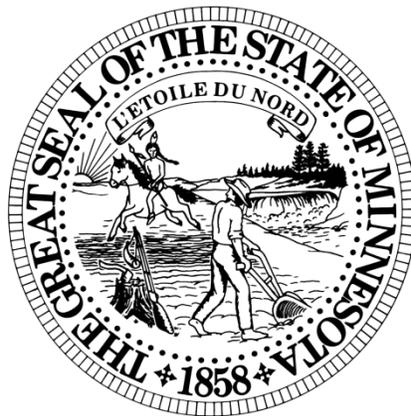




# DESIGN GUIDELINES

STATE OF MINNESOTA

Department of Administration



FEBRUARY 2011 - Fourth Edition



# DESIGN GUIDELINES

## TABLE OF CONTENTS

TABLE OF CONTENTS .....	2
INTRODUCTION .....	3
GENERAL REQUIREMENTS (ALL DESIGN DISCIPLINES) .....	4
CONSULTANT CHECKLIST FOR ASSEMBLIES .....	13
SUSTAINABLE & HIGH PERFORMANCE REQUIRMENTS (ALL DESIGN DISCIPLINES).....	14
ARCHITECTURAL BUILDING ENVELOPE & INTERIORS	
A. ARCHITECTURAL BUILDING ENVELOPE .....	15
B. INTERIORS .....	18
MECHANICAL & ELECTRICAL SYSTEM ASSEMBLIES	
A. MECHANICAL SYSTEM ASSEMBLIES.....	20
B. ELECTRICAL SYSTEM ASSEMBLIES .....	23
CONSULTANT CHECKLIST FOR SPECIFICATIONS .....	25
DIVISION 00 BIDDING REQUIREMENTS, CONTRACT FORMS, CONDITIONS OF THE CONTRACT..	25
DIVISION 01 GENERAL REQUIREMENTS .....	28
DIVISION 02 EXISTING CONDITIONS .....	37
DIVISION 03 CONCRETE .....	38
DIVISION 04 MASONRY.....	41
DIVISION 05 METALS.....	43
DIVISION 06 WOOD AND PLASTICS .....	44
DIVISION 07 THERMAL AND MOISTURE PROTECTION.....	47
DIVISION 08 DOORS AND WINDOWS.....	53
DIVISION 09 FINISHES... ..	57
DIVISION 10 SPECIALTIES .....	59
DIVISION 11 EQUIPMENT .....	60
DIVISION 12 FURNISHINGS (FURNITURE, FIXTURES & EQUIPMENT) .....	62
DIVISION 13 SPECIAL CONSTRUCTION.....	63
DIVISION 14 CONVEYING EQUIPMENT .....	64
DIVISION 21/22/23/25 MECHANICAL.....	65
DIVISION 26/27/28 ELECTRICAL .....	73
DIVISION 27/28 TECHNOLOGY & DATA/COMMUNICATIONS .....	95
DIVISION 31 EARTHWORK/SITWORK .....	98
DIVISION 32 EXTERIOR IMPROVEMENTS .....	100
DIVISION 33 SITE UTILITIES .....	105
APPENDIX A CAPITOL COMPLEX GUIDELINES .....	108
APPENDIX B TECHNOLOGY GUIDELINES (INTERTECH).....	109
APPENDIX C SPACE GUIDELINES .....	110
APPENDIX D PROJECT REPORT & FACT SHEET FORM.....	111
APPENDIX E BUILDINGS, BENCHMARKS & BEYOND (B3) SUSTAINABLE GUIDELINES & SB2030.116	
LEED COMPARISONS TO STATE'S SUSTAINABLE GUIDELINES	
APPENDIX F PROJECT DESIGN KICK-OFF CHECKLIST.....	117
APPENDIX G DESIGN GUIDELINE REQUEST FORM .....	129
APPENDIX H DESIGN GUIDELINE VARIANCE REQUEST FORM .....	130



## DESIGN GUIDELINES

### INTRODUCTION TO THE USE OF THE GUIDELINES

This document contains criteria to be used in the programming and design of State buildings. It is intended to be a guideline; it is not a substitute for the technical competence expected of a design or construction professional, nor does it release the professional or the firm they represent, from responsibility for their design.

The items in this checklist are to be incorporated into your design and submitted along with the documents and information required of your contract services and deliverables (template contract is available at the Department of Administration website [www.admin.state.mn.us/recs](http://www.admin.state.mn.us/recs) )

1. Indicate that you have incorporated the guideline by checking the "Complete" box next to the item.
2. If a specific guideline does not fall within your scope of work, mark the N/A (Not Applicable) box next to that item.
3. The majority of the guidelines are based upon actual experience that the State has had with failure of products, systems or designs when maintaining and operating State owned facilities. You may request a variance for an item or items if you can satisfactorily substantiate that an alternate design or assembly provides better performance. Verbal substantiation is not acceptable. You must provide a written evaluation of a design that has served a previous client with that design for a minimum period of 10 years and shows a lifecycle cost performance that will substantiate its use. Use the "Design Guideline Variance Request Form" in Appendix H.
4. Unlike a private development using amortization of the original building and charging all later expenses to a tenant, the State owns and provides maintenance for the life of the building. If you request a variance for an item based on your belief that it is too costly; you must substantiate your claim with a comparative life-cycle cost analysis.
5. To avoid schedule problems, you must identify and request a guideline variance and substantiate your alternate design solution during the design development phase. After completion of the design development phase, no further opportunity to contest the guideline will be available or entertained.
6. Should you have a suggestion or request for inclusion into these guidelines, please use the form in Appendix G.

#### GUIDELINE OBJECTIVES

1. Safe, functional facilities.
2. Long-lived buildings.
3. Low maintenance buildings.
4. No operational defects in buildings.
5. Incorporate sustainable design principles (*The State of Minnesota Sustainable Building Guidelines*) into site and building design to reduce operating costs, increase energy efficiency, and minimize negative impacts to building occupants and the environment.



## DESIGN GUIDELINES GENERAL REQUIREMENTS

**NOTE: THIS SECTION APPLIES TO ALL DESIGN DISCIPLINES**

### **A. GENERAL REQUIREMENTS**

#### **1. ARCHITECTURAL DESIGN AND ENGINEERING**

- 1.1 Licensed professionals shall perform all project designs and all contracted submittals shall be signed in accordance with State law.
- 1.2 All designs shall at a minimum, when required by State Law, shall meet or exceed all applicable state building codes and shall meet recognized published standards and best design practices.
- 1.3 Design consultants shall provide all instruments of service and deliverables as contained in their Basic Services Agreement (contract) with the State.
- 1.4 Design consultants shall comply with "The State of Minnesota Sustainable Building Guidelines" including the Sustainable Buildings (SB) 2030 requirements. See Appendix H for weblinks to the guidelines.
- 1.5 Provide monthly project status updates using the "Project Report & Fact Sheet" contained in Appendix D.

#### **2. INTEGRATED DESIGN**

- 2.1 Early coordination of all design disciplines (structural, mechanical, electrical, piping, technology, geo-technical, etc.) is required so that an orderly, integrated building design is achieved.

#### **3. OWNER PROVIDED INFORMATION**

- 3.1. During the design process, the consultant will be provided the following information from the State appropriate for the project: Unless noted otherwise, all Manuals & Guidelines are available on the Department of Administration website: [www.admin.state.mn.us/recs](http://www.admin.state.mn.us/recs)
  - a. *Consultant Designer Procedures Manual* – Describes the procedures, responsibilities and submittals required during the course of a project.
  - b. *Design Guidelines* – Describes quality and performance requirements for projects for inclusion into the contract documents.
  - c. *Space Guidelines* – Standard office & workstation sizes for offices. See Appendix C.
  - d. *Division 00 documents* – An electronic copy of the state's "front-end" requirements will be provided upon requesting a bid opening date to the Dept. of Administration's Materials Management Division (MMD). (Not available on the website).
  - e. *Predesign Manual* (if predesign is included in the scope of work).

- f. *Pre-design Document* - The approved pre-design or a written preliminary scope of work and/or program for the project.
- g. *Scope of Work & Schedule*- If a pre-design document for the project does not exist, a scope of work, project schedule and budget will be provided. (Not available on the website).
- h. *Estimated Cost of Construction* - An estimated construction budget for the project as described in the Consultant's Basic Services Agreement with the State.
- i. *Existing plans and specifications* – If existing. (Facilities hold these documents).
- j. *Masterplan* -A copy of the facility's Master Plan document and Strategic Plan. (If available).
- k. *Building Infrastructure Guidelines for State Owned Buildings* - the technology requirements to be incorporated into the project. (Included in the Appendix B of this document).
- l. *Building Air Quality – A Guide for Building Owners, Facility Managers and Agency Contacts*.
- m. *Contractors/Vendors Guidelines Related to Buildings and Parking Facilities -for the Capitol Complex* (See Appendix A of this document).
- n. *Geo-technical borings and reports* - (in consultation and coordination with the consultant architect/engineer of record).
- o. *Topographic and/or Land Title Survey* - A physical, topographical and boundary survey including legal description of the Project site (in consultation and coordination with the consultant architect/engineer of record).
- p. *Asbestos and hazardous materials survey* report and abatement design (in consultation and coordination with the consultant architect/engineer of record).
- q. *The State of Minnesota Sustainable Building Guidelines* - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG). Refer to B3-MSBG for criteria and definitions related to "stand-alone addition" and "major renovation." - See Appendix E.
- r. *Preferred Equipment List* - In new facilities and renovations located on the Capitol Complex in St. Paul, plans and specifications shall incorporate recommended equipment and components.
- s. *Law/Appropriation Language* - An explanation of legislative intent, and a re-statement of the statutory requirements that govern the project. (Not available on the website).
- t. *Facility Contact* - The name(s) of the facility or user agency liaison personnel. (Not available on the website).
- u. Other appropriate documents requested by the consultant architect/engineer of record.

#### **4. CONSULTANT (Architect/Engineer of Record) PROVIDED WORK**

- 4.1 This document along with the requirements contained in the Basic Services Agreement, the Request For Proposal and the *Consultant Designer Procedures Manual* comprise the scope of work that will be required of the consultant vendor.
- 4.2 During the design process, the consultant architect/engineer of record will coordinate information needed to compile a complete set of bid documents for the project.
- 4.3 The design process used by the State follows the general industry sequence of Schematic Design, Design Development and Construction Documents. There are requirements for submittals during and at the completion of each phase that must be approved in writing before beginning the next phase. Specific requirements of each are contained in the *Consultant Designer Procedures Manual* and in the contract (*Basic Services Agreement*). The consultant (Architect/engineer of record) will be required to certify completion of the procedures using the *Design Guidelines* checklists.
- 4.4 If LEED certification will be sought for a project, at least one principle participant of the project team shall be a LEED Accredited Professional, accredited for the specific project type seeking certification.
- 4.5 The consultant architect/engineer shall submit documentation to the Center for Sustainable Building Research related to the State of Minnesota Sustainable Building Guidelines (B3-MSBG) if the project is a new building or substantially "stand-alone" addition receiving funding from the bond proceeds fund after January 1, 2004 or a major renovation receiving funding from the bond proceeds fund after January 1, 2009. Documentation shall be submitted at the end of each project phase.

## 5. OWNER REVIEWS

- 5.1. To assure that the design guidelines are met, each phase of a project is reviewed by the State Project Manager, the facility or user agency involved. Other State consultants with expertise in various areas may also be required to review the documents depending on the project scope of work. Each phase of the design is required to meet the State's *Design Guidelines* and *Consultant Designer Procedures Manual* before the consultant architect/engineer of record is authorized to proceed. The *Design Guidelines* along with the Responsibilities & Services and Instruments of Service/Deliverables detailed in the Basic Services Agreement/Contract are to be used by the consultant architect/engineer of record as the guide when providing services to the state.
- 5.2. A schedule will be established for each project, prepared by the consultant, and agreed to by the State Project Manager, and the user agency. The consultant architect/engineer of record is responsible for integrating the State's review time into the schedule. The State Project Manager, will determine the amount of review time needed for each project. The scheduled review time assumes the consultant architect/engineer of record produces drawings of sufficient clarity that a single review and revision is all that is required for each phase. Additional time is required if additional review is needed to bring the documents into conformance.
- 5.3. Variances to these guidelines must be approved in writing by the State through the State Project Manager, prior to incorporation of the proposed variance into the documents. The variance request must be substantiated in the schematic design phase with authorization to proceed prior to initiation of the design development phase. (Refer to item #5 of the introduction.)

## 6. PRODUCT SPECIFICATIONS

- 6.1 The State requires all product specifications, assemblies and installations to comply with current recognized published standards and best practices as a minimum standard.

The following is a list of typical standards. The IBC/Minnesota State Building Code and Standards supercede where products and installation are covered under the code. ASTM, ANSI, NFPA, UL, FM, and Warnock Hersey compliance are to be specified when they exceed other standards.

AAMA-Association of Architectural Metals Manufacturers  
AAMA – American Architectural Manufacturers Association  
AABC – Associated Air Balance Council  
ACA – American Correctional Association  
ACI- American Concrete Institute  
AISC- American Institute of Steel Construction  
AISI – American Iron and Steel Institute  
ALSC- American Lumber Society  
AMCA – Air Movement Control Association  
ANSI- American National Standards Institute  
ANSI/TIA/EIA- Electronic Industries Association/Telecommunications Industry Association (EIA/TIA)  
Commercial Building Standard for Telecommunication Pathways and Spaces (No. 568)  
APA- American Plywood Association  
API – American Petroleum Institute  
ARI – Air Conditioning and Refrigeration Institute  
ASHRAE-American Society of Heating, Refrigeration and Air conditioning Engineering  
ASME – American Society of Mechanical Engineers (Standards)  
ASSE – American Society of Safety Engineers  
ASTM- American Society of Testing Materials  
AWI- American Woodworkers Institute  
AWS- American Welding Society  
AWWA – American Water Works Association  
CISPI – Cast Iron Soil Pipe Institute  
EIA – Electronics Industries Association  
ETL – Electrical Testing Laboratory  
ETL – Electrotechnical Laboratory  
FCC – Federal Communications Commission (EMI -Electromagnetic Interference emission Standards)  
FCI – Fluid Controls Institute  
FM – Factory Mutual

FS – Federal Specification / MILitary Specification / DOD- Department of Defense Specification  
 GA- Gypsum Association  
 GANA- Glass Association of North America  
 HI – Hydraulic Institute  
 ICEA – Insulated Cable Engineers Association  
 IEEE – Institute of Electrical and Electronic Engineers  
 IES – Institute for Environment and Sustainability  
 IPCEA – Insulated Power Cable Engineers Association  
 ISA – Instrument Society of America  
 ISO – International Standards Organization  
 MnDOT – Minnesota Department of Transportation (Standard Specifications for Construction)  
 ML&PB- Minnesota Lathing & Plaster Bureau  
 MSS – Manufacturers Standardization Society  
 NAAMM-National Association of Architectural Metal Manufacturers: NAAMM Standard SW-1  
 NAIMA – North American Insulation Manufacturers Association  
 NCMA-National Concrete Masonry Association: NCMA-TEK  
 NCPWB – National Certified Pipe Welding Bureau  
 NEBB – National Environmental Balancing Bureau  
 NECA – National Electrical Contractors Association  
 NEMA – National Electrical Manufacturers Association  
 NICET – National Institute for Certification in Engineering Technologies  
 NFPA- National Fire Protection Association  
 NPCA – National Paint and Coatings Association  
 NRCA-National Roofing Contractors Association: Roofing and Waterproofing Manual  
 NRTL – Nationally Recognized Testing Laboratory Listing and Labeling  
 PCI- Precast/Prestressed Concrete Institute  
 PDI – Plumbing and Drainage Institute  
 SDI – Steel Deck Institute  
 SDI – Steel Door Institute  
 SJI – Steel Joist Institute  
 SMACNA-Sheet Metal and Air Conditioning Contractors' National Association: SMACNA Architectural Sheet Metal Manual.  
 SSPC – Steel Structures Painting Council (The Society for Protective Coatings)  
 SSPMA – Sump and Sewage Pipe Manufacturers Association  
 TEMA – Tubular Exchanger Manufacturers Association  
 TCA – Tile Contractors Association  
 UL- Underwriters Laboratory  
 USASI – United States of America Standards Institute  
 Warnock-Hersey

- 6.2 To maintain product quality and comply with the requirements for public bidding, “sole source” product specifications or requirements are not allowed unless specifically approved by the State. The State requires the consultant architect/engineer of record, to select and specify, at a minimum, 2 or 3 quality manufacturers/products, to establish minimum acceptable quality. If the consultant architect/engineer determines that a process of substituting “equal or better” products during bidding is feasible, then the consultant architect/engineer of record must specify the process and guarantee an “equal or better” product. Model or product numbers for approved alternate products must be cited in addenda when prior approvals occur.

## 7. QUALITY

- 7.1 The State will contract separately for all Quality Assurance Testing. Coordinate testing needs or requirements with the State Project Manager. The consultant designer shall solicit and review proposals from three independent testing companies and make recommendation for selection to the State Project Manager. Quality assurance testing shall be indicated in each specification division; defining the type of test and method; test frequency; test pass/fail tolerance; and action required for failed tests. Where applicable, include testing for:

1. Engineered fill gradation
2. Soil compaction
3. Drain tile slope

4. Structural concrete design and strength
5. Masonry mortar design and strength
6. Masonry grout design and strength
7. Masonry prism strength
8. Concrete masonry unit acceptance
9. Exterior block acceptance
10. Structural steel fabrication plant acceptance
11. Structural bolt tensile strength, chemistry, and hardness
12. Structural Bolted and welded connections
13. Special Inspections as required by code
14. Waterproofing
14. Sprayed fireproofing density, thickness, adhesion/cohesion and the absence of asbestos
15. Sealant adhesion
16. Window air and water infiltration
17. Asphalt paving
18. High voltage equipment before energizing
19. Other materials or products that should be tested by owner to assure quality installation

7.2. The general intent of the design process is to ensure that the quality standards for the building not be compromised.

7.3. For renovation projects, investigate and determine the remaining service life of all building components. Where the age of the component exceeds the following schedule, report on age and condition and receive written direction from the State on whether to repair or to replace. Investigation and recommendations for the following building components: waterproofing systems, exterior walls, doors, windows and roofs, may be conducted by a specialized consultant. The State Project Manager will determine when specialized consultants will be used. At a minimum, design consultant shall specify a pre-installation meeting for all building envelope (roof & wall) assemblies.

	<u>Age (In Years)</u>
Foundation walls & footings	75
Superstructure ( Columns/Beams/Floor systems)	75
Waterproofing /underdrainage / Slab on grade	50
Exterior Walls	50
Exterior Doors and Windows	30
Roofs, Elevators/Conveyance Systems, Fire alarm, Security System	20
HVAC Controls and Equipment	30
Air Conditioning Units	20
Air Handling Units	30
Boiler & Furnace	35
Heating, Cooling and Sprinkler Piping	50
Compressed air & gas systems, Sanitary and Interior Storm Drains	50
Communication and data	15
Power Distribution System	35

7.4. When the Estimated Cost of Construction is \$1 million or more, the State will require a quality control review of 100% complete contract documents prior to bidding. The consultant shall schedule time for this review as well as time to incorporate recommended changes (typically 1 month minimum).

7.5. All design disciplines must stipulate in their specifications that the product installer/subcontractor must supervise the work and, at a minimum, have five (5) years experience installing the product.

7.6. Specifications for any specialized construction (such as detention products & equipment, food service equipment, laboratory equipment, laboratory mechanical equipment, etc.) shall pre-qualify subcontractor/installers prior to or during bidding. Coordinating with the State Project Manager, the consultant shall develop a prequalification form to be used during bidding for the purpose of prequalifying installers.

7.7. In addition to the B3-MSBG requirements for bonded projects, the Department of Administration Design Guidelines incorporate all of the B3-MSBG requirements, many of the B3-MSBG recommendations and several additional LEED® credits from LEED NC 2.2 for all improvement projects to ensure quality

construction, reduce long-term operating costs, and reduce negative environmental impacts. The purpose is to bring all State projects up to a level comparable to a LEED Silver certified building (NC v2.2).

## **8. CONTRACTS**

- 8.1 The consultant shall incorporate the State's "front-end" into the contract and Project Manual.
- 8.2 Construction documents will be organized for single prime contracts unless another delivery method is approved by the State Project Manager.
- 8.3 Alternates, if any, shall be deducts.
- 8.4 The consultant shall develop a bid contingency plan for the project. (Redesign of the project will be required, at no cost to the State, should bids exceed the approved estimated construction cost provided by the consultant).
- 8.5 The consultant shall develop a Special Conditions Specification to cover project specifics such as liquidated damages, phasing schedule, substantial and final completion dates, construction schedule updates, site security requirements, builder's risk insurance, etc.
- 8.6 The consultant shall review requirements for sub-consultant site visits with the State Project Manager.

## **9. STATEMENT OF PROBABLE/ESTIMATED COST OF CONSTRUCTION**

- 9.1 If the consultant's statement of probable construction cost exceeds the budgeted construction cost, notify the State Project Manager immediately, and consult with the State Project Manager and user agency representative. (Redesign of the project will be required, at no cost to the State, should bids exceed the approved estimated construction cost provided by the consultant). See the Basic Services Agreement (Consultant Contract) for cost estimating responsibilities.

## **10. HAZARDOUS MATERIALS**

- 10.1. As a State policy, all projects undertaken in existing buildings will be surveyed for hazardous materials such as asbestos containing materials (ACM) and lead paint prior to any work occurring. This survey will be undertaken by the State, and will be paid for by the project funds.
- 10.2. All hazardous materials abatement will be done under a separate contract by the Department of Administration prior to a renovation./remodeling project. The consultant must receive approval from the State Project Manager before planning work in areas known to contain asbestos containing materials.
- 10.3. The consultant shall coordinate new work with the abatement designer in order to reconstruct areas/components that were demolished or removed as a result of the abatement.
- 10.4. No new materials that contain or may contain asbestos shall be specified.
- 10.5. The consultant shall include the Owner's hazardous materials and lead paint surveys in their project specification/manual.

## **11. SITE SURVEY**

- 11.1. The consultant architect/engineer of record shall define the scope and required features of the site survey in accordance with standard AIA site survey requirements. Upon consultation and coordination with the consultant, the State will contract with a registered land surveyor to obtain necessary site documentation.
- 11.2. The consultant architect/engineer of record shall review the environmental assessment and/or environmental impact requirements with the applicable agency having jurisdiction.

## **12. SOIL BORINGS / GEOTECHNICAL INVESTIGATIONS**

- 12.1. The consultant architect/engineer of record shall recommend the number and location of soil borings. An independent geo-technical consultant contracted by the State to prepare a report of the soils investigation findings along with recommendations and restrictions for foundation and paving designs.

## **13. UTILITIES**

- 13.1. The consultant designer shall include locations on their contract documents of all utilities, existing and new, that are within the area of work
- 13.2. The consultant architect/engineer of record shall coordinate their design with utility companies and the facility/campus for connections of water, sewer, gas, electric, etc
- 13.3. The consultant architect/engineer of record shall investigate existing utility infrastructure services to determine if they have capacity to support the new work.
- 13.4. The consultant architect/engineer of record shall specify equipment that will meet or exceed the efficiency standards and qualifications for utility rebate programs. And shall provide all documentation required by the utility to evaluate and process rebate applications. The consultant architect/engineer of record shall work with the facility staff of the agency to assist in obtaining all possible utility rebates on the project.
- 13.5. Specify that the contractor(s) shall be required to provide necessary documentation, including invoices, required by the utility(s) for the purpose of processing and approving rebate applications.

## **14. TEMPORARY FACILITIES**

- 14.1. Coordinate with the State Project Manager and user facility to determine whether the contractor shall pay for temporary construction heat and facilities until substantial completion. Specifications shall define provisions for all temporary facilities, such as construction heat, phone, toilets, parking, site access, materials storage, food service access, etc. When a project occurs on the Capitol Complex area, include "*Contractors/Vendors Guidelines Related To Buildings And Parking Facilities*" in the specifications. (See Appendix for this document).
- 14.2. The use of all new and existing HVAC systems during the construction phase is prohibited. If use of existing system is necessary, request and receive written approval, and specify all conditions necessary to assure that the system is returned in equal or better condition. At a minimum, follow SMACNA air quality control measures and provide MERV 8 filtration which will be removed prior to occupancy. Coordinate with Minnesota Sustainable Building Guidelines (B3-MSBG) Section P.4 to establish indoor air quality procedures during construction and warranty period according to Construction Air Quality Management Plan and Warranty Period Air Quality Management Plan.

## **15. SUSTAINABLE & HIGH PERFORMANCE BUILDINGS**

- 15.1. New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG). Submit documentation as required to the Center for Sustainable Building Research at the University of Minnesota.
- 15.2. Where the B3-MSBG guidelines are not mandatory as outlined in Item 15.1, comply with the sustainable design principles incorporated into these Design Guidelines as applicable to the specific project. Submission of documentation to the Center for Sustainable Building Research at the University of Minnesota is not required.
- 15.3. Plans for a new building or for a renovation of 50 percent or more of an existing building or its energy systems must include designs which use active and passive solar energy systems, earth sheltered construction, and other alternative energy sources where feasible. A new building must consider meeting at least two percent of the

energy needs of the building from renewable sources (limited to wind and sun) located on the building site (MN Statute 16B.32 Energy Use).

- 15.4 When practicable, geothermal and solar thermal heating and cooling systems must be considered when designing, planning, or letting bids for necessary replacement or initial installation of cooling or heating systems in new or existing buildings that are constructed or maintained with state funds. For the purposes of this section, "solar thermal" means a flat plate or evacuated tube with a fixed orientation that collects the sun's radiant energy and transfers it to a storage medium for distribution as energy for heating and cooling. (MN Statute 16B.326 Heating and Cooling Systems: State-Funded Buildings).

- 15.4.1 A new State building must be designed to have two percent of its energy provided by alternative energy source. The predesign and design must include a written plan for compliance.

- 15.5 In conjunction with The State of Minnesota Sustainable Building Guidelines, conduct a Life-Cycle-Cost Analysis on all major systems of the building, including but not limited to: Structural system, including foundation; building envelope, including roof, wall, and window systems; mechanical systems and components; and major electrical systems and components, including lighting.
- 15.6 Schedule and coordinate with the Department of Administration to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds efficiency standards and qualifications for applicable utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued. Specify that the contractor(s) shall be required to provide necessary documentation, including invoices, required by the utility(s) for the purpose of processing and approving rebate applications and shall work with the Department of Administration to assist the State in obtaining all possible utility rebates on the project.
- 15.7 Consider future recycling and reuse of all assemblies. Designs should consider non-destructive detailing for future removal of assemblies for reuse. For remodeling projects, evaluate the life expectancy of the assembly or components for potential reuse.

## **16. SPACE PLANNING and TENANT RELOCATIONS**

- 16.1. For office facilities, coordinate preliminary space fit planning with the Department of Administration and the State Project Manager.
- 16.2. Obtain the State's "Space Guidelines" from the State's Project Manager or they can be downloaded from the following website address: [www.admin.state.mn.us/recs](http://www.admin.state.mn.us/recs) . Deviation from these guidelines requires the user agency to substantiate the operational need for deviating from the guidelines.
- 16.3. **MN Statute 16B.335, Subd. 5 & 6:** Building and relocation projects shall review the implications of utilizing information technology on space utilization. Construction and remodeling funds shall include money for cost-effective information technology investments that would enable an agency to reduce its need for office space, provide more of its services electronically, and decentralize its operations. The Office of Enterprise Technology must review and approve the information technology portion of construction and major remodeling program plans.

## **17. SAFETY**

- 17.1 Consultants are to specify that contractors are to provide Material Safety Data Sheets (MSDS) for materials brought onto the site.
- 17.2 Consultants are to specify that the contractor shall hold weekly safety meetings with all concerned subcontractors, suppliers, and occupants. Or, in accordance with the contractor's insurance company if more frequent meetings are required. And, specify that contractors are to provide weekly documentation on safety meetings and incidents.
  - 17.2.1 See the State's General Conditions of the Contract for Construction (amended A201) for contractor's safety requirements.

- 17.3 All welding or other flame or heat related work shall follow the “Hot Works” program contained in the Appendix of this guideline or online at: [www.admin.state.mn.us/recs](http://www.admin.state.mn.us/recs) .

## **18. SECURITY FEATURES AND SYSTEMS DESIGNS & DOCUMENTS**

- 18.1 Security features of building plans, building specifications, and building drawings of state-owned facilities and nonstate-owned facilities leased by the state are classified as nonpublic data when maintained by the Department of Administration and may be shared with anyone as needed to perform duties of the Commissioner. (Minnesota Statute 13.64 ).

18.1.1 The design consultant(s) shall not release any documents and/or information containing security information without the approval of the Department of Administration and/or the user Agency.

## **19. PRODUCT SUBSTITUTIONS DURING CONSTRUCTION**

- 19.1 Product substitutions are to be reviewed with the State prior to approval by the architect/engineer.

**END OF SECTION**



---

## **DESIGN GUIDELINES CONSULTANT CHECKLIST FOR ASSEMBLIES**

Minnesota is geographically located to have what is known as a "continental climate". We experience the full range of seasonal changes resulting in climate and temperatures that cycle from hot and humid to frigid cold and dry as well as experiencing varied degrees of wind, rain, sleet, snow, frost and sun. Buildings exposed to the elements in Minnesota must be recognized as dynamic, not static, structures that are designed and built to withstand and accommodate a wide variety of environmental elements.

The building envelope is the assembly that is subjected to and constantly in direct contact with the elements of the exterior environment and thus, has the greatest potential for performing well or experiencing failure(s). Leakage and moisture intrusion into the building envelope or failure of a particular product within the envelope assembly has the potential to damage interior property, expose occupants to microbiological (mold) growth and result in huge costs and/or liabilities to the State. As a result, a primary focus of the State's *Design Guidelines* will be to address requirements for the building envelope assembly to assure that the envelope will perform well over a period of many years.

Along with a building envelope that does not allow water to penetrate to the interior, a properly designed mechanical system will further enhance indoor air quality to provide safe environments for the public and building occupants.



# DESIGN GUIDELINES - CONSULTANT CHECKLIST

## SYSTEM ASSEMBLIES

### ALL ASSEMBLIES (applies to all design disciplines and systems)

#### Sustainable & High Performance Requirements

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>1. MN Statute 16B.32 Energy Use:</b> Plans for a new building or for a renovation of 50 percent or more of an existing building or its energy systems must include designs which use active and passive solar energy systems, earth sheltered construction, and other alternative energy sources where feasible. A new building must consider meeting at least two percent of the energy needs of the building from renewable sources (limited to wind and sun) located on the building site.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>2. MN Statute 16B.325 Sustainable Building Guidelines:</b> New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG). Submit documentation as required to the Center for Sustainable Building Research at the University of Minnesota. <b>Appendix E contains LEED comparisons.</b></p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>3. Geothermal and solar applications for Heating &amp; Cooling Systems – for State Funded Buildings: MN Statute 16B.326</b></p> <p>When practicable, geothermal and solar thermal heating and cooling systems must be considered when designing, planning, or letting bids for necessary replacement or initial installation of cooling or heating systems in new or existing buildings that are constructed or maintained with state funds. For the purposes of this section, "solar thermal" means a flat plate or evacuated tube with a fixed orientation that collects the sun's radiant energy and transfers it to a storage medium for distribution as energy for heating and cooling.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>4. Life Cycle Costing:</b> In conjunction with <i>The State of Minnesota Sustainable Building Guidelines</i>, conduct a Life-Cycle Cost Analysis on all major systems of the building:</p> <ul style="list-style-type: none"> <li>a. Structural System (including foundation)</li> <li>b. Envelope....Roof, Wall &amp; Window systems</li> <li>c. Mechanical Systems &amp; Components</li> <li>d. Major Electrical systems &amp; components (including lighting).</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>5. Schedule and coordinate with the State's facility staff to identify all utility rebate opportunities. Specify equipment that meets or exceeds efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued. Specify that the contractor(s) shall be required to provide necessary documentation, including invoices, required by the utility(s) for the purpose of processing and approving rebate applications.</b></p>

## ARCHITECTURAL ASSEMBLIES

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Consider future recycling reuse of all assemblies. Designs should consider non-destructive detailing for future removal of assemblies for reuse. For remodeling projects, evaluate the life expectancy of the assembly or components for potential reuse. |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Comply with the requirements of the State of Minnesota Sustainable Building Guidelines, Section M.2, Evaluation of Environmentally Preferable Materials.  |

## Architectural Building Envelope

### Roof & Flashing

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. The fundamental goal for every building project is to have designs that provide durable and maintainable roofs that will, with comprehensive annual roof management, provide 40 years of service life for low-sloped roofs (less than 2" per foot) and a minimum of 40 years of service life for steep-sloped roofs (greater than 5" per foot). Roof systems shall be designed for simple repair and maintenance to achieve expected performance life. |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Design the roof using proven roof system types and materials (for this climate) to provide positive slope from all points on the roof to the roof drain system. <b>Do not design flat roof areas to allow standing water.</b>  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Use systems with at least 20 years of satisfactory performance history. Use materials with at least 10 years of satisfactory performance history.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Review the proposed roof type with the facility. For low sloped and flat roofs, a 4-ply built-up roof (with granular surfaced, modified bitumen flashing) is the desired roof system.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. All roof system designs shall comply with the EnergyCode and Minnesota Building code, which adopts the International Building Code, and shall also meet local code requirements. Buildings, additions, and major renovations are to be designed to meet the Sustainable Buildings 2030 requirement (see <i>The State of Minnesota Sustainable Building Guidelines</i> ).   |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. All roof system designs shall follow the requirements in Specification Section 07 500 of these guidelines.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Walls must be constructed or repaired as required for both new construction and re-roofing construction to prevent water entry into and below the roofing system. This can include design features such as through-wall flashing, window or louver sill modifications, and masonry restoration.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. For re-roofing projects, specify that the roofing contractor shall investigate existing conditions prior to starting construction work by extracting sample cores of the existing roof to verify conditions (identify roofing materials, condition, and determine if hazardous materials are present).   |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Conform to the additional requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section S.11, for Heat Island Reduction.   |

### Foundations

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. All foundation walls that enclose occupied spaces below grade shall be externally waterproofed. The consultant or the Owner's waterproofing consultant shall inspect the installation on a full-time basis. The consultant designer shall recommend scope and scale of waterproofing inspection service for the project during the schematic design phase. |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Foundation walls enclosing occupied space below grade shall include a drain tile system. The drain tile discharge lines shall have a slope of no less than 1/4" per foot and drain to a sump pit equipped with a pump, connected to a storm drainage system or day-lighted to a pond or drainage way.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Foundation walls that enclose occupied space below grade shall be cast-in-place concrete and waterproofed using a hot fluid applied waterproofing system.  |

# ARCHITECTURAL ASSEMBLIES

## Foundations

Complete  N/A

4. Backfilling operations shall be undertaken to provide adequate protection of the installed foundation and waterproofing. All required testing, and repair work if needed, shall be performed prior to backfilling. Testing of waterproofing at all foundation penetrations is required.

## Floors

Complete  N/A

1. For occupied space below grade, place slab on grade concrete floors above engineered fill so that ground water will drain quickly. Provide an underslab membrane, drain tile, and sump pumps. Review need for drain tile below the slab.
2. Review slab-on-grade designs with geotechnical and structural engineers with respect to curing time and moisture content as they relate to the finished floor product.

Design issue:

- a. Finish floor manufacturers often will not warrant their product and/or adhesive flooring products may lose adherence when a concrete slab-on-grade has a high moisture content. This will impact the project completion time waiting for the moisture content in the slab to dissipate before the final floor finish can be installed.
- b. If moisture/water is present below the slab; the moisture content in the slab may always remain high unless below slab drainage is present.

c. Carefully review soil conditions and ground water levels in the geotechnical report. Specify soil replacement, engineered fill, underslab membrane, sump pumps and drain tile as necessary to provide low moisture content in slab-on-grade concrete floors.

3. Specify mock-ups for all major floor systems (terrazzo, wood, tile, carpet, floor penetrations) to obtain seamless details.

4. Provide a listing of all equipment requiring housekeeping pads. Provide a unit price allowance for providing additional pads.

5. Conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2 Specify Low-emitting Materials.

6. Comply with the requirements of the State of Minnesota Sustainable Building Guidelines, Section M.2, Evaluation of Environmentally Preferable Materials.

## Walls

Complete  N/A

1. All exterior wall systems at some point in their life cycle will leak. Wall designs must incorporate a "second line of defense" against water and moisture infiltration. Typical wall systems to be used are:
  - a. Drainage wall: A cavity wall system that allows for water/moisture infiltration to be drained to the exterior.

b. Rain screen wall: A cavity wall system that allows for water/moisture infiltration to be drained to the exterior and is baffled to allow equalization of pressure.

2. When exterior walls include the use of brick, the wall design shall comply with the "*Brick Institute of America*" recommendations. (See the Brick Institute's Technical Notes for the use of brick in construction).

3. Masonry or poured-in-place concrete backup is required for all exterior brick walls. Metal or wood stud framing systems are not allowed at exterior walls with brick veneer. Exceptions to this may include small residential buildings or buildings with a 20 year life-cycle and must be approved in writing by the State.

4. Continuously flashed cavity wall construction is required; below all window and curtain wall sills, on walls located above adjoining roofs, and at ground level conditions where windows occur.

# ARCHITECTURAL ASSEMBLIES

## Walls

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	5. Thin veneer systems, such as EIFS (Exterior Insulation Finish System), are <u>not</u> allowed for exterior walls at grade level. Approval by the State Project Manager is required for use at any location. Processed organic materials (including paper and particle board) are prohibited within all exterior wall systems.
<input type="checkbox"/>	<input type="checkbox"/>	6. Exterior wall construction detailing shall be developed to prevent condensation caused by cold surfaces in contact with conditioned interior air.
<input type="checkbox"/>	<input type="checkbox"/>	7. Provide 2" minimum air space between brick veneer and cavity insulation.
<input type="checkbox"/>	<input type="checkbox"/>	8. For masonry walls, specify vertical control joint locations to be at a maximum spacing of 25 feet of wall ,but not more than 1.5 times the wall height (interior or exterior). In addition, vertical control joints shall be located at all changes in wall height, at all changes in wall thickness, above movement joints in foundation floors that bear on the wall, near one or both sides of door and window openings (one side for openings up to 6 feet in width, and both sides for wider openings), and adjacent to corners of walls or intersections within a distance equal to half of the control joint spacing.
<input type="checkbox"/>	<input type="checkbox"/>	9. Masonry wall shall have lateral support at vertical intervals of not more than 20 feet, provided by floor or roof diaphragms or other means.
<input type="checkbox"/>	<input type="checkbox"/>	10. Verify expansion and contraction influences on wall sections
<input type="checkbox"/>	<input type="checkbox"/>	11. Specify building expansion joints and expansion joints between all new and existing structures based upon the structural engineer's recommendation.
<input type="checkbox"/>	<input type="checkbox"/>	12. Horizontal masonry course reinforcing and masonry accessories shall be stainless steel, Type 304, for all exterior walls.
<input type="checkbox"/>	<input type="checkbox"/>	13. Specify stainless steel eye and lintel wall ties for all exterior cavity wall construction. Corrugated ties are <u>not</u> acceptable.
<input type="checkbox"/>	<input type="checkbox"/>	14. Wall cavities shall be unobstructed, free from mortar droppings. The architect shall provide instructions in specifications as to the means to accomplish.
<input type="checkbox"/>	<input type="checkbox"/>	15. For masonry cavity wall construction, weep holes are required. Specify doubled-back 3/8" cotton rope with a minimum spacing of 16" on-center. Rope weeps shall extend through brick and run a minimum of 16" horizontally in the cavity, extend up to and be tied to brick ties. Interlace successive rope weeps. Additionally, provide joint vents for ventilation and drying out of cavity space.
<input type="checkbox"/>	<input type="checkbox"/>	16. Require fluid-applied or trowel-on vapor retarder to be applied to the outside (cavity side) of masonry wythe.
<input type="checkbox"/>	<input type="checkbox"/>	17. Require through-wall flashing of copper or stainless steel, beginning a minimum of 8" above base course of brick. Flashing above doors, mechanical louvers, and windows to be seamless and end dammed. Detail all through-wall flashing to prevent contact with sealant.
<input type="checkbox"/>	<input type="checkbox"/>	18. Through-wall flashing shall extend through the mortar joint and a drip shall be formed.
<input type="checkbox"/>	<input type="checkbox"/>	19. Specify that masonry walls shall be cleaned after the work is complete.
<input type="checkbox"/>	<input type="checkbox"/>	20. All structural masonry and exterior masonry shall be reviewed by structural engineer for integrity.
<input type="checkbox"/>	<input type="checkbox"/>	21. To eliminate potential problems of complexity, constructability, and excessive cost, all architectural design features containing curves and/or non-right angle planes shall be fully evaluated by the consultant designer through the use of isometric detail drawings during the design phases.
<input type="checkbox"/>	<input type="checkbox"/>	22. Justification by the consultant designer for use of indentations in exterior wall planes is required. The ultimate goal is to have the building design be as straightforward as possible to allow construction to occur in such a manner to eliminate complex footing designs and/or flashing details and ineffective insulation. If there is a compelling reason for the design to incorporate features such as indentations, the designer must receive approval from the State and if approved, take precautions and detail the building so as to maintain the integrity of the insulation system, (continuous and no reduction in thickness) and assure that cavity walls drain and vent properly.

## ARCHITECTURAL ASSEMBLIES

### Walls

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	23. Vapor Barriers are required on the warm side of all insulation. Completely detail the vapor barrier to prevent condensation from occurring based upon ASHRAE defined relative humidity levels that may be anticipated for the project location or caused by the programmed use of the facility.
<input type="checkbox"/>	<input type="checkbox"/>	24. Exterior walls shall be insulated to reduce the thermal transmittance and energy losses, exceeding the Minnesota State Energy Code by 30%. If LEED certification will be sought for a project, the mandatory and prescriptive or performance requirements need to meet or exceed ASHRAE 90.1
<input type="checkbox"/>	<input type="checkbox"/>	25. Conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2 Specify Low-emitting Materials.
<input type="checkbox"/>	<input type="checkbox"/>	26. Comply with the requirements of the State of Minnesota Sustainable Building Guidelines, Section M.2, Evaluation of Environmentally Preferable Materials.

## INTERIORS

### Walls - Interior

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. All partition walls enclosing offices, classrooms, and other spaces that require acoustic separation shall be continuous floor to deck, shall include a bead of acoustical sealant between runners and substrates, and be filled with acoustic insulation unless directed otherwise by the State Project Manager.
<input type="checkbox"/>	<input type="checkbox"/>	2. General design requirements shall be for a NC 35 (noise criteria level) for offices and classrooms and NC 20 for ITV and specialized functions at full cooling or full heating conditions. Other spaces, shall at a minimum meet ASHRAE requirements and the required performance criteria described in the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.7, Effective Acoustics.
<input type="checkbox"/>	<input type="checkbox"/>	3. Do not design gypsum board finishes on the inside face of exterior walls. (The risk potential for mold growth is increased substantially should moisture/water enter via the exterior wall). Organic materials (gypsum board with paper face, wood, etc.) are prohibited in exterior wall assemblies.
<input type="checkbox"/>	<input type="checkbox"/>	4. Review mechanical and fixtures, furniture, equipment (FF&E) that will be installed near exterior and interior walls. Provide the appropriate wall composition to avoid future problems with the potential for water or little ventilation.
<input type="checkbox"/>	<input type="checkbox"/>	5. Gypsum board of any type is not allowed as a substrate/backer for ceramic/porcelain tile.
<input type="checkbox"/>	<input type="checkbox"/>	6. Gypsum board of any type is not allowed in "wet" locations where sinks, toilet compartments, drinking fountains, janitor rooms and like rooms or locations occur.
<input type="checkbox"/>	<input type="checkbox"/>	7. Corridors and lobbies are considered public, high traffic areas. Specify durable materials only. As a minimum, specify high impact gypsum board. Specify appropriate level of finish for various locations.
<input type="checkbox"/>	<input type="checkbox"/>	8. Identify locations/rooms to receive acoustical insulation and sealant. Detail wall conditions with acoustical details.
<input type="checkbox"/>	<input type="checkbox"/>	9. Do not force the design of mechanical/utility spaces. Provide an integrated design to allow sufficient space in mechanical and other utility rooms in order to easily access equipment for servicing.
<input type="checkbox"/>	<input type="checkbox"/>	10. Conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2 Specify Low-emitting Materials.
<input type="checkbox"/>	<input type="checkbox"/>	11. Comply with the requirements of the State of Minnesota Sustainable Building Guidelines, Section M.2, Evaluation of Environmentally Preferable Materials.

## ARCHITECTURAL ASSEMBLIES

### Ceilings - Interior

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Provide a minimum clearance of 48" from top of ceiling system to bottom of the floor structure above. This provision is included to allow integration of ductwork, piping, wiring, and maintenance access for above ceiling systems.
<input type="checkbox"/>	<input type="checkbox"/>	2. Provide access doors for maintenance and servicing of all equipment located above solid enclosed ceilings, including but not limited to filters, strainers, control actuators, damper actuators, control valves, sound attenuators, boilers and chiller tube pull, knock-out panels, etc.
<input type="checkbox"/>	<input type="checkbox"/>	3. Review elevation heights of ceilings, fixtures or equipment with Plant Management or facility maintenance staff to ensure lift devices will provide access to high locations.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify acoustical ceiling tiles that are not susceptible to warping or sagging at high humidity levels.
<input type="checkbox"/>	<input type="checkbox"/>	5. Conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2 Specify Low-emitting Materials.

### Interiors - General

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Coordinate space use design with the mechanical and electrical design and specify materials and designs that are appropriate for the programmed use of the space. i.e. Laboratories require chemical resistant finishes and increased ventilation & exhaust rates; or, educational music room spaces require sound separation walls, acoustical finishes, sound insulation, acoustical door hardware and humidity control for instrument storage.
<input type="checkbox"/>	<input type="checkbox"/>	2. Provide recycling areas as designated in the Minnesota Building Code and the State of Minnesota Sustainable Building Guidelines, Section M.3, Waste Reduction and Management.
<input type="checkbox"/>	<input type="checkbox"/>	3. Coordinate interior building design with the State of Minnesota Sustainable Building Guidelines (B3-MSBG) Section I.7, Effective Acoustics, to establish interior conditions that avoid harmful noise effects and produce a basis for a positive soundscape acceptable to occupants and appropriate to their tasks.
<input type="checkbox"/>	<input type="checkbox"/>	4. Comply with the requirements of the State of Minnesota Sustainable Building Guidelines, Section M.2, Evaluation of Environmentally Preferable Materials.

**See additional guidelines in the specification sections of this manual.**

**END OF SECTION**



## DESIGN GUIDELINES - CONSULTANT CHECKLIST

### MECHANICAL SYSTEM ASSEMBLIES

#### ALL ASSEMBLIES (applies to all design disciplines and systems)

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>1. MN Statute 16B.32 Energy Use:</b> Plans for a new building or for a renovation of 50 percent or more of an existing building or its energy systems must include designs which use active and passive solar energy systems, earth sheltered construction, and other alternative energy sources where feasible. A new building must consider meeting at least two percent of the energy needs of the building from renewable sources (limited to wind and sun) located on the building site.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>2. MN Statute 16B.325 Sustainable Building Guidelines:</b> New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG). Submit documentation as required to the Center for Sustainable Building Research at the University of Minnesota. For remodel/renovation projects comply with the Department of Administration's <i>Sustainability Guidelines for Consultants</i>.</p> <p style="margin-left: 40px;">NOTE: ENERGY MODELING IS REQUIRED</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>3. Geothermal and solar applications for Heating &amp; Cooling Systems – for State Funded Buildings: MN Statute 16B.326</b></p> <p>When practicable, geothermal and solar thermal heating and cooling systems must be considered when designing, planning, or letting bids for necessary replacement or initial installation of cooling or heating systems in new or existing buildings that are constructed or maintained with state funds. For the purposes of this section, "solar thermal" means a flat plate or evacuated tube with a fixed orientation that collects the sun's radiant energy and transfers it to a storage medium for distribution as energy for heating and cooling.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>4. Life Cycle Costing:</b> In conjunction with <i>The State of Minnesota Sustainable Building Guidelines</i>, conduct a Life-Cycle Cost Analysis on all major systems of the building:</p> <ul style="list-style-type: none"> <li>e. Structural System (including foundation)</li> <li>f. Envelope....Roof, Wall &amp; Window systems</li> <li>g. Mechanical Systems &amp; Components</li> <li>h. Major Electrical systems &amp; components (including lighting).</li> </ul>

## MECHANICAL SYSTEM ASSEMBLIES - Continued

Complete

N/A

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. The mechanical design shall comply with the current State Building Code, ASHRAE Standards, and the State of Minnesota Sustainability Guidelines. The HVAC system design shall consider issues related to indoor air quality, including location of air intakes and exhausts, filtration and special circumstances related to venting of hazardous substances for buildings. |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Air conditioning will be included in all designs unless approved otherwise in writing by the State Project Manager.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Study and select available energy sources as mandated by State Statues to provide building heating, cooling, and process needs. Demonstrate through life-cycle cost analysis the most appropriate fuel and power sources using the State of Minnesota Sustainable Building Guidelines (B3-MSBG) Section P.6, Lowest Life Cycle Cost.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. The mechanical system installed shall be tested using tracer gas analysis to determine if the mechanical system as installed meets minimum ASHRAE Standards.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Air intakes at or below grade are not allowed. Air intakes shall be located so as not to intake building or vehicle exhaust.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Infiltration shall not be accepted for exhaust fan makeup.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Substantial Completion shall not be certified until testing and balancing on air and water is completed and test and balance reports are reviewed and approved by the State.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Interview facility/agency personnel to determine the activities that do or will occur in the space and determine ventilation requirements of each space accordingly, include material safety data information for special use spaces such as printing, etc.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Obtain written approval from the State on the diversity factors to be used in sizing fans and coils. The design intent is not to provide an oversized HVAC system, but to consider and accommodate future changes.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Avoid the use of antifreeze (glycol) to solve freeze protection problems for chilled water, hot water and steam coils.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. Design quiet, efficient mechanical systems without reliance on internal lining.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. Interior duct lining is prohibited.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. Provide ample space in mechanical room between air handling equipment and the walls where ducts exit, to allow noise abatements to be installed. Refer to the State of Minnesota Building Design Guidelines (B3-MSBG), Section I.7 Effective Acoustics for performance criteria.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 14. Integrate the mechanical rooms into the plan of the building. (Rooftop equipment is not allowed and penthouses are discouraged).   |
| <input type="checkbox"/> | <input type="checkbox"/> | 15. Provide sound & vibration isolation between mechanical rooms and occupied spaces. Refer to the State of Minnesota Building Design Guidelines (B3-MSBG), Section I.7 Effective Acoustics for performance criteria.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 16. Mechanical rooms shall provide adequate space and sufficiently large openings to service and replace mechanical equipment in the future, with little or no demolition.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 17. Provide access panels to service valves, VAV terminal units, sound attenuators and all other mechanical equipment located in chases or above inaccessible ceilings.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 18. Plumbing fixture quantities should, in general, exceed the minimums required by the State Building code. Consult with the user agency/facility on each project.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 19. Provide reheat coils at all zone controlled VAV heating units to assure that minimum air flow will occur without sub-cooling spaces.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 20. Reheat systems shall be provided for all constant air flow air conditioning systems.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 21. Design shall show capability of cooling coil discharge air temperatures to 50°F at design conditions to provide proper humidity control.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 22. Thermostat zones shall avoid controlling spaces with different interior/exterior or directional exposures.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 23. All buildings shall be provided with an approved automatic fire sprinkler system (exceptions include small storage/shed type structures).  |

## MECHANICAL SYSTEM ASSEMBLIES - Continued

Complete

N/A

- |                          |                          |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <b>24.</b> Specify equipment & systems training for facility staff. Training shall include a training session plus video presentation w/overview handouts.  |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>25.</b> Schedule and coordinate with the State facility staff to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued. .Specify that the contractor(s) shall be required to provide necessary documentation, including invoices, required by the utility(s) for the purpose of processing and approving rebate applications. And that the contractor(s) shall work to assist the State in obtaining all possible utility rebates on the project. |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>26.</b> See Architectural Assemblies – B. Interiors-General for coordination to provide the appropriate mechanical design to accommodate the programmed use of the space.  |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>27.</b> The State of Minnesota Sustainable Building Guidelines, Section E.1, require exceeding the Minnesota State Energy Code by at least 30%.  |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>28.</b> Conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section E.4 Atmospheric Protection, which outlines refrigerant selection requirements and bans CFCs. If LEED certification will be sought for a project, follow prerequisite and/or enhanced refrigeration management guidelines.   |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>29.</b> Plumbing equipment shall comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG) Section S.8, Building Water Efficiency, for water use reduction requirements.  |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>30.</b> Reference the State of Minnesota Sustainable Building Guidelines (B3-MSBG) Sections P.4 and P.5, Design and Construction Commissioning and Operations Commissioning, for required and recommended commissioning activities. At the State Project Manager's discretion, Commissioning may start at any point of time during the Project; such as at the beginning of construction in lieu of the beginning of design. However, if LEED certification will be sought for a project, the commissioning activities will have to follow LEED requirements for prerequisite and/or enhanced commissioning.   |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>31. MN Statute 16B.32 Energy Use:</b> Plans for a new building or for a renovation of 50 percent or more of an existing building or its energy systems must include designs which use active and passive solar energy systems, earth sheltered construction, and other alternative energy sources where feasible. A new building must consider meeting at least two percent of the energy needs of the building from renewable sources (limited to wind and sun) located on the building site.   |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>32. MN Statute 16B.325 Sustainable Building Guidelines:</b> New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG). Submit documentation as required to the Center for Sustainable Building Research at the University of Minnesota.  |

**See additional guidelines in the specification sections of this manual.**

**END OF SECTION**



# DESIGN GUIDELINES - CONSULTANT CHECKLIST

## ELECTRICAL SYSTEM ASSEMBLIES

**ALL ASSEMBLIES (applies to all design disciplines and systems)**

Complete      N/A

- 1. MN Statute 16B.32 Energy Use:** Plans for a new building or for a renovation of 50 percent or more of an existing building or its energy systems must include designs which use active and passive solar energy systems, earth sheltered construction, and other alternative energy sources where feasible. A new building must consider meeting at least two percent of the energy needs of the building from renewable sources (limited to wind and sun) located on the building site.
  
- 2. MN Statute 16B.325 Sustainable Building Guidelines:** New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG). Submit documentation as required to the Center for Sustainable Building Research at the University of Minnesota. For remodel/renovation projects comply with the Department of Administration’s *Sustainability Guidelines for Consultants*.
  
- 3. Geothermal and solar applications for Heating & Cooling Systems – for State Funded Buildings: MN Statute 16B.326**  
When practicable, geothermal and solar thermal heating and cooling systems must be considered when designing, planning, or letting bids for necessary replacement or initial installation of cooling or heating systems in new or existing buildings that are constructed or maintained with state funds. For the purposes of this section, "solar thermal" means a flat plate or evacuated tube with a fixed orientation that collects the sun's radiant energy and transfers it to a storage medium for distribution as energy for heating and cooling.
  
- 4. Life Cycle Costing:** In conjunction with *The State of Minnesota Sustainable Building Guidelines*, conduct a Life-Cycle Cost Analysis on all major systems of the building:
  - a. Structural System (including foundation)
  - b. Envelope....Roof, Wall & Window systems
  - c. Mechanical Systems & Components
  - d. Major Electrical Systems & Components (including lighting)

## ELECTRICAL SYSTEM ASSEMBLIES - continued

Complete      N/A

- |                          |                          |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. The capacity of the existing electrical service/utility must be verified to determine if the capacity will support the design.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Interior lighting is to be fluorescent unless specific program requirements make other lighting types necessary. Incandescent lighting is discouraged. During submittals for the DD Phase, provide a summary of proposed lighting types and light levels. Variation from the fluorescent standard shall be approved in writing by the State.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. All conduit and cable tray shall be accessible for installation and physical characteristics of cable (sweeps). The building shall be designed such that future communication data and/or power cable can be added. This could include provisions for conduit, cable tray, floor duct etc. Consideration shall be made to account for the physical characteristics of various cable types in terms of sweeps, pull distances, transmission distances and fire code requirements.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Specify that contractor is to notify engineer and fire marshal or inspector to conduct a walkthrough prior to installing wiring and EXIT signage. (Approximately mid-point of construction).   |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Specify training on equipment and systems to be provided to facility staff. Training shall include a training session plus video presentation and overview handouts of video presentations.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Schedule and coordinate with the state facility staff to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued. .Specify that the contractor(s) shall be required to provide necessary documentation, including invoices, required by the utility(s) for the purpose of processing and approving rebate applications. And that the contractor(s) shall work to assist the State in obtaining all possible utility rebates on the project. |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. See Architectural Assemblies – B. Interiors-General for coordination to provide the appropriate electrical design to accommodate the programmed use of the space.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Reference the State of Minnesota Sustainable Building Guidelines (B3-MSBG) Sections P.4 and P.5, Design and Construction Commissioning and Operations Commissioning, for required and recommended commissioning activities. At the State Project Manager's discretion, Commissioning may start at any point of time during the Project; such as at the beginning of construction in lieu of the beginning of design. However, if LEED certification will be sought for a project, the commissioning activities will have to follow LEED requirements for prerequisite and/or enhanced commissioning.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. The State of Minnesota Sustainable Building Guidelines, Section E.1, requires exceeding the Minnesota State Energy Code by at least 30%.   |

**See additional guidelines in the specification sections of this manual.**

**END OF SECTION**



## DESIGN GUIDELINES CONSULTANT CHECKLIST FOR SPECIFICATIONS

### DIVISION 00      BIDDING REQUIREMENTS, CONTRACT FORMS, CONDITIONS OF THE CONTRACT

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <ol style="list-style-type: none"> <li>1. The following Division 00 Sections are provided by the State. To obtain these documents and request a bid date, the Consultant shall list the values of work by division on the BID REQUEST FORM (available at the State’s website <a href="http://www.admin.state.mn.us/recs">www.admin.state.mn.us/recs</a>) and submit to the State Project Manager a minimum of one month prior to the requested bid date.               <ol style="list-style-type: none"> <li>a. Advertisement for Bids: (Consultant shall edit in coordination with Materials Management Division and State Project Manager).</li> <li>b. Fax System Subscription</li> <li>c. Instructions to Bidders</li> <li>d. Special Instructions for Non-Minnesota Contractors &amp; Form SD-E.</li> <li>e. Proposal (bid) Forms: (Consultant shall edit in coordination with the State Project Manager).</li> <li>f. Bid Bond Form</li> <li>g. Related Documents (Incorporated by reference)                   <ol style="list-style-type: none"> <li>1. AIA Document 201 - General Conditions of the Contract for Construction</li> <li>2. Construction Contract &amp; Related Forms</li> <li>3. Listing of Targeted Group Contractors</li> </ol> </li> <li>h. Special Conditions of the Contract (State’s amendments to the AIA Doc. 201).</li> <li>i. Prevailing Wage Rates- by county. (available at <a href="http://www.doli.state.mn.us">www.doli.state.mn.us</a>)</li> <li>j. Notice to Bidders Affirmative Action Certificate of Compliance</li> <li>k. Department of Human Rights Contract Compliance Program</li> </ol> </li> </ol> |
| <input type="checkbox"/> | <input type="checkbox"/> | <ol style="list-style-type: none"> <li>2. The following additional items are to be incorporated into the project manual:               <ol style="list-style-type: none"> <li>a. Security Requirements for Contractors (for projects located within secure facilities such as prisons, or facilities for the mentally ill and dangerous)</li> <li>b. Contractors/Vendors Guidelines Related to Buildings and Parking Facilities (for Capitol Complex projects) See Appendix A</li> <li>c. The State’s “Hot Works” requirements (all projects). These requirements are available at: <a href="http://www.admin.state.mn.us/recs">www.admin.state.mn.us/recs</a> See Appendix A</li> <li>d. Hazardous Material (asbestos &amp; lead paint, etc.) surveys. (For renovation/remodeling projects).</li> <li>e. Liquidated or Actual Damages</li> <li>f. Substantial and Final Completion Dates</li> <li>g. Temporary Facilities</li> <li>h. Builders Risk Insurance</li> </ol> </li> </ol>   |
| <input type="checkbox"/> | <input type="checkbox"/> | <ol style="list-style-type: none"> <li>3. Assign a Section number and list the above documents in your Table of Contents included in the Project Specification.</li> </ol>  |
| <input type="checkbox"/> | <input type="checkbox"/> | <ol style="list-style-type: none"> <li>4. Prior approval product forms or installer pre-qualification forms.</li> </ol>   |
| <input type="checkbox"/> | <input type="checkbox"/> | <ol style="list-style-type: none"> <li>5. Obtain current Prevailing Wage Rates information from the Minnesota Department</li> </ol>   |

**DIVISION 00**

**BIDDING REQUIREMENTS, CONTRACT FORMS,  
CONDITIONS OF THE CONTRACT - Continued**

Complete N/A

of Labor and Industry for the county where the Project is located. Include a complete copy of the listing in the Project Specification.

**00 1000 - Advertisement for Bids**

Complete N/A

- 1. The consultant, in coordination with the State Project Manager and the user agency, shall develop the pre-bid conference, bid date(s) and time and include in this section.
- 2. In addition to the builders exchanges listed on the advertisement for bids, include the names of any exchanges that are in the area of the project site.

**00 2200 – Geo-technical Data**

Complete N/A

- 1. The geo-technical investigation, recommendations and report will be provided by the State under a separate contract. The consultant shall formulate the requirements of the investigation (i.e. soil boring locations and quantity, foundation type, foundation depth and loading, paving design, etc.) and coordinate the acquisition of the geo-technical investigation.
- 2. Include the entire soils report (geo-technical investigation) in the Construction Documents.
- 3. Formulate the requirements for and solicit proposals to have a complete topographical and boundary survey performed of the entire site and/or site area to accommodate construction of a new building or building addition.
- 4. Provide recommendations for single or multiple paving designs based upon anticipated use (parking, service drive, etc.) and the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section S.11, Heat Island Reduction.
- 5. Confirm that the final design complies with all geo-technical recommendations.

**00 2300 - Hazardous Materials - (For Renovation Projects)**

Complete N/A

- 1. When renovation or remodeling of an existing building, a survey for asbestos and lead paint is **required**. Hazardous Materials design and abatement are included in the overall cost and schedule for the renovation project. The hazardous materials survey, design, abatement and monitoring will be under a separate contract with the state and will precede the general construction. Scope and schedule coordination for the sequencing and/or phasing of general construction will be required.
- 2. Assist the State in identifying where new general construction work will occur. Provide a preliminary plan of new work areas so that the State can obtain a hazardous materials survey for those areas. The survey will be provided by the State under a separate contract.
- 3. Include the State’s hazardous materials survey document in the contract documents.
- 4. Coordinate new design work with the State’s hazardous materials abatement contract specialist. Provide the State with floor plans indicating where the scope of work will occur. The State will use these documents to obtain asbestos & lead paint surveys.
- 5. Access to carry out abatement may require demolition of existing construction (walls and ceilings) that may not be included in the general construction work. Coordinate documents for the new work with the State's abatement designer for rebuilding or patching of walls, floors, ceilings that will be removed during this abatement.
- 6. Where ceiling & fixture removal occurs during abatement, verify the need for temporary lighting.
- 7. Verify the need for reconnecting fire alarm and security systems following abatement.
- 8. When phasing of all work occurs in an occupied building, verify temporary partition,

**DIVISION 00 BIDDING REQUIREMENTS, CONTRACT FORMS,  
CONDITIONS OF THE CONTRACT - Continued**

**00 2300 - Hazardous Materials - (For Renovation Projects)**

Complete N/A

toilet room, exiting, fire protection and security system needs for the new work.

For example, half of an existing office building floor requires renovation but there may be a requirement for patching in areas that are outside of the area of renovation due to abatement.

9. All projects involving the removal of caulking and sealants, shall be surveyed and tested for PCB content and removed and disposed of in accordance with current laws.

**00 4000 - Proposal Forms**

Complete N/A

1. A formal request, using the BID REQUEST FORM, must be made to Materials Management Division (MMD) of the Department of Administration in order to schedule a bid opening date and to receive the State's standard front-end (DIV 00) documents. Coordinate with the State Project Manager to complete the Bid Request Form and submit it to MMD. The Bid Request Form is available at [www.admin.state.mn.u/recs](http://www.admin.state.mn.u/recs)
2. The Proposal (Bid) Forms will be provided with the standard front-end documents. Coordinate with the State Project Manager and edit the Bid Proposal Form and Advertisement for Bids. The Bid Proposal Form shall include deduct alternates, unit prices, and construction time in calendar days as well as other specified submittal requirements necessary for a complete bid.
3. **Posted bids:** Based upon information provided on the Bid Request Form, MMD will determine if there are to be "Posted Bids" for the Mechanical and Electrical (M&E) work. If M&E posted bids are required, they will typically be scheduled to be opened one to two weeks prior to the Prime general contractor bid opening date.

**END OF SECTION**



## DESIGN GUIDELINES CONSULTANT CHECKLIST FOR SPECIFICATION

### DIVISION 01 GENERAL REQUIREMENTS

#### 01 0000 - General Requirements

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. List any standards used on the project. Industry standards referenced, and those reflected in the design, shall be the same and the most current edition as of the bid date, with the exception of AIA document A201, which shall be the edition that is referenced in the State’s “front-end”.
<input type="checkbox"/>	<input type="checkbox"/>	2. If a conflict arises between the standards and the specification language, the specification shall supersede the referenced standard.
<input type="checkbox"/>	<input type="checkbox"/>	3. If the project involves multiple prime contractors, each prime shall provide trash/debris hauling for their work.
<input type="checkbox"/>	<input type="checkbox"/>	4. When the project involves posted mechanical & electrical bids, the general contractor shall be responsible for all trash/debris hauling.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify that the contractor shall coordinate final cleaning with the owner.
<input type="checkbox"/>	<input type="checkbox"/>	6. When the project involves work in an occupied building; specify submittals by contractor of Material Safety Data Sheets (MSDS) for construction products.
<input type="checkbox"/>	<input type="checkbox"/>	7. When a project occurs on the Capitol Complex area, include “ <i>Contractors/Vendors Guidelines Related To Buildings And Parking Facilities</i> ” in the specifications. (Note: These guidelines are contained in the Appendix of this document).
<input type="checkbox"/>	<input type="checkbox"/>	8. Determine the contractor prequalification criteria for the project. Include Contractor and subcontractor prequalification submittal forms in the bid documents with instructions for submittal and prior approval during bidding.
<input type="checkbox"/>	<input type="checkbox"/>	9. For renovation/remodeling projects, the design consultant shall specify x-raying requirements for core drilling/penetrations to avoid existing installations such as cabling, piping, rebar reinforcing. All Mechanical, Piping, Fire Protection Plans are to indicate this requirement also.

#### 01 0000 - Sustainable & High Performance Requirements

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. MN Statute 16B.32 Energy Use: Plans for a new building or for a renovation of 50 percent or more of an existing building or its energy systems must include designs which use active and passive solar energy systems, earth sheltered construction, and other alternative energy sources where feasible. A new building must consider meeting at least two percent of the energy needs of the building from renewable sources (limited to wind and sun) located on the building site.

ENERGY MODELING IS REQUIRED

DIVISION 01 GENERAL REQUIREMENTS - Continued

**01 0000 - Sustainable & High Performance Requirements – continued**

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>2. MN Statute 16B.325 Sustainable Building Guidelines:</b> New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG). Submit documentation as required to the Center for Sustainable Building Research at the University of Minnesota.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>3. Geothermal and solar applications for Heating &amp; Cooling Systems – for State Funded Buildings: MN Statute 16B.326</b>                      When practicable, geothermal and solar thermal heating and cooling systems must be considered when designing, planning, or letting bids for necessary replacement or initial installation of cooling or heating systems in new or existing buildings that are constructed or maintained with state funds. For the purposes of this section, "solar thermal" means a flat plate or evacuated tube with a fixed orientation that collects the sun's radiant energy and transfers it to a storage medium for distribution as energy for heating and cooling.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p>4. Designs must comply with <b>MN Statute 16B.32</b> -Alternative energy sources. Plans prepared for a new building or for a renovation of 50 percent or more of an existing building or its energy systems must include designs which use active and passive solar energy systems, earth sheltered construction, and other alternative energy sources where feasible.                      A new State building must be designed to have two percent of its energy provided by alternative energy source. <b>The predesign and design must include a written plan for compliance.</b></p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>5. Life Cycle Costing:</b> In conjunction with <i>The State of Minnesota Sustainable Building Guidelines</i>, conduct a Life-Cycle Cost Analysis on all major systems of the building:                      Structural System (including foundation)                      Envelope....Roof, Wall &amp; Window systems                      Mechanical Systems &amp; Components                      Major Electrical systems &amp; components (including lighting).</p>

**01 1100-Summary of the Work**

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<p>1. In the Summary of Work, include a description of the work, the names, phones, addresses, e-mails etc. of A/E consultants, State Project Manager and Facility Representative, as well as other Division 1 sections required by the specific project scope of work and conditions.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p>2. Unless in a separate section, include a project schedule with the number of days for substantial completion.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p>3. Specify the requirement for schedule updates to be submitted with each pay request from the contractor.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p>4. Specify requirements for information that the contractor shall include with their schedule. At a minimum, specify that the schedule shall be broken down to indicate stop and start dates for major elements and systems installation The A/E team shall develop a schedule monitoring procedure to be used during construction. (See consultant procedure for the construction phase).</p>

## DIVISION 01 GENERAL REQUIREMENTS - Continued

### 01 2200 - Unit Prices/Allowances

- | Complete                 | N/A                      |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. During the bidding process, to address the possibility that unforeseen conditions are encountered during soils excavation that may be a result of findings that were not detected during the geo-technical investigation, and work is necessary beyond what is indicated in the construction documents, make provisions on the proposal/bid form for the contractor to provide line item unit prices for excavation, fill material and compaction. The unit price for material shall be on a cost per cubic yard basis. Excavation quantities shall be as measured in place prior to excavating. Fill and compaction quantities shall be as measured in place after compaction. |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Allowances: Indicate how the allowance is to be calculated. Specify a defined quantity and total cost. Dispensation of allowances shall be by Supplemental Agreement to the General Contractor's Contract for Construction.   |

### 01 2300-Alternates

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. All alternates shall be deducts. For bidding purposes, alternates are to be listed in order of priority and must be accepted in numerical order (i.e. Alternate No. 3 cannot be accepted prior to Alternate No. 1 or 2). |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Provide a line item on the proposal/bid form for each alternate.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Prepare a specification section for alternates wherein the full scope of work for each alternate is clearly defined.   |

### 01 2600-Special Project Procedures

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Describe any unique procedures or schedules. Special Project Procedures may include: <ol style="list-style-type: none"><li>Working in a secure prison facility (obtain security procedures from the facility and include in this section).</li><li>Coordination of work with academic or legislative calendar or similar occupant needs.</li><li>Special hours for use of, or work on, the premises.</li><li>Coordination of work with other contractors (i.e. asbestos abatement).</li><li>Project walk-through at bi-weekly intervals.</li><li>Pre-installation meetings.</li><li>Phased Construction.</li><li>Work within an environmentally sensitive Facility (labs, etc.).</li><li>Power/utility service downtime.</li><li>Long-lead time for specific materials.</li><li>Contractors responsibilities as related to LEED certification.</li></ol> |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Specify and coordinate with user facility, any requirements for noise or odor control to be provided by the contractor when work is within occupied buildings or adjacent to neighboring occupied building   |

### 01 3100-Project Meetings

- | Complete                 | N/A                      |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Indicate the frequency of project meetings during the construction phase. Specify the location where meetings will be held. The Consultant, contractor's representative, major subcontractors representatives and facility representative shall attend all meetings. The Consultant shall conduct all meetings. <b>(The consultant designer is responsible for minutes of all design meetings and all construction meetings).</b> |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Meetings shall include pre-construction, quality control, pre-installation, regular construction and project walk-through at bi-weekly intervals.   |

**DIVISION 01 GENERAL REQUIREMENTS - Continued**

**01 3100-Project Meetings**

- | Complete                 | N/A                      |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Specify pre-installation meetings so that they are scheduled the same day as the regularly scheduled construction meeting: <ul style="list-style-type: none"> <li>a. Concrete formwork, placing, and Back-shoring</li> <li>b. Waterproofing</li> <li>c. Mortar/masonry/exterior finish and through-wall flashing</li> <li>d. Roof</li> <li>e. Entrance and window installation</li> <li>f. Sealant</li> <li>g. Vapor barrier</li> <li>h. Fire protection and ductwork</li> <li>i. 10-month walk-through (prior to warranty expiration)</li> <li>j. Concrete slabs on-grade and underslab membrane.</li> </ul> |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Specify As-built verification inspections <ul style="list-style-type: none"> <li>a. Contractor shall incorporate all Addendum items prior to first payment.</li> <li>b. Below grade- prior to backfilling.</li> <li>c. Walls, roofing at enclosure</li> <li>d. Above ceiling work before closure of finished ceilings</li> <li>e. Penthouse mechanical and electrical during testing &amp; balancing</li> </ul>   |

**01 3300-Submittals**

**SEE 01 7700 for Contract CloseOut Submittals**

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Specify that the contractor shall submit an updated construction schedule with each Request for Payment.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Specify that the contractor shall submit a schedule of values with each Request for Payment. Consultant designer shall review and approve the Schedule of values prior to submittal of Application and Certificate for Payment.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Specify the number of working days allowed for architect's and engineer's review of shop drawings. (Maximum 14 working days).  |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Define requirements and procedures for all submittals ( shop drawings, samples and product data).  |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Specify that the contractor(s) shall be required to provide necessary documentation, including invoices, required by the utility(s) for the purpose of processing and approving rebate applications. And that the contractor(s) shall work with the Department of Administration's Energy Management Services to assist the State in obtaining all possible utility rebates on the project.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. If LEED certification will be sought for a project, specify that the contractor shall be required to submit necessary documentation, including cost information, as required by the desired credits.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Specify that the Contractor shall submit a Waste Management & Recycling Plan for the project. See The State of Minnesota Sustainable Building Guidelines for the requirements. For projects where the Guidelines do not apply, the project must comply with MN Statute <u>16B.327</u> . Contractor shall submit a Waste Management and Recycling Program Plan for the project to the Architect who shall review and submit to the State when the work includes construction, renovation, or demolition of a state building. The plan must indicate and the contractor and any subcontractors must divert from deposit in a landfill and must recycle at least 50 percent of the nonhazardous construction and demolition waste, measured by tonnage or volume, produced by the project or demonstrate that the waste was delivered to construction and demolition waste recycling facilities that maintain a 50 percent annual recycling rate. This requirement applies to a project to construct, renovate, or demolish a state building. If the project is located greater than 40 miles from a construction and demolition waste recycling facility that is able to meet the requirements and can process the applicable building materials, the contractor shall indicate such in the Waste Management and Recycling Plan. |

**DIVISION 01 GENERAL REQUIREMENTS - Continued**

**01 4500-Quality Control Services**

- | Complete   | N/A                                   |  |  |   |  |  |  |  |  |  |
|--|---------------------------------------|--|--|---|--|--|--|--|--|--|
| <input type="checkbox"/>   | <input type="checkbox"/>              | 1. The State will provide quality control testing services under a separate contract with an independent testing company. Allow 1.5 months in the schedule.  |  |   |  |  |  |  |  |  |
| <input type="checkbox"/>   | <input type="checkbox"/>              | 2. Specify the quality control testing that is required in individual specification sections. Clearly define the following: <table border="0" style="margin-left: 20px;"> <tr> <td>a. Type of test and method</td> <td>c. Tolerance for pass/fail</td> </tr> <tr> <td>b. Frequency of testing</td> <td>d. Action required for a test failure</td> </tr> </table>   | a. Type of test and method   | c. Tolerance for pass/fail  | b. Frequency of testing  | d. Action required for a test failure  |  |  |  |  |
| a. Type of test and method   | c. Tolerance for pass/fail            |  |  |   |  |  |  |  |  |  |
| b. Frequency of testing  | d. Action required for a test failure |  |  |   |  |  |  |  |  |  |
| <input type="checkbox"/>   | <input type="checkbox"/>              | 3. Specify the following requirements for quality control testing: <table border="0" style="margin-left: 20px;"> <tr> <td>a. The testing company shall distribute copies of the test results to the architect, civil engineer, structural engineer, State Project Manager, and the general contractor.</td> </tr> <tr> <td>b. The Contractor shall schedule and coordinate all construction testing and inspections.</td> </tr> <tr> <td>c. The contractor shall provide safe access to testing/inspection areas and secure and protect samples and testing equipment. Provide all necessary scaffolding, lifts, enclosures, temporary heat, etc. as required by the inspection or testing agencies in order to perform their work.</td> </tr> <tr> <td>d. If initial tests find noncompliance with contract documents, all retesting shall be performed by the testing company, and all additional testing costs shall be deducted from the construction contracts by Supplemental Agreement.</td> </tr> <tr> <td>e. The contractor shall provide a minimum of 4 working days notice to appropriate firms before starting work requiring inspection or testing. For the continuation of work items specify a minimum of 2 working days notice thereafter for each testing and inspection. If the work is covered up prior to any required testing or inspection, it shall be uncovered for review at the contractor's expense.</td> </tr> <tr> <td>f. The inspection and testing agencies are not authorized to release, revoke, alter or enlarge requirements of the contract documents or approve, reject or accept any portions of the work.</td> </tr> <tr> <td>g. Specify that no rejected materials shall be incorporated into the work. All rejected materials shall be immediately removed from the site at no expense to the State.</td> </tr> <tr> <td>h. Specify that inspection and testing services shall assist in certification of certain aspects of the work. These services do not relieve the contractor of responsibility for compliance with the requirements of the contract documents.</td> </tr> </table> | a. The testing company shall distribute copies of the test results to the architect, civil engineer, structural engineer, State Project Manager, and the general contractor. | b. The Contractor shall schedule and coordinate all construction testing and inspections. | c. The contractor shall provide safe access to testing/inspection areas and secure and protect samples and testing equipment. Provide all necessary scaffolding, lifts, enclosures, temporary heat, etc. as required by the inspection or testing agencies in order to perform their work. | d. If initial tests find noncompliance with contract documents, all retesting shall be performed by the testing company, and all additional testing costs shall be deducted from the construction contracts by Supplemental Agreement. | e. The contractor shall provide a minimum of 4 working days notice to appropriate firms before starting work requiring inspection or testing. For the continuation of work items specify a minimum of 2 working days notice thereafter for each testing and inspection. If the work is covered up prior to any required testing or inspection, it shall be uncovered for review at the contractor's expense. | f. The inspection and testing agencies are not authorized to release, revoke, alter or enlarge requirements of the contract documents or approve, reject or accept any portions of the work. | g. Specify that no rejected materials shall be incorporated into the work. All rejected materials shall be immediately removed from the site at no expense to the State. | h. Specify that inspection and testing services shall assist in certification of certain aspects of the work. These services do not relieve the contractor of responsibility for compliance with the requirements of the contract documents. |
| a. The testing company shall distribute copies of the test results to the architect, civil engineer, structural engineer, State Project Manager, and the general contractor.   |                                       |  |  |   |  |  |  |  |  |  |
| b. The Contractor shall schedule and coordinate all construction testing and inspections.  |                                       |  |  |   |  |  |  |  |  |  |
| c. The contractor shall provide safe access to testing/inspection areas and secure and protect samples and testing equipment. Provide all necessary scaffolding, lifts, enclosures, temporary heat, etc. as required by the inspection or testing agencies in order to perform their work.   |                                       |  |  |   |  |  |  |  |  |  |
| d. If initial tests find noncompliance with contract documents, all retesting shall be performed by the testing company, and all additional testing costs shall be deducted from the construction contracts by Supplemental Agreement.   |                                       |  |  |   |  |  |  |  |  |  |
| e. The contractor shall provide a minimum of 4 working days notice to appropriate firms before starting work requiring inspection or testing. For the continuation of work items specify a minimum of 2 working days notice thereafter for each testing and inspection. If the work is covered up prior to any required testing or inspection, it shall be uncovered for review at the contractor's expense. |                                       |  |  |   |  |  |  |  |  |  |
| f. The inspection and testing agencies are not authorized to release, revoke, alter or enlarge requirements of the contract documents or approve, reject or accept any portions of the work.   |                                       |  |  |   |  |  |  |  |  |  |
| g. Specify that no rejected materials shall be incorporated into the work. All rejected materials shall be immediately removed from the site at no expense to the State.   |                                       |  |  |   |  |  |  |  |  |  |
| h. Specify that inspection and testing services shall assist in certification of certain aspects of the work. These services do not relieve the contractor of responsibility for compliance with the requirements of the contract documents.   |                                       |  |  |   |  |  |  |  |  |  |
| <input type="checkbox"/>   | <input type="checkbox"/>              | 4. Submit documentation on Life Cycle Costs. See Guideline Section 01 000.   |  |   |  |  |  |  |  |  |

**01 5000-Construction Facilities and Temporary Controls**

- | Complete   | N/A                      |  |  |   |  |  |  |  |  |   |                                 |                                  |
|--|--------------------------|--|--|---|--|--|--|--|--|---|---------------------------------|----------------------------------|
| <input type="checkbox"/>   | <input type="checkbox"/> | 1. The consultant shall coordinate with the facility or user agency to define responsibility and use of or access for the following: <table border="0" style="margin-left: 20px;"> <tr> <td>a. Fencing, site security, and lighting for materials and pedestrians.</td> </tr> <tr> <td>b. Contractor parking and material staging areas.</td> </tr> <tr> <td>c. Temporary utilities; water, electricity, toilets, steam, fuel, phone/fax.</td> </tr> <tr> <td>d. Field office with complete plans, specs, addenda and shop drawings.</td> </tr> <tr> <td>e. Temporary heat (installation, operation and removal). Specify who is responsible and for what duration.</td> </tr> <tr> <td>f. Temporary enclosures for safety, security, thermal, and dust protection for new and existing spaces/systems/components.</td> </tr> <tr> <td>g. Protection of new and existing roofs.</td> </tr> <tr> <td>h. Site maintenance/control of erosion, weeds, snow, debris, etc.</td> </tr> <tr> <td>i. Tree and foliage Protection.</td> </tr> <tr> <td>j. Construction Limits &amp; Fencing</td> </tr> </table> | a. Fencing, site security, and lighting for materials and pedestrians. | b. Contractor parking and material staging areas. | c. Temporary utilities; water, electricity, toilets, steam, fuel, phone/fax. | d. Field office with complete plans, specs, addenda and shop drawings. | e. Temporary heat (installation, operation and removal). Specify who is responsible and for what duration. | f. Temporary enclosures for safety, security, thermal, and dust protection for new and existing spaces/systems/components. | g. Protection of new and existing roofs. | h. Site maintenance/control of erosion, weeds, snow, debris, etc. | i. Tree and foliage Protection. | j. Construction Limits & Fencing |
| a. Fencing, site security, and lighting for materials and pedestrians.   |                          |  |  |   |  |  |  |  |  |   |                                 |                                  |
| b. Contractor parking and material staging areas.  |                          |  |  |   |  |  |  |  |  |   |                                 |                                  |
| c. Temporary utilities; water, electricity, toilets, steam, fuel, phone/fax.   |                          |  |  |   |  |  |  |  |  |   |                                 |                                  |
| d. Field office with complete plans, specs, addenda and shop drawings.   |                          |  |  |   |  |  |  |  |  |   |                                 |                                  |
| e. Temporary heat (installation, operation and removal). Specify who is responsible and for what duration.                 |                          |  |  |   |  |  |  |  |  |   |                                 |                                  |
| f. Temporary enclosures for safety, security, thermal, and dust protection for new and existing spaces/systems/components. |                          |  |  |   |  |  |  |  |  |   |                                 |                                  |
| g. Protection of new and existing roofs.   |                          |  |  |   |  |  |  |  |  |   |                                 |                                  |
| h. Site maintenance/control of erosion, weeds, snow, debris, etc.  |                          |  |  |   |  |  |  |  |  |   |                                 |                                  |
| i. Tree and foliage Protection.  |                          |  |  |   |  |  |  |  |  |   |                                 |                                  |
| j. Construction Limits & Fencing   |                          |  |  |   |  |  |  |  |  |   |                                 |                                  |
| <input type="checkbox"/>   | <input type="checkbox"/> | 2. When a project occurs on the Capitol Complex area, include “ <i>Contractors/Vendors Guidelines Related To Buildings And Parking Facilities</i> ” in the specifications.   |  |   |  |  |  |  |  |   |                                 |                                  |

DIVISION 01 GENERAL REQUIREMENTS - Continued

**01 5000-Construction Facilities and Temporary Controls**

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	3. Depending upon the size and duration of the project, the field office will be provided by the contractor and will require space and facilities for the owner, consultants, architect/engineer of record, and testing lab personnel.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify to prohibit the use by construction personnel of all new and existing mechanical systems during the construction phase. If use of existing system is necessary, request and receive written approval, and specify all conditions necessary to assure that the system is returned in equal or better condition. At a minimum, if permanent air handling units are to be used during construction, follow SMACNA air quality control measures and provide MERV 8 filtration which will be removed prior to occupancy. Coordinate with Minnesota Sustainable Building Guidelines (B3-MSBG) section P.4 to establish indoor air quality procedures during construction and warranty period according to Construction Air Quality Management Plan and Warranty Period Air Quality Management Plan.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify that contractors are not to use passenger elevators in new construction. For existing facilities, verify if staff will allow contractors to use existing elevators.
<input type="checkbox"/>	<input type="checkbox"/>	6. Specify that the Contractor shall comply with the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section M.3 Waste Reduction and Management.

**01 7500 / 23 0500 - HVAC Commissioning and HVAC Test and Balance**

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. <i>The State of Minnesota Sustainable Building Guidelines</i> - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG).
<input type="checkbox"/>	<input type="checkbox"/>	2. The mechanical design shall comply with the current State Building Code, ASHRAE Standards, and the State of Minnesota Sustainability Guidelines. The HVAC system design shall consider issues related to indoor air quality, including location of air intakes and exhausts, filtration and special circumstances related to venting of hazardous substances for buildings.
<input type="checkbox"/>	<input type="checkbox"/>	3. For projects not required to meet the requirements of the State of Minnesota Sustainability Building Guidelines, (B3-MSBG), Commissioning will be determined by the State on an individual project basis. Specify test and balance by contractor with full time verification inspection by owner's independent testing company.
<input type="checkbox"/>	<input type="checkbox"/>	4. Schedule and coordinate with the State facility staff to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued. .Specify that the contractor(s) shall be required to provide necessary documentation, including invoices, required by the utility(s) for the purpose of processing and approving rebate applications. And that the contractor(s) shall work to assist the State in obtaining all possible utility rebates on the project.
<input type="checkbox"/>	<input type="checkbox"/>	5. At the State Project Manager's discretion, Commissioning may start at any point of time during the Project; such as, at the beginning of construction in lieu of the beginning of design. Reference the State of Minnesota Sustainable Building Guidelines (B3-MSBG) Sections P.4 and P.5 for required and recommended commissioning activities. However, if LEED certification will be sought for a project, the commissioning activities will have to follow LEED requirements for prerequisite and/or enhanced commissioning

DIVISION 01 GENERAL REQUIREMENTS - Continued

**01 7300-Cutting and Patching**

Complete

N/A

1. Describe all cutting and patching requirements for both building and site in the specification.

2. Coordinate bid documents to clearly define responsibility for mechanical, electrical and structural cutting & patching.

DIVISION 01 GENERAL REQUIREMENTS - Continued

**01 7700-Contract Closeout**

Complete      N/A  
           

1. Specify that the following submittals are required prior to project closeout and final payment to the contractor:

CLOSE OUT CHECKLIST

PROJECT \_\_\_\_\_ STATE PROJECT NO. \_\_\_\_\_  
 CONTRACTOR \_\_\_\_\_ DATE SUBMITTED \_\_\_\_\_  
 PROJECT PHASE \_\_\_\_\_ DATE COMPLETE \_\_\_\_\_

\_\_\_\_\_ Check as Completed      Description \_\_\_\_\_

**Substantial Completion (Each Project Phase)**

- \_\_\_\_\_ Contractor’s letter stating readiness for Substantial Completion inspection
- \_\_\_\_\_ Attached list of incomplete items
- \_\_\_\_\_ System operating and testing report
- \_\_\_\_\_ Operation and maintenance manuals and Instructions
- \_\_\_\_\_ Certificate of Substantial Completion (or partial completion)
- \_\_\_\_\_ Certificate of Occupancy
- \_\_\_\_\_ Utility Rebate Documentation
- \_\_\_\_\_

**Final Completion**

- \_\_\_\_\_ Contractor’s written notice of readiness for Final Inspection
- \_\_\_\_\_ Application for final payment
- \_\_\_\_\_ Signed “punchlist” showing all items completed
- \_\_\_\_\_ Sustainability Documentation
- \_\_\_\_\_ Contractor’s Affidavit of Payment IC-134s
- \_\_\_\_\_ Contractor’s final Summary of Payments
- \_\_\_\_\_ Consent of Surety to final payment

Subcontractors

- \_\_\_\_\_ Final list of subcontractors and material suppliers
- \_\_\_\_\_ Contractor’s Record Documents
- \_\_\_\_\_ Final payroll reports, certifications
- \_\_\_\_\_ Contractor’s Affidavit of Payment IC-134s

Individual Sections

- \_\_\_\_\_ Guarantees and Warranties
- \_\_\_\_\_ Operation and maintenance manuals and Instructions – final
- \_\_\_\_\_ Test & Balancing Reports
- \_\_\_\_\_ Certificates of Owner Training
- \_\_\_\_\_ Extra Materials
- \_\_\_\_\_ Attic Stock, Tools and Spare Parts
- \_\_\_\_\_ Record/As-Built Plans & Specifications delivered to A/E team. (Note: A/E to update electronic files & deliver to owner-see contract for quantity)
- \_\_\_\_\_ Building Permit, Health Dept Plumbing Permit and/or Sanitary/Storm Sewer Permits,

## DIVISION 01 GENERAL REQUIREMENTS - Continued

### 01 7700-Contract Closeout

Complete

N/A

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Specify that the contractor provide the Record/as-built drawings and specifications. The consultant A/E team shall update the electronic files of Record Documents and deliver disks (CDs) to the State Project Manager.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Specify that two (2) copies of the Operation & Maintenance manuals are submitted and tabbed by specification division in 3-ring binders for the facility.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Specify that the contractor shall provide instruction training for operation of the mechanical systems.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. For computerized or sophisticated systems (HVAC/building automation, security, fire alarm systems, etc.) specify that training is to be provided for State maintenance staff.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Specify that the contractor is to notify the consultant designer, in writing, that they have reviewed the work and that it is ready for the substantial completion inspection. Written notification shall be provide by the contractor requesting final inspection when all punch list items are completed.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Specify that the contractor shall reimburse the State for re-inspection costs beyond the two inspections for substantial completion and that the reimbursement will be by a Supplemental Agreement to the contract for construction that deducts the re-inspection costs.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Attach copies of the punch list(s) to the Certificate of Substantial Completion.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Provide a statement by the contractor and consultant certifying that all non-conforming work observed and reported has been remedied by correction or by supplemental agreement.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Extra "Attic-Stock" materials shall be turned over to the user facility.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. Activation of Warrantees by Contractor are required.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. Schedule and coordinate with the State facility staff to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued. .Specify that the contractor(s) shall be required to provide necessary documentation, including invoices, required by the utility(s) for the purpose of processing and approving rebate applications. And that the contractor(s) shall work to assist the State in obtaining all possible utility rebates on the project. |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG). Submit documentation as required to the Center for Sustainable Building Research at the University of Minnesota.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 14. Specify that the contractor shall comply with a pre-occupancy building flush-out as described in LEED NC v2.2. Coordinate with the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section P.4   |
| <input type="checkbox"/> | <input type="checkbox"/> | 15. Conduct a final clean-up by independent green cleaning service using cleaning products that meet the Green Seal GS-37 standard, floor cleaners complying with CA Code of Regulations maximum VOC content, and disposable paper products, supplies, and trash bags meeting the minimum requirements of US EPA's Comprehensive Procurement Guidelines.   |

**END OF SECTION**



# DESIGN GUIDELINES

## CONSULTANT CHECKLIST FOR SPECIFICATIONS

**DIVISION 02      EXISTING CONDITIONS**

**02 4100 –Existing Conditions - Demolition**

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Specify the disposal of debris at approved landfills.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Specify the procedure the contractor shall follow if asbestos or other hazardous materials are encountered. (Stop work in the affected area, notify consultant architect/engineer of record and the facility immediately.)   |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Specify dust and noise control, protection of adjacent buildings, roofs, structures and finishes.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Review with code officials and clearly define how the contractor shall provide access and egress from an occupied building or site.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Clearly define ownership of equipment and materials that are removed during demolition.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. <i>The State of Minnesota Sustainable Building Guidelines</i> - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG). |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Specify that the Contractor shall submit a recycling and waste management program for demolition and construction waste complying with the requirements of the State of Minnesota Sustainable Building Guidelines, Section M.3, Waste Reduction and Management.  |

For projects where the Guidelines do not apply, the project must comply with MN Statute 16B.327. Specify that the Contractor shall submit a Waste Management and Recycling Program Plan for the project to the Architect who shall review and submit to the State when the work includes construction, renovation, or demolition of a state building. The plan must indicate and the contractor and any subcontractors must divert from deposit in a landfill and must recycle at least 50 percent of the nonhazardous construction and demolition waste, measured by tonnage or volume, produced by the project or demonstrate that the waste was delivered to construction and demolition waste recycling facilities that maintain a 50 percent annual recycling rate. This requirement applies to a project to construct, renovate, or demolish a state building. If the project is located greater than 40 miles from a construction and demolition waste recycling facility that is able to meet the requirements and can process the applicable building materials, the contractor shall indicate such in the Waste Management and Recycling Plan.

**END OF SECTION**



# DESIGN GUIDELINES

## CONSULTANT CHECKLIST FOR SPECIFICATIONS

### DIVISION 03 CONCRETE

#### 03 3000 - Concrete Formwork

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify backshoring rather than reshoring.
<input type="checkbox"/>	<input type="checkbox"/>	2. With backshoring, specify and refer to ACI 347-14 Section 3.8.3 (1997) (work must be performed under careful supervision by the contractor and engineer due to the potential of high slab and shoring loads that can develop).
<input type="checkbox"/>	<input type="checkbox"/>	3. With backshoring, provide maximum areas for forms to be removed prior to installing backshoring.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify that backshores must be installed immediately as forms are removed.
<input type="checkbox"/>	<input type="checkbox"/>	5. Form removal: Specify, for each structural type of cast-in-place concrete, the strengths required before removal of formwork is allowed.
<input type="checkbox"/>	<input type="checkbox"/>	6. Specify how concrete strengths are to be determined prior to formwork removal is allowed.
<input type="checkbox"/>	<input type="checkbox"/>	7. Specify that the contractor shall verify that any form coatings, agents, sealers, curing agents, surface coatings applied to concrete forms, concrete or concrete blocks are compatible with waterproofing and thru-wall flashing materials.

#### 03 3000 - Concrete Reinforcement

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify the thickness of concrete (coverage) between the reinforcing bars and concrete surfaces.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify epoxy-coated rebar (ASTM A775) and accessories for all exposed concrete work. (Parking ramps, garage floors, loading docks, exterior stairs, curbs, walks, etc.)
<input type="checkbox"/>	<input type="checkbox"/>	3. Define code required special inspections of reinforcing steel.
<input type="checkbox"/>	<input type="checkbox"/>	4. The State's independent inspection consultant will provide observations of structural reinforcing steel. Specify that the contractor shall not place any structural concrete until the inspection consultant has observed the reinforcing steel for that portion of work scheduled for concrete placement.

#### 03 3000 - Cast-in-Place Concrete

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify all finishes and tolerances for level, plumb and sloped concrete.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify 1/8" per foot minimum slope-to-drain on concrete slabs with floor drains.
<input type="checkbox"/>	<input type="checkbox"/>	3. Coordinate the design for sleeves, conduit and accessories.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify: Slump, compressive strength, air iron and reactivity potential for each concrete application.

## DIVISION 03 CONCRETE - Continued

### 03 3000 - Cast-in-Place Concrete

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify that the contractor shall provide the specified concrete mix designs. Mix designs shall be designed and signed by a professional engineer employed by a qualified independent testing laboratory (other than owner's testing lab).
<input type="checkbox"/>	<input type="checkbox"/>	6. The structural engineer of record shall review and approve concrete mix designs.
<input type="checkbox"/>	<input type="checkbox"/>	7. The structural engineer shall, during design, provide a written statement on where <i>fly ash</i> will be specified for concrete mix designs.
<input type="checkbox"/>	<input type="checkbox"/>	8. Specify placement, curing, form removal, shoring, etc. to achieve project and program requirements for levelness and flatness (deflection).
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify that all supported concrete shall have attained a minimum compressive strength of 100% of twenty-eight day strength (tested with field cured cylinders) prior to form removal. Exception: The structural engineer may design otherwise so as to allow construction to proceed as required by project needs.
<input type="checkbox"/>	<input type="checkbox"/>	10. Specify that all substrates, receiving waterproofing and thru-wall flashings, be free of coatings, form release agents, sealers, curing agents, treatments and the like, unless written prior approval of product use is obtained from the specified waterproofing or thru-wall flashing manufacturers.
<input type="checkbox"/>	<input type="checkbox"/>	11. The State's inspection consultant will provide observations of structural reinforcing steel. Do not place any structural concrete until the inspection consultant has observed the reinforcing steel for the portion of work scheduled for concrete placement.
<input type="checkbox"/>	<input type="checkbox"/>	12. Specify that, if concrete of a concrete delivery truck was rejected for any reason, the truck will not be allowed on-site for the next 12 hours.
<input type="checkbox"/>	<input type="checkbox"/>	13. Specify that all concrete shall be Ready-Mix concrete and delivered in accordance with ASTM C94.
<input type="checkbox"/>	<input type="checkbox"/>	14. Specify that concrete in each load is placed within 90 minutes after water was added for non-air-entrained concrete and 60 minutes after water was added for air entrained concrete.
<input type="checkbox"/>	<input type="checkbox"/>	15. Specify that the concrete shall not free-fall more than 5 feet during placement.
<input type="checkbox"/>	<input type="checkbox"/>	16. Specify minimum concrete curing requirements to meet or exceed the current building code adopted by the State of Minnesota (ACI 318 not ACI 301).
<input type="checkbox"/>	<input type="checkbox"/>	17. Specify both cold and hot weather requirements for placement and curing of concrete.
<input type="checkbox"/>	<input type="checkbox"/>	18. Curing compounds are allowed when approved by the structural engineer of record and the State Project Manager.
<input type="checkbox"/>	<input type="checkbox"/>	19. Specify that concrete shall be maintained above 40°F and in a moist condition for a minimum of seven days after placement, in conformance with the Current building code.
<input type="checkbox"/>	<input type="checkbox"/>	20. All slab on grade concrete floors shall have a non-permeable moisture barrier placed below the concrete slab. To maintain project schedule, coordinate moisture content of slab-on-grade concrete with allowable moisture content for floor finishes.
<input type="checkbox"/>	<input type="checkbox"/>	21. The consultant designer shall submit a written design strategy for preventing vapor and moisture transmission into the building.

### 03 4500 - Precast Concrete

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify that the manufacturer of precast and pre-stressed concrete shall submit calculations certified by a Minnesota registered professional engineer to the consultant architect/engineer of record for approval.
<input type="checkbox"/>	<input type="checkbox"/>	2. The design team shall coordinate all openings in precast with the structural engineer.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify that the contractor shall obtain prior approval from the structural engineer prior to doing any field cut openings in the precast concrete.
<input type="checkbox"/>	<input type="checkbox"/>	4. Post-tensioned concrete is allowed with prior approval from the State Project Manager.

**DIVISION 03      CONCRETE - Continued**

**03 4500 - Precast Concrete**

Complete

N/A

5. When cambered decks for cast concrete structures are designed, provide a transversed section indicating how the roof design accounts for the camber in the deck.

6. Specify stainless steel connection hardware and ties at exterior walls and parking structures.

**END OF SECTION**



## DESIGN GUIDELINES CONSULTANT CHECKLIST FOR SPECIFICATIONS

### DIVISION 04 MASONRY

#### 04 1000 – Mortar

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify that the method of measuring materials for the mortar and grout used shall be by bucket calibrated by weight; measurement of materials by shovel shall not be permitted.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify to re-temper mortar only twice within two hours after introduction of water. Mortar must be replaced within 2 hours after initial mixing.
<input type="checkbox"/>	<input type="checkbox"/>	3. Mortar cement shall be only Portland cement.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify that contractor shall provide the mortar mix designs for approval. The mix designs shall be designed and signed by a professional engineer employed by a qualified independent laboratory; said laboratory to be other than the State's testing laboratory. The structural engineer shall approve mortar mix designs.
<input type="checkbox"/>	<input type="checkbox"/>	5. The consultant architect/engineer of record shall specify all mortar performance characteristics and ASTM criteria pertinent to the specific project.

#### 04 2000 - Unit Masonry

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Comply with the envelope standards contained in these guidelines under "WALL ASSEMBLIES".
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify the use of low lift masonry practices; grout vertical re-bar cells in no more than 4-foot lifts.
<input type="checkbox"/>	<input type="checkbox"/>	3. Running bond is preferred for exterior masonry and structural masonry.
<input type="checkbox"/>	<input type="checkbox"/>	4. All exterior masonry joints shall be tooled concave. Raked joints are not allowed except for interior masonry.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify that the exterior brick must be SW grade to meet ASTM C216. The selected brick must pass freeze-thaw pre-qualification testing prior to bidding.
<input type="checkbox"/>	<input type="checkbox"/>	6. Specify that two job-site sample panels be fabricated, the first panel is to be a free standing (3' x 3' area) of the brick wall and will be used to evaluate chips and other aesthetic characteristics. The second sample shall be 4' high by 6' long and located in a designated part of the permanent building. Include back-up masonry or wall construction, through wall flashing, moisture barrier, wall ties, insulation, reinforcing, control joint and outside corner. The sample panels will be used to determine the color and workmanship standard for installation of all components
<input type="checkbox"/>	<input type="checkbox"/>	7. For masonry walls, specify vertical control joint locations to be at a maximum spacing of 25 feet of wall ,but not more than 1.5 times the wall height (interior or exterior). In addition, vertical control joints shall be located at all changes in wall height, at all changes in wall thickness, above movement joints in foundation floors that bear on the wall, near one or both sides of door and window openings (one side for openings up to 6 feet in width, and both sides for wider openings), and adjacent to corners of walls or intersections within a distance equal to half of the control joint spacing.

**DIVISION 04 MASONRY - Continued**

**04 2000 - Unit Masonry**

<b>Complete</b>	<b>N/A</b>	
<input type="checkbox"/>	<input type="checkbox"/>	<b>8.</b> Masonry walls shall have lateral support at vertical intervals of not more than 20 feet, provided by floor and roof diaphragms or other means.
<input type="checkbox"/>	<input type="checkbox"/>	<b>9.</b> Masonry course reinforcement and accessories shall be type 304 Stainless steel at all exterior walls.
<input type="checkbox"/>	<input type="checkbox"/>	<b>10.</b> Specify stainless steel eye and lintel wall ties for all cavity wall construction at all exterior walls. Corrugated ties are not acceptable.
<input type="checkbox"/>	<input type="checkbox"/>	<b>11.</b> Verify that masonry construction complies with the " <i>Brick Institute of America</i> " recommendations.
<input type="checkbox"/>	<input type="checkbox"/>	<b>12.</b> Specify masonry cleaning so that cleaning shall not diminish the appearance or weather resistance of the building exterior. Specify sequence and protection so that cleaning does not damage adjacent permanent surfaces.
<input type="checkbox"/>	<input type="checkbox"/>	<b>13.</b> Specify full head and bed joints in masonry.
<input type="checkbox"/>	<input type="checkbox"/>	<b>14.</b> Specify hot and cold weather requirements for brick to include a cure time of not less than 48 hours at no less than 40 degrees.
<input type="checkbox"/>	<input type="checkbox"/>	<b>15.</b> Specify hot and cold weather requirements for concrete masonry units to include a cure time of not less than 24 hours at no less than 40 degrees.
<input type="checkbox"/>	<input type="checkbox"/>	<b>16.</b> All concrete masonry units shall be specified by performance, not by manufacturing process, unless a compelling argument is presented to and endorsed by the State.

**END OF SECTION**



## DESIGN GUIDELINES CONSULTANT CHECKLIST FOR SPECIFICATIONS

### DIVISION 05 METALS

#### 05 1200 - Structural Steel

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify Special Inspections for structural steel in accordance with the building code.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify testing of structural bolts to be tested by the State's independent testing company.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify all bolted connections to be tested by the State's independent testing company.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify that the prime contractor shall submit welding certificates to the consultant architect/engineer of record prior to proceeding with welding work.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify that the State's independent testing company inspect all field welds, including metal decking. 100% of all full penetration welds will be tested with non-destructive testing. At least 50% of partial penetration welds will be tested with non-destructive testing.
<input type="checkbox"/>	<input type="checkbox"/>	6. Specify that welders will be required to have satisfactorily passed AWS qualification/certification testing. Fabricator and erectors shall submit current welding certifications, for fabrication plant and field welding, to the structural engineer of record for written approval prior to the start of welding. If re-certification of welders is required, retesting will be Contractor's responsibility. The prime Contractor shall submit the welding certifications to the consultant architect/engineer of record.
<input type="checkbox"/>	<input type="checkbox"/>	7. Specify that the fabrication plant must comply with quality control provisions established by the Steel Deck Institute. Submit documentation that verifies compliance, which must be approved in writing by the consultant architect/engineer of record prior to start of work. Written approval of the fabrication must be acquired from the building official and structural engineer.
<input type="checkbox"/>	<input type="checkbox"/>	8. As part of the code record and code plans, include requirements for fire protection of the structural steel. See Section 07 8100 regarding spray applied fireproofing.
<input type="checkbox"/>	<input type="checkbox"/>	9. For building designs with exposed metal deck, specify that the deck shall be mechanically fastened in lieu of welded.
<input type="checkbox"/>	<input type="checkbox"/>	10. For new buildings, provide an analysis and opinion of the Cumulative Effects of Floor Vibration as it relates to the specific site. Include existing or planned conditions which will have an effect on the structure.

#### 05 5000 – Miscellaneous Metals

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Design stair or guardrails so that the platform rail (back rail) shall have the same clearance to structure as the supported handrails.

END OF SECTION



## DESIGN GUIDELINES CONSULTANT CHECKLIST FOR SPECIFICATIONS

### DIVISION 06 WOOD and PLASTICS

#### 06 0000- General

- |                          |                          |   |
|--------------------------|--------------------------|---|
| Complete                 | N/A                      |   |
| <input type="checkbox"/> | <input type="checkbox"/> | 1. For all products: Design and Specify that the contractor is to provide “Low-emitting materials in the project per Section 1.2 of <i>The State of Minnesota Sustainable Building Guidelines</i> . |

#### 06 1000 - Rough Carpentry

- |                          |                          |  |
|--------------------------|--------------------------|--|
| Complete                 | N/A                      |  |
| <input type="checkbox"/> | <input type="checkbox"/> | 1. For all products, conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2 Specify Low-emitting Materials.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Specify kiln dry and moisture content of all permanent lumber.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Specify exterior grade for all plywood.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Specify the requirement for a grade stamp on all wood brought to the construction site for structural use.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Fire treated plywood is not allowed as a substrate for roofing or exterior walls. Verify use as interior blocking with code official.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Review and verify with code official, the materials use requirements for Construction Types. (i.e. verify the use of wood blocking at roof and window openings when wood is not allowed for a Construction Type). |

#### 06 2000 - Finish Carpentry

- |                          |                          |  |
|--------------------------|--------------------------|--|
| Complete                 | N/A                      |  |
| <input type="checkbox"/> | <input type="checkbox"/> | 1. For all products including particleboard and other composition products, conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2 Specify Low-emitting Materials. Avoid products with added urea-formaldehyde resins. |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Specify formaldehyde <u>off-gassing</u> rates to be less than 0.03 milligrams per square foot of surface/hr in accordance with ASTM D5116-90.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Specify kiln dry and moisture content of all lumber.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Specify grade and species of lumber.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Specify only screws or bolts for use with treated wood. Screws or bolts must be unaffected by treatment chemicals and corrosion resistant, such as galvanized or stainless steel.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Select options for interior wood species and stain for the State Project Manager & user agency’s review.  |

## DIVISION 06 WOOD and PLASTICS - Continued

### 06 4000 – Architectural Woodwork/Casework

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify Architectural Woodwork Institute (AWI) standards for quality.
<input type="checkbox"/>	<input type="checkbox"/>	2. Avoid installing casework against exterior walls. When unavoidable, provide adequate ventilation behind casework (to avoid potential for mold growth on walls behind casework).
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify that casework shop drawings are to show electrical devices, thermostats and other elements for coordination.
<input type="checkbox"/>	<input type="checkbox"/>	4. Verify that specified products are compatible with the climatic environment in which they will be installed; particularly the relative humidity levels.
<input type="checkbox"/>	<input type="checkbox"/>	5. Contact and Coordinate architectural casework & countertops with MINNCOR. MINNCOR specifications for general/office space casework & countertops are below:

#### CASEWORK CONSTRUCTION

##### Materials

- 3/4" Maple Plywood, Veneer Core
  - Sides
  - Bottom
  - Stretcher
  - Shelves
- 1/2" Maple Plywood, Veneer Core
  - Backs
- 1/4" Hardwood Edgebanding

##### Joinery

- 5mm Multiple Holes For Adjustable Shelves
- All Components Glued, And Screwed Together

#### PLASTIC LAMINATE COUNTER TOP CONSTRUCTION

##### Wood Edge

- 3/4" Exterior Glue Plywood Veneer Core
  - Sink Area Tops
- 3/4" Industrial Western Particle Board Core
  - Non-Sink Tops
- Exposed Areas
  - Standard Grade Plastic Laminate
  - Overlay At Finished Edges with 5/16" Fillet
- Front and Finished Counter Edges
  - 3/4" Hardwood Edge with 5/16" Fillet

##### Plastic Laminate Self Edge

- 3/4" Exterior Glue Plywood Veneer Core
  - Sink Area Tops
- 3/4" Industrial Western Particle Board Core
  - Non-Sink Tops
- Exposed Areas
  - Standard Grade Plastic Laminate
  - Plastic Laminate Overlay At Finished Edges
- Front and Finished Counter Edges
  - Plastic Laminate

##### PVC Edge

## DIVISION 06

## WOOD and PLASTICS - Continued

- ¾" Exterior Glue Plywood Veneer Core
  - Sink Area Tops
- ¾" Industrial Western Particle Board Core
  - Non-Sink Tops
- Exposed Areas
  - Standard Grade Plastic Laminate
- Front and Finished Counter Edges

3mm PVC Edge



6. For all products including particleboard and other composition products, conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2 Specify Low-emitting Materials. Avoid products with added urea-formaldehyde resins.

**END OF SECTION**



# DESIGN GUIDELINES

## CONSULTANT CHECKLIST FOR SPECIFICATIONS

**DIVISION 07 THERMAL and MOISTURE PROTECTION**

**07 0000- General**

- |                          |                          |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. For all products, conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2 Specify Low-emitting Materials. |
|--------------------------|--------------------------|---|

**07 1300 - Waterproofing**

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Specify that all interior and exterior waterproofing require full time inspection by the Owner’s waterproofing consultant.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Review the waterproofing system with the State Project Manager.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Mechanical room floors, shower room floors and walls, and other wet spaces above occupied space shall be waterproofed.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Specify hot fluid applied waterproofing for all exterior foundation walls enclosing occupied space below grade and on foundation walls constructed in less than well draining natural soils. Bentonite, membrane, and cold applied products are not advised and will not be allowed on roofs/plaza decks, but may be used at free draining soils and other low risk conditions with approval of the State Project Manager. |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Specify a waterproof and vapor barrier membrane below all slabs-on-grade with sealing of all penetrations; also specify a pre-installation conference ..   |

**DIVISION 07 THERMAL and MOISTURE PROTECTION - Continued**

**07 2100 - Building Insulation**

Complete	N/A	<p><b>Note to Designer:</b> The State of Minnesota Sustainable Building Guidelines - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG) including Section E.1, Energy Use Reduction by at Least 30%.</p>
<input type="checkbox"/>	<input type="checkbox"/>	1. Vapor Barriers are required on the warm side of all insulation. Completely detail the vapor barrier to prevent condensation from occurring based upon ASHRAE defined relative humidity levels that may be anticipated for the project location or caused by the programmed use of the facility.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify procedures/precautions for installation of vapor barriers (for each distinct location).
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify insulation by type and manufacturer, stating performance characteristics of density, aged average R-value per inch, flame spread and fire rating, etc.

**07 5000 – Roofing 20-YEAR ROOF DESIGN** (gravel surfaced built-up roof).

Complete	N/A	<p><b>Note to designer:</b> The following checklist is for the design of low slope roofing systems for a minimum 20-year service life. Coordinate with the State Project Manager when choosing the roof system for new buildings. A 40-year service life design should be considered for new buildings (see 40-Year Roof Design following this section).</p>
<input type="checkbox"/>	<input type="checkbox"/>	1. Interior roof drain systems are preferred vs. scuppers and downspouts. Optimize roof drainage systems by configuring roof drainage patterns to avoid flow conflicts with equipment curbs and other roof curbs or penetrations. Avoid locating penetrations close to drains. Internal overflow drains are preferred. If parapet drains overflow scuppers and/or drains are used, coordinate their locations so that they are not within 10 feet of a sidewalk and are not located above ground-mounted equipment (i.e. transformers, switchgear, condensers, etc.).
<input type="checkbox"/>	<input type="checkbox"/>	2. Roofs for new buildings shall not have flat spots (areas with slopes less than ¼” per foot) except where required at drain sumps; all slopes shall be at least ¼” per foot. The building design shall ensure that no deficient slope occurs on the roof due to camber of structure or location of mechanical units.
<input type="checkbox"/>	<input type="checkbox"/>	3. A 1/8” per foot slope is allowed for re-roofing existing buildings where ¼” per foot slope is not possible.
<input type="checkbox"/>	<input type="checkbox"/>	4. Maximum slope for Low Slope Systems shall be 2”per foot. Minimum slope for Steep Slope Systems shall be 5” per foot.
<input type="checkbox"/>	<input type="checkbox"/>	5. Design for 45-degree insulation valley lines (plan view of sloped insulation). Use complimentary sloped insulation (same as slope rate).
<input type="checkbox"/>	<input type="checkbox"/>	6. Minimize roof penetrations. Penetrations in the roof system are generally high maintenance items and lead to premature roof failure due to movement from thermal expansion/contraction, and service requirements. For re-roofing projects, where possible, relocate conduits and pipes to inside the building. For new roof projects, do not locate equipment, conduits, and pipes on the roof.
<input type="checkbox"/>	<input type="checkbox"/>	7. Maximum 3’ x 3’ flat spots at roof drain sumps on a built-up roof are acceptable for construction reasons (installation of the drain bowl).
<input type="checkbox"/>	<input type="checkbox"/>	8. Specify on-site storage requirements for roofing materials (tarp and pallet).
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify proven Roof System Types and Materials (For the climate at the project location).
<input type="checkbox"/>	<input type="checkbox"/>	10. Roof pavers are not allowed on a gravel surfaced built-up roof. Provide roof membrane protection for access to roof top equipment per roof manufacturer’s recommendation for the type of roof. Verify walkway locations with the facility maintenance staff.

**DIVISION 07 THERMAL and MOISTURE PROTECTION - Continued**  
**07 2100 - Building Insulation**

Complete	N/A	
		<b>Note to Designer:</b> The State of Minnesota Sustainable Building Guidelines - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG) including Section E.1, Energy Use Reduction by at Least 30%.
<input type="checkbox"/>	<input type="checkbox"/>	11. Optimize Roof Drainage by configuring roof drainage pattern(s) to allow water to flow to drain without obstruction. Prevent equipment curbs and other required penetrations from occurring close to drains. Relocate drains as required.
<input type="checkbox"/>	<input type="checkbox"/>	12. Design of watertight and/or properly flashed walls for both new construction and re-roofing construction, to prevent water entry into and below the roof system, must be carefully evaluated. This could include design features such as through-wall flashing, window or louver sill modifications, parapet wall waterproofing, masonry restoration, etc.
<input type="checkbox"/>	<input type="checkbox"/>	13. When designs incorporate tapered insulation, provide a minimum of 1-1/2" of insulation thickness at roof drain locations.
<input type="checkbox"/>	<input type="checkbox"/>	14. Roof flashing height shall be a minimum of 12" above the top of the roof membrane.
<input type="checkbox"/>	<input type="checkbox"/>	15. Flashing height for new construction shall be determined based upon future re-roofing. Choose flashing heights to anticipate and accommodate possible future needs for additional roof insulation.
<input type="checkbox"/>	<input type="checkbox"/>	16. Through-wall flashing shall be installed in all cavity wall construction above roof flashing and below all doors, windows, louvers, or other wall penetrations.
<input type="checkbox"/>	<input type="checkbox"/>	17. Specify that contractor shall protect all existing structures adjacent to the work.
<input type="checkbox"/>	<input type="checkbox"/>	18. The height of the lower through-wall flashing material shall be a minimum of two brick courses above the highest parapet/expansion joint/control joint.
<input type="checkbox"/>	<input type="checkbox"/>	19. Window and curtain wall sills shall be a minimum of 12" above the top of the roof flashing.
<input type="checkbox"/>	<input type="checkbox"/>	20. All roof system designs shall comply with the Minnesota Building code, which presently adopts the International Building Code. The design shall also meet any local code requirements.
<input type="checkbox"/>	<input type="checkbox"/>	21. Use roof system vapor barriers to provide system protection from interior humidity conditions. Vapor barriers can also be used for construction sequencing purposes such as achieving a watertight condition or providing a staging area from which to install through-wall flashing.
<input type="checkbox"/>	<input type="checkbox"/>	22. Roof systems shall be designed for simple repair and maintenance to achieve expected performance life.
<input type="checkbox"/>	<input type="checkbox"/>	23. Roof Warranties: A 3-year contractor's warranty and a minimum 20-year manufacturer's warranty (full system warranty) are required.
<input type="checkbox"/>	<input type="checkbox"/>	24. Gravel stop roof edge details, pitch pans or pitch pockets are <u>not</u> permitted.
<input type="checkbox"/>	<input type="checkbox"/>	25. Use of treated wood is not permitted.
<input type="checkbox"/>	<input type="checkbox"/>	26. On new construction locate a roof drain within 10 feet (approximately) of any cooling tower.
<input type="checkbox"/>	<input type="checkbox"/>	27. For re-roofing and/or remodeling projects, install new roof drains to replace marginal/poorly-performing drains.
<input type="checkbox"/>	<input type="checkbox"/>	28. Use EPDM rubber or ice and water shield (not poly) behind/under all sheet metal cap and counterflashings
<input type="checkbox"/>	<input type="checkbox"/>	29. Use drive cleat corners to join roof edge sheet metal.
<input type="checkbox"/>	<input type="checkbox"/>	30. Use welded hoods to weldable stacks.
<input type="checkbox"/>	<input type="checkbox"/>	31. Do not locate roof penetrations in insulation valley lines or roof drain sumps.
<input type="checkbox"/>	<input type="checkbox"/>	32. For re-roofing projects remove or relocate existing penetrations in valley lines and/or relocate roof drains
<input type="checkbox"/>	<input type="checkbox"/>	33. Do not use sealant except for kerf and/or reglet insert locations (sealant priming is required).
<input type="checkbox"/>	<input type="checkbox"/>	34. Base flashing heights shall be a minimum of 8 inches, preferably 12 inches. Roof edge conditions can be less than 8 inches.
<input type="checkbox"/>	<input type="checkbox"/>	35. Use pre-finished sheet metal or other approved metals such as copper.

**DIVISION 07 THERMAL and MOISTURE PROTECTION - Continued**  
**07 2100 - Building Insulation**

Complete	N/A	<p><b>Note to Designer:</b> The State of Minnesota Sustainable Building Guidelines - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG) including Section E.1, Energy Use Reduction by at Least 30%.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>36.</b> Use 3" = 1" - 0" scale details on drawings to adequately show all elements clearly. Use isometric drawings to show intersections of flashing conditions.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>37.</b> Include ladders/hatches for proper roof access to all roof areas. Access ladders require safety railings. Avoid locating roof hatches close to parapet edges. If unavoidable, guardrails must be provided at the roof.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>38.</b> Design the roof to isolate it from moisture penetration, which may occur due to adjacent conditions.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>39.</b> Provide periodic inspection as required during construction (typically of three inspections per week is preferred). Coordinate inspection requirements with the State Project Manager.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>40.</b> Roofing submittals are required prior to scheduled pre-installation meeting.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>41.</b> A pre-installation meeting shall be held prior to delivery of materials to the site. For re-roofing projects, the pre-installation meeting shall occur prior to roofing tear-off.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>42.</b> Specify that contractor shall provide night seals, drain edges, and penetrations for water tightness at the conclusion of each days work prior to leaving the job site.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>43.</b> Specify that periodic removal of wet, damaged, or rejected materials from the site shall be enforced.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>44.</b> Test each bulk load of asphalt delivered to the site per ASTM D: 312 procedures. Obtain one sample of new membrane construction per each 1,000 square feet of roofing or each roof section and analyze per ASTM D3617.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>45.</b> Conform to the additional requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section S.11, for Heat Island Reduction.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>46.</b> When removal / demolition of an existing roof is to occur, specify that the contractor shall submit a Waste Management and Recycling Program Plan for the project to the Architect/Engineer who shall review and submit to the State when the work includes removal of an existing roof. The plan must indicate and the contractor and any subcontractors must divert from deposit in a landfill and must recycle at least 50 percent of the nonhazardous construction and demolition waste, measured by tonnage or volume, produced by the project or demonstrate that the waste was delivered to construction and demolition waste recycling facilities that maintain a 50 percent annual recycling rate. This requirement applies to a project to construct, renovate, or demolish a state building. If the project is located greater than 40 miles from a construction and demolition waste recycling facility that is able to meet the requirements and can process the applicable building materials, the contractor shall indicate such in the Waste Management and Recycling Plan.</p>

**07 5000 – Roofing 40-YEAR ROOF DESIGN** (gravel surfaced built-up roof).

Complete	N/A	<p><b>The following checklist is for the design of low slope roofing systems for a 40-year service life. They are in ADDITION to the requirements for a 20-year service life.</b></p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>1.</b> The 40-year service life roof system to be designed is dependent upon the facility having an ongoing service &amp; maintenance program. Verify design requirements with the program administrator.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>2.</b> Checklist items for a 20-year service life roof have been provided for in the design.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>3.</b> Roofs shall not have flat spots (areas with slopes less than 1/4" per foot) except where required at drain sumps; all slopes shall be at least 1/4" per foot. The building design shall ensure that no deficient slope occurs on the roof due to camber of structure or location of mechanical units. 3' x 3' flat spots are required at the roof drain.</p>

**DIVISION 07 THERMAL and MOISTURE PROTECTION - Continued**

**07 5000 – Roofing 40-YEAR ROOF DESIGN** (gravel surfaced built-up roof).

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	4. Window and curtain wall sills, door and louver sills and lowest through-wall flashing shall be a minimum of 30" above the roof deck.
<input type="checkbox"/>	<input type="checkbox"/>	5. Roof Warranties: A roofing contractor’s five-year warranty is required. Minimum 20-year manufacturers’ warranties required.
<input type="checkbox"/>	<input type="checkbox"/>	6. All roofing and sheet metal work shall be inspected full time 100% during construction. Inspection will be by the owner’s independent vendor. Daily inspections will be required to verify protection of roofs adjacent to construction. Coordinate inspection requirements with the State Project Manager.
<input type="checkbox"/>	<input type="checkbox"/>	7. Specify that the contractor shall coordinate work with the owner’s independent roof inspector.
<input type="checkbox"/>	<input type="checkbox"/>	8. So that the contractor is aware, specify that, on a daily basis during roofing work, the owner’s independent inspector will assess climatic conditions to determine if that day is suitable for roofing work to occur. This assessment will be used as a basis to determine the appropriateness of assigning liquidated damages.
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify that the owner’s independent inspector will check night seals, drain edges, and penetrations for water tightness at the conclusion of each days work prior to leaving the job site.
<input type="checkbox"/>	<input type="checkbox"/>	10. Specify that the owner’s independent inspector(s) will notify the contractor as to the need for repair and/or relocation of all unanticipated piping, conduit, and masonry conditions that are not in conformance with the design guidelines.
<input type="checkbox"/>	<input type="checkbox"/>	11. Specify that the architect/engineer shall be notified immediately if any work is in nonconformance.
<input type="checkbox"/>	<input type="checkbox"/>	12. Specify that changes during construction, that deviate from the approved design, are not allowed unless approved by architect/engineer.
<input type="checkbox"/>	<input type="checkbox"/>	13. Specify that contractor shall be responsible to report reductions from planned work crew size(s) for all scheduled workdays prior to occurrence.
<input type="checkbox"/>	<input type="checkbox"/>	14. When removal / demolition of an existing roof is to occur, specify that the contractor shall submit a Waste Management and Recycling Program Plan for the project to the Architect/Engineer who shall review and submit to the State when the work includes removal of an existing roof. The plan must indicate and the contractor and any subcontractors must divert from deposit in a landfill and must recycle at least 50 percent of the nonhazardous construction and demolition waste, measured by tonnage or volume, produced by the project or demonstrate that the waste was delivered to construction and demolition waste recycling facilities that maintain a 50 percent annual recycling rate. This requirement applies to a project to construct, renovate, or demolish a state building. If the project is located greater than 40 miles from a construction and demolition waste recycling facility that is able to meet the requirements and can process the applicable building materials, the contractor shall indicate such in the Waste Management and Recycling Plan.

**07 6000 - Flashing and Sheet Metal**

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify gauges of flashing and sheet metal.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify type of sheet metal to be used; i.e. galvanized, pre-painted, pre-finished steel; anodized aluminum, etc.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify and detail the isolation of dissimilar metals.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify that no fasteners shall penetrate horizontal surfaces of parapet flashing.
<input type="checkbox"/>	<input type="checkbox"/>	5. Detail and specify all flashing joints are to overlap in shingle fashion in the direction of water flow/drainage.

**DIVISION 07 THERMAL and MOISTURE PROTECTION - Continued**  
**07 8000 – Fireproofing (Spray Applied Fire Resistive Material – SFRM)**

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Low density spray applied fire resistive material can be susceptible to mold when in contact with moisture and increase the potential for poor indoor air quality and large remediation costs. And, can easily be accidentally removed when future above-ceiling work occurs resulting in a compromise in the fire protection of structural members. Consider other methods of fire protection (concrete structure, above ceiling sprinkler systems, plaster enclosure, trowel on applications, etc). If alternative methods are determined to be unfeasible, spray-on fireproofing systems may be allowed. Approval of the proposed fireproofing system, by the State Project Manager, will be required.
<input type="checkbox"/>	<input type="checkbox"/>	2. If spray applied fireproofing is approved, the specified product shall: <ol style="list-style-type: none"> <li>a. Contain 60% Portland cement by weight.</li> <li>b. Have a minimum dry density of 40 pcf and have UL statement that the “product has been evaluated for exterior use”.</li> <li>c. Be encapsulated with product recommended by the SFRM manufacturer.</li> <li>d. Be formulated with mold inhibitors.</li> <li>e. Contain no asbestos or mineral fibers.</li> <li>f. Be field tested to conform to minimum thickness required fire resistance ratings, density, hardness, bond strength, noncombustibility, and additional tests as required by current code or recommended by A/E of record.</li> <li>g. Have UL test documentation (A/E to require submittal of documentation).</li> </ol>
<input type="checkbox"/>	<input type="checkbox"/>	3. In all computer, telephone, mechanical and electrical spaces use metal stud framing and gypsum board to encapsulate spray applied fireproofing.
<input type="checkbox"/>	<input type="checkbox"/>	4. Review and approve surface of fireproofing application prior to encapsulation.
<input type="checkbox"/>	<input type="checkbox"/>	5. For remodeling projects, specify cleaning and surface preparation of existing steel in conformance with fireproofing manufacturers’ recommendations.

**07 9000 - Joint Sealers**

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify minimum and maximum depth and width for each sealant application.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify that the sealant installer must have five years experience specializing in installing sealants.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify quality joint sealants and caulks, 2 part polyurethane for exterior sealants. Although sealants are a small part of the construction package, they are important in the performance and integrity of the building envelope. Always use manufacturer’s recommendation for sealants.
<input type="checkbox"/>	<input type="checkbox"/>	4. For primary sealant joints in curtainwall construction, specify that the curtainwall manufacturer shall be responsible for selecting the sealant that is warranted to be compatible with all components of the exterior wall that come in contact with the sealant.
<input type="checkbox"/>	<input type="checkbox"/>	5. Sealants shall be compatible with the back-up material, thru-wall flashings, and other substrates as determined by the sealant manufacturer.
<input type="checkbox"/>	<input type="checkbox"/>	6. Specify minimum and maximum depth and width for each sealant application.
<input type="checkbox"/>	<input type="checkbox"/>	7. Specify compressible rubber gasket backer for large (3/4” or greater) joints.
<input type="checkbox"/>	<input type="checkbox"/>	8. Specify a primer at all exterior joints. Apply material in a manner that will prevent exposed stain residue.
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify temperature requirements for sealant installation, 100°F maximum and 40°F minimum temperature until sealant has properly cured.
<input type="checkbox"/>	<input type="checkbox"/>	10. Conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2 Specify Low-emitting Materials.
<input type="checkbox"/>	<input type="checkbox"/>	11. When the project includes removal of existing sealants or caulking, sampling and testing of the caulk/sealant for PCB content shall occur prior to any removal. Should the PCB content exceed toxic levels established by the EPA or State Pollution Control Agency, the material shall be removed and disposed of in accordance with the law.

**END OF SECTION**



# DESIGN GUIDELINES

## CONSULTANT CHECKLIST FOR SPECIFICATIONS

**DIVISION 08 DOORS and WINDOWS**

**08 0000 – General**

- |                          |                          |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. For all products, conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2 Specify Low-emitting Materials. |
|--------------------------|--------------------------|---|

**08 1000 - Hollow Metal (Steel) Doors and Frames**

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Specify only standard sizes. If standard sizes are not possible, get approval from the State Project Manager in advance.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Specify 18-gauge steel for interior doors, 16 gauge for interior frames, 14 gauge galvanized exterior doors and frames. <u>Minimum.</u>  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Exterior doors and frames shall be galvanized or stainless steel.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Corridor doors, oversize doors and other high load doors shall specify additional hinge reinforcing in the frame.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Specify frames to be factory pre-assembled with mitered and fully welded joints ground smooth and delivered to the job site with spreaders.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Specify shop priming for all metal frames. Paint shall be applied uniformly inside, outside, and under removable stops and trim.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. If knock-down and two-piece frames are unavoidable, specifications must require quality standards for securing and finishing these frames.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. All fire-rated doors and frames shall bear the appropriate UL label Class A/B/C, or other testing authority such as Warnock Hersey, that is recognized/acceptable by code.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Specify early separate delivery of schedule-critical hollow metal door frames.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Specify that shop drawings be started immediately following notice to proceed to achieve early frame delivery. Shop drawings shall be submitted to the consultant architect/engineer of record for approval in sufficient detail to assure a comprehensive quality control check. Shop drawings door and frame numbers shall be identical to those on the architectural drawings and door schedule. |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. Specify transport, handling, and job site storage/protection requirements for doors and frames (spreaders, wrapping, vertical storage, pallets, etc.).  |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. Specify that all frames shall be delivered prior to start of masonry construction.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. Specify seamless end channel closure pieces at door heads.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 14. All metal/steel frames in masonry walls shall be grouted full with portland cement grout. Gypsum grout is not permitted.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 15. Specify that all coiling overhead and counter doors be tested for opening and closing to avoid binding.   |

## DIVISION 08 DOORS and WINDOWS - Continued

### 08 1000 - Wood Doors

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify that formaldehyde off-gassing rates are to be less than 0.03 milligrams per square foot of surface area per hour in accordance with ASTM D5116-90. Avoid products with added urea-formaldehyde resins.
<input type="checkbox"/>	<input type="checkbox"/>	2. All wood doors shall be solid core, guaranteed against manufacturing defects for the life of the building.
<input type="checkbox"/>	<input type="checkbox"/>	3. Shop drawings shall be submitted in sufficient detail to assure a comprehensive quality control check. Shop drawing door numbers shall be identical to those on the architectural drawings and door schedule.
<input type="checkbox"/>	<input type="checkbox"/>	4. Define requirements for delivery, storage, and handling to assure that manufacturer's criteria are met. Doors shall not be delivered until building is enclosed, warm, and dry, and the painting subcontractors are on the job and ready to apply finish immediately after delivery.
<input type="checkbox"/>	<input type="checkbox"/>	5. Wood door adhesives shall be 100% waterproof.
<input type="checkbox"/>	<input type="checkbox"/>	6. All wood doors shall be mortised from templates furnished by the hardware supplier and coordinated with hollow metal supplier.
<input type="checkbox"/>	<input type="checkbox"/>	7. Specify all edges of wood doors are to be sealed.

### 08 4000 - Aluminum Entrances and Windows

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. All windows shall be vertical unless approved by the State Project Manager. (Skylights are prohibited. Clerestory windows are acceptable.)
<input type="checkbox"/>	<input type="checkbox"/>	2. All windows and entrances shall be "monumental" (heavy commercial) grade and thermally broken systems, EXCEPT jambs of doors.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify all fire and smoke containment requirements for aluminum window walls and aluminum curtainwall assemblies; specification may be written to have single source responsibility. Window and/or curtainwall manufacturer shall be responsible for these requirements.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify that the manufacturer shall submit a cutaway sample of the frame section/profile and anchoring system to be used. Retain sample until installed units are verified to be in conformance with construction documents.
<input type="checkbox"/>	<input type="checkbox"/>	5. Finish shall be by anodizing only.
<input type="checkbox"/>	<input type="checkbox"/>	6. Bottom of window rough opening shall be a minimum of 18" above grade, slabs on grade, or other horizontal surface.
<input type="checkbox"/>	<input type="checkbox"/>	7. Shop drawings shall detail all frame section components and show elevations, dimensions, and details of all entrances and windows, including descriptions of metal finishes, glazing and sealant material.
<input type="checkbox"/>	<input type="checkbox"/>	8. Contractor shall be responsible for establishing proper dimensions of rough and masonry openings and verification of same.
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify that the manufacturer/fabricator supply factory glazed, unitized construction of the assembly in the largest possible expanse as possible or practical.
<input type="checkbox"/>	<input type="checkbox"/>	10. Specify that the window manufacturer shall submit and window installer shall install a sample window on the date of the scheduled pre-installation conference. The consultant architect/engineer of record will be in attendance and required to observe the complete installation of this unit. The pre-installed unit shall be tested for air and water infiltration at time of installation. Pre-installed unit shall pass tests prior to installation of remaining units and prior to payment for window materials.
<input type="checkbox"/>	<input type="checkbox"/>	11. Verify that window openings are thermally broken, sill is flashed to exterior, flashing is end dammed, and that wall conditions do not short circuit thermal break of installed window.
<input type="checkbox"/>	<input type="checkbox"/>	12. Doors and frames shall be shop mortised and reinforced per hardware manufacturer's templates for specified hardware items.
<input type="checkbox"/>	<input type="checkbox"/>	13. Weather-stripping for exterior doors shall be continuous at head, jambs and door bottoms. Specify weather stripping that has been tested for low-temperature performance.

## DIVISION 08 DOORS and WINDOWS - Continued

### 08 4000 - Aluminum Entrances and Windows

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	14. Care shall be exercised during handling and installation of windows to prevent damage to product finishes. Specify that protection shall be provided throughout the duration of the project so that the work shall be free of scratches, dents, and deformations. Units with any damages or defects shall be replaced at no expense to the State.
<input type="checkbox"/>	<input type="checkbox"/>	15. Glazing units shall be provided according to manufacturer's recommendation for sealants and edge clearances.
<input type="checkbox"/>	<input type="checkbox"/>	16. All glazing including spandrel glass shall be insulated glass.
<input type="checkbox"/>	<input type="checkbox"/>	17. Specify that the aluminum entrance contractor shall furnish and install/apply all isolation, caulking, and sealant materials required to caulk all joints between entrance frames and other construction materials to provide a completely thermally broken, weather tight installation.
<input type="checkbox"/>	<input type="checkbox"/>	18. Thresholds shall be set in double bed of sealant.
<input type="checkbox"/>	<input type="checkbox"/>	19. Specify air and water infiltration, and deflection criteria for all windows.
<input type="checkbox"/>	<input type="checkbox"/>	20. After installation, require cleaning of all frames, glass, adjacent masonry, etc. Remove misplaced sealants, other materials, and stains.
<input type="checkbox"/>	<input type="checkbox"/>	21. Specify that the exterior portion of the window frame be anchored to the building structure.
<input type="checkbox"/>	<input type="checkbox"/>	22. The State will contract with an independent testing company to field-test installed windows for compliance with specified performance criteria for air and water infiltration. The State's independent testing company shall conduct all tests and re-tests. Verify this requirement with the State Project Manager.
<input type="checkbox"/>	<input type="checkbox"/>	23. The State will determine the total number of windows to be tested and which windows will be tested.
<input type="checkbox"/>	<input type="checkbox"/>	24. Specify that the test area shall include perimeter caulk joint.
<input type="checkbox"/>	<input type="checkbox"/>	25. Specify that the Contractor shall assist with testing procedures and otherwise cooperate with testing company.
<input type="checkbox"/>	<input type="checkbox"/>	26. Specify that all failed window installations shall be removed, re-installed and re-tested until they pass.
<input type="checkbox"/>	<input type="checkbox"/>	27. Specify that all re-testing and associated costs shall be paid for by the contractor by means of a deduct change order to the construction contract.
<input type="checkbox"/>	<input type="checkbox"/>	28. For each failed window test, an additional window shall be tested at the contractor's expense by means of a deduct change order to the construction contract.
<input type="checkbox"/>	<input type="checkbox"/>	29. Verify design to ensure that all adjacent conditions and wall openings will allow for removal/replacement of glazing.

### 08 5000 - Wood Windows

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<b>Note to Designer:</b> The State of Minnesota Sustainable Building Guidelines - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG) including Section E.1, Energy Use Reduction by at Least 30%.
<input type="checkbox"/>	<input type="checkbox"/>	1. The State Project Manager shall approve the use of wood windows.

### 08 7000 - Hardware

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Consultant designer shall contract, at their expense, the services of a Certified AHC hardware consultant to develop the hardware specification and schedule.
<input type="checkbox"/>	<input type="checkbox"/>	2. Provide a clear definition of extent and scope of finished hardware items to be included in the project specification
<input type="checkbox"/>	<input type="checkbox"/>	3. Review hardware components, finish, manufacturer, and keying requirements with the facility prior to preparing project specification.

## DIVISION 08 DOORS and WINDOWS - Continued

### 08 7000 - Hardware

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	4. Alarmed exit devices will only be allowed upon State Project Manager approval; investigate/ recommend magnetic locking device wired to fire alarm system.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specified hardware shall be suitable and adaptable to details and surrounding conditions.
<input type="checkbox"/>	<input type="checkbox"/>	6. Require UL listed hardware for doors that are to receive UL labels.
<input type="checkbox"/>	<input type="checkbox"/>	7. Hardware on doors serving hazardous or restricted locations shall comply with all building code requirements.
<input type="checkbox"/>	<input type="checkbox"/>	8. The hardware schedule and product data shall be submitted to the architect for approval prior to ordering. The submittal shall include each hardware item, base metal, finish and type number.
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify that the hardware supplier shall be accessible to the project's vicinity.
<input type="checkbox"/>	<input type="checkbox"/>	10. Specify that hardware samples shall be furnished upon request.
<input type="checkbox"/>	<input type="checkbox"/>	11. Hardware supplier shall furnish copies of the final approved hardware schedule to the General Contractor for distribution to appropriate subcontractors and the facility.
<input type="checkbox"/>	<input type="checkbox"/>	12. Necessary templates and schedules shall be submitted as early as possible to the hollow metal door and frame and/or wood door fabricators in accordance with their fabrication schedule to assure that there is no delay in the project construction schedule.
<input type="checkbox"/>	<input type="checkbox"/>	13. Upon approval of the hardware schedule by the architect of record, a keying schedule shall be submitted for review and approval by the facility.
<input type="checkbox"/>	<input type="checkbox"/>	14. Manufacturer's written installation and adjustment instructions shall be strictly followed. Require that adjustment instructions be included in the O & M manuals.
<input type="checkbox"/>	<input type="checkbox"/>	15. Installation of hardware shall be by experienced personnel.
<input type="checkbox"/>	<input type="checkbox"/>	16. Specify that hardware shall be fitted before final coat of paint or other finishes are applied.
<input type="checkbox"/>	<input type="checkbox"/>	17. Specify that the hardware shall be permanently installed after finishing operations are complete and dry.
<input type="checkbox"/>	<input type="checkbox"/>	18. Specify that the hardware shall be properly adjusted and left in operating condition at the time of final completion.
<input type="checkbox"/>	<input type="checkbox"/>	19. Coordinate with electrical specification any special provisions for alarms and/or releases.
<input type="checkbox"/>	<input type="checkbox"/>	20. Specify that the contractor shall provide construction cylinder cores, keys and core puller.
<input type="checkbox"/>	<input type="checkbox"/>	21. Specify a construction keying schedule.

### 08 8000 - Glazing

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. All glazing shall be vertical.
<input type="checkbox"/>	<input type="checkbox"/>	2. Review safety glass types with the facility.
<input type="checkbox"/>	<input type="checkbox"/>	3. Glass material shall be specified in accordance with performance criteria: daylight transmittance, daylight reflectance, U value - winter night, U value - summer day, shading coefficient, and relative heat gain.
<input type="checkbox"/>	<input type="checkbox"/>	4. All exterior glass shall be insulating glass except interior side vestibule doors and windows.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify that the glass manufacturer's warranty shall guarantee insulating glass units for a period of ten years. Guarantee shall be in writing and delivered to the facility via the consultant architect/engineer of record as part of the O & M manuals.
<input type="checkbox"/>	<input type="checkbox"/>	6. The State of Minnesota Sustainable Building Guidelines - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG) including Section E.1, Energy Use Reduction by at Least 30%.

END OF SECTION



## DESIGN GUIDELINES CONSULTANT CHECKLIST FOR SPECIFICATIONS

### DIVISION 09 FINISHES

#### 09 0000- General

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. For all products, conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2, Specify Low-emitting Materials.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. The State of Minnesota Sustainable Building Guidelines - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG). |

#### 09 0000 - Finishes

- | Complete                 | N/A                      |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. For each type of finish work, specify minimum and maximum requirements for variances in substrate and ambient conditions, including but not limited to, moisture and temperature requirements.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Specify ventilation and isolation requirements to avoid complaints regarding noxious fumes during installation of building products and systems. Define requirements for construction personnel as well as for non-construction related personnel in occupied spaces for remodeling projects. Specify that the contractor shall comply with a pre-occupancy building flush-out as described in LEED NC v2.2. Coordinate with the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section P.4. |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Specify that formaldehyde off-gassing rates are to be less than 0.03 milligrams per square foot of surface area per hour in accordance with ASTM D5116-90. Avoid products with added urea-formaldehyde resins.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. On renovation projects in occupied buildings, specify that the contractor shall submit Material Safety Data (MSD) Sheets on finish products.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. For all products including paint, conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2, Specify Low-emitting Materials.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Specify a non-cracking membrane below thin set epoxy terrazzo floor.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Specify that floors be cleaned prior to installation of furniture and equipment.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Specify that the contractor shall review floor waxing products with the facility staff.   |

#### 09 3000 – Ceramic Tile

- | Complete                 | N/A                      |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Specify a modified Portland cement mortar for setting ceramic tile. Do not allow organic adhesives. |

## DIVISION 09 Finishes

### 09 3000 – Ceramic Tile

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Specify ceramic tile floors in shower and toilet rooms shall be installed in a reinforced mortar bed over a waterproof membrane per Tile Council of America (TCA) recommendations. Both the membrane and finished floor shall be sloped to drain.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Specify cementitious board as a substrate for ceramic wall tile. Do not specify or allow gypsum board products as a substrate. Provide a poly liner behind the cementitious board to a height of 4 feet from the floor. Install per Tile Council of America recommendations.                             |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Specify a waterproof membrane below all ceramic floor tile in showers and toilet rooms. The waterproof membrane shall be liquid applied or sheet material with heat or solvent welded seams. The membrane shall extend up walls a minimum of 12 inches and shall carefully be sealed to the floor drain. |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Specify that all membrane installations shall be flood tested to a minimum depth of 4 inches prior to installation of tile materials. All tests shall be witnessed by the Architect.   |

### 09 5000 – Acoustical Ceilings

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Specify that prior to installation of ceilings, an above-ceiling inspection by the engineers of record is to occur.              |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Specify that acoustical ceiling materials shall be warranted against mold growth.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Specify that acoustical ceiling panels shall be warranted against sagging due to high humidity levels.                           |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Specify acoustical materials to meet program occupancy requirements for acoustic absorption, cleanability and damage resistance. |

END OF SECTION



## DESIGN GUIDELINES CONSULTANT CHECKLIST FOR SPECIFICATIONS

### DIVISION 10 SPECIALTIES

#### 10 2000 – Toilet Compartments

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. High-density polyethylene solid plastic toilet partitions, screens and shower compartments shall be specified unless otherwise approved by the State Project Manager. Recommended for all applications where durability and vandal resistance is required. (Stone partitions are also acceptable).   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Coordinate with Mechanical to specify lavatory faucet fixtures with water outlets located above the top edge of the lavatory or countertop (i.e. - water flow is to be within the lavatory basin). All plumbing fixtures specified and installed shall comply with the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section S.8, Building Water Efficiency. |

#### 10 4000 – Identifying Devices

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Specify that all signage shall comply with ADA and State of Minnesota Accessibility Code.                                    |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Comply with signage standards when projects are located in the Capitol Complex and at campus locations throughout the State. |

#### 10 4000 – Fire Extinguishers

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Design drawings shall locate fire extinguishers on floor plans in accordance with code-required locations. Locate fire extinguishers along exit paths of office cubicles in an open office plan. |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Comply with signage standards when projects are located in the Capitol Complex and at campus locations throughout the State.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Provide a unit price allowance for fire extinguishers and their installation in the bid documents.   |

#### 10 0000 – Miscellaneous Specialties

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Specify coordination of projection screen mounting in ceilings. Coordinate locations so as not to interfere with other wall mounted accessories (markerboards, chalk trays, map rails, etc.) |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Comply with signage standards when projects are located in the Capitol Complex and at campus locations throughout the State.   |

END OF SECTION



# DESIGN GUIDELINES

## CONSULTANT CHECKLIST FOR SPECIFICATIONS

### DIVISION 11 EQUIPMENT

#### 11 0000 - Equipment

Complete	N/A	<p><b>Note to Designer:</b> The State of Minnesota Sustainable Building Guidelines - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG) including Section E.1, Energy Use Reduction by at Least 30%.</p>
<input type="checkbox"/>	<input type="checkbox"/>	1. The Consultant Designer shall recommend equipment after consultation with the facility.
<input type="checkbox"/>	<input type="checkbox"/>	2. Steam in contact with food or food containers shall not be the same as, and shall be isolated from, treated heating plant steam.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify that formaldehyde off-gassing rates are to be less than 0.03 milligrams per square foot of surface area per hour in accordance with ASTM D5116-90. Avoid products with added urea-formaldehyde resins.
<input type="checkbox"/>	<input type="checkbox"/>	4. Coordinate color and finish of accessory equipment with other building finishes. (i.e. if hardware and window finishes are clear aluminum or chrome; do not provide laboratory accessories and faucet hardware with bronze or brass finishes).

#### 11 1000 - Detention Equipment

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Unless the Architect/Engineer has demonstrated experience in correctional/detention facility design, a detention consultant shall be contracted for all such projects.
<input type="checkbox"/>	<input type="checkbox"/>	2. Unless directed in writing by the Department of Corrections, comply with the appropriate American Correctional Association (ACA) design standards and current amendments when designing correctional facilities including: <ul style="list-style-type: none"> <li>a. Standards for Adult Correctional Institutions</li> <li>b. Standards for Correctional Boot Camp Programs</li> <li>c. Standards for Juvenile Community Residential Facilities</li> <li>d. Standards for Juvenile Detention Facilities</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify construction materials, equipment and finishes to provide the level of security and abuse resistance required for the Department of Corrections' custody level defined in the project program or predesign. <ul style="list-style-type: none"> <li>a. Level 1 – Minimum Custody – MCF Stillwater, Lino Lakes, Faribault</li> <li>b. Level 2 – Minimum Custody – MCF Faribault, Willow River</li> <li>c. Level 3 – Medium Security – MCF Moose Lake, Lino Lakes, Faribault</li> <li>d. Level 4 – Close Custody – MCF St. Cloud, Rush City, Stillwater</li> <li>e. Level 5 – Maximum Custody – MCF Oak Park Heights</li> <li>f. Female Facilities (all levels) – MCF Shakopee</li> <li>g. Juvenile Facilities - Red Wing and Thistledeew Camp</li> </ul>

## DIVISION 11 EQUIPMENT

### 11 1000 - Detention Equipment

- | Complete                 | N/A                      |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Specify detention hardware and equipment that has been tested to meet appropriate ASTM standards: <ul style="list-style-type: none"><li>a. A627-03 Standard Test Methods for Tool-resisting Steel Bars and Shapes</li><li>b. F1450-05 Standard Test Methods for Hollow Metal Swinging Door Assemblies for Detention Facilities</li><li>c. F1592-05 Standard Test Methods for Detention Hollow Metal Vision Systems</li><li>d. F1643-05 Standard Test Methods for Detention Siding Door Locking Device Assembly</li><li>e. F1915-05 Standard Test Methods for Glazing for Detention Facilities</li><li>f. F1916-98 Standard Specification for Selecting Chain Link Barrier Systems</li></ul> |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Specify security glazing to meet recognized standards for abuse resistance, assault resistance and bullet resistance as appropriate, including: <ul style="list-style-type: none"><li>a. Consumer Product Safety Commission (CPSC) 16CFR 1201 – Safety standards for glazing materials</li><li>b. National Institute of Justice (NIJ) 0108.01 – Ballistic Resistant Protective Materials H.P.White TP.0500 Forced Entry / Ballistic Standard</li><li>c. Walker McGough Foltz and Lyerla (WMFL) Levels 1-3 forced entry procedures plus ballistics.</li></ul>  |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Design and detail detention facilities and equipment to reduce the opportunity for inmate suicide, reference: “REDUCING THE OPPORTUNITY FOR INMATE SUICIDE: A DESIGN GUIDE,” by Randall Atlas, published in Psychiatric Quarterly, Summer 1989, <a href="http://www.cpted-security.com/prisons4.htm">www.cpted-security.com/prisons4.htm</a>  |

### 11 4000 – FOODSERVICE EQUIPMENT

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Unless Consultant Designer has demonstrated expertise in foodservice facility and equipment design, a recognized foodservice consultant, acceptable to the State Project Manager and the facility, shall be contracted for all such projects |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. All foodservice facility design and equipment specifications shall conform to the MINNESOTA FOOD CODE, Chapter 4626, and shall be reviewed and approved by the Minnesota Department of Health.   |

**END OF SECTION**



# DESIGN GUIDELINES CONSULTANT CHECKLIST FOR SPECIFICATIONS

## DIVISION 12 FURNITURE, FIXTURES & EQUIPMENT

### 12 0000- General

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. For all products, conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2, Specify Low-emitting Materials. |
|--------------------------|--------------------------|--|

### 12 0000 – Furniture, Fixtures & Equipment

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <b>Complete</b>          | <b>N/A</b>               |  |
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Specify the requirement for office cubicle system furniture installer shall provide plywood floor protection when delivering and moving the furniture or equipment into or within the building. |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Specify coordination of location of electrical “whips”, power and data/communications cabling with the installation of owner’s office furniture, systems furniture and equipment.               |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Review FF&E products & specs with MINNCOR Industries. Specify MINNCOR products when project scope includes similar products to those available through MINNCOR.                                 |

### 12 0000 - Furnishings

- |                          |                          |   |
|--------------------------|--------------------------|---|
| <b>Complete</b>          | <b>N/A</b>               |   |
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Specify that formaldehyde off-gassing rates are to be less than 0.03 milligrams per square foot of surface area per hour in accordance with ASTM D5116-90. Avoid products with added urea-formaldehyde resins. |

END OF SECTION



---

## DESIGN GUIDELINES CONSULTANT CHECKLIST FOR SPECIFICATIONS

### DIVISION 13 SPECIAL CONSTRUCTION

#### 13 0000 - Special Construction

Complete N/A

**Note to Designer:** The State of Minnesota Sustainable Building Guidelines - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG) including Section E.1, Energy Use Reduction by at Least 30%.

1. Review all special construction products or systems with the State Project Manager.

**END OF SECTION**



## DESIGN GUIDELINES CONSULTANT CHECKLIST FOR SPECIFICATIONS

### DIVISION 14      CONVEYING EQUIPMENT

#### 14 0000 - Elevators

- | Complete                 | N/A                      |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Elevator capacity shall be sized to accommodate movement of an emergency medical gurney, equipment, furnishings, etc.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Verify agency or facility product preference, and service records.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Keyed elevators will be keyed to the building system and schedule.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Review fire protection of the elevator equipment room with the elevator inspector <b>and</b> fire marshal.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Specify to provide interior protection for elevator cabs.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Verify hoistway structural needs for cab, equipment.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Verify mechanical and electrical needs for the hoistway.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. <i>The State of Minnesota Sustainable Building Guidelines</i> - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG), including Section E.1, Energy Use Reduction by at Least 30%.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Review and specify the current code requirements for elevators per the Minnesota State Building Code and the "Elevator Checklist and Scheduling,?" Require that the contractor certify that the checklist items are completed prior to requesting a final inspection by the elevator inspector. The checklist is located on the Department of Labor & Industry website: <a href="http://www.dli.mn.gov/CCLD/ElevatorForms.asp">http://www.dli.mn.gov/CCLD/ElevatorForms.asp</a> and <a href="http://dli.mn.gov/CCLD/docs/elev_ready.doc">http://dli.mn.gov/CCLD/docs/elev_ready.doc</a> |

#### Division 1 thru 14 – Additional Requirements

- |                          |                          |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. See other guideline requirements in the General Requirements and Assemblies Sections of these Guidelines.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. See the Consultant Designer Procedures Manual for procedures and submittal requirements.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Schedule and coordinate with the State facility staff to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued. .Specify that the contractor(s) shall be required to provide necessary documentation, including invoices, required by the utility(s) for the purpose of processing and approving rebate applications. And that the contractor(s) shall work to assist the State in obtaining all possible utility rebates on the project. |

**END OF SECTION**



---

## **DESIGN GUIDELINES CONSULTANT CHECKLIST FOR SPECIFICATIONS**

### **MECHANICAL SPECIFICATION GUIDELINES**

(Note: Also see Consultant Procedures, General Requirements and Assemblies Sections)

# MECHANICAL SPECIFICATION GUIDELINES- Continued

## Division 21, 22, 23, 25 – General Requirements

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>1. <i>The State of Minnesota Sustainable Building Guidelines</i></b> - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG).</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>2.</b> All products specified and installed shall comply with the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2, Specify Low-Emitting Materials.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>3.</b> All products specified and installed shall comply with the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section S.8, Building Water Efficiency. Equipment and systems that exceed the standards shall be used when total life cycle cost analysis indicates sufficient energy savings. Upgrades shall be approved by the State Project Manager.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>4.</b> All products specified and installed shall comply with the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section S.13, Wastewater Reduction and Management. Provide low flush/water conservation plumbing fixtures.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>5. Geothermal and solar applications for Heating &amp; Cooling Systems – for State Funded Buildings: MN Statute 16B.326</b>                      When practicable, geothermal and solar thermal heating and cooling systems must be considered when designing, planning, or letting bids for necessary replacement or initial installation of cooling or heating systems in new or existing buildings that are constructed or maintained with state funds. For the purposes of this section, "solar thermal" means a flat plate or evacuated tube with a fixed orientation that collects the sun's radiant energy and transfers it to a storage medium for distribution as energy for heating and cooling.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>6. MN Statute 16B.32 Energy Use:</b> Plans for a new building or for a renovation of 50 percent or more of an existing building or its energy systems must include designs which use active and passive solar energy systems, earth sheltered construction, and other alternative energy sources where feasible. A new building must consider meeting at least two percent of the energy needs of the building from renewable sources (limited to wind and sun) located on the building site.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>7. Life Cycle Costing:</b> In conjunction with <i>The State of Minnesota Sustainable Building Guidelines</i>, conduct a Life-Cycle Cost Analysis on all major systems of the building:</p> <ul style="list-style-type: none"> <li>e. Structural System (including foundation)</li> <li>f. Envelope....Roof, Wall &amp; Window systems</li> <li>g. Mechanical Systems &amp; Components</li> <li>h. Major Electrical systems &amp; components (including lighting).</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<p><b>8. Energy/Utility Rebates:</b> Schedule and coordinate with the State facility staff to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued. .Specify that the contractor(s) shall be required to provide necessary documentation, including invoices, required by the utility(s) for the purpose of processing and approving rebate applications. And that the contractor(s) shall work to assist the State in obtaining all possible utility rebates on the project.</p>

## MECHANICAL SPECIFICATION GUIDELINES- Continued

### Division 21, 22, 23, 25 0000 - continued

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify that all cooling coils shall have stainless steel drip pans large enough to keep all condensate off the floor, and shall be manufactured with 1/4"/foot slope to drain. Require inspection and water test prior to acceptance. Provide a general note on the plans.
<input type="checkbox"/>	<input type="checkbox"/>	10. Specify refrigerant that meets the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section E.4, Atmospheric Protection and has been approved for use by the manufacturer of the specified equipment and is generally accepted within the industry as a refrigerating that will be available throughout the life expectancy of the equipment. If LEED Certification will be sought for a project, follow prerequisite and/or enhanced refrigerant management guidelines.
<input type="checkbox"/>	<input type="checkbox"/>	11. Include all necessary sound and vibration eliminators before ducts and pipes leave mechanical room.
<input type="checkbox"/>	<input type="checkbox"/>	12. Verify the minimum headroom clearance that will be acceptable to the facility within mechanical spaces for access aisles.
<input type="checkbox"/>	<input type="checkbox"/>	13. Conduit, piping, duct work, mechanical air handlers, and condensing units are not allowed on the roof. Minimize roof penetrations.
<input type="checkbox"/>	<input type="checkbox"/>	14. Mechanical penetrations in roof drain sump area are not allowed.
<input type="checkbox"/>	<input type="checkbox"/>	15. Detail automatic controls diagrammed on construction documents to provide minimum outdoor air quantities for each supply fan on projects with more than one fume hood.
<input type="checkbox"/>	<input type="checkbox"/>	16. Specify automatic controls to increase supply (make-up) air to meet exhaust needs when fume hoods are included in a project.
<input type="checkbox"/>	<input type="checkbox"/>	17. Specify that unions or flanges and access doors in the ductwork shall be provided on all coil connections to allow for ease of future cleaning.
<input type="checkbox"/>	<input type="checkbox"/>	18. Specify that flow measuring devices shall be provided for all coils, radiation elements, pumps, and secondary piping or as approved otherwise in writing by the facility or user agency.
<input type="checkbox"/>	<input type="checkbox"/>	19. Specify pressure gauges with shut-off cocks for all pumps and chillers.
<input type="checkbox"/>	<input type="checkbox"/>	20. Specify thermometers with wells for heating and cooling coils, hot water boilers, and converters.
<input type="checkbox"/>	<input type="checkbox"/>	21. Specify water flow balanced to no less than 90% of required flow.
<input type="checkbox"/>	<input type="checkbox"/>	22. Specify that pump discharge pressure shall be adjusted to the lowest setting possible to achieve balance at the most remote hydronic terminal.
<input type="checkbox"/>	<input type="checkbox"/>	23. Specify that the contractor shall pay for sanitary connection, water connection, and all other required connection charges.
<input type="checkbox"/>	<input type="checkbox"/>	24. Review labeling of equipment and temperature control gages with Plant Management or facility maintenance staff. Specify the requirements for all labeling.
<input type="checkbox"/>	<input type="checkbox"/>	25. Specify that the contractor shall indicate locations of all above ceiling equipment on the as-built plans.
<input type="checkbox"/>	<input type="checkbox"/>	26. Coordinate with the architect for the design of spaces that contain exhaust systems so as that the pressure in surrounding spaces is not affected.

### Division 21, 22, 23, 25 0000 - continued

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	27. When boilers are included in the design; specify additional equipment that is required. Review boiler chemical spec. with facility maintenance staff.
<input type="checkbox"/>	<input type="checkbox"/>	28. In bid documents, provide a list of equipment requiring housekeeping pads and include sizes. Develop a unit price for additional pads.
<input type="checkbox"/>	<input type="checkbox"/>	29. Specify sound attenuation for vacuum pumps.
<input type="checkbox"/>	<input type="checkbox"/>	30. Coordinate heights of equipment with facility maintenance staff. Avoid designs where access lifts cannot reach.

## MECHANICAL SPECIFICATION GUIDELINES- Continued

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <b>31.</b> Reference the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section P.5, Operations Commissioning, with regard to measurement and verification of the following scope: Water device and system level; Water whole building; Energy device and system level; Energy whole building; and Indoor environmental quality.  |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>32. MN Statute 216C.19 Energy Conservation:</b> Comply with the energy conservation requirements as outlined in the State Statute 216C.19 for the following items: Roadway lighting, outdoor display lighting, outdoor lighting, promotional practices by energy supplies, natural gas outdoor lighting, gas lamps, room air conditioners, gas-powered equipment, fluorescent lamp ballasts, motors, commercial HVAC equipment, showerheads/faucet, and conservation rules.   |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>33. MN Statute 216C.20 Energy Conservation in Public Buildings:</b> The rules concerning heat loss, illumination, and climate control standards adopted within the State Building Code shall include standards for all existing buildings heated by oil, gas, or electric units which are owned by the state, the University of Minnesota, any city, any county, or any school district. Compliance with standards adopted pursuant to this section shall not be mandatory for buildings owned by any city, county, or school district except as otherwise provided by this section. Illumination standards are mandatory for all public buildings open to the public during normal business hours and which exceed 5,000 square feet in gross floor area where economically feasible. No enclosed structure or portion of an enclosed structure constructed after January 1, 1978 and used primarily as a commercial parking facility for three or more motor vehicles shall be heated. Incidental heating resulting from building exhaust air passing through a parking facility shall not be prohibited, provided that substantially all useful heat has previously been removed from the air. |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>34. For renovation/remodeling projects, the design consultant shall specify x-raying requirements for core drilling/penetrations to avoid existing installations such as cabling, piping, rebar reinforcing. All Mechanical, Piping, Fire Protection Plans are to indicate this requirement also.</b>   |

## 21 0000 - Fire Protection

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <b>1.</b> The consultant designer shall specify a registered engineer (Fire Protection Engineer) shall design all fire protection system designs.   |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>2.</b> Obtain local Fire Marshal approval at each design phase (review standpipe, hydrant and fire department connection locations). Invite local or State Fire Marshal to be present at substantial completion inspection walk-through. |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>3.</b> A performance specification is acceptable for fire protection system bidding. If a performance specification is not possible, get approval from the State Project Manager in advance.   |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>4.</b> Consult with the facility or user agency for sprinkler head type. Concealed-type sprinkler heads are preferred where applicable.  |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>5.</b> The Fire Protection Engineer shall size the mains and the fire pumps.   |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>6.</b> The Fire Protection Engineer shall coordinate to provide wiring for fire pumps.   |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>7.</b> Sprinkler heads should be located on architectural reflected ceiling plans in spaces that are architecturally sensitive.  |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>8.</b> The Fire Protection Engineer shall show standpipes, test headers, fire department connection valves, water flow indicators, and cross mains on the drawings.  |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>9.</b> The Fire Protection Engineer is to provide notes on the drawings for any special conditions, Siamese connection detectors and fire pumps, etc.  |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>10.</b> Vitriolic connections are not allowed on automatic sprinkler systems when installed in concealed ceilings or shafts.   |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>11.</b> Verify existing water service capacity and flow rates. Take into consideration capacities required for other water systems included in the building.   |
| <input type="checkbox"/> | <input type="checkbox"/> | <b>12.</b> Coordinate heights of equipment with facility maintenance staff. Avoid designs where access lifts cannot reach.  |

## MECHANICAL SPECIFICATION GUIDELINES- Continued

### 22 0000 – Plumbing

- |                          |                          |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Specify all water supply lines shall be copper.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Specify that dielectric couplings shall be used at all connections of dissimilar metals.   |
| <input type="checkbox"/> |                          | 3. Submit catalog cut-sheets to facility and review all proposed plumbing equipment including; valves, hose bids, gages, traps, meters, fixtures, etc.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Identify expansion compensation for steam, chilled water, and domestic water lines.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Provide a separate roof drain at each cooling tower location.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Via a preliminary code review, verify the number of floor drains needed in each equipment room.. Incorporate these into the documents. Specify and detail requirements for floor drains.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Faucets and flush valves shall be automatic type, hard wired (non-battery operated); if the facility does not desire hard wired faucets and valves, provide low-flow aerators for water conservation.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Specify lavatory faucet fixtures with water outlets located above the top edge of the lavatory or countertop (i.e. - water flow is to be within the lavatory basin). All plumbing fixtures specified and installed shall comply with the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section S.8, Building Water Efficiency. |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Coordinate plumbing fixture and faucet hardware and toilet room accessories with the building finishes. (i.e. provide chrome faucet finish with brushed aluminum door hardware).   |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. As part of the punchlist walkthrough, the consultant shall coordinate the testing of the operation of plumbing fixtures.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. Coordinate water closet fixture and seat gage at mounting holes for correct height.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. Specify sizes of all vents and drainage requirements. Detail vent lines and terminations.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. Specify eyewash stations in all areas where chemicals are handled. Verify code requirements for locations of eyewash stations. Verify code requirements for water temperature that serves plumbed eyewash stations. Verify drain requirements for eyewash stations in accordance with code. Include all requirements in the bid documents.                        |
| <input type="checkbox"/> | <input type="checkbox"/> | 14. Verify code requirements for locations where overhead plumbing is prohibited or where the code requires separation of piping. Show all details in documents.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 15. Specify labeling of piping. Coordinate with facility maintenance staff.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 16. Coordinate heights of equipment with facility maintenance staff. Avoid designs where access lifts cannot reach.   |

### 22 1000- Fuel Oil Tanks, Distribution, Piping

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <b>Complete</b>          | <b>N/A</b>               |  |
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Specify an allowance for filling new fuel tanks and ballasts.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Specify that the contractor shall manually monitor tanks until automatic controls are installed.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Specify that the contractor shall provide tank registration and documentation as required by the MPCA (Minnesota Pollution Control Agency).   |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Underground storage tanks are to be designed in accordance with MPCA rules and regulations and MN State Fire Codes. Prior to bidding, review design with the State Fire Marshal and/or local fire department. |

### 23 0000 – HVAC & Ductwork

- |                          |                          |   |
|--------------------------|--------------------------|---|
| <b>Complete</b>          | <b>N/A</b>               |   |
| <input type="checkbox"/> | <input type="checkbox"/> | 1. No fiberboards ductwork shall be allowed.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Identify the pressure classifications of all ductwork on each HVAC sheet.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Specify ductwork to be at a minimum pressure classification of 2 inch water column.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. For ductwork that is upstream of VAV boxes, specify a minimum pressure classification of 4” water column or equal to the maximum fan outlet static pressure, whichever is greater. |

## MECHANICAL SPECIFICATION GUIDELINES- Continued

### 23 0000 – HVAC & Ductwork

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	5. Mechanical specifications shall include a table of sheet metal duct gauges, or reference a nationally recognized standard, which shall preclude exceptions or alternate construction methods proposed by contractors.
<input type="checkbox"/>	<input type="checkbox"/>	6. Radius fittings shall be predominantly utilized for rectangular ductwork.
<input type="checkbox"/>	<input type="checkbox"/>	7. “Tie Rods” shall not be allowed to reduce the duct metal gauge thickness or joint reinforcement.
<input type="checkbox"/>	<input type="checkbox"/>	8. Round ductwork shall be limited to spiral lock seam construction. Snap lock duct construction shall not be allowed.
<input type="checkbox"/>	<input type="checkbox"/>	9. Die formed elbows, rather than mitered elbows, shall be provided on all round ductwork sizes of 10 inch diameter or smaller. Mitered fittings on 12 inch diameter and larger shall be fabricated with at least five pieces to reduce friction and pressure drop.
<input type="checkbox"/>	<input type="checkbox"/>	10. Pittsburgh lock & seam duct construction shall be used on all ductwork with a width or height dimension exceeding 16”, on fume hood exhaust ducts, on exhaust ductwork connected to a fan exceeding 2 inches water column, on all ductwork requiring greater than 2 inches water column pressure classification and on all ductwork installed upstream of VAV boxes.
<input type="checkbox"/>	<input type="checkbox"/>	11. “Slip and Drive” duct connections shall not be provided on ductwork of any dimension, width or height, exceeding 16 inches. Reinforcing angle iron joints shall be utilized on all four sides of ductwork, width and height.
<input type="checkbox"/>	<input type="checkbox"/>	12. All supply ducts, both heating and cooling, shall be insulated. In conditioned areas, foil faced fiberglass shall be provided. Specifications shall require additional insulation at VAV boxes to assure water will not condense on exposed heating coil tube ends and/or other metal parts. Insulation shall be specified to prevent water from dripping on ductwork or duct accessories and staining the ceiling below.
<input type="checkbox"/>	<input type="checkbox"/>	13. Ductwork in mechanical spaces and/or other non-conditioned areas shall be insulated with rigid fiberglass and covered with fiberglass mesh foil face covering. Round ductwork in mechanical spaces shall be avoided in order to eliminate the need for utilizing fiberglass blanket insulation.
<input type="checkbox"/>	<input type="checkbox"/>	14. No insulating materials which can support the growth of mold, yeast and/or other microorganisms, shall be allowed.
<input type="checkbox"/>	<input type="checkbox"/>	15. On HVAC drawings, provide and detail access space for removing coils and fans from Air Handling Units (AHUs).
<input type="checkbox"/>	<input type="checkbox"/>	16. Detail ductwork connections to fans and AHUs to provide aerodynamic airflow and to follow recommended design practice. Allow space for air intake design of AHUs which will provide for accurate measurement of outside air quantities during the Testing & Balancing of the HVAC system.
<input type="checkbox"/>	<input type="checkbox"/>	17. HVAC schedules shall identify the minimum amount of outside airflow required for each HVAC unit, both in CFM and percent to meet design intent, B3-MSBG Guidelines, and/or code requirements. Refer to the State of Minnesota Sustainable Building Guidelines (B3-MSBG) Section I.4, Ventilation Design, for required and recommended criteria for ventilation system design. If LEED certification will be sought for a project, the B3-MSBG recommendations will require implementation.
<input type="checkbox"/>	<input type="checkbox"/>	18. Exhaust Fan schedules shall identify the supply fan number and exhaust air quantity provided from each supply fan. Where multiple supply fans provide conditioned make-up air or and exhaust fan, the supply number and quantity of make-up air from each unit shall be identified on Mechanical Equipment Schedules.
<input type="checkbox"/>	<input type="checkbox"/>	19. Ceiling grids shall be shown on HVAC duct drawings to verify that diffusers will match up with the ceiling grid to avoid lighting, sprinkler, etc. conflicts.
<input type="checkbox"/>	<input type="checkbox"/>	20. Specify that the contractor shall submit shop drawing layouts (plans) of the HVAC ductwork.
<input type="checkbox"/>	<input type="checkbox"/>	21. Access panels shall be provided at intervals not exceeding twenty feet on ductwork branches and mains to allow for cleaning and/or inspection. The location and sizes of access panels shall be shown on the HVAC drawings. Access panels shall be double wall construction, insulated and installed to prevent condensed water from dripping on the ceiling.

## MECHANICAL SPECIFICATION GUIDELINES- Continued

### 23 0000 – HVAC & Ductwork

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	22. Interior duct lining is not acceptable, specifically within 40 feet of mechanical units.
<input type="checkbox"/>	<input type="checkbox"/>	23. Detail the distances from elbows and fittings when required for proper air flow.
<input type="checkbox"/>	<input type="checkbox"/>	24. Rooftop ductwork is not allowed.
<input type="checkbox"/>	<input type="checkbox"/>	25. Detail/draw volume dampers to be shown on each branch duct line.
<input type="checkbox"/>	<input type="checkbox"/>	26. Obtain a copy of, and include in the project manual, the State's specification for Test and Balancing. Testing and Balancing shall be specified and 100% reviewed by engineer of record prior to Substantial Completion.
<input type="checkbox"/>	<input type="checkbox"/>	27. Balancing damper shall be shown in contract documents and not left to the discretion of the contractor.
<input type="checkbox"/>	<input type="checkbox"/>	28. Dampers for adjusting air flow shall be detailed to be at least 5 feet upstream from each air outlet.
<input type="checkbox"/>	<input type="checkbox"/>	29. Specify that the supply fan be adjusted to the lowest horse power setting required to achieve full air flow at the most remote terminal unit. The fan shall not be set at high RPM and then throttled to meet corresponding requirements. Specify that all outlets shall be adjusted to no less than 90% of required flow.
<input type="checkbox"/>	<input type="checkbox"/>	30. Refer to the State of Minnesota Sustainable Building Guidelines (B3-MSBG) Section I.1, Restrict Environmental Tobacco Smoke, for additional criteria for eliminating environmental tobacco smoke from entering the building.
<input type="checkbox"/>	<input type="checkbox"/>	31. Provide air filters for air systems to protect system components and provide filtered air to system users. Secondary filters shall have a minimum air filtration efficiency of 90% (minimum MERV 13 rating) when tested in accordance with ASHRAE Standard 52.1, Atmospheric Dust Spot Method.
<input type="checkbox"/>	<input type="checkbox"/>	32. Systems that serve large meeting areas or classrooms shall be interconnected to a central monitoring system. Room occupants shall be able to adjust the environmental controls via a tight bandwidth.
<input type="checkbox"/>	<input type="checkbox"/>	33. Indoor design temperature shall be 72° F and 20% RH for heating occupied spaces unless superseded by the State Project Manager. Coordinate with the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.5, Thermal Comfort.
<input type="checkbox"/>	<input type="checkbox"/>	34. At the State Project Manager's discretion, Commissioning may start at any point of time during the Project; such as, at the beginning of construction in lieu of the beginning of design. Reference the State of Minnesota Sustainable Building Guidelines (B3-MSBG) Sections P.4 and P.5 for required and recommended commissioning activities. However, if LEED certification will be sought for a project, the commissioning activities will have to follow LEED requirements for prerequisite and/or enhanced commissioning.

### 23 0000 - Humidification

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Humidification steam shall not be the same as, and shall be isolated from, treated heating plant steam
<input type="checkbox"/>	<input type="checkbox"/>	2. Dehumidification shall be provided in areas that experience high humidity levels (i.e. pools, dish washing areas of kitchens, etc.). Desiccant dehumidification is preferred. Conventional air conditioning is not an acceptable means of dehumidification in high humidity spaces.
<input type="checkbox"/>	<input type="checkbox"/>	3. Coordinate with state staff utility personnel to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify access ladders to cooling chambers are to extend within 12" of finished roof. Detail to allow for movement across vibration isolators.

**MECHANICAL SPECIFICATION GUIDELINES- Continued**  
**23 1000 – Facility Fuel Systems**

- 
- 1. Specify the natural gas pressure setting that the contractor is to provide. Verify the setting during the punchlist walkthrough.

**END OF SECTION**



---

## **DESIGN GUIDELINES CONSULTANT CHECKLIST FOR SPECIFICATIONS**

### **ELECTRICAL SPECIFICATION GUIDELINES** (Note: Also see Consultant Procedures, General Requirements and Assemblies Sections)

# ELECTRICAL SPECIFICATION GUIDELINES

## ELECTRICAL DIVISIONS 26, 27, 28 – General Requirements

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<b>1. The State of Minnesota Sustainable Building Guidelines</b> - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG) including Section E.1, Energy Use Reduction by at Least 30%.
<input type="checkbox"/>	<input type="checkbox"/>	<b>2.</b> All products specified and installed shall comply with the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section I.2, Specify Low-Emitting Materials.
<input type="checkbox"/>	<input type="checkbox"/>	<b>3.</b> All lighting products specified and installed shall comply with the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG) per Appendix E-1, including lighting controls and accessories to reduce energy use by a minimum of 30%.
<input type="checkbox"/>	<input type="checkbox"/>	<b>4. Geothermal and solar applications for Heating &amp; Cooling Systems – for State Funded Buildings: MN Statute 16B.326</b> When practicable, geothermal and solar thermal heating and cooling systems must be considered when designing, planning, or letting bids for necessary replacement or initial installation of cooling or heating systems in new or existing buildings that are constructed or maintained with state funds. For the purposes of this section, "solar thermal" means a flat plate or evacuated tube with a fixed orientation that collects the sun's radiant energy and transfers it to a storage medium for distribution as energy for heating and cooling.
<input type="checkbox"/>	<input type="checkbox"/>	<b>5. MN Statute 16B.32 Energy Use:</b> Plans for a new building or for a renovation of 50 percent or more of an existing building or its energy systems must include designs which use active and passive solar energy systems, earth sheltered construction, and other alternative energy sources where feasible. A new building must consider meeting at least two percent of the energy needs of the building from renewable sources (limited to wind and sun) located on the building site.
<input type="checkbox"/>	<input type="checkbox"/>	<b>6. Life Cycle Costing:</b> In conjunction with <i>The State of Minnesota Sustainable Building Guidelines</i> , conduct a Life-Cycle Cost Analysis on all major systems of the building: <ol style="list-style-type: none"><li>Structural System (including foundation)</li><li>Envelope...Roof, Wall &amp; Window systems</li><li>Mechanical Systems &amp; Components</li><li>Major Electrical systems &amp; components (including lighting).</li></ol>
<input type="checkbox"/>	<input type="checkbox"/>	<b>7. Energy/Utility Rebates:</b> Schedule and coordinate with the State facility staff to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued. Specify that the contractor(s) shall be required to provide necessary documentation, including invoices, required by the utility(s) for the purpose of processing and approving rebate applications. And that the contractor(s) shall work to assist the State in obtaining all possible utility rebates on the project.

# ELECTRICAL SPECIFICATION GUIDELINES

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<b>8.</b> At the State Project Manager's discretion, Commissioning may start at any point of time during the Project; such as, at the beginning of construction in lieu of the beginning of design. Reference the State of Minnesota Sustainable Building Guidelines (B3-MSBG) Sections P.4 and P.5 for required and recommended commissioning activities. However, if LEED certification will be sought for a project, the commissioning activities will have to follow LEED requirements for prerequisite and/or enhanced commissioning.
<input type="checkbox"/>	<input type="checkbox"/>	<b>9. MN Statute 16B.335, Subd. 5 &amp; 6:</b> Building and relocation projects shall review the implications of utilizing information technology on space utilization. Construction and remodeling funds shall include money for cost-effective information technology investments that would enable an agency to reduce its need for office space, provide more of its services electronically, and decentralize its operations. The Office of Enterprise Technology must review and approve the information technology portion of construction and major remodeling program plans.
<input type="checkbox"/>	<input type="checkbox"/>	<b>10. MN Statute 216C.19 Energy Conservation:</b> Comply with the energy conservation requirements as outlined in the State Statute 216C.19 for the following items: Roadway lighting, outdoor display lighting, outdoor lighting, promotional practices by energy supplies, natural gas outdoor lighting, gas lamps, room air conditioners, gas-powered equipment, fluorescent lamp ballasts, motors, commercial HVAC equipment, showerheads/faucet, and conservation rules.
<input type="checkbox"/>	<input type="checkbox"/>	<b>11. MN Statute 216C.20 Energy Conservation in Public Building:</b> The rules concerning heat loss, illumination, and climate control standards adopted within the State Building Code shall include standards for all existing buildings heated by oil, gas, or electric units which are owned by the state, the University of Minnesota, any city, any county, or any school district. Compliance with standards adopted pursuant to this section shall not be mandatory for buildings owned by any city, county, or school district except as otherwise provided by this section. Illumination standards are mandatory for all public buildings open to the public during normal business hours and which exceed 5,000 square feet in gross floor area where economically feasible. No enclosed structure or portion of an enclosed structure constructed after January 1, 1978 and used primarily as a commercial parking facility for three or more motor vehicles shall be heated. Incidental heating resulting from building exhaust air passing through a parking facility shall not be prohibited, provided that substantially all useful heat has previously been removed from the air.
<input type="checkbox"/>	<input type="checkbox"/>	<b>12.</b> For renovation/remodeling projects, the design consultant shall specify x-raying requirements for core drilling/penetrations to avoid existing installations such as cabling, piping, rebar reinforcing. All Mechanical, Piping, Fire Protection Plans are to indicate this requirement also.

## 26 0000 - Basic Electrical Requirements

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<b>1.</b> For work that occurs on the Capitol Complex, specify that the contractor shall be allowed one, clearly marked vehicle, with company name, to be parked in the construction zone. All other vehicles, private or company, must be parked off-site in an approved area. Verify cost with owner to provide a parking allowance for other contractor vehicles.
<input type="checkbox"/>	<input type="checkbox"/>	<b>2.</b> Coordinate electrical drawings and specifications with each other, with sections of Division 1, and with drawings and specifications of other Divisions.
<input type="checkbox"/>	<input type="checkbox"/>	<b>3.</b> Verify the accuracy of each reference to a specifications section, drawing, detail, etc., whether by number, title, or both. Verify that such phrases as “as shown on the drawings” or “as noted in the specifications” are validated by requirements on the drawings or in the specifications.
<input type="checkbox"/>	<input type="checkbox"/>	<b>4.</b> Require compliance with all applicable codes, laws, regulations, standards, etc.

# ELECTRICAL SPECIFICATION GUIDELINES

## 26 0000 - Basic Electrical Requirements

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify that the requirements of the contract documents govern where superior to codes, laws, regulations, standards, etc.,
<input type="checkbox"/>	<input type="checkbox"/>	6. Specify, directly or by reference, temporary electrical systems for construction (lighting, power, and special electrical systems).
<input type="checkbox"/>	<input type="checkbox"/>	7. Specify, directly or by reference, electrical alternates or electrical content of alternates.
<input type="checkbox"/>	<input type="checkbox"/>	8. Specify, directly or by reference, submittal requirements.
<input type="checkbox"/>	<input type="checkbox"/>	9. Require shop drawings of major items of electrical equipment, special electrical systems, and any other items of special interest or concern.
<input type="checkbox"/>	<input type="checkbox"/>	10. Require at least two sets of as-built drawings, at least one set of which is prepared at the project site as work progresses. Require the recording of all changes or deviations from the contract documents, exact location and elevation of underground conduits, duct banks and direct burial wiring, relocation of devices to avoid obstacles, routing of conduit from outlet to outlet, routing of conduit under floor, overhead, in walls or exposed, combining of circuits into common conduit, exact sizes of conduits and conductors, revisions to circuit breaker quantity or arrangement in panelboards.
<input type="checkbox"/>	<input type="checkbox"/>	11. Specify that preparation of as-built drawings does not constitute authorization to make changes unknown to or unapproved by Owner or Owner's representative.
<input type="checkbox"/>	<input type="checkbox"/>	12. Require at least two sets of operation and maintenance manuals, each containing approved shop drawings; operation and maintenance information; and as-built drawings.
<input type="checkbox"/>	<input type="checkbox"/>	13. Provide a one line diagram in the electrical drawings of the power distribution system to show, at a minimum, distribution from source(s) (utility and emergency) to major loads (panelboards, motor control centers, large motors, significant control centers (dimming, etc.) via transformers, switchboards, distribution panelboards, transfer switches, safety and disconnect switches, etc.
<input type="checkbox"/>	<input type="checkbox"/>	14. Use standard ANSI electrical symbols on all drawings. Use industry standard symbols where ANSI standards do not exist, or create symbols where neither exists. Provide a symbol legend in the electrical drawings for all symbols used.
<input type="checkbox"/>	<input type="checkbox"/>	15. Make clear in the specifications and on the drawings that the electrical work is to result in complete operational electrical systems including incidental equipment and accessories reasonably expected for a complete system but not necessarily itemized in the drawings and specifications.
<input type="checkbox"/>	<input type="checkbox"/>	16. Require the Contractor to test and supervise the initial operation of all equipment and special systems.
<input type="checkbox"/>	<input type="checkbox"/>	17. Require the Contractor to demonstrate the equipment and special systems to the facilities personnel, and instruct them in operation and maintenance.
<input type="checkbox"/>	<input type="checkbox"/>	18. Clearly indicate the extent to which electrical drawing dimensions can be scaled or are diagrammatic. Where applicable, refer the Contractor to Architectural and other drawings that contain location details and dimensions.
<input type="checkbox"/>	<input type="checkbox"/>	19. Provide separate, enclosed electrical equipment room(s) on each floor of the building, located, sized, and arranged to facilitate operation and maintenance.
<input type="checkbox"/>	<input type="checkbox"/>	20. Provide scaled layout drawings of electrical rooms showing that equipment fits in the space and provides code compliant clearances.
<input type="checkbox"/>	<input type="checkbox"/>	21. Require electrical equipment to be installed in a manner that prevents noise and vibration transfer to surrounding space. Refer to the State of Minnesota Building Design Guidelines (B3-MSBG), Section I.7 Effective Acoustics for performance criteria.
<input type="checkbox"/>	<input type="checkbox"/>	22. Require doors on vault rooms containing medium or high voltage equipment to be self-locking.
<input type="checkbox"/>	<input type="checkbox"/>	23. Limit electrical equipment in tunnels to essential lighting, conduit enclosed wiring, and special system components such as smoke/fire detectors, security detectors, etc.
<input type="checkbox"/>	<input type="checkbox"/>	24. Prohibit the installation of conduits and wiring in air ducts and plenums other than ceiling return-air plenums.

## ELECTRICAL SPECIFICATION GUIDELINES

### 26 0000 - Basic Electrical Requirements

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	25. After the conclusion of bidding, incorporate all addendum items into a post bid set of drawings, specifications, and supporting studies and reports. Submit the post bid documents to the State within 30 calendar days after bidding is concluded.
<input type="checkbox"/>	<input type="checkbox"/>	26. Prepare a short circuit and fuse/circuit breaker coordination study to be the basis for selection of all electrical overcurrent devices to assure proper equipment and personnel protection. Submit the study to the State with the post bid drawings and specifications.
<input type="checkbox"/>	<input type="checkbox"/>	27. Coordinate heights of equipment with facility maintenance staff. Avoid designs where access lifts cannot reach.
<input type="checkbox"/>	<input type="checkbox"/>	28. Schedule a meeting with the Department of Administration's Energy Management Services to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued. .Specify that the contractor(s) shall be required to provide necessary documentation, including invoices, required by the utility(s) for the purpose of processing and approving rebate applications. And that the contractor(s) shall work with the Department of Administration's Energy Management Services to assist the State in obtaining all possible utility rebates on the project.
<input type="checkbox"/>	<input type="checkbox"/>	29. At the State Project Manager's discretion, Commissioning may start at any point of time during the Project; such as, at the beginning of construction in lieu of the beginning of design. Reference the State of Minnesota Sustainable Building Guidelines (B3-MSBG) Sections P.4 and P.5 for required and recommended commissioning activities. However, if LEED certification will be sought for a project, the commissioning activities will have to follow LEED requirements for prerequisite and/or enhanced commissioning.

### 26 0000 - Basic Electrical Materials and Methods

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Require all electrical materials and equipment to be listed and labeled by UL where UL provides such listing and labeling.
<input type="checkbox"/>	<input type="checkbox"/>	2. Coordinate with state staff utility personnel to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify copper buses, connection devices, and conductors.
<input type="checkbox"/>	<input type="checkbox"/>	4. Require all transformers to be dry type, copper wound, cast coil, adequately vented for proper cooling.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify appropriately K-rated transformers.
<input type="checkbox"/>	<input type="checkbox"/>	6. Incorporate oversized neutral conductors in the design where needed to accommodate harmonic currents caused by electronic equipment such as elevator digital controls, variable speed drives, computers, lighting controls, electronic ballasts, etc.
<input type="checkbox"/>	<input type="checkbox"/>	7. Coordinate and provide wiring for fire pumps and associated controls and alarms.
<input type="checkbox"/>	<input type="checkbox"/>	8. Coordinate and clearly identify responsibility for final electrical connections at electrically powered equipment.

# ELECTRICAL SPECIFICATION GUIDELINES

## 26 0000 - Basic Electrical Materials and Methods

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	9. Consult with the facility or user agency to determine whether emergency power is to be provided by generation or batteries.
<input type="checkbox"/>	<input type="checkbox"/>	10. Provide detailed equipment specifications, rather than performance specifications, for emergency generation.
<input type="checkbox"/>	<input type="checkbox"/>	11. Require wiring for street lighting services to be located within 24" of inner curb lines.
<input type="checkbox"/>	<input type="checkbox"/>	12. Require wiring for site lighting to be located within 6 inches of walkways.
<input type="checkbox"/>	<input type="checkbox"/>	13. Coordinate and clearly specify the extent to which the electrical subcontractor is responsible for cutting and patching.
<input type="checkbox"/>	<input type="checkbox"/>	14. Require electrical equipment to be clean inside and out when presented for acceptance.
<input type="checkbox"/>	<input type="checkbox"/>	15. Require scratches on painted surfaces of electrical equipment to be neatly repaired with paint of matching quality and color.
<input type="checkbox"/>	<input type="checkbox"/>	16. Require firestopping at every location where electrical work penetrates fire and smoke separations.
<input type="checkbox"/>	<input type="checkbox"/>	17. Specify firestopping materials and methods appropriate to conditions that will be encountered on this project. Identify and provide installation details. List specific UL or other approved test assembly numbers.
<input type="checkbox"/>	<input type="checkbox"/>	18. Specify all floor mounted electrical equipment to be placed on concrete housekeeping pads. Pads shall be a minimum of 4 full inches thick. Pads shall be one to four inches larger than the footprint of the supported equipment.

## 26 0 – Conduit

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Require wiring in Type I and Type II structures to be run in metal raceways.
<input type="checkbox"/>	<input type="checkbox"/>	2. Limit use of flexible metal conduit in Type I and Type II structures to connections to be recessed lighting fixtures, motors, and equipment subject to or sources of motion or vibration.
<input type="checkbox"/>	<input type="checkbox"/>	3. Limit length of flexible metal conduit to six feet or less, except for lighting fixture whips, which may be longer if allowed by governing codes.
<input type="checkbox"/>	<input type="checkbox"/>	4. Require flexible metal conduit used in outdoor, wet, or damp locations and for final electrical connections to dry-type transformers to be liquid tight flexible metal conduit.
<input type="checkbox"/>	<input type="checkbox"/>	5. Require an insulated equipment grounding conductor in every piece of flexible metal conduit.
<input type="checkbox"/>	<input type="checkbox"/>	6. Rigid nonmetallic conduit may be specified for exterior branch circuit wiring installed below grade.
<input type="checkbox"/>	<input type="checkbox"/>	7. Specify metal sweeps and elbows for nonmetallic conduits.
<input type="checkbox"/>	<input type="checkbox"/>	8. Require an insulated equipment grounding conductor in each run of nonmetallic conduit.
<input type="checkbox"/>	<input type="checkbox"/>	9. Require buried conduits to pitch away from buildings.
<input type="checkbox"/>	<input type="checkbox"/>	10. Identify methods for buried conduit drainage. Design conduits to drain into pits, pull boxes, or hand holes.

# ELECTRICAL SPECIFICATION GUIDELINES

## 26 0 – Conduit

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	11. Require a pull cord or wire, as strong as #16 galvanized wire and of a material that maintains strength over time, in every run of empty conduit provided for future work.
<input type="checkbox"/>	<input type="checkbox"/>	12. Require buried conduits to have at least 24 inches of cover from top of conduit to finished grade.
<input type="checkbox"/>	<input type="checkbox"/>	13. Require buried metallic conduits to be protected with a wrap or coating that prevents oxidation and deterioration.
<input type="checkbox"/>	<input type="checkbox"/>	14. Avoid routing conduits under walkways, driving surfaces, or large paved areas unless absolutely necessary. Where necessary to do so, use 2-inch or larger rigid steel sleeves under every walkway, driving surface, and large paved area.
<input type="checkbox"/>	<input type="checkbox"/>	15. Specify steel and malleable iron conduit fittings. Do not allow thinwall indenter type fittings.
<input type="checkbox"/>	<input type="checkbox"/>	16. Specify conduit straps, hangers, clamps, inserts, and anchors. Require UL listed products, where such exist, compatible with the environment in which installed.
<input type="checkbox"/>	<input type="checkbox"/>	17. Specify steel expansion type anchors. Do not allow lead, fiber, wood, or plastic anchors.
<input type="checkbox"/>	<input type="checkbox"/>	18. Require concealed conduits in Type I and Type II structures to be 3/4-inch or larger, except, 1/2-inch conduit may be used in walls 2-1/2 inches or less in thickness or when the number of conductors is limited to 3 at the final terminal point of the device and equipment served. Flexible metal conduit in lengths of six feet or less used for three-wire (line, neutral, and equipment ground) light fixture whips may be 3/8-inch.
<input type="checkbox"/>	<input type="checkbox"/>	19. Require surface raceway systems enclosing devices to be grounded with a system of grounding conductors electrically connecting together all devices, the raceway, and the building ground system.
<input type="checkbox"/>	<input type="checkbox"/>	20. Require all raceway to be supported by structure. Do not allow raceway to be supported from other raceway.
<input type="checkbox"/>	<input type="checkbox"/>	21. Require all conduits in finished space to be concealed.
<input type="checkbox"/>	<input type="checkbox"/>	22. Require each section or fitting of a cable tray system to be bonded to the next fitting or section with a copper bonding jumper.

## 26 0 – Low-Voltage Power Conductors and Cables (600V and Less)

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Require all electrical conductors to be soft drawn, stranded, annealed copper.
<input type="checkbox"/>	<input type="checkbox"/>	2. Require lighting and power conductors to be #12 or larger.
<input type="checkbox"/>	<input type="checkbox"/>	3. Do not allow conductors to be drawn into conduit until plastering and tile work are complete and conduit has been thoroughly swabbed out.
<input type="checkbox"/>	<input type="checkbox"/>	4. Require conductors installed in flexible metal conduit at terminal connections of rotating, vibrating, or moveable equipment to be stranded.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify Type THHN, THWN, or XHHW insulation for branch circuit conductors smaller than #6 AWG.
<input type="checkbox"/>	<input type="checkbox"/>	6. Specify Type THW insulation for feeder conductors larger than #8 AWG.
<input type="checkbox"/>	<input type="checkbox"/>	7. Specify electrically insulated, spring action, corrosion resistant, twist-on connectors for splicing conductors smaller than #6 AWG.
<input type="checkbox"/>	<input type="checkbox"/>	8. Specify copper compression connectors, or lugs similar to Burndy "Hydent", for joining or terminating conductors larger than #8. Require joins or splices to be covered with electrical insulating tape to a thickness equal to the original conductor.
<input type="checkbox"/>	<input type="checkbox"/>	9. Require bus duct to have copper bus.
<input type="checkbox"/>	<input type="checkbox"/>	10. Require plug-in and feeder bus duct rated 225 amps and greater to have built-in ground bus.
<input type="checkbox"/>	<input type="checkbox"/>	11. Identify and size all feeder circuits on the electrical drawings.

## ELECTRICAL SPECIFICATION GUIDELINES

### 26 0000 – Low Voltage Primary Cable Terminations And Splices

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Require the Contractor to use only adequately trained personnel to perform primary cable terminations and to demonstrate this adequacy, prior to any work, by providing training certificates acceptable to the State.
<input type="checkbox"/>	<input type="checkbox"/>	2. Require the Contractor to perform and pass hipo testing of primary cables before performing final connections to equipment.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify single conductor terminations wherever possible to enable separate maintenance of each cable.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify terminations rated for the amp capacity of and designed for the exact type and dimensions of the primary cable being installed. Identify the Contractor's responsibility to coordinate the recommendations of the manufacturers of materials used.
<input type="checkbox"/>	<input type="checkbox"/>	5. Require submittals to identify detailed termination and splicing installation procedures and requirements complete with construction drawings and associated material lists.
<input type="checkbox"/>	<input type="checkbox"/>	6. Require primary cables to be color coded using an orange color band for Phase A, yellow for Phase B, and tan for Phase C.
<input type="checkbox"/>	<input type="checkbox"/>	7. If owner is providing powered furniture systems under separate contract, specify primary power connections to these systems.

### 26 2000 – Wiring Devices

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify the desired quality level for devices using manufacturer and catalog number or equivalent means. Avoid the use of general terms such as “commercial grade” without clearly defining such terms to assure that all prospective suppliers will provide the desired quality level.

### 26 2000 – Wiring Devices – continued

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify that there shall be no feed-through wiring from ground fault circuit interrupter (GFCI) receptacles to other receptacles except as specifically noted on the drawings.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify single, three-way, and four-way toggle switches to be positioned so that the switched device is off when all switch handles are in the down position.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify device color.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify cover plate material and color.
<input type="checkbox"/>	<input type="checkbox"/>	6. Require standard straight blade duplex and GFCI duplex receptacles to be rated for 20 amps.
<input type="checkbox"/>	<input type="checkbox"/>	7. Specify lighting and general-purpose wall toggle switches to be 20-amp quiet type.
<input type="checkbox"/>	<input type="checkbox"/>	8. Specify weatherproof covers for outdoor receptacles that are wet location listed when in use.
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify devices installed on opposite sides of the same wall to be offset from each other by at least six inches. Do not allow direct back-to-back installation.
<input type="checkbox"/>	<input type="checkbox"/>	10. Specify devices to be installed plumb and level.
<input type="checkbox"/>	<input type="checkbox"/>	11. Specify screw-terminal devices. Do not allow spring loaded or other quick connections to be used.
<input type="checkbox"/>	<input type="checkbox"/>	12. Specify each receptacle device to be tested for proper polarity and grounding.
<input type="checkbox"/>	<input type="checkbox"/>	13. Specify wall box dimming switches that have separate dimming and on/off controls so that the switch can be turned on and off without disturbing the dimming setting.
<input type="checkbox"/>	<input type="checkbox"/>	14. Specify wall box dimmer switches to achieve desired rating when multiple switches are ganged.
<input type="checkbox"/>	<input type="checkbox"/>	15. Do not allow shared neutral conductors on the load side of wall box dimming switches.

## ELECTRICAL SPECIFICATION GUIDELINES

- |                          |                          |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 16. Specify an equipment grounding conductor for each device circuit. Require the device grounding terminal to be connected to the equipment grounding conductor. |
|--------------------------|--------------------------|---|

### 26 0000 – Medium-Voltage Electrical Distribution

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Determine whether the electrical service to the building is a medium voltage primary service or a low voltage secondary service.
<input type="checkbox"/>	<input type="checkbox"/>	2. Design and specify a medium voltage primary underground electrical service to an appropriate number of primary switches, transformers, and distribution switchboards as separate components or packaged into unit substations.
<input type="checkbox"/>	<input type="checkbox"/>	3. Avoid overhead primary systems where possible. Where an overhead system is necessary, submit sag and tension charts to the State Project Manager.
<input type="checkbox"/>	<input type="checkbox"/>	4. Indicate line and grade on the drawings for underground and overhead electrical installations. Provide plan and elevation (profile) views of primary service showing other construction, existing below and above grade utilities, and conditions which may be encountered during installation.
<input type="checkbox"/>	<input type="checkbox"/>	5. Require top of primary electrical duct bank to be maintained at a depth of 30 inches below finished grade except where prevented by site conditions such as underground obstructions or where traversing to duct bank opening in a manhole or building electrical vault.
<input type="checkbox"/>	<input type="checkbox"/>	6. Consult with and receive approval from the State Project Manager on the source of primary service, type of system, sequence of primary service components, and types of material and equipment to be used before schematic design is started. Provide a preliminary estimate of the building coincident kilowatt demand with the design development documents.
<input type="checkbox"/>	<input type="checkbox"/>	7. Where the primary electric service is from a public utility company, coordinate and specify the point of connection to the utility system and the method by which this is accomplished.
<input type="checkbox"/>	<input type="checkbox"/>	8. Include in the specifications the statement, "Upon installation, all electrical equipment shall be connected, switched, and energized according to the requirements of applicable State and Federal OSHA Standards."

### 26 0000 - Primary Cable Conductors

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify ethylene-propylene rubber or crosslinked polyethylene insulation for underground primary cable phase conductors.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify single conductor neutral, Type THW or THHN/THWN, copper, 600 volt, same size as phase conductor.
<input type="checkbox"/>	<input type="checkbox"/>	3. Require metallic drain wire insulation shielding.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify 40 per cent maximum duct and conduit fill.
<input type="checkbox"/>	<input type="checkbox"/>	5. Obtain the State's approval of primary distribution system cable sizes prior to completion of construction documents.
<input type="checkbox"/>	<input type="checkbox"/>	6. Show, on the electrical drawings, routing of cable, supports, splice locations, and grounding locations of cable sheath, cable shielding, and neutral.
<input type="checkbox"/>	<input type="checkbox"/>	7. Specify procedures, including cold weather procedures, for installing underground cable.
<input type="checkbox"/>	<input type="checkbox"/>	8. Identify criteria and values for testing insulation of new primary cables after installation, but prior to connection to the system.
<input type="checkbox"/>	<input type="checkbox"/>	9. Obtain the State's approval before specifying testing of existing primary cables.
<input type="checkbox"/>	<input type="checkbox"/>	10. Require the Contractor to provide notification when systems are ready for testing, perform specified testing, provide a copy of each test report, and pay for all testing, including retesting after test failures.

# ELECTRICAL SPECIFICATION GUIDELINES

## 26 0000 - Primary Cable Terminations And Splices

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Require the Contractor to use only adequately trained personnel to perform primary cable terminations and to demonstrate this adequacy, prior to any work, by providing training certificates acceptable to the State.
<input type="checkbox"/>	<input type="checkbox"/>	2. Require the Contractor to perform and pass hipo testing of primary cables before performing final connections to equipment.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify single conductor terminations wherever possible to enable separate maintenance of each cable.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify terminations rated for the amp capacity of and designed for the exact type and dimensions of the primary cable being installed. Identify the Contractor's responsibility to coordinate the recommendations of the manufacturers of materials used.
<input type="checkbox"/>	<input type="checkbox"/>	5. Require submittals to identify detailed termination and splicing installation procedures and requirements complete with construction drawings and associated material lists.
<input type="checkbox"/>	<input type="checkbox"/>	6. Require primary cables to be color coded using an orange color band for Phase A, yellow for Phase B, and tan for Phase C.
<input type="checkbox"/>	<input type="checkbox"/>	7. If owner is providing powered furniture systems under separate contract, specify primary power connections to these systems.

## 26 2000 – Low Voltage Switchgear

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify metal enclosed, freestanding, fused/non-fused air interrupter type primary switchgear.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify externally mounted load interrupter operating handles with kirk key interlocking, accommodation for padlocking in both open and closed position, and plainly visible open and closed switch position indication.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify provisions for manually transferring load to an alternate primary feeder where an alternate feeder is provided.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify primary switchgear and parts (including cables where used for bussing) designed and constructed to withstand and protect against the stresses associated with local utility fault conditions.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify doors on switch sections equipped with safety glass observation windows sized and located so the open and closed positions of load interrupter blades are readily discernible from the exterior of the enclosure.
<input type="checkbox"/>	<input type="checkbox"/>	6. Require primary switchgear sections to be completely front accessible, with front-connected interior components replaceable from the front. Highlight this feature on approved shop drawings.
<input type="checkbox"/>	<input type="checkbox"/>	7. Require phase busses to be full BIL voltage insulated and connections booted.
<input type="checkbox"/>	<input type="checkbox"/>	8. Specify full side barriers between adjacent switchgear sections with full air space voltage insulation around bus passing through barriers.
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify the phase arrangement on three-phase busses to be A-B-C from left to right as viewed from the front of the switchgear.
<input type="checkbox"/>	<input type="checkbox"/>	10. Specify requirements for supporting incoming and interior primary cable conductors.
<input type="checkbox"/>	<input type="checkbox"/>	11. Specify power fuse assemblies of a type that allows the fuse assembly to be disconnected from the bus with a hook stick, with the pivot point of the assembly on the load side so that fuses are de-energized when the assembly is in the open position.
<input type="checkbox"/>	<input type="checkbox"/>	12. Require fuses for protection of transformers to be installed only in the feed point of the transformer.
<input type="checkbox"/>	<input type="checkbox"/>	13. Require a fuse handling tool and hook stick for each switchgear lineup, mounted in a location accessible to equipment.

## ELECTRICAL SPECIFICATION GUIDELINES

### 26 2000 – Low Voltage Switchgear

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	14. Specify a minimum of 3 spare fuses or fuse refills for each size and type installed, to be furnished for each service location.
<input type="checkbox"/>	<input type="checkbox"/>	15. Specify and require these equipment ratings to be identified in the submittals and imprinted on a metal nameplate attached to the outside of each switchgear section containing a set of power fuses: (1) Maximum continuous ampere rating of the power fuse holder, (2) catalog number of installed fuse or fuse refill unit, (3) ampere and voltage rating of the installed fuse refill unit, (4) manufacturer's name, and (5) manufacturer's type or style number.
<input type="checkbox"/>	<input type="checkbox"/>	16. Specify and require these equipment ratings to be identified in the submittals and imprinted on a metal nameplate attached to the outside of each switchgear assembly: (1) manufacturer's of switchgear assembly name and drawing number, (2) nominal voltage (KV), (3) maximum design voltage (KV), (4) basic impulse level (BIL) (KV), (5) main bus continuous current (Amps), (6) ground bus continuous current (Amps), (7) momentary (Amps).
<input type="checkbox"/>	<input type="checkbox"/>	17. Specify and require these equipment ratings to be identified in the submittals and imprinted on a metal nameplate attached to the outside of each switchgear section containing a load interrupter switch: (1) Continuous load current (amps), (2) Load current interrupting (amps), (3) Momentary (10 cycle, Rms., Asym) (amps), (4) Fault closing (Rms., Asym) (amps), (5) Switch Manufacturer's name, (6) Manufacturer's catalog number.
<input type="checkbox"/>	<input type="checkbox"/>	18. Require shop drawings and operation and maintenance manuals to include data sheets providing maximum allowable values for contact resistance across switch, maximum allowable values for A.C. and D.C. high voltage field test, and time-current curves of the high voltage rated power fuses.
<input type="checkbox"/>	<input type="checkbox"/>	19. Require a 3/8-inch wide white enamel (verify color with the State) mimic bus to be painted on the front of the primary switchgear to identify busses, switches, fuses, and other major components.
<input type="checkbox"/>	<input type="checkbox"/>	20. Require the mimic bus layout to be included in the submittals.
<input type="checkbox"/>	<input type="checkbox"/>	21. Locate primary switchgear intended to interrupt load currents on transformer banks within vaults near the entrance to vaults so it can be operated without passing other vault installations.
<input type="checkbox"/>	<input type="checkbox"/>	22. Specify a 30-inch or wider aisle behind primary switchgear having nonremovable back covers.
<input type="checkbox"/>	<input type="checkbox"/>	23. Specify code compliant working space behind primary switchgear with removable back covers.
<input type="checkbox"/>	<input type="checkbox"/>	24. Locate primary switchgear having switches controlling incoming primary feeders convenient to vault exit(s) and, where possible, closer to the exit(s) than the other primary equipment.
<input type="checkbox"/>	<input type="checkbox"/>	25. Identify criteria for Contractor acceptance testing of main switch contact resistance, including the requirements that the switch be operated at least 5 times with State personnel observing the operations and that test data be included in the operation and maintenance manuals.

### 26 2000 - Transformer And Switchgear Rooms/Vaults

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Locate transformer and primary switchgear vaults to allow convenient removal and replacement of transformers and other equipment, especially heavy and bulky equipment, without transporting it through the building.
<input type="checkbox"/>	<input type="checkbox"/>	2. Provide a plan in the drawings showing the route for transporting equipment between the vault(s) and outdoor loading/delivery location(s).
<input type="checkbox"/>	<input type="checkbox"/>	3. Design lighting and receptacle circuits in transformer and primary switchgear vaults to be served by emergency power.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify vault doors to be self-locking.

# ELECTRICAL SPECIFICATION GUIDELINES

## 26 2000 - Transformer And Switchgear Rooms/Vaults

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	5. Coordinate with Division 15 for design of adequate ventilation for transformers and other heat producing electrical equipment. Adequate ventilation includes keeping leaves and dirt out of the vault, filtering ventilation air if necessary to prevent dust and dirt infiltration of dry type transformers, locating air intakes to avoid introduction of objectionable materials such as exhaust gases, limiting vault temperature to 40 degrees C with an outdoor temperature of 35 degrees C.
<input type="checkbox"/>	<input type="checkbox"/>	6. Locate dry type transformers at least 12 inches from walls.
<input type="checkbox"/>	<input type="checkbox"/>	7. Design vaults to have two personnel entrances/exits.
<input type="checkbox"/>	<input type="checkbox"/>	8. Require all floor mounted electrical equipment to be placed on 4-inch thick concrete housekeeping pads.
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify a rectangular warning sign, not smaller than 9 inches high by 12 inches wide, to be mounted on the outside of each vault entrance door, and displaying the warning " <b>DANGER -HIGH VOLTAGE - KEEP OUT</b> ".
<input type="checkbox"/>	<input type="checkbox"/>	10. Show vault ground bus bars on the electrical drawings, installed on the inside of vault perimeter walls, preferably six feet above the floor. Provide one 3-foot or longer section of ground bus bar for each primary switchgear lineup, main service transformer, or secondary switchboard in the vault.

## 26 0000 - Main Service Transformers

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify cast coil, liquid filled, or dry type transformers up to 15 KV voltage class. Base selection on reliability, economic, and operational considerations. Report transformer choices and rationale for those choices in the Design Development documents.
<input type="checkbox"/>	<input type="checkbox"/>	2. Choose transformer location based on ease of removal, replacement, maintenance, provision for ventilation, economical operation, minimizing problems resulting from noise generated by the transformer, minimizing problems resulting from a transformer failure, and minimizing electromagnetic field interference with office or operational electronics.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify transformers connected primary Delta to secondary Wye.
<input type="checkbox"/>	<input type="checkbox"/>	4. Limit main service three-phase transformer bank ratings to 1500 KVA or less.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify a laminated plastic identification plate with 1/2-inch high white letters on a black background for each transformer.
<input type="checkbox"/>	<input type="checkbox"/>	6. Require all main service transformers to have two 2.5 per cent taps above and two 2.5 per cent taps below nominal voltage.
<input type="checkbox"/>	<input type="checkbox"/>	7. Avoid specifying liquid filled transformers where there is a reasonable alternative.
<input type="checkbox"/>	<input type="checkbox"/>	8. If a liquid filled transformers is specified, locate it within a curbed area to retain the liquid contents in event of a leak.
<input type="checkbox"/>	<input type="checkbox"/>	9. Require transformers used for building service to have a minimum 95 KV BIL rating without the use of external devices.
<input type="checkbox"/>	<input type="checkbox"/>	10. Require cast coil and dry type transformers to be listed by a qualified testing laboratory such as UL.
<input type="checkbox"/>	<input type="checkbox"/>	11. Require cast coil and dry type transformer insulation systems to have a minimum rating of 220 degrees C with average winding temperature rise not to exceed 115 degrees C above a 40 degrees C ambient.
<input type="checkbox"/>	<input type="checkbox"/>	12. Specify transformer dimensions, weight, voltage ratings, impedance, excitation current, no load loss, efficiency (at full, 3/4, 1/2, and 1/4 load; provide certified copy in each operation and maintenance manual), per cent regulation (at full load, 80% P.F., and at full load, 100% P.F.), full load losses, basic impulse level (BIL) of primary and secondary windings, nameplate (location, layout, and entries), location of accessories, noise level at full load, and tap arrangement and percentage of nominal voltages at different tap settings.
<input type="checkbox"/>	<input type="checkbox"/>	13. Specify transformer acceptance tests to be performed on site, prior to energizing.
<input type="checkbox"/>	<input type="checkbox"/>	14. Specify transformer windings shall be copper only.

# ELECTRICAL SPECIFICATION GUIDELINES

## 26 0000 - Underground Primary Power Distribution

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Require ducts for underground primary electric service to be smooth-wall polyvinyl chloride (PVC) conduit rated for underground installation encased in a reinforced concrete envelope.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify means to attach the formed raceway system to the bottom of the trench to prevent the tendency of "floating" to the surface of freshly poured concrete. Preferred attachment is to a pre-poured "sidewalk" on the bottom of the trench upon which forms can be built after the duct cells are attached.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify a minimum fall of 6 inches per 100 feet of duct from buildings and toward manholes.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify ducts equipped with end bells at conduit terminations such as at manholes, equipment pads, and building walls.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify ducts sized at 4 inches minimum raceway.
<input type="checkbox"/>	<input type="checkbox"/>	6. Require all ducts to be encased in a continuously reinforced concrete envelope not less than 3 inches beyond any surface of the duct, using plastic spacers installed at intervals of eight feet or less, to produce and secure a uniform spacing.
<input type="checkbox"/>	<input type="checkbox"/>	7. Rectangular is the preferred shape for manholes. Design rectangular manholes to suit project conditions.
<input type="checkbox"/>	<input type="checkbox"/>	8. Show duct bank entrance locations at each manhole on electrical drawings.
<input type="checkbox"/>	<input type="checkbox"/>	9. Base round manhole design on an inside diameter of at least 8 feet.

## 26 0000 - Electric Service And Distribution (600 Volts And Below)

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Size feeders between transformers and main switchboards for at least 125 per cent of full load transformer capacity.
<input type="checkbox"/>	<input type="checkbox"/>	2. Size secondary service and distribution conductors to provide for load growth during the life of the building. Provide recommendations during Design Development. Specifically address potential year-round cooling as required due to computer heat loading.
<input type="checkbox"/>	<input type="checkbox"/>	3. Prohibit splicing of underground service conductors between the transformer vault or pad mounted transformer and the main protective device.
<input type="checkbox"/>	<input type="checkbox"/>	4. Design a code-required ground fault protection system to provide minimum possibility of power outage to critical building facilities. Consider a coordinated system on the feeders to permit incremental settings to provide reasonable continuity of electric service. Verify ground fault protection for personnel protection.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify drawout mounted ground fault relays or include provisions for testing without service interruptions.
<input type="checkbox"/>	<input type="checkbox"/>	6. Require ground fault sensors to be set at "0" time delay and "minimum" ground current flow during construction.
<input type="checkbox"/>	<input type="checkbox"/>	7. Specify ground fault sensor time delay and ground current flow settings to be used when construction is completed.
<input type="checkbox"/>	<input type="checkbox"/>	8. Obtain ground fault sensor tripping curves and characteristics.
<input type="checkbox"/>	<input type="checkbox"/>	9. Require the Contractor to test the system ground fault performance when first installed, submit a written record of the test, and include a copy in each operation and maintenance manual.
<input type="checkbox"/>	<input type="checkbox"/>	10. Specify the criteria and method for testing ground fault protection in the field.

## 26 0000 - Power Factor Correction

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Coordinate with the State to determine whether any secondary voltage power factor correction will be needed.

# ELECTRICAL SPECIFICATION GUIDELINES

## 26 2000 – Electric Service Entrance

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify a distribution switchboard for each separate new building.
<input type="checkbox"/>	<input type="checkbox"/>	2. Locate distribution switchboards in dry, adequately ventilated rooms free of other mechanical equipment, piping, or duct work not associated with the electrical service. Prohibit the installation of piping, duct work, etc., in ceiling or furred space cavities below the structural ceiling of a switchboard room.
<input type="checkbox"/>	<input type="checkbox"/>	3. Require distribution switchboards to be mounted on 4-inch thick concrete housekeeping pads.
<input type="checkbox"/>	<input type="checkbox"/>	4. Require distribution switchboards to be aligned and accessible front and back, and located so that additional sections can be added.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify a main bus extending through all sections of a distribution switchboard with a capacity at least equal to the frame rating of the main protective device.
<input type="checkbox"/>	<input type="checkbox"/>	6. Specify full height section bus in each distribution switchboard section.
<input type="checkbox"/>	<input type="checkbox"/>	7. Size the main bus and the main protective device of a distribution switchboard to allow for at least 25 per cent future growth. Verify the future growth allowance with the State.
<input type="checkbox"/>	<input type="checkbox"/>	8. Specify at least 10 per cent of the branch unit mounting space be reserved for future branch protective devices.
<input type="checkbox"/>	<input type="checkbox"/>	9. Identify distribution switchboards on the drawings.
<input type="checkbox"/>	<input type="checkbox"/>	10. Require circuit protective devices, circuit controlling devices, and meters on distribution switchboards to be identified by the circuit served.
<input type="checkbox"/>	<input type="checkbox"/>	11. Fully specify distribution switchboard characteristics, including fault current ratings of total switchboard assembly.
<input type="checkbox"/>	<input type="checkbox"/>	12. Require each distribution switchboard section to have an easy-to-read, permanently attached identification plate containing complete switchboard characteristics including fault current ratings.
<input type="checkbox"/>	<input type="checkbox"/>	13. Provide, on the electrical drawings, a bus diagram of each distribution switchboard. Include all components. Provide an accompanying schedule on the same sheet showing voltage and current ratings for all devices in the switchboard.
<input type="checkbox"/>	<input type="checkbox"/>	14. Specify UL approved, bolted pressure type fused switches, rated 600 volts, for switchboard mounted fused switches rated 800 amps and larger.
<input type="checkbox"/>	<input type="checkbox"/>	15. Incorporate rejection feature for non-current limited fuses in which only Class "R" fuses are intended in switchboard fused switches.
<input type="checkbox"/>	<input type="checkbox"/>	16. Specify all switchboard buses to be copper only.

## 26 2000 - Switchboards

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify wiring for laboratory, kitchen, hospital, and similar equipment, including connection wiring between equipment and the distribution center serving the area.
<input type="checkbox"/>	<input type="checkbox"/>	2. Describe responsibility and coordination of work by Contractor and equipment supplier, including the requirement that rough-in locations and requirements be verified with equipment suppliers' shop drawings prior to installation of the wiring system.
<input type="checkbox"/>	<input type="checkbox"/>	3. Require equipment suppliers/installers to drill all holes and cut all openings in their equipment required to accommodate placement and connection of wiring.
<input type="checkbox"/>	<input type="checkbox"/>	4. Do not require the Contractor to do any electrical work within equipment that is normally an integral part of the equipment.

## 26 0000 – Electrical Power Monitoring

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify only one watt-hour demand meter for metering the electrical energy to a building, except where self-support facilities require sub-metering or where specifically otherwise required by the State.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify a digital read out meter with demand and pulse.

# ELECTRICAL SPECIFICATION GUIDELINES

## 26 2000 - Switchboards

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	3. Do not specify direct reading meters where current transformers are necessary.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify type, rating, and ratios of instrument transformers necessary to meter installations.
<input type="checkbox"/>	<input type="checkbox"/>	5. Require submittals to include manufacturer's catalog sheets, data sheets, wiring diagrams, multiplier ratio calculations, and installation requirements.
<input type="checkbox"/>	<input type="checkbox"/>	6. Require the watt-hour meter to have a 15 minute block-interval type demand register, re-settable from outside the meter.
<input type="checkbox"/>	<input type="checkbox"/>	7. Require watt-hour and demand registers to be digital readout type.
<input type="checkbox"/>	<input type="checkbox"/>	8. Require meters to have multiplier ratios stamped at the proper location on meter.
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify State pre-approved communications (RS-232, RS-422, RS-485 or other) if electronic metering is specified.
<input type="checkbox"/>	<input type="checkbox"/>	10. Specify one per cent accuracy for all recorded measurements except power factor, where an accuracy of two per cent is acceptable.
<input type="checkbox"/>	<input type="checkbox"/>	11. Reference the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section P.5, Operations Commissioning, with regard to energy device and system level measurement, whole building energy measurement, and submetering.

## 26 2000 – Enclosed Switches

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify horsepower rated, heavy duty safety and disconnect switches.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify safety and disconnect switch enclosures suitable for the environments in which the switches are to be installed.
<input type="checkbox"/>	<input type="checkbox"/>	3. Require safety and disconnect switches to have a door/handle interlock requiring the handle to be in the OFF position to open the door.
<input type="checkbox"/>	<input type="checkbox"/>	4. Require the handle of safety and disconnect switches to clearly indicate switch ON and OFF handle positions.
<input type="checkbox"/>	<input type="checkbox"/>	5. Require safety and disconnect switches to provide for the handle to be padlocked ON or OFF.
<input type="checkbox"/>	<input type="checkbox"/>	6. Require safety and disconnect switches to be fused.
<input type="checkbox"/>	<input type="checkbox"/>	7. Require a disconnect switch near each piece of fixed electrical equipment to facilitate removal or repair of equipment.

## 26 0000 – Grounding and Bonding for Electrical Systems

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Provide fully designed and specified grounding systems on the drawings and in the specifications rather than performance specification systems based on general conformance to the NEC.
<input type="checkbox"/>	<input type="checkbox"/>	2. Provide a facility grounding system one line diagram on the drawings.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify types of cable attachment or connection to cable, flat metal, pipes, conduits, boxes, enclosures, etc.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify individual single point grounding systems, independent from the building electrical system, to eliminate ground current flow for sensitive, specialized equipment and facilities, such as electron microscopes, instrument laboratories, lightning protection, radio frequency shielded rooms, etc.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify a system common point ground bus inside all switchboards for termination of neutral grounding conductor, main bonding jumper, equipment grounding conductors, grounding electrode conductor, and other required ground conductors.
<input type="checkbox"/>	<input type="checkbox"/>	6. Design adequate grounding of neutrals of generators, shielded isolation transformers, and regulation transformers as required for separately derived systems.
<input type="checkbox"/>	<input type="checkbox"/>	7. Specify individual grounding conductors in raceways serving data processing equipment. Conform to manufacturer recommended grounding conductor sizing. If manufacturer sizing is not available, conform to the NEC.

## ELECTRICAL SPECIFICATION GUIDELINES

### 26 0000 – Grounding and Bonding for Electrical Systems

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	8. Specify a ground bus for termination of grounding conductors in each panelboard serving data processing equipment. Determine, based on system requirements, whether the ground bus should be bonded to the panelboard enclosure or should be insulated from the panelboard enclosure and connected to ground at some other point.
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify the testing methods required to demonstrate compliance with grounding system resistance requirements.
<input type="checkbox"/>	<input type="checkbox"/>	10. Require grounding system testing to be done in the presence of the design consultant.
<input type="checkbox"/>	<input type="checkbox"/>	11. Require the grounding system test results to be tabulated and submitted to the design consultant for review and evaluation.
<input type="checkbox"/>	<input type="checkbox"/>	12. Require the grounding system test results to be included in the final project record document submittals.

### 26 2000 – Low Voltage Transformer

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Locate transformers in accessible, ventilated, cool, dry, clean locations.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify transformers suitable for the environment where installed.
<input type="checkbox"/>	<input type="checkbox"/>	3. Require dry type transformers rated 25 KVA and above to be designed for a maximum of 115 degrees C temperature rise above a 40 degrees C ambient, with an insulation system rated 220 degrees C.
<input type="checkbox"/>	<input type="checkbox"/>	4. To prevent excessive transformer winding temperatures, specify mechanical ventilation and cooling in areas where the ambient temperature is otherwise likely to rise above 40 degrees C.
<input type="checkbox"/>	<input type="checkbox"/>	5. Require transformer sound levels to be equal to or better than ANSI standards based on transformer location.
<input type="checkbox"/>	<input type="checkbox"/>	6. Protect areas requiring a very low ambient noise level, such as libraries and reading rooms, from transformer noise by specifying transformers with lower sound levels, locating transformers away from such areas, adding sound attenuating materials around transformers, or a combination of these.
<input type="checkbox"/>	<input type="checkbox"/>	7. Require submittals to include nameplate data, loss data, factory insulation test data, and instruction bulletins.
<input type="checkbox"/>	<input type="checkbox"/>	8. Specify transformer windings shall be copper only.
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify cast coil, liquid filled, or dry type transformers up to 15 KV voltage class. Base selection on reliability, economic, and operational considerations. Report transformer choices and rationale for those choices in the Design Development documents.
<input type="checkbox"/>	<input type="checkbox"/>	10. Choose transformer location based on ease of removal, replacement, maintenance, provision for ventilation, economical operation, minimizing problems resulting from noise generated by the transformer, minimizing problems resulting from a transformer failure, and minimizing electromagnetic field interference with office or operational electronics.
<input type="checkbox"/>	<input type="checkbox"/>	11. Specify transformers connected primary Delta to secondary Wye.
<input type="checkbox"/>	<input type="checkbox"/>	12. Limit main service three-phase transformer bank ratings to 1500 KVA or less.
<input type="checkbox"/>	<input type="checkbox"/>	13. Specify a laminated plastic identification plate with 1/2-inch high white letters on a black background for each transformer.
<input type="checkbox"/>	<input type="checkbox"/>	14. Require all main service transformers to have two 2.5 per cent taps above and two 2.5 per cent taps below nominal voltage.
<input type="checkbox"/>	<input type="checkbox"/>	15. Avoid specifying liquid filled transformers where there is a reasonable alternative.
<input type="checkbox"/>	<input type="checkbox"/>	16. If a liquid filled transformers is specified, locate it within a curbed area to retain the liquid contents in event of a leak.
<input type="checkbox"/>	<input type="checkbox"/>	17. Require transformers used for building service to have a minimum 95 KV BIL rating without the use of external devices.

## ELECTRICAL SPECIFICATION GUIDELINES

### 26 2000 – Low Voltage Transformer

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	18. Require cast coil and dry type transformers to be listed by a qualified testing laboratory such as UL.
<input type="checkbox"/>	<input type="checkbox"/>	19. Require cast coil and dry type transformer insulation systems to have a minimum rating of 220 degrees C with average winding temperature rise not to exceed 115 degrees C above a 40 degrees C ambient.
<input type="checkbox"/>	<input type="checkbox"/>	20. Specify transformer dimensions, weight, voltage ratings, impedance, excitation current, no load loss, efficiency (at full, 3/4, 1/2, and 1/4 load; provide certified copy in each operation and maintenance manual), per cent regulation (at full load, 80% P.F., and at full load, 100% P.F.), full load losses, basic impulse level (BIL) of primary and secondary windings, nameplate (location, layout, and entries), location of accessories, noise level at full load, and tap arrangement and percentage of nominal voltages at different tap settings.
<input type="checkbox"/>	<input type="checkbox"/>	21. Specify transformer acceptance tests to be performed on site, prior to energizing.
<input type="checkbox"/>	<input type="checkbox"/>	22. Specify transformer windings shall be copper only.

### 26 20000000 - Panelboards

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Require panelboard enclosures to be at least 20 inches wide and 5.75 inches deep.
<input type="checkbox"/>	<input type="checkbox"/>	2. Require panelboard door trim to be installed plumb, square, and true with oval (truss) head screws inserted into tapped holes in enclosure flanges.
<input type="checkbox"/>	<input type="checkbox"/>	3. Require each panelboard section to have a clear, plastic-covered, typed circuit directory mounted in a metal card holder on the inside of the hinged front door.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify bolt-on circuit breakers attached to the panelboard bus with machine screws.
<input type="checkbox"/>	<input type="checkbox"/>	5. Require circuit breaker current ratings to be engraved in easy to read numbers on each toggle handle (each common trip handle on multiple pole breakers) and clearly visible without the need to remove a cover.
<input type="checkbox"/>	<input type="checkbox"/>	6. Require circuit breakers of the same frame size and number of poles to be interchangeable and removable from the front of the equipment without disturbing adjacent units.
<input type="checkbox"/>	<input type="checkbox"/>	7. Require circuit breakers to have trip indicating feature that is not visible when the breaker is in the ON or OFF position and clearly visible when the breaker is tripped.
<input type="checkbox"/>	<input type="checkbox"/>	8. Specify circuit breaker short circuit interruption current rating.
<input type="checkbox"/>	<input type="checkbox"/>	9. Require circuit breakers to be full height. Do not allow half-height, space saver, or tandem breakers.
<input type="checkbox"/>	<input type="checkbox"/>	10. Do not allow panelboards to be attached to switchboard structures.
<input type="checkbox"/>	<input type="checkbox"/>	11. Require spare conduits stubbed into the nearest accessible ceiling space from each flush recessed panelboard for future additional wiring. Provide up to four spare conduits based on one spare conduit for each single pole circuit breaker spare or space.

### 26 2000 – Fuses

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify each size and type of fuse required.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify non-renewable, dual element cartridge type fuses.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify current limiting fuses for coordination purposes and circuit breaker protection.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify rejection type fuses and fuseholders wherever available in the sizes and types required.
<input type="checkbox"/>	<input type="checkbox"/>	5. Require three spare fuses for each type and size provided for the project.
<input type="checkbox"/>	<input type="checkbox"/>	6. Specify a wall mounted cabinet for spare fuses with separate compartments for each fuse size. Size cabinet to meet project requirements.

# ELECTRICAL SPECIFICATION GUIDELINES

## 26 2000 - Motor Control Centers

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Require motor starter switches with thermal overloads to be installed outside cabinet unit heater and enclosed unit ventilator enclosures. Clearly show locations of these switches on the drawings. Specify key operated switches where exposure to the public is a problem.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify a motor control center (MCC) in areas where there are eight or more three phase motors.
<input type="checkbox"/>	<input type="checkbox"/>	3. Require MCC bus work to be braced to withstand the available short circuit current.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify the MCC short circuit current.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify full voltage non-reversing magnetic starters with fusible disconnect for 120/208-volt motors smaller than 20 HP and 277/480-volt motors smaller than 40 HP.
<input type="checkbox"/>	<input type="checkbox"/>	6. Specify autotransformer or part winding thpe starters with fusible disconnect for 20 HP or larger 120/208-volt motors and for 40 HP or larger 277/480-volt motors.
<input type="checkbox"/>	<input type="checkbox"/>	7. Require MCC bussing to extend to all starter locations and spaces for future starter locations.
<input type="checkbox"/>	<input type="checkbox"/>	8. Coordinate starter selection with specific motors identified in Division 15.
<input type="checkbox"/>	<input type="checkbox"/>	9. Require MCC's to be designed so that, after installation, starter units may be rearranged, removed, or added as required.
<input type="checkbox"/>	<input type="checkbox"/>	10. Specify a control circuit voltage of 120 volts.
<input type="checkbox"/>	<input type="checkbox"/>	11. If transformers are used to provide the required control voltage, specify both primary and secondary fuses.
<input type="checkbox"/>	<input type="checkbox"/>	12. Specify push button START/STOP control in lieu of hand/off/automatic control for fan motors controlled through energy management systems.
<input type="checkbox"/>	<input type="checkbox"/>	13. For duplex pumps with one intended as standby, include an alternator in the design that allows the stopping and automatic switching for restart through one energy management start/stop point.
<input type="checkbox"/>	<input type="checkbox"/>	14. Specify at least two auxiliary contacts in each magnetic starter.
<input type="checkbox"/>	<input type="checkbox"/>	15. Provide a motor control center schedule on the electrical drawings.
<input type="checkbox"/>	<input type="checkbox"/>	16. Provide schematic wiring diagrams on the electrical drawings showing interlocking of circuits internal to MCC's to be wired at the factory.
<input type="checkbox"/>	<input type="checkbox"/>	17. Coordinate with state staff utility personnel to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued.

## 26 5000 - Lighting

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Design lighting to comply with State energy codes and the State of Minnesota Sustainable Building Guidelines (B3-MSBG) including Section E.1, Energy Use Reduction by at Least 30%.
<input type="checkbox"/>	<input type="checkbox"/>	2. Prepare compliance reports for interior and exterior lighting to demonstrate compliance with State lighting energy codes and the State of Minnesota Sustainable Building Guidelines (B3-MSBG) including Section E.1, Energy Use Reduction by at Least 30%. Submit reports with the post bid construction documents.
<input type="checkbox"/>	<input type="checkbox"/>	3. Adhere to lighting quality standards and guidelines of the Illumination Engineering Society (IES) in lighting design.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify the most efficient light source available that meets the color rendering, light level, task, mounting height, maintenance, system voltage, and all other design criteria.
<input type="checkbox"/>	<input type="checkbox"/>	5. Design and specify exit lighting to meet all applicable codes, including those for energy conservation and life safety.
<input type="checkbox"/>	<input type="checkbox"/>	6. Specify LED type exit lighting manufactured to comply with UL924.

## ELECTRICAL SPECIFICATION GUIDELINES

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	7. Coordinate heights of fixtures with facility maintenance staff. Avoid designs where access lifts cannot reach.
<input type="checkbox"/>	<input type="checkbox"/>	8. Coordinate locations of fixtures with respect to room equipment and accessories so that access is possible.
<input type="checkbox"/>	<input type="checkbox"/>	9. Coordinate locations of pendant fixtures with respect to room equipment to avoid blocking or interfering with equipment.
<input type="checkbox"/>	<input type="checkbox"/>	10. Coordinate with state staff utility personnel to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued.
<input type="checkbox"/>	<input type="checkbox"/>	11. The building lighting system shall be designed following requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG) per Section I.6, Quality Lighting, requiring flexible lighting controls to accommodate various uses of a given space.
<input type="checkbox"/>	<input type="checkbox"/>	12. Adjustable task lighting shall be incorporated into the lighting design, except in multi-occupant classrooms, conference rooms, and meeting rooms following recommended guideline I.11, Personal Control of IEQ Conditions and Impacts from the State of Minnesota Sustainable Building Guidelines.
<input type="checkbox"/>	<input type="checkbox"/>	13. Specify T8 lamps for tubular fluorescent lamp applications.
<input type="checkbox"/>	<input type="checkbox"/>	14. Specify a fluorescent lamp color temperature of 3500K unless special requirements dictate another color.
<input type="checkbox"/>	<input type="checkbox"/>	15. Specify compact fluorescent lamps rather than incandescent in small lamp application wherever possible.
<input type="checkbox"/>	<input type="checkbox"/>	16. Specify quartz restrike lamps in night/emergency light fixtures using HID lamps.
<input type="checkbox"/>	<input type="checkbox"/>	17. Do not include low pressure sodium lamps in the design.
<input type="checkbox"/>	<input type="checkbox"/>	18. Require lamp disposal to conform to all applicable hazardous waste disposal laws and regulations.
<input type="checkbox"/>	<input type="checkbox"/>	19. Coordinate with state staff utility personnel to identify preferred lamp types in order to minimize the number of lamp types that are to be stocked for the facility or that are needed for specialized areas of the facility.
<input type="checkbox"/>	<input type="checkbox"/>	20. Coordinate with state staff utility personnel to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued.
<input type="checkbox"/>	<input type="checkbox"/>	21. Reference the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section E.1, Energy Use Reduction by at Least 30%.
<input type="checkbox"/>	<input type="checkbox"/>	22. Specify ballasts that conform to applicable CBM specifications and standards.
<input type="checkbox"/>	<input type="checkbox"/>	23. Require ballasts to have an "A" sound rating.
<input type="checkbox"/>	<input type="checkbox"/>	24. Specify solid state electronic fluorescent ballasts with full nominal ANSI light output with fixture input watts of not more than 37 watts for one F32T8 lamp, 62 watts for two F32T8 lamps, 90 watts for three F32T8 lamps, and 114 watts for four F32T8 lamps.
<input type="checkbox"/>	<input type="checkbox"/>	25. Limit input third harmonics to less than 20 per cent.
<input type="checkbox"/>	<input type="checkbox"/>	26. Specify ballasts with a power factor of at least 90 per cent.
<input type="checkbox"/>	<input type="checkbox"/>	27. Require ballasts to comply with FCC and NEMA limits for EMI and RFI and to not interfere with the operation of other normal electrical equipment.
<input type="checkbox"/>	<input type="checkbox"/>	28. Require disposal of ballasts containing PCB's to conform to all applicable hazardous waste disposal laws and regulations.
<input type="checkbox"/>	<input type="checkbox"/>	29. If the label of an existing ballast being removed from service does not clearly indicate that the ballast is free of PCB's, dispose of the PCB containing ballasts.
<input type="checkbox"/>	<input type="checkbox"/>	30. Coordinate with state staff utility personnel to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued.
<input type="checkbox"/>	<input type="checkbox"/>	31. Reference the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section E.1, Energy Use Reduction by at Least 30%.

# ELECTRICAL SPECIFICATION GUIDELINES

## 26 5000 - Interior Lighting

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify energy efficient light fixtures equal to or better than fluorescent for interior lighting.
<input type="checkbox"/>	<input type="checkbox"/>	2. Where access in a building is required beyond normal working hours, include a night light system in the design that provides illumination levels based on NFPA life safety requirements.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify fixtures and lenses appropriate to the environment (vandal resistant, minimum security, medium security, maximum security, damp location, wet location, hazardous area, etc.).
<input type="checkbox"/>	<input type="checkbox"/>	4. Include 3-way and 4-way controls in the lighting design for long corridors.
<input type="checkbox"/>	<input type="checkbox"/>	5. Coordinate with state staff utility personnel to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued.

## 26 5000 - Exterior Lighting

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify high pressure sodium light fixtures for area and security lighting unless color rendering is an overriding need.
<input type="checkbox"/>	<input type="checkbox"/>	2. Design pedestrian walkway lighting to conform to IES lighting level standards.
<input type="checkbox"/>	<input type="checkbox"/>	3. Design main building entrance exterior lighting to provide illumination of 5 foot-candles.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify surface mounted hinged bases for poles and standards over 8 feet high.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify construction, materials, and finish of exterior lighting posts, bollards, poles, fixtures, and accessories to be resistant to damage from vandalism.
<input type="checkbox"/>	<input type="checkbox"/>	6. Specify in-line fuses readily accessible through hand holes in exterior pole and bollard lighting.
<input type="checkbox"/>	<input type="checkbox"/>	7. Locate poles and bollards to minimize interference with pedestrian traffic and street and walkway maintenance equipment.
<input type="checkbox"/>	<input type="checkbox"/>	8. Design exterior lighting to be controlled by a central campus control system, or if that is not available, by photoelectric cell (ON) and time switch (OFF).
<input type="checkbox"/>	<input type="checkbox"/>	9. Show trenching details for underground wiring on the drawings.
<input type="checkbox"/>	<input type="checkbox"/>	10. Coordinate with state staff utility personnel to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued.
<input type="checkbox"/>	<input type="checkbox"/>	11. <b>MN Statute 16B.328 Outdoor Lighting Fixtures Model Ordinance:</b> An outdoor lighting fixture may be installed or replaced using state funds only if meeting the requirements outlined in subdivision 3 or one of the listed conditions applies.

## 26 3000 - Engine Generations

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Coordinate generator voltage rating with the State and design and specify power generation systems and components in detail. Include auxiliary items such as batteries and control devices. Performance specifications are not acceptable.
<input type="checkbox"/>	<input type="checkbox"/>	2. Coordinate and verify design and specification of fuel, exhaust, cooling, and ventilation systems with Division 15.
<input type="checkbox"/>	<input type="checkbox"/>	3. Locate engine generator sets to disperse exhaust fumes and noise without affecting the normal functions of the building and surrounding site.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify devices that dampen vibrations to acceptable levels.
<input type="checkbox"/>	<input type="checkbox"/>	5. Obtain MPCA combustion source permitting.
<input type="checkbox"/>	<input type="checkbox"/>	6. Submit generator design load data with post bid documents submittals.

# ELECTRICAL SPECIFICATION GUIDELINES

## 26 3000 - Engine Generations

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	7. Determine whether peak shaving is a requirement of the generator system design.
<input type="checkbox"/>	<input type="checkbox"/>	8. Specify direct coupled engine and generator systems.
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify voltage and frequency regulation and dip for all classes of load applications.
<input type="checkbox"/>	<input type="checkbox"/>	10. Require the prime mover to be a reciprocating internal combustion engine.
<input type="checkbox"/>	<input type="checkbox"/>	11. Verify that the engine cooling system is a closed system.
<input type="checkbox"/>	<input type="checkbox"/>	12. Design all engine cooling controls to be connected to both normal and emergency power.
<input type="checkbox"/>	<input type="checkbox"/>	13. Design the emergency generator system to be automatically started by a loss of power or a predefined voltage decrease.
<input type="checkbox"/>	<input type="checkbox"/>	14. Require instrumentation to include AC voltmeter, AC ammeter, engine coolant temperature gauge, oil pressure gauge, run time meter. ammeter/voltmeter phase selector switch, and voltage adjusting control.
<input type="checkbox"/>	<input type="checkbox"/>	15. Design mechanical and electrical connections at the unit to be made with flexible connection products.
<input type="checkbox"/>	<input type="checkbox"/>	16. Require engine generator units to be installed on a reinforced concrete or steel platform at least 4inches above adjacent floor line or grade.
<input type="checkbox"/>	<input type="checkbox"/>	17. Include sufficient main circuit breakers and automatic transfer switches in the emergency power generation system design to separate life safety and emergency loads from other loads according to applicable codes and regulations, including local authority having jurisdiction interpretations of these.
<input type="checkbox"/>	<input type="checkbox"/>	18. Specify UL listed automatic transfer switches.
<input type="checkbox"/>	<input type="checkbox"/>	19. Specify available fault and withstand current ratings of transfer switches.
<input type="checkbox"/>	<input type="checkbox"/>	20. Specify transfer switch bypass switches where service continuity is required.
<input type="checkbox"/>	<input type="checkbox"/>	21. Specify the engine generator supplier shall be a factory authorized dealer of the manufacturer that stocks spare and repair parts, provides service with its own staff of factory trained maintenance personnel and has been an authorized dealer for 5 years.
<input type="checkbox"/>	<input type="checkbox"/>	22. Coordinate with state staff utility personnel to identify all viable utility rebate opportunities. Specify equipment that meets or exceeds the efficiency standards and qualifications for utility rebate programs. Upgraded equipment specifications that have incremental costs covered by project budget are to be pursued.
<input type="checkbox"/>	<input type="checkbox"/>	23. Specify engine generator submittals to include engine and generator manufacturer's operating and maintenance manuals and parts lists, master service manuals, voltage regulator and governor manuals and wiring diagrams, schematic wiring diagrams for generator and control systems, specification sheets for starting batteries, engine block heaters, and accessories, operational data that identifies voltage versus motor starting KVA requirements, and acceptance test results.
<input type="checkbox"/>	<input type="checkbox"/>	24. Specify thorough on-site engine generator testing using a load bank as required, after installation is complete. Testing shall include demonstration of all operational requirements, including open and closed transition switching as applicable at light (quarter-load), medium (half-load) and full load. Testing shall also include four consecutive hours of operation at full load.
<input type="checkbox"/>	<input type="checkbox"/>	25. Specify that contractor shall provide all fuel for testing of generator and that the fuel tank shall be full upon final acceptance by engineer/architect/owner.
<input type="checkbox"/>	<input type="checkbox"/>	26. Specify a minimum manufacturers warranty period of two (2) years after date of acceptance for engine, generator and accessories.
<input type="checkbox"/>	<input type="checkbox"/>	27. Require the engine/generator supplier to provide all manufacturers required and recommended inspections, adjustments, service and maintenance for the duration of the warranty period at no additional cost to the contract.

## 26 3000 – Battery Emergency Power Supply

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify lead calcium batteries of the latest type for the intended application, designed for a 20-year life expectancy, and provided with a prorated manufacturer's warranty, for engine starting, UPS systems, and central emergency power systems.

## ELECTRICAL SPECIFICATION GUIDELINES

### 26 3000 – Battery Emergency Power Supply

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify maintenance free nickel cadmium or better batteries for individual emergency exit signs and lighting units.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify transparent cell jars with minimum and maximum electrolyte levels clearly marked for multi-cell batteries.
<input type="checkbox"/>	<input type="checkbox"/>	4. Require specific gravity and amp hour capacity to be identified on multi-cell batteries.
<input type="checkbox"/>	<input type="checkbox"/>	5. Require each cell in a multi-cell battery and each battery in a multi- battery bank to be numbered sequentially.
<input type="checkbox"/>	<input type="checkbox"/>	6. Design a clear space adjacent to and above the battery equipment for maintenance of units.
<input type="checkbox"/>	<input type="checkbox"/>	7. Include adequate ventilation in battery storage room design.
<input type="checkbox"/>	<input type="checkbox"/>	8. Specify automatic equalize and float battery charging. When equalizing voltage is achieved at the battery terminals, the unit switches automatically to lower float charge mode.
<input type="checkbox"/>	<input type="checkbox"/>	9. Require float and equalize charging to incorporate automatic temperature compensation and voltage regulation.
<input type="checkbox"/>	<input type="checkbox"/>	10. Require battery chargers to have ammeters and voltmeters.
<input type="checkbox"/>	<input type="checkbox"/>	11. Require submittals for batteries to include manufacturer installation and maintenance instructions, the battery discharge curve, acceptance test results, and a copy of the manufacturer's warranty.
<input type="checkbox"/>	<input type="checkbox"/>	12. Require battery charging equipment submittals to include schematic diagrams, wiring diagrams, and parts list.

### 26 4000 - Lightning Protection for Structures

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Evaluate the building design, site elevations, and other site conditions and make recommendations to the State regarding the merits of providing a lightning protection system. |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. If included, specify lightning protection systems that carry the "Master Label" as defined by UL.   |

### Division 26 0000 – Additional Requirements

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. See other guideline requirements in the General Requirements and Assemblies Sections of these Guidelines.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. See the Basic Service Agreement (your contract) for procedures and submittal requirements.  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. The State of Minnesota Sustainable Building Guidelines - New buildings and substantially "stand-alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG) including Section E.1, Energy Use Reduction by at Least 30%. <b>Energy Modeling is required.</b>                         |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. <b>MN Statute 16B.32 Energy Use:</b> Plans for a new building or for a renovation of 50 percent or more of an existing building or its energy systems must include designs which use active and passive solar energy systems, earth sheltered construction, and other alternative energy sources where feasible. A new building must consider meeting at least two percent of the energy needs of the building from renewable sources (limited to wind and sun) located on the building site. |

END OF SECTION

# ELECTRICAL SPECIFICATION GUIDELINES

## Division 27 0000 – Technology and Data / Communications

Complete

N/A

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. See Appendix B for technology design guidelines and requirements.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Meet with the State's Office of Enterprise Technology (OET) to coordinate technology design requirements.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. All technology and computer equipment rooms and phone rooms, conduit and box rough-ins, for data/communications and other technology systems shall be provided in the construction documents. The State will contract separately for cabling, device plates, equipment and devices. |

**END OF SECTION**

# ELECTRICAL SPECIFICATION GUIDELINES

## 28 3000 - Fire Detection and Alarm Systems

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Include fire alarm systems in the design as required by applicable codes and regulations and interpretations of these by the local authority having jurisdiction.
<input type="checkbox"/>	<input type="checkbox"/>	2. Design fire alarm systems to comply with the requirements of NFPA 72.
<input type="checkbox"/>	<input type="checkbox"/>	3. Include a fire alarm system riser diagram in the drawings. Identify all components and locations.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify the complete operation of the fire alarm system. Define all component parts and their function as they relate to the system and other integrated equipment, including smoke control requirements in Division 15.
<input type="checkbox"/>	<input type="checkbox"/>	5. Do not allow pre-signal or outside fire alarm signal provision.
<input type="checkbox"/>	<input type="checkbox"/>	6. Do not incorporate a "routing maintenance" alarm or trouble signal which annunciates either audibly or through a city tie connection.
<input type="checkbox"/>	<input type="checkbox"/>	7. Selection of automatic detection equipment and internal alarm signal devices shall be determined in consultation with the State.
<input type="checkbox"/>	<input type="checkbox"/>	8. If a zoned fire alarm system is designed and specified, include a system trouble annunciation and a keyed alarm acknowledge at the main fire alarm control panel. Require the keyed alarm acknowledge to be capable of silencing main fire alarm control panel and remote annunciator panel audible trouble indications.
<input type="checkbox"/>	<input type="checkbox"/>	9. Do not allow remote annunciator panels to contain a system reset switch. Require the system reset switch to be located only at the main fire alarm control panel.
<input type="checkbox"/>	<input type="checkbox"/>	10. Specify the brief description of each zone to be displayed at remote annunciator panels.
<input type="checkbox"/>	<input type="checkbox"/>	11. Include a key box in the design for the fire department to retrieve the silencing key. Coordinate requirements with the fire department.
<input type="checkbox"/>	<input type="checkbox"/>	12. Determine whether a form C auxiliary alarm and trouble contact is required for connection to a central monitoring system and include if required.
<input type="checkbox"/>	<input type="checkbox"/>	13. If the system is part of a campus system, require the system to be keyed to a campus master core.
<input type="checkbox"/>	<input type="checkbox"/>	14. Require smoke and sprinkler alarms to be annunciated separately.
<input type="checkbox"/>	<input type="checkbox"/>	15. Include in the fire alarm system design and specifications connections to automatic fire protection sprinkler systems, ventilation supply and exhaust duct detection equipment and controls, smoke and fire door holding devices, smoke damper controls, elevator recovery controls, etc.
<input type="checkbox"/>	<input type="checkbox"/>	16. Specify that the Contractor is required to supply all instrumentation, 2-way radios, and personnel to perform required fire alarm system tests.
<input type="checkbox"/>	<input type="checkbox"/>	17. Require a State-witnessed pre-test of the system prior to scheduling an initial test. This test will consist of a spot-check of devices to determine proper operation.
<input type="checkbox"/>	<input type="checkbox"/>	18. Require a comprehensive initial test and demonstration, witnessed by persons designated by the State. Include testing of all devices for proper operation and annunciation. Include disconnecting of parts of the system to simulate "trouble" conditions.
<input type="checkbox"/>	<input type="checkbox"/>	19. Specify submittal of fire alarm system certification testing and test reporting as required by NFPA 72.
<input type="checkbox"/>	<input type="checkbox"/>	20. Require the Contractor to coordinate all testing with the local authority having jurisdiction over the fire alarm system and to schedule testing to meet the test witnessing requirements of the local authority.
<input type="checkbox"/>	<input type="checkbox"/>	21. Require submittals to include complete as-built system wiring diagrams, main control and annunciator front panel layouts, main control panel module locations and interconnecting wiring, operation and maintenance manuals, installation instructions, operating instructions, maintenance criteria and instructions, testing and cleaning criteria and procedures, spare and repair parts lists, etc. Include interconnecting wiring to related systems, such as HVAC, fire protection sprinkler, elevator controls, smoke dampers, etc., in the system wiring diagrams.
<input type="checkbox"/>	<input type="checkbox"/>	22. Require training to be included as part of the system installation.

## **ELECTRICAL SPECIFICATION GUIDELINES**

### **28 3000 - Fire Detection and Alarm Systems**

**Complete**

**N/A**

**23.** Require submittal of training syllabus information at least two months prior to the initial test.

**24.** Require the Contractor to request a list from the State of personnel who will participate in the training.

**25.** Require system and equipment trainers to be factory certified.

**26.** Require trainers to provide certification that attendees have demonstrated sufficient knowledge of the system.

**END OF SECTION**

**Divisions 31, 32, 33**

**EARTHWORK, EXTERIOR IMPROVEMENTS, SITE UTILITIES**



**31 0000 - Earthwork / Site Work**

<b>Complete</b>	<b>N/A</b>	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify that the contractor shall restore or repair any damaged roads, sidewalks, curbs, utilities, or plant material.
<input type="checkbox"/>	<input type="checkbox"/>	2. Avoid grades that exceed 25% for ease of grounds/lawn maintenance.
<input type="checkbox"/>	<input type="checkbox"/>	3. Slopes from accessible parking to a building entry shall not exceed 1:20. Conform to ADA and the Minnesota State Building Code Chapter 1340
<input type="checkbox"/>	<input type="checkbox"/>	4. Slope grades away from structures for drainage. Conform to the International Building Code
<input type="checkbox"/>	<input type="checkbox"/>	5. Provide for snow plowing and piling of snow in parking areas.
<input type="checkbox"/>	<input type="checkbox"/>	6. Review existing soils for potential for future heaving and cracking of sidewalks or other site amenities. Recommend additional soils replacement or sidewalk design.
<input type="checkbox"/>	<input type="checkbox"/>	7. Specify that the Contractor shall comply with the requirements of the State of Minnesota Sustainable Building Guidelines, Section M.3, Waste Reduction and Management.
<input type="checkbox"/>	<input type="checkbox"/>	8. Site Drainage shall be designed to comply with the State of Minnesota sustainable Building Guidelines (B3-MSBG), section S.2, Stormwater Management, including required performance criteria for Runoff Rate and Runoff Quality.
<input type="checkbox"/>	<input type="checkbox"/>	9. The consultant designer shall notify the State with recommended soil boring locations and survey requirements to request a geotechnical report and certified site survey.
<input type="checkbox"/>	<input type="checkbox"/>	10. Use the recommendations of the geotechnical/soils engineer to determine and define excavation depth and extent.
<input type="checkbox"/>	<input type="checkbox"/>	11. Use numeric elevations and simple geometry to clearly define excavation extent and depth so that little interpretation is required.
<input type="checkbox"/>	<input type="checkbox"/>	12. Using the recommendations of the geotechnical/soils engineer, define requirements for excavation depth and extent, fill, backfill, compaction, and surface drainage.
<input type="checkbox"/>	<input type="checkbox"/>	13. The consultant designer's civil engineer shall incorporate all previously determined mitigation or environmental assessment requirements into the project design.
<input type="checkbox"/>	<input type="checkbox"/>	14. Specify that the contractor shall provide a 3-day notice to the consultant designer prior to filling, backfilling or compaction operations. The consultant designer shall inspect foundations, foundation insulation, foundation drain tile, foundation waterproofing, or any underground construction prior to backfilling.
<input type="checkbox"/>	<input type="checkbox"/>	15. Specify that all backfill or fill materials to be placed in paved areas or as backfill in building areas shall consist of less than 5% passing the #200 sieve, except topsoil cap for exterior wall backfill.
<input type="checkbox"/>	<input type="checkbox"/>	16. Specify that foundation wall waterproofing must be backfilled within 3 days of placement.

**Divisions 31, 32, 33**

**EARTHWORK, EXTERIOR IMPROVEMENTS, SITE UTILITIES**

<b>Complete</b>	<b>N/A</b>	
<input type="checkbox"/>	<input type="checkbox"/>	17. When foundations are to be waterproofed, specify that the toe of the excavations must be at least 3'-0" from foundation walls.
<input type="checkbox"/>	<input type="checkbox"/>	18. Specify protection of bottom of excavations and backfill from frost and freezing.
<input type="checkbox"/>	<input type="checkbox"/>	19. Specify that no frozen backfill or backfill containing ice or snow shall be used.
<input type="checkbox"/>	<input type="checkbox"/>	20. Specify that no fill shall be placed on frozen material or soil covered with ice or snow. Do not let backfill or fill material freeze during placement and compaction.
<input type="checkbox"/>	<input type="checkbox"/>	21. Specify that in-place foundations, supporting soils and slabs be protected from frost penetration until project completion.
<input type="checkbox"/>	<input type="checkbox"/>	22. Specify that the contractor shall immediately remove standing water from foundation excavations.
<input type="checkbox"/>	<input type="checkbox"/>	23. Specify that the bituminous paving plant shall be MN/DOT certified and provide MN/DOT certified mixes to the consultant designer for approval before start of work.
<input type="checkbox"/>	<input type="checkbox"/>	24. The consultant designer shall investigate all available documentation, identify, seek out and show all existing above ground and all documented underground utilities within the site limits and/or scope of work. Additionally, contact local utility companies and obtain current documentation of utilities and their locations.
<input type="checkbox"/>	<input type="checkbox"/>	25. The consultant designer shall visit the project location, observe and record all visible utilities, and coordinate their findings with all other utility information for inclusion in the contract documents.
<input type="checkbox"/>	<input type="checkbox"/>	26. The design engineer shall review soil conditions with the geotechnical engineer, architect and structural engineer with regards to backfill material. The objective is to provide backfill that will quickly drain water away from the foundation.
<input type="checkbox"/>	<input type="checkbox"/>	27. Conform to the additional requirements of the State of Minnesota Sustainable Building guidelines (B3-MSBG), Section S.3, for Soil Management.
<input type="checkbox"/>	<input type="checkbox"/>	28. Conform to the requirements of the State of Minnesota sustainable Building Guidelines (B3-MSBG), Section S.6, for Erosion and Sedimentation Control.

**END OF SECTION**

## Divisions 31, 32, 33

### EARTHWORK, EXTERIOR IMPROVEMENTS, SITE UTILITIES

#### 32 0000 - Exterior Improvements - Paving

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Do not specify epoxy paint for parking lot striping.
<input type="checkbox"/>	<input type="checkbox"/>	2. If parking stalls are numbered, specify that contractor shall turn over stencils to Plant Management Division or facility maintenance staff (Owner).
<input type="checkbox"/>	<input type="checkbox"/>	3. Review all bollard locations with Plant Management Division or facility maintenance staff (Owner). Note: Due to snowplowing requirements, bollards are discouraged except for protection of openings at overhead doors.
<input type="checkbox"/>	<input type="checkbox"/>	4. Review sidewalk widths, finishes and locations with Plant Management Division or facility maintenance staff (Owner) for snow plowing and maintenance conditions.
<input type="checkbox"/>	<input type="checkbox"/>	5. Conform to the requirements of the State of Minnesota sustainable Building Guidelines (B3-MSBG), Section S.6, for Erosion and Sedimentation Control. Specify cleaning of catch basins and run-off as required by the local jurisdiction or Minnesota Pollution Control Agency.
<input type="checkbox"/>	<input type="checkbox"/>	6. Conform to the additional requirements of the State of Minnesota Sustainable Building guidelines (B3-MSBG), Section S.3, for Soil Management.
<input type="checkbox"/>	<input type="checkbox"/>	7. Conform to the additional requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section S.11, for Heat Island Reduction.

#### 32 0000 – Exterior Improvements - Lawn Irrigation Systems

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Specify that the Contractor shall maintain a skilled foreman on the site during the entire installation of the irrigation system. The foreman shall have the authority to act for all matters pertaining to the work.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify that the contractor is required to examine the site and that submission of a bid proposal comprises acceptance of plans, details and specifications.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify that the contractor shall agree to commence work within the specified time frame.
<input type="checkbox"/>	<input type="checkbox"/>	4. Specify that the contractor shall be warranty all work (parts & labor) for a minimum of one year from the date of substantial completion and acceptance. During warranty period, the contractor shall promptly repair or replace and all parts that are defective.
<input type="checkbox"/>	<input type="checkbox"/>	5. Specify that the contractor shall be warranty all parts for a minimum of two years from the date of substantial completion and acceptance. (Unless manufacturer is longer).
<input type="checkbox"/>	<input type="checkbox"/>	6. Specify that the contractor shall be responsible for the first fall “blow-down” and spring “start-up” of the system. These activities are to be coordinated with the owner.
<input type="checkbox"/>	<input type="checkbox"/>	7. Specify that the Contractor shall be responsible for coordinating his work with other trades and/or the general contractor.
<input type="checkbox"/>	<input type="checkbox"/>	8. Specify that the installation shall comply with all local and state laws and codes.
<input type="checkbox"/>	<input type="checkbox"/>	9. Specify that the contractor shall secure all necessary permits, arrange for all necessary inspections and locates also pay all fees or expenses in conjunction with the work.
<input type="checkbox"/>	<input type="checkbox"/>	10. Specify that the Contractor shall confine his operations to the areas within the construction zone.
<input type="checkbox"/>	<input type="checkbox"/>	11. Specify that the Contractor shall be responsible for securing his equipment/supplies.
<input type="checkbox"/>	<input type="checkbox"/>	12. For work that occurs on the Capitol Complex, specify that the contractor shall be allowed one, clearly marked vehicle, with company name, to be parked in the construction zone. All other vehicles, private or company, must be parked off-site in an approved area. Verify cost with owner to provide a parking allowance for other contractor vehicles.
<input type="checkbox"/>	<input type="checkbox"/>	13. Specify that the contractor is responsible for cleaning all debris that is caused by the work. And to leave the site in a neat and clean condition.

## Divisions 31, 32, 33

### EARTHWORK, EXTERIOR IMPROVEMENTS, SITE UTILITIES

#### 32 0000 – Exterior Improvements - Lawn Irrigation Systems

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	14. Specify that all materials, pipe, valves, heads, controllers, etc. are delivered to the site in unbroken bundles of coils; packaged to protect from damage.
<input type="checkbox"/>	<input type="checkbox"/>	15. Specify that deliveries of all solvents, adhesives and similar materials are to be in unopened containers with manufacturer's original label legible.
<input type="checkbox"/>	<input type="checkbox"/>	16. Specify that the contractor shall provide training for operation and maintenance of the system.
<input type="checkbox"/>	<input type="checkbox"/>	17. Coordinate with the facility the location of all lawn irrigation sprinkler heads.
<input type="checkbox"/>	<input type="checkbox"/>	18. Submit a scaled drawing during design (designer) and an installation drawing (contractor) to Plant Management Division or the facility maintenance staff.
<input type="checkbox"/>	<input type="checkbox"/>	19. Specify that the contractor shall submit an as-built drawing of the final installation including all Operation and Maintenance Documentation.
<input type="checkbox"/>	<input type="checkbox"/>	20. When work includes connection or addition to an existing system, specify that the new work must account for existing in design and installation to ensure all systems are complete and functional throughout the project and at all times.
<input type="checkbox"/>	<input type="checkbox"/>	21. Specify testing of all mains, laterals, risers and fittings, heads, drain valves, and controls. Coordinate with Plant Management Division or facility maintenance staff.
<input type="checkbox"/>	<input type="checkbox"/>	22. The design is to ensure "head-to-head" coverage and is to exclude coverage of hard surface areas under normal wind conditions.
<input type="checkbox"/>	<input type="checkbox"/>	23. Design and specify to locate spray heads so as to avoid spraying, walls, monuments and other features that could be damaged from frequent watering.
<input type="checkbox"/>	<input type="checkbox"/>	24. Design and specify sprinkler heads to be perpendicular to finished grades unless otherwise noted. Install sprinkler heads adjacent to walls, curbs and other paved areas at grade and install heads in lawn area where turf is not yet established at finished grade.
<input type="checkbox"/>	<input type="checkbox"/>	25. Specify that contractor shall verify finished grades with architect/engineer prior to installation.
<input type="checkbox"/>	<input type="checkbox"/>	26. Specify that heads with a 1" or greater inlet shall be installed using PVC "swing-joints". And heads with inlets smaller than 1" shall be made with poly tee fittings (no saddles fitted directly to piping).
<input type="checkbox"/>	<input type="checkbox"/>	27. Specify separate metering of lawn irrigation system to avoid sewer fees.
<input type="checkbox"/>	<input type="checkbox"/>	28. Specify shut-off valves, back-flow prevention and air stem valves.
<input type="checkbox"/>	<input type="checkbox"/>	29. The irrigation system shall be designed & installed for seasonal drainage.
<input type="checkbox"/>	<input type="checkbox"/>	30. When the work is for an expansion of an existing system, specify components that are compatible with the existing system also with owners' attic stock and repair parts (should be approved at pre-bid with owner.) If different 15% attic stock should be approved. During work, the existing system shall continue to work or accommodations will be made to water affected area until work is complete.
<input type="checkbox"/>	<input type="checkbox"/>	31. Designer shall review subsurface irrigation piping also interior and exterior space with owner's facility staff.
<input type="checkbox"/>	<input type="checkbox"/>	32. For subsurface or drip irrigation systems, specify a removable filtering system installed between the main line and the irrigated zone. Provide pressure-reducing valves. Both the filtering and pressure reducing components shall be enclosed in a valve box and coupled by PVC unions. (Exception for some manufacturers).
<input type="checkbox"/>	<input type="checkbox"/>	33. For subsurface or drip irrigation systems, specify that irrigation lines shall be plugged at the end with a removable plug to allow flushing of the system. Plugs shall be installed in small valve boxes for easy access.
<input type="checkbox"/>	<input type="checkbox"/>	34. System controllers are to be electronic; Irritrol Controller / Dial Series or demonstrated approved equal capable of full automatic or manual operation and housed in a heavy-duty metal waterproof, lockable cabinet. All controllers shall come equipped with a remote control system. All controllers and parts shall be compatible with owners' attic stock and repair parts. (Should be approved at pre-bid with owner). If different 15% attic stock should be approved. Verify base spec manufacturers with facility staff maintenance.

## Divisions 31, 32, 33

### EARTHWORK, EXTERIOR IMPROVEMENTS, SITE UTILITIES

#### 32 0000 – Exterior Improvements - Lawn Irrigation Systems

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	35. Specify all control wiring/cable will be a minimum #14 gauge, single strand solid copper wire and UL approved for direct underground burial.
<input type="checkbox"/>	<input type="checkbox"/>	36. Specify to provide tracer wiring to be installed along all main and lateral lines and will be a minimum #14 gauge single strand copper and direct buried.
<input type="checkbox"/>	<input type="checkbox"/>	37. Specify that there shall be no wire splices between the controller and valve. Connections to valves must be enclosed in a valve box and wire ends attached by wire nuts, all enclosed in a direct-bury splice kit. All wires between the controller and the point of direct burial must be enclosed in approved conduit.
<input type="checkbox"/>	<input type="checkbox"/>	38. Specify that all valve boxes shall not be installed closer than 18" to any sidewalk, drive or hard surface. And, treated wood or bricks shall support boxes.
<input type="checkbox"/>	<input type="checkbox"/>	39. Specify that fill to support valve boxes shall be a porous fill such as ½" river rock, a minimum of 4" in depth from the base and extending 4" from each side to allow for drainage away from box.
<input type="checkbox"/>	<input type="checkbox"/>	40. Specify the top of the valve box to match finish grade.
<input type="checkbox"/>	<input type="checkbox"/>	41. Specify a maximum of two valves shall be installed in one valve box.
<input type="checkbox"/>	<input type="checkbox"/>	42. Valve boxes and covers shall be 12" minimum heavy duty plastic. Valve boxes and covers shall be compatible with owners' attic stock and repair parts. (This should be approved at pre-bid with owner) If different 15% attic stock should be approved.
<input type="checkbox"/>	<input type="checkbox"/>	43. Electric valves shall be globe/angle configuration with female pipe thread inlet and outlet. Valves shall have a manual flow control. Typically provide 24 volt, 60 cycle solenoid-actuated. Typically, valves 2 inches and smaller may be plastic and if larger than 2", provide brass. All valves and repair parts shall be compatible with owner's attic stock. (This should be approved at pre-bid with owner.) If different 15% attic stock should be approved.
<input type="checkbox"/>	<input type="checkbox"/>	44. Specify quick-coupling valves with optional horizontal stabilization.
<input type="checkbox"/>	<input type="checkbox"/>	45. Specify all zone valves shall be tagged using a plastic or brass tag that identifies it with the zone number that corresponds to the same number on the controller.
<input type="checkbox"/>	<input type="checkbox"/>	46. Specify that all valves shall be installed using PVC unions on both sides to allow for easy replacement.
<input type="checkbox"/>	<input type="checkbox"/>	47. PVC Pipes: Specify all 1-1/2" and larger piping shall be virgin, high impact, schedule 40 PVC pipe. All PVC pipe shall be continuously and permanently marked with manufacturer's name, material size and schedule type. All free of defects.
<input type="checkbox"/>	<input type="checkbox"/>	48. In accordance with manufacturers' recommendations, specify a two-step glue process for PVC piping and fittings.
<input type="checkbox"/>	<input type="checkbox"/>	49. PVC fittings: Specify PVC pipefittings shall be made of schedule 40 PVC and be free of any defects.
<input type="checkbox"/>	<input type="checkbox"/>	50. Polyethylene Pipe: Specify that all 1-1/4" and smaller piping shall be flexible, non-toxic, and 100% virgin polyethylene pipe. All polyethylene pipe sizes shall have a minimum 100psi working pressure rating. All polyethylene pipes shall be continuously and permanently marked with manufacturer's name, material size and schedule type. All free of defects.
<input type="checkbox"/>	<input type="checkbox"/>	51. Poly fittings: Specify PVC or nylon insert fittings shall be used.
<input type="checkbox"/>	<input type="checkbox"/>	52. Specify that all installations shall be according to manufacturer's current written instructions and recommendations.
<input type="checkbox"/>	<input type="checkbox"/>	53. Specify that all installations shall provide for expansion and contraction; sloped for drainage.
<input type="checkbox"/>	<input type="checkbox"/>	54. Prior to backfilling of trenches, specify that the contractor shall notify designer and/or staff facility for inspection.
<input type="checkbox"/>	<input type="checkbox"/>	55. Specify all backfill material shall be free of rocks and debris that is larger than 1 ½".
<input type="checkbox"/>	<input type="checkbox"/>	56. Specify contractors to install system with a minimum of 12" cover; based on finished grade.

**Divisions 31, 32, 33**

**EARTHWORK, EXTERIOR IMPROVEMENTS, SITE UTILITIES**

**32 0000 – Exterior Improvements - Lawn Irrigation Systems**

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<b>57.</b> Where piping and wiring crosses below hard surfaces, penetrates soil walls or similar surfaces greater than 3 feet; specify piping and wiring shall be enclosed in 4" PVC sleeves or a minimum of 2" greater than the largest diameter pipe. An additional or spare sleeve shall be installed.
<input type="checkbox"/>	<input type="checkbox"/>	<b>58.</b> Specify contractor to provide double-sleeved protection for piping that is installed below hard surfaces. (Sidewalks, drives, plazas, etc.).
<input type="checkbox"/>	<input type="checkbox"/>	<b>59.</b> Specify joint connections from steel water mains to plastic shall be made using threaded flanged fittings.
<input type="checkbox"/>	<input type="checkbox"/>	<b>60.</b> Specify all main line poly connections shall be double clamped using stainless steel type clamps.
<input type="checkbox"/>	<input type="checkbox"/>	<b>61.</b> Specify joints shall set for 24 hours prior to pressurizing the system.
<input type="checkbox"/>	<input type="checkbox"/>	<b>62.</b> Specify that contractor shall test system after completion of each section to hold 100-psi air pressure for one hour. Contractor shall be responsible for repairs and adjustments. Contractor shall notify facility staff to be present when system is pressure tested.
<input type="checkbox"/>	<input type="checkbox"/>	<b>63.</b> As a sustainable design measure, zone the lawn irrigation system for timed watering in the early morning and/or late afternoon to avoid excessive water evaporation. Coordinate with Plant Management Division or facility maintenance staff.
<input type="checkbox"/>	<input type="checkbox"/>	<b>64.</b> Rain sensors are to be equipped with a by-pass switch.
<input type="checkbox"/>	<input type="checkbox"/>	<b>65.</b> Specify rain sensors for irrigation systems to prevent unnecessary watering.
<input type="checkbox"/>	<input type="checkbox"/>	<b>66.</b> Avoid different (multiple manufacturers) head/nozzle types for lawn head/nozzle types for lawn irrigation systems. All heads shall be compatible with owner's attic stock and repair parts. ( They should be approved at pre-bid with owner.) If different a 15% attic stock should be approved. Rotors are to be Hunter I-40's, I-20's or pop-ups. No sprays or rotors are to be on the same zone. Nor Aqua-pore or Netapheme.
<input type="checkbox"/>	<input type="checkbox"/>	<b>67.</b> All major irrigation system components are to be installed in protected, vandal proof locations, and easily accessible for maintenance and operation.
<input type="checkbox"/>	<input type="checkbox"/>	<b>68.</b> When installation includes buried tanks, the designer shall have soil testing performed for backfill and compaction.
<input type="checkbox"/>	<input type="checkbox"/>	<b>69.</b> Conform to the requirements of the State of Minnesota sustainable Building Guidelines (B3-MSBG), Section S.6, for Erosion and Sedimentation Control.
<input type="checkbox"/>	<input type="checkbox"/>	<b>70.</b> Conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section S.7, for Landscape Water Efficiency.

## Divisions 31, 32, 33

### EARTHWORK, EXTERIOR IMPROVEMENTS, SITE UTILITIES

#### 32 0000 – Exterior Improvements - Landscaping

Complete	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	1. Coordinate with the facility the location of all security, lighting, utilities to include tunnels and irrigation.
<input type="checkbox"/>	<input type="checkbox"/>	2. Specify that all new plant material shall be maintained and warranted for a complete cycle of the seasons (no less than one year). Also to include two spring seasons. All turf (sod or seed) to be established (usually 6 weeks minimum except native grass seed which takes significantly longer) and to include all mowing and watering prior to acceptance.
<input type="checkbox"/>	<input type="checkbox"/>	3. Specify that all defective planting material shall be replaced and the new material shall be warranted for an additional complete cycle of the seasons (no less than one year). Also to include two spring seasons.
<input type="checkbox"/>	<input type="checkbox"/>	4. Coordinate with the facility the watering requirements for lawn areas and landscaped areas. It is the contractors' responsibility to maintain until subsequently complete or written acceptance from the owner.
<input type="checkbox"/>	<input type="checkbox"/>	5. When raised planters are being proposed, review with the user facility. Typically raised planters are considered high maintenance and not encouraged.
<input type="checkbox"/>	<input type="checkbox"/>	6. Propose hardy and/or indigenous plant materials that require minimal maintenance. Do not use plant materials which are disease or insect prone, or are included in the DNR Prohibited Plant List
<input type="checkbox"/>	<input type="checkbox"/>	7. Provide plants that are available from local nurseries. Do not propose plants from suppliers outside the State's region. Plants from outside the region were not raised in the same soils and climate and are difficult to replace. All plants should be pre-approved by owner.
<input type="checkbox"/>	<input type="checkbox"/>	8. Avoid plants that require meticulous care in soil preparation, fertilizing and spraying.
<input type="checkbox"/>	<input type="checkbox"/>	9. Evaluate the role and use (positive and negative) of Landscaping materials to achieve sustainable design efforts. (i.e. shading during the summer; windbreaks during the winter, security, etc.)
<input type="checkbox"/>	<input type="checkbox"/>	10. Verify the type of mulch (rock, wood, etc) and edging material with the facility maintenance staff.
<input type="checkbox"/>	<input type="checkbox"/>	11. For new sites and major expansions on existing sites, obtain the <i>Guide to Minnesota Environmental Review Rules</i> from the State's Environmental Quality Board. Submit the Environmental Assessment Worksheet (EAW). Using this submittal, the Environmental Quality Board will determine if an Environmental Impact Statement (EIS) is required for the project. a. When federal dollars are involved, a NEPA (National Environmental Protection Act) assessment may be required
<input type="checkbox"/>	<input type="checkbox"/>	12. Conform to the additional requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section S.11, for Heat Island Reduction.
<input type="checkbox"/>	<input type="checkbox"/>	13. Conform to the additional requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section S.4, for Sustainable Vegetation Design.
<input type="checkbox"/>	<input type="checkbox"/>	14. Conform to the requirements of the State of Minnesota Sustainable Building Guidelines (B3-MSBG), Section S.7, for Landscape Water Efficiency.

END OF SECTION

## Divisions 31, 32, 33

### EARTHWORK, EXTERIOR IMPROVEMENTS, SITE UTILITIES

#### 33 4000 – Site Utilities -Foundation Drainage

- | Complete                 | N/A                      |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. When ground water is a problem and sump pumps are deemed appropriate, specify two pumps per sump location with one wired to emergency power.   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. When the design of a building includes occupied space below ground, verify the need for an underfloor drain tile system; and at a minimum, specify a drain tile system and membrane vapor barrier below slabs on grade. Specify slope of drain piping to drains. The minimum pipe size for drainage shall be 6", encase in drainage rock and filter fabric. Consider filter fabric sock around the pipe or two layers of filter fabric protection. (Refer to Section 07120 for foundation waterproofing requirements.) |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. See "Assemblies" section of these guidelines.  |

END OF SECTION





---

## **APPENDIX**

to

## **DESIGN GUIDELINES**

<b>APPENDIX A</b>	<b>CAPITOL COMPLEX GUIDELINES</b> <ul style="list-style-type: none"><li>- CONTRACTORS/VENDORS GUIDELINES FOR BUILDINGS &amp; PARKING FACILITIES</li><li>- BACKGROUND CHECK REQUEST FORM (FOR CONTRACTORS)</li><li>- STANDARD OPERATING PROCEDURE FOR HOTWORKS</li><li>- PLANT MANAGEMENT PREFERRED EQUIPMENT LIST</li><li>- SIGNAGE GUIDELINES FOR THE CAPITOL COMPLEX</li></ul>
<b>APPENDIX B</b>	<b>TECHNOLOGY GUIDELINES</b>
<b>APPENDIX C</b>	<b>SPACE GUIDELINES</b>
<b>APPENDIX D</b>	<b>PROJECT REPORT &amp; FACT SHEET</b>
<b>APPENDIX E</b>	<b>BUILDINGS, BENCHMARKS, AND BEYOND (B3)</b> <ul style="list-style-type: none"><li>- LEED FOR NEW CONSTRUCTION V2.2: A COMPARATIVE ANALYSIS</li><li>- SUSTAINABLE BUILDINGS (SB) 2030</li><li>-</li></ul>
<b>APPENDIX F</b>	<b>PROJECT DESIGN- KICK-OFF CHECKLIST</b> <ul style="list-style-type: none"><li>- PROJECT MANAGEMENT PLAN</li><li>- CONSULTANT EXPECTATIONS</li><li>- AGENCY SIGN-OFF for PROJECT CLOSEOUT &amp; ACCEPTANCE</li><li>- PROJECT REPORT &amp; FACT SHEET (Short Form)</li></ul>
<b>APPENDIX G</b>	<b>DESIGN GUIDELINE REQUEST FORM</b>
<b>APPENDIX H</b>	<b>DESIGN GUIDELINE VARIANCE REQUEST FORM</b>



---

## APPENDIX A

### CONTRACTORS/VENDORS GUIDELINES RELATED TO BUILDINGS AND PARKING FACILITIES

for the  
**CAPITOL COMPLEX**

Includes

- **Contractors/Vendors Guidelines for Buildings & Parking Facilities**
- **Hotworks Standard Operating Procedure**
- **Plant Management Preferred Equipment List**
- **Background Check Request Form (for contractors)**
- **Signage Guidelines for the Capitol Complex**

INCORPORATED BY REFERENCE

(These documents are available from the Department of Administration's website:  
[www.admin.state.mn.us/recs](http://www.admin.state.mn.us/recs) "click on "Construction Services" and "Manuals, Guidelines, and Forms" and  
"Design Guidelines")

**\*INSTRUCTIONS TO A/E CONSULTANT: INCORPORATE THESE GUIDELINES INTO THE PROJECT MANUAL AND/OR CONSTRUCTION DOCUMENTS FOR PROJECTS OCCURRING WITHIN THE CAPITOL COMPLEX AREA**

**All new construction and/or changes to existing exteriors of buildings and grounds on the Capitol Complex must be reviewed and approved by the Capitol Area Architectural Planning Board (CAAPB)**



---

**APPENDIX B**

**TECHNOLOGY GUIDELINES**

**BUILDING INFRASTRUCTURE**

**GUIDELINES FOR**

**STATE-OWNED BUILDINGS**

**OFFICE OF ENTERPRISE TECHNOLOGY**

INCORPORATED BY REFERENCE

(The current edition of this document can be downloaded from the Department of Administration's website: [www.admin.state.mn.us/recs](http://www.admin.state.mn.us/recs) "click on "Construction Services" and "Manuals, Guidelines, and Forms" and "Design Guidelines")



---

## APPENDIX C

### SPACE GUIDELINES

( Department of Administration)

#### INCORPORATED BY REFERENCE

(The current edition of this document can be downloaded from the Department of Administration's website: [www.admin.state.mn.us/recs](http://www.admin.state.mn.us/recs) "click on "Construction Services" and "Manuals, Guidelines, and Forms" and "Design Guidelines"



# APPENDIX D

## PROJECT REPORT & FACT SHEET

---

PROJECT NAME

---

PROJECT LOCATION

---

State Project Number

### REPORT FOR MONTH OF

---

MONTH

---

YEAR

### PREPARED BY

---

NAME OF FIRM/CONSULTANT/ORGANIZATION/AGENCY

ADDRESS

CONTACT PERSON

PHONE & EMAIL

**NOTE TO CONSULTANT: THIS IS AN IMPORTANT COMMUNICATION TOOL TO KEEP STAKEHOLDERS INFORMED OF THE PROGRESS OF THE PROJECT. PROVIDE MONTHLY UPDATES ON THE PROJECT USING THIS TEMPLATE. IN ADDITION, INCLUDE THE MOST RECENT MONTHLY REPORT IN YOUR DESIGN PHASE SUBMITTALS.**

# PROJECT REPORT & FACT SHEET

**Date** January 2050

## Project

Name: MCF Faribault Expansion – Phase 1

State Proj # 78900FLL

## Project Members

Contracting Agency: Department of Administration, Real Estate & Construction Services-St Paul

A/E Consultant: XYZ Architects, Inc.

Contract# 123456

Contractor: Contractor /Construction Manager at Risk: Construction, Inc. (CM@Risk)

Contract #: 443509

## Budget/Costs

Funding: Laws 2010 Chap 189 Sec 18 Subd 5

Project Budget: \$47,500,000

Construction Budget: \$39,108,290

## Scope

- Total Area: 2 stories, 118,800 sq ft (new construction) and 33,000 sq ft of one story renovation Includes 14,000 sq ft mechanical penthouse, 4,000 sq ft vehicle/equip. storage 1,800 sq ft addition to existing main building
- Program: Functional spaces include support spaces for treatment program and infrastructure (physical plant spaces, food preparation)

## Construction Materials

- Exterior walls Architectural Precast Concrete, Brick veneer
- Interior structure Structural Steel
- Interior walls Gypsum Board on Metal studs, concrete masonry
- Interior Security Door Lockdown and detection, and camera surveillance
- Exterior Security High Security double row fence with concertina wire (razor wire), motion detection, camera surveillance, and patrol road

## Schedule

- Current Schedule Status Design DD Phase- 80% Complete
- Design Completion/Bidding August 1, 2050
- Notice to proceed date- construction September 21, 2050
- Substantial Completion date July 2052

## Current Status

Construction of Footing & Foundation underway

## Issues

Poor soils encountered during excavation. Replacement with engineered fill is underway

## **BUILDING SYSTEMS**

Describe primary elements of the project; then, provide a narrative description of the design parameters and goals to be achieved with the system.

NOTE: INCLUDE LIFE EXPECTANCIES OF ALL SYSTEMS

### **ARCHITECTURAL:**

Site size:

Site amenities:

Parking  Surface  Ramp/Structure & Number of Stalls

Historical Society (State Historic Preservation Office) review required features:

Narrative:

### **STRUCTURAL:**

Roof

Walls

Floors

Foundations

Narrative:

### **MECHANICAL:**

Heating System & Controls:

Cooling System & Controls:

Fire Protection System:

Narrative:

### **ELECTRICAL**

Primary Service Conductors with voltage

New components

Narrative:

### **TECHNOLOGY:**

Main Point Of Presence System:

Alternate Point of Presence System:

Narrative:

### **CIVIL/SITE INFRASTRUCTURE:**

Electrical Service:

Gas Service:

Water Service:

Sanitary Sewer Service:

Storm Sewer Service:

Fire Department Hydrant/Service:

Phone/Telecommunications:

Narrative:

## SUSTAINABILITY & ENERGY EFFICIENCY FEATURES

The following sustainability and energy efficiency features are included in the project. ( Based on *The State of Minnesota Sustainable Building Guidelines* ]

**A. Site & Water**

**B. Energy & Atmosphere**

**C. Indoor Environmental Quality**

**D. Material & Waste** – Describe waste management & recycling plan and provide metrics of amounts of materials that were recycled and diverted from landfills.

**E. ALTERNATIVE ENERGY SOURCES**

- 1 **MN Statute 16B.32 Energy Use:** Plans for a new building or for a renovation of 50 percent or more of an existing building or its energy systems must include designs which use active and passive solar energy systems, earth sheltered construction, and other alternative energy sources where feasible. A new building must consider meeting at least two percent of the energy needs of the building from renewable sources (limited to wind and sun) located on the building site. **Include narrative describing the decision making process.**
- 2 **MN Statute 16B.325 Sustainable Building Guidelines:** New buildings and substantially "stand alone" additions receiving funding from the bond proceeds fund after January 1, 2004 and all major renovations receiving funding from the bond proceeds fund after January 1, 2009 must comply with the State of Minnesota Sustainable Building Guidelines (B3-MSBG), including Section E.1, Energy Use Reduction by at Least 30%.
- 3 MN Statute 16B.326 Geothermal and Solar Applications for Heating and Cooling Systems for State Funded Buildings: Where practicable, geothermal and solar thermal heating and cooling systems must be considered when designing, planning, or letting bids for necessary replacement of initial installation of cooling or heating systems in new or existing buildings that are constructed or maintained with state funds. For the purposes of this section, "solar thermal" means a flat plate or evacuated tube with a fixed orientation that collects that sun's radiant energy and transfers it to a storage medium for distribution as energy for heating and cooling.

**Include a narrative of information on the alternative energy source systems**

## **CODES & LIFE SAFETY**

### **ZONING**

Project/Building:

Building/Site ratio:

Parking requirements:

Number of Stalls:

Setback requirements:

Environmental Assessments or Environmental Impact Statements:

Narrative:

### **CODE**

Design based upon the State of Minnesota Building Code (Minnesota adopts and amends the International Building Code )

Building Occupancy Type:

Primary Space Types:

Type of Construction:

Building Size

Number of Stories:

Square Feet per Floor:

Total Square Feet:

Space Efficiency: Usable v. Circulation/Mechanical etc.

Office Space: Gross Sq. Ft. per person:

Typical Work Station Size:

Fire Protection Description:

### **CAPITOL AREA ARCHITECTURAL PLANNING BOARD (CAAPB)**

(On the Capitol Complex, building permits are issued by the CAAPBoard)

Requirements:



## APPENDIX E

---

### **Buildings, Benchmarks & Beyond (B3) & LEED for New Construction v2.2 A Comparative Analysis**

This Document is INCORPORATED BY REFERENCE and located at the Department of Administration's website: [www.admin.state.mn.us/recs](http://www.admin.state.mn.us/recs) "click on "Construction Services" and "Manuals, Guidelines, and Forms" and "Design Guidelines", then click on Appendix E.

**Users of this Comparative Analysis please note:** All federal design guidelines currently reference LEED 3.0, in lieu of LEED NC 2.2. This document references 2.2 to maintain consistency and to avoid confusion across State Agencies.

### **The State of Minnesota Sustainable Building Guidelines (B3) & Sustainable Buildings 2030 (SB 2030)**

Complying with Sustainable Buildings 2030 is part of the State's larger scope of Sustainable Building Guidelines (B3); see "*The State of Minnesota Sustainable Building Guidelines*" for additional energy conservation design requirements. These guidelines are available at the following website: <http://www.msbg.umn.edu>

Instructions for complying with legislation and guidelines on designing for energy conservation are available at the following website: <http://www.mn2030.umn.edu>

Energy Standards for many building types can be determined by accessing the "Energy Standard Tool" from within the MSBG Tracking Tool in Guideline: <http://www.msbgtracking.com> .

Contact Garrett Mosiman at the Center for Sustainable Building Research to set up an account in the B3-MSBG Tracking Tool. Mr. Mosiman can be reached at [msbghelp@umn.edu](mailto:msbghelp@umn.edu) or 612.625.8409. Mr. Mosiman is the person to contact with all questions regarding Sustainability requirements and compliance.



## APPENDIX F

---

# PROJECT DESIGN – KICK-OFF CHECKLIST

Includes

- Checklist
- Project Management Plan
- Consultant Expectations
- Agency Sign-Off for Project Closeout & Acceptance
- Project Report & Fact Sheet (Short Form)



## REAL ESTATE AND CONSTRUCTION SERVICES (RECS) PROJECT DESIGN KICK-OFF CHECKLIST

### Key Items and Tasks for Architect/Engineer/Consultant to complete

<b>Date:</b>	
<b>State Project No.</b>	
<b>Consultant:</b>	
<b>Project Name:</b>	
<b>Facility &amp; Location:</b>	
<b>RECS Project Manager:</b>	

**Instructions: A-E Consultant checks Yes / No if they have completed the item listed. If N/A is checked, an explanation is entered in the “ITEM/TASK” column, directly below the item.**

<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>ITEM / TASK</u>
------------	-----------	------------	--------------------

#### GENERAL

- |                          |                          |                          |   |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <b>1.</b> Review your contract for all required services and deliverables prior to beginning work. See the attached “Consultant Performance Expectations”   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <b>2.</b> Do not begin work until a Notice To Proceed is received from the RECS Contract Coordinator.   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <b>3.</b> No additional work resulting in a contract change/fee adjustment shall be started or performed until approval from the RECS Project Manager is received and funds for the work have been encumbered into the contract.<br>The State will not approve or pay additional fees unless prior approval has been given by the RECS Project Manager and the Supplemental Agreement to the contract has been fully executed.  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <b>4.</b> The facility is not authorized to approve work that results in scope changes or a fee increase. Only the RECS Project Manager can authorize additional work.  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <b>5.</b> As early as possible, obtain a code review from the AHJ for plan review.  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <b>6.</b> Review the Project for all requirements: <ul style="list-style-type: none"> <li><input type="checkbox"/> Agency has legislative authority to fund project with operating funds (16B.30)*</li> <li><input type="checkbox"/> Scope of Work is per language of the Appropriation</li> <li><input type="checkbox"/> Predesign required (when construction cost is \$750,000 or greater)</li> <li><input type="checkbox"/> Legislative Notification &amp; Approval (all bonded projects)</li> <li><input type="checkbox"/> State Designer Selection Board (\$200 K + design; \$2 Mill + Project Cost)</li> <li><input type="checkbox"/> Historical Designation (&amp; involvement by State Historical Preservation Office)</li> <li><input type="checkbox"/> EAW (Environmental Assessment Worksheet) requirement</li> <li><input type="checkbox"/> B3 – MN Sustainable Building Guidelines (all new buildings &amp; major remodel)</li> </ul> |

<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>ITEM / TASK</u>
			<input type="checkbox"/> Hazardous Materials Abatement Survey (required for all remodelings) <input type="checkbox"/> Hazardous Materials Abatement Design & Const'n needed prior to construction

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>* 16B.30 ....a state agency may not undertake improvements of a capital nature without specific legislative authority.</p> <p>(b) Specific legislative authority is not required for repairs or minor capital projects financed with operating appropriations or agency receipts that:</p> <p>(1) are undertaken for asset preservation or code compliance purposes; or</p> <p>(2) do not materially increase the net square footage of a facility; and in either case</p> <p>(3) do not materially increase the cost of agency programs.</p> <p>(c) Unless the commissioner determines that an urgency exists, the commissioner of an agency undertaking a project with a cost in excess of \$50,000 pursuant to paragraph (b) shall notify the chairs of the senate Finance Committee, the house of representatives Capital Investment Committee, the house of representatives Ways and Means Committee, the appropriate house of representatives and senate finance divisions, and the director of the Legislative Coordinating Commission prior to incurring any contractual obligation with regard to the project.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>7. See RECS website for forms, Design Guidelines, Sustainable Design Guidelines, Predesign Manual, Payment Request forms, Supplemental Agreement Forms, and <i>General Information</i></p> <p><a href="http://www.admin.state.mn.us/recs/cs/cs.html">http://www.admin.state.mn.us/recs/cs/cs.html</a></p> <p>Link to Designer Procedures Manual -Table of Contents webpage</p> <p><a href="http://www.admin.state.mn.us/recs/cs/mg-dpm-toc.html">http://www.admin.state.mn.us/recs/cs/mg-dpm-toc.html</a></p>

### PREDESIGN

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>8. Predesign – Bonding Bill projects require a predesign to be submitted prior to beginning design – when the construction cost is \$750,000 or more. See</p> <p>a. Minnesota State Statute §16B.335, <i>Review of Plans and Projects</i>. Subd 3, <i>Predesign requirement</i></p> <p>b. Link to RECS Predesign Manual webpage</p> <p><a href="http://www.admin.state.mn.us/recs/cs/mg-pred-toc.html">http://www.admin.state.mn.us/recs/cs/mg-pred-toc.html</a></p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>9. Statute requirements for State Buildings and/or projects – Obtain “Applicable Statutes” Table/List.</p> <p>This is to be included in all predesigns along with all associated costs of the mandated requirements.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>10. Complete the Predesign Checklist. Review the predesign to ensure all requirements and costs for delivering the project are included in the project budget (Site acquisition, site and utilities development, design, construction, design and sustainability guidelines, alternative energy systems, commissioning, moving, occupancy.)</p>

### DESIGN

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>11. Review your contract services and deliverables required for each design phase.</p>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>12. Review and implement the State’s CAD guidelines.</p> <p>a. RECS CAD Guidelines webpage</p> <p><a href="http://www.admin.state.mn.us/recs/cs/mg-cadd-toc.html">http://www.admin.state.mn.us/recs/cs/mg-cadd-toc.html</a></p>

- 13. Prepare Design Kick-off Meeting Agenda
  - a. RECS as Key Contact for project and contract
  - b. Consultant's Key Contacts
  - c. Agency Team Contacts
  - d. Identify Project Criteria & Requirements
  - e. Establish and schedule regular/periodic design meetings
  - f. Identify Budget and Design expectations
  - g. Consultant is responsible for Sign-In Sheet, Meeting Minutes, and distribution (in a timely manner).

<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>ITEM / TASK</u>
------------	-----------	------------	--------------------

- |                          |                          |                          |  |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 14. Obtain existing drawings and information from facility   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 15. If needed for the project, request a site survey from the RECS PM. Determine survey requirements. If geotechnical services are needed, prepare scope statement for RECS PM use in soliciting proposals. Assist RECS PM with evaluation of proposals.   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 16. For all remodeling projects, determine if facility has an abatement survey for the project area. Inform the RECS Project Manager if a hazardous materials survey is needed. The RECS Project Manager will submit an order to obtain this.<br><b>NOTE:</b> The survey must be published with the project manual/specifications. |

**DESIGN - continued**

- |                          |                          |                          |  |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 17. For Bonded projects, at the end of Schematic Design Phase, assist the RECS Project Manager with preparation of a submittal package for LEGISLATIVE NOTIFICATION. <ul style="list-style-type: none"> <li>a. Submittal package is to contain current cost, scope and schedule information</li> </ul> Response from legislative chairs must be received PRIOR to entering Construction Document Phase                                     |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 18. Review the State's Design Guidelines and incorporate requirements into the project. <ul style="list-style-type: none"> <li>a. Link to RECS website for Manuals, Guidelines, and Forms: <a href="http://www.admin.state.mn.us/recs/cs/cs-mgf.html">http://www.admin.state.mn.us/recs/cs/cs-mgf.html</a></li> </ul>  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 19. Submit Design Guideline variance requests to the RECS Project Manager for approval. (Form is in the back of the Predesign Manual)  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 20. Review and incorporate Sustainability Guideline requirements into the project design. <ul style="list-style-type: none"> <li>a. Provide link to RECS State of Minnesota Sustainable Building Guidelines (MSBG-B3) <a href="http://www.msbg.umn.edu/">http://www.msbg.umn.edu/</a></li> </ul> Technical questions, related to a specific guideline or overall application of the guidelines, use the contact located on the B3 website. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 21. Implement a "Project Management Plan" and update on a monthly basis.<br>Example:   |
|                          |                          |                          |   |
|                          |                          |                          | Project Management Plan.doc (:   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 22. Verify code review procedures with the State and the City. <ul style="list-style-type: none"> <li>a. Submit Preliminary Application to State Building Codes and Standards Division Minnesota State Department of Labor and Industry they will</li> </ul>   |

determine who has authority for Plan Review and Inspections (State or local municipality or split between State and City). Webpage link: <http://www.doli.state.mn.us/buildingcodes.html>

- b. Determine zoning ordinances that apply
- c. Present design work that is to conformance with local zoning ordinances
- d. Provide Storm water calculations, requirements from Watershed Districts; SWPP permits; and Who the Authority Having Jurisdiction is (State or City) See <http://www.pca.state.mn.us/rulesregs/index.html>
- e. Obtain Fire Marshal reviews. Local or State. (Does the State defer to the local municipality?).
- f. Obtain Plumbing and Health reviews- Minnesota State Department of Labor and Industry-Building Code and Standards

<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>ITEM / TASK</u>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23. For Projects on the Capitol Complex, the below link is the “Preferred List of Equipment” Link: <a href="http://www.admin.state.mn.us/recs/cs/cs-mgf.html">http://www.admin.state.mn.us/recs/cs/cs-mgf.html</a>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	24. Review and Specify Project CLOSEOUT items contained in the State’s Design Guidelines. See <a href="http://www.admin.state.mn.us/recs/cs/design/dg-noappendix.pdf">http://www.admin.state.mn.us/recs/cs/design/dg-noappendix.pdf</a> (page 33)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25. Link to RECS website to obtain Consultant Pay Requests: <a href="http://www.admin.state.mn.us/recs/cs/cs-mgf.html">http://www.admin.state.mn.us/recs/cs/cs-mgf.html</a>

**BID DOCUMENT PREPARATION & BIDDING**

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	26. Obtain, complete and submit a BID REQUEST Form to the RECS Project Manager Link to form: <a href="http://www.admin.state.mn.us/recs/cs/cs-forms/bidreq.doc">http://www.admin.state.mn.us/recs/cs/cs-forms/bidreq.doc</a> <ul style="list-style-type: none"> <li>a. Bid Request Form is used to establish: bid dates, insurance requirements, type of front-end,</li> <li>b. After receipt of the “Bid Request” Form, the A201 “General Conditions” will be generated and the targeted business goals will be identified. They will become part of the specifications.</li> <li>c. See RECS PM for requirements for other project delivery methods.</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27. After receipt of contract “Front-end”, edit the Ad for bids and Bid Forms, Assign a Specification Division Number to each front-end section in the Table of Contents.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	28. Edit the State’s “Special Conditions” Specification Section (attached to the contract “Front-end”) <ul style="list-style-type: none"> <li>a. Insert Substantial and Final Completion Dates or number of calendar days following the “Notice To Proceed”</li> <li>b. Insert the Liquidated Damages Amount if applicable.</li> <li>c. Provide and reference the Facility Security Requirements for Contractors</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29. Obtain facility security requirements (to be published in the bid documents)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	30. Publish the Hazardous Materials Survey, Geotechnical Report, Site Survey, with the bid documents package.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	31. Verify and publish project facilities and utilities that are available for the contractor’s use.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	32. Obtain and publish the Prevailing Wage Rates (for the county where the project is located). These are available at the Dept of Labor & Industry website: <a href="http://www.doli.state.mn.us/pw_rates.html">http://www.doli.state.mn.us/pw_rates.html</a>

Publishing the Prevailing Wages for the county where the project is located is REQUIRED BY LAW.

- |                          |                          |                          |   |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 33. For projects located on the Capitol Complex, Obtain and publish the Capitol Complex Guidelines for Contractors<br>Link: <a href="http://www.admin.state.mn.us/pmd/5-3_job_site_guidelines.htm">http://www.admin.state.mn.us/pmd/5-3_job_site_guidelines.htm</a>   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 34. Obtain and publish the State’s “HotWorks” Capitol Complex Guidelines for Contractors<br>Link: <a href="http://www.admin.state.mn.us/pmd/5-3_job_site_guidelines.htm">http://www.admin.state.mn.us/pmd/5-3_job_site_guidelines.htm</a>   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 35. The project will be bid out via the State’s Online Bidding system. Deliver documents to the State in electronic format (pdf)<br>Instructions for the Online Distribution of Construction Plans and Specifications are located at: <a href="http://www.admin.state.mn.us/recs/cs/cs-mgf.html">http://www.admin.state.mn.us/recs/cs/cs-mgf.html</a> |

<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>ITEM / TASK</u>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

- |                          |  |  |  |
|--------------------------|--|--|--|
| <input type="checkbox"/> |  |  | 36. Instructions for Construction Solicitations<br><a href="http://www.mmd.admin.state.mn.us/pdf/constructioninstructions.pdf">http://www.mmd.admin.state.mn.us/pdf/constructioninstructions.pdf</a><br>Link to MMD ALP Manual Appendices<br><a href="http://www.mmd.admin.state.mn.us/alpappendices.htm">http://www.mmd.admin.state.mn.us/alpappendices.htm</a> |
|--------------------------|--|--|--|

**BID DOCUMENT PREPARATION & BIDDING**

- |                          |                          |                          |   |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 37. Ensure Project Close-out documents are published with the bid set<br>See <a href="http://www.admin.state.mn.us/recs/cs/design/dg-noappendix.pdf">http://www.admin.state.mn.us/recs/cs/design/dg-noappendix.pdf</a> (page 33)  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 38. Publish the Dept of Revenue Form IC-134 (used IC-134 link <a href="http://www.admin.state.mn.us/recs/cs/cs-mgf.html">http://www.admin.state.mn.us/recs/cs/cs-mgf.html</a><br>For Final payment, Contractor and subs must complete this form, submit it to the Dept of Revenue, receive Revenue’s signature and submit the document with final payment request. – See “Project Closeout” |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 39. Determine minimum qualifications for the contractors. Incorporate and publish these with the bid documents.   |

**BIDDING PHASE**

- |                          |                          |                          |   |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 40. Consultant is to Schedule and conduct a PRE-BID Conference. <ul style="list-style-type: none"> <li>a. Prepare a Pre-Bid Agenda &amp; provide Sign-In Sheet to verify attendance. Inform contractors that in order to receive addenda, they need to download plans from MMD’s QuestCDN site.</li> <li>b. Inform bidders of unique requirements, particularly those that relate to their bid:           <ul style="list-style-type: none"> <li>1) Contractor is responsible for all SAC/WAC charges, permits, fees</li> <li>2) Contractors must pay Prevailing Wages and are required to submit certified payrolls –every 2 weeks</li> <li>3) Parking costs</li> <li>4) Hours of Work</li> <li>5) Requirements for health tests</li> <li>6) Requirements for security background check</li> </ul> </li> <li>c. Inform contractors that the General Contractor is responsible for paying all permits &amp; fees, including SAC / WAC charges.</li> </ul> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 41. If special inspection and/or testing services are needed, prepare scope statement for RECS PM use in soliciting proposals; assist in evaluation of proposals.   |

- 42. Following receipt of bids, Consultant conducts reviews bid with apparent low bidder and provides a letter of recommendation to award to the RECS PM.
- 43. After receipt of Consultant’s recommendation, the RECS PM prepares a Recommendation To Award/Reject and forwards to the Construction Projects Operations Manager.

**CONSTRUCTION**

- 44. Prepare the Pre-Construction Meeting Agenda, schedule and chair the meeting  
Link to template: <http://www.admin.state.mn.us/recs/cs/cs-forms/preconmtg.doc>
  - Inform contractor of prevailing wages & reporting requirements
  - Inform contractor of other requirements i.e. mock-ups etc.
- 45. Contractor is to obtain all necessary permits.

<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>ITEM / TASK</u>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	46. Communication Guidelines. <ul style="list-style-type: none"> <li>a. Contractor is to go through the Architect with all communications</li> <li>b. Architect is to go through and copy the RECS PM with all communications.</li> <li>c. Voice mails &amp; emails are to be responded to within 24 hours.</li> <li>d. Contractor shall not do additional work without prior authorization by the RECS PM. The facility is NOT AUTHORIZED to add work</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	47. No “end-of-project” delay claims are allowed. Contract time extensions are per the contract and based on changes to the work and delays that are outside the contractor’s control (i.e. weather). And Contractor shall provide written notification and justification to substantiate the claim.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	48. Consultant is to establish regular Project Meetings and confirm meeting date within 24 hours of each meeting.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	49. Contractor shall post prevailing wage rates on the job site, and in a location that is accessible to all workers.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50. Contractor Pay Requests Forms are available at the following link: <a href="http://www.admin.state.mn.us/recs/cs/cs-mgf.html">http://www.admin.state.mn.us/recs/cs/cs-mgf.html</a>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	51. Consultant prepares Developing Encumbrance (DE) forms for change orders and forwards to RECS PM; Then, when pricing is received, Consultant prepares a Supplemental Agreement (SA) for review by RECS PM. <ul style="list-style-type: none"> <li>a. Consultant shall ensure all change order documentation (labor units, material units, their unit costs and totals are included).</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	52. Procedures for enforcing Owners Rights (notices of non-conforming work, etc) <a href="file:///S:/web/pdfs/OwnerRightsProced%20050503mtg.pdf">file:///S:/web/pdfs/OwnerRightsProced%20050503mtg.pdf</a>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	53. Conduct Punchlist Walkthrough
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	54. Issue Certificate of Substantial Completion – <u>Attach full punchlist</u> to Certificate <ul style="list-style-type: none"> <li>a. Include the number of days the contractor has to complete punchlist items.</li> </ul>

**PROJECT CLOSEOUT / POST CONSTRUCTION PHASE**

- 55.** Obtain all project CLOSEOUT submittals:  
See <http://www.admin.state.mn.us/recs/cs/design/dg-noappendix.pdf> (page 33)
- 56.** Obtain Agency Acceptance of Project. Submit Agency Sign-Off Sheet (Attached)
- 57.** Schedule and Conduct 10-month warranty walk-through
- 58.** Obtain Contractor and subcontractor’s completed IC-134 link (Withholding Affidavit for Contractors)  
Link :[http://www.mmd.admin.state.mn.us/pdf/apx\\_q2\\_sampleIC134Form.pdf](http://www.mmd.admin.state.mn.us/pdf/apx_q2_sampleIC134Form.pdf)
- 59.** Contractor Evaluation Form and Vendor Performance Report Form submitted at the conclusion of the project  
<file:///S:/RECSWEB/internal/index.html>  
NOTE: A Vendor Performance Report may be submitted at any time during the performance of the Contract.
- 60.** Consultant Evaluation Form is submitted at the conclusion of the project.  
<file:///S:/RECSWEB/internal/index.html>
- 61.** See the attached “Agency Sign-Off for Project Closeout and Acceptance”  
The consultant shall review this to ensure all items are completed.
- 62.** Prepare a final report on the project. Using the “Project

**SIGNATURES**

I have read the above and reviewed the documents/links cited.

Consultant Principal in Charge

Printed Name \_\_\_\_\_ Signature\_\_\_\_\_Date \_\_\_\_\_

Consultant’s Project Manger

Printed Name \_\_\_\_\_ Signature\_\_\_\_\_Date \_\_\_\_\_

Return completed form to RECS Project Manager

## CONSULTANT PERFORMANCE EXPECTATIONS

The success of any project is dependent upon a shared understanding of how the process works, open, effective, and positive communication and mutual respect. This represents the first step towards a successful project by clearly identifying the process, expectations, and our requirements for communication.

### Expectations

- Consultant shall schedule regular Project Meetings.
- Consultant shall provide an Agenda prior to all Project Meetings.
- Consultant shall communicate project status on a monthly basis using the "Project Report and Fact Sheet". There are numerous stakeholders that require ongoing status updates to monitor the project and funding.
- Consultant is responsible for Estimated Cost of Construction.  
Refer to Article 1.5 of the Basic Services Agreement.
- Consultant shall update the Estimated Cost of Construction at the conclusion of SD, DD, and CD phases.  
Refer to Articles 2 and 3 of the Basic Services Agreement.  
See 1.0.21, 2.02 and 3.0.8 of Exhibit A
- Consultant shall provide and update Project Schedule  
Refer to Articles 2 and 3 of the Basic Services Agreement.
- Consultant requires "Authorization to Proceed".  
Design  
Refer to Articles 2.4 and 3.3 of the Basic Services Agreement  
Bidding  
Refer to Article 5 of the Basic Services Agreement  
Construction  
Refer to Article 6 of the Basic Services Agreement

### Contractual items

- Consultant shall complete Supplemental Agreements when the scope of work has changed.  
Refer to Article 8.4 of the Basic Services Agreement. This is the Consultants responsibility. See [http://www.admin.state.mn.us/recs/cs/cs-forms/contractor\\_supplemental\\_agreement.doc](http://www.admin.state.mn.us/recs/cs/cs-forms/contractor_supplemental_agreement.doc)
- Article 12, Schedule of Exhibits-Exhibit G  
State Designers Procedure Manual, see <http://www.admin.state.mn.us/recs/cs/mg-dpm-toc.html>  
Instructions to A/E for On-Line Distribution of Contracting Plans and Specifications see <http://www.admin.state.mn.us/recs/cs/cs-onlinebiddocs.html>  
CAD Guidelines, see <http://www.admin.state.mn.us/recs/cs/mg-cadd-toc.html>  
Sustainable Guidelines see <http://www.admin.state.mn.us/recs/cs/mg-sus-toc.html>
- Exhibit A, 4.0 Referenced Documents  
Design Guidelines, see <http://www.admin.state.mn.us/recs/cs/mg-dg2-toc.html>  
Space Guidelines, see <http://www.admin.state.mn.us/recs/sms/spaceguide.html>  
Sustainability, see <http://www.admin.state.mn.us/recs/cs/mg-sus-toc.html>  
Energy Conservation/High Performance Buildings and Systems
- Meeting Minutes are to be prepared by the Consultant.  
Refer to Article 1.1.1, 2.1.1, 3.1.1, and 5.1.1

Your contract is not open-ended. It is a lump-sum amount that is budgeted for the project. By Statute and per the contract no additional work beyond the original contract and executed amendments is allowed unless agreement is reached on additional work, and an amendment to the contract is fully signed and executed. The Project Manager and customer agency that is funding the project must see a written proposal, reach agreement/approve it, and, if approved, then an amendment must be signed by all parties. Again NO work can be performed until a contract or amendment is fully executed. This is the State's contracting law and there are no exceptions allowed; DO NOT submit a request for additional fees after work has been performed – it will not be approved.

#### **Other links for the A/E**

- Materials Management Division (MMD), see <http://www.mmd.admin.state.mn.us/>
- Minnesota Department of Labor and Industry, see <http://www.dli.mn.gov/main.asp>
- Bid Request Form (under "Construction Contracts"), see <http://www.admin.state.mn.us/recs/cs/cs-mgf.html>
- Consultants Pay Request Form, see <http://www.admin.state.mn.us/recs/cs/cs-forms/consultantpayrequest.xls>
- Pre Construction Meeting Requirements, see <http://www.admin.state.mn.us/recs/cs/cs-forms/preconmtg.doc>

#### **Miscellany**

- Sustainability is required on all projects, refer to B3 Guidelines, see <http://www.msbg.umn.edu/index.html>
- Review your contract and deliverables required for each design phase
- No additional work resulting in a contract change/fee adjustment shall be started or performed until approval from the RECS Project Manager is received and funds for the work have been encumbered into the contract.

#### **Communication Expectations**

- RECS's Project Manager shall be copied on all emails and correspondence.
- Consultant shall confirm the next meeting date within 48 hours of a Progress Meeting.
- Consultant shall respond to Voice Mail messages within 24 hours.
- Consultant shall respond to E Mail messages within 24 hours.
- **Update your client (the State stakeholders) with a Monthly Project Report (Appendix D).**

The State Project Manager is accountable to our customer agency for delivering all projects within the available budget and schedule and to keep them informed of the status as the project progresses. This is a critical aspect of our business model and thus, we hold our consultants accountable to achieve the same goals. We will be looking for solid information for the updates you provide on the cost and schedule, with emphasis on explanation of budget creep if it occurs and meeting a completion date.

**REAL ESTATE AND CONSTRUCTION SERVICES**

**AGENCY SIGN-OFF for  
PROJECT CLOSEOUT and ACCEPTANCE**

<b>Date:</b>	
<b>Project No. Contractor:</b>	
<b>Project Name:</b>	
<b>Facility &amp; Location:</b>	
<b>RECS Project Manager:</b>	

**CLOSEOUT SUBMITTALS/TASKS**

<u>Yes</u>	<u>No</u>	<u>N/A</u>	<u>ITEM / TASK</u>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. I participated and provided input into the creation of the punchlist.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Contractor has completed the punchlist items to my satisfaction
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Operations and Maintenance Manuals have been received, reviewed and are acceptable.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. A copy of the As-built (record documents) have been received. (1 hardcopy and 1 electronic set of specifications and drawings – 3 copies to PMD)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. If specified, training has been performed by the contractor
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Specified “attic stock” / spare material has been received
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Utility rebate documentation has been received.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Final Cleaning by contractor has been completed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. Contractor and subs have submitted all IC-134s (for final payment)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Other _____

**PROJECT ACCEPTANCE**

YES                      NO

- |                          |                          |                             |             |
|--------------------------|--------------------------|-----------------------------|-------------|
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Project is ACCEPTED      | DATE: _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Project is NOT Accepted | DATE: _____ |

**Reason(s) if not accepted:**  
\_\_\_\_\_  
\_\_\_\_\_

**AGENCY SIGNATURES:**

**Agency primary designee:**

Printed Name \_\_\_\_\_ Signature \_\_\_\_\_

**Agency Technical or secondary designee:**

Printed Name \_\_\_\_\_ Signature \_\_\_\_\_

Return completed form to RECS Project Manager; PM places a copy in contract file

# PROJECT REPORT & FACT SHEET (Short Form) – See Appendix D for long form

**Date** January 2050

## Project

Name: MCF Faribault Expansion – Phase 1

State Proj # 78900FLL

## Project Members

Contracting Agency: Department of Administration, Real Estate & Construction Services-St Paul

A/E Consultant: XYZ Architects, Inc.

Contract# 123456

Contractor: Contractor /Construction Manager at Risk: Construction, Inc. (CM@Risk)

Contract #: 443509

## Budget/Costs

Funding: Laws 2010 Chap 189 Sec 18 Subd 5

Project Budget: \$47,500,000

Construction Budget: \$39,108,290

## Scope

- Total Area: 2 stories, 118,800 sq ft (new construction) and 33,000 sq ft of one story renovation Includes 14,000 sq ft mechanical penthouse, 4,000 sq ft vehicle/equip. storage 1,800 sq ft addition to existing main building
- Program: Functional spaces include support spaces for treatment program and infrastructure (physical plant spaces, food preparation)

## Construction Materials

- Exterior walls Architectural Precast Concrete, Brick veneer
- Interior structure Structural Steel
- Interior walls Gypsum Board on Metal studs, concrete masonry
- Interior Security Door Lockdown and detection, and camera surveillance
- Exterior Security High Security double row fence with concertina wire (razor wire), motion detection, camera surveillance, and patrol road

## Schedule

- Current Schedule Status Design DD Phase- 80% Complete
- Design Completion/Bidding August 1, 2050
- Notice to proceed date- construction September 21, 2050
- Substantial Completion date July 2052

## Current Status

Construction of Footing & Foundation underway

## Issues

Poor soils encountered during excavation. Replacement with engineered fill is underway



## APPENDIX G

# DESIGN GUIDELINE REQUEST FORM

(Please Type or Print)

Date: \_\_\_\_\_ Agency: \_\_\_\_\_

Submitted by: \_\_\_\_\_ Facility: \_\_\_\_\_

Phone: \_\_\_\_\_ Address: \_\_\_\_\_

Fax: \_\_\_\_\_ Email: \_\_\_\_\_

### **SPECIFICATION DIVISION:**

(From the State's *Design Guidelines*)

### **SUGGESTION:**

### **BASIS FOR SUGGESTION or REVISION:**

(The primary criteria for deciding on whether to incorporate a suggestion into the Design Guidelines Manual will be to substantiate a REOCCURRING problem with performance of a product, system or design which results in a safety problem, a higher than normal cost to remedy or a higher than normal Operational Cost to maintain).

### **DOCUMENTATION OF NEED:**

(Attach photographs/information that substantiates the need for this guideline)

Submit to: State Project Manager



## APPENDIX H



### DESIGN GUIDELINE VARIANCE REQUEST FORM

(Please Type or Print)

Date:	Project Name:
Submitted by:	State Proj. No.
Firm:	Facility:
Address:	Facility Address:
Phone:	
Fax:	
Email:	

**SPECIFICATION DIVISION & ITEM No. :** (Item From the Design Guideline Manual)

**VARIANCE REQUEST:**

**BASIS FOR VARIANCE REQUEST:**

**DOCUMENTATION OF NEED:**

(Attach photographs/information that substantiates the need for this variance)

Submit to: State Project Manager