

DIVISION 1 - GENERAL REQUIREMENTS

01000 - GENERAL REQUIREMENTS

1. The following items apply to Division 1 specification sections:

1.1. The A/E shall prepare Section 01010, Summary of Work, and other Division 1 sections required by specific project conditions.

1.2. For eligible, appropriate projects, the A/E shall use the specifications that form part of the annual contract, supplementing those specifications with additional specification sections and keynotes on the construction drawings.

1.3. The A/E shall coordinate Division 1 specification sections with the requirements in the General Conditions and Supplementary Conditions.

01026 - UNIT PRICES

In Section 01026, the A/E shall clearly define the work that will be ordered or modified by unit price. Include all labor materials and mark ups in unit prices.

01030 - ALTERNATES

The A/E shall clearly define all work to be added, deleted or modified by each alternate. Consider all effects that the alternate will have on the project, including to other systems and scheduling.

01045 - CUTTING AND PATCHING

1. Cutting

1.1. At a minimum, include the following text in the project manual: Limit dust, dirt and noise dispersal to the lowest practical level. Comply with governing regulations regarding environmental hazards and general dust control. Notify the owner's representative of possible exposure to harmful dusts and vapors, flammable or explosive materials, and other potential hazards.

1.2. Review Appendix B - Dust, Contaminant, Odor and Fungal Control Measures, and incorporate appropriate control measures as pertains to the project.

2. Patching: Patch to match existing adjacent materials. When identical patching materials are not available, review alternatives with the owner's representative. Review alternatives with the University Architects Office for exteriors and historic buildings.

01050 - BUILDING LOCATION SURVEY

The contractor shall hire a registered land surveyor to establish and maintain control points necessary for construction.

01060 - BUILDING CODE REGULATORY REQUIREMENTS

1. In accordance with Minnesota statute, the University of Minnesota enforces the Minnesota State Building Code and other applicable codes and regulations in university-owned facilities.
2. The university carries out this responsibility through a university building official appointed by the Regents of the University of Minnesota.
3. A building permit is required for all new construction, alterations, demolition, remodeling, additions, electrical work, wiring, mechanical, plumbing work and temporary work that is conducted on University of Minnesota property.
4. The owner's representative shall make an application and pay for building permits issued by the university building official.
5. The A/E and owner's representative shall work together to complete Appendix A - Special Inspection and Testing Services. Refer to Section 01400 - Quality Control Services.
6. University building, electrical, mechanical, plumbing and fire inspectors shall inspect construction work conducted on University of Minnesota property.
7. The contractor shall request an inspection from the University Building Code Division, 270 Donhowe Building, 319 15th Ave. SE, Minneapolis, MN 55455; (612) 625-3318, 48 hours before the inspection is needed.
8. As provided for in state law, the contractor may be required to uncover work that was covered prior to being inspected.
9. The A/E shall specify that the contractor is to retain the following on the job site:
 - A. A signed copy of the building permit
 - B. A copy of the inspection sign off card
 - C. Requests for mechanical/electrical inspections
 - D. University Building Code approved plans and specifications that are signed and stamped

10. The contractor shall obtain permits other than those issued by the university building official that include, but are not limited to, high-pressure steam, elevators, and city and county utilities.

01120 - SPECIAL PROJECT PROCEDURES

1. The A/E shall work with the university to develop this section for projects that pose an exposure for adjacent university spaces to dust, odor, noise, vibration or other contaminants. Special consideration may be necessary for patient areas, sensitive research areas, computer labs, research animal spaces or other sensitive operations. Review Appendix B - Dust, Contaminant, Odor and Fungal Control Measures. University Planning shall allocate space and determine the cost of relocating occupants in remodeling areas. If deemed necessary, the owner's representative shall coordinate such work with the university.

01200 - PROJECT MEETINGS

1. Pre-bid Meeting

1.1. After advertising or inviting bidders, the A/E shall coordinate a pre-bid meeting.

1.2. The A/E shall schedule and notify attendees.

1.3. The A/E, eligible contractors, the owner's representative, users representative and others as identified by the owner's representative shall attend.

1.4. The A/E shall record attendance and minutes, and issue written addenda based on comments and questions during the meeting. Addenda shall be distributed to all planholders.

2. Refer to Appendix C - Preconstruction Meeting Agenda Form.

3. Project Progress Meetings

3.1. Project progress meetings, coordinated with the owner's representative, shall be scheduled periodically throughout construction. The frequency of these meetings shall commensurate with the size and complexity of the project.

3.2. Review the A/E submittals list, the contractor's construction schedule, the change log and the contract closeout submittals, including the status of the project record documents at the project progress meetings.

3.3. The A/E shall notify the university building official and the Department of Environmental Health and Safety (DEHS) of the date, time and location of the

project progress meetings. The A/E shall copy the university building inspector and DEHS on all meeting minutes.

3.4. Pre-Installation Meetings: The A/E may designate activities that require pre-installation meetings for coordination of contractors, installers and suppliers.

01300 - SUBMITTALS

1. Contractor's Construction Schedules

1.1. The A/E shall define special components that the contractor is to include in the contractor's construction schedule.

1.2. These components may include, but not be limited to:

- A. Time required to complete each construction activity
- B. Relationships of the construction activities to one another
- C. Identification of critical activities
- D. Identification of long lead-time items
- E. Disruption of utility services
- F. Phased construction activities

1.3. The A/E shall review the contractor's construction schedule at the project progress meetings.

2. List of Contractors/List of Materials: The A/E shall review and approve the list of contractors/list of materials with the owner's representative.

3. 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. Refer to Appendix AA - Electronic Submittal Standards.

4. Hazardous Material Training Certificates: Prior to the commencement of work, the A/E shall forward the Hazardous Material Training certificates to the Facilities Management Hazardous Materials coordinator.

5. A/E Project Submittal List

5.1. Include the A/E's Project Submittal List in Section 01300 of the project manual.

5.2. Refer to Appendix J - Example of A/E's Project Submittal List.

6. Contractor's Submittal Schedule: Specify that the contractor is to use the A/E Project Submittal List included in Section 01300 of the project manual to develop a submittal schedule.

7. Fire Protection System Shop Drawings, Product Data and Samples

7.1. The University Building Code Division reviews shop drawings for sprinklers, standpipes, smoke control systems, kitchen exhaust hood extinguishing systems, fire alarms, storage tanks and refrigerant detection systems. The storage tanks include underground and aboveground tanks that store flammable, combustible or hazardous materials. The review shall proceed as follows:

7.1.1. The contractor shall submit four copies of the shop drawings and related submittals to the university fire inspector for approval at the following address: University Building Code Division, 319 15th Ave. SE, Suite 270, Minneapolis, MN 55455.

7.1.2. The university fire inspector shall coordinate the reviews with outside agencies or jurisdictions as necessary.

7.1.3. Refer to Division 16, Section 16680 - Fire Alarm Systems for more information.

8. Metal Shop Drawings: Submit electronic and hard copies of the approved metal shop drawings at project closeout. Electronic copies in .pdf format are preferred.

01380 - CONSTRUCTION PHOTOGRAPHS

1. Requirements

1.1. The A/E shall confirm project specific requirements for photographic documentation with the owner's representative and University Architects Office.

1.2. University of Minnesota buildings, including associated objects and landscapes that are listed or eligible for listing on the National Register of Historic Places (NRHP) require photo documentation to the State Historic Preservation Office standards. These historic properties also may require documentation to meet National Park Service Historic American Building Survey and/or Historic American Engineering Record standards. The Regent's Historic District properties and NRHP-eligible or NRHP-listed properties are required to follow the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings. Consultation with the Office of the University Architect prior to initiating documentation is required.

01400 - QUALITY CONTROL SERVICES

1. Testing and Inspections

- 1.1. The A/E shall specify the required testing and inspections.
- 1.2. Confirm with the owner's representative the scope of work for which the university shall retain the independent testing agencies.
- 1.3. The A/E shall work with the owner's representative to complete Appendix D - Request for Proposals for Testing and Environmental Services, and Appendix A - Special Inspection and Testing Services.
- 1.4. Testing and inspections shall include special inspections as required by the latest applicable building code, as well as other non-structural testing that is essential to proper performance of building systems.
- 1.5. The contractor shall pay for re-testing of materials or systems when tests do not meet project specifications.
- 1.6. American Concrete Institute (ACI) Level 1 certified personnel shall conduct concrete testing. Provide documentation of this certification to the A/E, the university building official or the university upon request.
- 1.7. The special inspector shall be either a third party structural engineer and/or an International Conference of Building Officials (ICBO) certified special inspector. The structural engineer of record may be approved to perform some of the special inspection functions with concurrence and approval of the building official. In areas where ICBO certifications are not available, the University Code Division shall determine the acceptability of the proposed inspector based on independent certification programs and the proposed inspector's project experience. Certain inspectors or inspection companies may not be approved for a given project if their general experience, experience with construction at the university or qualifications are found to be unacceptable to the university building official.

2. Inspection of Adjacent Facilities

- 2.1. Where demolition, excavation, underpinning, pile driving or similar work is to be performed adjacent to or in the immediate vicinity of existing structures, contact the owner's representative to determine if the building surveys and seismic monitoring are required.
- 2.2. Records of the pre-construction survey shall note pre-construction defects, measurements, elevations and newly discovered defects or changes.

01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

1. Temporary Utilities

1.1. General Requirements

1.1.1. The university owns and operates electric, telephone, steam and water distribution networks as indicated below:

A. Minneapolis Campus: The university operates electric, steam and telephone. The City of Minneapolis Waterworks provides water and sewer.

B. St. Paul Campus: The university operates electric, steam, water and telephone. The St. Paul Board of Water Commissioners provides sewer.

1.1.2. Before final presentation of the design development phase of the project, the A/E shall provide a preliminary assessment of the temporary utilities required for construction. The A/E shall coordinate the locations of, and capacity for, temporary utility connections with the university. The A/E shall confirm with the university owner's representative how the cost for the temporary utilities will be addressed in the project budget.

1.1.2.1. The A/E's preliminary assessment shall include, but not be limited to:

A. Estimating the amount of service required for construction

B. Determining if the contractor's point of connection is an extension of the university utility systems or if the utility is to be provided by a public utility company

C. Determining if the university utility system needs upgrading prior to the contractor's point of connection

D. Confirming with the owner's representative how the costs for any upgrades to the utility systems shall be addressed in the project budget. The university may pay these costs directly or include the required upgrades in the contractor's scope of work.

E. For non-metered utilities, determining in the assessment where charges are to be directed

1.1.2.2. The contract documents shall include the A/E's preliminary assessment and the contractor point of connection.

1.1.3. The contractor is responsible for the cost of the installation and removal of the temporary utility systems from the contractor point of connection forward. Materials furnished by the contractor for the temporary system shall remain the contractor's property.

1.1.4. To ensure that the long-term, expensive research experiments conducted throughout the university are not disrupted, specify that the utility outages associated with connection and disconnection of the temporary utility systems must be scheduled with the owner's representative a minimum of 14 days in advance of the outage occurring.

1.1.5. Payment of utility charges

1.1.5.1. The contractor shall pay for metered utility charges incurred during construction until the date of Substantial Completion. Confirm with the university how the cost of temporary utility charges shall be paid for when the project is completed in phases. Include this information in the contract documents.

1.1.5.2. The contractor shall pay for metered temporary utility charges whether furnished by the university or by an independent utility company.

1.1.5.3. The university shall read university-supplied meters on a monthly basis. The university shall invoice the contractor for the metered utility charges.

1.1.5.4. When the university is the source of non-metered utilities, the university shall pay for the utility usage incurred during construction.

1.1.5.5. The owner's representative shall coordinate meter installation, billing and removal as follows:

1.1.5.5.1. Electric: The contractor shall be responsible for current transformers. The university shall be responsible for socket and meters.

1.1.5.5.2. Steam and Condensate: The contractor shall be responsible for the meters.

1.1.5.5.3. Water and sewer: Verify with the owner's representative.

1.1.5.6. The owner's representative shall contact the metering department in Energy Management in the Donhowe Building after Substantial Completion and the meter(s) is installed.

1.1.5.7. The metering department in Energy Management in the Donhowe Building shall be notified once steam and electrical work has begun.

1.2. Temporary Electric Service

1.2.1. PROHIBITED: The use of university non-metered electrical energy for electric heating.

1.2.2. The main disconnect switch, overload protection, fault protection and provision for metering shall meet University Electric Utilities requirements.

1.2.3. The contractor shall have the temporary power service inspected by the University Building Code Office prior to being energized.

1.2.4. If temporary electric power needs a dedicated power source, coordinate with University Energy Management.

1.2.5. Construction Site Lighting: Provide temporary exterior lighting with 0.3 foot-candles around the perimeter fence line of construction sites for the safety of pedestrians traveling to and from adjacent facilities.

1.3. Temporary Water

1.3.1. The contractor shall provide a back-flow prevention device between the existing water system and the temporary construction system.

1.3.2. Water shall be provided from the existing building service without cost to the contractor for remodeling work.

1.3.3. The contractor shall maintain the system in a manner that will prevent freezing, flooding or contamination.

1.4. Telephone

1.4.1. The contractor shall provide and pay for telephone service to the field office. Include Appendix G - Office of Information Technology Request for Onsite Construction/Temporary Telephone and Data Service and the following text in the project manuals for projects on the Twin Cities campus:

1.4.1. Provide and maintain telephone service to the field office. The university operates telephone lines on campus. Basic monthly service includes local and toll service.

1.4.2. The contractor shall complete the form titled Request for Temporary Telephone Service and return it to the Office of Information Technology.

1.4.3. The contractor shall be billed for the labor time and materials required for the installation, plus the cost of the monthly service.

2. Temporary Heat

2.1. PROHIBITED: Using completed portions of the permanent system for construction purposes without the expressed written consent of the university owner's representative. (This prohibited item is to ensure that the permanent HVAC system in a building is clean and dust-free and that its one-year correction period begins on the date of Substantial Completion.)

2.2. For new construction projects, the contractor shall provide temporary construction heat, including temporary enclosures for heat retention.

2.3. For remodeling projects, the temporary construction heat may be an extension of the existing building heating system if it is adequate for the purpose. The A/E shall specify if the existing system is adequate. If the existing building heating service is inadequate, the contractor shall provide temporary construction heat.

2.4. Where the temporary system is an extension of the existing building heating service, the contractor shall provide piping extensions and terminal units required.

2.5. Where steam from the university system is used for construction, the contractor shall provide and install temporary steam and condensate meters to measure consumption. The contractor shall pipe condensate back to the university's return mains.

3. Toilets

3.1. PROHIBITED: Contractors or subcontractors using toilet facilities in existing buildings, except when specifically approved by the owner's representative.

3.2. The contractor shall provide portable self-contained units. Where the owner's representative approves the use of existing toilet facilities, the contractor shall clean the facilities daily and at the final comprehensive conclusion of the project.

4. Vermin Control: To ensure that pests and vermin are not attracted to the job site, all food waste shall be disposed of in a container with a lid. Refer to Division 2 – Site Work, Section 02050 – Demolition for more information. Also Refer to Appendix U - Insect and Rodent Control.

5. Dust Control: The A/E shall specify measures to contain construction-related dust, contaminants and odors within the construction limits. Construction-related dust, contaminants and odors shall not interfere with normal university operations. Refer to Appendix B - Dust, Contaminant, Odor and Fungal Control Measures.

6. Weather Protection: To protect facilities during remodeling or new construction from damage due to weather, the A/E shall specify the following. This language is required whenever roofs, walls or windows are disturbed as part of a remodeling project, or when exterior work may impact existing drainage systems.

6.1. Provide necessary measures to protect temporary and final work, existing and adjacent buildings, material and equipment from weather damage. This includes groundwater, rainwater, wind, ice, snow and the backing up of sewers and drains.

6.2. Provide temporary weather-tight enclosures, pumps, equipment, grading, bailing or other work necessary to ensure this protection.

6.3. Provide temporary insulated weather-tight enclosures of all openings in exterior walls and roofs.

6.4. Provide temporary enclosures to withstand gale force wind.

6.5. The contractor shall inspect, protect, maintain and ensure constant operation of existing roof drains.

6.6. The contractor shall protect areas of partial demolition until area is enclosed and weather-tight.

6.7. The contractor shall inspect, protect, maintain and ensure intended operation of existing interior building floor drains in the construction area.

6.8. The contractor shall inspect, protect, maintain and ensure intended operation of existing site drainage, exterior catch basins and areaway drains within the construction site so water does not pond.

7. Temporary Erosion and Sediment Controls

7.1. General Requirements: As identified in the Program Information/General Requirements section, Basic Design Requirements of these construction standards, the A/E must include temporary and permanent erosion and sediment

control measures as part of the construction specification. In general, guidance on temporary erosion and sediment control measures can be found at www.pca.state.mn.us/water/pubs/sw-bmpmanual.htm and at www.metrocouncil.org/environment/watershed/bmp/manual.htm. Specifically, the erosion and sediment control measures must comply with City of Minneapolis Erosion Control, Ramsey County Erosion and Sediment Control Handbook and City of Duluth Erosion Control Requirements as applicable. These measures include, but are not limited to, silt fences, storm inlet protection and entry/exit provisions to minimize tracking and stabilize exposed soil.

7.2. Silt Fences: Silt fences must be installed down gradient from all disturbed areas prior to beginning construction. The A/E shall identify on the construction plans specifically where the silt fences shall be installed to control sediment migration for the construction site. Install silt fences with posts 4 feet apart or shorter. Drive posts at least 2 feet into the ground. Anchor the silt fence in a trench that is at least 6 inches wide and 6 inches deep on the upside slope of the posts. Lay fabric in trench, backfill trench and compact it. Make splices in fabric at fence posts. Overlap fabric at least 6 inches. Silt fence post shall be at least 2-inch square or larger hardwood pine, T-section or U-section steel posts that weigh no less than 1 pound per lineal foot.

7.3. Storm Inlet Protection

7.3.1. PROHIBITED: Bales or fabric under grates.

7.3.2. Install inlet protection at all catch basins and storm sewer inlets that could possibly receive runoff from the construction site. Catch basin inserts or staked silt fences are preferred.

7.4. Street Sweeping: Remove all soil and sediment tracked or otherwise deposited on public or private pavement areas. Remove soil and sediment on a daily basis. Street washing is only allowed after sweeping or shoveling sediment from the areas.

7.5. Construction Site Vehicle Entry/Exit: Before beginning construction, install temporary rock construction exit(s) at each point where vehicles exit the construction site. Use 1-inch and 2-inch diameter rock such as MNDOT CA-1 or MNDOT CA-1 Course Aggregate. Place the aggregate in a layer at least 6 inches thick across the entire width of the exit(s). Extend the aggregate at least 50 feet into the construction site. Use geotextile fabric beneath the fabric to prevent migration of soil into the rock from below. If this control measure does not adequately control sediment tracking onto paved surfaces, a tire wash station shall be added.

7.6. Site Stabilization: All disturbed areas shall be stabilized according to MPCA Construction Site Storm Water Requirements. All exposed soil areas with a

continuous positive slope within 100 lineal feet of state waters, or from a curb, gutter, storm sewer inlet, temporary or permanent drainage ditch or other storm water conveyance, shall have temporary protection or permanent cover within the following timeframes. For slopes steeper than 3:1, temporary protection or permanent cover shall be established within seven days of disturbance if the contractor has not been or will not be working in the area. For slopes between 10:1 and 3:1, temporary protection or permanent cover shall be established within 14 days of disturbance if the contractor has not been or will not be working in the area. For the purpose of this provision, exposed soil areas do not include stockpiles or surcharge areas of sand, gravel, aggregate, concrete or bituminous.

7.7. Inspections: At a minimum, the contractor shall inspect each erosion and sediment control device after it rains or weekly, whichever is applicable. The contractor shall keep copies of inspection logs in the site trailer that identify which items were inspected and what corrections were made, as applicable.

7.8. Discharge

7.8.1. PROHIBITED: Concrete truck washout and other construction-generated wastes being discharged into storm sewers.

7.8.2. Any storm water discharge from a construction site must be visibly free of sediment and contain only rainwater.

7.8.3. Refer to Division 15 - Mechanical, Section 15025 - Storm Drainage for more information.

7.9. Maintenance: The contractor shall maintain all temporary erosion and sediment control measures until the project is complete or final site stabilization. The contractor shall replace or repair damaged or defective erosion and sediment control measures. The contractor also shall completely remove all temporary erosion and sediment control measures upon completion of the project or final site stabilization.

01505 - CONSTRUCTION WASTE MANAGEMENT

1. Hazardous Waste Management

1.1. General: Evaluation, on-site storage, transportation, disposal and other aspects of Hazardous Waste Management shall comply with Pollution Control Agency Hazardous Waste Rules, Chapter 7045.

1.2. Hazardous Waste from Abatement and Demolition: Appendix K - Section 13280 - Hazardous Materials Procedures specifies the requirements for the disposal of hazardous wastes during the abatement and demolition phases. The

contractor shall be responsible for collecting the listed materials in containers that the DEHS provides. The contractor also shall arrange for DEHS to collect the containers when full.

1.3. Hazardous Waste from Construction Activities: The contractor is responsible for the proper management of hazardous waste generated by his or her construction activities. Such waste is considered excess or unwanted hazardous construction-related materials, including, but not limited to, aerosols, paints, activators, adhesives and caulks. In no case shall such construction hazardous waste be co-mingled with demolition hazardous waste (refer to item 1.2). In no case shall such construction hazardous waste be co-mingled with non-hazardous construction or demolition waste.

1.4. Submittals

1.4.1. The contractor shall submit the Demolition and Construction Hazardous Waste Management Plan to the hazardous materials manager in Facilities Management 10 calendar days prior to the start of construction, and copy the owner's representative. The plan shall include the following elements:

1.4.1.1. The facilities to be used, indicating which of the targeted wastes are to be received, projected volumes and documented permit status of each.

1.4.1.2. Maintenance of a Demolition and Construction Hazardous Waste Log. The log shall include dates, facility, transporter, weights, and a file of waste receipts and shipping papers for all waste shipped off-site.

1.4.2. The contractor shall maintain the Demolition and Construction Hazardous Waste Log and submit the completed log to the hazardous material manager in Facilities Management at the end of demolition and at the end of construction.

2. Solid Waste Management Plan

2.1. General

2.1.1. Manage construction and demolition waste through reuse, recycling and reduction methods. Typical designated waste streams are land clearing debris, concrete and masonry, metals, dimensional wood and lumber, wooden pallets, gypsum wallboard, paper and cardboard. Depending upon the project, other large volume wastes may be included such as bricks, asphalt and carpeting.

2.1.2. A specified percentage of the waste shall be collected, segregated and sent for recycling or reuse. Documented waste reduction strategies shall be credited toward the percentage of waste goal.

2.1.3. Specifications of the Solid Waste Management Plan shall include standard instructions for handling designated wastes. The instructions shall stress the need for not contaminating the recyclable wastes.

2.1.4. The contractor is encouraged to work with the university Waste Management Division to evaluate recycling options. The Waste Management Division can recycle properly segregated and uncontaminated cardboard, and scrap metal at no cost.

2.1.5. Where required, the A/E and the owner's representative shall determine whether existing carpets, carpet cushions and accessories shall be removed and/or demolished. If deemed necessary, the contractor shall remove, store and replace existing furniture, furnishings and detached equipment. Refer to Appendix M - Carpet Specification Guide for more information.

2.2. Definitions

2.2.1. Reduction: Eliminating excess material or waste by ordering materials to fit the module of the design. Two ways to achieve reduction is to eliminate cut-off waste from lumber, drywall or carpeting; and working with suppliers to eliminate or reduce packaging.

2.2.2. Reuse: Salvaging components from remodeling or demolition projects. These components are then resold or transferred to salvage businesses, non-profits, material exchange networks or used in new construction at the same site or elsewhere. Reusable items include plumbing and mechanical equipment, doors, windows, fixtures and trim. Other reuse strategies include returning unused products or shipping containers/pallets to vendors.

2.2.3. Recycling: Recovering materials that have existing and stable markets that can be used as raw materials for manufacturing new products. Examples include cardboard, metals and concrete.

2.3. Submittals: The contractor shall submit the Solid Waste Management Plan to the owner's representative 10 calendar days prior to the start of construction. The plan shall include the following elements:

2.3.1. Whether construction waste shall be recycled or reused by source separation, time-based separation or co-mingled for delivery to an off-site separation facility.

2.3.2. The targeted materials for recycling and reuse, the projected volume and their destination. Identify recyclable or other recoverable materials that shall not be targeted in this project, and provide reasons why they shall not be recycled/recovered.

2.3.3. The goal of what percentage of waste shall be diverted from landfills or incinerators.

2.3.4. The landfill and recycling facilities to be used. Indicate the targeted wastes to be received and the projected volumes. Document the permit status.

2.3.5. Maintenance of a construction waste log that includes dates, facility, transporter and weights. Also include a file of receipts for waste shipped off-site.

2.4. Implementation

2.4.1. The contractor shall conduct a pre-construction waste management conference to discuss the plan requirements, schedules and procedures. Attendees shall include the owner's representative, the architect, a representative from the university Waste Management Division, waste management personnel from the contractor's firm and suppliers when appropriate.

2.4.2. The contractor shall designate an on-site party that is responsible for implementing the plan and instructing workers during orientation and safety meetings. The party shall provide instruction on separation, handling and recovery methods, and distribute the plan to site foremen and each subcontractor.

01525 - CONSTRUCTION AIDS

Fully enclose waste chutes with tight joints. Rigidly support them at each floor. Provide water spray or full enclosure at the discharge end to prevent noticeable dust dispersal.

01530 - BARRIERS AND ENCLOSURES

1. Fences

1.1. The contractor shall enclose the construction site limits, including the staging area, with a 2-inch and 6-foot-high mesh chain link fence with a top rail and lockable gates. Anchor steel posts, and space them not more than 10 feet on center. To avoid cutting or damaging pavement, sidewalks or waterproof plaza membranes, use portable base posts where appropriate.

1.2. The contractor shall close and lock gates at times when construction personnel are not present.

1.3. Remove fencing and restore the staging area to original condition before final completion.

1.4. The A/E shall review project specific requirements with the owner's representative.

1.5. General Protection: Contract documents shall identify adjacent existing improvements to remain, including structures, pavements, utilities, trees, shrubs and lawn areas.

2. Tree and Plant Protection

2.1. PROHIBITED: Using trees that are to remain for crane stays, guy anchors or other fastenings.

2.2. PROHIBITED: Lighting fires, storing materials, piling debris or parking motorized equipment within the spread of the branches of any tree.

2.3. PROHIBITED: Placing excavated material against shrubs or tree trunks.

2.4. Specify that trees and shrubs shall be protected from damage unless noted that they shall be removed.

2.5. Specify which trees and shrubs are protected before starting work. Ensure that such trees and shrubs remain protected until work is completed.

2.6. Verify protection requirements with the owner's representative. Indicate protection requirements on the drawings. Specify boxing or fencing as follows:

2.6.1. Install concrete highway traffic barriers around shrubbery and the outer perimeter of low-hanging branches.

2.6.2. Shore and brace trees adjacent to open excavation to maintain soil around the root system. Notify the owner's representative immediately of damage to crowns or root systems. The contractor shall secure a qualified arborist to remedy damage.

2.6.3. If any tree that is to remain is severely damaged or should die within three years because of contract operations, replace it with the same caliper and species. If a replacement is not available, the contractor shall reimburse the university in an amount equal to \$1,000 for each inch of diameter of the lost tree, measured 48 inches above grade. Refer to

Program Information/General Requirements, item 6. Site Planning for more information. (PROVIDE LINK HERE)

01570 - TRAFFIC REGULATION AND PARKING

1. The contractor shall comply with all posted regulations, signs and directions regarding traffic, parking and loading/unloading. In areas of high vehicle/pedestrian activity such as the mall area, Church St. and Washington Ave., the contractor shall have a person with a flag directing pedestrians and traffic while vehicles enter or leave the site.

2. Construction Staging Area

2.1. The A/E shall work with the owner's representative during the design process to define the location and size of the staging area, as well as the number of contractor's vehicles permitted to park in the staging area. Consult with University Police, Parking and Transportation Services, the local University Zone Office and University Landcare.

2.2. Construction staging areas shall occupy the smallest possible space without compromising safety of the project. The contractor shall install temporary fencing at the perimeter of the staging area. In special cases where significant landscape or historic fixtures are adjacent to construction activities, the contractor may be required to install chain link fencing and/or concrete barriers at perimeter of staging area.

2.3. Include Appendix H - Construction Staging Area and Parking Vehicle Permit Application and the following language in the project manual:

2.3.1. PROHIBITED: Construction personnel parking personal vehicles in staging area.

2.3.2. Parking for personal vehicles is available in university parking lots and ramps at regular parking rates.

2.3.3. The contractor may use the staging area as indicated on the drawings for material storage, equipment or other necessary purpose directly related to the work.

2.3.4. The owner's representative shall provide one or more signs that read "Construction Staging Area, Vehicle Permit Required, Violators Will be Tagged and Towed." Display these signs prominently on the perimeter fence. Return signs to the owner's representative before final completion of the project.

2.3.5. [Number of] site-specific Construction Staging Area Parking hangtag(s) is authorized for this project. The contractor at his or her

discretion may distribute hangtag(s) to the contractors. Each vehicle parked in the staging area shall have a Construction Staging Area parking hangtag appropriately displayed. Vehicles not in compliance with these regulations will be subject to tagging and impounding by police.

2.3.6. The owner's representative shall complete the attached Construction Staging Area Parking Vehicle Permit Application, including the detailed site map, and forward it to Parking and Transportation Services prior to starting work on a project.

2.3.7. The cost of each site-specific Construction Staging Area Parking hangtag(s) is \$___ per month. The contractor shall pay this cost directly to Parking and Transportation Services, Suite 300, Transportation and Safety Building, 511 Washington Ave. SE, Minneapolis, when they pick up the site-specific hangtag(s). Refer to Program Information/General Requirements, item 6. Site Planning for more information.
(PROVIDE LINK HERE)

01580 - PROJECT IDENTIFICATION AND SIGNS

1. Confirm with the owner's representative if a project identification sign is required. Refer to Appendix F - Facilities Signing and Graphics Standards. The contractor may have a sign on the field office stating the contractor's name and address.
2. Small signs to direct traffic or deliveries may be erected as needed.
3. Other signs on the site are prohibited. Refer to Program Information/General Requirements, item 6. Site Planning for more information. (PROVIDE LINK HERE)

4. Signage Standards for the Duluth Campus

- 4.1. Appendix F - Facilities Signage and Graphic Standards shall be followed unless indicated otherwise.
- 4.2. The word mark for UMD shall be University of Minnesota-Duluth.
- 4.3. A - C style signs shall have level accurate (Gold/Red/Blue/Bronze) reveal strips and building names added to Appendix F signage. The full building name or official abbreviation shall be used. Non-connected buildings shall use a maroon reveal strip.
- 4.4. All concourse directional signs that are effected by a project, including those located away from the project site that would now show the new building, shall be updated as part of the project.

4.5. A standard campus directory shall be added near the main entrance of new academic/general public buildings.

4.6. All campus directories, maps and directory listings shall be updated as part of the project.

4.7. For additional sign information, sample layouts and review of sign specifications, contact Erik Larson, 241 DAdB, 1049 University Drive, Duluth, MN 55812; e-mail: elarson@d.umn.edu.

01590 - FIELD OFFICES

1. Field offices for new construction shall be portable buildings that are adequate for the contractor's needs. If the project warrants, additional space may be required to accommodate the A/E's needs.

2. For remodeling projects, the A/E shall confirm with the owner's representative if space is available within an existing building for a construction field office. Refer to Program Information/General Requirements, item 6. Site Planning for more information. (PROVIDE LINK HERE)

01650 - COMMISSIONING

1. General Requirements: The purpose of this section is to describe the commissioning process.

1.1. Definitions

1.1.1. Commissioning: The systematic process of verifying and documenting that all building facility systems interact in accordance with the design documentation and intent, as well as with the owner's operational needs. Owner's needs include training of operational personnel. The facility systems shall interact from the design phase to a minimum of one year after acceptance.

1.1.2. Construction Tests: Tests required within the contract documents that the design professionals specify (not the commissioning authority).

1.1.3. Commissioning Plan: Documentation that the commissioning authority prepares in cooperation with the A/E to outline the steps of the commissioning process and the roles and responsibilities of the commissioning team members.

1.1.4. Commissioning Report: Documentation submitted to the university upon completion of the commissioning process to include a draft version

at Substantial Completion and a final version at the end of the first year of occupancy. The report documents the commissioning process and the final configuration of the commissioned building systems. At a minimum, the final report shall include the following: test reports, corrective action reports, an executive summary, a commissioning plan and a design intent document. The final report also shall include graphical trends for all major equipment during a design-heating week and a design-cooling week such as AHUs, chillers and converters. Provide a minimum of three copies of the commissioning report.

1.1.5. Design Intent Document: Documentation that the design professionals prepare that summarizes building systems performance criteria, assumptions made for design and proposed system operation.

1.1.6. Equipment Training: Training that design professionals specify and require for operations and maintenance staff within the contract documents.

1.1.7. Functional Performance Tests: Written procedures that the commissioning authority develops and the contractor performs under the direction of the commissioning authority. Test procedures are included as part of the commissioning specification section of the contract documents.

1.1.8. Opposite Season Testing: Tests or parts of tests that need to be performed at a time other than the end of construction because of inappropriate timing. For example, most chilled water systems need to be tested in the summer.

1.1.9. Pre-Functional Checklists: Checklists that the contractor completes to confirm that equipment is ready for verification testing.

1.1.10. Systems Training: Training that the commissioning authority provides for operations and maintenance staff regarding design intent, uniform operation of equipment as a system and interaction between individual systems. Submit a training plan and agenda to the university prior to the training session. Training manuals shall be in a three-ring binder with a minimum of three copies supplied to the university.

1.2. The implementation of this process requires participation and cooperation between the A/E, the general contractor, appropriate contractors, the commissioning authority and the university. At each phase of the design process, the A/E, the commissioning authority and the university shall work together so that the contract documents clearly define the contractor's participation in the commissioning process. The responsibilities of the design phase participants are further defined within their contracts.

1.3. The university shall retain a commissioning authority on a per project basis. The university shall identify the building systems to be commissioned on each project. The latest edition of ASHRAE Guideline 1 (1996): Guideline for Commissioning HVAC Systems is the guideline used to commission the HVAC systems for university projects. Follow the same pattern per ASHRAE guidelines for commissioning of building systems. The commissioning authority shall be either an outside consultant not associated with the design engineer or a member of the university staff.

1.4. The processes of commissioning the building systems shall begin during the schematic design phase. The commissioning authority shall coordinate the commissioning activities. The A/E, general contractor and appropriate contractors shall cooperate with the commissioning authority. The A/E, general contractor and appropriate contractors shall provide the labor and material necessary to complete the commissioning of the building systems.

2. Purpose

2.1. Verify and document the operational and functional performance of building systems and their interface with each other for compliance with design intent document.

2.2. Compile documentation of the tests and inspections for the systems to be commissioned. Include documentation as part of the commissioning report. The tests and inspections shall include those specified elsewhere in the contract documents.

2.3. Verify that the Operations and Maintenance manuals and As Built drawings are complete and accurate.

2.4. Verify that operations and maintenance tools and spare components are supplied as required by the contract documents.

2.5. Coordinate training of maintenance personnel on commissioned equipment and systems.

2.6. Track occupant complaints during one-year correction period to identify system deficiencies.

3. Documentation: The A/E shall provide the following documents to the commissioning authority:

- A. Design intent document
- B. Contract documents, including addenda
- C. Authorized revisions
- D. Shop drawings and submittals

- E. Construction tests
- F. Test and balance report
- G. Equipment completed start-up checklists
- H. Records pertaining to required code inspections and sign-off documentation
- I. Test results
- J. Meeting minutes

4. Responsibilities

4.1. PROHIBITED: The A/E relying on the commissioning authority to find deficiencies.

4.2. The architect and engineer shall:

4.2.1. Interpret specifications.

4.2.2. Provide clarifications, calculations and design assumptions for verification when requested.

4.2.3. Complete normal duties of the contract such as generating a punch list and following up on the punch list.

4.2.4. Incorporate the commissioning information that the commissioning authority provides into the appropriate specification sections of the project manual.

4.1.5. Interpret construction documents to resolve disputes and deficiencies in the commissioning report. Issue direction to correct such issues.

4.2. The general contractor shall:

4.2.1. Confirm that the building systems that will affect the performance of the commissioned systems are complete.

4.2.2. Direct cooperation of specialty contractors, including electrical, mechanical, TAB and controls, under their jurisdictions as required for the commissioning process.

4.2.3. Direct and coordinate how the contractor corrects deficiencies in the system.

4.3. The specialty contractor shall provide labor, material and equipment required to facilitate the commissioning process, as well as correct deficiencies in the system.

4.4. The university shall observe the commissioning process.

4.5. The Commissioning Authority shall:

4.5.1. Abide by the responsibilities defined in the commissioning plan.

4.5.2. Provide all commissioning reports.

5. Submittals: The commissioning authority shall submit a commissioning plan to the A/E prior to the commissioning process. The plan shall include checklists and the required personnel to confirm that the commissioning tests support the design intent. The A/E, commissioning authority and university shall approve the training plan that the contractor who is providing the training has prepared. After the testing period, the commissioning authority shall submit three copies of the original commissioning report to the A/E for review and distribution.

6. Instrumentation: To ensure that results of the test are consistent, the commissioning authority shall be allowed to test instruments that the specialty contractor used to calibrate the system.

7. Functional Performance Tests

7.1. Specialty contractors shall carry out commissioning test procedures. These tests shall include verification of control devices for proper operation and calibration, testing of interlocks and safety devices, operation of equipment through all modes of operation, simulation of all abnormal conditions for which there is a specified system response, and determining that system operation meets design intent. If more than 10 percent of the verification test fails, the whole test shall be considered failed. Any system that fails shall be calibrated again, and the system shall be tested again.

7.2. This test also shall include verification of test and balance readings. The verification process shall not exceed 10 percent of total readings. A deviation of 10 percent between verification reading and the reported data shall constitute a failure. If more than 10 percent of the verification test fails, the whole test shall be considered failed. Any system that fails shall be calibrated again and the system shall be tested again.

8. System Performance Monitoring: To confirm that systems function consistently, the system shall be monitored to verify performance as specified by the commissioning authority. The commissioning authority shall submit the test, and the controls contractor shall implement it.

9. Opposite Season Commissioning: The commissioning authority shall schedule opposite-season commissioning with the contractors. This includes all equipment that

could not be commissioned during Substantial Completion because of it being the inappropriate season

10. The contractors shall submit copies of the service tickets to the commissioning authority during the one-year correction period. This step verifies that there are no unresolved deficiencies with the system.

01700 - CONTRACT CLOSEOUT

1. Cleaning

1.1. The entire project area shall be cleaned immediately prior to final inspection.

1.2. Each surface or unit shall be cleaned to the condition expected for a typical cleaning and maintenance program in a commercial building.

1.3. The interior of cabinets and casework, converters, unit heaters, radiation, electric panels and similar items shall be cleaned, as well as accessible space in tunnels, shafts, pipes, plenums, crawl spaces and similar areas.

1.4. If generating dust and debris while completing the punch lists, clean the effected areas again prior to occupancy.

2. Submittals

2.1. It is not uncommon for the university to have difficulty obtaining final submittal items from the contractor unless the contractor works on them from the beginning of the project. Therefore:

2.1.1. The A/E shall advise the owner's representative throughout construction as to the status of the contract closeout submittals including, but not limited to:

- A. The ongoing development of the maintenance and operations manuals
- B. Record documents
- C. Equipment data and instructions

2.1.2. Refer to Appendix I – Equipment Data Information and Instructions for Contractors Engaged in all Facilities Management Projects for directions and instructions regarding equipment data. All equipment data shall be bound in one section in the O and M manual.

2.2. The contractor shall assemble and submit the following as one package before making application for final payment:

- A. Executed current Change Log - Appendix CC
- B. Consent of Surety
- C. Documentation that the contractor returned university keys
- D. Documentation that the contractor returned signs reading, "Construction Staging Area, Vehicle Permit Required, Violators Will be Tagged and Towed"
- E. Documentation that the punch list is complete
- F. Executed Certificate of Occupancy
- G. Executed TGB Total Payment Affidavit
- H. Executed TGB Verification of Completed Work Affidavit
- I. Executed Prevailing Wage Payment Affidavit
- J. Evidence of Completed Operations Liability insurance coverage during the one-year correction period
- K. Waste manifests, Toxicity Characteristic Leachate Procedure and OSHA monitoring results for asbestos or lead, as required by the contract documents
- L. Photographs that illustrate the overall construction progress

2.3. Operations and Maintenance Manuals

2.3.1. The contractor shall assemble and submit as one package the following before making application for final payment:

- A. Three copies of the Operations and Maintenance Manuals. Deliver one set to Facilities Management Engineering Records, Room B-11, Donhowe Building, and two sets to the University Zone office.
- B. A copy of the transmittal letter to the owner's representative

2.3.2. The manuals shall be bound in heavy-duty, vinyl-covered, three-post, loose-leaf binders, and be permanently labeled on the front and the spine of each binder.

2.3.3. Arrange the manuals according to the numbers used in the specification sections of the project manual. Include a table of contents that identifies the responsible installing contractor, contact person, and telephone number with area code and thumb tab index sheets.

2.3.4. Provide pocket folders for folded sheet information.

2.3.5. The Operations and Maintenance Manuals shall include the following type of information for materials, equipment and systems described in the complete project manual:

- A. A copy of the executed Certificate(s) of Substantial Completion to inform all necessary university personnel about the starting date of the one-year correction period
- B. Final approved shop drawings, including product data, data sheets and catalog information
- C. The manufacturer's required preventative maintenance inspections, testing, service, lubrication, maintenance instructions and schedules
- D. Documentation of manufacturer's initial startup
- E. Operating instructions, including typical start-up and shutdown procedures
- F. Emergency instructions
- G. Parts lists and local service organization
- H. Signed record copy of bonds, guarantees and warranties required in the contract documents
- I. Record copy of test results, affidavits, certificates, approvals and inspections required in the contract documents
- J. Wiring and piping diagrams
- K. Electrical System Protective Device Study
- L. University equipment forms for each applicable piece of equipment. Refer to Appendix I – Equipment Data Information and Instructions for Contractors Engaged in all Facilities Management Projects
- M. Other information required by the specifications

2.3.6. The contractor shall instruct university personnel in the use of Operations and Maintenance Manuals.

2.4. Project Record Documents

2.4.1. General Requirements: The contractor shall maintain a set of contract documents at the job site, on which variations shall be accurately marked with red erasable pencil on a daily basis. Record all changes as a result of change orders, the architect's supplementary instructions, the contractor change directives or other miscellaneous items related to the job. The A/E shall review shop drawings, product data and samples to ensure that the requirements of the contract documents have been met.

2.4.2. Contract Drawings

2.4.2.1. Maintain a clean, undamaged set of blue or black line prints of the contract drawings to use as the project record documents.

2.4.2.2. Mark the drawing sets to show where the installation varies substantially from the work as originally shown.

2.4.2.3. Pay particular attention to recording concealed elements that will be difficult to measure and record later. Also record new information that is important to the owner, but is not shown on the contract drawings.

2.4.2.4. Note the related change order number where applicable. Refer to Procedures for Construction - Phases of Project Development.

2.4.2.5. Organize the record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets. Print the university project name, project number, drawing numbers and titles on the cover sheet.

2.4.3. Record Project Manual

2.4.3.1. Maintain a clean, undamaged, complete set of the project manual to use as the project record documents.

2.4.3.2. Include one copy of the addenda and other written documents issued during the construction period such as change orders, RFIs and PRs with the record project manual.

2.4.4. The contractor shall submit the project record documents to the A/E for final inspection and comment at the completion of the job.

2.4.5. Refer to Appendix AA - Electronic Submittal Standards for requirements regarding the project record drawings that the A/E has prepared.

2.4.6. The A/E shall specify that the contractor not receive final payment until the university has received and approved the record documents and the Operating and Maintenance Manuals in writing.

2.4.7. The A/E shall not receive final payment for his or her prepared project record documents until the university receives and accepts them in writing.

2.4.8. Two months before expiration of the one-year correction period, the A/E shall conduct a walk-through and provide a written summary of findings and recommendations.

2.4.9. The EHO shall approve and return an executed certificate of pesticide application to the contractor for inclusion in the final closeout documents. Refer to Division 2, Section 02050 - Demolition.

2.4.10. Complete Appendix E - Utility Meter Report and return it to the university owner's representative and Facilities Management Energy Accounting, 300 Donhowe Building, 14 days prior to the activation, termination or change in payment responsibility of a utility service. The completed form establishes the dates of the contractor's responsibility to pay for the monthly charges for the utilities during the construction period. The contractor shall complete a separate form for each type of utility service.

End of Division 1 - General Requirements
University of Minnesota Facilities Management
November 2002 (Revised: December 2006)