

# EXHIBIT I

## Architectural & Engineering Design Standards

### Prescott Campus University Construction & Planning



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# Architectural & Engineering Design Standards Prescott Campus

## Abbreviations:

UCP – ERAU University Construction & Planning Department

U. N. O. – Unless Noted Otherwise

## Division 1 – General Data

## Division 2 – Site Construction

02810 – Irrigation systems

02930 – Exterior plants

– Hardscape

## Division 3 – Concrete

03050 – Basic Concrete Materials and Methods

03100 – Concrete Forms and Accessories

03150 – Concrete Accessories

03200 – Concrete Reinforcement

03210 – Reinforcing Steel

## Division 4 – Masonry

## Division 5 – Metals

## Division 6 – Wood and plastics

06100 – Rough carpentry

06200 – Finish carpentry

06240 – Plastic laminate

06420 – Custom casework

## Division 7 – Thermal and moisture protection

07100 – Waterproofing

07200 – Insulation

07212 – Board insulation

07310 – Shingles

07412 – Metal roofing and siding

07460 – Rain gutters and leaders

07500 – Membrane roofing

## Division 8 – Doors and windows

08110 – Steel doors and frames

08200 – Wood and plastic doors and frames

08410 – Aluminum entrances and storefronts

08420 – Steel entrances and storefronts

08500 – Metal windows

08710 – Hardware

## Division 9 – Finishes

09251 – Gypsum wallboard

09500 – Ceiling

09650 – Resilient flooring and accessories

09685 – Sheet carpet

09900 – Painting

- Division 10 – Specialties
  - 10260 – Wall and corner guards
  - 10400 – Identifying devices
  - 10520 – Fire protection specialties
  
- Division 11 – Equipment
  - 11130 – Audio visual equipment
  
- Division 12 – Furnishings
  - 12500 – Window coverings (Curved PVC)
  
- Division 13 – Special construction
  - 13850 – Door control systems
  - 13900 – Fire suppression and supervisory systems
  
- Division 14 – Conveying systems
  - 14200 – Elevators
  
- Division 15 – Mechanical
  - 15010 – General
  - 15410 – Plumbing fixtures (and accessories)
  - 15500 – HVAC
  - 15850 – Air handling
  - 15860 – Centrifugal fans
  
- Division 16 – Electrical
  - 16000 – General
  - 16050 – Basic electrical materials and methods
    - Conduits
  - 16300 – High voltage distribution (above 600 volts)
  - 16320 – Transformers
  - 16400 – Service and distribution (600 volts and below)
  - 16420 – Service entrance
  - 16480 – Motor control
  - 16490 – Switches
  - 16500 – Lighting
  - 16501 – Lamps
  - 16400 – Service and distribution
  - 16420 – Service entrance
  - 16502 – Ballasts and accessories
  - 16530 – Site lighting

**Special Note for all Contractors: Hazardous Materials are used on this campus. All ERAU Contractors have the right and obligation to read about these materials before using them or being exposed to them.**

- Material Safety Data Sheets (MSDS) are on file in the Occupational Safety & Health (OSH) Program Manger’s Office.
- Copies of this program are maintained at each Department/Area, and also in Building F4A, the (OSH) Program Manger’s Office.
- An MSDS should be on file for each chemical or hazardous material used.
- If you become aware of a situation where an MSDS is not on file, please tell us immediately so that we can order it and have it available to you.
- Take time to review the MSDS file.
- Know the hazards and characteristics of every material you use.

- Contractors: Should there be Hazardous Materials used by your company at any University work site, MSDS's must to be provided to the University prior to work commencing.

## **DIVISION 1 - GENERAL DATA**

### **Section 01100 - GENERAL GUIDELINES**

#### **1. 00 General Requirements**

- A. These standards are for the guidance of Architects, Engineers and Contractors in the technical design of new buildings and additions to buildings. They are minimum standards. Actual design should be consistent with the overall program, building quality and scope of project. The design should be in context with and in harmony with the existing buildings on campus, with sensitivity to the surrounding pallet of materials and colors.
- B. These standards convey owner expectations and requirements and outline specific products and components that the University has standardized for use on all construction projects. Incorporation of these products facilitates efficient and cost-effective operations and is based on a history of successful use. Specification of these products, and adherence to design standards, is expected to expedite the design process, avoid costly change orders, and ensure that the project can be constructed within budget.
- C. Embry-Riddle (ERAU) has experienced the installation of obsolete components of manufacturers without local vendor representation, making it difficult (and in some cases impossible) to obtain replacement parts. Components accepted for installation must be of the latest production model running line, with spare parts readily obtainable.
- D. If the Architect and/or the Engineer desires to make any exceptions to the Design Standards, written approval from the University Construction & Planning department (UCP) must be obtained. Electronic mail communication to request the exceptions is acceptable.
- E. ERAU's standardized Wiring Requirements for Information Technology including telephone, data, fiber optic, computers and telephone/I. T. rooms are available in Exhibit II: Standardized Wiring Requirements.
- F. **All architects, engineers and contractors are contractually required to comply with these standards or provide information regarding an or equal substitute. The Standards must be reflected in the design documents. ERAU will not accept any single source vendors, unless written approval is received from UCP before design has been completed.**
- G. All subcontractors to provide Embry-Riddle with a final Operation and Maintenance Manual listing manufacturer name and model # for each part used in their portion in lieu of excess stock, unless otherwise noted in the sections below.
- H. All Contractor's (General or otherwise) and Sub-Contractor's of General Contractor's or otherwise, employed through Embry-Riddle Aeronautical University (ERAU) to perform construction work on the Main Campus at 3700 Willow Creek Road, Prescott, AZ or at the Flight Training Center (FTC) at the Love Field Airport Location are to note:

The facilities & grounds located, as described above, are regulated within the scope of safety regulations governed by the Occupational Safety & Health Act within CFR 29 1910, General Industry Regulations and incorporated into the ERAU comprehensive safety policies. Paragraph 1910. 12 (Construction Work) adopts the standards prescribed in CFR Part 1926 as Occupational Safety & health standards under section 6 of the Act and shall apply, according to the provisions thereof, to every employment and place of employment of every employee engaged in construction work. Each employer shall protect the employment and places of employment of each of his employees engaged in construction work by complying with the appropriate standards prescribed in this paragraph. Thus,

the standards (substantive rules) published in Subpart C and the following subparts of Part 1926 of this chapter are applied.

## 1.02 Drawing Standards

- A. Each set of drawings shall satisfy the following minimum requirements:
  - 1. Provide a key map and key plans to show the location of the work site.
  - 2. Provide sufficient information to enable the contractor to determine from the drawings alone the total quantities of all materials and equipment required to execute the work.
  - 3. Locate all equipment, piping, and ductwork accurately and free of interference with all other building components.
  - 4. Present plans of all trades with the same orientation.
  - 5. Present all information in any orderly manner, legible, and consistent with the highest professional standards.
  - 6. Provide plans for International Building Code and Life Safety Code approval. Plans will clearly show exit paths and the measured distances to exits and all fire rated wall conditions.
  - 7. Have imprinted on each sheet the registration seal and legal signature of the registered professional architect or engineer who is responsible for designs and who retains all calculations.
- B. Drawing Medium:
  - 1. Plot all drawings to the same sheet size for all trades.
  - 2. The Project title and record date will be the same on all sheets.
  - 3. All drawings shall be produced in AutoCAD and be prepared by trained AutoCAD operators.
  - 4. Layers to follow the AIA CAD Layer Guidelines as published in the United States National Cad Standards Manual.
  - 5. Drawings to be numbered per the Uniform Drawing System - Drawing Set Organization as published in the United States National Cad Standards Manual.
  - 6. Incorporate the Drawing number into the AutoCAD file name for each drawing.
- C. Line Work:
  - 1. Line widths shall be graded for identification purposes from very thin (hatching patterns) to wide (elements cut in horizontal or vertical sections) using a consistent pattern.
- D. Lettering:
  - 1. Lettering, as printed, shall not be smaller than 1/8" in height (12" for 1/8" scale, 6" for 1/4" scale, 3" for 1/2" scale, etc.)
- E. Scales:
  - 1. Floor plans shall be drawn at not less 1/8" = 1' - 0". Enlarged detail plans (bathrooms, mechanical rooms, etc. ) at not less than 1/4" = 1' - 0", preferably at 1/2" = 1' - 0".
  - 2. Indicate the scale used under each drawing or note as not to scale.
- F. Symbols and Abbreviations:
  - 1. Indicate the complete set of the symbols and abbreviations used for each discipline on the General Drawings.
- G. Site Plan:
  - 1. Show all outside piping and mechanical equipment on the architectural site plan. If necessary, repeat this information on separate engineering site plans for clarity.
- H. Floor Plans:
  - 1. Show all fixtures and equipment on the plans.
  - 2. All room and space numbers to be approved by ERAU prior to distribution to Architect's design professionals.
  - 3. On the Reflected Ceiling Plan show all light fixtures, including exit signs and emergency lights, HVAC supply and return grilles, sprinkler heads, and audio and video equipment.
  - 4. ERAU to provide Furniture Plans as needed to Architect.
- I. Roof Plan:
  - 1. Show all equipment, piping, and any ductwork located on roof. Show all roof penetrations and provide appropriate details of each type condition. Use standard details of the National Roofing Contractors Association (N. R. C. A. ).
- J. Building Sections:
  - 1. Indicate all building components including ductwork and piping.
  - 2. In spaces such as ceiling spaces above hallways or any other space where HVAC ductwork or piping is located, show the location and elevation of each trade's work. 908
- K. Isometrics, Schematic Diagrams, Typical and Special Details:

1. Use to clarify plan and section views.

### 1.03 Document Review and Archival Documents

#### A. Construction Document Review

1. At 100% Schematic Design Documents submit the following:
  - a. Five full size sets of the Drawings for review and comments by ERAU.
  - b. Two sets of the Project Manual.
2. At 100% Design Documents submit the following:
  - a. Five full size sets of the Drawings for review and comments by ERAU.
  - b. Two sets of the Project Manual.
3. At approximately 95 % - 100% completion of Construction Documents submit the following:
  - a. Five full size sets of the Drawings for final review and comments by ERAU.
  - b. Two sets of the Project Manual.

#### B. Archival Documents

1. At the time the Letter to Proceed is given to the Contractor, provide a CD-ROM with all addendums added to the drawing set. All AutoCAD drawings of the bid documents. All cad drawings shall be whole and complete with NO X refs to symbols or other drawings. **The format of the CAD file shall be AutoCAD DWG or DXF. No other format will be accepted.**
2. At the completion of the Work, **Contractor shall submit the following:**
  - a. One hard copy set of As-Built Drawings showing all changes made to the building and utility line locations during construction:
  - b. Provide a second CD-ROM with all change orders and as-built changes. All cad drawings shall be whole and complete with NO X refs to symbols or other drawings. The format of the CAD file shall be Autocad DWG or DXF. No other format will be accepted.
  - c. Three three ring binders containing the Project Manual including all Addenda and authorized Change Orders.
  - d. Three copies of all Operational Manuals, Shop Drawings, Product Data and Schedules.
  - e. One three ring binder containing all approved interior finish material submittals and samples.
  - f. One copy of the General Contractor's contact directory of all subcontractors and suppliers who worked on the Project.
  - g. Any additional record documents required per the Project Manual.

### 1.04 Typical Program Requirements, See Specific Building Program Requirements generated by UCP

#### A. Building Design and Circulation:

1. All building entrance doors must be locked to entry from the exterior, and never locked to exit from the interior per the exit requirements of the Building Code. **Main entrance doors to have security card readers and electric strikes. All exterior doors to be monitored.**
2. Provide access to all building service closets from common public corridors or the exterior.
3. Open Office areas should be configured in suites and have locked and/or card reader door security.
4. Verify the fire rating of walls enclosing mechanical & electrical systems. Specify in architectural documents that all fire rated assembly work to be sealed with an approved fire stop foam at all <sup>4</sup> wall and floor penetrations by pipes, conduits, ducts, etc. Specify fire rated walls to have fire rating notice stenciled above ceiling line per Building Code.
5. Coordinate locations for recessed fire extinguisher cabinets, emergency lighting and exit signs. Fire extinguisher units to be approved by Campus Fire Marshal. Fire extinguisher cabinets to be installed **at 32" AFF** to the bottom of the cabinet, max 54" AFF to controls.
6. The color of all wall and ceiling mounted fire alarm devices to be white or off-white with red lettering. The color of the lettering of all exit signs to be **red**.
7. Ceiling plenums must have adequate clearances for ductwork and other building system

- components. Corridor ceiling height to be a minimum of 8'-0" clear.
8. Provide adequate custodial closets and custodial storage rooms. Each custodial closet to have a floor mop sink and space for owner supplied shelving and mop holders. All custodial closets to have an out swinging door. Floor finish to be sealed concrete when possible. FRP wainscot all walls.
  9. Buildings with laboratories may require areas for handling the delivery and return of gas bottles. Provide empty bottle holding areas including chain restraints.
  10. On each floor adjacent to vending areas and break rooms provide an area 25 square feet in size for recycling container and trash receptacles.
  11. Stair design:
    - a. In buildings with concrete structure, stairs to be sealed concrete, no paint. In buildings with steel structure, stairs to be concrete filled pan treads with closed risers. Floor to be protected during construction.
    - b. Stair riser and tread dimensions to be designed per Building Code requirements.
    - c. Provide non-slip nosings on all stair treads. Not to be painted.
    - d. Provide roof access from at least one stair. Access hatch to be secured with a deadbolt lockset.
    - e. Stairs used for frequent communication may have upgraded finishes, i. e. rubber treads, with maintenance considerations a priority.
  12. Provide separate sleeves under walks and roadways for future power, lighting, communication and irrigation lines.
  13. Exterior grades shall slope away from buildings and the building floor elevation must be high enough to prevent rainwater from entering the building at any door.
- B. Building Donor Recognition:
1. When buildings or portions of buildings are to be identified for donor recognition, signage, recognition plaques, *et al*, shall conform to standards adopted by ERAU.

## DIVISION 2 - SITE CONSTRUCTION

### Section O2441 – Irrigation

#### PLASTIC PIPE AND FITTINGS

- A. All irrigation in drip type; no spray heads required.
- B. Plastic Pipe: All plastic pipe that will be under continuous pressure shall be Schedule 40 PVC and all non-pressure laterals shall be Class 200 PVC. All pipe and fittings shall conform to National Bureau of Standards.
- C. PS 22 and PS 21 for pressure pipe. PVC pipe shall be continuously marked with identification of the manufacturer, type, class, size, and shall conform to ASTM D 2241 meeting and classification system of ASTM D 1784. Solvent shall meet ASTM D 2274 and D 2855 requirements. Pipe shall be produced in 20 – foot lengths. Pipe shall be free of holes, foreign material, blisters, wrinkles or dents.
- D. PVC Flexible Nipple: All flexible nipples to use PVC flexible irrigation pipe, 1/2" IPS Heavy Wall Hose. 840 O. D. 147 wall thickness.
- E. PVC Fittings: Fittings on PVC lines under three inches shall be Schedule 40 PVC, Type 1, Cell Classification 13454-B, and shall comply with ASTM D 2466, D 2467, and D 1784.
- F. Risers and Threaded Nipples: All threaded PVC nipples shall be Schedule 80 PVC pipe as specified. Risers shall be Schedule 40 galvanized steel pipe unless otherwise specified.

#### VALVE BOXES

- A. All valves shall be installed in valve boxes with bolt-down lid as per manufacturer's recommendations.

#### AUTOMATIC VALVES

- A. Automatic valves shall have the minimum specifications of the type specified on the Drawings. Valves shall have a manual bleed screw in the handle and bleed ports protected with built-in filter. Valves shall be made of non-corrosive material. The valve shall be installable at any angle and have a flow control and manual shutoff. The solenoid shall be 24 volts A. C. 60 Hz and have a consumption not exceeding 2 watts. [Standard Manufacture: Irritrol Valves.](#)

#### CONTROLLER

- A. The controller shall have an infinite timing adjustment per station from 0 to 60 minutes and a 14-day programming capability. The controllers shall be capable of automatic, semiautomatic, or manual operation with multi-cycling capability. The controllers shall be UL listed and fused circuit protection shall be incorporated. There shall be no time lag between stations and a master valve circuit shall be standard equipment. Locks shall be provided on the timing mechanism and on the cabinet door. The controller shall be capable of manual operation with the timing mechanism removed.
- B. The controllers shall have no less than 4 stations. Some visual means must be provided to show which station is in operation at any one time. Controllers shall meet all safety standards required by OSHA.
- C. Controller shall be Rain Bird ESP Series, four-station, outdoor type, or approved equal.

#### WIRE

- A. Wire shall be UL approved for direct burial, type UF. Minimum gauge shall be No. 14 AWG. Wire shall be furnished in minimum 2,500-foot reels. Control wire must be insulated, single strand copper designed for 24 to 50 volts and copper conductor must meet or exceed ASTM B-3 specifications.

#### WIRE SPLICING MATERIALS

- A. All electrical wire splices must be made watertight using an approved sealing material such as PenTite PVC socket and sealing plug Rainbird PVC socket and sealing plug Rainbird PT-100 Series or an approved equivalent.

#### BACKFLOW PREVENTERS

- A. Backflow preventers: Wilkins Model 975XLV Reduced Pressure Principle with Elbows; sizes can vary
- B. **Bubbler spray heads shall be Rainbird, spray heads shall be Hunter, and control systems shall be Iritrol, all installed** per Facilities Management standard. A serviceable screen shall be included on the bubbler to prevent foreign materials from entering sprinkler.

#### AUTOMATIC DRAIN VALVES

- A. Automatic drain valves shall be constructed of corrosion-resistant cyclolac plastic or brass. The valve shall open when pressure in line decreases to 3 psi and seal again when pressure increases to 3 psi. Valves shall have screens on both inlet and outlet and shall have ½ inch male pipe threaded connections. Automatic valves to be installed only on laterals of average pipe size 1-1/2" or less. Automatic valves to be installed at low points and at 100' on center in the laterals.

#### TRENCHING

- A. Excavations shall be of sufficient depth and width to permit proper handling and installation of the pipe and fittings. Cut trenches for pipe to the required grade lines. Compact the trench bottom to provide an accurate grade and uniform bearing for the full length of the line. Trenches shall be straight. When two pipes are in the same trench, maintain a minimum of four inches between the pipes.
- B. Depth: Trenches shall provide local – 30 inches clearance between top of pipe and finish grade for pressure lines, and 18 inches for non-pressure lines, except where indicated otherwise on Drawings. Lines between master valves and zone valves may be considered non- pressure lines.
- C. Staking: Stake-out all sprinkler head and valve locations. Prior to trenching, the stake-out shall be approved by the Owners representative.
- D. Trim: Trenches shall be accurately trimmed to provide a uniform bed, free from rocks, clods, or other sharp-edged objects.
- E. Dewatering: Any water which may be encountered or may accumulate in the excavation shall be pumped out or otherwise removed as necessary to keep bottom of the trench or excavation free and clear of water during the progress of the work.
- F. Sleeved Crossings: All pipe and wiring under sidewalks, roadways, or parking lots shall be sleeved in suitable PVC sleeves.
- G. Grade for Drainage: The minimum pitch to drains shall be 3 inches in each 100 feet

#### INSTALLATION

- A. General: Install all materials and equipment in a neat and workmanlike manner in accordance with the recommendations of the manufacturers of the materials and ASTM 2774.
- B. Pipe:
  - 1. Install plastic pipe in accordance with the manufacturer's recommendations and the approved procedures. Manufacturer's recommended procedures and the following requirement specified herein for making solvent welds shall be strictly adhered to. Plastic pipe and fittings shall be carefully handled and stored under cover to avoid damage. Beds upon which the plastic materials are to be transported or stored are to be the full length of the pipe to avoid causing damage. Damaged or dented pipe shall not be used in the work.



2. Plastic pipe and fittings less than three-inch diameter shall be solvent-welded, using solvents and methods recommended by the manufacturer of the pipe, except that all connections between plastic pipe and metal valves or steel pipe shall be made with screw fittings, using plastic male adapters with a non-hardening pipe dope applied to male threads. Screwed connections shall be made up with light wrench pressure. Steel pipe shall not be screwed into plastic fittings except for head risers. Main lines under continuous pressure shall be welded with heavy-duty gray PVC cement.
3. Application of solvent shall be with a non-synthetic bristle brush after thoroughly cleaning all pipe and fittings of dirt, dust and moisture. All solvent-welded joints shall cure at least 15 minutes before being moved or handled, and at least 24 hours before water is allowed to enter the pipe. Apply solvent in accordance with ASTM D 2855 using the procedure indicated below in the sequence shown.
  - a. Apply an even coat of solvent to the outside of the pipe, then to the inside of the fittings, and then reapply a light coat of solvent to outside of pipe, making sure that coated area of pipe is equal to the full depth of the fitting socket.
  - b. Inset pipe quickly into fitting and turn approximately one half turn to distribute solvent and remove air bubbles; check tees and ells for correct position.
  - c. Use clean rags and wipe off excess solvent.
  - d. After solvent-welded joints have been allowed to cure for 24 hours, install sprinkler heads.
  - e. Pressure test piping as specified.
4. Pipe shall not be laid in water or in trench when weather conditions are unsuitable for the work, except when otherwise expressly permitted. The interior of the pipe shall be thoroughly cleaned of foreign matter before being assembled.
5. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells and joints. When work is not in progress, open ends of pipe and fittings shall be securely closed so that no trench water, earth or other substances will enter the pipes or fittings.
6. Any section of pipe found to be defective before or after laying shall be replaced with sound pipe.
7. Minimum horizontal clearance between lines in the same trench shall be four inches.
- C. Saddle Taps: No saddle taps will be permitted. Branches shall be made only with fittings and reducers. Use no bushings, street ells, or close nipples, except at swing joint assemblies.
- D. Jacked Pipe: The crossing of existing pavement to remain shall be accomplished by jacking Schedule 40 steel pipe. The pipes shall be jacked to a tolerance of 1" in 10' off of true line and grade. The leading section of pipe shall be equipped with a jacking head securely attached to the pipe to prevent any alignment variation during the jacking operation.
- E. Controllers: The controllers are located on the Drawings. Make power connections at the location noted. Mount and wire the controllers according to the manufacturer's approved procedures and as specified as shown. [Standard Manufacture: Irritrol MC Plus.](#)
- F. Sprinkler Heads: Sprinkler heads shall be of the type specified and shall be installed to grade unless otherwise specified. Install sprinkler heads a minimum of six inches and a maximum of eight inches from curbs, walks, driveways, building walls, etc. Teflon tape or Teflon sealer shall be used on threaded connection at heads and joints. Head shall be installed in the vertical position, hand-backfilled and compacted to near original density. [Standard Manufacture: PGP Hunter, or Hunter I40 \(large head\)](#)
- G. Valves: Cover all automatic and manual control valves with locking valve boxes as specified. Set boxes to grade. Install all automatic valves in accordance with the recommendations of the manufacturer and as detailed.
- H. Control Wiring: Install control wires in same trenches as sprinkler main lines and laterals whenever practicable. The wires shall be snaked in the trench to allow for displacement of the wire during backfilling. Lay wires on the trench bottom on one side of the pipe only. All wire in same trench to be taped together every ten feet.
- I. Splices: Wire splices shall be kept to a minimum and if needed shall be made only in common splice boxes located in valve boxes. Provide a slack-wire loop at each valve with enough slack so that wire splices can be extended 24 inches above ground level to facilitate testing and trouble-shooting. No wire size smaller than No. 14 AWG shall be permitted.
- J. Codes: All 115-Volt A. C. wiring shall be installed in accordance with the requirements of the National Electrical Code. Service to controllers shall consist of one black and one white wire. Electric control lines from controller to automatic valves shall be a different color from the 115-Volt service to

the controllers. The 24-Volt common ground shall be of one continuous color and a different color from the other 24-Volt lines and the 115-Volt service. All electrically operated devices and all metal enclosures shall be connected to ground, as approved.

### Section 02500 – Fencing / Outdoor Accessories

1. Specify black vinyl-coated with 2" mesh formed from 9 gage steel wire unless otherwise noted.
2. Bike Rack: High Style FSC-LBR9PSURF, High Style Bike Racks, Finish: Black Powder Coat, Mount Style: Surface, height 36" Bike Capacity: 9 #of loops 7, 2 total. Existing or new concrete pad will be required at each bike rack location.
3. Wabash Valley: Ash, Trash, Benches & Picnic Tables. Black Diamond, Plastisol coated furniture

### Section 02900 – Landscaping

#### General

- All new plants must be equipped with a drip irrigation system.
- Patch existing paths as required, to as is condition.
- All planting areas shall be mulched with gravel over woven or spun-bonded weed barrier. Plastic shall not be used. River rock / cobblestone (3" – 6") is acceptable.
- All new plants shall be typical of their species and healthy, with full, symmetrical branching habits. Trees may be B&B or container-grown.
- Provide site design, plans, and all labor, materials and equipment necessary for finish grading, installation of planting mixture, trees, shrubs, ground cover, lawn and related work specified herein.
- Provide, as part of this contract and bid amount, for all trees, plants, and ground cover provided herein, 45 days of maintenance after acceptance of completed work. This maintenance shall include watering, weeding, cultivating, removal of dead material and debris, the resetting of trees, etc.

**Sod:** turf type fescue (tall fescue only) 1-1/2" thick w/no weeds - sod only on new construction.

**Grass:** over seeding acceptable only at existing grass areas.

#### Acceptable Plants

Deodar Cedar	Arizona Cypress
New Mexico Locust	New Mexico Olive
Quaking Aspen	Staghorn Sumac
Apache Plume	Three-Leaf Sumac
Gro-Low' Sumac	'Regal Mist' Muhly
Silky Thread Grass	Rocky Mountain Penstemon
Penstemon strictus	Turf-Type Tall Fescue
Mimosa	Arizona Ash
Salvia	Euonymus Alata
Cliff Rose	Potentilla
Caryopteris Blue Mist	Purple Robe Locust
Autumn Blaze Maple	Bradford Pear
Pinion Pine	Red Yucca
Dessert Spoon	Italian Cypress
Blue mist (native plant)	

#### Unacceptable Plants:

Pyracantha	Sea Green Juniper
Ground Cover Honeysuckle	Privet
TAM Juniper	Pfizer Juniper
Russian Olive	Prunis Purple Leaf Plum
Cottonwood	Elm
Poplar	Sycamore
Leylandii Cypress	Russian Sage (use Blue Mist)

Any deviation from plants listed above must be approved by UCP

#### Hardscape:

1. All borders between grass and landscape beds must have 6" mow strip.
2. Walkways: 3/4" rock *or*, 4"x8" pavers installed with min. 4" chat base (plate compacted) and min. 1" sand layer *or*, 3/4" rock, minimum 3" thick w/weed mat underlayment (Pollyspun/Landmaster) w/border as specified above. Plate compacted to insure stability.
3. Retaining Walls: 6" to 12" stock fractured granite or boulders *or*, concrete.
4. Ditches: 3" to 6" Salt River rock (*or* larger) w/weed mat underlayment (Pollyspun/Landmaster)
5. Slopes: E-curlex 2 erosion control blanket w/acceptable ground cover plants
6. **Ground Covering: Landscape rock "Madison gold" - 3/4" rock *or* larger w/ weedmat underlayment Madison Gold 3/4" sized rock is acceptable. Screen rock with a lot of fines in NOT acceptable. At remote areas 3/4" rock is acceptable, grey.**
7. **Decomposed granite is prohibited, U. N. O.**

### **DIVISION 3 – CONCRETE**

1. All Exterior concrete walkways shall have 4" compacted ABC base. Flatwork shall have a minimum 3,000 psi. 4" min. on thickness of concrete with thicken edges, 6" min. [unless approved by UCP to omit](#). Broom finish. Curing compound provided on all slabs per Plant Maintenance specifications.
2. Footings shall be a minimum of 2,500 psi concrete. Per approved construction drawings.
3. Pin into all existing sidewalks and saw cut *or* install control joints in curbs along every sidewalk joint.
4. [All circular accent exterior concrete walkways shall be Davis Colors: Base canyon.5lb #160, QC Const. Products = cocoa brown CH-1. W/ Ashler Slate stamp pattern. U. N. O. as identified per construction drawings.](#)

### **DIVISION 4 – MASONRY**

1. Exterior walls with mixture of split face and plain intregal color CMU are preferred.
2. All exterior masonry will be sealed.
3. Typical wall assemblies are colored conc. / masonry / metal / glass.
4. [Exterior masonry walls shall be furred out with 3 5/8" metal studs w/ R11 batt insulation on interior. 6" furr out at plumbing walls. Where exposed masonry use R12 foam filled CMU cells.](#)
5. No wood, no stucco on exterior finishes; EIFS is acceptable

### **DIVISION 5 – METALS**

1. Exterior railings and stairs to be steel. Minimum schedule 40 pipe *or* ASTM A 500 structural tube, shop primed.

### **DIVISION 6 - WOOD & PLASTICS**

#### **Section 06100 - Rough Carpentry**

1. Minimum thickness of roof sheathing, 5/8" cdx plywood. U. N. O.

#### **Section 06200 - Finish Carpentry**

1. Formaldehyde containing particleboard and similar composition products are not allowable.

#### **Section 06240 - Plastic Laminates**

1. Guides for plastic laminate finishing are as follows: min. .050" exposed horizontal surfaces; min. .028" exposed vertical surfaces; min. .020" cabinet linings and concealed backing.

#### **Section 06420 - Custom Casework**

1. Case *or* millwork specified as receiving a painted finish should be limited to lower cost species (birch, poplar, etc...).
2. All cabinet and millwork tops, sides, dividers, shelving, etc. , shall be 3/4" minimum stock.
3. Stained veneer materials shall conform to AWI custom grade, minimum thickness 1/16".
4. Unexposed framing shall be nominal 1 x 2 hardwood, AWI custom grade.
5. Doors and drawer fronts shall be 3/4" minimum core stock.
6. Drawer boxes shall be 1/2" minimum with minimum 1/4" plywood bottoms.
7. Cabinet tops should be of sufficient height to comply with minimum disabled accessibility requirements, all cabinets to come with locks.

8. Most shelving should be designed as fully adjustable, ¾" minimum thickness.
9. "Line bore and pin" method of shelving adjustment (either in cabinets or standing shelving) is desired. Shelf standards mortised in with brackets is also acceptable.
10. All millwork and accessory hardware shall comply with ANSI A156. 9, minimum quality level Type 2 (institutional). Hinges, guides, slides, etc. , shall utilize bearings complying with BHMA 201.
11. All cabinet hinges should be self-closing.
12. Drawer slides should allow full extension (1" longer than total drawer depth) and be specified as heavy duty (100 lb. minimum), Blum or approved alternate.
13. The use of painted particleboard as the finish for cabinets and tops is not acceptable.
14. Particleboard is allowable as core stock in low/no moisture areas when receiving a high-pressure plastic laminate finish.
15. Particleboard is not an acceptable material for shelving with greater than a 2 foot unsupported span.
16. The use of melamine or other similar low mill finishes (less than . 020") as interior cabinet lining or underside of shelving is not acceptable. Melamine thermo fused ¾" is acceptable for interior finish of cabinets only.
17. All exposed cabinet hardware should be specified with a permanent, durable finish that is easily cleanable.
18. All countertops designed as work surfaces shall be of an appropriate height to accommodate the physically disabled.
19. All millwork designed to support electrical equipment (computers, phones, clocks, etc...) shall have grommet openings allowing cords, interconnect cables, etc. , to be concealed or routed internally. Grommets shall be 2-1/2" minimum diameter plastic, color to match adjacent finish. [Grommet holes are to be drilled on-site, after equipment layout is determined by Owner. Once equipment is installed IT staff to mark appropriate spot at countertop for Facilities Management to drill hole and install grommet.](#)

## **DIVISION 7 - THERMAL & MOISTURE PROTECTION**

Roof design: Minimum roof slope for shingled roofs is 3:12.

- There will be an overhang above all windows and doors.
- Parapet walls are to be the minimum required for code required fire separation walls.
- Combine all plumbing and mechanical vents below the roof in order to minimize roof penetrations.
- Roofing sub-contractors must have a minimum of 10 years experience in Prescott and able to guarantee the roofing for a minimum of 20 years.

### **Section 07100 - Waterproofing**

This section applies to sheet waterproofing of building components that receive, or are in and around areas to receive such treatment. Proper architectural design and detailing of areas exposed to moisture should not rely solely on such treatments as the only barrier to moisture, but rather as a "guarantee" or "second line of defense"; in other words, the design and specification of appropriate materials should in itself greatly mitigate a majority of moisture infiltration problems.

1. Metal coping to have Kynar factory finish

### **Section 07200 - Insulation**

1. Design Standard: Roofing systems in conjunction with proposed insulation or other exposed horizontal surfaces shall attain a minimum composite R-value of 30.
2. Roof insulation should be installed just below the roof sheathing so the fire sprinkler system is in a warm space.
3. Walls or other exposed vertical surfaces shall attain a minimum composite R-value of 19.

### **Section 07212 - Board Insulation**

1. Exterior board insulation to be Dow "Styrofoam" or U. L. Industries "Foamular" or Amoco "Amofoam" extruded polystyrene foam. Bead board is not acceptable.
2. Exterior board insulation must be installed over an approved vapor barrier.

### **Section 07310 - Shingles**

1. Use Tamko or Elk 30 year architectural shingles. Minimum pitch 3:12. For pitches between 3:12 & 3. 99:12, use 2 ply underlayment, minimum. For pitches 4:12 and steeper, use 1 ply underlayment, minimum. All roofing to be installed per manufacturer's recommendations.

2. Residence halls 1 & 2: Elk color Sablewood, Hall 3, 4 & 5: Tamco, Rustic Black  
Private Residence/Storage Bldgs R1,R2,R3,R4:Elk color Hickory

#### **Section 07412 - Metal Roofing & Siding**

1. Metal roofing to be standing seam, concealed fasteners, 24 ga. , UL 90 wind uplift design
2. Maximum fastener row spacing 24". Galvalume ASTM A 792 coating, 20 year warranty. Install over minimum No. 30 roofing felt. 24 ga. Zincalume coated steel w/ 20 year warranty. Copper penny6 Kynar.

#### **Section 07460 - Rain Gutters & Leaders**

1. Gutters & leaders to be continuous. 026 gauge aluminum with factory finish; gutters to be installed with brackets spaced at 3'-0" min.
2. Leaders to continue to underground pipes to lead water a minimum of 10 ft. away from the building on the downhill sides.
3. On the uphill sides of buildings, pipe the rainwater around the building and daylight drains a minimum of 10 ft. away from the buildings.
4. Do not discharge rainwater towards a neighboring building.
5. Gutters to be a min. 5" depending on Sq. Ft. roof area to be drained. Downspouts to be a min. 3" X 3" depending on Sq. Ft. of roof to be drained.

#### **Section 07500 - Membrane Roofing**

1. This section applies specifically to membrane roofs, but also pertains to other methods of roofing or those areas effectively acting as "roofs" (decks, overhangs, balconies, etc...).
2. To aid in attaining both the written specification and warranties called for by ERAU, the A/E should design and detail appropriate roof slopes, drainage system(s), cants, flashing, protection devices or materials and utilize good common sense.
3. Roofing techniques, systems and materials should be utilized that are "time proven" (+5 years) and be designed as "composite" systems instead of appliques.
4. Roofing contractor must be approved by the manufacturer whose materials are used.

### **DIVISION 8 - DOORS & WINDOWS**

Building entries: It is desirable to include a vestibule at each major entry door with "Lees First Step" Walk off mats (provided by Owner) on the entire floor. Each main entry will have a minimum of 2 sets of double doors (1 interior and 1 exterior) separated by a minimum of 7 LF. Doors will be either hollow metal or aluminum storefront with panic hardware and will be lockable. There will be a minimum depth of 6' of roof cover above each entry point.

#### **Section 08110 - Steel Doors & Frames**

1. **Doors, frames and hardware shall be specified as commercial heavy-duty quality.** Pre-finished anodized bronze. Minimum door thickness shall be 1-3/4" thick. Interior doors shall comply with SD1-100, Grade II, and heavy-duty, minimum 16-gauge faces. Exterior doors shall comply with SD1-100, Grade III, and extra heavy-duty, minimum 16-gauge faces. **Aluminum doors are acceptable if heavy duty grade.**
2. All exterior doors shall have thresholds, closures, weather-stripping and padded stops.
3. Door Frames: All frames shall be specified as welded. Knockdowns are not acceptable for exterior doors, but are acceptable for interior doors. An inspection of anchoring method must be made prior to drywall or closing up of walls.
4. Doors: All exterior doors that are not storefront will be 16-gauge steel with vertical steel rib stiffeners and reinforced for all door hardware. All exterior doors will have stainless steel kick plates.
5. **Hinge: Roton continuous door hinges are required at al exterior storefront doors.**

#### **Section 08200 - Wood and Plastic Doors & Frames**

1. This section applies to interior applications. Do not specify endangered or limited tree species for wood door veneers. Doors receiving painted finishes should be limited to low cost species (birch, maple, etc. ). Welded hollow metal frames should be utilized. (Timely frames are acceptable)
2. Wooden doors are acceptable only for interior usage, must be solid core, and have adhesives that are 100% waterproof. Hollow core doors shall not be used.

3. The minimum grade door used will be solid core flush prime coat hardboard, commercial heavy-duty grade, 1-3/4" thick. All doors should be specified from a single manufacturer.
4. Use site lights adjacent to conference room doors and in areas determined best by designing architect.
5. Doors shall have a minimum of 3, 26d ball bearing hinges.
6. Masonite painted interior doors are an approved alternate.
7. All exterior doors frames shall be welded. All interior doors may have knockdown frames.

**Section 08410 - Aluminum Entrances and Storefronts**

1. All exterior glass shall be insulating glass, except vestibule doors and windows.
2. Glass manufacturer shall provide a written warranty that shall guarantee insulating glass units for a period of 10 years.
3. Aluminum entrance section hardware shall meet all requirements in Section 08700.
4. Weather-stripping for exterior doors shall be continuous at head, jambs and door bottoms.

**Section 08420 - Steel Entrances and Storefronts**

1. Steel entrances and storefronts shall pass water leak testing prior to substantial completion and prior to payment for materials and labor. Test area shall include perimeter caulk joint. All retesting and associated costs shall be paid for by the Contractor, via deduct change order.
2. Glass manufacturer shall provide a written warranty that shall guarantee insulating glass for a period of 10 years.
3. Steel entrance section hardware shall meet all requirements in Section 08700. Weather-stripping for exterior doors shall be continuous at head, jambs and door bottoms.

**Section 08500 - Metal Windows**

1. Glass manufacturer shall provide a written warranty that shall guarantee insulating glass units for a period of 10 years.
2. All windows shall pass water leak testing prior to substantial completion and prior to payment for materials and labor. Test area shall include perimeter caulk joint. All failed windows shall be retested until they pass. All retesting/associated costs shall be paid by Contractor, via deduct change order.
3. Interior windows to be fixed, hollow metal frame with thermal break

**Section 08710 - Hardware**

**A. Closures:**

Exterior entry doors shall have commercial, heavy-duty closers by Norton, LCN or approved equal. Interior doors may use self-closing hinges; All doors shall have a minimum of 3, 26d ball bearing hinges. [Roton continuous door hinges are required at all exterior storefront doors.](#)

1. Concealed overhead - LCN 2031
2. Rixon Firemark 2000E
3. Rixon Firemark 2000I
4. LCN 4041
5. LCN 1461

**B. Locks:**

1. Furnished and installed by contractor: locks and keys will be Schlage, Lever handle, heavy duty locksets, 2 3/4" backset, satin chrome finish:
  - a. Model ND 53HD Rhodes
  - b. Model #1E6222S2RP2 626. Rimlock. (when needed on exterior doors) Schlage
  - c. Model ND10S Rhodes, Lever handle passage set, for non lockable doors.
  - d. Model #ECL-230D, DETEX emergency exit device for fire exits. Cross Building Supply
  - e. Model #99 (series), VON DUPRIN Rim Device & Exit Panic Bars, Cross Building Supply – Prefer devices without rods.

**C. Keying Systems:**

1. ERAU to arrange meeting to determine keying needs. To attend: Department Head, UCP Manager, Director of Safety, and Locksmith.
2. Use standard ERAU keying codes. Provide Schlage Everest B keying system.

3. Use only original key blanks for all areas other than student dorm rooms.
4. Use neuter bow key blanks for all student dorm areas. They must be stamped "DO NOT DUPLICATE." Keys can be obtained from CLARK SECURITY PRODUCTS.
5. See University Locksmith for Master key codes, keyway types, and keying levels before starting work.
6. Key mechanical rooms, maintenance areas, custodial areas, and IT areas differently. See Locksmith for codes.
7. Supply legible records to University Locksmith, with floor plans, building codes, flow charts, and door numbers.
8. Supply 6 each construction keys to Locksmith.
9. Consult Director of Safety and UCP when in doubt, or if any questions should arise during any phase of construction.
10. Provide removable cores, to be installed by Contractor at end of job; end user cores provided by the contractor, combined and installed at the completion of the job. Model 80-037, Lock core, 6 pin, Schlage, combined to University standards.
11. Copy UCP on any transmittals to Safety Department or University Locksmith. Contractor must keep written minutes of all meetings.
12. Construction cores are to be provided and installed by Contractor.
13. All door hardware, including but not limited to: strikes, hinges, closers, panic hardware, stops, thresholds, sweeps, pulls on exterior doors will be furnished and installed by Contractor.

**D. Hardware:**

1. All doors that can hit walls shall have Ives WS401CCV or Trimco W1276CCS bumpers.
2. All interior hollow metal frames shall have rubber door silencers equal to Ives 20 silencers. 2 per pair and 3 per single doorframe.
3. Panic hardware is to be provided where required by Codes and on any exterior doors that have security card access.

**E. Acceptable Manufactures:**

Acceptable Manufacturers - to the greatest extent possible, obtain each kind of hardware from one manufacturer only.

<u>Product Specified</u>	<u>Manufacturer</u>	<u>Acceptable Substitute</u>
- Butt hinges		Hager, PBB
- Locksets, latch sets, privacy sets, cylinder keys and keying	Schlage	
- Door closers	LCN or Norton	
- Overhead concealed Closers	LCN or Norton	
- Protection plates, pull plates, wall bumpers, floor stops, door stops, flush bolts	Hager	H. B. Ives
- 1-1/4" diameter door pulls	Hager	Forms & Surfaces
- Overhead stops & holders	Rixson-Firemark	Yale
- Thresholds, drip caps weatherstrip	Pemko Mfg.	Zero, Reese
- Key cabinet	Lund Equipment	Telkee, Key Control
-Exit devices	Yale, Von Duprin	Yale, Von Duprin

Consult UCP for any alternates to above specifications.

**F. Finish Hardware**

PART I – GENERAL



1. 01 - Work Included

- A. This section includes furnishing of all items of finish hardware as hereinafter specified or obviously necessary to complete the building, except those items that are specifically excluded from this section of the specification.

1. 02 - Related Work Specified Elsewhere

- A. Hollow metal doors and frames
- B. Heavy duty Aluminum anodized doors and frames
- C. Wood doors and frames

1. 03 - Description of Work

- A. Furnish labor and material to complete hardware work indicated, as specified herein, or as required by actual conditions at building.
- B. Include all necessary screws, bolts, expansion shields, and other devices, if necessary, as required for proper hardware application. The hardware supplier shall assume all responsibility for correct quantities.
- C. All hardware shall meet the requirements of federal, state and local codes having jurisdiction over this project, notwithstanding any real or apparent conflict herewith in these specifications.
- D. Fire-Rated Openings
  - 1. Provide hardware for fire-rated openings in compliance with A. I. A. (NBFU) Pamphlet No. 80, NFPA Standards NO. 101, UBC 702 (1997) and UL 10C. This requirement takes precedence over other requirements for such hardware. Provide only hardware that has been tested and listed by UL for the types and sizes of doors required, and complies with the requirements of the door and doorframe labels.
  - 2. Where panic exit devices are required on fire-rated doors, provide supplementary marking on door UL label indication fire door to be equipped with fire exit hardware and provide UL label on exit device indication "Fire Exit Hardware"
- E. Fasteners
  - 1. Hardware as furnished shall conform to published templates generally prepared for machine screw installation.
  - 2. Furnish each item complete with all screws required for installation (typically, all exposed screws installation).
  - 3. Insofar as practical, furnish with Phillips flat head screws, finished to match adjacent hardware.
  - 4. Install door closers and exit devices with close head through bolts (sex bolts).

1. 04 - Quality Assurance

- A. The supplier must be a directly franchised distributor of the products and have in their employ an AHC (Architectural Hardware Consultant). This person is to be available for consultation to the architect, owner and general contractor at reasonable times during the course of work.
- B. The finish hardware supplier shall prepare and submit to the architect 6 copies of a complete schedule identifying each door and each set number, following the numbering system and not creating any separate system. The finish hardware supplier shall submit the schedule for review, make corrections as directed and resubmit the corrected schedule for final approval. Approval of schedule will not relieve contractor of the responsibility for furnishing all necessary hardware, including the responsibility for furnishing correct quantities.
- C. No manufacturing orders shall be placed until detailed schedule has been submitted to the architect and written approval received.
- D. After hardware schedule has been approved, furnish templates required by manufacturing contractors for making proper provisions in their work for accurate fitting, finishing hardware setting. Furnish templates in ample time to facilitate progress of work.
- E. Hardware supplier shall have office and warehouse facilities to accommodate the materials used on this project.
- F. Hardware manufacturers are to supply both a pre-installation class as well as a post-installation walk-thru to ensure proper installation and provide for any adjustments or replacements of hardware as required.

1. 05 - Delivery, Storage and Handling

- A. Wrap to protect finishing hardware items for shipment. Deliver to manufacturing contractors'



hardware items required for their application; deliver balance of hardware to job; and store in designated location. Each item shall be clearly marked with its intended location.

- 1.06 - Warranty
  - A. Furnished material shall be warranted for 1 year after installation or longer as the individual manufacturer's warranty permits.
  - B. Overhead door closers to be warranted in writing by manufacturer against failure due to defective materials and workmanship for a period of 10 years commencing on the date of final completion and acceptance. In the event of failure, the manufacturer is to promptly repair or replace the defective with no additional cost to the owner
- 2.02 - Finish of Hardware
  - A. Exterior hinges to be stainless steel (32D); interior hinges to be brushed chrome. Door closers to be brushed chrome, u. n. o. Locks to be brushed chrome, exit devices to be anodized aluminum. Overhead holders to be brushed chrome, u. n. o. , flat goods to be stainless steel or brushed chrome and the thresholds to be mill finish aluminum.
- 2.03 - Hinges and Pivots
  - A. Exterior butts shall be stainless steel. Butts on all out swinging doors shall be furnished with non-removable pins (NRP).
  - B. Interior butts shall be as listed.
  - C. Doors 5' or less in height shall have 2 butts. Furnish 1 additional butt for each 2'6" in height or fraction thereof. Dutch door shall have 2 butts per leaf.
- 2.04 - Keying
  - A. All exterior locks and cylinders shall be Schlage system, interior locks and cylinders shall be Schlage
  - B. All locks and cylinders to be construction master keyed in a manner that can be removed.
  - C. Provide 3 each change keys per lock and 6 each grand master and master keys. Stamp "DO NOT DUPLICATE."
  - D. All cores are to be Schlage, simple format, Everest "B"

## DIVISION 9 - FINISHES

### Section 09251 – Gypsum Wallboard

1. ASTM C 36; regular types except where special types are required. Minimum 5/8" thick.  
[Texture: Skip Trowel, Interior wall sound control shall be provided at all rest rooms, conference rooms, directors offices and lecture halls.](#)

### Section 09500 – Ceiling

1. Ceiling tile – 2'x 2' Armstrong #756A fissured 5/8". White grid.

### Section 09650 - Resilient Flooring and Accessories

1. Vinyl composition tile shall be applied with a suitable waterproof mastic.  
**All VCT tile floors are to be finished by the contractor, minimum 2 layers, per manufactures recommendations.**  
Standard VCT: Armstrong Excelon or equal (to be approved by UCP)
2. Tile shall be a minimum of 12" x 12" x 1/8" Composition 1, asbestos free, rated as heavy-duty commercial. A minimum of 2%, or one box of product as extra for maintenance purposes is required. Product extra requirements apply to each type/color or product if more than one is specified.
3. When a composition base material is utilized, it is to be a rubber base rather than vinyl. Specify that all inside & outside corners shall be pre-formed. Base shall be 4" toeless base, dark in color (to hide impact marks), matte finish. Exposed or junction edges of the tile shall receive vinyl or aluminum reducer strips.
4. Exposed integrally colored concrete may be used in high traffic areas.
5. All grout lines are to be sealed in accordance with the manufacturer's recommendations.
6. No finish of any kind is to be applied to glazed ceramic tile

### Section 09685 - Carpet

1. [Lee's MBH, Faculty IV, Workforce, or Attribute](#)

2. Carpet to be installed by certified Lee's installers.
3. Carpet to be rolled cut
4. Lee's first step to be used at entry doors where possible

### **Section 09900 - Painting**

1. Painting products shall be specified from Sherwin Williams.
2. Semi gloss or Eggshell walls.
3. Semi gloss doors, door trim & window trim.
4. Semi gloss ceiling.
5. All wet areas to have mildew resistant paint.
6. University Standard Paint Colors:
  - a. Classrooms and Residence Halls Interior: SW6000 Snowfall
  - b. Offices Interior: SW6099 Sand Dollar wall color
  - c. Interior Trim: SW6093 Familiar Beige (doors, frames, wood trim)
  - d. Overhangs and Ceilings: SW6098 Pacer White
  - e. Exterior Body: SW6101 Sands of Time
  - f. Exterior Trim: SW6102 Portabello (if matching existing Canyon Brown use SW....)
  - g. Exterior Door :SW6230 Rainstorm (Interior side of door matches the interior trim)
  - h. Flight Buildings Interior: SW6000 Snowfall
  - i. All exterior steel: Including light poles, handrails to be painted SW62548 TriCorn Black
7. Private Residence / Observatory Buildings R1, R2, R2-A, R3, R4, R5  
 Exterior Body: Sherwin Williams Paint Color 6088 Nuthatch  
 Exterior Trim & Garage Door: Sherwin Williams Paint Color 6089 Grounded  
 Exterior Doors: Classic Paint Color 474 Mistletoe

### **Section 09950 – Wall Covering**

1. Ceramic tile on all wet walls and other restroom walls to top of partition; throughout.
2. At all janitors closets install FRP wainscot on all wet walls.

## **DIVISION 10 - SPECIALTIES**

### **Section 10150 - Toilet Compartments**

1. Partitions to be floor mounted with overhead support
2. Phenolic or steel, or plastic partitions to be specified
3. Partitions mounting bracket to be continuous

### **Section 10100 - Visual Display Boards**

1. To be provided and installed in Classrooms and Labs by contractor as part of construction budget; whiteboards to be 4' high x 20' long where possible
2. All white boards to be porcelain enamel markerboards. Porcelain enamel warranty: Furnish the manufacturer's written warranty agreeing to replace porcelain enamel whiteboards that do not retain their original writing and erasing qualities.
3. Acceptable Manufacturers:
  - a. Claridge Projects and Equipment, Inc.
  - b. NACO/GSI (Polyvision)**
  - c. Lemco, Inc.
  - d. Venus Manufacturing Co.
4. Acoustic sound panels Allied Acoustical, Inc. 1730 W. Buchanan, Phoenix

### **Section 10260 – Wall and Corner Guards**

1. Chair rails are desirable in all classrooms. Prefer high impact PVC 1/8" thick.
2. Corner guards shall be provided in all high traffic areas. Mfr. & Style must be approved by UCP.
3. Consider chair rails and corner guards in all traffic areas.

### **Section 10400 - Identifying Devices**

1. All interior signs shall conform to ERAU signage specifications and ADA.
2. Signage may be fabricated by Owner; cost is to be part of construction contract.
3. Signage to be installed by Contractor; locations to be determined by UCP.

### **Section 10520 - Fire Protection Specialties**

1. Cabinets to be recessed and ADA approved. Cabinet doors shall be clear glass.  
Top of cabinet door not to exceed 54" A. F. F. Bottom of cabinet 30" to 32" AFF
2. Campus standard for Fire Hydrants is Waterous. Model #: to be determinate by civil engineer.

### **Section 10800 – Toilet & Washroom Accessories**

1. **Paper towel dispensers** – GEORGIA PACIFIC, CORMATIC P15, ROLL DISPENSER, NO ELECTRIC HAND DRYERS. Units provided AT NO COST to the University by Sodexo.
2. **Toilet paper dispensers** – GEORGIA PACIFIC MFG NO 58250 Units provided AT NO COST to the University by Sodexo
3. **Liquid soap dispensers** – AIRKEM, EPICARE MIRROR MOUNT OR WALL Units provided AT NO COST to the University by Sodexo
4. Napkin / Tampon dispensers – UNISORCE DUAL NO 1
5. Sanitary Napkin RECEPTACLE – RUBBERMAID 6140, PARTITION OR WALL MOUNT
6. Sanitary dispenser – FEMININE HYGIENE VENDING MACHINE MFG NO DIZS
7. Seat Covers dispenser – Georgia Pacific Seat Covers 57724
8. Sheet mirrors above all vanities
9. Baby Changing Station: Oval Baby Bear, KB108-12 Grey Granite, at all public restrooms.

## **DIVISION 11 – EQUIPMENT**

### **Section 11130 – Audio Visual Equipment**

1. All ceiling mounted projectors to have outlet at ceiling with control box at wall near instructors station. Fixed, overhead and computer projectors and monitors to be provided by Owner (FF&E budget.)
2. Projection screens provided and installed by Contractor; provide adequate blocking.
  - Hang in center of room approx. 134" +/- from 96" screen
  - Blocking for projector to be provided
  - 2 speakers (Owner provided) on either side of projector for sound amplification
  - Media Services Contractor to install all Owner provided equipment

## **DIVISION 12 – FURNISHINGS**

### **Section 12500 – Window Coverings (Curved PVC)**

PVC - Virgin vinyl with anti-static coating. thickness min. .050", beaded edge .003". Perforated; (see standard below) Color selection to be approved by UCP.

Track - G71 Style metal scissors or equal (No plastic scissors).

Track Format - 1-15/16" width, 1-3/8" height wall average 0.050" and material of clear anodized aluminum alloy 6063-T5. Carriers - G71 style

Perma-wand control. Stack to one side. Perma-wand

Manufacturer's warranty - 10 years on fixed parts (scissors, carrier, track, etc.) 1 year on all other parts & labor.

Window coverings for offices: Perforated vertical blinds

Window coverings for classrooms & labs: Non perforated vertical blinds

Window coverings for conference rooms: Non perforated vertical blinds

Window coverings for all residence hall rooms: Non perforated vertical blinds

### **Section 12670 - Rugs & Mats**

1. Contractor to provide aluminum grate entrance mats on interior and exterior of major entries.
2. Owner to provide interior walk-off mats as required.

## **DIVISION 13 - SPECIAL CONSTRUCTION**

### **Section 13825 - Security Systems**

### **Section 13835 - Elevator Monitoring Control Systems**

### **Section 13845 - Alarm Detection Systems**

### **Section 13850 – Door Control Systems**

1. Blackboard SA 3000 One Card Security System access to Entry Doors
2. On all suite main entry doors, install Onity Integra 3 Offline Card Locks
3. All exterior doors to be monitored with:
  - a. Monitor/reader
  - b. Blackboard SM-8 security monitors
4. One set of entry doors to be equipped with automatic opener to meet wheelchair accessibility codes.

### **Section 13900 – Fire Suppression and Supervisory Systems**

1. All construction to conform to City of Prescott fire alarm and fire sprinkling requirements.
3. Residence Halls 1 thru 5- Manual fire Alarm Pull Stations Fire-Lite BG-12 Series shall be used.
4. Residence Halls 1 thru 5- Horns Fire- Lite SpectrAlert Series shall be used
5. Each building will have a separate Firelight MS 9200 alarm panel with fire and security alarm detectors all connected to the University wide monitored alarm system.
6. Alarm panel must be programmable by selected ERAU vendor. Single source vendors not acceptable. Notifier Panels are not acceptable.
7. Contractor to provide portable fire extinguishers and shall mount, locate and install per Fire Marshall recommendations. All fire extinguishers shall have appropriate signage. OSHA 1910.157(c)(1) provided by the contractor.

## **DIVISION 14: CONVEYING SYSTEMS**

### **Section 14200 - Elevators**

1. No proprietary elevator systems are to be specified.
2. Elevators can be Dover, Marquis, Thyssen Krupp or other approved; elevator to be hydraulic.
3. Elevator controls shall comply with the most recent Fire / Life Safety and ADA codes.
4. specifications shall include attention to interlock to existing or proposed fire detection systems and devices.
5. Machinery spaces shall be located to minimize vibration and noise, and shall be fully sound attenuated if located near occupied areas.

## **DIVISION 15: MECHANICAL**

1. Detailed drawings of all mechanical equipment layouts are required to insure there is adequate room for maintenance. All designs must provide adequate access for maintenance of all mechanical equipment or replacement of filters. Consider location, avoid loud equipment in work areas, provide reasonable access for maintenance staff, avoid sprinkler lines, conduit or additional building infrastructure in these areas.
2. VAV Air handler system are preferable for all new construction.
3. All equipment controls must be compatible with Metasys building control systems, U.N.O.

### **Section 15010 - General**

1. Each building will have separate gas and water meters provided and installed by Contractor.
2. Equipment to be of commercial grade (Trane / American Standard / York) with economizers and hail guards, or approved equal.
3. If exterior equipment is ground mounted shall be on concrete pads. (Roof mounted units are acceptable if roof has access)
4. All mechanical rooms and spaces shall be adequately sized, lighted and arranged so that any and all repair and maintenance that may be necessary can be performed. Controls, mixing boxes, balance dampers, fire dampers, valves, filter banks, heat exchanger coils, pumps, belts, etc., shall be accessible for repair or replacement and shall not be obstructed by any pipe, conduit or other obstacle. Contractor is responsible to coordinate all trades to insure access is available to all new units.
5. All gas appliances shall be de-rated for the appropriate elevation.
6. All service and supply systems, including, but not limited to, steam, high temperature hot water, natural gas, domestic water, waste and electrical, shall be sized for peak demand throughout the project and shall be sized as far back as the main meter or central distribution system. The

- adequacy of any central distribution system to carry all added peak loads shall be determined, and no loads shall be connected to any such system that is determined to be undersized.
7. Drainage piping in labs where chemicals are used is to be caustic or acid resistant.
  8. No plastic or PVC water piping will be used for potable water supply. Use soft copper type L on all yard lines up to 2".
  9. Sewer pipe to be Schedule 40 DWV, not SDR 35. **Note: In some cases ABS piping is acceptable for below grade waste piping, must have written authorization from UCP**
  10. Provide shutoff valves, readily accessible in wall or ceiling for EACH room with water service. All shutoff valves should be high quality, domestic "ball valves". Facilities Maintenance Department to approve all valve locations prior to finalizing plans/specs. All concealed or vandal-proof vanities are to provide ready access to maintenance personnel. All access panels to be hinged and lockable.
  11. All concealed valves, trap primers, air chambers, mechanical devices shall have stainless steel, hinged, lockable access panels measuring no less than 12" x 12".
  12. Floor grade to all shower and floor drains must be sufficient to drain the entire area served.
  13. The Professional Consultant, through his sub-consultants, shall be responsible for coordination of all systems including, but not limited to, electrical systems, control systems, heating and cooling systems, plumbing systems and any other mechanical systems as one included in the building design. This responsibility includes all mechanical sub-contractors, Federal, State and Local agencies, and franchised service companies.
  14. The Professional Consultant shall construct a process and instrumentation diagram drawing depicting all pressure gauges, thermometers and flow meters required for the project. Included on this drawing shall be actual design flows, pressures and temperatures for each and every system.
  15. Gauges and thermometers shall be specified for all HVAC equipment.
  16. Quality Assurance: The selection of products or service companies shall be from those firms whose products or services have proven satisfactory in similar service for not less than three years.
  17. Repair or replacement parts, or required service, shall be readily available, and the supplier of products or services shall have a proven track record of response to complaints or problems during, and after, the warranty period.
  18. **Use Danfoss VFD's on all HVAC equipment specified for variable frequency drives, or equal. Unless proposed alternate is approved by owner.**
  19. **All exterior underground gas piping must be installed per code and the Arizona Corp. Commission requirements. Piping is to be PE pipe manufactured by Rinker.**
  20. **Heating for all facilities is to be provided using gas-fired equipment: NO ELECTRIC HEAT WILL BE ACCEPTED**
  21. **Where chillers are used, they are to be air-cooled type: NO COOLING TOWERS WILL BE ACCEPTED. Provide freeze protection for all exposed piping and components (Specify type: glycol, heat tape...)**
  22. **In most cases the roof rainwater drainage is to be connected to the campus storm water drainage system. Overflow drainage is to be addressed using roof scuppers or overflow drains separately piped to grade.**
  23. **All buildings are to have a backwater valve on 3", 4" and 6" drains. Valves to be CLEAN CHECK INC. U.N.O. Extendable backwater valve.**
  24. **All underground meters, valves, etc. shall be in boxes appropriately designed for the utility and clearly marked with the utility name. (ie: Gas, water, electric, etc.)**
  25. **Hot and cold fluid piping is to be insulated to avoid heat loss and condensation.**
  26. **All ductwork is to be insulated on the outside of the duct lines to avoid condensation. Avoid the use of internal duct insulation and duct board as the duct lining will deteriorate and insulation particles are blown into the building spaces. It is acceptable to use internal duct insulating liner (w/ backing that can be cleaned) for the first 20 feet of ductwork before and after air handler fans and in the low velocity ductwork downstream of the VAV boxes to minimize system noise to the space.**
  27. **Ambient noise should not exceed 50% of the OSHA PEL for the given type of work space.**
  28. **Design should consider equipment efficiency. Factor in equipment lifecycles costs, energy cost and installation costs before a system is selected.**

#### **Section 15410 – Plumbing Fixtures (and Accessories)**

1. Lavatories - All standard buildings & offices: American Standard Aqualyn **or equal, white 4" centers**
2. Mop sinks to be pre-molded stone type with wall mounted faucet with hose end, brace, and vacuum breaker with sink edges, Mop sink faucet shall be Wolverine brass model #93363, 8" wall mounted.



3. Sink – Dorms only: Sterling Vikrell SR 0c-20-0. Dorm sink faucet shall be, Single lever handle faucet 4" center Wolverine Brass Model: Endurance cat #85200 with pop-up.
4. Public Restroom Sinks: American Standard Aqualyn or equal, white 4" centers = Sloan model #ETF-600 – hardwired
5. Kitchen Sinks: Elkay, Stainless Steel kitchen sink sized per bldg. With Single lever handle faucet 8" center Wolverine brass model; Endurance cat #85000, less spray. Three Compartment sink: Elkay Lustertone LTR Series 18 Gauge-Type 302-Self Rim Model #LTR-4622 Standard bowl depth 7 1/2"
6. Water Closets - Dorms only: Vitra-"Atlantis" elongated white front toilet bowl. 1.6 GPF or equal (dorms only, non-ADA).
7. Water Closets – Vitra-"Atlantis" elongated white front toilet bowl. 1.6 GPF ADA compliant or equal. 9/22/04 As acceptable equals: TOTO Brand CT 705 1.6 GPF Flushometer Toilet, CT 705L 1.6 GPF Flushometer Toilet (ADA Compliant), CT708 Wall Hung Flushometer Toilet 1.6 GPF. Sensor operated.
8. Wood white toilet seats.
9. Urinals – American Standard Maybrook low consumption, white, w/ Sloan Optima Systems 8186-1.0 urinal flushometer or Waterless Co. LLC, Kalahari Model # 2003, porcelain unit. (Falcon/Sloan makes several models, but their operating costs are 300% higher because of the nature of their traps) Waterless Co. LLC, Kalahari Model # 2003
10. Shower valves will be Wolverine brass model Encore II cat #85651 with shut off valves on the valve. Shower valves to have temperature balancing and mixing valves
11. Hot water heaters will be A.O. Smith brand and circulating pumps will be Grundfos brand with stainless steel impellers. The domestic hot water will have a circulating pump and a return loop.
12. All domestic water supply piping will be copper.
13. All sinks on campus with angle stop shall use ¼ turn ball valve type angle stop with a separate supply line.
14. When called for all water circulation pumps used on domestic hot water systems need to be Grundfos.
15. All new building water supply shall have pressure release valves, Watts #223 25-75, PSi 3" unless noted otherwise.
16. All back flow preventors shall be Zurn Wilkins (not a Clean Check backwater valve)
17. Drinking Fountains: To be Elkay
18. Showers:
19. Showerhead: Wolverine Brass, Brass Shower Head #53671 1 3/4" face.
20. Shower valves: Wolverine Brass "Encore II" (1/2" copper seat on hot and cold, 1/2" FIP outlet to supply) Drain: Stainless steel strainer Shower pans: cultured marble, curb and full height surround with combo. White on white. Floor to be floated before marble shower pan installed. Marble surround to be full height, from the floor to the ceiling.

It's a porcelain unit. Falcon/Sloan makes several models, but their operating costs are 300% higher because of the nature of their traps.

### Section 15500 - HVAC

1. Consult UCP for input prior to and during the design of the mechanical systems.
2. Window A/C and Heat Units - use units with slide out chassis. Minimum of 10.0 EER. DX 12.0 EER
3. Thermostat:  
Smaller Buildings and Flight Line: Johnson Controls N2 Thermostat (TEC1100 Series).  
Or approved equal.

Larger Buildings and Academic areas: Metasys. Unitary Controller (AS-UNT111-1) Temperature Element TE-6700 Series Johnson Controls, or approved equal.

Mechanical Engineer shall inquire the following before designing a system:

1. Building to be connected to the campus system, not stand-alone.
2. Graphics are not required.
3. Connection to campus fiber system is to be coordinated by IT and provided by contractor.

### Section 15850 – Air Handling

1. Air handler blowers shall be sized for a 80% maximum blower speed is required to provide design air flows, velocities and pressures to minimize vibration and noise.

2. Ventilation standards shall be a minimum of 20 cubic feet per minute per occupant.

### Section 15860 – Centrifugal Fans

1. In-line fans/blowers shall have **complete clearance at access panels** for service and maintenance.
2. Grease fittings shall be extended for easy access without the need for equipment shutdown.
3. Fans to be direct drive.

### Fire Sprinkler Criteria: To be provided upon request

1. Types of sprinkler systems required for various use groups such as classrooms, computer rooms, shops, etc. must be designed as outlined by NFPA and the local fire marshal.
2. Approved sprinkler head manufacturers and types: per Facilities Management
3. Fire pump system as defined by NFPA and the local fire marshal.
4. All fire sprinkler systems must be installed in compliance with NFPA and the local fire marshal requirements:

## DIVISION 16: ELECTRICAL

### Section 16000 – General

1. Each building will have a separate electric meter provided and installed by Contractor.
2. All work shall comply with the exterior lighting ordinances of the Local Government, with all requirements of the National Electrical Code (latest edition) and requirements of the local power supplier.
3. All materials shall be new, Underwriter listed and standard first line products of their respective kinds.

### Section 16050 – Basic Electrical Materials and Methods

1. In order to conform to existing building standards, use the following equipment:
  - a. 2'x4', T-8 fluorescent recessed lensed, troffer, electronic ballast, Lithonia #2GT8428A12120
  - b. 2'x4', T-8 fluorescent, low profile wrap around surface fixtures, elec. ballast, Lithonia #LB428120
  - c. Outside nightlight: Hubbell model Perimalux NRG-308-4W-PC
  - d. Emergency two light fixture, Lithonia model #ELM2, 120/277 volt, 12 watt, smooth white
  - e. Exit sign, red LED battery back-up Lithonia model #LQMSW3R120/277ELN
  - f. F28T8 41K fluorescent light tube, Phillips model #F28T8/TL741/ALTO 28 watt
  - g. GFCI Duplex receptacle 120 volt, 20 amp, Leviton model #6899
  - h. Motion sensor wall switch, Watt Stopper Universal, PIR model #WS-120/277 0-800 watt ballast
  - i. White t-bar grid.
2. In general, no more than six circuits shall be run in a single  $\frac{3}{4}$ " homerun if conductors are #12's or smaller. Size of all homerun conduits shall be  $\frac{3}{4}$ " minimum. Do not combine homeruns when shown separate. If conduit is greater than  $\frac{3}{4}$ ", fill shall be no more than **40% as allowed by NEC**.
3. Neutral conductors shall be #10 AWG minimum where two or more 15 or 20 amp circuits share a common neutral.
4. Conduits:
  - a. Wiring of every description shall be in an approved raceway. All conduit shall be a minimum of  $\frac{3}{4}$ ". Exception:  $\frac{1}{2}$ " conduit may be used in walls for dead-end runs only.
  - b. Flexible Steel Conduits shall be used only where approved by the CPM for connection to equipment which is movable for adjustment, mounted on isolation units for elimination of vibration and sound, or for connection from a close-by junction box to lay-in type light fixtures in a "T" grid ceiling. Run green ground wire in all flexible conduits. Seal tight flex shall be applied spirally wound steel.
  - c. Type "MC" cable shall not be used without the specific written acceptance by the Owner. If allowed by the Owner, the minimum size wire shall be #12.
5. No conduit shall be run exposed in finished areas without specific written acceptance by the Owner. Surface mounted conduit or wiremold is not acceptable, unless specifically approved by owner.
6. Conduits & Fittings: Conduit stubbed up/down or through floor slabs shall be wrapped RGS (rigid / steel) or wrapped IMC with a minimum of 6" conduit exposed out of slab for connection of threaded or compression fitting. Conduit bend shall not extend out of top of slab.
7. Telephone plates and devices or jacks (modular) shall match electrical device plates and devices, in color and material. Wall plates to match wall color where possible, verify UCP

8. Different systems shall be run in separate conduits as complete systems with conduit, wire-ways, boxes, etc... Examples of separate systems are as follows: 120/208 volts, 277/480 volts, fire alarm, emergency lighting and power, computer / telephone, intrusion alarms, building automation and energy management. Electrical wires, electronic wires and air lines shall not be run in the same conduit. Control wiring of different voltages for the wiring of electrical equipment shall not be run in the same conduit as power feeders.
9. All power wiring shall be in conduits or raceways regardless of voltage.
10. All main service, main feeder and general circuitry wiring shall be specified as copper.
11. Telephone, communication cabling and power limiter cable for fire alarm systems shall be in a conduit system unless the cable is plenum rated.
12. Sleeves shall be specified for penetration through floor and through firewalls. Sleeves shall extend a minimum of 4" AFF (above finished floor) and/or extend a minimum of 6" beyond each wall surface. Fireproofing shall be provided for all penetrations.
13. All electrical equipment, disconnects, starters, panels, devices and plates shall be installed plumb and true. All adjacent boxes shall be aligned and level. Devices will be installed with enough clearance and access to comply with National Electrical Code, to allow for maintenance, repairs and/or calibration.
14. All Panel boards, disconnects and starters shall be mounted at a height to make testing and maintenance as easy as possible. In no case shall panel boards be mounted so that the maximum height of any circuit breaker exceeds 78" to top of breaker. For panel boards with excessive height, mount panel board so that the bottom of the cabinet will not be less than 12" above the finished floor.
15. Conductor splices shall only be allowed in outlet boxes, gutters, junction boxes or pull boxes as allowed by National Electrical Code.

#### **Section 16300 – High Voltage Distribution (Above 600 volts)**

1. Each new building shall provide the necessary switches and transformers for its connected load.
2. High voltage switchgear shall be pad mounted, low profile, dead front type, tan finish as manufactured by S&C Electric Company with Cooper Power Systems X-Limiter Full Range Current-limiting Fuses (15.5kV, amp size as required) on branch feeder sections and fault indicators located on the feeder sections.
3. High voltage cable shall be #1/0 solid (branch feeder) or #750 kcmils (service feeder) AL 1-C 15 kV or 21kV .220 mills "TRXLPE" with concentric neutral, jacketed. LoadBreak Elbows Connectors 200A, 15kV.  
Approved alternate: High voltage cable shall be #1/0 solid or #750 kcmils AL 1-C 15 kV .220 mills 133% insulation "XLPE" with concentric neutral, jacketed. LoadBreak Elbows Connectors 200A, 15kV. Written approval from University Construction & Planning must be received to use this alternate. (associated costs to be considered)
4. Provide 15kV Metal Oxide Varistor Elbow Surge Arresters at each transformer.
5. All terminations shall meet APS specs.

#### **Section 16320 – Transformers**

1. Service transformers shall be three phase pad mounted, dead front loop feed, oil filled (non-PCB), air cooled, 95kV BIL, Bay-o-net current-limiting oil immersed fusing. Transformer shall be located at exterior service side of building for accessibility.
2. Captive Pentahead bolt shall be used on transformer door (Penta head socket to be turned over to FMD when job is complete).
3. Transformers shall not be located in basements or other areas subject to contaminant by floodwaters.

#### **Section 16400 - Service & Distribution (600 volts and below)**

1. All switchboard, distribution panel, MCC and branch circuit panelboard buses shall be copper. All enclosures shall be field punched. Pre-punched knockouts are not approved.
2. All switchgear shall be specified as Square "D" or equal.
3. Panic buttons shall be installed in each electrical service entrance switchboard room at the exits. These panic buttons shall be wired to a shunt trip main breaker in parallel with the ground fault trip. The buttons shall be Allen Bradley #800T-BGA (or approved equal) extended head red push-button units with Allen Bradley #800-N13 (or approved equal) extra-long guard ring. These panic buttons



are to be marked "EMERGENCY POWER OFF SWITCH" by a red and white laminate label. Mushroom head pushbuttons are not acceptable.

4. All panelboards shall have door-in-door construction.

#### **Section 16420 – Service Entrance**

1. Service entrance switchboards shall be provided with digital multiple meter with amp, volts, kilowatt-hour, kilowatt demand, power factor and harmonics. Meter shall have the capacity to communicate with owner's EMCS system.
2. Label switchboards with CT ratios.
3. Provide an equipment ground, sized per NEC, to all electrical distribution equipment.
4. All conductors used for grounding will be color-coded green continuously in all visible places, cabinets, equipment, pull boxes, junction boxes, switchboards, etc., or shall be bare copper continuously.
5. Conductors used for isolated grounds shall be green with orange stripe or tracer.

#### **Section 16480 – Motor Control**

1. Motors shall have disconnecting means furnished by the Contractor. Westinghouse, General Electric, Square D or Crouse-Hinds are approved manufacturers. Magnetic starters shall be installed on motors 1 hp or larger (controls to be 120 volt). Magnetic starters shall have green and red pilot lights, in covers. All switches to be HD heavy-duty rated.
2. All magnetic switches to have one overload relay per phase.
3. Single-phase motors are to be protected with Allen Bradley Bulletin 600 or Fusetrans fuses.

#### **Section 16490 - Switches**

1. Motion sensing switches shall be specified for all toilet rooms, conference rooms, work rooms, hallways, storeroom type spaces and any other heavy use areas with more than six (6) two-lamp fixtures. Motion sensors shall be of the infrared or ultra-sonic type controlled by EMS (if applicable); Toilet rooms shall be equipped with motion sensing switches for both lights and fans controlled by EMS (if applicable).
2. Motion sensing switches are not required at offices.
3. Motion sensor covers are almond, provided by Pas and Seymour (manufacture)
4. Toggle: extra hard use industrial specification grade, back and side wired, 20 amps, 120/277 volts, brown, Hubbel 1221.
5. Momentary contact: 3-position single pole throw, match face plate, Hubbel #1557.
6. Lighted toggle: clear, Hubbel #1221, ILC.
7. Pilot toggle: clear, Hubbel #1221, PLC.
8. All switches to have body securely locked to bridge by staked screw assembly. Back wire through a hole with clamp type wiring assembly suitable for stranded wire.
9. Lighted toggle switches shall be used in all tunnels and equipment rooms so switch locations will glow in the dark. Lighted toggle switches shall be white or clear, not red or ivory.
10. Coverplates in exposed wiring to be steel rounded to box edge. Oversized plates are not acceptable. Wall switches shall be on the latching side of doors according to the architectural plans. All switches shall be 48" high to the bottom of the switch, except where located in cabinets, see details.
11. Switch plate, outlet and data port covers shall be nylon. Verify color with owner.  
Standard Interior wall color: SW6000 Snowfall, white plates  
Standard offices Interior wall color: SW6099 Sand Dollar, almond plates, Motion sensor covers are almond, provided by Pas and Seymour (manufacture)

#### **Section 16500 - Lighting**

1. Interior lighting shall be designed to the maximum efficiency incorporating energy saving fixtures and day lighting when possible.
2. Target range for lighting electrical consumption should be no more than 1.5 watts/s.f. 2X4 troffer lights w/ electronic ballasts. E.S. w/ parabolic diffusers.
3. In general, prismatic lens in 2x4 troffers in corridors; parabolic lens or indirect lighting in Classrooms, Labs, heavy Computer areas
4. Cove or architectural lighting in Lobbies, Atriums, Executive Conference Rooms, etc. may be used with owner's approval.

5. Zoned lighting in Classrooms/Labs; dimming via dual level switching (inner and outer tubes of fixtures).
6. Interior Fixture Heavy duty, light fixture for Gymnasiums, sport facilities, convention centers, labs, warehouses: Bay Lyter HighBay 17, 17" Aluminum Reflector HighBay, #Y H 17 400(E/BT37) MA 3, Steel Hook with Locking nut and plate #725, wire guard guard17n(17") 208 Volt is standard application but needs to be verified as older buildings could be 240 volt.
7. Typical workstation desk tops to have the minimum foot-candle count as possible.
8. Emergency lights to be Lithonia ELM2

#### **Section 16501 - Lamps**

1. Lamps shall be General Electric, Voss, Westinghouse, Sylvania, Green or equal.
2. Parabolic Troffers, 3" Louvers 2PM3N G B 2 28 16 L,S 120 GEB.
3. Incandescent fixtures to be approved by UCP.

#### **Section 16502 – Ballasts & Accessories**

1. Fluorescent fixtures shall be provided with fully electronic ballasts. All ballasts shall be rapid start with total harmonic distortion less than 20%. Power factor: 95% minimum, lamp current crest factor – 1.6 or less, sound rating "A", parallel operation required, minimum five year material and labor replacement warranty. Specify: Valmont Ultramizer, Advance, Motorola, EBT, Magnitek, Triad, or approved equal.

#### **Section 16530 – Site Lighting**

1. All exterior lighting shall meet the requirements of the local lighting ordinances (dark sky, etc.)
2. All exterior entries illuminated by light fixtures attached to the building. Minimum wire size shall be #10. All wire to be stranded.
3. Exterior building lights Exterior Building Mounted Light Fixture: Architectural Surface-Mounted H.I.D. #613-050NLXL, Black, Exceline, 50 HPS, PC, wall mounted (meets City of Prescott night sky ordinance)
4. Provide site lighting as required.
5. Provide photocell sensors for exterior lighting.
6. Exterior walkway lights are: ExceLine Site Master Roadway Series Horizontal Lamp Cutoff Luminaire Model #: SMR 15 4 LX 8 = SMR 15 (150(E/BT/ED28) 4 (Distribution) LX (Source) 8 (Voltage 120/277)
7. Exterior parking lot lights: ExceLine Site Master Roadway Series Model # SMR 40 4 LX 8 SMR 40 (400(ED/ET18)
8. Walkway and Parking Lot Poles: Design 101 Square Straight Steel Poles 10-39 Ft. Color: Black
9. No bollard lighting.
10. Emergency lighting at exterior of building to be Lithonia #AFN DB EXT
11. Emergency Phones: PLC-7 Stainless Triangle Column (MB) w/ RR7331/1 phone installed in unit – 2button auto dial w/ 2" button with silk screen phone panel @ no.

#### **See EXHIBIT II: ERAU Prescott Campus Standardized Wiring Requirements.**

**All Information Technology / Special Systems shall follow IT "Standardized Wiring Requirements for New Construction and Renovations" document located at <http://stats.pr.erau.edu/maps/PRCwiring.doc>**

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