

PROGRAM INFORMATION/REQUIREMENTS

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GENERAL

1. It is the intent of this section to inform the AE about specific requirements that are to be addressed and/or incorporated into the contract documents to provide direction and set expectations for the contractors engaged in the construction of the project. These requirements are for elements, systems, concepts, etc. that do not necessarily fall neatly into a CSI Division and thus are placed here to keep the intent intact.
2. The requirements in this section are intended to apply to projects on all campuses, stations, locations, etc. under the University of Minnesota, unless otherwise noted. In particular there will be references to the University of Minnesota Duluth (UMD) campus that will apply only to that campus.
3. Where “Landcare” is mentioned in this section it will have different contact points depending on the campus/location the work is taking place on. For the Twin City Campuses, this function resides in Facilities Management Landcare. For Crookston it resides in Facilities and Operations. For Morris it resides in Plant Services and Master Planning. For Duluth it resides in Facilities Management – Engineering Services. In all cases “Landcare” shall refer to the specific department/group/etc. that is responsible for the care and maintenance of the exterior grounds on that campus. The AE shall work with the Project Manager and the appropriate “Landcare” group to determine which requirements, listed below, pertain to the campus/location where the project will occur. Some requirements will vary depending in the facility location and the “Landcare” group that is charge of those facilities.

BASIC DESIGN REQUIREMENTS

1. Responsibility for Compliance in Design: The A/E is responsible for producing a design that complies with applicable codes, ordinances, statutes, regulations and laws, and all of the University Standards and Procedures for Design (Standards) herein.

1.1. The applicable codes, ordinances, statutes, regulations and laws include, but are not limited to, the following:

- A. Americans with Disabilities Act - EEOC Accessibility Guidelines and MR 1341
- B. Environmental Protection Agency standards
- C. Metropolitan Council Environmental Services requirements
- D. Minnesota Department of Health regulations
- E. Minnesota Department of Labor - OSHA regulations
- F. Minnesota Department of Natural Resources
- G. Minnesota Food Code
- H. Minnesota Pollution Control Agency standards
- I. Minnesota State Energy Code

- J. Minnesota Well Code
- K. National Electric Code
- L. Scientific Equipment and Furniture Association (SEFA)
- M. State Building Code, including all referenced documents
- N. U.S. and Minnesota departments of labor rules and regulations - OSHA
- O. U.S. Nuclear Regulatory Commission
- P. Uniform Fire Code

1.2. Verify dates of applicable codes with the University Building Code Office.

1.3. It is understood that the basic minimum requirements described within these Standards are in addition to the applicable codes, ordinances, statutes, regulations and laws. There has been no attempt to repeat the code requirements throughout the divisions.

2. Applicable Regulations

2.1. The A/E is responsible for compliance with the program requirements of the project. Projects estimated to cost more than \$100,000 typically have a pre-design phase that describes basic parameters. Refer to Section 6 – Planning in this document - Predesign Outline for Capital Projects. In the event a pre-design phase does not exist, verify requirements with the Project Manager, and identify the project stakeholders.

2.2. There are some functional areas or systems that have special requirements. For some of the most common special function areas and systems, a more detailed description of their needs has been prepared. The special function areas and systems are found in Division 13 – Special Construction, Systems and Guides and are as follows:

A. Chemical Laboratories	Division 130010
B. General Purpose Classrooms	Division 130020
C. Food Service	Division 130030
D. Parking and Transportation Services	Division 130040
E. Landcare	Division 130050
F. Graphics and Signage	Division 130060

2.3. The A/E shall notify the Project Manager if the specific requirements for one of the special function areas and systems conflict with other requirements of the Standards.

3. Permits

3.1. Building Permits: The Contractor is responsible for securing and paying for all permits from the University Building Code Office, with the exception of high-pressure

steam and elevator. The requirement extends to all major subcontractors, including fire protection, plumbing HVAC, electrical, low voltage, utilities, earthwork, etc. See the University Building Office website at <http://www.bcd.umn.edu/> for more detailed information. The contractor is responsible for applying for, securing and paying for high-pressure steam and elevator permits through the State of Minnesota.. See also Division 1, section 01 41 00 for more information.

3.2 Air Permit Regulations: Air permit regulations are extremely complex and have different permit requirements depending on the campus, existing permits, specific project, and facility. Therefore, the Department of Environmental Health and Safety (DEHS) requires evaluation of all air emission sources to determine whether a project requires a permit or an amendment to existing permits. The permitting and amendment process can take a minimum of six months and up to 14 months. In some cases, the MPCA requires that a permit be issued prior to starting construction. DEHS shall issue a letter of approval to the project manager, indicating that construction can start based upon the evaluation or issuance of a permit from MPCA.

Three Steps to a Permit Amendment

1. Identifying Processes and Equipment that may Require a Permit Amendment

Below is a representative list of processes, equipment and facilities that may be subject to air permit regulations. If a proposed project includes or modifies equipment of the type listed below, the Department of Environmental Health and Safety (DEHS) shall evaluate emission sources and shall determine if an air permit is required prior to starting construction or modification. If there are any questions as to whether the project involves equipment requiring an air permit, call DEHS at (612) 626-7957. (Refer to appropriate emissions checklist in the Forms Section of the Standards for submitting information on engines, boilers/furnaces, laboratories or other sources.)

1.1. Combustion Equipment

- A. Engines used to power generator sets or fire pumps.
- B. Boilers, furnaces or other space-heating equipment powered by fossil fuel or wood (excludes water heaters strictly used for domestic purposes)...
- C. Dryers, ovens or furnaces powered by fossil fuel or wood, and used in processing material
- D. Incinerators

2. Storage Vessels

- A. Solvent storage tanks
- B. Petroleum product storage tanks, except for tanks that store liquid petroleum gas (LPG) and liquid natural gas (LNG), natural gas or lubricating oils
- C.

3. Materials Handling

- A. Grain-handling equipment such as conveyors, grinders and elevator legs
- B. Ore-handling equipment such as conveyors, screeners and pellet equipment
- C. Shredders and crushers
- D. Distribution of fuel such as gasoline and diesel fuel from bulk storage tanks into vehicles

4. Cleaning, Coating and Finishing of Materials (Other than Laboratory Scale Operations)

- A. Solvent cleaning, degreasers and parts washers
- B. Ethylene oxide sterilizers
- C. Sand blasting or other types of abrasive blasting
- D. Fermenters
- E. Painting, including but not limited to paint booths, spray guns and dip tanks
- F. Plating: chrome plating or chromic acid anodizing
- G. Surface coating of a product (includes but is not limited to coating wood, metal and plastics)

5. Laboratories and Research Facilities

New or renovated laboratories do not require a permit amendment because they are considered “insignificant activities”. However, aggregate laboratory emissions are tracked and calculated based on the total number of operating fume hoods and a standard emission factor.

The University is required to track the number of fume hoods in operation. If your project involves the installation or removal of fume hoods, please call DEHS at (612) 626-7095.

6. Additional Operations that may Require Permits

- A. Offset printing
- B. Minerals processing
- C. Pharmaceutical manufacturing
- D. Animal or domestic wastewater treatment facilities
- E. Soil roasters
- F. Woodworking done as part of construction activities
- G. Metals recovery operations

Stack Height

Processes and equipment that emit air pollution must be designed and installed to meet ambient air quality standards (MN Rules 7009). A key component in meeting these standards is stack height. In general, exhaust stacks must be approximately ten feet above the highest roof line to disperse the exhaust and avoid building downwash, which can cause ambient air quality problems. Alternate location of exhaust stacks requires submission of modeling to DEHS to document compliance with these standards. DEHS will review modeling and determine whether it meets the standards

or whether further modeling is required.

2. Filling Out Internal Forms

Use the appropriate checklist located in the Forms section of the Standards for the emission sources that will be installed or removed as part of the project. Submit completed checklist to DEHS. Information required to fill out the checklist will include: make and model number of the equipment to be installed; throughput and output capacity of the equipment; building, equipment and stack locations; and expected construction schedule. Call Twin Cities

3. Providing Notifications of Removal, Installation and Operation DEHS (612) 626-7957 or (612) 626-7095 with any questions or comments regarding form applicability or other details.

Depending on the type and capacity of equipment installed under a permit amendment, the MPCA may require notifications of the installation, removal and/or initial operation of the newly permitted units. A/E and project managers must provide expected and actual milestone dates to DEHS for review and submittal to the MPCA

3.3 Storm Water Permits and Requirements

National Pollutant Discharge Elimination System (NPDES) Construction Permits

A/E will include language in the construction documents requiring that a NPDES Construction Permit be in place before commencement of construction for all new development or redevelopments that require such permits. Such permits are required for any construction activity disturbing:

- One acre or more of land.
- Less than one acre of land if that activity is part of a "larger common plan of development or sale" that is greater than one acre.
- Less than one acre of soil, but the Minnesota Pollution Control Agency (MPCA) determines that the activity poses a risk to water resources.

These permit applications will include the requisite Storm Water Pollution Prevention Plans (SWPPP), addressing both (1) construction site erosion and sediments controls and (2) post-construction storm water management. The SWPPPs will be prepared by the Architect/Engineer (A/E) to comply with NPDES permit requirements and adhere to the University's storm water standards. A/E will submit SWPPP and NPDES Construction permit application to DEHS or its designated campus point of contact for review and approval. DEHS or its designated campus point-of-contact for storm water will arrange for owner's signature on permit applications.

(1) Construction Site Erosion and Sediment Controls.

All construction projects that fall under the NPDES Construction Permit criteria (see University of Minnesota Capital Project Management

above) are required to have temporary erosion and sediment controls. For each project the Architect/Engineer must incorporate into construction documents and SWPPPs controls which shall meet the established standards of the campus storm water steering committee and the State of Minnesota. Standards for temporary erosion and sediment controls are detailed in Division 1, Section 01 57 13. Construction documents will require the Contractor to implement these controls according to schedules and specifications in the documents. The field representative of the Architect/Engineer will provide direction and feedback to the Contractor concerning the Contractor's installation of erosion and sediment controls per the construction documents. The construction documents will require the Contractor to inspect for effectiveness of these controls and correct any problems, to document all inspections and corrections, and to provide an Erosion Control Supervisor with a valid certification in erosion prevention to direct the Contractor's and subcontractors' operations. Certification will be the equivalent of that offered by the University of Minnesota Erosion and Sediment Control Certification Program.

(2) Post Construction Storm Water Management

For projects that fall under the NPDES Construction Permit criteria (see above) and projects disturbing more than 0.5 acres of land, A/E will design a storm water management plan that reduces impervious cover, promotes infiltration, and captures and treats the storm water runoff to meet campus-wide pre-settlement conditions using acceptable Best Management Practices (BMPs). A/E will contact DEHS concerning the campus-wide standard which is based on United States Department of Agriculture's Natural Resources Conservation Service curve number methodology.

As part of the design process, the A/E must incorporate post construction BMPs for the campus or location they are working at into construction documents to meet the standards set forth in the Stormwater Procedure. For the Twin City, Crookston, Morris, Research Outreach Centers (ROC's) and all other areas – except Duluth (UMD) these procedures are found at:

http://policy.umn.edu/Policies/Operations/Safety/ENVIRONMENT_PROC04.html.

For UMD these procedures are found at:

<http://www.d.umn.edu/fm/stormwater/index.html>

4. Building Design Service Life Expectancy: University facilities shall be designed with 50-year life expectancy. Facilities requiring less than 50 year life expectancy must be preapproved by the CPM University Architect's office representative. The life expectancy for any facility shall equal the life expectancy for the following items: designed life of building; inaccessible or structural components; expensive or difficult to replace components, including below ground drainage; and service, installation and external work. Exception: Buildings with a 50-year life expectancy shall have a life expectancy for major, replaceable components of 25 years.

5. Preservation of Architecturally Significant Elements

5.1. The Board of Regent’s Historic Preservation Policy acknowledges that the university has a responsibility to protect the physical features and historic character of properties designated as state or national historic sites, which includes those properties that are considered eligible for such designation.

5.2. Before carrying out any undertaking, including renewal and new construction, which will affect designated or listed properties, the university is required in cooperation with the Minnesota Historical Society to determine appropriate treatments and to seek ways to avoid and mitigate any adverse effects on designated or listed properties.

5.3. The CPM University Architect’s Office provides analysis, interpretation and advisory input on all historic buildings, objects, landscapes, and archaeological sites affected by renewal, new construction, restoration, rehabilitation, renovation and maintenance projects throughout the university system. Contact the University Architect representative in CPM through the Project Manager early in the planning of all projects associated with designated or listed historic university buildings, object landscapes and archaeological sites. A current listing of university historic properties is maintained in Appendix B of the University Historic Preservation Plan, available for viewing, downloading and printing in Adobe .pdf format from the CPM Web site at:
https://cpm.umn.edu/sites/cpm.umn.edu/files/historic_rp_0.pdf

6. Planning

6.1 – Predesign Outline for Capital Projects

6.1.1 The following outline identifies the content and organization of predesign documentation for major capital projects at the University of Minnesota. This documentation is necessary to provide detailed project information to the university administration and to the Board of Regents before any project is included in the annual capital budget. For projects included in the university capital request to the state, predesign documentation is needed to support the request and to meet the requirements of Minnesota Statutes 16B.335, Subdivision 3. **Not all sections apply to all projects.** Include only the sections that are relevant to a particular project. Please contact University Planning for additional information on preparing predesign documents.

6.1.2. The primary responsible party for each element of the predesign is indicated as follows:

- A. BFO Budget and Finance Office
- B. D/UG Dean/director/department head/user group
- C. DEHS Department of Environmental Health and Safety
- D. FM Facilities Management
- E. OGC Office of the General Counsel

F. CPM Capital Project Management - Planning
G.UBCO University Building Code Official

6.1.3. Statement of Need

6.1.3.1. Include a brief description of the following programs: (D/UG)

- A. Historical background
- B. Mission and objectives
- C. Instructional, research, public service and continuing education functions
- D. Statutory requirements and/or other mandates (if any)
- E. Relationship to the strategic academic plan at the university
- F. Current facility deficiencies/inadequacies
- G. Description of planning/decision-making process for determining programmatic needs
- H. Expected outcomes from the capital project

6.1.4. Program Analysis

6.1.4.1. Include a description of current and projected needs of the following: (D/UG)

- A. Personnel (faculty and staff, percentage of appointment)
- B. Enrollment
- C. Credit hours and weekly contact hours for academic courses
- D. Research activities

6.1.4.2. Include a description of the functional requirements of users as follows: (D/UG)

- A. Program activities to be accommodated
- B. Physical and functional requirements to be achieved
- C. Special equipment needs
- D. Applicable standards

6.1.4.3. Provide results of the Minnesota Facilities Model (MFM) audit (CPM).

6.1.4.4. Outline the preliminary architectural/engineering program based upon the preceding needs (CPM).

6.1.4.5. Identify and evaluate alternatives for addressing the following needs: (CPM and D/UG)

- A. Space reallocation

- B. Remodeling
- C. New construction

6.1.5. Financial Analysis

6.1.5.1. Document current year and two-year projected revenue and expenses of the following: (D/UG and BFO)

- A. Non-sponsored revenues and expenses
- B. Sponsored research revenues and expenses
- C. Tuition generated by the program
- D. Other revenues and expenses

6.1.5.2. Include a fundraising feasibility statement from the following appropriate unit: (D/UG and BFO)

- A. University of Minnesota Foundation
- B. Minnesota Medical Foundation
- C. College

6.1.6. Site Analysis: New Construction/Major Remodeling

6.1.6.1. Identify and evaluate alternative sites(CPM)

- A. Master Plan directives
- B. Physical and functional opportunities/constraints
- C. Development cost implications

6.1.6.2. Specify preliminary development requirements for the recommended site (CPM).

6.1.6.3. Include a statement of community/neighborhood involvement in site selection for the following: (CPM)

- A. Community involvement process
- B. Community issues
- C. Response to community issues

6.1.7. Environmental/Code/Hazardous Material Analysis

6.1.7.1. Identify and evaluate existing environmental conditions (CPM, FM and DEHS).

6.1.7.2. Review existing building conditions and summary of required upgrades (UBCO).

6.1.7.3. Mention any extraordinary or atypical code requirements (UBCO).

6.1.7.4. Describe special occupant safety requirements (DEHS and UBCO).

6.1.8. Cost Analysis

6.1.8.1. Provide cost estimates for the following recommended alternative: (CPM)

- A. Construction costs
- B. Other project costs
- C. Projected cash flow for funding (based on project schedule)
- D. Current year and projected annual facility operating costs for the proposed building
- E. Annual capital depreciation

6.1.8.2. Document the following cost information: (CPM)

- A. Assumptions upon which estimates are based
- B. Cost history for comparable projects

6.1.9. Project Schedule

6.1.9.1. Indicate the implementation schedule for the following: (CPM)

- A. Design
- B. Bidding
- C. Construction
- D. Occupancy

6.1.9.2. Specify the funding sequence (CPM).

6.1.10. **Diagrams/Concept Plans:** Provide conceptual drawings of the recommended solutions in sufficient detail to illustrate the scope of the project, test the adequacy of the space allocation, and provide a basis for accurate preliminary cost planning. (CPM and FM)

6.1.11. Design Guidelines

6.1.11.1. Include Master Plan/district guidelines for the following: (CPM/PSRE)

- A. Image/architectural character
- B. Open space/landscape
- C. Circulation

6.1.11.2. Include site guidelines for the following: (CPM)

- A. Orientation/focus
- B. Setbacks/landscape treatment
- C. Access/circulation
- D. Service requirements
- E. Utilities

6.1.11.3. Include the following architectural design guidelines: (CPM)

- A. Architectural style
- B. Building facades
- C. Building structural systems
- D. Building fenestration
- E. Roof system
- F. Detail and ornament
- G. Interior elements

6.1.11.4. Mention infrastructure improvements (CPM).

6.1.12. Neighborhood Impact Assessment

6.1.12.1. Outline issues that will affect the immediate neighborhood (CPM).

6.1.12.2. Indicate alternatives that have been considered such as no build and other locations (CPM).

6.1.12.3. Specify alternative sites that have been considered (CPM).

6.1.12.4. Outline how the following will impact the neighborhood and proposed mitigation: (CPM)

- A. Traffic/transportation/parking
- B. Noise and air pollution
- C. General quality of life

6.1.13. Gender Equity Impact Assessment: Intercollegiate Athletic Projects: Provide a statement regarding how the project will affect Title IX compliance requirements at the university (GC).

6.2. The A/E shall request a site survey plan through the Project Manager for the project. The university shall engage a registered land surveyor to prepare a site survey plan.

6.3. The Site Survey Plan

6.3.1 The plan shall show and include, but not be limited to, the following minimum requirements: adjacent property lines, topographical data, existing building lines, grades, pavements, soil borings, a hydro-geological study, trees, adjacent conditions, existing structures and existing utilities including associated easements (above and below grade). To establish the expectations at the university for re-use or disposal or existing topsoil, provide gradation curve analysis of topsoil. Submit the test results of the analysis to the Project Manager and Landcare. The findings from these requirements shall be used to prepare a construction site plan coordinated with existing conditions.

6.3.2. The plan shall incorporate the appropriate campus coordinate grid system, elevation datum and data such as manhole numbers. Include a key or legend on the topographical plan that clearly identifies points of interest. Make certain that markings on the key or legend are uniquely identifiable. The plan shall be sent to the University both electronically and as a reproducible drawing at 1 inch equals 20 feet scale. Refer to Program Information/Requirements – Computer-Aided Design Requirements for additional information. For the Twin City, Crookston, Morris, Research Outreach Centers (ROC's) and all other areas – except Duluth these plans shall be sent to Engineering Records. For the Duluth (UMD) campus these plans shall be sent to Facilities Management Engineering Support Services.

6.4. The A/E shall review the site survey plan and report any inconsistencies and/or incomplete information to the Project Manager. Include the site survey plan in construction documents.

6.5. Define contract and construction limits and outside staging areas on the site survey plan prior to the start of construction. Coordinate staging areas with Landcare prior to the end of the Schematic Design Phase (subject to approval from the Project Manager and Landcare). Make adequate provisions to include dumpsters for recycling and reuse purposes.

6.6. Site planning shall provide for access, service and utility routes that interface with adjacent areas and structures.

6.7. Considerations for site planning shall include, but not be limited to:

- A. Pedestrian traffic patterns
- B. Service vehicle access
- C. Fire and emergency equipment access
- D. Program parking
- E. General university parking
- F. Vehicle storage
- G. Bicycle storage

- H. Terrain
 - I. Preserved or removed vegetation
 - J. Storm and sanitary management plan
 - K. Water or soil contamination
 - L. Existing utility capacities and locations
 - M. Accessibility for people with disabilities, including parking
 - N. Egress patterns and lighting, including light levels for safety
 - O. Property lines
 - P. Utility easements
- 6.8. Exterior building components such as mechanical or electrical equipment, dumpsters, emergency generators and specific program support equipment shall be screened and secured from public view/access. The A/E shall address placement and screening and the University Architect shall approve.
- 6.9. Review site and landscape plans with Landcare prior to completion of the Schematic Design Phase.
- 6.10. Review site and landscape plans with DEHS during the predesign phase to discuss environmental concerns. If there is a change in A/E following predesign, the A/E responsible for further development of the project shall review site and landscape plans with DEHS during schematic design.
- 6.11. Duluth Campus Additional Requirements
- 6.11.1. Site Drawing Survey Layout
- 6.11.1.1. Elevations shall be NAVD datum. Coordinate system shall be St. Louis County JM 96.
 - 6.11.1.2. Plat information shall be shown on a plat plan, including all existing and proposed easements when necessary. The university property line shall be shown if the project is taking place in an area where UMD does not own all adjacent property. Some property, plat and easement information can be obtained from Erik Larson, 241 DAdB, 1049 University Dr., Duluth, MN 55812, e-mail elarson@d.umn.edu.
- 6.11.2. Survey
- 6.11.2.1. Survey information (monument data) can be obtained by written request from Facilities Management Engineering Support Services. Include the project name, the project number and contact information. Submit to Erik Larson, 241 DAdB, 1049 University Drive, Duluth, MN 55812, e-mail elarson@d.umn.edu.
 - 6.11.2.2. Sightlines for joint UMD/MNDOT monuments on campus must not be infringed upon. If a project will block one of the sightlines, additional second

order points and NGS registration to complete the circuit will be required as part of the project.

6.11.2.3. Damage to a university survey point shall be replaced in kind.

6.11.2.4. Projects on the periphery of the campus shall include a property survey as part of the planning processes. GPS coordinates shall be determined for any property corner found or set during these surveys. This information shall be submitted to Erik Larson, 241 DAdB, 1049 University Dr., Duluth, MN 55812, e-mail elarson@d.umn.edu.

7. Service and Loading Dock Entrances

7.1. Include a service entrance that is protected from the weather and accessible from a separate service drive in the design of new buildings.

7.2. Locate the service entrance adjacent to storerooms, a waste compactor, waste and recycling collection rooms, a service elevator and a loading dock.

7.3. Include two parking spaces, with signage for service vehicles at the service entrance. Service driveways must accommodate one 30-foot tandem axle vehicle. Coordinate with the Project Manager on axle loading.

7.4. Establish an area where snow and ice can be drained and removed at the service entrance.

7.5. Unless the program requires an elevated receiving bay, provide for grade level loading and unloading. In an effort to prevent personal injuries, provide a 5,000-pound capacity weatherproof dock leveler at all docks. The program of some facilities may require an interior receiving bay or other receiving facility. To ensure that the dock is operated in accordance with the applicable OSHA regulations, the A/E shall review materials-handling procedures with the user to determine if a dock hook is necessary.

7.6. To facilitate shipping and receiving, provide a 6-foot by 7-foot service entrance door opening. Provide one active and one passive leaf with delayed action closure.

7.7. Loading docks shall have a powered, overhead or rollup door. Any overhead or rollup door shall have a separate entrance door.

7.8. Loading dock storm water infrastructure shall be designed to facilitate capturing spills prior to release to the environment.

7.9. Signage shall be included at the loading dock indicating actions to follow in

case of a spill and who to notify.

8. Service Elevator

8.1. Include elevators in buildings that are two stories and higher. Locate the service elevator adjacent to the service entrance. In smaller buildings, the service elevator may perform a dual function with the passenger elevator(s).

8.2. Provide direct service to all floors in the buildings, including floors where mechanical and electrical rooms are located.

8.3. Service elevator interiors shall be a minimum of 5 feet, 8 inches wide by 7 feet, 5 inches deep by 8 feet high with a cab door opening 4 feet wide by 7 feet, 6 inches high.

8.4. A Door Hold feature with activation via momentary push button actuation shall be provided to facilitate loading and unloading.

8.5. To limit access of mechanical rooms to authorized personnel, elevators that open directly into mechanical rooms and building service areas shall be equipped with a security access device. The device shall be located on/in the car station operating panel.

9. Room Numbering System Standards

9.1. Twin Cities and all other Campuses, Stations or Research Outreach Centers (excluding Duluth – see below)

9.1.1. CPM shall assign room numbering systems and floor level designations for new construction and remodeling projects before becoming final. The architect shall contact the CPM Project Manager when room numbers are being established to arrange the review and approval process.

9.1.2. The starting point for the building room numbering system shall be the main entrance for the building, that is, the front door. Room numbering shall then proceed throughout the floor in a logical sequence. Whenever practical and possible, the room numbering system should follow a similar and logical sequence between floors of a building, so the general public senses a familiarity of space with each floor.

9.1.3. Odd-numbered rooms shall be on one side and even-numbered rooms on the other side. For example, the door to room number 124 should be across the corridor from the door to room number 123.

9.1.4. Room numbers shall be in the following sequence on each level:

- A. Sub-basement: S1 - S99
- B. Basement: 1 - 99
- C. First floor: 100 - 199
- D. Second floor: 200 - 299 and so on
- E. Zeros (0) are not to be used in front of one or two digit numbers

9.1.5. Buildings that have floor levels that include a ground floor shall have a room number sequence as follows:

- A. Sub-basement: S1 - S99
- B. Basement: B1 - B99
- C. Ground: 1 - 99
- D. First floor: 100 - 199
- E. Second floor: 200 - 299 and so on
- F. Zeros (0) are not to be used in front of one or two digit numbers

9.1.6. In the Health Sciences Building, a floor level designator often precedes the room number so the room number assumes the following format:

- A. Sub-basement: S-100 through S-199
- B. Basement: B-100 through B-199
- C. First floor: 1-100 through 1-199 and so on

Note: This sequence allows floors with more than 100 rooms to have nine ranges of room numbers per floor. For example, the first floor could have the following range of numbers: 1-100 through 1-199, 1-200 through 1-299, 1-300 through 1-399 and so on up to 1-900 through 1-999.

9.1.7. Rooms are given a prime room number when the door to the room opens to a corridor. Rooms that open off from another room rather than the corridor are given a suffix after the room number of the room that does open to the corridor. Number in a clockwise progression around the main room. For example:

9.1.7.1. Room 110 opens to the corridor. There are four rooms that open to Room 110. They are numbered as rooms 110, 110A, 110B and 110C.

9.1.7.2. In the Health Sciences buildings, the suffix often times takes the form of a number rather than a letter. In the above example, the four rooms would be numbered 110-1, 110-2, 110-3 and 110-4. In the Health Sciences buildings that have a floor level

designator, the four rooms would be numbered with a letter suffix: 1-110A, 1-110B, 1-110C and 1-110D.

9.1.7.3. Top-level administrative offices often have a door that opens to the reception area and another door that opens to the corridor. In these cases, it is acceptable to number the room off the reception area with a suffix rather than with a prime number off the corridor.

9.1.8. Since new room(s) could be added later, there should be a skip in room numbering to accommodate the new rooms in the future.

9.1.9. Whenever possible, reception areas, classrooms, dining areas, main conference rooms and other high-visibility rooms should be numbered with easy to recall numbers such as 100, 120, 125 and 150.

9.1.10. When a room is split by a folding partition, the rooms thus created can be numbered as prime room numbers or as suffixes. For example, Room 125 can be divided into three rooms and numbered as 125A, 125B and 125C; as 125, 125A and 125B; or as 125, 130 and 135.

9.1.11 Cubicles should also be numbered using the same logic as room numbering.

9.2. Duluth Campus (All UMD buildings are connected)

9.2.1. The first floor is the floor with the main exits used for pedestrians/fire access (unless the building is between two buildings with the same non-standard floor designators).

9.2.2. The ground floor is used when the main entrance/exits are one floor above the secondary entrance/exits.

9.2.3. The basement floor is used when it is below grade with no exits.

9.2.4. A “G” or “B” prefix to a two-digit number denotes the basement or ground floor.

9.2.5. Room numbers shall be three digits (XXX) unless an alphabetical character is used as a suffix or the building is over nine stories.

9.2.6. Hallway areas are numbered X00 or X50. The main hallway always ends in X00. Doors separate hallway areas (not changes in direction or less than one-story changes in elevation). If hallways need to be broken up for construction purposes (w/o doors) the room number stays the same, but can have a numeric designator added to the end (X00 - #)

9.2.7. Stair towers are numbered X00A, X00B, or X50B, X50C, etc. The "A" stair tower shall be on the south side or east side, and subsequent stairs numbered as you head north or west. Stair towers are numbered alphabetically across the building even if they are in different hallways. The used suffix letter is then left unused in the other hallway. Mid floor landings are numbered along with the floor below.

9.2.8. Vestibules are numbered X00X after the stair towers are completed.

9.2.9. Closets, even those that cannot be entered in the hallways are numbered X00X after the vestibules have been numbered. Closets that cannot be entered within a room are still numbered with an alphabetical suffix to the room number.

9.2.10. Elevators are numbered X00EE1, X00EE2, etc.

9.2.11. Rooms are numbered on odd and even sides, east to west and south to north. The first room on the southwest corner would be the lowest odd number. Room numbers are based upon the location of the primary door for each room. Room numbers shall progress orderly as you move down the hall, regardless of what side they are on. It is preferable to leave unused room numbers between rooms if possible, especially around large rooms that may later be split into multiple rooms.

9.2.12. Rooms within another room share the same number with a letter suffix. Rooms with suffix letters shall have a clockwise progression around the main room.

9.2.13. Island rooms along a sub-corridor (no doors separating it from the main corridor) are all numbered even or odd depending upon the side of the main corridor they are on, regardless of what side of the sub-corridor they are on.

9.2.14 Review with UMD Engineering Support prior to the completion of the Schematic Design Phase.

10. Custodial Requirements: General Requirements

10.1. Facilities Management provides custodial service for university buildings. The Twin Cities campus includes 19.1 million gross square feet of facilities. The annual overall custodial program includes 726,000 hours of custodial service.

10.2. Starting with the programming phase and continuing throughout the design phases, verify the custodial requirements with the Maintenance and Operation

staff. The equipment and supplies for each building depend on the interior finishes, program requirements and the size of the building.

10.3. Include a custodian office/locker room and a bulk storeroom adjacent to the service entrance in buildings that exceed 25,000 gross square feet of floor area. The size of these rooms shall be appropriate to the building area and use based upon square footage.

10.4. Provide a minimum of one custodial room per floor. Locate the custodial rooms so that the maximum distance between rooms is approximately 250 feet and the area served by each room does not exceed 15,000 gross square feet of floor area.

11. Custodial - Equipment and Supplies: The following is a list of the type, approximate size and quantity (determined by finishes and square footage) of equipment and supplies that shall be stored in the buildings:

- A. Auto scrubber: minimum 3 feet by 5 feet of space, one per floor
- B. Carpet extractor: minimum 3 feet by 3 feet of space, one per floor
- C. 36-inch diameter trash barrel: one per custodial room
- D. Vacuum cleaner: minimum 3 feet by 3 feet of space, one per closet
- E. 24-inch diameter floor buffer and 5-gallon pails of floor wax: one per floor
- F. Case of toilet paper: minimum 2 feet by 3 feet floor of space, one per closet
- G. Case of paper towels: minimum of two, 2 feet by 3 feet floor of space, one per closet

12. Custodial Rooms

12.1. All custodial rooms shall be a minimum of 120 square feet with no less than a 6-foot width in any area.

12.2. Include a floor-mounted slop sink, hot and cold water, hose faucet with 4 feet of hose, mop rack, GFI duplex outlets and shelving for cleaning supplies. To minimize damage from overflowing slop sinks, spilled cleaning chemicals and spilled equipment reservoirs, provide a floor drain adjacent to the slop sink. Provide a 5-foot long board 6 feet above the finished floor with hooks or pegs at 6-inch intervals to hang brooms, dust and wet mops (hung by the head with the handle down), vacuum cleaner hoses and dust pans. Ensure that there is discussion with the architect and maintenance staff to determine whether one equipment storage room with an eyewash station is necessary.

12.3. To accommodate the storage of custodial equipment, provide 36-inch wide doors that open out.

12.4. Ensure that there is adequate ventilation for the hydrogen gas that is produced when the battery-operated equipment is recharged.

13. Waste Disposal: General Requirements

13.1. During each design phase, verify with Facilities Management, Waste Services, the requirements for the waste collection areas and the method of disposal, compaction and hauling. These requirements will vary depending on the program needs and the size of the building.

13.2. If the volume of trash warrants, a stationary compactor shall be located near the service entrance. The compactor will reduce collection costs and keep the dock area clean and clear of trash. For lesser waste volumes, dumpsters shall be located outside of the building, adjacent to the dock area. The dumpster location should facilitate the loading of the dumpster without manual lifting (i.e., dumping down into the dumpster from dock height is required). Outdoor compactors and dumpsters should be protected from snow and rain. A typical six cubic yard dumpster can receive up to 6 tons of precipitation annually. Design for both indoor and outdoor compactors shall include a data line to allow for the ability to remote monitor capacity.

13.3. Provide a room located adjacent to the service entrance for receiving and storing recyclable materials. The room shall provide space for four to six hampers depending on the building. Dimensions of a hamper are 30"W x 44"L x 40"H. The layout of the room and placement of the hampers within the room should allow for easy movement of hampers in and out of the room (subject to verification according to 15.1.). For buildings that have laboratories that will generate Infectious Wastes refer to Section 15.4)

13.4. For new buildings and for buildings with food service operations, comply with Division 13 00 30 - Food Service Construction Guide. Refer to Part 21 - Solid Waste and Recycling Materials.

13.5. For storage areas of bedding waste and carcasses, comply with Division 13 00 02 - Food Service Construction Guide. Refer to Part 21 - Solid Waste and Recycling Materials.

13.6. For new or renovated food facilities and research animal quarters, comply with Division 1 section 01 57 16 - Temporary Pest Control.

14. Recycling

14.1. During each design phase, verify with Facilities Management Waste Recovery Services the quantity and location requirements for the recycling collection sites on each floor of the building.

- 14.2.** Design dedicated space throughout the building for recycling stations consisting of four separate containers for the collection of waste and recyclable materials. Each station requires floor space for four 15”x15”x 32.5” containers. Dedicated space for stations should also accommodate 13”x13” signage posted approximately 4” above each container. The four containers included in each station are: Paper recycling, cans & bottles recycling, organics recycling, and trash. When relevant, organics recycling may be swapped with lab plastics recycling. Waste Recovery Services should be consulted in this decision. For more information on organics reference Division 13 00 30 - Food Service Construction Guide, Part 21 - Solid Waste and Recycling Materials.
- 14.3.** Break rooms should accommodate a full station and signage.
- 14.4** Provide space for one battery collection container (one-gallon bucket) near at least one station per hallway.
- 14.5** Rooms with paper towel dispensers should accommodate a 15”x15”x28” container for organics collection within arm’s reach of the dispenser. Bathrooms should accommodate an organics container within arm’s reach of the dispenser and within arm’s reach of the door. Large bathrooms may need an organics container near the dispenser and another near the door. Bathrooms should also accommodate a 15”x15”x28” container for trash collection.
- 14.6** In buildings designed prior to the use of the standardized stations, occupants moved recycling and trash containers into hallways, stairwells, or other unsafe or inaccessible areas. It has been observed that stations are not moved when space for them is included in the design. Therefore, provide space for stations easily accessed by building occupants.
- 14.7** Contact Capital Project Management Design Project Manager for built-in Recycling Cabinetry design drawings.

15. Hazardous Wastes

- 15.1.** For all buildings, provide two shelves for storage of spent fluorescent lamps in the room allocated for recycling (refer to item 13.3 above). One shelf shall be 18 inches wide by 108 inches long with filling access from the end. The other shelf shall be 24 inches wide by 54 inches long with 30 inches clearance above for filling. The shelf shall be located so it does not interfere with the recycling hampers or block movement of the hampers in and out of the room.
- 15.2.** For buildings that include centralized storage areas for hazardous wastes, verify with the Hazardous Waste Officer (HWO) in DEHS that the design is in compliance with hazardous waste regulations.
- 15.3.** For buildings that have programs that include laboratories, verify with the HWO that the proper amount of space is allocated in the laboratory area to store

chemical waste, radioactive waste and infectious wastes.

15.4. In addition to space within laboratories for the collection of infectious waste, provide a designated area for the staging of infectious wastes near the dock prior to collection from the building. If animal carcasses or tissues are generated in the building, then the staging area may require some space that is refrigerated (Also refer to Division 13 00 30 - Food Service Construction Guide, Part 21 - Solid Waste and Recycling Materials).

16. Public Toilet Rooms

16.1. Design public toilet room entrances to screen fixtures from external view. Corridor and vestibule doors shall swing in the same direction.

16.2. Provide ceramic tile finishes on the floors and walls.

16.3. Toilet room ceilings shall be painted plaster, painted concrete or other approved moisture resistant material.

16.4. Toilet partitions shall be stainless steel and/or corrosion resistant material.

16.5. To facilitate maintenance, provide accessible isolation valves for each restroom group. Provide a 2-foot wide maintenance pipe chase with a man door in restrooms where there are 10 or more fixtures located back-to-back.

16.6 The following toilet room accessories will be provided by the District within which the project resides. Some of the items may be provided at no cost to the project. PM shall contact and verify this with the District Project Coordinator assigned to the project.

1. Paper towel dispensers
2. Soap dispensers
3. Toilet Paper holders
4. Sanitary napkins disposal bins
5. Feminine product dispensers.

17. Mechanical and Electrical Equipment Rooms/Spaces/Locations

17.1. Facilities Management maintains all building shell and infrastructure including, but not limited to, fire and life safety, mechanical, electrical and utilities.

17.2. Consistent with OSHA, 29 CFR 1910 General Industry Standard, all building shell and infrastructure including, but not limited to, fire and life safety, mechanical, electrical and utilities shall be designed and installed so that it is

accessible for preventative maintenance and repair work. Repair work shall be done weekly, monthly, quarterly and annually as required. This will result in the most efficient use of time and money for the maintenance and operations staff (optimal life cycle costs), as well as reduce the possibility of injury to maintenance and operations personnel. Review the section drawings through mechanical rooms with the Facilities Management Energy Management and/or FM District personnel. Refer to Division 23, Section 230006 – Access for Maintenance. The appropriate FM reviewers (above) shall make the final determination if the adequacy of maintenance accessibility is in question.

17.3. The A/E shall design and engineer solutions for implementation of OSHA 29 CFR 1910 General Industry Standard. If the A/E cannot find an engineering solution, the Facilities Management Safety Department shall assist in coming up with an acceptable administrative control or acceptable personal protective equipment. The frequency of a maintenance activity is directly related to the potential for an injury accident to the employee and a claim to the university workers compensation insurance. Before 1993, the university paid more than \$2 million annually in workers compensation claims. Since 1993, the university has reduced the number of injury accidents and annual workers compensation pay out.

17.4. The University of Minnesota must comply with federal law, OSHA, 29 CFR 1910 General Industry Standard for the preventative maintenance and repair work conducted by the maintenance and operations staff in university buildings. The State of Minnesota enforces this federal law.

17.5. Incorporate the following items into the design of mechanical and electrical equipment rooms:

17.5.1. PROHIBITED: Stairs only to the floor where the equipment room is located.

17.5.2. PROHIBITED: Vertical ladders for access to areas where maintenance personnel need to carry toolboxes and other materials.

17.5.3. Adequate access to and clearance around equipment so that routine preventative maintenance can be conducted.

17.5.4. Indicate on the contract documents, the necessary maintenance service areas adjacent to the equipment. For example, an area one and a half times the length of the chiller tube is required to service the tube.

17.5.5. Design the equipment rooms so that the necessary maintenance service areas adjacent to the equipment are free of other equipment.

17.5.6. Equipment that requires service shall be placed in equipment rooms. When it is located in other spaces such as ceiling or floor plenums and chases, it is difficult to service, creates interruptions to activities in occupied spaces and can be unsafe to access to maintain.

17.5.7. The service door into the rooms shall be a minimum 6-foot-wide by 7-foot-high opening with one active and one passive leaf delayed-action closure. Wherever the width is not needed to meet code and/or provide adequate access or clearances around equipment, service doors to small electrical rooms and/or closets need not be a minimum of 6 feet wide, nor be a double door.

17.5.8. Equipment rooms shall be on the same level as the elevator.

17.5.9. Provide a wall-mounted service sink with a hose attachment on the faucet in all mechanical rooms.

17.5.10. Provide a beam/trolley/chain fall lifting point (beam must be free of fireproofing or insulation) to facilitate the removal of chiller end caps and the replacement of elevator hoist machines and elevator generators.

17.5.11. Provide floor drains at all pumps, chillers and air-handling units.

17.5.12. Pitch floors to the floor drains.

17.5.13. Provide emergency lighting so maintenance and operations staff can exit safely during a power outage.

17.5.14. Consider the safety of maintenance personnel when locating equipment. Provide adequate lighting and ventilation, electrical outlets, access routes, walkways, stairs, protective enclosures and barriers.

17.5.15. If the service time for equipment is more than 20 minutes, provide service platforms to access equipment. See Fall Protection section below for more information

17.5.16. Provide non-compact fluorescent lighting.

17.6. Provide a means for replacing equipment access panels and knockout panels in the future.

18. Fall Protection – New and Existing Buildings

18.1. Fall Protection at Roofs, leading edges (interior and exterior) and areas requiring access for maintenance: The A/E shall review fall protection strategies during the design phase of the project with CPM, Codes and with the Facilities Management Safety Director. The A/E shall provide in its design systems to protect maintenance personnel from leading edge hazards.

Each employee on a walking/working surface (horizontal and vertical surfaces) with an unprotected side or edge, which is 4 feet or more above a lower level, shall be protected from falling. Design strategies include, but are not limited to:

- A). Architectural design elements such as parapets, penthouses, architectural screens, etc. to eliminate the hazard.
- B). Locating roof access, equipment and other devices requiring maintenance away from the leading edge a minimum of 15’-0” (or as required by code for the item in consideration) to eliminate the hazard.
- C). Utilizing guardrail systems (penetrating and non-penetrating) to protect the employee from the hazard.
- D). Utilizing personal anchorage (tie-off) systems to protect the employee from the hazard.
- E). Other strategies and systems that the A/E may design and recommend.

Examples of such work include, but are not limited to:

- A. Maintenance on rooftop such as repairing roofs, unplugging roof drains, skylight cleaning/maintenance and other building system maintenance
- B. Work on platforms that are designed to access and maintain specific equipment
- C. Work on any other walking and working surface not otherwise addressed with a possibility to fall more than 4 feet to another level/surface
- D. Window washing (interior and exterior).
- E). Light bulb replacement.
- F. Other devices and elements requiring maintenance and inspection.

18.2. Existing Buildings: The A/E’s shall evaluate existing building conditions for Fall Protection, leading edge hazards, window washing and maintenance of equipment. Identify building system deficiencies to CPM, Facilities Management Safety Director and Codes; implement systems and strategies (as

noted in 18.1) as directed by the University.

18.3. Personal anchorage shall be independent of any anchorage being used to support or suspend platforms. Personal anchorage also shall be capable of supporting at least 5,000 pounds per employee attached.

18.4 Additional information regarding fall protection can be found at the following OSHA website:
http://www.osha.gov/Publications/fall_protection_qc.html

19. Access Panels and Doors/Roof Access

19.1. Wherever valves, clean-outs, dampers, controls, and other mechanical and electrical components are concealed in ceilings or walls and require service, adjustment or replacement, provide 2-foot by 2-foot hinged, lockable panels that are keyed to the University Best lock system. The panels shall be located in close proximity to the equipment to be serviced. Consideration shall be given to providing service platforms when frequent inspection or service is necessary on equipment such as kitchen duct clean-outs. There shall be no equipment located on the floor beneath the access panels and/or doors that would restrict the placement of a ladder or other lift device needed to service equipment above the ceiling. Panel material and finish shall be resistant to damage or soil by normal anticipated use.

19.2. Provide a roof access hatch or an access door from a non-public area to all major roof areas where rooftop equipment needs to be serviced. All roof access hatches shall be designed with an inside hasp capable of accepting a padlock. Doors with normal door hardware shall be lockable from the inside, i.e. the keyway for entry shall be on the roof side of the door. Both provisions are to prevent unauthorized entry into a building from the outside roof area.

20. Fresh Air Intakes: Fresh air intakes shall not be located where vehicle or equipment exhaust or other hazardous or obnoxious fumes could enter the system. Pay special attention to locations of roadways, alleys, loading docks and fume hoods discharge and their distance/direction from proposed location of fresh air intakes.

21. Building Overhang Requirements: PROHIBITED: Occupied building spaces that hang over unheated exterior spaces to avoid mechanical systems from being subject to freezing.

22. Recycled Materials: The university recommends and supports the use of recycled materials in the construction and remodeling of University buildings. The A/E shall incorporate these recycled content construction materials when available and when they meet or exceed the specifications of their virgin material counterparts.

23. Planters

23.1. PROHIBITED: Installing planters immediately adjacent to buildings or on top of buildings as part of the roof structure.

23.2. Install waterproofing systems in planters to avoid water damage to building foundations, spaces, roofs and walls.

HAZARDOUS MATERIALS MANAGEMENT REQUIREMENTS

1. **PROHIBITED:** The installation of any material or equipment that contains asbestos. No lead-containing coatings shall be applied at the university without approval from the Hazardous Materials program manager.
2. The presence of hazardous materials is possible on any construction project considered at the University of Minnesota. To minimize the potential negative impact the presence of hazardous materials may have on the safety, budget or schedule of a project, attention must be paid to upfront activities.
3. Upon being assigned a project, the University Project Manager (PM) must contact appropriate representatives in the Facilities Management Hazardous Material Program (HMP) and/or the Department of Environmental Health and Safety (DEHS). The HMP representative should supply any existing hazardous material reports/surveys that have been conducted in the building and/or the area the project will take place. The reports/surveys may be for asbestos, lead, mercury, radiation, etc. The DEHS representative should provide any Phase 1 and/or Phase 2 surveys previously conducted in the land, building or area of the building where the project will take place. In both cases, if no reports/surveys exist, HMP and/or DEHS shall conduct the necessary investigation to generate those reports/surveys. HMP will charge the project for preparation of the report; therefore the PM must take this into account when preparing the project budget. DEHS typically prepares the Phase 1/2 survey at no cost to the project. When completed the report/survey is to be sent to the PM for inclusion in the project construction documents. DEHS will also consult with the PM regarding whether a Qualified Environmental Consultant (QEC) should be retained to deal with certain hazardous materials. The QEC may conduct/assist with the Phase 1, 2 surveys and the formation of a contingency plan.
4. Should hazardous materials be present at the intended construction site, the PM shall make arrangements with HMP/DEHS for the abatement/encapsulation of those materials. In most cases, the Design Consultant (A/E) and the General Contractor (GC) will not be involved in this effort. However, both the A/E and the GC must be made aware of the presence of those hazardous materials. The PM shall forward the hazardous material reports to the A/E to include in the Construction Documents. The PM shall also direct the A/E to the HMP website to gather additional direction/information regarding the various types of hazardous material present. This

information shall also be included in the construction documents to direct the GC regarding his actions if hazardous materials are found on the construction site. The HMP website is: <https://facilities.umn.edu/architect-vendor-resources/university-standards>.

5. Should the nature or location of the hazardous materials require the involvement of the A/E or the GC, the PM shall arrange for HMP/DEHS to meet with the A/E to assist in preparing appropriate specification sections or drawings for the Construction Documents that direct the actions of the GC.

UTILITY INFRASTRUCTURE SERVICE REQUIREMENTS

Approval: Review utility infrastructure requirements, services and budget with Facilities Management Energy Management or UMD Facilities Management at the beginning of Pre-Design or earlier. At a minimum the following utilities shall be reviewed: Storm Sewer, Sanitary Sewer, Water, Steam, Chilled Water, Electrical, Voice/Data (Office of Information Technology), and natural gas (outside utility company).

MAIN SERVICE TRANSFORMERS REQUIREMENTS

1. **Location:** Locate main service transformers required for new or remodeled buildings in 3 hour rated electric vaults within the building or buildings they will serve. For specific requirements, refer to Division 26, Section 260500 - General Electrical Requirements.
2. **Upgrading Existing Supply:** Main service transformers and associated 15 kV equipment that are needed in an existing building to upgrade supply shall be installed in 3 hour rated electrical vaults within the building. If such installation is impractical, construct a subsurface electric vault on an exterior wall of the building.

UNIVERSAL DESIGN REQUIREMENTS

1. **Universal Design:** The purpose of universal design is to design projects that accommodate all people to the greatest extent possible without the need for individual adaptation. When designing projects at the university, consider the following guidelines:
 - 1.1. **Equitable Use:** Provide the same means of use for all users, identical whenever possible, equivalent when not. Avoid segregating or stigmatizing any users. Make provisions for privacy, security and safety equally available to all users. Make the design appealing to all users.
 - 1.2. **Flexibility in Use:** Provide choice in methods of use. Accommodate right-handed or left-handed access and use. Facilitate accuracy and precision for users.

and provide adaptability for their space.

1.3. Simple and Practical Use: Eliminate unnecessary complexity. Be consistent with expectations and intuition of the users. Accommodate a wide range of literacy and language skills and arrange information consistent with its importance.

1.4. Perceptible Information: Use different modes such as pictorial, verbal and tactile for repeated presentation of essential information. Maximize legibility of essential information. Differentiate elements in ways that can be described. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

1.5. Tolerance for Error: Arrange elements to minimize hazards and errors. The most used elements shall be the most accessible. Hazardous elements shall be eliminated, isolated or shielded. Provide warnings of hazards or errors.

1.6. Minimal Physical Effort: Allow users to maintain a neutral body position. Use reasonable operating forces. Minimize repetitive actions. Minimize sustained physical effort.

1.7. Size and Space for Approach and Use: Provide a clear line of sight to important elements for any users that are seated or standing. Make all components reachable for any users that are seated or standing. Accommodate variations in hand and grip size and provide adequate space for users of assisted devices or personal assistance.

1.8. Noise Criteria

1.8.1. Quiet space is a necessary condition for a person to comfortably rest, study or do research. Unwanted periodic noise or loud noise and reverberation interfere with these activities. Poor acoustics are a barrier to those with mild to moderate hearing loss, speech impairments and learning disabilities. Poor acoustics also interfere with communication for individuals who use English as a second language. HVAC systems, water circulation pumps and other mechanical systems can be the source of intolerable acoustical stimuli. The A/E shall determine appropriate noise criteria for a project, and design systems and select equipment that achieve the criteria.

1.8.2. The following background noise criteria are suggested: concert halls, NC 20; sleeping rooms, NC 30; classrooms and lecture halls, NC 30; libraries, NC 30; open-plan office areas, NC 40; laboratories with fume hoods, NC 45.

1.8.3. The following reverberation times for unoccupied rooms are

suggested: Classrooms and lecture halls, 0.6 to 0.7 seconds maximum. Outside of buildings, noise must be less than 50dBA at night in residential areas and similar Noise Area Classifications. When measured outside of a building, noise caused by building mechanical equipment must meet Minnesota Rule 7030.0040, Noise Pollution Control.

2. General Information

- 2.1. **PROHIBITED:** Wheelchair platform lifts for accessible routes to primary areas in new construction projects.

Exception: When wheelchair platform lifts are the only reasonable option available, the lifts will have interior controls on both sides of the car, will be quiet while in operation and will have automatic door openers to enter lift from all possible directions.

- 2.2. The A/E shall address the needs of people with disabilities both in the building design and within the contract and construction limits. Indicate on the drawings, circulation patterns and disability parking that may be affected by the construction.

2.3. The A/E shall request a copy of the University of Minnesota Accessibility Guide and Map from Disability Services prior to completion of predesign for Universal design implications relative to access/circulation during construction and/or project design. Site planning shall include consideration and signage requirements for continuous accessibility for people with disabilities. Areas adjacent to the construction project shall remain accessible to people with disabilities.

2.4. Projects shall be designed according to the Americans with Disabilities Act (ADA) Accessibility Guidelines. Use State Building Code requirements where they are more restrictive.

2.5. The contract documents shall use terms such as "disability" or "accessible" in lieu of "handicap."

2.6. Locate equipment i.e. general office type equipment, etc. in wheelchair-accessible areas. The most frequently used materials shall be placed on lower shelves.

3. **Curb Cuts:** To be consistent with state standards, curb cuts shall comply with the Minnesota Department of Transportation Standard 7036D.

4. Accessible Toilet Rooms

- 4.1. **PROHIBITED:** Jumbo toilet paper dispensers in accessible toilet stalls and restrooms.
- 4.2. Each new or significantly renovated building shall provide at least one fully accessible unisex/family toilet room. Unisex/family toilet room shall have a lockable door. In addition to the features listed below the unisex toilet room shall contain a transfer table and bedpan washer.
- 4.3. Stall Door Hardware: Locking mechanisms shall be easily operable with one hand, and be of a paddle or slide-latch design. A door pull shall be placed on both sides of the door near the latch. Doors are required to have gentle, spring-loaded action.
- 4.4. Coat Hooks: Coat hooks in fully-accessible stalls/rooms will be mounted at 48" AFF and centered on the panel parallel to the interior of the latch side of the door. In ambulatory stalls coat hooks will be mounted at 48" AFF and centered on the interior of the stall door.
- 4.5. Toilet Paper Dispensers: To ensure access to grab bars, mount a single-roll or double-roll toilet paper dispenser below the horizontal grab bar.
- 4.6. Sanitary Product Disposal Unit: Sanitary product disposal unit to be located 14" from the back wall and 4" below the grab bar.
- 4.7. Urinals: Accessible urinals shall be floor mounted whenever possible.
- 4.8. Faucets: Sensor type faucets are preferred if possible. Single handled faucets will be considered.
- 4.9. Toilet Room Entry Door Hardware: Provide a push/pull device instead of a latch mechanism.
- 4.10. Ambulatory Stalls: Ambulatory stalls shall be as deep as the fully accessible stalls.
- 4.11. Baby changing stations shall not be located inside accessible stalls.

5. Assembly Areas - Sightlines

- 5.1. Design considerations should always be given to maximizing sight lines for all occupants while balancing accessibility with building code requirements.

6. Elevators

- 6.1. Car Controls in Cab: To be within reach and function, floor buttons shall be located 48 inches maximum above the floor.
- 6.2. Emergency Communications: To be within reach and function, controls shall be installed 35 inches to 48 inches above the floor.
- 6.3. The car emergency communications device shall be hands-free, accessible, and not require a door or panel to be opened for use.
- 6.4. Signaling devices must provide visual and audible communication. Where appropriate, include voice communication as well.
- 6.5. If instructions for use are provided, essential information shall be presented in both tactile and visual form.

7. Front Reception or Service Counter: The lower portion of the counter shall be located centrally and directly from the customer's main entry viewpoint. Maximum height will be 36" AFF if there will not be a business (check signing, form signing, etc.) transaction on that counter. Maximum height should be 32" AFF if there will be business transacted and 30" AFF for a minimum height.

8. Podiums and Lecterns in Classrooms and Assembly Rooms

- 8.1. When a podium or lectern is fabricated as part of the project, provide the following features to accommodate instructors who are short or tall, seated or standing:
 - A. Adjustable height feature
 - B. Easily operable controls
 - C. Knee clearance where possible, including 30 inches in width, 27 inches to 29 inches in height and 19 inches in depth
- 8.2. Refer to Division 130020 General Purpose Classrooms for complete information on classroom types and design.

9. Lighting in Classrooms and Assembly Rooms: In classrooms, auditoriums and assembly rooms with a seating capacity of more than 49 people, refer to Division 130020 General Purpose Classrooms for sign language interpreter requirements. In locating the interpreter's lighting area, the relationship to the presenter and/or multi-media presentation materials is critical.

10. Science Wet and Dry Rooms or Laboratories

10.1. In instruction or research areas, provide one station that has the following features:

- A. Lower fixed height or adjustable height capability
- B. Knee clearance of 30 inches in width, 27 to 29 inches in height, and 19 inches in depth
- C. Large and easily operable controls
- D. A ledge along the front to prevent hazardous substances from spilling
- E. Braille identification to the left of controls

Note: A station shall include all functional activities such as fume hoods, workbench, sink, eye wash area and safety shower.

10.2. Entrances into science wet and dry rooms and laboratories shall be accessible.

11.3 Refer to Division 13 00 10 Laboratories for additional information regarding lab types, lighting, layouts and equipment design requirements.

11. Student and Employee Kitchens, Lounges and Break Rooms: Provide accessible features such as lever faucets, a 34-inch high counter, and knee clearance under sinks and work areas. If microwaves are provided, use countertop models. If refrigerators are provided, use side-by-side or bottom freezer models.

12. Door Opening Force: The maximum force for pushing or pulling open interior hinged doors shall be 5 pounds as required by ADA and the Minnesota Accessibility Code, current edition.

ELECTRONIC DATA SUBMITTAL STANDARDS

PART 1: WORKING WITH THE UNIVERSITY OF MINNESOTA ELECTRONIC DATA SUBMITTAL STANDARDS

1. Organization

- 1.1. The first part of this standard describes how to conform to these standards: The purpose and scope of the standards, receipt and delivery of data and communication.
- 1.2. The second part of the standard describes the University's technical requirements for CAD data.
- 1.3. The third part of this standard describes the University's requirements for Geographical Information Systems (GIS) sharing and standards.
- 1.4. "University" refers to University of Minnesota.
- 1.5. "University Project Manager" refers to University Capital Project Management (CPM) Project Manager.

- 1.6. "FM CAD Manager" refers to University Facilities Management(FM) Engineering Records Manager.
- 1.7. "University GIS Service Center" refers to a GIS responsible unit within University Information Technology group of University Services.
- 1.8. "Consultant" refers to the person or organization that is preparing the Contract Documents and CAD and other data, whether or not the person or organization is part of the University.

2 Purpose and Scope of the Data Standards

2.1 Refer to University modified AIA Standard Form of Agreement Between Owner and Architect for clear direction as to consultants responsibilities for providing project contract documents. Also refer to University Design Standards Division One Sections for related consultant submittal responsibilities. For certain projects consultant additional responsibilities may also be included as contracted additional services.

2.2 Contract Document Project Manuals and Operations and Maintenance Manuals shall be provided by the consultant to the University in MS Word® (.docx) or Adobe® Portable Document Format (.pdf), without encryption and without any other security restrictions such as password restrictions, certificate security and/or Adobe life-cycle rights management. Project Manuals shall follow the Construction Specifications Institute current edition of Master Format, Green Format and/or Unifomat as appropriate to the project design intent, scope of work and construction contract delivery method selected by the University.

2.3 Computer-Aided Design (CAD) is a required tool for producing the documentation required for construction and management of University facilities. It also provides a common medium of information exchange. In fact, the true power and potential of CAD is the ability to re-use and share the information contained within the CAD document. The key to realizing this potential is common organizing principles-standards for the production and dissemination of CAD information. The standard organization of files, layers and entities, as well as standardized software applications is essential for effective work and communication. Standards are necessary to ensure that:

A. CAD drawings and data created in one phase (such as design) are readily usable in subsequent and/or later phases (such as facility management).

B. Drawings and data are:

1. Applicable for intended use,
2. Compatible with the available University CAD equipment and software,

3. Compatible between one project and/or project discipline with those created for other projects,
4. Able to be transferred and integrated with other applications such as BIM and facility management electronic tools,
5. Consistent in one department of the University with those developed by other University departments.

C. University CAD drawings and data with pertinent national, international and industry standards are compatible.

2.4 Because CAD guidelines continuously change with technology, it is important that they evolve and improve. To ensure that the University and its consultants conform to the broader scope of the current edition of the National CADD Standard, sponsored by the National Institute of Building Sciences (NIBS) CADD Council, these University standards incorporate, but are not limited to, recommended guidelines from the following:

- A. American Institute of Architects (AIA), CAD Layer Guidelines, 2002
- B. Construction Specifications Institute (CSI), Uniform Drawing System (UDS)
- C. Tri-Service CADD/GIS Technology Center, symbols and deliverables
- D. GSA PBS National CAD/CIFM Standards

Refer to the following Web site for complete and required CAD guidelines that affect the University of Minnesota: www.nationalcadstandard.org.

3. Why the University has Data Standards

3.1. This CAD data standards manual is part of the comprehensive capital planning, project delivery and facilities management strategy at the University. Much of the CAD data created for the University will be brought into the University's PSRE SPACE Management System and this data must follow these CAD data standards to be readily useful within the SPACE Management and other University systems.

3.2. This document sets performance standards for CAD data delivered to the University. The University does not intend to influence the methods or means of practice of outside consultants. Consultants may use any CAD system to develop construction documents for the University as long as the delivered data conforms to the current University CAD data standards.

3.3. The University is committed, however, to enforcing how information is delivered to ensure that it is predictable and easy to reuse. As a result, these Electronic Contract Document Submittal Standards will be included as part of the contractual requirements for delivery of electronic information to the University.

4 Scope of the CAD Data Standards

4.1. This data specification covers all construction documents prepared by or on behalf of the University. CAD drawings and project manual specifications shall be provided for all projects, regardless of size. Where appropriate to the project scale, scope of work, and construction contract delivery method, contract document specifications may be included directly on the contract drawings. The deliverables described in this manual must be provided for each sheet that is issued for design and ultimately for construction on a project and must include all supporting data files that are used to produce the finished sheets.

4.2. If additional electronic design drawings, BIM or 3-D models are provided, the consultant shall initiate discussion with the University Project Manager and FM CAD Manager to determine an acceptable format for those deliverables.

5 Who Must Use the Standards? Anyone who is going to prepare Contract Documents and CAD data for the University, including University staff, contractors and consultants who must read and become familiar with this document before proceeding with any work.

6 Basic CAD Software: The designated CAD software for the University is AutoCAD[®] by Autodesk. Regardless of the software used by the consultant to generate the original documents, any and all CAD drawings must be delivered to the University on a Compact Disc in non-encrypted/unrestricted DWG (DraWinG) (.dwg) file format from AutoCAD[®].

7. CAD Application Software: CAD application software packages operate on top of, or in conjunction with, the basic CAD software to extend its capabilities. The extensions enhance the productivity of design, drafting and modeling, and link non-graphic attribute data to the graphic entities. All CAD application packages that the University and its consultants use to modify or create CAD layers or other entities must comply with these standards.

8 Requesting CAD Data from the University

8.1. Consultants may request copies of existing CAD data for University facilities. CAD data is provided for the convenience of the recipient only. This data has been gathered from a variety of sources, and it may or may not conform to University CAD standards. The data may be incomplete or may not accurately reflect current facility conditions.

8.2. The University makes no representation as to the completeness or accuracy of the data. Consultants also should keep in mind that CAD data appears to be extremely accurate because it is computer-generated, however, its appearance does not guarantee that the data truly represent existing conditions. CAD data that

consultants submit to the University must be accurate and conform to the current CAD standards, even if reference data that the University provided was inaccurate or did not conform to the standards.

9. How to Request Data: Requests should be made to the University Project Manager. The University Project Manager shall review the request and forward it to FM CAD Manager, who will have the requested files copied and sent to the University Project Manager for forwarding to the consultant.

10. Deliverables that the University Requires

10.1. At the conclusion of a project, there are several types of materials that consultants must submit to the University as follows:

- A. CAD drawings and PDF documents,
- B. Maintenance and Operation Manuals,
- C. Other required performance and/or testing documentation.

10.2. Each of these submittals is explained in more detail below.

11. CAD Drawings: Consultants shall deliver a complete set of the project CAD documents in electronic format to the University. These documents must include all supporting CAD files and must be delivered as follows:

- A. In the currently supported AutoCAD® version used by the University. Verify the University's current release product with the University Project Manager and FM CAD Manager. As of February 2013, the 2011 version of AutoCAD® is preferred, but nothing previous to the 2008 version is acceptable,
- B. On acceptable archival media,
- C. Using the data structure defined in this manual.

12. AutoCAD® 2011 or Current Version File Format

12.1. **PROHIBITED:** .dxf format files.

12.2. All files must be delivered in native non-encrypted/unrestricted DWG (DraWinG) (.dwg) file format. The currently supported version of AutoCAD® at the University must be able to use the native file format without being converted. Verify the University's currently supported AutoCAD® release product with the University Project Manager and the FM CAD Manager.

12.3. Include model space, but do not include x drawings.

13. Acceptable Media for Delivery of CAD Data

- 13.1. CAD files for all drawings should be delivered to the University on acceptable archival CD-ROM discs. Files shall be delivered in a non-encrypted, unrestricted and uncompressed format.
- 13.2. Digital media labels shall contain the following information as a minimum:
- A. Building name, building number and address,
 - B. University project name and number,
 - C. Short description of media content,
 - D. Consultant name and telephone number,
 - E. University contact name and telephone number,
 - F. Date of submittal,
 - H. Original software used to generate the files,
 - G. Virus scanned.
- 13.3. Both the CD-ROM case and the CD-ROM itself shall be labeled.
- 13.4. All digital media that contains files for entry into the University drawing library must be scanned for viruses. This includes all files received from sources within and outside of the University.
- 13.5. Consultants may be allowed to deliver the CAD files in a compressed format on different media with prior written permission from the University Project Manager and FM CAD Manager. In these cases, a licensed copy of the compression software with documentation must be provided to the University at no additional cost to the University.
- 13.6. Consultants may be required to provide assistance in returning the files to the native format at no additional cost to the University.

14. Reflecting As Built Conditions

- 14.1. The University needs CAD data that reflects the actual condition of its facilities. CAD drawings that consultants submit must show As Built conditions of any facilities affected by a project.
- 14.2. As Built drawings include design and detail changes that may have taken place after the initial issue of construction documents, as well as changes made to the actual facility during construction.

15. Conformance to Electronic Submittal Standards

- 15.1. Electronic documents that consultants deliver to the University must comply with the University Electronic Submittal Standards that are in effect during the current project.

15.2. The current CAD drawings for the project may contain information that has been extracted from existing University CAD drawings, which may not conform to the current CAD standards. The consultant must make sure that all CAD data delivered with a project conforms to the current CAD data standard, even if the source drawings did not conform.

15.3. The consultant shall be required to update any non-conforming CAD drawings that are used to produce the current drawings for the project.

16. Documentation: The delivered CAD drawing files must be accompanied by a documentation description that lists all sheet files. This information must cover all CAD files delivered to the University.

17. Submittal Schedule

17.1. The final submittal of As Built CAD data shall be made after project construction is complete and facilities have been occupied.

17.2. In addition, the University may require sample submittals at key milestones in the development of the CAD drawings, specifications and data in accordance with the contract.

17.3. Sample submittals are not intended to be a burden on the consultant, and typically will involve a limited number of drawings. At a minimum, it is recommended that digital media be provided at the first and final submittal milestones. Providing digital media at the first submittal milestone allows the University to verify that the data structures that the consultant is using conform to the Electronic Submittal Standards and are readily usable on the University CAD systems.

18. Validation of Delivered Materials

18.1. The University FM CAD Manager shall validate the CAD data and other materials that the consultant submits. If submittals do not conform to the Electronic Submittal Standards, the University shall reject the submittals from the consultant.

18.2. The consultant shall be responsible for revising the materials to make them conform to the Electronic Submittal Standards.

19. Communication about the Electronic Submittal Standards

19.1. These standards will be most effective for the University and most usable for consultants if there is communication between consultants, the FM CAD Manager and the University Project Manager.

19.2. Consultants should ask questions about the Electronic Submittal Standards before beginning work. Contact the FM CAD Manager with technical questions. Concerns regarding the impact of the Electronic Submittal Standards on a particular project must be discussed with the University Project Manager.

20. Suggestions for the Electronic Submittal Standards: The content of the Electronic Submittal Standards is intended to be neither static nor all-inclusive, and thus will be updated and enhanced as appropriate. Suggestions for improvements are encouraged. Questions are valuable because they help the University understand the actual conditions of the design and construction process for each project. Questions raise issues that result in better Electronic Submittal Standards. Submit suggestions, as well as any pertinent new information that will enhance these standards to the FM CAD manager.

PART 2: TECHNICAL REQUIREMENTS FOR CAD DATA

1. The organization and format of the CAD deliverables should support the requirements of the University project for design, construction, bidding and archiving. The deliverables also should readily support the integration of information into other University management systems such as PSRE SPACE with minimal effort.

2. The University standards for types of CAD files, file names and sheet numbering are based on industry standards. The requirements of these standards are described below.

3. Saved State of CAD Model Files: CAD files shall be delivered in the state described below:

3.1. Blocks shall not be exploded.

3.2. Drawings shall be purged.

3.3. Drawings shall be zoomed in on extents.

3.4. Drawings shall be left in paperspace and all x references bound.

3.5. All layers shall be on.

3.6. The menu shall be saved in .dwg.

4. Sheet Sizes, Borders and Title Blocks: Sheet sizes, borders and title blocks used for University projects shall comply with the current version of Uniform Drawing System (UDS) drawing sheet standards developed by the Construction Specifications Institute.

5. Text and Fonts

5.1. PROHIBITED: Custom fonts.

5.2. All text on University CAD drawings shall be in standard AutoCAD® supported fonts.

PART THREE: USING UNIVERSITY GIS BASE MAP

1. Introduction to using the University GIS Base Map: The University GIS Service Center is the owner of the complete and integrated University Geographic Information System (GIS) Base Map. Multiple University departments provide input data to the GIS Base Map and these departments shall be the recognized owners of their source datasets. The GIS Service Center and the departmental input data owners shall negotiate how individual datasets will be shared with the GIS Service Center and each GIS data layer's metadata will be updated to reflect these agreements.
2. The GIS Base Map is defined as the foundational University spatial database, maintained at an appropriate level of completeness and accuracy to meet the goals of the Enterprise GIS Program. The Base Map serves as the foundation upon which other University geospatial data is built. While the Base Map is considered foundational data, selected Base Map content may not be appropriate for public use and must be managed accordingly by the University GIS Service Center.
3. The University GIS Service Center has developed minimum standards and procedures for check-out and sharing the GIS Base Map. GIS standards support the specifications, policy, and processes required to create and maintain GIS Base Map data for the University of Minnesota system. Adoption of these standards ensures consistency in the U-Wide application of Base Map geospatial data.
4. The GIS Service Center provides oversight of and responsibility for the GIS Base Map and its standards. Additional information related to University GIS Base Map minimum standards may be obtained by contacting University Services GIS Service Center through the University Project Manager. Also see University GIS on line at: <http://www.uservices.umn.edu/gis/>.

End of Electronic Data Submittal Standards

End of Program Information/Requirements