



# **Southern Utah University**

## **Design Requirements**

To be used as a supplement to the Utah Division of Facilities Construction and Management (DFCM) Design Requirements

[http://dfcm.utah.gov/downloads/design\\_manual/design\\_requirements.pdf](http://dfcm.utah.gov/downloads/design_manual/design_requirements.pdf)

Sept. 20, 2016

The items listed below are supplemental requirements to the DFCM Design Requirements and are specific to Southern Utah University. These requirements will be implemented into all SUU projects.

### **Concrete**

- For all flatwork, use SUU mix
  - Sunroc: 6003A
  - Western Rock: SUU Spec
- Requirements for Exterior Concrete
  - 4000 Psi and 6.0 Bag
  - 3.0 Lbs. of Macrofiber (650 Fiber, Fortafiber) per cubic yard of concrete
  - Pozzolans: Less than 15%
  - Air Entrainment: 6 ¼% plus or minus 1 ¼%
  - Use of calcium chloride prohibited
  - Seal with Pentra-Sil 244 (28 days after pour)
- Quality Control Testing: required on any pour greater than one (1) cubic yard
  - Concrete: one set of cylinders for every 10 cubic yard. Test every load for temperature, slump, and air
  - Subgrade: 98% compaction

### **Door Hardware**

- Cylindrical Locks
  - Schlage ND Vandlgard Series levers
    - IC core cylinders
    - 626 finish
  - Auto Openers
    - LCN4642 or 4631 Aluminum or Dark Bronze finish
    - LCN8310-356 WS RF transmitter
    - LCN8310-865 RF receiver
  - Closers
    - LCN4041 Super Smoothee Closer Aluminum or Dark Bronze finish
  - Panic Hardware
    - VonDuprin 99 Exit Device
    - VonDuprin 99 Exterior Trim
      - IC core cylinders
      - 26D finish
  - Cylinders
    - Everest D Family restricted keyway
      - 626 finish

- Hinges
  - Continuous Geared Hinges - Hager Roton
  - Ball Bearing 4-1/2 by 4-1/2 Butt hinges - Ives or Hager
- Keying
  - Match SUU's existing master key system
  - Schlage Everest D Family Restricted keyway
  - Master Key System shall be provided by/coordinated with Southern Utah University's lock shop
- Doors/Openings
  - (Exterior Door) Wide style and rail (10") store front doors 1" bronze/ LOW-E glass
  - (Interior/Vestibule Door) Wide style and rail (10") store front doors ¼" clear glass
  - Steel, key removable mullion
  - SDI 100 16 gauge welded hollow metal frames
  - SDI 100 18 gauge hollow metal doors
  - Marshfield premium grade wood doors.
- Door Trim
  - Kick Plates and Armor Plates
  - Minimum thickness of .050 stainless steel
  - Threshold – Pemko or National Guard
- Wall Stops and Holders
  - Wall Stops required at location where the door or hardware interacts with another structure.
  - Magnetic Holders only – Ties into Fire Panel – Coordinate with SUU electrical shop
  - Simplex or Rixon
- Electronic Access Control
  - Match SUU's existing Electronic Access Control System
  - TAC Continuum
  - All low-voltage wiring will be entirely in conduit or approved protected raceway.
  - System and components shall be coordinated with Southern Utah University's lock shop.

### **Interior Finishes**

- Paint
  - Gypsum: new or patch work will be primed with one coat of an appropriate sheet rock primer. Paint with two coats interior latex satin sheen. Facilities Management will approve all colors.
  - Metal surfaces: Prime with appropriate metal primer designed for exterior or interior surfaces. Paint with semi-gloss oil based products. Facilities Management will approve all colors.
  - Floors: prepare all concrete by means of acid washing or concrete floor cleaner, whichever is appropriate for the specific situation. Paint all floors with epoxy or

waterborne epoxy with gloss sheen. Use of a slip resistant additive is recommended. Facilities Management will approve all colors.

- Any specialty items that may require different products or procedures must be approved by an authorized facilities management technical advisor.
- Flooring
  - All stairs must have contrasting color or material, approved by SUU facilities Management, at the leading edge of each step unless otherwise stated.

### **Mechanical**

- Adhere to manufacturer's recommendations for working area provided around and in front of all equipment. Service access cannot be blocked by piping, conduit, cable trays, or other obstructions installed as part of the construction process. Place equipment so as to accommodate ready service access to unit.
- Provide adequate access for service of equipment via access panels in ceilings or catwalks in attic space. All access methods must meet OSHA, NFPA and other pertinent regulations.
- Provide lighting in attic areas for all pathways to equipment and where equipment is located. Minimum of 15 foot candles, with adequate lighting at equipment location for service to be performed safely.
- Provide service outlet at equipment (110V duplex outlet).
- Place all wiring in trays, conduit or bundled - install parallel to ceiling and walls.
- Provide chemical circulation ports on both inlet and outlet of hot water converters (domestic and heating) located on the equipment side of isolation / shut-off valves (for tube "boil-out").
- All fire system main drains shall be piped to the exterior of the building where landscaping will not be damaged.
- All pumps must have high and low side pressure gauges. Water systems must have thermal wells for installation of thermometers at critical points where the temperature delta is important for operating systems.
- Water systems must have ball style shut off valves installed on supply and return lines at zone branch departures from the main line. Shut off valves will be installed for the isolation of any device on the water system, allowing repair and maintenance with a minimum of water loss. All valve locations shall be clearly indicated on "Record" drawings.
- All work must be done in a professional manner.
- A representative from the IT department should be included when designing or bidding new head ends or control systems that utilize campus network or fiber resources.

### **Electrical**

- Acceptable rigid raceways: GRC, IMC, EMT, and PVC. EMT only above grade, PVC only below grade. All metallic raceways below grade must be wrapped with 10 mil tape.

- Acceptable flexible raceways: Steel flexible conduit, liquid tight steel flexible conduit: 6 foot or shorter lengths, aluminum or non-metallic not allowed. No concealed flexible conduit unless special permission is granted by SUU.
- No cast aluminum conduit fittings or locknuts; except for screw in cast aluminum flex connectors on conduits 1 inch or smaller or where specifically allowed by SUU.
- Steel connectors shall be insulated throat or have bushings. All nipples shall have bushings.
- Unless approved by SUU staff, non-removable anchors shall not be used.
- No gang-able or handy boxes shall be used unless special permission is granted by SUU.
- All four inch square boxes shall be 2-1/8" deep, minimum, unless approved by SUU. No more than 3- 3/4" conduits in this size box. More than 3 conduits will require 4-11/16" x 2-1/8" square boxes.
- No NM, MC, BX, ENT conduit, or AC cable shall be used.
- Aluminum wire will not be allowed, including main feeders. Panel buss bars and transformer windings shall also be copper.
- Circuit number & Panel Identification shall be displayed at each junction box and device box. Permanent marks acceptable at junction boxes only. Device plates, panels, and disconnect, etc. shall use label makers.
- Fire alarm system wiring shall have red covers on all j-boxes and be piped in a Class-A loop.
- All local and national electrical codes and standards shall be followed.
- Conduits shall be strapped within 18" of j-boxes, panels etc. and then at least two straps for every ten-foot piece of conduit. Flex will be strapped within 12 inches of j-boxes and every three feet thereafter.
- Screw gun brackets shall be used to support boxes and conduit in the walls.
- Receptacles and switches shall be spec. grade 20 amp devices. They shall be weather resistant in outdoor and damp locations.
- All panels shall have bolt-in type circuit breakers. Some exceptions will be made in residential locations.
- Minimum size conduit shall be 3/4 inch unless special permission granted by SUU.
- Seismic wires size #12 minimum, galvanized shall be used where required.
- All supports must come from structure.
- Minimum burial depth for conduit is 24 inches with warning tape no more than 12 inches or less than 8 inches above buried line. All buried conductors will be in conduit.
- All bends over 22-1/2 degrees in PVC shall be GRC or IMC wrapped with 10mil tape. All below grade GRC and IMC shall be wrapped with 10 mil tape.
- Multi-wire Branch Circuits shall comply with N.E.C. 210.4 but all receptacle branch circuits shall have a neutral wire for each ungrounded conductor (120 volt circuits).
- A green grounding wire shall be pulled in all conduit used for power.
- Low or control voltage and signal/data wiring shall not share a raceway with line voltage.
- All work must be done in a professional manner.
- Unless otherwise approved by SUU electrical staff, there shall be no more than one conductor of each phase in each conduit.

- Three pole breakers shall not be used to serve single phase circuits.
- See University for light fixture detail.
- See University for Emergency Blue Light detail.
- A representative from the IT department should be included when designing or bidding new head ends or control systems that utilize campus network or fiber resources.

### **Communication Systems**

#### Communications rooms:

- Never locate under or adjacent to water such as, but not limited to, restrooms, irrigation sprinklers, etc. The only water that shall be permitted is fire sprinklers required by fire code.
- Communications rooms should be located near the center of a building in order to minimize cable lengths. For multi-story buildings the rooms should be stacked vertically. Whenever possible the main room (MDF) should be centered vertically. Then, when cable length permits, all cables shall be home run to the MDF to be terminated if space permits growth. This will save space as well as the cost of having multiple AC units, UPS systems and possibly excess network equipment.
- Communications rooms shall be dedicated space, not shared with electrical, custodial, or any other utility or service.
- Communications rooms shall not have any walls that are building exterior walls. They should not be adjacent to elevator shafts or transformers.
- The ease of adding more cables in the future must be considered in the design.
- Communications closets shall be accessible without going through a classroom or an office.
- Cooling should be separate from the building cooling system and should be capable of running year round even if the rest of the building is being heated.
- Power shall be supplemented by a backup generator or UPS.
- Conduit fill for design shall be as follows:  
 $\frac{3}{4}$ " – 3 Cables, 1" – 6 Cables, 1  $\frac{1}{4}$ " – 10 Cables, 1  $\frac{1}{2}$ " – 26 Cables, 2" – 26 Cables, 3" – 59 Cables, 4" – 105 Cables

#### Cabling between buildings:

- Fiber optic cables
  - These shall be Corning Freedom LST Gel Free loose tube cables.
  - Unless otherwise specified the fiber count should be 12 SM and 12 MM (hybrid preferred).
  - Fibers should be terminated in a wall mountable housing.
  - Connectors should be LC.
- Twisted pair cables
  - To support legacy applications, there should be a (minimum) 25 pair cable. It shall be terminated on 66 blocks with surge suppression.

#### Twisted pair cabling and termination within buildings:

- All pieces of a twisted pair solution should be Systimax Category 6.

- There should be no distinction between telephone and data cables or jacks in materials, color, termination, labeling, or anything else.
- PVC cable color shall be slate.
- Plenum cable color shall be blue.
- Data/telephone jacks shall be black.
- Face plates shall be stainless steel, unless otherwise specified by the campus to match surroundings.
- Terminations in the communications room shall be made on wall mounted Visi-Patch blocks. Patch panels are not acceptable.
- All cables shall be home run to the communications room.

### **Miscellaneous:**

- A standard office shall have two outlets each in two different locations (total 4) placed appropriately for where furniture would most likely be placed. Larger offices should have more locations appropriate for the size.
- Mediated rooms and classrooms will require 3 data runs to the presenter / teacher station. A 1" conduit is required between the teacher station and projector and or wall mount TV location. If the room specs a TV, then 2 data outlets are required at the TV location. Rooms that call for a projector should have two data outlets and a power outlet at the projector. The projector mount and location should be approved by the SUU IT Media Tech. Classrooms will require at a minimum 2 data outlets in the ceiling grid space for a wireless access point.
- A network drop shall be provided for wireless access points, high on a wall or in the ceiling. There should be, as a minimum, 2 data drops per 2000 sq. feet of floor space. The number and location of data drops can change due to expected user density. For example, a stadium style classroom would need more Wi-Fi density than a similar area used as office space. Please contact IT by one of the methods listed below for discussion and design review.
- Lobby or foyer areas on the main floor should have 1 data drop on the wall or in the ceiling for an emergency notification IP speaker.
- When paths are possible, 3/4 inch conduits home run to the communications room are preferred. If cable tray is used, it should be above hallways, not above offices, classrooms or restrooms.
- No more than two boxes max may be daisy chained on one conduit. One is preferable.
- All faceplates, jacks, and termination blocks shall be numbered. The numbering must match the campus' documentation system so please contact IT by one of the methods listed below for more information.
- At the conclusion of a project, provide IT with a floor plan that shows jack locations and numbers. Also provide test results. Ask about acceptable formats.

### **Grounds**

- Any landscape damaged by the contractor or sub-contractors will be fixed to SUU Grounds standards before receiving final payment.

- Any damage to grass areas such as holes or heavy machinery driving on grass causing compaction should be handled in the appropriate way.
  - Damaged area should be over excavated by 12 inches, and at least 6 inches of approved top soil will be added to the area. Each damaged area should be cut with a sod cutter in order to create defined lines where the new approved sod begins and to create an even continuation from old grass to new grass. New sod cannot be laid on top of old grass!
- Any damage to trees should be brought to the attention of the grounds crew as soon as possible. It will be up to the Director of Grounds & Gardens if the tree can be salvaged or should be replaced.
  - Damage due to compact drip line, broken limbs, damaged roots, lack of water, or damaged bark can result in replacement of tree. The replacement tree should be the same species of the damaged tree unless otherwise approved by the Director of Grounds and Gardens who has the right to deny any new tree that does not meet certain requirements of a healthy tree.
  - Trees should be planted according to SUU Grounds specifications listed on the SUU website. The bucket, wire basket, and or burlap should be removed as much as possible. All trees must have a (1) year warranty from the date the project is complete.
- The grounds crew will be in charge of isolating any sprinkler lines that are outside the assigned work area but may still affect the project; However, any sprinkler lines inside the project will be the responsibility of the contractors to protect. If sprinkler lines are damaged, the grounds crew should be notified so they can check the area for any potential issues. Any re-designing of sprinkler lines and heads because of construction should always be designed with head-to-head coverage.
  - All sprinkler parts should be replaced with similar product (e.g., Schedule 40 should be replaced with Schedule 40. Schedule 80 should be replaced with Schedule 80.)
  - All sprinkler heads and valves should be replaced with Rainbird products.
- All trash and debris should be cleaned up daily. Wind may carry some of the debris or trash past the work area; However, the contractor or sub-contractors are still responsible for cleaning their own trash.
- All new clocks must be Rainbird brand and must be capable of connecting to the Maxi-Com central control system. The clock may require a phone line or a two wire connection.
- If the back flow system or pressure vacuum breaker (PVB) is altered in any way, the contractor must follow all state codes regarding backflow prevention.
- Weed fabric should be used under any mulch or decorative rock added to all planters. Dewitt brand is preferred but any weed fabric used must meet the specifications of the Dewitt 4oz.
- Mulch products must be approved by the grounds supervisor in charge of the project or the Director of Grounds and Gardens.
- Approved Soil
  - 20 % Organic Materials (Screened Mushroom Mulch)
  - 20 % Washed Sand



- 60 % Screened Soil
- Approved Sod
  - 80 % Cool Weather Blue Grass
  - 20 % Fine Fescue

**Custodial**

- All custodial closet doors must swing out of the room
- Custodial closets will have finished walls throughout
- Include 1 custodial supply room of approximately 80 square feet per building in addition to the custodial closets on each floor.

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