

UAMS Technical Design Standards

This document identifies UAMS’ needs and standards for materials, workmanship, equipment and systems. The Consulting Design Teams and Contractors shall follow code requirements and industry standards – items within this document are provided as a supplement.

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DIVISION 02 – EXISTING CONDITIONS

02 00 01 Owner General Requirements and Design Intent

- A. UAMS endeavors to maintain records of existing conditions. However, it is the Contractor and A/E Consultant's responsibility to verify all existing conditions that may affect the work of the project.
- B. If unknown hazard material, asbestos or lead are discovered during construction, stop work, secure the affected areas(s), take all necessary precautions to prevent damage and release of Asbestos Containing Materials (ACM) fibers into the air, and notify the Project Planner/Manager.
- C. A/E shall verify adequate capacity for all utility tie-ins

02 84 16 Handling of Lighting Ballast and Lamps Containing PCBs and Mercury

- A. If light fixtures and lamps contain PCB or mercury, notify the Project Planner/Manager

END OF DIVISION 02

DIVISION 03 - CONCRETE

03 00 01 Owner General Requirements and Design Intent

- A. Exposed concrete floors shall be treated with a hardener and dustproofing agent
- B. Concrete floors intended to receive finishes shall be treated with a vapor retarder

END OF DIVISION 03

DIVISION 04 - MASONRY

04 00 01 Owner General Requirements and Design Intent

- A. All exposed masonry (brick or block) shall have a Water Repellent Treatment applied after cleaning with a non-staining, gum resin solution. Silicone coatings are not acceptable.
- B. Masonry subject to graffiti shall be treated with a graffiti protective coating.
- C. Efflorescence: Particular care must be taken in the selection of materials and in design and detailing of exterior walls to prevent efflorescence in brickwork. Certification of ASTM testing shall be provided to owner.

END OF DIVISION 04

DIVISION 05 - METALS

05 00 01 Owner General Requirements and Design Intent

- A. Ornamental Metal Work (Architectural) and exterior handrails shall be constructed of anodized aluminum
- B. All steel exposed to the weather or moist environments shall be galvanized

END OF DIVISION 05

DIVISION 06 – WOOD, PLASTICS AND COMPOSITES

06 20 23 Interior Finish Carpentry

- A. Millwork shall comply with standards of the *Architectural Woodwork Institute (AWI)* “Quality Standards,” Custom grade for materials and installation
- B. Exposed face veneer matching panels shall be book matched, Grade A

06 41 00 Architectural Wood Casework

- A. Provide only 7-ply veneer core plywood or MDF boards with Type II water resistant glue for laminates

END OF DIVISION 06

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

07 00 01 Owner General Requirements and Design Intent

- A. Fire resistance for roofing systems shall have a class "A" rating as listed by *Underwriters Laboratory, Inc.*
- B. Newly installed roofs must have a minimum of 1/2" per foot slope. Existing roofs require positive drainage. Flat roofs are prohibited.
- C. Allowable low slope roof materials are:
 - 1. Thermoplastic Polyolefin (TPO) single-ply
 - a. Minimum thickness – 60 mil
 - b. Color – White
 - 2. Torch-applied modified bitumen
 - a. Minimum 2 ply system
 - b. Aluminum or granular coating
- D. Warranties shall consist of the Manufacturer's 20-year full value warranty and Contractor's 1-year full warranty.
- E. Contractor shall provide walk-mats to access equipment needing regular maintenance.

07 10 00 Dampproofing and Waterproofing

- A. Below-grade foundation walls and all masonry work shall be minimum warranty of 5 years from substantial completion for complete replacement of failed materials.
- B. Exterior slabs and/or deck areas which allow weather exposure to building interior shall be waterproofed by positive water stops

07 24 00 Exterior Insulation and Finish Systems

- A. EIFS shall be a water drainage or pressure equalized system

07 60 00 Flashing and Sheet Metal

- A. All flashing shall have a minimum height of eight inches (8") above finished roof membrane

07 70 00 Roof Penetrations and Wall Specialties and Accessories

- A. Pitch pockets are not allowed
- B. All roof penetrations shall have a minimum 24" clear between penetrations and perimeter of roof
- C. Mechanical equipment curbs:

1. Curbs shall be minimum 12" at top of slope

07 80 00 Fire and Smoke Protection

- A. Comply with *UAMS' Maintenance of Smoke/Fire Barriers - Policy Number 11.1.08*; Refer to Appendix E.
- B. Firestopping shall be limited to one manufacturer per building; acceptable manufactures are 3M, Hilti, or STI. Manufacture for each building shall be designated by UAMS.
- C. Sprayed on fire-resistant materials for structural elements shall be a non-friable cementitious type and not flake off
- D. Notify the UAMS Project Manager and commissioning authority at the appropriate time (before the ceiling tile is installed) that the area is ready for inspection.

END OF DIVISION 07

DIVISION 08 – OPENINGS

08 00 01 Owner General Requirements and Design Intent

- A. Provide minimum of 42" wide door leaf on all patient pathways
- B. Doors and Frames shall be from a single manufacturer

08 12 13 Hollow Metal Frames

- A. All hollow metal frames shall be welded construction

08 14 16 Flush Wood Doors

- A. Doors shall be the following:
 - 1. Solid core
 - 2. Book match when paired
 - 3. Minimum Grade 'A' 5-ply veneers with vertical edge of same species as face, Grade A
 - 4. Rated and non-rated doors shall have same veneer
 - 5. ~~White Maple~~ or birch wood, with clear finish

08 33 00 Coiling Doors and Grilles

- A. All coiling doors, grilles and trim in public view shall be stainless steel finish

08 40 00 Entrances, Storefronts and Curtain Walls

- A. Finish shall be the following:
 - 1. New construction: Brushed aluminum
 - 2. Renovation/remodel: Match adjacent
- B. Finish shall be guaranteed for 20 years
- C. Approved manufacturers are Kawneer, Efco, US Aluminum, and Vistawall
- D. At all spandrel panel locations, the panel and framing shall be fully insulated and have a non-permeable vapor barrier to prevent condensation.
- E. Aluminum entrances and storefronts shall be installed complete by a single manufacturer or their representative

08 42 29 Automatic Entrances

- A. Automatic entrances shall be designed for heavy use applications
 - 1. A disconnect switch shall be provided above ceiling
- B. Low energy barrier free operators are required
- C. Automatic entrances shall be coordinated and interface with fire alarm and security requirements
- D. Door control shall allow for manual or automatic operation
- E. Specify Stanley when applicable, or equal
- F. Vestibules shall be designed to limit intrusion of outside air into the lobby entrance areas; provide minimum 14' perpendicular between doors
- G. Entrance floors shall include recessed grated carpet
- H. Revolving doors, when approved by UAMS, shall not be less than 18 feet in diameter

08 71 00 Door Hardware

- A. Hardware shall be ~~full mortise Best bored~~ locksets
- B. Hardware shall be coordinated with the Security and Fire Alarm system requirements
 - 1. Keyways generally shall be a ~~5 7~~ pin Best key system, integrated into the campus master system. ~~High security areas require 7 pin keyways~~
 - 2. Permanent keys shall be delivered to the UAMS Project Planner/Manger
- C. Slim line door panic hardware shall be used
 - 1. Acceptable manufacture or equal: Von Duprin
- D. All corridor doors shall have kick/armor plates
 - 1. 36" tall armor plates shall be used on cross-corridors openings
- E. Provide magnetic hold opens on all cross-corridors doors
- F. Wall-mounted doorstops shall be used; floor stops where necessary shall be placed in a location that does not cause a tripping hazard
- G. All doors in patient areas shall be positive latched
- H. Provide astragals and coordinators for double pair of doors requiring rating or security; astragal shall be constructed on active leaf of door pairs with latching hardware
- I. **Door closers shall be LCN, Corbin Russwin or equal, match area.**

08 81 00 Glass Glazing

- A. Water test each piece of exterior glass (ASTM E 331)

08 91 00 Louvers

- A. Shall be extruded aluminum fixed louvers
- B. Louver shall include an insect screen on the interior
- C. Louver shall have an anodized 20 year finish in a color approved by UAMS

END OF DIVISION 08

DIVISION 09 – FINISHES

09 00 01 Owner General Requirements and Design Intent

- A. Color palette will be provided by UAMS Interiors Planner
- B. Provide the following finishes based on room type; Refer to Appendix C.

09 21 00 Plaster and Gypsum Board Assemblies

- A. Acute Care and Ambulatory care
 - 1. Surfaces shall have a level 5 finish
- B. Business occupancies
 - 1. Surfaces receiving semi-gloss paint shall have a level 4 finish with a light orange peel coating
 - 2. Surfaces exposed to grazing light (corridors, etc.) shall have Level 5 finish
- C. Provide access doors where mechanical and electrical access is required for maintenance

09 30 13 Ceramic Tiling

- A. Ceramic tile is prohibited in patient or equipment transport areas
- B. Tiles shall be 12" minimum and grout lines ¼" or less with true straight lines (for ease of cleaning)
- C. Grout shall be sealed prior to acceptance, sealer must be acceptable to grout manufacture
- D. Attic stock: Specify a minimum of 50 SF or 10%, whichever is greater, of each type and of each color of ceramic tile used (except for borders and accents where 5% of each type is required).

09 51 00 Acoustical Ceilings

- A. Acoustical panels shall be limited to Armstrong (color: white) with the following styles:
 - 1. Armstrong 1774 Dune Tegular 15/16", 24" x 24" x 5/8"
 - 2. Armstrong 704A Cortega Angled Tegular 15/16", 24" x 24" x 15/16"
 - 3. Armstrong 770 Cortega Square Lay-in, 24" x 24" x 5/8"
 - 4. Armstrong 868 VL Fireguard Non-perforated, 24" x 24" x ¾"
- B. Systems shall receive Armstrong 15-year warranty.
- C. Attic stock: Provide two unopened cartons of each type of ceiling tile if different from the campus standard

09 53 00 Acoustical Ceiling Suspension Assemblies

- A. Ceiling Grid shall be 15/16 inch; slim line grids are not permitted

09 65 00 Resilient Flooring

- A. VCT floors are not to be waxed by the contractor
- B. Vinyl Tile
 - 1. Acceptable manufacturers are Armstrong, Mannington, Tandus Centiva, Johnsonite or equal
 - 2. Patterns shall be approved by the UAMS Interior Planner
 - 3. Tiles shall be Class I or Class II
 - 4. Attic stock: Provide one unopened carton of each color and type
- C. Sheet Vinyl Flooring
 - 1. Seams shall be heat welded with a color to match the flooring
 - 5. Cap strips sealed against the wall shall be used at wall terminations

09 65 13 Resilient Base and Accessories

- A. Attic stock:
 - 1. Rubber base: Provide one unopened carton of each type and color
 - 2. Rubber accessories: Provide 50 LF
 - 3. Rubber stair treads: Provide 10 each of each color or type
- B. Vinyl Tile

09 67 23 Resinous Flooring

- A. Install epoxy flooring with integral base in toilet rooms, animal holding areas, and kitchens; chemical epoxy flooring shall be used in cage wash areas
- B. Preferred manufacturer or equal: Desco
- C. Provide warranty for minimum 5 years
- D. Floors shall be seamless and trowel down only, broadcast is not allowed
- E. Bases shall be of the same material as the floor

- F. Bases shall have a edge strip at the top sealed against the wall

09 68 00 Carpeting

- A. Carpet tile shall be used; sheet carpeting is not permitted
- B. UAMS Interior Planner shall provide manufacturer and pattern
- C. Wear warranty shall be 15 years limited; backing warranty shall be lifetime limited
- D. Carpet padding shall not be used; specify vinyl backing with quick release adhesive
- E. Attic stock: Provide 5% of carpeted area of the project for each carpet type in unopened carton and matching dye lot

09 69 00 Access Flooring

- A. Floors shall be Bolted/Snap-on Stringer System
 - 1. Electrodeposition paint finish
 - 2. Light weight cementitious fill in panels
 - 3. Non-combustible, Class A flame and smoke rating
 - 4. Grounded with electrical continuity
 - 5. Perforated tiles as required for maximum airflow
- B. Acceptable manufacture or equal - Tate Access Floors Concore 2500
- C. Provide suction cup to UAMS Project Planner/Manager (for floor removal from support)

09 72 16 Flexible Vinyl Wall Covering

- A. Apply material behind wall covering to allow quick release during stripping

09 91 13 Exterior Painting

- A. Provide ~~Pittsburg Paint~~ Sherwin-Williams products only
- B. Ferrous Metals apply three coats:
 - i. 1st coat: Rust primer
 - ii. 2nd and 3rd coats Exterior alkyd semi-gloss paint

- C. Galvanized Metal apply three coats:
 - a. Pretreatment: Chemical wash
 - b. 1st coat: Galvanized iron primer
 - c. 2nd and 3rd coats: Exterior alkyd semi-gloss paint
- A. Structural Steel – Semi Gloss Finish
 - 1. 1st Coat: acrylic primer
 - 2. 2nd Coat and 3rd Coat acrylic urethane

09 91 23 Interior Painting

- A. Provide ~~Pittsburg Paint~~ Sherwin-Williams products only
- B. Provide minimum 2 finish coats per the following:

LOCATION	TYPE	FINISH
Walls	For Acute Care, high impact or moist areas: Epoxy	Eggshell Semi-gloss
	Other: Water based acrylic latex	Eggshell
Door Frames	Water based acrylic latex	Semi-Gloss Direct to Metal (DTM)
Ceilings	Water based acrylic latex	Flat
Wood Finishes	-	Stained with polyurethane varnish, or Satin alkyd enamel

END OF DIVISION 09

DIVISION 10 – SPECIALTIES

10 14 00 Signage

- A. Interior room signage will be Owner Furnished, Owner Installed
- B. Provide directional signs as directed by UAMS
- C. Room numbers and names determined by UAMS
- D. Signage manufacturer, font, type and style must be UAMS approved; Adhere to [UAMS logo guidelines](#)

10 14 16 Plaques

- A. All new buildings shall have a building plaque placed in a public area
- B. Plaques shall be cast bronze with a dark background; letters and logo shall be highlighted in bronze and sealed
- C. Mounting – tamper proof manual system

10 14 23 Panel Signage

- A. All exterior signs shall meet UAMS Creative Service Standards
- B. Illuminated signs shall be LED

10 21 23 Cubicle Track and Hardware

- A. Curtain track shall be Formatrac Bendable Track by InPro, or equal, with external hooks

10 26 00 Wall and Door Protection

- A. Acute and Ambulatory Care:
 - 1. Areas subject to impact shall have impact resistant gypsum board to 4' above finish floor
 - 1. In high traffic public areas: Provide wall and corner guards/rails that are PBT/PVC free plastic with non-corrosive mounting metal
 - 2. In staff and work area: Provide wall and corner guards that are stainless steel
 - 3. Acceptable manufacturers or equal : Acrovyn HR-4C (plastic) or Pawling BR-500 (plastic), Acrovyn ECR-32S (stainless steel)
- B. Business Occupancies

1. In public spaces: Provide full height corner guards that are PBT/PVC free plastic with non-corrosive mounting metal
2. In Office areas: Provide corner guards that are wood or PBT/PVC free plastic
3. Acceptable manufacturers or equal: Acrovyn

10 28 00 Toilet, Bath, and Laundry Accessories

A. Partitions

1. Partitions shall be solid plastic, high density polymer resin (HDPE), minimum $\frac{3}{4}$ " thick, overhead braced and anchored at wall and floor
 - a. Install in restrooms with two or more water closets or urinals
2. Partitions at urinals shall be wall mounted between urinals to provide privacy

B. Accessories

1. Mirrors
 - a. Restrooms with 1 (one) mirror - flat mirror
 - b. Restrooms with 2 (two) or more mirrors - 1 (one) ADA mirror, and the remaining mirrors shall be flat
2. Design for baby changing stations in public restrooms, Men's and Women's
3. Provide coat hook on inside of each toilet partition stall door
4. Provide blocking for all specialty items

10 44 13 Fire Extinguisher Cabinets

- A. All fire extinguishers shall be installed in a semi-recessed cabinet
- B. Fire extinguisher cabinets shall be sized for appropriate fire extinguisher

10 51 00 Lockers

- A. Standard lockers shall be metal, wood units may be used when approved by UAMS
- B. All lockers should be secured to the walls
 1. Provide attachments for padlocks

10 81 13 Bird Control Devices

A. Bird roosting deterrent measures shall be used for elevated horizontal exterior surfaces.

END OF DIVISION 10

DIVISION 11 – EQUIPMENT

11 12 00 Parking Control Equipment

- A. Equipment and devices must be fully compatible and programmable with EFMS and must be approved by UAMS Parking Operations for use.
- B. Provide separate 1-inch (minimum) conduits for electrical power and telecom/data connections between parking equipment items
- C. All cabling must be Cat 5e
- D. Provide surge and lightning suppression system for all electrical and communication lines for parking equipment
- E. Uninterruptable Power Supply (UPS) on all revenue equipment
- F. Install heavy-duty pipe bollards to protect surface mounted equipment and paint to match bollards campus wide
- G. Vehicle Sensor Loops must be installed according to manufacture requirements
- H. Cameras must be installed on all revenue equipment. Two positions are required:
 - a. Directly on credit card readers
 - b. Directly at license plate of vehicle in lane

11 13 13 Loading Dock Bumpers

- A. L-shape non-corrosive unit 18" x 18" x 4" thick. Heavy molded rubber compound reinforced with nylon, rayon, or tyrex cord. Space as necessary to protect the dock from damage.
- B. Acceptable manufacturers Pawling, Kelley, Durable Corp, Chalfant, McGuire

11 52 00 Audio-Visual Equipment

- A. Audio Visual Equipment will be Owner Furnished, Owner Installed
- B. Blocking, raceways with string pull and trim shall be Contractor Furnished, Contractor Installed

END OF DIVISION 11

DIVISION 12 – FURNISHINGS

12 20 00 Window Treatments

- A. Window treatments shall be selected based on exposure and room function
 - 1. Acceptable manufacture: MechoShade Systems, or approved alternate
 - 2. Window treatments that are prohibited: Vertical blinds and spring roller shades

12 35 53 Laboratory Casework

- A. At a minimum casework shall have the following features:
 - 1. Doors with glass inserts shall have removable 6mm laminated safety glass
 - 2. Drawers shall be full extension and interchangeable without the need for special tools
 - 3. Provide 2 keys for each lab; allow locks to be keyed differently

12 36 23 Plastic-Laminate-Clad Countertops

- A. Plastic laminate countertops are prohibited on horizontal wet surfaces

12 36 53 Laboratory Countertops

- C. Countertops shall be either:
 - 1. Solid surface with continuous backsplash and sides permanently sealed
 - 2. 316 stainless steel with a continuous backsplash and sides with welded seams

12 36 61 Solid Surfacing Countertops

- A. Solid surface tops shall be used in all wet areas
- B. Provide continuous back/side splashes; back/side splashes shall be sealed in epoxy to the countertop if not continuous
- C. Porous counter tops (natural materials such as granite) must be approved on a project basis

12 48 13 Entrance Floor Mats and Frames

- A. Provide recessed entry mat at entry vestibules

- B. Support shall be aluminum framed with “U” channels, locking bars, I beam supports, leg supports.
- C. Acceptable manufacturers: Balco

END OF DIVISION 12

DIVISION 13 – SPECIAL CONSTRUCTION

13 21 26 Cold Storage Rooms

- A. Cold storage rooms shall:
 - i. Have accessible evaporators
 - ii. All evaporators shall be coated with a rust inhibitor
- B. Control panel:
 - 1. Recording dial thermometers
 - 2. Alarms shall be wired to UAMS Campus Operations Call Center
 - 3. Locate at door of each room

13 49 00 Radiation Protection

- A. Lead Sheet
 - 1. UAMS will provide a physicist's report for requirements. The shielding report signed by the physicist-of-record shall show a layout of the room and the calculations in determining the shielding
 - 2. Provide lead lining, leaded glass and lead blocks to meet design requirements
 - a. Verify the weight of lead products do not exceed the structural capacity of the building
 - 3. Exhaust of radioactive materials:
 - a. Provide alarms wired to UAMS' *Central Control Center* to monitor radioactive fallout in the ductwork
- B. Integrated RFI/EMI Shielding Assemblies
 - 1. Shall be Contractor Furnished, Contractor Installed

END OF DIVISION 13

DIVISION 14 – CONVEYING EQUIPMENT

14 20 00 Elevators

- A. Consultants shall coordinate all elevator requirements with the elevator inspector prior to final submission to UAMS and obtain approval of elevator from the elevator inspector.
- B. The elevator control system shall:
 - 1. Any specialized service equipment needs to be provided with the project.
 - 2. The system shall be serviceable and maintainable by a trained elevator mechanic of the Owner's choice.
 - 3. All providers must be Schindler, Otis, Thyssen Krupp or equivalent.
 - 4. The original equipment manufacturer shall guarantee to sell and deliver, on a timely basis, proprietary component repair services, replacement and stock parts, and software updates to the Owner and/or to a third-party elevator maintenance company of the Owner's choice at a fair market price and provide same with whatever technical notices or bulletins as would be provided to the OEM organization in order to keep the equipment current.
 - 5. Technical and engineering support and assistance for control adjustment, maintenance or troubleshooting shall be provided by the original equipment manufacturer to any maintaining contractor designated by the Owner.
 - 6. Elevators must be able to support security and surveillance needs.
 - 7. Must provide minimum 3 year warranty.

14 92 00 Pneumatic Tube Systems

- A. Any material handling system must be fully compatible with existing Swisslog pneumatic tube delivery system at UAMS. Suppliers shall certify in writing their full compliance with all features and meet the reliability of the existing Swisslog Translogic system
- B. Provide sound attenuation when transport tubes and equipment are located over occupied space

END OF DIVISION 14

DIVISION 21 – FIRE SUPPRESSION

21 00 01 Owner General Requirements and Design Intent

- A. Provide concealed/flush sprinkler heads in occupied areas with drop-in ceiling
- B. Coordinate with fire department connections with Authority Having Jurisdiction and UAMS
- C. Dry sprinkler heads are required in all non-heated rooms and major electrical/data rooms
- D. Provide thrust resistance on all sprinkler systems per FM Global.

21 05 53 Identification for Fire-Suppression Piping and Equipment

- A. Identify Fire Suppression systems in accordance with UAMS Equipment Schedule and room numbers
- B. Indicate valve location with tags on the valves
- C. Indicate valve number on the drawings

END OF DIVISION 21

DIVISION 22 – PLUMBING

22 00 01 Owner General Requirements and Design Intent

- A. Refer to appendix F for tagging requirements.
- B. Provide label to identify piping contents approximately every 15'
- C. All devices that have the potential of discharging water, such as RPZ, relief valves, etc., shall be piped and drained back to an approved drainage system
- D. All valves shall be accessible
- E. Meter all new water and gas lines in buildings recording the flow and usage. These measurements will be returned to the Building Management system for monitoring
- F. Isolate piping from building where required to prevent transmission of noise and vibration; where piping noise is audible provide acoustical wrap on piping
- G. Sleeve all penetrations through concrete or block with a compatible heavy-duty sleeve that will prevent electrolysis
- H. Zone isolation valves for each plumbing system shall be installed at no less than one per floor and shall not interfere with other zones; means shall be provided to drain the system and the isolated zone
- I. Provide pressure monitor with digital display and connect back to BAS if space has a positive or negative pressure requirement

23 05 29 Hangers and Supports for Plumbing Piping and Equipment

- A. Indoor equipment in mechanical rooms shall be mounted on minimum 4" reinforced concrete pad with chamfered edges
- B. Supports for pipes or equipment shall be fastened to the building structure; supports being attached to other utilities are not acceptable
- C. Piping on roof shall be mounted on pedestal type stands that require no penetrations through the roof; Piping shall be a minimum of 1'-0" above the roof
- D. Exterior equipment shall be supported on galvanized structural steel supports designed by a Registered Arkansas Structural Engineer

22 07 00 Plumbing Insulation

- A. Exterior pipe shall include aluminum jackets around insulation
- B. All heating and cooling piping shall be insulated
- C. Electrical heat trace wiring is not permitted without UAMS approval

- D. In mechanical rooms, all piping shall be insulated with PVC jacket
- E. Roof storm lines shall be externally insulated to prevent condensation
- F. Seal all longitudinal and lateral insulation seams and joints

22 11 00 Facility Water Distribution

- A. All cold and hot water piping within a building:
 - 1. Acute/Ambulatory/research
 - a) Shall be Type “L” hard drawn copper tubing, mechanical press systems are not permitted on heating water.
 - 2. Educational and Business
 - a) “ style plumbing PEX” – low zinc or engineered plastic fittings (EP) – type “B” may be used if approved by UAMS
- B. High points of all water piping and where flow in pipe turns down shall be properly vented to prevent water hammer
- C. Copper piping below grade shall be sleeved with a 4-mil thickness polyethylene sleeve. Hot water lines shall have a red sleeve and cold water lines shall have a blue sleeve

22 11 19 Domestic Water Piping Specialties

- A. Exterior hose bib
 - 1. Exterior hose bibs shall be freeze proof, $\frac{3}{4}$ ” size, with chrome finish brass casting face
 - 2. Provide backflow preventer

22 13 00 Facility Sanitary Sewerage

- A. Waste arms for lavatories and sinks shall be DWV copper with cast brass adaptors and wrought copper fittings.
- B. Above grade all interior sanitary sewer, vent, and storm drain piping shall be:
 - 1. Standard weight cast iron soil pipe and no-hub fittings

- C. Below grade sanitary sewer, vent, and storm piping shall be:
 - 1. Standard weight cast iron soil pipe with hub and spigot fittings
 - a. Hub gaskets shall be equal to Tyler Pipes "Ty-seal"
- D. Equip mechanical rooms with adequate floor drains; use a minimum of 1 in 500 sf in areas requiring a floor drain
- E. Do not install drains or cleanouts in "clean/sterile areas".
- F. Install water sensors at appropriate low points of floor and connect back to the Control Center in all mechanical rooms over occupied spaces with a water source to notify UAMS of overflowing drains
- G. Elevator drainage drum is to have an alarm tied back to the Control Center through the BAS system to notify Control when the tank is about full and the line shall have a shut off valve to stop flow while the drum is being replaced. A minimum of two drums are required, one in service and one spare while the tank is properly being disposed; Provide a curb to contain the spill if the drum fails as required by EPA

22 14 00 Facility Storm Drainage

- A. Acceptable manufacturers for floor and roof drains should be equal to Wade, Kohler, and Zurn.

22 14 29 Sump Pumps

- A. Elevator sump pump shall:
 - 1. Be submersible
 - 2. Have the following items constructed of stainless steel: suction, discharge, intermediate chambers, impeller and terminal box cover
 - 3. Have high water level detection connected to BAS
 - 1. Program BAS to reduce elevator cab movement to a level above until water level is reduced

22 42 13 Commercial Water Closets and Urinals

- A. Water Closets
 - 1. Fixtures shall be wall mounted with 1.6 gpf
 - 2. Specifications should be equal to American Standard, Kohler, or Eljer
- B. Urinals
 - 1. Specifications equal to American Standard, Kohler, or Eljer

22 42 16 Commercial Lavatories and Sinks

A. Lavatories/Sinks

1. Lavatories incorporated into millwork shall be self-rimming vitreous with 8" faucet centers
2. Specifications equal to American Standard, Kohler, or Eljer

B. Janitor Sinks

1. Service sinks shall be floor models
2. Use separate spigots, hot and cold water supply to be independent
3. Install vacuum breakers on all spigots
4. Install check valves on both water supply lines

22 42 39 Commercial Faucets

- A. Faucets shall be electronic with 5-1/2" spout, splash-proof circuit control module, adjustable sensor screw, LED trouble shooting indicator light, time-out settings unless selected to be manual
- B. Design for hard-wired sensor type infrared; transformers shall be hidden, but accessible. Design to minimize the number of transformers by having multiple sensors on a transformer.
- C. Specifications equal to Delta, Chicago, Kohler, or Eljer

22 42 43 Flushometers

- A. Flush valves shall have an 11-1/2" high inlet rough-in, chrome-plated brass with sensor-operated flush meter for "no hands" operation.
- B. Design for hard-wired sensor type infrared unless noted otherwise by Owner. Transformers shall be hidden, but accessible. Design to minimize the number of transformers by having multiple sensors on a transformer.
 - i. When battery powered sensors are use, UAMS shall dictate battery type
- C. Specification equal to Royal, Sloan or Zurn AquaSense AV

22 45 13 Emergency Plumbing Fixtures

A. Emergency Showers

1. Shower shall be cast aluminum with flange for flush to ceiling mounting, stainless steel spreader, with pull rod for adequate reach complying with ADA

2. Furnish with air horn alarm. Mount alarm on wall adjacent to shower

22 47 19 Water-Station Water Coolers

- A. Electric Water Cooler shall be barrier free
- B. Unit shall have a limited five-year warranty on the sealed refrigeration system and component parts
- C. Specifications equal to Elkay, Oasis, and Halsey Taylor

22 63 00 Gas Systems for Laboratory and Healthcare Facilities

- A. Alarm panel locations will be established by Owner

22 67 13 Deionized-Water Piping

- A. All supply and return piping shall be equal to Orion Scheduled 80 Whiteline pipe.
- B. Fittings shall be Schedule 80 PVDF mechanical joint with electrometric face seal, PVDF snap ring and nut
- C. All fixtures shall have one gate valve per line at each fixture

END OF DIVISION 22

DIVISION 23 – HEATING, VENTILATING AND AIR-CONDITIONING (HVAC)

23 00 01 Owner General Requirements and Design Intent

- A. All valves shall be accessible and tagged according to Appendix F.
- B. All piping exposed to the weather shall be heat traced to maintain water temperature at 40 deg F minimum.
- C. All devices that have potential to dump water (i.e. RPZ, relief valves, etc.) must be piped and drained back to an approved drainage system
- D. If new construction reduces the Central Plant's chilled water, tower water, and steam loops capacity below 80% of capacity the project shall provide additional Central Plant equipment to maintain capacity.
 - 1. New building shall be connected to the loop as directed by UAMS
- E. Acute care/Ambulatory Care Rooms requiring a positive or negative pressure relationships shall have a digital manometer.
- F. Research: Rooms requiring a positive or negative pressure relationships shall have a digital manometer placed above the door
- G. Zone isolation valves for each plumbing system shall be installed at no less than one per floor and shall not interfere with other zones; means shall be provided to drain the system
- H. Temperature pressure monitoring shall be connected to the UAMS Campus Operations Call Center. Monitor the following:
 - 1. Steam flow and temperature
 - 2. Condensate return temperature
 - 3. Chilled water flow, supply and return temperature
- A. All equipment in the air distribution system shall be easily accessible for repairs or replacement without the need for removal of other utilities and to be located to minimize disruptions to a space and not over any equipment, transformers, panels, or telephone gear.
- B. All ductwork shall meet SMACNA standards.
- C. Steam should not be used for heating system or domestic hot water.
- D. Concrete floors for mechanical and hazardous storage rooms shall have a concrete curb minimum 4" tall. Should move to mechanical
 - i. Provide ramps on each side of curb for transportation of materials and equipment over the curb

23 01 30 Operation and Maintenance of HVAC Air Distribution

- A. Air intakes shall not be accessible to the general public, locate minimum two floors up
- B. Locate exhaust on roof
- C. Return air plenums are prohibited

23 05 23 General-Duty Valves for HVAC Piping

- A. All equipment shall have one shut off valve per line
- B. Provide isolation valves in heating water piping at each group of air terminals
- C. All two-way valves less than 1" on reheat coils shall have stainless stem and seats
- D. Design 2-way valves for all chilled water coils. No 3-way valves shall be used, unless it is at the end of a run
- E. Valves above 1" shall be pneumatically actuated with electronic controls
- F. All two-way valves less than 1" on reheat coils shall have stainless stem and seats on with VFD on the hot water pumps
- G. Design 2-way valves for all chilled water coils. No 3-way valves are to be used unless located at end of a run

23 05 29 Hangers and Supports for HVAC Piping and Equipment

- A. Provide hangers and supports as required per section 22 05 29.

23 07 00 HVAC Insulation

- A. Ductwork, grills, drip pans, louver blanks shall be externally insulated

23 09 00 Instrumentation and Control of HVAC

- A. Control systems shall be Siemens Insight Building Automation System
- B. All equipment and software shall be the most recent technology released by the manufacturer; Control manufacturers shall be Siemens
- C. Number of VAV boxes shall not serve more than 3 rooms unless approved by Owner. Provide reheats on all VAV excluding electrical and telecom.
- D. Control points and monitor points for all systems shall be coordinated with UAMS
- E. Direct Digital Control (DDC) panels shall be rated for a mechanical room environment

F. Panels shall have a minimum of 20% spare point capacity

G. Controller shall:

1. Provide a minimum of two communication ports
2. Continuously perform self-diagnostics for its communication system and components
3. Provide local and remote annunciation of any detected failures
4. Have battery backup for a minimum of 72 hours

23 10 00 Facility Fuel Systems

A. Tanks

1. Day tanks shall to be sized for a minimum of 24 hours run time

23 21 13 Hydronic Piping

A. Chilled Water Supply, Chilled Water Return, Heating Water Supply, and Heating Water Return piping:

1. Piping 3 inches or less shall be Type "L" hard drawn copper tubing
2. Piping 4 inches or more shall be Schedule 40 black steel

B. All VAV hot water coils shall have flushing capabilities

C. Fan coils shall not be utilized unless discussed with Owner

23 21 23 Hydronic Pumps

A. All pumps above 1 hp shall be vertically mounted direct coupled

B. All pumps above 25 hp shall have insulated boxes surrounding but not contacting the pump

C. Sound attenuation shall be provided where operations dictate

23 22 00 Steam and Condensate Piping and Pump

A. Equipment shall be designed to use low pressure steam

23 33 13 Dampers

A. Motorized smoke/fire dampers shall have:

1. Location and position status monitored by the BAS (whether open/close)
 2. Direct coupling actuator
 3. Two position actuator: 15 second run time and 15 second spring return.
 4. Metal housing with position indicators and auxiliary switches.
 5. Manual switch to allow service technician to disconnect hot lead to the motor for repair
 6. Reset accessible
- B. When remodeling an existing building, verify existing fire dampers are serviceable and report inaccessible ones UAMS Project Coordinator; when walls are declassified remove fire and/or smoke dampers within them
- C. Each branch shall have dampers as close to the main duct as possible

23 31 00 HVAC Ducts and Casings

- A. Externally insulate supply ductwork
- i. Replace all existing internally insulated ductwork
- B. Each branch shall have accessible extruded aluminum balancing dampers
- C. Flex duct is prohibited through any walls, ceilings or floors
- D. Duct exhausting for labs or high moisture areas shall be welded stainless steel

23 34 00 HVAC Fans

- A. Fans shall be direct drive
- B. Variable pitched drives shall be sized for 150% of motor horsepower capabilities
- C. Furnish units with weather tight roof and end panels to protect motor, shaft, bearings, and drives from the elements
- D. Motor horsepower (HP):
1. One-quarter HP and larger: shall be continuous duty, permanently lubricated, open drip proof type with thermal overload protection
 2. Less than one-quarter HP: shall be shade pole type
 3. 1-1/2 HP and larger: shall have full load efficiencies not less than the values scheduled by the engineer-of-record
- E. Motor bearings shall be double sealed type with 200,000 hour's average bearing life (L-50)

- F. Unit shall have re-lubricatable oversized pillow block ball bearings resiliently mounted in neoprene rings
- G. Design for 10% extra capacity for air flow and static pressure.
- H. Blowers shall be provided with a coating in the air stream to prevent corrosion

23 36 00 Air Terminal Units

- A. Heating water coils shall be attached to terminal outlet; coils shall be a minimum of two row

23 74 00 Packaged Outdoor HVAC Equipment

- A. Units shall be furnished with:

1. UV lights shall be installed inside units at pans and coils.
2. Double wall insulated casing
3. Fan wall type system
4. Access shall be equipped with 12" by 12" view ports with wire glass
5. Coil casings shall be constructed of continuous galvanized steel
6. Install magnahelic gauges on unit across filters and coils
7. Air filters racks shall be generic to accept any manufacturer filters
8. Name plates shall be engraved non-corrosive metal with performance information

- B. Specification equal to McQuay, York, Carrier, and Trane.

- C. Heat Recovery Unit shall have

1. Enthalpy recovery wheel
2. Pre-filters

- D. Variable Frequency Drives:

1. Shall be installed with bypass
2. Interlock in ATC to open VAV terminal units when placed in bypass
3. Variable Frequency Drives (VFDs) shall be kept in a conditioned environment not to exceed 85 deg F

4. Use for exhaust and return fans on motors greater than 1 HP; design for 10% extra capacity if on VFDs

END OF DIVISION 23

DIVISION 26 – ELECTRICAL

26 00 01 Owner General Requirements and Design Intent

- A. LED lighting and lighting controls shall be Siemens Insight Building Automation System
- B. All electrical panels, safety switches, switchgear and transformers shall be Square D, or equal
- C. Post One-Line & Riser Diagrams (in frame) visibly in the main electrical room in the building near the main switchgear
- D. Any work done on new and existing electrical equipment, panel boards or switchboards shall have an Arc Flash Study performed on that equipment and labeled as such after the study is completed
- E. Refer to Appendix F for tagging requirements
- F. Each branch circuit serving receptacles in office environments (data or electronic equipment) shall contain a dedicated neutral. Neutral sharing will not be allowed for any circuits

26 05 33 Raceway and Boxes for Electrical Systems

- A. All electrical wire shall be soft drawn copper
- B. Conductors #8 and larger shall be stranded
- C. Minimum conductor size shall be #12 AWG
- D. Use stranded conductors for control circuits 24V and below
 - 1. Minimum size shall be #16 AWG
- E. Label all Neutrals to the circuit that it serves
- F. When neutral conductors are required for the final connection and operation of kitchen equipment, the smallest allowable size shall be 10 AWG.
- G. Conduits above grade shall be:
 - 1. All conduit bends 1-1/4" or larger shall be factory made 90s
 - 2. Conduits shall be concealed except in electrical and mechanical rooms
 - 3. Liquid-tight flexible non-metallic conduit when subject to moist or corrosive conditions or serving a motor connection
 - 4. Healthcare:

- a. Galvanized rigid metal conduit or metallic tube shall be used for all primary runs, except at equipment connections or special conditions
- b. Hospital grade metal clad flexible conduit (MC Cable) may be used for secondary runs and equipment connections
- c. ½" conduit shall not be used

5. Ambulatory:

- a. Metal Clad flexible conduit (MC Cable) may be used

6. Business:

- a. Metal Clad flexible conduit (MC Cable) may be used
- b. PVC shall not be used.

- 7. Provide flexible conduit for light fixtures and motor connections (6' maximum length)
- 8. Motor connections shall be Stranded wire
- 9. All fire alarm wiring shall be in conduit with the junction boxes painted red.

H. Corridor receptacles shall be on dedicated circuits from adjacent area

I. All wiring shall be color coded by phase and voltage level

- 1. Conductors less than #6 shall have colored insulation
- 2. Conductor's number six and larger may color code by tape; Colors shall be as follows:

Phase	120/208	277/480
A	Black	Brown
B	Red	Orange
C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green

J. Use full size neutral and neutral conductors in all building

K. ½" conduit is not acceptable; Conduit size on campus is limited to ¾", 1", 1-1/2", 2", 2-1/2", 3", 4", 5"

L. The largest wire size to use on campus is 500 KCM

M. EMT conduit shall be:

- 1. Blue colored in communication circuits of 24V or less
- 2. Red colored in all Fire Alarm/Signal installations
- 3. Purple colored in all Emergency circuit installations

- N. Use full size neutral and neutral conductors
- O. For data or electronic equipment areas, use one size larger than carrying conductors
- P. For ambulatory/acute care areas:
 - 1. All wire installed on the load side of Isolated Ground Panels (Operating Rooms) shall be type "XHHW" or "XLP"
 - 2. Use of pulling compound on conductors is prohibited
- Q. Provide pull strings in empty systems conduits
- R. Plastic or insulated throat box connector shall be provided for all open conduit end
- S. Installation of electrical conduit
 - 1. May be run horizontally in walls
 - 2. Horizontal runs installed over other equipment shall be installed close to structure above
 - 3. Vertical runs shall be installed close to adjacent wall
 - 4. In all cases installation shall avoid conflicts with mechanical ductwork, piping and cable trays

26 05 53 Identification for Electrical Systems

- A. Provide operational identification and warnings to ensure safe and efficient operation and maintenance of electrical systems/equipment and electrically connected mechanical systems
- B. Provide plasticized tags with clearly written messages adequate for its intended purpose
- C. In addition to danger signs required by governing regulations and authorities, install appropriate danger signs at locations subsequently identified as constituting similar dangers for persons in or about project including:
 - 1. High Voltage (600V and higher)
 - 2. Critical Switches / Control devices
 - 3. Panel boards or switchboards electrical shock hazard (Available Arc Fault)
- D. Signs:
 - 1. Install engraved plastic-laminated sign for major unit of equipment, including but not limited to panel boards, electrical cabinets and enclosures, switchgear, power transfer equipment, transformers, starters, disconnects, junction boxes larger than 8" x 8", circuit breaker enclosures, power generating units
 - 2. Provide double line of text 3/8" high on 1-1/2" high sign, white lettering in black for circuits
 - 3. For equipment on emergency power, signs shall be red with white letters
 - 4. Signs shall contain at a minimum:

- a. Type of system
- b. Equipment number assigned by UAMS
- c. Voltage, amperage, circuit fed from or to
- d. Manufacturing date and serial number (all equipment, gear, and major switches)

E. Receptacle covers

1. Label on the front identifying the panel and circuit
2. Non-emergency: Cover color shall be selected by UAMS; Labels shall be clear, white or beige with black lettering
3. Emergency: Covers shall be red; Labels shall be clear, white or beige with black lettering

F. Panel boards, electrical cabinets, MDPs, automatic transfer switches, switchgear shall have electrical gear's voltage, amperage and branch (life safety, critical, or equipment) stated on it

1. Non-emergency 120/208V: Shall be labeled with Black Background with White lettering
2. Non-emergency 277/480V: Shall be labeled with Brown Background with White lettering
3. Emergency 120/208, & 277/480V: Shall be labeled with Red Background with White lettering

26 12 00 Transformers

- A. Substation transformers shall be cast resin type, primary and secondary
- B. Wall or ceiling mounted transformers are not acceptable
- C. K-rated transformers shall be used in data or electronic equipment areas
- D. Load shall be less than 80% of the transformers rating
- E. Acceptable Manufacturers: Square D, or equal

26 24 13 Switchboards

- A. Switchboards shall be rated with a minimum 600 VAC
- B. Enclosures shall have:
 1. General-purpose type 1 d rear
 2. Dead front construction with removable steel channels (1.5 inch floor sills) bolted to the frame

3. Open bottom and individually removable top plate for installation and termination of conduit
 4. Plated copper bus bars
 5. 4-wire systems, the neutral shall be of equivalent ampacity as the phase bus bar. Tapered bus is not acceptable
 6. Bussing shall include all necessary hardware to accommodate splicing for future additions
- C. Circuit breakers shall have:
1. Electronic trip
 2. Time/current response adjustments: Each adjustment shall have discrete settings (fully adjustable) and shall be independent of all other adjustments
 3. Microprocessor-based true rms sensing designed with sensing accuracy through the thirteenth harmonic.
 4. Local visual trip indication for overload, short circuit and ground fault occurrences
 5. Long Time Pickup indication to single when loading approaches or exceeds the adjustable ampere rating of the circuit breaker shall be provided
 6. Zone selective interlocking (ZSI) communications capabilities on the short-time and ground fault functions
- D. Switchboard/Switchgear metering shall be:
1. Similar to Square D type CM 2450 Digital Monitor with 0.2% accuracy with the following features: A, V, kW, kVAR, kVA, PF, F, THD, K-Factor, kWh, kVARd, kVAd, kVARh, kVAh, KYZ output, RS-485 communication port, kWd, kVARd, kVAd, date/time stamping, predicted power demand, onboard alarms, min/max readings, data log, event log, extend memory (100k), wave form capture, disturbance monitoring and programmable logic
 2. Capable of communicating with Modbus or BACnet
- E. Supplied with TVSS system for surge protection
- F. Fused switches below 600 volts are not allowed
- G. Acceptable manufacturers: Square D, or equal

26 24 16 Panelboards

- A. Power Distribution, lighting and appliance panel boards shall be/have:
- a. Dead-front safety type
 - b. Copper bus bars

- c. Bare uninsulated grounding bar bolted to enclosures
 - d. Enclosure fabricated by same manufacturer
 - e. Connect main feed at top of panel
- B. Sub-feed breakers are not allowed to feed additional panelboards
 - C. When multiple-pole breakers are required, provide with internal common trip so overload on one pole will trip all poles simultaneously
 - D. Provide a bare uninsulated grounding bar bolted to enclosures
 - E. The branch circuit breaker sub-assembly shall be in continuous contact and bolted to the panel enclosure back box; subassemblies mounted on “Z” brackets are not allowed. The circuit breaker sub-assembly shall utilize thermo-plastic mounting straps to properly align breakers
 - F. Construct with multiple knockouts and wiring gutters. Provide fronts with adjustable indicating trim clamps, and doors with flush locks and keys, all panelboard enclosures keyed alike, with concealed door hinges and door swings allowing full access
 - G. New panel fill by breaker count and amp capacity shall not exceed 75% each of total
 - H. Acceptable Manufacturers: Square D, or equal

26 24 19 Motor-Control Centers

- A. Shall not be used

26 27 26 Wiring Devices

- A. “Plug & play” devices (Pass & Seymour PT Series Devices or equal) are allowed in acute patient areas
- B. Receptacles in child and adolescent areas shall be tamper proof
- C. For clinical areas:
 - 1. Receptacles shall be hospital grade, 2-pole, 3-wire grounding
 - 2. Emergency Receptacles shall be:
 - a. Hospital grade, 2-pole, 3-wire grounding
- D. For non-clinical areas:
 - 1. Commercial grade, 2- pole, 3- wire grounding
- E. Switches shall be commercial grade quiet toggle for the application to be used.

26 41 00 Lightning Protection System

- A. All buildings shall have lightening protection.

26 51 00 Interior Lighting

- A. All fixtures shall be LED
- B. Conference/Presentation rooms shall be designed for dimmable fixtures
- C. Battery operated light ballast are not allowed in buildings with emergency power.

26 53 00 Exit Signs

- A. Exit signs shall match existing buildings

26 56 00 Exterior Lighting

- A. All fixtures shall be LED
 - a. Lights shall be controlled by both photocell and Siemens Insight Building Automation System
 - b. No "in ground" lighting
- B. The following Luminaire shall be met when designing exterior lights:

LOCATION	DESIRED	MINIMUM
Inside Parking Decks	5.0	2.0
Lots	1.0	0.4
Bus Shuttle Locations	4.0	2.0
Main Entrances	5.0	1.0
Other Entrances	1.0	0.2
Sidewalks	1.0	0.2
Local Roadways	1.0	0.2

END OF DIVISION 26

DIVISION 27 – COMMUNICATIONS

27 00 01 Owner General Requirements and Design Intent

- A. All installers must be BICSI certified.
- B. Low voltage cables shall be plenum rated.
- C. Contractor provide and install rough-in for a standard UAMS phone/data outlet (consists of a 4” square junction box with a single gang mud ring), conduit with protective bushing on ends, pull string, cable tray, etc. Wire pulls, jack faceplates, patch panels, racks and terminations are by Owner
- D. All Tele/Data jacks are to be Siemon products and therefore all contractor rough-in requirements should provide openings for installation of UAMS” Standard Siemon product use
- E. Television locations shall be provided with separate power and communications rough in.
- F. Tele/data rooms shall be centrally located on each floor and stacked between floors.

27 05 28 Pathways for Communication Systems

- A. Install cable trays above all racks at a min Height of 90” AFF
- B. Cable trays shall be ladder type with rungs 12” apart equal to Cooper B-line 166P12-18-144 & 16P-18-HT12
- C. Contractor shall Ground & Bond Cable tray and UAMS installed Data Racks
- D. Maximum of 4 feet between J-Hooks, Min width of J-Hooks to be 1”wide for flat portion of hook, Sizing & quantity of hooks, cable trays and sleeves to accommodate 200% of initial calculated cable requirements with a max of 100 Cat 6 cables per row of 4” j-Hooks
- E. Cables
 - 1. All cables shall be Category UTP. Category 6 Model 77-240-7B from Superior Essex
 - 2. For Patient Observation Video System: Category 6 Model 77-240-7B from Superior Essex
- F. Conduit
 - 1. Provide minimum 1” diameter conduit with pull string
 - 2. Conduit, connectors and whips shall be sized to accommodate the number of wires the area could receive with 60% free space; confirm sizing with UAMS Technology Support Services
 - 3. Provide protective bushings at conduit ends with open end within 2 feet of cable tray or hooks

- G. Contractor to provide and install conduit for all tele-data cabling in mechanical rooms
- H. Rough-In for Wireless LAN AP's shall include a suitable Cable path from cable tray to proposed Wireless AP locations via ¾" conduit or cable hooks to within 2 feet of Wireless AP locations. Solid ceiling areas are required to have 4 square box and single gang mud ring. Wireless AP locations and number of cables shall be determined by UAMS Network Engineering

27 11 00 Communications Equipment Room Fittings

- A. Provide 19" x 84" data racks for each floor and patch panels for both LAN & Telephone needs with vertical and horizontal wire management to be determined by UAMS Technology Support Services
- B. Contractor shall Ground & Bond UAMS installed Data Racks and bus bar
- C. Provide ¾" fire retardant plywood backboard or standard ¾" plywood with fire retardant paint. Installed at 20" AFF (just above power outlet height) to 116" AFF on all walls, circumference the room
- D. Provide emergency and normal power quad outlets on every wall and 8" AFF at each rack location
- E. Provide 4'-0" minimum clearance on three sides of every rack

27 30 00 Voice Communications

- A. Contractor shall install and provide exterior emergency telephones and their associated conduit and blue light on pole for all new parking lots. Equipment to be approved by UAMS Unified Communications.

27 51 16 Public Address and Mass Notification Systems

- A. Contractor shall provide ¾" conduit from a min of 2 feet of Cable Tray or J Hook route in accessible ceiling to within 6" to 18" of solid ceiling opening for speaker location. Contractor to provide 10" diameter cut in opening with minimum of 13" clearance in all directions from center.

27 52 23 Nurse Call/Code Blue System

- A. Install WEST Com nurse call system in all areas as required by Arkansas Department of Health Regulations. These are sole source items to match existing. Vendor must consult with Clinical Engineering to determine which Rauland-Borg model is applicable (Clinical Engineering)

27 53 13 Clock Systems

- A. Design for a central clock control system in all educational facilities for each classroom

END OF DIVISION 27

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

28 00 01 Owner General Requirements and Design Intent

- A. For the safety and security of UAMS personnel and property, all building shall have security equipment installed.
- B. Areas involving cash transactions/storage, patient files, medical/drug storage, infants, and research shall have access control and video surveillance.
- C. All cash transaction/storage areas shall have panic/robbery alarms.
- D. All high-risk areas (determined by UAMS Technical Security) shall have access control, video surveillance, and panic alarms.
- E. All systems shall be on Emergency Power. High-risk areas (determined by UAMS Technical Security) shall have battery backup.

28 05 13 Conductors and Cables for Electronic Safety and Security

- A. All cable for security systems shall be plenum rated
- B. Composite cable for access control doors shall be BELDEN B658AFS or equivalent.
- C. Individual cable for door status, motion detection, pushbuttons shall be 22awg stranded shielded twisted pair. Belden 6500FC or equivalent.
- D. Individual cable for card readers shall be 3 pair 22awg stranded shielded twisted pair. BELDEN 5504FE or equivalent.
- E. Individual cable to electric locking devices shall be a minimum of 18awg stranded twisted pair. BELDEN 6300FE (or equivalent) or BELDEN 6302FE (or equivalent). (or as required by the device)
- F. Networking cable shall be equivalent to Superior Essex 77-240-7B (Purple jacket).
- G. Unless authorized, all network cable and connections between security equipment shall be provided and installed by UAMS TSS Department.

28 10 00 Electronic Access Control and Intrusion Detection

All buildings (including Research) common entry/exit exterior doors shall be secured card access doors with closure. All interior doors (except Research) shall have Best hardware with passage or locksets depending on usage.

Elevator machine rooms, electrical rooms, mechanical rooms, and tele/data rooms shall be equipped with Best lockset storeroom function with closure.

- A. Door Controllers and Power Supplies.
 - 1. Equipment shall be located in a secure environment (Telecom/Data Room).
 - 2. Equipment cabinets must have key locks.
 - 3. Power supplies must meet requirements of Item E in Section 28 13 00.
 - 4. Door Lock power supply shall have a power distribution board containing individual circuit breakers for each point.
 - 5. Provide dedicated 20A dedicated emergency circuit
- B. Door controllers shall be SoftwareHouse iSTAR controllers.
- C. All inputs on the door controller must be wired with supervision resistors in accordance with the equipment manufacturer.
- D. Door status devices shall be supervised normally-closed contacts. Request-to-exit devices shall be supervised normally-open contacts.
- E. Locking devices shall be electro-mechanical fail-secure models (electrified panic hardware, electric strikes) EXCEPT for doors that would prohibit free egress to emergency exits. Maglocks may be used if authorized by UAMS Technical Security and will require all other locking hardware removed.
- F. All locking devices shall be 24vdc.
- G. All access control doors shall be equipped with a motion sensor.
- H. Access control doors where a maglock has been authorized, shall have an emergency release button that removes lock power from the maglock for 30 seconds. The pushbutton must state 'Push to Exit'.
- I. Card readers are limited to within 500 feet from the controller. Locking devices are limited to 1000 feet of the controller.
- J. Card readers shall be HID iCLASS SE models operating on 12vdc.
- K. One fire alarm relay shall be located within 3 feet of the door controller. The relay must be wired in accordance with the door controller manufacturer specifications.
- L. Exterior Non-Access Control Doors.
 - 1. Must have a door status sensor monitored by the security system.
 - 2. Ground floor stair access shall be equipped with a door closure and interior panic storeroom function and no exterior entry.
 - 3. Roof access (greater than two floors) doors shall be equipped with a door closure and storeroom function on the interior side and unlocked exterior side.

4. Roof access (less than three floors) doors shall be alarmed through the security system.

M. Exterior Access Control Doors

1. Manually operated doors shall have electronic latching panic hardware with request-to-exit switch and shall be fail-secure locking.
2. Powered Doors (auto-openers) must lock in fail-secure state and must have break-out option. The door operator shall be interfaced to the access control system to allow control of the door functions (determined during planning)
3. Doors shall have a card reader, door status sensor, and a request-to-exit motion sensor or touch bar that connect to the security system.
4. Shall be monitored by a video camera connected to the campus surveillance system.

N. Interior Access Control Doors

1. Interior door access control, surveillance (audio/video), and alarm requirements will be determined by UAMS Technical Security during planning.
2. Nursery areas shall be equipped with card-in/card-out access, video surveillance, and may require interfacing with the Infant protection system.
3. Telecom/Data rooms/closets that house data and/or security equipment shall be card access and monitored by video surveillance.
4. All research interior doors to labs and animal storage areas shall have card access control with closure and video surveillance.

28 23 00 Video Surveillance

- A. Network-based IP storage systems shall be utilized.
- B. Each location having a network recorder must have a properly sized UPS with supervision software to safely power down equipment.
- C. Cameras shall be tamper resistant, high resolution, color, IP communication with POE.
- D. Devices must be compatible with the current video surveillance system and must be approved by UAMS Technical Security for use.
- E. All patient visiting/waiting areas should have video surveillance cameras.

28 31 00 Fire Detection and Alarm

- A. All fire detection alarm system shall be Edwards or Computrols

- B. Provide most current version of software for use by UAMS
- C. A sequence of operation shall be provided with every system.
- D. The system shall include, but not limited to:
 - a. LCD annunciators,
 - b. one-way multi-channel voice communication system,
 - c. color graphic workstation and printer (unless compatible with existing system),
 - d. Discreet system control switch provided for reset, alarm silence, panel silence, drill switch, previous message switch, next message switch, and details switch.
 - e. Discreet system disable switch for speakers, strobes, elevator recall and shunt trip, doors, smoke dampers, atrium purge fans, AHU shutdown, stairwell pressurization fans, security, and a separate switch for all the above at one time.
- E. The control panel(s) shall:
 - a. Be a multi-processor based networked system designed especially for fire and smoke control
 - b. Provide one-way and two-way emergency audio communications
 - c. Allow interactions between any applications to be configured and modified using software provided by a single supplier
 - d. Be addressable points
 - e. Support multiple digital dialers and modems, support multiple communication ports and protocols
 - f. Panels network capable through TCIP addressing
- F. The network control panels shall include all software and ability to download the following features to UAMS:
 - a. All network applications and firmware from the configuration computer from a single location on the computer.
 - b. Electronic addressing of analog/addressable devices.
 - c. Operator interface control/display that shall annunciate, command and control system functions.
 - d. Internal audio signal with different programmable patterns to distinguish between alarms, supervisory, trouble, and monitor conditions.
- G. Systems reports that provide detailed description of the status of the system parameters for corrective action or for preventative maintenance programs. Reports shall be displayed by the operator interface or capable of being printed on a printer. Reports shall be capable to generate smoke sensitivity percentage.
- H. Authorized UAMS operator shall be able to operate to modify system functions like system time, date, passwords, holiday dates, restart the system and clear control panel event history file and perform test functions.
- I. For high rises, a Firefighter Smoke Control Station (FSCS) shall provide a graphic representation of the facility HVAC system and Stairwell Pressurization system. Fan override and control switches and fan/damper status LEDs shall be provided. The following minimum system controls and indicators shall be provided on the FSCS: Power ON, Trouble, and Signal Silenced LEDs; System Reset, Silence, Trouble Silence, and Drill push buttons. It shall be possible to annunciate text messages via LCD display mounted in the FSCS enclosure
- J. Preferred fire alarm system manufacturers shall be Computrols or Edwards with capacity to coordinate with existing systems.

- K. Training and required competencies shall be determined at the beginning of project and shall be observed by observed by the commissioning agent'
 - a. Specific training shall be on-site and be videotaped.
- L. Provide a minimum of 2% extra replacement devices for each type of fire alarm devices.
- M. Include a minimum of 3 keys to access the system.

END OF DIVISION 28

DIVISION 32 – EXTERIOR IMPROVMENTS

32 12 16 Asphalt Paving

- A. Final pavement exhibiting surface defects such as poor texture, roller marks, honeycomb, cracking, rich spots, brown spots, bleeding or waving shall be removed and replaced at no expense to UAMS.
- B. Tolerance is ¼” depression when measured with a 10” straightedge.
- C. Construction minimum standards shall be:
 - 1. 8” compacted subgrade, minimum 95% Standard Proctor density
 - 2. 8” crushed aggregate base course compacted to 100% of maximum dry density
 - 3. Tack coat dispersed at 0.4 gallons per square yard
 - 4. 3” Surface Course minimum density 90% theoretical density

32 13 13 Concrete Paving

- A. Tolerance of finish is 1/4” in 10 feet when measured with a 10” straightedge with no abrupt changes to create a tripping hazard
- B. Sidewalk construction shall be:
 - 1. 6” compacted subgrade, minimum 90% Standard Proctor density
 - 2. 2” crushed aggregate base course
 - 3. 4” concrete with pencil wire reinforcing
 - 4. Broom finish
- C. Concrete pavement shall be:
 - 1. 6” compacted subgrade, minimum 90% Standard Proctor density
 - 2. 6” crushed aggregate base course
 - 3. 6” concrete with pencil wire reinforcing
 - 4. Broom finish
- D. Dumpsters shall be situated on a concrete pad

32 90 00 Planting

- A. Plant material shall be inspected by the UAMS Grounds Landscape Tech or Coordinator prior to installation; UAMS shall approve plant material placement
- B. Plant materials not listed in the approved plant listing must be approved by UAMS.
- C. Landscaping should meet the standards of the American Association of Nurserymen, Inc.
- D. Anti-germination weed control agent shall be applied to finished topsoil in flower and shrub beds
- E. Sod shall be staggered with joints filled with topsoil
- F. Topsoil dressing within tree drip lines shall not exceed 4 inches; No soil is permitted on the root flare of any tree
- G. In areas of unprotected root zones (under drip lines), those areas should be covered with 4 inches of organic mulch to minimize soil compaction
- H. Landscape irrigation shall be placed outside of existing tree drip line
- I. Fencing:
 - i. All trees to be retained shall be protected during construction with temporary fencing prior to the commencement of any site preparation work (clearing, grubbing or grading)
 - ii. Construct fences to completely surround the tree or clusters of trees and locate at the outermost limits of the tree branches (drip line); Maintained throughout the construction project
 - iii. Where any of the above exceptions result in fence being closer than 4 feet to a tree trunk, protect the trunk with strapped-on planking to a height of 8 feet (or to the limits of lower branching)
- J. All grading within protected root zone shall be done by hand or with small equipment to minimize root damage
- K. Any roots exposed by construction activity shall be pruned flush with the soil. Backfill root areas with good quality top soil as soon as possible. If exposed root areas are not backfilled within 2 days, cover with organic material in a manner, which reduces soil temperature and minimizes water loss to evaporation.
- L. Trees most heavily impacted by construction activities should be watered deeply once a week during periods of hot, dry weather. Tree crowns should be sprayed with water periodically to reduce dust accumulation on leaves.
- M. Any trenching required for installation of landscape irrigation shall be placed as far from the existing tree trunks as possible.
- N. All finished pruning shall be done according to the National Arborist Association Pruning Standards for Shade Trees

END DIVISION 32

DIVISION 33 – UTILITIES

33 00 01 Owner General Requirements and Design Intent

- A. All underground piping shall be welded
- B. All underground valves shall be in an accessible vault of adequate size to allow valve replacement
- C. Piping underground shall be buried a minimum of 4 feet on main branches (exception will be sanitary and storm systems which are gravity feed)
- D. All underground piping shall have a means to trace down the pipe after concealment, including tracer wire for plastic pipe and tape identifying the system or “caution, underground line” placed 1 foot below grade above the pipe systems which could disrupt the services of the building, with the exception of sprinkler piping
- E. Provide inspection wells at appropriate spacing and locations
- F. Contractor shall be responsible for utility connection fees and other costs associated with turning on new utilities

33 10 00 Water Utilities

- A. Sanitary and storm sewer systems shall be:
 - 1. Gravity flow, non-pressurized
- B. Sanitary sewer lift stations are not allowed

END OF DIVISION 33

DIVISION 48 – ELECTRICAL POWER GENERATION

48 01 00 Operation and Maintenance for Electrical Power Generation

B. Emergency Service & Distribution

1. Emergency generators shall be designed with minimum 20% extra capacity
2. Automatic transfer switches shall be alarmed through the Siemens Building Automation System. The minimal alarms for the Automatic Transfer Switch shall be:
 - a. Normal Power Available
 - b. Emergency Power Available
 - c. Contactor in Normal Position
 - d. Contactor in Emergency Position
 - e. Test Switch Activated
3. Cummins emergency generators and Automatic Transfer Switches shall be used or equal.

C. Uninterruptible Power Supply

1. For Building Automation Systems provide:
 - a. Install for all critical equipment that cannot tolerate a down time longer than 1 minute in the event of a power failure (regardless of emergency power); consider computer reboot time requirements
 - b. Battery replacement shall not be needed sooner than 4 years; Battery discharge shall be gradient with unit calculation accurate within 2 minutes.
 - c. Provide redundancy with a parallel battery compartment
 - d. UPS remote monitoring capacity shall be able to communicate and coordinate with Siemens Insight Building Automation system
 - e. Emergency shut off button of UPS and HVAC systems shall be protected by a non-locking clear cover so that two steps are required before unit shut down
 - f. UPS shall have a bypass to disengage the UPS and return to emergency power separate from the UPS in event of a change out or system failure

END OF DIVISION 48