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2.4.1: UMHHC - DRAWING AND CONSTRUCTION DOCUMENT STANDARDS (SID-H-H)

Related Sections

Basis Guideline: NA
For an explanation of the use of these guidelines, see "Design Guidelines for UMHHC Facilities"

General

All project deliverables, including meeting minutes, cost opinions, transmittals, drawings, emails and cost opinions, shall include the correct RTN number and CBN number.

Coordinate and communicate with assigned Facilities Planning team, including Mechanical and Electrical Engineers, Interior Designers and Equipment Planners. Coordinate preliminary furniture and equipment layouts. Obtain preliminary equipment cut sheets from Equipment Planner for major or unusual equipment.

Coordinate and communicate with security and telecommunications staff, and special systems vendors as appropriate.

Obtain current floor plans from FPD.

Provide final schematic plan in electronic format to FPD for room number assignments in a format compatible with the version of AutoCAD in use by UMHHC Facilities Planning and Development. Electronic files submitted for the assignment of room numbers should be at 1:1 scale and should show new work only. Files should include only walls, doors, windows, and room types (names).

Review structural capacity of building for proposed use.

Conduct thorough code analysis. As appropriate, review proposed designs with regulatory authorities.

Obtain pre-design air testing if required by CSA worksheet. A/E shall be responsible for coordinating the schedule and any special needs with the UMHHC Building Manager and respective Air Test & Balance Company. A copy of all completed air test and balance reports shall be forwarded in PDF format to FAC-projectdept@med.umich.edu. The e-mail should contain the project RTN #, CBN # (if available), Project Name, building name, building level and room numbers included in the report.

At the start of the Design Development/Construction Document phase, confirm all assumptions in the Investigative Report, including all field observations.

If room configuration changes, obtain revised room numbering from FPD.

Submit Construction Documents to regulatory agencies if required, including BFS and HFES (submittal fees shall be paid by the A/E and listed as reimbursables on the CSA). UMH Design Manager will advise if preparation of the Operational Narrative will be part of the A/E scope of services. For leased buildings, coordinate submission of documents to local regulatory agencies with the building owner's representative, who shall pay the plan review fees. Respond to all regulatory agency comments in writing within one week. Copy all transmittals and correspondence with regulatory agencies to Design Manager and Capital Construction for file.

Confirm security system, fire alarm and other special system assumptions made during the Investigation with the appropriate UMHHC staff.

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Include a list of all applicable codes and a code analysis summary on the cover sheet of the Construction Documents.

Provide complete hardware sets and specifications, including all electrical hardware and wiring diagrams. A sequence of operations is to be included with all hardware sets.

Provide complete interior finish schedule and finish specifications for all finish materials as selected by the Interior Designer.

Refer to and incorporate UMHHC Design Guidelines.

Project manual specifications are typically only required for AEC managed projects. Project manual shall comply with AEC requirements and conform to the 1995 CSI 16-Division format unless directed otherwise.

Minimum Drawing Requirements

All drawings submitted to UMHHC become the property of UMHHC. No drawings submitted at any stage of a project shall be copyright protected.

Standard drawing sheet size is 22”x34” (ANSI D-size). With permission of the UMHHC Design Manager, 30”x42” (E-size) drawings may be used where the UMH standard D-size would require a scale smaller than 1/8”=1’-0” or where the E-size sheet would allow for a complete floor plan on a single sheet. Final deliverables (as-builts) are to be black ink on white paper. Drawings included for reference must have “For Reference Only by RTN #######” stamped visibly on each reference drawing. Drawing sets are to be rolled, printed side out with title blocks visible. For bulletins or addendums, 8-1/2”x11” (A-size) are acceptable where small sizes are applicable. All final (as-built) submittals shall be accompanied with an electronic copy of the drawing(s) conforming to the standards listed herein for submission of electronic drawing files. Electronic drawing files shall include drawing files in both DWG and PDF format. All drawing sets submitted for review and/or construction are to be uploaded to UMHHC’s reproduction website (currently Reprographics One - see UMH FPD website for link).

All drawing files issued in PDF format should be printed to black, i.e., no linetypes, equipment, furniture, or any other items shall be illustrated in color.

All drawings, including cover sheet, are to be printed on the UMHHC standard title block- see UMH FPD website for standard title block.

All lines are to be dark with crisp edges.

All text used on drawings shall be a minimum of 3/32” height (at full size) so that it is legible from a half-size set (i.e. 11”x17” for D-size).

Screening, shading, cross hatching and other indications shall not obliterate underlying information, and shall be capable of being reproduced without “bleeding”.

All plans in a given project set are to be oriented in the same direction. In all cases, north is to be “up” or to the right. All plan drawings shall have a north arrow.

All floor plan drawings shall include a small scale building key plan with a shaded “area of work”.

Building plans are to show a minimum of two vertical column lines and two horizontal column lines with their associated grid bubbles and identifications. Site plans to show a minimum of two coordinate points, preferably at the lower left and upper right of the drawing area.

Base Plan Master Files of UMHHC buildings are located in model space according to UMH’s survey grid and are available on FPD’s virtual network (if AE does not have access to FPD’s virtual network, contact

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your FPD project manager). AE shall maintain FPD's spatial coordinates so that plan sheets may be inserted as overlays to existing electronic drawings (i.e. plan views in CAD files should line up correctly when brought together electronically). Coordinate points should align in each file.

It is extremely important to field verify all dimensions, existing walls, doors, windows, built-ins, power, communications, fire alarm, special electrical systems, HVAC, plumbing, fire protection, etc. Any discrepancies found during design between actual field conditions and Base Plan Master Files are to be documented on marked up plots of the base plan master file(s) in question and communicated to UMHHC's FPD CAD Coordinator, Facilities Planning and Development, 2101 Commonwealth, Ann Arbor, MI 48105-5759. Project drawings are to reflect actual field conditions.

Include a complete index of drawings on the cover sheet of the drawing set. All drawings, regardless of set size, require a cover sheet. On projects with more than 30 sheets, include an index sheet on the first sheet of each series as well (a series is a segment of the drawing set such as the Architectural series or Electrical series). Index is to identify sheet number and title and indicate clearly if a drawing is included only for information and does not show work under the contract.

If drawings are added or deleted during the course of construction, A/E is to revise the index on the Record drawing set accordingly.

Include a complete symbol and abbreviation legend for each series on the first or second drawing of the series. (A series is a segment of the drawing set such as the Architectural series or Electrical series.).

Include a graphic scale bar on each plan drawing. Where scale applies to the entire drawing, the scale references are to be located near the lower right corner of the drawing area.

Where a portion of a plan or elevation appears on a sheet, use a reference key plan drawing to show location relative to the whole. The preferred location for the key plan is in the lower right corner of the drawing or in the title block area of the drawing, space permitting.

Cross-reference plans, elevations, sections and details. Identify sections on all plans; architectural, mechanical and electrical.

Distinguish clearly between existing, new, and replacement work.

Clear drawings shall be provided, indicating scope of any required demolition and new construction. All floor plan drawings shall include north arrows, graphic scales, and keyplans. Except for keyplans, a minimum scale of at least 1/8" = 1'-0" is required.

Produce drawings using standard AIA layering standards.

Provide proper line weight differentiation to assist in the readability of drawings.

All external referenced materials should have relative references and should be included with the original referenced drawing. If an external reference is not required in a drawing, the reference should be removed.

Utility shutdown information will be shown on the construction documents. Refer to Divisions 15 and 16 Basic Design Guidelines for specific format.

In order to fully coordinate all systems, architectural reflected ceiling plans are required. They are to show all ceiling mounted equipment including: lights, HVAC supply and return, smoke detectors, speakers, owner equipment, access panels, cameras and security devices, exit signs, IV tracks, curtain tracks, signage, (etc.). Generally equipment should be centered in ceiling tiles.

In renovation projects, existing equipment to remain is to be shown. If existing sprinkler heads are anticipated to remain, they must be shown on the reflected ceiling plan.

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In order to provide access above the ceiling, care should be taken to provide “free” tiles, particularly below cable trays, filters, and other areas that require on-going maintenance.

For new and existing plans, fire and smoke rated walls and other assemblies are to be indicated clearly on the drawings. Style of drawing line type symbols shall match the UMHHC Fire Wall Keyplans.

Titleblock Content

Dates Issued: List purpose and date of all issues, including as appropriate, 50% CD, 95% CD, Regulatory Review, Construction and Record Drawings. Every issued document, not submitted for construction or bids, must be labeled “Not For Construction” in the title block.

Sheet Number: All drawing numbers are to include a prefix which designates the discipline of work included on the sheet. Examples of appropriate sheet numbers are as follows:

- A-8 Eighth sheet of (A)architectural series.
- CL-2 Second Sheet of a series that includes both (C)ivil and (L)landscaping information.
- M-6 Sixth sheet of a series that includes (M)mechanical information.

Project Number: Indicate UMHHC project number (RTN # & CBN #). For projects managed by UM/Campus AEC, include the AEC “P100” number. The first row under “project number” is to be the UM/Campus assigned number and the second row is to be the UMHHC RTN & CBN#’s.

Sheet Title: A sheet’s title should uniquely identify a drawing sheet from others in a set and identify type of drawing using words such as:

- Plan
- Details
- Sections
- Elevations
- Schedules
- Risers
- Schematics

Identify the location. Where the project area requires multiple plan sheets, including unique building, level and zone in sheet title.

Project: UMHHC will provide a specific project name.

Approval/Issuance Area of Titleblock:

Keywords: Identify drawing content with appropriate keywords found in the Disciplines/Keywords table at the end of this document.

Location: Show Building, Level, Zone or other location information which is not already part of the Project Name or Sheet Title.

UM Design Mgr.: Identify the primary University Project Coordinator.

Approved/Checked/Coordination Checked: When submitting to UMHHC any sheet with information not previously submitted, note on one of the issuance lines the purpose of submittal and date (i.e. CONSTRUCTION MM/DD/YY). This applies to design review and contract issuances as well as addenda, bulletins, etc. All such notations of issue are to remain on sheets.

Issues for Dates: All documents issued must have a unique, current date. “Issued for” dates shall be noted as follows:

- Schematic Review (as needed)
- __% DD Review (as needed)

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- __% CD Review (as needed)
- 100% CD Review (mandatory)
- Construction (mandatory)

All drawings issued after the construction set shall be noted “Bulletin #__” as directed by the Design Manager. All changes shall be “bubbled” and all drawings shall be reissued as a complete set.

Special Notes for Capital Construction (UM Construction Services) CD’s

Smaller construction projects are generally managed by UMH FPD Construction Coordinators, constructed by UM Construction Services and do not go out to bid to General Contractors. Consequently, much of the standard boilerplate and notes required for a competitively bid project are not required.

These projects do not need full specifications or after-hours information. They do need to be prepared with standard UMHHC title block 22”x34” (ANSI D.)

These documents should include all information required to order the materials; i.e. manufacturer and model numbers, colors, sizes, etc.

Documents should include phasing drawings and temporary partition locations, as required.

Obtain all finish information from UMHHC Interior Design and put all information on the documents, including manufacturer, model, color name and all model numbers,

Final construction documents are to be submitted in PDF format to the UMH Design Manager and uploaded to the printing vendor.

A/E will submit documents to BFS and HEFS and include plan submission fees as reimbursable expenses, as required.

At the end of the construction phase of the project AutoCAD & PDF file formats are to be provided to FPD.

Backups

A/E’s shall retain available backups of electronic files for a minimum of 5 years from the close of the A/E’s contract with UMHHC.

Software Platform

Internally, UMHHC Facilities Planning and Development uses AutoCAD. Electronic files submitted to UMHHC FPD shall be in a format compatible with the release in use by UMHHC FPD and in conformance with the standards outlined herein for electronically prepared drawings.

Electronic File Transmission and Requests

Electronic files submitted to UMHHC Facilities Planning and Development are to be submitted in AutoCAD format with one “hard-copy” sheet per drawing file and conform to standards herein for layer names and drawing content. In addition to AutoCAD files, all drawings shall be submitted in PDF format.

Electronic files submitted to UMHHC Facilities Planning and Development for Interior Design use should be at 1:1 scale and show new work only. File should include only walls, doors, windows, room numbers, room types (names) and locations of electrical and data outlets. Doors should be shown at 90 degrees open. Room numbers and room types should be on one layer.

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Electronic files submitted to UMHHC Facilities Planning and Development for the assignment of room numbers should be at 1:1 scale and show new work only. File should include only walls, doors, windows, room numbers and room types (names).

Electronic drawing submittals shall not use external drawing references (x-ref). All external referenced materials should be permanently inserted in the drawing file.

Files translated from CAD programs other than AutoCAD shall have all "numbered" layers removed or replaced with appropriate AIA Guideline type layer names and translation routines should be written accordingly.

Electronic files may be transmitted to UMHHC Facilities Planning and Development via e-mail (FAC-projectdept@med.umich.edu), FPD Virtual Network, compact disc or posted to an FTP site accessible to UMHHC FPD except for final deliverables (Record Drawings). Final deliverables (Record Drawings) shall be transmitted on compact disc.

Room Numbering

Room numbering shall generally be provided by FPD.

Guidelines for assigning room numbers for University of Michigan Hospitals and Health Centers:

- UMH standard is a 4 digit room number, with the first digit being the floor. Rooms on floors with a 2 digit floor number (B1, 10, etc.) may have a 5 digit room number
- In a simple building start at the primary entrance and work counter-clockwise around the building with odd numbers on the perimeter and even numbers on the core.
- In a large, complex building with the potential to have more than 1000 rooms on a floor, divide the floor into wayfinding zones, each designated by a letter following the floor number. (Example: 1A101) In such cases, the wayfinding zones should correspond to any breakdowns in architectural construction drawings.
- Reserve numbers ending in 0 and 5 for corridors.
- For rooms where the primary entrance is from within another room, label the room number of the room it opens from with a letter suffix (example: where you get to a manager's office by going through the secretary's office, the secretary office would be 1001 and the manager office would be 1001A). Suites where all rooms open off a central core have the number of the central core room with a letter suffix (example, 1001, 1001A, 1001B).
- While they CAN be used in a large suite for general rooms, try to reserve the following letter suffixes for the following specific room types:
    - C—Communication Closets
    - E—Electrical Closets
    - I—avoid using it due to confusion with the numeral 1.
    - J—Janitor Closets
    - M—Mechanical Closets
    - O and Q—avoid using due to confusion with the numeral 0.
    - T—Toilet rooms
    - V—Vertical Shafts
    - X—Stairwells and Elevators
    - Z—Corridors
- The above specific room types must have room numbers with the above suffixes (i.e. corridor 1000Z)
- If a room looks like it could be subdivided in the future, skip a number in the sequence to allow for future expansion.
- In an existing building, for a room that has been created by the dividing of a larger room, follow the pattern discernable from the existing surrounding area.
- If a room has 2 entrances assign the number based on which door is the primary entrance. If neither entrance is "primary", use the lower of the two possible room numbers.

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- When a room has been created by combining two smaller rooms, use the lower of the existing room numbers.

Door Numbering

Door numbers shall relate to room numbers.

Disciplines/Keywords

Keywords are used by the UMH Archival Coordinator for archiving and logging each construction document sheet into a searchable software database. The following standard keywords (or combination thereof) shall be utilized on all CD sheets to indicate the sheet's content:

PRIMARY DISCIPLINE	KEYWORD	CONTENT/COMMENT
All disciplines	Demolition	Demolition / Existing conditions
	Details	
	Elevations	Interior or Exterior
	Index	
	New Work	
	Notes	
	Riser	
	Schedules	
	Sections	
	Specifications	
	Symbols	abbreviations, legend, key
	Title	
(A)rchitectural	Conveyance	Elevator / Escalator / RoboCarrier / P-Tube Cars, Tracks, Tubes
	Code	Fire/ Smoke Walls
	Dividers	Floor Plans/Information: Includes Partitions, Architectural Specialties, Interior walls.
	Enclosures	Exterior Walls, Windows, Window/Curtain Walls Roofs, roof stairs, Ladders, Railings.
	Equipment	Fixed, Movable & Misc. equipment.
	Finish	Room finish patterns, paint types
	Furniture	Freestanding, Furniture Systems, Plants. Woodwork, Millwork, Casework, Floor Coverings, Custom Cabinetry
	Phasing	Phasing Plans
	Reflected Ceiling	Grid, Penetrations, Suspended Elements
	Signs	Interior and exterior signs.
(C)ivil	Grading	Grading, Retaining walls, test borings, topographical.
	Roadways	Roads, Parking lots
	Survey	Property lines and survey benchmarks
	Utilities	Storm drainage, catch basins, exterior sanitary sewer, manholes, pumping stations, storage tanks, Site electrical substations and poles, Site communication (under/overhead), Fire hydrants and connections, natural gas manholes, meters, vaults and tunnels.
(E)lectrical	Auxiliary Systems	Lightning protection system, grounding system, Other auxiliary systems.
	Communications	Tel and Communication outlets, Data outlets, Sound or PA systems, TV antenna systems, Closed circuit TV, Nurse Call, Security, Paging systems, Central Dictation Systems, Bell systems, Clock systems, Misc. alarm systems, Intercom systems, Cable trays.
	Controls	Electric control systems, devices, wiring, VSD's
	Lighting	Lighting: special, emergency, roof, site; Switches, circuits
	One Line	
	Power	Panels, power equipment, switchboards, circuits, under floor/carpet raceways/wiring, feeders, busways.
	Receptacles	
(F)ire	Dividers	Firewalls
	Sprinklers	Sprinkler system, Standpipe system
(L)andscape	Improvements	Site improvements: fencing, walls, decks, bridges, pools, sports fields, play structures, site furnishings, telephone booths.
	Irrigation	Irrigation
	Planting	Trees, shrubs, flowers
	Walks	Sidewalks, steps
(M)echanical	Controls	Controls and instrumentation
	HVAC	HVAC Systems, diffusers, sheet metal, piping
	Medical Gas	Medical gas systems, Compressed air
	Special Systems	Special systems, Process systems, Dust and fume collection systems, Fuel system, Refrigeration systems, Snow melt systems.
(P)lumbing	Domestic Water	Domestic hot and cold water systems
	Equipment	Fixtures, Sump pumps

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	Special Waste Systems	Acid, Alkaline, Oil Waste systems
	Waste Water	Sanitary drainage, Storm drainage systems, Interior
(S)tructural	Beams	lintels
	Columns	Piles/Piers, Anchors
	Foundation	Slab, deck, concrete
	Framing	wind bracing
	Load	
	Truss	