

DIVISION 27 - COMMUNICATIONS

27 00 00 COMMUNICATIONS

27 05 00 COMMON WORK RESULTS FOR COMMUNICATIONS

27 05 01 GENERAL REQUIREMENTS

1. Wherever possible, electrical, telephone and data cabling are to be installed in concrete encased duct banks. Telephone and data are to be separated from electrical power.
2. All telecommunications cabling shall be kept in trays and /or conduits separate from primary or secondary power cabling. This includes any new telecommunications cabling installed in the existing utility tunnels. New cabling in tunnels shall be kept in separate trays or conduits and not laid together in trays containing primary or secondary power.
3. Install cable tray in corridors. (J-hooks may be used in corridors of Housing Units.)
4. Maximum length of cable runs, from wire closet rack to any individual wall outlet, shall not exceed to 280 feet. Stack IT rooms and locate in a centralized location.
5. Stack wire closets, Locate closets in a centralized location.
6. Install conduit across inaccessible ceilings.
7. Typical IT Equipment Room Requirements:
 - A. Minimum room size shall be 8 ft. x 12 ft.
 - B. Finished floors and walls
 - C. Provide minimum of one (1)-4'x8'x3/4" painted plywood panels, secured to finish walls, for component mounting.
 - D. Install minimum of 4 duplex receptacles. Locations and mounting heights within room to be coordinated with representative from University's IT department. Each receptacle to be on own 20 amp dedicated circuit with isolated ground from a generator panel when one is available and if not available run from nearest building panelboard.
 - E. Provide #4 bare copper ground to 10-hole bus bar mounted to the required plywood panel in each wire closet and equipment room.
 - F. All IT equipment rooms to be air-conditioned. Confirm equipment heat loads with representative from University's IT department. At no time shall the maximum ambient air temperature, within the IT equipment room, exceed 78 degree F.
 - G. Provide minimum of 8 - 4-inch diameter conduit stubs into room, from nearest primary cable raceway and/or between stacked IT rooms. Stub minimum of 6 inches above finished floor or below finished ceiling.
 - H. Provide minimum light level of 50 f.c. at 4 feet above finished floor. Lighting layouts shall consider equipment layouts so as to avoid shadows.
 - I. Provide smoke detector, NOT heat detector.
 - J. Room sizes and quantities may vary by project. Coordinate room locations, Layout and exact requirements with GVSU IT representative.
9. Standard Telcom/Data Drop Locations; All Non-Residential Buildings: Other than for exceptions noted below, all locations shall consist of a 4-inch sq., metal box with single gang plaster ring, 1-inch EMT stubbed up wall and to an accessible to ceiling. Where no accessible ceiling is available access panels (See Section 08 31 13 for other requirements) shall be provided for access to conduit stub and wire pulls to IT equipment room. When penetrating corridor walls a 1-1/4-inch EMT sleeve shall be provided to corridor.

Conduit and penetration shall be sealed as required to maintain wall fire rating, if any such rating is required.

- A. EXCEPTION #1: Systems Furniture Areas and Computer Labs: 4-inch sq. metal box with double gang plaster ring, 1-1/4-inch EMT stubbed up wall and to an accessible to ceiling. Where no accessible ceiling is available access panels (See Section 08 31 13 for other requirements) shall be provided for access to conduit stub and wire pulls to IT equipment room. When penetrating corridor walls a 2-inch EMT sleeve shall be provided to corridor. Conduit and penetration shall be sealed as required to maintain wall fire rating, if any such rating is required.
 - B. EXCEPTION #2: Science Labs: Where surface raceways are provided use standard #106 or Decora style single gang opening. Other in-wall drops to be standard as described above. 4-inch sq. metal box with double gang plaster ring, 1-1/4-inch EMT stub accessible to ceiling. Where no accessible ceiling is available access panels (See Section 08 31 13 for other requirements) shall be provided for access to conduit stub and wire pulls to IT equipment room. When penetrating corridor walls a 2-inch EMT sleeve shall be provided to corridor. Conduit and penetration shall be sealed as required to maintain wall fire rating, if any such rating is required.
10. Standard Telcom/Data Drop Locations; All Residential (Student Housing) Buildings: Shall consist of a 4-inch sq., metal box with single gang plaster ring, 3/4 -inch ent "smurf" tubing stubbed up wall and to an accessible corridor ceiling. Where no accessible ceiling is available access panels (See Section 08 31 13 for other requirements) shall be provided for access to conduit stub and wire pulls to IT equipment room. Conduit and penetration shall be sealed as required to maintain wall fire rating, if any such rating is required.
 11. Standard Classroom/Case Room: See Appendix C, Standard Detail 27.001, 27.002, 27.003, 27.004, 27.005 and 27.006.
 12. Public Telephones: Pay and courtesy phones are provided and installed by GVSU's IT dept. There is usually a wall phone in each public hallway. Provide J-box for cable installation. Provide support blocking. Comply with ADA requirement mounting height maximum of 48 inches above finish floor. Review proposed locations with GVSU at schematic design stage.
 13. GVSU IT will provide all voice and data wiring separately from contract.
 14. Where required the Telecommunications Contractor shall provide U.L. listed firestopping assembly for all openings and sleeves through floors and firewalls. The following product, or equal as approved by the University, shall be used on all projects:
 - A. STI SpecSeal SSP100 Putty
 - B. STI SpecSeal SSB Pillows

27 53 00 DISTRIBUTED SYSTEMS

27 53 13 CLOCK SYSTEMS

1. This Section includes a master clock and program system with master control unit and analog
2. An integrated, microprocessor-based system for originating and distributing time and time correction signals and for programming. Components display time at various locations. The system transmits time and program signals from a master control unit to indicating clocks, signal equipment, and remote switching devices over clock and program system wiring.
3. Wiring diagrams detailing wiring for power, signal, and control. Differentiate manufacturer-installed and field-installed wiring. Identify terminals and wiring color codes to facilitate installation, operation, and maintenance. Indicate recommended types and sizes for field-installed system wiring and show how wiring is protected from overcurrent.

4. Clocks must be compatible with existing Simplex master Clock system signals. Acceptable equipment is:
 - A. Simplex Model 6310-9221
 - B. Simplex Model 6410-9231
 - C. American Model B54BAAA301
5. Description: Unit serves as source of power for system clocks and provides time-correction signals to them. Unit controls programmable output circuits, both manually and automatically.
6. Time Reference Unit: Conforms to UL 863 "Electric Time Indicating and Recording Devices". Uses a quartz crystal oscillator time base to regulate system-timing functions to within a maximum deviation of plus or minus 2 seconds per month. Operates on internal, automatic recharging battery power for a minimum of 7 days when normal power is disconnected. Automatically resets system and corrects clocks upon resumption of power.
7. Microprocessor: An integral self-diagnostic program automatically checks the functioning of LEDs, switches, input keys, central processor, read-only memory (ROM), and random access memory (RAM) output circuits. A control panel display indicates failure by identifying the faulty device or circuit.
8. Lockout Codes: A minimum of 2 levels of access are available to restrict use of system operating and programming controls to authorized personnel:
 - A. Level 1: Access to all user programming and control functions.
 - B. Level 2: Access to review existing programs only.
9. Clock Control Function: Unit supervises and corrects individual system clocks automatically.
 - A. Daylight Savings Time Correction: Programmable for automatic correction.
 - B. Daylight Savings Time Correction: Programmable for automatic correction or accomplished by manual controls on front of pane.
 - C. Analog Synchronous Clocks: Correct for minute and second hand synchronization at least once each hour and for hour hand synchronization at least once daily.
10. Program Control Function: Programmable to automatically activate indicated signal or relay output circuits and signal devices selectively to produce programmed signals or initiate relay operation at any minute of any day of any 365-day cycle.
11. Housing: Steel cabinet with locking front panel. When cabinet is locked, time indication is visible at front panel face. Arrange cabinet for mounting as indicate.
12. Housing: Rack mounting enclosure with time indication visible at front panel face.
 - A. Clocks characteristics are:
 - B. Style: 12-inch round; +/- $\frac{1}{2}$ -inch
 - C. Back Ring: Black matte finish
 - D. Bezel: Glass: Clear Acrylic
 - E. White background with Roman Numeric numbers (1-12) and black hour, minute and second hands
 - F. 12 hour dial
14. Connection Provisions: Plug connector.
15. Clocks are to have 2310-4003 Dials and 2310-3003 Hands, or equal style.
16. Analog synchronous clocks shall be driven by self-starting, permanently lubricated, sealed synchronous motors, and equipped with sweep second hands and correcting solenoid actuators.
17. Wire is to be stranded. Size conductors as indicated but not less than recommended by system manufacturer for runs indicated. Comply with Division 16 Sections "Raceways" and "Wires and Cables".
18. Cable for Low-Voltage Control and Signal Circuits: Twisted-pair cable, unshielded except where manufacturer recommends shielded cable.
19. Plenum Cable: Indicated and installed without raceway in plenums and plenum ceilings, cable is UL listed and labeled as suitable for use in air-handling spaces.
20. Wiring Method: Install wiring in a complete raceway system.

21. **Wiring Method:** Install 120 V system wiring in raceway. Install low-voltage system wiring in cable tray where practical. Use listed plenum cable for low-voltage wiring in environmental air spaces, including plenum ceilings.
22. **Wiring Method:** Use metal-clad cable for 120 V system wiring and jacketed cable for low-voltage system wiring.
23. **Wiring Within Enclosures:** Bundle, lace, and train the conductors to terminal points with no excess. Provide and use lacing bars and distribution spools.
24. **Splices, Taps, and Terminations:** Make splices, taps, and terminations on numbered terminal strips in junction, pull and outlet boxes, terminal cabinets, and equipment enclosures.
25. **Tighten connections** to comply with tightening torques specified in UL 486A.
26. **Identification of Conductors and Cables:** Color-code conductors and apply wire and cable marking tape to designate wires and cables so they are uniformly identified and coordinated with system wiring
27. **Ground clocks, programming equipment, and conductor and cable shields** to eliminate shock hazard and to minimize ground loops, common mode returns, noise pickup, cross talk, and other impairments.
28. **Manufacturer's Field Service:** Provide services of a factory-authorized service representative to supervise the field assembly and connection of components and system pre-testing, testing, adjustment, and programming.
29. **Train Owner's operating personnel** in the programming and operation of the system. Train Owner's maintenance personnel in the procedures and schedules involved in programming, operating, troubleshooting, servicing, and providing preventive maintenance for the system. Provide a minimum of 4 hours of instruction.
30. **Schedule training** with at least 7 days' advance notice.
31. **Occupancy Adjustments:** When requested within 1 year of date of substantial completion, provide on-site assistance in adjusting and reprogramming to suit actual occupied conditions. Provide up to 2 visits to the site for this purpose without additional cost.

END OF SECTION