

SALT LAKE COMMUNITY COLLEGE
FACILITIES DESIGN STANDARDS

General Philosophy

The College historically is based on trade education and the trades remain an essential component of the curriculum. SLCC considers quality workmanship, sound construction, and innovative design approaches critical to the image of the College. The buildings and grounds at SLCC act both as an example of what the College offers and as a lesson for students; they must, therefore, represent the best possible techniques. Prior to schematic design these standards shall be discussed item by item. Exceptions and alternatives must be approved by the College.

DIVISION 1: GENERAL PLANNING AND DESIGN DATA

1. Buildings should be designed with many systems integrated using current technology with plans to accommodate future technology. Design shall meet a design criteria of 60 years and be adaptable to changes in space allocation..
2. Spacious telephone/data closets shall be provided at a reasonable interval on every level. These spaces must be air conditioned.
3. Exterior walls shall be brick, cast stone, or any other permanent type of material that does not require cleaning or painting. The materials selected must harmonize with materials used in other buildings on campus including soffit and trim.
4. Shops should be designed for maximum utilization of wall space and have a limited number of windows. Shop walls to be constructed of durable materials. Offices shall have windows or borrow light from adjacent spaces.

5. Each floor to have at least one janitors closet with adequate storage, water, slop sink, and ceramic tile on walls. Each building to have a facilities storage room in a convenient location in addition to janitor closets. See detailed room description at end of this division.
6. Chair rail shall be installed around drywall classrooms. Coordinate height with furniture to be used. Drywall is not recommended in corridors unless durable wainscot is provided to 3'-6" above finished floor.
7. Fire lanes at least 30 feet wide meeting the Fire Marshall's standards shall be provided.
8. Garbage enclosures or other methods of refuse storage shall be provided at each building. Gates are required at dumpster enclosures.
9. During construction, the contractor is to meter and pay utilities; electrical, water, etc.
10. Upon completion of work and before final payment, contractor is to furnish and deliver to owner four (4) sets of operating and maintenance instructions for each item of material, equipment and hardware used in the building. This includes, but is not limited to:
 - A. Mechanical equipment.
 - B. Electrical equipment, including light fixtures, hand dryers, fans, panels, transformers, switches, and motors.
 - C. Air-conditioning.
 - D. Plumbing and heating.
 - E. Hardware, including locks, door closures, hinges, panic devices, etc.
 - F. Restroom supplies and equipment, including booth partitions.
 - G. Pumps.

- H. Automation and temperature controls
 - I. Preventive maintenance system from manufacturer on College approved forms.
11. In each set of instructions the following information shall be included for each item of material, equipment and hardware installed.
- A. Name, address , phone number of manufacturer and/or fabricator as well as the installation contractor.
 - B. Trade name, catalog number, serial number, contract number, or other accurate provision for ordering replacement and spare parts.
 - C. Certified drawings, where applicable, showing assembly of parts and general dimensions.
 - D. Parts list.
 - E. Installation, operating, and maintenance instructions.
12. A preventive maintenance and lubrication schedule shall be provided on a College form for each item of equipment.
13. A list of all extra stock to be provided to College shall be included in specifications. Exact quantities not percentages shall be listed.
14. Driveways and loading docks shall be provided with adequate access by 40' delivery trucks (18 wheel type).
15. Student foot traffic to be directed away from truck loading/unloading zones and other high traffic areas.
16. Waterproof GFI power outlets and freeze-proof hose bibs on roofs.

17. Supplementary General Conditions shall include the following:

Liquidated Damages:

In addition to those damages stated in Section 8.4 of the general conditions 50% of the amount stated in the contractors agreement for liquidated damages shall be due the owner for each day or part thereof in excess of 30 days that the work remains incomplete after the substantial completion punch list. The substantial completion punch list shall be considered delivered on the date it is transmitted by facsimile, hand delivery or received by the contractor by certified mail.

NOTE: 1. The contractor's agreement also needs to reflect this addition.

2. Integrate into substantial completion certificate.
3. Coordinate with 9.6.1 (2) of the general conditions.

JANITOR CLOSETS/CUSTODIAL OFFICE DATA:

- A. Size 15' x 20' with metal shelving with adjustable shelves, 18" - 24" deep, depending on size of room, along one wall opposite sink.
- B. Outlets should be available 3' - 4' high from floor, 2 per wall
- C. Lighting should be 4' tubes.
- D. Floor drain shall be provided.
- E. Sinks should be equipped for solution centers provided by College Custodial Dept.
- F. One 3' x 4' bulletin board per closet.
- G. Adequate ventilation in each closet.
- H. Mop and broom holders by sink with at least 4 slots per holder.
- I. One closet, and/or one office space to accommodate custodial management personnel per building.
- J. Custodial closets for custodial only, no breaker boxes, fan units, etc.
- K. Storage room approximately 20' x 20' for bulk custodial supply per building by outside entrance.
- L. One central storage and delivery for the campus; i.e., small warehouse with overhead door access.
- M. Computer and phone access for Custodial Office and central storage room.
- N. Adequate delivery area and easy access to each building storage room for bulk supplies.
- O. Bigger-sized elevators; i.e., freight elevator for staff only for deliveries of supplies, furnishings, etc.

TRAINING ROOM

- A. Central room for custodial training with tables, chairs, white board, outlets for equipment, floor slop sink, mop and broom holders, with one section of carpet, one section of tile, one section of cement, one section of wood, one section of terrazzo, each section 5' x 5' except for carpet section, which should be 5' x 10'.

UTILITY (MOVING/LIGHTING) SECTION

- A. Storage Rooms - basement of each building and one large storage room for lighting products, furniture; i.e., new and used parts, equipment. Also a main office for this position. Storage for ADA items may have to be separate.
 - 1. Storage Room in each building to consist 20' x 20' with shelving around two or three walls with 2' spacing between shelves and 2' deep mounted to wall.
 - 2. 1-2 storage rooms (10' x 30') or a small warehouse 100' x 100'.
 - 3. Storage for lifts if separate from warehouse, if elevator is in this facility it will have to be big enough to accommodate equipment, carts. etc.

DIVISION 2: SITEWORK

1. Parking lots shall be sloped a minimum of 1/4" per foot to catch basins for proper drainage.
2. Parking lots shall be designed with numerous landscaped areas. The areas shall be located in ways that facilitate snow removal and storage.
3. Asphalt parking lots shall have at least 12" compacted base and 4" asphalt surface.
4. Parking stalls shall be 8'6" wide or larger with 16' x 4" stripes on each side. Stalls for disabled shall be provided as required.
5. Parking lots shall drain to storm drains.
6. Parking lot lighting shall be high pressure sodium or metal halide and be controlled by a photocell and Johnson Control system. All parking lot light fixtures shall be identical campus wide; i.e., same model and manufacturer. No exceptions.
7. Parking lot lighting poles shall be aluminum with anodized finish (maintenance free finish including escutcheons).
8. Parking lot lighting shall be zoned for energy and security lighting. Minimum intensity greater than one foot candle at any location.
9. Convenience outlets (110V) to be scattered at various points in parking lots or lighting poles. Assume every other pole in lots.
10. Control bollards with eyes and chains shall be installed in concrete bases.
11. Signage as per approved College signing standards shall be provided.
12. Walkway lighting is considered a security device and shall be designed to reduce the chance of injury, theft and vandalism and shall be high pressure sodium or metal halide.

Controls shall be photocell and controlled by the College HVAC computer. All walkway light fixtures shall be same model/manufacturer campus wide.

13. Landscaping shall be designed for ease of maintenance and shall consider the potential traffic patterns of the public and students. Xeriscaping concepts are recommended in an effort to reduce water consumption.
14. Concrete walks shall be 6" thick minimum and mixed with 100% virgin polypropylene fibrillated fibers at the rate of 1.5 lbs. per cubic yard into the total slab. Concrete flatwork 28 day strength to be 4000 PSI. The College's representative shall be notified 24 hours prior to placing concrete.
15. All walkways shall be accessible to the handicapped.
16. Sprinkler systems shall be Rainbird and shall use a computer clock attached to a master computer.
17. Sprinkler control boxes and contents shall be of a design approved by the College. Sprinkler valve boxes shall be located next to walks. Valve boxes shall be of size to allow for maintenance and free operation of all valves and levers.
18. Trees shall be a minimum of 2" caliper. 70% of trees should be type that live longer than 60 years...variety is important.
19. Sprinkler lines shall be schedule 40 PVC and installed in large sleeves under concrete and through foundations. All fittings on main lines (any line under constant pressure) shall be ductile iron ("Harco") or schedule 80 PVC depending on size of line.
20. Landscaping, including trees, berms, shrubs, grass and flowers shall all be included in the project. Beautification is a primary concern.

21. Trees shall be planted in a depression with an 8"+ drain hole in the bottom drilled to a depth terminating in sand or gravel and filled with gravel covered with filter fabric.
22. Specifications shall include the following:
 - A. All connections on pressurized mainlines shall be thrust-blocked according to industry standards.
 - B. All fittings of 2" or greater diameter shall be schedule 80 fittings.
 - C. A diagram of zones and specific areas of controller locations shall be provided by the contractor upon completion.
 - D. Contractor shall physically walk through each zone to ensure proper wiring and operation of each irrigation controller.
 - E. An isolation valve shall be installed for each inlet to each building.
 - F. An isolation valve shall be installed for each bank of valves for maintenance and troubleshooting purposes.
 - G. Any damage to landscape due to water being shut down while being repaired by contractor shall be repaired or replaced by the contractor.
 - H. Contractor shall be responsible for all maintenance of existing landscaping and existing landscape sprinkling systems occurring in or passing through contract area. This is true for electricity, phone/data, etc.
23. Asphalt roadways shall be designed to UDOT standards and have 5" asphalt over 12" roadbase minimum.

DIVISION 3: CONCRETE

1. All exposed concrete intended to be the finished surface on buildings or site structures shall be considered “architectural concrete” and detailed/specified as such.
 - A. Formwork to be of MDO plywood allowing a light sandblasted final finish.
 - B. Form ties to be cone type @ 2:0" O/C.
 - C. Cement to be type 1
 - D. Rustication joints to be detailed at appropriate intervals.
2. Testing: Paid for by owner, scheduled and coordinated by contractor.
3. Sandblasting: As approved by College
4. Flatwork mixes
 - A. Air: 6.5 percent \pm 1.5 percent.
 - B. Fly Ash: Not to exceed 15 percent of cement content by weight.
 - C. Fibermesh: 1.5 lb. of fiber per cubic yard of concrete.
 - E. Sealers: Curing, hardening and sealing agent: “Ashford Formula”. Application must begin immediately following final concrete finishing operation. Absolutely no work must occur on finished slab prior to sealing.
5. Also refer to Division 2: Sitework

DIVISION 4: MASONRY

1. Brick color is to be approved by College.
2. Paver color is to be approved by College, set in sand setting bed on concrete slab with Mirafi fabric over drain holes to subgrade, etc.
3. Laticrete in masonry joints exposed to possibility of vertical water penetration.

DIVISION 5: METALS

1. Railings shall be stainless steel or brass. Galvanized and rigid stock to absorb abuse may be used as outside fencing or gating. Use only stainless steel or anodized aluminum at interior stairs. (Possibly kynar approved if totally prefabricated and shop finished). Exterior railings stainless steel or anodized aluminum only.
2. Metal ladders are suggested to be galvanized steel.
3. Gratings and trench covers shall be designed to be structurally strong, stable and solid. Gratings shall be galvanized and a minimum 3/16" thick flat stock.
4. Field painted steel rails are not acceptable.

DIVISION 6: WOOD AND PLASTICS

DIVISION 7: THERMAL AND MOISTURE PROTECTION

1. Roof slope = 1/4" per foot
2. All coping must be anodized aluminum or non-ferrous material. All copes and exposed flashes shall be refinished aluminum either kynar finish, or anodized.
3. Waterproofing at all tunnels and foundation walls - Not Damproofing.
4. Roof systems preferred:
 - A. 4-ply glass built-up
 - B. 2-ply modified
 - C. EPDM
 - D. PVC
5. All frequently serviced mechanical equipment shall have walk mats leading to most common points of service from roof access point.
7. Fire proofing and stopping -- The brand name is not important but this item will be evaluated on every job as to meeting code criteria at penetrations for fire walls.

Penthouses -- Penthouses shall be designed to be aesthetically pleasing.

Skylights -- Are not recommended as a design for College facilities. However, the use of roof monitors or clerestorey daylighting is encouraged.

DIVISION 8: DOORS AND WINDOWS

1. Closers: LCN #4040 with EDA Arm or #4041 (No substitutes) with SEX bolts. Public access areas use 4040 Model with adjustment to 7# force max. Storerooms, etc. use 4041 model.
2. Key systems must be Schlage or Corbin and equal to and keyed to the existing systems by great grand grand building master keys and change keys. On remodel projects, the College will define cylinders to be used in existing hardware. On new buildings the keying shall incorporate College "ASSA" restricted cylinders to be installed in the above hardware. All keying shall be done by the College.
3. Door frames to be 16 gauge or heavier.
4. Exterior entry and window systems to be anodized aluminum with insulating glass.
5. Roll-up counter fire doors shall be pre-approved by the College as to manufacturer prior to specifying regardless of manufacturer. Doors shall be installed with a battery back-up device on the operating system allowing operation during power outages. The doors shall be motor down only, no ratcheting allowed. The doors shall be released to close upon alarm by local detectors only (not the building detection system) or the back-up fusible link in the assembly.
6. Upward acting sectional doors: all shall have heavy duty track and rollers. Doors shall have weather seal at jambs, head and sill.
7. Automatic door operators shall be Stanley Magic-Door, Len Pneumatic, or manufacturer prior approved by College.

8. Cabinet locks shall be Corbin or College-approved equal and keyed as required by users.
All cabinet locks shall be master keyed also.
9. All cabinet hinges shall be Blum.
10. All adjustable shelf brackets and accessories shall be Knappe and Vogt.
11. All interior doors to be solid core hardwood with hardwood edges.

DIVISION 9: FINISHES

1. Lay-in ceilings recommended for easy accessibility to electrical and mechanical. Five percent (5%) ceiling tile, floor tile, carpet, and ceramic tile shall be left on job in unopened cartons or full roll piece and specified by contract.
2. Extend ceramic tile to ceiling in restrooms - Showers complete including walls and ceiling.

Tile in restrooms shall be installed with round corners at the intersection of floor and ceiling, wall to wall inside and outside corners. Tile on floors in restrooms shall be no larger than 2" square pieces. Restroom partitions shall be marble and hardware should be of highest quality, durable and proved to withstand considerable abuse. Metal toilet partitions are acceptable but not recommended. Partitions shall be marble, stainless steel or solid plastic. Colors to be approved by the College.
3. Seal all finished concrete - Shop walls to be smooth to provide for ease of cleaning.
4. Seal all inside brick to a height of 6 feet minimum.
5. Finish of interior wood doors, and cabinetwork (new) shall have a stain of quality approved by the College, one coat of sanding sealer (oil base) sanded and dusted and one coat of varnish per split coat. Sand, dust, and apply first coat of varnish approved by the

College.

6. Finish of interior wall surface areas (new) shall be patched and sealed with PVA sealer as per specifications, sand and apply two coats of either 100% acrylic or oil base as approved by the College. Sand and apply finished coat of designated material.
7. Finish of interior trim and metal doors (new) shall be sealed, puttied, caulked and covered with oil base undercoat for sealer. Second coat applied after sanding and dusting and split coat shall consist of 1/3 oil enamel and 2/3 undercoat mixed. Sand and dust and apply finish coat of specified materials.
8. Finish of exterior trim (wood trim and metal doors) apply exterior sealer and one coat exterior oil base material if the surfaces have been prepared (filled, sanded, cleaned).
9. Refinish of interior wood doors and cabinetwork shall consist of sanding and cleaning, patching and sealing if necessary, wiping with a bonding agent and coated with one coat of varnish or two coats if required. Products to be approved by the College.
10. Refinish of interior wall surfaces shall consist of patching, sanding, sealing, and one coat of satin finish 100% acrylic enamel using a product approved by the College.
11. Paint materials shall be as manufactured by one of the following:

Devoe

Pratt and Lambert

Spectratone

Sherwin Williams

Benjamin Moore

Varnish materials shall be as manufactured by Pratt and Lambert.

12. Concrete sealer to be Ashford or JX500.

CARPET SPECIFICATIONS:

1. All carpet types will be with a solution dyed yarn. A class III extra heavy commercial rating.
2. All carpet will meet a flammability Class A rating.
3. Carpet to be furnished and installed under construction contract. In some cases, carpet may be furnished by College, but installation shall be by general contractor.
4. Carpet specs are recommended as a minimum standard and more stringent or better quality is acceptable.

<u>Carpet Spec.</u>	<u>Level Loop</u>	<u>Cut Pile</u>
Yarn:	BASF Zefstrom 500ZX	BASF Zefstrom 500
Pile Height:	.187	.250
Face Yarn		
Weight:	32 oz.	36 oz.
Primary Back:	Polypropylene	Polypropylene
Secondary Back:	Action Bacx	Action Bacx
Antimicrobial Microbial Treatment:	Yes	Yes
Density Factor:	6000 Min.	5000 Min.
Wear Warranty:	10 Years	10 Years
Static Control:	Less than 3.0 KV	Less than 3.0 KV

Unitary backing which will exceed 20 lb. Tuff bind is also acceptable.

5. Hallway carpet is recommended to be:
 - A. Milliken Trion Square, bonded modular cut pile in 18" x 18" squares. 137 oz./sq. Yd./ total weight or equivalent.
 - B. Milliken Carpet, regency Square tufted modular loop pile in 18" x 18" squares. 127 oz/sq yd./ total weight or equivalent
6. Level loop carpet will normally be installed by direct glue application rather than over

- pad. Used generally in classrooms and instructional and staff offices.
7. Cut pile carpet will normally be used in administrative and director offices and will normally be installed over pad.
 8. Carpet pad will be high density commercial approved pad.
 9. Flat vinyl base is to be used with all carpet installed. Base will normally be installed before the carpet.
 10. Carpet adhesive must be a premium grade, high solids quality.
 11. Seams shall be trimmed and sealed with latex on all cut edges.
 12. Carpet will be laid with a minimum amount of seams. A written approved seam pattern and plan shall be followed during installation.
 13. All floor imperfections will be filled with a latex additive patching compound.
 14. Tack strip of premium grade shall be used.
 15. Manufacturing Specifications:

Construction:	Pattern loop pile and/or tufted loop pile
Yarn Content:	Dupont Antron Lumen Nylon, type 6,6 (note: type 6.6 yarn is required)
Dye Method:	Solution dyed
Pile Weight:	28.0 oz. Sq. Yd.
Finished Pile Height:	.187"
Density:	5,390
Machine Gauge:	1/10
Stitches per inch:	90 (approximate)

Primary Backing: Woven polypropylene

Secondary Backing: Action-bac

Static Control: Manufactured from static control fiber. Static propensity is below
human sensitivity (3.5KV) under standard test conditions (70f;
20% RH)

Flame Resistance: Passes methenamine pile test (Doc FF 1-7); rated class 1 on
flooring radiant panel test (ASTM Method E-648 glue down)

Smoke Density: Rated less than 450 on NBS smoke density (ASTM method
E662-79)

Width: 12 Feet

Protective Features: Prefer anti-microbial protection

16. Each journeyman installer shall have at least five (5) years continuous experience in commercial and institutional installation. Each helper shall have at least two (2) years experience in commercial and institutional installation.

SECTION 10: SPECIALTIES

1. Every room shall be numbered with signage system in compliance with ADA. Final room numbering shall match working drawing room numbers and be approved by the Facilities Director, using an existing College model.
2. Every floor will have an exit plan located in strategic locations.
3. Outside Directory Signs to be included and match College standards.
4. Building shall have name on building at main entry locations.
5. Inside building directory shall be provided with letters. Directories are suggested for each new building or for buildings under the process of significant remodel. Directories are recommended to be illuminated podium type (back lit) covered with glass.
6. Recessed sanitary napkin receptacles to be provided by contractor and specified by the College. Must be heavy duty and indestructible. Accessories should be Standard, Bobrick, Bradley or A&J washroom accessories. Check with College for appropriate dispensing amount, brand names, types. Discard dispensers are recommended. Mirrors are required in all restrooms and dressing rooms. These mirrors are to be installed for easy replacement and maintenance.
7. Fire extinguishers shall be as manufactured by J. L. Industries or Larsen's Mfg. Co. Extinguishers shall have solid brass valves for durability during servicing.
8. Conference room to have white LCS Marker Board with foil back, aluminum frame, and tray. Marker boards and chalk boards shall be as manufactured by Lemco or College approved equal. Steel substrate only accepted. Chalk and white boards with multiple sliders are required in each classroom on two of four walls.
9. All classrooms and conference rooms shall be designed to accommodate two 40" TV

monitors suspended from ceiling at teaching end of room. Design entry into room accordingly. Monitors to be connected to campus-wide video system. Phone outlet required nearby.

DIVISION 11: EQUIPMENT

DIVISION 12: FURNISHINGS

1. **Furniture:** Steel Case and All Steel, paneled or freestanding.
 - A. Freestanding office: desk, desk bookcase, computer table, bookcase, vert/lat, five-drawer file, office chair, side chair, floor mat, and garbage can.
 - B. Paneled offices: corner unit, two work surfaces, 2 pedestals closed with lock bins and shelves, office chair, side chair, garbage can and floor mat.
2. **Classrooms:**
 - A. Steel Case classroom tables
 - B. Edutek stacking chairs
 - C. Edutek tablet arm chairs
 - D. Computer tables, Steel Case or All Steel 30" x 60"
 - E. ADA adjustable computer tables - KI
3. **Lounge/Lobby:** Adden or Buckstaff. Chairs, loveseats, couches, tables, end tables, coffee tables.
 - A. Lamps, College standards
 - B. Plants, College standards
 - C. Garbage cans, College standards

4. **Break/Vending areas:** Steel Case round tables, Edutek standing chairs, garbage cans, paper towel dispensers.
5. **Outdoor Furniture:** Landscape Forms
6. **Auditorium Seating:** Fetzer's, Inc. (Robert Fetzer, 484-6103)
7. **Activity Furniture:** Mighty-Lite tables, metal folding chairs, best offer.
8. **Blinds:**
 - A. Horizontal blinds, Levolor 1 3/8" or Hunter Douglas, Riviera, dustguard, lifetime warranty, headrail: 1" x 9/16" .0090" slat thickness, 11 slat per foot, guardian tilter, disengaging clutch mechanism.
 - B. Vertical blinds, Louver drape or Hunter Douglas 3 1/2" vanes vinyl or fabric with vinyl back.
 - C. Track, permalign #10 heavy-duty or permalign #6 depending on window size and application.
9. All entrance mats shall be recessed or aluminum. Aluminum with carpet preferred.

DIVISION 13: SPECIAL CONSTRUCTION

DIVISION 14: CONVEYING SYSTEMS

1. Two elevators are required per major building--escalators may be considered. One of the elevators shall be designed to serve as a freight elevator and sized accordingly.
2. The owner shall obtain a guarantee that the equipment and related spare parts for the elevator will not become obsolete for the average working life of the elevator.
3. The owner will receive four complete sets of maintenance manuals which shall include trouble-shooting sections, lubrication charts, schematics, list of parts, and recommended

preventative maintenance.

4. The owner will receive any specialized tools and manuals.
5. The owner will receive at least eight hours of training on the operation and maintenance of every elevator.

DIVISION 15: MECHANICAL

1. Mechanical system design shall comply with all applicable codes including:
 - Uniform Building Code
 - Uniform Fire Safety
 - State Building Board Code for Accessibility to the Americans with Disability Act
 - Utah State Energy Code
 - NEC (National Electrical Code)
 - NFPA (National Fire Protection)
 - Utah State Plumbing Code
 - Uniform Plumbing Code
 - Uniform Mechanical Code
2. All pipe and conduit exposed to the earth shall be cast iron or PVC. Electrical shall be rigid IMC or PVC. No Ferris materials may contact the earth or concrete placed on the surface of the earth.
3. The College has a Johnson HVAC computer located in the central heating plant.

Inasmuch as this is a very technical piece of equipment, proper correlation is an absolute necessity. Therefore, the mechanical engineer or the architect shall provide the detailed specifications and drawings required for tying controls for the new building into the existing control located in the heating plant. Design shall be state-of-the-art equipment.

All systems shall be Johnson as agreed to by DFCM.
4. A centrifugal or screw type chiller(s) shall be installed with a programmable micro processor control system which is user friendly and easy to operate. Training shall be

provided free of cost for one week; a factory tour for two persons is suggested.

5. At a convenient and accessible location on each item of equipment there shall be securely attached a substantial brass, or approved equal, name plate that shows thereon data such as name and address of manufacturer, type, size, job number, rated capacity, date of manufacture, etc., of equipment so that each item of equipment can be identified and spare parts or other services can be readily secured.
6. There must be a minimum of 36" clearance around all equipment.
7. All pumps and equipment shall be set on a concrete base a minimum of 4" above the floor and mounted on unistrut and isolation pads.
8. A hose bib will be installed--one minimum on each side of structure and in each restroom and mechanical room and near outside entrances. Exterior hose bibs to be freeze-proof.
9. All pipes conveying liquid to be insulated entire length except unions.

Minimum insulation thicknesses:

Roof Drain - 1"

D.C.W. - 1/2"

D.H.W. - 1"

H.W. Heat - 2" & smaller - 1", 2" & larger 1-1/2"

Steam - 2" & smaller - 1", 2" & larger - 1-1/2" on roller hangers.

Condensate - 1"

Chilled Water - 1-1/2" with sealed insulated through hangers with vapor shield 10" long to support insulation.

10. Valves shall be Crane, Walworth, Powell, Stockham, or approved equal.
11. Steam valves shall have a 200# rating with alloy renewable seats and discs.
12. Valves 2-1/2" and larger shall be flanged.
13. All branch lines of water and steam which supply more than one outlet shall be valved near the main with a union in the line. Ball valves where possible.

14. Relief valve exhaust will be run to the outside of the building.
15. All sinks, wash basins, and water closets shall have a shut-off valve on all supply lines next to the fixture. Supply lines from the valve shall be 3/8" brass, chrome plated. The following valves may be used:
 - Standard #R-2607
 - Crane #8-5001
 - Kohler #K-7601
16. There shall be one main valve for each restroom with an individual valve on each main branch line for steam and water so that areas of the building may be shut down for repair.
17. Fixtures - Kohler or American Standard
 - Faucets - Kohler, American Standard, Chicago, or equivalent.
18. Filters on all air handling units shall be disposable box filter material.
19. All steam traps to have gate valve for blowing down strainers and pipe to nearest floor drain.
20. All mechanical equipment with drains shall be piped to the nearest floor drain.
21. All pipe insulation sized and painted regardless of location.
22. Condensate return meter will be installed to record steam consumption and water meter installed on culinary sewer line.
23. All condensate return lines shall be schedule 80.
24. All condensate pumps shall be duplex.
25. All sewage pumps shall be duplex.
26. Drinking fountains to be wall mounted refrigerated units, stainless steel finish. Sunrock

- or equivalent with removable drain strainers.
27. Domestic pipe, fittings, and valves only.
 28. Each floor to have janitor closet with sink and back splash.
 29. The temperature of all rooms shall be individually controlled.
 30. Riser diagrams for mechanical piping.
 31. Offices, conference rooms, and classrooms to be air conditioned.
 32. All piping must be installed true and plumb. Piping will run parallel with building structure. All gas piping to be welded.
 33. All gauges shall be installed in an upright position with gauge cocks and snubbers for water (pigtailed for steam).
 34. Compressed air lines will be galvanized or Type L copper (no black iron).
 35. Equipment with tubes must have "tube pull clearance" in front of equipment.
 36. Valves and/or equipment above ceilings to be identified by a thumbtack placed in the ceiling.
 37. Electrically controlled flush valves with manual override shall be provided at all water closets and urinals. Recommended manufacturer is Zurn. Also provide battery backup device(s) for auto-flush systems.
 38. Cooling towers to be ceramic type..

APPROVED EQUIPMENT FOR HVAC

**ALL EQUIPMENT VENDORS MUST HAVE SERVICE PEOPLE IN THE STATE OF
UTAH.**

FAN UNITS

Trade
Carrier
American Standard
Temporal
Pace

CHILLERS

Carrier
Trade

PUMPS

Taco
B & G
Bell & Gossett
Armstrong

EXPANSION JOINTS

Yarway

EXHAUST FANS

Cook

HVAC CONTROLS

Johnson Controls

HEAT EXCHANGER

Bell & Gossett
Taco
Armstrong

PRESSURE RELIEF VALVES

CONDENSATE PUMPS

Watson McDaniel
Bell & Gossett
Spirax Sarlo

COOLING TOWERS

B.A.C.
Evapaco Cooling Towers

McDonnel Miller
Canbraco
Watson McDaniel
Kunkle

DIVISION 16: ELECTRICAL

The emphasis placed by this Division not only looks at the critical importance of electrical power as related to user needs, but on safety and security as well. The standards set forth provide for a quality electrical distribution from the basic service entrance to the end fixture.

With strong oversight and planning, an electrical system, including all aspects should be capable of being easily modified for future additions and revisions to campus buildings/structures. This would eliminate the generation of extra costs in material and labor for new projects.

16100 GENERAL

16100.1 An electrical meter shall be installed to record the power consumption of an entire building.

16200 EMERGENCY POWER

16200.1 Emergency lights and a backup generator shall be provided in working drawings and bidding documents.

16200.2 Control circuits for monitoring the status of emergency generators at the heat plant or central location shall be provided.

16300 WIRING AND PROTECTION

16300.1 At least three (3) 4" riser conduits shall be provided to each floor from the

- electrical vault for future electrical requirements for electronic data transmission.
- 16300.2 Electrical wall hand dryers to be provided in each restroom. Plan for one towel dispenser to be provided by the College.
- 16300.3 All panels and circuits must be properly labeled and approved in writing by the Facilities Division.
- 16300.4 Convenience outlets, 110V, are to be placed in halls and larger rooms 30 feet on centers or less. All walls, where practical, to have at least one convenience outlet. Offices are to have 2 duplex or 1 quad outlet per wall with the upper “left” outlet switched with the room light.
- 16300.5 Provide a 208 volt 30 amp circuit and plug in each mechanical. Specify NEMA configuration of plug.
- 16300.6 Provide 208 volt convenience outlets every 75 feet in tunnels.
- 16300.7 Provide in each electrical panel at least four (4) spare breakers and label as spares. Assure that blanks are used or live parts of panels are covered.
- 16300.8 Every lab and/or classroom shall have 208V 3 phase power plus spare conduit to nearest 208V panel.

16350 MOTOR CONTROLS

- 16350.1 Fractional H.P. motors shall be connected with stranded leads -- not solid wire, with proper connector fittings at motor terminals.
- 16350.2 Three leg load and phase protection on all three phase leads of the motor control center or on branch circuits and on all motor 5 HP or greater.
- 16350.3 Over voltage, under voltage protection with alarm capabilities should be

provided.

- 16350.4 A manual by-pass, capable of running the motor across-the-line shall be provided on all variable frequency drive controllers (VFD). This by-pass will be used as a backup in case the drive goes down or requires service.
- 16350.5 Where specifications require; a complete NEMA or IEC motor starter shall be supplied as a single unit, not as a summation of or added on component.

16400 CONTROL AND LOW VOLTAGE WIRING

- 16400.1 Contractor shall use standard MTW wire or equivalent for all control circuits and solderless connections, especially low voltage control. The wire shall be sized for load according to the requirements set forth in the NEC.

16450 COMMUNICATIONS

- 16450.1 Rough-in telephone facilities and computer conduit (with pull strings) to all offices and laboratories in the building including pay phones.
- 16450.2 Provide two each computer and telephone conduits in each office. Also provide for connection to campus video system.

16500 WIRING METHODS AND MATERIALS

- 16500.1 Provide four (4) spare 3/4" conduit lines from each panel into ceiling and/or floor and label as spares. Consider 3/4" conduit to be minimum size allowed.
- 16500.2 Provide exterior GFCI outlets around dock, loading, and service entrances of campus buildings. This should include exterior generator and transformer areas.

16550 LIGHTING

- 16550.1 Rooms and areas with more than one entrance shall be provided with 3-way or 4-

way switches as necessary. Large rooms that may be divided into smaller units shall be wired to accommodate ease in separating the light units.

16550.2 Exterior lighting shall be energy efficient and connected to a photo cell and tied to the lighting program in the HVAC computer.

16550.3 Adequate lighting (such as compact florescent) shall be provided in all tunnels, pipe chases, and mechanical rooms with 3-way switching where needed at doorways and end of circuits as in tunnels. Add convenience outlets where applicable.

16550.4 Florescent energy efficient lighting throughout except where incandescent proves more desirable. PL9 preferred.

16550.5 All lights shall be switched within each room and be electronically controlled by a CPU or sensing switches.

16550.6 With installation of hinged exterior light poles, the surrounding trees and vegetation shall be considered. Hinges shall be placed in a direction so light poles, when lowered for service, can be lowered directly to ground level without any interference.

16600 LAMPS AND BALLASTS

16600.1 The College will supply the electrical engineer with a list of lamps and ballasts now being used. Lamps and ballasts not on the list must be approved in advance by the Facilities Division.

16700 EQUIPMENT FOR GENERAL USE

16700.1 All exits shall be designated. Use LED exit lights, green in color, and match

existing specifications throughout the campus.

16800 ALARM AND DETECTION SYSTEMS

- 16800.1 The structure shall be tied to the central fire control system. This building will have pull stations in hallways and smoke and fire detectors in the ceilings of all areas. The system shall be addressable and totally compatible with the College master system.
- 16800.2 The fire alarm panel at the building shall be located near an entrance on the outside of the building near the service area approximately five (5) feet above the floor.
- 16800.3 Provide magnetic hold open devices tied into the fire alarm system on all office doors required to be fire rated and on all other fire rated doors that are likely to be preferred by user to be open, such as gates on stairs leading to building basements.

16850 CLOCK AND PROGRAM SYSTEMS

- 16850.1 Provide a Simplex clock and bell system tied with the system installed in the heating plant and provide a clock for each major room or suite.

16900 SPECIAL CONDITIONS

16950 TABLES AND EXAMPLES