



Planning, Design and Construction Guidelines For University of Missouri Health Care Facilities

Revision Date: 11/30/23

This document is supplemental to the UM Consultant Procedures and Design Guidelines. It is not intended to duplicate or conflict with UM standards unless standards are being exceeded.

Foreword

MU Health Care (MUHC) is the health care component of the University of Missouri's Columbia campus. It is a health care delivery system consisting of multiple Columbia-based hospitals and offsite clinics distributed across the regional service area. It includes the following:

- University Hospital (UH)
- Missouri Psychiatric Center (MPC)
- Missouri Orthopedic Institute (MOI)
- Women's Hospital (WH)
- University Physicians Medical Building (UPMB)
- Various Off-Site Facilities/Clinics

MU Healthcare is accredited by the Centers for Medicare and Medicaid Services through DNV–National.

University Hospital, the system's core hospital, was originally constructed in 1956 and is a Level I trauma center primarily serving Missouri residents. An ongoing master facility planning process continues to provide a framework for future growth and development along with reallocation of resources to meet the future health care needs of the community.

These Guidelines reflect requirements that are different for MU Health Care facilities. Any deviations from these standards during planning, design or construction shall be approved by the MUHC PD&C Department and/or UM Facilities Planning and Development (UM Authority Having Jurisdiction) in writing.

Deviations by the Consultant without MUHC approval shall be at the Consultant's risk.

MUHC CSI DIVISION GUIDELINES FOR CONSULTANTS – 2023**Rev. 11/30/23**

This document outlines information that should be used to establish basis of design for MU Health Care Facilities, which frequently differ from the typical campus facilities covered by the UM Consultant Procedure and Design Guideline (CPDG).

The 2022 Guidelines for Design and Construction of Hospitals and Outpatient Facilities (Facility Guidelines Institute, 2022) is referenced as minimum recommendations for the Hospital standards specified in this document. See the [University of Missouri Facilities Planning and Development](#) website for a more complete list of enforced codes and standards.

MPC projects additionally **may** require compliance with the Behavioral Health Design Guide Edition 9.0 dated November 2019 published by Behavioral Health Facility Consulting, LLC. Aspects of the design guides will be applied to projects in areas for MUHC designated *high risk patients*. See criteria and policy contained in MU Health Care – Self Harm Mitigation Program. The MUHC Project Contact can obtain the current version of the Policy via MUHC’s Navex system.

The following Guidelines are organized per CSI MasterFormat Divisions. They reference Products and Materials, but also reference some requirements for Submittals, Quality Assurance and Execution. Per University of Missouri guidelines, project specifications shall follow CSI MasterFormat conventions unless approved otherwise by the Owner’s Representative.

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DIVISION 1 – General Requirements**General**

- A. All domestic water, power, chilled water and steam is provided from MU's utility (CF Energy Management) for UH, MOI, MUPC, and UPMB facilities. All other facilities are supplied through municipal providers.
- B. Project design and material selection shall follow best practices and life cycle cost value per UM Consultant Procedures and Design Guidelines (CPDG).
- C. Design decisions that don't meet these or University of Missouri – Facilities Planning and Development (UM FPD) guidelines shall be reviewed, evaluated for impact to the total project and approved in writing by Owner's Representative and MUHC Planning, Design and Construction.
- D. Each Project shall be evaluated to determine need for 3rd party commissioning.
- E. Access to electrical and mechanical rooms shall be located outside sterile areas.
- F. All equipment shall be accessible for maintenance whether floor or ceiling mounted.
- G. Utilize universal room design so that items such as thermostats, light switches, etc. are installed in the same place on each unit and in like rooms.
- H. Coordinate room numbering with MU Health Care. Room numbering shall follow MUHC/MU room numbering guidelines. Numbering strategy shall be established at DD and be carried throughout the project. Numbering Approval shall be by MU Health Care.
- I. Use of open water features as an indoor design element is prohibited.
- J. Room names and numbers, and column lines and their designations, shall appear on all floor and partial floor plans as they appear on architectural drawings.
- K. Floor and partial plans shall include graphic scales, north arrows and key plan.
- L. Front end documents must include a list of anticipated major outages to systems that also indicates systems/areas outside the project area that will be impacted.
- M. Any devices required for system isolation to tie-in new work shall be shown on the plans. If isolation device doesn't exist, it shall be installed as part of the project. System isolation must be included in design if there are not sufficient devices existing to isolate required areas.
- N. If scope of work will impair utilities in other parts of the facility that are to remain operational during construction, design must include measure to keep those areas operational.
- O. The Operating and Maintenance Manual shall include a single equipment list of all equipment provided by the contractor. It shall be placed at the front of the manual. A template for the list

shall be included in the Division 1 Logs section. The following information is required for each piece of equipment:

1. Equipment Name
2. Equipment Designation
3. Manufacturer
4. Model Number
5. Serial Number
6. Location (Room Name & Number)

DIVISION 2 – Existing Conditions

- A. It is the consultant's responsibility to confirm that documents produced accurately reflect actual conditions to avoid unforeseen conditions which may result in construction change orders.
- B. Requirements for the Existing Conditions Report is outlined in the UM Consultant Procedures and Design Guidelines (CPDG).
- C. Report is required for every project unless otherwise indicated by the MUHC PM.

02 4000 Demolition

1. Remove all abandoned and permanently disconnected items. Do not abandon in place.
2. Terminate all MEP utilities per UM System requirements.
3. Airborne construction dust containment control from ceiling to deck:
 - a. If not feasible/possible to extend partition to deck, extend and seal tight 6-mil fire retardant polyethylene listed by Fire Underwriter's Laboratories, Griffolyn #T55R or Star-Tex of Lakeville, MN 55044 with Griffolyn Fire retardant tape, or approved equal, from ceiling to deck.

02 8000 Facility Remediation

1. Asbestos removal – All building materials testing positive for Asbestos Containing Materials (ACM) should be abated.
 - a. Abate as prescribed by MU Environmental Health and Safety (EH&S).
 - b. Following abatement of ACM, allow floor substrate to dry and test for PH and relative humidity compliance with manufacturer's requirements prior to installation of adhesives and new flooring materials.
 - c. Remove any debris and residual materials.
 - d. Any floor fill in good condition can remain in place. Must be top coated with a color acceptable to MUHC.
 - e. Note for MUHC PDC staff: refer to Navex policy per encountering ACM.

DIVISION 3 – CONCRETE

General

- A. Interior floor expansion joints shall support heavy wheeled equipment and provide a smooth transition.
- B. Install and seal cast in place sleeves at through floor penetrations. Top of sleeve at 1" AFF. Approved firestop system shall be incorporated and must result in a UL listed assembly. See Fire Stop section for more information.
- C. The finish and slope of concrete surfaces shall match project scope and function (i.e. Slope to floor and shower drains, etc.).
- D. When installing a mud slab for future use, provide troweled finish with sealer.
- E. Provide waterproof wall protection in the janitor's (ESC) closets around the mop sink and sealed to the floor. In lieu of concrete sealer, include a waterproof type of floor.

03 3006 Waterproofing Admixture for Cast-in-Place Admixture

- 1. Add Thorobond water-based polyvinyl acetate (PVA) (Thoro Acryl 60) bonding agent when bonding to existing concrete.

DIVISION 4 – MASONRY

- A. Special brick / block shapes should be avoided. Selected material should be readily available, not special order.
- B. Use quick release weeps so water escapes from cavity wall quickly. Do not use rope weeps.

DIVISION 5 – METALS

- A. Install steel backing, 20 gauge, at 10 inches above floors along all corridors, handrails, cabinetry, and any wall hung items exceeding 20 pounds, including but not limited to monitors, televisions, and baby changing.
- B. Wood Blocking is allowed at high load locations. See Division 6.

DIVISION 6 – WOODS, PLASTICS & COMPOSITES

- A. Install ¾" fire-rated plywood on all four walls of Communications rooms and ensure fire rating label of plywood is not obscured. See MU Telecommunications Construction Standards for more information.
- B. Standard particle board is not allowed in any areas exposed to moisture.
- C. Wood blocking shall be 2x fire treated and may be used in the following high load locations:

1. Grab Bars.
2. Sliding Doors.
3. Other locations as approved by MUHC PDC.

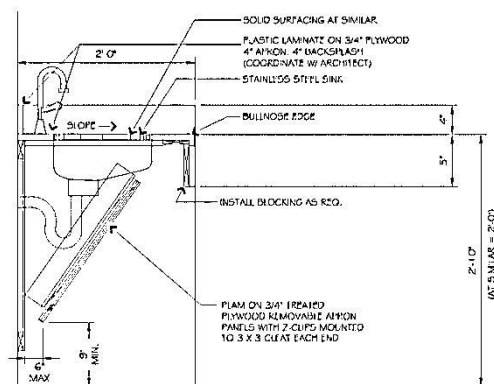
06 4100 Architectural Wood Casework

Refer to Appendix F for detailed casework requirements.

Cabinets:

Refer to Appendix D Interior Finishes Quick Reference Guides for Vertical and Horizontal Surface Materials required for various room types.

1. Quality Standard: AWI Custom.
2. Wood-look Laminate: Typical Grain Direction to be Vertical.
3. Reveal overlay construction.
4. Adjustable shelving shall be 24" deep for distribution management system in clean utility rooms or PAR storage.
5. Verify where sloped upper cabinet tops should be installed vs. full height PLAM soffits when needed.
6. Infection Control standards do not allow base cabinets under sinks to be used for storage. To insure against this, and to meet ADA requirements, cabinet construction under sinks shall be removable plywood apron panels mounted with Z-clips or screws. In public restrooms, design is to accommodate shallow-bowl sinks and ADA guidelines. In exam rooms and nurses' stations, design is to accommodate 10" deep-bowl stainless sinks.



7. Cabinet doors are to have PVC edge banding (self-edging not acceptable).
8. Seal all wooden casework edges including the wood that sits on the floor.
9. Cabinet door hardware for all areas to be 5-knuckle hinges.
10. Provide plastic laminate sloped top on upper cabinets or plastic laminate filler panel between top of upper cabinet and ceiling to minimize collection of dust and debris.

Countertops:

1. All transaction counters and sink counters shall be solid surface.
2. All work surfaces in Lab areas shall be epoxy resin or equal, no plastic laminate.
3. Plastic Laminate Application: For countertops not supported by continuous base cabinets, fabricate using 2 layers of $\frac{3}{4}$ " plywood (not MDF) covered with HPDL.
4. Vinyl Countertop Edge: PVC tee-molding to match thickness of countertop, color as scheduled.
5. Solid Surface Application: Substrate: $\frac{1}{2}$ " Plywood covered with $\frac{1}{2}$ " thick solid surface (typical).
6. Solid Surface Material
 - a. Preferred materials: See Finishes Legend.

Desk height built-in work surfaces:

1. No built-in base cabinets or pencil drawers.
2. Mobile file cabinets and pencil drawers will be supplied by Owner.
3. Grommet placement and installation will be by Owner after construction is complete.
 - a. Alternate: Place countertop 1.5" – 2" from back wall to accommodate wire management.
4. Clear space beneath workspace: 27-1/2" minimum to 30" maximum height (to accommodate standard Owner-furnished file cabinets and meet ADA Guidelines). Verify FFE heights with MUHC Planning, Design & Construction Staff.

Hardware:

1. Cabinet door hinges: 5-knuckle hinges.
2. Countertop supports to be surface-mounted Rakks #EH1824FM (18x24) or #EH1818FM (18x18) or approved equal.
3. Drawer and Door pulls: U-shaped wire pulls, 4" centers.
4. Drawer Slides:
 - a. Regular 100-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers.
 - b. File: Full extension, 150-pound rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions self-closing feature.

Locks:

1. Cabinet Locks – CompX National Stock Locks – Master Keyed to E041A.
2. Ives Elbow Catches IV2-A92. **Stamped steel catches are not allowed due to sharp edges.**

Miscellaneous:

1. Peg board: only nonporous products - plastic or polypropylene.

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

07 0500 Membrane Roofing

- A. Preferred roofing systems are PVC and Modified Bitumen cold applied utilizing zero or low VOC products.
 - 1. Address snow and ice conditions above entrances and walkways.
 - 2. Extended roofing system warranties shall be considered based on the scope of the project and use of the facility.
 - 3. Walkway pads shall be installed from roof access to and around all rooftop mounted equipment.
 - 4. Walk paths should be placed so that the worker is as far as practical from the roof's edge but never within 6' of the edge.
- B. Verify the need for window washing davits or anchors on roof.
- C. Area 6' from edge of roof shall be considered a "fall protection required" zone and protected by passive fall protection systems or , at a minimum, the 6' fall protection zone shall be marked with contrasting roof color to denote to workers they are in the *6' fall protection equipment required zone*.

07 8400 Fire Stopping

- A. Fire resistant penetrations, joint systems, and curtain wall to floor intersections
 - 1. Utilize UL/FM approved firestop systems. Firestop System Labels shall be installed at all through penetrations. Acceptable firestopping manufacturers are 3M, Hilti, and STI. Basis of Design shall be Hilti.
 - 2. Listed firestop details shall be provided on the project drawings. UL Listed and Rated cable pathways shall be installed at all through-wall penetrations of fire-rated barrier systems. Preferred manufacturer is STI EZ Path.
 - 3. Delegation of firestopping details for penetrations, joint systems, or curtain wall to floor intersections are not allowed. Engineering Judgements (EJ's) submitted to the UM System AHJ typically will not be granted, due to the ease of availability and the variety of proven (listed) firestop systems.
 - 4. The project plans shall include details for all proposed firestopping systems that could be encountered on the project based on the materials being used and the assemblies being penetrated. A detail for each type of firestop penetration, joint system, or curtain wall to floor intersection configuration should be included (re. penetration or joint systems in fire-rated walls, floors, assemblies, smoke barriers, or membranes, exterior curtain wall to floor intersections, and head of wall conditions).
 - 5. For renovation, addition, and remodel projects: the project work area shall be surveyed during the project design phase to document the existing firestopping conditions at all rated walls, barriers, and assemblies to determine the scope of firestopping needs and creating the list of details for inclusion in the project drawings.

6. During the construction phase, upon notification or discovery of an unknown or differing firestop field condition, the design consultant will provide additional listed details as necessary to restore compromised assemblies or firestop systems.
 7. Installation of firestop systems shall be performed by qualified personnel only. Installers should be International Firestop Council (IFC) certified installers; UL certified installer; Firestop Contractors International Association (FCIA) FM 4491 accredited, or a firestop manufacturer's approved installer; or equivalent. Installation personnel shall have a minimum of 3 years of experience in firestop installations. Installer qualifications must be included in the firestop submittals. Installer must be a trained, certified fireproofing expert using the proper UL listed assembly for each penetration through each type of rated wall assembly.
 8. A firestop pre-installation meeting will be conducted on site prior to the start of any firestop work. Required Attendees: Owner's representative, Contractor superintendent, all contractor trades persons performing firestopping work, and an inspection representative. Optional attendees: Consultant design team members, Commissioning personnel, firestop manufacturer's representative.
 9. Mockup requirements: A mockup of each fire rated design fire-resistant penetration, joint system, curtain wall to floor intersection, or head of wall configuration is required and must be reviewed for acceptance as a minimum standard for the Work. Mockups may remain in place as part of the project Work.
 10. Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions shall be effectively identified with signs or stenciling in concealed spaces. Such identification shall:
 11. Be located within 15' of end of each wall and at intervals not exceeding 30' measured horizontally along the wall partition.
 12. Include lettering not less than 3" in height with a minimum 3/8" stroke in contrasting color incorporating wording identifying the barrier designation and fire resistance rating.
 13. The Owner will engage a qualified (certified), independent, 3rd party special inspection agency to perform the firestop inspections as required by IBC Chapter 17.
 14. Where IBC Chapter 17 special inspection requirements do not apply, all firestop system inspections will be performed by Campus or 3rd party building inspectors, as required.
- B. MUHC Barrier Management Program
1. Permits to work in spaces above ceilings (including field verification in design or construction) and/or penetrating fire/smoke walls are required. Permits may be requested from MUHC Engineering Services office as part of an overall risk assessment process.
 2. Cable pathways shall be installed in wall and floor assemblies in lieu of sleeves and openings through barrier penetrations.
 3. Corridor Wall – At least one smoke and acoustical pathway shall be installed above each door at the room to corridor connection. Additional pathways may be required to facilitate necessary quantities of cabling serving the room.
 4. Smoke Barrier – UL listed fire-rated pathway(s) with a minimum fire resistance of 1-hour shall be installed at all through penetrations of smoke barrier wall assemblies.

5. Fire Barrier – UL listed fire rated pathway(s) with a fire rating to or greater than the barrier rating shall be installed through all penetrations of the fire barrier floor/wall assembly.
6. Acceptable Manufacturers:
 - a. STI – EZ Path Fire Rated Series 22, 33 or 44. EZ Path Smoke and Acoustical NEZ33
 - b. Hilti – Speed Sleeve CP 653
 - c. Sleeve Kit CFS-SL SK, Smoke and Acoustical Sleeve CS-SL-SA

07 9513 Expansion Joint Cover Assemblies

1. Smooth transition from one side of the assembly to the other.
2. Flexible fill-in of joint, with sufficient strength to sustain a portable X-ray machine going over the joint.
3. Sliding feet to be anchored to only to one side of the joint.
4. Doors shall have sufficient clearance to not get hindered, as well as meet requirements of Life Safety code.
5. Floating of floor surface provide insufficient base for fasteners.

DIVISION 8 – OPENINGS

General

- A. Provide clear access for wheelchair bound users at all doors. Doors shall be minimum 3'-8". 3'-0" doors may be used for spaces that will not typically need to accommodate a person of size wheelchair (offices, labs, etc.).
- B. All openings in rooms designed for negative or positive pressure shall seal when closed. Install automatic door bottoms or sweeps when appropriate.
- C. Fire and smoke door assemblies shall comply with NFPA 80 and 105 respectively.
- D. Door and frame assembly rating tags shall be visible. Applied hardware may not be installed in a manner that hides the tag. Tag shall not be painted over or obscured.
- E. Entrance vestibules shall be designed to minimize air exchange and accommodate electronic locking. Air curtains with heaters may need to be incorporated in some locations such as at main entrances and loading docks to minimize air infiltration.
- F. Sliding doors /ICU Doors- specify sliding door frames to be same **depth** as finished wall so the gypsum wall board is not exposed to damage.
- G. Provide Steel backing for door stops.

08 0671 Door Hardware

1. Basis of Design door hardware shall be confirmed with MUHC PDC PM.

2. Basis of Design door control vendor shall be ACC (Alarm Communication Center) and shall include types and manufacturers for various standard applications.
3. All exterior doors that have electronic access control shall have a key override.
4. Audible door-hold open alarms that sound after 15 seconds on all exterior doors that are not used by the general public.
5. Install heavy duty low power door operators on all main lobby public bathrooms. Also, any doors leading from waiting areas into clinical areas should be evaluated for inclusion of a power operator.
6. Power operators in rated openings shall be on fire alarm relay.
7. Install "Kill Switch" on all Auto Doors (Power Off switch).
8. Power from "Life Safety" Circuit for all egress auto doors.
9. Card Readers to be installed at all Soiled and Clean Utility, Med Rooms, Staff Locker/Break Rooms. No Mechanical Keypad Locks to be used.
10. Closers: Basis of design shall be LCN.
11. Handles: Lever Style 14 (Curved Return) and Rose Style D (3-1/2" Convex).
12. Doorstops: Use of 90-degree doorstops into patient rooms shall be discussed during design, as they do not typically allow good wheelchair or bed access.
13. Locks (New and Existing Construction)
 - a. To match existing key system, all locksets and cylinders shall be Best 93K series.
 - b. Any lock used must accept Best 7 Pin Core.
 - c. Finish: 626 finish unless matching different existing finish.
 - d. For aluminum storefront-type doors: Prefer Preferred Adams Rite Deadlocks/Deadlatches with key cylinders that will accept Best 7 pin cores.
 - e. Keyway: Best Preferred Peaks Keyway.
 - f. Privacy locksets shall have a slotted override button.
 - g. Locksets are always installed by contractor and uncombined cores turned over to MUHC key shop for keying.
14. Electric Strikes: Von Duprin or Folger Adams. Strikes must be 24V.
15. Panic Devices: Basis of design shall be Von Duprin.
16. Card Access Locks/Electronic Access Control System.

08 1000 Doors and Frames

08 1423 Clad Wood Doors

For MUHC Clinics:

- a. Eggers Industries Wood doors, stained.
- b. Plain Sliced Vertical Graining.

- c. Species and stain colors as approved by MUHC PD&C.

For UH, WH, MOI and MUPC Hospital spaces:

- a. **Inpro/VT Industries Palladium High Impact Doors.**
- b. Finishes and colors as approved by MUHC PD&C.

Rated doors:

- a. Rating labels shall be clearly visible on all fire-smoke-rated door/frame assemblies and shall not be painted over.
- b. Rated doors shall not be installed in walls that are not required to be rated.
- c. Installation Tolerances for Smoke Partition Doors and Fire Doors must meet NFPA 80 and 105 respectively.

Tolerances:

- a. Not more than 1/8" gap between the face of the door and jambs (Top and Sides).
- b. Not more than 1/8" between face of door and stop.
- c. Self-Closing.
- d. Maximum of 3/4 " gap at bottom of door to finish floor.
- e. Meeting Edges of pair of doors:
 - i. 1/8" on wood doors.
 - ii. 1/8" +/- 1/16" on steel doors.

Smoke Resistant Doors:

- a. Smoke Resistant Doors (Patient Room Doors and other non-rated doors): Same as above wood doors, except deviation of +/- 1/16" from 1/8".
- b. **Standard undercut is 3/4".**
- c. **Maximum undercut 1" with approval from MUHC Engineering Services.**

Door and Frame Assemblies:

- a. New doors must be installed in new frames. Use of existing frames with new doors will not likely produce installation that complies with required tolerances.
- b. Use of existing doors will require custom field-scribing to set required tolerances.

Door widths:

- a. All doors for patient traffic shall be 44" wide minimum.
- b. All new patient room doors to be 60" wide (double-leaf 42/18).

Door Frames:

- a. Only Welded Hollow Metal Frames are to be used in new wall construction.
- b. Knockdown frames are acceptable in existing walls when installing new door and frame. If door is wider than 36", welded frame is preferred.

- c. All new frames for fire doors shall be welded, securely anchored and installed plumb and level.
- d. The rating label on fire-rated frames shall be clearly visible and not painted. Manufacturer codes are prohibited.

Sliding Glass/Aluminum Storefront type doors (ICU/CCU):

- a. Isolation rooms (negative pressure) and Protective Environment rooms (positive pressure) require draft seals on doors.

08 5000 Windows (Replacement)

- a. **WH:** Non-operable thermally broken insulated units with Low 'E' coated tinted glass.
- b. University Hospital: EFCO Low 'E' double pane.

DIVISION 9 – FINISHES

General

- A. Flooring in new MRI locations shall be designed to delineate critical safety zones and/or gauss lines. The markings shall be permanent and embedded and not create cleaning or infection control issues.
- B. Epoxy Adhesive shall be used under sheet vinyl in patient rooms under bed location across entire length of room due to small wheels moving/rolling the material.
- C. Seal completely between wall assemblies that butt into window assemblies to prevent transfer of sound.
- D. Design rooms and spaces with high STC Partitions where sensitive information is being exchanged.
- E. Windowsills shall be solid surface.
- F. See Finishes Quick Reference Guides in appendices for more information.

09 0561 Flooring Preparation (where floors previously filled and abated)

- 1. Apply Acrylic 60 bonding agent tinted with red paint colorant to the floor and allow to dry tack free. Surface of floor should appear red when dry.
- 2. Apply 2 or more layers of Ardex feather finish until floor surface is level and smooth for the new flooring.
- 3. Hand scrape of light sand Ardex feather finish to recommended smoothness for type of flooring to be installed.
- 4. If red bonding agent appears during sanding, stop work and apply more Ardex to achieve a level and uniform floor finish.

09 2216 Non-Structural Metal Framing

1. Typical partition walls shall be constructed of gauge 20 studs. They shall extend to deck and be sound insulated to reduce sound transmission between walls, based on Facilities Guidelines Institute's "Design Criteria for Minimum Sound Isolation Performance Between Closed Rooms" and "Design Criteria for Speech Privacy for Enclosed Rooms and Open Spaces." recommendations.
2. At wall and window "T" junctions, sound transmission shall not be less than the STC of the wall.

09 3000 Tiling

09 3013 Ceramic Tile:

1. Wet walls of Toilet and Shower rooms in WH and University Hospital are to receive tile from floor to 84" AFF minimum.
2. Preferred Vendors: Crossville Ceramics, Dal-Tile, American Olean.
3. Contractor to provide 5 to 10% attic stock, to be determined at project's final review.
4. Grout shall be epoxy grout with minimal grout lines.

09 5100 Acoustical Ceilings:

1. 2x2 standard.
2. No reveal.
3. Preferred Vendors:
 - a. USG Ceilings Rockface Climaplus.
 - b. Armstrong Ultima #1910 or Cirrus series.
4. Damp or wet areas shall be WR gypsum board or moisture resistant ceiling panels.
5. Ceiling tiles are not required to be antimicrobial unless specifically requested for project by MUHC.
6. Contractor to provide 5 to 10% attic stock, to be determined at project's final review.

09 6000 Flooring

09 6500 Resilient Flooring:

1. Sheet vinyl, 6' or wider.
2. Welding rod to match colors selected.
3. Preferred vendors:
 - a. Teknofloor/Mannington Seamless.
 - b. Mannington Flooring Assurance III (Standard for Restrooms).
4. Contractor to provide 5 to 10% attic stock, to be determined at project's final review.
5. For all renovated areas scheduled to receive resilient flooring, where walls or plumbing are being demolished or re-worked, skim coat underlayment for resilient flooring product with Ardex, feather finish.
6. Adhesive: Epoxy adhesive in patient room bed zone.

7. Luxury Vinyl Tile:

- a. Preferred Vendor: Amtico Planks or Tiles.

09 6813 Carpet Tile:

1. Specify Carpet Tile only; Squares or planks. No broadloom.
2. Face Fiber must be Type 6,6 Nylon for known stain resistance.
3. Preferred Manufacturers: (These manufacturers are on University of Missouri Buying Contracts, allowing ease of ordering as well as discounted pricing when additional carpet is needed)
 - a. Mannington Commercial
 - b. Mohawk/Lees
 - c. Bentley
4. All patterns, colors, and designs to be approved by MUHC PD&C Designers.
5. Contractor to provide 5 to 10% attic stock, to be determined at project's final review.
6. Walk-off carpet tile at all public entries.
 - a. Preferred manufacturer: Mannington Entryway Systems (6.6 Nylon)

Resilient Base:

1. Preferred:
 - a. Johnsonite Tightlock Carpet - 4.5"
 - b. Johnsonite Tightlock Resilient – 4.375"
 - c. Johnsonite Millwork Reveal – 4.25"
2. See Finish Legend.

09 7000 Wall Finishes

09 7200 Wall Coverings:

1. Type II with high tensile and tear strength.
2. Wall vinyl on exterior walls to be micro vented.
3. Patterns or designs to be reasonably patchable.
4. Contractor to provide 5 to 10% attic stock, to be determined at project's final review.

09 9000 Painting and Coating:

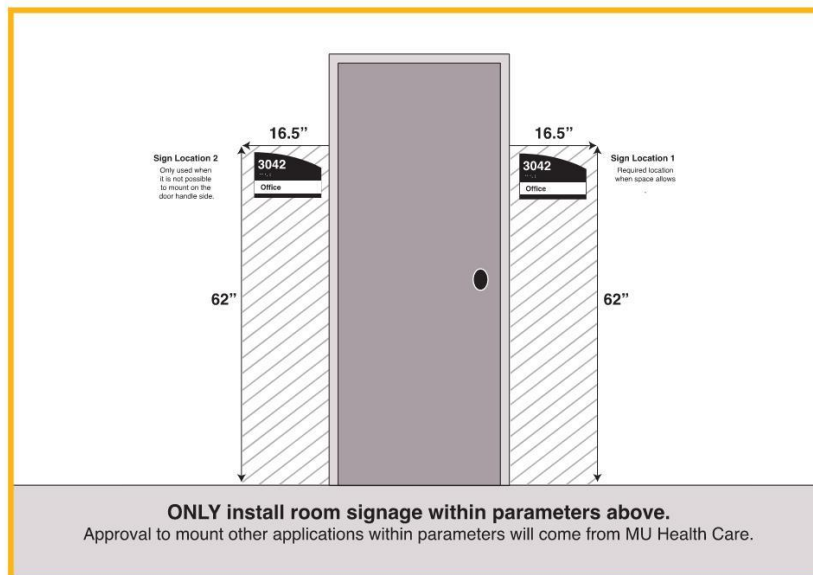
1. Utilization of different pigments by different paint manufacturers results in unreliability of color matching. The frequency of required paint patching at MUHC demands that the manufacturer and colors originally specified and approved by MUHC be provided by the Contractor with no substitution. Please refer to Appendix D.
2. MUHC has determined its preferred paint and coating manufacturer to be Sherwin Williams Paints. Please refer to Appendix D.
3. Submit actual painted samples of all specified colors. Submission of manufacturers' fan-deck or color chips not acceptable.

4. "Submit two paper "draw-down" samples, 8-1/2" x 11" in size, for each color specified. Where sheen is specified, submit samples only in that sheen."

DIVISION 10 – SPECIALTIES (DOES NOT APPLY TO BEHAVIORAL HEALTH)

10 1424 Signage

1. Room signage and wayfinding signage shall be coordinated by MUHC PDC Staff. It is provided by MU Health Care.
 - a. Room signs are installed at 60" to the top of the sign and 4" from the door frame on the door handle side.
 - b. Location may vary due to wall space allowance.
 - c. Signs could be mounted opposite of the door handle side, or on an adjacent wall.
 - d. No other application should be installed within 16.5" from the door frame and within 62" from the floor on the side designated for room signage.
 - e. The area past 14.5" from door frame and below 48" can be reviewed for other applications. Approval for this shall come from MU Health Care PDC.



2. Coordinate room numbering with MU Health Care.
 - a. Room numbering shall follow MUHC/MU Alpha/numeric room numbering guidelines.
 - b. Numbering strategy shall be established at DD and be carried throughout the project.
 - c. Example (P0000)
 - i. Prefix to be the building code designation.
 - ii. First number to indicate the floor level.
 - iii. Next three numbers for specific room on floor up to 999.

- d. Consultant must get approval for room numbering by end of DD and again before the final review. No room numbers may change without approval from MUHC PDC.
- 3. Include required signage and decals to meet fire department requirements, i.e., roof access points, hydrants, numbered exterior doors visible with light reflective material that is 4" wide minimum.

10 2113 Plastic Toilet Compartments

- 1. Bobrick DuraLine Series
 - Compact Laminate Solid Core Construction
 - Laminate Clad
 - Floor-Mounted, Overhead Braced.
 - Minimum 36" wide doors

10 2123 Cubicle Curtain track:

- 1. On The Right Track (No Substitutions Allowed)
 - Extruded Aluminum, White Baked Enamel.
 - Standard Concealed Stainless-Steel hardware.
 - MUHC Designers to specify cubicle curtain fabrics.

10 2800 Toilet, Bath and Laundry Accessories

- 1. CF/CI (Contractor Furnished, Contractor Installed) - The following items are typically by Contractor and must be specified. See Finish Legend in Appendix for preferred or required manufacturers.
 - a. Partially recessed Automatic Paper Towel Dispensers
 - b. Mirror over sink
 - c. Grab bars
 - d. Personal Shelf
 - e. Toilet paper dispenser
 - f. Sanitary napkin disposal (as requested)
 - g. Towel bars
 - h. Individual robe hooks (as requested)
 - i. Specimen pass thru (as requested)
 - j. Surface mounted towel dispensers. Refer to Appendix D for dispenser type based on type of space.
- 2. OF/CI (Owner Furnished/Contractor Installed) The following items are typically by Owner but must be accommodated in the design process. See Finish Legend for preferred or required manufacturers.
 - a. Soap dispensers
 - b. Alcohol dispensers.

- c. Sharps boxes
 - d. Glove dispensers
 - e. Multi-hook coat hooks – Wood flip hook Espresso or Natural by Organizeit.com
 - f. Marker/bulletin boards/signage
 - g. Pharmaceutical waste containers
- 3. Grab bars and other accessories exposed to frequent cleaning shall be Powder Coated clear or color to prevent chemical rusting.
 - 4. Public restrooms shall utilize ADA accessible, flip-down grab/support bar on the off-wall side of the toilet.
 - 5. Ensure that all shower seats are rated to accommodate patient weight requirements and that the supports/ blocking behind the wall will support/exceed the rating of the seats.
 - 6. Placement of robe/towel hooks in patient rooms should be without sharp edges and placed high enough to prevent patient safety hazard (i.e. catching shoulder or IV tubing on hook). Standard is the pulldown hooks for “organize it” .com. Ensure hooks meet ADA requirements.

DIVISION 11 – EQUIPMENT

General

- A. All fixed equipment must be accessible by maintenance on all sides for service. Minimum clearance shall be 24”.
- B. Wall mounted monitor brackets are purchased by Owner (Cerner); installed by contractor.

11 7000 Healthcare Equipment

- 1. Monitor/Keyboard channel mounting system: GCX Instrument Mounting System WC-0002 x length or equal
- 2. Headwalls and Rail: Hospital Systems Inc. (HIS)
- 3. Technology Wall Station Mounting System: Human Scale V6 or V7

11 8129 Facility Fall Protection

- 1. Fall protection needs shall be evaluated for all roof mounted equipment.
- 2. All roof mounted equipment shall be mounted beyond the OSHA prescribed 6’ fall hazard area of the roof’s edge.
- 3. On low sloped roofs, the 6’ *designated area* boundary shall be marked. Reference 29 CFR 1910.28 for applicable information.
- 4. Interior equipment that requires access for maintenance and repair at elevation more than 4’ above finished floor shall be evaluated to determine if an engineered fall projection solution is required.
- 5. MUHC Engineering Services and shall be integral to all discussions related to fall protection.

6. The Hierarchy of Controls as applied to fall hazards and risks at MU Health Care:
7. Elimination – Develop and implement revised work methods that preclude exposing workers to falls as first consideration.
8. Maximum use of passive fall protection – the use of passive engineering controls to isolate employees from a fall hazard:
 - i. Distance from the edge through use of low-sloped roof designated areas.
 - ii. The use of designated walk paths.
 - iii. Placement of guardrails systems as the primary means of work protection if workers are exposed to a fall risk within the six-foot zone.
9. Design for Safety – coordinate and advocate for fall protection strategies designed into all new construction and renovations.
10. Horizontal lifelines: As a general rule, MUHC personnel will not use horizontal lifelines and they should not be installed. Potential application and installation will be considered on a case-by-case basis.
11. On low-slope roofs where work tasks must be performed within 6’ of the fall hazard edge, the use of a guardrail system shall be evaluated as the first course of action.
12. Roof access hatches shall be guarded.
13. Skylights and other rooftop penetrations shall be protected by either a guardrail system or skylight screen system capable of supporting at least 200 pounds to prevent workers from falling through the opening to the surface below.
14. Fall Prevention Through Location – low-sloped roofs and designated areas.
15. Fall risks on low-slope roofs can, in some instances, be mitigated by distance from the fall risk edge. Therefore, there are three fall risk zones:
 - i. Six-Foot Zone: Fall Protection always required.
 - a. When work is performed less than six feet from the roof edge, fall protection is required in all cases.
 - b. Protection may be via a guardrail system, fall restrain, positioning lanyard, or PFAS.
 - ii. Six to 15’ Zone – Fall Protection may be required.
 - a. When work is performed at least six feet but less than 15 feet from the roof edge:
 - b. Fall protection is required if the task(s) are required on a frequent basis or if the task is not of a temporary nature.
 - c. Fall protection is not required in this designated area if the task is both infrequent and temporary.
 - d. Fall protection in this designated area may be via a guardrail system, fall restrain/positioning lanyard, or PFAS.

- iii. Greater than 15' zone – Fall Protection is conditionally not required.
 - a. When work is performed 15' or more from the roof edge, fall protection is not required provided procedures are in place and enforced that preclude worker from approaching within 15' of the roof's edge.

DIVISION 12 – FURNISHINGS

General

Interior Plantings are by MUHC. Design and installation considerations for MUHC personnel are included in Appendix A.

12 0000 Furnishings

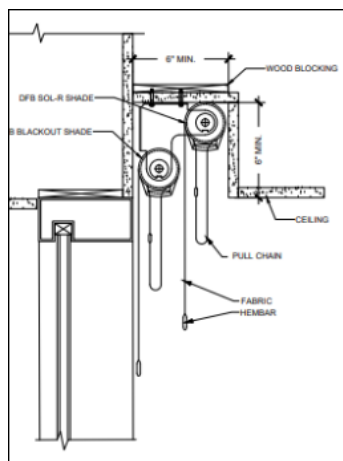
All furniture to be specified and procured by MUHC Designers.

12 2000 Window Treatments

12 2400 Window Shades:

1. Preferred: Chain-driven or motorized mesh roller shades. Manufacturer to be as approved through current University of Missouri Purchasing Agreements.
2. Openness factor of 3% required to provide adequate privacy after dark with the lights on in the room and prevent glare on computer screens.
3. Patient rooms require dual shades with black out.
4. All window pockets where shades are to be mounted between window wall and dropped ceiling shall be at deep enough to accommodate tools required to mount hardware, both horizontal or vertical mounts.

Figure 1 Window Shade Installation



DIVISION 13 – SPECIAL CONSTRUCTION

See [UM Consultant Procedures and Design Guidelines](#). All design guidelines posted are applicable.

DIVISION 14 – CONVEYING EQUIPMENT

- A. Otis Elevator is the basis of design for all elevator services. For all other design information, see [UM Consultant Procedures and Design Guidelines](#), Division 14.

DIVISION 21 – FIRE SUPPRESSION

- A. Include note for fire suppression work: **“CONSTRUCTION NOT RELATED TO FIRE SUPPRESSION SYSTEMS SHALL NOT TOUCH OR BE SUPPORTED BY ANY PART OF THE FIRE SUPPRESSION SYSTEM (INCLUDING SYSTEM SUPPORTS).”** This note to be referenced on drawings for all disciplines. Make sure this is discussed in all prebid meetings as applicable.
- B. Fire Sprinkler System shall be compliant with NFPA 13 and UM Standards/codes.
1. Quick response sprinkler heads shall be utilized.
 2. Shall be an engineered and certified system, compliant with NFPA 13 and University of Missouri codes/standards.
 3. Fully concealed sprinklers shall be installed in all spaces with finished ceilings.
 4. Schedule 40 black iron pipe only.
 5. Galvanized
 - a. Prohibited in new construction.
 - b. Discuss with MUHC Health Facilities Managing Engineer if found in existing construction.
 - c. Permissible in renovations only with permission from MUHC Health Facilities Managing Engineer and only if modifying an existing **galvanized** system.
 6. Dry-pipe systems must utilize nitrogen generator to prevent internal corrosion.
 7. All inspection/test valves to run to drain capable of handling the flow. (Low point drain). If no drain is available, run to outside building per code. If this occurs on the MU main campus, approval by MUHC is required.
 8. Main drain shall be piped to exterior of building. Confirm acceptable location with MUHC.
- C. CPVC piping is not allowed for permanent installations. Only allowed for temporary protection during construction.
- D. Flex heads
1. Not allowed in the hospitals (TH, CCA, MUPC, MOI, PCT, WH).

- a. **May** be utilized in offsite clinics (MOB's) at the discretion of MUHC **Health Facilities Managing Engineer**.
 - b. Stabilizing bracket must be included in the installation.
 - c. **If head is bent past the curvature stated by the manufacturer, it must be replaced prior to system testing at no cost to owner.**
- E. Malleable fittings are not allowed.
- F. Pre-Action Systems
- 1. Pre-action system and controls shall be a UL listed system with components contained within a manufactured cabinet.
 - 2. Must be compatible with the existing Fire Alarm system. Engineer shall confirm during design.
 - 3. Siemens devices shall not be used to activate a pre-action system.
 - 4. Pre-Action systems shall be cross zoned requiring two initiating devices, one from each circuit (zone) to arm the system.
- G. SEE [UM Consultant Procedures and Design Guidelines](#) FOR DESIGN CRITERIA TO BE INCLUDED IN DRAWINGS AND SPECIFICATIONS BY THE ENGINEER OF RECORD EVEN THOUGH IT IS DELEGATED DESIGN.

DIVISION 22 – PLUMBING

See [UM Consultant Procedures and Design Guidelines](#). All design guidelines posted are applicable. Information below supplements and supersedes information provided in Division 22 of those documents.

22 0100 Plumbing System Design

- A. All valves shall be tagged, and a valve schedule shall be provided. Valve tag numbering shall follow MUHC standard and start with the next number in the valve tag list. Consultant shall coordinate numbering with the MUHC Plumbing Trades Supervisor.
- B. No plumbing piping shall be exposed overhead where dust accumulation could occur that could create food contamination or patient exposure.
- C. **Trap primers are not used at MUHC hospitals. Approval for use on off-site facilities is through MUHC Health Facility Managing Engineer.**
- D. All new construction shall provide hose bibs at accessible points on the exterior of the building and shall be able to produce a minimum of 80 psi. If this pressure isn't achievable, Consultant shall advise of options/recommendations.
- E. Provide hose bibs for all roof mounted equipment that requires water for cleaning and/or general maintenance.

- F. Per MUHC water management plan: On backup feeds, crossover lines, bypasses, and other lines normally closed to water flow-through, install a valve and a drain line just upstream of that valve on both ends of the line (or only at the downstream end if the upstream end is the public/campus water main) to allow it to be thoroughly flushed to a drain prior to opening a valve that releases water from the line to points of use within the building. **This condition must be reviewed and approved by the UM AHJ.**
- G. Backflow devices shall be installed for the following equipment at a minimum:
 - 1. Cooling Towers
 - 2. Heating water systems
 - 3. Lawn irrigation systems
 - 4. Hose bibs
 - 5. Pools/spas
 - 6. Hydrotherapy tanks
 - 7. Fire sprinkler systems
 - 8. X-ray film processors
 - 9. Morgue tables
 - 10. Dialysis machines and central systems
 - 11. Sterilizers/autoclaves
 - 12. Endoscope washers
 - 13. Washing machines
 - 14. Carbonated beverage dispensers
 - 15. Food waste grinders
 - 16. Potato peelers
 - 17. Ice machines**
- H. RO/DI systems: to avoid unnecessary shutdowns, coordinate startup to prevent down time due to requirement for sanitization of system.
- I. For applications that require pure water services and will not utilize point-of-service canisters, polypro piping must be used unless otherwise stated by MUHC Managing Engineer.
- J. Ice machines are Owner Furnished, contractor installed (OFCI). Installation shall meet manufacturer's required clearances for air-cooled units. Minimum clearances shall be 6" on each side and 12" on the top.
 - 1. Confirm storage capacity with MUHC.
 - 2. Follett is preferred manufacturer.
 - 3. Confirm features (touchless switches, ice and water, ice only, ice shape, etc.).
 - 4. Water filtration unit and cup sink for drainage shall be included.

5. Water filters to be installed under the cabinet.
6. Water filters shall be 0.2 micron.
7. No top drawer in base cabinet under the ice machine.
8. Do not use washer boxes in the wall.
9. Tap on cold water supply to sink.
10. Tap on drains from sink.

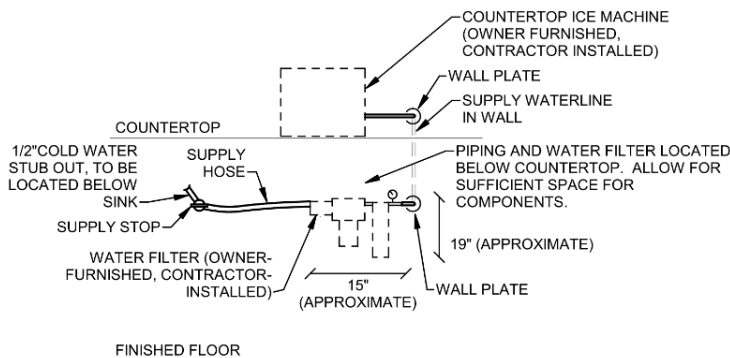


Figure 2 Ice Machine Below Counter Detail

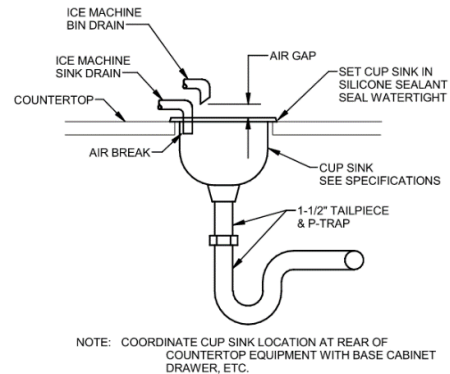


Figure 3 Countertop Ice Machine Drain Detail

- K. Drinking water fountains must meet **ADA** requirements and are to be integrated units – no separate condensing units.
 - a. Use independent filtering if entire building is not filtered.
 - b. Use Water filters shall be 0.2 micron.
- L. Piping insulation for renovation:
 1. For projects that modify small sections of piping, match existing insulation installation if insulation is in good condition.
 2. If project modifies most of the piping an area, new insulation shall match current insulation guidelines in UM Consultant Procedures and Design Guidelines, Division 22 Plumbing.
 3. If insulation in a project area is generally in poor condition, confirm scope of demolition and new insulation with MUHC PDC.
- M. Piping and fittings storage: all pipe and fittings used on MUHC projects shall be stored in a clean manner to prevent any contamination (including but not limited to sand, dirt, rock, cans, pests, etc.) of pipe prior to installation. Owner reserves the right to reject any materials not conforming to this practice.
- N. Victaulic Piping: Confirm with MUHC early in design whether Victaulic Piping is allowed.
- O. Press fittings only allowed with approval of MUHC PDC.

22 0553 Identification for Plumbing Piping and Equipment

- A. All piping except control line tubing shall be labeled.
- B. ASME A13.1- 2007 (R2013) references the technical definitions, color standards and color tolerances set forth in the American National Standards Institute (ANSI)/National Electrical Manufacturers Association (NEMA) Z535.1- 2006 (R2011) Safety Colors. The color shades suggested are intended to give the highest level of recognition to employees with both normal and color-deficient vision.
 - 1. Matrix:
 - a. Domestic Water Piping: Blue (Background) – White (Letters)
 - b. Sanitary Waste, Vent and Storm Drainage Piping: Black (Background) – White (Lettering)
 - c. Medical Air Systems: Yellow (Background) – Black (Letters)
 - d. Oxygen: Green (Background) – White (Letters)
 - e. Medical Vacuum: White (Background) – Black (Letters)
 - f. WAGD: Purple (Background) – White (Letters)

22 1316 Sanitary Waste and Vent Piping

- A. Includes Pipe and Fittings.
 - 1. Waste piping material to be cast iron.
 - 2. Waste laterals should be coated.
 - 3. PVC not allowed for hospitals since they are defend-in-place. PVC construction/barrier penetrations creates higher potential for toxic smoke throughout a smoke zone.
- B. Where low flow or water conservation type fixtures are used, the engineering design shall match the reduced water flow with drainpipe installation to produce proper drainage and slope.
- C. No double combinations are to be installed opposite one another to prevent formation of blockages (sanitary wipes, cloths, etc.).
- D. Sanitary drain double Y connections shall be offset where two drains come together.

22 3000 Plumbing Equipment

- A. Cleanouts
 - 1. Acceptable manufacturers:
 - a. Mifab
 - b. Jay R. Smith
 - c. Watts
 - 2. Cleanouts above floor grade are to have easy access.

3. None located in the ceiling servicing, minimum of 1 foot above finished floor.

B. Hot Water Recirculating Pump

1. Preferred Vendors:

- a. Bell & Gossett
- b. Armstrong
- c. Aurora

2. Redundant Pumps

- a. Should be used every day to prevent stagnant water in idle pumps and associated isolated piping.
- b. If switching idle pumps is a manually process, it is acceptable to alternate weekly.
- c. Preference is to include control of domestic pumps via the BAS system.
- d. Discuss with MUHC Health Facilities Managing Engineer during design.

C. Water Heater – Electric or Gas:

1. Standard water heaters are steam fired at MUHC Main Campus buildings. Use of electric or gas fired water heaters in design requires approval of Owner's Representative.
2. Acceptable manufacturers:
 - a. A. O Smith
 - b. Hesco, Inc.
 - c. State Industries
 - d. Rheem/Rudd

22 4000 Plumbing Fixtures

A. Faucets

1. Preferred Vendors:
 - a. Chicago Faucets
 - b. Zurn
2. Faucets intended for staff and patient use shall contain antimicrobial laminar flow aerators.
3. Per MUHC water management plan: Faucets for handwash sinks must be offset from the drain to minimize chance that biofilm in the drain will be loosened and transmitted. CDC recommends splash guards on sinks within 3 feet of areas for med prep or patient/clean supplies.
4. In public restrooms of off-site buildings(facilities with no generators), automated faucets shall be hard wired.
5. Battery operated inside the hospitals (facilities with generators)
6. Faucet stems shall have ceramic seats. Chicago Faucets preferred manufacturer.

7. Low flow faucets shall not have a flow less than 1.0 gpm and shall include an anti-microbial laminar flow aerator where installed at sinks.
- B. Lavatories - in countertops
 1. 19" x 19" x 10" deep stainless-steel bowl for Procedure, Soiled/Clean Utility, Med Room, Exam Rooms and Patient Rooms.
 2. Basis of Design:
 - a. Elkay Lustertone Classic Stainless Steel 19 ½ " x 19" x 10 1/8
- C. Lavatories - Wall hung.
 1. Appropriate blocking required to support weight.
- D. Shower valves (thermostatic and/or pressure balancing type)
 1. Hoses shall be short enough that the wand is at least 3" above the floor when hanging to prevent Legionella growth.
 2. Preferred manufacturers
 - a. Leonard
 - b. Simmons
 - c. Lawler
- E. Water Closets
 1. Preferred manufacturers (standard)
 - a. American Standard
 - b. Kohler
 - c. Crane
 2. Preferred manufacturers (bariatric)
 - a. Discuss with MUHC HF Managing Engineer
 3. Floor Mount only.
 4. Bottom discharge preferred. Floor-mount rear-discharge may be considered for specific applications.
 5. Auto Flush Valves (Public and Staff only):
 - a. Hard wired
 - b. Patient rooms: include hose type bedpan sprayer assembly.
 - c. Basis of Design: Sloan Royal 186-1
 6. Manual Flush Valves (Patient and On-call)
 - a. Basis of Design:
 - i. Toilet valves: Sloan 110, chrome exposed manual flushometer.

- ii. Urinal valves: Sloan 186, chrome exposed manual flushometer.
 - 7. Public restrooms shall utilize ADA accessible, flip-down grab/support bar on the off-wall side of the toilet.
 - 8. Ensure that all water closets are rated to accommodate patient weight requirements for patients of size and that the supports/ blocking behind the wall or in the floor will support/exceed that rating.
 - 9. MUHC prefers the top of the water closet seat to be at maximum ADA height AFF.
 - 10. Low-flow water closets shall not have a flow less than 1.6 gpm.
- F. Eye Wash and Emergency Showers
- 1. Eye Wash and emergency showers shall comply with ANSI-Z358.1.
 - 2. Validate if a unit is required through MUHC Safety. For eyewash units, Basis of Design would be a Guardian G5022 or equivalent.
 - 3. Per DNV, eyewash installation must meet requirements from the most current version of ANSI-Z358-1

22 6000 Medical Air, Gas and Vacuum

A. Medical Piping and Pipeline Components (No Substitutions)

1. Medical Gas Outlets

- a. WH - Beacon Medaes Gemini III
- b. UH Campus:
 - a. Medstar/Oxiequip outlet.
 - b. Suggested vendor: Amico

2. System inspections

- a. Shall be performed prior to concealing piping distribution systems in walls, ceilings, chases, trenches, underground, or otherwise hidden from view. (NFPA 99 – 2022 5.1.12.3.1.1)
- b. Inspections shall be conducted by a party technically competent and experienced in the field of medical gas and vacuum pipeline inspections and testing and meeting the requirements of an ASSE 6020, or ASSE 6030. (NFPA 99-2018 5.1.12.3.1.3)
- c. Inspections shall be performed by a party other than the installing contractor. (NFPA 99 – 2012 5.1.12.3.1.4)
- d. The presence and correctness of labeling and valve tagging required by this code for all concealed components and piping distribution systems shall be inspected. (NFPA 99 – 2012 5.1.12.3.2.2)

B. Design requirements

1. Medical Gas rooms containing cryogenic containers or positive pressure gases other than oxygen or medical air shall have an O₂ sensor installed. It will alarm outside the room and will be tied into the BAS where feasible.

DIVISION 23 – HEATING VENTILATION AND AIR CONDITIONING

See [UM Consultant Procedures and Design Guidelines](#). All design guidelines posted are applicable. Information below supplements and supersedes information provided in Division 23 of those documents.

General

- A. Per FGI Guidelines for Construction of Hospitals and Outpatient Facilities (FGI), if renovation efforts result in system modifications that “affect greater than 10% of the system capacity, designers shall utilize pre-renovation water/air flow rate measurements in the affected zones to verify that sufficient capacity is available and that renovations have not adversely affected flow rates in non-renovated areas.”
- B. Ventilation and space-conditioning requirements shall follow ASHRAE 170 unless specific policies have been put in place by MUHC/MU FPD to allow alternate practice.
- C. Consultants shall consider appropriate redundancy for each project and shall coordinate/confirm redundancy design intent with MU Health Care.
- D. Maintain a minimum access area of 24 inches around all above ceiling mounted equipment. Approval for any variance to this requirement by MUHC.
- E. Equipment placement in critical areas shall be coordinated and approved early in design. Reduce or eliminate above ceiling HVAC equipment in critical areas such as: Operating Rooms, Cath Labs, and Procedure Rooms.
- F. Duct or AHU humidifier installations shall include doors/access with view panel or window.
- G. All cooling coils shall incorporate 5-foot standardize UV lamps to inhibit biological growth on coils. UV lamps shall be encapsulated. Also protect components from UV damage/exposure.
- H. Differential pressure gages shall be installed across all filter banks.
- I. Gages and devices shall be labeled to indicate normal range of operation.
- J. The A/E shall include in the General Notes section of the Drawings a note stating, “No mechanical piping or HVAC duct (except where used for stairwell pressurization purposes) shall penetrate through fire resistance rated exit enclosures (stairwells and exit passageways)”.
- K. Refrigerants used in any equipment must be EPA approved and not scheduled to be phased out of production within the next five years.
- L. Where dampers and/or their housings are installed below 8' in a finished space or mechanical room, protect the exposed corners in order to avoid sharp edges that may cause injury.

M. Isolation Room Exhaust:

1. Grilles are to be located within 6" of the floor and behind the bed.
2. Power for the exhaust system must be accessible to staff (Key switch, knob).
3. Monitoring devices are required to verify the pressure differential (Negative/neutral)
4. Shall meet all ACH requirements and all applicable codes.
5. The A/E shall note on the drawings "Any walls of the room that are not designated as smoke partitions or smoke barriers shall be sealed airtight."

N. ***Smoke and fire damper locations shall appear on a dedicated drawing layer.*** Record Drawings shall include separate Fire and Smoke Damper drawing that shows locations of fire and/or smoke dampers and details.

O. One-line diagrams shall be provided for the following systems:

1. Supply/Return air flow from air handlers
2. Exhaust fans
3. Hydronic systems (Heating Hot Water, Chilled Water)
4. Steam supply and return

23 0513 Common Motor Requirements for HVAC Equipment

A. All electric motors must have shaft-grounding straps when used with VFD.

B. Acceptable Manufacturers:

1. Baldor
2. Toshiba
3. World Wide
4. Reliance
5. Weg

23 0593 Testing, Adjusting and Balancing

A. TAB is by a Third-Party TAB firm hired by the Owner. This statement conflicts with Note B. below- Dennis Haynes

B. TAB During Construction: First choice is to have TAB provided by MU Campus Facilities Energy Management (EM). For TAB provider other than EM, PM and MUHC shall work together to select consultant that is best suited to meet project needs.

C. Testing for current (preconstruction) performance prior to system modification is required during project evaluation and/or design. Owner will perform it for every project to confirm there is adequate air capacity to support the future or existing project program. This is required even if there is no anticipated increased load on the air handling system to confirm the system

still has adequate capacity to support existing programs. Consultant shall inform PM of any specific information that needs to be captured for their use.

- D. Minimum allowable airflow during balancing shall be the design CFM stated on the drawings. This must be stated in the TAB specifications.
- E. TAB specification provided in the bid package shall describe the Contractor's scope of work to support Third Party TAB.
- F. Separate TAB specification for the Third-Party TAB contractor's scope of work shall also be prepared. This shall be used by the CF PM to hire the Third-Party TAB firm.
- G. Third Party TAB scope shall be revised to include TAB of all water systems, including plumbing.
- H. Pressure critical spaces (including but not limited to OR's , Procedure Rooms and Cath Labs) shall have a series of blower door air pressure tests at the following project milestones:
 - 1. At beginning of design to determine if the project needs to include scope to make the space air-tight
 - 2. Prior to ceiling installation to shows room has met acceptable level of tightness before substantial completion is granted. This shall occur late enough in construction that the test can be successfully completed but early enough that corrections can be made without impacting project schedule.
 - 3. During Test and Balance (prior to substantial completion being granted). This requirement shall be met before project status can change to substantially complete.

23 0700 Mechanical Systems Insulation:

- A. Ductwork Insulation
 - 1. No exposed insulation inside duct work
 - 2. Flexible Elastomeric may be approved inside return air boots in plenum spaces with approval of MUHC Planning, Design and Construction

23 0800 Commissioning of HVAC Systems

- A. Commissioning shall be performed by a 3rd party Commissioning agent contracted by Owner on every project that installs major HVAC equipment.

23 2100 Building Hydronic Piping and Pump Systems

- A. Dielectric Waterways are the preferred method to isolate dissimilar piping materials per [UM Consultant Procedures and Design Guidelines](#).

23 2200 Steam and Condensate Piping and Pump Systems

- A. Condensate returns shall be pumped back to make-up water system and not to waste.

- B. Thermometers:
 - 1. Provide adjustable angle, industrial thermometers with 9" scales, cast aluminum cases, and chrome plated brass separable sockets.
- C. Chemical Water Treatment Products (WH Only):
 - 1. Garrett Callahan
 - 2. Nalco
- D. Boilers:
 - 1. Flow Meter - Acceptable Vendors:
 - a. Fluid Components International
 - b. American Meter

23 3000 HVAC Air Distribution

- A. Duct Labeling:
 - 1. Ductwork shall be labeled with flow direction and type (general exhaust, contaminated exhaust, kitchen hood exhaust, supply, outside air, return, etc.).
 - 2. Labeling shall be placed every 15 feet, within 5 feet of all elbows and tees, and on both sides of a wall penetration within 3 feet of the penetration.
 - 3. Labeling shall include source equipment information (AHU#, EF-#, etc.).
 - 4. Labeling shall be installed on each floor of duct risers, mechanical rooms and locations where multiple duct systems share a location or identification is ambiguous.
- B. Access doors shall be provided where duct mounted devices will require periodic inspection, maintenance or cleaning. Including but not limited to Humidifiers, Motorized Dampers, Return/Exhaust VAVs, Fire/Smoke dampers, Air Measuring Stations and MRI waveguides. A clear path to access doors must be maintained.
- C. Duct fabrication labels shall be placed on duct exterior only. No paper identification labels shall be inside the duct.
- D. All ductwork, fittings, VAV's etc. shall be palletized and shrink wrapped for delivery to the jobsite.
- E. Where dampers and/or their housings are installed below 8' in a finished space or mechanical room, protect the exposed corners to avoid sharp edges that may cause injury.
- F. Shipping:
 - 1. All ductwork and accessories shipped from fabrication shop(s) shall be shipped in an enclosed trailer or enclosed truck to protect the ductwork from damage, dirt, and moisture during transit to the jobsite.

2. Shop fabricated ductwork and fittings shall ship to the site completely assembled and both ends sealed with an adhered protective covering (hairnets are not acceptable).
3. cursory cleaning shall take place when any foreign substance is noted.

G. Handling:

1. When moving or unloading ductwork, ductwork shall not be placed on the ground.
2. Ductwork shall be placed directly in storage vans or within the building as it is unloaded, no exceptions.
3. Ductwork shall be moved on carts or dollies.
4. Ductwork that is wrapped shall not be dragged across the floor as it can damage the seals.

H. Installation and Final Clean:

1. Ductwork systems shall be installed at the site to maintain “shop” or “mill” (free of mill oil) conditions. The ductwork shall be cleaned as necessary to maintain these conditions.
2. Cleaning shall be performed using a 20% Isopropyl Alcohol to wipe down all interior surfaces upon installation.
3. Interior surfaces must be dust free and exterior surfaces must be free of foreign substances.
4. Cover all ends of installed ductwork at the end of each workday, or when work is suspended for any length of time, i.e., breaks, lunch, etc.
5. At the end of the workday, Contractor is to ensure all ends are protected with an air-tight cover on both stored and installed ductwork.
6. If installed prior to roofing, protect ductwork from water infiltration.

I. Storage:

1. Ductwork that is delivered to the site shall be installed as soon as possible.
2. Care shall be taken to schedule only enough material on site for the immediate workload.
3. Ductwork stored on site must be in enclosed vans or inside the building at least 4” above the floor to avoid damage from weather or spills.
4. Openings and ends shall be continually protected with an air-tight cover.
5. Owner reserves the right to reject any materials if contractor isn’t conforming to practices for keeping materials free of dirt and contamination.

J. Support: “clutcher” type duct supports are prohibited without prior approval from MUHC Health Facilities Managing Engineer.

K. Fire and/or smoke dampers:

1. Dampers must have a test switch installed as an assembly by the manufacturer located at damper for testing purposes. This switch will drop the signal from the fire alarm system shutting the damper down.

2. Dampers require access panels 18" x 18" to access damper for repairs or required testing. All fire/smoke dampers will need to have easy access, above ceiling with no obstructions.
3. All walls deemed as integral to Life Safety shall be clearly marked on the Mechanical drawings in addition to the Life Safety drawing sheets for clarity and reference for the respective tradesmen.

23 3600 Air Terminal Units

- A. Controllers for UH campus equipment shall be JCI.
 1. Confirm early in design if controls will be purchased by CF Energy Management or by MUHC Engineering Services.
 2. If controls installation is by MU Energy Management, the JCI controllers shall be ordered by Energy Management and installed by their personnel.
 3. If JCI controllers are installed in VAV terminal units by the factory, units shall be completely sealed and shall not be opened until they are installed, and ductwork connected.
- B. Controllers for WH equipment shall be Siemens.
- C. Air Terminal Units: two-pass heat coils to shall be basis of design for operating rooms, trauma rooms and burn treatment areas. Verify with MUHC.
- D. All VAV box installations shall have a service valve before the coil valve.
- E. Existing terminal units shall be protected during construction.
- F. It is preferable to have air terminal units control the return airflow of VAV systems rather than relying on manual dampers.
 1. Vortex shedding is the preferred type for systems with large amounts of lint.
- G. Acceptable manufacturers:
 1. Supply:
 - a. Titus (Basis of design)
 - b. Trane
 - c. Price
 2. Return
 - a. Accutrol (for high lint systems; no substitutions)
 - b. Titus (standard return)
 - c. Price (standard return)
 - d. Trane (standard return)
- H. Construction and record documents shall include a drawing or matrix detailing VAV connections to occupancy sensors.

23 3700 Air Outlets and Inlets

- A. Air outlets should be installed with filter media or blanked off (as directed by the Owner's Representative).
- B. Return air shall not be activated until all dust generating activities are complete. Temporary duct modifications, manual damper settings or overrides on control systems may be required. If return air must be activated prior to completion, upon approval by the Construction Manager, install filter media on return duct openings.
- C. Discuss type of return grilles to be used for each project. Egg crate grilles have been a past standard but have proven to be difficult to clean. Current standard for patient care spaces is perforated.
- D. Metal fittings shall be installed at each diffuser where flex duct is allowed. Do not attach flex duct directly to diffusers.

23 7000 Air Handling Units

- A. All air handlers shall be assigned an equipment tag. Equipment numbering shall follow MUHC standard and start with the next number in the AHU equipment list. Consultant shall coordinate numbering with the MUHC Mechanical Trades Supervisor. In no instance other than new or fully renovated facilities shall air handler equipment tag numbering start with a number "1".
- B. Use of roof mounted equipment shall be approved by MU Health Care.
- C. Air Handling Units (including their respective mechanical equipment rooms) and rooftop units are to be inspected for dirt/debris prior to any filter installation/start-up and shall be cleaned as necessary. Use 10% Isopropyl Alcohol solution to wipe down the inside surfaces of the air handlers.
- D. Basis of Design units for air handlers serving critical spaces shall be fan-array type with N+1 fan redundancy. Unit shall meet required capacity with one fan offline. Each fan in the array shall be served by a dedicated VFD or Electrically Commutated Motor (ECM).
- E. Air handling Units shall be draw-through.
- F. Location of coil relative to fan shall avoid moisture carryover and biological growth in filters.
- G. Elimination of moisture carryover from coils shall be included in design. Confirm parameters with MUHC PDC and ES.
- H. Design shall consider means of dehumidification/dew point control. Reheat coil, separate desaturation coil, or other means approved by MUHC shall be discussed during design and approved by MUHC.
- I. UV or other MUHC approved coil disinfection strategy shall be included.
- J. Steam coils are expressly prohibited.

- K. AHU manufacturer's representative shall be onsite during installation/assembly of equipment. Consultant shall confirm this requirement is included in the project specifications.
- L. Rooftop (outside) DX equipment shall include hail guards.
- M. AHU or duct airflow measurement devices must employ vortex shedding technology. VAVs are excluded from this requirement.
- N. Computer Room Air Conditioning Unit (Liebert Basis of Design, alternate Stultz):
 - 1. All cooling equipment shall be accessible for maintenance and be dedicated to the specialty data room.
 - 2. Service access panels installed per manufacturer specification.
- O. Leakage:
 - 1. Select an air handler with a manufacturer's designation showing air leakage is less than or equal to 2% of the design airflow rate.
 - 2. Putty shall be installed around all conduit and wiring holes.
 - 3. UL-approved gaskets shall be used to seal cabinet doors and access panels.
 - 4. All unused conduit knockouts shall be sealed with UL listed tape or mastic.
 - 5. All fixed seams in the cabinets and all seams between the cabinet and supply or return plenums shall be sealed with mastic or mastic and fiberglass mesh fabric.
 - 6. Sealing putty shall be used to seal the inside of the high-voltage wire conduit termination point in the air handlers after wiring has been installed.
 - 7. Insulation inside the air handler where the conduit enters shall be checked by the contractor. If the insulation has been compromised, it shall be repaired with approved spray glue and additional insulation.
 - 8. Contractor shall test the airtightness of the air handler cabinet and ducts to verify that the system meets code or program airtightness requirements.

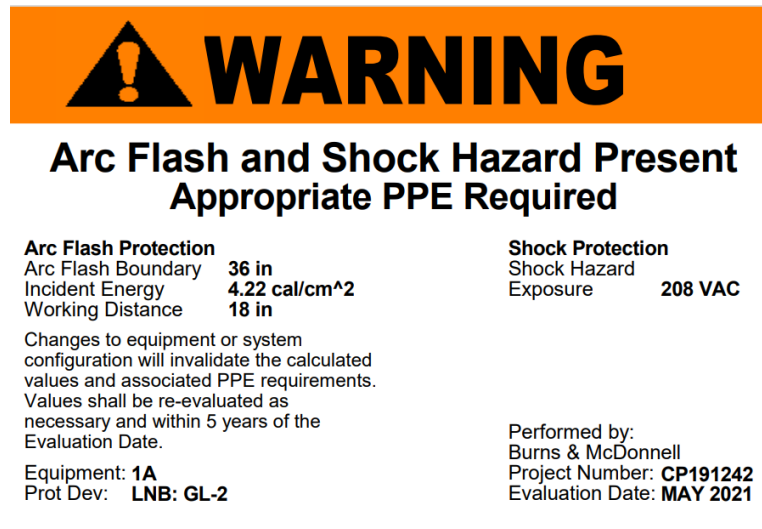
DIVISION 25 – BUILDING AUTOMATION SYSTEM

- A. UH Campus (MOI, MUPC, TH, CCA, PCT, LC, and UPMB), Quarterdeck, and several other off-site properties utilize Johnson Control (JCI) Metasys®. All controllers and thermostats are provided by the Owner. Replace all pneumatic controls during renovation.
- B. WH utilizes Siemens. There is no plan to change the WH BAS system to JCI at this time.
- C. Occupancy Sensors shall not utilize ultrasonic technology as it interferes with other systems in use. Plan density of sensors accordingly.
- D. For additional guidelines, see [UM Consultant Procedures and Design Guidelines, Division 23.](#)

DIVISION 26 – ELECTRICAL

- A. Avoid lighting fixtures that are costly to maintain or repair.
- B. All lighting fixtures must be placed so that they are easily accessible for future maintenance. If placement of fixtures will require anything other than a standard 12-foot ladder, placement will need to be approved by MU Health Care.
- C. Indirect recessed perforated basket type fixtures must be **LED**, and either Focal Point or Metalux. (Lithonia and Williams perforated baskets tend to be disorienting and nauseating to patients with astigmatism).
- D. Fire/Smoke barrier assemblies shall be clearly marked on the Electrical drawings.
- E. Preferred Vendor: Metalux Encounter 24EN LED Specification Grade Troffer
- F. Under cabinet lights: LED hard wired. Included and located only as requested by User/Client group. Coordination of power connection shall be included as a detail in the project drawings and confirmed with manufacturer prior to completion of 50% CD Review.
- G. All primary incoming power shall be noted as ABC (clockwise) rotation to match generator rotation. Notes must indicate that rotation is to be confirmed prior to ordering major electrical equipment and prior to termination of power cables.
- H. Power System Studies and Arc Flash Labels:
 - a. All Power System Studies (PSS) shall have the MU project number and Name prominently displayed on the cover sheet of the report.
 - b. All PSS diagrams and labels shall also have MU Project number and name included.
 - c. Confirm during design who is responsible for changing any and all recommended breaker settings during construction.
 - d. Report is required during construction to confirm breaker settings, who made the correction, and PSS labels are based upon correction.
 - e. Labels shall not be placed until breaker settings have been corrected.
 - f. Once breaker settings have been corrected, a Request for Change must be approved by MUCH Engineering Services before settings are modified again.

g. Typical label shall be as follows:



260519 Low Voltage Electrical Power Conductors and Cables:

A. CONDUCTORS:

1. Provide 98% conductivity copper conductors with 600-volt insulation.
2. For conductors No. 10 AWG, provide stranded type THWN-2 or THHN, unless approved by MUHC PD&C. For conductors No. 12 AWG, provide type TWHN-2 or THHN solid.
3. For conductors No. 14 AWG and smaller, provide stranded type THHN.
4. Per [*UM Consultant Procedures and Design Guidelines*](#), aluminum conductors are prohibited.
5. MC Cable must be hospital grade and is only allowed for lighting whips (5' or less; above ceiling only). **Any other use must be approved by MUHC PD&C in writing during design.** Construction documents must specifically state approved use of MC Cable and state "prohibited" if product is not allowed in the project.

260533 Raceway and Boxes for Electrical Systems:

A. Standardized Color Coding of Conduit

1. Red with uncolored J-boxes = Life Safety Branch
2. Orange = Critical Branch
3. Yellow = Equipment Branch
4. Red with Red J-boxes = Fire Alarm

261300 Medium Voltage Switchgear

A. EXTRA MATERIALS

1. Provide spare parts as recommended by manufacturer and as indicated on the drawings.
2. Provide a complete set of spare fuses of all sizes and ratings used in the switchgear.
3. Provide fuse cabinet.

B. PRODUCTS

1. Acceptable manufacturers
 - a. Square D
 - b. General Electric/ABB
 - c. Eaton
2. No other manufacturers are acceptable.
3. Barriers shall be included between Switchgear sections if more than one section is included in a cabinet.
4. Touch Safe terminal blocks shall be utilized.

C. EXECUTION

1. Contractor shall Install required safety labels including arc flash requirements.

262300 Low Voltage Switchgear:

A. GE/ABB Switchgear shall be the Basis of Design.

1. Barriers shall be included between Switchgear sections if more than one section is included in a cabinet.
2. Touch Safe terminal blocks shall be utilized.

262400 Switchboards, Panel boards and Motor Control Centers:

- #### **A. Panel board assembly shall be enclosed in a locking steel cabinet. The size of the wiring gutters shall be in accordance with UL Standard 67. Fronts shall have door with matching trim, be of code gauge full finished steel with rust inhibiting primer and baked enamel finish. Assembly shall have swing fronts.**

262726 Wiring Devices:

- #### **A. Install Hospital grade tamper resistant receptacles in all patient care areas including, but not limited to, pediatric rooms, unit corridors, waiting rooms and therapy or play areas.**
- #### **B. GFI Receptacles in all areas deemed "wet locations".**

262923 Variable Frequency Motor Drives:

- A. Starter Indicator lights/ operating signals shall include the following at a minimum:
 - 1. Power on
 - 2. Zero speed
 - 3. Enabled
 - 4. Over temperature
 - 5. Current limit
 - 6. Under voltage
 - 7. Over voltage
 - 8. Over current
 - 9. % Speed
 - 10. % Load
- B. Drives must have by-pass feature or 100% redundant backup drive. Preference is redundant drives if space is available. Confirm with MUHC PD&C HF Managing Engineer during design.

263200 Packaged Generator Assemblies

- A. Remote radiators for emergency generators are prohibited without prior approval from MUHC.

263600 Transfer Switches:

- A. General Transfer Switch Product Requirements:
 - 1. Motor Loads: For switches that serve motor loads, furnish closed transition transfer switch with in-phase monitor (make-then-break)
- B. Products:
 - 1. Acceptable manufacturers: Russelectric or ASCO.

265213 Emergency and Exit Lighting

- A. Basis of design Exist Lighting fixture shall be:
 - 1. Sure-Lites EUX7 series
 - 2. Edgelit
 - 3. Self-powered emergency
 - 4. LED lamps
 - 5. Red lettering
 - 6. Brushed Aluminum housing
 - 7. No self-diagnostics

- B. Emergency Lights (wall-pacs)
 - 1. Where emergency power is available, emergency egress lighting will be connected to the EP.
 - 2. Battery powered wall-pac units to be used for task lighting in approved anesthetizing locations.
 - 3. Where there is not EP, battery powered wall-pacs approved to be used.
 - 4. Consider using a remote battery system with numerous egress lighting. Less maintenance manpower for monthly and annual checks.
 - 5. If battery powered, battery system should be included.
 - 6. If critical access location (e.g., MRI) has battery powered lighting, the battery bank needs to be located in a perimeter location for ease of access by maintenance.
 - 7. Lights that are located in inaccessible location shall have remote battery banks.
- C. NOTE: Convenience lighting shall not be added without input from MUHC PDC. Formal process needed to request and approve convenience lighting.

DIVISION 27 – COMMUNICATIONS

- A. CAT 6A cable will be supplied by Owner, installed by Contractor.
 - 1. Conduits to be a minimum of 1-1/4" diameter.
 - 2. Typically include 3 drops per outlet.
 - 3. Termination will be by Owner.
 - 4. Daisy chaining boxes in not an acceptable practice.
 - 5. Conduit other than EMT shall be pre-approved during design by MUHC Managing Engineer.
- B. Nurse Call System will be by Owner.
 - 1. Rauland Responder 5
 - 2. CF PM will hire Nurse Call Vendor (All-Systems) via MUHC Blanket Contract during design to provide input in bid documents.
 - 3. Pathways are installed by the contractor. See Division 1.
- C. Fire/Smoke barrier assemblies shall be clearly marked on the Communications drawings.
- D. See CPDG Division 27 requirements for telecommunication room rated wall requirements.
 - 1. This requirement may be waived for renovation projects if they cause an undue hardship on the project. Submit a variance request for waiver to the UM AHJ for approval.
 - 2. The Physical Environment Committee must review the waiver request prior to it being sent to the UM AHJ.
- E. See [MU Telecommunications Construction Standards](#) for sizes, configuration, and where to locate IT closets.

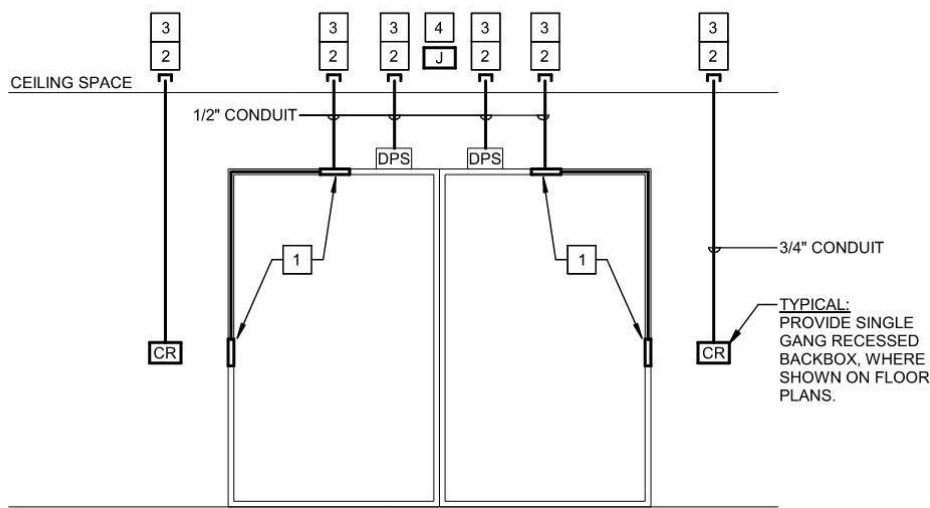
DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

Miscellaneous

- A. Cameras shall be mounted on the interior of all exit doors so that pedestrians entering the building can be identified. Cameras shall be mounted on the exterior in such a way that all entry points can be monitored either from a distance looking back at the entry point or from the building overlooking the exit.
- B. Any rooms that have regulatory items such as pharmacy drugs, telecom equipment, cash, nuclear products, high value items, high danger items, and high voltage works, shall have electronic access control with a manual key override. Provide cameras facing the outside of the door where these valuables, critical infrastructure or dangerous items are housed to monitor these items. Depending on the value or item being protected, include a camera inside the room with a 360-degree view.
- C. Any rooms that have critical infrastructure items, fire pumps, dialysis water preparations, emergency generators, water sources that could be contaminated, etc., should have access control with manual key override, electronic access, cameras, and alarms.
- D. Place license plate cameras, or other surveillance cameras, at vehicle entry points and building access points. The quantity and position of cameras will be dependent upon the site plan and specific layout of the grounds. Confirm locations with MUHC Security.
- E. For high-risk areas, suggest an intercom that can be accessed by dispatch so they can hear what is going on inside the room or building in the event of an alarm depending on the risk or value of what is inside the area. MUHC Security will confirm locations.

Card Access

- A. Access Card control system is On Guard coordinated with MUHC Security.
- B. Card readers should be located within reach of the door hardware, except at power operated openings.
- C. Per Division 8, all exterior doors that have electronic access control shall have a key override.



NOTES

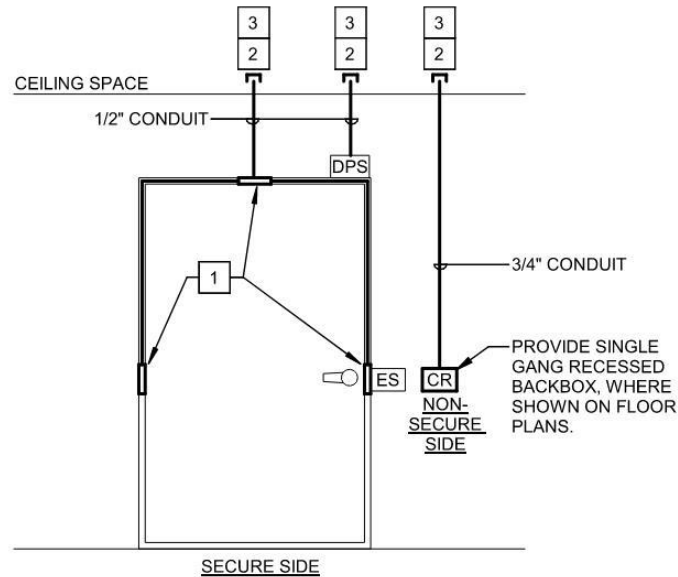
- 1. DETAIL IS DIAGRAMMATIC ONLY AND MAY NOT REPRESENT ACTUAL DEVICES/QUANTITY OF DEVICES REQUIRED. COORDINATE ALL REQUIREMENTS WITH FINAL DOOR HARDWARE PROVIDED AND AS CALLED OUT ON ARCHITECTURAL DRAWINGS. COORDINATE WITH SECURITY SYSTEM INSTALLER FOR EXACT ROUGH-IN LOCATIONS AND REQUIREMENTS.
- 2. COORDINATE FINAL REQUIREMENTS WITH ACCESS CONTROL VENDOR. PROVIDE EACH ACCESS CONTROL DOOR WITH ONE (1) 18/6 UNSHIELDED CABLE AND ONE (1) 22/6 SHIELDED CABLE.

KEYED NOTES

- 1. PROVIDE JUNCTION BOXES FLUSH WITHIN THE DOOR FRAME WITH 1/2" FLEXIBLE CONDUIT BETWEEN BOXES AS REQUIRED FOR ROUTING OF ACCESS CONTROL WIRING INSIDE DOOR FRAME.
- 2. STUB CONDUIT 6" ABOVE ACCESSIBLE CEILING.
- 3. LOW VOLTAGE ACCESS CONTROL SYSTEM CABLES: ROUTE TO DOOR ACCESS CONTROL PANEL IN LOCAL TELECOMMUNICATION ROOM.
- 4. PROVIDE 4" SQUARE JUNCTION BOX FOR CONNECTIONS TO DOOR OPERATOR. REFER TO FLOOR PLANS FOR POWER CIRCUITING REQUIREMENTS.

**10 ACCESS CONTROL ROUGH-IN DIAGRAM -
DOUBLE DOOR OPERATOR**

E500 SCALE: NO SCALE



NOTES

1. DETAIL IS DIAGRAMMATIC ONLY AND MAY NOT REPRESENT ACTUAL DEVICES/QUANTITY OF DEVICES REQUIRED. COORDINATE ALL REQUIREMENTS WITH FINAL DOOR HARDWARE PROVIDED AND AS CALLED OUT ON ARCHITECTURAL DRAWINGS. COORDINATE WITH SECURITY SYSTEM INSTALLER FOR EXACT ROUGH-IN LOCATIONS AND REQUIREMENTS.
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2. STUB CONDUIT 6" ABOVE ACCESSIBLE CEILING.
3. LOW VOLTAGE ACCESS CONTROL SYSTEM CABLES: ROUTE TO DOOR ACCESS CONTROL PANEL IN LOCAL TELECOMMUNICATION ROOM.

9 ACCESS CONTROL ROUGH-IN DIAGRAM

E500 SCALE: NO SCALE

Security

- A. Security Concerns: To prevent abduction, all access points to infant and pediatric care departments (including the Birthing Center) must be controlled with security devices. Specific examples include:
 - 1. Elevator vestibules with card access and a push button at the Nurse station to allow visitors to enter and depart. 24-volt system
 - 2. Stair doors locked down and accessed by either a card/proximity reader or push button at Nurse Station. 24-volt system. All of the system shall meet NFPA 101 19.2.2.2.5
 - 3. Delayed Egress only considered with AHJ approval.
 - 4. Provide digital cameras at isolated/remote locations as necessary to view potential visitors, doctors, etc. Include intercom as necessary.
- B. Confirm strategy with MUHC Security.

28 3100 Fire Detection and Alarm

*All fire alarm systems shall be designed in compliance with NFPA 72 (2010 and 2016 Editions) and sealed by a licensed engineer. **Follow UM CPDG's, Section 28 3100, for minimum standards for design documents to include even if this work is delegated design.***

- B. WH – Only Notifier Fire Alarm Systems and components may be utilized.
- C. UH Campus – Only Siemens Fire Alarm Systems and components may be utilized.
- D. Other sites: depending upon needs. Coordinate with MUHC.
- E. Duct detectors must be compatible with the Fire Alarm System installed. They must be addressable and controllable by the Fire Alarm Panel. They may not be stand alone. Contact MUHC Engineering Services for direction if stand-alone duct detection is found in an existing facility.
- F. Notification appliances – strobes must be visible at all times and may not be obscured by signage, window treatments, case work, projection screens, monitors, etc.
- G. Design Engineer shall coordinate all Siemens FA work with the MUHC Siemens contact.
- H. Add note to Fire Alarm drawings/specifications: **“Smoke detectors shall not be installed closer than 3’ to ANY air moving device (supply diffuser, return grille, exhaust grille, etc.).”**

DIVISION 31 – EARTHWORK

- A. See [UM Consultant Procedures and Design Guidelines](#). All design guidelines posted are applicable. Information below supplements and supersedes information provided in Division 31 of those documents.
- B. All removed topsoil is to be stockpiled at owner direction, with balance transferring to owner upon project completion.

DIVISION 32 – EXTERIOR IMPROVEMENTS

See [UM Consultant Procedures and Design Guidelines](#). All design guidelines posted are applicable. Information below supplements and supersedes information provided in Division 32 of those documents.

- A. All parking lots will be designed to facilitate snow removal.
- B. All paved surfaces shall be designed for proper slope and fall to carry water away to storm basins and away from pedestrian walk access.
- C. All pedestrian pathways shall meet ADA.
- D. Install sleeves under walks and roads for future development such as power/ signs /sprinklers to minimize number of roads or sidewalk cuts. Irrigation sleeves will be a minimum of 4" in diameter. Edge of sidewalk or curb shall be stamped/marked to indicate location of sleeve.
- E. All new construction shall provide hose bibs at accessible points on the exterior of the building and shall be able to produce a minimum of 80 psi.
- F. Functional irrigation shall be required in all landscaped areas and appropriately sized based on industry standards. Equipment shall be owner provided and owner installed.
- G. Disturbed grass or planted areas shall be repaired by Owner (MUHC or MU Landscape Services). Funding for repairs will be by the project.
 - 1. PM shall give direction to consultant for modifying special conditions in Division 1 to fit project parameters. A/E Consultant shall edit the applicable paragraphs of the Special Conditions provided in Division 1 document to fit project requirements.
- H. Locations for emergency oxygen connections shall be readily accessible and a concrete pad, large enough for a full-size tanker, must be in close proximity to these locations.

DIVISION 33 – UTILITIES

See [UM Consultant Procedures and Design Guidelines](#). All design guidelines posted are applicable.

APPENDIX A: ADDITIONAL DOCUMENTATION REQUIREMENTS

LIFE SAFETY PLAN (LSP)

Current draft of the **LIFE SAFETY PLAN (LSP)** will be provided by CF PM/MUHC PDC to the Consultant during design. The Design Consultant is responsible to modify and include a revised LIFE SAFETY PLAN (LSP) in the drawing set of the Contract Documents. The LIFE SAFETY PLAN must indicate all fire rated walls and assemblies, structural component ratings, smoke and fire compartments, means of egress travel distances and exits. The LIFE SAFETY PLAN should include the following General Notes:

1. All penetrations (new or existing) shall be sealed at all times, except when actively working with the penetration. Existing unsealed penetrations, once encountered, shall be sealed immediately with the appropriate fire/smoke stopping material. **See CPDG section 07 8400 for more information.**
2. Existing exits must remain accessible. Clear paths of travel to exits must be maintained within the construction limits. Contractor is to coordinate with Owner's Representative to maintain proper exit signage throughout construction. **Any revised/temporary egress plan must be approved by the UM AHJ. It must be drawn in plan view, include specific dates it will be in place, and is normally issued as an ASI during construction.**
3. Firewalls, fire barriers, fire partitions, smoke barriers and smoke partitions shall be effectively identified with stenciling in concealed spaces. Such identification shall: 1) Be located within 15' of the end of each wall and at intervals not exceeding 30" measured horizontal lying along the wall partition. 2) Include lettering not less than 3" in height with a minimum 3/8" stroke in a contrasting color incorporating wording identifying the barrier designation and fire resistance rating.

INFECTION CONTROL PLAN (ICP)

The Design Consultant is responsible to create and include an INFECTION CONTROL PLAN (**ICP**) in the drawing set of the Contract Documents. The INFECTION CONTROL PLAN should indicate locations and configurations of temporary dust and containment partitions, specifying in detail the type of construction for each partition and the path of debris removal to the exterior of the building. The following notes are to appear with the INFECTION CONTROL PLAN:

1. Dust Seal Partitions General Notes:
 - a. The Contractor is responsible to confine dust and debris to within the dust partition enclosure. There shall be NO visible dust or debris outside of the dust partitioned area. If Contractor is unable to maintain a dust and debris free area outside of dust-partition enclosure, more extensive measures will be required at the Contractors expense. The following General Notes further indicate required measures.
 - b. Precut materials for dust partitions in unoccupied areas.
 - c. Construct dust partitions of non-combustible gypsum board on one side of metal studs. Tape all joints and intersections with existing walls, decks and ceilings to

prevent the spread of dust. Extend dust-seal partitions from the floor through the suspended ceiling, to the underside of the floor deck above. At temporary walls that intersect existing finished walls, tape joint at the existing wall to seal the dust partition to the existing wall.

- d. Fire-retardant polyethylene may be used only when approved by the Owner's Representative where above-ceiling conditions are confirmed to preclude construction of a gypsum board partition tight to the deck.

As directed by CF Project Manager for dust partitions in prominent public view, include the following:

- a. Construct dust partition using vinyl covered gypsum board on the public side and install temporary vinyl base to match existing.

As directed by CF Project Manager for dust partitions required to be fire rated, include the following:

- a. Construct dust partition as a 1 hr. fire rated partition with rated door assemblies to maintain integrity of an existing rated partition. As deemed appropriate for each area and supporting Project Construction Risk Assessment. (PCRA)
- b. Provide 3'-0" minimum width access door of solid core wood with metal frame and hardware, including closer and gasketed threshold, tightly weather stripped to prevent flow of dust. Swing door into construction area. Keep enclosure locked during working and non-working hours. Key into Hospitals system as indicated by Owner's Representative.
- c. Maintain the integrity of dust-partition enclosures throughout the project. Verify penetrations and joints are continuously sealed. Keep all doors and windows closed. In the event of a breach of a dust partition enclosure, make immediately repairs and remediate dust and debris.
- d. Periodically HEPA vacuum inside the dust-partition enclosure (or as otherwise directed in the ICRA/IICM) and provide and maintain contamination control mats outside each dust-seal enclosure entry. Continuously monitor and immediately clean up dust tracked from demolition and construction areas into occupied areas of the building. Wipe transport cart wheels clean and cover cart debris each time the cart exits the dust partitioned work zone.
- e. Upon construction completion and after final cleaning, remove dust-seal enclosure material from work area and properly dispose of as debris. Minimize the spread of dirt and debris.

IC NOTES FOR MECHANICAL DRAWINGS

The Mechanical Engineering Consultant is responsible to include the following additional Infection Control notation on Mechanical Drawings of the Contract Documents:

1. All air duct covers, and HVAC equipment seals are to remain intact throughout dust generating construction. Immediately notify Owner's Representative of any observed penetrations in the dust covers or breaks in HVAC equipment seals.

2. Seal all HVAC return inlets in work areas with plastic sheeting and tape to prevent contaminants from entering the building's air system. Any existing return and exhaust air systems that must be cut and capped shall be capped outside of the construction area.
3. Coordinate with Owner's Representative before using existing HVAC supply air systems for temporary heating and cooling. In no case shall supply air fans serving occupied areas of the building be shut down without Owner's written approval. Openings in ductwork remaining within the construction area shall be sealed. Measures for maintaining proper building pressurization in all areas during construction shall be included in design.
4. HVAC systems designated with particle filters shall not be operated without filters in place. Temporary filters must have the same filtration as the permanent filters.

APPENDIX B: MUHC INTERIOR PLANTING REQUIREMENTS

GENERAL WORK INCLUDED:

1. Planters are typically funded from the Furniture Budget.
2. Maintenance is on contract in Environmental Services.
3. Design of planters shall include ready access to water.
4. Placement of planters and plants shall take into consideration the location of HVAC diffusers and drafts/winds from exterior doors.
5. All live plants shall have access to natural light or provision made for artificial light. If neither is available and where access is a problem, artificial plants will be used. Fire rated.
6. All interior planters shall be lined as to be watertight.

QUALITY ASSURANCE:

1. All plant materials shall comply with State and Federal laws relating to inspection for disease and insect control.
2. Qualification of Personnel
 - a. Use adequate numbers of skilled workmen trained and experienced in the work and familiar with requirements and methods needed for performance of the work.
 - b. At all times during planting operations, have on the site a person in a supervisory capacity who is knowledgeable in horticultural practices.

SUBMITTALS, INSPECTIONS, AND APPROVAL:

1. All materials shall be approved by the Landscape Architect or Owner.
2. Approval shall be either at the origin, by representative sample or photograph, at the option of the Landscape Architect or Owner.
3. At the origin of plant materials, trees, and other plants shall be approved and/or tagged by the Landscape Architect or Owner.
4. Substitutions
 - a. Submit samples for approval of any materials which may be suggested for substitution. Substitutions shall be of equal quality and value to the material specified.
5. Store all materials in locations as to prevent loss, damage, deterioration, or contamination.

EXECUTION:

1. Planting Bed Preparation
 - a. Filter fabric: Lay specified filter fabric over drainage layer to separate from soil mix, overlap four (4) inches at sides of planters. If planter is large enough to require seams in filter fabric, overlap filter fabric 4" and tape the seam continuously with duct tape. Punch for siphon tube where indicated.

PLANTING:

1. Move plants and soil materials into building by wheelbarrows, dollies, and other small, approved pneumatic tired vehicles. Provide protection from point of entry to planter being planted to prevent damage to floor. All vehicles being used must be approved by the Owner and Landscape Architect.

PROVISIONAL ACCEPTANCE:

1. The date of Provisional Acceptance will be the beginning date for the specified maintenance period.

APPENDIX C: MUHC GROUNDS EXTERIOR PLANTING REQUIREMENTS

GENERAL WORK INCLUDED:

1. Sodding and seeding of exterior areas disturbed by construction.
2. Work is typically funded by the construction project that caused the disturbance.
3. Typically performed by MUHC or MU Landscape Services.

SODDING:

1. Furnish all labor, materials, tools, equipment, and services for sodding, as indicated, in accordance with provisions of contract documents.
2. Location of work: Establish sodding on areas indicated, which are not occupied by other planting or construction. Seed disturbed areas outside limits of construction.
3. Any Seeded area will use the following seed mix breakdown: **[need breakdown]**
4. All sod areas must be free of netting.
5. Completely coordinate with work of other trades.

QUALITY ASSURANCE:

1. Minimum standards: In accordance with American Sod Producers Association, (ASPA) "Guideline Specifications for Sodding" (ASPA-01), current edition.

SUBMITTALS:

1. Project Information:
 - a. Certificates for sod stating botanical and common names and percentages of each species percentage of purity.
 - b. Sod labeled in accordance with ASPA-01 and equaling or exceeding specification requirements.
 - c. Fertilizer indicating chemical analysis.
 - d. Copies of invoices for fertilizer used on project, indicating grade furnished, to determine total quantity applied.
2. Contract Closeout Information:
 - a. Maintenance data.

PRODUCT DELIVERY, STORAGE, AND HANDLING:

1. Protect sod from drying out.
2. Deliver fertilizer to site in original unopened containers, labeled with manufacturers' chemical analysis.

JOB CONDITIONS:

1. Perform sodding during conditions conducive to successful results.
 - a. Provide proper and adequate protection.
 - b. Do not lay on dried-out soil.

- c. Do not place dried-out sod.
 - d. Do not lay when temperature is below 32 degrees F.
 - e. Do not lay on frozen soil.
 - f. Do not place frozen sod.
 - g. Lay within 24 hours of stripping.
2. Actual dates for sodding will vary depending on construction schedule and pending weather conditions. Notify Architect of anticipated dates for doing work at least 30 days in advance.

WARRANTY:

1. Remove and replace dead or dying sod during one year from substantial completion.
2. Replacement materials and methods identical to original.

PRODUCTS/MATERIALS:

1. Establish a smooth, healthy, uniform close stand of sod.
2. Materials:
 - a. Turf grass Sod:

Certified Approved Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.
 - b. Turfgrass Species: Sod of grass species as follows:

Fine leaf Fescue Blend

Not less than 95 percent germination.

Not less than 85 percent pure seed.

Not more than 0.5 percent weed seed.
3. Thickness of Cut: turf grass sod shall be machine cut at uniform soil thickness of 0.60 inch, plus or minus 0.25 inch, at the time of cutting. Measurement for thickness shall exclude top growth and thatch.
4. Pad Size: Individual pieces of turf grass sod shall be cut to the supplier's standard width and length. Maximum allowable deviation from standard widths and lengths shall be plus or minus 0.5 inch on width and plus or minus five percent on length. Broken pads and torn or uneven ends will not be acceptable.
5. Strength of Turf Sod Sections: Standard size sections of turf grass sod shall be strong enough that it can be picked up and handled without damage.
6. Moisture Content: Turf grass sod shall not be harvested or transplanted when its moisture content (excessively dry or wet) may adversely affect its survival.
7. Mowing Height: Before harvesting, the turf grass shall be mowed uniformly at a height of 2 to 2.5 inches.

8. Time Limitations: Turf grass sod shall be harvested, delivered and installed/transplanted within a period of 24 hours, unless a suitable preservation method is approved prior to delivery. Turf grass sod not transplanted within this period shall be inspected and approved by the inspecting officer or his representative prior to its installation.
9. Thatch: Turf grass sod shall be relatively free of thatch, up to 0.5 inch allowable (uncompressed).
10. Diseases, Nematodes and Insects: Turf grass sod shall be reasonably free of diseases, nematodes and soil-borne insects. Specific nursery and/or plant materials laws may require that all sod entering inter-state commerce be inspected and approved for sale. The inspections and approval must be made by the appropriate government representative of the agriculture department or office of entomologist.

Fertilizer

1. Commercial fertilizer analysis will be based upon a current soil nutrient test, meetings applicable requirements of State and Federal Law.

Water for Planting Purposes

1. Supplied by Owner.
2. Provide equipment necessary to transport water from source to required locations.
3. Lay out temporary watering system and arrange watering schedule to avoid walking over muddy and newly sodded areas.
4. Prevent puddling and water erosion and displacement of sod. Mow sod as soon as there is enough top growth to cut with mower set at recommended height for principal species and before height exceeds 3 IN.
5. Repeat mowing as required to maintain height.
6. Do not delay mowing until grass blades bend over and become matted.
7. Do not mow when grass is wet.
8. Time initial and subsequent mowing as required to maintain height of 2-1/2 to 3 IN.
9. Remove no more than one-half grass leaf surface at any time. Re-sod bare, dead or dying areas using same materials specified.

Soil Requirements

1. All sodded areas, shrub beds, tree plantings, and parking lot islands, will be excavated of fill dirt and back filled with dry screened topsoil.
2. All topsoil will be approved and initialed by MUHC Grounds Department Supervisor.
3. Topsoil will be back filled at the following depths:
 - a. Sod areas: Minimum 4" depth
 - b. Shrub Beds: Minimum 18" depth
 - c. Tree Plantings: Minimum 36" depth

- d. Parking lot Islands Minimum 36" depth

PLANT MATERIAL SELECTION AND QUALITY CONTROL:

1. All submittals of plant material shall be reviewed and approved by the MUHC Grounds Supervisor at design phase and at project implementation. Plant quality shall be consistent and is subject to approval by the supervisor. Work shall be inspected during and at final turnover to determine compliance with specifications. Inspection will be done by MUHC Grounds Department.
2. Exterior plants to be mid-Missouri native plants, with low maintenance. Locations identified for seasonal colors.

APPENDIX D: INTERIOR FINISHES QUICK REFERENCE GUIDES

| M Health Care | | Quick Reference Guide by Type of Space for Typical Finish Requirements in Healthcare Facilities | | | | | | | | | | | |
|--|---------------------------------|---|---------------|---------|---------------|------------------|---------------------|----------------------------------|--|-----------|-----------|------------------|--|
| Type of Space | Average Actual Sq Ft | Walls | Flooring Base | Ceiling | Lighting | Window Treatment | Wall Protection | Accessories Furnished/ Installed | Built in Casework Cabinets + Hardware Upper Base Top | | | Cubicle Curtains | Misc. Item |
| Managers Office | 80-120 | PNT2 | CPT1 RB2 | ACT1 | LT1 LT3 | WT1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Open Office Areas | 64-100 per person | PNT2 | CPT1 RB2 | ACT1 | LT1 LT3 | WT1 or WT4 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Exam & Treatment Rooms | 120-170 | PNT1 | RS1 RB2 | ACT1 | LT1 LT11 | WT1 or WT3 | N/A | 10,16,17,18,19,20, 21, 22 | PLC1 | PLC1 | SS1 | CC1 CC2 | |
| Patient Rooms (single occupancy) | 200-250 | PNT1 | RS1 RB2 | ACT1 | LT9 LT12 LT14 | WT1 or WT4 | WP4 | 10, 16, 17, 18, 19, 20 | PLC1 | PLC1 | PLT1 SS1 | CC1 CC2 | NURSE CALL SYSTEM, MED GAS OUTLETS, TACKBOARDS |
| Patient Restrooms | 70-100 | CT1 PNT1 | RS2 RB3 | ACT1 | LT9 LT14 LT24 | WT1 | SEE WALLS | 1-5, 9, 10, 16, 21 | PLC1 | PLC1 | SS1 | N/A | |
| Conference Rooms | 15 per person | WC1 or PNT2 | CPT1 RB1 | ACT1 | LT1 | WT1 WT4 | N/A | 8, 10 (IF SINK), 16, 18 | PLC1 | PLC1 | PLT1 SS1 | N/A | |
| General Waiting Rooms | 15 per person | WC1 or PNT1 | CPT1 RB1 | ACT1 | LT1 | WT1 | N/A | 18 | PLC1 | PLC1 | PLT1 SS1 | N/A | |
| Departmental Waiting Rooms | 15 per person | WC1 or PNT1 | CPT1 RB1 | ACT1 | LT1 | WT1 | N/A | 18 | PLC1 | PLC1 | PLT1 SS1 | N/A | |
| Public Restrooms | 70 per person | PNT1 CT1 | RS2 RB3 | ACT1 | LT1 LT25 | WT1 | SEE WALLS | 1-7, 9, 15, 16, 17, 21 | PLC1 | PLC1 | SS1 | N/A | |
| Call Rooms | 150-200 | PNT1 | CPT1 RB2 | ACT1 | LT1 | WT1 WT4 | N/A | 18 | PLC1 | PLC1 | PLT1 SS1 | NONE | |
| Corridors | 6'-12' width based on occupancy | PNT1 | LVT1 RB1, RB2 | ACT1 | LT1 | WT1 | VARIES; REVIEW W/PM | N/A | PLC1 | PLC1 | SS1 | N/A | WATER COOLER |
| Break Room/Doctor's Charting | 15 per person | PNT1 | RS1/LVT1 RB2 | ACT1 | LT1 | WT1 | N/A | 8, 15, 16, 18, 21, 22 | PLC1 | PLC1 | SS1 | N/A | |
| Clean & Meds | 150-200 | PNT1 | RS1 RB2 | ACT1 | LT1 | WT1 | WP3 | VARIES; REVIEW W/PM | PLC1 | PLC1 | SS1 | N/A | |
| Soiled | 150-200 | PNT1 | RS2 RB3 | ACT1 | LT1 | WT1 | WP3 | VARIES; REVIEW W/PM | PLC1 | PLC1 | SS1 | N/A | |
| Janitors**, Electrical, Mechanical & Data | 100-150 | PNT1 | **RS1 RB2 | ACT2 | LT26 | N/A | **WP3 | N/A | N/A | N/A | N/A | N/A | |
| Non Operating Procedure Rooms where Anesthetizing occurs | 150-250 | PNT4 | RS1 RB3 | ACT3 | LT18 | WT1 | VARIES REVIEW W/PM | 8, 15, 16, 17, 18, 19 | PLC1 SSC1 | PLC1 SSC1 | PLC1 SS1 | CC1 CC2 | MED GAS OUTLETS, ELECTRICAL |
| Operating Procedures Rooms where Anesthetizing occurs | 250-400 | PNT4 | RET1 RB3 | ACT4 | ? | N/A | WP3 | 8b, 19, 20 | PHC1 SSC1 | PHC1 SSC1 | PHC1 SSC2 | N/A | |
| Spaces not noted above: Reference FGI-2014 | FGI-2014 | TBD | TBD RB | ACT4 | ? | TBD | | | TBD | TBD | TBD | N/A | |
| (Facilities Guidelines Institute) | | | | | | | | | Standard Hardware all locations = CS-1, CL-1, HDW-1 | | | | |

| | | | |
|--|---------|--|--|
| Health Care | | UMHC CONSULTANT GUIDELINES - FINISH LEGEND | |
| Walls: | | | |
| | PNT1 | Sherwin Williams Semi-Gloss paint on walls (MPI-GL5 finish is required) for cleanability and durability scrub cycles, Level 5 Drywall Finish | |
| | PNT2 | Sherwin Williams Eggshell paint on walls (MPI-GL3 finish is required). Level 4 Drywall Finish | |
| | PNT3 | Sherwin Williams Semi-Gloss paint on metal trim (MPI-GL5 finish is required) for cleanability and durability scrub cycles. | |
| | PNT4 | Epoxy Coating. (MPI-GL5 finish is required) | |
| | CT1 | Ceramic Tile - Large format with minimal grout lines on wet walls | |
| | WC1 | Type II vinyl wall covering on one accent wall | |
| Flooring: | | | |
| | CPT1 | Mannington or Mohawk/Lee's Carpet Tile (squares or planks) | |
| | | Fiber shall be Dupont type. 6,6 solution dyed fiber, as part of manufacturer's standard product line Solution Dyed | |
| | LVT1 | Luxury Vinyl Tile - Amtico preferred | |
| | RS1 | Standard: seamless vinyl Teknofloor preferred | |
| | RS2 | Mannington Assurance III - slip resistant (All Restrooms) | |
| | RS3 | Altro Aquarius 2mm safety flooring for wet environments | |
| | WOT1 | Walk-Off Tile | |
| | RET1 | Resinous Epoxy Flooring | |
| | TRZ1 | Terrazzo | |
| Base: Preference: Johnsonite Tightlock or Millwork/Reveal, or equal | | | |
| | RB1 | Standard - Johnsonite Millwork Reveal - 4.25"H or equal (Resilient Base) | |
| | RB2 | Standard - Johnsonite Tight-lock (Carpet - 4.5"H, Resilient - 4.375"H) or equal (Resilient Base) | |
| | RB3 | Integral to flooring type (4" or 6" cove) (Resilient Base) | |
| Ceilings: | | | |
| | ACT1 | 2x2 non-regular acoustical tile, 15/16" grid; NRC shall be 70 or greater (Armstrong Ultima preferred) | |
| | ACT2 | Mylar or Ceramic Faced Moisture/Sag resistant 2x2 tile with 15/16" grid (Armstrong preferred) | |
| | ACT3 | Mold and water resistant 5/8" type X Gypsum Board w/ access panels | |
| Luminaires: ALL LED We need more specificity (i.e. preferred mfrs) nothing spec'd for OP and Procedure Rooms, Emergency power? Egress Lighting | | | |
| | LT1 | Metalux Encounter 2x2 | |
| | LT2 | Focal Point 2x2 | |
| | LT3 | Metalux Encounter 2x4 | |
| | LT4 | Focal Point 2x4 | |
| | LT5-8 | NOT USED | |
| | LT9 | Recessed Down, Round 6" | |
| | LT10 | Recessed Down, Square | |
| | LT11 | Recessed Exam | |
| | LT12 | Bed Ambient/Exam | |
| | LT13 | NOT USED | |
| | LT14 | Night Light | |
| | LT15-16 | NOT USED | |
| | LT17 | Sealed 2x2 | |
| | LT18 | Sealed 2x4 | |
| | LT19 | Surgical 2x2 | |
| | LT20 | Surgical 2x4 | |
| | LT21 | Troffer 2x2 | |
| | LT22 | Troffer 2x4 | |
| | LT23 | Task Lighting 2ft. | |
| | LT24 | Patient Vanity 2ft. | |
| | LT25 | Public Vanity 2ft. | |
| | LT26 | Strip w/ wireguard 4ft. | |
| | X | Exit | |
| Window Treatments: | | | |
| | WT1 | Chain-driven mesh roller shades; Brand to be determined by Owner / Per UM System Contracts (Draper Preferred) | |
| | WT2 | Motorized mesh roller shades; Brand to be determined by Owner (Draper Preferred) | |
| | WT3 | Removeable-wand operated mesh roller shades; Brand to be determined by Owner (Draper Preferred) | |
| | WT4 | Flex shade with black-out shade; Brand to be determined by Owner (Draper Preferred) | |

Wall Protection:

| | |
|-----|--|
| WP1 | Chair rail - vinyl or laminite over metal sub-frame, no real wood |
| WP2 | Solid Surface Backsplash |
| WP3 | C/S Acrovyn 4000 (non-PVC) rigid sheet (Or In Pro G2 Bioblend or Korogard Protective Wallcovering) |
| WP4 | Plastic Laminite Panels on Fire-Rated Core at headwalls and/or footwalls |
| WP5 | Ceramic Tile on wet walls |
| WP6 | Bumper Rails IPC 7000, or equal |

Casework:

| | |
|------|---|
| HDW1 | Reveal overlay 5 knuckle hinges on all casework - RPC 32mm Series; lvs latch IV2-A92 (Cast/Machined only, Stamped Product not allowed) |
| PHC1 | Phenolic Casework |
| PHT1 | Solid Phenolic countertops |
| PLC1 | Laminite Casework |
| PLT1 | Plastic Laminite countertops with t-mold edge (locations not otherwise indicated under SST). |
| SSC1 | Stainless Steel Casework |
| SS1 | Solid Surface countertops (at all sink locations) (10" deep drop-in sink); transaction tops. Preferred manufacturer: Corian Solid Surfacing |
| STC2 | Stainless Steel Countertops |
| WDC1 | Wood cabinets. Must be approved by Hospital PD&C. |
| CS1 | Cantilever Supports. Preferred: Rakkes #EH1824FM (18x24); #EH1818FM (18x18) |
| CL1 | Cabinet Locks - CompX National Stock Locks - Master Keyed to E041A |

Cubical Curtains:

| | |
|-----|--|
| CC1 | On the Right Track Privacy curtain at door - track and hardware furnished and installed by Contractor; |
| CC2 | Cubical Curtains. Must be compatible with "On the Right Track." Owner-specified contractor-furnished |

Accessories

Contractor-Furn'd/Contr. Installed

| | |
|------------|--|
| A-CF/CI-1 | enMotion partially recessed automatic paper towel dispenser (Public Restrooms) |
| A-CF/CI-2 | Mirror over sink: Bobrick B-290 Series |
| A-CF/CI-3 | Grab Bars: Bobrick B-5806 Series with Metal Lite Backer |
| A-CF/CI-4 | Personal Shelf: Bobrick B-295 Series |
| A-CF/CI-5 | Toilet Paper Dispenser: Bobrick B-2888 Series |
| A-CF/CI-6 | Napkin Disposal: Bobrick B-270 Series |
| A-CF/CI-7 | Personal Hygiene Dispenser: Bobrick B-2800 Series |
| A-CF/CI-8 | Glass Markerboards/Marker Wall Paint |
| A-CF/CI-9 | Seat Protectors: Bobrick B-221 Series |
| A-CF/CI-10 | Tri-fold paper towel Dispenser: (Bobrick B-262 (C-Fold) |
| A-CF/CI-11 | Baby Changing Table: Koala Care KB-100 Series |

Owner-Furn'd/Contr. Installed

| | |
|------------|--|
| A-OF/CI-15 | enMotion surface-mounted automatic paper towel dispenser: GP 59462 |
| A-OF/CI-16 | Soap Dispenser |
| A-OF/CI-17 | Sharps Box/Pharmacy Waste Holders |
| A-OF/CI-18 | Hand Sanitizer |
| A-OF/CI-19 | Glove Dispenser |
| A-OF/CI-20 | Alcohol Dispenser |
| A-OF/CI-21 | Coat Hooks |
| A-OF/CI-22 | Clock |
| A-OF/CI-23 | V6 Brackets, Space Labs, TV Brackets |

Owner-Furn'd/Owner Installed

| | |
|------------|--|
| A-OF/OI-25 | Medical Devices |
| A-OF/OI-26 | Signage |
| A-OF/OI-27 | Markerboards (Takeform Patient Information Boards) |

APPENDIX E: RESERVED

1.E.1 Construction Guideline



In FPD Review

Coming Soon

APPENDIX F: CUSTOM CASEWORK - LAMINATE CLAD CASEWORK

FIXED MODULAR LAMINATE CLADE CASEWORK AND COMPONENTS

DEFINITIONS

- A. Identification of casework components and related products by surface visibility.
 - 1. Closed Interiors: Any closed storage unit behind solid door or drawer fronts.
 - 2. Exposed Ends: Any storage unit exterior side surface that is visible after installation.
 - 3. Other Exposed Surfaces: Faces of doors and drawers when closed, and tops of cabinets less than 72 inches above furnished floor.
 - 4. Semi-Exposed Surfaces: Interior surfaces which are visible, bottoms of wall cabinets and tops of cabinets 72 inches or more above finished floor.
 - 5. Concealed Surfaces: Any surface not visible after installation.

QUALITY ASSURANCE

- A. A Single Source Manufacturer: All casework, countertops and architectural millwork products must be engineered and built by a single source manufacturer to ensure consistency and quality for these related products. Splitting casework, countertops and/or architectural millwork between multiple manufacturers is not permitted.

PRODUCT HANDLING

- A. Protect finished surfaces from soiling and damage during handling and installation with a protective covering.

JOB CONDITIONS

- A. Environmental Requirements: Do not install casework until permanent HVAC systems are operating and temperature and humidity have been stabilized for at least 1 week.
 - 1. Manufacturer/Supplier shall advise Contractor of temperature and humidity requirements for architectural casework installation areas.
 - 2. After installation, control temperature and humidity to maintain relative humidity between 25 percent and 55 percent.
- B. Conditions: Do not install casework until interior concrete work, masonry, plastering and other wet operations are complete

PRODUCTS

A. MATERIALS

1. Core Materials:

- a. Particleboard up to 7/8 inch thick: Industrial Grade average 45-pound density particleboard, ANSI A 208.1-2009, M-2 requirements.
- b. Particleboard 1 inch thick and thicker: Industrial Grade average 45-pound density particleboard, ANSI A 208.1-2009, M-2 requirements.
- c. Medium Density Fiberboard 1/4 inch thick: Average 54-pound density grade, ANSI A208.2-2009 requirements.

2. Decorative Laminates: GREENGAURD Indoor Air Quality Certified

- a. 1. High-pressure decorative laminate VGS (.028), NEMA Test LD 3-2005.
- b. 2. High-pressure decorative laminate HGS (.048), NEMA Test LD 3-2005.
- c. 3. High-pressure decorative laminate HGP (.039), NEMA Test LD 3-2005.
- d. 4. High-pressure cabinet liner CLS (.020), NEMA Test LD 3-2005.
- e. 5. High-pressure backer BKH (.048), (.039), (.028), NEMA Test LD3-2005.
- f. 6. Thermally fused melamine TFM laminate, NEMA Test LD 3-2005. (TFM allowed on casework interiors only, as specified below. Utilization of TFM on any exterior casework surfaces, including door and drawer faces and finished ends, will not be permitted.)

3. Edging Materials:

- a. 1mm PVC banding, machine applied.
- b. 3mm PVC banding, machine applied, and machine profiled to 1/8-inch radius.

B. SPECIALTY ITEMS

1. Support Members:

- a. Countertop support brackets: Epoxy powder coated, 11-gauge steel with integral cleat mount opening and wire management opening. Basis of Design: Rakks #EH1824FM or #EH1818FM
- b. Undercounter support frames: Epoxy powder coated.
- c. Legs: Epoxy powder coated.

C. CABINET HARDWARE

1. Hinges: 5 Knuckle

- a. Standard five-knuckle hinge with dull chrome finish. Conforms to ANSI/BHMA 156.9-2003 Grade 1 products.
- b. Concealed 120-degree swing, self-closing, clip-on style.
 - iii. Doors up to 34 inches in height have 2 hinges per door.

- iv. Doors 35 inches to 62 inches in height have 3 hinges per door.
 - v. Doors 63 inches to 80 inches in height have 4 hinges per door.
 - vi. All doors have rubber bumpers.
 - c. 270 degree opening angle.
 - d. Designed for 32mm boring system.
 - e. Drilled knuckle IDs and machine knuckle edges.
 - f. Non-removable knurled pin.
- 2. Pulls:
 - a. Pull program offering must include minimum of 20 metal pull design and finish option combinations including:
 - i. Contemporary Pull (Finish option: Brushed Nickel)
 - ii. Heavy Bow Pull (Finish option: Brushed Nickel)
 - iii. Petite Bow Pull (Finish option: Brushed Nickel)
 - iv. Metal Wire Pull (Finish options: Epoxy Powder Coated Gray, Beige, White, Black, Slate, Chrome, and Satin Chrome US26D)
 - b. All pulls with 96mm spacing on screws. Pull designs shall comply with the Americans with Disability Act (ADA).
- 3. Drawer Slides:
 - a. Regular, knee space and pencil: 100-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with self-closing feature. Paper storage, 150-pound load rated epoxy coated steel slides.
 - b. File: Full extension, 150-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with self-closing feature.
- 4. Adjustable Shelf Supports:
 - a. Injection molded transparent polycarbonate friction fit into cabinet end panels and vertical dividers, adjustable on 32mm centers. Each shelf support has 2 integral support pins, 5mm diameter, to interface pre-drilled holes, and to prevent accidental rotation of support. The support automatically adapts to 3/4 inch or 1-inch-thick shelving and provides non-tip feature for shelving. Supports may be field fixed if desired. Structural load to 1200 pounds (300 pounds per support) without failure.
 - b. Fixtures and Displays Recessed Heavy Duty 1/2" slotted standards for Slatwall and casework. #SSRBZ8

5. Locks:

- a. Removable core, disc tumbler, cam style lock with strike. Lock for sliding 3/4-inch-thick doors is a disc-type plunger lock, sliding door type with strike. Lock for sliding glass/acrylic doors is a ratchet type sliding showcase lock.
- b. Elbow catch or chain bolt used to secure inactive door on all locked cabinets. Elbow Catch shall be brass or aluminum, machined or cast, and deburred. Stamped steel latches shall not be specified.

6. Sliding Door Track: Anodized aluminum double channel.

D. FABRICATION:

- 1. Fabricate casework, countertops and related products to dimensions, profiles, and details shown.
- 2. All casework panel components must go through a supplemental sizing process after cutting, producing a panel precisely finished in size and square to within 0.010 inches, ensuring strict dimensional quality and structural integrity in the final fabricated product.
- 3. Cabinet Body Construction:
 - a. Tops and bottoms are glued and doweled to cabinet sides and internal cabinet components such as fixed horizontals, rails and verticals. Minimum 6 dowels each joint for 24-inch-deep cabinets and a minimum of 4 dowels each joint for 12-inch-deep cabinets. (Mechanical or metal hardware fasteners joining cabinet top and bottom panels to the sides will not be accepted.)
 - b. Tops, bottoms and sides of all cabinets are particleboard core.
 - c. Cabinet backs: 1/4-inch-thick medium density fiberboard panel fully captured by the cabinet top, bottom and side panels. Finish to match cabinet interior. 3/4-inch x 4-inch particleboard rails will be placed behind the back panel at the top and bottom and doweled to the sides utilizing 10mm hardwood fluted dowels. A third intermediate rail will be included on all cabinets taller than 56 inches. Utilize hot melt glue to further secure back and increase overall strength.
 - i. Exposed back on fixed or movable cabinets: 3/4-inch-thick particleboard with the exterior surface finished in VGS laminate as selected.
 - d. Fixed base and tall units have an individual factory-applied base, constructed of 3/4-inch-thick plywood. Base is 102mm (nominal 4 inch) high unless otherwise indicated on the drawings.
 - e. Base units, except sink base units: Full sub-top glued and doweled to cabinet sides. (Mechanical or metal hardware fasteners joining cabinet sub-top panel to the sides will not be accepted.)
 - f. Side panels and vertical dividers shall receive adjustable shelf hardware at 32mm line boring centers. Mount door hinges, drawer slides and pull-out shelves in the line boring for consistent alignment.

- g. Exposed and semi exposed edges.
 - i. Edging: 1mm PVC machine applied.
 - h. Adjustable Shelves in Cabinets
 - i. Core: Particleboard.
 - ii. Core Thickness: 3/4 inch up to 36 inches wide, 1 inch over 36 inches wide.
 - iii. Edge: 1mm PVC on Front Edge Only.
 - i. Interior finish, units with open Interiors:
 - i. Top, bottom, back, sides, horizontal and vertical members, and adjustable shelving faces with high-pressure decorative VGS laminate. Use of TFM on exposed open interiors will not be permitted.
 - j. Interior finish, units with closed Interiors:
 - i. Top, bottom, back, sides, horizontal and vertical members, and adjustable shelving faces with TFM Thermally Fused Melamine laminate.
 - k. Exposed ends:
 - i. Faced with high-pressure decorative VGS laminate. Use of TFM on exposed ends will not be permitted.
 - l. Wall unit bottom:
 - i. Faced with high-pressure decorative VGS laminate. Use of TFM on wall unit bottoms will not be permitted.
 - m. Balanced construction of all laminated panels is mandatory. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), are not permitted.
4. Drawers:
- a. Sides, back and sub front: Minimum 1/2-inch-thick particleboard, laminated with TFM Thermally Fused Melamine, doweled and glued into sides. Top edge banded with 1mm PVC.
 - b. Drawer bottom: Minimum 1/2-inch-thick particleboard laminated with TFM Thermally Fused Melamine, screwed directly to the bottom edges of drawer box.
5. Door/Drawer Fronts:
- a. Core: 3/4-inch-thick particleboard.
 - b. High-pressure decorative VGS laminate exterior balanced with high-pressure cabinet liner CLS. Use of TFM on exterior or interior surfaces of door/drawer fronts will not be permitted.
 - c. Edges: 3mm PVC, machine applied, external edges and outside corners machine profiled to 1/8-inch radius.
 - d. Provide double doors in openings over 24-inches wide.

6. Decorative Laminate Counter Tops

- a. Core:
 - i. 1-1/8-inch-thick ANSI A208.1-1993 M-2 particleboard.
- b. Surface: High-pressure decorative HGS/HGP laminate with balanced backer sheeting.
- c. Exposed edges of applied backsplash: HGS high-pressure decorative laminate.
- d. All countertop joints must be dry fit at the factory to check for consistency in color from one panel to the other and overall finished panel thickness, resulting in a high-quality product easy to install.

EXECUTION

A. INSPECTION:

- 1. The casework contractor must examine the job site and the conditions under which the work under this section is to be performed and notify the building owner in writing of unsatisfactory conditions. Do not proceed with work under this Section until satisfactory conditions have been corrected in a manner acceptable to the installer.

B. PREPARATION:

- 1. Condition casework to average prevailing humidity conditions in installation areas prior to installing.

C. INSTALLATION:

- 1. Erect casework, plumb, level, true and straight with no distortions. Shim as required. Where laminate clad casework abuts other finished work, scribe and cut to accurate fit.
- 2. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind.
- 3. Repair minor damage per plastic laminate manufacturer's recommendations.

D. CLEANING:

- 1. Remove and dispose of all packing materials and related construction debris.
- 2. Clean cabinets inside and out. Wipe off fingerprints, pencil marks, and surface soil etc., in preparation for final cleaning by the building owner.

E. COLOR SELECTION:

- 1. Laminate Color Selection:
 - a. To be selected by MUHC Designer.
 - b. Thermally fused melamine laminate available in White.
- 2. Hardware Color Selection:
 - a. Pulls: Brushed Chrome Steel Finish

- b. Miscellaneous Hardware (support brackets, table frames, etc.): Select from your choice of epoxy powder coating stock colors matched to White, Beige, Gray, Black, Slate and Chrome.
- 3. PVC Edge Banding Color Selection:
 - a. 3mm PVC: to match or coordinate with the laminate finish.

COUNTERTOPS

SECTION INCLUDES

- A. Countertops for architectural cabinetwork.
- B. Countertops for manufactured casework.
- C. Wall-hung counters and vanity tops.
- D. Sinks molded into countertops.

REFERENCE STANDARDS

- a. ANSI A161.2 - Performance Standards for Fabricated High Pressure Decorative Laminate Countertops; 1998.
- b. ANSI A208.1 - American National Standard for Particleboard; 2009.
- c. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use; 2009.
- d. ANSI Z124.3 - American National Standard for Plastic Lavatories; 2005.
- e. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.
- f. ISSFA-2 - Classification and Standards for Solid Surfacing Material; International Solid Surface Fabricators Association; 2001 (2007).
- g. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- h. PS 1 - Structural Plywood; 2009.

SUBMITTALS

- a. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
- b. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

QUALITY ASSURANCE

- a. Fabricator Qualifications: Same fabricator as for cabinets on which tops are to be installed.
- b. Installer Qualifications: Fabricator.

DELIVERY, STORAGE, AND HANDLING

- a. Store products in manufacturer's unopened packaging until ready for installation.
- b. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

FIELD CONDITIONS

- a. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PRODUCTS

A. COUNTERTOP ASSEMBLIES

1. Plastic Laminate Countertops: High pressure decorative laminate sheet bonded to substrate.
 - b. Laminate Sheet, Unless Otherwise Indicated: NEMA LD 3 Grade HGS, 0.048-inch (HGS, 1.2 mm) nominal thickness.
 - i. Surface Burning Characteristics: Flame spread 25, maximum; smoke developed 450, maximum; when tested in accordance with ASTM E84.
 - c. Finish: Matte or suede, gloss rating of 5 to 20.
 - d. Manufacturers:
 - i. Formica Corporation : www.formica.com.
 - ii. Lamin-Art, Inc : www.laminart.com.
 - iii. Panolam Industries International, Inc\Nevamar : www.nevamar.com.
 - iv. Panolam Industries International, Inc\Pionite : www.pionitelaminates.com.
 - v. Wilsonart International, Inc : www.wilsonart.com.
 - e. Exposed Edge Treatment: Square, substrate built up to minimum 1-1/4 inch (32 mm) thick; covered with matching laminate.
 - f. Exposed Edge Treatment: Molded rubber edge with T-spline, sized to completely cover edge of panel.
 - g. Back and End Splashes: Same material, same construction.
2. Plastic Laminate Countertops: Self-supporting high pressure laminate panel with decorative surface over structural members.
 - a. Panels: Phenolic resin impregnated Kraft paper core with melamine impregnated decorative surface papers; NEMA LD 3 Grade CGS.
 - i. Panel Thickness: 1 inch (25 mm).
 - ii. Finish: Matte or suede, gloss rating of 5 to 20.

- iii. Manufacturers:
 - i. Arborite, division of ITW Canada : www.arborite.com.
 - ii. Formica Corporation : www.formica.com.
 - iii. Panolam Industries International, Inc\ Pionite : www.pionitelaminates.com.
 - iv. Wilsonart International, Inc : www.wilsonart.com.
- 3. Exposed Edge Treatment: Square natural cut sanded and polished to semi-gloss sheen.
- 4. Back and End Splashes: Same material, same construction; minimum 4 inches (102 mm) high.
- A. Chemical Resistant Plastic Laminate Countertops: Chemical resistant high pressure decorative laminate sheet bonded to substrate.
 - 1. Laminate Sheet: NEMA LD 3 Grade HGL, 0.039-inch (HGL, 1.0 mm) nominal thickness.
 - a. Finish: Matte or suede, gloss rating of 5 to 20.
 - 2. Manufacturers:
 - a. Formica Corporation : www.formica.com.
 - b. Panolam Industries International, Inc\ Nevamar : www.nevamar.com.
 - c. Panolam Industries International, Inc\ Pionite : www.pionitelaminates.com.
 - d. Wilsonart International, Inc : www.wilsonart.com.
 - 3. Exposed Edge Treatment: Square, substrate built up to minimum 1-1/4 inch (32 mm) thick; covered with matching laminate.
 - 4. Back and End Splashes: Same material, same construction; minimum 4 inches (102 mm) high.
- B. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
 - 1. Flat Sheet Thickness: 1/4 inch (6 mm), minimum.
 - 2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISSFA-2 and NEMA LD
 - 3. Acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
 - a. Sinks and Bowls: Integral castings; minimum 3/4-inch (19 mm) wall thickness; comply with ANSI Z124.3.
 - b. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.

- c. Manufacturers:
 - i. Dupont: www.corian.com.
 - ii. Formica Corporation: www.formica.com.
 - iii. Avonite Surfaces: www.avonitesurfaces.com.
 - iv. Wilsonart International, Inc: www.wilsonart.com.
- d. Other Components Thickness: 1/2 inch (12 mm), minimum.
- e. Back and End Splashes: Same sheet material, square top; minimum 4 inches (102 mm) high.

Accessory Materials

- A. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch (19 mm) thick; join lengths using metal splines.
- B. Particleboard for Supporting Substrate: ANSI A208.1 Grade 2-M-2, 45 pcf (20 kg/cu m) minimum density; minimum 3/4 inch (19 mm) thick; join lengths using metal splines.
- C. Medium Density Fiberboard for Supporting Substrate: ANSI A208.2.
- D. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
- E. Joint Sealant: Mildew-resistant silicone sealant, white.

Fabrication

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 - 1. Join lengths of tops using best method recommended by manufacturer.
 - 2. Fabricate to overhang fronts and ends of cabinets 1 inch (25 mm) except where top butts against cabinet or wall.
 - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 - 2. Height: 4 inches (102 mm), unless otherwise indicated.
- C. Solid Surfacing: Fabricate tops up to 144 inches (3657 mm) long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
- D. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

PART 3 EXECUTION

Examination

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

Preparation

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

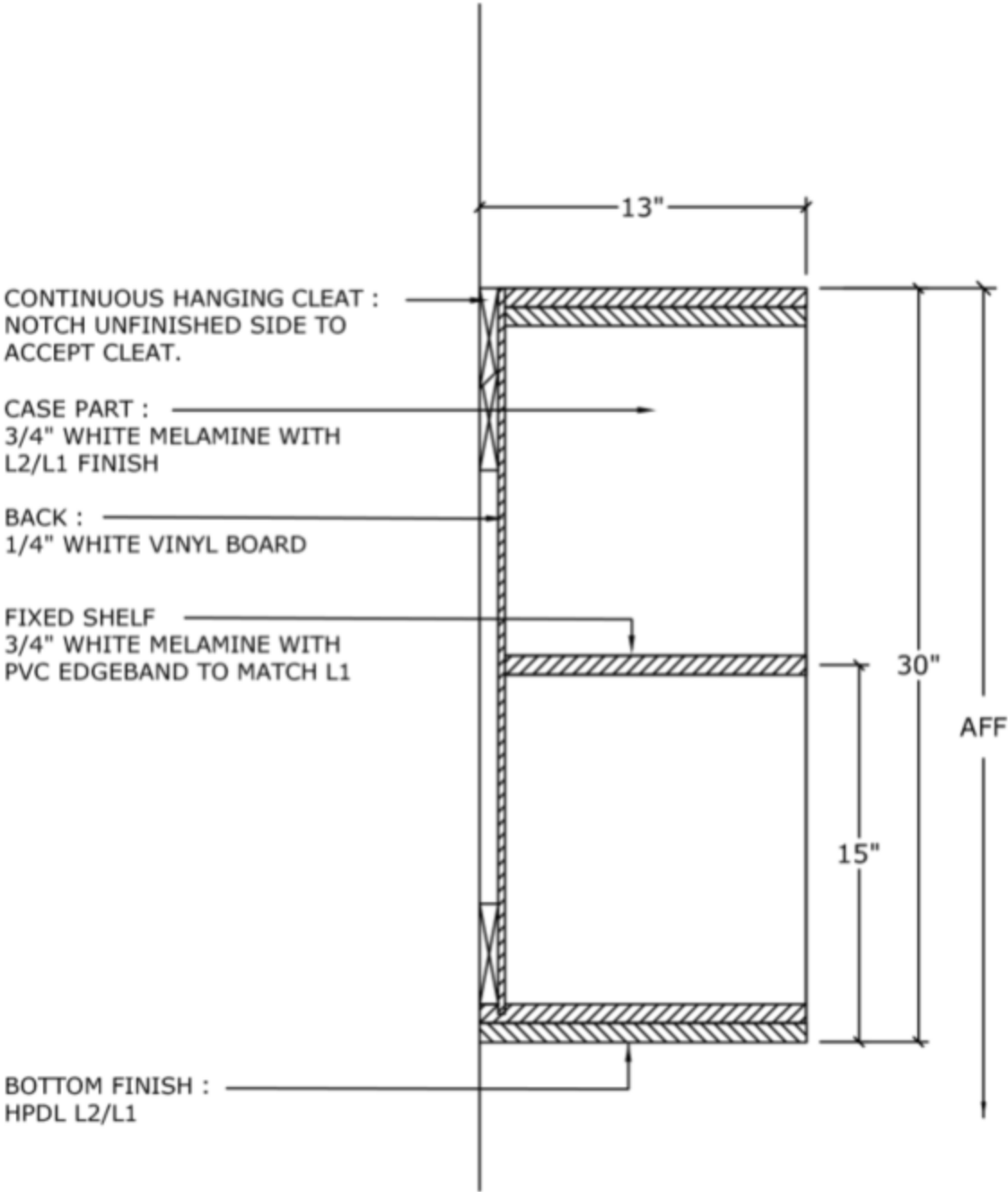
Installation

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch (16 mm).
- C. Seal joint between back/end splashes and vertical surfaces.

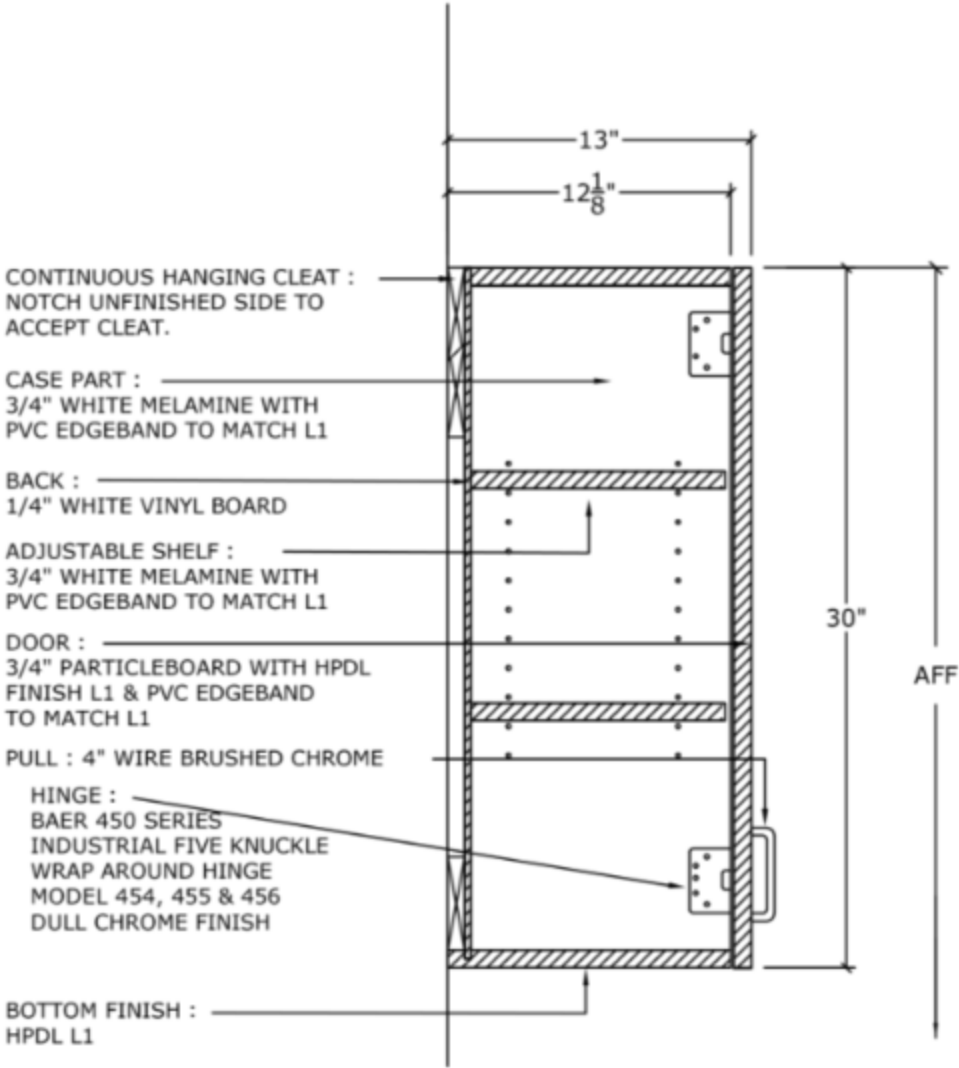
Tolerances

- A. Variation From Horizontal: 1/8 inch in 10 feet (3 mm in 3 m), maximum.
- B. Offset From Wall, Countertops: 1/8-inch (3 mm) maximum; 1/16 inch (1.5 mm) minimum.
- C. Field Joints: 1/8 inch (3 mm) wide, maximum.

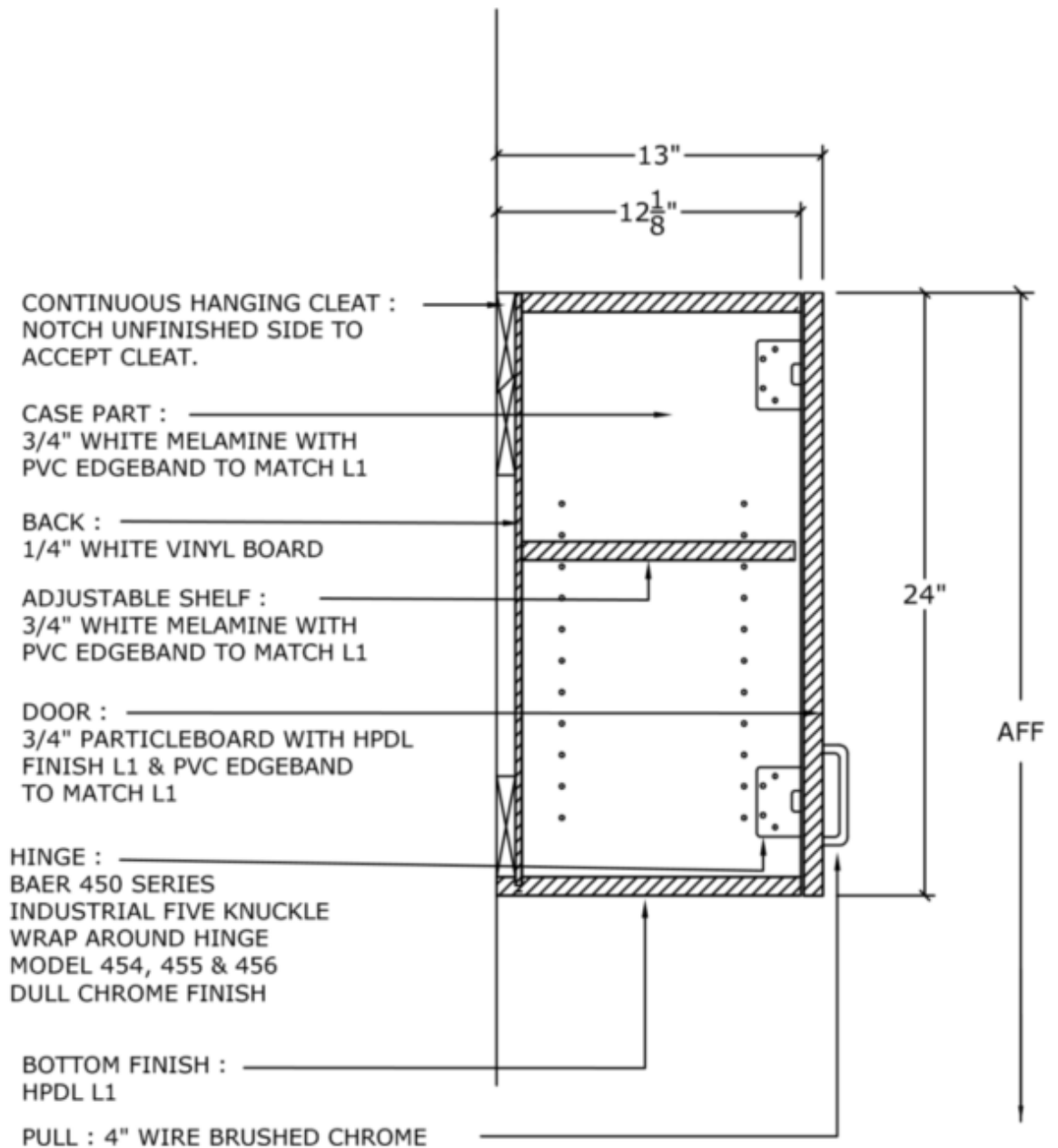
Wall Cabinet 30” High Open



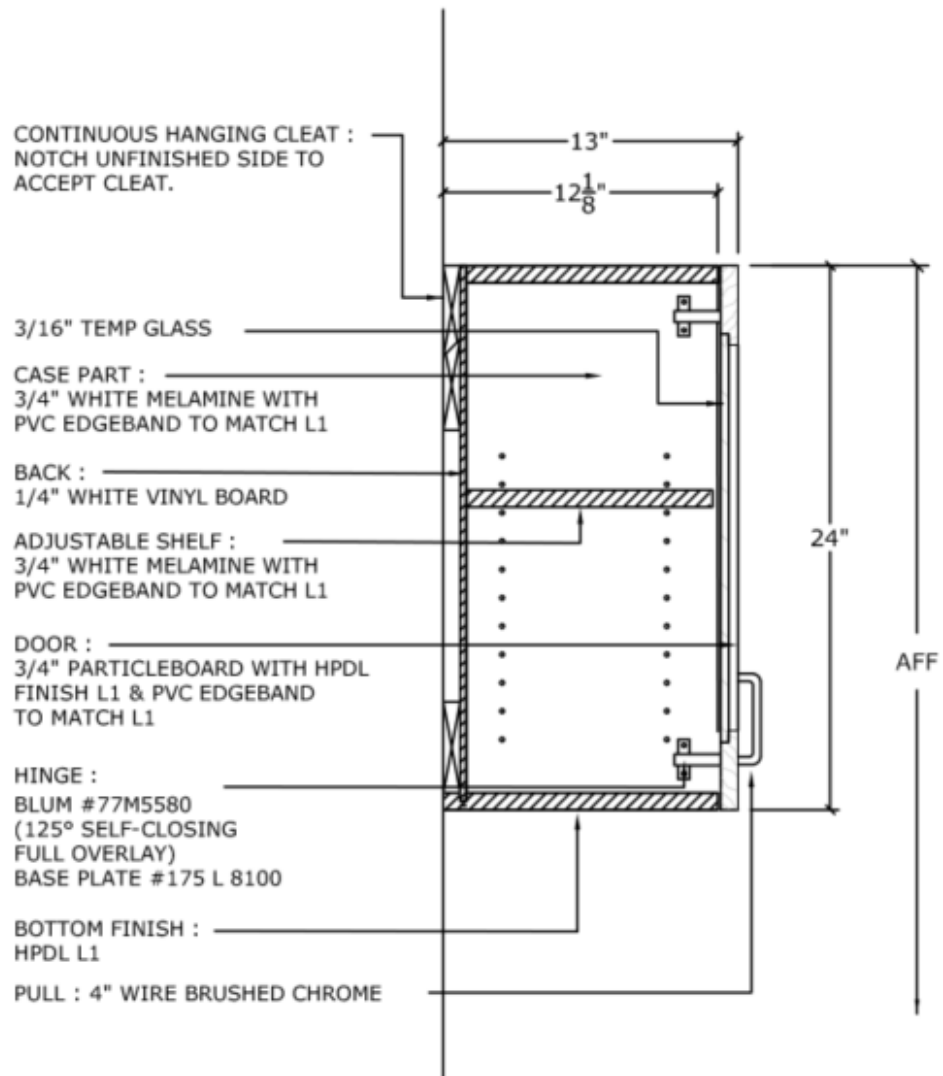
Wall Cabinet 30" High



Wall Cabinet 24" High



Wall Cabinet 24" High x 13 Deep With Glazing



APPENDIX G: Standards for Owner Furnished Equipment

Blanket Warmers

1. Basis of Design
 - a. Steris (in-patient areas)
 - b. Blickman and Petigo (off-site outpatient clinics)
2. Considerations
 - a. Full size units shall be on wheels to aid cleaning.
 - b. Half-size units must have a substantial base to sit upon
 - i. Unit needs to be on a stable surface.
 - ii. Unit is not to be larger than the surface it sets on.
 - iii. Need to be able to clean under the unit.
 - iv. Make sure the surface is strong to hold the weight of the warmer and blankets.
3. Confirm sufficient electrical power is available. Minimize any other equipment connected to the circuit.