EXISTING ADDRESSABLE FIRE ALARM AND SMOKE DETECTION SYSTEM. THIS IS A PERFORMANCE TYPE SPECIFICATION DESCRIBING THE MINIMUM ACCEPTABLE FIRE ALARM SYSTEM. THE CONTRACTOR SHALL DESIGN AND INSTALL THE FIRE ALARM AND SMOKE DETECTION SYSTEM IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 72 AND ADAG. THE FIRE ALARM DEVICES ON THE DRAWINGS ARE SHOWN IN SUGGESTED LOCATIONS. THE FINAL LOCATIONS OF ALL DEVICES SHALL BE SOLELY DETERMINED BY THE CONTRACTOR AND SHALL BE IN ACCORDANCE WITH NFPA 72 AND ADAG. ALL NEW DEVICES ADDED TO THE EXISTING FIRE ALARM CONTROL PANEL SHALL BE UL LISTED FOR OPERATION ON THE EXISTING PANEL.
- B. SUBMITTALS: SUBMIT PRODUCT DATA FOR APPROVAL.
- C. MATERIALS:
- 1. MANUFACTURER: MATCH EXISTING TYPE.
  - 2. FIRE ALARM STROBE LIGHTS: NFPA 72 COMPLIANT, FLUSH WALL OR CEILING MOUNTED, SELF-SYNCHRONIZING, XENON, FIRE ALARM STROBE LAMP AND FLASHER WITH FLASHRATE OF ONE FLASH PER SECOND, COMPLYING WITH THE REQUIREMENTS OF ADAG. PROVIDE RED LETTERED FIRE ON CLEAR LENS. THE STROBE SHALL BE FIELD-SELECTABLE TO PROVIDE 15, 30 75, OR 110 CANDELA SYNCHRONIZED FLASH OUTPUTS.
  - 3. FIRE ALARM HORN: ANSI S3.41 AND NFPA 72 COMPLIANT, FLUSH SURFACE MOUNTED FIRE ALARM HORN WITH ADJUSTABLE SOUND OUTPUT LEVEL. SOUND RATING: 87 DBA (REVERBERANT) AT 10 FEET ON THE HIGH SETTING AND 82 DBA (REVERBERANT) AT 10 FEET ON THE LOW SETTING. PROVIDE MINIMUM SOUND PRESSURE LEVEL OF 15 DBA ABOVE THE AVERAGE AMBIENT SOUND LEVEL IN EVERY OCCUPIED SPACE WITHIN THE BUILDING. PROVIDE INTEGRAL FIRE ALARM STROBE LIGHT AS SPECIFIED ABOVE WHERE INDICATED ON THE DRAWINGS.
  - 4. FIRE ALARM SYSTEM POWER BRANCH CIRCUITS: BUILDING WIRE AS SPECIFIED IN SECTION 26 05 19.
  - 5. NOTIFICATION APPLIANCE CIRCUITS: MINIMUM #12 AWG COPPER BUILDING WIRE, AS SPECIFIED IN SECTION 26 05 19.
  - 6. INITIATING AND SIGNALING LINE CIRCUITS: TWISTED, SHIELDED OR UNSHIELDED FIRE ALARM CABLE AS RECOMMENDED BY THE FIRE ALARM SYSTEM MANUFACTURER. MINIMUM SIZE #16 AWG.

- D. INSTALLATION:
- 1. ALL FIRE ALARM SYSTEM COMPONENTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
  - 2. INSTALL ALL SMOKE DETECTORS A MINIMUM OF THREE FEET FROM ANY AIR SUPPLY, RETURN, OR EXHAUST DIFFUSER AND A MINIMUM OF ONE FOOT FROM ANY LIGHT FIXTURE.
  - 3. DETECTORS SHALL NOT BE INSTALLED UNTIL AFTER THE CONSTRUCTION CLEAN UP OF ALL TRADES IS COMPLETE AND FINAL. PROTECTIVE DUST COVERS SHALL BE INSTALLED ON ALL DETECTORS PRIOR TO FINAL CLEAN-UP.
  - 4. TEST IN ACCORDANCE WITH NFPA 72 AND LOCAL FIRE DEPARTMENT REQUIREMENTS. PROVIDE A COMPLETED NFPA 72 INSPECTION AND TESTING FORM FOR INCLUSION IN THE OPERATION AND MAINTENANCE MANUAL AT THE COMPLETION OF TESTING AND COMMISSIONING THE FIRE ALARM SYSTEM.
  - 5. INSTALL FIRE ALARM WIRING IN A DEDICATED RACEWAY OR CABLING SYSTEM PER SECTION 26 05 33 AND 26 05 19.

