General Administration Facilities
Design Guidelines & Construction Standards

March 2003

Department of General Administration
Office of Capitol Planning & Management
Division of Engineering & Architectural Services

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A. Authority and Purpose

The General Administration Facilities Design Guidelines and Construction Standards are intended to:

- Establish a set of standard operating practices and materials for Capitol Campus construction as well as other GA owned facilities.
- Facilitate the work of consulting Architect/Engineers (A/E's) and Contractors on Capitol Campus and other GA owned building projects at satellite areas.

The Standards convey information that is unique to the Washington State Capitol Campus and State owned buildings managed by General Administration. Many of the requirements have developed out of maintenance experience; others are owner preference to maintain consistency with GA owned facilities. **Compliance is mandatory**. Exceptions will be made only upon specific written approval of General Administration. Submit exceptions to the GA Project Manager using the "Facilities Design Guidelines and Construction Standards Exception Request" form; a copy of this form is included immediately following this Introduction.

The designated "Owner" of the Capitol Campus is the Department of General Administration's Office of Capital Planning and Management (OCPM). Assisting OCPM in management of capital funded projects and off-budget performance contracts is General Administration's Division of Engineering and Architectural Services (E&AS). Compliance with requirements of these Guidelines and Standards will be monitored and enforced by the OCPM and E&AS Project Manager.

Requirements set forth in the Standards are to be incorporated in contract specifications and complied with during construction. The A/E shall follow the Standards in programming and design, and shall review Contract Documents for compliance with the Standards before bidding.

A secondary purpose of the Standards is guidance of the Project Manager and contractor on each project.

Suggestions for improving the Guidelines and Standards are welcome and may be addressed to:

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Office of Capitol Planning and Management
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Olympia, WA 98504-1019

Phone: 360/ 902-0971
E-mail: glarson@ga.wa.gov

B. Standards Control Procedures

OCPM and E&AS are jointly responsible for the development, maintenance, revision and distribution of these GA Facilities Design Guidelines and Construction Standards. The most recent version of the Guidelines and Standards will be accessible via the E&A Services home page on the world wide web. The Project Manager will ensure that the A/E has access to a current copy of the Guidelines and Standards at the time of agreement.

The Guidelines and Standards will be routinely reviewed and updated by OCPM and E&AS.

Guidelines and Standards distribution will be primarily through the Engineering & Architectural Services home page on the World Wide Web. Each revision will be dated. Paper copies will be made available upon request to the Project Manager.

C. Definition of Terms

The following are abbreviations and terms frequently used in the standards text. Note that the terms "A/E" and "Consultant" are used interchangeably throughout this document.

A/E	Architectural or Engineering consulting firm, under agreement to General Administration.
Consultant	Architectural or Engineering firm, in a prime or subordinate role, under agreement with the Department of General Administration to perform a specific consulting service.
CSI	Construction Specifications Institute.
GA	General Administration, including: OCPM: Office of Capitol Planning & Management E&AS: Division of Engineering & Architectural Services, acting on behalf of the Owner, OCPM DCF: Division of Capital Facilities DSS: Division of State Services
Project Manager	The person(s) designated by the Department of General Administration to officially represent the Department for the duration of the project.
Standards	Washington State Department of General Administration Facilities Design Guidelines and Construction Standards
Tenant	State department or agency occupying space affected by the project.

END OF INTRODUCTION SECTION

Washington State
Department of General Administration

FACILITY DESIGN GUIDELINES AND CONSTRUCTION STANDARDS EXCEPTION REQUEST

1. Current requirement (refer to the existing guideline or standard).

2. Recommended change to the existing guideline or standard.

3. Reason for the request (include technical, cost, schedule or other reasons):

4. Date change is needed:

Recommendations:

_____ ☐Approve ☐Deny
Project Manager

_____ ☐Approve ☐Deny
Property Manager

_____
Final Approval

☐Approve – Individual exception only
☐Change to be incorporated in the next revision of the Guidelines and Standards

Design Standards

Each prime consultant has signed an A/E Agreement with GA that refers to several other documents, including the Conditions of the Agreement. For Capitol Campus projects as well as other GA owned facilities, the A/E Agreement will also reference these Guidelines and Standards as a condition of the agreement.

A. Functional Program

The functional program will normally be provided to the Consultant, unless the A/E Agreement provides for the Consultant to develop the program.

The functional program is intended to identify the types of spaces required, the activities and number of people to be accommodated, space sizes and proximity relationships, services requirements, equipment to be accommodated, etc.

B. Technical Program

The technical program will identify the service and functional requirements relative to the Capitol Campus infrastructure. The technical program will normally be provided to the Consultant, unless the A/E Agreement provides for the Consultant to develop the program.

The requirements of both the functional and technical programs shall be fulfilled by the Consultant and evidenced at the schematic design phase.

C. Codes and Ordinances

Consultants are required to comply with all applicable codes and ordinances including Title 51 of the Washington Administrative Code (WAC) and the Americans with Disabilities Act. The Capitol Campus is located within the City of Olympia and the Olympia Building Official is the Authority Having Jurisdiction (AHJ) for most building related issues. The Olympia Fire Marshall is the AHJ for fire protection, alarm and life-safety issues. Electrical Inspection is performed by the City of Olympia. Labor & Industries electrical plan review is not required for campus projects.

The Labor & Industries Building is located in Tumwater, subject to City of Tumwater building inspection, and Labor & Industries electrical inspection.

General Administration owned buildings in other locations of the State shall comply with applicable codes and ordinances of the Local AHJ.

D. Record Information

General Administration maintains a Historical Records Center of drawings, specifications, operation and maintenance manuals, and other records for existing campus facilities. Consultants are expected to utilize this resource where applicable. Return all records at project completion.

Record information, while helpful, does not take the place of careful field investigation, measurement, and interviews with General Administration facilities staff. Consultants shall not rely on as-built drawings for location of existing utilities on site. It is mandatory that consultants field-verify all existing conditions. Consultants must contact DCF for verification of location of actual existing on-site utilities for A/E consultant work.

E. Design Considerations

Identify and evaluate any necessary alternates early in the design process. Due to continuous occupancy requirements, the construction sequence may need itemization as part of the contract documents. In extreme cases, the consultant will be asked to prepare a provisional master schedule including design process through construction period for inclusion in the contract.

Consultants together with their cost estimators shall visit the site during the initial design phase so there is a clear understanding of the complexities to the project and such complexities are reflected in the cost estimate. Construction cost estimates must include consideration of difficult work-site conditions, lack of parking, off-hours and overtime work, legislative sessions, working within occupied spaces, visitors, etc.

F. Connections to Existing Utilities & Services

Current policy mandates that any new and/or added capacity hook-ups to any existing campus utilities and services including electrical, sewer, storm, water, etc., will require the DFC Infrastructure Property Manager to sign-off on such hook-up as part of the "plan review" process. A required prerequisite will be a "live test" and/or "proof" that the existing utility lines have sufficient capacity to appropriately accommodate the new projected loads.

G. Asbestos Considerations

General Administration periodically surveys campus facilities and maintains detailed records of asbestos containing materials under the supervision of an industrial hygienist. In compliance with WAC 296-62-07707, General Administration will provide a good faith inspection and report upon request.

H. Lead Paint Considerations

The Office of Capitol Planning and Management is in the process of surveying campus facilities for presence of surfaces with lead paint and will be maintaining detailed records of such surveys. In compliance with WAC 296-62-07521.

Should the lead paint survey indicate the presence of surfaces with lead paint, GA will provide the A/E with a copy of a good faith inspection and report which the A/E shall include in the Contract Documents, as well as the following statement:

> "Under the WISHA Lead Standard in Construction, WAC 296-62-07521, air monitoring to determine if lead levels are safe shall be conducted, or a negative declaration which states no lead is present or that the work activity will not be unsafe based on prior monitoring of the same activity. All sampling data for exposure monitoring shall be submitted to the Owner's Representative for submittal to Environmental Services of OCPM for record retention."

I. Indoor Air Quality Considerations

Indoor Air Quality is a prime concern of tenants and GA on the campus. The consultant shall comply with Appendix X of the Instructions to Architects and Engineers. IAQ problems shall be prevented by judicious selection of materials and methods; protection of building materials from contamination

during construction; and adequate ventilation during building commissioning. For major projects, all building HVAC equipment shall run continuously with maximum outside air after installation of carpet and furnishings for a minimum period of time to flush out volatile organic compounds.

For minor projects, carpet and furnishings may be opened and aired out in the vendors warehouse for an adequate period of time.

Refer also to Guide Specifications Section 01734, Indoor Air Quality.

J. Resource Efficient Design

It is the policy of the State of Washington to have buildings designed that are resource efficient. To that end, the consultant shall comply with Appendix VIII of the Instructions to Architects and Engineers, titled "Energy and Environmental Guidelines (Resource Efficient Design)." These guidelines are aimed at achieving minimal use of energy and water, utilizing products containing recycled material or recyclable products whenever practicable, and diverting construction, demolition, and land clearing (CDL) waste from solid waste facilities; i.e., land fills.

Refer also to Guide Specifications Section 01732, Demolition and Construction Waste Management.

K. Commissioning

It is the policy of the State of Washington to have buildings commissioned to ensure that the facility's mechanical, electrical and designated systems' performance meets the design intent and the owner's functional criteria and operational needs. To that end, the consultant shall comply with Appendix VII of the Instructions to Architects and Engineers, titled "Commissioning Guidelines." These guidelines are aimed at delivering a facility that operates as it was intended, meets the needs of the building owner and occupants, and provides training of facility operators.

L. Energy Life Cycle Cost Considerations

It is the policy of the State of Washington that major facility designs be based on the total life cycle cost, including the initial construction cost, the cost of the energy consumed, and the costs of the operation and maintenance of the facility over its economic life. To that end, the consultant shall comply with Appendix IX of the Instructions to Architects and Engineers, titled "Energy Life Cycle Cost Guidelines." These guidelines are for the preparation of an Energy Life Cycle Cost Analysis (ELCCA) for a major facility (defined as having twenty-five thousand square feet or more of usable floor space) that is to be constructed or renovated by any public agency.

M. General Building Requirements

1. Capitol Campus designs may be subject to review and approval by the Capitol Campus Design Advisory Committee (CCDAC), the State Facilities Accessibility Advisory Committee (SFAAC), and the State Capitol Committee (SCC).

2. See "Exterior Furnishings and Fixtures Design Guidelines" for building exterior and site guidance.

3. Roof access shall be provided with stairway and railings. Access shall be keyed to campus maintenance master standard.

4. Roof related projects shall include installation of fall protection devices if not currently existing.

N. Historic State Capitol Buildings

The following State capitol buildings are historically significant. Unless and until directed otherwise by the State, treatment recommendations for these buildings shall follow the U.S. Secretary of the Interior's Standards for the Treatment of Historic Properties and associated guidelines.

1. Those listed on the National Register of Historic Places are indicated with(*).

2. Those considered by the State Office of Archaeology and Historic Preservation as eligible the National Register as of March 29, 2001, are indicated with (#).

3. Those above the line are 50 years old or older.

Old Capitol#
Governor's Mansion*
Dolliver*
Temple of Justice*
Power House#
Insurance*
Legislative*
Olmsted-designed portions of the West Capitol Campus*
Capitol Court (Old Thurston Courthouse)#
Newhouse*
Greenhouse#
1417-1419 S. Columbia (AP Press House)#
Cherberg*
201 W 14th Ave (UPI Press House)#
O'Brien*

Pritchard Building#
1063 Capitol Way (City of Olympia Heritage Register)
General Administration Building#

END OF GENERAL DESIGN REQUIREMENTS SECTION

A. General Building Requirements

1. Serviceability

Every building on the campus is intended to serve its purpose over a long period. The initial design and construction is a very small fraction of the facility's life cycle cost. The true value of an improvement is measured by its ability to accommodate users with low cost operations and maintenance.

Building services must be efficient, and ideally, transparent to the occupants and public. Service access and maintenance considerations must be given first priority to keep life cycle costs low.

2. Safety and Security

The Owner and consultant should cooperatively consider building security in the design of facilities. GA security personnel should be consulted early in the design phase to discuss surveillance, access control, etc.

3. Accessibility Provisions

Improvements shall comply with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and Washington State Title 51 WAC. Both are applicable - the most stringent controls. The Owner reserves the right to exceed minimum code requirements. ADA design review will be performed by the Division of Engineering & Architectural Services.

4. Structural Considerations

Provide adequate floor to floor height and interstitial space to allow effective maintenance.

5. Seismic Considerations

The consultant team shall provide seismic bracing for all systems in accordance with the current interpretation of the Uniform Building Code of the Local Jurisdiction. Generally this means all piping, conduit, ductwork, suspended equipment, suspended ceilings, etc. shall be braced.

6. Acoustical Control

Most interior spaces will be configured as open office. Acoustical control is critical and management of noise from mechanical systems, the exterior environment and occupant's activities must be achieved. Particular care is needed for evaluation of vibration from mechanical equipment mounted on structural members. Computer modeling and analysis shall be used where there is reasonable doubt concerning acoustical control. In new construction, ventilation equipment and other mechanical noise sources in office spaces shall be designed and specified to provide background sound which conforms to a noise criterion curve or equivalent not to exceed NC-35.

7. **Internal Accessibility**

Mechanical, electrical and communications distribution systems shall be provided with access. Pipe and duct shafts shall be provided with platforms, access doors at each landing, lighting and convenience outlets. Suspended ceiling grid systems shall be heavy duty classification to minimize support and seismic bracing wires.

8. **Room Data Sheets for Mechanical and Electrical Requirements**

Room data sheets shall be developed as part of the schematic design phase. Data sheets shall include electrical, mechanical, communications, storage, security and other requirements as applicable. Completed data sheets will be reviewed and approved by the Project Manager and tenant representative prior to starting Design Development.

9. **Maintenance Based Design & Construction**

The owner desires a completed facility that can be efficiently operated and maintained with minimum expenditure of resources during the useful life of the building. The following is intended to provide general guidance for maintenance-based design and construction and does not replace standards established for a specific facility by the owner.

a. Design is to be consistent with applicable codes, industry standards, and best practices as determined by the owner.
    1) Electrical equipment shall have sufficient access and working space for safe, convenient operations and maintenance per Article 110 of the National Electrical Code.
    2) Mechanical equipment room layouts shall be arranged to provide access for removal and servicing of all equipment.
    3) Provisions shall be made for maintenance access to all items of mechanical equipment, such as valves, controls, cleanouts, traps, strainers, heaters, filters, heat exchangers, etc.
b. Installed equipment should be economical to operate. Avoid discontinued, special order, or high-energy demand equipment that will cost more to replace, repair and operate than standard materials.
c. Lighting fixtures designed for inaccessible locations, such as high ceilings, requiring specialized equipment for maintenance should not be installed; but, if accepted by the owner as part of the design, the project shall provide access and the tools and equipment required to service and maintain the fixtures.
d. Surplus space to accommodate future expansion and technology needs shall be provided where possible.
e. Avoid spatial and functional conflict between HVAC mixing boxes and light fixtures, fire sprinklers and other systems.
f. Design shall provide for effective and efficient custodial care in recognition of its high life cycle cost. Criteria shall include, but not be limited to, custodial product and equipment storage areas adequate in terms of numbers and locations with sufficient space and ventilation.
g. HVAC system shall be designed with open protocol systems controls.
h. HVAC system ductwork shall be designed to exclude the use of interior duct lining.

B. Site Requirements

1. Roadways and Sidewalks

Routes of travel shall comply with ADA requirements for accommodating both abled and disabled persons. All outside paths shall be not less than 44 inches wide and shall have a slope no greater than 1:20. Refer to Paving, Bases & Appurtenances Section of Division 2 (02700) for additional design criteria and related requirements.

2. Utility Tunnels

Utility tunnels shall be minimum six feet high with service access width minimum 30”.

3. Landscaping

Refer to Guide Specification Section 01500, Temporary Facilities & Controls, for protection requirements of existing landscaping.

Refer to Landscaping Section of Division 2 (02900) for additional design criteria and related requirements.

C. Building Service Requirements

1. Vehicular access

Above grade emergency vehicle access shall be provided to all building entrances, either by roadway or sidewalk. Turning radiuses shall be adequate for the largest piece of emergency equipment maintained by the Local Fire Department. Garage access to emergency vehicles is not required.

2. Loading Dock

The loading dock shall provide a convenient, covered, all weather location for loading and unloading. Simultaneous access shall be provided for not less than three vehicles. Docks shall accommodate truck bed level unloading. A dock leveler shall be provided in one vehicle location.

Each loading dock bay shall be not less than twelve feet in width and eight feet in depth. Additional storage space shall be furnished for waste handling and recycling containers, as well as a cardboard compactor. Three phase, 120/208 volt power shall be provided to the compactor.

To avoid bird problems, loading docks should have flat, smooth walls and ceilings, with all light fixtures, conduits and pipes recessed.

For security purposes, include a call box/button to summon state escort and access. Provide conduit to accommodate CCTV camera coverage.

3. **Waste/Recycling Handling**

Adequate space for separate waste and recycling containers shall be provided in interior and exterior locations.

4. **Elevators, Vertical Access**

Elevators and stairways are required in every facility more than one story high to handle movement of people, material and equipment between floors. A dedicated freight elevator should be provided adjacent to the loading dock.

Design criteria for passenger elevators shall be as follows:

Maximum projected wait to load, up bound peak = 30 seconds.
Maximum projected wait to load, down bound peak = 30 seconds.
Maximum projected wait to load, daytime base = 30 seconds.

Elevators shall comply with ADA requirements. In addition, elevator compartment shall be sized large enough to accommodate a gurney for use in case of medical emergency.

Passenger elevators shall be provided with standby or emergency electrical power from an engine generator.

Refer to Elevator Section of Division 14 (14200) for additional design criteria and related requirements.

5. **Custodial Provisions**

Custodial care is the most costly annual maintenance item for any facility. Every provision that facilitates effective and efficient custodial care is an investment in the reduction of annual maintenance costs.

Design criteria for custodial spaces shall include the following:

a. Storage space of 400 square feet minimum near the loading dock. This space will be used to store large quantities of paper products, spare lamps, cleaning supplies, and equipment. An adjacent but separate subdivided area should be provided for a Custodial office and break room. Ceiling height shall be minimum eight feet. Storage room door shall be minimum 3'-6" wide, opening outward. Fluorescent lighting should provide an average of 40 foot-candles, maintained, at the floor. Ventilation should provide conditioned air with appropriate exhaust to the building exterior. A floor mounted sink should be located near the door. Splash shields should be provided on walls. A floor drain shall be provided in the center of the room. Duplex receptacles shall be provided on each wall. Telephone/communication jacks shall be provided in the office.

b. A storage space of 120 square feet minimum shall be provided on each floor. Ceiling height shall be minimum eight feet. Storage room door shall be minimum 3'-6" wide, opening outward. Fluorescent lighting should provide an average of 40 foot-candles, maintained, at the floor. Ventilation should provide conditioned air with appropriate exhaust to the building exterior. Do not mix with building HVAC to ensure good Indoor Air Quality. A floor mounted sink shall be located near the door. Splash shields should be provided on walls. A floor drain shall be provided in the center of the room. A duplex receptacle shall be provided.

Restrooms shall be provided with adequate floor drains. Jumbo roll tissue dispensers and flat seat cover dispensers shall be located in each stall. Soap dispensers shall be tank type, dispensing liquid soap. Twenty-five cent (.25) sanitary napkin/tampon dispensers shall be located in women's restrooms.

6. **Electrical Rooms and Closets**

Electrical rooms shall be devoted entirely to electrical equipment. There shall be no foreign piping, ductwork, etc. in the electrical room. Electrical room size shall provide for additional future equipment. Working clearances around equipment shall exceed National Electric Code minimum requirements by 25 percent. Unless otherwise exempted by code, there shall be two (2) exits, one at each end of the working space, in electrical rooms containing equipment rated 1200 amperes or more and over 6 feet in width containing overcurrent devices, switching devices, control devices, relays, and similar equipment.

Electrical closets shall be devoted entirely to electrical equipment. Closet doors shall be not less than 36" wide and shall swing out, away from electrical equipment.

7. **Designated Areas for Printers and Copiers**

Specific areas shall be designated for locations for printers and copiers. Spaces for copiers shall have direct ventilation to the exterior of the building.

END OF PROGRAMMING GUIDE SECTION

Document Requirements

A. Drawing Requirements

Drawings shall be prepared in accordance with the E&AS Policy No. POL 7.20.02 – Computer Aided Design (CAD) Guidelines. For remodel and renovation projects, existing features and systems shall be screened or half-toned to allow easy identification. Drawings shall include one-line diagrams, equipment schedules and text and/or graphical Sequence of Operations.

B. As-Built Drawings

As-built drawings shall be provided. Three sets of prints and one set of AutoCAD.DWG files on CD-ROM disks shall be furnished. All third party software (menus, fonts, etc.) required to view and manipulate the AutoCAD files shall be provided. A *readme* text file with specific instructions on external references, fonts, model and paper space, etc. shall be provided. Drawing files shall not be compressed (e.g. "zipped"). Refer to Guide Specifications Section 01780, Close-Out Submittals, for Record Document submittals required by Contractor at project close-out. Refer to Guide Specifications Section 01311, Project Meetings, for 'as-built' meetings required by Contractor and their subcontractors during the construction phase.

C. Specifications

Specifications shall be prepared in the Construction Specification Institute (CSI) format. Files shall be provided in MicroSoft Word format on CD-ROM disks. All addenda items issued during bidding period, plus all COs, COPs, FAs, RFIs, and the like, shall be annotated. Refer to Guide Specifications Section 01780, Close-Out Submittals, for additional Record Document submittal requirements at project close-out.

D. Permits and Certificates

Refer to Guide Specifications 01780, Close-Out Submittals.

E. Training

Refer to Guide Specifications 01770, Close-Out Procedures.

F. Warranty Contacts

Refer to Guide Specifications 01780, Close-Out Submittals.

G. Sub-Consultants Closeout Submittals

All sub-consultants to the prime consultant are not to include their own requirements regarding close-out submittals. Sub-consultants specification sections regarding closeout submittals including project record documents, operation and maintenance manuals, warranties, bonds, extra stock, etc., are only to reference seeing Section 01780. If the consultant has specific criteria they need beyond Section 01780, they can specifically identify it at the same time as being in addition to requirements of Section 01780.

H. Blue Print Security Protocol

Projects involving the Governor's Mansion and certain other locations on campus will involve special blue print security protocol as described below for purposes of maintaining building security protection.. The Project Manager will notify the A/E when such protocol is to be enforced.

City Plan Review

- When design documents are delivered to city for review and permit application they will have an attached cover letter stating: "These documents will not be released without written approval of the Department of General Administration, Office of Capitol Planning and Management, and the Washington State Patrol Executive Services Section."

Contractor Pre-Bid Walkthrough

- All contractors at pre-bid walk through will have submitted name, date of birth, and, SS number to project manager 48 hrs prior to walk through for security screening.

Bid Documents

- Only design documents that contain information that could be viewed by public passer-by will be available.
- No floor plans will be available.
- No site plans will be available.
- Scope and quantity of work will be available.
- Exterior elevations of building will be available.

Construction Phase

- All copies of construction documents will be signed out, numbered, and stamped "Do Not Duplicate." by the architect.
- Upon completion of project architect will return all copies of construction documents to General Administration.

END OF DOCUMENT REQUIREMENTS SECTION

Design Review Process

Formal Owner review shall occur at 95% completion of the schematic design, design development, and construction document stages. The design schedule shall include a minimum of two weeks review time for each stage. The E&AS Project Manager shall notify the appropriate OCPM Property Manager at the beginning of design. The Property Manager shall designate project review personnel from OCPM and the tenant, as applicable, to attend design coordination meetings and review the documents.

OCPM will develop project review and notification list(s). OCPM shall use a Plan Review Comment form to document review comments; see attached form immediately following this section. Forms requiring the Consultant's attention will be given to the Project Manager for forwarding to the Consultant. Plans marked up by a reviewer may be returned, but it is the intent that responses will be returned in writing, on the comment form.

PLAN REVIEW - Process/Policy

OCP 8-28-97

Objective: Receive benefit of multiple reviewers input to enhance plan quality.
Provide feedback to reviewers of comment results.
Provide consistent format and process for reviews.

- Design team is to present the project documents and cost estimate to the total plan review group at one time at an overview meeting in Olympia. The purpose of this meeting is to familiarize the entire review team with the design intent, project scope, and a "walk-through" of the documents and cost estimate so that appropriate review and comments can be made. Distribute documents and cost estimate to review team at this time.
- All drawings to be full size drawing sheets unless otherwise requested.
- Provide multiple review sets of plans/specs:
    - E&AS 1
    - OCPM 2
    - DCF 2
    - Agency (tenant) 1 or more for each agency
    - Stakeholders as appropriate
- Allow two (2) weeks review/response/acceptance time.
    - Reviewers return Plan Review Comments. First week
    - A/E analyze, reply and return. 3 days
    - Roundtable review. 1 day
    - Reviewers acknowledge acceptance and return. 2 days
- Reviewer comments will be returned to the OCPM Property Manager who will review the comments received and may edit them by consolidating any duplicate comments prior to forwarding comments to the E&AS Project Manager. If there are budget issues or conflicts in intended scope, these items will either be reviewed by OCPM and/or A/E with respective tenants to make a determination, or noted in the response column that it is being evaluated by OCPM.
- The OCPM Property Manager will schedule a meeting with the Consultant, E&AS, and any other parties who provided comments, to review the Consultant responses and resolve any disputes.

- Formal Review with State Facility Access Advisory Committee (SFAAC) may be required at Design Development. Comments will be presented on review forms and A/E shall reply within three days.
    - Required Documents: Bring at least one set full size drawing and models if available.
    - Meeting Participants: A/E, Owner Representative, maintenance staff, other stakeholders.
    - Agenda:
        1. Discuss access from bus stop to meeting rooms
        2. Office space, break rooms, restrooms
        3. Special features, inside or out
        4. Discuss functional use of each area.
    - Review comments will be sent to owner and A/E within 3 working days.
    - Reply from A/E is expected within 3 working days.

END OF DESIGN REVIEW PROCESS SECTION

Review Comments

Date: Reviewer: Position: Agency:			Project Title: Building: Owner Rep: Phone:	Action Taken on Comments By: C - Correction Made NC - Correction Not Made
Item No:	DWG Sheet/ SPEC Sect:	DWG Detail/ SPEC Para:	Comments:	Explanation:

6/26/98

Construction Standards

A/E shall work with the Project Manager to set the pre-bid meeting and bid dates. E&A Services will advertise the invitation to bid in accordance with Public Works law.

A. Documents

1. **Instructions to Bidders**

   E&A Services will furnish A/E with copy of latest edition of the Instructions to Bidders, which may include provisions requiring low bidder to submit a Responsibility Criteria form.

2. **Responsibility Criteria Form**

   Where Instructions to Bidders includes requirements for submittal of Responsibility Criteria form, such form shall be included immediately following the Instructions to Bidders document. E&A Services will furnish A/E with electronic copy of Responsibility Criteria form.

3. **Bid Proposal Form**

   E&A Services will furnish A/E with electronic copy of Bid Proposal form. Modify as necessary to meet project conditions.

END OF BIDDING REQUIREMENTS SECTION

A. Documents

1. **General Conditions**

   E&A Services will furnish A/E with copy of latest edition of the General Conditions For Washington State Facility Construction. Include immediately following the Bid Proposal form.

2. **Supplemental Conditions**

   E&A Services will furnish A/E with copy of latest edition of the Supplemental Conditions For Washington State Facilities Construction. Include immediately following the General Conditions.

3. **Certificate of Insurance Form**

   E&A Services will furnish A/E with a copy of the Certificate of Insurance form, Form S.F. 500A. Modify as necessary to meet project conditions. Include immediately following the Supplemental Conditions.

4. **Prevailing Wage Rates**

   Include prevailing wage rates immediately following the Certificate of Insurance form. Include both Journey Level and Apprentice Level Wage Rates, together with Benefit Code Key. Wage rates and Benefit Code Key may be obtained online at www.lni.wa.gov/prevailingwage.

END OF CONDITIONS OF THE CONTRACT SECTION

Guide Specifications

Summary of Work

Refer to Guide Specification Section 01110.

Appendix A: Assignment of Pre-Purchased Products/Equipment

Allowances

Refer to Guide Specification Section 01210. Coordinate with Bid Proposal form.

Alternates

Refer to Guide Specification Section 01230. Coordinate with Bid Proposal form.

Modification Procedures

Refer to Guide Specification Section 01250.

Unit Prices

Refer to Guide Specification Section 01270. Coordinate with Bid Proposal form.

Payment Procedures

Refer to Guide Specification Section 01290.

Project Coordination

Refer to Guide Specification Section 01310.

Project Meetings

Refer to Guide Specification Section 01311.

Communication

Refer to Guide Specification Section 01315.

Construction Schedule

Refer to Guide Specification Section 01320. For projects of limit scope and projects with construction cost less than $1,000,000, coordinate with OCPM whether the Construction Schedule provisions contained in the Supplemental Conditions will suffice and the more detailed requirements of Section 01325 may be omitted.

Submittal Procedures

Refer to Guide Specification Section 01330.

Regulatory Requirements

Refer to Guide Specification Section 01410.

Reference Standards and Definitions

Refer to Guide Specification Section 01420.

Contractor Quality Control

Refer to Guide Specification Section 01450. Refer also to the following associated forms:

Form 01450-F1: Contractor Quality Control Daily Report

Form 01450-F2: Contractor's Quality Control Test Report

Testing Laboratory Services Provided by Owner

Refer to Guide Specification Section 01455.

Historic Preservation Inspection Services

Refer to Guide Specification Section 01456.

Waterproofing Inspection Services

Refer to Guide Specification Section 01458.

Temporary Facilities & Controls

Refer to Guide Specification Section 01500.

Product Requirements

Refer to Guide Specification Section 01600.

Substitution Request Form

Safety Procedures

Refer to Guide Specification Section 01712.

Field Engineering

Refer to Guide Specification Section 01720.

Cutting and Patching

Refer to Guide Specification Section 01730.

Selective Demolition

Refer to Guide Specification Section 01731.

Demolition & Construction Waste Management

Refer to Guide Specification Section 01732. Refer also to the following associated forms:

Sample Form: Demolition & Construction Waste Management Plan

Blank Form: Demolition & Construction Waste Management Plan

Indoor Air Quality

Refer to Guide Specification Section 01734.

Cleaning

Refer to Guide Specification Section 01740.

Close-Out Procedures

Refer to Guide Specification Section 01770.

Close-Out Submittals

Refer to Guide Specification Section 01780.

END OF GENERAL REQUIREMENTS SECTION

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division1 Specification Sections, apply to this Section.

1.02 WORK COVERED BY THE CONTRACT DOCUMENTS

A. This project includes various trades. Coordinating of construction activities by the Contractor will be required to ensure that the project will not affect the operation of State personnel throughout the entire construction process. Site access is limited and adjacent areas will remain occupied during construction.

1. Each trade is governed by General and Supplemental Conditions of the Contract and all provisions of Division 1, General Requirements, whether or not specifically referenced for its particular work.

B. Briefly, and without force and effect upon the Contract Documents, the Work of the Contract can be summarized as follows:

[Specifier insert description]

C. ***[Specifier modify as required]*** The Project work also includes the selective demolition, removal, and disposal of various type of hazardous materials off-site, using methods and locations approved by the state, including all costs thereof.

D. ***[Specifier modify as required]*** The Work is included in a single Base Bid, plus alternate bids, if indicated and as accepted.

1.03 SPECIAL REQUIREMENTS

A. Special requirements and conditions apply to the work of this contract and are intended to limit the disruption of existing operations. Refer to Section TEMPORARY FACILITIES & CONTROLS, Section 01500.

B. The Contractor shall photograph and videotape in sufficient detail the existing interior and/or exterior and grounds of all areas that will be affected by construction and haul routes to substantiate existing conditions that might otherwise be construed as damage caused by the Contractor. Date all material and deliver (2) copies to the Owner within (7) days following the Notice to Proceed. Any damage within the limits of construction or areas used by the Contractor outside of the limits of construction shall be the responsibility of the Contractor to repair unless the damage can be positively identified by photograph or videotape as being a previously existing condition.

1. Handling of photo-documentation of special, secure areas may require special handling and storage. Owner will identify when these circumstances are present and how the photo-documentation will be handled.

1.04 HAZARDOUS MATERIALS ***[Specifier delete or modify as required]***

A. ***[Specifier modify as required]*** Hazardous material abatement is included in the scope of work of this project. Refer to Hazardous Material Abatement for detailed information and requirements.

B. Hazardous materials anticipated to be impacted by the work of this project include ***[Specifier identify]***. No other hazardous materials have been identified or are known to exist within the project area at the time of bid. Should any work activities by this Contract discover/disturb any additional hazardous material, the Contractor is directed to immediately cease work activity in the area found to be potentially hazardous, notify the Owner, and await Owner's directions as the appropriate action to be initiated.

C. All products used in the construction shall be asbestos free. Products which are described as "less than 1% asbestos" or "virtually asbestos free" are not acceptable. Only products which are asbestos free are permitted in the construction of this project.

D. All paint products used in the construction shall be lead free.

1.05 WORK UNDER OTHER CONTRACTS

A. Work on the Project which may be executed by others and which is excluded from this Contract, are as follows:

1. Prior to the Contractor's Notice to Proceed, the Owner will remove all moveable items within the limits of construction that are not identified to remain or be removed or reused by the contractor.
2. The removal from the construction area of any containers of toxic or hazardous chemicals or materials is to be accomplished by the Owner prior to any construction activities commencing. Should there be any known hazardous materials left in the construction area, Contractor shall be informed by the Owner pursuant to Article 5.07 of the General Conditions.

B. ***[Specifier modify as required]*** The Contractor shall be aware that the Owner is planning on undertaking a number of other distinct projects which will be occurring in and around the project site during the duration of this project. At the time of bid, those projects include:

C. Cooperate fully with separate contractors so that work under those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.

1.06 CONTRACTOR'S WORK & RESPONSIBILITIES - GENERAL

A. Unless otherwise indicated, Contractor's work and responsibilities include, but are not limited to the following:

1. Providing and paying for labor, materials, equipment, tools, machines, facilities, and services necessary for proper execution and completion of work.
2. Paying required taxes.
3. Securing and paying for, the following items as necessary for proper execution and completion of work (as applicable at time or receipt of Bid):
   a. Permits; refer to Article 1.16 for provisions regarding City of Olympia building permit fees paid for by Owner.

b. Fees.
c. Licenses.
d. Inspections, unless otherwise noted.
e. Connection and tap charges.

4. Enforcing strict discipline and good order among employees.
   a. Smoking shall not be permitted within any building or within 15 feet of any building entrance. Smoking shall not be permitted on building rooftops
   b. No Contractor employee shall bring animals onto project site.
5. Using new materials, unless otherwise noted.
6. Maintaining required egress and other requirements in accordance with governing Codes and Ordinances throughout the work.
7. Maintaining all existing utilities used by State personnel.
8. Maintain in a secure state all areas used or controlled by the Contractor.
9. Compliance with all OSHA and WISHA requirements.
10. Ensuring that all subcontractors are familiar with requirements of Division 0, Division 1, and the work of other sections related to its own work.
11. Giving required notices.

B. Do not employ on work persons not skilled in assigned tasks.

1.07 WORKING HOURS

A. The project site has a number of agencies and tenants, as well as the public doing business with those agencies, which will continue to conduct business during the course of this project. At any given time, agencies and tenants may or do operate twenty-four (24) hours per day, seven (7) days per week.

B. Contractor's normal working hours for this project shall be defined as follows ***[Specifier select option and modify as required***]:

Normal working hours for this project are defined as 7:00am to 6:00pm Monday through Friday. Outside working hours for this project are defined as 6:00pm to 5:00am Monday through Friday. Construction phasing and work hours are identified in the Contract Documents.

(or)

Normal working hours for this project are defined as 6:00pm to 5:00am Monday through Friday. Outside working hours for this project are defined as 7:00am to 5:00pm Monday through Friday. Construction phasing and work hours are identified in the Contract Documents.

Contractor's normal working hours may, at Contractor's option, also include weekends which shall be defined as beginning at 6:00pm Friday evening and ending at 5:00am Monday morning.

Owner approval of weekend work must be obtained before weekend work will be permitted. Contractor shall notify Owner of intent to engage in weekend work a minimum of seven (7) days in advance of dates of work. Owner reserves right to deny request for weekend work depending on potential conflicts with other activities that may be occurring. Denial of request for weekend work shall not be cause for a delay claim to project.

C. ***[Specifier modify as required]*** The A/E, Owner and E&A Services Project Manager will not typically be working during Contractor's normal working hours as defined above. Contractor shall incorporate any affect that this may have on the progress of the project as part of the Base Bid of the project – no overtime payments will be authorized for contractor or

subcontractors to communicate with the A/E, Owner and E&A Services Project Manager outside of Contractor's normal working hours nor will time delays be recognized due to the unavailability of these parties during Contractor's normal working hours.

D. All service outages and electrical tie-ins will be required to be made at specific times and may occur only with advance notification and Owner approval. The Contractor shall be responsible for scheduling and completing this work in compliance with the requirements of the contract documents. Refer to Temporary Facilities & Controls for scheduling service interruptions and outages with the Owner. Refer to Project Coordination for specified utility outage and tie-in requirements.

E. Weekly and Special construction meetings during the State workday are to be attended by the Contractor's Project Manager, Superintendent, Quality Control Representative and Sub-contractor representative(s) of current work in progress.

F. No overtime payments will be authorized for the Contractor to address anything affecting normal operations of the building outside of Contractor's normal working hours if the impacts to the normal operations are the result of the Contractor not making the building suitable for normal operations at the conclusion of the Contractor's normal working hours.

G. The Contractor shall provide the names, pager and home telephone number(s) of two contact person(s) for the Contractor and each major sub-contractor who are capable of addressing an emergency issue that may occur outside of Contractor's normal working hours. Site Representatives will have available the Owner's emergency list.

1.08 PREMIUM PAY

A. Any overtime required to complete this Project outside the Contractor's defined normal working hours shall be included as a part of this contract. No additional payments will be authorized for work performed on weekends, holidays, time required to attend meetings outside the Contractor's normal working hours, or time outside the Contractor's normal working hours required to communicate any identified issues from a previous work shift.

1.09 OWNER'S USE OF PREMISES

A. ***[Specifier – verify Owner will vacate]*** Owner will vacate the building and make all areas accessible to the Contractor by the date of the Notice to Proceed.

B. There may be other temporary facilities in use by other State agencies in the vicinity of this project. The Contractor shall coordinate construction staging and access to the Work to avoid disruption to activities within other temporary facilities.

C. Owner will maintain existing lawn and landscape areas not affected by the Contractor's work during the construction period.
   1. Contractor shall provide reasonable and safe access to Owner's personnel as needed for maintenance of these areas.
   2. Contractor shall provide continued electrical and water service to the existing automatic irrigation system while it is operational during the construction period.

D. Owner's personnel will be present on a limited basis during the construction period as necessary to maintain or inspect existing facilities.
   1. Contractor shall provide Owner's personnel reasonable and safe access and escort as needed to maintain and inspect facilities.

1.10 CONTRACTOR USE OF THE PREMISES

A. During the construction period the Contractor shall have use of the premises in areas containing project work as indicated in the Contract Documents. Coordinate ingress and egress to minimize disruption of traffic, legislative activities and Owner's use of the premises. Contractors shall not block ingress and egress to accessible entrance, accessible routes of travel or accessible parking.

B. ***[Specifier –verify whether entire building or portion thereof will be vacated; modify as appropriate.]*** Contractor shall control, secure and have responsibility for certain portions of the project site and building areas from the date when the area is vacated by Owner to the date of Substantial Completion. These areas shall generally include:

[Specifier insert description]

C. Monitor and secure portions of the buildings and site under Contractor's control to prevent unauthorized access. Inspect premises at end of each work day to ensure all doors are locked and exterior openings are closed and secure.

D. Keep existing driveways and entrances serving the premises clear at all times. Do not use these areas for parking or storage of materials, except where noted.

E. Do not unreasonably encumber the sites with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary, obtain and pay for such storage off-site.

F. Limit construction access to only those areas that require work under this Contract.

G. Contractor is fully responsible for damage or loss that occurs to existing facilities, occupants and public as a result of the work performed. Take precautions to protect existing facilities, occupants and public. Immediately repair or replace items damaged or lost as a result of work under the Contract.

H. Cooperate fully with the Owner during construction operations to minimize disruptions of Owner's operations at and around the project site.

I. Assume full responsibility for protection and safekeeping of products stored on-site.

J. Do not use the following area except as indicated:
   1. Owner occupied areas and accessible route of travel without permission
   2. Parking or accessible parking areas other than indicated.
   3. Owner's garbage and recycle dumpsters.

K. Maintain water and electrical service to existing irrigation system to allow operation during construction period.

L. The existing building and surrounding surfaces that are affected by this Project are to be maintained in a watertight condition throughout the construction period. At all times during the Project, the Contractor is to cover any existing horizontal or vertical surfaces exposed by construction work which have not been made watertight by the installation of new materials prior to the end of the work shift. Repair damage immediately caused by water infiltration.

M. Schedule deliveries to avoid Owner peak commute time periods; i.e., between the hours of 7:30am to 8:30am and the hours of 4:30pm to 5:30pm.

1.11 WORK SEQUENCE

Specific interim milestones within the overall Contract Time are required by this contract. Refer to Project Coordination, Section 01310, for a complete description and graphic representation of these milestones.

1.12 PRODUCTS ORDERED IN ADVANCE ***[Specifier delete or modify as required]***

A. General: The Owner has negotiated purchase orders with suppliers of material and equipment to be shipped to the project site for incorporation into the Work. The Owner has assigned these purchase orders to the Contractor. The costs for purchasing and shipping are included in Owner's pre-purchase. Costs for receiving, handling, storage, and installation shall be included in Contractor's Contract Sum.

1. The Contractor's responsibilities are the same as if the Contractor negotiated the purchase orders. If necessary as directed by the Owner, the Contractor shall execute final purchase order agreements and arrange for shipping.
2. A "Schedule of Products Ordered in Advance" is included at the end of this Section.

1.13 OWNER-FURNISHED ITEMS ***[Specifier delete or modify as required]***

A. FOIC Equipment: Items designated by the abbreviation "FOIC", meaning furnished by Owner but Installed by Contractor, will be delivered to the jobsite for consignment to the Contractor. Contractor shall assume custody and responsibility for same after inspecting and determining that they are complete and in acceptable condition for installation. Under no conditions is any equipment to be installed prior to the building being enclosed and heated unless specifically approved by the Owner. Installation of such items includes uncrating and all preparatory work necessary for proper installation including blocking and backing, rough-ins, setting in place, building-in, leveling and attaching to building elements, making all mechanical and electrical connections required, and finish work including caulking, grouting, furring, and painting adjacent surfaces, leaving same in completely installed and operable conditions satisfactory to A/E.

1. The Owner will arrange for and deliver necessary shop drawings, product data, and samples to the Contractor.
2. The Owner will arrange and pay for delivery of Owner-furnished items according to the Contractor's Construction Schedule. Contractor shall clearly identify dates for delivery of F.O.I.C. items on schedule.
3. Following delivery, the Owner and Contractor will inspect items delivered for damage.
4. If Owner-furnished items are damaged, defective, or missing, the Owner will arrange for replacement.
5. The Owner will arrange for manufacturer's field services and for the delivery of manufacturer's warranties to the appropriate Contractor.
6. The Contractor shall designate delivery dates of Owner-furnished items in the Contractor's Construction Schedule.
7. The Contractor shall review shop drawings, product data, and samples and return them to the A/E noting discrepancies or problems anticipated in use of the product.
8. The Contractor is responsible for receiving, unloading, and handling Owner-furnished items at the site.
9. The Contractor is responsible for protecting Owner-furnished items from damage, including damage from exposure to the elements. The Contractor shall repair or replace items damaged as a result of his/her operations.

1.14 WORK NOT INCLUDED IN CONTRACT ***[Specifier delete or modify as required]***

A. Work Not Included in Contract: NIC & FIO: The items of work noted on Drawings and/or described in the Project Manual as "NIC" (Not In Contract) or "FIO" (Furnished and Installed by Owner) will be performed under other contracts operating concurrently with the work of this Contract, and are not included in this Contract:

[Specifier insert description]

B. Contractor is responsible for scheduling the work, storing such equipment if requested, and coordinating related work in the Contract with installation of NIC and FIO equipment. Contractor shall provide all preparatory work necessary for proper installation including blocking and backing, and finish work including caulking, grouting, furring, and painting adjacent surfaces as required for NIC and FIO equipment.

1.15 MISCELLANEOUS PROVISIONS

A. Stored Products
   1. Assume full responsibility for the protection and safekeeping of products under this Contract, stored on and off the site.
   2. Move any stored products, under Contractor's control, interfering with operations of the Owner or separate contractor.
   3. Obtain and pay for the use of additional storage or work areas needed for operations.

B. Notify subcontractors to become familiar with requirements of Division 0, Division 1 and the work of Sections related to their own work. Instruct them that these conditions and requirements apply to their work in each Section of the technical specifications.

C. Contractors and Subcontractors submitting bids for this Project are required to thoroughly familiarize themselves with specified products and installation procedures. Submit any objections or substitution requests for the products and procedures specified in accordance with Product Requirements. Submittal of Bid constitutes acceptance of products and procedures specified.

D. Conflicts & Omissions in Contract Documents
   1. Bring immediately to A/E's attention any conflicts and omissions between the Drawings and Specifications and between the Drawings or specifications and actual site conditions. In the event of a conflict or discrepancy among or in the Contract Documents, interpretation shall be governed as indicated in Article 1.02 of the General Conditions For Washington State Facility Construction.
   2. Where conflicts and omissions have not been brought to A/E's attention, it is understood that Contractor has figured the most costly method or methods.

E. Mechanical/Electrical Requirements of General Work
   1. General: Except as otherwise indicated, comply with applicable requirements of Division 15 sections for mechanical provisions within units of general (Division 2-14) Work and with applicable requirements of Division 16 sections for electrical provisions within units of general (Division 2-14) Work.
   2. Refer to Division 15 and 16 sections for the characteristics of the respective mechanical and electrical services to be connected to units of general work. Provide units manufactured or fabricated for proper connection to and utilization of available services. Except as otherwise indicated, final connection of mechanical service to general work is defined as being mechanical work, and final connection of electrical service to general and mechanical work is defined as being electrical work.
   3. Except as otherwise indicated, comply with applicable provisions of the National Electrical Code (NEC) and standards by National Electrical Manufacturer's Association (NEMA), for electrical components of General Work. Provide Underwriters Laboratories listed and labeled products where applicable.

F. It is the Contractor's responsibility to verify all field measurements, survey control, staking and conditions. No allowance will be made for any items incorrectly fabricated or installed due to failure to perform such verification prior to commencing the work.

1.16 PERMITS AND FEES

A. General.

1. For projects within the City of Olympia jurisdiction, the Owner will provide the General Contractor an Owner Permit Billing Tracking Slip for the Contractor to submit to the City to obtain the General Contractor's Building Permit. The Tracking Slip will be used by the City to bill the Owner directly.
2. ***[Specifier - edit as required]*** The Contractor shall obtain all other permits and local business licenses necessary for the execution of the work and pay all permit (except as indicated in paragraph "1" above), utility and miscellaneous fees required by, but not limited to, the following: City of Olympia, [Lacey,] [Tumwater,] [_____,] Puget Sound Energy, [_____,] Thurston [_____] County Health Department, and the State of Washington Department of Labor and Industries.
3. The Contractor shall coordinate and schedule all work with respective permitting agencies and utility companies necessary for completion of the work.
4. Contractor shall be responsible for providing all information, documents, and fees to the permitting agencies and utility companies within 30 days after issuance of the Notice to Proceed as necessary to obtain and coordinate permits and utility connections.

B. ***[Specifier - edit as required]*** The Drawings and Specifications have been submitted for plan review to the City of Olympia [Lacey] [Tumwater] and Thurston County, so that permits will be available to the Contractor for this project on or before the Date of Notice to Proceed.

1.17 UTILITIES

A. Existing Utilities

1. Utilities of record are shown on the Drawings insofar as possible to do so. These however, are shown for convenience only and neither the Owner nor A/E assumes responsibility for improper locations or failure to show utility locations on the Drawings.
2. The Contractor shall contact all utility companies to perform a site locate of the respective utilities, including but not limited to telephone/cable/data, electrical, gas, sewer, water and storm services. Notify Owner's Site Representative when such utility locates are to take place.
3. The Contractor is responsible to locate and protect all utilities that belong to the Owner. See other applicable Sections of Divisions 1, 2, 15 and 16 for more information.
4. Exercise reasonable care to prevent damage to existing utilities. Immediately repair, restore or relocate utilities damaged during construction. Contractor shall not leave site until repairs have been accomplished.

B. Coordinate all new utility service requirements with serving utility companies including, telephone/cable/data, electrical, gas, sewer, water and storm services. Observe specification standards, written details, and sketches showing equipment locations and dimensions as indicated by the utility company. Coordinate scheduling of utility company work with all other trades.

C. Utility Costs

1. Contractor shall be responsible for securing all public utility connection, tap and inspection fees necessary to make the project fully operational. See Supplemental Conditions for reimbursement / payment of utility connection charges. The Owner will not reimburse the

Contractor for additional charges due to the Contractor's lack of coordination, timelines or schedules and payment of charges.

2. Contractor to obtain and pay for, without reimbursement from Owner, permits and fees required for water usage from fire hydrants.

D. Utility shut-downs may not occur prior to the Date of the Notice to Proceed, or after the date of Substantial Completion.

E. Contractor to provide all layout, site preparation, trenching, backfilling, patching and restoration work required for utility work at no additional cost to the Owner.

F. See Section 01500 for using existing permanent utilities.

PART 2 – PRODUCTS

Not Used. ***[Specifier modify as required]***

2.01 ROOFING MATERIAL

A. Special requirements for substitution requests on membrane waterproofing are required for this project. The submittals are to be received by the A/E no later than 20 days prior to bid opening date. Any membrane roofing submittals received after that date will not be considered.

PART 3 – EXECUTION

The contractor shall be aware of all special requirements for the Project execution described in the contract documents. These items consist of, but are not limited to: specific time frames for work, sequence and special requirements for demolition, load limits, and all other criteria described in the contract documents.

[Specifier –if PRODUCTS ORDERED IN ADVANCE is used, insert a schedule here. See Appendix A of this Section for "Assignment of Pre-Purchased Materials" form to be used by the Owner to designate pre-purchased products/equipment.]

[Schedule of Products Ordered in Advance]

[Section	Product/Equipment Description	Manufacturer]

END OF SECTION 01110

Assignment of Pre-Purchased Products/Equipment

Section _____

To ensure timely acquisition of long-lead-time products or equipment, the following items have been pre-purchased by the Owner for installation by the Contractor. Full payment for these products/ equipment will be made by the Owner, including all standard delivery charges to the site.

_____

_____

This equipment has been purchased [through] [directly from]:

Company Name _____

Address _____

Contact Person _____ Phone No. _____

Effective on the date of Notice to Proceed, the Contractor accepts assignment of this purchase and shall be fully responsible for all further coordination of the manufacturing and delivery process as if the equipment had been purchased directly by the Contractor. This responsibility includes ensuring that the equipment meets the Owner's specifications of Section _____ and ensuring that this equipment is delivered in a timely manner to meet the Contractor's construction schedule.

The Contractor shall be responsible for providing the Owner with all standard equipment and installation warranties as if the equipment were purchased by the Contractor.

The projected shipping date at the time the Owner placed the order is _____. The Contractor shall coordinate with the Manufacturer or his designated representative to ensure that this date is met or adjusted to meet the Contractor's installation schedule.

Following Notice to Proceed, no further contact will be made by the Owner with the Manufacturer other than for billing and payment purposes.

Owner-provided equipment includes only the items listed above. All appurtenances, parts, and other fittings required for a complete and operational installation shall be provided and installed by the Contractor, including _____.

Failure by the Contractor to execute the requirements of this Section may result in non-compliance with the contract completion date which may result in payment of liquidated damages.

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes administrative and procedural requirements governing allowances.

1. Selected materials and equipment are specified in the Contract Documents by allowances. In some cases, these allowances include installation. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:
[Specifier delete items not required]
1. Lump-sum allowances.
2. Unit-cost allowances.
3. Contingency allowances.

1.03 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise the A/E of the date when the final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At the A/E's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by the A/E from the designated supplier.

1.04 SUBMITTALS

A. Submit proposals for use of allowances, in the form specified for Change Orders.

B. Submit invoices to show the actual amount paid, plus a copy of each permit.

1.05 ALLOWANCES

A. Use the allowance only as directed for the Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. At Project closeout, credit unused amounts remaining in the contingency allowance to the Owner by Change Order.

1.06 UNUSED MATERIALS

A. Return unused materials to the manufacturer or supplier for credit to the Owner, after installation has been completed and accepted.

1. When requested by the A/E, prepare unused material for storage by Owner where it is not economically practical to return the material for credit. When directed by the A/E, deliver unused material to the Owner's storage space. Otherwise, disposal of unused material is the Contractor's responsibility.

PART 2 – PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine products covered by an allowance promptly upon delivery for damage or defects.

3.02 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.03 SCHEDULE OF ALLOWANCES ***[Specifier delete or modify as required]***

A. Allowance No 1:

END OF SECTION 01210

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes administrative and procedural requirements governing Alternates.

B. General:

1. Each bidder shall state in their bid, in the spaces provided in the Bid Form:
   [Specifier modify as required]
   a. Their proposal for performing the work of the Base Bid.
   b. Additive Alternate proposals, stating the sums to be added to the Base Bid for adding items of work listed in this section.
   c. Substitute Alternate proposals, stating the sums to be added to or deducted from the Base Bid for substituting materials and/or construction listed in this section.
   d. Deductive Alternate proposals, stating the sums to be deducted from the Base Bid for deleting items of work listed in this section.
2. All bid prices shall include adjustments in the work of all trades as may be necessary.
3. Identification of Work listed below is general in nature. The Contractor shall provide all materials and associated work necessary to complete the Work of each respective described Alternate.
4. The cost or credit for each Alternate is the net addition to or deduction from the Contract Sum to incorporate the Alternate into the Work. No other adjustments are made to the Contract Sum.

1.03 DEFINITIONS

A. The Base Bid includes all work indicated in the Contract Documents and any issued Addenda for all building and site construction work, all as designated and shown in the Contract Documents, EXCEPTING only the work included in the following Alternate Bids described in this section which may result in changes to the costs.

B. An Additive Alternate is an amount proposed by bidders and stated on the Bid Form for certain work defined in the Contract Documents that may be added to the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

C. A Substitute Alternate is an amount proposed by bidders and stated on the Bid Form for certain work defined in the Contract Documents that may be added to or deducted from the

Base Bid amount if the Owner decides to accept a different product or construction process for the specified product or process.

D. A Deductive Alternate is an amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be deducted from the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1.04 PROCEDURES

A. Modify or adjust affected adjacent Work as necessary to completely and fully integrate the Alternate Work into the Project.

1. Include as part of each Alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.

B. Immediately following the award of the Contract, notify each party involved, in writing, of the status of each Alternate. Indicate whether Alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of any negotiated modifications to Alternates.

C. Execute accepted Alternates under the same conditions as other Work of this Contract.

D. A "Schedule of Alternates" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials necessary to achieve the Work described under each alternate.

PART 2 – PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 SCHEDULE OF ALTERNATE BIDS

[Specifier include Alternate Bid(s) by number and a brief description of the work. Identify any pertinent Alternates on the drawing sheets.]

END OF SECTION 01230

GUIDE SPECIFICATIONS

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PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Requirements for Changes are also included in Part 7 of the General Conditions For Washington State Facility Construction and Supplemental Conditions. This Section specifies additional detail regarding administrative and procedural requirements for handling and processing contract modifications. In the event of conflicts between this specification and Part 7, the General Conditions and Supplemental Conditions shall supercede any requirements identified herein.

1.03 INITIAL REQUIREMENTS

A. Prior to submitting any cost proposals, the Contractor shall submit a breakdown of all applicable trade and class wage rates intended to be incorporated into this Project using a form acceptable to the A/E and Owner. As a minimum, the breakdown shall show:

1. Basic wage rate (based on L&I Intent to Pay Prevailing Wages or union agreement);
2. Fringe Package (based on L&I Intent to Pay Prevailing Wages or union agreement);
3. FUI (Federal Unemployment Insurance);
4. FICA (Federal Insurance Compensation Act);
5. SUI (State Unemployment Compensation Act);
6. WC (Workers Compensation);
7. Medicare;
8. Any other specific trade costs that affect hourly rate. If an acronym is used, also identify the full name for it.

B. Contractor shall submit verification of the above rates if requested by the Owner.

C. Within 30 days of the Notice to Proceed, the Contractor shall submit a list of all equipment anticipated to be used on the project and whether it is owned or to be rented, using a form acceptable to the A/E and Owner. If during the construction process additional equipment is brought to the Project site, Contractor shall submit updated list.

1.04 MINOR CHANGES IN THE WORK

A. The A/E will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or Contract Time, on a form prepared by the A/E. If the contractor believes a cost is associated with the supplemental instructions, the Contractor is to provide written notice to the A/E within 7 days of receipt of the instructions.

1.05 OTHER CHANGES IN THE WORK

A. Changes to the work can be by:

1. Change Order Proposal issued by the A/E to the Contractor on the Owner's behalf.
2. Field Authorization issued by the A/E to the Contractor on the Owner's behalf.
3. Request initiated by the Contractor and submitted to the A/E.

B. Change Order Proposal (COP). The A/E will issue a detailed description of proposed Owner initiated changes in the Work on the Owner's standard COP form that may require adjustment to the Contract Sum or Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. COP requests issued by the A/E are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.
2. Within 14 calendar days of receipt of a proposal request, or quicker if the project schedule necessitates, submit an estimate of cost necessary to execute the change to the A/E for the Owner's review.

C. Field Authorization (FA). The A/E may issue, on behalf of the Owner, a FA instructing the Contractor to proceed with a change or specific portion of the change in the Work or specific protion of a COP, for subsequent inclusion in a Change Order.

1. The FA will contain a complete description of the change in the Work. It also designates the method to be followed to determine change in the Contract Sum or Contract Time.
2. The Contractor must provide a Not To Exceed (NTE) amount to be indicated on the FA.
3. As the Work progresses, the Contractor is to monitor its costs. If the costs indicate they will exceed the NTE prior to being able to complete the work, the Contractor is to stop work and notify the Owner. A decision will be made by the Owner to stop the change at that time, or authorize an increase in the NTE amount.
4. The Contractor is not to proceed with the work until the FA is signed by the Contractor, A/E, Owner, and E&AS Project Manager.
5. Maintain detailed records of time and material documentation of work as required by the Field Authorization.
   a. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.
   b. Include daily accounting of time spent by each person working specifically on such work, signed by Owner's Site Representative, together with copies of all related purchase orders.

D. Contractor Initiated Change Request. When latent, unforeseen, or other conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the A/E.

1. Provide initial documentation describing the proposed change, reason for changes, and why the proposed change is not part of the Base Bid.

E. Detailed Documentation of Owner or Contractor initiated Changes.

1. Support each lump sum proposal quotation, and each unit price (not previously established) with sufficient substantiating data.
2. On request, provide additional data to support time and cost computations:
   a. Labor required.
   b. Equipment required.
   c. Products required.
      1) Recommended source of purchase and unit cost.
      2) Quantities required.

d. Taxes, insurance, and bonds.
e. Documented credit for work deleted from Contract.
f. Overhead and profit.
g. Justification for any change in Contract Time.

3. Support each proposal for additional costs, and time-and-material/force account work with documentation, as required for lump-sum proposal. Include additional information:
   a. Name of A/E or Owner's authorized agent who ordered work, and date of order.
   b. Dates and times work was performed, and by whom.
   c. Time record, summary of hours worked, and hourly rates paid.
   d. Receipts and invoices for:
      1) Equipment used, listing dates and times of use.
      2) Products used and listing of quantities.
      3) Subcontracts.
4. Document Requests for Substitutions.
5. Statement as to whether overtime work is, or is not, authorized.

F. Approval or Rejection of Proposal.
   1. When change is initiated by A/E or Owner through a COP.
      a. Contractor to submit in writing his detailed proposal. Quotation will be guaranteed for period specified in Proposal Request beginning from signing of proposal. If no period specified, guarantee quotation for sixty (60) days from signing.
      b. Owner reviews proposal and responds in writing by one of the following:
         1) Requesting additional information.
         2) Incorporating into a change order.
         3) Rejecting.
      c. Contractor is not to proceed with work until a signed Change Order is received from the Owner.
   2. When Change is initiated by Contractor.
      a. Owner reviews and responds in writing by one of the following:
         1) Agrees with Contractor's cost proposal;
         2) Requesting additional information;
         3) Rejecting
      b. If the Owner responds by agreeing to the Contractor's change proposal, a Change Order will be processed.
      c. If additional information is requested by Owner, respond in writing within fifteen (15) days of Owner's request.

1.06 CHANGE ORDER PROCEDURES

A. Upon final agreement of costs and/or time on either an Owner COP, FA or a Contractor initiated proposal, a Change Order will be process by E&AS.
   1. The Contractor can not submit an invoice for Work changes until a fully executed Change Order is completed.

END OF SECTION 01250

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 DEFINITIONS

A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if the estimated quantities of Work required by the Contract Documents are increased or decreased.

1.03 PROCEDURES

A. Unit prices include all necessary material, labor, equipment, services, mobilization, demobilization, safety and tool costs, delay and impact costs, insurance, all overhead, profit, and applicable taxes.

B. Contractor shall notify the A/E and Owner when work designated as an allowance or unit price is to be performed. Contractor and Owner's representative shall jointly either measure the affected work and confirm in writing the agreed upon quantities provided prior to the work being covered. Contractor shall not receive credit or payment for work designated as a unit price if the Contractor fails to follow the preceding process.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Comply with Specifications and standards for each applicable product.

PART 3 – EXECUTION

3.01 UNIT PRICE SCHEDULE

[Specifier list and describe individual work for unit prices.]

END OF SECTION 01270

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.
B. Requirements for Schedule or Values and Applications for Payment are also included in part 6 of the General Conditions For Washington State Facility Construction. This specification section includes additional detail regarding procedural requirements. In the event of conflicts between this specification and Part 6, the General Conditions shall supercede any requirements identified herein.

1.03 SCHEDULE OF VALUES

A. Submit a list of all Subcontractors and Material Suppliers, and a copy of each Subcontractor's and Material Supplier's contract with the General Contractor.

B. The Schedule of Values and the Contractor's Construction Schedule are to be developed and agreed to in conjunction with the Subcontractors.

1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
   a. Contractor's Construction Schedule.
   b. Application for Payment forms, including Continuation Sheets.
   c. List of subcontractors.
   d. Schedule of allowances.
   e. Schedule of alternates.
   f. List of products.
   g. List of principal suppliers and fabricators.
   h. Schedule of submittals.
2. Submit the Schedule of Values to the A/E for approval at the earliest possible date but no later than 30 days after the issuance of the Notice to Proceed, and not less then 14 days prior to the first application for payment.

C. Use the Project Manual table of contents as a guide to establish the format for the Schedule of Values. Provide at least one line item for each listed Specification Section beginning with Divisions 2, relating directly to the pertinent applicable activities of the Progress Schedule, with each line item broken down separately for labor and materials. Include the following as a minimum:

1. Include separate line item values for construction progress schedule and updates, mobilization, permits/bonds/insurances, temporary facilities, supervision, survey and layout, demobilization, commissioning and equipment/systems start-up, and project closeout retainage.
   a. General Conditions and Mobilization shall not exceed 3% of the Contract amount.
   b. Demobilization shall be not less than 1% of the Contract amount.
   c. Project closeout retainage value, for duration between Substantial Completion and Final Acceptance, shall be not less than 2% of the Contract amount. Of that amount, 1% shall be for "Punchlist Work". This amount will not be released until Final Completion is reached.
      1) This closeout retainage shall be in addition to the 5% retainage withheld per General Conditions item 6.04, and shall be for the purpose of protection of the Owner in the completion of any outstanding items on the Final Acceptance Punch List, and for reimbursing the Architect and their consultants for additional 'punch list' re-inspections beyond the first re-inspection; refer to Section 01770.
   d. Schedule preparation and updates shall not be less than 1/2% of the Contract amount.
2. Major cost items, which are not directly a cost of actual work-in-place, such as distinct temporary facilities, may be either shown as items in the Schedule of Values or included in General Conditions and Mobilization or Demobilization at the Contractor's option.
3. Line item amounts shall be rounded off to nearest whole dollar, with total of the primary schedule of values breakdown equal to the Contract Sum.
4. Provide at least one line item for each Specification Section, and at least one line item for each pertinent item within each specification section.
5. No line item of the Schedule of Values shall be greater than $30,000.
6. Break down items of work that include both labor and material into those respective components.
7. Provide breakdown by phasing of construction, or area of work.
8. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed.
   a. Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing, if required.
   b. Include separate line item cost for shop drawing preparation.
9. Unit Cost Allowances: Show the line-item value of unit-cost allowances, as a product of the unit cost, multiplied by the measured quantity. Estimate quantities from the best indication in the Contract Documents.
10. Margins of Cost: Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of general overhead and profit margin for each item.

D. Identify work, if any, to be performed by minority-owned business enterprises (MBE) and women-owned business enterprises (WBE).

E. Identification: Include the following Project identification on the Schedule of Values:

1. Project name and location.
2. Name of Architect.
3. Project Number.
4. Contractor's name and address.
5. Date of submittal.

F. Listing: Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

1. Related Specification Section.
2. Description of Work.
3. Name of subcontractor.
4. Name of manufacturer or fabricator.
5. Name of supplier.
6. Change Order (numbers) that affect value.
7. Dollar value.
8. Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

G. Schedule of Values Updating: Update and resubmit Schedule of Values prior to the next Application for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum. Add a new line item for each Change Order, and provide a breakdown of several line items for large or complicated Change Orders.

1.04 APPLICATIONS FOR PAYMENT

A. General:

1. Submit itemized payment request as required in General Conditions together with Schedule of Values and other submittals as listed herein.
2. Except as otherwise indicated, sequence of progress payments is to be regular, and each must be consistent with previous applications and payments; it is recognized that certain applications involve extra requirements, including initial application, application at times of Substantial Completion, and final payment application.
3. Contractor shall not "project" work completed beyond the date of Application for Payment submittal for the purpose of payment request.

B. Each Application for Payment shall be consistent with previous applications and payments as certified by the A/E and paid for by the Owner.

1. If the Contractor withholds any portion of a previous payment from a subcontractor or material supplier, other than normal retainage, the Contractor shall provide a letter to the A/E with the next Application for Payment stating the reasons for withholding the payment.

C. Payment Application Times: Progress payments will be based upon a monthly period, with the 24th day of each month being the cut-off date. The new payment period will then begin on the 25th of each month.

D. Draft Payment Application: Draft copies shall be provided to the A/E and Owner at least 48 hours prior to the last regular construction meeting of the month at which the payment request will be reviewed. The draft payment request shall be a copy of the previous month's approved payment request, with proposed percentages and dollar amounts (rounded off to nearest whole dollar) hand written beside each line item, and a total percentage complete and dollar amount for the month. Once the amounts are reviewed and agreed to by the A/E and Owner, the Contractor shall prepare the actual payment request as required in this section based upon the amounts agreed to.

1. Have available for A/E review current Project Record Documents delineating any and all revisions since the previous application for payment.

E. Application Preparation: Complete every entry on the actual payment request form. The A/E will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders issued prior to the last day of the construction period covered by the application. If a Change Order includes more than one Change Order Proposal (COP) or Field Authorization (FA), list each COP or FA individually.

F. Transmittal: Submit 4 original signed copies (no photocopies of signatures are permitted) of each Application for Payment to the A/E by a method ensuring receipt within 48 hours.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the A/E.

G. Initial Payment Application: The principal administrative actions and submittals which must precede or coincide with submittal of first payment application can be summarized as follows, but not necessarily by way of limitation:

1. Submit Statement of Intent to Pay Prevailing Wages on Public Works Contract on form issued by the State of Washington, Department of Labor and Industries. One is required from the Contractor and one from each of those subcontractors who will provide labor on the project site.

   When these forms have been filled in, the Contractor shall send them to the Industrial Statistician in Olympia for certification. After certification, three copies will be returned to the Contractor. He shall forward the Owner's copy directly to the Owner (do <u>not</u> send through the Architect). The Contractor shall also post on the Project site one certified copy of each Statement of Intent. For further information, phone the Industrial Statistician (360) 902-5335.

   Processing of an application will not begin until an approved copy is on file with the Owner for each classification of laborers, workers, or mechanics employed by the Contractor or Subcontractor that are included in an application for payment; no exceptions.

2. Submit and receive review comments for construction progress schedule.
3. Submit schedule of values, allocated to the various portions of the work; the schedule shall be used as a basis for the Contractor's Application for Payment.
4. List of Subcontractors, complete with phone numbers, business address and contact person.
5. List of major material suppliers and fabricators, complete with phone numbers, business address and contact person.
5. Contractor’s Progress Schedule (preliminary if not final).
6. Schedule of Unit Prices, as applicable.
7. Schedule of Submittals (preliminary if not final).
8. Listing of Contractor's staff assignments and principal consultants.
9. Copies of acquired building permits and similar authorizations and licenses from governing authorities for current performance of the work.
10. Initial progress report.
11. Initial settlement survey and damage report, if required.
12. Quality Control Plan.
13. Safety Plan.
14. MWBE participation listing.
15. Waste Management Plan.
16. List of emergency contact information.
17. Other documents as may be required in the Contract Documents.

H. Applications each Month During Construction:

1. Submit itemized application, in number of copies as specified herein, each with waivers of mechanics liens from principal subcontractors, sub-subcontractors and suppliers as specified below.
2. Applications are to be signed by a responsible officer of Contracting firm. Do not sign in black ink; no photocopies or signature permitted.
3. Application for Payment shall include the following:
   a. Application and Certificate for Payment on Contract.
   b. State of Washington Invoice Voucher.
   c. Invoice Voucher - Escrow.
   d. Certificate for Material Stored on Job Site.
   e. Invoices for materials stored off site, as applicable.
   f. Updated Construction and Submittal Schedules: If substantial changes have occurred in the Project Construction Schedule, or if enough changes have occurred that the schedule is rendered inaccurate or ineffective, submit with Application For Payment a revised updated Construction Schedule for evaluation and measurement of actual work-in-place with said application for payment, together with updated submittal schedule. If the Contractor does not submit a revised schedule with a payment request it is agreed by the Contractor that the project is still on schedule according to the last submitted schedule.
      1) In addition, should actual work completed be more than 14 days behind schedule, submit a recovery schedule per requirements of Section 01320, Construction Schedule, subparagraph 3.04C.4.b.
4. When A/E finds Application for Payment properly completed and correct, the A/E will sign and transmit all copies of Application for Payment to Owner for processing.
5. If A/E or Owner find Application for Payment improperly or incorrectly executed, an annotated copy will be returned for a NEW SUBMITTAL.
6. Only minor corrections are allowed, with approval of Owner.

I. Application at Time of Substantial Completion: See Section 01770 for principal administrative actions and submittals which must precede or coincide with such special applications.

1.05 PAYMENT FOR STORED MATERIAL

A. See General Conditions for Washington State Facility Construction Article 6.03.

1.06 SUBSTANTIATING DATA

A. When A/E / Engineer requires substantiating information, submit data in a timely manner justifying line item amounts in question.

1.07 APPLICATION FOR FINAL PAYMENT

A. Application for a FINAL pay request will be accepted for processing only after satisfactory completion of the following:
   1. Punchlist items complete and accepted;
   2. Agreement on all Change Order costs;
   3. Required permits signed off;
   4. Submittal of Record Documents (as-builts);
   5. Submittal of O&M Manuals;
   6. Submittal or Warranty Manuals;
   7. All training has been provided to Owner designated staff and signed rosters submitted to the Owner.
   8. All security badges and building keys have been returned.
   9. Other requirements as specified in Section 01770, Closeout Procedures.

1.08 RELEASE OF RETAINAGE

A. Pursuant to the completion of Work performed in accordance with a public works contract and Final Acceptance by the Owner, the following requirements must be satisfied to allow the release of retained contract funds at the earliest possible date.

1. All Contract Closeout items have been reviewed by the A/E, any corrections made by the Contractor, and final copies received by the Owner.
2. The A/E maintains a Construction Completion Checklist of requirements for completing the project. When the A/E determines that the checklist has been completed, the A/E consults with E&AS for concurrence that all requirements have been met for establishing Final Completion.
3. If there are no outstanding items required of the Contractor on the Construction Completion Checklist, the A/E provides a letter to the Owner with a copy to the Contractor that to the best of its knowledge, information, and belief, the Contractor has reached Final Completion on the project in conformance with the Contract Documents.
4. E&AS sends the Owner its Notification of Project Completion for the Owner's signature and return to E&AS.
5. Upon receipt of the signed Notification of Project Completion, E&AS issues its Completion Notice.
6. E&AS sends the Department of Revenue its Notice of Completion of Public Works Contract and sends the Contractor written notice of Final Acceptance.
7. Certificate of Payment of State Excise Taxes by Public Works Contractor. Following receipt of Owner's notice of completion and after determining that all taxes, increase and penalties due from Contractor have been paid, the Department of Revenue will issue this certificate to the Owner, releasing the state's lien on the retained percentage.
8. Certificate of Payment of Contributions, Penalties and Interest on Public Works Contract. Upon receiving a copy of the Owner's notice of completion from the Department of Revenue and determining that the Contractor is in compliance with the provisions of the Employment Security Act, the Employment Security Department will issue this certificate to the Owner, releasing its lien on the retained percentage.
9. Request for Release. This form must be completed by the Contractor and mailed to the Department of Labor and Industries, Industrial Insurance division, Contract Release Section, Olympia, Washington 98504. One copy of the Contractor's request for release, including attached list of Subcontractors, should be transmitted to Owner.
10. Certificate of Release. Upon receipt of Contractor's request for release and verification from its records that the industrial insurance and medical aid premiums have been paid by Contractor and each Subcontractor, the Department of Labor and Industries will issue a statement to that effect, releasing Owner from further liability.
11. At the time E&AS sends the Contractor written notice of Final Acceptance, it advertises the acceptance of the project which begins the forty five (45) day period for liens to be filed.
12. At the end of the forty five (45) day period, if all three (3) letters of release have been received, and there are no liens filed that have not been released, the retainage will be released.
    a. If the retainage was placed in an escrow account, E&AS will notify the escrow company that the retainage may be released. No invoice billing from the Contractor for the retainage is required.
    b. If the Contractor has elected to not put the retainage in escrow, an invoice for the retainage amount must be submitted and processed to allow release of the retained money.

END OF SECTION 01290

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY ***[Specifier modify as required]***

A. ***[Specifier delete or modify as required]*** The complexity of accomplishing a renovation project in and adjacent to an occupied and fully operational building requires that careful planning and coordination be developed and followed to accomplish the work. This planning and coordination shall minimize disruption to operations and allow involved parties to anticipate construction activity and to integrate other contract(s) with this Project.

B. Coordinate scheduling, submittals and work identified in the Contract to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.

C. Coordinate work between all Sections of Contract Documents to avoid conflicts and omissions. Take special care to coordinate work indicated as Architectural, Mechanical, Electrical and other major Divisions of the Contract Documents.

D. Responsibility

1. The Contractor shall be in charge of this Contract and the site, as well as the directing and scheduling of all Work. Contractor shall be on site at all times work of this Contract is in progress. Do not delegate responsibility for coordination to any subcontractor.
2. Anticipate interrelationship of all subcontractors and their relationship with the total Work.
3. Resolve differences or disputes between subcontractors and materials suppliers concerning coordination, interference, or extent of Work between Sections. Contractor's decisions, if consistent with Contract Document requirements, shall be final.
4. Final responsibility for the performance, interface, and completion of the Work and the Project in accordance with the Contract Documents shall be with the Contractor.

1.03 PROJECT PHASING & MILESTONES ***[Specifier modify as required]***

A. Interim project phases and milestones within these phases will be required by this Contract. Those requirements are graphically represented in the project schedule at the end of this section.

1. Prior to any work beginning on the site, the Contractor shall submit, and receive final approval on:
   a. Construction schedule;
   b. All required plans, such as, but not limited to, safety, demolition, quality control, and waste management;

c. On all materials to be used on the project in accordance with Section 01330.

B. Refer to Section 01110 for specified Contractor's Working Hours on this project, including Working Hours specified for completing the work required by project phasing and milestones.

C. Progress Schedule: Refer to Section 01320, Construction Schedule.

1.04 SPECIAL COORDINATION

A. There are occupied spaces outside of the limits of construction. These spaces will not be vacated for construction during this contract. Any work in these surrounding areas must be coordinated with the Owner.

B. Additional special requirements and conditions apply to the work of this contract. Refer to Section 01500 for detailed description of these additional requirements and conditions.

C. The Owner may require access to the site to perform work related or unrelated to the project. The Contractor shall coordinate with the Owner to accommodate such work within the contract time.

D. ***[Specifier delete or modify as required]*** Refer to Section 01110 for a description of other Contractor work for the Owner that is expected to be occurring within the building or other adjacent location to the construction limits of this Project. Cooperate with the Owner Contractors during the duration of this Project to prevent impact to this or other Owner projects.

E. The Owner's custodial staff will typically be working during Contractor's normal working hours. Contractor shall coordinate with the Owner to accommodate such work within the contract time, including the use of any elevator, if the Contractor elects to utilize the elevator as indicated in Section 01500.

1.05 CONSTRUCTION ORGANIZATION

A. On-Site Lines Of Authority & Communications: Refer to Section 01315.

B. Intra-Project Communications: Comply with procedures for intra-project communications including:

1. Submittals.
2. Reports and records.
3. Recommendations.
4. Coordination drawings.
5. Schedules.
6. Resolution of conflicts.

C. Construction Mobilization
1. Cooperate with the Owner's Representative in allocation of mobilization areas of site; for field offices and sheds, for access, traffic and parking facilities.
2. During construction, coordinate use of site and facilities through Owner's Representative.
3. Comply with Architect and Owner Representative's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
4. Coordinate field engineering and layout work under instructions of Owner's Representative.

D. Coordination Of Reports/Activities: Coordinate both the procedural timing and the listing (naming and sequencing) of reports/activities required by provisions of this Section and other sections, to afford consistency and logical coordination between submitted reports or lists. Maintain coordination and correlation between separate reports by updating at monthly or shorter time intervals. Make appropriate distribution of each report and updated report to entities involved in the work including Architect and Owner. In particular, provide close coordination of progress schedule, schedule of values (see Section 01290), listing of subcontracts, schedule of submittals, progress reports, and payment requests.

E. Coordination Of Submittals

1. Schedule and coordinate submittals specified in the Contract Documents.
2. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to and placing in service equipment.
3. Coordinate request for substitutions to assure compatibility of space, of operating elements and effect on work of other Sections.

F. Coordination & Pre-Installation Meetings: Refer to Section 01311, Project Meetings.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

3.01 COOPERATION & COORDINATION OF WORK

A. The Contractor is responsible for the coordination of the work of all trades; coordinating the installation of their work and that of all subcontractors to ensure compliance with the Contract Documents and to expedite the progress of the Project. Contractor shall check specifications, addenda, and drawings covering all trades as the work progresses. Contractor shall promptly report to the Architect what they consider omissions, conflicts or points requiring clarification.

B. Contractor shall prepare and distribute to each entity performing work at project site, a written memorandum of instructions on required coordination activities, including required notices, reports and attendance at meetings.

C. It is the responsibility of the Contractor to ensure that the work of subcontractors complies with Conditions of the Contract, Division 1 - General Requirements, and the work of other Sections related to their own work. No additional payments or time extensions will be authorized for failure on the part of subcontractors to be familiar with and in compliance with the aforementioned specification divisions and sections.

D. Inclusion of portions of the work under particular divisions of the specifications or sections of the drawings does not in every case conform to the categories of work customarily subcontracted to particular crafts or trades. In such cases, the Contractor shall be responsible to inform bidders, subcontractors, crafts and trades, that work assigned to them is contained in sections other than the usual. In every case, the General Contractor shall be responsible to provide at its cost, all work required in the Contract Documents.

1. Provide project interface and coordination as required to properly and accurately bring together the several parts, components, systems, and assemblies and as required to complete the Work and the Project, pursuant to General Conditions for Washington State Facility Construction, paragraphs 4.01A, 4.01B and 4.01E, Article 4.04, and paragraph 5.01A.

2. Provide interface and coordination of all trades, crafts, and subcontracts as required to provide correct and accurate connection of abutting, adjoining, overlapping, and related Work, and provide all anchors, fasteners, accessories, appurtenances, and incidental items as required to complete the Work properly, fully, and correctly in accordance with the Contract Documents.
3. Provide additional structural components, miscellaneous metal, bracing, blocking, backing, clips, anchors, fasteners, and installation accessories as required to properly anchor, fasten, or attach materials, equipment, appliances, hardware, systems, assemblies, cabinets, and architectural features to the structure.
4. Provide excavation and backfill, trenching and drilling for all trades as required for the installation of their Work.
5. Provide concrete foundations, pads, supports, bases, and grouting for all trades as required for the installation of their Work.
6. Provide caulking, sealing, and flashings as required to weatherproof the building complete and as required to insulate the building thermally and acoustically. Include caulking, sealing, flashings, and related work as required to prevent moisture intrusion, air infiltration, and light leakage.
7. Provide equipment, appliances, fixtures, and systems requiring plumbing and mechanical services, rough-in, and connections, or other utilities and services, with such services, rough-in, and final connections.
8. Provide equipment, appliances, fixtures, and systems requiring electrical and cabling services, rough-in, and connections, or other utilities and services, with such services, rough-in, and final connections.
9. Materials, equipment, component parts, accessories, incidental items, connections, and services required to complete the Work which are not provided by subcontractors shall be provided by the Contractor.

3.02 PROJECT COORDINATION & SCHEDULING CONTROL

A. The Contractor shall schedule and coordinate the work of all subcontractors on the project including their use of the site. Responsibility for coordination and close adherence to time schedules rests solely with the Contractor who shall maintain coordination and scheduling control at all times.

B. Each subcontractor responsible to the Contractor shall cooperate diligently with the Contractor in the execution of their work so as to cause no delay in the completion of the Project. This responsibility includes the completion of all work in a timely manner. All Contractors, Prime Contractor and Subcontractors, shall diligently comply with the following requirements:

1. Cooperate in planning and layout of the work well in advance of operations.
2. Inform other contractors of requirements at proper time to prevent delay or revisions.
3. Be informed on the requirements of other contractors and check own work for conflicts with the work of other contractors.
4. Insure delivery of materials and performance of work on coordinated schedule with other contractors.
5. Contractor shall ensure subcontractors and equipment suppliers are responsible for compatibility and completeness of the installation and operation of the equipment in their respective Specification Sections including conformance with code requirements.
6. Attend Pre-Installation meetings identified in Section 01311.
7. Contractor shall be represented on the job site by his superintendent at all times when there is construction going on, including the work of his subcontractors, as well as his own.

C. Changing Subcontractors: The General Contractor shall be responsible for all the additional expenses incurred by changing subcontractors during the course of this project. These additional expenses include, but not limited to, the engineering expenses for revised

submittal, request for information, or any clarification or duplication that might occur due to the fact that the initial documents have been revised.

3.03 MECHANICAL AND ELECTRICAL COORDINATION

A. All mechanical subcontract work (insulation, plumbing, fire sprinkler, air distribution, sheet metal, steam, balancing and controls, etc.), performed under Division 15 work on this project, shall be the sole responsibility of one Mechanical Subcontractor. In turn, this Mechanical Subcontractor shall answer to the General Contractor. This Mechanical Subcontractor shall be responsible for coordination between his subs to make sure that all the tie down between the different mechanical subs are in place assuring that all systems under work of Division 15 are in proper working condition.

B. Coordination Of Space

1. Coordinate use of Project space and sequence of installation of mechanical and electrical work which is indicated diagrammatically on Drawings. Follow routings shown for pipes, ducts and conduits as closely as practicable, with due allowance for available physical space; make runs parallel with lines of building. Utilize space efficiently to maximize accessibility for other installations, for maintenance and for repairs.
2. In finished areas, except as otherwise shown, conceal pipes, ducts, wiring and the like in the construction. Coordinate locations of fixtures and outlets with finish elements.

C. Resolve all “tight” or restricted conditions involving work of various sections in advance of installation of mechanical and electrical work.

D. Prior to proceeding with work in these areas, Contractor shall be responsible for preparing supplementary drawings for review showing all Work in “tight” areas, and provide minor adjustments and additional work necessary to overcome “tight” conditions, at no increase in Contract Sum. “Tight” areas shall be identified by the Contractor, however, the Owner reserves the right to require supplementary drawings for any areas affected by the construction activity whether or not identified as “tight” by the Contractor. (“tight” shall be defined here as “a condition so close in structure as to prevent passage; allowing little or no room for free motion or movement.”)

E. Equipment Connections: Refer to Section 01110 and to General Requirements in Mechanical and Electrical Divisions. Work includes but is not limited to:

1. Provide motors and equipment for current characteristics as shown on Electrical drawings:

a. Electrical Contractor:

1) Electrical Contractor shall furnish and install all wiring except:

a) Temperature control wiring.
b) Equipment control wiring.
c) Interlock wiring.

2) The Electrical Contractor shall furnish and install all power wiring complete from power source to motor or equipment junction box, including power wiring through starters. After all circuits are completed, Electrical Contractor shall be responsible for all power wiring.

[Specifier –verify the following; Owner installs some controls]

b. Mechanical Contractor: Mechanical Contractor shall, regardless of voltage, furnish and install all temperature control wiring, all starters not factory mounted on equipment, and all interlock wiring and equipment control wiring for the equipment that the Mechanical Contractor furnishes.

3.04 JOB SITE FIELD MEASUREMENTS AND TEMPLATES

A. Obtain field measurements required for accurate fabrication and installation of Work included in this Contract. Exact measurements are the Contractor's responsibility.

B. Contractor shall be responsible for field verifying actual dimensions where "+/-" dimensions are indicated.

C. Furnish or obtain templates, patterns, and setting instructions as required for installation of all Work. Verify all dimensions in the field.

3.05 DIMENSIONS

A. The Structural Drawings are to be used in conjunction with the Architectural, Mechanical and Electrical Drawings. Primary structural elements are dimensioned on the structural plans and details. Not all secondary dimensions are shown, such as exact door and window locations, wall configurations, slab slopes and depressions, curbs, etc. Coordination of the structure with the dimensions as shown on the Drawings and architectural items to be embedded into, or attached to the structure, is the responsibility of the Contractor. Any dimensional discrepancies between the Architectural, Civil, Structural, Mechanical and Electrical drawings shall be reported to the Owner's Representative and Architect before proceeding with the work.

3.06 INTENT OF DRAWINGS

A. The work of the Contractor and subcontractors shall conform to the intent of the architectural and coordination drawings as reviewed by the Architect. Drawings are partly diagrammatic and do not intend to show in details all features of work. The Contractor shall carefully review the work to be performed by other trades, compare related drawings and shall thoroughly understand the building conditions affecting their work.

B. All changes required in the work caused by failure to do so shall be at no expense to the Owner.

3.07 INTERFERENCES & RIGHT-OF-WAY

A. Make proper provisions to avoid interferences. Where conflicts occur, architectural and structural has right-of-way over mechanical and electrical work; concealed mechanical work has right-of-way over concealed electrical work; exposed electrical fixtures have right-of-way over mechanical fixtures.

B. Submit conflicts which cannot be resolved by right-of-way to the Owner for direction.

C. Submit reflected ceiling coordination plans showing work by all applicable trades for review and approval by the Architect.

3.08 NOTIFICATION & CORRECTION OF DEFECTIVE WORK

A. Coordinate the Work of all subcontractors and make certain that, where the work of one trade is dependent upon the work of another trade, the work first installed is properly placed, installed, aligned and finished as specified or required to properly receive subsequent materials applied or attached thereto.

B. Direct subcontractors to correct defects in substrates they install when subcontracts of subsequent materials have a reasonable and justifiable objection to such surfaces. Promptly notify the Owner's Representative and Architect of any defects or imperfections in preparatory work which will in any way affect satisfactory completion of the work.

C. Under no condition shall a section of work proceed prior to preparatory work having been completed, cured, dried or otherwise made satisfactory to receive such related work. Do not force subcontractors to apply or install products to improperly finished product.

D. Correction of defective work shall be the responsibility of the Contractor or subcontractor providing the defective work. Correction of work due to underlying defects shall be the responsibility of the Contractor or subcontractor providing overlying work.

E. Nonconformance Report (NCR)

1. Reference Document: State of Washington Nonconformance Report (NCR).
2. Procedure: If, after an oral discussion or directive, the Contractor fails to correct work that in the opinion of the Owner's Representative fails to conform to the Contract Documents a Nonconformance Report shall be issued. Upon receipt of NCR, Contractor shall take immediate action to correct work. Review corrections at progress meetings for nonconforming work.

3.09 COORDINATING UTILITIES

A. Contractor shall be responsible for coordination of and shall cooperate with all utilities to be installed for service to the Project. Utilities may include, but are not limited to, natural gas, telephone, electrical, and cable television. The Contractor shall maintain communication with the utilities in order to coordinate time and requirements of the utilities' installation.

B. Contractor shall provide all work necessary to comply with the requirements of the Contract Documents for utility work that does not meet the Contract Document requirements, or for work that is disturbed by the utility installation.

3.10 COORDINATION DRAWINGS

A. Coordination Drawings - General

1. The purpose of coordination drawings is to resolve potential interdisciplinary dimensional interferences and conflicts prior to shop fabrication or field installation of components and systems. While the A/E has exercised the accepted standard of care in performing overall dimensional coordination in the preparation of the Construction Documents, additional factors influence coordination which the Contractor must address in the coordination drawings. These factors include, but are not limited to, specific means and methods, the sequence of work, the characteristics of the specific equipment to be installed (where the documents allow multiple options), and the bidding assumptions made by each Contractor.
2. Where work by separate entities requires off-site fabrication of products and materials which must be accurately interfaced and closely intermeshed to produce required results, prepare coordination drawings consisting of plans, sections and details to indicate how

the work shown by separate shop drawings will be interfaced, intermeshed, and sequenced for installation; comply with submittal requirements of Section 01330.

3. The Mechanical/Electrical coordination process shall be performed on site at the Mechanical subcontractors field office. The following parties shall be directly involved and participate, under the direction of the General Contractor, on regularly scheduled weekly basis: Contractor, Plumbing/HVAC Wetside subcontractor, HVAC Dryside subcontractor, Fire Protection subcontractor, Electrical subcontractor, Automatic Temperature Control System subcontractor, and Low Voltage Electrical Systems subcontractor. Additional subcontractors and vendors shall participate at various times as required: Masonry and Structural Steel subcontractors, Drywall and Ceiling subcontractors, and others as required.
4. Each trade's superintendent is expected to participate in the development of coordination drawings. All piping and equipment shall be shown, and all piping greater than 4 inches shall be indicated in double line fashion on the coordination drawings.
7. Coordination meetings shall be held on a minimum of once a week for the duration of the coordination process which shall commence immediately upon Notice to Proceed.
8. The Owner and General Contractor shall have full time onsite representation, and will participate in the resolution of conflicts that may arise from indicated routings or service requirements.
9. The Contractor and each applicable subcontractor shall sign drawings to indicate their participation in the coordination process and their agreement that the individual systems and components can be installed as indicated in the drawings and in the conformance with the Contract Documents.
10. Upon completion of the Project, all coordination drawings shall be turned over to the Owner as a record document submittal.

B. Coordination Drawings – Drawing Criteria: Prepare coordination drawings per following guidelines:

1. Sheet size same as Contract Drawings. Drawings at appropriate scale to depict necessary detail; but not less than 1/4" = 1'-0" for plans and elevations, 1/2" = 1'-0" for sections and details.
2. Drawings to contain elements of construction in their correct dimensional relationship, including but not limited to, floors, walls, ceilings including ceiling heights, roofs, columns, beams, soffits, openings, supports, hangers, equipment, fixtures, and other appurtenances. Develop drawings sequentially through Architectural, Structural, Civil, Mechanical, and Electrical trades.
3. Put signatures of Contractor and each subcontractor on each drawing to confirm their participation in coordination process and agreement that individual systems and components can be installed accordingly.

3.11 CLOSEOUT DUTIES

A. General

1. Coordinate completion and cleanup of work by the various trades in preparation for Substantial Completion.
2. After Owner occupancy of premises, coordinate access to site by the various trades involved for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.
3. Assemble and coordinate closeout submittals.

B. At Completion Of Work Of Each Subcontract: At completion of work of each subcontract, conduct inspection to assure that:

1. Work is acceptable.
2. Temporary facilities and debris have been removed from site.

C. At Substantial Completion

1. Conduct inspection and prepare list of work to be completed or corrected.
2. Assist Architect and Owner's Representative in inspection.
3. Supervise correction and completion of Work as established in Architect's inspection reports ("punch lists").
4. Obtain Certificate of Occupancy from governing authorities.

D. At Final Completion: Assist Architect and Owner's Representative in inspection.

END OF SECTION 01310

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:

1. Preconstruction meeting;
2. Progress meetings;
3. Monthly construction schedule meetings;
4. As-built update meeting;
5. Coordination meetings;
6. Pre-installation meetings prior to starting certain work;
7. Commissioning meetings;
8. Project closeout meetings;
9. Owner training meetings.

1.03 PRECONSTRUCTION MEETING

A. The Owner will schedule a preconstruction conference before starting construction, at a time convenient to the Contractor and the A/E, but no later than 15 days after the Notice To Proceed. The conference will be held at the Project Site or another convenient location as selected by Owner.

B. Attendance is required of the following:

1. A/E and A/E's consultants;
2. Owner's Representatives;
3. E& A Services Project Manager;
4. Contractor's Superintendent and Project Manager; Contractor's QC Representative if different individual than the Project Manager.
5. Major Subcontractors;
6. Others, as requested.

C. Discussion will cover items of significance, including the following:

1. Communication chain and persons authorized to direct changes;
2. The Work;
3. Owner's Site Representative's roles;
4. Work hours, sequence, phasing, and occupancy;
5. Special project procedures;
6. Procedures and processing:

a. Application for payments;
b. Change Order Proposals (COP);
c. Field Authorizations (FA);
d. Change Orders (CO);
e. Requests for Information (RFI);
e. A/E Supplemental Instructions (ASI)
e. Field decisions;
h. Submittals;
i. Others as appropriate.

7. Project record documents including review of as-builts on a regular basis during construction;
8. Construction facilities, and controls;
9. Temporary utilities;
10. Security procedures;
11. Housekeeping procedures;
12. Utility shutdowns / Outage Request Form;
13. Parking;
14. Equipment deliveries and priorities.
15. Schedule Review;
16. CQC System:
    a. CQC Representative
    b. CQC daily report
17 Hazardous material abatement procedures, if any.
18. Use of site and premises by Owner and Contractor.
19. Others, as appropriate.

D. The A/E will:

1. Conduct the meeting to review contract administration requirements.
2. Record, produce, and distribute copies of the minutes to the Owner and General Contractor within seven (7) days of the meeting.

E. The General Contractor shall be responsible to distribute copies to all other Contractor attendees.

1.04 PROGRESS MEETINGS

A. For purposes of coordination and scheduling, after start of the work, Contractor's QC representative, project manager and superintendent and all subcontractors whose work is in progress as otherwise requested, shall attend a progress meetings which shall be held once each week at the jobsite or as otherwise designated, to enable an orderly review of the construction progress and to provide for systematic discussion and analysis of concerns that may arise relative to execution of the work.

B. Contractor, and Subcontractors as required, shall incorporate attendance at these meetings as part of the Base Bid of the project – no overtime payments will be authorized for Contractor or Subcontractors to attend weekly Progress Meetings or other special meetings if required.

C. Meeting Locations: Contractor's project field office or Owner provided meeting room, unless otherwise agreed.

D. Attendance: Representatives attending meetings are required to be qualified and authorized to act on behalf of their firms. Attendance shall include:

1. A/E and A/E's consultants, as appropriate;

2. Owner's Representative;
3. E&A Services Project Manager;
4. Contractor's Superintendent, Project Manager, and QC Representative;
5. Subcontractors, as appropriate;
6. Suppliers, as appropriate;
7. Others, as appropriate.

E. Agenda: Discussion will pertain to items, such as:

1. Attendees; list of attendees and company they represent;
2. Review and approve minutes of previous meeting; written corrections, additions and/or deletions to previous minutes acknowledged;
3. Review work in progress since previous meeting together with previous "look-ahead" schedule;
4. Review plans for progress for subsequent work period together with new "look-ahead" schedule;
5. Review construction schedule; confirm current status of work;
6. Present corrective measures and procedures to regain project schedule, as applicable;
7. Present field observations, problems, and conflicts; discuss concerns pertaining to:
   a. Civil items.
   b. Structural items.
   c. Mechanical items.
   d. Electrical items.
   e. Architectural items.
8. Discuss problems impeding progress schedule;
9. Review Contractor's quality control system; discuss any concerns and corrective measures.
10. Review submittal schedules and logs, present methods to expedite as required;
11. Review off-site fabrication;
12. Review delivery schedules;
13. Review outstanding RFIs;
14. Review proposed changes for:
    a. Effect on construction schedule and on completion date.
    b. Effect on any other contracts of the project,
15. Review Change Order Proposal log and finalize prices;
16 Review draft of Application for Payment (at end of month);
17. Confirm status of the "as-built" drawings and review required revisions to Project Record Documents; see update requirements specified below;
18. Confirm status of shop drawing submittals and approvals.
19. Review project safety;
20. Review any outstanding Non-Compliance Notices;
21. Review any tenant impacts.
22. Review any other business.
23. Confirm next meeting date, location and time plus those requested to be in attendance.

F. A/E will:

1. Administer progress meetings throughout work progress;
2. Record, reproduce, and distribute copies of minutes within 3 working days of the meeting to all meeting participants, the General Contractor is responsible to distribute copies to all other Contractor attendees;
3. Ascertain that work is prosecuted consistently with contract documents and construction schedules.

G. At Contractor's option, weekly progress meetings can be held integrally with monthly CPM Scheduling meeting and As-Built Update meeting specified herein.

H. Contractor shall be responsible to provide the following at each meeting:

1. Current (and updated if necessary) construction schedule with 3 week 'look ahead'.
2. One set of record documents (drawings, specifications, COs, COPs, RFIs, FAs, etc.).
3. Current (and updated if necessary) submittal schedule.
4. Current (updated) set of "as-built" Project Record Documents.

1.05 MONTHLY CONSTRUCTION SCHEDULE MEETINGS, REPORTING

A. In addition to specific coordination meetings for each element of work, and other regular project meetings for other purposes, hold general scheduling meeting each month to review status according to recent updated schedule reports.

B. Require each entity then involved in planning, coordination or performance of work to be properly represented at each meeting. Review each entity's present and future needs including interface requirements, time, sequences, deliveries, access, site utilization, temporary facilities and services, hours of work, hazards and risks, housekeeping, change orders, and documentation of information for payment requests.

C. Discuss whether each element of current work is ahead of schedule, on time, or behind time in relation with updated progress schedule. Determine how behind-time work will be expedited, and secure commitments from entities involved in doing so.

D. Discuss whether schedule revisions are required to ensure that current work and subsequent work will be completed within Contract Time.

E. Review everything of significance which could affect progress of the work.

F. Project Manager will take meeting notes of each meeting and distribute copies to everyone in attendance. General Contractor shall distribute copies of meeting notes to all others affected by decisions or actions resulting from each meeting.

1.06 AS-BUILT UPDATE MEETING

A. Following each monthly scheduling meeting, Contractor shall meet with all major subcontractors whose work is in progress at the site, including but not limited to mechanical, plumbing, electrical, fire sprinkler, masonry, structural steel, civil, and as otherwise designated, to review and verify incorporation of all revisions of the previous month and transfer all non-recorded installed record information to the day-by-day working set of "Project Record Copy" blueprints, with all revisions clearly indicated in red pen. Where applicable, said information shall be obtained from generated coordination drawings; refer to Section 01310. Refer also to Section 01780, Closeout Submittals, for basic required information and other provisions related to 'as-built' requirements.

1.07 COORDINATION MEETINGS

A. Contractor shall hold weekly coordination meetings with his subcontractors and suppliers as deemed necessary by the Contractor for coordination of the work. Meetings shall be held on site. The Owner and the A/E will be available to attend such meetings upon request. Refer to Section 01310 for additional information and requirements pertaining to coordination meetings.

B. The Contractor shall hold weekly coordination meetings with its prime subcontractors beginning the first week after the Notice To Proceed. The superintendent of the Contractor and prime subcontractors shall review the Contractor's schedule for the first three (3) months of work and thoroughly review the work required by the Contract Documents for that period. The Contractor shall submit Design Clarification Requests, Requests For Information, or any other type of information requests the Contractor may use, for the three (3) month work period during the first month after Notice To Proceed to minimize any conflicts that might occur when mobilization begins.

C. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special preinstallation meetings.

D. Request representation at each meeting by every trade currently involved in coordination or planning for the construction activities involved.

E. The Contractor shall continue to hold coordination meetings with its prime subcontractors on a regular weekly basis, and, beginning one month in advance of the next three (3) month work increment, review the Contractor's schedule and contract documents and submit Design Clarification Requests, Requests For Information, or any other type of information requests the Contractor may use. This process shall continue for each three (3) months, or increments of 3 month work segments until the completion of the Project.

F. Record meeting results and distribute copies to A/E and Owner and to others affected by decisions or actions resulting from each meeting.

1.08 PRE-INSTALLATION MEETINGS ***[Specifier - delete or modify as required]***

A. General: Prior to commencement of work listed below or as otherwise determined by the A/E or Owner, the General Contractor or his general superintendent, the responsible foremen for the subcontractors performing said work, plus all associated sub-subcontractors, suppliers, fabricators, vendors, and others as appropriate, shall attend a meeting for the purpose of establishing a full understanding of the procedures and requirements for the orderly progress of the designated work.

B. All subcontractors and major suppliers are required to attend these pre-installation meetings prior to commencing work of their respective specifications Section, or as required by related work in other specification sections. Contractor may elect to group several Sections or Divisions to minimize the number of these meetings.

C. Require attendance of entities directly affecting, or affected by, work of the Section including A/E, Owner's Representative, Contractor's Project Manager and Superintendent with Lead man performing the work, and/or the appropriate Subcontractors/Suppliers/Fabricators.

D. Contractor shall notify the A/E and Owner not less than seven (7) days prior to the scheduled starting of any of the work listed below so that they may schedule said meetings. All applicable submittals as well as the Subcontractor's safety plan and insurance certificates shall have been submitted to and approved by the Owner prior to scheduling this conference.

Work requiring pre-installation meetings shall include, but not necessarily be limited to, the following.

[Specifier - edit as appropriate]

1. Landscaping
2. Cast-in-place concrete.
3. Precast concrete.
4. Interior masonry.
5. Exterior masonry.
6. Masonry cleaning/restoration
7. Structural steel.
8. Interior architectural woodwork/casework.
9. Waterproofing / water repellent treatment (each respective type).
10. Insulation.
11. Roofing (each respective type).
12. Firestopping and fireproofing.
13. Joint sealers.
14. Hollow metal doors and frames.
15. Aluminum windows/storefronts/curtain walls
16. Plaster.
17. Gypsum board assemblies.
18. Tile.
19. Acoustical ceilings.
20. Resilient flooring (each respective type).
21. Carpeting.
22. Painting.
23. HVAC sheetmetal.
24. Plumbing
25. Fire sprinklers
26. Fire alarm
27. Non-typical specialty items
28. Balancing controls

E. Work Plan: Develop a work plan for each definable segment of work. Complete the work plan prior to the pre-installation meeting, and this shall serve as the basis for discussion and contract compliance. Include a review of contract requirements to assure that materials and equipment delivered and assembled for construction conform to contract requirements and that control testing, including procedures, are finalized. Examine work areas, upon which new work is to be placed, to verify the substrate for the new phase of work.

F. Agenda

1. Review technical contract requirements with any options. Contractor to submit any options and resove with Owner any conflicts, interference, or compatibility problems.
2. Insurance and certifications.
3. Schedule. Include the work on the four (4) week Short Interval Schedule.
4. Review requirements as relates to:
   a. Schedule.
   b. Submittals and mock-ups - status of approval; review contract requirements. Note: All submittals pertaining to a pre-installation meeting shall have been reviewed by Architect/Engineer and returned to Contractor.
   c. Tolerances.
   d. Manufacturer's requirements.
   e. Weather limitations.
5. Materials - available and ready for use.
6. Persons responsible for work.

7. Quality control methods:
   a. Testing/Inspection requirements - required inspections and tests, who samples and how often? Criteria for performance of work.
   b. Acceptability of substrates - criteria for approving substrate.
   c. Required performance results.
   d. Recording requirements.
8. Applicable governing rules and regulations.
9. Temporary facilities and controls:
   a. Safety, environmental controls, security, noise.
   b. Space and access limitations.
10. Protection of work, curing periods and related subjects.
11. Other business

G. A/E will record, reproduce and distribute copies of minutes prior to the next meeting or within seven (7) days of each meeting to all meeting participants.

1.09 COMMISSIONING MEETINGS

A. Refer to 'General Requirements' Sections of Divisions 15 and 16 for commissioning meeting requirements.

1.10 PROJECT CLOSEOUT MEETINGS

A. For the purpose of attaining project closeout, commencing immediately following established date of Substantial Completion, Contractor's project manager and superintendent and all subcontractors who have outstanding punch list items associated with their work, or as otherwise requested and including all subcontractors involved in the building systems commissioning process, shall attend weekly closeout meetings which shall be held at the jobsite.

B. Such meetings shall be held to review and discuss the resolution of all punch list items in order to attain Final Completion. Closeout meetings shall continue on a weekly basis until all punch list items have been resolved and Final Completion is attained.

1.11 TRAINING MEETINGS FOR OPERATING INSTRUCTIONS OF OWNER'S PERSONNEL

A. Refer to Section 01770 for training requirements related to operating instructions of Owner's personnel.

1.12 ADDITIONAL MEETINGS

A. As the construction progresses, additional meetings may be required. These may be called at the direction of or by the A/E or Owner.

END OF SECTION 01311

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 GENERAL COMMUNICATION

A. Telephone communication and correspondence shall be between Contractor's Representative and A/E.

B. Subcontractors are not to contact members of the design team directly unless explicitly agreed to by Contractor, A/E and Owner. All such contact and discussions are to be documented in writing by the subcontractor and submitted to the A/E and Owner through the Contractor.

C. Transmit problems or questions in writing using a Request for Information (RFI) form through the General Contractor.

D. ***[Specifier –delete this if work occurs during normal 7:00 a.m. to 5:00 p.m. hours.]*** The A/E, Owner, and E&AS project manager will not typically be working during the Contractor's normal working hours as defined in Section 01010. The Contractor shall anticipate that all communication and weekly construction meetings with these parties will occur between the hours of 8:00 a.m. and 5:00 p.m. Monday through Friday throughout the duration of the Project.

E. The Contractor shall incorporate any cost affect this may have on the progress of the Project into his Base Bid. No overtime payments will be authorized, or time delays allowed, for the Contractor or subcontractors to communicate with the A/E, Owner, or E&AS project manager outside of the Contractor's normal working hours.

F. On-Site Lines Of Authority & Communications: Establish on-site lines of authority and communications including attendance at Pre-construction Meeting and Progress Meetings as required by the A/E and Owner's Site Representative. All on-site lines of authority and communications shall be established through the A/E.

1.03 EMERGENCY COMMUNICATION

A. An Emergency list will be established for use in case of emergencies in off-hours.

1. Identify a person under General, Mechanical and Electrical from the security list provided in Section 01500 that shall be available to contact during all off-hours with authority to address any emergency situation. The person designated on the list shall be available to be at the project site within 30 minutes of being contacted. Additional names and numbers may be necessary to be provided depending on the trade and activity.

2. Submit the list to the A/E, who will include the same information for design team members and Owner representatives.

1.04 CORRESPONDENCE

A. All correspondence to and from Contractor will be routed through A/E with a copy to E&AS Project Manager and Owner's Site Representative.

B. Number correspondence sequentially beginning with Serial Number 001. Include project title and project number.

1.05 REQUEST FOR INFORMATION (RFI)

A. When field conditions or Contract Document contents require clarification or verification by the A/E or A/E's sub-consultants, a written RFI is to be submitted per the following:

1. Identify the nature and location of each clarification/verification using a RFI form; provide as a minimum the following information:
   a. Project name and number;
   b. Date;
   c. Date response required by; allow 7 working days for returning responses. The consultant will expedite those RFI's indicated by the contractor as being critical to the construction process.
   d. RFI number;
   e. Subject;
   f. Initiator of the question;
   g. Indication of costs, if known;
   h. Location on site;
   I. Contract drawing reference;
   j. Contract specification section and paragraph reference;
   k. Descriptive text;
   l. Space for reply on same page as questions; and
   m. Single subject matter, 1 item each - architectural, civil, structural, mechanical, electrical
2. Number each RFI sequentially beginning with #001. Only one questions per RFI. Also, they may be identified as GEN, CIVIL, STRUCT, MECH, ELEC, by sequential numbers.

B. Route: RFI's in same manner as correspondence

C. Copy: RFI's in same manner as correspondence.

1.06 NON-COMPLIANCE NOTICE (NCN)

A. If, after an oral discussion or directive, the Contractor fails to correct work that in the opinion of the A/E fails to conform to the Contract Documents, an NCN shall be issued. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. Upon receipt of the NCN, the Contractor shall take immediate action to correct work. Review corrections at progress meetings for non-compliant work.

END OF SECTION 01315

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

1. This section supplements General and Supplemental Conditions requirements and specifies administrative and procedural requirements for preparation of a preliminary Construction Schedule, Contractor's final master Construction Schedule, hereinafter called the Construction Schedule, Short Interval Schedules ('look-aheads'), and monthly updates.
2. The provisions and requirements of this Section supercede those contained in Article 3.02 of the General Conditions, as supplemented, where said provisions or requirements are in conflict.

B. Definitions:

"Day", as used throughout the Contract unless otherwise stated, means "calendar day".

1.02 SYSTEM DESCRIPTION

A. System Requirements: The purpose of the schedules and reports is to:

1. Ensure adequate planning and execution of the work by the Contractor so that it is completed within the milestone dates and total number of working days allowed in the Contract.
2. Establish the standard against which satisfactory completion of the project shall be judged.
3. Assist the A/E and Owner's Representative in monitoring progress.
4. Assess the impact of any changes to the Contract.
5. Support the basis for progress payments.

B. Float or Slack Time in the Schedule:

1. Float time is defined as the amount of time between the earliest start date and the latest start date or between the earliest finish date and the latest finish date of an activity or chain of activities on the 'Critical Path Method' (CPM) Construction Schedule.
2. Joint Ownership of Float: The Contractor's construction schedule will begin with the date of issuance of Notice to Proceed and conclude with the date of Substantial Completion of the Project, which is the Time of Completion indicated in the Bid Proposal. Float or slack time within this construction schedule is not for the exclusive use or benefit of either the Owner or the Contractor, unless otherwise identified in these Contract Documents, but is a jointly owned project resource available to both parties as needed to meet Contract milestones and the Contract Substantial Completion date. Any float time to activities not on the critical path shall belong jointly to the Contractor and Owner, and may be used by the Contractor and Owner throughout the construction process. However, the Contractor and Owner can mutually reserve and apportion float time according to the needs of the Project.

3. Limited Damage for Delay:
   a. No time extensions will be granted nor delay damages paid until a delay occurs that impacts the project's critical path, consumes all available float or contingency time available, and extends the work beyond the specified contract completion date.
   b. Any float time remaining at the established date of Substantial Completion shall belong to the Owner, and may be used by the Owner in determining if additional contract days are to be awarded for changes in the Contract or for delays to the Contract caused by the Owner. The Contractor shall not be entitled to any adjustment in the Contract Time, the Contract Schedule, or the Contract Price, or to any additional payment of any sort by reason of the Owner's use of any float time remaining between established date of Substantial Completion and the final completion date.
4. Non-Sequestering of Float: Pursuant to the float-sharing requirements of these Contract Documents, the use of float suppression or float hiding techniques such as preferential sequencing or logic, special lead/lag restraints, using multiple critical paths, scheduling activities which can be done concurrently as sequential activities on the critical path or artificially inflating the duration of activities on the critical path are prohibited and the use of float time disclosed or implied by the use of alternate scheduling techniques shall be shared to the proportionate benefit of the Owner and the Contractor. Sequestering of float shall be cause for rejection of Contractor's schedule submittal.
5. Float Developed by Accelerated Actions of Owner or A/E: Float may be added to the Construction Schedule through the expedited activities of the Owner or the Architect. The Construction Schedule must show all scheduled Owner or A/E activities which can affect the critical path including submittal review, delivery of Owner provided items, testing or permit compliance reviews or inspections. Times for these activities on the Construction Schedule must reflect the maximum time or latest date of delivery/arrival indicated in the Specifications or Drawings. If no duration or delivery date is shown or specified, the schedule is to indicate reasonable dates and duration for those items. If A/E or Owner create float by doing activities ahead of schedule, this time will be identified each month and may be used to offset delays which may be caused by A/E, Owner or other delay occurrences outside of the Contractor's control.

C. If the Contractor should desire or intend to complete the Work earlier than any required Milestone or Completion date, the Owner or A/E shall not be liable to the Contractor for any costs or other damages should the Contractor be unable to complete the Work before such Milestone or Completion date.

1.03 SUBMITTALS

A. General: Comply with pertinent provisions of Section 01330.

B. All schedule submittals, including schedule updates, will be reviewed jointly by the A/E and the Contractor. Such review of the Contractor's schedules shall not constitute an approval or acceptance of the Contractor's construction means, methods, or sequencing or its ability to complete the Work in a timely manner. Neither the Owner's nor the A/E's review will relieve the Contractor of the sole responsibility for the accuracy, adequacy, or completeness of the schedule, the logic of the schedule, and/or completion of the Contract requirements in accord with such schedule. Neither Owner's nor A/E's review shall constitute acknowledgment that the relationships between various work items or activity durations are reasonable or appropriate.

C. Preliminary Progress Schedule:
   1. Submit the Preliminary Progress Schedule to the Architect within fourteen (14) days after the Notice to Proceed.
   2. Re-submit the Preliminary Progress Schedule to the Architect until the schedule meets all requirements of this Section.

3. Each submittal shall be in the form of three (3) copies of a computer plotted time-scaled logic diagram, the accompanying baseline schedule CD-ROM, and hard copy computer reports sorted by activity number, early start and total float.

D. Progress Schedule:

1. Within forty-five (45) days after issuance of Owner's written Notice to Proceed, and before any further progress payment need be made, the Contractor, after consultations and sign-offs with its major Subcontractors and Suppliers of any tier has been performed, shall submit a complete Contractor's Construction Schedule to the Owner and A/E for Owner's and A/E's review.
2. Initial submittal shall be in the form of one reproducible copy and three prints, in addition to providing CD-ROM of the baseline schedule.
3. The Owner and A/E will review the substance of Contractor's Construction Schedule and return to the Contractor with comments within ten (10) days. Within ten (10) days following return of reviewed Construction Schedule, the Contractor shall meet with the A/E to discuss Owner's and A/E's Schedule review comments and revisions to the Schedule.
   a. Within ten (10) days following said meeting, Contractor shall submit a final Construction Schedule implementing all revisions as directed in the above noted meeting.
   b. This submittal shall be in the form of four (4) colored copies of a computer plotted time scaled logic diagram with the critical path highlighted in bold contrasting color, the accompanying schedule CD-ROM, four (4) copies of the computerized reports sorted by activity identification number, early start, total float and cash flow curves indicating early and late starts, plus four (4) copies of the corresponding Schedule of Values. Provide the same for each update.
4. When submitting the final schedule, the Contractor shall include its cover letter of transmittal and include a statement that the schedule has been completed and concurred with by its subcontractors.
5. Progress Payment will be withheld until Contractor's Construction Schedule has been submitted in final form and content satisfactory to the A/E and Owner.

E. Periodic Updates to Progress Schedule:

1. Submit an Updated Progress Schedule with each request for a monthly progress payment as required in Part 3 of this Section.
2. Each submittal shall be in the form of one reproducible copy and three prints, in addition to providing a CD-ROM of each update version.

F. Distribution: Copies of reviewed schedule and every revision thereof shall be submitted to the A/E, the Owner, and to everyone whose time performance is essential to achieving the progress shown on the schedule.

1.04 QUALITY ASSURANCE

A. Experience of Scheduler:

1. Employ a scheduler who is thoroughly trained and experienced in compiling construction schedules, in analyzing schedules by use of the Critical Path Method, and in preparing and issuing periodic reports as required.
2. Provide references from a minimum of three past projects of work similar to this project, with similar scheduling requirements.
3. Replace any scheduler whom the Owner deems incompetent.
4. If Contractor does not have the qualified scheduling personnel, he shall retain an outside consultant specializing in CPM scheduling to prepare and maintain the progress schedule.

5. Submit names and experience of proposed employee or consulting firm to Owner prior to submission of preliminary schedule.
6. Upon review of Contractor's scheduler/consultant, the Contractor shall conduct a meeting with the A/E and Owner, Contractor Project Superintendent and Contractor's subcontractor's to explain the scheduling system, monitoring system and demonstrate the use of the schedule during the project.

B. ***[Specifier modify as required]*** The Owner may contract for independent certified CPM scheduler assistance throughout the project in reviewing and providing recommendations regarding the draft and regular updates of the Contractor's schedule.

C. Coordination with Subcontractors and Suppliers:

1. The scheduler shall prepare the Project Schedules and their updates in cooperation with major subcontractors and suppliers.
2. In scheduling work of subcontractors and deliveries by suppliers, the Contractor represents that he has agreement regarding schedule with those supplying materials and performing the work.

D. Reliance Upon the Reviewed Schedule:

1. The Progress Schedule, as reviewed by the A/E, will be an integral part of the Contract and will establish interim completion dates for the various activities under the Contract.
2. Should any activity on the critical path not be completed within 15 calendar days after the stated scheduled date, the Owner shall have the right to require the Contractor to expedite completion of the activity by whatever means appropriate and necessary, without additional compensation to the Contractor. In addition, Contractor shall submit a "Recovery Schedule" which shall logically demonstrate method or methods Contractor proposes to initiate to get back on schedule within thirty (30) days of said date; i.e, additional tradepersons, shifts, work days, or crews.
3. In addition to above, should any activity be 15 days or more behind schedule, the Owner shall have the right to perform the activity or have the activity performed by whatever method the Owner deems appropriate.
4. Costs incurred by the Owner and the A/E in connection with expediting construction activity under this Article shall be the responsibility of the Contractor.
5. It is expressly understood and agreed that failure by the Owner to exercise the option either to order the Contractor to expedite an activity or to expedite the activity by other means shall not be considered to set a precedent for any other activities.

PART 2 – PRODUCTS

2.01 CONSTRUCTION PROGRESS SCHEDULE REQUIREMENTS

A. Critical Path Network Analysis Diagram:

1. Prepare and maintain a computer generated progress schedule using Microsoft Project software consisting of a network analysis system generally known as the Critical Path Method (CPM). Software version shall match versions owned by Owner and, where applicable, independent scheduler.
2. Comply with "The Use of CPM in Construction--A Manual for General Contractors" published by the Associated General Contractors of America, Inc..
3. Graphically show the order and interdependence of all activities necessary to complete the Work, and the sequence in which each such activity is planned to be accomplished.
4. Commence progress schedule preparation immediately following Notice of Award of the Contract.
5. Key the progress schedule to the Schedule of Values (Section 01290) in order to aid analysis of monthly payment requests.

B. Required Data: Show complete sequence of construction by activity, indicating critical path of activities, including but not limited too:

1. Date for Notice to Proceed;
2. Date for Substantial Completion;
3. Project mobilization;
4. Operating constraints and sequences specified by Owner;
5. Shop Drawing, product data, samples, mock-up submittals and reviews, by specification section;
6. Date for final color selections to not affect the Critical Path;
7. Provide demolition schedule as indicated in the Construction Documents;
8. Planned versus actual status for each Work activity;
9. Material procurement - fabrication, delivery to job site, and installation - of equipment and critical materials;
10. Fabrication of special material and equipment, its installation and testing;
11. Utility shutdowns, road closures, etc.;
12. Any intermediate (milestone) completion dates identified in the Contract Documents; include coordination activities as milestones, such as utility tie-ins, outages, Owner furnished items, City inspections, etc.;
13. Delivery windows for all Owner furnished items. Establish earliest and latest delivery dates in consultation with the manufacturer;
14. Contractor transfer of any existing Owner equipment;
15. Show interrelationships and dependencies including activities of separate contractors;
16. Long lead items;
17. Testing, commissioning, Owner training sessions, and other close out activities;
18. Show Field Authorizations (FA) and Change Orders (CO) when they impact the critical path of the schedule;
19. Punch list;
20. Punch list corrections.
21. Final cleanup.
22. All activities by the Architect that affect progress, required dates for completion, or both, for all and each part of the Work.

C. Number and Duration of Activities on the Network Analysis:

1. Treat each trade or type of work as a separate activity or set of activities on the network analysis. Each activity shall be coded for responsibility (Contractor, Owner, Architect, etc.), Subcontractor, Discipline (Mechanical, Electrical, Roofing, etc.). Each project phase (i.e., 1, 1-A, 2, etc.) shall be scheduled separately.
2. At a minimum treat each section of the technical specifications as one or more trades or types of work.
3. Treat submittal, fabrication, delivery, installation, and startup as separate activities for each trade, type of work and item of equipment, including any items procured under any early procurement contracts transferred and/or assigned by Owner, required for performance of Work. The fabrication and delivery activities shall have the appropriate logic ties to submittal/review and construction activities.
4. Submittal and review activities for shop drawings, samples, etc., shall allow reasonable durations for preparation of submittals, submittal review, revisions and re-submittal review. Refer to Section 01330 for specified durations for processing submittals by the Architect and its Consultants, or the Owner and its Consultants, as applicable. Shorter review times for critical submittals may be negotiated on an individual basis. Re-submittals shall have the same review times allotted as the initial submittals. Re-submittal of shop drawings or samples necessitated by required corrections shall not be cause for extension of time. If certain submittals are critical, they shall be so identified at the time of submission to assure priority treatment. The submittal activities shall have the appropriate logic ties to delivery and construction activities.
5. No activity or task shall be longer than 15 calendar days duration, with shorter durations if they affect other activities. The activities shall show early and late start, early and late

finish, and float dates. Break down major tasks into sub-tasks or by area to meet this criteria.

5. Where activities extend more than 15 days divide activities into logical component activities.
6. Show on the diagram, as a minimum for each activity, preceding and following event numbers, description of each activity, cost, and activity duration in calendar days.

D. Cost and Manpower Loaded Schedule: All construction activities which occur on-site shall be cost loaded with costs, manpower and equipment.

1. Show dollar value of activities correlated to schedule of values.
2. Show manpower for each activity.

E. Mathematical Analysis:

1. Furnish the mathematical analysis of the network diagram by computer printout, including a tabulation of each activity. Show the following information as a minimum for each activity:
   a. Preceding and following event numbers.
   b. Activity description.
   c. Estimated duration of activities.
   d. Earliest start date and earliest finish date (by calendar date).
   e. Latest start date and latest finish date (by calendar date).
   f. Slack or Float (in calendar days).
   g. Monetary value of each activity.
   h. Percentage of activity completed.
   i. Contractor's earnings based on portion of activity completed.
2. The means used in making the mathematical computation shall be capable of compiling the total value of completed and partially completed activities and be capable of accepting modifications reviewed for time and logic adjustment.

F. Baseline Schedule: The initial Schedule when reviewed by the A/E and Owner shall be identified as the Baseline Schedule and shall be known as Revision 0. Each subsequent reviewed change to the Schedule shall be as a Revision numbered in sequence (Revision 1, 2, 3, etc.). The Baseline Schedule shall be an un-statused schedule; submitted with no progress percentages applied to activities. The first update shall include the preliminary schedule activities and remaining activities updated as of the second monthly pay request.

PART 3 – EXECUTION

3.01 PRELIMINARY CONSTRUCTION SCHEDULE

A. General:

1. Prepare and submit the Preliminary Progress Schedule to the Architect within 14 days after the Notice of Award, showing all elements itemized in 2.01B above.
2. The schedule shall have been developed by the Contractor in conjunction with its Subcontractors. Major subcontractors greater than 20 percent of the contract are required to review and sign off on the progress schedules as a condition to the Owner authorizing progress payment approval.

B. Re-submittal: Re-submit the Preliminary Construction Schedule to the A/E until the schedule meets all requirements of this section.

C. Scope of Preliminary Construction Schedule: The Preliminary Progress Schedule shall detail, at a minimum, all work which will be accomplished in the first 60 calendar days following the Notice to Proceed. The general approach of the balance of the work shall be indicated.

D. Limitation on Construction:

1. Mobilization and submittals can be in process during the review period.
2. No construction work shall be permitted until the Preliminary Construction Schedule is submitted and reviewed.

E. Initial Progress Payment: The first pay request will be based on the update of the preliminary schedule. This submittal shall be in the form of three (3) copies of a computer plotted time-scaled logic diagram, the accompanying Microsoft Project CD-ROM, and hard copy computer reports sorted by activity number, early start and total float.

3.02 COMPLETE CONSTRUCTION SCHEDULE

A. General: Submit the complete (Master) Construction Schedule to the A/E within forty-five (45) days following the Notice to Proceed.

B. Subcontractor Participation:

1. Involve all major subcontractors in preparation of the Master Construction Schedule.
2. Obtain approval of the schedule from each major subcontractor and submit in writing together with the final Construction Schedule.

C. Start-Up and Testing: Include adequate time for start-up and testing of the complete facility.

D. Progress Payments:

1. Shall be withheld in the absence of a reviewed Construction Schedule.
2. No adjustment or extension of time shall be granted for failure to meet the activity dates as shown. Failure to comply with these requirements shall be cause for rejection of any progress payments presented thereafter, until such time as these requirements are met.

E. Distribution: Copies of reviewed preliminary Construction Schedule and every reviewed revision thereof shall be submitted to the A/E, the Owner, and to everyone whose time performance is essential to achieving the progress shown on the schedule.

3.03 SHORT INTERVAL SCHEDULE

A. Prepare a 4-week Short Interval (“look-ahead”) Schedule. Show one (1) prior week of actual progress (planned vs actual performance). Forecast three (3) weeks of start and completion dates for each activity, task or event in comparison to the prepared schedule.

1. Activities in the Short Interval Schedule shall relate directly to activities in the Construction Schedule. Each activity shall be coded with the same ID number, specification number, or other reference the contractor uses on the Construction Schedule. The Short Interval Schedule will have more detail, but each of the details must be related to the Construction Schedule coding.
2. Indicate start, on-going, intermittent and completion for each activity, task, or event.
3. The schedule shall show critical path work, as defined by the Construction Schedule, that has been affected by any changed conditions authorized through a change order or field order.

B. Prepare and submit a current Short Interval Schedule at each weekly Construction Progress Meeting.

3.04 UPDATES

A. General:

1. The scheduler shall attend all meetings concerning project progress, alleged delays, or time impact.
2. The schedule shall be modified to reflect the original Contract completion date, subject to review by the Owner. Prior to submittal of the schedule update, the Contractor shall submit an advanced worksheet indicating the intended report status. The Owner, A/E and Contractor shall then meet and agree upon the completion status of the work in progress, and any major logic changes proposed by the Contractor.
3. Maintain the Construction Schedule at the project meeting location and update weekly by drawing a line vertically through the corresponding progress of each task on the schedule as of the date of that project meeting. The line shall be in varying colors so that differentiation between weeks is readily apparent.

B. Weekly Meetings:

1. Update the reviewed Construction Schedule at each weekly Project Meeting.
2. Indicate "actual" progress in percent complete for each activity.
3. At each project meeting discuss the Short Interval Schedule. Any deviation from the planned schedule shall be explained by Contractor, with corrective measures, if necessary, to bring progress of Work back in line with the Contract Completion date.

C. Monthly Update:

1. If substantial changes have occurred in the Construction Schedule, or if enough changes have occurred that the schedule is rendered inaccurate or ineffective, submit with the next application for payment a revised updated Construction Schedule showing the original baseline schedule and revised schedule on the same copy for evaluation and measurement of actual work-in-place.
2. If the contractor does not submit a revised schedule with a payment request, it is agreed by the Contractor that the project is still on schedule according to the last submitted schedule.
3. The Contractor shall maintain an ID system so that if the logic changes, or other tasks are inserted, the original task and any inserted task always maintain the originally assigned ID number.
4. Contractor shall submit an updated schedule at the monthly progress meeting following either one of the following two occurrences:
   a. Upon completion of a major milestone; or,
   b. When the actual work completed is more than two (2) weeks behind schedule. Should the schedule show the project completion to be more than two weeks behind, the Contractor shall submit a written explanation and recovery schedule outlining corrective action taken or proposed to bring events back on schedule within a 30 day period.
5. Show changes occurring since previous schedule submission, such as:
   a. Any major changes in scope, including authorized Field Orders or Change Orders;
   b. Contractor reorganization of his work sequence unrelated to changes in scope;
   c. Activities modified since previous submission;
   d. Revised projections for progress and completion, as applicable; and
   e. Any other identifiable changes.
6. Provide narrative report as needed to define:
   a. Problem areas, anticipated delay, and impact of these on schedule; and
   b. Corrective action recommended and its effect.

D. Subcontractor Participation:

1. Involve all major subcontractors in preparation of the Periodic Updates of the Construction Schedule.
2. Obtain approval of the schedule from each major subcontractor and submit in writing together with the Periodic Updates of the Construction Schedule.

E. Change Orders:

1. Authorized changes to the work shall be included in the schedule network as they occur in the same format and level of detail as contained in the current updated schedule. Enough activities shall be included to adequately describe the work. Code the activities in such a way that they can be identified to the specific Change Order. Insert the Change Order Activities in the network with appropriate logic ties to original network activities.
2. Utilize the time impact analysis submitted with the change order to demonstrate the effect of delays on the overall project schedule.

3.05 TIME EXTENSIONS

A. The Contractor shall notify the Owner and Architect in writing within seven (7) days of the event of any event which could delay performance or supplying of any item of the work affecting the critical path. Contractor shall indicate the expected duration of the delay, the anticipated effect of the delay on the Contractor's Construction Schedule, and the action being taken to correct the delay situation.

B. Extensions of time to the Contractor's Contract may be granted only for delays to activities on the critical path that actually delay the Project Completion beyond the date of Substantial Completion, or for delays to activities that transform that activity onto the critical path, and as a result cause a final completion date beyond the contracted final completion date.

C. Following receipt of an executed Change Order extending the Contract Time, the activity data and logic relationships shall be incorporated into the current detailed CPM schedule during the next scheduled progress update, as outlined above in Paragraph F "Change Orders" above. In the event the Contractor is entitled to a change in the Contract Time, the adjustment to the contract Time shall be as defined in the General Conditions.

3.06 ABNORMAL INCLEMENT WEATHER

A. The Contractor shall not be entitled to an extension of time for inclement weather except under the provisions of Paragraph 3.05A.6 of the General Conditions, as supplemented.

B. Except for site work which may critically affect the Contract Time, no extension of time will be made for abnormal inclement weather after the principle portions of the Work are sufficiently closed-in (exterior walls up and roof in place) so as to permit any structure, or major portion thereof which is part of the Work, to be adequately heated so as to allow the various trades to perform their work.

C. If the total calendar days lost due to abnormal inclement weather, from the start of the Work at the Project site by the Contractor until the principle portions of the Work are enclosed, exceeds the total number of days to be expected for the same period, a time extension, if granted, shall only be the number of calendar days needed to equal the excess number of calendar days lost due to such abnormal inclement weather.

3.07 AS-CONSTRUCTED PROGRESS SCHEDULES

A. General:

1. At the completion of the project submit an as-constructed progress schedule.

2. The contractor's project manager and project scheduler must certify the progress schedule as representing the way in which the project was actually constructed.

END OF SECTION 01320

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including the following:

1. Shop Drawings.
2. Product Data.
3. Samples.

The individual submittal requirements of certain submittals are specified in applicable sections for each unit of work.

B. Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:

1. Permits.
2. Applications for Payment.
3. List of subcontractors.

C. Shop drawings, product data, samples, and similar submittals are not Contract Documents. Their purpose is to demonstate, for those portions of the Work for which submittals are required, how Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.

1.03 DEFINITIONS

A. Shop Drawings: Shop drawings include specially-prepared technical data for this project, including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form for general application to several projects. Reproduction of Contract Document drawings are not considered to be shop drawings unless approved by the A/E.

B. Product Data: Product data includes standard printed information on materials, products and systems, not specially-prepared for this project, other than the designation of selections from among available choices printed therein.

C. Samples: Samples include both fabricated and unfabricated physical examples of materials, products, and units of work; both as complete units and as smaller portions of units of work; either for limited visual inspection or (where indicated) for more detailed testing and analysis.

D. Field Samples: Field samples are full-size physical examples erected on-site to illustrate finishes, coatings, or finish materials. Field samples are used to establish the standard by which the Work will be judged.

E. Mockups: Mockups are full-size assemblies for review of construction, coordination, testing, or operation; they are not Field Samples.

F. Coordination Drawings: Coordination Drawings show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or to function as intended.

1. Preparation of Coordination Drawings is specified in Section 01310 and may include components previously shown in detail on Shop Drawings or Product Data.

1.04 SUBMITTAL PROCEDURES

A. Provide a submittal on every product and material used in the Project. Before submittal of shop drawings, brochures, and lists, Contractor shall carefully review same for proper identification, completeness, correctness, dimensions, and technical applicability to the Contract Document requirements and note all corrections, items needing clarification, additional comments, and the like. Upon thorough review and subsequent acceptance by the Contractor, if so accepted, Contractor is to note its approval together with said notes or amendments thereto for compliance with the Contract Documents by suitable stamp, date and the signature of the Contractor or its authorized representative. Submittals will be returned to the Contractor without action by the A/E if the items submitted are not stamped, signed, and identified as approved or approved as noted or other similar language indicating approval by the Contractor, or if the submittal is obviously not thoroughly reviewed.

B. Submission of shop drawings and samples shall be accompanied by one original and one copy of a transmittal letter containing Project name, Contractor's name, number of drawings and samples, titles and other pertinent data.

C. Many products are specified by one or more named products/manufacturers. In those circumstances where Contractor submits an unnamed, non-prior approved product/manufacturer during this ‘shop drawing’ phase, said submittal shall be submitted in conformance with product substitution requirements of Section 01600, Article 2.03.

D. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
   a. The Contractor shall provide submittals requiring coordination with other submittals to the A/E at one time. The A/E will review submittals as received, provide comments, and return them to the Contractor. If the Contractor did not submit all submittals requiring coordination at the same time, and a later submittal identifies conflicts, the Contractor will be responsible for all costs associated with changes necessary to properly coordinate the installation of the materials.
3. To avoid the need to delay installation as a result of the time required to process submittals, the Contractor shall anticipate the review times noted in this section and anticipate the possibility of a resubmittal or rejected submittal and the effect that action would have on the Project schedule.

a. All required submittals shall be initially received by the A/E within 60 days ***[Specifier modify to suit job conditions]*** following the Notice To Proceed date, or sooner as required by the following submittal review times, to meet the Construction Schedule need for materials related to the submittals. Submittals received after these time periods shall not be a cause for delay claims to the Project. A/E will not accelerate review time for submittals received after the indicated time periods, regardless of any potential impact to the Contractor's schedule.
b. Submittals requiring color selection and material selection are interdependent on receiving all submittals at the same time that have such selection requirements. Allow 20 working days from the date of receipt of the last such submittal by the Contractor for the A/E to complete color selections and mail out from the A/E's office.
c. For all other submittals, allow 10 working days after receipt by the A/E to complete the initial review and mail out from the A/E's office.
d. If the A/E must delay processing a submittal to permit coordination with subsequent submittals, the 10 working days will begin upon receipt of the last such coordination submittal from the Contractor.
e. If several submittals are provided by the Contractor at the same time, allow 20 working days after receipt by the A/E to complete the initial review and mail out from the A/E's office. Provide an "Order Of Priority List" to the A/E with the submittal.
f. If an intermediate submittal is necessary, process the same as the initial submittal.
g. Allow 10 working days for reprocessing each submittal after receipt.

E. Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block. Consecutively number each submittal beginning with the number 001.

1. Provide adequate space for the Contractor's stamp and approval, plus a space approximately 4 by 5 inches each on the label or beside the title block on Shop Drawings to record the A/E's review and approval markings and the action taken.
2. Include the following information on the label or title block for processing and recording action taken.
   a. Project name and job number.
   b. Date.
   c. Name and address of the A/E.
   d. Name and address of the Contractor, subcontractor, supplier and manufacturer as appropriate.
   e. Number and title of appropriate Specification Section.
   f. Drawing number and detail references, as appropriate.

F. Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the A/E using a transmittal form. Submittals received from sources other than the Contractor will be returned through the Contractor without action.

1. Address no more than one topic or related topics on a single transmittal (i.e. mechanical items shall not be submitted under same transmittal with electrical items).
2. Record relevant information, deviations, and requests for data, including minor variations and limitations from the Contract Documents.
3. Shop drawings, product data, samples, and mock-up as required for submissions by the technical specification sections are to be submitted for A/E's review/approval. The number of submittals required is noted in the parenthesis.
   a. Shop Drawings: (6) sets; provide one (1) additional set for Structural, Mechanical, Electrical and Elevator submittals
   b. Product Data: (6) copies; provide one (1) additional copy for Structural, Mechanical, Electrical and Elevator submittals
   c. Samples: (3) samples
   d. Mock-ups: As required by any technical specification section.
   e. Demonstrations: As required by any technical specification section.

f. Reference applicable mechanical and electrical technical specifications' sections for additional submittal requirements.

4. Material and Color Submittal: Submit samples of actual colors of materials.
5. Number submittals as follows: Numerical Order, Spec Section, Revision Letter.
6. In the event of the need to "revise and resubmit" a submittal, resubmit same in acceptable form/content, clearly identifying deviations from previous submittal content.

1.05 SHOP DRAWINGS

A. Submit drawings drawn to accurate scale. Do not reproduce Contract documents or copy standard information for use as Shop Drawings. Standard information prepared without specific references to the project is not a Shop Drawing.

B. Include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings. Include the following information:

1. Dimensions;
2. Identification of products and materials included;
3. Compliance with specified standards;
4. Notation of coordination requirements;
5. Notation of dimensions established by field measurements; and
6. Any deviation from contract drawings or specifications;
7. Date when review has to be finalized to meet schedule.

C. Except for templates, patterns and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2" x 11", but no larger than 24" x 36".

D. Shop drawings shall clearly indicate the correct configurations and relative sizes, materials, metal gauges, etc. of the various components and the proposed methods of fabrication, required clearances, supports and any other pertinent data.

E. All items shown on shop drawings that do not conform to plans and specifications shall be specifically noted as such (flagged) and brought to the A/E's attention. In any case, the A/E's stamp of review shall not include approval of unauthorized changes in the Contract Documents, except where specific written approval is given.

F. Contractor is responsible for obtaining and distributing required prints of shop drawings to its subcontractors and material suppliers after as well as before final review by the A/E. Prints of reviewed shop drawings shall be made from returned transparencies which carry the Contractor's and A/E's appropriate stamps. A/E / Owner and applicable consultants and governing agencies will retain up to a total of 4 copies of each shop drawing submittal. Reproducible transparency and all remaining prints not otherwise retained will be returned to Contractor.

G. At A/E's discretion, the prints distributed by the A/E including the one print returned to the Contractor (in addition to the original transparency) may consist of copies made from the marked-up and stamped transparencies.

1.06 PRODUCT DATA

A. Product data includes Material Safety Data Sheets (MSDS), manufacturer's printed installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves.

1. Where product data must be specifically prepared because standard printed data is not suitable, submit as Shop Drawings.

B. Mark each copy to show applicable choices and options, and indicate the applicable information on selected products. Include the following information:

1. Manufacturer's printed recommendations.
2. Compliance with recognized trade association standards;
3. Compliance with recognized testing agency standards;
4. Application of testing agency labels and seals;
5. Notation of dimensions verified by field measurement;
6. Notation of coordination requirements; and
7. Any deviation from Contract Drawings or Specifications;
8. Date when review has to be finalized to meet schedule.

C. The Contractor is responsible for providing certification that all construction materials used on the Project are 100% free of asbestos and lead.

1.07 SAMPLES AND MOCK-UPS

A. Submit samples and mock-ups that are identical with the material or product proposed. Samples include partial sections of components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.

1. Package samples to facilitate review. Prepare samples to match the A/E's sample. Include the following:
   a. Generic description of the sample;
   b. Sample source;
   c. Product name or name of manufacturer;
   d. Compliance with recognized standards;
   e. Availability and delivery time; and
   f. Specification section.

B. Submit samples and mock-ups for review of kind, color, pattern, and texture, for a comparison of these characteristics before the actual component installation and after final submittal.

1. Where variation in color, pattern, texture or other characteristics are inherent in the material, submit not less than four (4) units to show approximate limits of the variations.

C. Where samples are for selection of appearance characteristics from a range of standard choices, submit a full set of choices for the material or products.

D. Maintain sets of approved samples and mock-ups, at the project site, for quality comparisons throughout the course of construction.

E. Demolish and remove all samples and mock-ups, at the project site, for quality comparisons throughout the course of construction.

1.08 A/E's ACTION

A. Except for submittals for record, information or similar purposes, A/E will review each submittal, mark to indicate action taken, and return promptly.

B. Approval of submittals does not release Contractor from a proper installation, compliance with applicable codes, or coordination of the Work.

C. The A/E will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be marked to indicate the action taken.

D. The following is a copy of the A/E's review stamp ***(Specifier modify as needed)*** :

ARCHITECT'S REVIEW	RESPONSE REQUIRED OF CONTRACTOR
____No Exceptions Taken ____Rejected	
	____Confirm and Verify
____Note Markings ____Comments Attached	
	____Resubmit

Architect's review is for general conformance with the design concept and contract documents. Markings or comments shall not be construed as relieving the Contractor from compliance with the project plans and specifications, nor departures therefrom. The Contractor remains responsible for details and accuracy, for confirming and correlating all quantities and dimensions, for selecting fabrication processes, for techniques of assembly, for coordination of his work with that of other trades, and for performing his work in a safe manner.

By:_____ Date:_____

E. The A/E will distribute the reviewed submittals as follows:

(1) copy to A/E file; along with (1) sample
(1) copy to Owner; along with (1) sample
(1) copy to E&A Services Project Manager
(3) copies returned to Contractor; along with (1) sample

For those submittals requiring review by A/E subconsultant (i.e. Structural, Mechanical, Electrical, Elevator, etc…):

(1) copy to A/E subconsultant

END OF SECTION 01330

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 DESCRIPTION

A. Under General Conditions for Washington State Facility Construction, Article 5.02 C., the Contractor is to comply and give notices required by various authorities having jurisdiction. Except where otherwise expressly required by applicable Laws and Regulations, neither the Owner or A/E shall be responsible for monitoring the Contractor's compliance with those requirements. The Contractor is responsible for keeping building department, fire department, and other authorities completely informed of any changes in the work in a timely manner. This includes contract modifications, amendments, additions, shop drawings, and the like, current as of the Contract Document date.

B. The Contractor is responsible for gaining approval as required for Owner occupancy within contract schedule requirements.

C. Make any and all adjustments or modifications as required to conform to ordinances, and regulations.

1.02 COMPLIANCE REQUIREMENTS

A. Referenced codes establish minimum requirement levels. Where provisions of various codes or standards conflict, the more stringent provisions govern. Promptly submit to A/E written notice of observed contract document variations from legal requirements.

B. Compliance requirements include, but are not limited to the following:
[Specifier modify edition dates, etc as required]

1. Uniform Building Code and Related Standards, Washington State Amendments, as adopted by the City of Olympia.
2. Barrier-Free Code Washington Administrative Code (WAC) 51-40.
2. The Life Safety Code NFPA 101.
3. Fire Doors/Windows, NFPA 80.
4. Rules and Regulations for the State Board of Health.
5. Department of Labor and Industries Regulations.
   a. In particular, note requirements of the Hazard Communication Standard, WAC 296-62-054 through -05427.
6. Department of Ecology Regulations.
   a. In particular, note requirements of Emission Standards - Volatile Organic Compounds, WAC 173-490.
7. Mechanical Work:
   a. Uniform Mechanical Code.
   b. Uniform Plumbing Code.
   c. National Fire Protection Association Codes.

d. Uniform Fire Code.

8. Electrical Work:
   a. Underwriters' Laboratories (UL).
   b. National Manufacturers' Association.
   c. National Fire protection Association, National Electric Code (NEC), National Electric Safety Code.
9. Environmental Requirements: All work to be performed in compliance with applicable provisions of chapters 43.21C RCW and 90.50 RCW as amended, 70.105 RCW, Hazardous Waste Management Act of 1976, and other applicable federal, state, and local statues, ordinances and regulations dealing with prevention of environmental pollution and the preservation of public natural resources that affect or are affected by this project, as well as applicable provisions of Title 39 RCW and Chapter 60.28 RCW are referred to the attention of the Contractor and are incorporated herein.
10. Factory Mutual (FM).
11. Industrial Risk Insurers (IRI).
12. Energy Requirements:
    a. Comply with insulation and energy conservation requirements of State of Washington.
13. Remediation Requirements: Reference technical specifications for additional regulations concerning abatement and remediation of hazardous materials.
14. Occupational Safety and Health Administration (OSHA)
15. Washington Industrial Safety and Health Act (WISHA)
16. City of Olympia Codes, Standards & Ordinances.

[16. City of [Tumwater] [Lacey] [_____] Codes, Standards & Ordinances.**]**

C. Drawings and Specifications govern whenever Drawings and Specifications require higher standards than are required by governing codes, regulations, and the like.

1.03 SUBMITTALS

A. For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established in conjunction with compliance with standards and regulations bearing upon performance of the Work prior to Final Completion.

END OF SECTION 01410

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 DEFINITIONS

A. General: Basic contract definitions are included in the General Conditions for Washington State Facility Construction. The following supplements Part 1 of those Conditions and expands on definitions and intent of language generally used in the Contract Documents.

B. "Accepted": The term "accepted" means accepted by the A/E when used in conjunction with the A/E's duties and responsibilities as stated in the Conditions of the Contract.

C. "Approved": Where used in conjunction with A/E's response to submittals, requests, applications, inquires, reports, and claims by Contractor, the meaning of the term "approved" will be held to limitations of A/E's responsibilities and duties as specified in General and Supplementary Conditions. Where the terms "or approved" or "as approved" or "for approval" are used, the A/E is the sole judge of the quality and suitability of the proposed substitutions. In no case will "approval" by A/E be interpreted as a release of Contractor from responsibilities to fulfill requirements of the Contract Documents. Whenever a material, article or piece of equipment is identified on the Drawings or in the Project Manual by reference to manufacturer's or vendor's names, trade names, catalog numbers, or the like, and followed by the wording "or approved", "or approved substitute" or "equivalent, as approved", it is so identified for the purpose of establishing a standard, and any material, article, or piece of equipment of other manufacturers or vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or piece of equipment so proposed is, in the opinion of the A/E, of equivalent substance, quality, appearance or function and has been approved by the A/E in writing prior to bid opening in conformance with the provision of Section 01600, Product Requirements, Article 2.03. It shall not be purchased or installed by the Contractor without A/E's and Owner's prior written approval.

D. "A/E", "Consultant": The term "A/E" and "Consultant" as used herein, shall mean the design firm identified in the Contract Documents.

E. "As required": Means as required to suitably complete the work and at the direction of the A/E.

F. "Authority Having Jurisdiction": The term "Authority Having Jurisdiction" (AHJ) is any person which has responsibility related to issuing final occupancy and permits for this Project.

G. "Conditions" or "General Conditions": Means General Conditions for Washington State Facility Construction.

H. “Coordinate”: Means the Contractor is to coordinate scheduling, submittals, and work of various sections of the specifications, drawings and construction of all trades to assure efficient and orderly sequence of interdependent construction elements for a complete and operating installation.

I. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the A/E, requested by the A/E, and similar phrases. However, no such implied meaning will be interpreted to extend A/E’s responsibility into Contractor’s area of construction supervision.

J. "Furnish": The term "furnish" means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.

K. “General” or “General Requirements”: The provisions or requirements of Division 1 Sections. General Requirements apply to entire work of Contract and where so indicated, to other elements of work which are included in the Project.

L. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Project Manual (Specifications and Detail Book), and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the reader locate the reference. Location is not limited, and is applicable where reasonably implied and necessary in conformance with work specified, drawn, or required for completion.

M. “Inspection”: As used in reference to actions of the A/E or his/her consultants, shall mean to review or observe the Work, but not to “inspect” the Work as the Contractor or Authority Having Jurisdiction will inspect.

N. "Install": The term "install" describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations to permanently affix to project, as applicable in each case.

O. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.

   1. The term "experienced," when used with the term "installer," means having a minimum of 5 previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of Authorities Having Jurisdiction.

P. “Install in Accordance with Manufacturer’s Instructions and Directions”: Throughout the Documents, although it may not be specifically stated, the Contractor is to install all work in accordance with Manufacturer’s literature, unless otherwise noted or directed, for the best results. Where more than one Manufacturer is involved in the work, or its component parts, the Contractor shall follow each Manufacturer’s literature.

   1. In the event of conflict between the Manufacturer’s lterature, or its literature and the Contract Documents, the Contractor shall submit the discrepancy or conflict to the A/E for resolution and written instruction prior to proceeding with any work.
   2. No Manufacturer preparatory steps or installation procedures may be omitted. If the Contract Documents genernalize the installation precedure, but do not necessarily mention all procedures, those procedures are not exempt from being completed by the Contractor umless they are specifically modified or stated as being exempt.

Q. “Owner” or “OCPM” (Office of Capital Planning & Management): The term “Owner” or “OCPM” as used herein, shall mean the “State of Washington, Office of Capital Planning and Management, acting through the Division of Engineering And Architectural Services (E&AS)”.

1. The Owner may assign a project specific Site Representative to be present on-site during construction. This “Site Rep” will observe and report daily activities to the Owner and provide assistance to assure Owner impacts, project access, construction quality and construction related responses are addressed. As an agent of the Owner, the Site Rep may expedite Owner decisions.
2. The Site Representative will make daily visits to the site to review the progress of the work and its conformance with the Contract Documents. The Site Representative will bring relevant issues to the attention of the Contractor’s QA Representative and the Architect. The Site Representative will coordinate with the Building Manager and Zone Coordinator on Owner related issues.
3. The Site Representative will photograph the work and issue written reports to all concerned parties at regular intervals.
4. The Site Representative will participate in the pre-construction meeting, quality control meetings, progress meetings, pre-installation meetings, and closeout/punch list meetings in addition to walk-throughs.

R. “Product”: The term “product” as used in the Project Manual includes materials, systems and equipment provided by the Contractor for use in the Work.

S. “Project Manual”: The term “Project Manual” is/are the volume(s) which include the Bidding Requirements, Conditions of the Contract, and the Specifications, Divisions 1 to 16 inclusive, as applicable, and as listed in the Table of Contents bound therein, with any details and schedules as applicable.

T. "Project Site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction, with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

U. "Provide": The term "provide" means to furnish, coordinate, and install, complete, in place and ready for the intended use.

V. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

W. “Satisfactory”: The term “satisfactory”: means “satisfactory to the A/E and Owner”; the A/E shall be the sole judge of the acceptability of a product or an installation.

X. “Selected”: The term “selected” means “selected by the A/E and Owner” and is not necessarily limited to a manufacturer’s standard line of colors, finishes or details.

Y. “Similar”, “Similar to”: Where the words “similar” or “similar to” are used:

1. Where it occurs in the Contract Documents, shall mean that a portion of the Work shall have common features and be visually consistent with, but may not necessarily be identify to, related portions of the Work. Contractor shall correlate similar conditions of the Work. The Contractor shall identify any uncertainties to the A/E. Do not proceed without A/E’s direction.
2. Where it is followed by a manufacturer’s name and product, model, or type number, such manufacturer, product, model or type number shall be considered as the standard of quality for the item or product work specified, in a general and technical sense, not meaning “identical”, and the provisions pertaining to “or approved” shall apply to any other proposed material, article, or piece of equipment of other manufacturers or vendors.

Z. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

AA. “Trades”: Is any person or group of people which provides services to or work on the Project. Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.

BB. “Verify”: Means the Contractor is to verify existing conditions and coordinate any variations from what is shown in the Contract Documents with the A/E.

1.03 SPECIFICATION AND DRAWING FORMAT AND CONTENT EXPLANATION

A. The General Conditions, Supplemental Conditions, and Division 1 of these specifications shall be a part of technical Divisions and Sections the same as if they were specifically called for in each section.

B. Wording of these Specifications: These Specifications are of the abbreviated or streamlined type and may include incomplete sentences. Words such as “shall,” “the Contractor shall,” “shall be,” and similar mandatory phrases, are included by inference.

C. Tense, Gender, Singular, Plural: Present tense words include future tense. Words in masculine gender include feminine and neuter genders. Words in the singular include plural. Plural words include singular.

D. All, Entire, and the Like: For brevity throughout the documents, these words may be omitted. Read their implications into all work, as the following parenthetical insertion exemplifies: “Balance and adjust (all) dampers.”

E. Specification by Reference: Any material specified by reference or number, symbol or title of a specified standard, such as commercial standard, ANSI and ASTM documents, Federal Specifications, trade association standard, or the like, shall comply with the following:

1. The latest revision requirements thereof;
2. Any amendment or supplement thereto in effect on date of the Project Manual, except as modified;
3. When building code requirements refer to a different issue of standards specifications, such issue governs.

F. Drawings are in part diagrammatic and do not necessarily show complete details of construction, work or materials, performance or installation. They do not necessarily show how construction details, other items or work, fixtures, and equipment may affect any particular installation. The Contractor is required to ascertain and correlate the work to bring the parts together into a satisfactory and completed whole.

1. Where on any of the drawings a portion of the work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to all other portions of the work.
2. Wherever a detail is referenced and developed for a specific condition, same or similar detail shall apply to identical or similar conditions elsewhere on project even though not specifically referenced.

1.04 INDUSTRY STANDARDS

A. Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly

into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Comply with the standards in effect as of the date of the Contract Documents.

C. Where compliance with 2 or more standards is specified and the standards established differ or have conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer to the A/E before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum acceptable. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the A/E for a decision before proceeding.

D. Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Contractor shall obtain copies directly from the publication source and have them available at the job site all reference standards which are referenced in the technical specifications of the Project Manual or on the Drawings.

E. Graphic Standards: Symbols used in the Contract Documents, except as otherwise noted, are those symbols recognized in the construction industry for purposes indicated.

F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations, as referenced in the Contract Documents, are defined to mean the associated names. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents. The following list may not be complete or may have additional listings not used in the Contract Documents. Refer to Gales Research Company "Encyclopedia of Associations", available in most libraries, for any missing names.

AA Aluminum Association
900 19th St., NW, Suite 300
Washington, DC 20006

AABC Associated Air Balance Council
1518 K St., NW
Washington, DC 20005

AAMA American A/Eural Manuf's Assoc.
1540 E. Dundee Road, Suite 310
Palatine, IL 60067

ADC Air Diffusion Council
One Illinois Center, Suite 200
111 East Wacker Drive
Chicago, IL 60601-4298

AAN American Association of Nurserymen
1250 Eye St., NW, Suite 500
Washington, DC 20005

HEI Heat Exchange Institute
c/o Thomas Associates, Inc.
1300 Sumner Ave.
Cleveland, OH 44115-2851

HI Hydronics Institute
P.O. Box 218
35 Russo Place
Berkeley Heights, NJ 07922

HI Hydraulic Institute
9 Sylvan Way
Parsippany, NJ 07054-3802

IBD Institute of Business Designers
341 Merchandise Mart
Chicago, IL 60654

ICEA Insulated Cable Engineers Assoc, Inc.
P.O. Box 440
South Yarmouth, MA 02664

AASHTO American Association of State Highway and Transportation Officials
444 North Capitol St., Suite 249
Washington, DC 20001

AATCC American Association of Textile Chemists and Colorists
P.O. Box 12215
Research Triangle Park, NC 27709

ABMA American Bearing Manufacturers. Assoc
1101 Connecticut Ave., NW, Suite 700
Washington, DC 20036

ACI American Concrete Institute
P.O. Box 19150
Detroit, MI 48219

ACIL American Council of Independent Laboratories
1629 K St., NW
Washington, DC 20006

ACPA American Concrete Pipe Assoc.
8300 Boone Blvd., Suite 400
Vienna, VA 22182

ADC Air Diffusion Council
One Illinois Center, Suite 200
111 East Wacker Dr
Chicago, IL 60601-4298

AFBMA Anti-Friction Bearing Manufacturers Assoc. (Now ABMA)

AFPA American Forest and Paper Assoc. (American Wood Council of the)
2nd Floor, 1250 Connecticut Ave., NW
Washington, DC 20036

AGA American Gas Assoc.
1515 Wilson Blvd
Arlington, VA 22209

AHA American Hardboard Assoc.
1210 W. Northwest Highway
Palatine, IL 60067

AI Asphalt Institute
P.O. Box 14052
Lexington, KY 40512-4052

IEC International Electrotechnical Comm. (Available from ANSI)
1430 Broadway
New York, NY 10018

IEEE Institute of Elect & Electronic Eng
345 E. 47th St.
New York, NY 10017

IESNA Illuminating Engineering Society of North America
345 E. 47th St.
New York, NY 10017

IGCC Insulating Glass Certification Council
C/o ETL Testing Laboratories, Inc.
P.O. Box 2040
Route 11, Industrial Park
Cortland, NY 13045

ILI Indiana Limestone Institute of America
Stone City Bank Building, Suite 400
Bedford, IN 47421

IRI Industrial Risk Insurers
P.O. Box 5010
85 Woodland St
Hartford, CT 06102-5010

ISA Instrument Society of America
P.O. Box 12277
67 Alexander Dr.
Research Triangle Park, NC 27709

LIA Lead Industries Association, Inc.
295 Madison Ave.
New York, NY 10017

LPI Lightning Protection Institute
3365 N. Arlington Heights Rd., Suite J
Arlington Heights, IL 60004

MCAA Mech Contractors Assoc of America
1385 Piccard Dr.
Rockville, MD 20850-4329

ML/SFA Metal Lath/Steel Framing Assoc.
(A Division of the National Association of A/Eural Metal Manufacturers)
600 S. Federal St., Suite 400
Chicago, IL 60605

AIA — The American Institute of Architects
1735 New York Ave., NW
Washington, DC 20006

AIA — American Insurance Assoc.
1130 Connecticut Ave., NW, Suite 1000
Washington, DC 20036

AIHA — American Industrial Hygiene Assoc.
2700 Prosperit Ave., Suite 250
Fairfax, VA 22031

AISC — American Institute of Steel Construction
One East Wacker Dr., Suite 3100
Chicago, IL 60601-2001

AISI — American Iron and Steel Institute
1101 17th St., NW
Washington, DC 20036-4700

ALI — Associated Laboratories, Inc.
c/o HOH Chemicals
500 S. Vermont St.
Palatine, IL 60067

ALSC — American Lumber Standards Committee
P.O. Box 210
Germantown, MD 20875

AMCA — Air Movement and Control Assoc.
30 W. University Dr.
Arlington Heights, IL 60004-1893

ANSI — American National Standards Institute
11 West 42nd St., 13th Floor
New York, NY 10036

AOAC — AOAC International
2200 Wilson Blvd., Suite 400
Arlington, VA 22201-3301

AOSA — Association of Official Seed Analysts
California State Seed Laboratory
1220 N St.
Sacramento, CA 95814

APA — American Plywood Assoc.
P.O. Box 11700
Tacoma, WA 98411

API — American Petroleum Institute
1220 L St., NW
Washington, DC 20005

MSS — Manufacturers Standardization Society of the Valve and Fittings Industry
127 Park St., NE
Vienna, VA 22180

NAA — National Arborist Assoc.
Route 101, P.O. Box 1094
Amherst, NH 03031-1094

NAAMM — National Association of A/Eural Metal Manufacturers
600 S. Federal St., Suite 400
Chicago, IL 60605

NAIMA — North American Insulation Manufacturers Assoc.
44 Canal Center Plaza, Suite 310
Alexandria, VA 22314

NAPA — National Asphalt Pavement Assoc.
NAPA Building
5100 Forbes Blvd.
Lanham, MD 20706-4413

NAPF — National Association of Plastic Fabricators (Now DLPA)

NBHA — National Builders Hardware Assoc. (Now DHI)

NCRPM — National Council on Radiation Protection and Measurements
7910 Woodmont Ave., Suite 800
Bethesda, MD 20814

NEC — National Electrical Code (from NFPA)

NECA — National Electrical Contractors Assoc.
3 Bethesda Metro Center, Suite 1100
Bethesda, MD 20814

NEII — National Elevator Industry, Inc.
185 Bridge Plaza, North
Fort Lee, NJ 07024

NEMA — National Elect Manufacturers Assoc.
2101 L St., NW, Suite 300
Washington, DC 20037

NETA — International Electrical Testing Assoc.
P.O. Box 687
Morrison, CO 80465

ARI	Air-Conditioning and Refrigeration Institute 4301 Fairfax Dr., Suite 425 Arlington, VA 22203
ARMA	Asphalt Roofing Manufacturers Assoc. 6000 Executive Dr., Suite 201 Rockville, MD 20852-3803
ASA	Acoustical Society of America 500 Sunnyside Blvd. Woodbury, NY 11797
ASC	Adhesive and Sealant Council 1627 K St., NW, Suite 1000 Washington, DC 20006-1707
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329
ASME	American Society of Mech Engineers 345 East 47th St. New York, NY 10017
ASPE	American Society of Plumb Engineers 3617 Thousand Oaks Blvd., Suite 210 Westlake, CA 91362
ASSE	American Society of Sanitary Engineering P.O. Box 40362 Bay Village, OH 44140
ASTM	American Society for Testing and Materials 1916 Race St. Philadelphia, PA 19103-1187
ATIS	Alliance for Telecommunications Industry Solutions 1200 G St., NW, Suite 500 Washington, DC 20005
AWI	Architectural Woodwork Institute P.O. Box 1550 13924 Braddock Rd., No. 100 Centerville, VA 22020
AWS	American Welding Society 550 LeJeune Rd., NW Miami, FL 33126
NFPA	National Fire Protection Assoc. One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101
NFPA	National Forest Products Assoc. (Now AFPA)
NHLA	National Hardwood Lumber Assoc. P.O. Box 34518 Memphis, TN 38184-0518
NLGA	National Lumber Grades Authority 4400 Dominion St., Suite 103 Burnaby, BC V5G 4G3
NMCA	National Concrete Masonry 2302 Horse Pen Road Herndon, VA 22071-3406
NPA	National Particleboard Assoc. 18928 Premiere Ct. Gaithersburg, MD 20879
NPCA	National Paint and Coatings Assoc. 1500 Rhode Island Ave., NW Washington, DC 20005
NRCA	National Roofing Contractors Assoc. 10255 W. Higgins Rd., Suite 600 Rosemont, IL 60018-5607
NSF	National Sanitation Foundation 3475 Plymouth Rd. P.O. Box 130140 Ann Arbor, MI 48113-0140
NTMA	National Terrazzo and Mosaic Assoc. 3166 Des Plaines Ave., Suite 132 Des Plaines, IL 60018
NWMA	National Woodwork Manuf. Assoc. (Now NWWDA)
NWCB	Northwest Wall & Ceiling Bureau 1032-A N.E. 65th Street Seattle, WA 98115
NWWDA	National Wood Window and Door Assoc. 1400 E. Touhy Ave., #G54 Des Plaines, IL 60018
PATMI	Power Actuated Tool Manufacturers' Institute, Inc. 1000 Fairgrounds Rd., Suite 200 St. Charles, MO 63301

AWPA American Wood Preservers'
PO Box 286
Woodstock, MD 21163-0286

AWWA American Water Works Assoc.
6666 W. Quincy Ave.
Denver, CO 80235

BHMA Builders' Hardware Manuf Assoc.
355 Lexington Ave., 17th Floor
New York, NY 10017

BIFMA The Business and Institutional Furniture Manufacturer's Association
2680 Horizon Dr., SE, Suite A1
Grand Rapids, MI 49546-7500

CAGI Compressed Air and Gas Institute
c/o Thomas Associates, Inc.
1300 Sumner Ave.
Cleveland, OH 44115-2851

CAUS Color Association of the United States
409 W. 44th St.
New York, NY 10036

CBM Certified Ballast Manufacturers Assoc.
1422 Euclid Ave., Suite 402
Cleveland, OH 44115-2851

CCC Carpet Cushion Council
P.O. Box 546
Riverside, CT 06878

CFFA Chemical Fabrics & Film Assoc, Inc.
c/o Thomas Associates, Inc.
1300 Sumner Ave.
Cleveland, OH 44115-2851

CGA Compressed Gas Assoc.
1725 Jefferson Davis Highway
Suite 1004
Arlington, VA 22202-4100

CISCA Ceiling and Interior Systems.
Construction Assoc
579 W. North Ave., Suite 301
Elmhurst, IL 60126

CISPI Cast Iron Soil Pipe Institute
5959 Shallowford Rd., Suite 419
Chattanooga, TN 37421

CRI Carpet and Rug Institute
P.O. Box 2048
Dalton, GA 30722

PCA Portland Cement Assoc.
5420 Old Orchard Rd.
Skokie, IL 60077

PCI Precast/Prestressed Concrete Institute
175 W. Jackson Blvd.
Chicago, IL 60604

PDI Plumbing and Drainage Institute
c/o Sol Baker
1106 W. 77th St., South Dr.

Indianapolis, IN 46260

PEI Porcelain Enamel Institute
102 Woodmont Blvd., Suite 360
Nashville, TN 38205

RFCI Resilient Floor Covering Institute
966 Hungerford Dr., Suite 12-B
Rockville, MD 20805

RMA Rubber Manufacturers Assoc.
1400 K St., NW
Washington, DC 20005

SDI Steel Door Institute
30200 Detroit Rd
Cleveland, OH 44145

SGCC Safety Glazing Certification Council
c/o ETL Testing Laboratories
Route 11, Industrial Park
Cortland, NY 13045

SHLMA Southern Hardwood Lumber Manufacturers Assoc.
(Now HMA)

SIGMA Sealed Insulating Glass Manuf Assoc.
401 N. Michigan Ave.
Chicago, IL 60611

SMACNA Sheet Metal and Air Conditioning Contractors National Assoc.
4201 Lafayette Center Dr.
Chantilly, VA 22021

SPRI Single Ply Roofing Institute
20 Walnut St.
Wellesley Hills, MA 02181

SSPC Steel Structures Painting Council
4516 Henry St.
Pittsburgh, PA 15213

CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Rd. Schaumburg, IL 60173
CTI	Ceramic Tile Institute of America 12061 West Jefferson Blvd. Culver City, CA 90230
DHI	Door and Hardware Institute 14170 Newbrook Dr. Chantilly, VA 22021-2223
DIPRA	Ductile Iron Pipe Research Assoc. 245 Riverchase Parkway East, Suite O Birmingham, AL 35244
DLPA	Decorative Laminate Products Assoc. 13924 Braddock Rd. Centreville, VA 22020
ECSA	Exchange Carriers Standards Assoc. (Now ATIS)
EIA	Electronic Industries Assoc. 2001 Pennsylvania Ave., NW Washington, DC 20006-1813
EJMA	Expansion Joint Manufacturers Assoc. 25 N. Broadway Tarrytown, NY 10591
ETL	ETL Testing Laboratories, Inc. P.O. Box 2040 3933 Route 11, Industrial Park Cortland, NY 13045
FCIB	Floor Covering Installation Board 310 Holiday Ave. Dalton, GA 30720
FM	Factory Mutual Systems 1151 Boston-Providence Turnpike P.O. Box 9102 Norwood, MA 02062
FTI	Facing Tile Institute P.O. Box 8880 Canton, OH 44711
GA	Gypsum Association 810 First St., NE, Suite 510 Washington, DC 20002
GANA	Glass Assoc. of North America 3310 S.W. Harrison St. Topeka, KS 66611-2279
SSPMA	Sump and Sewage Pump Mfg Assoc. P.O. Box 647 Northbrook, IL 60065-0647
STI	Steel Tank Institute 570 Oakwood Rd. Lake Zurich, IL 60047
TCA	Tile Council of America P.O. Box 326 Princeton, NJ 08542-0326
TIMA	Thermal Insulation Manuf Assoc. (This Organization is now defunct. See NAIMA)
UL	Underwriters Laboratories 333 Pfingsten Rd. Northbrook, IL 60062
UNI	Uni-Bel PVC Pipe Assoc. 2655 Villa Creek Dr., Suite 155 Dallas, TX 75234
WCLIB	West Coast Lumber Inspection Bureau P.O. Box 23145 Portland, OR 97281
WLPDIA	Western Lath, Plaster, Drywall Industries Assoc. (Formerly California Lath & Plaster Assoc.) 8635 Navajo Rd. San Diego, CA 92119
WRI	Wire Reinforcement Institute 1101 Connecticut Ave. NW, Suite 700 Washington, DC 20036-4303
WSC	Water Systems Council 600 S. Federal St., Suite 400 Chicago, IL 60605
WWPA	Western Wood Products Assoc. Yeon Building 522 SW 5th Ave. Portland, OR 97204-2122
W.W.P.A	Woven Wire Products Assoc. 2515 N. Nordica Ave. Chicago, IL 60635

G. Federal Government Agencies: Federal government agency names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations, as referenced in the Contract Documents, are defined to mean the associated names. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents. The following list may not be complete or may have additional listings not used in the Contract Documents. Refer to Gales Research Company "Encyclopedia of Associations", available in most libraries, for any missing names.

ADAAG ADA Accessibility Guidelines
Access Board
1331 F Street NW, Suite 1000
Washington, DC 20004-1111

CE Corps of Engineers
(U.S. Department of the Army)
Chief of Engineers - Referral
Washington, DC 20314

CFR Code of Federal Regulations
(Available from the Government Printing Office)

N. Capitol St. between G and H St., NW
Washington, DC 20402
(Material is usually first published in the "Federal Register")

CPSC Consumer Product Safety Commission
5401 Westbard Ave.
Bethesda, MD 20207

CS Commercial Standard
(U.S. Department of Commerce)
Government Printing Office
Washington, DC 20402

DOC Department of Commerce
14th St. and Constitution Ave., NW
Washington, DC 20230

DOT Department of Transportation
400 Seventh St., SW
Washington, DC 20590

EPA Environmental Protection Agency
401 M St., SW
Washington, DC 20460

FAA Federal Aviation Administration
(U.S. Department of Transportation)
800 Independence Ave., SW
Washington, DC 20590

FHA Federal Housing Administration
(U.S. Department of Housing and Urban Development)
451 Seventh St., SW
Washington, DC 20201

FS Federal Specification (from GSA)
Specifications Unit (WFSIS)
7th and D St., SW
Washington, DC 20407

GSA General Services Administration
F St. and 18th St., NW
Washington, DC 20405

MIL Military Standardization Documents
(U.S. Department of Defense)
Naval Publications and Forms Center
5801 Tabor Ave.
Philadelphia, PA 19120

NIST National Institute of Standards and Technology
(U.S. Department of Commerce)
Gaithersburg, MD 20899

OSHA Occupational Safety and Health Administration
(U.S. Department of Labor)
200 Constitution Ave., NW
Washington, DC 20210

PS Product Standard of NBS
(U.S. Department of Commerce)
Government Printing Office
Washington, DC 20402

REA Rural Electrification Administration
(U.S. Department of Agriculture)
14th St. and Independence Ave., SW
Washington, DC 20250

FCC	Federal Communications Commission 1919 M St., NW Washington, DC 20554	USDA	U.S. Department of Agriculture Independence Ave. Washington, DC 20250
FDA	Food and Drug Administration 5600 Fishers Lane Rockville, MD 20857	USPS	U.S. Postal Service 475 L'Enfant Plaza, SW Washington, DC 20260-0010

END OF SECTION 01420

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Relate Work Specified Elsewhere

1. Testing Laboratory Services Provided by Owner: Section 01455

[Specifier – edit as appropriate; include second paragraph "1." for projects involving cleaning and/or restoration work on Historical Buildings.]

1. Historic Preservation Inspection Services: Section 01456
2. Masonry Restoration: Section 04910
3. Repointing Campus Historical Buildings: Section 04915
4. Stone Restoration: Section 04920
5. Stone Masonry Cleaning & Poulticing: Section 04940

1.02 SUMMARY

A. The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with these specifications. The Contractor Quality Control (CQC) system shall consist of plans, procedures, and organization necessary to provide materials, equipment, workmanship, fabrication, construction, and operations, both on-site and off-site, that complies with contract requirements and is keyed with the construction schedule. The Contractor shall review and certify as correct and complete, and in compliance with contract requirements, all shop drawings and lists of materials, fixtures, and equipment as required by technical specifications.

[Specifier –delete the following paragraph if not applicable.]

B. Work under this Contract involves a historically significant structure on the National Register of Historic Places and is part of the Washington State Capitol Campus Historic District. In addition to other requirements, Work of this Contract including Contractor's quality control system shall be performed under the guidelines of the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

C. Quality Control is the sole responsibility of the Contractor. Quality Assurance is the responsibility of the Owner.

D. Recurring Deficiencies: If recurring deficiencies indicate that the CQC System is not adequate, corrective action shall be taken as directed by Owner. Progress payments may be withheld until such corrective action has been completed per the General Conditions, Section 6.05.

1.03 DEFINITIONS

A. Definable Feature of Work: A "definable feature of work" is a task which is separate and distinct from other tasks and has separate control requirements. It could be identified by

different trades or disciplines, or it could be work by the same trade in a different environment. Although each Section of the specifications may generally be considered as a definable feature of work, there is frequently more than one definable feature under a particular Section.

1.04 QUALITY CONTROL SYSTEM

A. The 3 phase inspection system shall include the following minimum requirements:

1. Preparatory Inspection: This shall be an integral part of pre-installation meeting for designated portion of work, as set forth in Section 01311, be performed prior to beginning any such work, and shall include:

   a. A review of applicable specifications.
   b. A review of the contract plans.
   c. A check to assure that all materials and/or equipment have been tested, submitted and approved.
   d. A check to assure that provisions have been made to provide control inspection and testing.
   e. Examination of the work area to assure that all required preliminary work has been completed and is in contract compliance.
   f. A physical examination of required materials, equipment and sample work to assure that they conform to approved shop drawings or submitted data and are properly stored.
   g. Discussion of procedures for constructing the work, including repetitive deficiencies, construction tolerances and workmanship standards specified in the documents.

2. Initial Inspection: This shall be performed as soon as work begins on a definable feature of work and the following shall be accomplished:

   a. A check of preliminary work to ensure that it is in contract compliance. Review of the preparatory meeting minutes.
   b. Verification of full contract compliance and verify required control inspection and testing is underway.
   c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare work with sample panels, etc., as appropriate.
   d. Resolve all differences.
   e. This inspection phase should be repeated for new crew on site performing the work or any time standards are not being met.

3. Follow-Up Inspection: These should be performed daily to assure continuing compliance with contract requirements, including control testing, until completion of the particular feature of work. The Owner or Owner's representative may require joint State-Contractor inspections at any time and on a periodic basis to evaluate the effectiveness of the quality control system.

B. As-Builts: The Contractor shall maintain full size marked-up drawings, survey notes, sketches, nameplate data, pricing information, description, and serial numbers of all installed equipment as well as other information depicting as-built conditions. This information shall be updated daily and be maintained in a current condition at all times until completion of work and shall be available for review by Owner or Owner's representative at all times. Upon completion of the work, this information shall be furnished to the Owner in conformance with requirements of Section 01780, Close-Out Submittals.

C. Tests: All operation and acceptance tests, where specified, are to be performed to verify control measures are adequate. These tests are to be documented (see example test form; Form 01450-F2) and a copy provided to the Owner.

1.05 QUALITY CONTROL ORGANIZATION

A. The Contractor shall identify a Quality Control (QC) organization, describing lines of authority and acknowledgment that the QC staff shall implement the inspection program. The staff shall include a full time, on-site representative who shall report to the Project Manager or someone higher in the Contractor's organization. Project Manager in this context shall mean the individual with responsibility for the overall management of the project including quality and production, and shall be subject to approval by the Owner.

[Specifier – include the following subparagraphs "1." And "2." for projects involving cleaning and/or restoration work on Historical Buildings; edit as necessary.]

1. It is the intent of this project to preserve the existing structure and its historic materials to the greatest extent possible. The gentlest means possible shall be used to perform the work and the greatest care shall be taken to assure that historic materials are not damaged in the process of the work of this Section.
2. Due to the historic significance of this building, the Quality Control (QC) organization shall be staffed by personnel familiar with the historic performance and characteristics of masonry construction. The QC organization project manager shall have the following qualifications:

   a. Actively involved in not less than 3 projects of similar size and scope involving historic masonry projects with in the last 10 years.

      1) Submit list of historic projects including name, location, cost, Owner/Architect/ Engineer's name and phone number.
      2) Contractor may not change QC project manager without written approval of the Owner.

B. The Contractor's site representative shall be on the work site at all times during progress of the work with complete authority to take action necessary to ensure compliance with the Contract Documents. This includes authority to stop work, if necessary. Additional staff, if needed, for the QC organization is to be at a satisfactory level as required to perform the activities outlined in this Section, subject of Owner's approval.

C. Contractor shall submit full resumes giving experience and qualifications of all personnel proposed for Contractor's Quality Control (QC) organization. Owner shall reserve the right to reject any person proposed for Contractor's Quality Control (QC) organization based on Owner's review of each resume.

1.06 CONTRACTOR QUALITY CONTROL PLAN

A. Quality Control Plan: The Contractor shall submit a quality control plan to the A/E for review prior to the start of construction. Allow 15 working days after receipt in the A/E's office for QC plan review and comments. The plan shall include the following elements:

1. A statement of how the plan will operate and a supporting organization chart to show the individual on the Contractor's staff responsible for implementing and controlling the plan and staffing of the testing and inspection activities.
2. Identify a Contractor Quality Control Representative, if other than the Contractor's superintendent, who shall be on the site at all times during progress of the work with complete authority to take action necessary to assure compliance with the contract documents.
3. A staffing plan for Contractor inspectors which is consistent with the scope and Construction Schedule for the project.
4. Resume(s) of proposed inspector(s) showing their experience and qualifications for the proposed inspection activities. Experience must be of the same type as will be required for this project.
5. A coordination plan showing how the efforts of the Contractor's quality control staff will be coordinated with the A/E, retained special inspectors, and engineers.

6. Procedures for scheduling, reviewing, certifying and managing submittals.
7. Methods to be used for documenting the 3 phase inspection system.
8. Procedures for tracking construction deficiencies from identification through corrective action and establishing verification that deficiencies have been corrected.
9. Copy of Contractor's Quality Control Daily Report (see example daily report form following this Section; Form 01450-F1). Report shall include entries for identifying weather conditions (temperature, dry, wet, amount of rain), trade activities (classification of workers within the trade, staffing number for each trade, what work trade was performing on the project), equipment on site (rented and contractor owned, what equipment was being used for each day), important communications with A/E, Owner, Inspectors, Supplier or specific Trade, factual record containing specification reference for the work being performed, and quality control activities. The report shall include entries for the Quality Control Representative's signature certifying that all materials and supplies incorporated into the work are in compliance with the Contract Documents and A/E approved modifications. This report will not be accepted as the daily quality control report unless it also incorporates the specific requirements of this Section.
10. Copy of inspection form for the different activities which will be inspected including but not limited to the following:
    a. For concrete elements inspection forms shall include pre-placement, placement, and post-placement inspection items:
        1) Foundation inspection.
        2) Slab on grade inspection.
            a) Subgrade preparation.
            b) Reinforcing.
            c) Concrete placement/curing.
    b. Structural steel inspection.
    c. Welding inspection.
    d. The Contractor shall prepare inspection forms with check-off items for key construction elements to be signed off by the Contractor's inspectors and reviewed from time to time by the A/E.
11. Procedure for tracking and inspecting "As-Built" plans.

[Specifier – include the following Paragraph "B." for projects involving cleaning and/or restoration work on Historical Buildings; edit as necessary.]

B. Quality Control Plan for Historical Restoration Work: In addition to quality control plan specified above for work of this Project in general, Contractor shall also submit to the A/E for review prior to the start of construction a quality control plan specifically formulated for historical restoration work. Allow 15 working days after receipt in the A/E's office for review, comments, modifications, and acceptance of the plan. Plan shall include the following elements:
[Specifier – include the following for brick masonry restoration work (refer to Guide Spec 04910); edit as necessary.]
1. Indicate methods for surveying original layout and collecting datum points for brick.
2. Indicate methods for maintaining original line and levels when resetting brick.
3. Indicate methods for shoring and providing a safe working environment
4. Indicate method for protecting openings in exterior walls from bat and other mammal infiltration.
5. Indicate methods for removal of damaged mortar joints and brick.
6. Indicate method for cleaning brick – removing mortar and sealant.
7. Indicate methods of storing, stacking and protecting brick throughout the course of the work.
8. Indicate precautions to be taken against theft and/or vandalism of stored materials.
9. Indicate methods for accessing pointing work and for protecting adjacent areas during this work, including adjacent building materials, landscaping, etc.
10. Indicate methods of mixing and storing pointing mortars.

11. Indicate methods for removing excess mortar from brick surfaces.
12. Indicate methods for final pointing.

[Specifier – include the following for stone masonry restoration work (refer to Guide Spec 04920); edit as necessary.]

1. Indicate methods for providing a safe working environment.
2. Indicate methods for removal of damaged mortar joints.
3. Indicate method for cleaning masonry.
4. Indicate precautions to be taken against theft and or vandalism of stored materials.
5. Indicate methods for accessing pointing work and for protecting adjacent area's during this work, including adjacent building materials, landscaping and the like.
6. Indicate methods for mixing and storing pointing materials.
7. Indicate methods for removing excess mortar from masonry surfaces.
8. Indicate methods for final pointing/tooling.
9. Indicate methods for waterproofing open joint areas.

[Specifier –include the following for stone masonry cleaning and poulticing work (refer to Guide Spec 04940); edit as necessary.]

1. Indicate methods for storing, transporting and mixing chemicals.
2. Indicate methods for protecting adjacent surfaces not being cleaned during cleaning.
3. Indicate method for protecting surrounding areas from excessive run-off during cleaning.
4. Indicate methods for providing access to areas to be poulticed, including safety precautions and fall protection to be used.
5. Indicate methods for protecting areas below those being poulticed.
6. Indicated methods for applying poultice materials.
7. Indicate methods for removing poultice .
8. Indicate methods cleaning up poultice materials.

1.07 COORDINATION MEETING / ACCEPTANCE OF PLAN

A. Before start of construction, the Contractor shall meet with the Owner and A/E representatives to discuss the QC Plan. During the meeting, a mutual understanding of the system details shall be developed. Acceptance of the QC Plan is conditional and will be predicated on satisfactory performance during construction. The Owner shall be notified of any changes to the plan, and those changes are subject to review and acceptance by the Owner.

1.08 CONTRACTOR'S PRE-INSTALLATION QUALITY CONTROL

A. Well in advance of the installation of every major unit of work, which requires coordination with other work, the Contractor shall ensure that the unit of work can be installed and function as intended and required in conjunction with other work which has preceded or will follow. In the event of conflict, the Contractor shall determine corrective action required, inform the A/E, and proceed with the A/E's concurrence.

B. See Section 01600, BASIC PRODUCT REQUIREMENTS for further requirements.

C. Perform inspection of all products and equipment immediately following delivery to the Project site to determine conformance with the Contract Documents and any evidence of damage.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 QUALITY ASSURANCE - CONTROL OF INSTALLATION

A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, both on and off-site to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from A/E before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

3.02 TOLERANCES

A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of the highest quality.

B. Comply with manufacturer's tolerances. Should manufacturer's tolerances conflict with Contract Documents, request clarification from A/E before proceeding.

C. Adjust Products to appropriate dimensions, position before securing Products in place.

3.03 REFERENCES & STANDARDS

A. For products and workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue of Contract Documents, except where a specific date is established by code.

C. Obtain copies of standards and instructions where required by product specification sections.

D. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the A/E shall be altered from the Contract Documents by mention or inference otherwise in any reference documents.

E. Assure manufacturer's instructions are adhered to to obtain specified warranties.

3.04 MANUFACTURER'S CERTIFICATES

A. When required by individual Specification Sections, submit manufacturers' certificate, in duplicate, that products meet or exceed specified requirements.

3.05 MOCK-UPS

A. Tests will be performed under provisions identified in this Section and identified in the respective product Specification Sections.

B. Assemble and erect specified items with specified attachment and achorage devices, flashings, seals, and finishes.

C. Accepted mock-ups shall be a comparison standard for the remaining Work.

D. Where mock-up has been accepted by A/E and is specified in product Specification Sections to be removed, remove mock-up and clear area when directed by Owner.

3.06 MANUFACTURER'S FIELD SERVICES

A. When specified in respective Specification Sections, require supplier and manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to make appropriate recommendations.

B. Representative shall submit written report to A/E listing observations and recommendations. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.

3.07 REPORTING

A. The QC representative shall maintain a daily record of all inspections and tests performed for each shift of Subcontractor operations in an appropriate format. These records shall provide factual evidence that continuous quality control inspections and tests have been performed, including any defects, causes for rejection, proposed remedial action and corrective actions taken.

3.08 TRANSMITTAL OF DOCUMENTATION

A. Submit copies of previous weeks Contractor's hand written Contractor Quality Control Daily Reports and ~~i~~Contractor's Quality Control Test Report forms to the A/E and Owner at each weeks progress meeting.

3.09 NON-COMPLIANCE NOTICE (NCN)

A. The Owner will notify the Contractor of any detected non-compliance with the foregoing requirements. If, after such notice, the Contractor fails to correct such non-compliant work, an NCN shall be issued. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification.

B. Upon receipt of the NCN, the Contractor shall take immediate action to correct work. Review corrections at progress meetings for non-compliant work.

C. If the Contractor fails or refuses to take corrective action to comply promptly, the Owner may issue an order stopping all or part of the work until satisfactory corrective QC action has been taken. Progress payments may be withheld until such corrective action has been completed per the General Conditions, Section 6.05.

D. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

END OF SECTION 01450

Contractor Quality Control Daily Report

Report Number: _____ Date: _____ Project No.: _____

Location of Work: _____

[ ]	AM			Max _____					
[ ]	PM	Weather _____	Temp	Min _____		Wind _____		Rain _____	inches

1. Contractor / Subcontractor Activity:

	Work in Progress	Contractor / Subcontractor	Scheduled Activity ID#	Equipment	Craft	Time Worked
A.						
B.						
C.						
D.						
E.						
F.						
G.						
H.						
I.						
J.						
K.						
L.						

2. List specific inspection performed (pre-installation, initial, and follow-up) and results of these inspections (include corrective actions):

_____

_____

_____

_____

_____

3. List type and location of test performed and results of these tests:

_____

_____

_____

_____

_____

Contractor Quality Control Daily Report

4. List work done under Change Order Proposal:

_____

_____

_____

_____

_____

5. List any instructions given by Owner on construction deficiencies, re-testing required, etc., with action to be taken:

_____

_____

_____

_____

_____

6. Activity Safety Inspection: (Note safety violations and corrective action taken. Indicate phase of work where violations occurred.)

_____

_____

_____

_____

_____

7. Upcoming Work: (Indicate next major phase of work anticipated and approximate date of Preparatory Inspection meeting to cover this work.)

_____

_____

_____

_____

_____

8. Indicate items of construction equipment, other than hand tools, at the job site and whether or not used:

_____

_____

_____

_____

_____

Contractor Quality Control Daily Report

9. Remarks: (Cover any conflicts in plans, specifications, or instructions or any delay to the job attributable to weather conditions.)

_____

_____

_____

_____

_____

10. CERTIFICATION: I certify that the above report is complete and correct and that I, or my authorized representative, have inspected all work performed this day by the Contractor and each subcontractor and have determined that materials, equipment and workmanship are in compliance with the plans and specifications, except as may be noted above.

_____

Contractor's Quality Control Representative

Contractor's Quality Control Test Report

Test Report Number: _____ Date: _____ Project No.: _____

Location of Test: _____

DESCRIPTION OF ITEM, SYSTEM OR PART OF SYSTEM TESTED:

_____

_____

_____

_____

_____

DESCRIPTION OF TEST:

_____

_____

_____

_____

_____

NAME AND TITLE OF PERSON IN CHARGE OF PERFORMING TESTS FOR CONTRACTOR:

NAME _____

TITLE _____

SIGNATURE _____

I HEREBY CERTIFY THAT THE ABOVE DESCRIBED ITEM, SYSTEM OR PART OF SYSTEM HAS BEEN TESTED AS INDICATED ABOVE AND FOUND TO BE ENTIRELY SATISFACTORY AS REQUIRED IN THE CONTRACT SPECIFICATIONS.

SIGNATURE OF CONTRACTOR
QUALITY CONTROL INSPECTOR _____

REMARKS:

_____

_____

_____

_____

_____

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Testing and Inspection Service: The Owner may select and employ one or more Independent Testing Agencies, Engineering Services or Special Inspectors, hereinafter called Owner's Testing Representative (OTR), to conduct tests and inspections as specified, requested by the Owner, or required by Authorities Having Jurisdiction (AHJ). The OTR will provide inspector(s) approved by the AHJ. For the purpose of this specification section, all references made herein to OTR shall be those tests or inspections which will be conducted by an inspector provided by the Owner.

B. Soils Engineer: Owner will employ and pay for services of Soil Engineer to monitor the geotechnical aspects of construction as required.

C. Tests and inspections which are normally associated with obtaining permit approval by AHJ shall be provided and paid for by the Contractor.

D. In general, materials, quantities and extent of tests are identified in the respective specification sections.

1.03 QUALITY ASSURANCE - INDEPENDENT TESTING AGENCY

A. Qualifications:

1. Agency employed by Owner shall be a testing laboratory qualified by the United States Bureau of Standards, to provide inspection and material testing services for the general construction quality control, and which will meet basic requirements of ASTM E329 "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction".
2. Meet "Recommended Requirements for Independent Laboratory Qualification" published by American Council of Independent Laboratories.
3. Authorized to operate in the State of Washington.

B. Testing Equipment: Calibrated at reasonable intervals by devices of accuracy traceable to either:

1. National Bureau of Standards.
2. Accepted values of natural physical constants.

C. Certification: Submit to A/E and Local Building Department certification of meeting the above qualifications. In addition, submit credentials of inspector to perform welding inspection showing such inspector is an AWS certified inspector.

1.04 DUTIES OF OWNER'S TESTING AGENCY

A. The OTR will be available during Contractor's normal working hours and identified overtime, second shift and out of area activity as scheduled by the Contract Documents.

B. The OTR shall conduct testing and inspection services, interpret them, and evaluate the results for compliance with the Specifications. Testing and inspection services which are performed shall be in accordance with applicable standard methods of ASTM or other procedures specified.

C. Continuous and special inspections shall be performed by the OTR as required by Contract Documents and governing authorities.

D. The Inspectors are not authorized to do the following:

1. Release, revoke, alter or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of the work, unless otherwise specifically noted.
3. Perform any duties of the Contractor.
4. Stop Work.

1.05 CONTRACTOR'S RESPONSIBILITIES

A. It is the Contractor's responsibility to initiate and coordinate all required tests and inspections including conformance with requirements of all applicable public agencies and authorities. Inspection of the work shall not relieve the Contractor from any obligation to fulfill this contract. Contractor shall be responsible for coordinating the testing requirement with the OTR and provide the OTR no less than two (2) working days advance notification to schedule tests.

B. For the purpose of inspection, the OTR shall at all times have free access to all parts of the work and to the shops where the work is in preparation, and the Contractor shall at all times provide and maintain proper facilities and safe access for such inspection. The Contractor shall cooperate with OTR personnel, and furnish access, tools, samples, certifications, test reports, design mixes, equipment, storage, and assistance as requested by the OTR.

1. Make available at project site to the OTR or Soils Engineer safe access and working environment, and adequate quantities of samples of materials proposed to be used which require testing.
2. Provide to the OTR the approved design mix to be used for concrete, mortar, grout, and other materials mixes which require testing by the testing laboratory.
3. Furnish copies of product test reports performed by Contractor as required by Contract Documents.
4. Furnish incidental facilities necessary for the following:

   a. To obtain and handle samples at the project site or at the source of the product to be tested.
   b. To facilitate inspections, geotechnical monitoring, and tests.
   c. For storage and curing of the test samples.
   d. Electrical power and water required for testing procedures.

5. Provide incidental labor, when requested, to facilitate testing and inspections.

C. Where defective work requires redesign of portions of construction, such redesign costs shall be backcharged to the Contractor by a deductive Change Order.

D. All costs associated with Contractor scheduled testing outside its normal working hours which is not identified in the Contract Documents, insufficient advance notice to the OTR of cancellation of a test or inspection to allow rescheduling of the OTR's work load, and for re-

testing of non-conforming material, will be backcharged to the Contractor by a deductive Change Order.

1.06 TEST AND INSPECTION REPORTS

A. Copies of tests, special sampling operations and inspection reports shall be distributed at weekly intervals, except as noted under NOTIFICATION OF NON-COMPLIANCE. All reports will be signed by a Registered Engineer. Such reports shall include all tests made, regardless of whether such tests indicate that the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported.

B. Laboratory Test Reports

1. Obtain and handle samples at project site or at source of product to be tested.
2. Furnish laboratory test reports of materials and construction as required; include:

a. Date issued.
b. Project title and number.
c. Testing laboratory or engineering firm name, address, and telephone number.
d. Name and signature of representative.
e. Description of method of test.
f. Identification of sample and portion of the work tested.
g. Description of location in the work of the sample.
h. Time and date of obtaining sample.
i. Time and date of test of sample.
j. Weather and climatic conditions.
k. Results of tests and compliance with Contract Documents.
l. Evaluation of results tests, including recommendations for action, when requested by A/E or Structural Engineer.

C. Inspection Reports: Furnish "Inspection at Site" reports for each site visit documenting activities, observations, and inspections of work being inspected include:

1. Date issued.
2. Project title and number.
3. Testing Laboratory or engineering firm name, address, and telephone number.
4. Name and signature of representative.
5. Observations on weather and climatic conditions.
6. Time and date.
7. Conditions and/or status of the work being inspected.
8. Actions taken.
9. Recommendations or evaluation of the work.

D. Test and inspection reports shall be distributed as follows: ***[Specifier modify as required]***

1. A/E: 2 copies;
2. Structural Engineer: 2 copies.
3. Soil Consultant: 1 copy;
4. Owner: 2 copies;
5. Contractor: 1 copy;
6. Olympia Building Department: 2 copies.

1.07 NON-COMPLIANCE OF WORK

A. The Contractor shall instruct his employees that the OTR and/or Owner's Representative shall have the authority to reject work whenever the provisions of the Contract Documents are not being complied with. Rejected workmanship shall be satisfactorily corrected and rejected

materials shall be removed from the job site without charge to the Owner. . Where OTR take cores or cut-outs to verify compliance, repair prior to acceptance. If the Contractor does not correct such rejected work within 15 calendar days, or provide written notice of when it will be corrected, the Owner may elect to correct same and back charge the Contractor by a deductive Change Order.

1.08 NOTIFICATION OF NON-COMPLIANCE

A. Anything found by the OTR or Owner's Representative to be in non-compliance when they are on-site shall be immediately reported to the Contractor , A/E, and/or OTR/Owner's Representative.

B. If a laboratory test result indicates material on-site did not conform to the Contract Documents, the OTR shall make an effort to immediately contact the Contractor by phone. The OTR shall also fax a copy of the Non-Conformance to the Contractor, A/E and the Owner's Representative.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

3.01 DETAILED SITEWORK INSPECTION & TESTING REQUIREMENTS

A. Special Inspection & Structural Observation Requirements - General

1. Special inspection and structural observation requirements and programs shall be in accordance with the following provisions of the 1997 UBC, as adopted and amended by the State of Washington:

   a. Section 106.3.5 Inspection and Observation Program.
   b. Section 108 Inspections.
   c. Chapter 17 Structural Tests and Inspections.

2. Refer to Structural Notes for additional provisions pertaining to special inspection and structural observation and conform to same as if specified herein.

B. Geotechnical Inspections

1. General:
   a. During excavations or fill operations and preparation for building foundations, placement of subsurface drainage systems, utility bedding, or other major excavations, the Contractor shall notify the A/E and facilitate inspection of site by Owner's Geotechnical Testing Agency to ascertain that conditions encountered are in conformance with the contract documents for depth of foundation, influence of groundwater, and requirements for drainage for foundations, excavations, cut, fill and slopes.
   b. Placement and compaction of all structural fill shall be inspected by Owner's Testing Agency.

2. Inspections:
   a. Inspect and approve native and imported structural backfill materials proposed for the various conditions of work for conformance with specifications.
   b. Determine whether weather conditions are detrimental to site grading cut and fill work.

c. Observe and approve all subgrades for suitability for receiving any backfill.
d. Observe subgrade compaction procedures of subgrades under future paving and slab areas to evaluate the subgrade performance, the effectiveness of the procedure, and to recommend adjustments in the procedure as field conditions dictate.
e. Observe and approve precautionary measures taken by the Contractor for protection of exposed sloped subgrades and recommend necessary adjustments in such measures as field conditions dictate. Determine whether replacement or reconditioning and recompaction of subgrade materials which become soft/wet is necessary due to wet weather conditions.
f. Determine whether previously frozen and thawed subgrade soils at excavations are suitable for new work to be placed thereon.

3. Compaction Tests:
   a. Within the provisions of the technical specifications (Division 2) for earthwork testing and sampling, Contractor shall cooperate for the Testing Agency to perform testing or sampling for verification of conditions as noted above. Moisture Density tests, in-place density tests, and other tests may be performed as required by the Contract Documents or Uniform Building Code, as adopted by local jurisdiction, and to verify Contractor's earthwork operations.
   b. Conform to referenced ASTM D1557, ASTM D2922, ASTM D3017, ASTM D4318 and ASTM C136, as applicable. Take in-place density tests for the following, of frequencies set forth in Section 02300:
      1) Compacted fills, subgrades, sub-bases and base courses.
      2) Utility trench bottoms, backfill of utility trenches under all future concrete slabs on grade, foundation walls, and asphalt pavings.
      3) Fills under grade beams and pile caps, and backfill of new building walls.

C. Structural Cast-In-Place Concrete

1. General: Testing will be performed as required by Uniform Building Code, as adopted by local jurisdiction, and these Specifications. Tests and inspections may include, but not necessarily be limited to, the following:
   a. Inspection of reinforcing steel and embedded items in place. Verify proper placement of reinforcing bars, fabric, and spirals prior to placement of concrete check condition of surfaces of reinforcing and embedded items for bond integrity with concrete; verify placement locations, sizes and anchorage of all items embedded in concrete.
   b. Concrete formwork including configuration, form and steel cleanliness. Inspect erected formwork for conformance with approved drawings, for design and seal of form joints, and for type and location of form ties.
   c. Reinforced concrete inspection and material testing shall be made in accordance the ACI 301 Chapter 16, Testing, and Chapter 17, Evaluation and Acceptance of Concrete, and appropriate ASTM Standards.
2. Testing: Test materials for compliance with Specifications. Review and check proposed mix designs. Conduct tests of concrete in accordance with the following procedures:
   a. Sampling Fresh Concrete: ASTM C172, except modified for slump to comply with ASTM C94.
   b. Slump: ASTM C143; one test for each concrete load at point of discharge and one test for each set of compressive strength test specimens.
   c. Air Content: ASTM C173, volumetric method and ASTM C231 pressure for normal weight concrete; one for each set of compressive strength test specimens.
   d. Concrete Temperature: Test hourly when air temperature is 40 degrees F and below, and when 80 degrees F and above; and each time a set of compression test specimens made.

e. Compression Test Specimen: ASTM C31; one set of 6 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
f. Compressive Strength Tests: ASTM C39; one set for each 100 CY or fraction thereof, of each concrete class placed in any one day or for each 5,000 SF of surface area placed; 2 specimens tested at 7 days, 1 specimen tested at 14 days, 2 specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

1) When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.
2) When total quantity of a given class of concrete is less than 50 CY, strength test may be waived by Owner if, in his judgment, adequate evidence of satisfactory strength is provided.
3) When strength of field-cured cylinders is less than 85% of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
4) Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.

3. Test Results: Test results will be reported in writing and expedited to Contractor, A/E, Construction Manager, Structural Engineer and Local Building Department. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.

4. Additional Tests: The testing service will make additional tests of in-place concrete, as directed by Construction Manager, when test results indicate specified concrete strengths and other characteristics have not been attained in the structure. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42, or by other methods as directed. Contractor shall pay for such tests conducted, and any other additional testing as may be required, when unacceptable concrete is verified.

5. Patching: Where core test results are satisfactory, fill core holes with non-shrink patching grout to meet or exceed the strength of the adjoining concrete, and finish to match adjoining concrete surface.

D. Mortar

1. General: Independent laboratory to test exact proportions of mortar mixes specified under Section 04065 using the same aggregate and other materials furnished by Contractor proposed to be used on the work; material samplings shall comply with ASTM C780, Article 9, "Sampling".

2. Pre-Construction Evaluation of Mortars:
a. Provide pre-construction evaluation of mortars in compliance with ASTM C780 using test methods and procedures specified therein in Annexes A1 through A7, inclusive.
b. Under test method Annex A6, test mortar mixes for compliance with specified compressive strengths.
c. Should test specimens fail to meet specified compressive strengths, immediately notify A/E and Contractor.

3. Construction-Site Evaluation of Mortars:
   a. Take three 2 x 4 inch cylinder specimens for each 30 cu.yd. of mortar or fraction thereof being placed each day, conforming to UBC Standard 24-22.
   b. Test mortar specimens for compliance with specified compressive strengths as indicated on Structural Drawings.
   c. Should test specimens fail to meet specified compressive strengths, immediately notify A/E and Contractor; perform further testing of construction-site mortar when so directed by A/E.

E. Reinforced Concrete Unit Masonry

1. General: Periodic special on-site inspection/observation by the Testing Agency is required during placement of reinforced and/or fully grouted concrete masonry. Tests will be performed as required by Uniform Building Code, as adopted by the local jurisdiction having authority and these specifications.

2. Inspections: Will include, but not necessarily be limited to, the following:

   a. Check reinforcing steel in place.
   b. Inspect all cells and clean-outs.
   c. Inspect grouting operation.
   d. Refer to Structural Notes for additional inspection requirements.

3. Testing: Will include, but not necessarily be limited to, the following:

   a. Test materials for compliance with specifications.
   b. A set of five masonry prisms shall be built and tested in accordance with UBC Standard No. 24-26 prior to the start of construction. Materials used for the construction of the prisms shall be taken from those specified to be used in the Project. Prisms shall be constructed under the observation of the engineer or special inspector or an approved agency and tested by an approved agency.
   c. A set of three (3) prisms shall be built and tested during construction in accordance with UBC Standard No. 24-26 for each 5,000 square feet of wall area, but not less than one (1) set of three (3) prisms for the Project.
   d. Make report of test results in writing and expedited to Contractor, A/E, Owner, Structural Engineer and Local Building Department. Include in test reports the project identification name and number, date, name of subcontractor, name of testing service, and identification letter.

F. Exterior Masonry Veneer

1. Inspect and approve substrates for application of masonry veneer materials.
2. Furnish continuous (full time) inspection during application of masonry veneer materials.

G. Welding: Verify conformance with applicable Sections of Division 5. All welding shall be subject to special inspection.

H. Structural Steel Framing & Fabrications

1. General: Tests will be performed as required by Uniform Building Code, Chapter 17, as adopted by local jurisdiction and these specifications.
2. Shop Bolted Connections: Inspect in accordance with AISC specifications.
3. Shop Welding: Inspect and test during fabrication of structural steel assemblies, as follows:

   a. Verify use of "Washington Association of Building Officials" (WABO) certified welders, and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.

b. Perform visual inspection of all welds including fillet welds.
c. Perform tests of complete penetration welds as required by technical specifications as follows. Inspection procedures listed are to be used at Testing Laboratory's option.

1) Radiographic Inspection: ASTM E94 and ASTM E142; minimum quality level "2-2T".
2) Ultrasonic Inspection: ASTM E164.

4. Field Bolted Connections: Inspect in accordance with AISC specifications.
5. Field Welding: Inspect and test during erection of structural steel as follows:

a. Verify use of "Washington Association of Building Officials" (WABO) certified welders, and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies and submit copies of such reports to Contractor, A/E, Owner, Structural Engineer and Local Building Department.
b. Perform visual inspection of all welds including fillet welds.
c. Perform tests of full penetration welds as required by technical specifications as follows:

1) Radiographic Inspection: ASTM E94 and ASTM E142; minimum quality level "Z-2T".
2) Ultrasonic Inspection: ASTM E164.

6. Testing Program Summary: Testing agency special inspector shall submit a summary of the proposed testing program for review and approval; submit directly to Contractor, A/E, Owner, Structural Engineer and Local Building Department.

I. Metal Deck & Shear Studs

1. General: Tests will be performed as required by Uniform Building Code, as adopted by local jurisdiction, and if required by specific technical specification sections.
2. Tests and Inspections: Will include, but not necessarily be limited to, providing inspection during welding as required. Inspection of welds shall be done visually, except as indicated otherwise.

J. Structural Metal & Lightgauge Framing: Inspection at jobsite as required during high tensile bolting and welding to assure specification and Building Code compliance.

K. Roofing & Waterproof Membranes

1. Inspect and approve substrates for application of waterproofing and roofing materials, inspect all joints and flashings.
2. Furnish continuous (full time) inspection during application of waterproofing and roofing materials, including roofing related sheet metal flashings and counterflashings.

L. Water Repellent Application

1. Inspect and approve substrates for application of water repellent materials.
2. Furnish continuous (full time) inspection during application of water repellent materials.

M. Miscellaneous

1. General: Provide other special inspections required by Uniform Building Code as adopted by local jurisdiction for structural or other work, or requested by Owner.
2. Additional Testing Services: Additional testing which may be performed by the Owner's independent testing agency, if any, are specified elsewhere in Contract Documents.

3.02 MECHANICAL & ELECTRICAL WORK SUBCONTRACTS

A. Inspection and tests required for Mechanical and Electrical Systems Work are covered under Sections of Divisions 15 and 16 respectively; no work required under this Section.

END OF SECTION 01455

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Relate Work Specified Elsewhere
[Specifier –edit as appropriate.]
1. Masonry Restoration: Section 04910
2. Repointing Campus Historical Buildings: Section 04915
3. Stone Restoration: Section 04920
4. Stone Masonry Cleaning & Poulticing: Section 04940

1.02 SUMMARY

A. The Owner may select and employ a Historic Preservation Representative having expertise in historic preservation to conduct on-site observations and inspections as specified herein, to ensure on the Owner's behalf that the Work is carried out in conformance with the Contract Documents.

1.03 DEFINITIONS

A. Definable Feature of Work: A "definable feature of work" is a task which is separate and distinct from other tasks and has separate control requirements. It could be identified by different trades or disciplines, or it could be work by the same trade in a different environment. Although each Section of the specifications may generally be considered as a definable feature of work, there is frequently more than one definable feature under a particular Section.

1.04 HISTORIC PRESERVATION REPRESENTATIVE QUALIFICATIONS & CREDENTIALS

A. Qualifications: The Historic Preservation Representative shall have a working knowledge of the unique characteristics of historic buildings whose primary occupation falls under one or more of the following categories:
1. Preservation Architect.
2. Heritage Consultant.
3. Historic Preservation Specialist.
4. Architectural Conservator.
5. Restoration Expert.
6. Highly trained special inspector with minimum 5 years experience on restoration projects of similar size and scope.

B. Certification: Submit to A/E certification of meeting one or more of the above qualifications.

1.05 QUALITY ASSURANCE PLAN

A. The Quality Assurance Plan shall include the following minimum requirements:
   1. Preparatory Phase:
      a. This phase shall consist of a meeting conducted and documented by the HP Representative. Representatives of the Owner, A/E, Contractor, applicable Subcontractors, and any preservation architect and historic preservation officers involved in the planning, funding or execution of the project, as applicable, shall be present.
      b. The purpose of this meeting is to ensure that all parties have a clear understanding of the Work to be performed and the role of the HP Representative.
      c. Contents of the meeting shall include:
         1) A delineation of responsible parties and lines of communication pertaining to historic preservation issues.
         2) A review of the Contract Documents and requirements.
         3) A review of work plans and discussion of construction methods and materials.
         4) A preliminary schedule for QC site visits.
      d. The HP Representative shall prepare a report for distribution to attending parties, presenting the results of the meeting; listing key contact personnel, specific issues discussed regarding contract requirements and construction methods and materials, resolution of those issues, and a schedule regarding expected frequency of site visits.
   2. Initial Construction Phase:
      a. This phase shall consist of an evaluation of an initial representative portion of each definable feature of work. The HP Representative shall observe the initial representative portion of work, while in progress, with the Contractor's superintendent and/or job foreman involved.
      b. The purpose of this phase is to provide early verification that the work is carried out in conformance with the Contract Documents.
      c. This phase shall include:
         1) An examination of the quality of the workmanship.
         2) A verification of material confirmation to the Contract Documents.
         3) An evaluation of required testing and inspection procedures.
         4) Possible rework of areas in question.
         5) A review of potential adjustments to working procedures and other issues.
      d. At the completion of the initial phase for each definable feature of work, the HP Representative will submit a report to all parties involved, detailing:
         1) Findings regarding workmanship and materials.
         2) Rework issues.
         3) Unresolved conflicts.
         4) Pertinent information on Contractor and Subcontractor conformation to Contract Documents.
         5) Details of site conversations with superintendent or foreman of work crews will be included. This information shall include discussions of problems with materials, workmanship issues, or difficulties in executing Project requirements.
      e. In the event that a variance with the Contract Documents is deemed acceptable, the HP Site Representative shall document this procedure.
   3. Follow-Up Phase:
      a. This phase shall consist of the ongoing inspection of definable features of work until completion, to ensure the continuing conformance of the work to the Contract Documents.
      b. The frequency of these site evaluations shall be determined during the preparatory phase, but may be influenced by conditions found during construction.
      c. The purpose of this phase includes:
         1) Ensuring that the Work is in compliance with the Contract Documents.

2) Verifying that the workmanship conforms to the standards established during the preparatory and initial phases.
3) Ensuring that materials utilized throughout the Project are in conformance with established standards.
4) Ensuring that any rework items have been corrected and documented.

d. At the completion of each site visit, the HP Representative will submit a report detailing:
   1) Conforming sections of work.
   2) Ongoing rework issues.
   3) Material compliance/nonconformance and Contractor/Subcontractor workmanship.
   4) Details of onsite conversations with Contractor and Subcontractor representatives will be included. Ongoing workmanship or material problems will be documented, along with continuing Project specification problems.

4. Final Completion Inspection:
   a. In addition to the above phases of quality assurance, the HP Representative will verify that each definable feature of work is substantially complete, in conformance with Contract Documents, and the quality of work is acceptable.
   b. A final report will be issued clearing any previous noncompliance/nonconformance issues, resolving any material any material submittal issues, and certifying all workmanship.
   c. A final completion report will not be issued until all outstanding issues have been addressed and resolved to the satisfaction of the HP Representative.

END OF SECTION 01456

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Work includes, but is not limited to, the following:

1. Cooperation with independent Inspection Agency employed by Owner under separate contract to perform specified services including, but not limited to:
   a. Exterior waterproofing and moisture protection.
   b. Roof repairs in conjunction with installation of Fall Protection System.

1.03 RELATED SECTIONS

A. Coordinate related work specified in other parts of the Project Manual including, but not limited to:

[Specifier –Edit to fit project requirements]
1. Section 07120 –Built-up Bituminous Waterproofing.
2. Section 07130 – Sheet Membrane Waterproofing.
3. Section 07140 – Fluid-Applied Waterproofing.
4. Section 07160 – Cementitious and Reactive Waterproofing.
5. Section 07170 – Bentonite Waterproofing.

1.04 PROCEDURE

A. Under this Contract an independent agency employed by the Owner will perform monitoring, inspections, and tests of waterproofing and associated work.

1. Contractor shall cooperate with and allow full access to site by inspecting and testing agency for performance of specified inspection services.
2. Employment of Waterproofing Inspection Services does not relieve Contractor of obligations to perform any work under this Contract.

PART 2 – PRODUCTS

2.01 CONTRACTOR RESPONSIBILITIES

A. Cooperate with Agency personnel. Provide required access to work.

B. Facilitate inspections and tests.

C. Provide for test sample storage, as required.

D. Notify Inspection Agency at least 5 full working days prior to starting work under Section [07120] [07130] [07140] [07160] [07170].

E. Repair and patch, water-tight, area impacted by testing at no additional cost to Owner.

2.02 DUTIES OF INSPECTION AGENCY

A. Inspection shall be paid for by Owner. A partial list of required work is indicated for informational purposes only. The Inspectors work will include, but may not be limited to, the following:

1. Examination of substrates prior to waterproofing.
2. Interim inspections as work progresses.
3. Monitoring of environmental/weather conditions.
4. Monitoring of methods and materials for conformance to Contract Documents and good waterproofing practices whether or not specifically indicated by Contract Documents.
5. Monitoring of Contractor's water testing procedures and results.
6. Performing such tests and laboratory services as may be needed to verify waterproofing conformance to Contract Documents and weather-tightness.

B. Promptly submit after each visit written report to A/E, Contractor, Owner and others as appropriate. Inform A/E and Contractor immediately by phone of any work in non-compliance.

C. Perform, at Contractor's expense, additional inspections and tests requested by A/E or Owner when initial testing shows non-compliance with Contract Documents.

D. Limitations of Inspection Agency:

1. Agency is not authorized to:
   a. Add, alter, revise, or revoke requirements of Contract Documents.
   b. Approve or accept any portion of the Work.
   c. perform any duties of the Contractor.

PART 3 – EXECUTION

3.01 WATERPROOFING INSPECTION

A. Waterproofing inspection shall be performed by the Testing Laboratory to determine compliance with the Contract Documents.

END OF SECTION 01458

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes requirements for construction facilities and temporary controls, including temporary utilities, support facilities, security and protection. Nothing in this section is intended to limit types and amounts of temporary work required, and no omission from this Section will be recognized as an indication that such temporary activity is not required for successful completion of the work and compliance with the requirements of the Contract Documents.

B. Unless otherwise noted, the temporary utilities described herein shall be provided by the Contractor. Work and requirements include, but are not necessarily limited to, the following:

1. Provide temporary devices, equipment, power and other utilities as needed for use, convenience and safety of personnel engaged in the work of the Contract. Installations of temporary utilities is to be safe, non-hazardous and sanitary; they are to be protective of persons and property, and be free of deleterious effects.
2. Locate temporary utilities where required or as directed or approved by Owner and A/E.
3. Make all service connections to existing services in approved manner, in accordance with code requirements, and with prior approval of Owner.
4. Install extensions and branches, as required.
5. Maintain and protect temporary utilities.
6. Remove from site upon completion of the Project or when directed.

1.03 SUBMITTALS

A. Within 15 calendar days of the Notice To Proceed, the Contractor shall submit to the A/E and Owner a schedule with dates and a location sketch indicating implementation and termination of each temporary utility.

B. Within 15 calendar days of the Notice To Proceed, the Contractor shall submit to the A/E and Owner a list of the General, Mechanical, and Electrical Contractor principal staff assignments, including the Superintendent and other personnel that will be in attendance at the site. Identify individuals, list their addresses and telephone numbers, and their duties and responsibilities.

1. Submit two contact names of personnel for each trade listed below that will be available 24 hours a day, and can be to the project site within 30 minutes, in case of emergency. Provide home phone number and cell phone or pager number for each of the following: ***[Specifier modify as required]***

a. General Contractor

b. Mechanical Subcontractor
c. Electrical Subcontractor
d. Fire Protection Subcontractor
e. Demolition Subcontractor

1.04 QUALITY ASSURANCE

A. Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:

1. Building code requirements: Local and state.
2. Health and safety regulations.
3. Utility company regulations.
4. Police, fire department, and rescue squad rules.
5. Environmental protection regulations.

B. Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

C. Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

1.05 WORKING HOURS

A. Refer to SUMMARY OF WORK for a description of the Contractors normal working hours.

1.06 SPECIAL CONDITIONS

A. The Contractor is responsible for providing and maintaining controls using methods, equipment and temporary construction as necessary to protect against unfavorable conditions during the construction of the project. Following are requirements related to restrictions and other physical conditions that will affect the Contractor's methods of work.
[Specifier edit the following list as required]

1. Varying types of temporary dust barriers shall be required to isolate construction areas from non-construction areas and provide for sound attenuation.
2. Circulation through areas under construction shall be required to maintain egress or other circulation paths through the building. Contractor shall be required to keep these areas available for such uses during the course of construction.
3. Availability of on-site storage is minimal. Contractor shall account for bringing materials in and disposing of materials on a regular basis.
4. Construction access is limited, both for location and height restrictions.
5. The Contractor shall provide exhausting for any vehicles or equipment which will be in a space where exhaust fumes can accumulate. Exhaust ducting must be routed to open air space in a manner acceptable to the Owner which will not restrict normal daily activities. The Contractor shall provide temporary exhausting, or other proven method of controlling other odor causing activities, such as, but not limited to, welding or demolition.
6. The use of jackhammers or other similar equipment that causes excessive vibration is not permitted.
7. Demolition shall occur in a controlled manner to avoid excessive dust, noise and vibration generation.
8. Contractor shall be required to give the Owner ample notice to relocate tenants that will be in the path of construction activity. Responsibility for relocating tenants within the limits of construction will be the Owner's.

9. Avoid use of tools and equipment that leak or leave waste material behind. In cases where minor leakage is unavoidable (generators, compressors, etc.), drip pans shall be provided.

1.07 EXISTING WORK

A. Existing construction and equipment not scheduled to be removed shall be kept in its original condition. If damaged, replace at no additional cost to the Owner.

B. Repair damaged surfaces to match adjacent finish.

1.08 PROTECTION OF EXISTING UTILITIES

A. Known utilities of record are shown on the Contract Drawings but are not to be considered as As-Built. The Contractor shall consider that the actual As-Built location may be within a tolerance of five (5) feet vertically or five (5) feet either side horizontally of that indicated in the documents. The Contractor shall take the following steps:

1. Notify Owner in writing, on each occasion, of the intent to work near existing utility services or structures or when a new excavation or sawcutting operation is about to begin. Submit procedure for approval to assure safe and continuous operation of the services. See CUTTING AND PATCHING and SELECTIVE DEMOLITION Sections.
2. Proceed with sufficient caution within the As-Built tolerance area to preclude damaging any known utilities. In the event unidentified utilities are encountered, notify Owner's Representative immediately.
3. In the event unknown utilities are damaged during construction, temporary services and/or repairs shall be made immediately by the Contractor to maintain continuity of services. Costs for temporary and/or permanent repairs will be accounted for through a Change Order.

1.09 CONSTRUCTION OPERATIONS IN OR AROUND A PUBLIC BUILDING

[Specifier –Edit as appropriate, depe nding on an occupied or vacant facility]

A. State facilitities typically are open to the public Monday through Friday from 6:00 a.m. to 6:00 p.m., with some areas operational twenty-four (24) hours a day. Employees including those with disabilities have access to the building twenty-four (24) hours a day. Consideration and concern for the safety of workers and the public shall be in the Contractor's mind at all times.

[Specifier –Edit as appropriate, depending on occupancy conditions]

B. Contractor shall recognize that the public as well as the employees can be expected to be on the project site during the course of the project. Certain areas within the limits of construction may be vacated by the Owner prior to the NTP. When vacated, these areas will be available for Contractor use throughout the duration of the project. Access through these areas by the Owner shall be provided where indicated, both during and outside the Contractor's normal working hours. Disturbance of building occupants shall be kept to an absolute minimum. Regular and emergency egress and accessible routes of travel shall be maintained at all times and shall be kept free of construction materials and debris. Any periods of interruption shall be coordinated with the Owner and shall not commence without the Owner's prior written approval. In general, notification must be given seven (7) days in advance and be indicated on the CPM schedule.

C. Contractor shall be limited to staging areas and routes into and out of the project area as designated in the Contract Documents and which do not block accessible entrances or accessible parking. Storage of construction debris and stockpiled materials shall only be permitted in those areas indicated and within the construction area in a manner that does not

obstruct or cause potential harm to anyone using identified paths through the construction area. Care must be taken that no hazardous or dangerous materials or debris be left in accessible areas. All construction materials shall be stored in secured areas.

D. A portion of the work may require the Contractor to work outside the identified limits of construction. Contractor shall be required to coordinate all such work with the Owner and notify the Owner a minimum of (2) weeks in advance. Such notification shall include an identification of the area which the Contractor will require to perform the work, a description of the work to be performed, and a duration (in calendar days) until the work is completed.

   1. Work in these areas will affect the Owner's normal operations and require coordination. The Owner will be responsible for temporarily relocating people. The Contractor shall be responsible for the protection of any equipment or furniture in these locations during construction.

E. At all times during the project the Contractor shall provide a safe, non-hazardous pathway for the designated primary and temporary emergency egress routes indicated on the drawings. The pathway shall be a minimum 4 feet wide and clearly marked at 10-foot intervals by directional painted arrows, cones and tape, or other commonly recognized and identifiable means. The pathway shall be a non-slip surface, either modifying the existing surfaces as necessary or providing a slip resistant plywood surface. Any exterior pathways shall be maintained so water does not pond on the route and no trip hazards exist.

F. Security.

   1. Maintenance of Security:
      a. It is the Contractor's responsibility to provide adequate security to protect the building and work site from unauthorized entry. Contractor shall be solely responsible for any theft, damage, or injury caused by a breach of such security.
      b. Initiate security program promptly after job mobilization, when enclosure fence, gates, and temporary enclosures are installed.
      c. Maintain security program throughout construction period, until Owner occupancy or Owner acceptance precludes the need for Contractor security.
   2. Entrance Control:
      a. Provide control of all persons and vehicles entering and leaving Project site.
      b. Allow entrance only to authorized persons with proper identification.
      c. Owner's access to construction site shall be allowed at all times.
   3. Identification Badges and Access Keys:
      a. Capitol Campus buildings have secured areas, or are completely secured, requiring the Contractor and all workers under its responsibility to wear identification badges at all times and access the facility by key, or card key. The Owner will provide identification badges, which will also act as card key access where the Owner has those capabilities.
      b. Work at certain facilities or within certain areas of a facility shall require all workers pass a clearance security check and wear photo ID badges. For such projects, submit within 7 calendar days of the Notice To Proceed the name and drivers license number of each employee to work at the project site. Following a clearance security check, the Contractor and Owner will make arrangements for a photo ID badge to be made. This process can take up to 7 working days.
      c. Work can only be performed by workers having ID badges. Sharing or use of a persons ID badge by another person will result in both parties being denied access for further work on the project. At the end of the project, all ID badges are to be returned to the Owner.
      d. A maximum of 5 non-assigned badges will be issued by the Owner for Contractor use throughout the project. These badges are for Contractor personnel who may only be involved for a short period of time or who may not be known at beginning of project.

e. The Owner will provide keys to the Contractor where card key access is not available. The Contractor shall sign a receipt for received keys.
f. At the end of the project, all keys and card keys shall be returned to the Owner. The Contractor shall obtain a signed receipt from the Owner for all returned items and forward the original receipt to E&A Services project manager.
g. Failure by the Contractor to return all ID badges and keys will require the contractor to reimburse the Owner for all costs associated with the item that has not been returned. For ID badges, the cost is $100.00 each. For actual keys, the cost to the Contractor shall be for re-keying the entire facility the keys provided access to. A unilateral deductive Change Order will be written to the Contract.

G. Emergency Procedures.

1. For emergencies requiring ambulance, fire department or police assistance, dial 9-1-1 from regular phones or 9-9-1-1 from State system phones. This phone number shall be posted at all Contractor phones.
2. Should the Contractor find it necessary to call for police assistance or protection in the exercise of its responsibilities, or in the event of other emergencies, call 9-1-1 first, then contact General Administration's Service Center at 360-725-0000, and notify the Owner Representative.

H. Fire Safety.

1. Conduct operations in a manner that is fire-safe for the work area and adjacent areas. Maintain the premise clear of rubbish, debris, or other materials constituting a potential fire hazard. Maintain a proper fire separation between work area and any adjacent occupied areas. The local fire codes are incorporated herein by reference; adhere to all applicable provisions as determined by the local fire department. Contractor shall notify the Olympia Fire Department at commencement of construction.
2. Obtain permits as necessary, including but not limited to:
   a. Cutting, Welding, Soldering, or any other type of open flame. Olympia Fire Department requires a Burn Permit on any open flame work. Permits are free.
   b. Storage of flammable materials (propane, butane, etc.) and/or compressed gasses.
3. Where significant or continued non-compliance with fire safety is noted, Owner reserves the right to stop the work at no extra cost or extension of time, pending remedial action. Reimburse Owner as appropriate, for any fines or penalties levied by the local fire department.
4. Report all construction fires and/or hazardous spills immediately by calling 9-1-1 and notifying the Owner Representative.
5. Contractor shall maintain all hallways, corridors, and/or adjacent egress areas free of construction materials, equipment, and rubbish at all times. Do not impair floor to floor fire separation. Submit an RFI for any clarifications needed regarding existing fire separations.
6. Provide temporary portable fire extinguishers for project as required by code. Permanently assigned fire extinguishers located in buildings do not alleviate Contractor's responsibility to provide standby extinguishers for project and "Fire Watch" needs.
   a. A "Fire Watch" is to continue at least 30 minutes after "Hot Work" or cutting, welding or soldering procedures have stopped. A "Fire Watch" shall include monitoring of floors directly above and below "Hot Work" areas. "Hot Work" denotes any open flame procedure for the heating of materials during application processes.
   b. Provide combustible and finished surfaces, equipment, electric cables, and personnel with protection to prevent damage or injury from molten metal, falling sparks, and welding arcs. Whenever practical, perform cutting and welding operations off-site.
7. Provide and install temporary exit signs to mark pathway, as needed, to insure a clear direction for emergency exit travel in occupied areas adjacent to the construction project. Review the temporary exiting routes and signage with Owner's Representative prior to making the changes.

I. Fire Protection Systems

1. Building and/or parking areas on the campus are either partially or fully protected with different types of fire suppression and smoke or ionization detection systems.
2. The Contractor shall plan for disabling of the fire alarm system or portion of a system in advance by submitting an Outage Request. Outages shall be requested only for those isolated areas which will be directly affected by work during a particular shift. "Blanket" outages shall not be permitted as the safety of the building and occupants cannot be compromised.
3. The Owner and Olympia Fire Department shall be notified seven (7) days in advance of work involving the disconnection or impairment of the fire alarm or protection systems.
4. If the Contractor causes a false alarm by failing to properly submit an Outage Request, submitting an inaccurate Outage Request, or accidentally discharges any protection system where the Fire Department responds, a unilateral deductive Change Order for $500.00 will be written against the Contract to cover charges to the Owner from the Fire Department, and Owner costs for responding to the alarm.
5. The Contractor is to be fully familiar with and aware of all equipment that is being used on the project and the effect it could have on the systems.

J. Service Outages

1. Continuity of equipment and utility services to Owner property around the Project shall be maintained at all times. Equipment or utility shutdowns required to facilitate construction work shall be accomplished in accordance with the following requirements:
   a. Service outages and interruptions shall be indicated on the overall construction schedule as well as the interval schedule.
   b. Confirm all requests for equipment and utility outages in writing to the Owner on the Owner's Outage Request Form not less than two (2) working days prior to the proposed outage date.
2. Service outages to existing equipment and utilities shall be kept to an absolute minimum. Any outages required in the course of construction, whether for temporary services, cutovers, or testing shall be closely coordinated with the Owner and A/E. All service outages and electrical tie-ins will be required to be made between 6:00 p.m. Sunday and 4:00 a.m. Monday, unless otherwise indicated. The Contractor is responsible to reimburse the Owner for backcharges of missed outages or re-connect stand-by time of Owner staff.
3. Do not proceed with any work requiring a service outage until confirmation is received from the Owner. Unless otherwise specifically indicated, written permission from the Owner takes a minimum of two (2) working days and a maximum of seven (7) working days from the time of request by the Contractor. Failure of the Contractor to submit outage requests which allow adequate time for Owner review and action shall not be grounds for requesting additional time or compensation.
4. Materials & equipment required for the work to be accomplished during an outage shall be complete and available on the job for review by the Owner at the time of the outage request. If the Contractor is not adequately prepared, the shutdown request will not be granted and must be rescheduled.
5. Only Owner's personnel will shut down and restart equipment and utilities. Owner will inspect the installation prior to restarting and will not restart if an unsafe condition exists. In the event Contractor's work is not completed during the time scheduled for the shutdown, Owner may elect to restart the equipment or utility services. In that event, additional outage requirements shall be rescheduled in accordance with the preceding requirements. Restarting shall not be construed as acceptance of the work as complete.

   [Specifier –coordinate this paragrpah with Section 01110, 1.07]

   a. Owner's personnel required to complete utility outages, restarts and inspections will not typically be working during the Contractor's normal working hours as defined in

Section 01110. Contractor shall incorporate any affect that this may have on the progress of the project as part of the Base Bid. No overtime payments will be authorized for contractor or subcontractors to coordinate such work with Owner's personnel outside of Contractor's normal working hours nor will time delays be recognized due to the unavailability of these parties to complete these tasks during Contractor's normal working hours.

6. Include in the bid all costs associated with equipment and utility outages. Owner will make no extra payment for overtime work, schedule changes or failure to complete utility connections within authorized shutdown periods.

K. Material Storage

1. Confine storage to the designated areas. Maintain the storage areas in a clean and orderly manner.
2. Storage of materials on any existing structure shall not exceed the following:
   a. Roof: 25 lbs per square foot
   b. Framed Floors: 100 lbs. per square foot
   c. Slab-on-Grade Floors: 100 lbs. per square foot
3. Contractor shall be responsible for making provisions for any additional storage areas needed that cannot be accommodated within the limits of construction.

[Specifier –This Article 1.10 is unique only to the OB2 building, and can be deleted if the project is eslewhere. If the project is in OB2, review paragraphs "A."through "F."and modify as needed.]

[1.10 OPERATION OF THE DIS COMPUTER CENTER

A. The Department of Information Services (DIS) Computer Center, located on the Service Level of OB-2, is a one of a kind facility which operates twenty-four (24) hours a day, seven (7) days a week. It is intended that the work in this contract shall be completed in such a manner to allow DIS to maintain normal operations in the DIS Computer Centers.

B. DIS maintains rigid control of access to the DIS Computer Center. It is anticipated that Contractor access to these areas shall not be required to complete the work of this project. However, during the course of the project, should access become necessary, Contractor shall be required to obtain prior approval from DIS for access to these areas.

C. Vibrations caused by certain construction activities can be extremely detrimental to the continued operations of certain equipment within the DIS area. Care shall be taken to minimize structure borne vibrations during construction, particularly on the Service Level and First Floor.

D. Any work required by this project requiring access to or temporary interruptions in the security envelope at these areas must be coordinated in advance with the DIS Facility Service Manager.

E. Outage requests required by the Project which may affect DIS operations require a ninety (90) day advance request and review period.**]**

1.11 SPECIAL REQUIREMENTS

A. Coordination: In addition to the requirements stated elsewhere in these specifications, Contractor shall coordinate the following with the Owner:

1. All room, system or condition surveys requiring access to spaces other than public corridors or garage spaces shall be identified at least 48 hours in advance of their occurrence for Owner's review.
2. Pedestrian access and emergency egress routes shall be maintained throughout the Contract duration. Locations of these routes and relocation of these routes for

construction purposes shall be identified at least 48 hours prior to their being physically established. The conditions proposed for the access routes shall be clearly detailed by the Contractor for Owner's review.

PART 2 – PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Use qualified personnel for installation of temporary work. Locate temporary installations where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify as required.

B. Provide each temporary installation ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until they are no longer needed or are replaced by authorized use of completed permanent installations.

3.02 TEMPORARY UTILITIES

A. If the Contractor decides to use any of the equipment or materials installed under this contract for heating, power, lighting, or any other project need while the Project is still under construction, warranty on those materials shall not begin until Substantial Completion.

B. Engage the appropriate local utility company to install temporary service as needed or connect to existing service when it is on a public right-of-way, or the Owner when it will be connected to systems within the Owner's property lines. Where the utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.

1. Arrange with utility company and Owner for a time when service can be interrupted, if necessary, to make connections for temporary services.
2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
3. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.
4. The Contractor may use existing Owner power, heat and water, and Owner will pay all consumption costs. The Owner has a number of agreements in place with outside entities related to conservation of resources. In using Owner services, the Contractor shall take reasonable measures to conserve usage. Should these existing systems be less than adequate for construction purposes, Contractor shall provide additional means as necessary at no additional cost to the Owner. Any damage to existing systems as a result of the Contractor's use shall be immediately repaired at the Contractor's expense.

C. Temporary Water. The Contractor may use existing Owner water. Supplement as required. Provide additional piping, hoses, etc. as required. The contractor is to confirm the source of any existing water to be used with the Owner prior to either connecting to, or opening, any source. Water lines may be unmarked and may relate to potable water, fire suppression systems, irrigation, or other service. Failure to confirm with the Owner the proper source could cause false alarms.

D. Temporary Electric Power. The Contractor may use existing Owner power. The Contractor is to confirm the source of power with the Owner prior to making any connections. When the work is to be performed, the Owner is to be notified so they may observe any modifications

being made. If existing power is inadequate for any reason, provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnects, automatic ground-fault interrupters, and main distribution switch gear.

1. If the Contractor provides its own distribution system, overhead wiring shall be installed where least exposed to damage and the vertical clearance is adequate for any Owner related service or delivery vehicles.
2. No arc welders of heavy usage equipment are to be connected to the Owners system. The Contractor shall provide separate gas generators for this purpose.

E. Temporary Lighting. The Contractor may use existing Owner lighting. Where lighting is inadequate, supplement as follows:

1. Install and operate temporary lighting that will fulfill security and protection requirements without operating the entire system. Provide temporary lighting that will provide adequate illumination for construction operations and traffic conditions.
2. Provide a minimum of 5 foot-candles, higher if required by codes or regulations, of illumination in all building work areas where construction work is being accomplished; increase illumination to a minimum of 50 foot-candles for painting and other interior fine finish work. Provide additional illumination as directed for proper installation and inspection of interior finish work. Permanent lighting equipment may be used after it is installed provided that any damaged components are replaced, and that all components are cleaned prior to acceptance of the project.
3. Provide temporary lighting as required for Owner use during non-construction times where construction has caused existing lighting to be temporarily out-of-service or blocked by construction staging materials. Temporary lighting must provide illumination levels equal to pre-construction conditions.
4. Remove temporary lighting and power equipment and accessories and their connections at completion of the work or sooner if approved or directed.

[Specifier -Use for an existing facility - Edit as appropriate]

F. Temporary Heat. The Contractor may use existing Owner heating systems subject to compliance with provisions specified below. Where existing systems are inadequate, provide temporary heat required by construction activities for curing or drying of completed installations or for protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on workmen, completed installations, or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.

1. No “salamander” type heaters are permitted in occupied facilities, or where the use is detrimental to finishes.
2. The existing heating system may be used in lieu of the temporary equipment in conformance with the following requirements:
   a. The responsibility for the heating system and its full operation is to be coordinated by the Contractor with the Owner until final acceptance of the building.
   b. Provide air filters on any building fan equipment used for temporary heat.
   c. Return air dampers to be closed; unit to run with 100% outside air.

[or] c. Ensure that procedures, engineering controls, and other appropriate controls are utilized to maintain acceptable indoor air quality for building occupants during the course of construction. Properly filter or completely seal off return air to prevent construction dust from entering occupied areas, or getting into the HVAC system.

   1) Seal off all ventilation system ducting which is not actively required for temporary heating in construction spaces.

   d. Filters for any heating or air handling equipment, or similar equipment operated during construction, shall be replaced by the Contractor prior to the Owner re-occupying the space, at no additional cost to Owner.

e. Re-lubricate all equipment used.
f. All testing, balancing and filter changes, etc., noted in mechanical specifications are still required in addition to any cleaning, changing of filters, etc., performed during temporary operations.
g. Should the Owner determine ducts are getting too dirty during construction, the Contractor shall clean inside of ducts by power vacuuming.

3. Pay all costs until final acceptance. Should Owner occupy part of the facilities during construction, utility costs will be apportioned upon agreed unit costs.

[OR]
[Specifier - Use for a new facility in conjunc tion with second "G" below - Edit as appropriate]

F. Temporary Heat & Ventilation

1. Furnish by methods approved by Architect, temporary heat and ventilation including fuel and power and attendance as required for the work when no other heat or ventilation is available.
2. Provide facilities and temporary units as required to comply with requirements. Provide temporary heat and ventilation required to:
   a. Maintain adequate environmental conditions to facilitate progress of the work.
   b. Meet specified minimum conditions for installation of materials.
   c. Protect materials and finishes from damage due to temperature or humidity.
3. Provide adequate forced ventilation of enclosed areas to:
   a. Cure installed materials.
   b. Disperse humidity.
   c. Prevent hazardous accumulations of dust, fumes, vapors, or gases.
4. Portable heaters: Use standard approved units complete with controls; the use of "salamanders" will not be permitted, except in exceptional cases when prior approval of Architect is obtained and proper ventilation in conjunction with said use is provided, as approved.
5. Non-availability of temporary heat when required for said work shall cause stoppage of said work.
6. Include all costs for temporary heat in bid items.
7. See technical divisions for temperatures required for work of the various trades.

[Specifier - Use for an existing facility in conjunc tion with first "F." above - Edit as appropriate]

G. Temporary Ventilation.

1. Ventilate enclosed areas to exterior to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases. Where/when toxic or volatile materials are used, Contractor shall provide containment within specific work zones and 100% ventilation in an effort to maintain indoor air quality.
2. Refer to paragraph 3.04B below for additional indoor air quality requirements.

[OR]
[Specifier - Use for a new facility in conjuncti on with second "F." above - Edit as appropriate]

G. Use Of Permanent Systems For Maintaining Proper Conditions Within Building

1. After the permanent heating system is sufficiently installed, it may be used in lieu of the temporary equipment upon approval by Mechanical Engineer and in conformance with the following requirements for said use:
   a. The responsibility for the heating system and its full operation remains with the Contractor until final acceptance of the building.
   b. Provide air filters on any building fan equipment used for temporary heat.
   c. Return air dampers to be closed; unit to run with 100% outside air.
   d. Filters for any heating or air handling equipment, or similar equipment operated during construction, shall be replaced by the Contractor before Owner occupies the space at no additional cost to Owner.

e. Re-lubricate all equipment used.
f. All testing, balancing and filter changes, etc., noted in mechanical specifications are still required in addition to any cleaning, changing of filters, etc., performed during temporary operations.
g. Should the Owner determine ducts are getting too dirty during construction, Contractor shall clean inside of ducts by power vacuuming.

2. Pay all costs until final acceptance. Should Owner occupy part of facilities during construction, utility costs will be apportioned upon agreed unit costs.
3. All heating systme equipment warranties shall commence at Substantial Completion, regardless of when put into operation.

H. Temporary Telephones and Fax Machine. The Contractor may request the use of existing Owner wiring system to arrange for its individual needs. The Owner will not pay for any costs the Contractor may be required to pay for rewiring or extending wiring to locations for the Contractors use. The Contractor is to arrange for its own direct billing of local and long distance service and pay for all local and long distance service.

1. Provide separate lines for voice and for fax. Provide a telephone and fax machine.
2. At the telephone, post a list of important telephone numbers.
3. The Contractor's Superintendent shall be required to carry a cellular phone with a local 360 area code throughout the duration of the project. The phone shall be always on, except when the Superintendent is at the site office and available to the connected phone.

I. Temporary Toilets. Contractor shall provide temporary sanitary facilities, including temporary toilets, wash facilities, and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.

[Specifier –delete if not required]

J. Temporary Storm Sewer. If storm sewers are available, provide temporary connections to provide drainage that can be discharged lawfully, or other storm drainage accommodations as indicated on the Civil documents. Provide drainage ditches, dry wells, stabilization ponds, and similar facilities as indicated on the Civil documents or as required by the agencies having jurisdiction.

1. Filter out excessive amounts of soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
2. Maintain temporary drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.

3.03 TEMPORARY SUPPORT FACILITIES

A. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.

[Specifier - select which of the Para. "B" and "C" options below is appropriate]

B. Field Office. The Owner shall designate a space within the facility for the Contractor to utilize as a temporary field office for Contractor personnel.

C. At the time of bid, this space has not been designated, however, the Contractor may assume that it is in reasonable proximity to the work area. The Owner will identify a room for weekly Progress Meetings within the facility of sufficient size to accommodate table(s) and chairs for up to (15) attendees.

OR

B. Field Office. The Contractor shall provide a prefabricated or mobile unit to accommodate:

1. An office for the Contractor.

2. A separate area of adequate size for weekly Progress Meetings of sufficient size to accommodate table(s) and chairs for up to (15) attendees and a lay-out table of adequate size to accommodate the construction documents. Space shall be wheelchair accessible.
3. Locate field offices, storage sheds, and other temporary construction and support facilities for easy access and within the limits of construction and staging area.

C. Provide noncombustible construction for offices, shops, and sheds located within the construction area or within 30 feet of building lines. Comply with requirements of NFPA 241.

OR

B. Field Office. The Contractor shall provide a prefabricated or mobile unit to accommodate the Contractors needs.
1. Locate field offices, storage sheds, and other temporary construction and support facilities for easy access and within the limits of construction and staging area.
2. The Owner will identify a room for weekly Progress Meetings within the facility of sufficient size to accommodate table(s) and chairs for up to (15) attendees.

C. Provide noncombustible construction for offices, shops, and sheds located within the construction area or within 30 feet of building lines. Comply with requirements of NFPA 241.

D. Temporary Barriers and Enclosures. Refer to Section 01560, Temporary Barriers and Enclosures.

OR

D. Temporary Enclosures. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
1. The Contractor shall be responsible for the determination of and maintenance of proper security measures for the job site temporary facilities for the duration of the construction Project including, but not limited to:
   a. Locks on all construction equipment boxes, temporary storage and office facilities, and construction equipment (vehicles, cranes, dozers, forklifts, etc.).
   b. Temporary construction cores for all exterior and storage room doors, locksets or cylinders.
   c. Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism. Contractor is responsible for any theft or vandalism of its materials and equipment.
   d. The Contractor shall hold the Owner harmless from all damage, vandalism, stolen equipment or supplies on the Project Site for whatever reason, or from injury to or death of unauthorized persons trespassing on Project Site because of inadequate security measures until the Owner releases the Contractor from security responsibilities in writing or at Final Completion, whichever occurs first.
2. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
3. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 sq.ft. or less with plywood or similar materials.
4. Close openings through floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
5. Where temporary wood or plywood enclosure exceeds 100 sq.ft. in area, use UL-labeled, fire-retardant-treated material for framing and main sheathing.

E. Chain Link Fence. Provide temporary six (6) foot high, or higher if indicated or needed by the contractor to limit access, chain link fence panels with top rail securely fastened to tubular metal posts set in heavy concrete bases to prevent easy relocation. As a minimum, provide

around contractor staging area, and pedestrian pathways to Project site, or as otherwise indicated.

[Specifier - select which of the options below is appropriate]

F. Temporary Lifts, Hoists, Towers, or Crane. Temporary construction lifts, hoists, towers, or cranes, if determined by the Contractor to be necessary to accomplish the work required by this contract, shall be the responsibility of the Contractor. The locations for this equipment shall be within the limits of construction.

1. Structural support required for temporary lifts, hoists, towers, or cranes shall be provided by the Contractor. Structural support shall be designed by a licensed structural engineer and shall be submitted for review in accordnace with SUBMITTALS PROCEDURES section.
2. Placement of temporary construction lifts, hoists, towers or cranes outside of the limits of construction shall not be permitted.

[OR]

F. Temporary Lifts and Hoists. Provide facilities for hoisting materials and personnel. Truck cranes and similar devices used for hoisting materials are considered “tools and equipment” and not temporary facilities.

[Specifier –delete if not required.]

G. Temporary Elevator. The Contractor may use an existing Owner designated elevator, or provide his own alternate means of vertical transportation.

[OR]

G. Temporary Elevator. Contractor may elect to utilize the existing elevator during the course of the project or provide separate, alternate methods of vertical transportation for materials and/or personnel. The following conditions shall apply to each option:

1. Should the Contractor elect to utilize an existing Owner designated elevator, the following conditions shall apply:
   [Specifier –edit as appropriate.]
   a. The existing service elevator or designated elevator is used by the Owner for freight, mail, other daily deliveries and custodial use. The uses of the service elevator by the Owner during Contractor’s normal working hours shall have priority over the Contractors use throughout the duration of the project.
   b. Any damage or interruption in the continuous operation of the elevator during Contractor’s normal working hours shall be addressed immediately by the Contractor. Contractor to schedule use of the elevator to allow adequate time to accomplish any required repairs prior to the Owner’s next regular work shift.
   c. Damage or service interruptions requiring assistance from elevator maintenance personnel shall be initiated by the Contractor and shall be completed by the elevator maintenance staff under the State maintenance agreement. The emergency telephone in the service elevator may be used to contact DCF Customer Service where an attendant is able to contact a representative from the maintenance staff.
      1) Assessment of the liability for the costs incurred to address the repairs shall be discussed at the Progress Meeting immediately following the repair. Damage that is a result of normal wear and tear will be repaired at State expense. Damage attributable to Contractor misuse/abuse shall be paid for by the Contractor.
   d. Contractor shall inspect the elevator cab interior, along with the frames and doors at each floor, at the end of each working shift in which the service elevator is used by the Contractor. Contractor to prepare a written report, signed by the Contractor and on-site Owner’s Representative, recording the results of this inspection and verifying that the elevator is in normal working condition. Copies of this record are to be kept on-site by the Contractor and shall be made available for inspection by Owner and A/E upon request.
   e. The Contractor shall become familiar with the operations and weight restrictions of the elevator. Contractor use of the elevator shall be limited to ninety (90) percent of

the rated capacity of the elevator. Contractor use of the elevator implies that the Contractor is aware of the operating procedures and is operating the elevator within the limits of weight restrictions as noted in this Section.

f. Protective materials shall be provided by the Contractor at the cab interior and the door frames on each floor. This protection shall consist of rigid insulation covered with plywood on all walls with provisions made for access to the elevator controls. The doors on each floor shall be covered with plastic sheeting or plywood for protection. These materials shall be attached in a manner which is not detrimental to the existing cab and/or jamb finishes. Protective materials may be left in place during the duration of the project. Removal of protection at the completion of the project, and repair/painting of any damage to existing surfaces caused during construction, shall be the responsibility of the Contractor.

g. The Contractor shall be responsible for pre-scheduling use of the elevator to the fullest extent possible. Use of the elevator shall be identified on the look-ahead schedule discussed at each progress meeting during the Construction Phase. The Owner shall be responsible for conveying this information to the tenants. This will allow tenants to anticipate and plan around times when the Contractor will require use of the elevator.

h. The Contractor is to consolidate need for elevator use to a shorter, concentrated block of time rather than intermittent uses over a longer period of time. Coordinate use with other Owner uses to minimize impact on Owner and/or tenants normal operations throughout construction.

i. The Owner has noted that higher than average use is expected during the following times:

   1) The Legislative Session, which typically runs from January to March or April.
   2) The last week of each month due to material deliveries and other government functions. Scheduling of Contractor use of the elevators during these times shall be minimized.

j. The elevator has been fitted with an Owner installed key-operated door override. The override acts to hold the elevator doors in an open position to allow adequate time for movement of construction debris and carts in and out of the cab. Use of this feature by the Contractor shall be restricted to those times when materials are being actively loaded or unloaded. The Owner will provide two keys for the hold-open switch to the Contractor at the beginning of the Construction Phase. The Contractor shall be responsible for ensuring that all construction personnel using the service elevator are familiar with the requirements of this section. The keys shall be returned to the Owner upon completion of the project.

k. A dedicated elevator operator shall not be required. However, the Contractor shall be responsible for monitoring all construction related use of the elevator, whether by Contractor or by Subcontractors.

l. Contractor to submit a written report, for the State's review and concurrence, prior to the start of the Construction Phase which clearly states the condition of the motor, hoist cables, doors, and jambs. This report will be used as a baseline for evaluation of conditions at the conclusion of the contract, or in response to damage during the project. The report shall include photographs taken two or three days before installing protective material at the elevator to document the pre-construction status. These photographs shall include the walls, ceiling, floor and door of the cab interior along with outside faces of doors and jambs at each floor level.

m. An on-site meeting shall be required prior to the Contractor's first use of the elevator to discuss these issues. The meeting will be attended by the Contractor, Owner, and A/E. At the meeting, the Owner will document the pre-use condition and will familiarize the Contractor with the operating characteristics of the elevator.

n. The Owner reserves the right to retract the availability of the elevator for Contractor use at any time during the project if the conditions of use as outlined above are not followed by the Contractor. No additional time or expenses will be authorized for developing alternate means of vertical transportation if the Owner retracts this

privilege due to Contractor's non-compliance with conditions as outlined in this section.

2. Should the Contractor elect to provide alternate means of vertical transportation, the following conditions shall apply:
   a. The type of vertical transportation shall be determined by the Contractor.
   b. The location of the alternate means of vertical transport must be within the limit of construction area. The specific location shall be determined by the Contractor.
   c. The cost for the alternate means of vertical transport, including but not limited to installation, operation and removal, shall be the responsibility of the Contractor and shall be included in the base bid of the project.

H. Project Identification and Temporary Signs.

1. Project Identification Signs: The Office of Capitol Planning & Management Site Representative will coordinate the procurement and placement of the project sign with the DCF Sign Shop, which shall have a maximum size of 4' x 8'. The DCF Sign Shop Sign Standards will be incorporated, including use of non-gendered graphics and text, and which will include the following information:
   a. General Administration Logo and name.
   b. Project Name.
   c. Schedule (Start to Final Completion).
   d. Project Lead (Office of Capitol Planning & Management).
   e. Project Manager (E&AS P/M).
   f. Designer (A/E of record).
   g. Contractor (awarded).
   h. Budget (Contract award amount including bid and alternates used).
2. Temporary Signs: Temporary signs for directional information, or required because of union regulations, are acceptable. Contractor shall prepare such signs as required to provide directional information to construction personnel and visitors. Support on posts or framing of preservative-treated wood or steel. Do not permit installation of unauthorized signs.
3. Contractor will be allowed one (1) separate sign placed on their temporary field office structure, limited to a maximum 3' x 3' size.

I. Temporary Exterior Lighting. Install exterior yard and sign lights so signs are visible when Work is being performed.

J. Collection and Disposal of Waste. Refer to Section o1732, Demolition & Construction Waste Management.

[OR]

[Specifier –use this paragrpah "J"if separate Section 01732 is not included.]

J. Collection and Disposal of Waste. Collect and dispose of waste from construction areas and elsewhere daily. Comply with requirements of NFPA for removal of combustible waste material and debris. Strictly enforce requirements. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully. On-site containers and dumpsters for collection of waste materials, debris, and rubbish will be permitted only in the Contractor's approved areas and must be provided by the Contractor. The type of dumpster and method of disposal shall be determined by the Contractor.

1. Clearance restrictions at the site may prohibit the use of large and/or front-end loaded dumpsters.
2. Contractor shall supply their own cleaning equipment, dumpsters and barrels. No use of similar Owner items is permitted.

K. Stairs. Until permanent stairs are available, provide temporary stairs where ladders are not adequate. Cover finished, permanent stairs with a protective covering of plywood or similar material so finishes will be undamaged at the time of acceptance.

L. Traffic Maintenance and Control. Whenever the Contractor's operations affect public vehicular or pedestrian traffic, the Contractor shall be responsible for the installation and maintenance of any and all traffic and pedestrian control devices including flaggers, signage, temporary barriers and other measures as deemed necessary be the authority having jurisdiction.

1. Right-of-Way. Strict attention should be paid to maintaining fire lanes, roadways, walkways, and loading areas with a minimum interruption, with appropriate safety measures, and as required by Owner, Department of Labor and Industry, Police Department, and Fire Department. Obtain written approval to restrict any public or private street, sidewalk, lane or alley from Owner. Restrictions include partial or full lane closures, parking restrictions, sidewalk closures, detours, complete street closures, shoulder work, and pedestrian rerouting, as well as the placing of building materials or equipment on Public right-of-way. Requirements as follows:
   a. Obtain Owner's written approval for any work as indicated below:
      1) 5 days notice for partial closure of an arterial street and complete closure of any local access street, alley or sidewalk.
      2) 3 days notice for restriction of any parking.
      3) 2 week notice for complete closure of any arterial street.
   b. The actual time and date of all closures will be subject to approval by Owner. Closures normally will be scheduled for nights, weekends, school vacations or other low intensity use periods. Normally, no work will be scheduled in the public use areas between the hours of 7 a.m. to 9 a.m. and 3 p.m. to 6 p.m.
   c. The duration of all closures shall be held to a reasonable minimum.
   d. Include in the bid all costs associated with equipment and utility shutdowns. Owner will make no extra payment for overtime work, schedule changes or failure to complete utility connections within authorized shutdown periods.
   e. Design and usage of traffic control devices shall conform to the specifications contained in the Manual on Uniform Traffic Control Devices (MUTCD) from the U.S. Department of Transportation, Federal Highway Administration.
   f. Unless a section of street is to be completely closed to vehicular traffic, work shall be accomplished with minimum disruption to the flow of traffic. Schedule and layout work areas to maintain the maximum number of traffic lanes normally available to be opened in the direction of the heaviest flow of traffic during peak hours.
   g. Clean pedestrian and driving surfaces daily or more often as required to keep the paths clean. Clean spillage from trucks immediately. Keep adjacent areas clean.
2. Vehicular Access to the Project Area shall be limited as follows:
   [Specifier –a. through f. are examples, modify as required; text in [ ] is specific to OB-2]
   [a. Interior areas shall be accessed by the ramp from 14th Street to the OB-2 Service Level garage. Egress is through the OB-2 garage, down a ramp into the NRB (Natural Resources Building) tunnel which travels east and exits onto Jefferson Street. Access into and out of these areas is one-way traffic only, but is generally open 24 hours per day.]
   [b. Access to the OB-2 Service Level garage shall be limited to vehicles not exceeding 27-feet in length and 13-feet in height due to height restrictions and turning limitations. No vehicles exceeding these limits shall be permitted in the garage. Contractor shall be responsible for any damage caused by Contractor's or subcontractor's vehicles exceeding these limits.]
   c. Do not park vehicles in traffic lanes. [Loading and unloading of tools and material will be allowed at the loading docks, however, the loading dock will also be used by the

tenants during Contractor's normal working hours and its use must be coordinated with the Owner. Coordinate with Owner a minimum of three (3) days in advance.]

d. Conduct operations in such a manner to avoid unnecessary interference to existing pedestrian and vehicle traffic. Provide flaggers and traffic control signs and devices as necessary and/or as required by Owner. Follow construction traffic routes as specified by Owner or provide traffic plan detailing proposed method of delivery, storage, equipment.

e. [Vehicle deliveries shall be prohibited from entering the Plaza Garage. The height and clearance restrictions in the Plaza Garage are not sufficient for vehicles other than passenger vehicles.]

1) Limit vehicle deliveries during Owner peak traffic hours of 7:00 a.m. to 9:00 a.m. and 3:00 p.m. to 6:00 p.m.

f. [Access to and within OB-2 is extremely limited.] Interfering with existing traffic and pedestrian patterns is not permitted during construction except as permitted by the drawings.

1) Do not remove or alter any exiting vehicular traffic control, parking, building, or any other signs or devices without obtaining approval from Owner and/or the City of Olympia.

2) Do not install any of the above mentioned type of signs without approval of Owner and/or the City of Olympia.

g. The Contractor shall review delivery routes to the construction site and staging areas to determine any limitations for height or length of delivery vehicles. The Contractor shall be responsible for any damage repair costs caused by either Contractor's or subcontractor's vehicles or deliveries to the Contractoor or subcontractor's.

3. Contractor Parking. Parking is limited to the Contractor's staging area or streetside metered parking. The Contractor may purchase parking permits from the Parking Office at the GA Service Center for any available parking in Owner parking areas. Contractor shall pay meter fee and/or required to obtain permits for parking from the Parking Office. Payment for all campus parking is required.

a. Service stalls shall not be used for contractor staff parking. Service stalls are designated for temporary service workers such as a Quest or other communications vehicle, a DCF vehicle or other short term service parking. Contractor staff shall register with Parking Services for assigned parking at a space available basis. Current fee for assigned parking is $30 per month.

b. Parking by the Contractor is not permitted in any stalls designated as "RESERVED", ADA, or otherwise marked, regardless what time of day. Parking citations and/or impounding of vehicles may result from failure to comply with these regulations and will be the sole responsibility of the Contractor.

c. The Project 'staging area' shall not be used for Contractor staff parking. One or two Contractor vehicles may be permitted to park within the staging area, depending on space availability as approved by Parking Services.

M. Temporary Equipment

1. Thermometer:

a. Maintain one twelve inch minimum size high/low register outdoor thermometer. Mount at convenient location not in direct sunlight. Contractor to record daily, high and low temperatures and include on Contractor's Quality Control Daily Report form; refer to Section 01450.

b. Thermometer Range: Minus 60 to plus 110F.

2. Protective Headgear: Provide for visitor's use ten (10) new adjustable WISHA approved hard hats.

N. Construction Aids

1. Provide construction aids and equipment required by personnel to facilitate the execution and inspection of the work.
   a. Include scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes, protective enclosures, and other such facilities and equipment.
   b. Refer to respective Sections for particular requirements for each trade.
2. Maintain all facilities and equipment in a first-class condition.
3. Comply with all applicable requirements specified in Project Manual. Install in accordance with "Quality Assurance" provisions, Specifications and Manufacturer's instructions. Where these may be in conflict, the more stringent requirements govern.
4. Relocate construction aids as required by:
   a. Construction progress.
   b. Storage requirements.
   c. Accommodation of Owner's legitimate requirements.
   d. Accommodation of any other Contractor employed at site.
5. Completely remove temporary materials, equipment and services when construction needs can be met by use of permanent construction, or at Project completion.
6. Clean and repair damage caused by installations or by use of temporary facilities and clean site areas affected by temporary installations. Restore damaged vegetation.
7. Restore existing permanent facilities used for temporary purposes to specified or to original conditions.

O. Cleaning: Refer to Section 01740, Cleaning, for cleaning during construction and final cleaning.

3.04 PROTECTION OF EXISTING FACILITIES AND OCCUPANTS

[Specifier – Portions of this Article are unique only to the East Campus Plaza areaOB2 building, and can be deleted if the project is eslewhere. Otherwise, review and modify as needed.]

A. Contractor shall plan their work to ensure that they complete construction in accordance with the Contract Time allowed while complying with the access and time restrictions estanblished.

B. Building shall remain accessible to all pedestrian traffic, abled and disabled. Contractor shall maintain required means of fire egress throughout the Contract duration.

[C. Contractor shall provide exterior grade plywood as required to protect newly installed roofing membrane and concrete slabs from the work of all follow-on trades.]

[D. Areas beneath OB-2 plaza are to remain occupied at all times. These areas house offices, storage, cafeteria, computer operations, and parking. At all times during the Project, Contractor shall temporarily cover any existing horizontal structural deck surfaces exposed by demolition which have not been permanently covered by the installation of new roofing membrane. It is Contractor's responsibility to maintain a watertight condition until the new watertight roofing is applied. Failure to do so will require Contractor to provide the following:]

[OR]

D. Weather Protection: The Contractor shall be responsible for maintaining occupied spaces in a watertight condition that will be affected by the Project work. At all times during the project, the Contractor shall temporarily cover any existing horizontal or vertical surfaces exposed by demolition which have not been finished by the installation of permanent new material. Failure to do so will require the contractor to provide the following:

1. Contrator shall provide and install 6 mil plastic sheeting and tape to cover all building elements including, but not limited to, furniture, files, office equipment, fixed and portable computer equipment, building mechanical and electrical equipment, food service equipment, foods, and food preparation and servicing areas, as applicable.

2. Plastic sheeting shall be tented over equipment to allow for continuous operation of equipment (do not block air intakes or exhausts). While allowing for operation or access to equipment, protect from dust, debris and water intrusion.
3. This action shall not relieve the Contractor from their responsibility for damage resulting from moving the equipment, dropping or moving construction materials, utility failures or other actions committed or caused by the Contractor in the process of construction.
4. Sheeting shall be installed under areas where demolition or construction activities or flood testing will expose interior space below to potential areborne dust, loosened building debris, or water intrusion.
5. Material shall be promptly removed after exposure to above hazards has passed. Remove all tape residues and repair any damage caused by installation and removal of sheeting material.

E. Indoor Air Quality and Dust Control: Refer to Section 01734, Indoor Air Quality.

F. Dustproof Partitions and Dust Propagation Prevention

1. The Contractor shall be responsible for protecting areas outside of the limits of construction from the environment within the limits of construction for the duration of construction. Contractor shall install and maintain dust-proof enclosures and other equipment as required to separate the work area from occupied areas or equipment. Dustproof partitions shall extend floor-to-ceiling, or to structure above where area above the finished ceiling is a return air plenum, providing an air-tight enclosure at each location, provided with double chamber passage way doors or flaps.
   a. The Contractor shall submit a temporary dust partition plan, dust evacuation plan and construction sequence plan in accordance with SELECTIVE DEMOLITION and referenced regulations. This plan shall be approved by the Owner and A/E before construction is permitted to begin.
2. Use of flammable or non-fire-retardant materials for temporary partitions, sheeting, curtain, enclosures, etc., within the existing building shall not be permitted. All material used for this purpose shall be fire-retardant type. Plastic sheeting commonly known as “visqueen” is specifically forbidden. Only plastic sheeting designated as fire-retardant (minimum 6 mil thick) will be permitted.
3. Provide temporary dust-proof partitions, sealing of existing doors, etc. to confine dust or debris-producing activities at all dust or moisture-producing operations. Include use of portable air filtration equipment in confined spaces where extensive off-gasing and/or dust is expected. Confinement to the immediate work area is mandatory. Type and location of protective measures shall be proposed by the Contractor in accordance with the proposed work plan and be coordinated with the Owner. The building outside of the limits of construction shall be maintained in current operational condition throughout the duration of the project.
4. Provide negative air machines, venting to the exterior, to provide negative air pressure within the construction work area.
5. All cutting, grinding, sanding, sweeping and other dust producing activities shall be accomplished wet, including wet sanding of GWB surfaces. Particular attention must be taken to insure that the HVAC system does not become contaminated or spread dust. Dust spreading from the point of origin (including floor and ceiling plenums) must be minimized, even within confines of dust-proof partitions.
6. Removal of material shall be accomplished in units as large as possible to minimize the dust created by breaking material into smaller pieces. Refer to SELECTIVE DEMOLITION.
7. Field cutting of material installed by this project shall be sequenced and located to minimize the impact of dust.
8. Contractor shall provide dust protection around ANY STAGING AREA OUTSIDE THE Limits of Construction that is within an enclosed building or parking area if area is used for cutting materials. Contractor shall be responsible for damage to parked cars or the building mechanical system caused by dust created in this area.

G. Odor Control: Project products will contain solvents that when used inside a building, or if used outside can be drawn into the building through the air intake systems. Both situations will be sensitive to occupants within the building. The Contractor shall provide a written procedure for the control of emissions prior to any use. Isolate and vent to the outside if within a building, or provide preventitive measures for being drawn into air intakes for areas where solvents are to be used.

H. Noise and Vibration Control

1. The City of Olympia Noise Ordinance shall be considered a minimum level of requirement for this project and shall be enforced by the Contractor. In accordance with the Environmental Performance Standards of this Ordinance, the maximum allowable noise levels as measured at the property line of noise impacted uses or activities shall not exceed the following levels:

Maximum Sound Level (dB(A))	Duration of Any One-Hour Period (min)	Applicable Hours**
47	Continually	10 p.m. – 7 a.m.
52	15	
57	5	15*
62	1	10 p.m. – 7 a.m.

* Total not to exceed 15 minutes in any one hour.
** The lower noise levels apply on all hours of weekends and holidays.

2. Maintain the level of construction noise inside adjacent buildings and/or rooms from exceeding 85 dBA during the periods the Contractor is working. Contractor shall meet this criterion by erecting barriers between equipment or job and such interior areas, or by providing equipment noise attenuators.
3. Machinery and Equipment – General: Electric-driven is preferred in place of gas or diesel powered machinery. If noise levels on any equipment cannot reasonably be brought down to criteria, either that equipment will not be allowed on the job or use times will have to be scheduled subject to approval of the Owner. Conformance to this specification shall be included in the Contract price and no compensation shall be allowed for special equipment, overtime, etc., that may be required.
4. Outdoor Vehicle and Internal Combustion Engine Noise: Notwithstanding the exterior noise level requirements specified in paragraph “1.” above, the noise level of each piece of vehicle and internal combustion engine noise shall not be greater than 85 dBA at a distance of 50 feet as measured under noisiest operating conditions. Rubber-tired equipment shall be used whenever possible instead of equipment with metal tracks. Mufflers for stationary engines shall be equipped with nosie attenuators of hospital-area quality for silencing. Construction traffic plan shall be approved by the Owner. Routing shall be through the nearest campus exit, subject to approval of Owner.
5. Equipment:
   a. Air Compressors: Equip air compressors with isolating spring base for vibration and silencing packages for noise reduction. Electric-driven preferred.
   b. The use of core-drilling or saw cutting equipment, or electric driven drills, is required for all demolition. Scabblers and Roto Hammers are permitted. Other pneumatic tools are not allowed without prior approval.

[Specifier –coordinate the following with Owner and with requirements of Section 01730, Cutting & Patching.]

[OR] b. Jack Hammers and Roto Hammers: May be used where no other alternative is available if permitted by the Owner. The use of core-drilling or saw cutting equipment or electric driven drills is preferred. [Time of use subject to approval by Owner’s

Representative.] [All use of air hammers and other noisy or vibrating equipment to occur prior to 8 a.m. and after 5 p.m., subject to approval by Owner.]

1) The Contractor may request that heavy-duty jack hammers be permitted where no other alternative is available. Requests for prior approval shall be submitted following the same procedures outlined in the Service Outage sections. Request must state the reason that other means are not feasible, the duration of proposed hammering and the noise level & vibration expected by this work.
2) The Contractor shall anticipate that the time required for Owner review may be a minimum of (30) days. Owner review may not result in method being approved. Contractor shall not proceed with proposed method until receiving written permission from the Owner. If permitted, Owner may restrict the hours when use of such equipment will be permitted. No additional cost will be approved for time claimed due to this review request, whether the request is ultimately accepted or denied.

c. Arc Welders: No arc welders are to be connected to Owner's utilities, unless approved by the Owner. Provide separate gas generators for arc welders.
d. Limited Hours of Use Within Buildings: Within occupied facilities, noise producing equipment used is subject to approval of Owner and shall be, in general, allowed only before 7 a.m. and after 6 p.m. Specific scheduling is required, with two (2) weeks advance notice required and approval by Owner.

I. Pollution Control

1. Provide methods, means, and facilities required to prevent contamination of soil, water, and atmosphere. Allow no discharge of noxious substances from construction operations.
2. Provide equipment and personnel and perform emergency measures required to contain any spillages. Remove contaminated soils and liquids.
   a. Excavate and dispose of all contaminated earth off-site in compliance with laws and regulations.
   b. Replace with suitable compacted fill and topsoil. Provide Owner with receipt of soil acceptability prior to installation.
3. Take special measure to prevent harmful substances from entering public waters.
   a. Prevent disposal of wastes, effluents, chemicals, and other such substances in or adjacent to bodies of water, or in sanitary or storm sewers.
   b. When any runoff contains hazardous chemicals, collect and dispose of legally. Submit proposed collection methods to A/E and Owner for approval by Owner.
4. Provide systems for control of atmospheric pollutants in accordance with Federal/State/ Local published rules and regulations.
   a. Prevent toxic concentrations of chemicals.
   b. Prevent harmful dispersal of pollutants into the atmosphere.

J. Tree, Plant & Lawn Protection

1. Preserve and protect existing trees, plants and lawns at the site which are designated to remain, and those adjacent to the site.
2. No storage or traffic shall be permitted within the drip or root zone of any planting.
3. Carefully supervise excavating, grading and filling, and subsequent construction operations, to prevent damage.
   a. All work within the branch spread of trees shall be done by hand. When roots are encountered during excavation, the Owner shall be immediately notified. Do not further expose or cut until a determination is made by the A/E or Site Representative. Where roots are to be cut, pruned cleanly. Protect all exposed roots with moist organic mulch or burlap; backfill as soon as possible.
   b. Under no circumstances shall the Contractor, for his convenience or ease of construction, remove existing trees designated to remain.

c. Fertilize all trees where roots have been exposed.

4. If branches or roots need to be removed due to construction, use a certified arborist approved by the Owner to perform such work.
5. Any damaged plant material that is to remain shall be replaced with the same species and equal size, or repair in accordance with arborist requirements, at no cost to the Owner. Damage is defined as changes to the tree appearance which were not originally there.
   a. Trees which cannot be suitably replaced greater than six (6) inch caliper shall be paid for at the rate of $100.00 per square inch of cross sectional area measured three (3) feet above existing grade. This amount shall be credited to the Owner.
   b. Damaged and destroyed trees shall be removed from the site, the stumps grubbed, and the ground surface repaired, all at Contractor's expense.
6. Do not drive heavy equipment directly over lawn areas; protect with boards and/or plywood to prevent rutting and need for restoration. Remove protection at the end of each work day so as to maintain healthy growth and reapply as necessary. Any damaged lawn areas shall be restored to an 'as-is' condition.

K. Landscape Maintenance and Restoration

1. If a landscaped area is indicated to be a construction staging/parking area, protect surface adequately to avoid damage. Restore to existing condition using the following requirements:
   a. Remove all construction equipment, building material, debris, and remnants of destroyed sod or plantings before commencing landscape restoration.
   b. Rough grade the site according to the existing conditions or specified grading plan.
   c. Till or hand pick (except under trees) soil to a depth of 8 inches. Remove any rocks over 1 inch in diameter, torn roots and debris.
   d. Amend soil, if topsoil does not exist or was removed, with 4 inches of organic material and till to a depth of 12 inches.
   e. Fine grade the area according to existing conditions or to exact grading specifications.
   f. Replace materials to match original conditions.
2. Tree and Shrub Planting
   a. Location and spacing of trees, shrubs and groundcover according to existing conditions shall be determined in the field with the A/E and Owner. Do not plant material without an approval or in field locating.
   b. Standard planting procedure shall consist of:
      1) Preparing a hole for the plant of 1-1/2 times the diameter of the rootball to be planted.
      2) Do not dig the hole any deeper than the rootball to assure proper surface grade. Bottom of hole shall have loss material amended with organic material.
      3) The plant shall be planted at the proper depth.
      4) The hole shall be backfilled with existing loose soil taken from the excavation of the hole and watered in until the proper grade is achieved.
3. Final Landscape Inspection: Final inspection shall take place at the completion of the work to verify conformance to the specifications and/or original conditions.
4. The Contractor shall maintain its staging area by mowing or trimming grass and other growth to a height no greater than six (6) inches.

[Specifier Note: Verify with Project Manager if the following is applicable.]

L. Bat Infestation: Once any opening large than 1/4" is made in the wall surface, the entire open area shall be fully covered in a manner that will preclude bat infiltration, but will allow continued mortar curing.

1. Materials: Open weave sun protection fabric of the type used in greenhouses. Openings not greater than 1/16", or approved equal.

2. Covering shall be installed at the end of each days work and removed as required to perform work the following day.
3. Contractor shall consult with Eden Advanced Pest Technology of Olympia, to ensure that all steps necessary are taken to ensure against bat infiltration.
4. Protection shall remain in place until wall it completely sealed.

3.05 OPERATION, TERMINATION, AND REMOVAL

A. Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
2. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

C. Unless the A/E requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove all materials placed by the contractor that do not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at the temporary entrances, as required by the governing authority.
2. At Substantial Completion, clean and restore permanent facilities used during the construction period to its original condition.

END OF SECTION 01500

OUTAGE AND DCF SUPPORT REQUEST FORM

Must be received by Customer Service Center **two working days** prior to outage.
DO NOT BEGIN WORK UNTIL YOU HAVE BEEN NOTIFIED FOR APPROVAL OF THIS REQUEST.
If you have any questions, contact: *CUSTOMER SERVICE CENTER* AT 725-0000.

OUTAGE NUMBER:

Building Name: _____ WR/SO Number: _____

Date of Application: _____ /_____ /_____ Requester's Name: _____

Agency:_____ Phone #: _____ Pager #: _____

Date Requested for Outage From: _____ /_____ /_____ To: _____ /_____ /_____

Time Requested for Outage From: _____ :_____ To: _____ :_____ **(use 24 hr. clock time)**

CHECK AS APPROPRIATE: ☐ Regular Hours ☐ After Hours ☐ Weekend ☐ Holiday

Describe the work to be performed (reason for outage): _____

_____

_____

List areas, portions of building(s), grounds, systems, etc., which will be affected: _____

_____

Will permits be required? _____ IF YES, DCF must be contacted and specific approval for work must be obtained. Drawings showing the location must be submitted with this application.

CAPITAL PROJECTS ONLY: Project Name & Number: _____

Contractor(s): _____ Phone #: _____

Property Manager/Site Observer _____ Phone #: _____

Date & Time Received _____ ***Received By (initial)*** _____

APPROVAL and VERIFICATIONS:

DCF Zone Coordinator: _____ BSS: _____

Tenant Agencies Contacted: _____ _____

_____ _____

DEPARTMENT OF GENERAL ADMINISTRATION
DIVISION OF CAPITOL FACILITIES

OUTAGE AND DCF SUPPORT REQUEST CHECK-LIST

CHECK-LIST TO BE COMPLETED FOR ALL APPROVED REQUESTS
BY THE APPROPRIATE DCF CUSTOMER SERVICE CENTER EMPLOYEE

1. Additional systems affected but not listed on the reverse side of this form: _____

_____

_____

2. Has (have) the appropriate agency facilities coordinator(s) been notified? ☐ Yes ☐ No

Coordinator Name: _____ Date Notified: ____/____/____ Time: ___:___

3. Others notified as appropriate:

Night Custodians: _____ Date Notified: ____/____/____ Time: ___:___

Alarm Center: _____ Date Notified: ____/____/____ Time: ___:___

Powerhouse: _____ Date Notified: ____/____/____ Time: ___:___

Fire Department: _____ Date Notified: ____/____/____ Time: ___:___

Campus Security (WSP): _____ Date Notified: ____/____/____ Time: ___:___

Elevator Maintenance: _____ Date Notified: ____/____/____ Time: ___:___

4. Keys (if applicable) issued for the following areas: _____

_____

Keys issued to (name): _____ Phone Number: _____

Key Issue Card attached: ☐ Yes ☐ No Date to be returned: _____/_____/_____

5. Copy of WR or SO attached: ☐ Yes ☐ No

6. If excavation is required, notify utilities coordinator at **1-800-424-5555.**

7. Log outage on *OUTAGE STATUS BOARD.*

Name of DCF Employee performing notification: _____ *Date:* ____/____/____

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. For requirements peculiar to a given product, material, or piece of equipment, see appropriate technical specification Section.

1.02 DEFINITIONS

A. Definitions used in this Section are not intended to change the meaning of other terms used in the Contract Documents.

1. Product: "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from the Contractor's previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
2. "Named Products" are items identified by the manufacturer's product name, including such items as a make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
3. "Materials" are products that must be shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
4. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.03 SUBMITTALS

A. See Section 01330 for submittal requirements.

B. Proposed Product List:

1. .
2. .

C. Long-Lead-Time Items

1. Provide copies of purchase orders for long-lead-time items to the Architect within thirty (30) days after receipt of Notice to Proceed.
2. Forward copies of acknowledgment, production and shipping schedules to Architect as they are received for all required items.

D. Submit three (3) copies in conformance with provisions of Article 2.03 below.

1.04 QUALITY ASSURANCE

A. To the fullest extent possible, provide products of the same kind from a single source.

B. When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options. Compatibility is a basic general requirement of product/material selections.

C. Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior. Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. All access routes, staging areas, loading restrictions, and other uses of the building shall be coordinated and approved by the A/E and Owner prior to the start of work. Ease of access to the building is limited and should be verified prior to moving materials.

B. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.

1. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing to prevent damage, deterioration, loss or theft. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage. Where appropriate, submit MSDS for all delivered products.
2. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
3. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
   1) Store with lids sealed, outside of building, all glues, adhesives, sealers, caulking, mastics, cleaners, paints, thinners and related flammable and hazardous materials.
3. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that quanitities are correct and that products are undamaged and properly protected. Reject damaged and defective items.
4. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units. Store and protect in accordance with manufacturers' instructions, with seals and labels intact and legible.
5. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
6. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.
7. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
8. Prevent contact with material that may cause corrosion, discoloration, or staining.
9. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.06 JOB CONDITIONS

A. Pre-Installation Conferences

1. At each meeting review progress of other work and preparations for particular work under consideration, including requirements of Contract Documents, options, related change orders, purchases, deliveries, shop drawings, product data, quality control samples, possible conflicts, compatibility problems, time schedules, weather limitations, temporary facilities, space and access limitations, structural limitations, governing regulations, safety, inspection and testing requirements, required performance results, recording requirements, and protections.
2. Record attendees, signification discussions of each conference, and agreements and disagreements, along with final plan of action; distribute record of meeting promptly to everyone concerned including A/E and Owner.
   a. Do not proceed with the work if associated pre-installation conference cannot be concluded successfully.
   b. Instigate actions to resolve impediments to performance of the work, and reconvene conference at earliest date feasible.
3. Discuss any pertinent issues at the weekly Progress Meetings; see Section PROJECT MEETINGS.

PART 2 - PRODUCTS

2.01 GENERAL PRODUCT REQUIREMENTS

A. Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.
   1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
   2. Standard Products: Where available, provide standard products of types which have been produced and used previously and successfully on other projects and in similar application.
   3. Color and Appearance Consistency of Finish Materials: All finish materials of their respective kinds, in regards to construction phasing, shall be consistent in color and appearance throughout the total Project and shall be purchased out of one dye lot, production run, batch, etc., as applicable, for the total Project for each respective material.

B. Additional Requirements: Material and equipment incorporated in to the work:
   1. Shall conform to applicable specifications and standards.
   2. Shall comply with size, make, type and quality specified or as specifically approved in writing by Architect.
   3. Shall be ASBESTOS, FORMALDEHYDE and LEAD FREE.
   4. Manufactured and Fabricated Products:
      a. Design, fabricate, and assemble in accordance with first-class "Workmanship" as defined in these Contract Documents.
      b. Manufacture like parts of duplicate units to standard sizes and gauges; parts to be interchangeable.
      c. Two or more items of the same kind to be identical and by same manufacturer (whether furnished under one Section or more).
      d. Products shall be suitable for service conditions.
      e. Adhere to indicated equipment capacities, sizes, and dimensions unless variations are specifically approved in writing.
      f. Except where field finishing is specified or otherwise required, products and fabricated items shall be pre-finished off-site.
   5. Do not use materials and equipment for other than designed or specified purposes and uses.

C. Nameplates: Except as otherwise indicated for required approval labels, and operating data, do not permanently attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view either in occupied spaces or on exterior of the work.

1. Labels: Locate required labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface which, in occupied spaces, is not conspicuous.
2. Equipment Nameplates: Provide permanent nameplate on each item of service-connected or power-operated equipment. Indicate manufacturer, product name, model number, serial number, capacity, speed, ratings and similar essential operating data. Locate nameplates on an easily accessed surface which, in occupied spaces, is not conspicuous.

2.02 PRODUCT SELECTION

A. The Contract Documents and governing regulations govern product selection. Procedures governing product selection include the following:

1. Proprietary Specification Requirements. Where only a single product or manufacturer is named, or indicates “no equals”, “no substitutions”, or “no exceptions”, provide the product indicated. Notify A/E if it is discovered that the named product does not comply with the contract documents, or is not appropriate for the function intended.
2. Semiproprietary Specification Requirements. Where two or more products or manufacturers are named, or indicates “no equals”, “no substitutions”, or “no exceptions”, provide one of the products indicated. . Notify A/E if it is discovered that none of the named products complies with the contract documents, or is not appropriate for the function intended.
3. Nonproprietary Specification Requirements. Where the Specifications list products or manufacturers, or indicate “or approved equal” or “other acceptable”, comply with Contract Document provisions concerning PRODUCT SUBSTITUTION to obtain approval for use of another product.
4. Descriptive Specification Requirements. Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
5. Performance Specification Requirements. Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated. Submit manufacturer's recommendations contained in published product literature or by the manufacturer's certification of performance for approval by A/E.
6. Visual Matching. Where matching an established sample is required, the A/E’s decision will be final on whether a proposed product matches satisfactorily.
   a. Where there is no product available within the specified category which matches satisfactorily and also complies with other specified requirements, comply with the provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category.
7. Visual Selection. Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures ..." or similar phrases, select a product and manufacturer that complies with other specified requirements. The A/E will select the color, pattern, and texture from the product line selected.

2.03 PRODUCT SUBSTITUTION

A. General Provisions

1. The requirements for substitutions do not apply to specified Subcontractor options on products and construction methods. Revisions to Contract Documents, where requested by Owner or Architect, are "changes" not "substitutions".
2. Subcontractor's determination of and compliance with governing regulations and orders issued by governing authorities do not constitute "substitutions" and do not constitute a basis for change orders, except as provided for in contract documents. Otherwise, the Subcontractor's requests for changes in products, materials and methods of construction required by contract documents are considered requests for "substitution", and are subject to requirements hereof.
3. If a bidder or Contractor desires approval of some material or product other than that specified, it shall submit a written request for approval of the substitute item in accordance with the following requirements:
   a. All such requests must be made on the SUBSTITUTION REQUEST FORM at end of this Section. Where specifications specify a product color and/or pattern, Contractor shall include a sample of proposed product/item at a size appropriate to make an evaluation with the specified product.
   b. No request for approval will be considered unless submitted in accordance with this Section.
   c. Final decision as to whether an item is an equal or satisfactory substitution rests with Owner.
4. Every substitution request must state whether the item offered is equal or equivalent to the specified product. The substitute material or product must be accompanied by its reference in the Contract Documents and complete catalog, technical and other information. If applicable, include samples showing comparison of physical and other pertinent characteristics as required to establish equivalence of acceptability for the proposed application. Where specific test results are required by the Contract Documents, the comparison data for the proposed item shall be based upon the same test methods as those specified, or they shall be correlated to clearly demonstrate comparability. The same guarantee described for the specified product is required for the substitution.

B. Substitutions – During Bidding Period: During the Bid period, submit substitution requests for approval of substitute materials or products, for all items indicated as proprietary or “approved equal” semi-proprietary. All requests shall be received by A/E no later than seven (7) days, or as indicated elsewhere in the Contract Documents, prior to scheduled time for receipt of bid in order to receive consideration. Bidders will be informed by addendum of additional materials and products approved for use. No other form of approval will be given during the bid period and bidders shall not rely upon any approval not incorporated into the Contract Documents in this manner.

C. Substitutions – After Starting Work: After Contract Award, substitution requests for approval of substitute materials or products for all items indicated as proprietary, semi-proprietary or “approved equal” will not be considered, unless one or more of the following conditions exists. With its request, Contractor shall indicate which condition it believes applies.

1. Unavailability. A substitution is required because the specified item is not available, due to factors beyond the control of Contractor. (Unavailability due to late order is not cause for substitution requests).
2. Unsuitability. Subsequent information or changes disclose inability of the specified item to perform as intended.
3. Regulatory Requirements. Final interpretation of Code, regulatory requirements, safety requirements, or insurance requirements necessitate a change due to inability of the specified item to conform.
4. Warranty. Manufacturer or fabricator cannot certify or warrant performance of specified item as required.
5. Owner's Benefit. In the judgment of the Contractor, acceptance of the proposed substitution is clearly in Owner's best interest because of cost, quality, or other

consideration. In requesting a substitution under this clause, Contractor shall furnish substantiation of any such reason.

D. Substitution requests for approval of substitute materials or products for all items **not** followed by restrictive language will be considered if the Contractor submits information and documentation as required by 2.03C above. The proposed product or material shall be equal or equivalent to the specified item and shall be subject to the same redesign and coordination as all substituted items.

1. Substitution requests submitted for an unnamed, non-prior approved product/ manufacturer where such products are specified by the listing of three or more named approved products/manufacturers, shall be accompanied with a check in the amount of $100, made payable to the A/E for additional time required to research and evaluate such unnamed product/manufacturer. Such payment will only afford review of such a submittal and does not guaranty said proposed substitute product/ manufacturer will be approved.

E. In making request for approval of substitute materials, the Bidder/Contractor shall represent that it has investigated the proposed product and, in its opinion, it is equal or superior in equivalence in all respects to that specified. Also, Contractor shall coordinate all trades including changes thereto as may be required, that it waives all claims for additional costs which subsequently become apparent as a consequence of the substitution, and that it will bear all costs related hereto, including costs of A/E's services for redesign, if deemed necessary.

F. Substitutions will not be considered if they are indicated or implied on Shop Drawings or other project data submittals, without proper notice shown on the SUBSTITUTION REQUEST FORM at the end of this Section. Submissions received that include products or manufacturers not listed in the specifications or approved on the form during the bid period will be returned and marked “Revise and Resubmit”.

G. Action By A/E

1. During Bidding Period: If the A/E approves any proposed substitution, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.
2. After Start of Work:
   a. Within one week of receipt of Contractor's request for substitution, the A/E will request whatever additional information or documentation may be needed for their evaluation of the request.
   b. Within two weeks of receipt of request, or within one week of receipt of requested additional information or documentation (whichever is later), the A/E will notify the Contractor of either their acceptance or rejection of the proposed substitution.
      1) Rejection will be the endorsement on the form provided by the Contractor and will include statement of the reasons for rejection (non-compliance with the requirements for requested substitutions, or other reasons as detailed).
      2) Acceptance will be the endorsement on the form provided the Contractor.

PART 3 - EXECUTION

3.01 INSPECTIONS & ACCEPTANCE OF SUBSTRATES

A. Installer's Inspection of Conditions

1. Require Installer of each major unit of work to inspect substrate to receive the work, and conditions under which the work will be performed, and to report (in writing to Contractor) unsatisfactory conditions.
2. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.
3.

B. Contractor's Inspection. Inspect each item of material or equipment immediately prior to installation, and reject damaged and defective items.

3.02 GENERAL INSTALLATION PROVISIONS

A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

1. When Contract Documents require installation of work to comply with Manufacturer's printed instructions, obtain and distribute instructions to concerned parties, including A/E, and field office, before starting that particular work.
2. Until project is complete, maintain at jobsite one (1) set of complete installation and maintenance instructions for materials and equipment.
3. Handle, install, connect, clean, condition and adjust products in accordance with Manufacturer's recommendations, directions and specified requirements.
   a. Should job conditions or specified requirements conflict with Manufacturer's instructions, consult with A/E for further instructions.
   b. Do not proceed with work without clear instructions.
4. Perform work in accordance with Manufacturer's instructions. Do not omit any preparatory step or installation procedure unless it is:
   a. Verified with and accepted by A/E in writing.
   b. Specifically modified or exempted by Contract Documents.
   c. Perform additional requirements that are specified which are greater than the manufacturer's requirements and do not have a deleterious affect on the product being installed.

B. Owner-Furnished Products

1. Refer to Drawings and/or Section 01110 for identification of Owner furnished products.
2. Owner's Responsibilities:
   a. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
   b. Arrange and pay for product delivery to site.
   c. On delivery, inspect products jointly with Contractor.
   d. Submit claims for transportation damage and replace damaged, defective, or deficient items.
   e. Arrange for manufacturers' warranties, inspections, and service.
3. Contractor's Responsibilities:
   a. Review Owner reviewed shop drawings, product data, and samples.
   b. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
   c. Handle, store, install and finish products.
   d. Repair or replace items damaged after receipt.

C. Attachment & Connection Devices & Methods

1. Provide attachment and connection devices and methods necessary for anchoring work securely and properly in place as it is installed; install true to line and level, and within recognized industry tolerances if not otherwise indicated.
2. Allow for expansions and building movements.
3. Provide uniform joint widths in exposed work, organized for best possible visual effect. Refer questionable visual-effect choices to A/E for final decision.

D. Precautions

1. Acclimate product to room conditions as required by standard specifications and/or as recommended by manufacturer.
2. Install work during conditions of temperature, humidity, exposure, forecasted weather, and status of project completion which will ensure best possible results for each unit of work, in coordination with entire work.
3. Isolate each unit of work from non-compatible work, as required to prevent deterioration.
4. Re-check measurements and dimensions of the work, as an integral step of starting each installation.
5. Coordinate enclosure (closing-in) of work with required inspections and tests, so as to avoid necessity of uncovering work for that purpose.

E. Mounting Heights: Except as otherwise indicated in the Contract Documents, mount individual units of work at industry recognized standard mounting heights, for applications indicated. Refer questionable mounting height choices to A/E for final decision.

F. In-Place Protection

1. General
   a. During handling and installation of work at project site, clean and protect work in progress and adjoining work on a basis of perpetual maintenance.
   b. Apply suitable protective covering on newly installed work where reasonably required to ensure freedom from damage or deterioration at time of Substantial Completion; otherwise, clean and perform maintenance on newly installed work as frequently as necessary through remainder of construction period.
   c. Adjust and lubricate moving components to ensure operability without damaging effects. Contractor is responsible for function, condition and unblemished appearance of all work on Project, and any item or work judged defective by A/E shall be subject to replacement at no additional cost to Owner.
2. To extent possible through reasonable control and protection methods, supervise performance of work in a manner and by means which will ensure that none of the work, whether completed or in progress, will be subjected to harmful, dangerous, damaging, or otherwise deleterious exposures during construction period.

G. Replacement: .

END OF SECTION 01600

SUBSTITUTION REQUEST FORM

TO: Design Firm
Address
City, Zip Code

ATTN: Project Manager

PROJECT NAME:

CONTRACTOR: _____

We hereby submit for consideration, the following product instead of the specified items for above project:

SECTION PARAGRAPH SPECIFIED ITEM

_____ _____ _____

Proposed substitution: _____

Attach complete dimensional information and technical data, including laboratory tests, if applicable.

Include complete information on changes to Drawings and Specifications which proposed substitution will require for its proper installation.

Submit with request all necessary samples and substantiating data to provide equal quality, performance, and appearance to that specified. Clearly mark Manufacturer's literature to indicate equality or equivalence in performance. Indicate differences in quality of materials and construction.

Fill in blanks below:

A. Does the substitution affect dimensions shown on Drawings:

___ No ___ Yes. If yes, clearly indicate changes:

_____

B. Will the undersigned pay for changes to the building design, including engineering and detailing costs caused by requested substitution?

_____

C. What effect does substitution have on other trades, other Contracts, and contract completion date?

_____

D. What effect does substitution have on applicable code requirements?

_____

E. Differences between proposed substitution and specified item.

_____

F. Manufacturer's warranties of the proposed and specified items are:

Same _ Different (explain) _____

G. List of names and addresses of 3 similar projects on which product was used, date of installation, and A/E's name and address. (Attach list with requested information)

H. Cost impact:_____

Undersigned attests function and quality are equal or equivalent to specified items.

CERTIFICATION OF EQUAL OR EQUIVALENT PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL OR EQUIVALENT PERFORMANCE

_____ Date _____
Signature

_____
Firm

_____

_____

_____
Address

_____
Telephone

Signature must be by person having authority to legally bind Contractor to the above terms.

For Use by A/E: ___ **Accepted** _____ **Not Accepted**

___ **Accepted As Noted** _____ **Received Too Late**

END OF FORM

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 PRELIMINARY WORK

A. Prior to the start of and during the course of above and below ground Work the Contractor shall make a thorough survey of the entire worksite to determine all potential hazards and notify the Owner in writing of any such hazards prior to the commencement of work. Workmen shall be made aware of those hazards and shall be instructed in procedures and the use of equipment for their protection. The Contractor shall verify the location, condition, and whether it is active or inactive of all utilities on and near the worksite and take precautions to protect all people working on the project, the general public, and the property.

B. Submit a site specific safety plan in accordance with Supplemental Conditions section 5.07.

1.03 IMMINENT DANGER

A. The Contractor shall be wholly responsible for all accidents or death occurring at any time during the progress or completion of this project which may happen to any person employed to perform work on this project; or for any injury or death its work, operations, or persons performing work on this project may cause to any person not employed in the work of this project; or for any damage its work, operations, or persons performing work on this project may cause to the work being constructed, or to any existing public or private property, either on or adjoining the project site or along any routes of travel. Completion of this project includes any time work is being performed on this project, even after final acceptance by the Owner.

1.04 SAFETY

A. The Contractor shall ensure that all persons, while on the work site, comply with the requirements of WISHA, these requirements, and the safety precautions contained in the several Specification Sections. The Contractor shall promptly and fully comply with, execute and, without separate charge thereof to the Owner, shall enforce compliance with the provisions of the latest adopted Washington Industrial Safety and Health Act, with particular attention paid but not limited to Chapter 296-155, WAC Safety Standards for Construction Work; with particular attention paid but not limited to Chapter 296-24 WAC General Safety and Health Standards; with particular attention paid but not limited to Chapters 296-27, 196-350 and 296-360 WAC regarding Administrative Safety and Health Act Chapter 49-17 RCW, and any addenda thereto.

B. The Contractor shall immediately advise the Owner of inspections conducted by WISHA at the work site, and shall transmit copies of reports, citations and violations to the Owner and A/E.

1.05 SAFETY RESPONSIBILITIES

A. Contractor shall be responsible to:

1. Ensure compliance with these requirements, WISHA requirements, and other safety requirements.
2. Authorize immediate action to correct substandard safety conditions.
3. Review and act to ensure compliance with safety procedures with its supervisors, subcontractors, and suppliers.
4. Make thorough daily safety inspections of the work site and immediately act to eliminate unsafe acts and unsafe conditions.
5. Investigate worksite accidents and recommend immediate corrective action.
6. Assist in the preparation of accident investigation and reporting procedures.
7. Be responsible for the control, availability, and use of safety equipment, including employee personal protective equipment.
8. Submit two (2) copies of site specific safety plan to Owner.

1.06 REQUEST FOR VARIANCES

A. Requests for variances to deviate from WISHA requirements must follow the current established procedures by that Agency.

1.07 FAILURE TO COMPLY

A. If work on the project is stopped due to the Contractor's failure to comply with the requirements of WISHA or other applicable safety requirements, no part of the time loss due to any such suspension of operations or stop orders shall be made the subject of a claim for extension of time or for increased cost or damage by the Contractor.

END OF SECTION 01712

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. General: This Section specifies administrative and procedural requirements for field-engineering services including, but not limited to, the following:

1. Utility verification
2. Work layout and control

1.03 SUBMITTALS

A. Submit a certificate signed by the land surveyor or professional engineer certifying the location and elevation of improvements.

B. Submit a record of Work performed and record survey data as required under provisions of Sections 01330 and 01780.

1.04 QUALITY ASSURANCE

A. Engage a land surveyor registered in Washington State to perform required land surveying services. The same firm shall provide the project record document for that work.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify layout information shown in the Documents, in relation to the property survey and existing benchmarks, before proceeding to lay out the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.

1. Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points or requirements to relocate reference points because of necessary changes in grades or locations.
2. Promptly replace lost or destroyed Project control points. Base replacements on the original survey control points.

B. Establish and maintain a minimum of 2 permanent benchmarks on the site, referenced to data established by survey control points.

   1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

C. The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction.

   1. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping.

3.02 PERFORMANCE

A. The Contractor shall include in his Bid retaining and paying all associated costs for the following:

   1. Registered land surveyor for project layout;
   2. Registered land surveyor to complete as-built survey at completion of the project.

B. Work from established lines and levels. Establish benchmarks and markers to set lines and levels for the construction and elsewhere as needed to locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.

   1. Advise entities engaged in construction activities of marked lines and levels provided for their use.
   2. As construction proceeds, check every major element for line, level, and plumb.

C. Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes, and invert elevations.

D. Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels, and control lines and levels required for mechanical and electrical work.

E. Furnish information necessary to adjust, move, or relocate existing structures, utility poles, lines, services, or other appurtenances located in or affected by construction. Coordinate with local authorities having jurisdiction.

F. At the completion of work, complete an as-built site survey covering the same site area, extent of detail, and scale as included in the Contract Documents; also including all changes and improvements resulting from work under this contract. Provide final Project Record Document in accordance with Section 01780.

END OF SECTION 01720

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. General Contractor is responsible for all cutting, fitting, and patching, required to complete the Work and to:

1. Make its several parts fit together properly;
2. Join new work to existing work;
3. Uncover portions of the Work to provide for installation of any ill-timed work;
4. Remove and replace defective work;
5. Remove and replace work not conforming to requirements of Contract Documents;
6. Remove samples of installed work as specified for testing;
7. Provide routine penetrations of non-structural surfaces for installation of piping, duct work, and electrical conduit.

[Specifier –Include for remodel projects requiring selective demolition]

B. In addition to selective demolition specified in Section 01731 and that specifically shown, cut, move or remove items necessary to provide access or to allow alterations and new work to proceed. Include such items as:

1. Removal of abandoned items and items serving no useful purpose, such as abandoned piping, conduit and wiring, and miscellaneous brackets, hardware and the like.
2. Cleaning of surfaces, and removal of surface finishes as needed to install new work and finishes.
3. Repair or removal of hazardous or unsanitary conditions.

C. Conduct X-ray inspections prior to any cutting to locate existing utilities not shown on the plans.

D. For additional requirements for cutting and patching see respective Specification Sections.

1.03 DEFINITIONS

A. "Cutting and patching" includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and patching required to restore surfaces to their original condition.

1. "Cutting and patching" is performed for coordination of the work, to uncover work for access or inspection, to obtain samples for testing, to permit alterations to be performed or for other similar purposes.
2. Cutting and patching performed during the manufacture of products, or during the initial fabrication, erection or installation processes is not considered to be "cutting and

patching" under this definition. Drilling of holes to install fasteners and similar operations are also not considered to be "cutting and patching".

3. "Selective Demolition" is recognized as related-but-separate categories of work, which may or may not require cutting and patching as defined in this Section.

1.04 SUBMITTALS

A. Submit written request to Owner and A/E a minimum of 48 hours in advance of executing any cutting and alteration affecting:

1. The work of the Owner or any separate Contractor;
2. Structural value or integrity of any element of Project;
3. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems;
4. Efficiency, operational life, maintenance, or safety of existing operational elements;
5. Visual quality of sight-exposed elements.

B. Include with Request:

1. Project identification;
2. Description of affected work and products to be used;
3. Necessity for cutting;
4. Effect on work of Owner or any separate Contractor;
5. If structural modifications is a contractor alternative to work shown in the Contract Documents, the Contractor shall retain and submit calcuations of a Washington State registered structural engineer that the proposed work will not change the load-carrying capacity or load-deflection ratio of the structural element;
6. Weatherproof integrity of Project;
7. Description of proposed work designating extent of cutting, patching or alteration. Include the following:
   a. name trades to be executing the Work;
   b. products proposed to be used;
   c. extent of refinishing to be done;
   d. alternatives to cutting and patching;
   e. where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with the original structure.
   f cost proposal (when applicable);
   g. written permission of any separate Contractor whose work will be affected;
   h. list of utilities that will be disturbed or otherwise affected by Work. Indicate duration of disruption.

C. Should work conditions or schedule indicate change of products from original installation, submit substitution request as specified in Section 01600.

D. Submit written notice to A/E designating date and time work will be uncovered.

E. Approval by the A/E to proceed with cutting and patching does not waive the A/E's right to later require complete removal and replacement of unsatisfactory work.

1.05 QUALITY ASSURANCE

A. Requirements For Structural Work: Do not cut-and-patch structural work in a manner resulting in reduction of load-carrying capacity or load/deflection ratio; submit proposed cutting and patching of structural elements to Architect for structural approval before proceeding.

B. Operational & Safety Limitations: Do not cut-and-patch operational elements and safety-related components in a manner resulting in reduction of capacities to perform in manner

intended, including energy performance, or resulting in decreased operational life, increased maintenance, or decreased safety.

C. Visual Requirements: Do not cut-and-patch work which is exposed on exterior or exposed in occupied spaces of buildings, in a manner resulting in reduction of visual qualities or resulting in substantial evidence of cut-and-patch work, both as judged solely by Architect. Remove and replace work judged by Architect to be cut-and-patched in a visually unsatisfactory manner.

1.06 WARRANTY

A. Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible if identical materials are unavailable or cannot be used. Use materials whose installed performance will equal or surpass that of existing materials.

B. Salvaged Materials: Salvage sufficient quantities of cut or removed material to replace damaged work of existing construction, when material is not readily obtainable on current market.

1. Store salvaged items in a dry, secure place on site, or deliver to Owner as noted.
2. Items not required for use in repair of existing work shall remain the property of Owner at the Owner's option; otherwise they shall become Contractor's salvage.
3. Salvaged items to be re-used shall be cleaned, refinished, etc., as appropriate before reinstallation.
4. Do not incorporate salvaged or used material in new construction except where specifically indicated or with written permission of A/E.

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.

1. Before proceeding, meet at the Project Site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

B. Prior to cutting into existing concrete or masonry, the Contractor shall conduct X-ray inspections to verify location of existing internal conditions (conduit, structural steel, etc.) to ensure that they will not be damaged during cutting and demolition work.

C. After uncovering work, inspect condition affecting product installations and work performance. Advise A/E in writing if there are conditions which will change the Contract Document requirements.

3.02 PREPARATION

A. Provide adequate temporary support of work to be cut to assure structural integrity of affected work and safety for Contractor and Owner personnel.

B. Protect existing and adjoining construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Avoid cutting existing pipe, conduit, or ductwork serving the building but scheduled to be removed or relocated until provisions have been made to bypass them.

3.03 PERFORMANCE

A. Employ skilled workmen to perform cutting and patching. Skilled shall mean workmen trained in the installation and repair of the specific material(s) impacted.

B. Execute cutting and removals by methods preventing damage to other work. Use core drilling equipment and diamond saws for cutting required openings in concrete and masonry. Provide proper surfaces to receive installation of repairs.

C. Work shall be performed under the direct supervision of the General Contractor and only by specialists or workers skilled in the necessary trades for materials requiring cutting and patching. Employ qualified installer or fabricator to perform cutting and patching for sight-exposed finished surfaces.

D. Execute fitting and adjustment of products to provide finished installations complying with specified products, functions, tolerances, and finishes.

E. Restore cut or removed work. Install new products as required to complete work in accordance with Contract Documents. Quality of patched or extended work shall be not less than that specified for new work.

F. Fit work air-tight to pipes, sleeves, ducts, conduit, and other surface penetrations. Maintain required clearance around pipe in accordance with National Fire Protection Association NFPA-13. Provide required firestopping in conjunction with patching.

G. Refinish entire surfaces as necessary to provide even finish matching adjacent finishes:

1. For continuous surfaces, refinish to nearest intersection.
2. For an assembly, refinish the entire unit.

3.04 CUTTING

A. Only sawcutting or core drilling of concrete and masonry are permitted; no jack hammering, hammering, or chopping. Limited use of rotohammers is acceptable. Use of these pieces of equipment shall occur when the building occupancy is at its lowest in the space adjoining the work.

B. Cut existing construction using methods least likely to damage elements retained or adjoining construction.

1. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
3. Where services are required to be removed, relocated, or abandoned, by-pass utility services, such as pipe or conduit, before cutting. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit flush with remaining wall, floor, or ceiling to prevent entrance of moisture or other foreign matter after by-passing and cutting.
4. Monitor cutting to detect any movement of surrounding work after cutting has occurred.

3.05 PATCHING

[Specifier –coordinate with mechanical and electrical spec sections]

A. Except as specified otherwise, all patching is the responsibility of the applicable trade and performed under the direction of the Contractor. All patching shall conform to the requirements set forth herein and to the standards set forth in these Contract Documents for applicable like work and materials.

B. Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
2. Patching shall match existing or adjacent surfaces, and shall match existing materials and assemblies so as to retain all existing fire ratings. Existing walls, floors, ceilings, beams and other building surfaces shall be neatly finished by patching, filling or otherwise as directed by the A/E.
3. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
4. Where removing walls or partitions extending from one finished area into another, patch and repair floor and wall surfaces at the removed area to obtain a uniform transition between any adjoining spaces. Provide an even surface of uniform color and appearance. If necessary to achieve uniform color and appearance, remove existing floor, wall and ceiling coverings and replace with new materials.
5. Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
6. Fit work air-tight to pipes, sleeves, ducts, conduit, and other surface penetrations.
7. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material allowed in these specifications to full thickness of the penetrated element.
8. When finished surfaces are cut in such a way that a smooth transition with new work is not possible, terminate existing surface in a neat manner along a straight line at a natural line of division, and provide trim appropriate to finished surface as approved by A/E.

C. Refinish entire surfaces from corner to corner or to change in material as necessary to provide an even finish matching adjacent finishes.

1. For continuous surfaces, refinish to nearest intersection.
2. For an assembly, refinish the entire unit.

3.06 CLEANING

A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

END OF SECTION 01730

GUIDE SPECIFICATIONS

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PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Provide all selective building remodel demolition as indicated on the Drawings, as specified herein, and as needed for complete and proper installation of new work indicated.

1.03 RELATED WORK IN OTHER SECTIONS

A. Temporary barriers and enclosures covered under Section 01500.

B. Cutting and patching including associated requirements for alteration work covered under Section 01730.

C. Construction waste management covered under Section 01732.

D. Hazardous materials abatement covered under Section 13280.

1.04 WORK TO BE REMOVED BY OWNER BEFORE STARTING WORK

A. Prior to selective building demolition work for this Project in existing buildings to remain, Owner will remove certain equipment, furnishings and inventory items as necessary for Contractor's progress of the Work.

1.05 SUBMITTALS

A. Submit demolition plan addressing the following, as applicable:

1. Location of dust and water barriers for work in each construction area, including details.
2. Proposed method of preventing dust/dirt/debris from entering into Owner occupied areas (control plan).
3. Occupant egress.
4. Demolition disposal route to dumpsters, including debris chute if used, and cleanup plan.
5. Proposed dust/dirt/debris control at dumpster and debris chute.
6. Schedule of activities that could disturb the Owner occupied areas (noise, smells, vibration, etc.).
7. Description of method(s) for protecting existing and installed work.
8. Schedule of required utiltity and building system shutdowns.
9. Schedule of demolition work in Owner occupied areas.
10. Daily cleanup plan for Owner occupied areas.
11. Identify demolition work (saw cutting, drilling, removal) that will involve or affect any structural element or part of the building structure.

12. Submit the proposed flooring and adhesive removal process to the Section 09650 and 09680 floor covering installers for review and approval.

1.06 PROJECT SITE CONDITIONS

A. Condition Of Building Prior To Selective Demolition: Accept premises on as "as-is" condition. Owner assumes no responsibility for building condition now, at time of bidding, nor thereafter. Damage or loss resulting from any cause to buildings, persons and/or property shall not relieve Contractor from his obligation to complete all work under the Contract.

B. Protection

1. General:
   a. Before beginning selective demolition activities, erect barriers, fences, overhead protection, walkways, covered passage ways, guard rails, chutes, shoring, and the like, to protect personnel, construction and vegetation.
   b. Construct temporary enclosures as required to limit dust and noise in conformance with respective requirements specified in Section 01500.
   c. Keep free of damage those portions of existing buildings which are to remain. Contractor shall provide total protection for all existing portions of buildings against damage caused by construction means and any or all weather elements including water leakage caused by the construction means.
   d. Use pneumatic-tired wheeling equipment or buggies over floors or in areas to remain.
   e. Any damage occurred shall be immediately corrected by the Contractor as directed by the Architect or Owner, at Contractor's expense.
   f. Cooperate with Owner for maintaining their continuous operations in all remaining portions of the existing facilities during the work of this Project.
   g. Remove temporary protection and cover when no longer needed.
2. Utilities: Keep building drains open for free drainage at all times. Take care not to cause damage to any existing utilities; if damaged, repair such damage at no cost to Owner in manner approved by the applicable utility.
3. Tree and Plant Protection: Refer to Section 01500, paragraph 3.04G.

C. Maintain security at all times of existing buildings and mechanical/electrical systems to remain. Refer to Section 01500, paragraph 1.09F, for additional security requirements.

D. Service Outages: Refer to Section 01500, pargraph 1.09J.

E. Traffic Maintenance and Control: Refer to Section 01500, paragraph 3.03L.

F. Dust Control: Refer to Section 01500, paragraph 3.04F.

G. Indoor Air Quality: Refer to Section 01734, Indoor Air Quality.

H. Hazardous Material Discovery: See Section 13280, Hazardous Material Abatement, for discovery of asbestos containing materials and other hazardous materials during demolition operations.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.01 INSPECTION

A. Building Examination

1. Prior to Starting Demolition: Contractor and Owner to make a complete inspection of condition of the existing buildings, including visible defects. Make careful notes on condition of the existing work. Inspection report to be accepted and signed by both parties to the survey.
2. At Completion of Demolition: Contractor and Owner to make examination for possible damage to the building facilities caused by demolition work. Examination report to be accepted and signed by both parties to the inspection where no damage is apparent.

3.02 DEMOLITION

A. Selective Building Demolition - General

1. Do all demolition, drilling and/or removal work, as applicable, required for the completion of new work in existing buildings to remain as shown on Drawings or specified. Refer to Demolition Plans and associated Drawings and details for specific items of construction to be removed and other demolition requirements for the new work.
2. The extent of demolition required for the entire project shall be verified by the Contractor at the jobsite and performed to the fullest extent required due to actual job conditions and requirements of new work indicated.
3. Where demolition occurs next to existing work to remain, remove carefully only those items required for placing new work.
4. Remove all loose material caused by or remaining from demolition work. Cut openings and/or pockets neatly ready for installation of new work. Use carborundum saws or approved means or devices where cuts will remain exposed in the completed work.
5. Coordinate demolition work with work in other Sections.

B. Materials & Equipment To Be Removed For Re-Use Or Turned Over To Owner

1. Carefully remove, disassemble or dismantle and store on the site those items to be removed and re-used in the completed work or retained by Owner, all as indicated on the Drawings and/or as specified.
2. Prior to removing any additional removed or demolished re-usable salvaged materials from site, Owner shall inspect said materials for selection of additional items to be retain. Carefully remove, disassemble or dismantle and deliver salvage materials and equipment and store in approved locations on site, as directed.
3. All other debris and non-selected materials and equipment shall become the property of the Contractor and removed from site.

C. Debris

1. Remove debris from buildings and grounds and haul away from site as work proceeds, all at Contractor's expense. Allow no debris to accumulate on grounds or within buildings.
2. Contractor shall thoroughly clean entire Project area of demolition debris and dust prior to installation of any new work.

3.03 SALVAGE

A. To Owner

1. Owner to retain title of items to be removed for re-use in the new Work and as otherwise indicated or selected by the Owner to be retained as specified above.
2. Carefully deliver salvage materials and equipment and store in approved locations on site, as directed.

B. To Contractor: Remove from site all other equipment and materials removed for new work and not otherwise specified and/or selected by Owner to be retained or re-used in the new work; let no removed said material accumulate at site.

END OF SECTION 01731

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 DESCRIPTION

A. The Owner desires that this project shall generate the least amount of waste possible and that processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors shall be employed.

B. Of the waste material that is generated, as much as economically feasible shall be reused, salvaged, or recycled. This is consistent with the intent of RCW 39.04.135 and is mandated whenever practicable.

D. With these goals, the contractor shall develop a Waste Management Plan for this project.

1.03 DEFINITIONS

A. Chemical Waste: Includes petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals and inorganic wastes.

B. Class III Landfill: A landfill that accepts non-hazardous waste such as household, commercial and industrial waste, including construction, remodeling, repair and demolition operations.

C. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

D. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

E. Environmental Pollution and Damage: The presents of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humanity; or degrade the utility of the environment for aesthetic, cultural or historical purposes.

F. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

G. Inert Fill: A permitted facility that accepts inert waste such as asphalt and concrete exclusively.

1. Inert Solids / Inert Waste: Non-liquid solid waste including, but not limited to, soil and concrete, that does not contain hazardous waste or soluble pollutants at concentrations in

excess of water-quality objectives established by a regional water board pursuant to local regulations and does not contain significant quantities of decomposable solid waste.

H. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

I. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

J. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

K. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

L. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

M. Return: To give back reusable items or unused products to vendors for credit.

N. Reuse: To reuse a construction waste material in some manner on the project site.

O. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

P. Sanitary Wastes:

1. Garbage: Refuse and scraps resulting from preparation, cooking, distribution or consumption of food.
2. Sewage: Domestic sanitary sewage.

Q. Sediment: Soil and other debris that has been eroded and transported by storm or well production runoff water.

R. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

S. Toxic: Poisonous to humans either immediately or after a long period of exposure.

T. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

U. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

A. See Section 01330 for submittal procedures.

B. Landfill Alternatives Proposal – Draft Waste Management Plan: Within 14 working days after receipt of Notice to Proceed, or prior to any trash or waste removal, whichever occurs first, Contractor shall submit to the A/E and Owner for review and approval three (3) copies of the Draft Waste Management Plan projecting trash/waste that will require disposal and alternatives to landfilling, with net costs. The plan shall contain, as a minimum, the following:

1. An analysis of trash/waste to be generated and landfill options as specified for Waste Management Plan described below.

2. Describe as many alternatives to landfilling as possible.
   a. List each material proposed to be salvaged, reused, or recycled during the course of the Project.
   b. Estimate quantities for each waste stream.
   c. State the proposed recycle or disposal method for each waste stream.
   d. State on-site storage method for each waste stream.
   e. State transporation method for each wast stream.
   f. State the estimated net cost resulting from each alternative, after subtracting revenue from sale of recycled or salvaged materials and landfill tipping fees saved due to diversion of materials from the landfill.
3. Provide alternatives to landfilling for at least the following materials:
   a. Aluminum and plastic beverage containers.
   b. Corrugated cardboard.
   c. Wood pallets.
   d. Clean dimensional wood: May be used as blocking or furring.
   e. Land clearing debris.
   f. Excavated soils.
   g. Concrete: May be crushed and used as riprap, aggregate, sub-base material, or fill.
   h. Bricks.
   i. Concrete masonry units (CMUs).
   j. Precast concrete panels.
   k. Asphalt paving: May be recycled into paving for project.
   l. Metals, including packaging banding, metal studs and trim, ductwork, piping, sheet metal, structural steel, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
   m. Glass.
   n. Gypsum drywall and plaster.
   o. Carpet, carpet cushion, carpet tile, and carpet remnants, both new and removed: DuPont (http://flooring.dupont.com) and Interface (www.interfaceinc.com) conduct reclamation programs.
   p. Asphalt roofing shingles.
   q. Paint.
   r. Plastic sheeting.
   s. Rigid foam insulation.
   t. Plumbing fixtures.
   u. Mechanical and electrical equipment.
   v. Fluorescent lamps (light bulbs).
   w. Acoustical ceiling tile and panels.
4. Include the names for each subcontractor who will transport solid or hazardous waste from the site and the name of the receiving facility that will accept waste for disposal.

C. Review and Approval: The Draft Waste Management Plan will be reviewed by the A/E for comment and approval with a copy going to the Owner.

1. The plan is checked to make sure all materials that may be economically recycled are listed.
2. The plan is also checked for the haulers, recyclers and disposal facilities, to include recycling, general waste and hazardous waste facilities.
3. Plan review comments are made by the A/E. Once an acceptable response is received the plan is approved.

D. Waste Management Plan: Include the following information:

1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.

2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
   a. List each material proposed to be salvaged, reused, or recycled.
   b. List the local market for each material.
   c. State the estimated net cost, versus landfill disposal.
4. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
5. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.
7. Recycling Incentives: Describe procedures required to obtain credits, rebates, or similar incentives.

E. Implementation: The Contractor shall submit monthly a progress report summary of waste generated at the project. The summary shall be submitted on a form acceptable to the Owner and shall contain the following information:

1. For each material recycled, reused, or salvaged from the project, the amount (in tons or cubic yards), the date removed from the job site, the receiving party, the transportation cost, the amount of any money paid or received for the recycled or salvaged material, the net total cost or savings of salvage or recycling the material. Include manifests, weight ticket receipts or invoices.
2. The amount (in tons or cubic yards) of material landfilled from the project, the location of the receiving facility, the total amount of tip fees paid at the landfill, and the total disposal cost. Include manifests, weight tickets, receipts and invoices.

[OR]

E. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.

1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
2. Submit Report on a form acceptable to Owner; refer to sample and blank forms immediately following this Section.
3. Landfill Disposal: Include the following information:
   a. Identification of material.
   b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
   c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
   d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
4. Incinerator Disposal: Include the following information:
   a. Identification of material.
   b. Amount, in tons or cubic yards, of trash/waste material from the project delivered to incinerators.
   c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.

d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.

5. Recycled and Salvaged Materials: Include the following information for each:
   a. Identification of material, including those retrieved by installer for use on other projects.
   b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
   c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
   d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
6. Material Reused on Project: Include the following information for each:
   a. Identification of material and how it was used in the project.
   b. Amount, in tons or cubic yards.
   c. Include weight tickets as evidence of quantity.
7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

F. Recycling Incentive Programs:

1. Where revenue accrues to Contractor, submit copies of documentation required to qualify for incentive.
2. Where revenue accrues to Owner, submit any additional documentation required by Owner in addition to information provided in periodic Waste Disposal Report.

[OR]

F. Rebate Program Submittal: Prepare 3-ring binder with rebate information and product documentation as required for Owner to qualify for Rebate Programs. Submit binder with final closeout submittals.

1.05 RESOURCES

A. Contractor may request specific technical assistance or referrals from the following resources:

1. Sustainable Design and Construction
   Program Coordinator
   Facilities Engineering Services Group
   Engineering and A/Eural Services
   Department of General Administration
   (360) 902-7199

2. Waste Reduction Specialist
   Solid Waste Services Program
   Department of Ecology
   (360) 407-6352

B. Recycling Centers

1. City of Olympia provides hauling services to local processors. They do not charge a rental fee for bins, but do charge to haul the material plus any fees charged by the processor (pass through fee). Advantage to using them: deal with only one hauler. They will transfer any recyclable accepted by Pacific Disposal, Jones Quarry or local composting operations. They also haul garbage for City of Olympia customers.
2. The following is a partial list of local Recycling Centers for Contractor's information only. For more information, contact the Department of Ecology Recycling (1-800-RECYCLE) or the Solid Waste Department of nearby Counties.

a. Asphalt, Brick and Concrete:
City of Olympia - (360) 753-8368.
Jones Quarry, Tumwater - (360) 352-1022.
Pacific Disposal, Tumwater - (360) 352-2046.
Randles Sand & Gravel, Puyallup (self-haul) - (206) 531-6800.
Foran Waste Landfill, Tacoma (self-haul) - (206) 572-2867.
Rhine Demolition, Tacoma (self-haul) - (206) 537-5852.
Woodworth & Co., Tacoma (3-tab roofing all self-haul) - (206) 383-3585.

b. Pure Porcelain:
City of Olympia - (360) 753-8368.
Jones Quarry, Tumwater - (360) 352-1022.
Pacific Disposal, Tumwater - (360) 352-2046.

c. Window Glass:
City of Olympia - (360) 753-8368.
Jones Quarry, Tumwater - (360) 352-1022.
Pacific Disposal, Tumwater - (360) 352-2046.

d. Clean Wood:
Campbell's Chipping, Olympia - (360) 866-8134.
Hawks Prairie Compost Center, Lacey - (360) 754-4348.
Rainier Wood Recyclers, Lacey (clean construction debris like plywood and 2s4's, no paint) - (360) 456-5557.
City of Olympia - (360) 753-8368.
Jones Quarry, Tumwater - (360) 352-1022.
NW Waste Wood Management, Tumwater - (360) 493-1197 (pager: 360/971-7508).
Pacific Disposal, Tumwater - (360) 352-2046.
Recovery One, Tumwater - (360) 956-9510.
Recovery One, Tacoma (no drywall, roofing, carpeting, or insulation; but wood, metals, nails and screws are okay) - (206) 627-1180.
Rhine Demolition, Tacoma - (206) 537-5852.

e. Water-Based Painted Wood:
City of Olympia - (360) 753-8368.
Pacific Disposal, Tumwater - (360) 352-2046.
Recovery One, Tumwater - (360) 956-9510.
Recovery One, Tacoma - (206) 627-1180.

f. Land Clearing Debris:
Campbell's Chipping, Olympia - (360) 866-8134.
Rainier Wood Recyclers, Lacey - (360) 456-5557.
Recovery One, Tumwater - (360) 956-9510.
Randles Sand & Gravel, Puyallup - (206) 531-6800.
Recovery One, Tacoma - (206) 627-1180.

g. Stumps:
Rainier Wood Recyclers, Lacey - (360) 456-5557.
NW Waste Wood Management, Tumwater - (360) 493-1197 (pager: 360/971-7508).
Recovery One, Tumwater - (360) 956-9510.
Randles Sand & Gravel, Puyallup - (206) 531-6800.
Recovery One, Tacoma - (206) 627-1180.

h. On-Site Grinding:
Campbell's Chipping, Olympia - (360) 866-8134.
Rainier Wood Recyclers, Lacey - (360) 456-5557.

Jones Quarry, Tumwater - (360) 352-1022.

i. Soils:
Jones Quarry, Tumwater - (360) 352-1022.
Randles Sand & Gravel, Puyallup - (206) 531-6800.
Foran Waste Landfill, Tacoma - (206) 572-2867.

j. Carpet Padding:
L&W Distribution, Kent (have pick-up service; polyurethane padding; no rubber waffle pad) - (206) 852-9080.
Patrick's Floor Express and B&R have drop-off trailers.

k. Corrugated Cardboard:
City of Olympia - (360) 753-8368.
Pacific Disposal, Tumwater - (360) 352-2046.

l. Drywall:
City of Olympia - (360) 753-8368.
Pacific Disposal, Tumwater (no painted at all) - (360) 352-2046.
New West Gypsum, Fife (no lead painted drywall) - (206) 922-9343.

m. Metals:
J&J Salvage, Lacey - (360) 754-5865.
Law Recycling, Lacey - (360) 456-5555.
Rochester Recycle & Salvage, Rochester - (360) 273-5358.
Pacific Disposal, Tumwater - (360) 352-2046.
South Sound Steel, Tumwater - (360)705-3532.

n. Co-Mingled Recyclables:
City of Olympia - (360) 753-8368.
Pacific Disposal, Tumwater - (360) 352-2046.

C. Waste Haulers The following is a partial list of local waste haulers for Contractor's information only. For more information, contact the Department of Ecology Recycling (1-800-RECYCLE) or the Solid Waste Department of City of Olympia or Thurston County.

Campbell's Chipping, Olympia - (360) 866-8134.
J&J Salvage, Lacey - (360) 754-5865.
Law Recycling, Lacey - (360) 456-5555.
Rainier Wood Recyclers, Lacey - (360) 456-5557.
Rochester Recycle & Salvage, Rochester - (360) 273-5358.
City of Olympia - (360) 753-8368.
All-Star, Tumwater - (360) 352-0438.
Jones Quarry, Tumwater - (360) 352-1022.
Pacific Disposal, Tumwater - (360) 352-2046.
Hub Recycling, Centralia - (360) 736-0741.
Recycle Services, Centralia - (800) 525-4167.
New West Gypsum, Fife - (206) 922-9343.
Pallets Reconditioned, Puyallup - (206) 897-2466.
Randles Sand & Gravel, Puyallup - (206) 531-6800.
Tacoma Recycling Co. Inc., Tacoma - (206)474-9559.
Woodworth & Co., Tacoma - (206) 383-3585.

1.06 ADDITIONAL RECYCLING REQUIREMENTS

A. Handling

1. Materials shall be free of dirt, adhesives, solvents, petroleum contamination and other substances deleterious to recycling process. Clean materials which are contaminated prior to placing in collection containers.
2. Arrange for collection by or delivery to the appropriate recycling center or transfer station that accepts construction and demolition waste for purpose of recycling.

B. Participation In Re-Use Programs

1. Industrial Materials Exchange (IMEX) program sponsored by the Local Hazardous Waste Management Program in King County.
   a. IMEX is a free service designed to help businesses find markets for materials that traditionally would be discarded. The premise of the IMEX program is that material discarded by one business may be a resource for another business.
   b. To obtain a current Materials Listings Catalog, call IMEX at (206) 296-4899.
2. Habitat for Humanity - South Puget Sound, a non-profit housing organization that rehabilitates and builds housing for low income families.
   a. Sites requiring donated materials vary. Contact HFH at (360) 956-3456.

C. Rebate, Tax Credits, Etc.: Rebates, tax credits and other savings obtained for recycled or re-used materials shall accrue to Contractor.

PART 2 - PRODUCTS

2.01 PRODUCT SUBSTITUTIONS

A. Notify Owner's Representative when Contractor is aware of materials, equipment or products that meet the aesthetic and programmatic intent of Contract Documents, but which are more environmentally-sensitive than materials, equipment or products specified or indicated in the Contract Documents.

B. For each proposed product substitution, submit the following information in addition to requirements specified in Section 01600:

1. Relative amount of waste produced, compared to specified product.
2. Cost savings on waste disposal, compared to specified product, to be deducted from the Contract Sum.
3. Proposed disposal method for waste product.
4. Markets for recycled waste product.

PART 3 - EXECUTION

3.01 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.

1. Pre-bid meeting.
2. Pre-construction meeting.
3. Regular job-site meetings.
4. Job safety meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.

1. As a minimum, provide:
   a. Separate area for storage of materials to be reused on-site, such as wood cut-offs for blocking.
   b. Separate dumpsters for each category of recyclable.
   c. Recycling bins at worker lunch area.
2. Provide containers as required.
3. Provide temporary enclosures around piles of separated materials to be recycled or salvaged.
4. Provide materials for barriers and enclosures that are nonhazardous, recyclable, or reusable to the maximum extent possible; reuse project construction waste materials if possible.
5. Locate enclosures out of the way of construction traffic.
6. Provide adequate space for pick-up and delivery and convenience to subcontractors.
7. If an enclosed area is not provided, clearly lay out and label a specific area on-site.
8. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

J. Disposal Operations:

1. Promptly and legally transport and dispose of removed and demolished items and waste materials that are not identifie-d to be recycled or reused.
2. Do not burn, bury or otherwise dispose of rubbish and waste materials on project site.

END OF SECTION 01732

Demolition and Construction Waste Management Plan ***SAMPLE***

Project Name: Student Hall Contact/Phone: Joe Smith / (206) 555-2222
Expansion
Project Location: Washington Community College, Green City

Material	Estimated Quantity	Proposed Disposal Method	Proposed Handling Procedure	Hauler
Demolition				
Asphalt from parking lot	100 tons	Ground on-site, use as fill		
Wood framing	6 tons	Recycle - Wood Recycling NW	Separate into "clean wood" dumpster, nails ok.	A
Decorative wood beams	300 bd.ft.	Salvage - Green City Salvage	Remove by hand, store on site, on pallets, for pick up.	C
CMU block	60 tons	Ground on-site, use as fill		
Ceiling tile	10,000 SF	Recycle - A-1 Ceiling Tile	Remove whole, Stack on pallets and shrink wrap for pick up.	E
Metal track	4 tons	Recycle - Green City Metals	Separate into "metals" dumpster.	A
Doors	40	Salvage - Green City Salvage	Work with salvage company to remove by hand.	C
Sheet rock	30 tons	Recycle - Green's Gyp Recycle	Separate into "Gypsum Board" dumpster, no lead paint.	A
Carpet	30 CU YDS	Recycle - D-2 Carpets	Separate into "Carpet" dumpster, provided by D-2.	B
Fluorescent lamps	1,000	Recycle - Green's Hazardous Wst.	Use boxes and store in dry location on site for pick up.	A
Fluorescent ballasts	400	Recycle - Green's Hazardous Wst.	Use in drums and store in dry location on site for pick up.	A
Remaining wastes	8 tons	Garbage - City Disposal	Dispose in "trash" dumpster.	D
New Construction				
Concrete, brick & CMU	10 tons	Recycle - Green's Quarry	Break up (2' minus) and put in "concrete" dumpster.	A
Forming boards		Reuse then recycle - Wood Recy.	Reuse, then put in "clean wood" dumpster	A
Clean wood scrap	4 tons	Recycle - Wood Recycling NW	Separate into "clean wood" dumpster, nails ok.	A
Sheet rock	8 tons	Recycle - Green's Gyp Recycle	Separate into "Gypsum Board" dumpster, no lead paint.	A
Scrap metal	4 tons	Recycle - Green City Metals	Separate into "metals" dumpster.	A
Cardboard	10 CU YDS	Recycle - Green City Recycle	Separate into "cardboard" dumpster.	A
All other wastes	8 tons	Garbage - City Disposal	Dispose in "trash" dumpster.	D

Haulers: A - Acme Hauling D - City Disposal
B - EZ Carpet recycling E - A-1 Ceiling Tile
C - Green City Salvage

Demolition and Construction Waste Management Plan

Project Name:_____ **Contact/Phone:**_____

Project Location:_____

Material	Quantity	Disposal Method	Proposed Handling Procedure	Hauler
Demolition				
New Construction				

Haulers: A

_____

B

_____

C

_____

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SECTION INCLUDES

A. Construction procedures to promote adequate indoor air quality after construction.

B. Building flush-out after construction and before occupancy.

C. Testing indoor air quality before commencement of construction; existing building areas only.

D. Testing indoor air quality after completion of construction.

E. Testing air change effectiveness after completion of construction.

1.03 PROJECT GOALS

A. Dust and Airborne Particulates: Prevent deposition of dust and other particulates in HVAC ducts and equipment.

1. Cleaning of ductwork is not contemplated under this Contract.
2. Contractor shall bear the cost of cleaning required due to failure to protect ducts and equipment from construction dust.
3. Establish condition of existing ducts and equipment prior to start of alterations.

B. Airborne Contaminants: Procedures and products have been specified to minimize indoor air pollutants.

1. Furnish products meeting the specifications.
2. Avoid construction practices that could result in contamination of installed products leading to indoor air pollution.

C. Ventilation: HVAC system has been designed to achieve the minimum requirements for ventilation specified in ASHRAE 62 with air change effectiveness of 0.9 or greater.

1.04 REFERENCES

A. ASHRAE Std 62 - Ventilation For Acceptable Indoor Air Quality; 2001.

B. ASHRAE Std 129 - Measuring Air-Change Effectiveness; 1997.

C. SMACNA (OCC) - IAQ Guideline for Occupied Buildings Under Construction; 1995.

1.05 DEFINITIONS

A. Adsorptive Materials: Gypsum board, acoustical ceiling tile and panels, carpet and carpet tile, fabrics, fibrous insulation, and other similar products.

B. Contaminants: Gases, vapors, regulated pollutants, airborne mold and mildew, and the like, as specified.

C. Particulates: Dust, dirt, and other airborne solid matter.

D. Wet Work: Concrete, plaster, coatings, and other products that emit water vapor or volatile organic compounds during installation, drying, or curing.

1.06 SUBMITTALS

A. See Section 01330 for submittal procedures.

B. Indoor Air Quality Management Plan: Describe in detail measures to be taken to promote adequate indoor air quality upon completion; use SMACNA IAQ Guidelines for Occupied Buildings Under Construction as a guide.

1. Submit not less than 60 days before enclosure of building.
2. Identify potential sources of odor and dust.
3. Identify construction activities likely to produce odor or dust.
4. Identify areas of project potentially affected, especially occupied areas.
5. Evaluate potential problems by severity and describe methods of control.
6. Describe construction ventilation to be provided, including type and duration of ventilation, use of permanent HVAC systems, types of filters and schedule for replacement of filters.
7. Describe cleaning and dust control procedures.

C. Interior Finishes Installation Schedule: Identify each interior finish that either generates odors, moisture, or vapors or is susceptible to adsorption of odors and vapors, and indicate air handling zone, sequence of application, and curing times.

D. Duct and Terminal Unit Inspection Report.

E. Air Contaminant Test Plan: Identify:

1. Testing agency qualifications.
2. Locations and scheduling of air sampling.
3. Test procedures, in detail.
4. Test instruments and apparatus.
5. Sampling methods.

F. Air Contaminant Test Reports: Show:

1. Location where each sample was taken, and time.
2. Test values for each air sample; average the values of each set of 3.
3. HVAC operating conditions.
4. Certification of test equipment calibration.
5. Other conditions or discrepancies that might have influenced results.

G. Ventilation Effectiveness Test Plan: Identify:

1. Testing agency qualifications.
2. Description of test spaces, including locations of air sampling.
3. Test procedures, in detail; state whether tracer gas decay or step-up will be used.
4. Test instruments and apparatus; identify tracer gas to be used.

5. Sampling methods.

H. Ventilation Effectiveness Test Reports: Show:

1. Include preliminary tests of instruments and apparatus and of test spaces.
2. Calculation of ventilation effectiveness, E.
3. Location where each sample was taken, and time.
4. Test values for each air sample.
5. HVAC operating conditions.
6. Other information specified in ASHRAE 129.
7. Other conditions or discrepancies that might have influenced results.

1.07 QUALITY ASSURANCE

A. Testing and Inspection Agency Qualifications: Independent testing agency having minimum of 5 years experience in performing the types of testing specified.

PART 2 PRODUCTS

Not Used.

OR

[2.01 MATERIALS

A. Low VOC Materials: See Section 01115, Green Building Requirements, for specific requirements for materials with low VOC content.]

PART 3 EXECUTION

3.01 CONSTRUCTION PROCEDURES - GENERAL

A. Prevent the absorption of moisture and humidity by adsorptive materials by:

1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
3. Provide sufficient ventilation for drying within reasonable time frame.

B. Begin construction ventilation when building is substantially enclosed.

C. If extremely dusty or dirty work must be conducted inside the building, shut down HVAC systems for the duration; remove dust and dirt completely before restarting systems.

D. When working in a portion of an occupied building, prevent movement of air from construction area to occupied area or into building HVAC system.

E. All tool and equipment used within a building return air space shall be equipped with a filter system to reduce the introduction of particulate and odor into the return air.

F. Fabricated products shall be pre-finished off-site wherever practical and to the greatest extent possible. The use of spray equipment for applying finishes in buildings shall be used only upon approval of Owner.

G. Provide temporary seal over all open ends of newly installed ductwork during the construction duration, until initial startup of associated HVAC system equipment.

H. HVAC equipment and supply air ductwork may be used for ventilation during construction:

1. Operate HVAC system on 100 percent outside air, with 1.5 air changes per hour, minimum.
2. Ensure that air filters are correctly installed prior to starting use; replace filters when they lose efficiency.
3. Do not use return air ductwork for ventilation unless absolutely necessary and only then with approved filtering methods.
4. Where return air ducts must be used for ventilation, install auxiliary filters at return inlets, sealed to ducts; use filters with at least the equivalent efficiency as those required at supply air side; inspect and replace filters when they lose efficiency.

I. Do not store construction materials or waste in mechanical or electrical rooms.

J. Prior to use of return air ductwork without intake filters clean up and remove dust and debris generated by construction activities.

1. Inspect duct intakes, return air grilles, and terminal units for dust.
2. Clean plenum spaces, including top sides of lay-in ceilings, outsides of ducts, tops of pipes and conduit.
3. Clean tops of doors and frames.
4. Clean mechanical and electrical rooms, including tops of pipes, ducts, and conduit, equipment, and supports.
5. Clean return plenums of air handling units.
6. Remove intake filters last, after cleaning is complete.

K. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.

L. Use other relevant recommendations of SMACNA IAQ Guideline for Occupied Buildings Under Construction for avoiding unnecessary contamination due to construction procedures.

3.02 ADDITIONAL CONSTRUCTION PROCEDURES FOR OCCUPIED BUILDINGS

A. Tenants have varying degrees of sensitvity to both air borne and settled dust which could be exacerbated during the construction process. In addition, certain areas may operate in a clean room environment and dust can create serious operational problems.

B. The Owner may perform an independent indoor air quality (IAQ) test prior to the beginning of construction which will be used as the baseline level for the building. ~~A~~ When performed, a copy of this report will be given to the Contractor prior to the beginning of any construction activity. The Owner may perform similar air quality tests on a periodic basis throughout construction. The results of these tests will be compared to the baseline test and the results will be analyzed by the Owner to determine if acceptable indoor air quality is being maintained.

C. The Contractor shall be responsible for proposing and employing any mitigation measures required to ensure that air quality levels and dust control during construction do not exceed the baseline levels measured prior to construction. These measures may include, but not be limited to, temporary construction barriers, negative air machines, exhaust venting to the exterior, filters on mechanical ductwork, charcoal filtering systems, and the like.

D. The Contractor shall be responsible for maintaining the baseline indoor air quality (IAQ) of the environment outside of the limits of construction throughout the duration of the project. Areas within the limits of construction, where those areas are completely isolated from the adjacent

environment, are not required to comply with the requirements of this section except as noted below.

E. Dust and other construction debris, which may not be quantitatively measured by the IAQ testing described above, shall be mitigated throughout the project. Dust and debris settling on building surfaces outside of the limits of construction shall be cleaned thoroughly at the end of each working shift. In addition, dust and debris on paths within the limits of construction as identified on the drawings shall be cleaned to avoid tracking dust outside of these areas.

F. IAQ and dust control measures on previous projects have been monitored closely by the Owner and have required significant attention by the Contractor. This attention involves both time and dust mitigation procedures that may be considered by the Contractor to be beyond those measures employed on other projects in which the Contractor is typically involved.

1. Contractor shall anticipate that significant attention to IAQ, dust control and daily cleaning will be required by this project and shall include all mitigation measures required to meet the requirements of this project in the base bid. No additional costs shall be approved for providing IAQ compliance, dust control mitigation or project cleaning measures.

G. Contractor shall ensure that procedures, engineering controls, and other appropriate controls are utilized to maintain acceptable indoor air quality for building occupants during this Project. Before work is commenced, Contractor shall submit to the Owner a Work Plan designed to maintain indoor air quality during and after the Contractor's work. The Work Plan shall include the following:

1. Material Safety Data Sheets (MSDS) for all 'off-gassing products Contractor intends to use; these include all glues, adhesives, sealers, caulking, mastics, cleaners, paints, thinners, and related products.
2. Curtailment, and/or supplemental or auxiliary workplace ventilation during the work as required to control contaminants, odors, vapors, and the like, from entering the intake system and to vent same directly outside.
3. Contractor work schedule.
4. Fume, dust, and odor suppression and/or auxiliary air filtration/cleaning.
5. Use of low hazard or low-emitting materials.
6. Plan for eliminating contaminant entry into HVAC system including outside air intakes.
7. Work practices that minimize contaminant generation.
8. Other appropriate hygiene practices.
9. Contractor contact person for IAQ problems/resolutions.

H. Contractor, as appropriate, shall notify the Owner at least 24 hours in advance, of work to be performed on the which may have adverse impacts on indoor air quality of workplace conditions.

I. Should complaints about indoor air quality be receive by Owner from building occupants, Contractor shall work with Owner to minimize the source of the problem.

3.03 BUILDING FLUSH-OUT

A. Contractor's Option: Either full continuous flush-out OR satisfactory air contaminant testing is required, not both.

B. Perform building flush-out before occupancy.

C. Do not start flush-out until:

1. All construction is complete.
2. HVAC systems have been tested, adjusted, and balanced for proper operation.

3. Cleaning of inside of HVAC ductwork, specified elsewhere, has been completed.
4. Inspection of inside of return air ducts and terminal units confirms that cleaning is not necessary.
5. New HVAC filtration media have been installed.

D. Building Flush-Out: Operate all ventilation systems at normal flow rates with 100 percent outside air for at least 14 consecutive days.

1. Obtain Owner's concurrence that construction is complete enough before beginning flush-out.
2. If additional construction involving materials that produce particulates or any of the specified contaminants is conducted during flush-out, start 14 day period over.

E. Install new HVAC filtration media after completion of flush-out and before occupancy or further testing.

3.04 AIR CONTAMINANT TESTING

A. Contractor's Option: Either full continuous flush-out OR satisfactory air contaminant testing is required, not both.

B. Perform air contaminant testing before starting construction, as base line for evaluation of post-construction testing.

C. Perform air contaminant testing before occupancy.

D. Do not start air contaminant testing until:

1. All construction is complete.
2. HVAC systems have been tested, adjusted, and balanced for proper operation.
3. Cleaning of inside of HVAC ductwork, specified elsewhere, has been completed.
4. New HVAC filtration media have been installed.

E. Indoor Air Samples: Collect from spaces representative of occupied areas:

1. Collect samples while operable windows and exterior doors are closed, HVAC system is running normally, and the building is unoccupied.
2. Collect samples from spaces in each air handler zone.
3. Collect samples from height from 48 inches to 84 inches above floor.
4. Collect samples from same locations on 3 consecutive days during normal business hours; average the results of each set of 3 samples.
5. Exception: Areas with normal very high outside air ventilation rates, such as laboratories, do not need to be tested.
6. When retesting the same building areas, take samples from at least the same locations as in first test.

F. Outdoor Air Samples: Collect samples at outside air intake of each air handler at the same time as indoor samples are taken.

G. Analyze air samples and submit report.

H. Air Contaminant Concentration Determination and Limits:

1. Carbon Monoxide: Measure in ppm, in relation to outdoor air; not more than outside air.
2. Carbon Dioxide: Measure in ppm, in relation to outdoor air; not more than 700 ppm higher than outdoor air.
3. Airborne Mold and Mildew: Measure in relation to outside air; not higher than outside air.
4. Formaldehyde: Measure in micrograms per cubic meter, in relation to outside air; not more than 20 micrograms per cubic meter higher than outside air.

5. Total Volatile Organic Compounds (TVOC): Measure in micrograms per cubic meter, in relation to outside air; not more than 200 micrograms per cubic meter higher than outside air.
6. 4-Phenylcyclohexene (4-PC): Measure in micrograms per cubic meter, in relation to outside air; not more than 3 micrograms per cubic meter higher than outside air.
7. Total Particulates (PM): Measure in micrograms per cubic meter, in relation to outside air; not more than 20 micrograms per cubic meter higher than outside air.
8. Regulated Pollutants: Measure in relation to outside air; not more than contained in outside air.

I. If air samples show concentrations higher than those specified, ventilate with 100 percent outside air and retest at no cost to Owner, or conduct full building flush-out specified above.

3.05 VENTILATION EFFECTIVENESS TESTING

A. Perform ventilation effectiveness testing before occupancy.

B. Do not begin ventilation effectiveness testing until:

1. HVAC testing, adjusting, and balancing has been satisfactorily completed.
2. Building flush-out or air contaminant testing has been completed satisfactorily.
3. New HVAC filtration media have been installed.

C. Test each air handler zone in accordance with ASHRAE 129.

D. If calculated air change effectiveness for a particular zone is less than 0.9 due to inadequate balancing of the system, adjust, and retest at no cost to Owner.

END OF SECTION 01734

GUIDE SPECIFICATIONS

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PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 DESCRIPTION

A. This Section includes administrative and procedural requirements for cleaning and protection during construction and final cleaning at Substantial Completion.

B. Related Requirements: Coordinate related requirements specified in other parts of the Project Manual; special cleaning requirements for specific construction elements are included in appropriate Sections of Divisions 2 through 16.

1.03 QUALITY ASSURANCE

A. General Cleaning Requirements: Conduct cleaning and waste disposal operations in compliance with governing laws, codes, and ordinances. Comply fully with Federal and Local environmental and anti-pollution regulations.

1. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains.
2. Burning or burying of debris, rubbish, or other waste material on premises is not permitted.

B. Conform to State safety regulations (WISHA requirements).

C. Documentation of waste management, spill response, procedures and contingency plans to be made available to Owner's Representative upon request.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cleaning Agents

1. Use only cleaning agents and methods recommended by Manufacturer of surface material to be cleaned.
2. Use cleaning materials only on surfaces recommended by cleaning material Manufacturer; Do not use cleaning materials damaging to surfaces.
3. Do not use cleaning materials creating hazards to health or property.

PART 3 - EXECUTION

3.01 CLEANING & PROTECTION DURING CONSTRUCTION

A. General:

1. Contractor and each subcontractor at all times shall keep the premises free from accumulation of waste materials, debris and rubbish caused by their operations.
2. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
3. Execute periodic cleaning. Keep work area free from accumulation of construction waste materials and rubbish.
4. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
5. Provide on-site containers for collection of waste materials, debris, and rubbish.
6. Allow no debris, broken or open cartons, or other refuse to collect in the project or around it; allow no inflammable or hazardous materials to be stored on the site without approved fire protection precautions and procedures.

B. Waste Removal: Remove all waste materials, debris and rubbish from site periodically and dispose of at legal disposal areas away from the site, at Contractor's expense.

C. Street and Parking Area Cleaning: Immediately clean all spilled material which results from the work of this Contract and waste hauling operations; use motorized equipment and hand labor as required. Remove from streets, driveways or parking areas in time to prevent such materials from affecting traffic or clogging street drainage system; clean any drains thusly contaminated.

D. Non-Compliance: If the Contractor fails to enforce clean-up procedures, the Owner may do the cleanup and the cost thereof shall be charged to the Contractor and/or subcontractors, as applicable, as provided in Paragraph 3.4 of the General Conditions.

E. Dust Control

1. Clean interior spaces prior to start of finish painting. Continue cleaning on an "as-needed" basis until painting is finished.
2. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.
3. Control site dust as necessary to meet local jurisdiction requirements.

OR

[Specifier –use the following in lieu of 3.01 above for exterior site work projects only.]

3.01 CLEANING DURING CONSTRUCTION – GENERAL REQUIREMENTS

A. Execute periodic cleaning. Keep work, site, and adjacent properties free from accumulation of construction waste materials, rubbish, and windblown debris.

1. Protect new materials from damage by construction debris.
2. Dispose daily all flammable, hazardous, and toxic waste materials. Storage of these materials will not be permitted on the interior of the building.
   a. Disposal and storage shall be in accordance with 40 CFR; WAC 173-303; 49CFR; State and Local fire codes and regulations.

B. Provide on-site containers for collection of waste materials, debris, and rubbish.

1. Periodically remove from site.
2. Dispose of legally at disposal areas away from site.

C. Store volatile wastes in covered metal containers and remove from premises daily. Prevent accumulation of wastes which create hazardous conditions. Provide adequate ventilation during use of volatile or noxious substances.

D. Debris Control: In accordance with Section 01732, Demolition & Construction Waste Management, and the following:

1. Maintain all areas free of extraneous debris.
2. Initiate and maintain a specific program to prevent accumulation of debris at construction site, storage and parking areas, and along access roads and haul routes.
   a. provide containers for deposit of debris as specified.
   b. Prohibit overloading of trucks to prevent spillages on access and haul routes.
      1) Provide periodic inspection of traffic areas to enforce requirements.
3. Schedule periodic collection and disposal of debris as specified. Provide additional collection and disposal of debris whenever the periodic schedule is inadequate to prevent accumulation.
4. Keep storm sewers free of debris or extraneous materials.

E. Street and Off-Site Cleanup

1. Vehicles used to haul materials off-site shall be constructed or loaded so as to prevent any leaking of materials from the vehicle (RCW 46.61.655). Contractor shall be responsible for keeping sidewalks, lawns, parking areas and streets clear of all construction materials, debris, gravel, rock and dirt attributed to the Contractor or his Subcontractors. Clean-up shall be on a daily and/or “upon request” basis as determined by the A/E.
2. Contractor shall plan operations to minimize the need for cleaning street areas adjacent to the construction site, access roads, and haul routes utilized for Work under this Contract. The use of water to perform cleaning work shall be held to a minimum. Contractor shall provide self-propelled pickup sweepers for pavement cleaning and for debris removal. As a minimum:
   a. Clean streets in accordance with local street use requirements.
   b. Clean streets used for hauling excavated material from the work site to the nearest arterial or for a minimum distance of three blocks at the end of each shift of hauling excavated materials.
   c. Clean streets of debris from installation of systems or other construction activities.
   d. Prohibit overloading of trucks to prevent spillages on access road and haul streets.
   e. Water wash staging areas once per week or more frequently as needed to control dust.
   f. provide wheel wash facilities to remove dirt, clay, stones, or other deposits from the tires or between wheels before trucks and/or other equipment be allowed to travel over paved streets.
      1) Water used for washing vehicles and equipment shall not be allowed to enter storm drains unless sediment, petroleum products, fresh concrete products, or other deleterious materials are separated prior to drainage.
   g. Transportation of excavated material by vehicles driven or moved on public streets or highways shall conform to the requirements of the local jurisdictions.

3.02 FINAL CLEANING

A. Provide final cleaning operations when indicated. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition

expected in a normal commercial building cleaning and maintenance program, complying with manufacturer's instructions.

B. Cleaning to include all exposed surfaces and materials within the limits of construction, whether installed by the Contractor, installed by the Owner, or existing prior to the beginning of this project.

   1. The extent of cleaning existing facilities (remodel and/or addition projects) shall apply only to those areas of new work, or existing areas impacted by the construction activities, even if simply due to workmen passing through the space.

C. Complete the following cleaning operations before requesting review for certification of Substantial Completion for the entire Project or a portion of the Project.
[Specifier - modify as required]

   1. Clean the Project Site, yard and grounds, in areas disturbed or impacted by construction activities, including landscape development areas, of rubbish, waste material, litter, and foreign substances.
   2. Sweep paved areas broom clean, and wash.
   3. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
   4. Remove all rubber tire marks and other discoloration from all new concrete paving, and all existing concrete paving impacted by construction activities
   5. Remove petrochemical spills, stains, and other foreign deposits.
   6. Remove tools, construction equipment, machinery, and surplus material from the site.
   7. Remove snow and ice to provide safe access to the building.
   8. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
   9. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
   10. Broom and mop clean concrete floors and floors finished with V.C.T., sheet vinyl, and similar surfaces.
   11. Vacuum clean carpet and similar soft surfaces, removing debris and excess nap. Shampoo, if required.
   12. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
   13. Remove labels that are not permanent labels.
   14. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
      a. Do not paint over “UL” and similar labels, including mechanical and electrical nameplates.
   15. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
   16. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
   17. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
   18. Clean ducts, blowers, and coils if units were operated without filters during construction.
   19. Clean food-service equipment to a sanitary condition, ready and acceptable for its intended use.

20. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs and defective and noisy starters in fluorescent and mercury vapor fixtures.
21. Leave the Project clean and ready for occupancy.

D. Rid the project of rodents, insects and other pests that may have entered as a result of the work.

E. Removal of Protection: Remove temporary protection and facilities installed for protection and administration of the work during construction. Restore landscaping and other repair as necessary or required.

F. Compliances: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner. Do not use Owner's containers for trash generated by cleaning or construction.

1. Where extra materials of value remaining after completion or associated work have become Owner's property, arrange for disposition of these materials as directed.

END OF SECTION 01740

GUIDE SPECIFICATIONS

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PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:

1. Training of Owner's personnel.
2. Maintenance Materials submission.
3. Substantial Completion.
4. Final Acceptance.

1.03 SEQUENCE OF CLOSE-OUT

A. The Contractor's superintendent shall perform a review of all installed work (general, mechanical, electrical) and note any corrections, touch-up, or otherwise restore marred, exposed surfaces, that is necessary to comply with the Contract Document requirements before requesting the A/E to review the Work. The Contractor shall develop a written correction list (pre-punch list) and track the completion of the items by initialing and dating each item, signifying that it has been reviewed and properly completed.

B. Comply with items under SUBSTANTIAL COMPLETION by submitting documentation and the Contractor's initialed correction list to the A/E with a letter requesting the A/E's review of the project.

C. Upon receipt of the information from the Contractor, the A/E will visit the site and review the Project with the Owner for compliance with the Contract Documents. The A/E will develop a punch-list of any work that still needs corrections. If the list is incidental corrective punch work to complete, the A/E will issue the notice of Substantial Completion with the corrections list attached. If the correction work is still significant, the Contractor shall complete the corrections in the same format as its pre-punch list and request additional reviews by the A/E as necessary to establish that the Project is complete to the point where the Substantial Completion notification can be issued.

D. Provide operation and maintenance instruction on installed equipment to Owner designated staff.

E. The Contractor shall correct any outstanding punch list items and submit all other close-out documentation to the A/E as indicated under FINAL ACCEPTANCE. When punch lists have been verified by the A/E as being complete and all documentation is satisfactory and accepted by the A/E, the A/E will issue its notification of Final Acceptance.

F. Upon receipt of the A/E's notification of Final Acceptance, E&AS will advertise the Project as being accepted, starting the 45 day lien period.

1.04 PROJECT RECORD DOCUMENT SUBMITTAL

Refer to Section 01780, Closeout Submittals.

1.05 OPERATION AND MAINTENANCE MANUALS

Refer to Section 01780, Closeout Submittals.

1.06 OPERATING INSTRUCTION OF OWNER'S PERSONNEL

A. The Contractor shall provide for operating and maintenance instruction of Owner's personnel for items installed under this contract. Contractor shall provide for this instruction at a mutually agreeable time and place, which may be outside of Contractor's normal working hours.

1. After completion of commissioning, Contractor and major subcontractors shall provide qualified personnel for conducting full on-site operation and maintenance training and instruction to Owner's designated user personnel and maintenance crews in the proper operation, adjustment and maintenance of all operation equipment and systems. Include all general, mechanical and electrical operating systems and equipment. Contractor shall schedule this period in advance with the Owner and appropriate subcontractor or vendor's representative. This shall be scheduled two (2) weeks after submittal of the final Operating and Maintenance Manuals so that such information will be available for Owner staff familiarization prior to the time of this instructional period. Provide a minimum of (8) hours of such training and instructions on site, unless otherwise directed, conducted to Owner's satisfaction. Such instruction shall be given in time blocks not exceeding (4) hours in any one-day and shall be exclusive of off-site factory training for such items as the energy management system.
2. At each training session, provide a sign-in sheet for signature of all Owner staff that attend. Identify the sign-in sheet with the training being provided and the date of the training. Submit the sign-in sheet(s) with FINAL ACCEPTANCE procedure.
3. Except as otherwise specified, arrange for each installer of work requiring continuing maintenance or operation to meet with Owner's personnel at project site to provide basic instructions needed for proper operation and maintenance of entire work. Include instructions by manufacturer's representatives where installers are not expert in the required procedures.
4. Use operation and maintenance manuals as the basis for instruction. Review contents of manual with personnel in full detail to explain all aspect of operations and maintenance; include as a minimum record documentation, tools, spare parts and materials, lubricants, fuels, identification system, control sequences, hazards, cleaning and renewal of finishes, and similar procedures and facilities.
5. For operational equipment, demonstrate start-up, shut-down, emergency operations, noise and vibration adjustments, safety, economy/efficiency adjustments, and similar operations. Review maintenance and operations in relation with applicable warranties, agreements to maintain bonds, and similar containing commitments.
6. All equipment operation and maintenance instructions and training shall be video taped in a professional manner, at the expense of the Contractor, and the edited film delivered with documents for FINAL ACCEPTANCE.
7. For additional requirements for operating instructions, see respective Specification Sections.
8. In addition, provide (4) hours training for the energy management system.
9. Provide a minimum of (4) hours additional follow-up training sessions to be conducted four (4) months following initial training. Systems/equipment to be covered under these training sessions shall be as determined by the Owner.

10. In addition to or in conjunction with these training sessions, provide for (4) seasonal adjustment training sessions of the energy management system.

B. The Contractor shall submit a training synopsis for each system required under the Contract Documents to review operations and maintenance instruction and training. Submit training synopsis with each respective preliminary Operation and Maintenance Manual submittal. Each synopsis shall be reviewed by the A/E and approved or returned with comments if necessary. Written approval by the A/E of each synopsis is required prior to beginning such training.

C. For additional requirements for operating instructions, see respective Specification Sections.

1.07 MAINTENANCE MATERIALS

A. Provide maintenance materials (tools, spare parts, extra stock, etc) indicated in other sections of the specifications.

1. Submit a receipt to the Owner identifying the product and quantity that is being provided.
2. Obtain Owner's signature on the receipt.
3. Send original receipt to E&AS Project Manager and include a copy of the receipt in the Warranties, Bonds, Extra Stock, and Permits manual.

1.08 SUBSTANTIAL COMPLETION

A. Substantial Completion is defined in the General Conditions. Before requesting A/E's review for certification of Substantial Completion, complete the following, and provide a letter of request for Substantial Completion. List exceptions in the request.

1. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Advise the Owner of pending insurance changeover requirements.
3. Make final changeover of permanent locks and transmit keys, and a list identifying each key to the Owner. The list is a receipt to be signed by the Owner with a copy delivered to E&AS Project Manager and a copy placed in the Operation and Maintenance Manual hardware section. Advise the Owner's personnel of changeover in security provisions.
4. Complete startup testing and commissioning of systems; submit Balancing Logs.
5. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.
6. Complete final clean-up requirements.

1.09 FINAL ACCEPTANCE

A. Before requesting certification of Final Acceptance and final payment, complete the following. Submit all of the following items together – no partial submittals will be accepted.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
2. Submit an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the work for which the Owner of property might in any way be responsible, have been paid or otherwise satisfied. (AIA Document G706).
3. Submit Contractor's Affidavit of Release of Liens (AIA Document G706A): If any liens are filed and cause the Owner to employ the services of any attorneys, the cost of the services will be deducted from the retainage.
4. Submit a letter from the Contractor's Bonding Company addressed to Owner and submitted to A/E approving release of final payment and waiving submittal of final receipts as well as a statement confirming the extension of the Bond for the one-year

warranty period. Final receipts from all subcontractors and material and equipment suppliers shall be furnished to the A/E by the Contractor if the Surety does not waive this requirement.

5. Submit a copy of the A/E's final review list ("punch list") of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, identifying the name and company of the individual who confirmed completion of each item, and date when confirmation inspection was performed.
6. Submit consent of surety to final payment on AIA Form G707.
7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
8. Submit State Department of Labor and Industries Affidavit of Wages Paid (State Form 9843) approved by Department of Labor and Industries for all trades that have performed work on the Project.
9. Submit certified Statement indicating asbestos or lead containing material were not utilized or incorporated on the Project provided by Contractor under this contract.
10. Submit final As-Built Documents.
11. Submit final Operation and Maintenance Manuals.
12. Submit final Warranties, Bonds, and Permit Manual.
13. Submit keys and keying schedule.
14. Submit a list of all paints used, manufacturer, and formulation for each.
15. Submit evidence of completion of commissioning of designated building systems.
16. Submit evidence of completion of Owner's training for all designated systems and videotape(s).
17. Evidence of Compliance with Requirements of governing Authorities.
    a. Certificate of Occupancy, if not submitted at time of Substantial Completion. (Note: Certificate of Occupancy is required to be submitted with Substantial Completion Request unless otherwise exempted by Owner in writing.)
    b. Certificates of Inspection
        1) Mechanical Work.
        2) Electrical Work.
    c. Others as required by Regulatory Agencies.
18. Submit all other required close-out documents.

1.10 REVIEW FEES

A. The A/E and its consultants will complete one initial and one final project review of the Work at Substantial Completion and at Final Acceptance to establish and verify completion of punch list work. Should it be necessary for the A/E or its consultants to perform any additional reviews due to failure of Work to comply with completion status claimed by the Contractor, A/E and its consultants shall be compensated by the Contractor for each additional review required until the Work is satisfactorily completed. This compensation shall be at the A/E's and its consultants standard hourly billing rate at the time of the review, and expenses associated with the visit. Compensation by the Contractor will be through a deductive change order to the Contractor's contract.

END OF SECTION 01770

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SECTION INCLUDES

A. Project Record Document submittal.

B. Operation and Maintenance manuals.

C. Warranties, Bonds, Extra Stock, and Permits manuals.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment. The following submittal procedure shall occur prior to Final Acceptance.

1. Submit original copy of as-builts (drawings & specifications) to A/E for review.
2. Compile and organize any drawings or schedules in the Project Manual onto sheets of the same size as the Contract Drawings and submit with other record documents.
3. Contractor will be notified within 15 work days if the submitted documents are acceptable.
4. Should the submittal be unacceptable for any reason, the Contractor shall make requested modifications and resubmit to the A/E. Continue to resubmit as necessary until the submittal is acceptable.
5. Upon acceptance of the submittal, A/E will within 30 work days incorporate the Contractor's as-builts into the A/E's original Contract Documents.
6. The A/E will return the specifications, the Contractor's original as-builts, and provide the Contractor with an AutoCAD disk.
7. The Contractor shall use the AutoCAD disk to obtain at its cost the following from a printer of its choice:
   a. Electrostatic reproducibles made of each sheet of the Contract Drawings and compilation sheets at its original size, and any other drawings the Contractor may have provided as as-built drawings. The Contractor shall stamp each reproducible sheet as "As-Built", date, and sign each sheet.
   b. After item a. is completed, for each electrostatic reproducible, the Contractor shall have three sets of prints made on bond paper (or blue/black line prints at Contractor's option) and edge bound.
8. The Contractor shall submit to the Owner the electrostatic reproducibles, 3 sets of prints, record specifications, and Contractor's original marked-up as-builts.

B. Operation and Maintenance Data:

1. Submit two (2) copies of preliminary Operating and Maintenance Manuals for operational and non-operational equipment for review by A/E. Submit for each system upon attaining

50% system completion, together with respective training synopsis; refer to Section 01770. Upon review, A/E will return one copy with comments.
2. Submit 1 copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with A/E comments. Revise content of all document sets as required prior to final submission.
3. Within 10 days following receipt of the A/E approval and comments, and prior to Owner training, Contractor shall prepare and transmit to the A/E three (3) final copies of each of the above manuals.

C. Warranties, Bonds, Extra Stock, and Permits:

1. Obtain and assemble executed certificates, warranties, bonds, receipts for extra stock, permits signed by any authorities having jurisdiction, and any required service and maintenance contracts from the respective manufacturer's, suppliers, and Subcontractors. These may be tabbed in the front of the General Operation and Maintenance Manual provided they do not over-fill the binder(s).
2. Verify that documents are in proper form, contain full information, and are notarized.
3. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.
4. Co-execute submittals when required.
5. Submittal of warranties, bonds, extra stock and permit manual to match submittal requirements of Operation and Maintenance Manual.
6. Provide Table of Contents neatly typed, in complete and orderly sequence. Include complete information for each of the following:
   a. Product or work item;
   b. Firm, with name of principal, address, and telephone number;
   c. Scope;
   d. Date of beginning of warranty or service and maintenance contract;
   e. Duration of warranty or service maintenance contract;
   f. Proper procedure in case of failure;
   g. Instances which might affect validity of warranty or bond; and
   h. Contractor, name or responsible principal, address, and telephone number.
7. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
8. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
9. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.
10. Furnish two (2) executed copies, except furnish three (3) additional confirmed copies required for inclusion into Operation & Maintenance manuals.

PART 2 PRODUCTS

2.01 PROJECT RECORD DOCUMENTS

A. Project Record Documents include the following:

1. Marked-up copies of Contract Drawings.
2. Marked-up copies of Project Manuals (Specifications and Detail Book, as applicable), all volumes.
3. Addenda.
4. Reviewed and marked-up copies of shop drawings and product data.
5. Newly prepared drawings.
6. Change Orders, RFIs and other modifications to the Contract issued in printed form during construction.
7. Architect's Clarifications and Proposal Request with all supporting documentation.

8. Construction Change Directives.
9. Record Samples.
10. Field records for variable and concealed conditions.
11. Record information on Work that is recorded only schematically.
12. Manufacturer's instruction for assembly, installation, and adjusting.
13. Other miscellaneous record documents as listed below and applicable.
    a. Field records on excavations and foundations.
    b. Field records on underground construction and similar work.
    c. Survey showing locations and elevations of underground lines.
    d. Invert elevations of drainage piping.
    e. Surveys establishing building lines and levels.
    f. Authorized measurements utilizing unit prices or allowances.
    g. Records of plant treatment.
    h. Ambient and substrate condition tests.
    i. Certifications received in lieu of labels on bulk products.
    j. Batch mixing and bulk delivery records.
    k. Testing and qualification of tradesmen.
    l. Documented qualification of installation firms and/or personnel.
    m. Load and performance testing.
    n. Inspections and certifications by governing authorities.
    o. Leakage and water-penetration tests.
    p. Fire-resistance and flame-spread test results.
    q. Final inspection and correction procedures.

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintenance of Documents and Samples:

1. Store and maintain in field office apart from the Contract Documents used for construction, one complete set of record documents and samples which are used to record as-built conditions.
2. Do not use Project Record Documents for construction purposes; protect from deterioration and loss in a secure fire-resistant location. Maintain record documents in good order and in a clean, dry, legible condition.
3. Make record documents and samples available at all times for review by A/E and Owner's Representatives.
4. Record actual revisions to the Work concurrent with construction progress.
5. Ensure entries are complete and accurate, enabling future reference by Owner.
    a. As specified in Section 01311, following each monthly progress schedule meeting, Contractor shall meet with all major subcontractors whose work is in progress at the site, including but not limited to mechanical, plumbing, electrical, security, fire protection, civil, and as otherwise designated, to review all "as-built" revisions on the day-by-day working set of "Project Record Copy" and verify installed record information from the previous month is properly recorded on the day-by-day "Project Record Copy", with all revisions and pertinent information clearly indicated.

B. Record Drawings and Shop Drawings: A clean, undamaged set of Contract Drawings including coordination drawings and shop drawings shall be kept at the job site as as-built record documents. Record "as-built" drawings shall comprise Architectural, Structural, Civil, Landscape, Irrigation, Plumbing, Mechanical, Fire Protection and Electrical drawings, plus all special equipment, all of which form a part of the Contract Documents.

1. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawings that show conditions fully and accurately. Where shop drawings, RFI's or other communication record are used to

identify a change, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date. Items required to be marked include, but are not limited to, the following:

a. Indicate field changes of dimension and detail.
b. RFIs.
c. Depths of foundations below the first floor.
c. Horizontal and vertical measurements of underground services and utilities, referenced to the building or other permanent construction.
d. Note changes of directions and locations, by dimensions and elevations, as utilities are actually installed.
e. Duct size and routing. Indicated locations of mechanical dampers, valves, reheat boxes, cleanouts, and other items that require maintenance.
f. Show measured locations of construction-concealed internal utilities and appurtenances referenced to visible and accessible features of the structure.
g. Record accurate locations of piping, valves, traps, dampers, duct work, equipment, and the like.
h. Revisions to electrical circuitry.
i. Indicate details not on original Contract drawings.
j. “X-out” conditions not constructed and appropriately annotate "not constructed" to convey the actual "as constructed" condition.

2. Mark record sets in a clear, legible manner, using red ink (no pencils); use other colors to distinguish between variations in separate categories of the work. Use ‘whiteout’ to erase errors.
3. Mark new information that is important to Owner, but which was not shown on Contract Documents or Shop Drawings.
4. Show addenda items, change orders, RFI, or other means of communication used in the construction process.
5. Show and date revisions to drawings with a "cloud" drawn around the revision.
6. Organize record drawing sheets in manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set. Where shop drawings, RFI’s or other communication record are used as a reference, include a copy of them as part of the record drawings.

C. Shop Drawings

1. Maintain as record documents; legibly annotate to record changes made after review.
2. Include subcontractor reproducible shop drawings for all special equipment including as a minimum where applicable to the project, ductwork layout, fire sprinkler system layout, temperature control system, fire alarm system, intrusion alarm system, communications systems, data systems, detention security systems and others as deemed appropriate. Record Drawing shop drawings shall be easily reproducible; i.e., on mylar or of standard copy machine size, as appropriate and approved.

D. Project Manual(s): During the construction period, maintain one complete copy of the Project Manual(s), including Specifications, Detail Book(s), addenda, and one copy of other written construction documents, such as Change Orders and RFI's issued in printed form during construction.

1. Legibly mark these documents in red ink to show substantial variations in actual work performed in comparison with the text of the specification and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and product data. Record at each product section description of actual products installed, including the following:

a. Manufacturer's name and product model and number.
b. Product substitutions or alternates utilized.

c. Changes made by Addenda and modifications.

2. Mark Detail Book schedules, details, etc., to indicate the actual installation where the installation varies from that indicated in the Detail Book and modifications issued. Complete information in accordance with Paragraph 3.01C below for all detail drawings.
3. Each prime contractor (Subcontractor) is responsible for marking up Sections that contain its own Work.
   a. General Contractor shall be responsible for collecting marked-up record Sections from each of the other prime contractors. General Contractor shall also be responsible for collating these Sections in proper numeric order with its own Sections to form a complete set of record Specifications.
   b. General Contractor shall be responsible for submitting the complete set of record Specifications as specified.

E. Record Product Data

1. Maintain one copy of each product data submittal, and mark-up variations in actual work in comparison with submitted information. Include both variations in product as delivered to site, and variations from manufacturer's instructions and recommendations for installation.
2. Give particular attention to concealed products and portions of the work which cannot otherwise be readily discerned at a later date by direct observation. Note related change orders and mark-up of record drawings and project manuals.
3. Note related Change Orders and mark-up of record Drawings, where applicable.
4. Upon completion of mark-up, submit complete set to Architect for Owner's records.
5. Where record Product Data is required as part of maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as record Product Data.
6. Each prime contractor (Subcontractor) shall be responsible for marking up and submitting record Product Data for its own Work.
7. Insofar as possible, insert record product data in individual sub-sections of O&M Manuals. Refer to 3.05 below.

F. Record Sample Submittal: Immediately prior to date(s) of substantial completion, Architect (and including Owner's personnel where desired) will meet with Contractor at site, and will determine which (if any) of submitted samples maintained by Contractor during progress of the work are to be transmitted to Owner for record purposes. Comply with Architect's instructions for packaging, identification marking, and delivery to Owner's sample storage place.

G. Miscellaneous Record Submittals: Refer to Paragraph 2.01A.13 above for listing of miscellaneous record documents and to other Sections of these specifications for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the work. Immediately prior to date of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to Architect for Owner's records.

3.02 OPERATION AND MAINTENANCE DATA - GENERAL

A. General: For all operational equipment installed, Contractor shall submit operation and maintenance documents in manuals as specified herein. Separate sets of manuals shall be prepared for Division 15 and 16 equipment. For non-Division 15 and 16 equipment, the manuals shall contain both operational and non-operational items and equipment.

B. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

C. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

D. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

E. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. Content for Operational Equipment.

1. Product Data.
   a. Compile product data and related information for Owner's maintenance and operation. All manufacturer literature shall be original printed matter; photocopies, printouts from websites or other non-original reproductions are not acceptable.
   b. Product data shall contain detailed information relative to the following:
      1) Description of unit or system, and component parts.
      2) Equipment functions, normal operating characteristics, and limiting conditions.
      3) Assembly, installation, alignment, adjustment and checking instructions.
      4) Operating instructions and sequences for start-up, break-in, routine and normal operation, regulation and control, shutdown, and emergency conditions. Include control diagrams and sequence of operation by controls manufacturer.
      5) Routine procedures and guide for preventative maintenance and trouble shooting, including a schedule of recommended checks; disassembly, repair, and reassembly instructions.
      6) Detailed servicing and lubrication schedule. Include list of lubricants required.
      7) Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
      8) Complete nomenclature and model number of replaceable parts. Include with list manufacturer's current prices and recommended quantities to be maintained in storage.
      9) Safety precautions and safety features.
      10) Outline, cross-section and assembly drawings, engineering data, and color coded wiring diagrams as installed.
      11) Test data and performance curves.
      12) Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
      13) Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
      14) Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
      15) Test and balancing reports.
   c. Include only sheet pertinent to specific product.
   d. Annotate each sheet to:
      1) Clearly identify specific product or part installed.
      2) Clearly identify data applicable to installation.
   e. Delete references to inapplicable information.
2. Drawings.
   a. Supplement product data with drawings as necessary to clearly illustrate relations of component parts of equipment and systems.
   b. Coordinate drawings with information in Project Record Documents to ensure correct illustration of completed installation.
   c. Do not use Project Record Documents as maintenance drawings.
3. Supplement product/installation data with written text.

a. Organize in consistent format under separate headings for different procedures.
b. Provide logical sequence of installations for each procedure.

4. Special Mechanical Subcontractor Requirements: Comply with Division 15 requirements.
5. Special Electrical Subcontractor Requirements: Comply with Division 16 requirements.

3.04 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For all A/E non-operational products, applied materials and finish items installed, including but not limited to, floor coverings such as vinyl composition tile, acoustical ceiling panels, marker boards, etc., Contractor shall submit maintenance information as specified herein. Provide detailed information relative to the following:

1. Manufacture's data, giving full information on products.
   a. Catalog number, size, and composition.
   b. Color and texture designations.
   c. Information required for re-ordering special manufactured products.
2. Instructions for care and maintenance.
   a. Manufacturer's recommendation for types of cleaning agents and methods.
   b. Cautions against cleaning agents and methods, which are detrimental to the product.
   c. Recommended schedule for cleaning and maintenance.
   d. Instructions and recommendations for repair of finish.
3. Moisture protection and weather-exposed products.
   a. Include product data listing applicable reference standards, chemical composition, and details of installation.
   b. Provide recommendations for inspections, maintenance, and repair.

B. For additional requirements for maintenance data, see respective Specification Sections.

C. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

3.05 OPERATION AND MAINTENANCE MANUALS

A. Prepare instructions and data by personnel experienced in maintenance and operation of described products. Prepare data in the form of an instructional manual.

B. Format of Operation and Maintenance Manuals

1. Binders
   a. Commercial quality, stiff cover, metal-hinged 8-1/2 x 11 inch three D side ring binders with durable and cleanable plastic covers. Binders shall be Wilson Jones #344 Series or equivalent as approved by the A/E.
   b. Provide suitable ring size for content with a 1-inch minimum, up to 3-inch maximum, range.
   c. When multiple binders are used, correlate data into related consistent groupings.
2. Cover and Spine: Identify the cover and spine of each volume with typed or printed title of the project, project number, and the words OPERATION AND MAINTENANCE INSTRUCTIONS.
3. For Contractor produced pages, paper shall be 8-1/2" x 11", white, 20 pound minimum.
4. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.
5. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
6. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
7. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.

8. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   a. Part 1: Directory, listing names, addresses, and telephone numbers of A/E, A/E Consultants, Contractor, Subcontractors, and major equipment suppliers.
   b. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      1) Significant design criteria.
      2) List of equipment.
      3) Parts list for each component.
      4) Operating instructions.
      5) Maintenance instructions for equipment and systems.
      6) Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   c. Part 3: Project documents and certificates, including the following:
      1) Shop drawings and manufacturer's printed product data.
      2) Air and water balance reports.
      3) Certificates.
      4) Photocopies of warranties and bonds.
      5) Materials Safety Data Sheets (MSDS) for each product used on the Project.
9. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.
10. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

3.06 WARRANTIES, BONDS, AND PERMIT MANUAL

A. Project Warranty – General: If, within one (1) year after the Date of Substantial Completion of the Work, or designated portion thereof, or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be defective or not in accordance with the Contract Documents, the Contractor, and where applicable, his subcontractor that portion of the work, shall correct it promptly after receipt of a written notice from the Owner or Architect to do so. This obligation shall survive Termination of the Contract. The Owner will give such notice promptly after discovery of the condition.

B. Categories Of Specific Warranties
   1. Warranties on the work are in several categories, including those of General Conditions, and including (but not necessarily limited to) the following specific categories related to individual units of work specified in sections of Divisions 2 through 16 of these specifications.
      a. Special Project Warranty (Guarantee): A warranty specifically written and signed by Contractor for a defined portion of the work; and, where required, countersigned by subcontractor, installer, manufacturer or other entity engaged by Contractor.
      b. Specified Product Warranty: A warranty which is required by contract documents, to be provided for a manufactured product incorporated into the work; regardless of whether manufacturer has published warranty without regard for specific incorporation of product into the work, or has written and executed warranty as a direct result of contract document requirements.
      c. Coincidental Product Warranty: A warranty which is not specifically required by contract documents (other than as specified in this section); but which is available on a product incorporated into the work, by virtue of the fact that manufacturer of product has published warranty in connection with purchases and uses of product without regard for specific applications except as otherwise limited by terms of warranty.

2. Refer to individual sections of Divisions 2 through 16 for the determination of units of work which are required to be specifically or individually warranted, and for the specific requirements and terms of those warranties (or guarantees).

C. Disclaimer and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

D. General Limitations

1. It is recognized that specific warranties are intended primarily to protect Owner against failure of the work to perform as required, and against deficient, defective and faulty materials and workmanship, regardless of sources.
2. Except as otherwise indicated, specific warranties do not cover failures in the work which result from: 1) Unusual and abnormal phenomena of the elements, 2) The Owner's misuse, maltreatment or improper maintenance of the work, 3) Vandalism after time of substantial completion, or 4) Insurrection or acts of aggression including war.

E. Related Damages & Losses

1. General: In connection with Contractor's correction of warranted work which has failed, remove and replace other work of project which has been damaged as a result of such failure, or must be removed and replaced to provide access for correction of warranted work.
2. Consequential Damages: Except as otherwise indicated or required by governing regulations, special project warranties and product warranties are not extended to cover damage to building contents (other than work of Contract) which occurs as a result of failure of warranted work.

F. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

G. Reinstatement Of Warranty Period: Except as otherwise indicated, when work covered by a special project warranty or product warranty has failed and has been corrected by replacement or restoration, reinstate warranty by written endorsement for the time period starting on the date of acceptance of replaced or restored work and ending upon date original warranty would have expired if there had been no failure, with an equitable adjustment for depreciation.

H. Replacement Cost, Obligations: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. Contractor shall be responsible for the cost of replacing or restoring defective Work regardless of whether the Owner has benefited from use of the Work through a portion of anticipated useful service life.

I. Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, right, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.

J. Rejection Of Warranties: Owner reserves the right, at time of final acceptance or thereafter, to reject coincidental product warranties submitted by the Contractor, which in opinion of Owner tend to detract from or confuse interpretation of requirements of Contract Documents.

K. Contractor's Procurement Obligations: Do not purchase, subcontract for, or allow others to purchase or sub-subcontract for materials or units of work for project where a special project

warranty, specified product warranty, certification or similar commitment is required, until it has been determined that entities required to countersign such commitments are willing to do so.

L. Co-execute warranties when required. Provide originals of each for inclusion in each operation and maintenance manual.

M. Retain warranties and bonds until time specified for submittal.

N. SPECIFIC WARRANTY FORMS

1. Where a special project warranty (guarantee) or specified product warranty is required, prepare a written document to contain terms and appropriate identification, ready for execution by required parties.
2. Submit draft to Owner (through Architect) for approval prior to final executions.
3. Form of Warranty to state the following:

   I (We), (insert Contractor name), certify (insert name of trade or portion of work being guaranteed) installed by (insert name of appropriate subcontractor) on (insert the name of the project and project number) located in Olympia, WA, is performed in strict accordance with Contract Documents. Further, I (we) guarantee this work to be (watertight, without lead, other, etc.) caused by defects in materials and workmanship, for (fill in specific required guarantee period) years from (date of substantial completion), and will repair, or replace, without delay, any defects in materials and workmanship discovered within warranty period.

   Sincerely,

   (Name of Contractor/responsible principal/address/telephone number)
   Signed by Owner, Partner, or other person authorized to commit firm.

END OF SECTION 01780

Basis of Design

This section applies to the design and installation of general site work items.

Design Criteria

- Coordinate with the Project Manager for work hour limitations on noise and use of heavy equipment on campus roads, sidewalks and planting areas, site access, and staging areas.
- Protection of existing trees, plants and other vegetation shall be in accordance with provisions of Guide Specification Section 01500, Temporary Facilities & Controls.

Products, Materials and Equipment

Site Signage

- All site signage shall conform to the Washington State Capitol Campus Sign Standards for State Buildings and Grounds, under the direction of the General Administration Sign Shop.
- For post mounted signage, the post type, size and footing detail shall be consistent with existing adjacent signage, where applicable, and approved by the GA Project Manager.

Exterior Furnishings and Fixtures

- All exterior furnishings and fixtures located on the Capitol campus shall conform to the Washington State Capitol Campus Exterior Furnishings and Fixtures Design Guidelines as published by General Administration. Such items include lighting fixtures, waste receptacles, benches and tables, drinking fountains, bicycle racks and lockers, and certain miscellaneous items.

Installation, Fabrication and Construction

Excavating and Trenching

- Approval to dig shall be obtained from DCF Infrastructure Property Manager prior to any excavation work or utility trenching work on the Capitol campus.

Saw Cutting Existing Paving

- Wherever saw cutting of existing sidewalk or roadway paving occurs, all slurry resulting from the saw cutting process shall be vacuumed and removed off site and disposed of in a lawfully manner. Do not allow slurry to enter storm drainage sewer system.

Utility Marking

- Locator wire along with warning tape shall be placed above all utility lines during backfilling process.

END OF SITE WORK SECTION

Basis of Design

This section applies to the design and installation of site pavements and appurtenances, including associated paving bases and ballasts.

Design Criteria

- Sidewalks shall be designed and constructed to be able to withstand a driving load of 36,000 lbs. without cracking.
  - Sidewalks shall be placed on minimum 4" of compacted structural fill, compact subgrade and structural fill to minimum 95% of maximum dry density as determined by ASTM D1557.
  - For edges of sidewalks without integral curbs, thicken outer 12 inches to 6 inch depth.
- Sidewalk finish texture and control joint grid pattern shall match existing adjacent sidewalks; typically 2' x 2' grid pattern on West Campus. Isolation joints in walks shall be sized and located to match existing adjoining or adjacent condition.
- Sidewalks in certain areas on West Campus will require the addition of "Lamp Black" color additive in the concrete mix to match color of existing concrete; verify need for color additive with Owner's Project Manager.
- Sidewalks in certain areas on East Campus will require the addition of "Miami Buff" color additive in the concrete mix to match color of existing concrete; verify need for color additive with Owner's Project Manager.
- The use of colored sealer to obtain colored concrete is not permitted.
- Painted curb markings of appropriate colors shall be used to delineate any parking restrictions such as fire hydrant zones, bus stops, loading zones, approaches to corners, and other zones where parking is to be prohibited.
- All existing pavement markings within the project limit lines or adjacent thereto shall be reviewed. Conflicting markings shall be removed and other markings moved due to revised pathways. This shall include, but not be limited to, parking stall divisions, assigned stall markers, ADA markings, stop line markings, direction arrows, pedestrian walkways, no parking hatching, and speed bumps.
- All traffic control signs shall comply with the Washington State Capitol Campus Sign Standards for State Buildings and Grounds, and be reviewed by the GA Sign Shop before installation.

Submittals

- Colored Concrete: Require minimum three (3) samples of proposed concrete mix with color additive added in three slightly varying amounts, recording amount of additive per cubic yard for each sample mix, for selection of matching mix design. Include texture finish for matching existing texture finish, for approval.
  - Approved color and texture sample to be used as work control sample for surface finish.

Products, Materials and Equipment

Concrete

- 3,000# f'c Portland cement concrete of materials including admixtures per requirements of Division 3 for cast-in-place concrete.

Light Bases

- West Campus Historical Street Lamp Poles: Shall be mounted on 24" diameter, 36" deep concrete footings with five (5) #6 vertical rebar and four (4) #3 horizontal rebar loops evenly spaced. Poles base anchors shall be stainless steel threaded rods with nuts and washers as required to match pole base bolt pattern. Finish height shall be 2" above finish grade elevation (top of topsoil) or flush with concrete paving where abutting to or integral with.
- 30' Area Lighting: Shall be 24" diameter, 72" deep concrete footing with five (5) #6 vertical rebar and four (4) #3 horizontal rebar loops evenly spaced. Poles shall be anchored per manufacturer's instructions. Finish height shall be 24" above finish grade elevation.

Installation, Fabrication and Construction

Pavement –Sidewalks, Ramps, Curbs, Stairs

- Install all walks and curbs in accordance with Standards of Local Jurisdiction. Curb ramps shall also conform to ADA Accessibility Guidelines, Paragraph 4.7, of size and configuration consistent with existing adjacent curb ramps.
  - Begin curing immediately after placement, protect concrete from premature drying, excessively hot and cold temperatures, and mechanical injury.
  - Maintain curing procedures for seven (7) days at minimum temperature of 50 degrees F; keep moist and protect from vehicle and pedestrian traffic.
- Cleaning of concrete mixers will not be allowed on campus grounds. Contractor shall submit methods of cleaning concrete equipment including delivery equipment.
- Where appropriate, temporary storm drain catch basin filters shall be installed to prevent construction materials from entering into the system.

END OF PAVING, BASES & APPURTENANCES SECTION

Basis of Design

This section applies to the design and installation of underground irrigation systems for landscape areas and lawns, including restoration and/or repair of existing systems.

Design Criteria

- Irrigation piping flow velocity shall not exceed 5 feet per second.
- Provide an irrigation system water header with isolation valves, strainer, pressure reducing valves, double check valve assembly and gauges. Where possible, install the water header in an adjacent building. If this is not possible, provide an adequately sized valve vault to facilitate equipment repair/maintenance.
- Design irrigation systems with a 3-inch or larger mainline to permit gravity drainage.
- Irrigation system static pressure range shall not vary by more than 10%.
- Design irrigation system lateral piping to limit pressure drops to less than 20% of the average sprinkler operating pressure.
- Provide quick coupler valves every 100 feet or less.
- Install sprinkler heads of the same manufacturer and psi rating within the same irrigation zone.
- Zone the irrigation system according to microclimate. Zone incompatible and unique microclimates separately and/or grouped based on microclimate compatibility. Zone turf and bed areas separately.
- Install a manual shutoff valve to isolate the irrigation system from the water supply main.
- Design irrigation systems to avoid over spray, and to avoid spray blockage from adjacent aboveground utilities (e.g., electric transformers, light standards, etc.).
- Record “as-built” drawings shall be provided for all newly installed, removed and/or relocated irrigation sprinkler piping including location and type designation of all associated sprinkler heads, valves, controllers, etc.
- Systems shall be provided with appropriate backflow preventers.

Products, Materials and Equipment

Piping & Fittings

- All main line and lateral line piping shall be Schedule 40 PVC.
- Fittings for Rain Bird 1800 Series heads shall be EZP flexible tubing with E-Z Pipe Elbow.
- Fittings for Hunter sprinkler heads shall be elbow nipple swing joint.

Sprinkler Heads

- For Plant Areas: Rain Bird 1812 pop-up sprinkler head with 12” pop-up clearance.
- For Small Lawn Areas: Rain Bird 1804 pop-up sprinkler head with 4” pop-up clearance.
- For Large Lawn Areas: Hunter I-20 / I-40 Series rotary sprinkler head.

Controllers

- Rain Bird ESP-MC Series with “MAXICOM” programmable software compatibility.

Wiring

- 14 gauge UF single strand controller wire.

Installation, Fabrication and Construction

- Install all piping and equipment per manufacturer’s instructions.
- Restore all disturbed lawn and planting areas to original “as-is” condition.
- Install locate wire or trace wire in over top of all main line and lateral line piping.

END OF LANDSCAPE IRRIGATION SYSTEMS SECTION

Basis of Design

This section applies to the design and installation of landscaping trees, plants and lawns, including restoration and/or repair of existing landscape/lawn areas.

Design Criteria

- Landscaping shall be species which grow in USDA Zone 4, drought and freeze resistant. Low-water design is encouraged.
- The minimum top 8 inches of planting bed soil shall have an organic amendment content of 20 to 25%.
- Sodded lawn is preferred over seeded lawn including hydroseeding.
- Provide for 2 to 3 fertilizations of new plantings (trees, shrubs, lawn) through maintenance period following final project acceptance. Provide for minimum 60 day maintenance period following final project acceptance.

Products, Materials and Equipment

Plants

- All plant material furnished shall meet the grades established by the American Standard Nursery Stock (ANSI Z60.1-1986).
- All plants shall be weed free.
- Root system for each plant shall fill entire container.

Compost

- Shall meet Washington State Department of Ecology Grade A Standard. As a general rule, the following guidelines should be used in selecting a compost:
  - Appearance, Size, and Color: Brown to black in color, 1/4” to 1/2” in size, with an “earthy” odor.
  - Physical Appearance: 30 to 50 percent moisture content, 30 percent or greater organic matter, and less than 70 percent ash content.
  - Chemical Properties: Carbon-to-nitrogen ratio below or equal to 30:1, nitrogen content between 0.5 and 3.0 percent, phosphorus content greater than 0.2 percent, and a pH level between 6.0 and 8.0. Metals content shall conform to state and federal regulations.

Imported Topsoil

- Imported topsoil shall be a 3-way composted mix containing an organic amendment content of 20 to 25%.
  - The base topsoil shall be a friable sandy loam typical of topsoils cultivated locally, free of objectionable subsoil materials, weeds, noxious weed seeds, refuse, sticks, brush, and rocks larger than 1" across the greatest dimension, and shall contain no more than 10% rocks or gravel by volume.

Sod

- Shall be field grown one calendar year or longer, have a well developed root structure, and be free of all weeds, disease, and insect damage.

- Prior to cutting, the sod shall be green, in an active and vigorous state of growth, and mowed to a height not exceeding one inch.
- The sod shall be cut with a minimum of one inch of soil adhering. Provide sod composed of the following:

  60% Perennial Turf Type Rye Grass.
  20% Hard Fescue.
  20% Bluegrass.
- Sod shall be equal to that as grown by Country Green Turf Farms, 7725- B Yelm Highway S.E., Olympia, Washington 98513, (360) 456-1006.
- Sod shall be non-netted.

Installation, Fabrication and Construction

Soil Preparation of Existing On-Site Soils (first option is a minimum; second option is preferred)

- Minimum Requirement: For existing subsoils including reused topsoil, spread a 2 inch layer (6.2 cubic yards per 1000 sq.ft.) of compost over existing finish subsoil and rototill into top 4 to 6 inches of soil for a finished organic amendment content of 20 to 25% in the finished top 6 to 8 inches of soil. Rototill with minimum 2 passes to thoroughly mix compost with soil and eliminate layering of compost at the soil surface.
- Preferred Requirement: For existing subsoils including reused topsoil, spread a 4 inch layer (12.4 cubic yards per 1000 sq.ft.) of compost over existing finish subsoil and rototill into top 6 to 8 inches of soil for a finished organic amendment content of 20 to 25% in the finished top 10 to 12 inches of soil. Rototill with minimum 2 passes to thoroughly mix compost with soil and eliminate layering of compost at the soil surface. **Note:** This requirement is substantially more expensive than the 'minimum' requirement as it requires special rototilling equipment to reach the 12 inch depth.
- Where subsoil is clay or compacted soils, rototill top 6 inches of subsoil first, prior to application and incorporation of compost.
- Soil prep at planting/lawn areas over East Campus plaza areas shall follow 'minimum' requirement due to the depth of the existing soils over the underlying waterproof membrane.
- Finish grade shall be ½" below all adjoining paved surfaces.

END OF LANDSCAPING SECTION

Basis of Design

This section applies to the design and installation of cast-in-place concrete structures, building elements, and site elements.

Design Criteria

- Require sample slabs with color additive in the concrete mix in varying amounts to produce and verify color match with existing in-place paving.

Products, Materials and Equipment

Concrete

- Portland Cement: Conform to the requirements of ASTM C150.
- Sand and Coarse Aggregate: Conform to the requirements of ASTM C33.
- Fly Ash: Conform to the requirements of ASTM C618, Class F, with maximum 1% loss on ignition (LOI).
- Air Entraining Agent: Conform to the requirements of ASTM C260.
- Water-Reducing Admixture: Conform to the requirements of ASTM C494, Type A, except Type F or G for concrete to be pumped.
- Reinforcing Steel: Conform to the requirements of ASTM A615, Grade 60.
- Welded Wire Fabric: Conform to the requirements of ASTM A185, Fy=65 ksi.

Color Admixture for Exterior Paving

- “Lamp Black” color additive to match color of existing concrete paving at certain areas on West Campus.
- “Miami Buff” color additive to match color of existing concrete paving at certain areas on East Campus.

Installation, Fabrication and Construction

- Refer to “Paving, Bases & Appurtenances” Standard (02700) for exterior paving requirements.
- Begin curing immediately after placement, protect concrete from premature drying, excessively hot and cold temperatures, and mechanical injury.
- Maintain curing procedures for seven (7) days at minimum temperature of 50 degrees F; keep moist and protect from vehicle and pedestrian traffic.
- Cleaning of concrete mixers will not be allowed on campus grounds. Contractor shall submit methods of cleaning concrete equipment including delivery equipment.
- Where appropriate, temporary storm drain catch basin filters shall be installed to prevent construction materials from entering into the system.

END OF CONCRETE SECTION

Basis of Design

This section applies to products and procedures applicable to masonry restoration and cleaning of historic buildings.

Design Criteria

- Repair and replacement materials shall match remaining historic construction in all physical and visual aspects including material, form, color, texture and workmanship.
- Pointing mortar shall meet the State of Washington, Department of General Administration Campus Maintenance Program Standards. The compressive strength of the repointing mortar shall be equal or less than the compressive strength of the surrounding masonry.
- Perform work using the gentlest methods available. Prevent damage to materials and finishes to remain.
- As much of the historic material as possible shall be saved.
- Mortar joints shall be duplicated in joint width and profile.
- Only qualified personnel shall point historic buildings.
- Only trained personnel shall perform cleaning of historic buildings.
- Pressure washers shall not be above 180 psi. Water temperature shall not exceed 200 degrees F.
- No biocides or waterproofing shall be applied to historic buildings.

Products, Materials and Equipment

Brick Masonry Restoration

- Refer to Guide Specifications Section 04910, Brick Masonry Restoration.

Repointing Campus Historical Buildings

- Refer to Guide Specifications Section 04915, Repointing Campus Historical Buildings.

Stone Restoration

- Refer to Guide Specifications Section 04920, Stone Restoration.

Repolishing Marble

- Refer to Guide Specifications Section 04921, Repolishing Marble.

Epoxy Patching Small Cracks & Holes In Marble

- Refer to Guide Specifications Section 04922, Epoxy Patching Small Cracks & Holes In Marble.

Dutchman Repair of Marble

- Refer to Guide Specifications Section 04923, Dutchman Repair of Marble.

Regrouting Deteriorated Joints In Marble

- Refer to Guide Specifications Section 04927, Regrouting Deteriorated Joints In Marble.

Repointing Marble

- Refer to Guide Specifications Section 04928, Repointing Marble.

Stone Masonry Cleaning & Poulticing

- Refer to Guide Specifications Section 04940, Stone Masonry Cleaning & Poulticing.

Cleaning Dirt on Marble

- Refer to Guide Specifications Section 04941, Cleaning Dirt on Marble.

Removing Mortar Deposits & Stains From Marble

- Refer to Guide Specifications Section 04942, Removing Mortar Deposits & Stains From Marble.

Removing Unknown Stains From Marble Using a Poultice

- Refer to Guide Specifications Section 04943, Removing Unknown Stains From Marble Using a Poultice.

Installation, Fabrication and Construction

- Refer to requirements specified in respective restoration and/or cleaning sections.

END OF MASONRY RESTORATION & CLEANING SECTION

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

[Note: This Guide Specification is based on brick masonry restoration at the existing Governor's Mansion caused by the February 2001 earthquake. Modify as necessary to fit current project requirements.]

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

B. Relate Work Specified Elsewhere
   1. Flashing and Sheet Metal: Section 07600
   2. Sealants: Section 07900

1.2 DESCRIPTION

A. The work of this Contract involves a historically significant structure listed on the National Register of Historic Places and is part of the Washington State Capitol Campus Historic District. In addition to all other requirements, all Work of this Section shall be performed under the guidelines of the *Secretary of the Interiors Standard's for the Treatment of Historic Properties*. While Work under this Contract is in progress, protect existing building, grounds, contents, and occupants, including those on adjacent property, whether private or public, from damage or harm.
   1. It is the intent of this Section that:
      a. All repair and replacement materials shall match remaining historic construction in all physical and visual aspects including material, form, color, texture and workmanship.
      b. As much of the historic material as possible will be saved.
      c. All work will be done using the gentlest methods available.
      d. Sound historical materials will not be put at risk due to the work of this section.

[Specifier Note: Edit Paragraph "C" below to fit project scope.]

B. Work includes, but is not limited to the following:
   1. Removal, cleaning and reinstallation of damaged existing brick veneer.
   2. Replacement of damaged – chipped, cracked, spalled and broken - brick masonry.
   3. Repair and repointing of damaged mortar joints at exterior brick veneer walls.
   4. (_____)

1.3 REFERENCES

A. Codes: The provisions of the Washington State Historic Building Code and the Uniform Codes for Building Conservations shall apply. Confirm requirements with Engineer / Architect and Building Official before proceeding with work.

B. Industry Standards:

ASTM A167-99	Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
ASTM C144-99	Specification for Aggregate for Masonry Mortar
ASTM C270-01	Mortar for Unit Masonry, Standard Specifications
ASTM C207-01	Specification for Hydrated Lime for Masonry Purposes (1992)
ASTM C780-00	Method for Pre-construction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
MIW	The Northwest Masonry Guide, available from the Masonry Institute of Washington, (425) 803-0627

C. Repointing mortar shall be prepared and placed in accordance with the Department of the Interior / National Park Service Cultural Resources Preservation Brief Number 2: "Repointing Mortar Joints in Historic Masonry Buildings", Revised edition October 1998; in compliance with the guidelines set forth by the Secretary of the Interior's Standards for Rehabilitation and as specified herein.

1.4 QUALITY ASSURANCE

A. The gentlest means possible shall be used to perform the work and the greatest of care shall be taken to ensure that the bricks and other historic materials are not damaged in the process of the work of this Section.

B. Due to the historic significance of this building, all work of this Section shall be performed by a mason familiar with historic the performance and characteristics of historic brick masonry construction. The Masonry Contractor to perform the work of this Contract shall have the following qualifications:

1. Successfully completed not less than three (3) projects of similar size and scope involving historic masonry projects within the last ten (10) years.
   a. Submit list of historic projects including name, pictures, location, cost, Owner/ Architect/Engineer's name and phone number.
2. Project superintendent shall have a minimum of eight (8) years experience and shall have worked on a minimum of three (3) projects of similar size and scope involving historic buildings.
   a. Submit list of historic projects supervised by this Superintendent including name, location, cost, Owner/ Architect/Engineer's name and phone number.
   b. Contractor may not change Superintendent without written approval of Owner.
3. Only skilled journeymen masons who are familiar and experienced with the materials and methods specified and with the design requirements shall be used for masonry restoration. One skilled journeyman mason, trained in historic restoration, shall be present at all times during masonry restoration and shall personally direct the work. Journeyman mason shall have a minimum of 3 years experience and have worked on a minimum of 2 historic masonry structures.
   a. Submit list of historic projects performed by Journeymen to participate in this project, including name, location, cost, Owner/ Architect/Engineer's name and phone number.
4. The ratio of apprentices to journeyman on this project shall not exceed two (2) apprentices to one (1) journeyman.
5. Certification: All repointing shall be performed by a craftsperson trained in the use of the specified products. Contractor shall provide proof of training to the Architect by submitting a certificate from a U.S. Heritage Group Lime Mortar Workshop or similar workshop course. Contact US Heritage Group at (773) 286-2100 regarding an on-site training program for this project.

C. Source of Materials: Obtain materials for patching, and repointing from a single manufacturer to ensure match of quality, color and texture.

D. Quality Control Plan: Comply with the requirements of Section 01450.

E. Quality Assurance: The Owner's Historic Preservation Representative and the Architect will review work on a regular basis for conformance with the approved Qualify Control Plan.

F. Pre-Construction Conference: Prior to beginning work of this Section, Contractor shall convene meeting with Architect and Owner's Representative(s) to review the Quality Assurance Plan, survey and all job conditions and processes.

G. Testing: Test mortar in accordance with UBC requirements, ASTM E447 standards and as further specified herein.

1.5 SUBMITTALS

A. Shoring Design: A minimum of 5 days prior to installation of shoring, submit shoring design to Architect for review of impact to historic fabric of building.

B. Test panels:
   1. Locate Test Panels as directed by Architect and Owner's representative.
   2. Approved Test Panels will demonstrate quality of materials and workmanship expected.
      a. Prepare, install and finish each sample according to specifications.
      b. Sample shall be applied to existing building masonry.
      c. Samples shall cure a minimum of 14 days prior to Owner's approval.
      d. Approval shall be based on a viewing distance of fifteen (15) feet from wall.
   3. Prepare one 4-foot square Test Panel showing pointing work to be performed under this section.
      a. Removal of mortar: A 2 foot x 2 foot section of Test Panel shall demonstrate removal of mortar as required for repointing.
      b. A 2-foot x 2-foot section of Test Panel shall demonstrate the complete removal of mortar as required to remove brick.
      c. Pointing: A 2 foot x 4 foot section of the Test Panel shall demonstrate pointing techniques.
   4. Approved sample panels shall be maintained for duration of job as a benchmark of the standard of quality to be achieved.

C. Materials Safety Data Sheets (MSDS) as appropriate.

D. Certificates (except where the material is labeled with such certification by the producers of the materials) that all materials supplied comply with all the requirements of these specifications and the appropriate standards.

E. Quality Control Plan: Comply with the requirements of Section 01450.

F. Certification of training as required herein and as may be required by product manufacturers to maintain product warranty.

1.6 SUBSTITUTIONS

A. Substitutions of pointing mortar will not be allowed. The State Department of General Administration has developed a Maintenance Program for all of the historic building on the Capitol Campus. The goal of that program is to ensure that new materials that are compatible with historical materials are used, and that standard materials are used throughout the campus to ensure the success of future maintenance.

B. If alternative methods and materials (other than pointing mortars) are proposed for any phase of restoration work; provide written description and program of testing to demonstrate effectiveness for use on this project. Provide documentation showing compliance with the requirements for substitutions and the following information:
   1. Coordination information, including a list of changes needed to other work that will be necessary to accommodate the substitution.
   2. A comparison of the substitution with the specified products and methods, including performance, weight, size, durability, and visual effect.
   3. Certification that the substitution conforms to the requirements of the contract documents and is appropriate for the applications indicated.

C. Materials substitution requests shall be accompanied by independent laboratory tests reports, from a lab designated by the Architect, to establish equivalent performance levels and specifications compliance.
   1. The submitting party shall pay for testing.

1.7 DELIVERY, STORAGE, AND HANDLING

A Deliver materials to site in manufacturer's original unopened containers and packaging, bearing labels as to type and names of products and manufacturers.

B. Deliver and store restoration material in manufacturer's original, unopened containers with the grade, batch and production date shown on the container or packaging.

C. Protect all materials during storage and construction from wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials.

D. Protect mortar and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturers recommendations for minimum and maximum temperature requirements for storage.

E. Comply with the manufacturers written specifications and recommendations for mixing, application, and curing of repointing mortars and patching materials.

F. Brick Storage:
   1. Protect brick during storage and construction against moisture, soiling, staining, physical damage and theft.
   2. Handle brick to prevent chipping, breakage, soiling or other damage. Do not use pinch or wrecking bars without protecting edges of brick with wood or other rigid materials.
   3. Place and stack pallets of brick to distribute weight evenly and to prevent breakage or cracking of bricks.

1.8 PROJECT SITE CONDITIONS

A. The Contractor shall be responsible for adequate shoring of walls to remain to ensure a safe working environment and to protect the building.

B. Do not perform any masonry repointing unless air temperatures are between 40 degree Fahrenheit (10 deg. C) and 95 degrees Fahrenheit (32 deg C) and will remain so for at least 48 hours after completion of work.
   1. Phase repointing during hot weather by completing process on the shady side of the building or schedule installation of materials during cooler evening hours to prevent premature evaporation of the mortar.

2. Optimum air temperature is between 40° F and 80° F and optimum temperature should remain so for at least 48 hours after completion of work. Employ the following procedures if optimum temperatures cannot be maintained:
   a. Air temperature 40F to 32F: Sand or mixing water shall be heated to produce mortar temperatures between 40F and 120F. Maintain temperatures of mortar on boards above freezing.
   b. Air temperature 32F or lower: Area of work shall be heated to raise temperature to 40 degrees .

C. Do not use frozen materials or materials mixed or coated with ice or frost. Do not change the freezing point of mortar by the use of admixtures or anti-freeze agents, and do not use chlorides in the mortar.

D. Cover partially completed work when work is not in progress.

1.9 PROTECTION

A. Protect open wall areas from water infitration.

B. Protect the following:
   1. Protect persons, motor vehicles, building site and surrounding buildings from injury resulting from masonry restoration work.
   2. Protect sills, ledges and projections from droppings.
   3. Prevent repointing mortar from staining the face of masonry or other surfaces to be left exposed. Immediately remove all repointing mortar that comes in contact with such surfaces.
   4. Damage occurring to the building as a result of work of this section of Contractor's failure to protect against such damage shall be the Contractor's responsibility. The contractor shall restore damaged areas to the complete satisfaction of the Architect at no expense to the Owner.

PART 2 - PRODUCTS

2.1 GENERAL

A. Comply with "Quality Assurance" "References", Specifications, and Manufacturer's standards, recommendations and data provisions.
   1. Where these may be in conflict, the more stringent requirements govern.

2.2 MORTAR

A. Brick Setting Mortar: Type "N" mortar. Mortar shall be mixed to result in maximum bond strength with a compressive strength of 750 psi at 28 day. Air entrainment will not be allowed.
   1. Portland Cement: White Portland Cement, ASTM C150 (UBC STD. 26-1) Type I, II, or III. Use a low alkali cement.
   2. Aggregates: ASTM C144 for mortar and UBC STD. 24-23.
   3. Lime: ASTM C207, Type S hydrated lime for masonry purposes.
   4. Water: Clean and potable.
   5. The intent of this contract is to maintain a 750 psi strength Type "N" mortar. Contractor may use a prepackaged mix, or mix the mortar on site. Proportions shall be as recommended by ASTM, UBC and the manufacturer to result in a mortar of the specified strength.

a. Prior to beginning work, Contractor shall perform compression testing of mortar at 7 days to confirm strength. Additional mortar testing shall be performed at 14 days and 28 days to confirm strength.
b. Configuration of mortar test samples shall match configuration of mortar joint.

B. Brick Pointing Mortar: Provide pointing mortar that meets the State of Washington Department of General Administration Campus Maintenance Program Standards. Contractor shall be responsible for meeting manufacturer's recommendations for storing, mixing and installation of mortar:
1. The repointing mortar shall match the existing face mortar in color, grain size and texture; color shall match General Administration's pre-existing color choice. The compressive strength of the repointing mortar shall be equal or less than the compressive strength of the surrounding brick during wet condition of brick.
2. Product: Hydraulic Lime Mortar for the Repair and Repointing of Historic Masonry Buildings manufactured by U.S. Heritage Group, Inc., 3516 North Kostner Ave., Chicago, IL 60641 Phone: 773-286-2100 Fax: 773-286-1852. No substitution will be accepted.

2.3 REPLACEMENT BRICK

A. It is the intent of this project to salvage, preserve and reuse existing brick to the greatest extent possible for this project.
1. Whenever possible, sound brick with exterior surface damaged shall be turned to show undamaged face.

B. Should replacement brick be required due to irreparable damage, match color, texture, compressive strength and size of existing brick veneer.

2.4 MASONRY ACCESSORIES

A. Veneer Anchors: Prefabricated, adjustable anchor acceptable for masonry veneer installation on wood studs wall.
1. Manufacturer: Dur-O-Wal, Heckmann, Fero, or approved equal.
2. Product: Details are based on Dur-O-Wal #213S, adjustable anchor capable of engaging bed joint wires.
3. Material: Stainless steel
4. Provide 9-gauge wire at bed joints with anchors. Attach wire to anchor per manufacturer's recommendations.

B. Sealant: Coordinate with Section 07900. As required herein and to match existing in formula, color and texture.
1. Pre-molded Joint Filler (as applicable): Rigid urethane foam, thickness as recommended by manufacturer based on joint width.

C. Vapor Barrier: If necessary due to damage to existing barrier, match existing asphalt saturated felt. Apply in shingle overlap method.

D. Flashing:
1. Base Flashing: Two-part flashing fabricated of 26 gauge, 304 Stainless Steel.
2. Head Flashing at openings: 22 gauge, galvanized steel. To be back-primed, primed and painted.

E. Veneer Wall Cavity Drainage System: Cavity drainage fabric and weep hole filler fabricated of Nylon, high density polyethylene (HDPE) or polyester, fabricated in a 90% open mesh, 1" or 0.4" thick as required to fit existing cavity. Fabric and Weep Hole Filler shall be product of a single manufacturer.

1. Manufacturer: Details and installation requirements are based on Mortar Net USA, Ltd., 541 South Lake Street, Gary, IN 46403, Telephone: (800) 664-6638, (219) 939-3870; Fax: (219) 939-3877; Dur-o-Wal, or approved equal.
2. Fabric: Based on width of cavity: Mortar Net MN 10-1: 10" (254 mm) high x 1" (25.4 mm) thick material or Mortar Net MN 10-4: 10" (254 mm) high x 0.4" (10.2 mm) thick material.
3. Weep Hole Filler: Mortar Net Weep Vents: 100% recycled polyester, 90% open mesh bonded with flame retardant adhesive
   a. Thickness as required to fill joint.
   b. Color: As required to match new pointing mortar.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify installation conditions as satisfactory to receive work of this Section.
   1. Do not proceed until unsatisfactory conditions have been corrected.
   2. Beginning work constitutes contractor's acceptance of conditions as satisfactory.

3.2 PROTECTION

A. Protect existing brick veneer and all other existing materials to remain from damage due to the work of this section.

3.3 SURVEY

A. Prior to removing brick, establish bonding patterns, levels and coursings.
   1. Set datum points to ensure that brick is returned to its original location and that lines and levels align with existing brick to remain.
   2. Confirm existing joint dimensions at all opening and ensure that those dimensions are maintained when brick is reinstalled.

B. Establish lines and levels. Protect from disturbance throughout the course of the Work.

3.4 BRICK CLEANING

A. Gently remove all mortar from brick. Do not use power tools that may chip or scar brick.

B. Remove all sealant from face of brick. Carefully pull sealant away from surface with a sharp knife – so not scrape, scratch or scar brick surfaces.

C. Clean veneer units of slurry, dust, dirt, oil, paint, grease, and the like.

3.5 MASONRY INSTALLATION, GENERAL

A. Comply with referenced unit masonry standards and other requirements indicated as applicable to each type of installation included in project.

B. Provide temporary bracing and shoring of masonry where needed during removal process. Contractor shall be responsible for the design of all shoring.
   1. Shoring design shall be submitted to Architect for review.
      a. Purpose of review will be for impact on historic elements only.

D. In areas of damaged veneer, carefully remove full masonry units from joint to joint and in a manner to permit the replacement of full size units. Do not use power tools to remove

veneer. Remove all surface mortar. Do not damage brick when removing from wall or removing mortar.

E. Clean existing brick as noted in Section 3.4.

F. Re-use salvaged brick to the fullest extent possible. Salvage original removed brick to ensure that all brick in new work is original. Locate replacement brick on other elevations in concealed areas or areas shielded from public view. Integrate replacement brick throughout the field of brick.

G. Match coursing, bonding, color, compressive strength and texture of existing masonry. Reinstalled brick shall align with existing brick. Joints between veneer and existing openings shall match original in dimension and appearance.

3.6 BRICK VENEER REINSTALLATION

A. Confirm that existing waterproof membrane is in good condition before reinstalling brick veneer. If membrane is torn, or otherwise damaged, notify Architect for further direction before proceeding with work.

B. Install veneer anchors. Anchor veneer to existing wood structure with adjustable stainless steel veneer anchors. Attach anchors to existing structure with stainless steel screws and washers as recommended by manufacturer and as required to maintain integrity of moisture barrier.

C. Install base flashing at bottom course of reinstalled veneer, or where wall is adjacent to paving one course above top of paving. Base Flashing shall also be installed at all support angles. Install head flashing at all window and door heads.

D. Cavity Drainage: To ensure cavity drainage provide drainage fabric over Base Flashing.
   1. Match product size to cavity size. Cavity should be no more than 1/4" wider than 1" thick material and 0.4" thick material should touch both the outer wythe and the inner wall.
   2. Inspect for and repair holes in flashing immediately prior to installing Mortar Net.
   3. Preparation: Clean flashing and weep holes so they are free of mortar droppings and debris immediately prior to installing Mortar Net. If wicks are used, prevent mortar from coating or covering wicks inside the cavity. Washing flashing with water or chemicals prior to installation is not necessary.
   4. Fabric Installation:
      a. For most walls, install 1 continuous row of fabric at base of wall and over all wall openings directly on flashing.
      b. To prevent mortar bridging between he outer wythe and inner wall, install flashing extending from the bottom of fabric to 6" minimum above the top of fabric.
      c. Lay the first 1 or 2 courses of brick at flashing level, then install The fabric continuously by placing it against the inside of the openings. No fasteners or adhesives are required, and mortar need not have set.
      d. The fabric should not come in contact with wall ties, however if necessary, fabric may be cut or torn to accommodate ties, conduit, plumbing or other materials that bridge or intrude into cavity between inner and outer walls.
      e. Compress fabric horizontally so it can be forced into cavities slightly smaller than its nominal thickness without affecting fabric or wall performance.
      f. When forcing fabric into a cavity, be sure mortar has set sufficiently to resist outward pressure from product.
   5. Weep holes shall be installed at 2’-0” on center at first course of brick above through-wall flashing. Fill weep holes with fabric manufactured for such purpose to ensure against plugging.
      a. Fabric shall match mortar color:

E. Mix setting mortar to the maximum flow and with the maximum amount of water consistent with workability resulting in ready adherence to masonry and ease of spreading. Mortar may be retempered to replace water lost to evaporation only.
   1. Apply setting bed of mortar to required thickness to align with existing veneer to remain.
   2. Do not over furrow.

F. Apply mortar to sides of brick and shove veneer units in place so as to eliminate voids in the mortar joints.

G. Lay brick veneer units true to lines as required to match original construction and align with existing brick veneer at each end.

H. Pointing: Hold back, or rake out, setting mortar 1” from face of brick. Point with approved Pointing Mortar and tool joints as described n Section 3.07 below and as required to match existing joints.

I. Joints should be pointed in layers or "lifts" where the joints are deeper than 1/2 inch. Apply in layers not greater than 1/2 the depth until a uniform depth is formed. Compact each layer thoroughly and allow it to become thumbprint hard before applying the next layer.

J. Follow manufacturer’s recommendation regarding timing of tooling of joints. The joints shall be finished to match the original historic joint profile.

K. Remove all excess mortar from face of brick before it dries. Do not damage brick in removal of mortar.

3.7 REPOINTING

A. All damaged mortar at joints (unless otherwise noted) shall be removed (raked-out) back to sound, solid backup material. Raked-out joints shall leave a clean, square face at the back of the joint to provide for maximum contact of pointing mortar with the masonry backup mortar. Shallow joints or feather edging shall not be permitted. Rake out joints to a minimum depth of 2.5 times the width of the existing mortar joint.
   1. Examples:

      1/16" Mortar joint needs to be cut out to a depth of 3/16" minimum
      1/8" Mortar joint needs to be cut out to a depth of 5/16" minimum
      1/4" Mortar joint needs to be cut out to a depth of 5/8" minimum
      3/8" Mortar joint needs to be cut out to a depth of 15/16" minimum
      1/2" Mortar joint needs to be cut out to a depth of 1-1/4" minimum
      3/4" Mortar joint needs to be cut out to a depth of 1-7/8" minimum
      1” Mortar joint needs to be cut out to a depth of 2-1/2" minimum

B. Contractor shall not widen the existing masonry joints. The surrounding masonry edges shall not be further spalled or chipped in the process of mortar removal. Damage to surrounding brick resulting from mortar removal will not be permitted. Contractor shall replace all brick damaged during mortar removal with replacement units that match the original exactly.

C. Brush, vacuum, blow out or flush joints with water to remove dirt and loose debris, working from top to bottom of wall.

D. Exposed surface of brick or stone adjacent to joint shall be wet prior to repointing. Maintain a water sprayer with misting capabilities on site at all times during the repointing process.

E. Walls should be presoaked with water prior to repointing.

F. To ensure against drying too fast. Walls shall be misted with water a minimum of 3 minutes at the end of the day after initial installation and three times per day minimum – morning, noon and night – for 72 hours following installation.

G. Rinse joints with water to remove dust and mortar particles. Time the rinsing application so that at the time of pointing excess water has evaporated or run off. Joint surfaces should be damp but free from standing water.

H. Mortar shall be mixed according to manufacturer recommendations. The mortar material shall resemble the consistency of brown sugar during installation. This drier consistency enables the material to be tightly packed into the joint, allows for cleaner work, and prevents shrinkage cracks as the mortar cures.

I. Joints should be pointed in layers or "lifts" where the joints are deeper than 1/2 inch. Apply in layers not greater than 1/2 the depth until a uniform depth is formed. Compact each layer thoroughly and allow it to become thumbprint hard before applying the next layer.

J. Follow manufacturer's recommendation regarding timing of tooling of joints. The joints shall be finished to match the original historic joint profile.

K. Remove all excess mortar from face of brick before it dries. Do not damage brick in removal of mortar.

L. Keep mortar from drying out too quickly. Protect from direct sun, high winds for the first 72 hours after installation. Thoroughly soak the wall a minimum of three times per day for the first three (3) days until mortar and brick no longer take in moisture. Protect freshly pointed areas with plastic sheeting for the first 24 hours after installation.

3.8 CLEANING

A. Cleaning: Thoroughly clean brick after completion of installation. Remove dirt, excess mortar, stains and other defacements. Do not damage brick or mortar during cleaning.

B. Leave site neat, clean and free of debris at the end of each days work.

C. Restore brick storage area to condition it was in prior to beginning the work of this section.

END OF SECTION 04910

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY OF WORK

A. For repointing, resetting, and relaying of historic masonry as shown on the Drawings and as specified in the construction documents.

1.3 SUBMITTAL

A. Submit the following items in time to prevent delay of work and to allow adequate time for review of submittals, if needed. Do not order materials or start the execution of the work before receiving the written approval:

1. Samples of all specified materials and Materials Safety Data Sheets (MSDS) as appropriate.
2. Certificates, except where the material is labeled with such certification by the producers of the materials, that all materials supplied comply with all the requirements of these specifications and the appropriate standards
3. Color- match repointing mortar samples to existing original mortar or specified alternative.
4. Written verification that all specified items will be used. Provide purchase orders, shipping tickets, receipts, etc. to prove that the specified materials were ordered and received.
5. Restoration Program: Submit written program for each phase of restoration process including protection of surrounding material on building and site during operations. Describe in detail material, methods and equipment to be used for each phase of restoration work.

1.4 QUALITY ASSURANCE

A. All repointing must be performed by a craftsperson that is familiar with historic mortar formulations, curing conditions and performance characteristics. Contractor shall provide proof of such knowledge to the Architect. A firm having not less than 5 years successful experience in comparable masonry restoration projects and employing personnel skilled in the restoration process and operations indicated must perform Work.

B. Only skilled journey level masons who are familiar and experienced with the materials and methods specified and with the design requirements shall be used for masonry restoration. One skilled journey level mason, trained in historic restoration, shall be present at all times during masonry restoration and shall personally direct the work.

C. Repointing: Prepare 2-4 samples (4'x4' size)of cured mortar (location to be determined) for demonstrating quality of materials and workmanship expected in mortar joints. Prepare, install

and finish each sample according to specifications with all kinds of building conditions. Sample must be applied to actual masonry. Samples should cure a minimum of 14 days prior to Owners approval. Approval should be based on a viewing distance of 15 feet from the wall. Samples should remain in place for duration of job.

D. Cutting of joints: Prepare 2x4 sample of joint removal and raking to remain in place for the duration of the job unless otherwise noted.

E. Source of Materials: Obtain materials for patching, and repointing from a single manufacturer source to ensure match quality, color, texture and detailing.

F. Site Observation

1. In addition to the Site Representative the Owner may designate a Historic Preservation (HP) Representative for this Project to perform historic preservation inspection services in accordance with provisions of Section 01456. This HP Representative may also perform the duties of the Site Representative.
2. The HP Representative will make daily visits to the site to review the progress of the work and its conformance with the Contract Documents. The HP Representative will bring relevant issues to the attention of the Contractor's QA Manager and the Architect. The HP Representative will coordinate with the Building Manager and Zone Coordinator on Owner related issues.
3. The HP Representative will photograph the work and issue written reports to all concerned parties at regular intervals.
4. The HP Representative will participate in the pre-construction meeting, quality assurance meetings, progress meetings, pre-installation meetings, and closeout/punch list meetings in addition to walk-throughs.

1.5 SUBSTITUTIONS

A. No alternative substitutions of materials or methods will be accepted.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site in manufacturer's original unopened containers and packaging, bearing labels as to type and names of products and manufacturers.

B. Deliver and store restoration material in manufacturers original, unopened containers with the grade, batch and production date shown on the container or packaging.

C. Protect restoration materials during storage and construction from wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials

D. Protect mortar and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturers recommendations for minimum and maximum temperature requirements for storage.

E. Comply with the manufacturers written specifications and recommendations for mixing, application, and curing of repointing mortars and patching materials.

1.7 PROTECTION/SITE CONDITIONS

A. Protect persons, motor vehicles, building site and surrounding buildings from injury resulting from masonry restoration work.

B. Do not perform any masonry repointing unless air temperatures are between 40 degree Fahrenheit (10 deg. C) and 95 degrees Fahrenheit (32 deg C) and will remain so for at least 48 hours after completion of work. Phase repointing during hot weather by completing process on the shady side of the building or schedule installation of materials during cooler evening hours to prevent premature evaporation of the mortar.

C. Do not use frozen materials or materials mixed or coated with ice or frost. Do not lower the freezing point of mortar by the use of admixtures or anti-freeze agents, and do not use chlorides in the mortar.

D. Prevent repointing mortar from staining the face of masonry or other surfaces to be left exposed. Immediately remove all repointing mortar that comes in contact with such surfaces.

E. Cover partially completed work when work is not in progress.

F. Protect sills, ledges and projections from droppings.

G. Damage occurring to the building as a result of work of this section of Contractor's failure to protect against such damage shall be the Contractor's responsibility. Contractor shall restore damaged areas to the complete satisfaction of the Architect at no expense to the Owner.

PART 2 - PRODUCTS

2.1 REPOINTING MORTAR MATERIALS

A. Repointing mortar shall be prepared and placed in accordance with the Department of the Interior National Park Service Cultural Resources Preservation Briefs 2, "Repointing Mortar Joints in Historic Masonry Buildings", Revised edition October 1998, and in compliance with the guidelines set forth by the Secretary of the Interior's Standards for Rehabilitation.

B. Repointing mortar shall match the original in grain size and texture. Compressive strength of the repoinitng mortar shall be equal or less than the compressive strength of the original mortar and surrounding [brick] [stone] in wet condition. The replacement mortar shall contain approximately the same ingredient proportions of the original mortar.

C. All replacement mortar ingredients and mortar formulations shall be established from Campus Standard Plans.

D. Testing laboratory shall supply a ready mixed mortar sample sufficient in size for a mock up sample at the site.

E. Mixing of individual mortar ingredients at the construction site will not be permitted.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of unit masonry.

B. Do not proceed until unsatisfactory conditions have been corrected.

3.2 MASONARY INSTALLATION, GENERAL

A. Comply with referenced unit masonry standard and other requirements indicated applicable to each type of installation included in Project.

B. Before removing any deteriorated masonry units, established bonding patterns, levels, bedding planes and coursings.

C. Provide temporary bracing of masonry where needed during removal process.

D. Cut out full units from joint-to-joint and in a manner to permit the replacement of full size units.

E. Build new masonry to the full thickness as shown on Drawings. Key [brick] [stone] into existing structure wherever possible providing mortar as required.

F. Re-use salvaged [brick] [stone] to the fullest extent possible. Integrate new replacement [brick] [stone] in concealed areas or shielded from public view.

G. Match coursing, bonding, color, bedding, and texture of existing masonry.

H. Pre-wet Masonry: Wet [brick] [stone] which have an initial rate of absorption of more that 30 grams per 30 square inches per minute. Use wetting methods to ensure each [brick] [stone] unit is nearly saturated but surface dry when laid.

3.3 REPOINTING OF MORTAR JOINTS IN BRICK AND STONE

A. All joints (unless otherwise noted) shall be raked back to sound, solid back up material. All raking out should leave a clean, square face at the back of the joint to provide for maximum contact of pointing mortar with the masonry back up mortar. Shallow or feather edging shall not be permitted.

B. Existing mortar joints shall be raked out a minimum depth of 2-1/2 times the width of the existing mortar joints.

1. Examples:

1/16” Mortar joint needs to be cut out to a depth of 3/16” minimum
1/8” Mortar joint needs to be cut out to a depth of 5/16” minimum
¼” Mortar joint needs to be cut out to a depth of 5/8” minimum
3/8” Mortar joint needs to be cut out to a depth of 15/16” minimum
½” Mortar joint needs to be cut out to a depth of 1-1/4” minimum
¾” Mortar joint needs to be cut to a depth of 1-7/8” minimum
1’ Mortar joint needs to be cut to a depth of 2-1/2” minimum

C. Existing horizontal mortar joints (bed joints) that are filled with a hard Portland mortar may be raked out using a diamond blade that is narrower than the joint width. The middle one-third of the mortar joint may be cut using a rotary power saw. The remaining mortar shall be removed from the masonry joints by hand using masonry chisels or pneumatic carving tools powered by air.

[or]

C. The existing mortar shall be removed from the masonry joints by hand using masonry chisels.

D. Vertical joints (head joints) SHALL NOT be raked out using rotary power saws. All vertical head joints shall be removed by hand.

E. Existing historic lime-based mortar shall be removed using only small-headed chisels that are permitted.

F. Contractor shall not widen the existing masonry joints. The surrounding masonry edges shall not be spalled or chipped in the process of mortar removal. Damage to surrounding [brick] [stone] shall not be permitted. Contractor shall replace all [brick] [stone] damaged during mortar removal with replacement units that match the original exactly.

G. Brush, vacuum, or blow out to remove dirt and loose debris, working from top to bottom of wall.

H. Exposed surface of [brick] [stone] adjacent to joint shall be wet prior to repointing. Maintain a water sprayer on site at all times during the repointing process.

I. Walls shall be wet down 24 hours before mortar installation and presoaked with water 10 minutes prior to repointing. Walls shall be misted with water for duration of at least 3 minutes at the end of the day after initial installation. Mist walls with water for 72 hours after initial distillation; three times per day minimum – morning, noon and night.

J. Time the water application so that at the time of pointing excess water has evaporated or run off. Joint surfaces shall be damp but free from standing water.

K. Mortar shall be mixed according to manufacturer recommendations and the following:

1. To dry mix pour entire contents of mortar tub into mixing tray.
2. Completely mix in dry state for minimum of 5 minutes.
3. For small quantity amounts, use clean 1-quart paint cans with tight fitting lids, and separate dry mortar into cans.
4. When pointing small joints, only mix mortar that can be used in 4 hours.

The mortar material shall resemble the consistency of brown sugar during installation. This drier consistency shall enable the material to be tightly packed into the joint and allow for cleaner work and prevent shrinkage cracks as the mortar cures.

L. Joints shall be pointed in layers or “lifts” where the joints are deeper than 1-1/4 inch or until a uniform depth is formed. Compact each layer thoroughly and allow it to become thumbprint hard before applying the next layer.

1. Lift Examples:

3/16” joint depth (1/16” joint existing) point in one lift
5/16” joint depth (1/8” joint existing) point one in lift
5/8” joint depth (1/4” joint existing) point one in lift
15/16” joint depth (3/8” joint existing) point one in lift
1-1/4” joint depth (1/2” joint existing) point one lift
1-7/8” joint depth (3/4” joint existing) point in two lifts approximately 1” each
2-1/2” joint depth (1” joint existing) point in three lifts approximately +3/4” (each)
Over 2-3/4 joint depth-point in lifts of no more than 1-1/4”each

M. When mortar is thumbprint hard joints shall be finished to match the original historic joint profile.

N. Keep mortar from drying out to quickly. Protection from direct sun and high winds for the first 72 hours after installation. Thoroughly soak the wall a minimum of three times per day for the first three (3) days. Protect freshly pointed areas with plastic sheeting for the first 24 hours after installation.

END OF SECTION 04915

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

[Note: This Guide Specification is based on stone masonry restoration at an existing historic campus building. Modify as necessary to fit current project requirements.]

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

B. Relate Work Specified Elsewhere
   1. Cutting and Patching: Section 01730
   2. Selective Demolition: Section 01731

1.2 DESCRIPTION

A. Work includes but is not limited to:
   1. Repoint damaged mortar joints in sandstone (Bid Form Item No. 25).
   2. Realign and repoint 1,000 pound stone parking barricade (Bid Form Item No. 27).

B. The work of this Contract involves a historically significant structure on the National Register of Historic Places and is part of the Washington State Capitol Campus Historic District. In addition to other requirements, Work of this Section shall be performed under the guidelines of the *Secretary of the Interior's Standards for the Treatment of Historic Properties.* While work under this contract is in progress, protect existing buildings, grounds, contents, and occupants, including those on adjacent property, whether private or public, from damage or harm.
   1. It is the intent of this Section that:
      a. Repair and replacement materials shall match remaining historic construction in all physical and visual aspects including material, form, color, texture and workmanship.
      b. As much of the historic material as possible will be saved.
      c. Perform work using the gentlest methods available. Prevent damage to materials and finishes to remain.
      d. Sound historical materials will not be put as risk due to the work of this Section.

1.3 REFERENCES

A. Applicable provisions of the following standards shall apply to the work of this Section, except as modified herein, and are hereby made a part of these Specifications to the extent required. See Section 01420 for listed association, council, institute, society, and the like organization for its full name and address.

MIW	The Northwest Masonry Guide, available from the Masonry Institute of Washington, 425-803-0627

NPS Standards The Secretary of Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings

Preservation Briefs 2: Repointing Mortar Joints in Historic Masonry Buildings

B. Regulatory Requirements: This structure is a qualified historic structure, as such the provisions of the Washington State Historic Building Code and the Uniform Code for Building Conservation shall apply. Confirm requirements with Architect and Building Official before proceeding with work.

1.4 SUBMITTALS

A. Submit per Section 01330 and the following:

1. Product Data:
   a. Data on mortar products, including patching materials.
   b. Certificates, except where the material is labeled with such certification by the producers of the materials, that materials supplied comply with the requirements of these specifications and appropriate standards.
2. Samples: Repointing mortars. Indicate color match with existing.
3. Written verification that specified items will be used. Provide purchase orders, shipping tickets, receipts and the like, to prove that the specified materials were ordered and received.
4. Qualifications of Mason/Craftsperson: Submit qualifications to show experience as required in paragraph 1.5B. below.
5. Restoration Program.

B. Mock-Ups:

1. Prepare 2 - 4 samples , 4' x 4', of cured mortar for demonstrating quality of materials and workmanship expected in mortar joints.
   a. Apply to actual masonry. Location to be determined. Coordinate with Owner and Architect.
2. Prepare, install and finish each sample according to specifications with all kinds of building conditions.
3. Cure samples a minimum of 14 days prior to Owner's approval. Approval will be based on a viewing distance of 15 feet from the wall.
4. Mock-ups shall remain in place for duration of project.

1.5 QUALITY ASSURANCE

A. It is the intent of this project to preserve the building's historic materials to the greatest extent possible. The gentlest means possible shall be used to perform the work and the greatest care shall be taken to assure that historic materials are not damaged in the process of the work of this section.

B. Due to the historic significance of this building, work of this section shall be performed by a mason familiar with the historic performance and characteristics of masonry construction. The masonry subcontractor to perform the work of this contract shall have the following qualifications:

1. Successfully completed not less than 3 projects of similar size and scope involving historic masonry projects with in the last 10 years.
   a Submit list of historic projects including name, location, cost, Owner/Architect/ Engineer's name and phone number.

2. Project superintendent shall have a minimum of 3 projects of similar size and scope involving historic building.
   a. Submit list of historic projects supervised by this superintendent including name, location, cost, owner/architect/engineer's name and phone number.
   b. Contractor may not change Superintendent without written approval of the owner.
3. Only skilled journey level masons who are familiar and experienced with the materials and methods specified and with the design requirements shall be used for masonry restoration. One skilled journey level mason, trained in historic restoration, shall be present at all times during masonry restoration and shall personally direct the work. Journey level masons shall have a minimum of 3 years experience and have worked on a minimum of 2 historic masonry structures.
4. The ratio of apprentices to journeymen on this project shall not exceed two apprentices to one journeymen.
5. Certification: Repointing shall be performed by a craftsperson trained in the use of the specified products. Contractor shall provide proof of training to the Architect by submitting a certificate from U.S. Heritage Group at (773) 286-2100 regarding an on site training program for this project.

C. Source of Materials: Obtain materials for patching and repointing from a single manufacturer to ensure, match of quality, color and texture.

D. Quality Control Plan: Comply with the requirements of Section 01450 and the following:

1. Indicate methods for providing a safe working environment.
2. Indicate methods for removal of damaged mortar joints.
3. Indicate method for cleaning masonry.
4. Indicate precautions to be taken against theft and or vandalism of stored materials.
5. Indicate methods for accessing pointing work and for protecting adjacent area's during this work, including adjacent building materials, landscaping and the like.
6. Indicate methods for mixing and storing pointing materials.
7. Indicate methods for removing excess mortar for masonry surfaces.
8. Indicate methods for final pointing/tooling.
9. Indicate methods for waterproofing open joint areas.

E. Quality Assurance: The Owner's Historical Preservation Representative and the Architect will review work on a regular basis for Contractor's conformance with the Quality Control Plan.

F. Preconstruction Conference: Prior to beginning work of this section, Contractor shall convene meeting with Architect and Owner to review the Quality Control Plan, survey and all job conditions and procedures.

1.6 DELIVERY, STORAGE, AND HANDLING

A. In accordance with requirements of 01600 and the following:

1. Deliver materials and store on the site in original containers with seals unbroken and labels intact until time for use, in accordance with manufacturer's instructions.
   a. Labels shall indicate types and names of products and manufacturers. Show grade, bach and production date.
2. Protect restoration materials during storage and construction from wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials.
3. Protect mortar and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.
4. Comply with manufacturer's written specifications and recommendations for mixing, application, and curing of repointing mortars and patching materials.

1.7 PROTECTION/SITE CONDITIONS

A. Protect persons, motor vehicles, building site and surrounding buildings from injury resulting from masonry restoration work.

B. Weather Conditions:

1. Cold Weather Requirements: Do not work in temperatures below 40º F, when the substrate is colder than 40º F, or when the temperature is expected to fall below 40º F for 48 hours after installation of repair mortars.
2. Hot Weather Requirements: Protect repair mortar from direct sunlight and wind using protection measures submitted and approved when the ambient air temperature exceeds 70º F. Do not use or prepare mortar when ambient air temperature is above 90º F at the location of the work.
3. Phase repointing during hot weather by completing process on the shady side of the building or schedule installation of materials during cooler evening hours to prevent premature evaporation of the mortar.
4. Do not use frozen materials or materials mixed or coated with ice or frost. Do not lower the freezing point of mortar by the use of admixtures or anti-freeze agents, and do not use chlorides in the mortar.
5. Prevent repointing mortar from staining the face of masonry or other surfaces to be left exposed. Immediately remove repointing mortar that comes in contact with such surfaces.
6. Cover partially completed work when work is not in progress.
7. Protect sills, ledges and projections from droppings.
8. Damage occurring to the building as a result of work of this section of failure to protect against such damage shall be restored to the complete satisfaction of the Architect at no expense to the Owner.

PART 2 - PRODUCTS

2.1 GENERAL

A. Comply with “Quality Assurance” “References,” Specifications and Manufacturers’ standards, recommendations and date provisions. Where these conflict, the more stringent requirements govern.

2.2 MORTAR

A. Pointing mortar: Provide pointing mortar that meets the State of Washington, Department of General Administration Campus Maintenance Program Standards. Contractor shall be responsible for meeting manufacturers’ recommendations for storing, mixing and installation of mortar.

1. The repointing shall match the existing face mortar in color, grain size and texture. The compressive strength of the repointing mortar shall be equal or less than the compressive strength of the surrounding masonry.
2. Product: Hydraulic Lime Mortar for the repair and Repointing of Historic Masonry Buildings manufactured by U.S. Heritage Group, Inc. 3516 North Kostner Ave., Chicago IL. 60641, Phone (773) 286-2100, Fax (773) 286-1852. No substitution will be accepted.

PART 3 – EXECUTION

3.1 EXAMINATION & PREPARATION

A. Examine conditions, with installer present, for compliance with requirements for installation tolerances and other specific conditions affecting performance of unit masonry.

B. Locate the cracked sandstone mortar joints and confirm with the Owner which cracked joints are within the scope of the Contract.

C. Do not proceed until unsatisfactory conditions have been corrected.

D. Protect all ledges below where repointing work is being performed from mortar droppings.

3.2 REPOINTING OF MORTAR JOINTS

A. Unless otherwise noted, rake back joints to sound, solid back up material. Raking out shall leave a clean, square face at the back of the joint to provide for maximum contact of pointing mortar with the masonry back up mortar. Shallow or feather edging is not permitted.

B. Rake out existing mortar joints a minimum depth of 2-1/2 times the width of the existing mortar joints.

1. 1/16" mortar joint needs to be cut out to a depth of 3/16" minimum
2. 1/8" mortar joint needs to be cut out to a depth of 5/16" minimum
3. 1/4" mortar joint needs to be cut out to a depth of 5/8" minimum
4. 3/8" mortar joint needs to be cut out to a depth of 15/16" minimum
5. 1/2" mortar joint needs to be cut out to a depth of 1-1/4" minimum
6. 3/4" mortar joint needs to be cut to a depth of 1-7/8" minimum
7. 1" mortar joint needs to be cut to a depth of 2-1/2" minimum

C. Remove the existing mortar from the masonry joints by hand, using masonry chisels or pneumatic carving tools powered by air.

D. Remove vertical head joints by hand. Do not rake out vertical joints using rotary power saws.

E. Remove existing historic lime-based mortar using only small-headed chisels, which are permitted.

F. Do not widen the existing masonry joints. Take care not to chip or spall the surrounding masonry edges in the process of mortar removal. Damage to surrounding brick or stone is not permitted. Replace stone damaged during mortar removal with replacement units that match the original exactly.

G. Brush, vacuum, blow out or flush joints with water to remove dirt and loose debris, working from top to bottom of wall.

H. Wet exposed surface of stone adjacent to joint prior to repointing. Maintain a water sprayer on site at all times during the repointing process. Wet down walls 24 hours before mortar installation and presoak with water 10 minutes prior to repointing.

I. Mist walls with water for duration of at least 3 minutes at the end of the day after initial installation. Mist walls with water for 72 hours after initial distillation; 3 times per day minimum – morning, noon and night.

J. Rinse stone joint with water to remove dust and mortar particles. Time the rinsing application so that at the time of pointing excess water has evaporated or run off. Joint surfaces should be damp but free from standing water.

K. Mortar shall be mixed according to manufacturer recommendations. The mortar material shall resemble the consistency of brown sugar during installation. This drier consistency enables the material to be tightly packed into the joint and allows for cleaner work and prevents shrinkage cracks as the mortar cures.

L. Point joints in layers or “lifts” where the joints are deeper than 1-1/4" or until a uniform depth is formed. Compact each layer thoroughly and allow it to become thumbprint hard before applying the next layer.

1. 3/16" joint depth (1/16" joint existing) point in one lift
2. 5/16" joint depth (1/8" joint existing) point one in lift
3. 5/8" joint depth (1/4" joint existing) point one in lift
4. 15/16” joint depth (3/8" joint existing) point one in lift
5. 1-1/4" joint depth (1/2" joint existing) point one lift
6. 1-7/8" joint depth (3/4" joint existing) point in two lifts approximately 1" each
7. 2-1/2" joint depth (1" joint existing) point in three lifts approximately +3/4" (each)
8. Over 2-3/4" joint depth-point in lifts of no more than 1-1/4"each

N. Finish the joints when mortar is thumbprint hard to match the original historic joint profile (convex joint).

O. Keep mortar from drying out to quickly. Protect from direct sun and high winds for the first 72 hours after installation. Thoroughly soak the wall a minimum of 3 times per day for the first 3 days. Protect freshly pointed areas with plastic sheeting for the first 24 hours after installation.

3.3 CLEANING

A. Cleaning: Thoroughly clean stone after completion of mortar installation. Remove excess mortar, dirt, stains and other defacements. Do not damage stone or mortar during cleaning.

B. Leave site neat, clean and free of debris at the end of the each days work.

C. Restore storage area to condition it was in prior to beginning the work of this section.

END OF SECTION 04920

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

A. General: Work of this Section includes all labor, materials, equipment and services necessary to complete the Work as described on the drawings, as specified in this Section, and as may be required elsewhere by the Contract Documents, applicable Laws and Regulations and Site conditions.

B. Work of this section describes the requirements for repolishing marble using polishing powder and water. This procedure applies to highly polished stone and is not suitable for use on honed marble surfaces.

B. Determine original finish of marble before proceeding with any repolishing procedure.

C. Repolishing reflective surfaces may be necessary after treatment if the surface gloss has been altered. This is especially true if the surface has been etched.

D. Perform as needed to repolish specular stone surfaces.

1.3 QUALITY ASSURANCE

A. It is the intent of this project to preserve the building's historic materials to the greatest extent possible. The gentlest means possible shall be used to perform the work and the greatest care shall be taken to assure that historic materials are not damaged in the process of the work of this section.

B. Due to the historic significance of this building, work of this section shall be performed by stone masons familiar with the historic performance and characteristics of stone masonry construction. The masonry subcontractor to perform the work of this Contract shall have the following minimum qualifications:

1. Successfully completed not less than 3 projects of similar size and scope involving historic stone masonry polishing projects within the last 10 years.
   a Submit list of historic projects including name, location, cost, Owner/Architect/ Engineer's name and phone number.
2. Project superintendent shall have a minimum of 3 projects of similar size and scope involving historic buildings.
   a. Submit list of historic projects supervised by this superintendent including name, location, cost, owner/architect/engineer's name and phone number.
   b. Contractor may not change Superintendent without written approval of the owner.

3. Only skilled workers who are familiar and experienced with the materials and methods specified shall be used for marble work. One skilled journey level mason, trained in historic stone restoration, shall be present at all times during polishing process and shall personally direct the work. Journey level masons shall have a minimum of 3 years experience and have worked on a minimum of 2 historic masonry structures.

C. Quality Control Plan: Comply with the requirements of Section 01450.

D. Pre-Installation Conference: Prior to beginning any work of this contract, meet with Architect and Owner to review Quality Control Plan and all proposed procedures.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data including application instructions.

B. Test Panel:
1. Locate Test Panels as directed by Architect and Owner's representative.
2. Approved Test Panels will demonstrate quality of materials and workmanship expected.
   a. Prepare, install and finish sample panel according to specifications.
   b. Sample shall be applied to existing building marble.
3. Approved sample panel shall be maintained for duration of job as a benchmark of the standard of quality to be achieved.

C. Materials Safety Data Sheets (MSDS) as appropriate.

D. Certificates (except where the material is labeled with such certification by the producers of the materials) that all materials supplied comply with all the requirements of these specifications and the appropriate standards.

E. Quality Control Plan: Comply with the requirements of Section 01450.

F. Certification of experience and training as required herein and as may be required by product manufacturers to maintain product warranty.

PART 2---PRODUCTS

2.1 MANUFACTURERS

A. Eastern Marble Supply Company
P.O. Box 392
Scotch Plains, NJ 07076
908/789-6400

2.2 MATERIALS

A. Mineral water.

B. Marble Polishing Powder: A finely ground buffing powder manufactured specifically for restorative type polishing of polished marble surfaces, such as "Marbalite #52" (Eastern Marble Supply Company) or approved equal. Polishing agents may also be available at a hardware store or local stone dealer.

C. Clean, lint-free cloths.

2.3 EQUIPMENT

A. Buffing pads for Polished Finish: Fiber brush pads manufactured specifically for restorative type polishing of polished marble surfaces

B. Hand-held buffing machine

PART 3---EXECUTION

3.1 ERECTION, INSTALLATION, APPLICATION

A. Wet the surface with mineral water.

B. Sprinkle the marble polishing powder over the surface.

C. Dampen cloths with mineral water (if they are to be used).

D. Rub the powder onto the stone with the damp cloths or by using a hand-held buffing machine.

1. Apply polishing powder to marble surfaces to comply with manufacturer's recommendations for hand application methods, unless otherwise indicated. Do not allow to remain on surface for periods longer than that indicated or recommended by manufacturer.

E. Buff until surface shines.

F. Wipe clean with a damp cloth.

END OF SECTION 04921

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

A. General: Work of this Section includes all labor, materials, equipment and services necessary to complete the Work as described on the drawings, as specified in this Section, and as may be required elsewhere by the Contract Documents, applicable Laws and Regulations and Site conditions.

B. Work of this section describes the requirements for patching small cracks and holes in marble with a two-component epoxy resin.

C. This procedure is appropriate for cracks smaller in width than 1/8 inch and for holes smaller in diameter than 2 inches.

1.3 QUALITY ASSURANCE

A. It is the intent of this project to preserve the building's historic materials to the greatest extent possible. The gentlest means possible shall be used to perform the work and the greatest care shall be taken to assure that historic materials are not damaged in the process of the work of this section.

B. Due to the historic significance of this building, work of this section shall be performed by stone masons familiar with the historic performance and characteristics of stone masonry construction. The masonry subcontractor to perform the work of this Contract shall have the following minimum qualifications:

1. Successfully completed not less than 3 projects of similar size and scope involving historic marble repair projects within the last 10 years.
   a Submit list of historic projects including name, location, cost, Owner/Architect/ Engineer's name and phone number.
2. Project superintendent shall have a minimum of 3 projects of similar size and scope involving historic buildings.
   a. Submit list of historic projects supervised by this superintendent including name, location, cost, owner/architect/engineer's name and phone number.
   b. Contractor may not change Superintendent without written approval of the owner.
3. Only skilled workers who are familiar and experienced with the materials and methods specified shall be used for marble patching work. One skilled journey level mason, trained in historic stone restoration, shall be present at all times during polishing process and shall personally direct the work. Journey level masons shall have a minimum of 3 years experience and have worked on a minimum of 2 historic masonry structures.

C. Quality Control Plan: Comply with the requirements of Section 01450.

D. Pre-Installation Conference: Prior to beginning any work of this contract, meet with Architect and Owner to review Quality Control Plan and all proposed procedures.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data for epoxy adhesives or resins, including mixing instructions and precautionary handling instructions.

B. Materials Safety Data Sheets (MSDS) as appropriate.

C. Certificates (except where the material is labeled with such certification by the producers of the materials) that all materials supplied comply with all the requirements of these specifications and the appropriate standards.

D. Quality Control Plan: Comply with the requirements of Section 01450.

E. Certification of experience and training as required herein and as may be required by product manufacturers to maintain product warranty.

PART 2---PRODUCTS

2.1 MATERIALS

A. Patching Resin: Manufacturer's standard 2-component epoxy resin, designed specifically for patching or bonding of marble units.

1. Factors to consider when selecting an epoxy should include permeability, absorption, thermal expansion coefficients and ultraviolet lighting conditions.

B. Aggregate for Epoxy: Ground marble dust to match color of existing marble.

C. Clean, potable water.

2.2 EQUIPMENT

A. Hacksaw Blade.

B. Chisels.

C. Hand-held Water Bottle.

D. Steel Trowel.

E. Caulking gun.

F. Stiff bristle brushes (non-metallic).

G. Resurfacing Screens for Honed Finish: A fine grit screen manufactured specifically for restorative type cleaning and resurfacing of honed marble surfaces.

H. Grinding Stones for Honed Finish: Fine grit emery stones manufactured specifically for restorative type grinding and resurfacing of honed marble surfaces.

I. Soft, nylon bristle brushes.

PART 3---EXECUTION

3.1 ERECTION, INSTALLATION, APPLICATION

A. Using a chisel or hacksaw blade, carefully remove unsound marble material and old patching material from cracks and holes to expose sound marble material for contact with epoxy patch.

B. Brush, vacuum or flush cracks and holes to remove dirt and loose debris.

C. Mix 2-component epoxy resin with marble dust aggregate to create a paste with a consistency suitable for application (based on SHIPO approval). Use marble dust from stone pieces of the same type, color, etc.

D. Using a caulking gun or spatula, apply patching material in cracks and holes as recommended by manufacturer to conform to adjacent marble surfaces.

E. Allow patching material to cure for period as recommended by manufacturer.

F. Once hardened, grind and polish surface of patching material to match surface characteristics of adjacent marble.

END OF SECTION 04922

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

A. General: Work of this Section includes all labor, materials, equipment and services necessary to complete the Work as described on the drawings, as specified in this Section, and as may be required elsewhere by the Contract Documents, applicable Laws and Regulations and Site conditions.

B. Work of this section describes the requirements for repairing severely cracked marble blocks using dutchman repair. This procedure is also appropriate for large spalls in marble.

C. The proposed method and procedures shall be reviewed by the Historic Preservation Representative prior to performing work of this Section. Follow recommendations from the Historic Preservation Representative.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM),100 Barr Drive, West Conshohocken, PA 19428, (610) 832-9585 or FAX (610) 832-9555.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data for epoxy adhesives or resins, including mixing instructions and precautionary handling instructions.

B. Samples: Submit samples of marble dutchman units. Include full range of colors and textures required to match existing stone. Submit samples of stainless steel pins for patching.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Contractor performing the work shall have a minimum of 5 years experience in masonry restoration work of the type described for this project.
2. If requested by the Owner, furnish a statement of the experience and qualifications of the firm and of the key personnel who will work on this project. Include the names and addresses of successful projects completed, and for each, the name and address of the owner and the architect.

1.6 DELIVERY, STORAGE AND HANDLING

A. Packing and Shipping: Deliver stone materials to the project site in undamaged condition.

B. Storage and Protection:

1. Store and handle stone to prevent their deterioration or damage due to moisture, extreme temperature changes, contaminants, breakage, chipping or other causes.
2. Do not use pinch or wrecking bars to move or place stone. Lift stone with wide belt slings where possible. Use wood rollers to move stone laterally.

1.7 PROJECT/SITE CONDITIONS

A. Environmental Requirements: The work is to be executed only when the air and surface temperature is 40 F and rising, or less than 90 F. No pointing or patching is to be executed when the temperature is 45 F and falling, or when freezing temperatures are expected within 48 hours.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Jahn Restoration Techniques and Research
Cathedral Stone Company
2505 Reed Street, NE
Washington, DC 20018

B. Sika Corporation
201 Polito Ave.
Lyndhurst, NJ 07071
201/933-8800

2.2 MATERIALS

A. Marble for replacement marble pieces and dutchman repairs to match existing marble type, color and finish, complying with ASTM C503. Size of replacements and dutchman pieces shall be as required by field conditions.

B. Reinforcement/Anchors: Stainless steel type 302/304 3/8" in diameter threaded rods, length as required.

C. Cementitious patching material such as "M70 Stone Restoration Mortar" (Jahn Restoration), or approved.

D. Epoxy grout: High-modulus, low viscosity, high strength epoxy grouting/sealing/binder adhesive such as "Sikadur 35, Hi-Mod LV" (Sika Corporation), or approved equal.

E. Clean, soft cloths

F. Clean, potable water

2.3 EQUIPMENT

A. Stiff fiber bristle brushes

B. Stiff wire bristle brushes

C. Chisel

D. Hammer

E. Trowel

F. Spray bottle

G. Masonry drill

PART 3---EXECUTION

3.1 PREPARATION

A. Protection: Protect existing adjacent materials during the execution of the work. Provide necessary protection and conduct work procedures to avoid damage to doors, windows, flashing, roofing and other existing material assemblies.

3.2 ERECTION, INSTALLATION, APPLICATION

A. Carefully remove loose stone fragments. Reuse all pieces of spalled stone which are in sound condition without serious cracks or flaws.

B. Clean any exposed metal anchors of all corrosion by scraping and brushing with a stiff wire bristle brush. Replace any unsound anchors as necessary with new stainless steel anchors of approximate size and shape to match existing. Bed new anchors in epoxy grout.

C. For large fragments, square off the portion of spalled stone for replacement with dutchman repair. Remove dust and debris from cavity and fragments using a stiff fiber bristle brush.

D. Fit the dutchman for size.

E. For dutchman larger than 4" by 4" by 1", additional reinforcement may be required.

1. Drill holes (size determined by size of reinforcement selected) into both the sound stone and the dutchman.
2. Inject adhesive into the holes and set stainless steel pins into the holes.

F. Coat abutting surfaces of the stone with epoxy adhesive, and secure the stone dutchman in place until the adhesive is cured.

G. Clean any residual adhesive from the edges using a clean soft cloth. Wet the stone with clean, potable water and fill any chipped areas and edges with patching mortar. Avoid featheredging. Tool surface level with surrounding stone. Keep mortar damp (80%-90% RH) for 72 hours or until cured.

END OF SECTION 04923

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

A. General: Work of this Section includes all labor, materials, equipment and services necessary to complete the Work as described on the drawings, as specified in this Section, and as may be required elsewhere by the Contract Documents, applicable Laws and Regulations and Site conditions.

B. Work of this section describes the requirements for regrouting deteriorated joints in marble.

C. The proposed method and procedures shall be reviewed by the Historic Preservation Representative prior to performing work of this Section. Follow recommendations from the State Historic Preservation Representative.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM),100 Barr Drive, West Conshohocken, PA 19428, (610) 832-9585 or FAX (610) 832-9555.

B. American National Standard Institute (ANSI), 1430 Broadway, New York, NY 10018 (use most recent versions).

1.4 QUALITY ASSURANCE

A. It is the intent of this project to preserve the building's historic materials to the greatest extent possible. The gentlest means possible shall be used to perform the work and the greatest care shall be taken to assure that historic materials are not damaged in the process of the work of this section.

B. Due to the historic significance of this building, work of this section shall be performed by stone masons familiar with the historic performance and characteristics of stone masonry construction. The masonry subcontractor to perform the work of this Contract shall have the following minimum qualifications:

1. Successfully completed not less than 3 projects of similar size and scope involving historic marble repair projects within the last 10 years.
   a Submit list of historic projects including name, location, cost, Owner/Architect/ Engineer's name and phone number.
2. Project superintendent shall have a minimum of 3 projects of similar size and scope involving historic buildings.

a. Submit list of historic projects supervised by this superintendent including name, location, cost, owner/architect/engineer's name and phone number.
b. Contractor may not change Superintendent without written approval of the owner.

3. Only skilled workers who are familiar and experienced with the materials and methods specified shall be used for marble grouting work. One skilled journey level mason, trained in historic stone restoration, shall be present at all times during re-grouting process and shall personally direct the work. Journey level masons shall have a minimum of 3 years experience and have worked on a minimum of 2 historic masonry structures.

C. Quality Control Plan: Comply with the requirements of Section 01450.

D. Pre-Installation Conference: Prior to beginning any work of this contract, meet with Architect and Owner to review Quality Control Plan and all proposed procedures.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's product data for epoxy adhesives or resins, including mixing instructions and precautionary handling instructions.

B. Materials Safety Data Sheets (MSDS) as appropriate.

C. Certificates (except where the material is labeled with such certification by the producers of the materials) that all materials supplied comply with all the requirements of these specifications and the appropriate standards.

D. Quality Control Plan: Comply with the requirements of Section 01450.

E. Certification of experience and training as required herein and as may be required by product manufacturers to maintain product warranty.

1.6 DELIVERY, STORAGE AND HANDLING

A. Packing and Shipping: Deliver materials to the project site in undamaged condition.

B. Storage and Protection: Store and handle materials to prevent their deterioration or damage due to moisture, extreme temperature changes, contaminants, or other causes.

PART 2---PRODUCTS

2.1 MATERIALS

A. Setting Materials: Joints should be filled to match existing mortar or marble color, as directed by Architect and owner

1. Portland Cement: ANSI/ASTM C 150, Type I, except complying with staining requirements of ASTM C 91 for not more than 0.03% water soluble alkali

2. Hydrated Lime: ANSI/ASTM C 207, Type I
3. Sand: ANSI/ASTM C 144, non-staining, except graded with 100% passing the No. 166 sieve for 1/4" and narrower joints
   a. For white pointing mortar and grout, furnish natural white sand or ground white stone complying with specified requirements
   b. For colored pointing mortar and grout, furnish ground marble, granite or other sound stone, meeting specified grading requirements for sand, of color required to match existing mortar and grout color
4. Clean, potable water

5. Dry-Set Mortar: Factory-sanded Portland cement and additives complying with ANSI A 118.1, of type approved by mortar manufacturer and marble supplier for application indicated

B. Molding Plaster: ANSI/ASTM C 59

C. Clean, potable water

2.2 EQUIPMENT

A. Masonry Drill

B. Hacksaw Blade

C. Chisel and mallet for removing deteriorated grout

D. Brushes: Soft bristled nylon only

E. Hand-held Water Bottle

F. Steel Trowel

PART 3---EXECUTION

3.1 PREPARATION

A. Protection: Prevent grout or mortar used in regrouting and repair work from staining face of surrounding marble and other surfaces. Remove immediately grout and mortar in contact with exposed marble and other surfaces.

3.2 ERECTION, INSTALLATION, APPLICATION

A. Carefully remove deteriorated mortar and grout from joints by hand with a chisel and mallet and other hand tools, unless otherwise indicated and approved by Architect and owner

B. Clean marble surfaces within raked-out joints to provide reveals with square backs and to expose marble for contact with pointing mortar. Brush, vacuum or flush joints to remove dirt and loose debris.

1. Caution: Be careful not to spall edges of marble units. Epoxy patch any existing marble units which become damaged. See Section 04922 for epoxy patching procedures.

C. Fill joints in marble unit with grout of color to match existing mortar color or to match marble color, except at expansion and control joints indicated to be filled with sealant. Color of mortar shall be established in mock-ups. Finish grout flush with finished surface of marble.

D. Fill all gaps and skips to produce a finished joint which is uniform in color, smooth and without voids, pinholes, or low spots.

E. Remove grout spillage from face of marble as work progresses.

F. Cure grout by maintaining in a moist condition for 7 days.

G. For Regrouting Stone Floors: Do not permit traffic during setting of units or for at least 24 hours after final grouting of joints.

END OF SECTION 04927

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

A. General: Work of this Section includes all labor, materials, equipment and services necessary to complete the Work as described on the drawings, as specified in this Section, and as may be required elsewhere by the Contract Documents, applicable Laws and Regulations and Site conditions.

B. Work of this section describes the requirements for raking out and repointing deteriorated or inappropriately repointed horizontal and vertical joints on exterior marble.

C. The proposed method and procedures shall be reviewed by the Historic Preservation Representative prior to performing work of this Section. Follow recommendations from the Historic Preservation Representative.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM),100 Barr Drive, West Conshohocken, PA 19428, (610) 832-9585 or FAX (610) 832-9555.

1.4 QUALITY ASSURANCE

A. It is the intent of this project to preserve the building's historic materials to the greatest extent possible. The gentlest means possible shall be used to perform the work and the greatest care shall be taken to assure that historic materials are not damaged in the process of the work of this section.

B. Due to the historic significance of this building, work of this section shall be performed by stone masons familiar with the historic performance and characteristics of stone masonry construction. The masonry subcontractor to perform the work of this Contract shall have the following minimum qualifications:

1. Successfully completed not less than 3 projects of similar size and scope involving historic marble repair projects within the last 10 years.
   a Submit list of historic projects including name, location, cost, Owner/Architect/ Engineer's name and phone number.
2. Project superintendent shall have a minimum of 3 projects of similar size and scope involving historic buildings.
   a. Submit list of historic projects supervised by this superintendent including name, location, cost, owner/architect/engineer's name and phone number.
   b. Contractor may not change Superintendent without written approval of the owner.

3. Only skilled workers who are familiar and experienced with the materials and methods specified shall be used for marble repointing work. One skilled journey level mason, trained in historic stone restoration, shall be present at all times during repointing process and shall personally direct the work. Journey level masons shall have a minimum of 3 years experience and have worked on a minimum of 2 historic masonry structures.

C. Regulatory Requirements: Marble Design Manual, ASTM C144, Aggregate for Masonry mortar; ASTM C150 Portland Cement; manufacturer's printed recommendations for product use and installation.

D. Certifications: Prior to delivery, submit certificates attesting compliance with applicable specifications for grades, types, classes.

E. Field Samples: Prior to raking out all areas, cut back joints at location selected by the Architect and Owner using the methods specified. Raking will continue at no additional cost to the Owner, until an acceptable sample is achieved. This area will serve as standard for joint raking for the entire job. It will be marked and left unpointed until all other pointing is completed. Point when directed by the Architect and Owner.

F. Quality Control Plan: Comply with the requirements of Section 01450.

G. Pre-Installation Conference: Prior to beginning any work of this contract, meet with Architect and Owner to review Quality Control Plan and all proposed procedures.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's product data including mixing instructions and precautionary handling instructions.

B. Materials Safety Data Sheets (MSDS) as appropriate.

C. Certificates (except where the material is labeled with such certification by the producers of the materials) that all materials supplied comply with all the requirements of these specifications and the appropriate standards.

D. Quality Control Plan: Comply with the requirements of Section 01450.

E. Certification of experience and training as required herein and as may be required by product manufacturers to maintain product warranty.

1.6 PROJECT/SITE CONDITIONS

A. Existing Conditions: No stone work shall be performed when the air temperature is 40 F and falling or when stone surface temperature is 40 F or below.

PART 2---PRODUCTS

2.1 MATERIALS

A. Portland cement: Type I, ASTM C150, gray and/or white as necessary to match mortar color specified.

B. Hydrated Masons Lime: ASTM C207.

C. Aggregate: Clean sharp sand free of loam, silt, soluble salts and organic matter. Aggregate shall conform to the size gradations specified as a result of laboratory analysis of an approved sample.

1. Choose the color of the aggregate so that the dry mortar color matches specified color.

D. Water: Clean and free of deleterious amounts of oils, acids, alkalis and organic matter.

2.2 EQUIPMENT

A. Chisels

B. Joint tools

C. Hawks

D. Stiff fiber bristle brushes

E. Trowels

F. Rubber mallet

2.3 MIXES

A. Proportions for Marble Pointing, or as determined by mortar analysis:

1. Portland cement: 1 part by volume
2. Lime: 2 parts by volume
3. Aggregate: 9 parts by volume
4. Water: To form a workable consistency

B. Mixing Procedures:

1. Measure materials by volume or equivalent height.
2. Do not measure by shovel. Use known measure.
3. Mix ingredients in clean mechanical batch mixer for 3-5 minutes.
4. Let mortar sit for 20 minutes prior to use to allow for initial shrinkage. Use mortar within 1« hours of initial mixing.

PART 3---EXECUTION

3.1 ERECTION, INSTALLATION, APPLICATION

A. Rake out all stone joints in designated areas by hand using a chisel less in width than joint width. Clean all mortar from surfaces within the joint or crack so that the new pointing mortar bonds to the building material, not old mortar. Do not chip or spall edges of the marble. If work is found unacceptable, all raking shall cease without additional cost to Owner until deficiencies in tools, workers or methodologies have been corrected to the Architect and Owner's satisfaction.

B. Joint depth to be at least 3/4" but in all cases rake back to expose sound mortar.

C. Brush, vacuum or flush joints to remove all dirt and loose debris.

D. Reduce initial absorption of the stone by thoroughly wetting (surface dry) with clean water just prior to repointing.

E. Pack joints with mortar leaving no voids. Place mortar in layers not exceeding 1/4" depth. Apply succeeding layers only after preceding layer has taken initial set.

F. Use clean tools and equipment free from hardened or partially set mortar.

G. Clean excess mortar from stone and joints, removing splashed mortar and droppings immediately.

H. Do not retemper or use mortar which has partially set, is caked or is lumpy.

I. Finish horizontal and vertical face joints. Do not allow mortar to extend over the surface of the stone.

J. Curing: Keep joints damp (90% RH) for at least 72 hours or until surface is cured. Protect joints from rapid drying due to wind (i.e., covering tarps, enclosure on scaffolding).

3.2 ADJUSTING/CLEANING

A. At the time of repairing, pointing and resetting the marble, immediately remove mortar, grout and adhesives from the face of the masonry.

B. Use only tools and equipment which are clean and free of hardened or partially hardened material.

C. Clean marble only with fiber bristle brushes and water. Use no acids, detergents, or other cleaning agents.

END OF SECTION 04928

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

B. Related Work Specified Elsewhere.

1. Unit Prices Allowances; Section 01240 (for poulticing).
2. Mortar; Section 04065.
3. Stone Restoration: Section 04920.
5. Sealants: Section 07900.

1.2 DESCRIPTION

A. General: Work of this Section includes all labor, materials, equipment and services necessary to complete the Work as described on the drawings, as specified in this Section, and as may be required elsewhere by the Contract Documents, applicable Laws and Regulations and Site conditions.

B. Work of this section describes the requirements for removal of all soil, soot and biological growth from masonry surfaces and the removal of damaging salts by poulticing.

C. Work of this section includes, but may not be limited to the following:

1. Pre-wetting of sandstone and granite.
2. Masking of particular areas of stone with polyethylene sheeting to protect from run down from cleaning agents.
3. Covering and protection of landscape plant materials.
4. Application of biodegradable detergent solution to designated areas.
5. Application of calcium hypochlorite solution to designated areas.
6. Application of biocide solution to designated areas.
7. Rinsing with clean water.
8. Selective poulticing of sandstone as indicated to remove damaging salts.

1.3 QUALITY ASSURANCE

A. It is the intent of this project to preserve the building's historic materials to the greatest extent possible. The gentlest means possible shall be used to perform the work and the greatest care shall be taken to assure that historic materials are not damaged in the process of the work of this section.

B. Due to the historic significance of this building, work of this section shall be performed by stone masons familiar with the historic performance and characteristics of masonry construction. The masonry subcontractor to perform the work of this contract shall have the following qualifications:

1. Successfully completed not less than 3 projects of similar size and scope involving historic stone masonry cleaning projects within the last 10 years.
   a Submit list of historic projects including name, location, cost, Owner/Architect/ Engineer's name and phone number.
2. Project superintendent shall have a minimum of 3 projects of similar size and scope involving historic buildings.
   a. Submit list of historic projects supervised by this superintendent including name, location, cost, owner/architect/engineer's name and phone number.
   b. Contractor may not change Superintendent without written approval of the owner.
3. Only skilled journey level masons who are familiar and experienced with the materials and methods specified and with the design requirements shall be used for stone masonry cleaning. One skilled journey level mason, trained in historic restoration and cleaning, shall be present at all times during cleaning process and shall personally direct the work. Journey level masons shall have a minimum of 3 years experience and have worked on a minimum of 2 historic masonry structures.
4. The ratio of apprentices to journey level personnel on this project shall not exceed two apprentices to one journey level.
5. Certification: Repointing shall be performed by a craftsperson trained in the use of the specified products. Contractor shall provide proof of training to the Architect by submitting a certificate from U.S. Heritage Group at (773) 286-2100 regarding an on site training program for this project.

C. Quality Control Plan: Comply with the requirements of Section 01450.

D. Pre-Installation Conference: Prior to beginning any work of this contract, meet with Architect and Owner to review Quality Control Plan and all proposed procedures.

1.4 SUBMITTALS

A. Sample Panels: Provide the following panels using the techniques proposed for review and approval of the Architect. Approved test panels shall be left in place for comparison of the progress of the Work.
   1. Cleaning Granite: Prior to reinstallation, clean the exposed face of one of the granite block stair treads.
   2. Cleaning Sandstone: A test panel of wall surface ten square feet in area, at a location selected by the Architect, shall be cleaned for review and approval by the Architect, prior proceeding with the Work of this Section.
      a. Notify the HP Representative and Architect at least 72 hours in advance of testing.
      b. No general cleaning shall commence until acceptance is obtained.
      c. Document tests by recording locations and procedures on elevation drawings.
   3. Poutlicing Application: Prepare 2 - 4 foot square panels on the building in location selected by the Architect showing representative installation and adhesion of poultice materials. Sample installation shall be done in the presence of the Architect and Owner.
      a. Provide 72 hours notice of when installation will be carried out.
   4. Poultice Removal: On one of the 4 foot square panels provide a demonstration of poultice removal techniques.
      a. Provide 72 hours notice of when installation will be carried out.
   5. Repeat the test processes and alter methods and materials as required to achieve results that are satisfactory to the Architect and Owner.
   6. The approved sample panels shall be used as a standard for all masonry cleaning and poulticing work.

B. Product Literature: Submit manufacturer's product and instructions for use to for all cleaning and poultice materials. Include appropriate MSDS sheets on all materials.

1.5 JOB CONDITIONS

A. Avoid cleaning during periods of extreme or excessive winds and during freezing weather or when temperature is predicted to fall below 35 degrees F.

B. Protection:

1. Products used for cleaning stone may be harmful to plants, metal, glass and pavers. Any damage to materials caused by the cleaning process is unacceptable and shall be repaired to the satisfaction of the Architect at no additional cost to the Owner.
2. During cleaning take all precautions necessary to avoid staining or streaking of masonry adjacent to areas being cleaned. Check condition of adjacent materials frequently during cleaning process, and stop all cleaning if discoloration or alteration of surface texture is observed.
3. When cleaning from scaffolding in traffic areas, drape scaffolding with plastic or burlap to reduce spray drift.
4. Protect trees and plants around the building from contamination or danger.
5. Protection of Existing Stone
   a. Protect all architectural detail elements and surfaces from breakage, marring, abrasion, disfigurement and/or other damage during the staging or moving of lifts and/or other access equipment to building.
   b. Immediately notify Architect of any such damage for evaluation prior to continuing work sequence.
   c. Protection of existing stone:
      1) Stone that will not be poulticed, shall be protected from any run down of treatment solutions protect stone with heavy polyethylene sheeting. Top edges should be sealed to building stone with either removable adhesive tape or a prior accepted method of sealing protective sheeting to stone.
      2) All stone shall be pre-wetted with clean potable water immediately prior to cleaning to protect stone from deep penetration of runoff.
6. Protection of Existing Landscape Materials And Automobiles:
   a. Any existing plant material including trees, shrubs, and lawn shall be covered during the cleaning operation to protect from damage by cleaning process.
   b. Assure that proper coverage is in place prior to work above for that particular section.
   c. If drift from cleaning spray is anticipated for any particular work, notify Owner prior to commencing work by 48 hours of that area so automobiles can be moved and/or block from over-spray area.
   d. Protect lawns from damage due to lifts, washers, and fuel spills.

C. Test all drains and other water removal systems to assure that drains and systems are functioning properly prior to performing any cleaning operations. Notify Owner immediately of any and all drains or systems that are found to be stopped or blocked. Do not begin work of this Section until the drains are in working order.

1. Provide a method to prevent solids such as masonry residue from entering the drains or drain lines. Contractor shall be responsible for cleaning out drains and drain lines that become blocked or filled by sand or other solids because of work performed under this contract.

D. Channel runoff and control residue from cleaning with loose sand or sandbags as required. Allow liquid runoff to evaporate, and dispose of solid materials appropriately and as acceptable to the governing authorities.

E. All uncompleted work shall be protected at any time when liable to injury from storms or freezing.

F. Materials shall be used only at the manufacturer's recommended temperature tolerances for masonry materials.

1. The work shall be protected during hot weather from premature or rapid drying.
2. Work shall not be permitted in freezing weather, or when temperature of the air is expected to freeze within 48 hours of work.

1.6 PRODUCT HANDLING

A. All materials shall be delivered to the job site in unopened containers as shipped by the manufacturer. The Architect shall be permitted to view delivered materials in their original unopened containers.

1. Store, handle and protect all materials from damage, moisture, dirt, and intrusion of foreign matter.
2. Immediately re-seal containers after partial use.
3. Remove and replace damaged materials.

B. Store materials at job site in a secure area acceptable to the Owner, off the ground, and under cover. Comply with manufacturer's recommendations for storage and handling.

PART 2 - PRODUCTS

2.1 MATERIALS - GENERAL

A. Comply with "Quality Assurance" provisions, "References", Specifications, and Manufacturer's data. Where these may be in conflict, the more stringent requirements govern.

B. Unless otherwise indicated, dilute chemical cleaning materials with water to produce solutions of concentration indicated but not greater than that recommended by chemical cleaner manufacturer.

2.2 CLEANING MATERIALS

A. Iron Oxide Spot Remover: Super Iron Out (R) as manufactured by Iron Out, Inc., 1515 Dividend Rd., Ft. Wayne, IN 46808-1126, (888) 476-6688, or approved equal.

B. Water: Shall be potable, non-staining and free of materials detrimental to all surfaces to be cleaned. Water shall be heated to 150 degrees F.

C. Miscellaneous Items

1. Nylon bristle brushes
2. Sponges
3. Separate plastic buckets for collecting waste
4. Goggles
5. Rubber gloves
6. Protective raingear.

D. Other Materials: Provide other materials indicated or required for a complete cleaning of stone work as shown.

2.3 POULTICE MATERIALS

A. Washed, graded silica sand, 60 mesh.

B. Fuller’s earth as distributed by Conservator’s Emporium, or accepted equal.

C. Laponite as distributed by Conservation Resources Intl., Springfield, VA or accepted equal.

D. Cotton flock as distributed by International Filler Corp. or accepted equal.

1. 200 mesh
2. Color: white

E. Ammonium Carbonate, food grade or U.S.P. grade. As manufactured and distributed by Integris, Renton WA.

F. De-ionized or distilled water. Contractor may have water company (such as Sparkletts) provide water de-ionizer canister to site for duration of the project. If so, locate canister as directed by Owner.

G. Poultice Removal Materials: Medium hard plastic spatulas.

2.4 MISCELLANEOUS MATERIALS

A. Provide other materials not specifically described but required for complete and proper performance of the Work. Use new materials of first quality of their respective kinds.

B. Masking: Window glass shall be protected during masonry cleaning by the use of plastic/polyethylene sheeting and blue painters tape, or approved.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify than conditions are satisfactory for commencement of the Work of this Section. Do not begin the work of this Section until unsatisfactory conditions have been corrected.

B. Inspect surfaces for existing damage, make a complete listing of preconditions for review by the Architect and Owner.

3.2 PROTECTION

A. Comply with recommendations of manufacturer's "Material Safety Data Sheets."

B. General: Comply with manufacturer's recommendations for protecting building surfaces against damage from exposure to their products.

C. Protect unfinished work when stopping for the day.

D. Do not allow cleaning or poulticing operations to obstruct building drainage or drainage at grade. Protect all roof drains and area drains at grade.

3.3 PREPARATION

A. Surface Preparation: Comply with manufacturer's preparation requirements. Remove all loose surface debris and bird droppings from the dry stone by means of careful scraping and brushing.

3.4 CLEANING

A. Stone Cleaning:

1. Clean all granite and areas to be poulticed.

2. Step 1: Pre-Wetting of Stone
   a. Pre-wet with low-pressure water all stone surfaces indicated to be cleaned. Treat only enough surface area so that pre-wet condition continues to prevent penetration of runoff into stone depth. Evaporation of pre-wetting water will limit extent of treatment area. Judgment of mason will be critical to observed evaporation rate. Include all areas affected by rundown in pre-wetting operation.
3. Step 2: Application of Calcium Hypochlorite
   a. Apply calcium hypochlorite in a spray form over selected designated areas. Use only a low-pressure spray (i.e. less than 200 psi) for application.
   b. The angle of spray shall not be greater than 45° to the face of stone and at a distance of no closer than 18".
   c. Use of a soft bristle brush (bristles of brush should be no stiffer than that of a "shoe brush") for removal of biological growth.
4. Step 3: Control of Run Down
   a. Use a wet vacuuming system to control run down of wastewater, which will have diluted salts in solution. Make every effort to control cleaning solution and rinse water from being redeposited onto lower stone surfaces.
5. Step 4: Rinse Water Application
   a. Apply clean rinse water by flooding technique over immediate work area where cleaning has occurred.
6. Finished work shall show no signs of stains, scratches, streaks or runs of discoloration from cleaning. Leave all exposed surfaces neat and clean. The appearance of the brick and stone after cleaning and after adequate drying time shall be uniformly clean.

3.5 IRON OXIDE REMOVAL

A. Safety:
   1. Applicators to know and understand MSDS. Avoid skin and eye contact with both solid product and its solution. Re-seal supply containers immediately after dispensing solid. Store in a dry environment. Do not introduce moisture to supply container or use wet tools to dispense powder. To prevent pressure build up, do not mix solution in a closed container.
   2. Use adequate ventilation. Water solution of this product releases gases that may cause respiratory irritation. Individuals with respiratory ailments or a known sensitivity to sulfites should not carry out this operation.
   3. Do not combine Super Iron Out with any other agents, as potentially hazardous gases may released.

B. Preparation:
   1. Do not carry out iron stain removal when freezing conditions are expected within 48 hours, or when rain is predicted that may interfere with controlling the application of the solution.
   2. Super Iron Out is to be used in accordance with manufacturer's directions. Solution is to be prepared in small quantities no more than one hour before use. Do not store unused solution over night or from one shift to the next.
   3. Mix Super Iron Out with warm potable water in a plastic bucket in the proportion of 1 cup of powder per gallon of warm water (2 oz. by volume, per quart). Strength of the stain removal action will diminish rapidly, do not prepare more solution than can be applied and removed within one hour.

C. Application:

1. Pre-wet location of stain (s) ten minutes prior to cleaning in order to prevent the absorption of the treatment solution into the stone. Pre-wetting is to be done with potable water and to extend beyond the area of treatment solution spreading.
2. Brush treatment solution onto pre-wetted stained area. For very small locations, a paintbrush should be used to minimize the application of solution to areas where it is not required. Allow solution to remain in contact with surface until stain is gone or until five minutes have passed, whichever occurs first.
3. Collect solution with sponges and discharge into waste bucket. Distribute fresh potable water over treated area to rinse. Retrieve this rinse water and discharge into waste bucket. Repeat once. Discharge waste solution thoroughly from sponges so as not to return treatment chemicals to the stone surface during rinsing.
4. If iron stains are still visible, repeat application of cleaning solution and rinse procedure above. If stains fail to respond consult Architect or Stone Conservation Consultant before modifying concentration or dwell time.

D. Cleanup:

1. Allow stone to dry. In the course of stain removal some general cleaning will also occur. If a disparity in appearance results between treated and untreated areas, it may be necessary to conduct an overall cleaning of the granite via pressure washing or nylon scrub brushes with clear water.
2. In the event that any white efflorescence is observed upon drying, or blanching of areas subjected to the treatment solution occurs, this is evidence of the incomplete removal of the treatment solution. Such an occurrence requires immediate re-rinsing.
3. Do not flood surface as a means of rinsing. Residual treatment chemicals absorbed into adjacent stone not intended for treatment may have detrimental effects on that stone.
4. Odor of treatment solution will diminish rapidly as it oxidizes in the air. Discard waste solution in accordance with local regulations. Do not allow treatment solution to enter building drains.

3.6 POULTICING

A. Poultice Preparation:

1. Pretreatment Solution: Dissolve 10% by weight of ammonium carbonate in de-ionized water, (e.g. 100 grams in 1 liter).
2. Poultice:
   a. Prepare a 5% by weight Laponite solution in de-ionized water at least 24 hours in advance. For example, 50 grams of Laponite powder are slowly added to one liter of water while mixing with a paddle wheel stirrer. When all lumps have been dispersed, the mixture is set aside and allowed to gel overnight.
   b. The remaining ingredients are proportioned by volume. Insure that all dry ingredients are thoroughly mixed in a dry container before adding water. Combine one part of Fuller's earth and one part cotton flock by shaking them together in a large container (a plastic drum works well) or tumbling them in a barrel-type mixer.
   c. Add 6 parts of dry sand to the Fuller's/flock mixture and mix thoroughly.
   d. Add minimal distilled water with constant mixing until the mix assumes a clumped consistency.
   e. Add only enough Laponite gel to produce a trowelable or blowable slurry depending upon application method.

B. Poultice Application: Poulticing shall be accomplished during dry weather with a minimum temperature of 40 degrees F.

1. For pneumatic application the operation will require three applicators: one person to apply the pretreatment solution, the nozzle man, and one person to trowel the material to a smooth layer.
2. Shelter work area to allow uninterrupted drying. Ventilate as necessary.
3. Vacuum and brush any visible salts from the stone surface before poultice application. In areas where acrylic sealer residues are flaking from surface, remove what can be easily brushed off without scrubbing. Stone spalls or scales that are physically displaced from the surface may be removed with prior approval of the Architect.
4. Mist surface of stone with pretreatment solution, immediately before poultice application. Do not apply excess that leads to more than 6” run down.
5. Insure that ammonium carbonate solution is not allowed to drip across copper alloy fittings such as roof flashing as it may create blue/green stains.
6. Using a pneumatic pumping system and/or hand trowel, apply a thin, uniform layer of poultice onto sandstone approximately 3/16” thick. Insure that curved surfaces are covered uniformly, indented areas are completely covered and that projections are not exposed.

C. Poultice Removal

1. Poultice shall be allowed to remain in place until completely dry.
   a. Protect poultice from wetting.
   b. Most of the extracting action will happen in the very last stages of drying. The point at which the poultice lightens in color, is not the point at which it is dry. Poultice shall be allowed to remain in place for an additional 10 days without wetting from rain and/or excessive humidity.
2. The poultice shall be completely removed from the stone.
   a. The poultice shall be removed by gentle scraping with a plastic spatula.
   b. Vacuum up poultice residue.

3.8 COMPLETION

A. Following completion of the cleaning operation remove and dispose of all cleaning and masking materials in a legal manner. Window and other non-cementitious surfaces shall be left clean.

B. All residue washed from building surfaces shall be swept or flushed away from surrounding sidewalks and service areas nightly. All premises shall be clean and neat at all times.

C. Sand and poultice residue shall be completely removed from all areas including roofs, planters, and sidewalks.

D. Clean any windows impacted by cleaning and/or poulticing operations.

END OF SECTION 04940

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

A. General: Work of this Section includes all labor, materials, equipment and services necessary to complete the Work as described on the drawings, as specified in this Section, and as may be required elsewhere by the Contract Documents, applicable Laws and Regulations and Site conditions.

B. Work of this section describes the requirements for cleaning honed and polished marble surfaces by machine buffing or using liquid cleaners or mild detergents.

C. The proposed method and procedures shall be reviewed by the Historic Preservation Representative prior to performing work of this Section. Follow recommendations from the Historic Preservation Representative.

1.3 QUALITY ASSURANCE

A. Mock-Ups: Prior to start of general marble cleaning, prepare the following sample panels on building where directed by A/E and o\Owner. Obtain A/E, Owner and Historic Preservation Representative's acceptance of visual qualities before proceeding with the work. Retain acceptable panels in undisturbed condition, suitably marked, during cleaning as a standard for judging completed work.

1. Demonstrate materials and methods to be used for each type of cleaning and resurfacing for each type of marble surface and condition on sample panels of approximately 4 sq. ft. in area.
2. Have manufacturer's representative present when the sample work is being done and when the sample work is being inspected for approval.
3. Test adjacent non-marble materials for possible reaction with cleaning materials.
4. Allow waiting period not less than 7 calendar days after completion of sample cleaning to permit study of sample panels for negative reactions.

B. Safety Precautions: When working with chemicals, workers should wear protective clothing including goggles, face shields, gloves, etc. in compliance with governing federal safety codes and regulations.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data including mixing instructions and precautionary handling instructions.

B. Materials Safety Data Sheets (MSDS) as appropriate.

C. Certificates (except where the material is labeled with such certification by the producers of the materials) that all materials supplied comply with all the requirements of these specifications and the appropriate standards.

D. Quality Control Plan: Comply with the requirements of Section 01450.

PART 2---PRODUCTS

2.1 MANUFACTURERS

A. BASF-Wyandotte Corporation
Chemical Specialties Division
1609 Biddle
Wyandotte, MI 48192
313/246-6100

B. ProSoCo, Inc.
755 Minnesota Avenue
P.O. Box 1578
Kansas City, KS 66117
800/255-4255 or 913/281-2700

C. Eastern Marble Supply Company
P.O. Box 392
Scotch Plains, NJ 07076
908/789-6400

2.2 MATERIALS

[Specifier Note: Edit the following paragraphs as appropriate for type of surface finish to be cleaned.]

A. Liquid Marble Cleaner: A water-soluble non-acidic chemical cleaner manufactured specifically for restorative type cleaning of polished and honed marble surfaces. Cleaner shall contain no abrasives, grease, lye, or other caustic or corrosive ingredients, such as "Sure Klean Liquid Marble Cleaner" (ProSoCo, Inc.), or approved.

B. Cleaning Detergent: A mildly alkaline phosphorous-free biodegradable liquid soap.

C. Cleaning Compound for Buffing a Honed Finish: An abrasive cleaning compound, containing no caustic or harsh fillers, manufactured specifically for restorative type cleaning of honed marble surfaces such as "Wyandotte Detergent" (BASF-Wyandotte Corporation), or approved.

D. Polishing Agent for Buffing a Polished Finish: A finely ground buffing powder manufactured specifically for restorative type polishing of polished marble surfaces, such as "Marbalite #52" (Eastern Marble Supply Company), or approved.

E. Clean, potable water

2.3 EQUIPMENT

A. Buffing pads for Polished Finish: Fiber brush pads manufactured specifically for restorative type polishing of polished marble surfaces.

-OR-

A. Buffing Pads for Honed Finish: Synthetic pads manufactured specifically for restorative type cleaning of honed marble surfaces.

B. Soft natural bristle brushes (DO NOT USE WIRE BRUSHES OR STEEL WOOL).

C. Circular buffing machine (for floors)

-OR-

C. Hand-held buffing machine (for surfaces other than floors)

D. Mop and bucket (non-metallic)

E. Sponges

F. Clean, dry cloths

PART 3---EXECUTION

3.1 PREPARATION

A. Protection: Prevent chemical cleaning and stain removal solutions from coming into contact with other surfaces which could be damaged by such contact.

B. Surface Preparation: Prior to cleaning, remove cellophane tape, masking tape, etc. from surface.

3.2 ERECTION, INSTALLATION, APPLICATION

A. General: Perform each cleaning method indicated in a manner which results in uniform coverage of all surfaces, including corners, moldings, interstices and which produces an even effect without streaking or damage to marble surfaces. CLEAN TO ACHIEVE A DESIRED (NOT NEW) APPEARANCE.

[Specifier Note: Edit the following paragraphs as appropriate for type of surface finish to be cleaned.]

B. Cleaning Honed Marble: Follow procedures in Paragraph D. below.
-OR-
B. Cleaning Honed Marble:

1. Machine buff with a cleaning compound (see Materials, Section 2.2 B. above):
   a. Thoroughly wet honed marble surface with hot water.
   b. Sprinkle cleaning compound onto surface.
   c. Buff surfaces using a large circular buffing machine with a synthetic pad for floors or a hand-held machine for other surfaces to lift dirt build-up.
   d. Treat edges and corners of surfaces not accessible with the hand-held machine.

e. Thoroughly rinse surfaces with clean, clear water to remove loosened dirt and standing water. Change rinse water frequently and repeat rinsing as required to completely remove water and dirt residue from surface.
f. Repeat process as to achieve the desired appearance.
g. Dry surfaces with clean, dry cloths or dry mop floors after rinsing to prevent streaking.

C. Cleaning Polished Marble: Follow procedures in Paragraph D. below.
-OR-
C. Cleaning Polished Marble:

1. Machine buff with a polishing agent (see Materials, Section 2.2 B. above):
   a. Mix polishing agent with water to create a paste compound as recommended by manufacturer.
   b. Apply paste mixture to surface and buff using a hand-held machine with a fiber brush buffing pad. Treat areas of approximately 9 sq. ft. at a time, first running the pad horizontally and then vertically across surface.
   c. Repeat process as necessary to achieve the desired appearance.
   d. Final polish by first wetting with clean water followed by running a clean buffing pad across the surface until dry.

D. Cleaning Either Honed or Polished Marble: Clean by one of the following methods:

1. Method 1: Apply a liquid marble cleaner to the surface (see Materials, Section 2.2 A. above):
   a. Apply cleaner to honed or polished marble surface using a stiff bristle brush.
   b. Allow cleaner to remain on surface for period recommended by chemical cleaner manufacturer taking care not to allow cleaning material to dry.
   c. Sponge rinse surface thoroughly using clean, clear water to completely remove dirt and cleaner residue. Change rinse water frequently.
   d. Repeat process as necessary to achieve the desired level of cleanliness.
   e. Wipe the surface with a clean, dry cloth to prevent streaking.
2. Method 2: Apply a mild detergent solution to the surface (see Materials, Section 2.2 A. above):
   a. Mix mild detergent with warm water to create cleaning solution.
   b. Thoroughly wet the honed or polished marble surface with hot water.
   c. Apply cleaning solution with a cloth, sponge or soft-fibered brush. Wash in small overlapping areas.
   d. Sponge rinse surface thoroughly using clean, clear water to completely remove dirt and cleaner residue. Change rinse water frequently.
   e. Wipe the surface dry with clean, soft cloths to prevent streaking.

END OF SECTION 04941

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

A. General: Work of this Section includes all labor, materials, equipment and services necessary to complete the Work as described on the drawings, as specified in this Section, and as may be required elsewhere by the Contract Documents, applicable Laws and Regulations and Site conditions.

B. Work of this section describes the requirements for removing mortar deposits or other concrete-based residues from marble. Mortar deposits may be spattered onto adjacent surfaces during repointing or other repair work. If left on the surface, these deposits and residual film can be difficult to remove.

C. The proposed method and procedures shall be reviewed by the Historic Preservation Representative prior to performing work of this Section. Follow recommendations from the Historic Preservation Representative.

1.3 QUALITY ASSURANCE

A. It is the intent of this project to preserve the building's historic materials to the greatest extent possible. The gentlest means possible shall be used to perform the work and the greatest care shall be taken to assure that historic materials are not damaged in the process of the work of this section.

B. Due to the historic significance of this building, work of this section shall be performed by stone masons familiar with the historic performance and characteristics of stone masonry construction. The masonry subcontractor to perform the work of this Contract shall have the following minimum qualifications:

1. Successfully completed not less than 3 projects of similar size and scope involving historic marble repair projects within the last 10 years.
   a Submit list of historic projects including name, location, cost, Owner/Architect/ Engineer's name and phone number.
2. Project superintendent shall have a minimum of 3 projects of similar size and scope involving historic buildings.
   a. Submit list of historic projects supervised by this superintendent including name, location, cost, owner/architect/engineer's name and phone number.
   b. Contractor may not change Superintendent without written approval of the owner.
3. Only skilled workers who are familiar and experienced with the materials and methods specified shall be used for marble cleaning work. One skilled journey level mason,

trained in historic stone restoration, shall be present at all times during cleaning process and shall personally direct the work. Journey level masons shall have a minimum of 3 years experience and have worked on a minimum of 2 historic masonry structures.

C. Quality Control Plan: Comply with the requirements of Section 01450.

D. Pre-Installation Conference: Prior to beginning any work of this contract, meet with Architect and Owner to review Quality Control Plan and all proposed procedures.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data including mixing instructions and precautionary handling instructions.

B. Materials Safety Data Sheets (MSDS) as appropriate.

C. Certificates (except where the material is labeled with such certification by the producers of the materials) that all materials supplied comply with all the requirements of these specifications and the appropriate standards.

D. Quality Control Plan: Comply with the requirements of Section 01450.

E. Certification of experience and training as required herein and as may be required by product manufacturers to maintain product warranty.

PART 2---PRODUCTS

2.1 MANUFACTURERS

A. ProSoCo, Inc.
755 Minnesota Avenue
P.O. Box 1578
Kansas City, KS 66117
800/255-4255 or 913/281-2700

2.2 MATERIALS

A. Clean, potable water

B. Liquid Marble Cleaner: A water-soluble non-acidic chemical cleaner manufactured specifically for restorative type cleaning of polished and honed marble surfaces; "Sure Klean Liquid Marble Cleaner" (ProSoCo, Inc.), or approved. Cleaner shall contain no abrasives, grease, lye, or other caustic or corrosive ingredients.

C. Drying Materials: Clean natural fiber rags

2.3 EQUIPMENT

A. Garden hose and nozzle

B. Stiff bristle brushes (non-metallic)

C. Wood or plastic scraper

PART 3---EXECUTION

3.1 EXAMINATION

A. Examine the marble surface CAREFULLY to determine the cause of staining before proceeding with any cleaning operation.

3.2 PREPARATION

A. Test clean a small area before attempting to clean large areas.

B. Protection: Provide adequate wash solutions (i.e. water, soap and towels) before starting the job.

3.3 ERECTION, INSTALLATION, APPLICATION

A. Remove large pieces of mortar deposits using a wood or plastic scraper.

B. Clean surface with approved commercial stone cleaner and water. Follow manufacturer's written instructions.

END OF SECTION 04942

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

[Specifiers Note: The cleaning or removal of stains from stone may involve the use of liquids, detergents or solvents which may run off on adjacent material, discolor the stone or drive the stains deeper into porous stones. Use the products and techniques described here only for the combinations of dirt/stain and stone specified.]

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

A. General: Work of this Section includes all labor, materials, equipment and services necessary to complete the Work as described on the drawings, as specified in this Section, and as may be required elsewhere by the Contract Documents, applicable Laws and Regulations and Site conditions.

B. Work of this section describes the requirements for preparing a general poultice for removing unknown stains from marble.
   1. A poultice is made by adding a solvent or chemical cleaning agent to water and blended with an inert filler to make a smooth paste. The paste is then applied over the stain using a trowel or spatula.
   2. The liquid portion of the paste migrates into the stone where it dissolves some of the staining material. The liquid gradually moves back beyond the stone surface and into the poultice, from which it evaporates, leaving its burden of dissolved staining material in the poultice.
   3. When the poultice has dried, it is scraped and brushed away.

1.3 QUALITY ASSURANCE

A. It is the intent of this project to preserve the building's historic materials to the greatest extent possible. The gentlest means possible shall be used to perform the work and the greatest care shall be taken to assure that historic materials are not damaged in the process of the work of this section.

B. Due to the historic significance of this building, work of this section shall be performed by stone masons familiar with the historic performance and characteristics of masonry construction. The masonry subcontractor to perform the work of this contract shall have the following qualifications:
   1. Successfully completed not less than 3 projects of similar size and scope involving historic stone masonry cleaning projects within the last 10 years.
      a Submit list of historic projects including name, location, cost, Owner/Architect/ Engineer's name and phone number.

2. Project superintendent shall have a minimum of 3 projects of similar size and scope involving historic buildings.
   a. Submit list of historic projects supervised by this superintendent including name, location, cost, owner/architect/engineer's name and phone number.
   b. Contractor may not change Superintendent without written approval of the owner.
3. Only skilled journey level masons who are familiar and experienced with the materials and methods specified and with the design requirements shall be used for stone masonry cleaning. One skilled journey level mason, trained in historic restoration and cleaning, shall be present at all times during cleaning process and shall personally direct the work. Journey level masons shall have a minimum of 3 years experience and have worked on a minimum of 2 historic masonry structures.

C. Quality Control Plan: Comply with the requirements of Section 01450.

D. Pre-Installation Conference: Prior to beginning any work of this contract, meet with Architect and Owner to review Quality Control Plan and all proposed procedures.

1.4 SUBMITTALS

A. Sample Panels: Provide the following panels using the techniques proposed for review and approval of the Architect. Approved test panels shall be left in place for comparison of the progress of the Work.
   1. Poutlicing Application: Prepare 2 - 4 foot square panels on the building in location selected by the Architect showing representative installation and adhesion of poultice materials. Sample installation shall be done in the presence of the Architect and Owner.
      a. Provide 72 hours notice of when installation will be carried out.
   2. Poultice Removal: On one of the 4 foot square panels provide a demonstration of poultice removal techniques.
      a. Provide 72 hours notice of when installation will be carried out.
   3. Repeat the test processes and alter methods and materials as required to achieve results that are satisfactory to the Architect and Owner.
   4. The approved sample panels shall be used as a standard for all masonry cleaning and poulticing work.

B. Product Literature: Submit manufacturer's product and instructions for use to for all cleaning and poultice materials. Include appropriate MSDS sheets on all materials.

PART 2---PRODUCTS

2.01 MATERIALS

A. Liquid Cleaner: Laundry bleach, a 6% solution of hydrogen peroxide (H_20_2), or detergent such as "Tide", or approved.
   1. Hydrogen Peroxide (H202): Other chemical or common names include Peroxide of Hydrogen; Solution of Hydrogen Dioxide; Superoxol; (hydrogen peroxide is commonly sold as a 3% solution; Superoxol is a 30% solution; Superoxol causes flesh burns; 3% hydrogen peroxide does not).

B. White absorbent material (molding plaster, untreated white flour, white tissue, paper towels, powdered chalk, talc, fullers earth or laundry whiting).

C. Mineral water

D. Plastic sheeting

E. Clean dry towels for blotting the area after treatment

2.02 EQUIPMENT

A. Glass or ceramic container for mixing the solution

B. Wooden utensil for stirring the ingredients

C. Wood or plastic spatula

D. Masking tape

PART 3---EXECUTION

3.1 ERECTION, INSTALLATION, APPLICATION

A. For Unknown Stains:
1. Thoroughly rinse the area to be treated with mineral water.
2. Mix the liquid solution to be used in a glass or ceramic bowl.
3. Thoroughly moisten the stained surface with this liquid. Dampen area well beyond the stain.
4. Mix the remaining liquid with the white absorbent material to form a paste the consistency of oatmeal or cake icing. (Approximately one pound of paste is needed for every square foot of surface area to be treated).
5. Using a wooden or plastic spatula, apply the paste to the stained surface in layers no more than 1/4 inch thick. Extend poultice well beyond the stain to prevent forcing the stain into previously clean stone.
6. Check the coating for air pockets or voids.
7. Cover the poultice with plastic sheeting and seal with masking tape.
8. Let set for 48 hours.
9. After set period, dampen the poultice with mineral water.
10. Remove the poultice with a wooden or plastic spatula to avoid scratching the surface.
11. Again, thoroughly rinse the cleaned area with mineral water, blot with clean towels and allow the surface to dry.
12. Once the surface has dried completely, check for remaining residue and repeat the treatment if necessary.

B. For Dingy Marble:
1. Thoroughly rinse the area to be treated with mineral water.
2. Add enough water to "Tide" powdered laundry detergent to achieve a very thick paste the consistency of pancake batter.
3. Spread the paste over the affected area with a wood or plastic spatula to a thickness of about 1/4".
4. Cover the area with plastic sheeting and allow to soak for three days.
5. Remove the plastic and allow the poultice to dry.
6. Remove the dried poultice with a wood or plastic spatula and a stiff bristle brush.
7. Thoroughly rinse the surface with clean, clear water and allow to dry.
8. Repeat as necessary to achieve the desired level of cleanliness.

END OF SECTION 04943

Basis of Design

This section applies to the design and installation of metal fabrications.

Design Criteria

- Roof access shall be provided with stairway and railings. Access shall be keyed to campus maintenance master standard.

END OF METAL FABRICATIONS SECTION

Basis of Design

This section applies to the design and installation of fluid-applied waterproofing systems.

Scope

- These standards and procedures apply to roofs located over occupied and service spaces which are below grade and covered with earth or walking surfaces, and above grade roofs which are developed as plazas for landscaping, planters, and pedestrian circulation.

Design Criteria

Codes, Regulations, and Standards

All products, materials, equipment, and installation shall conform to the following codes, regulations, and standards of latest issue:

- American Society for Testing and Materials.
- Factory Mutual Standards.
- National Roofing Contractors Association Roofing and Waterproofing Manual.
- National Fire Protection Standards.
- Underwriters Laboratories Standards.
- Uniform Mechanical Code.
- Uniform Plumbing Code.
- Washington State Energy Code.

General Requirements

- Provide minimum 15 year waterproof warranty period.
- Soils reports and the drawings shall graphically identify water tables.
- Joints in concrete slabs-on-grade and foundation joints shall have water stops.
- A sub-grade perimeter drainage system is required, and in some cases, under slab drainage.
- All seismic joints, expansion joints, perimeter joints, joints at shaft walls, that cannot be successfully provided with water stops, shall have vertical curbs that extend one foot minimum above the waterproof membrane; and appropriate flashings.
- The structure shall slope one-quarter of an inch per foot minimum (valley) away from all joints and carry water to drains at the sloped structural deck or over the edge of the foundation wall. The design of the structure shall enhance the slope as building creep relaxes.
- No upset beams or appendages shall impede the flow of water.
- Conduits, piping, etc., shall be surface mounted above or below the structural slab. Cast-in conduits or piping are not allowed.
- Conduit and piping shall not penetrate the horizontal waterproof membrane.

- Area drains shall be designed to accept the complete rate of flow from a 100 year storm as contributed from the deck, adjacent walls, and other run-off without requiring water storage on the deck surface.
- Horizontal joints shall be designed with armor plate guard, gasket, and interior gutter drain system. Vehicular traffic areas shall be fully supported; designed for H-20 load. The joint shall be the high point, or a curb at the adjacent building, with positive slope away from the joint. Stainless steel flashing at side walls and over up-set curbs shall be tent-like and adequately cover the vertical surfaces.
- See Standards Drawings (SD drawings) for specific installation details.

Products, Materials and Equipment

Waterproofing Membrane –Hot, Fluid Applied

- The waterproofed membrane shall be manufactured for submerged installation; American Hydrotech Inc. “Monolithic Membrane 6125” or American Permaquik Inc. “Permaquik 6100”; 180 mils nominal thickness.
- Refer to Guide Specifications Section 07145, Hot Asphalt Rubberized Waterproofing.

Waterproofing Membrane –Cold, Fluid Applied

- The waterproofed membrane shall be manufactured for submerged installation; W.R. Grace “Procor Deck System 3R”, 120 mils thickness.

Installation, Fabrication and Construction

Hot, Fluid Applied Waterproofing Membrane –Below Grade & Plaza Roofs

- Refer to Guide Specifications Section 07145, Hot Asphalt Rubberized Waterproofing.
- Area drains shall be installed within sloped/depressed areas in the structural slab. The clamping ring shall engage the membrane at this point. Grate extensions shall not be used. Side rim weep holes are inadequate and impede water flow. A separate surface grate is required.
- The waterproof membrane shall extend up sidewalls or curbs a minimum of one foot or a minimum of four inches above block pavers, sidewalk or planting soils. The membrane shall be terminated with a clamping bar, caulking, and stainless steel flashing.
- Seismic joint covers shall be mechanically fastened to the building through a full bed of sealant.
- Vertical joints shall be installed with continuous interior and exterior gaskets. At transitions (floors, roofs, etc.) the gaskets shall be installed shingle fashion over through-wall flashings.

END OF FLUID-APPLIED WATERPROOFING SECTION

GUIDE SPECIFICATIONS

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Work of this Section includes, but is not limited to:

1. Preparation of existing concrete slab to receive new waterproof membrane.
2. Installation of new waterproof membrane
3. Installation of protection board
4. Installation of drain fabric

1.2 RELATED SECTIONS

A. Coordinate related work specified in other parts of the Contract Documents, including but not limited to the following:

1. Section 01458 - Waterproofing Inspection Services
2. Section 01500 - Temporary Controls
3. Section 01731 - Selective Demolition
4. Section 03300 - Cast-in-Place Concrete
5. Section 03730 – Concrete Rehabilitation for epoxy ejection of cracks
6. Section 07900 - Sealants
7. Section 15000 - Hydronic Snow-Melt System

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM).

1.4 SYSTEM DESCRIPTION

A. Furnish and install a complete waterproofing assembly including surface conditioner, surface preparation layer, a monolithic, fabric-reinforced rubberized asphalt membrane, protection course and drain fabric.

B. To ensure total system compatibility all products must be purchased from a single-source manufacturer.

1.5 SUBMITTALS

A. Applicator qualifications as required by Paragraph 1.06 below.

B. Quality Assurance / Work Plan: Within in 21 days of Notice to Proceed, Contractor shall provide a written Waterproofing Quality Assurance / Work Plan as outlined in Paragraph 1.6 below.

C. Certification showing full time quality control of production facilities and that each batch of material is tested to insure conformance with the manufacturer's published physical properties.

D. Certification showing that all waterproofing components are being supplied by a single-source manufacturer.

1.6 QUALITY ASSURANCE

A. The Waterproofing Contractor shall demonstrate qualifications to perform the work of this Section by submitting the following documentation:

1. Successfully completed not less than five (5) comparable waterproofing projects involving significant historic buildings.
2. Certification or license by the membrane manufacturer as a locally based, authorized applicator of the product the installer intends to use, for a minimum of five (5) years.
3. List of three (3) projects, satisfactorily completed within the last five (5) years, of similar scope and complexity to this project. Previous experience submittal shall correspond to specific membrane system proposed for use by applicator.

B. Quality Assurance / Work Plan: Contractor shall provide a written Waterproofing Quality Assurance / Work Plan.

1. Methods for providing work of the highest industry standard as required by these Contract Documents and as recommended by the product manufacturer(s) shall be defined. Submit all information necessary, including, but not limited to the following:
   a. Methods for protecting surrounding stone and other features to remain.
   b. Methods for cleaning existing concrete substrate and for providing environmental protection during cleaning.
   c. Methods to be employed to minimize odor from the installation.
   d. Proposed testing methods for watertightness of waterproof membrane.
   e. Proposed methods of remove any over spray or drips from surround materials.

C. The rubberized asphalt membrane product shall contain an inert clay filler to enable the product to be resistant to acids (fertilizers, building washes and acid rain).

D. Technical Representation: A Technical Representative, employed by the membrane manufacturer with a minimum of ten (10) years experience with the installation of the specified product in the Pacific Northwest, shall be available to assist the Contractor and Architect in application of the products and final inspection of the assembly.

1. The Technical Representative shall be able to provide on-site consultation within 24 hours of being notified when necessary.
2. At a minimum the Technical Representative shall be on-site for the following:
   a. Pre-Construction Conference
   b. Review of Substrate
   c. Set-up of and commencement of waterproofing operation
   d. Review of installation at the 25%, 50% and 75% stages.
   e. Review of transitions from new membrane to existing membrane.
   f. Water testing
   g. Final Inspection

E. Membrane Manufacturer Qualifications: Manufacturer shall demonstrate qualifications to supply materials of this section by certifying the following:

1. Membrane Manufacturer must show evidence that the specified rubberized asphalt has been manufactured by the same source, under the same name for fifteen (15) years and successfully installed on a yearly basis for a minimum of fifteen (15) years on projects of similar scope and complexity.

2. Membrane Manufacturer must not issue warranties for terms longer than they have been manufacturing their hot fluid applied rubberized asphalt membrane.

F. Pre-Construction Conference: The Manufacturer's Technical Representative shall meet with Contractor, Waterproofing Subcontractor, Architect and Owner at the jobsite to review and discuss Quality Assurance/Work Plan and project conditions as it relates to the integrity of the waterproofing assembly.

G. Owner will employ a Waterproofing Inspector for this project. Contractor shall coordinate the work of this Section with Owner's Inspector. See Section 01458 for requirements.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original unopened containers of packaging clearly labeled with manufacturer's name, brand name, instruction for use and all identifying numbers.

B. Materials shall be stored in a neat, safe manner, not to exceed the allowable structural capacity of the storage area.

C. Store materials in a clean, dry area protected from water and direct sunlight.

D. Store all adhesives at temperatures between 60°F (15.5°C) and 80°F (26.6°C). If exposed to lower temperatures, restore materials to 60°F (15.5°C) min. temperature before using.

1.8 JOB CONDITIONS

A. Protection: The Legislative Building is a significant historical building. The work area is adjacent to decorative stone surface to remain in place. Contractor shall protect all surfaces from overspray, splatters and drips. If surrounding stone or materials are soiled, Contractor shall remove all traces of material and all staining in a method to be approved by the Architect, at no additional cost to the Owner.

B. Application of the membrane shall not commence nor proceed during inclement weather. All surfaces to receive the membrane shall be free of water, dew, frost, snow and ice.

C. Application of membrane shall not commence nor proceed when ambient temperature is below 0°F (-17.7°C).

D. Preparation and application of membrane must be conducted in well ventilated areas.

E. Adhesives contain petroleum distillates and are extremely flammable. Do not breathe vapors or use near an open fire. Do not use in confined areas without adequate ventilation. Consult container or packaging labels and Material Safety Data Sheets (MSDS) for specific safety information.

F. Do not allow waste products (petroleum, grease, oil, solvents, vegetable or mineral oil, animal fat, etc.) to come in contact with the waterproofing membrane. Any exposure to foreign materials or chemical discharges must be presented to membrane manufacturer for evaluation to determine any impact on the waterproofing membrane assembly performance.

G. Concrete Deck/Wall Surface Condition: Refer to Section 03300 for new concrete. Refer to Paragraph 3.2 for requirements at existing concrete substrate.

H. Deck/Wall Preparation: Refer to Paragraphs of Article 3.2, Preparation.

I. Contractor shall assure adequate protection during installation of the waterproofing assembly.

J. Odor Control: Contractor shall take the following precautions to ensure that odors from the installation are kept to a minimum.

1. Locate heating apparatus in storage area mid-way between the Legislative Building and the Temple of Justice.
2. Lid of kettle shall be kept closed at all times, except when material is being loaded.
3. Surface Conditioner shall be mixed and prepared off-site.
4. Coated buckets shall not be "burned out" on site. Provide enough buckets to transport a day's worth of material from the kettle to the placement site. Remove material coating buckets off-site.
5. Heat material to the minimum temperature recommended by the manufacturer for successful installation.

1.9 WARRANTY

A. Upon completion of the work, the Contractor must supply the Owner with a single-source warranty of U.S. origin direct from the manufacturer.

B. Warranty: Total System Warranties: Covers components of the waterproofing assembly, including membrane, protection sheet, protection board, drain fabric and flashing.
1. Duration of Membrane Warranty: 15 year (watertight condition).

PART 2 - PRODUCTS

2.1 GENERAL

A. Refer to Article 1.4, System Description. All components must be obtained as a single-source from the membrane manufacturer to ensure total system compatibility and integrity.

B. Waterproofing System Manufacturers:

1. American Hydrotech, Inc.
303 East Ohio Street
Chicago, Illinois 60611-3318
(800) 877-6125
FAX: (312) 661-0731

1904 Third Ave., Suite 325
Seattle, WA 98101
(206) 441-6125
FAX: (206) 441-0914

2. American Permaquik, Inc.
5500 Main Street, Suite b-1
Williamsville, NY 14221
(716) 633-3124
FAX: (716) 634-6968

Salleeco, Inc.
Puyallup, WA 98373
(800) 370-7821
FAX: (253) 848-6289

3. Or approved equal.

C. Waterproofing System Manufacturer – Substitute Cold-Applied System:

1. Grace Construction Products.
62 Whittemore Avenue
Cambridge, MA 02140
(866) 333-3726
FAX: (800) 784-8569

Charles Lander
Bellevue, WA 98015
(425) 747-7737
FAX: (425) 671-0181

2.2 MATERIALS

A. Membrane:

1. Membrane shall be a hot, fluid-applied, fabric-reinforced, rubberized asphalt membrane meeting the CGSB-37.50-M89 standard and other pertinent physical properties. The

following properties are based on American Hydrotech Inc., Monolithic Membrane 6125 FR (Fabric Reinforced assembly) and shall set the standard for performance on this project:

PROPERTY	TEST METHOD	TYPICAL RESULT
Flash point CGSB-37.50-M89	ASTM D-92, (246°C)*	475°F
Low Temperature Crack Bridging Capability	CGSB-37.50-M89	No cracking, adhesion loss, or splitting
Water Vapor Permeability CGSB-37.50-M89	ASTM E-96, PROCEDURE E	1.6 ng/Pa(s)M^2
Water Resistance (5 days/50°C)	CGSB-37.50-M89	No delamination, blistering, emulsification, or deterioration
Water Absorption	CGSB-37.50-M89	.22 g weight gain
Toughness	CGSB-37.50-M89	13.0 Joules
Ratio of Toughness to Peak Load	GSB-37.50-M89	0.069
Viscosity	CGSB-37.50-M89	7.0 seconds
Heat Stability	CGSB-37.50-M89	No change in viscosity, penetration, flow or low temperature flexibility
Low Temperature Flexibility (-25°C)	CGSB-37.50-M89	No delamination, adhesion loss, or cracking
Penetration CGSB-37.50-M89 @ 77°F (25°C)	ASTM D-1191	75.0 mm
@ 122°F (50°C)		121.7 mm
Flow CGSB-37.50-M89 @ 140°F (60°C)	ASTM D-1191	0.0 mm
Softening Point (82°C)	ASTM D-36	180°F
Elongation	ASTM D-1191	1000 % minimum
Resiliency	ASTM D-3407	40% minimum
Bond to Concrete @ 0°F, (-18°C)	ASTM D-3408	Pass
Acid Resistance	ASTM D-896	Pass-50% Nitric Acid
Procedure 7.1 (N-8)	50% Sulfuric Acid	
Resistance to	ASTM D08.22	100 psi
Hydrostatic Pressure	Draft 2	(equals 231 foot head of water)
Resistance to Salt Water sodium carbonate calcium chloride	ASTM D-896 similar 20% sodium chloride	No delamination, blistering, emulsification or deterioration

PROPERTY	TEST METHOD	TYPICAL RESULT
Resistance to Fertilizer nitrogen/phosphorus potash	ASTM D-896 similar undiluted, 15/5/5,	No delamination, blistering, emulsification or deterioration
Resistance to Animal Waste	3-year exposure	No deterioration
Solids Content		100%-no solvents
Shelf Life		10 years (sealed)
Specific Gravity		1.23 ±.02

*45°F more than the application temperature recommended by the manufacturer.

B. Surface Conditioner: A surface conditioner for concrete surfaces - American Hydrotech, Inc., Surface Conditioner. See limitations above under Paragragh 1.8 regarding on-site preparation of Surface Conditioner.

C. Surface Preparation Materials: Use hot fluid-applied rubberized asphalt waterproof membrane to level existing concrete substrate.

D. Flashing/Reinforcing

1. Spunbonded polyester fabric reinforcing sheet - American Hydrotech, Inc., Flex Flash F to be used throughout installation.
2. 60-mil (1.5 mm) thick, uncured neoprene flashing/reinforcing sheet - American Hydrotech, Inc., Flex Flash UN. To be used as indicated and/or as recommended by manufacturer.

E. Adhesives/Sealant

1. Contact adhesive to bond flashing together - American Hydrotech, Inc., Splicing Cement
2. Contact adhesive to bond flashing to an approved substrate - American Hydrotech, Inc., Bonding Adhesive
3. Sealant to seal flashing seam edge - American Hydrotech, Inc., Lap Sealant

F. Separation Sheet: 10 mil polyethylene

G. Protection Board: High strength Permaboard, as manufactured by American Hydrotech, Inc.

1. 4.6mm thick.

H. Composite Drainage System: Core and a non-woven needle-punched filter fabric. Material shall be a maximum of 1/4" thick (6.35mm) and have a compressive strength of 30,000psf minimum:

1. Hydrodrain 300 as manufactured by American Hydrotech, Inc., or approved equal

I. Topping: Existing stone block treads will be reinstalled on fully grouted setting bed.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine all surfaces to receive the waterproofing assembly to verify it is acceptable and proper for the application of the membrane. Refer to manufacture's Pre-Installation & Application Guidelines.

B. Do not proceed with the installation of the waterproofing membrane assembly until all deck defects have been corrected and all conditions are acceptable.

C. Commencement of installation of the waterproofing assemble shall constitute acceptance of the substrate.

3.2 PREPARATION

A. Surface Preparation and Leveling: At existing concrete substrate all sharp projections and fins shall be knocked off. Amplitude of existing concrete shall not vary more than 1/2”.

1. Prior to installing waterproof membrane the concrete substrate shall be notched as indicated for the installation of Snow-Melt System tubing (see Section 15000).

B. All surfaces must be dry, smooth, free of depressions, voids, protrusions, clean and free of unapproved curing compounds, form release agents and other surface contaminants.

1. New Cast in-place concrete:
   a. Poured in place concrete must be monolithic, smooth, free of voids, spalled areas, laitance, honeycombs, and sharp protrusions , clean and free of unapproved curing compounds, form release agents.
   b. Concrete shall be complete cured – 28 days minimum.

C. Substrate cleaning

1. Thoroughly sweep the substrate that is to receive the waterproofing membrane.
2. Using an compressed air, blow the surface clean to remove any remaining loose debris
   a. Do not use water to clean the substrate.
3. As a final check to determine if concrete has been properly cleaned, apply a test patch of membrane to the surface and check its adhesion.

3.3 INSTALLATION

A. Surface conditioner application (to concrete)

1. Apply the surface conditioner to the concrete using a hand held sprayer evenly at a rate of 300 to 600 SF/gallon (7.4 -14.7 m^2/L) depending on surface texture. Surface conditioner should "tan" the surface, not blacken it.
2. Allow sufficient time for the surface conditioner to thoroughly dry prior to the membrane application.
3. Protect stone from surface conditioner.

B. Membrane preparation

1. The membrane shall be heated in double jacketed, oil bath or air jacketed melter with mechanical agitation, specifically designed for the preparation of a rubberized asphalt membrane.
2. Heat membrane until membrane can be drawn-free flowing at a temperature range between 350°F (176°C) and 375°F (190°C).
   a. Do not overheat membrane (see Paragraph 1.08 above).

C. Detailing/Flashing

1. All detailing and flashings shall be done in accordance with the manufacturer's standard guideline details.
2. All detailing and flashing shall be completed before installing the membrane over the field of the substrate.

D. Membrane Application

1. Apply the rubberized asphalt membrane at a rate to provide a continuous, monolithic coating of 90 mil minimum (approx. 2.3 mm), into which is fully embedded a layer of the spunbonded polyester fabric reinforcing sheet, followed by another continuous monolithic coat of membrane at a minimum thickness of 125 mil (approx. 3.2 mm). Total membrane thickness is to be 215 mils (approx. 5.5 mm).
2. Overlap fabric reinforcing sheet 1-2 inches (25.4 mm - 50.8 mm) with membrane between sheets.
3. Install neoprene reinforcing as recommended by manufacturer and as indicated on the drawings.

3.4 SEPARATION LAYER INSTALLATION

A. Separation/Protection layer shall be installed as follows:

1. Embed the separator sheet into the membrane while it is still hot to insure a good bond.
2. Overlap adjoining sheet edges (dry) a minimum of 2-3" (50.8 mm - 76.2 mm) to insure complete coverage.
3. The separator sheet must be covered by protection board as soon as possible, within 30 days of membrane installation.

3.5 WATER TEST

A. All steps and landings shall be water tested using a soaker hose for a minimum period of 72 hours to check the integrity of the membrane installation. Contractor shall be responsible for water recycling and protection of adjacent areas from flooding. See Section 01579 for Environmental Protection requirements.

B. If leaks should occur the water must be drained completely and the membrane installation repaired and retested until no leaking is found.

3.6 PROTECTION BOARD AND DRAIN FABRIC

A. Install protection board and drain fabric on vertical and horizontal surfaces in accordance with manufacturer's recommendations.

B. Layout and position protection board and drain fabric and allow to lay flat. Cut and fit to perimeter and penetrations.

C. Bond all geotextile overlap edges to adjacent drainage course geotextiles with adhesive as recommended by the manufacturer to insure geotextile integrity.

D. Place subsequent topping materials as soon as possible.

3.7 OVERBURDEN PLACEMENT

A. General: Contractor shall examine the steps and landings to be covered with stone in order to insure that all deck areas have received the membrane, the membrane is free of damage, it is properly protected, and all flashing has been properly installed, before reinstallation of stone block treads and paving.

3.8 JOB COMPLETION

A. Contractor and a representative of the membrane manufacturer shall inspect the waterproofing assembly and notify the contractor of any defects. All defects must be corrected to ensure a watertight installation.

B. Remove overspray, splatters and drips of waterproofing material from surrounding stone walls, paving, and any other existing exposed element that has been soiled

C. Clean up all debris and equipment.

END OF SECTION 07145

Basis of Design

This section applies to the design and installation of roofing systems.

Design Criteria

- The preferred roof system for low sloped roof decks is a single ply membrane with minimum fifteen (15) year warranty.
- Attachment method over plywood and metal decks shall be by mechanical attachment. Use fully adhered method only where application is over concrete deck, and at all vertical wall substrates.
- Color typically shall be light gray. Where exposed to public view from ground level, a darker color such as charcoal may be desired.
- Provide plywood sheathing to reinforce substrate areas under roofing membrane at roof access points.
- Provide walking pads from roof access point to and around all equipment. Walk pad shall be installed at a minimum of 6 feet from the roof edge.
- Install fall protection on all new roof assemblies; refer to Guide Specifications Section 11015, Fall Protection.

Products, Materials and Equipment

Single-Ply Membrane Roofing

- Single ply membrane manufactured by Sarnafil, J.P. Stevens, or approved.
- Membrane thickness shall be 60 mils.

Installation, Fabrication and Construction

Single-Ply Membrane Roofing

- Refer to requirements specified in respective roofing section.

END OF LOW-SLOPED ROOFING SECTION

Basis of Design

This section applies to the design and installation of joint sealants.

Design Criteria

- 2-Part sealant shall only be installed on horizontal surfaces exposed to weather.
- Bond breaker tape shall be used on all mortar joints behind caulking

Products, Materials and Equipment

- No specific requirements.

Installation, Fabrication and Construction

- No specific requirements.

END OF SEALANT SECTION

Basis of Design

This section applies to the design and installation of building entrances and to exterior and interior doors.

Design Criteria

- Doors shall not contain asbestos.
- Doors shall be standard 84” height.

Products, Materials and Equipment

- No specific requirements.

Installation, Fabrication and Construction

- No specific requirements.

END OF DOORS SECTION

Basis of Design

This section applies to the design and installation of glazed storefronts, windows, and curtainwalls, and their coordination with other exterior cladding systems.

Design Criteria

- Windows shall match existing style and construction on existing buildings.
- Windows typically shall be non-operable to allow HVAC system to control building temperature and pressure. Where operable windows are provided, they must be able to be opened with a closed fist or electronically.

Products, Materials and Equipment

- No specific requirements.

Installation, Fabrication and Construction

- No specific requirements.

END OF WINDOWS SECTION

Basis of Design

This section applies to the selection and installation of finish hardware for exterior and interior doors.

Design Criteria

- Lock sets and Latch sets

  1) All doors and handles susceptible to abuse shall be heavy-duty mortise type with non-handed lever handles and trim.

  2) Selection of Lock sets shall be coordinated with Owner. Perimeter doors shall be reviewed for electronic control. ADA compliant.

  3) It is desirable that new electronic card openers be able to be converted to proximity cards if needed, and be located on the same wall and location as any automatic door opener. Coordination that allows the door to open automatically with security opener is preferred.

- Panic Hardware:

  1) Provide panic exit hardware as required by the Uniform Building Code, N.F.P.A. #101, or if more restrictive, as required by the AHJ. Do not use pairs of doors with vertical rod exit devices. Provide single doors with fixed or removable mullions and heavy duty rim type devices.

  2) Panic hardware function shall be determined in keying meeting with Owner and hardware supplier.

- Keys and Keying

  1) Provide figure eight removable cores in all locks. Temporary construction cores shall be provided by the Contractor. Permanent cores shall be received and installed by the Division of Capitol Facilities lock shop.

  2) Mechanical and electrical rooms shall be keyed alike to the Capitol Campus UMM maintenance key. Keying shall be performed by the Division of Capitol Facilities.

- Door Closures

  1) All doors on required exiting corridors will be rated 20 minute with self-closing devices and latching hardware.

  2) Janitor closets generally require doors with 20 minute rating. To facilitate their closure, but discourage the propping open of doors--all should have 180 degree hold open and self-closing device.

  3) Overhead closures are preferred. All closures shall have adjustments for latch and closing speeds, and back-check control.

4) Door closures shall not be required on access doors and panels which are only opened under maintenance supervision. This shall include access panels in public corridors, doors in shafts or pipe chases, and electrical/telephone closets (3 feet deep or less).

- Door Openers for Disabled Access

1) Entry doors and high use doors: LCN 6824 Series. This LCN unit is a pneumatic unit requiring a compressor or building air. The unit is activated by a push button on each side of the door. Unit shall have a toggle shut off switch so that push pad does not activate motor when door is in night time locked position.

2) Entry doors and high use doors that exceed the capacity of an LCN Auto-equalizer: Rixson PH27 Series. This is a full size Rixson Floor Closer especially designed for heavy doors and operation by the disabled. It can be used for new construction or as a replacement unit to an existing full size Rixson Floor closer.

- Toilet Rooms: In discussing double-acting doors for existing toilet room modifications, the following is recommended:

1) LCN 6030 with Center Pivot Hardware: LCN is manufacturing a double swing closer which mounts within the head section of door jamb. It requires 1-3/4" x 4". This will require the removal of existing jamb, wood or hollow metal, and replacement with a KD (for existing construction) and a welded hollow metal frame (new construction), with no stops. The hollow metal frame will require a pocket to contain the closer. Minimum door width will need to be 36". For new construction where concrete floors are involved a Rixson 40 or 50 Series will also provide double action of doors.

Products, Materials and Equipment

Refer to Guide Specifications Section 08700, Finish Hardware.

Installation, Fabrication and Construction

Refer to Guide Specifications Section 08700, Finish Hardware.

END OF FINISH HARDWARE SECTION

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Work under this section includes the complete finish hardware requirements for the project. Quantities listed are for the Contractor's convenience only and are not guaranteed. Items not specifically mentioned, but necessary to complete the work shall be furnished, matching the items specified in quality and finish.

B. Related Sections:

1. Steel Doors and Frames - Section 08110
2. Aluminum Entry Doors – 08120
3. Flush Wood Doors - Section 08210
4. Access Doors - Section 08310
5. Electrical - Division 16

1.3 REFERENCES

A. Standards

1. ANSI/BHMA A156.18 - 1993 Materials and Finishes
2. NFPA 80 - 1995 - Standard for Fire Doors and Windows
3. Underwriters Laboratories - Building Materials Directory

1.4 SUBMITTALS

A. General Requirements: All Submittals shall be in accordance with Section 01330, Submittals.

B. Product Data: Submit Six (6) copies of manufacturer's data for each item of finish hardware

C. Finish Hardware Schedule:

1. Upon contract award, the finish hardware supplier shall submit a complete detailed Finish Hardware Schedule. The submittal shall include six (6) copies each.
2. Schedules shall be completely detailed in vertical form including all quantities, stock numbers, finishes, and sizes. List hardware for each opening individually under separate headings in the same order as the door schedule. Each heading shall indicate opening location, handing, degree of opening, door size, type, fire rating, door and frame material. Schedules in horizontal or coded form are not acceptable.

3. Indicate product Manufacturer and incorporate cross-reference to symbols used in Article 2.3, Hardware Schedule. Do not continue individual headings on separate pages. A cross reference for any abbreviations or symbols used shall be included. Submittals not conforming to the these requirements will be returned without review, for re-submittal.
4. Schedule Format Example:

   HW 1 ONE SINGLE DOOR 101, CORRIDOR 100 FROM CLASSROOM 101, LHR 90, 3'0" X 7'0" X 1-3/4 W X HM 20 minute

1-1/2	pr	Butts	BB179 US26D 4-1/2 x 4-1/2
1	ea	Lock set	796L-L9555 US 32D x CLS x WBX
1	ea	Closure	P120 SBL x SNB
1	ea	Kick plate	5014 - 8 x 34 - 410
1	ea	Wall Stop	W 9 US26D
3	ea	Silencers	33

5. Owner approval of the finish hardware schedule shall not relieve the hardware supplier of responsibility for errors or omissions.
6. At the completion of the project three copies of as-built record hardware schedules including keying shall be provided to Owner via General Conditions and Instructions to A/Es.

D. Revisions: The Finish Hardware Submittal shall be kept current throughout the project duration. Supplier shall make any necessary corrections and send two (2) revised copies to the Contractor for use during construction. Submit only cover sheet and revised pages. All revisions shall clearly identify changes from previous submittal content.

E. Samples: If requested by the Architect, submit one (1) sample of each exposed hardware category, finished as required, and tagged with full description for coordination with the hardware schedule. Samples will be reviewed, by the Architect, for design and finish only, compliance with other requirements is the responsibility of the Contractor. Units which are acceptable and remain undamaged through submittal procedures may be used on the project.

F. Color Samples: Submit Six (6) set of color charts and physical samples of each product requiring color selection.

G. Key Schedule / Meeting: After receipt of the approved finish hardware schedule, the Hardware Supplier shall prepare a keying schedule and index indicating door numbers, hardware submittal heading, page numbers and locking function of each Opening. The Finish Hardware Supplier shall then meet with the Owner and a representative from the DCF Key Shop to prepare the permanent keying schedule. After completion of the Key meeting, submit four (4) copies of the keying schedule indicating the complete project key system for approval. The keying schedule shall then be reviewed by the Owner to ensure all lock sets are functionally correct and keying meets the Owner's requirements. Obtain approval from DCF Key Shop prior to proceeding with lock portion of the project.

H. Templates:

1. Hardware for application to metal shall be made to template. After receipt of the approved finish hardware schedule, provide metal door and frame manufacturers with two revised copies of the finish hardware schedules and blueprint templates (or

template numbers if the manufacturers have template catalogs). Upon request, check the shop drawings of such other work to confirm that provisions will be made for the proper installation of hardware.

2. Templates and hardware schedules shall be provided no later than ten days after approval of hardware schedules.

I. Operations and Maintenance Data.

1. Submit Maintenance and Operations Manuals under the provisions of Section 01780, Close-Out Submittals.
2. Manuals shall contain final copy of the Finish Hardware Submittal, Product Data, Templates, Key Schedule, Installation Instructions, Wiring Diagrams, and Warrantees.

1.5 QUALITY ASSURANCE

A. Supplier Qualifications:

1. Finish hardware shall be supplied by a recognized builders' hardware supplier who has been furnishing hardware in the same area as the project for a period of not less than five (5) years. They shall be a factory authorized distributor of the Locksets and Door Closers.
2. The supplier's organization shall include an Architectural Hardware Consultant, certified by the Door and Hardware Institute, who is available at all reasonable times during the course of the work to meet with the Owner, A/E or Contractor for project hardware consultation.
3. The supplier shall maintain a stock and parts inventory of all items supplied for future service to the Owner.

B. Source: Obtain each kind of Hardware (Butts, Locksets, Door Closers, etc.) from only one manufacturer.

C. Installer: Finish hardware shall be installed only by experienced tradesmen, either at the door and frame fabrication plant or at the project site.

D. Regulatory Requirements:

1. All finish hardware shall comply with applicable local and/or state current building codes.
2. Hardware for fire-rated openings shall also be in compliance with all fire and building codes applicable to the district in which the building is located. Provide only hardware which has been tested and listed by "UL" for the types and sizes of doors required, and which complies with the requirements of the door and door frame labels.
3. All Hardware shall be in compliance with Americans With Disabilities Act (ADA) and Chapter 11, Washington State Building Code WAC 51-40.

1.6 PRODUCT HANDLING AND STORAGE

A. Packaging: All hardware items to be packed in their original factory shipping cartons. The hardware supplier shall mark each item of hardware individually for each opening as to location of installation in accordance with approved hardware schedule. Basic installation instructions shall be included in the packages.

B. Storage: Provide a locked room at the jobsite for the storage of the hardware.

1.7 WARRANTY

A. Finish hardware shall be guaranteed against defects in workmanship and operation for a period of one (1) year, backed by a factory guarantee of the hardware manufacturer. All Door Closers shall have guaranty of Ten (10) Years.

B. No liability shall be assumed by the hardware supplier where faulty operation is due to improper installation or failure to exercise normal maintenance.

1.8 MAINTENANCE

A. Furnish Provide One (1) Set of Special Tools required for Installation and Adjustment, which shall be delivered directly to the Owner prior to substantial completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Products may be furnished by the Manufacturers as specified below. Any requests for products not listed must be made in accordance with substitution requirements of Section 01600, Product Requirements, prior to bid.

Product	Acceptable Manufacturers
Cylinders	*Russwin/Corbin*
Butts	Stanley, Hager
Exit Devices	Von Duprin 99 Series Sargent 80 Series Ingersol Rand
Lock sets and latches	Corbin/Russwin, or as directed to meet existing conditions
Closures	LCN 40 Series Corbin/Russwin 2210
Automatic Openers for Disabled Access	LCN 6824 Series Rixson PH27 Series (for doors requiring capacity exceeding listed LCN series)
Door Stops	BBW
Push/Pull Plates	Cipco
Kick plates	Cipco
Thresholds and Weather-strip	Pemko

B. Finishes: Hardware items shall be building specific to match existing finishes; otherwise, hardware items shall be supplied in the following finishes. Any deviations shall be discussed with the Owner.

Butts	US26D, Satin Chrome Plated
Lock sets	US26D
Exit Devices	US26D

Closures	Sprayed Aluminum (BHMA 689)
Door stops	US 26D
Kick and Mop Plates (Interior)	Brushed stainless steel or brass to match door hardware.
Kick Plates (Exterior)	US32D, Satin Stainless Steel
Smoke Gasketing	As selected
Threshold, Weatherstrip & Door Bottoms	As listed

C. Butts:

1. Butts shall be sized as follows:
   a. Exterior & Vestibule Doors: 5 x 4-1/2
   b. Interior doors 3'-1" and over: 5 x 4-1/2
   c. Interior doors 3'-0" and less: 4-1/2 x 4-1/2
2. Quantity (per Leaf):
   a. Doors 84” and under shall have 3 butts per leaf.
   b. Use of doors over 84” high is discouraged. Doors over 90" shall have 1 butt added for each additional 30" of height.
3. Out swinging exterior doors plus all locked interior doors shall have NRP feature.
4. Width of Hinges shall be as require to clear projecting trim or other conditions to allow maximum degree of opening
5. For unusual size or weight doors, furnish type, size and quantity recommended by the hinge manufacturer.

D. Locksets, Latchsets and Cylinders

1. Lock sets and latch sets shall be heavy duty mortise type with 3/4" anti friction latch bolt.
2. Provide curved lip strikes sufficient to protect trim.
3. All locks shall be wrought box strikes.
4. Dead bolt functions shall be 1" projection.
5. Backset: 2-3/4".
6. Furnish all Locksets and Cylinders with Key Removable Interchangeable Cores.
7. All Locksets and Latchsets shall be listed with Underwriters Laboratories for A label and lesser class doors.
8. Provide Knurled Knobs or Levers at all Hazardous Location

E. Exit Devices

1. Exit devices shall have reinforced crossbars.
2. Exit devices for labeled fire doors shall be fully UL approved and furnished less dogging feature.
3. Furnish Sex Nuts and Bolts at all Wood Doors
4. Provide Glass Bead Kits where interference with Vision Frames occurs.
5. Exit Device Lever Handles shall match Lockset design.

F. Door Closers

1. All closures shall be sized as recommended by manufacturer's catalog though consideration should be given to any wind conditions or mechanical ventilation systems that might affect sizing requirements. Required pull shall not exceed eight pounds.
2. If, after the closures are installed, a larger size closer is required, the hardware supplier shall furnish the larger size at no additional cost to the Owner.
3. Closure for wood and mineral core doors shall be furnished with hex-nut and bolt type fasteners.

4. Closures shall be guaranteed against mechanical defects for a period of five (5) years.
5. Furnish drop plates where required.
6. Provide special closer mounting as required where interference with weatherstrip or sound seals occur.
7. Furnish Door Closers for Fire Rated Doors in compliance with UBC Standard 7-2 (1997)
8. Furnish Fifth Hole Spacers or Shoe Supports where required by Frame configuration.
9. Furnish Shoulder Through Bolts for all Wood Doors

G. Automatic Door Openers

1. Units shall have a toggle shut off switch so that push pad does not activate motor when door is in night time locked position.
2. Units shall be installed on doors where opening pressure is greater than 8.5 lbf for exterior doors and greater than 5 lbf for interior doors.
3. Units shall be installed in close proximity to card key readers.

H. Door Stops & Holders

1. Furnish Overhead Stop and Holders sized as recommended by Manufacturer.
2. Furnish Overhead Stop and Holders with Special Shims, Brackets, or Special Template Mounting where required.
3. Contractor shall provide proper solid backing for all wall-type stops.
4. Stops applied to concrete shall be fastened with steel tampins and machine screws.
5. Where wall stops are specified, but cannot be used because of a construction detail, floor stops shall be furnished.
6. Coordinate Voltage and location requirements for Magnetic Holders with Electrical Contractor.

I. Pushes and Pulls: Push and pull plates shall be cut for cylinders or fitted with thumb knobs as required to fit deadlocks or night latches.

J. Kick plates, Mop Plates and Armor Plates

1. Exterior and interior plates shall be stainless steel, 0.05" minimum thickness.
2. Kick plates shall be a minimum of 8" high and 2" less than door width; mop plates 6” high.
3. Kick Plates shall be applied to the Push Side of the Door, Mop Plate applied to the Pull Side.
4. All plates shall beveled four edges (B4E) and countersunk for screws.

K. Thresholds

1. Furnish all Thresholds with ¼”-20 x 2” Zinc Plated Flat Head Sleeve Anchors.

L. Door Silencers

1. Furnish Rubber Door Silencers for all openings not specified to have Smoke Gasketing.
2. Quantity: Furnish three (3) for each single door frame, and four (4) for each pair of door frames.
3. Type 1229A for metal frames, and 1229B for wood frames.

2.2 KEYING

A. Establish a New Master Key System for this project. All Locksets and Cylinders shall be keyed to the new as directed.

B. Provide Brass Construction Cores and Keys during the construction period. Plastic Construction Cores are unacceptable.

C. The Finish Hardware Supplier shall meet with the Owner and a representative from the DCF Key Shop to prepare the permanent keying schedule as stipulated in paragraph 1.4G above.

D. Prior to Substantial Completion, Permanent Cores, Change Keys, and Control Keys, prepared according to the approved keying schedule, shall be transmitted via Registered Mail, Return Receipt Requested, directly to the Division of Capitol Facilities Key Shop, Olympia Washington 98504-1019. The installation of permanent cores will be performed by DCF. All Construction Cores will be turned over to the Contractor; Contractor in turn shall return said cores to the Finish Hardware Supplier.

E. Furnish:

Six (6) Master Keys per Set
Four (4) change keys per Lockset or Cylinder.
Four (4) Construction Keys
Two (2) Construction Control Keys
Two (2) Permanent Control Keys

2.3 HARDWARE SCHEDULE

[Specifier –Add hardware schedule obtained from Hardware Consultant.]

PART 3 - EXECUTION

3.1 PREPARATION

A. Examination: Examine Doors, Frames, and related items for conditions that would prevent the proper application of the Finish Hardware. Do not proceed until defects are corrected.

B. Provide solid blocking for all wall stops and magnetic holders.

C. Fasteners: Check all conditions and use fastening devices as needed to securely anchor all hardware as per manufacturer's published templates. Self-tapping sheet metal screws are not acceptable. All Door Closers applied to wood doors shall be shoulder through-bolted.

3.2 INSTALLATION

A. Mounting Heights: Mounting Heights: Mount units at heights as recommended in "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames (1990)" by Doors and Hardware Institute, except as indicated below. Products not specifically covered shall be installed in accordance with the manufacturers templates and instructions.

1. Hinges:
   a. Top Hinge: 7-1/4”, Top of frame rabbet to centerline of hinge.
   b. Bottom Hinge: 12-1/4”, Bottom of Frame to centerline of hinge
   c. Intermediate Hinges: Centered, equal spacing between top and bottom hinges.
2. Mortise Lock Strikes: 40”, bottom of frame to centerline of Strike.
3. Wall Stops: Locate Wall Stops intended for use with Knob and Lever Handle Locksets at the Centerline of the Spindle or Pull.

B. Install each hardware item in compliance with manufacturer's instructions.

1. Wherever cutting and fitting are required to install hardware surfaces which will be painted or finished at a later time, install each item completely and then remove and store in a secure place. After completion of the finishes, re-install each item.
2. Do not install surface-mounted items until finishes have been completed on the substrate.
3. Furnish Overhead Stop and Holders with maximum degree of opening that project conditions will allow.
4. Locate Floors Stops at maximum degree of opening that project conditions will allow. Do not locate Floor Stops where they create a hazardous condition. Stops should be located no more than 1/3 Door width from the Latch Edge of the Door.

C. Upon completion of the work, the hardware supplier in the presence of the Owner, shall check and adjust each operating item of hardware for each door to insure proper operation or function of every unit. This shall include verifying fit and operation of each lock set with the proper change key which voids the construction key. The keys shall then be tagged with the door number and delivered to the Owner. Door tags will be provided by Owner.

D. Replace units which cannot be adjusted to operate freely and smoothly.

3.3 FINAL ADJUSTMENT

A. Wherever hardware installation is made more than one (1) month prior to acceptance or occupancy, make a final check and adjustment of all hardware items during the week prior to acceptance or occupancy. Clean and lubricate operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

B. After mechanical systems have been balanced, adjust Door Closers to comply with following CABO/ANSI A117.1 requirements.

1. With the door open 70 degrees, the door closer shall be adjusted so that the door will take at least three (3) seconds to move to a point where the leading edge of the door is three inches from latching.
2. The maximum force for pushing or pulling a door open shall be as follows: (these forces do not apply to the force required to retract latch bolts or disengage other devices securing the door)
   a. Fire Doors: The minimum opening force allowable by the appropriate administrative authority.
   b. Exterior Doors: 8.5 lbf.
   c. Interior Doors: 5.0 lbf.

C. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes

END OF SECTION 08700

Basis of Design

This section applies to interior and exterior plaster and gypsum board assemblies.

Design Criteria

Plaster Repair

- Plaster repair for historic buildings shall be consistent with Historic Preservation Representative directions and recommendations.

Gypsum Board

- Due to possible asbestos containing cores of gypsum board panels manufactured outside of the USA, gypsum board panels for capital campus projects shall be manufactured in the USA. Each panel shall contain the wording “Made in the USA” or “USA Gypsum” or similar wording certifying manufacture in the USA.
- It is preferred that ‘gypsum board’ panels contain recycled content material, either in its paper facings and/or its gypsum core; such recyled content shall be certified by the manufacturer.

Products, Materials and Equipment

Gypsum Board

- Standard Fire-rated Gypsum Wallboard: Conforming to ASTM C36, Type "X", U.L. listed, 5/8” thickness, 4 foot widths, long edges tapered and eased, with surface suitable for decoration; as manufactured by USG, Gold Bond Building Products, James Hardie Gypsum, Louisiana-Pacific, or approved.
- Fire-Rated Water-Resistant Board: Water-resistant gypsum backing board conforming to ASTM C630, Type "X", U.L. listed, with a water-resistant gypsum core surfaced with water-resistant paper both sides, 5/8 inch thickness, 4 foot width, tapered and eased edges; as manufactured by Gold Bond Building Products, James Hardie Gypsum, Louisiana-Pacific, or approved.
- Shaft Wall Liner Panels: Conforming to ASTM C442, 1 inch thickness, 2 foot width, long edges beveled, fire-resistant gypsum core with multi-layered paper facings treated to resist moisture penetration.

Installation, Fabrication and Construction

Plaster Repair

- General: Remove damaged or delaminated plaster materials, taking care not to disturb remaining sound materials. In kind repair of interior walls and ceilings, including plaster, provided the repair is restricted to the damaged area and does not affect adjacent materials. Remove loose material and dampen substrate prior to applying repair materials.
- Hairline Cracking: Repaint damaged wall surface filling hairline cracks with paint.
- Minor Cracking - Up to 1/8" width with no visible damage to the substrate material over which the plaster is installed, and with no visible damage to adjacent plaster, and the wall is not displaced: Fill voids in cracks and small areas of flat plaster repair with appropriate plaster patching material and blend to adjacent sound plaster. Fill void using high gauge lime putty (50 % to 50% gauging plaster).

- Telegraphed Cracking - Less than one inch in width with visible damage to substrate material; the wall is not displaced and there are no structural concerns:
  1. Fill crack voids in substrate masonry with appropriate cementitious patching material.
  2. Fill voids in flat plaster that are wider than three inches with in kind patching material, pressing reinforcing mesh into the plaster basecoat material. Apply additional coats of plaster to match the repair to adjacent sound material.
- Repairing Plaster Area Damage - Without significant substrate damage: Remove loose plaster. Apply in kind plaster patching material in several layers to blend repair to adjacent sound plaster.

Gypsum Board

- For installation and finishing of gypsum board conform to the American Society for Testing Methods Standard ASTM C840, "Standard Specifications for Application and Finishing of Gypsum Board", the Northwest Wall & Ceiling Bureau's specifications and recommendations, and to the gypsum board manufacturer's standard specifications and recommendations.
- In addition, installation and finishing of gypsum board shall conform to the latest edition of the following:
  a. Gypsum Association Publication GA - 201, Gypsum Board For Walls And Ceilings.
  b. Gypsum Association Publication GA - 216, Application And Finishing of Gypsum Board.
  c. Gypsum Association Publication GA - 600, Fire Resistance Design Manual.

END OF PLASTER & GYPSUM BOARD SECTION

Basis of Design

This section applies to interior ceiling finishes not indicated in other sections.

Design Criteria

- Suspended ceilings shall be heavy duty grid with standard 2'x2' or 2'X4' ceiling panels; match existing in remodel or building addition work. Concealed spline ceiling systems shall not be used.
- Provide two (2) extra cartons of each type ceiling panels used on the project.

Products, Materials and Equipment

Acoustical Ceiling Panels

- Approved Manufacturers:
  a. Armstrong World Ind.
  b. U.S. Gypsum.
  c. Celotex.

Suspension Grid System

- System type: ASTM C635 (UBC Standard 25-2) - defined Intermediate Classification steel non-fire-endurance-rated grid system, of exposed 15/16-inch grid (USG "DX System" or equal) for all lay-in panels.
- Approved Manufacturers:
  a. Donn Products Inc.
  b. Chicaco Metallic Corp.
  c. Armstrong World Ind.
  d. U.S. Gypsum

Installation, Fabrication and Construction

Suspension Grid System

- Conform to ASTM C636, Article 2, UBC Standard 25-2, and the suspension system manufacturer's instructions for component assembly.

END OF CEILINGS SECTION

There are a variety of paints that meet or exceed the current EPA and Washington State regulations on VOC's in paint. The Department of General Administration requires that paints used on GA properties be of paints with VOC levels of 0–100 gm/l. Best results, especially for chemically sensitive individuals, is for non-VOC paints, levels with less than 1 gm/l (the grams per liter include colorants). A General Administration Representative must approve any products not within the EPA and Washington State regulations for VOC's.

Basis of Design

This section applies to Interior and Exterior painting.

Quality Assurance

- Interior and Exterior paints, stains, varnishes, lacquers and primers must be of a specified brand. The State of Washington currently uses finish products produced by the Kelly Moore Paint Company throughout the Capitol Campus.
- Interior walls and ceilings surfaces shall be painted in accordance with the following criteria over an appropriate prime/base coat, unless otherwise stated.
  a) Areas not otherwise listed below to be washable acrylic latex with eggshell finish.
  b) Corridors, stairwells, entry vestibules, lobbies, laundry facilities / rooms, public wash / shower / bathrooms with be washable acrylic latex with semi-gloss finish.
  c) Public change / wash / shower rooms and institutional facility bathing and shower rooms will be washable waterborne epoxy with a semi-gloss finish.
  d) Public and institutional facility "clean" or "sanitary" areas such as food preparation and laboratory areas will be waterborne epoxy in a semi-gloss finish.
- Painting is to be of "premium grade", one coat of primer and two coats of finish.
- Qualified journeyman, as defined by local jurisdiction, shall be engaged in painting and decorating work.
- A minimum of five (5) years of experience as a journey level painter shall be required of all painting supervisors on the job.
- A journeyman must accompany apprentices at all times while on the job. A minimum of one apprentice shall be present for every three journeymen.
- Inspect substrates prior to starting work, submit a written report of any unsatisfactory conditions. Beginning work shall imply acceptance of substrate.
- All work subject to inspection by Owner's Site Representative, or other quality assurance association.

Regulatory Requirements

- Conform to the latest edition of Industrial Health and Safety Regulations issued by applicable authorities having jurisdiction in regard to site safety (ladders, scaffolding, venting, etc.).
- Conform to requirements of local authorities having jurisdiction in regard to the storage, mixing, application and disposal of all paint and related wasted materials.

Product Delivery, Storage and Handling

- Deliver all painting materials in sealed, original labeled containers bearing manufacturer's name, brand name, type of paint or coating and color designation, standard compliance, materials, content as well as mixing and/or reducing and application requirements.
- Store all paint materials in original labeled containers in a secure (lockable), dry, heated and well ventilated single designated area meeting the minimum requirements of both paint manufacturer and authorities having jurisdiction and at a minimum ambient temperature of 45 degrees F. Only materials used on specific projects are to be stored on job site.
- Where toxic and/or volatile / explosive / flammable materials are being used, provide adequate fireproof storage lockers and take all necessary precautions and post adequate warnings (e.g. no smoking) as required.
- Take all necessary precautionary and safety measures to prevent fire hazards and spontaneous combustion and to protect the environment from hazard spills. Materials that constitute a fire hazard (paints, solvents, drop clothes, etc.) shall be stored in suitable closed and rated containers and removed from the site on a daily basis.
- Comply with requirements of authorities having jurisdiction, in regard to the use, handling, storage and disposal of hazardous materials.
- Storage of Materials in occupied areas is not acceptable, check with Building Manager for availability of storage area, if none available, remove of materials daily is required.

Scheduling

- Schedule painting operations to prevent disruption of and by other trades.
- Schedule painting operations in occupied facilities to prevent disruption of occupants in and about the building. Painting shall be carried out [after facility working hours] [during silent hours] [on weekends] in accordance with Owner's operation requirements. Schedule work such that painted surfaces will have dried before occupants are affected.

Project / Site Requirements

- Perform no painting or decorating work when the ambient air and substrate temperatures are below 50 degrees for both interior and exterior work.
- Perform no exterior painting work unless environmental conditions are within the paint manufacturer's requirements or until adequate weather protection is provided. Where required, suitable weatherproof covering and sufficient heating facilities shall be in place to maintain minimum ambient air and substrate temperatures for 24 hours before, during and after paint application.
- Perform no interior painting or decorating work unless adequate continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above minimum requirements for 24 hours before, during and after paint application. Provide supplemental ventilating and heating equipment if ventilation and heating from exiting system is inadequate to meet minimum requirements.
- Perform no painting or decorating work when the relative humidity is above 85% or when the dew point is less than 5 degrees variance between the air / surface temperature.

- Perform no painting or decorating work when the maximum moisture content of the substrate exceeds:
  a) 12% for concrete and masonry (clay and concrete brick/block).
  b) 15% for wood.
  c) 12% for plaster and gypsum board.
- Conduct all moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple cover patch test.
- Test concrete, masonry and plaster surfaces for alkalinity as required.

  Note: Concrete and masonry surfaces must be installed at least 28 days prior to painting and decorating work and must be visually dry on both sides.
- Apply Paint only to dry, clean, properly cured and adequately prepared surfaces in areas where dust is no longer generated by construction activities such that airborne particles will not affect the quality of finished surfaces.

Products, Materials and Equipment

- All materials shall comply with EPA and State of Washington regulations regarding Volatile Organic Compounds (VOC). All oil-based paints are not to exceed 250 gm/l VOC.

Mixing and Tinting

- Unless otherwise specified, all paint shall be ready-mixed and pre-tinted. Re-mix all paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and color and gloss uniformity.
- Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.
- Where thinner is used, addition shall not exceed paint manufacturer's recommendations. Do not use kerosene or any such organic solvents to thin water-based paints.
- If required, thin paint for spraying according in strict accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to General Administration Representative.

Installation, Fabrication and Construction

Surface Preparation

- Remove and securely store all miscellaneous hardware and surface fittings / fastenings (e.g. electrical plates, mechanical louvers, door and window hardware (e.g. hinges, knobs, locks, trim, frame stops), removable rating / hazard / instruction labels, washroom accessories, light fixture trim, etc. From wall and ceiling surfaces, doors and frames, prior to painting. Carefully clean and replace all such items upon completion of painting work in each area. Do not use solvent or reactive cleaning agents on items that will mar or remove finishes (e.g. lacquer finishes). Doors shall be removed before painting to paint bottom and top edges and then re-hung.
- Protect all adjacent interior surfaces and areas, including rating and instruction label on doors, frames, equipment, piping, etc., from painting operations and damage by drop clothes, shields,

masking, templates, or other suitable protective means and make good any damage caused by failure to provide such protection.

- Substrate defects shall be made good and sanded by others ready for painting particularly after the first coat of paint. Start of finish painting of defective surfaces (e.g. gypsum board) shall indicate acceptance of substrate and any costs of making good defects shall be borne by the painter including re-painting of entire defective surface (no touch-up painting).

Application

- Do not paint unless substrates are acceptable and/or until all environmental conditions (heating, ventilation, lighting and completion of other subtrade work) are acceptable for applications of products.
- Apply paint or stain in accordance with manufacturer's written instructions.
- Apply paint and decorating material in a workmanlike manner using skilled and trade qualified applicators as noted under quality assurance.
- Apply paint and coatings within an appropriate time frame after cleaning when environmental conditions encourage flash-rusting, rusting, contamination or the manufacturer's paint specifications require earlier application.
- Painting coats specified are intended to cover surfaces satisfactorily when applied at proper consistency and in accordance with manufacturer's recommendations.
- Tint each coat of paint progressively light to enable confirmation of number of coats.
- Sand and dust between each coat to provide an anchor for next coat and to remove defects.
- Do not apply finishes on surfaces that are not sufficiently dry. Unless manufacturer's directions state otherwise, each coat shall be sufficiently dry and hard before a following coat is applied.
- Prime coat of stain or varnish finishes may be reduced in accordance with manufacturer's directions.

1) **Ferrous Metals**

   - All ferrous metal surfaces shall be primed, all sides, and painted, unless shop finished.
   - Clean ferrous surfaces of oil, grease, dirt, loose mill scale, and other foreign substances by solvent or mechanical cleaning. Touch up shop-applied prime coats wherever damaged or bare. Back prime backs, edges and ends of exterior ferrous metal work.
   - Two (2) coats of finish to be applied after primer has dried according to Manufacturer's suggestions

2) **Concrete**

   - Remove dirt, scale, powder, laitance, parting compounds, oil and grease, by light sandblasting or by approved alternate method. For cast-in-place work, allow at least 14 days before starting work, unless otherwise approved.
   - Fill pock marks and air holes, if applicable. Fill with an approved latex base primer and filler material. Thoroughly brush or roll over surface. Let dry for not less than 24 hours before painting.

- Remove contamination, dirt, dust and foreign matter from concrete floors. Apply surface treatment keep all traffic off surfaces until painted.
- Two (2) coats of finish to be applied after primer has dried according to Manufacturer's suggestions

3) **Concrete Masonry Units**

- Remove dirt, loose mortar, scale and efflorescence or powder.
- Holes and other surface imperfections must be filled with appropriate block filler. CMU installer must sack areas too large for block filler.
- Two (2) coats of finish to be applied after block filler has dried according to Manufacturer's suggestions.

4) **Metal Doors, Windows and Their Frames**

- Prepare surfaces including tops, bottoms and surfaces normally concealed from view.
- Two (2) coats of finish to be applied after primer has dried according to Manufacturer's suggestions

5) **Miscellaneous Metals** – Put metals in proper condition to receive paint. Grease, rust, scale, dirt and dust are required to be removed. Use only compatible prime paints with finish coats.

a) **Galvanized**

- All galvanized metal surfaces shall be primed, back-primed and painted (including edges), unless shop finished.
- Clean galvanized surfaces free of dirt, oil, silicone and surface contaminants.
- Prime surfaces with appropriate galvanized primer, following manufacturer's specifications.
- Two (2) coats of finish to be applied after primer has dried according to Manufacturer's suggestions.

b) **Iron and Steel**

- Shop primed surfaces – prime surfaces at welded or abraded spots. Clean previously primed surfaces free of any oil and grease.
- Surfaces not previously primed – Remove rust and scale by wire brushing, sandblasting or other method. Remove rust, dirt, oil and scale and clean surface. Prime entire surface.
- Two (2) coats of finish to be applied after primer has dried according to Manufacturer's suggestions

6) **Wood Products to Receive Stain**

- Remove dust and grit, this would include removing dirt, footprints, oil or other contamination's caused by other trades. Apply one coat of stain to cut ends and edges (tops, bottoms, behind hinges and latches) prior to installation.
- Apply stain to surface, wiping dry with clean dry cloth, making sure no lint or strings are left behind.

- Apply one (1) coat of sanding sealer, let dry (according to manufacturer's suggestions), then apply two (2) coats of Satin sheen Varnish.

7) **Wood Products to Receive Paint**

- Surfaces are to be cleaned of dirt and contamination. Wipe off dust and minor grit prior to prime and subsequent coats. Spot coat knots, pitch streaks and sappy sections with sealer. Backprime prior to installation. Fill all nail holes and fine cracks after primer has dried, sand smooth, ready for finish.
- Two (2) coats of finish to be applied after primer has dried according to Manufacturer's suggestions

8) **Cement Board, Siding, Piping, Shingles**

- Remove dirt, powdery residue and foreign matter, ready for paint on exposed surfaces.
- Two (2) coats of finish to be applied after primer has dried according to Manufacturer's suggestions

9) **Cement Plaster and Stucco** – Allow 14 days to cure before starting work in this section, unless otherwise approved.

- Remove dirt, loose material, scale, powder and other foreign material.
- Remove oil and grease with TSP, or similar cleaning solution, rinse and let dry.
- Fill minor isolated hairline cracks with patching plaster and smooth off to match adjacent surfaces.
- Two (2) coats of finish to be applied after primer has dried according to Manufacturer's suggestions

10) **Gypsum Plaster** – Allow 14 days to cure before starting work in this section, unless otherwise approved.

- Remove dust, dirt, loose materials and other foreign matter.
- Fill minor isolated hairline cracks with patching plaster and smooth off to match adjacent surfaces.
- Prime new Gypsum with Manufacturer's suggested primer.
- Two (2) coats of finish to be applied after primer has dried according to Manufacturer's suggestions.

11) **Gypsum Wallboard**

- Surfaces are to be flat, smooth and free from any imperfections, textured where required and left clean by other trades. If texture is applied, it must match adjacent substrates exactly.
- Remove any contamination, dust and dirt.
- If repairs are done after priming, reprime repaired areas.

- Two (2) coats of finish to be applied after primer has dried according to Manufacturer's suggestions

Do not paint:

- Non-Ferrous metals, such as brass, bronze, chrome, aluminum, or stainless steel.
- Finished plated hardware and plated hardware and plumbing fittings.
- Interior metal registers and grilles, unless factory finish is damaged or unless otherwise noted.
- Existing transparent finished woodwork, unless otherwise noted.
- Stone and /or marble.
- Plastic Laminate
- Glass, unless otherwise specified.
- Ceramic tile.

Mechanical and Electrical Equipment

Refer to sections 15 and 16 for schedule of color-coding and identification banding of equipment, ductwork, piping and conduit.

- Paint all shop primed equipment
- Remove louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports except where items are pre-finished.
- Do not paint identification markings.
- Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to limit of sight line.
- Paint exposed conduit and electrical equipment occurring in finished areas.
- Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
- Color code equipment, piping, conduit, and exposed ductwork in accordance with color schedule.

Historical Properties

In addition to all other requirements, all work in this section shall be performed under the guidelines of the Secretary of the Interior's Standard for the Treatment of Historic Properties. While work is in progress, protect existing building, grounds, contents, and occupants, including those on adjacent property, whether private or public, from damage or harm.

- All repair and replacement materials shall match remaining historic construction in all physical and visual aspects including material, form, color, texture and workmanship.
- As much of the historic material as possible will be saved.
- All work will be done using the gentlest methods available.

- Sound historical materials will not be put at risk.

Quality Assurance

- A Minimum of five (5) years experience in the installation and repair of 3-coat plaster systems and decorative gypsum plaster elements in historic buildings.
- Project superintendent/foreman shall have a minimum of eight (8) years experience and shall have worked on a minimum of three (3) projects of similar size and scope.
- Superintendent / Foreman shall be present at all times during repairs and shall personally direct the work.
- First class workmen experienced in the best and accepted methods of the trade shall do all work.

Quality Assurance Plan

- Indicate methods for protecting furniture, finishes and miscellaneous items to remain.
- Indicate method for managing dust control and debris removal.
- Indicate methods for removal of damaged plaster.
- Indicate methods for forming and installing new decorative elements.
- Indicate methods for final clean up, including complete removal of all dust and debris throughout job site.

Quality Control

The Owner's Site Representative and the Architect shall review work on a regular basis for conformance with the approved Quality Control Plan.

Phasing / Sequencing / Scheduling

If building is to remain occupied, the work will be phased to allow the occupants to relocate with the building to accommodate the construction process.

- Provide a detailed week-by-week schedule of the work and a three-week "looks ahead" schedule to allow occupants to plan around construction.
- Provide all protection necessary to ensure that dust does not penetrate from areas of work to areas where work is not in progress.
- Ensure that all furniture, fixtures and contents are protected from dust, damage, or theft throughout the course of the work.
- Ensure that dust from plaster removal and clean-up does not penetrate HVAC system. HVAC system shall be shut down, if possible, while work is being performed.
- At the completion of work, all furniture, equipment, carpets, floors and all other surfaces and contents shall be left completely free of dust and debris from the work performed on this project.

END OF PAINTS & COATINGS SECTION

Basis of Design

This section applies to the design and installation of interior and exterior signage not otherwise provided by Owner.

Design Criteria

- All signage shall conform to the Washington State Capitol Campus Sign Standards for State Buildings and Grounds, under the direction of the General Administration Sign Shop.
- In addition, all signage shall meet ADA specifications and be mounted with proper mounting hardware. Signage should assist in wayfinding such as identifying the building and accessible path of travel.
- All interior and exterior signs shall be updateable and repairable in-house.
- Use standard frame sizes whenever possible.
- No cluster directories - strip directories and sub-directories only.
- All directories shall utilize a vinyl lettering system.
- When silk-screened floor plans are used, supply name of manufacturer and a master printing.
- All signage including temporary construction signs shall be non-gendered.
- Electrical rooms shall be signed with Braille signage plaque to prevent inadvertent admittance by a person who has a visual impairment.

Products, Materials and Equipment

Interior Signage (If not provided by Owner)

- Interior sign frames shall be Kroy series frames.
- ADA signage shall utilize Kroy ADA series and meet or exceed ADA specifications.
- All emergency exits shall be signed, especially if they are to be alarmed exits.
- Character Proportion: Letters and numbers on signs shall have a width-to-height ratio between 3:5 and 1:1 and a stroke-width-to-height ratio between 1:5 and 1:10.
- Character Height: Characters and numbers on signs shall be sized according to the viewing distance from which they are to be read. The minimum height is measured using an upper case X. Lower case characters are permitted.

Height Above Finished Floor	Minimum Character Height
Suspended or Projected Overhead in compliance with 4.4.2	3 in (75 mm) minimum

- Raised and Brailled Characters and Pictorial Symbol Signs (Pictograms): Letters and numerals shall be raised 1/32 in (0.79 mm) minimum, upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille. Raised characters shall be at least 5/8 in (16 mm) high, but no higher than 2 in (50 mm). Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram. The border dimension of the pictogram shall be 6 in (152 mm) minimum in height.

- Finish and Contrast: The characters and background of signs shall be eggshell, matte, or other non-glare finish. Characters and symbols shall contrast with their background -- either light characters on a dark background or dark characters on a light background.
- Mounting Location and Height: Where permanent identification is provided for rooms and spaces, signs shall be installed on the wall adjacent to the latch side of the door. Where there is no wall space to the latch side of the door, including at double leaf doors, signs shall be placed on the nearest adjacent wall. Mounting height shall be 60 in (1525 mm) above the finish floor to the centerline of the sign. Mounting location for such signage shall be so that a person may approach within 3 in (76 mm) of signage without encountering protruding objects or standing within the swing of a door.
- All signage shall utilize fonts available through Gerber Sign Systems.
- Use standard frame and insert colors (no custom colors).

Exterior Signage (If not provided by Owner)

- All exterior signs shall be in compliance with campus signage standards and approved by GA Sign Shop.

Installation, Fabrication and Construction

- Install according to manufacturer's approved shop drawings and installation instructions and standard industry practices.
- Signage to be installed without drilling into wall surfaces. When possible a combination of silicone adhesive and double faced tape is preferable.

END OF SIGNAGE SECTION

Basis of Design

This section applies to the design and installation of equipment.

Design Criteria

- Paper towel dispensers shall be multi-fold type; do not specify C-fold. Specify large capacity dispensers. It is desirable to have two dispensers in restrooms with more than one lav.
- Do not specify combination paper towel dispenser / waste receptacle as these have been problematic in the past.

Products, Materials and Equipment

Toilet & Bath Accessories

- Refer to Guide Specifications Section 10801, Toilet & Bath Accessories.

Installation, Fabrication and Construction

Toilet & Bath Accessories

- Refer to Guide Specifications Section 10801, Toilet & Bath Accessories.

END OF TOILET & BATH ACCESSORIES SECTION

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Electric warm air hand dryers.
2. Toilet and bath accessories.
3. Janitorial mop and broom holders.
4. Underlavatory guards to prevent burns.

B. Work involves coordination of Owner-furnished products to be installed by Contractor (FOIC – Furnished by Owner, Installed by Contractor)

C. Coordinate work with Division 16 – Electrical.

1.3 SUBMITTALS

A. Product Data: For each product indicated.

B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required. Use room and product designations indicated on Drawings.

1.4 WARRANTY

A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace mirrors that develop visible silver spoilage defects within 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

[Specifier –modify as required]

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Electric Hand Dryer: Excel Dryer, 357 Chestnut Street East ; Longmeadow, MA 01028; 413/525-4531, 413/525-2853 (fax); or other reviewed and approved.

2. Toilet and Bath Accessories:
   a. Bobrick Washroom Equipment, Inc., (800) 368-7832
   b. Kimberly Clark
   c. Fort Howard
3. Underlavatory Guards:
   a. Truebro, Inc., (800) 340-5969

2.2 ELECTRIC HAND DRYER

A. Electric Hand dryer: Excel Dryer, "Xlerator", Model XL-C, energy efficient hand dryer. ADA compliant.
   1. Finish/Color: chrome
   2. Mounting: surface
   3. Operation: automatic (touch-less), 120V with dedicated circuit.

2.3 TOILET AND BATH ACCESSORIES

[Specifier –modify as required]

A. Finishes, General: unless noted otherwise, finishes to be satin finish stainless steel.

B. Multi-Fold Paper Towel Dispenser:
   1. Product: Kimberly-Clark "Windows" Series I #09906 universal towel dispenser, or approved, for use with multi-fold towels (Scottfold M Towels).

C. Double-Roll 'Hands-Free' Paper Towel Dispenser:
   1. Product: Kimberly-Clark "In-Sight" #09380 'Hands-Free' paper towel dispenser, or approved, with one 8" dia. and one 3-1/2" dia. rolls.

D. Paper Towel Waste Receptacle:
   1. FOIC (Furnished by Owner, Installed by Contractor).

E. Feminine Napkin/Tampon Waste Receptacle:
   1. FOIC (Furnished by Owner, Installed by Contractor).

F. Feminine Napkin/Tampon Dispenser:
   1. FOIC (Furnished by Owner, Installed by Contractor).

G. Liquid-Soap Dispenser: wall mounted "storage container" type soap dispensers:
   1. Product: Bobrick B-4112 Contura Series.

H. Double-Roll Toilet Tissue Dispenser:
   1. Product: San Jamar Quantum, 13" JBT.
   2. Dispensers shall be installed within reach. Dispensers that control delivery or that do not permit continuous paper flow shall not be permitted.

I. Single-Roll Toilet Tissue Dispenser:
   1. Product: Kimberly-Clark "JRT Jr. Escort" #09567 toilet tissue dispenser, or approved, with 9-3/8" dia. x 3.8" wide tissue roll with 3-1/4" dia. core, plus stub roll.

J. Toilet Seat Cover Dispenser:

1. FOIC (Furnished by Owner, Installed by Contractor).

K. Grab Bar (straight): Installation and sizes as indicated on Drawings.

1. Product: Bobrick; B-6206
2. Material: Stainless steel, 0.05 inch thick.
3. Mounting: Exposed.
4. Gripping Surfaces: Smooth, satin finish.
5. Outside Diameter: 1-1/2 inches for heavy-duty applications.

L. Grab Bar (corner): Installation and sizes as indicated on Drawings.

1. Product: Bobrick; B-6237
2. Material: Stainless steel, 0.05 inch thick.
3. Mounting: Exposed.
4. Gripping Surfaces: Smooth, satin finish.
5. Outside Diameter: 1-1/2 inches for heavy-duty applications.

M. Coat Hook and Bumper: Provide one in each toilet stall. Specified in Section 10155 – Toilet Compartments.

N. Mirror Unit: Sizes as indicated on Drawings.

1. Product: Bobrick; B-290
2. Frame: Stainless-steel angle.

O. Janitorial Mop and Broom Holder:

1. Product: Bobrick; B224
2. Material: Stainless steel.
3. Length: 48”
4. Hooks: 5
5. Mop/Broom Holders: 6, spring-loaded, rubber hat, cam type.

2.4 UNDERLAVATORY GUARD

A. Product: Truebro “Lav-Guard”

B. Insulating Piping Coverings: White, antimicrobial, molded-vinyl covering for supply and drain piping assemblies intended for use at accessible lavatories to prevent direct contact with and burns from piping. Provide components as required for applications indicated with flip tops at valves that allow service access without removing coverings.

2.5 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, No. 4 finish (satin), 0.0312-inch minimum nominal thickness, unless otherwise indicated.

B. Steel Sheet: ASTM A 366/A 366M, 0.0359-inch minimum nominal thickness.

C. Galvanized Steel Sheet: ASTM A 653/A 653M, G60.

D. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

E. Baked-Enamel Finish: Factory-applied, gloss-white, baked-acrylic-enamel coating.

F. Mirror Glass: ASTM C 1036, Type I, Class 1, Quality q2, nominal 6.0 mm thick, with silvering, electroplated copper coating, and protective organic coating complying with FS DD-M-411.

G. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

H. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.

I. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's Representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

1. Install grab bars to withstand a downward load of at least 250 lbf, when tested according to method in ASTM F 446.

B. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly. Replace damaged or defective items. Remove temporary labels and protective coatings.

END OF SECTION 10801

Basis of Design

This section applies to the design and installation of equipment.

Design Criteria

- Roof related projects shall include installation of fall protection devices if not currently existing.

Products, Materials and Equipment

Fall Protection

- Refer to Guide Specifications Section 11015, Fall Protection.

Installation, Fabrication and Construction

Fall Protection

- Refer to Guide Specifications Section 11015, Fall Protection.

END OF EQUIPMENT SECTION

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Related Work Specified Elsewhere:

1. Metal Fabrications: Section 05500
2. Painting: Section 09900

1.2 DESCRIPTION

A. General: Work of this Section includes all labor, materials, equipment and services necessary to complete the Work as described on the drawings, as specified in this Section, and as may be required elsewhere by the Contract Documents, applicable Laws and Regulations and Site conditions.

B. It is the intent of this Section that the Contractor provide and install a certified, design-build, pre-engineered Fall Protection System. The System is required to provide protection for users in leading edge conditions adjacent to areas identified as having a fall hazard of ten (10) feet or a more. The System shall be a “pass thru” system allowing users to walk uninterrupted the entire length of the system at each level and provide secure anchorage to arrest a fall by user. The system is broken into two parts:

1. Fall Restraint at the lower levels and low-slope building roofs, which restrains the user from falling over the leading edge.
2. Fall Arrest at the upper levels of the building, which engages a shock-absorbing lanyard or self-retracting lifeline to restrain users from falling more than 6 feet beyond the leading edge.

C. The Work shall include, but may not be limited to the following:

1. Fabricating or supplying fall restraint and fall arrest devices such as anchors, cables, plates connectors, and the like.
2. Installation of all fall devices.

[Specifier –edit the followi ng paragraph and its subparagraphs as necessary to fit specific project conditions; delete for projects involving new roofing assemblies.]

3. Restoration of roofing at areas where fall protection devices are installed.
   a. Fall Restraint Anchors shall be attached through existing membrane roofing. Roofs shall be repaired in kind to be watertight and resist wind forces.
   b. If the membrane roofing assembly is currently under warranty, all work shall be done in a manner approved by the membrane manufacturer to maintain the existing warranty.
4. Supplying “first-man” up hooking devices and the like.
5. Providing protection of existing interior and exterior finishes as required to perform the work of this Section. Removal of protection and restoration - in kind and to match existing - of finishes impacted by the work.

D. Due to the sensitivity of the building envelop (both stone and roofing membranes), attachment and roofing details are indicated on the drawings. Contractor shall verify all that details meet the requirements of the pre-engineered system and all applicable laws and regulations. Notify the Architect of any perceived discrepancy prior to proceeding with the work.

E. Nothing in the Contract Documents is to be construed to permit work not conforming to all applicable Laws and Regulation, and where conflict occurs, the Laws and Regulations shall govern, except where superior work is specified or indicated. Such conflicts shall be brought to the Architect's attention for clarification, prior to the submission of the Bid. If minor changes or additions to the work are required by the regulatory agencies after award of the Contract, these changes shall be included at no additional cost to the Owner.

1.3 REGULATORY REQUIRMENTS

A. All work and materials shall be in full accordance with the all applicable Laws and Regulations including the latest rules and regulations of the State Fire Marshal, the Safety Orders of the Division of Industrial Safety National Electrical Code, NFPA (Life Safety Code).

B. Washington State Administrative Code (WAC), Chapter 296-155, Part C-1 – Fall Restraint and Fall Arrest.

C. Occupational Safety and Health Administration (OSHA).

1. Part 1910 Occupational Safety and Health Standards
2. Part 1926 Safety and Health Regulations for Construction

D. American Society of Testing and Materials (ASTM)

E. American National Standards Institute

1. A 10.14 Safety Belts, Harnesses, Lanyards, Lifelines and Drop Lines for Construction and Industrial Use.
2. Z 359.1-1992: Safety requirements for Personal Fall Arrest Systems, Subsystems and Components.

1.4 SUBMITTALS

A. Submit in accordance with Section 01330.

B. Product Date: Manufacturer’s data and product information for all manufactured materials and products.

C. Shop Drawings:

1. Plans: Minimum scale shall be 1/8” = 1’-0”.
2. Elevations: Minimum scale shall be 1/4” = 1’-0”.
3. Member profiles, sizes, details.
4. Waterproofing details.
5. Connection details.

D. Operations and Maintenance Manuals: Indicating parts lists and maintenance requirements for all equipment, indicating proper procedures and equipment for safe operation of the system.

E. Test Certificate: Indicating completion of proof load testing on installed system.

F. Certificate of Liability Insurance.

G. Quality Assurance Plan: See Article 1.05 below.

H. Structural Calculations for entire system: Signed and sealed by Structural Engineer licensed to practice in the State of Washington.

[Specifier –edit the followi ng paragraph as necessary to fit specific project conditions.]

I. Assembly Mock-Up: Prior to actual drilling and installation of anchors and cable, provide mock-up of fall arrest assembly at location as directed. Do not proceed with work until mock-up has been approved by Architect.

1.5 QUALITY ASSURANCE

A. In order to assure uniform quality, ease of maintenance and minimal parts storage, it is the intent of this Section that all equipment be supplied by a single source. The Equipment supplier, in addition to the Contractor shall assume the responsibility for proper completion and installation.

B. Equipment shall be supplied and installed by a subcontractor regularly engaged in the manufacture and installation of fall protection systems. Subcontractor shall have successfully completed a minimum of five (5) comparable projects involving similar work within the last five (5) years.

C. Fall Protection Fabricator and Installer shall carry a valid insurance policy protecting the Owner's interest should anyone be injured while using the certified Fall Protection System as it is designed to be used, for the life-time of the system.

D. Quality Control Plan: Prior to beginning Work, submit a Quality Control Plan to Architect and Owner for review. Do not proceed without written notification from Owner: At a minimum, plan shall:

1. Indicate installation schedule including, but not limited to the following:
   a. When drilling and all noise generating activities are anticipated.
   b. When access to interior spaces will be required.
2. Indicate methods for mitigating noise of installation.
3. Indicate methods for providing fall protection of workers during installation of system.
4. Indicate methods for protecting surrounding interior and exterior finishes to remain.
5. Indicate methods for drilling stone and concrete.
6. Indicate methods for attaching anchors.
7. Indicate method for providing weather protection in the case inclement weather.
8. Indicate method for restoring all disturbed finishes.
9. Indicate methods for proof testing.

1.6 WARRANTY

A. Provide manufacturer's two (2) year warranty.

1.7 DELIVERY STORAGE AND HANDLING

A. Deliver manufactured materials in manufacturer's original, unopened protective packaging.

B. Store manufactured materials in manufacturer's original, unopened protective packaging. Prevent soiling, physical damage or wetting.

1.8 JOB CONDTIONS

A. Field Measurements: Prior to preparing Shop Drawings or beginning work, survey and field measure all areas to receive Fall Protection.

B. Do not begin work in inclement weather. In the event of rain after beginning installation, cover all open areas to provide weathertight protection. If leaking occurs, Contractor shall be responsible for repair of any damage or restoration of damaged finishes to their original condition before damage occurred, at no additional cost to Owner.

[C. Contractor shall provide a minimum of 10 days notice prior to needing access to roof area to allow Owner to notify all tenants.]

PART 2: PRODUCTS

2.1 MANUFACTURERS

A. Fall Protection System: Design Build system as described in Article 1.2 above. At Contractor's option, a manufactured system meeting the requirements of the ManSafe Fall Arrest System as manufactured by Latchways, Ltd. and distributed by Dalloz Fall Protection Fall Arrest Systems, Inc., 3980 Varsity Drive, Ann Arbor, Michigan 48108; telephone 1-800-325-6746, or approved equal may be used.

2.2 MATERIALS

A. All materials shall be new, and the complete fall protection system, except for accessory equipment, shall be essentially the product of one manufacturer regularly engaged in the production of such equipment.

B. Stainless Steel Plates and Bars: ASTM A666, Type 304 or 316.

C. Stainless Steel Fastener: ASTM A666, Type 304 or 316.

1. The Fall Protection System shall be attached to the supporting structure with appropriate fasteners. The fasteners shall be designed to support a load on the fall protection systems of two-times the maximum design load without failure.
2. Where through-bolting is not possible, practical or desirable, the listed fastening systems are acceptable:

D. Roof Anchors:

1. Stainless Steel: ASTM A666, Type 304 or 316..

2.3 FABRICATION

A. General:

1. Systems components shall be of the same material unless otherwise indicated.
2. Exposed work shall be true to line and level with accurate angles, surfaces and with straight square edges.
3. Coordinate anchorage system with supporting structure. Fabricate and locate anchoring devices as recommended by manufacturer to provide adequate support for intended use.
4. Fabricate joints in a manner to discourage water accumulation. Provide weep holes to drain any water that could accumulate in the exposed joints.

2.4 SYSTEM DESIGN

A. General: System shall be designed to a safety factor of 3 to 1.

B. Fall Arrest

1. The fall protection system shall be designed to allow users to walk uninterrupted the entire length of the system without having to unhook from the system to pass through intermediate

support points. The system shall be designed to support 2 users in case of a fall and to prevent the users from free falling more than six (6) feet.

2. All components shall be designed by the fall protection system supplier and shall meet the applicable requirements of ANSI A10.14.
3. Description
   a. Fall protection system shall consist of a stainless steel safety cable attached to the structure.
   b. The cable shall have a stainless steel entry terminal, swaged to the cable, at each end of the cable with a plastic spring gate.
   c. A stainless steel line tension device and turnbuckle shall be provided at one or both ends. Provide steel end brackets to attach the cable to the roof anchors.
   d. Support cable as indicated with stainless steel “D” rings and hangers designed to allow the user to pass without unhooking from the cable.
   e. Provide 2 stainless steel lanyard coupler devices with connector eye. The coupler device shall be able to be hooked and unhooked at the entry terminals and be able to pass intermediate cable supports and splices without having to be detached.
   f. Brackets and supports shall be attached to the structure with appropriate anchors of proper size and embedment, as per 2.2 C., to adequately support the intended loaded.

C. Fall Restraint:

1. The system shall be designed to prevent the users from falling over the leading edges and to support 2 users in case of a fall.
   a. Leading edges shall be as defined by the Washington State Administrative Code (WAC), Chapter 296-155, Part C-1 – Fall Restraint and Fall Arrest.
2. All components shall be designed by the fall protection system supplier and shall meet the applicable requirements of ANSI A10.14.
3. Description
   a. Fall protection system shall consist of a stainless steel safety cable attached to the structure.
   b. The cable shall have a stainless steel entry terminal, swaged to the cable, at each end of the cable with a plastic spring gate.
   c. A stainless steel line tension device and turnbuckle shall be provided at one or both ends. Provide steel end brackets to attach the cable to the roof anchors.
   d. Support cable as indicated with stainless steel “D” rings and hangers designed to allow the user to pass without unhooking from the cable.
   e. Brackets and supports shall be attached to the structure with appropriate anchors of proper size and embedment, as per 2.2 C., to adequately support the intended loaded.

PART 3: EXECUTION

3.1 INSTALLATION

A. Install in accordance with approved shop drawings and manufacturer’s instructions.

B. Fall protection system shall be installed under the direction of manufacturer’s authorized trained personnel.

C. Install anchorages and fasteners in accordance with manufacturer’s recommendations to obtain the allowable working loads published in the product literature and in accordance with the specification.

D. Do not load or stress fall protection system until all materials and fasteners are properly installed and ready for service.

E. Anchorage Drilled into Concrete

1. Follow manufacturer's recommendations
2. Do not cut or damage reinforcement
3. Clean drill hole and remove debris and contaminants in accordance with manufacturer's instructions.
4. Install anchorages at indicated locations, clearances and embedment depth.
5. When clearance and spacing of anchorage is not indicated on drawings, install at location recommended by manufacturer to obtain maximum working loads and in accordance with the following:
6. Anchorage Clearance to Edge of Concrete: Not less than 7 bolt diameters.
7. Anchorage Spacing Center to Center: Not less than 10 bolt diameters.
8. When embedment length is not indicated on drawings, install with embedment depth not less than 6 bolt diameters.

3.2 FIELD QUALITY CONTROL

A. After the safety system is installed and properly tensioned, the safety system manufacturer's approved authorized representative shall inspect and operate the system and shall make all final adjustments for proper operation.

B. After the system has been placed into operation, the manufacturer's authorized representative shall perform proof testing and issue a certificate attesting to the system's ability to withstand the proof load.

C. At least 3 sections of each separate Fall Arrest and Fall Restraint assembly, at each level of the building shall be tested using the following procedure. The following procedure is based on the Mansafe System as manufactured by Latchways. See Data Sheets No. 85500-98, 85480-98 or SS48 1-98. Noted illustrations are contained in the Data Sheets.

1. Use of a man-lift to apply a load for this testing procedure is not recommended. It is permissible to utilize the dead weight of a man-lift as the anchorage. The lift must be shut off with the emergency stop on and must be capable of withstanding at least a 2000 lb. load. Do not attach the testing rig to the basket of a man-lift.
2. Prior to beginning test, each system shall be visually inspected for obvious signs of damage or deterioration such as corrosion, loose cable strands, loose fittings, slip indicator separation, proper pre-tension, damaged plastic gates on entry/exit terminals, etc. Document any deficiencies, discrepancies from contract requirements and/or damage in writing and with photographs. Correct deficiencies and repair damage prior to testing.
3. User equipment such as transfasteners, lanyards, self-retracting lifelines, etc., shall be visually inspected prior to issuing Test Certification.
4. When all damage and deficiencies have been corrected, proceed by installing the proper proof-pest pools on the system (Xtenda 85500 or 85480 for single Xtenda's 5481 or S8P3 for double Xtenda's or approved equal.)
   a. Place a Pulley (Miller Equipment Model #RP105 or approved equal) on the lifeline to be tested as per drawing LW9999.1. The pulley should be positioned between the two intermediate support hangers of the longest span or in the middle of any single span lifeline. Do not install in the first bay or next to any corner bracket.
   b. Using a steel carabiner (Miller Equipment Model #17D-1 or approved equal) connect to the opening on the pulley, then connect one hook end of a 20' Ratchet Puller (Dayton Model #4Z312 or approved equal) to the carabiner.
   c. At this point, release enough cable out of the ratchet puller to reach the selected anchorage point.
   d. Using a dead-man anchorage or other suitable anchorage (at least 2000 lb. capacity), attach another steel carabiner to the anchorage, then attach one side of a load cell with 20 lb. divisions (Dillon AP Dynamometer Model #2000 lb. or approved equal) to the carabiner and attach the remaining cable end from the ratchet puller to the other side of the load cell. (See Drawing #LW9999.1)

e. Reset the dynamometer to zero.
f. Using the ratchet puller, begin tensioning thee load cell until a 1000 lb. reading is obtained. When a load of 1000 lb. has been obtained, leave the load on the system for 5 -10 seconds. Then release the tension, backing off the tension with small incremental steps. During the tensioning period, note any deformities such as structure or fabrication bending. If any deformation is observed, DO NOT continue applying any further load.
g. If any significant deformation takes place, stop the test and report it to Contractor, Architect and Owner.
h. Remove testing equipment in reverse order of installation. Remove the test proof tool before setting the pre-tension and tagging.
i. Set the pre-tension to 80 kg (180 lb.) and check slip indicators.
j. Walk the line with the selected attachment to check that the system operates properly in both directions. Make sure that the intermediate hangers have not been deformed during the load test.

5. Once you have completed the test and walked the system, place a tag certifying testing and mark with a permanent marker the Test Date, Manufacturer / Installer's name and telephone number.
6. Tag fall system with metallic tag to indicate fall arrest or fall protection limits.
7. Record all data in the O & M Manual for submittal to the Owner at Project Close-Out.

3.3 OPERATOR TRAINING

A. Provide operator training after the system has been installed and proof tested. Training is to take the form of a single class conducted at the installation site.

1. Training shall be professionally video-taped to insure a clear steady camera technique and a clear coordinated audio track. Three copies of the video shall be provided to the Owner.

3.4 COMPLETION

A. Restore all existing surfaces to their original condition at the beginning of work.

B. Remove all loose materials, crating and packing material from premises.

END OF SECTION 11015

Basis of Design

This section applies to the design and installation of interior furnishings.

Design Criteria

- Blinds shall be specification grade. Provide spare parts and repair kits.

Products, Materials and Equipment

- No specific requirements.

Installation, Fabrication and Construction

- No specific requirements.

END OF FURNISHINGS SECTION

Basis of Design

This section applies to hazardous materials abatement work.

Design Criteria

- Insert the following statement into the Contract Documents involving asbestos abatement work: “Contractor shall provide minimum 24 hour notification to the Department of Capitol Facilities customer service office (360/725-0000) prior to any planned asbestos abatement work.”

Products, Materials and Equipment

- No specific requirements.

Installation, Fabrication and Construction

- No specific requirements.

END OF HADARDOUS MATERIALS ABATEMENT SECTION

Basis of Design

This section applies to passenger and freight elevators.

Design Criteria

General Requirements

- Hydraulic elevators are restricted to a shaft length of 60 feet and five stops maximum. Telescoping type is not acceptable. Do not use hydraulic type where the water table is high enough to be in contact with piston cylinder assembly.
- Provide traction elevators in buildings with more than five stops and in buildings with high traffic.
- Dual-purpose freight/passenger elevators can be substituted for dedicated freight elevators in special situations or as a practical alternative as programming requirements indicate.
- Renovated elevators shall be upgraded to meet current Elevator Code to the extent practical.
- Size shaft/hoistway to accommodate all manufacturers for the type of elevator specified. Do not provide a shaft/hoistway that accommodates only one manufacturer's size of elevator.
- Elevators shall comply with ADA requirements. In addition, elevator compartment shall be sized large enough to accommodate a gurney for use in case of medical emergency.
- Provide seismic detectors.
- Pit shall have clearances under car for safety of workers in the pit. Access shall be by ladder.
- Call buttons in elevator lobbies and halls shall be centered at 42 in (1065 mm) above the floor. Such call buttons shall have visual signals to indicate when each call is registered and when each call is answered. Call buttons shall be a minimum of 3/4 in (19 mm) in the smallest dimension. The button designating the up direction shall be on top
- Refer to Programming Guide, page 00024-04, Item C.4, for additional elevator design criteria and related requirements.

Proprietary Equipment and Accessories Installed

- All elevator equipment on the State Capital Campus shall be as generic as possible. However if proprietary equipment is installed the following conditions shall be met:
  a. The equipment shall be available to DCF within 24 hours.
  b. The contractor shall identify all the proprietary equipment by name and determine availability.
  c. If a proprietary equipment is upgraded within twelve (12) months, vendor shall upgrade existing state campus equipment at no cost to the state. All proprietary equipment and accessories will be disclosed in writing. A list of these items will be made available together with a guarantee of availability. This guarantee shall specify that these parts will be available for the life of the equipment and within a twenty hour period of failure.

Elevator Type

- Capital Campus elevators are subject to heavy-duty service, are prone to vandalism, and are required to provide accessible access to most building areas. It is imperative that they be designed accordingly. Elevators shall be designed for combination passenger and freight (class A) services, as many delivery services on the campus utilize the convenience of the elevator.

Generally elevators should have a minimum of 150 FPM travel speed, however the actual speed should be verified with the Owner for each installation.

- The minimum desired car capacity is 3,500 pounds with minimum clear inside dimensions of 6'-8" wide by 5'-5" front to back. A larger sized elevator is preferred. The Owner may choose to waive this requirement in favor of the minimum accessibility requirement. This should be verified with the Owner.
- The basic control system is to be selective-collective. Elevators shall be designed to land at basement, attic and all intermediate floors. Locate the machine room overhead where possible for traction elevators and adjacent to the hoistway at the lowest landing for hydraulic elevators. The type of elevator installed should take into consideration initial installation cost, maintenance cost, and the need for higher horsepower requirements in some situations. Unless an exception is made by the Owner do not use a hydraulic elevator for passenger elevators over five floors or 150 feet per minute.

Elevator Pit

- Applicable codes, while allowing the use of a sump pump in the pit, do not allow a direct connection to a storm or sanitary drain. Therefore, it is imperative that elevator pits be thoroughly sealed to prevent water penetration. The pit shall be sealed against ground water and around the hydraulic shaft. A pit light with approved switch shall be installed in accordance with ANSI A17.1 rule 106.1E. A pit ladder shall be provided in compliance with the minimum standards for elevators according to the most recent elevator codes of the State.

Alarms and Emergency Communication

- The alarm button shall sound local alarm in the elevator car. The elevator subcontractor shall provide a set of dry alarm contacts with a pair of wires to the elevator controller to provide the means for the Owner or subcontractor to monitor the local alarm. A system trouble alarm shall be provided by the elevator contractor. A pair of dry contacts shall be provided with wiring to a terminal strip in the elevator controller. The contacts shall close if the car does not respond to any call button within five minutes. Wiring from the controller to the Owner's computerized control system panel shall be provided by the electrical subcontractor. The control system subcontractor shall make the termination in the field control panel and include these points on points list.
- The contractor shall provide ADA and ANSI A17.1 compliant two-way communication system between the elevators and a location agreed upon by the Owner and the contractor. Coordinate precise equipment with Owner prior to specifying. Provide a dedicated voice grade telephone line to each elevator controller for emergency communications to the Capitol Campus auto-dial network. The telephone device shall be full duplex, hands free, vandal-resistant equipment programmed for auto-dial to the CP&M control station. Recorded messages shall not be sent. The device shall meet all current ADA requirements. An intercom between the elevator and main elevator lobby or building fire control center should also be provided.
- All elevators shall be linked to the Capitol Campus auto-dial telephone system. The contractor shall provide all equipment and service to connect the elevator telephone to the campus network. Specific information on the telephone connection shall be obtained from the DCF Telecommunications Coordinator at 753-5685.

Elevator Fire Service

- The elevators shall be installed with phase I and phase II fire service features as required by ANSI A17.1. This includes alternate floor selection and the necessary signal fixtures in the car

and hall. The electrical contractor shall install the necessary smoke detectors as required by the State elevator code and make wiring in the building fire alarm system according to specifications provided by the local authority having jurisdiction, (the City of Olympia Fire Marshall). Contractor to contact METASYS personnel to interface new fire alarm system to Johnson Controls METASYS system.

Key Cylinder

- Keyed independent service shall be provided for the convenience of building maintenance personnel.
- CP&M specifies that the key cylinder shall be by BEST. The Owner will provide key specification upon request to the contractor. Contractor to contact CP&M lock smith supervisor to verify key cylinder requirements. In response to lobby smoke detectors, the elevator(s) shall return to the designated level and doors shall remain open until fire department resets. Key switch operation (phase II) shall be installed in accordance with ANSI A17.1.

Automatic Disconnecting for Fire Sprinklers

- For all buildings with fire sprinkler systems the sprinkler heads in the elevator machine room and the hoistways shall comply with ANSI A17.1, rule 102.2. The power supply disconnecting means shall be in accordance with WAC 296-81-277.

Vandalism and Reckless Damage Resistance

- *Elevator installations in many buildings on the Capital Campus are subject to a considerable amount use vandalism and reckless damage. Because of wanton disregard of state property by some individuals or groups, the consultant is encouraged to specify vandal resistant equipment such as signal fixtures. Installation of standard pre-engineered elevators are not rejected by this standard. But the following design standards shall be provided if the Owner desires in certain installations*.
- When required by the Owner, vandal resistant fixtures shall be Survivor/Plus by Adams Elevator Equipment Co. or an approved equal. Each button shall be flush mounted with minimal clearance between moving components to prevent jamming. Exposed services shall be of stainless steel, except where necessary to transmit light. All indicators shall be flush mount type with only small holes less than 3/8” and/or hairline joints to transmit light. All exposed fasteners shall be the tamper resistant type.
- Vandal-resistant push buttons shall be provided as follows: Diameter to be 1.25 inches, made of solid stainless steel. The surface shall be rounded with minimal clearance between the button and the halo to prevent jamming. The button travel shall be stopped by a metal shoulder to prevent the transfer of pressure to the electrical switch contract and mounting studs. The metal halo shall be recessed into the face of the plate to prevent prying. The jewel shall be made of Lexan or equal material. The electrical switch component shall be protected with a Lexan body and contain contacts silver to silver with self-cleaning wipe and be U.L. approved. All buttons shall be of the illuminated type per ANSI A117.1.
- When required by the owner, car lighting shall be of the vandal proof type. Architects and designers should avoid using suspended ceilings with incandescent lamps in elevator cars. These lights are expensive and easily removed. Indirect lighting within the car should be given strong consideration.

- Car interiors and doors shall be as graffiti resistant as possible. This is generally mandatory in elevators installed in parking structures and libraries. Verify actual requirements with the Owner.
- Permanent Braille symbols are required. The stick on type are consistently peeled off or otherwise removed. Any exception must be approved by the owner.

Eschuteson Hole

- Provide an eschuteson hole on all car doors.

Project Specific Requirements

Interlocks

- Each hoist way entrance shall be equipped with an approved type interlock tested as required by code. The interlock shall be designed to prevent operation of the car away from the landing until the doors are locked in the closed position as defined by code and shall prevent opening the doors at nay landing from the corridor side unless the car is at rest at that landing or is in the leveling zone and stopping at that landing. Interlocks shall bear Underwriters' Laboratories "B" label of approval.

Hoistway Door Unlocking Device

- Hoistway-door unlocking devices as specified by the ANSI/ASME A17.1 code shall be provided to permit authorized persons to gain access to hoistway when elevator car is away from the landing. Drill and mount each hoistway door for emergency access to interlock via broken-arm emergency door key. Use appropriate ferrule inserts to finish access holes.

Door Operation

- A direct current motor driven heavy duty operator shall be furnished and installed, designed to operate the car and hoistway doors simultaneously. Door movements shall be electrically cushioned at both limits of travel.
- The elevators shall be equipped to comply with ADA/ANSI A17.1 accessible codes. Install door jamb symbols per ANSI code at all landings. Locate all signals in this project at accessible levels.
- Supply a car-top inspection/operating station complete with light fixture and on/off switch and emergency stop switch. Locate this station at proper operating elevation.

Signal Fixtures - Vandal Resistant

- Provide vandal resistant car station with built in Braille Arabic identification conforming to and mounted at ADA/ANSI levels. Phase I and phase II shall be included as a control function. The car station shall include:

  a. Alarm Button.
  b. Keyed Emergency Stop.
  c. Capacity Plate (inlaid).
  d. Door Open Button.
  e. Door Close Button.
  f. Keyed Light Switch.
  g. Keyed Fan Switch.
  h. Keyed Independent Service Switch.
  i. Emergency Lighting mounted in car station.
  j. All signal fixture finished shall be No. 4 stainless steel.

Car Position Indicator and Car Riding Lantern and Gong Assembly

- A vandal-resistant car lantern and gong assembly shall be provided that consists of engraved chevron arrows highlighted at the three apex points by a round Lexan illuminated lens.
- An electronic chime shall be provided which meets ANSI accessible code by sounding once in the "up" direction and twice in the "down" direction. An acceptable alternative is a voice announcer system which meets ADA together with a car-riding lantern and gong assembly with a floor passing audible signal.

Controller and System Operation

- The elevator system shall be microprocessor based and software driven. The software shall be generic. Proprietary software will be considered only if all programming, information and special tools are provided to Owner to allow maintenance by others. The system shall operate in real time, continuously analyzing changing position, condition, and workload. The microprocessor should be capable of calculating estimated time of arrival (ETA) for calls registered.
- The microprocessor shall provide flexibility to meet defined patterns of traffic such as up peak, down peak, and heavy interfloor demands and still adjust for the many indeterminate variations in these patterns which occur in buildings.
- The position selector shall be part of the microprocessor system. The microprocessor control system shall store the floor position and slowdown points in memory.
- The drive control system shall be a dual-loop feedback system based primarily on car position. The velocity profile shall be calculated by the microprocessor control system producing extremely smooth and accurate stops. The velocity transducer shall permit continuous comparison of machine speed to velocity profile and to actual car speed. This accurate position/velocity feedback shall permit a fast and accurate control of acceleration and retardation.
- The controller shall include reverse phase protection, bypass, nudging, anti-nuisance, door time-saver, limited door reversal, independent service, and include all ADA requirements.
- Other features which should be included in supervisory operation include:
  a. Selective Collective Assignment
  b. Running MG Preference
  c. Delayed Car Protection
  d. Emergency Dispatching
  e. Parking Operation
  f. Anti-Nuisance Call Control
  g. Load Weighing Device

Machine Room and Remote Monitoring Requirements

- Remote monitoring of elevator operation is now an option available on microprocessor controllers. Whenever possible the elevator system installer shall provide as part of the installation a computer based system with keyboard that allows remote monitoring by service technicians.
- The installation must include a modem and appropriate serial port on the computer to allow the Owner to monitor the elevator operation on a similar computer in the Operations Center. The modem must be able to send and receive data over the Owner's campus wide network.
- Provide two telephone outlets, fully wired, in each machine room. The jacks must be RJ-11 or compatible technology and connected to the Owner's network. One line shall include a wall hung

handset for troubleshooting use by service technicians. The second line, capable of local service only, will serve as the means of connecting the modem to the network for remote monitoring.

- The design for the machine room shall provide the Owner with capability of maintaining a temperature of 50 to 90 degrees Fahrenheit. A Computerized Temperature Control System alarmable point shall be provided by the control system contractor.
- The HVAC system for the machine room must provide a dust free environment to the extent possible. Dust and other airborne particles are extremely detrimental to microprocessor equipment and repairs are very costly.
- The machine room shall be keyed to the Owner's machine room master key for the convenience of service personnel and security purposes. The Owner shall provide the contractor with the lock manufacturer and keyway at the time of construction.

At present remote monitoring capability is available on the high end microprocessor controllers and relay logic systems. These controllers are generally available only on electric traction elevators. Many of the conveyance systems installed for the State Capital facilities are hydraulic. Some modifications to the controllers, given the rapid increases in this technology would be possible to accomplish system monitoring on hydraulic units. The Owner must reserve the option to have hydraulic units installed with controller equipment that allows machine room and remote monitoring on high use passenger elevators. Aside from ADA requirements elevators are getting an increasing level of attention of safety issues from building occupants. The ability to monitor an elevator's performance in response to occupant complaints will significantly enhance the ability of the maintenance staff to respond to occupant assertions about faulty elevator operation.

Protective Pads

- Protective pads for the elevator car complete with the hanging hooks are to be included in the elevator specification. The pads are to be the maximum length allowed by code and cover all walls. Pads shall be delivered to Owner at start of the warranty period.

Entrapments and Failures

- Being confined involuntarily in an elevator is an upsetting experience for many people. Having an elevator which several members of the State Capital Campus depend on out of service for an extended period is unpleasant as well. Accessibility ramifications are foremost as an Owner concern. For the aforementioned reasons the Owner requires the following provisions as part of the new installation service:

  a. *In the event of an elevator malfunction involving passenger entrapment, the Owner may immediately contact the Division of Capital Facilities (CP&M) elevator maintenance contractor to assist in releasing the passengers, after which the Owner will notify the installation contractor of the action taken. Billing for such emergency service will be made by the elevator maintenance contractor directly to the installation contractor.*

  b. *In the event a maintenance problem occurs to the elevator other than passenger entrapment the Owner will contact the installation contractor for service. In the event the installation contractor concludes the problem cannot be resolved to restore the elevator to service within 2 hours with their own staff, the installation contractor will give the Owner permission to authorize the elevator service contractor to restore the elevator to service. Billings for such service will processed the same as for passenger entrapment.*

- The installation contractor shall provide the Owner a written statement accepting these terms.

Acceptance Tests

- All tests shall be performed in the presence of the Washington State Elevator Inspector and the Owner's representative. The installation contractor shall obtain State Elevator Certification, and shall pay the installation fee. Installation fee shall include the plan check fee, acceptance inspection, and the initial unrestricted operating permit.

Submittals

Operation and Maintenance Data

- Upon final acceptance of the elevator by the Owner the installation contractor shall provide the Owner with two copies of the Operation and Maintenance Manual for the elevator. The two copies are to be given to the Owner's elevator maintenance contract administrator. One copy will be provided to the elevator maintenance contractor on a loan basis. The other will be filed with other maintenance information in the Owner's as-built files. The General Contractor is under no obligation to include the same information in any other maintenance manuals.
- The manual shall be neatly organized and logically indexed and bound in a long lasting wear resistant cover. The manual shall include complete, directly reproducible as-built drawings, diagrams including wiring type, wiring control schematics, drawings showing physical location of relays and electrical components. Include complete preventative maintenance instructions detailing services to be performed, frequencies of service, and repair and overhaul instructions on all components of the elevator system. Provide a complete description of the elevator operation including the functions of signals, door devices, and other pertinent features. Complete troubleshooting information shall be provided as well as a complete parts list for the installed elevator system.
- The elevator contractor shall provide all drawings and control schematics on a 3.5" 1.4 megabyte diskette in AUTOCAD readable format verified by the Owner.
- The Owner is cognizant of the fact that modern control systems have components, which require special tools, and designated maintenance and troubleshooting information which the manufacturer considers proprietary. The installation contractor shall agree in writing prior to award of the contract for installation to disclose all requirements for proper maintenance, troubleshooting, and repair of the control (microprocessor based) system. The manufacturer's conditions for the Owner's acquisition of special manuals, tools, and/or components which are considered proprietary shall be clearly defined, including costs not included in the installation bid and copies of any documents required by the manufacturer for execution by the Owner. The contractor's failure to disclose information satisfactory to the Owner shall necessitate rejection of the bid. The Owner shall agree, in, that no reproduction or dissemination of the materials shall be made without the specific written permission of the company and that the materials shall not be used in any manner detrimental to installation contractor.

Maintenance

- The contractor shall provide new installation service concurrent with the warranty period. The warranty period shall be for twelve (12) months commencing from the date the Owner accepts the elevator(s) for substantial completion. The service shall include all necessary preventive maintenance and repairs to keep the elevator in operation condition and list all warranted items by name. Updated software versions shall be provided and installed by the vendor during the warranty period. The contractor will be reimbursed by the Owner for any repairs or service which are found to result from vandalism or caused by an interruption in the Owner's utility services.

Products, Materials and Equipment

Acceptable Manufacturers

1. ThyssenKrupp (formerly Dover)
2. Otis
3. KONE (formerly Montgomery)
4. Schindler

Installation, Fabrication and Construction

- Comply with manufacturer's instructions and the Elevator Safety Code for work required during installation.

END OF ELEVATOR SECTION

Basis of Design

This section applies to the general mechanical requirements for all Division 15 work.

Scope

- These standards and procedures contain the design criteria for mechanical systems and apply to all sections of Division 15. This information is intended to help the mechanical engineer during the design process. Alternate solutions may be discussed with the Project Manager.

General Requirements

- The Capitol Campus construction is permanent and mechanical systems must be designed for long life spans before major repairs or replacement is required. Quality, proven systems are required. Design must take into consideration required clearances and access to eventually replace all components and enclosures.
- All equipment should be located in building mechanical rooms or penthouse. Unitary roof top equipment should not be used. Mechanical rooms must be sized for repair, maintenance, and eventual replacement of equipment.
- Flood protection shall be provided in the mechanical rooms and penthouses. Four-inch concrete housekeeping pads shall be provided for equipment. Floor drains and/or sump pumps shall be provided.
- HVAC air intakes shall be adequately separated from exhaust piping and placed upwind from such piping, based on a prevailing SW wind.
- HVAC system design shall provide an acceptable minimum flow of constant air ventilation to occupied spaces (20 cfm/person for example).
- HVAC system shall run on maximum outside air efficiency and be capable of running on 100% outside air for flush-out purposes.
- New building spaces shall be flushed-out utilizing 100% outside air for a minimum 2-week period to exhaust contaminants prior to building space occupancy.
- HVAC system dampers larger than 2 square feet in size and control valves larger than 2-1/2 inches in size shall be electronic operated.

HVAC System Filters

- All ventilation air supplied to occupied space shall be filtered through minimum 30% efficient extended surface filters (pleated filters) per ASHRAE Standard 52 – Atmospheric Dust Spot Test Method. Filters shall be set in factory-built frames with hinged door, properly sized for specific unit.
- This filter requirement applies to main HVAC supply equipment and for VAV boxes at all State General Administration owned buildings.
- Pre-construction: Prior to any construction activities, the HVAC system shall be secured to prevent the introduction of particulates into the air distribution system. This may include isolating air intakes, air exhaust and providing prefilter medium to prevent the loading of particulates on the HVAC systems filters. If adverse loading is observed on the building's HVAC filters, they shall be required to be changed at the projects expense.
- Filters shall be maintained and a change out schedule established for each HVAC unit in a building that will take into account factors that contribute to rate at which the filter becomes used. The minimal change out schedule shall be no greater than one year.

- Upon the change out of filters the "Standard Operating Procedure for Filter Changes" shall be followed and documentation maintained for review.

Mechanical (Plumbing) Systems

- Separate sanitary and storm sewer lines.
- Provide access for maintenance on back flow preventers.
- Zone plumbing systems and provide individual isolation valves for each zone. Valves shall be properly identified with signage and indicated on as-built drawings.
- On remodel projects, remove all abandoned piping back to live connection.
- Provide hose bib centered along wall under all restroom vanities for custodial use. Provide hose bib also at each janitor sink.
- At public restrooms where more than one lavatory is to be provided, provide one deep utility sink with high gooseneck faucet at one end location in lieu of standard lav unit.

Steam and Heating Systems

- Steam lines shall be installed in utilidors with sufficient work space for maintenance. Lighting shall be provided for 1 foot candle average on the floor. 120 volt GFCI convenience outlets shall be provided at 200 foot intervals. Floor drains shall be provided at 100 foot intervals piped to pump stations located every 500 feet.
- Isolation valves shall be provided for each building. Valves shall be properly identified with signage and indicated on as-built drawings.
- Heating water converters shall have connections for treating hot water loop.
- All heating loops and condensate loops shall have sampling devices installed at appropriate intervals. Hydronic loops, condenser loops, and tower sump loops shall have sampling ports and a means for adding chemical treatment. Provide pot feeders on closed loops, located near pump unit.
- Condensate from hot water converters shall return to condensate system and back to central heating plant. Condensate shall be directed to a condensate return tank for flashing, before entering the relatively cold main condensate return line. High pressure drip steam traps shall be discharged into flash tank to avoid flash steam in condensate mains.
- Flash tanks shall be ASME approved.

Markings

- Equipment Nameplates: Black bakelite with white layer, 1/4" lettering with equipment schedule designations (e.g., "EF-1, Exhaust Fan No. 1").
- Pipe Marking: Three-band color code markings as designated below, with markings occurring at maximum 10 foot intervals in each space where piping is exposed; provide markings also at all concealed lines in chases and above ceilings.

WASHINGTON STATE CAPITOL CAMPUS
COLOR CODE SYSTEM FOR MECHANICAL ROOMS

SERVICE	3/4 BAND	3/4 BAND	1 1/2 BAND
Cold Water Dom.	Green	Green	Blue
Hot Water Dom.	Green	Orange	Blue
Hot Water Circ. Dom.	reen	Orange	Blue
Chilled Water Return	Green	Blue	Blue
Chilled Water Supply	Green	Purple	Blue
Heating Return	Green	Orange	Blue
Heating Supply	Green	Red	Blue
Condensation	Yellow	Red	Blue
Steam	Yellow	Red	Orange
Condenser Supply	Yellow	Yellow	Blue
Condenser Return	Yellow	Yellow	Blue
Waste and Soil	Green	Green	Brown
Vent	Green	Green	Aluminum
Steam Blow Off	Yellow	Red	Orange
Fire System	Painted Solid Red		
Other Sprinkler	Red	Green	Blue

ARROW INDICATES DIRECTION OF FLOW

Closeout Submittals

All sub-consultants to the prime consultant are not to include their own requirements regarding close-out submittals. Division 15 specification sections regarding closeout submittals including project record documents, operation and maintenance manuals, warranties, bonds, extra stock, etc., are only to reference seeing Section 01780. If the consultant has specific criteria they need beyond Section 01780, they can specifically identify it at the same time as being in addition to requirements of Section 01780.

Products, Materials and Equipment

Piping/Plumbing

- Building sanitary and storm lines shall be ductile or cast iron, no-hub.
- Potable water lines shall be copper Type L above ground, wrapped Type K below ground.

Fixtures

- Water closets and urinals shall be wall hung low flow type with carriers; Kohler or American Standard. Use hand flush flushometers; do not specify infrared flush meters. Flushometers shall be Sloan (no exception).
- Faucets and mixing valves shall be Moen low flow type.
- Floor drains shall be Zurn, Josham or Smith.
- Refrigerated drinking fountains shall be Halsey,Taylor, Haws or Elkay.

- Water shutoff / piping valves shall be Hibco, Kennedy, Apollo or Stockman.

Steam and Heating Systems

- System valves and flanges shall be 250 PSI class. Steam system piping shall be schedule 80 steel.
- Shutdown valves shall be motor operated globe valves, 250 pound class with 208/240 volt actuator. Control shall be 4-20 MA or 0-10 VDC proportional control.
- Provide cartridge type high pressure steam traps with integral strainer and blow down valve (yarway Unibody Mode 721 class 600 3/4).
- Provide steam turbine flow meter for each building; EMCO Model #TMP-965).
- Steam reducing stations shall be Spence.

Controls System

- Refer to Guide Specifications Section 15900, Energy Management Control System.
- Refer to Guide Specifications Section 15990, Testing, Adjusting and Balancing.

Installation, Fabrication and Construction

- Refer to requirements specified in the individual Mechanical Sections.

END OF GENERAL MECHANICAL REQUIREMENTS SECTION

Basis of Design

This section applies to the insulation of piping, ductwork and associated mechanical equipment, and liquid storage vessels.

Design Criteria

Codes, Regulations, and Standards

All work shall conform to the following codes, regulations, and standards of latest issue:

- Factory Mutual Standards.
- Washington State Energy Code.
- Uniform Fire Code.
- Uniform Mechanical Code.
- Uniform Plumbing Code.
- Underwriters Laboratories Standards.

General Requirements

- All surfaces shall be insulated to reduce energy loss or gain, avoid undesired condensation, and reduce corrosion.

Specific Requirements

- A vapor barrier jacket is required for chilled water piping, equipment, refrigerant suction piping, domestic cold water piping, rain leader piping, air handling ducts and equipment with air temperatures of 55 degrees F. or less.
- Pipe insulation in utility tunnels, up to the building service header main valve, shall have a uniformly ribbed, 0.01 inch minimum thickness metallic casing with a vapor barrier lining.
- Fittings, valves, and flanges shall have an insulation thickness no less than the adjacent piping but must be removable without damage for easy re-application.
- Demolition (removal) of carcinogenic insulation containing asbestos shall be performed by the Owner.
- Pipe insulation in maintenance areas (mechanical rooms, accessible shafts, etc.) is subject to mechanical damage (crushing, abrasion and laceration) resulting from maintenance activities. Rigid insulation materials protected with a canvas wrap are required in these spaces.
- Oversize Pipe Rings, Inserts, and Shields: Install the pipe insulation and jacket extending through the pipe hanger ring. Provide an extra high density insulation insert and metal shield within each hanger, except where pipe covering protection saddles are welded to the pipe.
    a. Insulating Inserts: Extra high density insulating inserts shall be the same thickness as pipe insulation, and shall be Pittsburgh-Corning "Foamglas" cover not less than the lower 40 percent of the circumference of the insulation; sizes of section, 6 inches minimum length up to 6 inch outside diameter, 8 inches minimum length for larger sizes. "Foamglas" shall not be used for high pressure steam. Install the insulating insert section to replace a cutout section of insulating material within the insulation jacket, with tightly fitted butt type joints. For pipe on

trapeze channel hangers, provide Pipe Shield Model A3000 insulated pipe support which covers 100 percent of the circumference of the pipe.

b. Metal Shields: Except where pipe covering protection saddles are specified, provide outside of the jacket and inside of each hanger, a metal shield of 18 gage sheet metal, minimum, covering lower 40 percent of the circumference of the insulation, length not less than that specified for cut-in section of high density insulating insert. On 6 inch and larger pipe, shields shall be 14 gage minimum, two pipe diameters in length.

Duct Liner

- The use of internal duct lining insulation is strictly prohibited.

Fiberglass (External) Duct Wrap Insulation

- Duct wrap insulation thicknesses and R-values shall meet the following requirements for the respective applications:

  a. Not Within Conditioned Space: Insulation shall be installed on supply, return, mixed, outside and transfer air duct located outside of the insulated building envelope and shall have an R-value equal to or greater than R-7. Duct wrap shall be 3" thick, .75 lb./cu. ft. density, minimum.

  b. In Concrete or in Ground: Insulation shall be installed on supply, return, mixed, outside and transfer air duct located in concrete or in the ground and shall have an R-value equal to or greater than R-5.3. Duct wrap shall be 2" thick, .75 lb./cu. ft. density, minimum.

  c. Within Conditioned Space (mixed and outside air duct only): Insulation shall be installed on outside air duct located within the conditioned space and shall have an R-value equal to or greater than R-7. Duct wrap shall be 3" thick, .75 lb./cu. ft. density, minimum.

  d. Within Conditioned Space (except mixed and outside air): Insulation shall be installed on supply, return, exhaust, relief and transfer air duct located inside of the insulated building envelope and shall have an R-value equal to or greater than R-3.3. Duct wrap shall be 1" thick, 1.5 to 3.0 lb./cu. ft. density, minimum.

Products, Materials and Equipment

General

- All insulation, facings, coatings, adhesives and other accessories shall have a fire hazard rating not to exceed 25 for Flame Spread and 50 for Fuel Contributed and Smoke Developed; ratings determined by UL Standard No. 723, NFPA Standard No. 255, test results from the approved testing laboratory shall be available to indicate that fire hazard ratings for materials do not exceed the above amounts.

Fiberglass Pipe Insulation

- Shall conform to FS HH-I-558, Form D, Type III, Class 12.

Fiberglass Pipe Fitting Insulation

- Shall conform to FS HH-I-558, Form E, Class 16.

Flexible Unicellular Polyolefin Pipe Insulation

- Shall conform to UBC 42-1 Class 1, UL 94HBF.

Fiberglass (External) Duct Wrap Insulation

- Shall be flexible fiberglass duct wrap insulation conforming to FS HH-I-558, Form B, Type I, Class 6, with factory applied foil-scrim-kraft facing (vapor barrier) consisting of aluminum foil reinforced with fiberglass scrim laminated to UL rated kraft; Johns Mansville “Microlite” flexible glass fiber blanket or approved substitute.

Installation, Fabrication and Construction

General

- Protect insulating products from moisture and contaminants during storage and installation Replace damaged insulation shall have a durable finish suitable for painting for color coding, or other identification marking.

Pipe Insulation

- Install pipe insulation products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.
- Install insulation on mechanical systems subsequent to testing and acceptance of tests.
- Clean and dry mechanical surfaces prior to insulating. Butt insulation joints firmly together to ensure complete and tight fit over surfaces to be covered.
- Maintain integrity of vapor-barrier jackets on mechanical insulation, and protect to prevent puncture or other damage.
- Cover valves, fittings and similar items in each piping system with equivalent thickness and composition or efficiency of insulation as applied to adjoining pipe run. Install factory molded, precut or job fabricated units (at Installer's option) except where specific form or type is indicated.
- Extend mechanical insulation without interruption through walls, floors and similar piping penetrations, except where otherwise indicated.
- Install protective metal shields and insulated saddles wherever needed to prevent compression of insulation.
- On remodel/renovation projects, repair damaged sections of existing mechanical insulation, damaged during construction period. Use insulation of same thickness as existing insulation, install new jacket lapping and sealed over existing.

Fiberglass (External) Duct Wrap Insulation

- All duct systems shall meet or exceed the insulation requirements of the WSEC (Washington State Energy Code). Where insulation thickness specified is larger than those listed in the WSEC, the larger values shall be used. Insulate the following duct systems as follows:
  a. Supply Duct: All supply air ducts shall have (1) layer of duct wrap.
  b. Return Duct: All return air duct shall have (1) layer of duct wrap.

c. Mixed Duct: All mixed air duct shall have (1) layer of duct wrap.

d. Outside Air Duct: All outside air duct shall have (1) layer of duct wrap.

e. Transfer Duct: All transfer air ducts shall have (1) layer of duct wrap.

f. Exhaust Duct: Provide (1) layer of duct wrap from exterior louver, roof cap, etc., to a point 10'-0" into building or to backdraft damper, whichever distance is less. All other exhaust duct to be uninsulated.

g. Relief Duct: Provide (1) layer of duct wrap from exterior louver, roof cap, etc., to a point 10-0" into building or to backdraft damper, whichever distance is less. All other relief duct shall be uninsulated.

h. At Fire Dampers and Fire Smoke Dampers: No duct wrap shall be used at Fire / Fire Smoke Damper installations, so as to prevent any hindrance of Fire / Fire Smoke Damper operation.

END OF MECHANICAL INSULATION SECTION

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section defines the Basic Materials and Methods used in the installation of LonWorks Control products to provide the functions necessary for control of the mechanical systems on this project.

1. Provide a Facility Management and Control System incorporating LonWorks, Direct Digital Control, equipment monitoring, and control consisting of microprocessor based plant control processors interfacing directly with sensors, actuators, and environmental delivery systems (i.e. HVAC units); electric controls and mechanical devices for all items indicated on drawings described herein including dampers, valves, panels, sensing devices; a primary communications network to allow data exchange between microprocessor based devices.

2. The system will consist of a flat, open architecture that utilizes the LonTalk protocol as the common communication protocol between all controlled and controlling devices, and LNS architecture for the definition of the device database. No other device database structure will be permitted. When necessary or desired, LonTalk packets shall be encapsulated into TCP/IP messages to take advantage of existing infrastructure or to increase network bandwidth. Any such encapsulation of the LonTalk protocol into IP datagrams shall conform to existing LonMark guidelines for such encapsulation. Systems that utilize non standard routing methods or hierarchal systems consisting of master or global controllers that poll and/or control less intelligent unitary controllers on a secondary bus will not be considered.

3. The system network shall be an Echelon LON (Local Operating Network). All nodes shall communicate with each other over one or more channels utilizing one of the LonMark approved transceivers (Type 1 – FTT-10A, Type 2 – Twisted Pair, Type 3 – Power Line, Type 4 – Link Power, Type 5 – Radio Frequency). There will be no consideration given to any system that does not use LonWorks as the primary communications network. System controllers shall be capable of sharing standard network variable data with other LonWorks-based devices that utilize the same transceivers.

4. System controllers shall utilize either the Echelon's 3120 or 3150 Neuron microprocessor for network communications. “Hosted” controllers that utilize a 3rd party chip coprocessor for communications are not acceptable. Controllers shall be capable of accepting control programs downloaded over the LON.

5. The system installed shall be able to seamlessly connect devices other than HVAC throughout the building regardless of subsystem type, i.e. HVAC and lighting shall coexist on the same network channel with out the need for gateways. These components shall share common software for network communications, configuration, time scheduling, alarm handling, history logging, custom programming and monitoring.

6. Gateways shall not be used unless authorized in writing by the project engineer. Use of a gateway requires submittal of the documentation as required by the owner or owner's representative. It is the intent of this specification that gateways be limited to integrating

legacy systems where applicable. Acceptance of gateways is at the sole written discretion of the owner and/or owner's representative.

7. System Monitoring and Supervisory Control shall be provided through the installation of a GUI (Graphical User Interface) software application that supports a direct driver to the LonWorks LNS database and is fully compliant and compatible with the Lonmaker Network Editor that is used on campus. The GUI workstation shall provide complete access to any point in the system at any time. The GUI shall be able to directly support LNS based discreet controller “plug-in” configuration modules as supplied by the device manufacturers. Remote Operator interfaces and configuration tools shall be supported in a client-server fashion.

8. The control system shall be able to accommodate multiple user operation. Access to the control system data should be limited only by operator password. Multiple users shall have access to all valid system data. All operator functions shall be recorded by an audit trait resident on the GUI platform.

9. The control system shall be designed such that mechanical equipment will be able to operate under stand-alone control. In general, the operation of any controllers on the network shall not rely on any other controller for its functional operation. System controllers that require a master computer will not be considered. Function specific modules may be used to supplement the functionality resident in each controller. As such, in the event of a network communication failure or the loss of any other controller on the LON, the control system shall continue to independently operate under local control of the resident program stored in nonvolatile memory as detailed herein. In such a case, each individual controller shall continue to perform basic functions until a network connection can be restored.

10. The documentation contained in this section and other contract documents pertaining to HVAC Controls is schematic in nature. The Contractor shall provide hardware and software necessary to implement the functions shown or as implied in the contract documents.

11. System configuration and monitoring shall be performed via a PC-type computer. Under no circumstances shall the PC be used as a control device for the network. It can be used for storage of data.

12. LonWorks components not supplied by the primary manufacturer shall be integrated to share common software for network communications, time scheduling, alarm handling, and history logging.

13. All system controllers shall utilize a peer-to-peer communications scheme to communicate with each other and with the PC-type monitoring computer(s).

14. Controllers shall contain non-volatile memory for storage of control programs, configuration, time schedules, and historical log data. All such data shall be retained in the event of a power failure. System controllers shall have an onboard, battery-backed real-time clock to ensure correct time-of-day operation following a power failure. Terminal Device Control Units controllers (VAVs, Heat Pumps, etc) shall be peers on the network and be able to synchronize data from plant controllers upon network power up.

15. History data logging and alarm detection shall be attained from all LonWorks controllers in the network, including third party LonWorks devices from alternate manufacturers. This data shall be monitored in the user interface software.

16. Controllers shall use a software mechanism for network addressing and Identification. It shall not be necessary to set physical network address switches on each controller.

17. System shall utilize LonMark defined standard network and command protocol Types (implicit messaging) for all data including, but not limited to, physical input and output values, input

and output overrides, as well as general purpose input and output values used by the controller's control program. The utilization of explicit messaging or protocol converters shall not be acceptable unless approved in writing by the owner representative prior to bid.

18. Individual products shall conform whenever possible to the LonMark Interoperability Standards. If products are not certified by the LonMark organization, product submittals must include the application source code, external interface file, resource files and complete documentation regarding all LonMark Objects, network variables and configuration properties supported by the device.

19. Products shall be provided with complete documentation. This shall include diagrams of all LONMARK objects supported by the product as well as relevant technical specifications. Undocumented products must be tagged and accepted by the Architect or Engineer prior to installation. Do not install undocumented products without such acceptance.

1.2 SUMMARY OF WORK

A. Provide LonWorks based products that communicate on multiple channels to meet the functional specifications as indicated on the Drawings and the dedicated product functional specifications and profiles specified in other sections.

B. Provide LonTalk routers as required to combine different communication channels onto a central field bus or as required to segment groups of Intelligent Devices and/or Control Units. Equip each router with a network transceiver on each network port (inbound and outbound) as dictated by the network type (Type 1 - FTT, Type 2 - TP, Type 3 - PL, Type 4 - LP, Type 5 RF, and Ethernet).

C. The BAS Contractor shall utilize Performance Calculations to simulate all network traffic in advance to minimize field troubleshooting prior to installation of network control devices. Additional routers and/or repeaters shall be installed by contractor to maintain acceptable network traffic.

D. The BAS Contractor shall utilize a LonWorks protocol analyzer tool to monitor network traffic on all installed control channels for a minimum of 24 hours per channel after final installation. The BAS contractor shall reconfigure nodes and/or install additional routers as necessary to maintain traffic to less than 50% of channel bandwidth capacity.

E. Provide Intelligent Devices (ID's), Programmable Control Units (PCU's), and Terminal Device Control Units (TDCU's) as herein specified, as needed to perform functions indicated in the input output summaries and sequences of operation, and/or indicated on the HVAC drawings.

F. Provide wire, raceway systems, 24 DC and/or 24 AC power supplies and final connections Ito nodes provided by this contract and the following Control Units to meet or exceed all pertinent and applicable codes.

G. The BAS Contractor shall provide all controls, sequences of operation, and systems monitoring as required by these specifications and by the drawings. Provide all required devices, sensors, hardware, software, wiring, controllers, etc.

1.3 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION.

A. Control Valves

B. Sensor Wells

1.4 QUALITY ASSURANCE

A. General: The HVAC Control System shall be furnished, engineered, and installed by Licensed Trade Technicians. The BAS contractor shall be an Echelon Certified Network Integrator or LonWorks Integrator. The contractor shall employ technicians who have completed Echelon factory authorized training. The contractor shall employ Echelon factory trained technicians to provide instruction, routine maintenance, and emergency service within 24 hours upon receipt of request.

B. BAS Contractor Qualifications:

1. The BAS contractor must be regularly engaged in the service and installation of LonWorks based systems as specified herein, and must have been so for a minimum of three (3) years. In addition, the contractor shall employ and assign to this project system integrators that are regularly engaged in the service and installation of LonWorks based systems as specified herein, and must have been so for a minimum of three (3) years. Written proof of these qualifications must be provided prior to bid.

2. The BAS contractor shall be an authorized representative in good standing of the manufacturer of the proposed hardware and software components and must have been so for a minimum of three (3) years. In addition, the contractor shall employ and assign to this project system integrators that have experience with the proposed hardware and software components of at least three (3) years. Written proof of these qualifications must be provided prior to bid.

3. The BAS contractor shall have an office that is staffed with designers trained in integrating interoperable systems and technicians fully capable of providing LonWorks instruction and routine emergency maintenance service on all system components.

4. The BAS contractor shall have in house capabilities to provide control strategies for whole building control. This includes HVAC and lighting applications.

5. The BAS contractor shall have a service facility, staffed with qualified service personnel, capable of providing instructions and routine emergency maintenance service for networked control systems.

6. The BAS contractor shall Submit a list of no less than three (3) similar projects, which have LonWorks based Building Systems as specified herein installed by the system integrator These projects must be online and functional such that the Owners/Users representative can observe the system in full operation.

7. The BAS contractor must be a certified LonWorks Integrator, or submit resumes with the proposal indicating passing certificates for Echelon Corporation's approved interoperable, or proof of equivalent training. Such proof must include summary of coursework and indicate both written and laboratory requirements of alternate training.

C. Hardware and Software Component Manufacturer Qualifications

1. The manufacturer of the hardware and software components must be primarily engaged in the manufacture of LonWorks based systems as specified herein, and must have been so for a minimum of five (5) years.

2. The manufacturer of the hardware and software components as well as its subsidiaries must be a member in good standing of the Echelon Open Systems Alliance.

3. The manufacturer of the hardware and software components shall have an authorized representative capable of providing service and support as referenced in section B above, and must have done so for a minimum of three years.

4. The manufacturer of the hardware and software components shall have a technical support group accessible via a toll free number that is staffed with qualified personnel, capable of providing instruction and technical support service for networked control systems.

5. The manufacturer of the hardware and software components must be authorized to certify LonWorks Integrators as defined by Echelon Corporation. They also must provide for Echelon Corporation's approved LonWorks curriculum.

6. The manufacturer of the hardware and software components must have no less than three (3) similar projects, which have LonWorks based building systems as specified herein installed by the authorized representative referenced above. The projects must be on-line and functional such the Owners/Users representative can observe the system in full operation.

D. Manufacturers listed below are acceptable providers of hardware or software as listed solely if full compliance with the specifications is demonstrated to the satisfaction of the project engineer. Only products demonstrating full compliance with the specifications will be accepted whether or not the manufacturer's name appears below:

1. Field Level Controllers Manufacturers:
   a. Invensys
   b. Honeywell
   c. TAC
   d. Johnson Controls
   e. Staefa
   f. Trane
   g. Siemens
   h. Circon

2. Operator Workstation/GUI software providers:
   a. Plexus Technology
   b. Circon
   c. TAC Vista
   d. OSS 2000

3. Network Editing and commissioning software:
   a. Lonmaker ONLY

E. Reference Standards

1. Control system components shall be new and in conformance with the following applicable standards for products specified:
   a. ANSI\EIA 709.1 (LonTalk Protocol)
   b. LonMark Certified (Version 3.1 Guidelines)
   c. UL 916 (Energy Management Equipment)

F. Products

1. Utilize standard components for all assemblies. Custom hardware, operating system, and utility software are not acceptable.

2. All products (PCU's, TDCU's and ID's) shall contain LonWorks networking elements to allow ease of integration of devices from multiple vendors.

3. All materials, equipment and software shall be standard components, regularly manufactured for this and other systems and custom designed for this project. All systems and components shall be thoroughly tested.

1.5 SUBMITTALS

A. General: Submit the following according to conditions of Contract and Division 15 Specification sections. In addition, provide the following:

1. Product data on all components used to meet the requirements of the specifications such as enclosures, network transceivers, XIF documentation, configuration parameter options, mounting details, power supplies, etc.

2. Provide the LonMark Profile version number the devices comply with.

3. Software documentation regarding the proposed PC operating system third party utilities and application programs, and the proposed application program for the Control Units.

4. Logical and physical diagrams for each channel indicating each node (control devices and ID's), node address (domain, subnet and group), channel type and router specifications.

5. Submit functional temperature control diagrams for each.

6. Mechanical system served by the HVAC Control System. Indicate and Tag each input/output served by each Control Unit or Intelligent Device.

7. Submit 8 sets of submittals for review within 3 weeks of contract award.

B. Shop Drawings

1. The controls contractor shall submit AutoCAD or Visio generated schematic drawings for the entire control system for review and approval before work shall begin. Included in the submittal drawings shall be a one-page diagram depicting the complete system architecture complete with a communications riser. Drawings shall include point-to-point wiring diagrams and must show all temperature controls, start- stop arrangement for each piece of equipment, equipment interlocks, wiring terminal numbers and any special connection information required for properly controlling the mechanical equipment. The submittal shall include a bill of material reference list as well as equipment sequences of operation.

2. The submittals shall include manufacturer's catalog data describing each item of control equipment or component provided and installed for the project.

3. System Color Graphics using the AutoCAD or Visio generated schematic drawings. Dynamic points, menus Icons, commandable points, etc. should be clearly identified.

4. Color conventions proposed for all graphics.

C. Close-Out Documents: Submit in accordance with requirements of Section 01780. Include final copies of shop drawings outlined in paragraph B above, reflecting all field modifications and change orders required to complete the installation.

1.6 OPERATION AND MAINTENANCE MANUALS

A. Submit in accordance with Section 01780.

B. Include the following documentation:

1. Network Management Software User Manual specific to each tool package provided.

2. Maintenance Instructions: Document all maintenance and repair/ replacement procedures. Provide ordering number for each system component, and source of supply. Provide a list of recommended spare parts needed to minimize downtime.

3. Documentation of network variables, network node configurations, priority interrupts, node binding, addressing structure, etc.

1.7 INSTRUCTION OF OWNER OPERATING PERSONNEL

A. All training shall be by the HVAC Controls Contractor and shall utilize specified manuals, as-built documentation, and the on-line help utility.

B. Operator training shall include 2 initial eight-hour sessions or, if the owner desires this time may be allotted differently. The initial operator training program shall be to establish a basic understanding of Windows based software, functions, commands, mouse, etc. The training shall encompass as a minimum:

1. Troubleshooting of input devices, i.e., bad sensors.

2. Sequence of operation review.

3. Sign on - sign off.

4. Selection of all displays and reports.

5. Commanding of points, keyboard and mouse mode.

6. Modifying English text.

7. Use of all dialogue boxes and menus.

8. System initialization.

9. GUI Software.

10. Lonmaker Network Management Software.

C. Conform to all additional requirements of Section 01770.

1.8 ACCEPTANCE PROCEDURE

A. Upon completion of the installation, Contractor shall start-up the system and perform all necessary calibration and testing to ensure proper operation of the project control systems.

B. Schedule a hardware demonstration and system acceptance test in the presence of the Contracting Officer and/or the Engineer. The acceptance testing is defined as demonstrating the sequence of operation as indicated in the drawings. The hardware demonstration is specified in this Section. The Contractor shall perform all tests prior to scheduling the acceptance test and hardware demonstration to insure the overall system is ready for inspection and observations.

C. When the system performance is deemed satisfactory in whole or in part by these observers, the system parts will be accepted for beneficial use and be deemed substantially complete as defined in Division 1.

1.9 WARRANTY

A. The HVAC Control System shall be free from defects in workmanship and material under normal use and service. If within eighteen (18) months from the date of substantial completion, the installed equipment is found to be defective in operation, workmanship or materials, the building systems contractor shall replace, repair or adjust the defect at no cost. Service shall be provided within 4 hours upon notice from Owner's designated Representative.

B. The warranty shall extend to material that is supplied and installed by the Contractor. Material supplied but not installed by the Contractor shall be covered per the above to the extent of the product only. Installation labor shall be the responsibility of the trade contractor performing the installation.

C. All corrective software modifications made during warranty service periods shall be updated on all user documentation and on user and manufacturer archived software disks.

1.10 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Do not install electronic hardware in the project until non-condensing environmental conditions have been established. Products installed in violation of this request will be replaced at no additional cost to the project.

B. Coordinate storage requirements for factory mounted terminal control units on air terminal devices, air handling units or other packaged control equipment. Do not store control units on site in non-conditioned areas.

C. Factory-Mounted Components: Where control devices specified in this section are indicated to be factory mounted on equipment, arrange for shipping control devices to unit manufacturer.

PART 2 - PRODUCTS

2.1 CENTRAL OPERATOR'S WORKSTATION

A. General Requirements:

1. A personal computer (PC) based workstation, with capabilities as follows:

A. Pentium 4 processor, 2.8 Gigahertz minimum processor speed

B. Minimum 512 MB of PC2700 DDR RAM

C. 1.2 MB floppy diskette drive

D. Minimum 120 Gigabyte Hard drive suitable for all peripherals and applications

E. Minimum 40X12X40 CD-RW drive

F. 3 button PS\2 or USB mouse

G. 101 + keyboard

H. 19-inch color Flat Screen monitor

I. Internal Iomega ZIP 250 drive

J. 56 KB Internal or external modem

K. 100baseT Ethernet adapter

2. The System shall support multiple Operator Workstations.

3. The Workstation shall not function as a dedicated control device to the network. It shall be connected to the LonWorks network via standard LonWorks network connection devices.

B. Operator Interface Software

1. The Interface software shall utilize Microsoft Windows XP or Microsoft Windows 2000 based operating and utility software.

2. The graphical user interface software shall be as outlined in "User Interface Software" below.

3. The Interface Software will not act as a control component for the network. In particular, it shall not perform the following functions:

   a. HVAC Global Sequence of Operation.
   b. Time of day synchronization for the network as desired by system operator

2.2 PROGRAMMABLE CONTROL UNIT (PCU)

a. General Requirements

1. Control Units shall be equipped with Echelon's 3120 or 3150 Neuron microprocessor for communications. There shall be no intermediate device between the Neuron chip and the input and output channels. As referenced above, “Hosted” controllers that utilize a 3rd party chip for communications processing are not acceptable. The controller shall have a minimum of 32K programmable non-volatile (flash or EEPROM) memory for general data processing, power supply, input/output modules, termination blocks, and network transceivers.

2. System controllers shall share network variable data with other LonWorks based devices across multiple channels.

3. Operating system software, custom operating sequence software and application programs shall be stored in programmable, non-volatile memory.

4. The PCU unit shall be equipped with a dedicated software clock battery. The battery shall be capable of maintaining time of day, day of week, date, month, and year, independent of system power for a 2-week period. Include an integral calendar with automatic leap year compensation. The PCU will provide time synchronization with TDCU's when required.

5. PCU packaging shall be such that complete installation and checkout of field wiring can be performed prior to the installation of electronic boards. Make all board terminations facilitate troubleshooting, repair and replacement. The complete PCU including accessory devices such as relay, transducers, power supplies, etc., shall be wired and housed in an enclosure or as required by the location and local code requirements.

6. Provide PCU boards with one (1) port to provide an optional LonWorks communication link

7. Equip PCU's with diagnostic indicators for the following:

   a. Transmit.
   b. Receive.
   c. IMOK - Application Program is running correctly

B. Input/Output Requirements:

1. The PCU shall contain Inputs of the Universal type capable of handling current, voltage, resistance, or open and closed contacts in any mix. Analog current and voltage inputs of the following types shall be supported in the PCU.

   a. 4-20 Ma.
   b. 0-1 volt.

c. 0-5 volt.
d. 0-10 volt.
e. 2-10 volt.
f. 1000 ohm RTD or 10K ohm thermistor

2. Provide programmable intermediate ranges and linearization table for sensor types specified under the heading, "Sensors". Standard linearization tables will be available for common sensors.

3. Thermistor type temperature sensors shall require programmable calibration constant unique to a specific resistance group.

4. Digital input types supported by the CU:

   a. Normally open contacts. (24V and 120V)
   b. Normally closed contacts. (24V and 120V)

C. The PCU shall accommodate both digital and true analog outputs. Voltage (0-10V) and current (4-20 mA) outputs shall be accommodated. All analog outputs shall be proportional current or voltage type with a minimum incremental resolution of 0.5% of the full operating range of the output. Match the proportional range of the output to the full operating range of the actuating device. Use zero and maximum output voltage or current values for shutdown and close-off modes. For troubleshooting and load analysis, the value of each analog output shall be available in the database for trending and display.

D. The analog/digital resolution process shall be 12 bit based. The digital to analog resolution process shall be a minimum of 12 bits.

E. PCU Software

1. General: A PCU shall operate totally standalone and independent of a central computer or master device. Software shall include a complete operating system (O.S.), communications handler, point processing, standard control algorithms, and specific control sequences.

2. O.S. software shall reside in programmable battery backed RAM, operate in real- time, provide prioritized task scheduling, control time programs, and scan inputs and outputs. O.S. shall also contain built in diagnostics.

3. Input/Output Point Processing Software shall include:

   a. Continuous update of input and output values and conditions. All connected points are to be updated at a minimum of one-second intervals.

   b. Assignment of proper engineering units and status condition identifiers to all analog and digital input and outputs.

   c. Analog input alarm comparison with the ability to assign two individual sets of high and low limits (warning and actual alarm) to an input or to assign a set of floating limits (alarm follows a reset schedule or control point) to the input. Each alarm shall be assigned a unique differential to prevent a point from oscillating into and out of alarm. Alarm comparisons shall be made each scan cycle.

4. Command Software

   a. A "fixed mode" option shall be supported to allow inputs to, and outputs from DDC control programs to set to a fixed state or value. When in the "fixed mode" inputs and output shall be assigned a high residual command priority to prevent override by application programs.

5. Run Time Totalization or Point Trending:

   a. It shall be possible to totalize run time (either on time or off time) for up to 40,000 hours with one-minute resolution. Run time counts shall be resident in non-volatile memory and have CU resident run time limits assignable through the operator's terminal.

   b. Totalized run time or trended data shall be batch downloaded to the Workstation on a daily or weekly basis. Trended data shall reside on the User Interface database server. The automatic update of this data shall be determined by the User Interface and facility management application requirements.

6. Transition Counting: A transition counter shall be provided to accumulate the number of times a device has been cycled on or off. Counter is to be non-volatile and capable of accumulating 40,000 switching cycles. Limits shall be assignable to counts to provide maintenance alarm printouts.

7. Custom DDC Control Loops

   a. Custom DDC programs are to be provided to meet the control strategies as called for in the sequence of operation sections of these specifications. Each CU shall have residential in its memory and available to the programs a full library of DDC algorithms, intrinsic control operators, arithmetic, logic and relational operators for implementation of control sequences:

      1) Proportional Control, Proportional plus Integral (PI), and Proportional plus Integral plus Derivative (PID).

      2) DDC control programs shall include an assignment of initialization values to all outputs to assure that controlled devices assume a fail- safe position on initial system start-up.

2.3 TERMINAL DEVICE CONTROL UNIT (TDCU)

A. General Requirements:

1. Control Units shall be equipped with a 3120 or 3150 Neuron microprocessor controller, programmable non-volatile memory for general data processing, power supply, input/output modules, termination blocks, and network transceivers.

2. System controllers shall be capable of sharing network variable data with other Lon-based devices that utilize the same transceivers.

3. Operating system software, custom operating sequence software and application programs shall be stored in programmable, non-volatile memory.

4. The TDCU shall synchronize values with PCU on the network upon power up of the network.

5. DCU packaging shall be such that complete installation and check-out of field wiring can be performed prior to the installation of electronic boards. Make all board terminations facilitate troubleshooting, repair and replacement. The complete CU including accessory devices such as relay, transducers, power supplies, etc., shall wired and housed in an enclosure or as required by the location and local code requirements.

B. Input/Output Requirements

1. The TDCU Inputs shall have inputs of the Universal type capable of handling current, voltage, resistance, or open and closed contacts in any mix. The TDCU shall support analog current and voltage inputs as is appropriate for the application.

2. As is appropriate for the applications, the Digital input types supported by the TDCU are:
   a. Normally open contacts.
   b. Normally closed contacts.
   c. Voltage/no-voltage.

3. The TDCU shall accommodate both digital and analog outputs when appropriate for the application. Voltage (0-10V) and current (4-20 mA) outputs shall be accommodated. All analog outputs shall be proportional current or voltage type with a minimum incremental resolution of 0.5% of the full operating range of the output. Match the proportional range of the output to the full operating range of the actuating device. Use zero and maximum output voltage or current values for shut- down and close-off modes. For troubleshooting and load analysis, the value of each analog output shall be available in the database for trending and display.

4. Digital outputs shall be capable of handling maintained as well as pulsed outputs for momentary or magnetic latching circuits. It shall be possible to configure outputs for 3-mode control (fast-slow-off) and 2-mode control.

5. The analog/digital resolution process shall be 10 bit based. The digital to analog resolution process shall be a minimum of 8 bit.

C. TDCU Software

1. General: A TDCU shall operate totally standalone and independent of a central computer for all specified control applications. Software shall include a complete operating system (O.S.), communications handler, point processing, standard control algorithms, and specific control sequences.

2. O.S. software shall reside in programmable flash memory, operate in real-time, provide prioritized task scheduling, control time programs and scan inputs and outputs. O.S. shall also contain built in diagnostics.

3. TDCU’s shall have canned programs to minimize configuration and installation time. Canned programs shall be able to be changed so the same hardware component can be utilized in the event the mechanical equipment is removed, and new mechanical equipment has been added. TDCU's shall also be available in a programmable version for unique equipment sequences of operation.

4. Input/Output Point Processing Software shall include:
   a. Continuous update of input and output values and conditions. All connected points are to be updated at a minimum of one-second intervals.
   b. Assignment of proper engineering units and status condition identifiers to all analog and digital input and outputs.
   c. Analog input alarm comparison with the ability to assign two individual sets of high and low limits (warning and actual alarm) to an input or to assign a set of floating limits (alarm follows a reset schedule or control point) to the input. Each alarm shall be assigned a unique differential to prevent a point from oscillating into and out of alarm. Alarm comparisons shall be made each scan cycle.

5. Command Software
   a. A "fixed mode" option shall be supported to allow inputs to, and outputs from DDC control programs to set to a fixed state or value. When in the "fixed mode" inputs and output shall be assigned a high residual command priority to prevent override by application programs.

2.4 LON ROUTERS, BRIDGES, REPEATERS AND TRANSCEIVERS

A. Routers, Bridges and Repeaters

1. Equip each router and bridge with a network transceiver on each network port (inbound and outbound) as dictated by the network type (Type 1 - FTT, Type 2 - TP, Type 3 - PL, Type 4 - LP, Type 5 - RF).

2. The network router shall be designed to route messages from a segment, sub-net, or domain in full duplex communication mode.

3. Routers and bridges shall utilize LonTalk protocol transport, network, and session layers to transparently route messages bound for a node address in another subnet or domain.

4. Routers, bridges and repeaters shall be fully programmable and permit a systems integrator to define message traffic, destination, and other network management functions utilizing LonWorks

5. The routers, bridges, and repeaters shall be capable of DIN rail or panel mounting and be equipped with status LED lights for Network traffic and power. All equipment shall be rack mounted.

B. Transceivers.

1. Type 1 Network Transceiver, Free Topology, and Twisted Pair: Provide a transformer isolated, twisted pair transceiver capable of mounting directly on a printed circuit board. The transceiver shall meet the following specifications:

   a. Meets LonMark Interoperability Association Standards.
   b. Differential Manchester encoded signaling for polarity insensitive network wiring.
   c. Transformer isolated for common mode rejection.
   d. 78kbs network bit rate up to distances of 2000m.

2.5 ELECTRONIC INPUT/OUTPUT DEVICES

A. Temperature Sensors and Transmitters

1. General Sensor & Transmitter Requirements

   a. Provide sensors and transmitters required as outlined in the input/output summary and sequence of operation, and as required to achieve the specified accuracy as specified herein.

   b. Temperature transmitters shall be equipped with individual zero and span adjustments. The zero and span adjustments shall be non-interactive to permit calibration without iterative operations. Provide a loop test signal to aid in sensor calibration.

   c. Temperature transmitters shall be sized and constructed to be compatible with the medium to be monitored. Transmitters shall be equipped with a linearization circuit to compensate for non-linearities of the sensor and bridge and provide a true linear output signal.

   d. Temperature sensors shall be of the resistance type and shall be either three- wire 100 ohm platinum RTD, or two-wire 1000 ohm platinum RTD.

   e. Thermistors are acceptable provided the mathematical relationship of a thermistor with respect to resistance and temperature with the thermistor fitting constraints is contained with the CU operating software and the listed accuracy's can be obtained. Thermistors

shall be certified to be stable +\- 0.24°F. over 5 years and 0.36°F accurate and free from drift for 5 years.

f. CU operating software shall be equipped with a self-calibrating feature for temperature sensors.

g. The following accuracies are required and include errors associated with the sensor, lead wire and analog to digital conversion.

B. Point Type Accuracy

1. Outside Air 0.5°F.

2. Chilled Water 0.5°F.

3. Room Temperature 1.00°F.

4. Hot Water/Steam 0.75°F.

5. Duct Temperature 0.5°F.

6. Sensors Used in Energy

7. Water (BTU) or Process

8. Calculations 0.1 °F

C. Sensors used in BTU or process calculations shall be accurate to +\-. 1 0°F. over the process temperature range. Submit a manufacturer's calibration report indicating that the calibration certification is traceable to the National Bureau of Standards (NBS) Calibration Report Nos. 209527/222173.

D. Thermowells

1. When thermowells are required, the sensor and well shall be supplied as a complete assembly including well head and greenfield fitting.

2. Thermowells shall be pressure rated and constructed in accordance with the system working pressure

3. Thermowells and sensors shall be mounted in a threadolet or 1/2″ NPT saddle and allow easy access to the sensor for repair or replacement.

4. Thermowells shall be constructed of the following materials:

   a. Chilled and Hot Water; brass.
   b. Steam; 316 stainless steel.
   c. Brine (salt solutions): marine grade stainless steel.

5. Outside Air Sensors

   a. Outside air sensors shall be designed to withstand the environmental conditions to which they will be exposed. They shall also be provided with a solar shield.

   b. Sensors exposed to wind velocity pressures shall be shielded by a perforated plate surrounding the sensor element.

c. Temperature transmitters shall be of NEMA 3R construction and rated for ambient temperatures.

6. Duct Type Sensors
   a. Duct mount sensors shall mount in a hand box through a hole in the duct and be positioned so as to be easily accessible for repair or replacement. A neoprene grommet (sealtite fitting and mounting plate) shall be used on the sensor assembly to prevent air leaks.
   b. Duct sensors shall be insertion type and constructed as a complete assembly including lock nut and mounting plate. Duct sensors probe shall be constructed of 304 stainless steel.
   c. For outdoor air duct applications, use a weatherproof mounting box with weatherproof cover and gasket.

7. Averaging Duct Type Sensors
   a. For ductwork greater any dimension than 48 inches and/or where air temperature stratification exists, utilize an averaging sensor with multiple sensing points. The averaging sensor shall be a 304 stainless steel tube with holes extending across the duct or plenum to be sampled. A bleed hole outside the duct or plenum causes air to enter the sample tube and exit at the bleed hole, thus bathing the sensor in average air. The averaging sensor shall be installed complete with end cap, compression fittings, gaskets, mounting flange and required accessories.
   b. Provide capillary supports at the sides of the duct to support the sensing string.

8. Room temperature sensors
   a. Sensor only
      1) Acceptable manufacturers: BAPI, MAMAC, ACI, Johnson Controls, TAC, Honeywell, Invensys, Staefa, Trane, Siemens, CSI
      2) Approved equal
   b. Sensor with override
      1) Acceptable manufacturers: BAPI, MAMAC, ACI, Johnson Controls, TAC, Honeywell, Invensys, Staefa, Trane, Siemens, CSI
      2) Approved equal
   c. Sensor with setpoint adjust
      1) Acceptable manufacturers: BAPI, ACI, Johnson Controls, TAC, Honeywell, Invensys, Staefa, Trane, Siemens, CSI
      2) Approved equal

E. Relative Humidity Sensors/Transmitter

1. The sensor shall be a solid state, resistance type relative humidity sensor of the Bulk Polymer Design. The sensor element shall be washable and shall resist surface contaminations.

2. Humidity transmitter shall be equipped with non-interactive span and zero adjustments, a 2 wire isolated loop powered, 4-20ma, 0-10 vdc linear proportional output.

3. The humidity transmitter shall meet the following overall accuracy including lead loss and A to D conversion.
   a. Room Type Sensor +\- 3% RH

4. Provide a single point humidity calibrator, if required, for field calibration. Transmitters shall be shipped factory pre-calibrated.

5. Acceptable Manufacturers:
   a. BAPI
   b. MAMAC
   c. ACI
   d. VERIS
   e. HYCAL
   f. Approved equal

F. Differential Pressure Transmitters and Accessories

1. General Air and Water Pressure Transmitter Requirements:
   a. Pressure transmitters shall be constructed to withstand 100% pressure over-range without damage and to hold calibrated accuracy when subject to a momentary 40% over-range input.
   b. Pressure transmitters shall provide the option to transmit a 0 to 5V dc, 0 to 10V dc, or 4 to 20 mA output signal.
   c. Differential pressure transmitters used for flow measurement shall be sized to the flow-sensing device and shall be supplied with shutoff and bleed valves in the high and low sensing pick-up lines (3 valve manifolds).
   d. Provide a minimum of a NEMA 1 housing for the transmitter. Locate transmitters in accessible local control panels wherever possible.
   e. Low air pressure, differential pressure transmitters used for room filter monitoring. Shall be equipped with a LED display indicating the transmitter output signal.

2. Low Air Pressure Applications (0 to 0.5" WC)
   a. The pressure transmitter shall be capable of transmitting a linear electronic signal proportional to the differential of the room and reference static pressure input signals with the following minimum performance specifications.
      1) Span: Not greater than two times the design space DP.
      2) Accuracy: Plus or minus 0.5% of F.S.
      3) Dead Band: Less than 0.3% of output.
      4) Repeatability: Within 0.2% of output.
      5) Linearity: Plus or minus 0.2% of span.
      6) Response: Less than one second for full span input.
      7) Temperature Stability: Less than 0.01% output shift per degree °F change.
   b. The transmitter shall utilize variable capacitance sensor technology and be immune to shock and vibration.
   c. Provide a two-year warranty for each transmitter. Replace all transmitters found to be defective at no cost to the Owner during the warranty period. Acceptable Manufacturers:
      1) VERIS - Model PXL100
      2) MAMAC appropriate
      3) Or Preapproved equal

G. low, Pressure, and Electrical Measuring Apparatus

1. Traverse Probe Air Flow Measuring Stations: Traverse probes shall be a dual manifold, cylindrical, type constructed of 3003 extruded aluminum with an anodized finish to eliminate surface pitting and unnecessary air friction. The multiple total pressure manifold shall have

sensors located along the stagnation plane of the approaching air flow and without the physical presence of forward projecting sensors into the airstream. The static pressure manifold shall incorporate dual offset static tips on opposing sides of the averaging manifold so as to be insensitive to flow-angle variations of as much as +\- 20° in the approaching airstream.

2. The air flow traverse probe shall not induce a measurable pressure drop, nor shall the sound level within the duct be amplified by its singular or multiple presence in the airstream. Each airflow measuring probe shall contain multiple total and static pressure sensors placed at equal distances along the probe length. The number of sensors on each probe and the quantity of probes utilized at each installation shall comply with the ASHRAE Standards for duct traversing.

3. Traverse probes shall be accurate to +\- 25% of the measured airflow range down to 0.25" wc static pressure.

4. Each flow measuring station shall be complete with its own dedicated microprocessor with a 4-line, 80 character, Alpha Numeric display and full function key pad. The panel shall be fully programmable and display calculated CFM directly on a LED monitor on the panel face.

5. Each station shall log air flow rates in real time and download data to its control unit (CU).

6. Provide 24 volt 1 phase power to each flow measuring station.

7. Acceptable Manufacturers: Air Monitor, Brandt, Ebtron, Air Sentinel or approved equal.

H. Shielded Static Pressure Sensor

1. Provide for each zone where required a shielded static pressure sensor suitable for ceiling surface mounting, complete with multiple sensing ports, pressure impulse suppression chamber with minimum volume of 50 cubic inches, airflow shielding, and 3/8" compression takeoff fittings, all contained in a welded stainless steel casing, with polish finish on the exposed surfaces.

2. These probes shall be capable of sensing the static pressure in the proximity of the sensor to within 1 % of the actual pressure value while being subjected to a maximum airflow of 1000 FPM from a radial source.

3. The shielded static sensing devices shall be used for both reference and space pressure sensing.

4. Pressure sensors used for outside air pressure reference purposes shall be equipped with a conduit seal for pneumatic tubing and bushings for a weather tight installation.

I. Static Pressure Traverse Probe

1. Provide multipoint traverse probes in the duct at each point where static pressure sensing is required.

2. Each duct static traverse probe shall contain multiple static pressure sensors located along the exterior surface of the cylindrical probe. Pressure sensing points shall not protrude beyond the surface of the probe.

3. The duct static traverse probe shall be of 304 stainless steel construction and (except for 3/4" dia. probes with lengths of 24" or less) be complete with threaded end support rod, sealing washer and nut, and mounting plate with gasket and static pressure signal fitting. The static

traverse probe shall be capable of producing a steady, nonpulsating signal of standard static pressure without need for correction factors, with an instrument accuracy of 21.

J. Venturi Flowmeter

1. Pressure drop on venturi type flowmeters shall not exceed 0.25" wc. Each venturi low and high pressure taps shall be equipped with nipples, valves and quick disconnects.

2. Equip each venturi with a metal identification tag indicating the size, location, GPM and meter reading for the GPM specified.

3. Provide (1) 6" dial differential pressure meter of the proper range to determine piping system flow rate. The meter shall be the property of the Owner.

4. Venturi meters shall utilize flanged or screwed connections for removal purposes and shall be rated for the system operating pressures.

5. The venturi flowmeter shall be factory calibrated to provide a minimum of flow accuracy between actual and factory flow calibration data.

K. Current Transformers:

1. The current transformers shall be designed to be installed or removed without dismantling the primary bus or cables. The transformer shall be of a split core design.

2. The core and windings shall be completely encased in a UL approved thermoplastic rated 94 V A. No metal parts shall be exposed other than the terminals.

3. The current transformers shall meet the following specifications:

   a. Frequency Limits: 50 to 400 Hz.
   b. Insulation: 0.6 KV Class, 10 KV BIL.
   c. Accuracy +\- 1% at 5.0 to 25.0 VA accuracy class with U.P.F. burden.

L. Current Sensing Switches

1. Current sensing switch shall be self-powered with solid state circuitry and a dry contact output. Current sensing switches shall consist of a solid state current sensing circuit, adjustable trip point, solid state switch, SPOT relay and an LED indicating the on or off status. A conductor of the load shall be passed through the window of the device. It shall accept overcurrent up to twice its trip into range.

M. Electronic Valve & Damper Actuators

1. General Requirements:

   a. Electronic actuators shall be electric, direct-coupled type capable of being mounted over the shaft of the damper. They shall be UL listed and the manufacturer shall provide a 2-year unconditional warranty from the date of commissioning. Power consumption shall not exceed 8 watts or 15 VA of transformer sizing capacity per high torque actuator nor 2 watts or 4 VA for VAV actuators.

   b. Electronic overload protection shall protect actuator motor from damage. If damper jams actuator shall not burnout. Internal end switch type actuators are not acceptable. Actuators may be mechanically and electrically paralleled on the same shaft to multiply the available torque. A reversing switch shall be provided to change action from direct to reverse in relation to control signal as operation requires.

N. Valve Actuators:

1. Control Valves Actuators (3 inch and smaller)

   a. Actuators shall have a gear release button on all non-spring return models to allow manual setting. The actuator shall have either an insulating air gap between it and the linkage or a non-conducting thermoplastic linkage. Care shall be taken to maintain the actuator's operating temperatures and humidity within its specifications. Pipes shall be fully insulated and heat shields shall be installed if necessary. Condensation may not form on actuators and shall be prevented by a combination of insulation, air gap, or other thermal break.

   b. The control circuit shall be fully modulating using 2 - 10 volt or 4 - 20 mA signals. Accuracy and repeatability shall be within %1 of control signal. A 2 - 10 v or 4 - 20 mA signal shall be produced by the actuator which is directly proportional to the shaft clamp position which can be used to control actuators which are paralleled off a master motor or to provide a feedback signal to the automation system indicating valve position.

   c. Valve body and actuators shall be shipped fully assembled and tested at the valve factory prior to shipment.

   d. Acceptable Manufacturer: BELIMO

2. Control Valve Actuators (4 inch and larger).

   a. The valve actuator shall consist of a permanent split capacitor, reversible type electric motor that drives a compound epicycle gear. The electric actuator shall have visual mechanical position indication, readable from a distance of 25 feet, showing output shaft and valve position. Unit shall be mounting directly to the valves without brackets and adapters, or readily adapted to suit all other types quarter-turn valves.

   b. The actuator shall have an integral terminal strip, which, through conduit entries, will ensure simple wiring to power supplies. Cable entries shall have UL recommended gland stops within the NPT hole to prevent glands from being screwed in too far and damaging cable.

   c. The actuator shall be constructed to withstand high shock and vibrations without operations failure. The actuator cover shall have captive bolts to eliminate loss of bolts when removing the cover from the base. One copy of the wiring diagram shall be provided with the actuator.

   d. The actuator shall have a self-locking gear train, which is permanently lubricated, at the factory. The gearing shall be run on ball and needle bearings. Actuators with 600 in/lbs. or more output torque shall have two adjustable factory calibrated mechanical torque limit switches of the single- pole, double-throw type. The motor shall be fitted with thermal overload protection. Motor rotor shaft shall run in ball bearings at each end of motor.

   e. The actuator housing shall be hard anodized aluminum for full environmental protection.

   f. The environmental temperature range of the actuator shall be -30°C to +60°C (-20°F to +140°F).

   g. For intermittent on/off service, the actuator shall be rated at a 20% duty cycle (i.e., 12 minutes extended duty in every hour, or alternatively; one complete cycle every 2 minutes). For more frequent cycling and modulating service, an actuator shall be rated for continuous duty. The actuator rated for continuous duty shall be capable of operating 100% of the time at an ambient temperature of 40°C.

h. The actuator shall have an integral self-locking gear train. Motor brakes shall not be required to maintain desired valve position. Levers or latches shall not be required to engage or disengage the manual override. Mechanical travel stops, adjustable to 15° in each direction of 90° rotation shall be standard, as well as two adjustable travel limit switches with electrically isolated contacts. Additional adjustable switches shall be available as option.

i. Single Phase Motor: The motor shall have Class B insulation capable of withstanding locked-rotor for 25 seconds without overheating. Wiring shall also be Class B insulation. An auto-reset thermal cutout protector shall be embedded in the motor windings to limit heat rise to 80°C in a 40°C ambient. All motors shall be capable of being replaced by simply disconnecting the wires and then removing mounting bolts. Disassembly of gears shall not be required to remove the motor.

j. Materials of Construction: The electric actuator shall have a pressure die- cast, hard-anodized aluminum base and cover. The compound gear shall be made of die-cast, hard-anodized aluminum or steel. An alloy steel worm gear shall be provided for manual override and torque limiting. Bearings for gears shall be of the ball and needle type; bronze bearings shall be used on the shafting parts.

k. Acceptable Manufacturer: BELIMO ONLY

2.6 CONTROL VALVES

A. General Control Valve Requirements

1. All automatic control valves shall be linear, fully proportioning, with modulating ball, plug or V-port inner guides unless otherwise specified. The valves shall be quiet in operation. The main steam valves shall fail-safe in a normally closed position in the event of control air failure or loss of electronic output signal.

2. All valves shall be capable of operating in sequence when required by the sequence of operation. All control valves shall be sized by the control manufacturer, and shall be guaranteed to meet the heating and cooling loads as specified. All control valves shall be suitable for the pressure conditions, and shall close against the differential pressures involved. Valve body pressure rating and connection type (screwed or flanged) shall conform to ANSI pressure classifications appropriate for the system working pressures. Acceptable Manufacturers: BELIMO ONLY

B. Hot and Cold Water Control Valves

1. Hot and cold water globe type control valves shall be single-seated type, with equal percentage flow characteristics. The valve discs shall be composition type and shall be sized using ISA methods.

2. Pressure drop through the valves shall not exceed 5 psi unless otherwise indicated.

3. Ball valves shall be equipped with 316 stainless steel trim, Teflon seals and adjustable packing gland nuts. Provide a handle for manual operation during start-up and maintenance.

2.7 SWITCHES

A. Current Sensing Switches

1. Current sensing switch shall be self-powered with solid-state circuitry and a dry contact output. Current sensing switches shall consist of a solid state current sensing circuit, adjustable trip point, solid state switch, SPOT relay and an LED indicating the on or off status. A conductor of the load shall be passed through the window of the device. It shall accept over current up to twice its trip into range.

2.8 ELECTRICAL CONTROL POWER AND LOW VOLTAGE WIRING

A. Provide low voltage interlock wiring between supply and exhaust fans where indicated, electrical wiring for relays (including power feed) for temperature and pressure indication.

B. Provide power wiring, conduit and connections for low voltage devices provided under this specification, alarms, flow switches, actuating devices for temperature, humidity, pressure and flow indication, point resets controlled by this Section.

C. Provide all other low voltage wiring required for the complete operation of the specified systems.

D. Install all wiring raceway methods complying with the requirements of the National Electrical Code.

E. Conduit shall be utilized in all mechanical room, electrical rooms and any other location dictated by governing code.

F. Network Communication Requirements

1. Wired network communication shall be via channels consisting of either 16 or 22 AWG twisted pair Echelon approved cable, depending on cable length.
2. Communication wire runs shall not be installed closer than six feet from high power transformers or run parallel within six feet of electrical high power cables. Care shall be taken to route the cable as far from interference generating devices as possible. All cable runs shall be parallel or perpendicular to the buildings structural elements.
3. All wire shall be non-shielded.
4. There shall be no power wiring, in excess of 30 VAC rms, run in conduit with communications wiring. In cases where signal wiring is run in conduit with communication wiring, all communication wiring and signal wiring shall be run using separate twisted shielded pairs (22awg) with the shields grounded in accordance with the manufacturer's wiring practices.

G. Input/Output Control Wiring:

1. RTD wiring shall be two-wire or four-wire twisted, shielded, minimum number 18 gauge.
2. Other analog inputs shall be a minimum of number 18 gauge, twisted, (shielded optional and device dependant).
3. Binary control function wiring shall be a minimum of number 18 gauge.
4. Analog output control functions shall be a minimum of number 18 gauge, twisted, (shielded optional and device dependant).
5. Binary input wiring shall be a minimum of number 18 gauge.

H. Splices

1. Splices in shielded cables shall consist of terminations and the use of shielded cable couplers, which maintain the integrity of the shielding. Terminations shall be in accessible locations. Cables shall be harnessed with cable ties as specified herein.

I. Conduit and Fittings

1. Conduit for Control Wiring, Control Cable and Transmission Cable: Electrical metallic tubing (EMT) with compression fittings, cold rolled steel, zinc coated or zinc-coated rigid steel with threaded connections.

2. Outlet Boxes (Dry Location): Sheradized or galvanized drawn steel suited to each application, in general, four inches square or octagon with suitable raised cover.
3. Outlet Boxes (Exposed to Weather): Threaded hub cast aluminum or iron boxes with gasket device plate.
4. Pull and Junction Boxes: Size according to number, size, and position of entering raceway as required by National Electrical Codes. Enclosure type shall be suited to location.

J. Relays: Relays other than those associated with digital output cards shall be general purpose, enclosed plug-in type with 8-pin octal plug and protected by a heat and shock resistant duct cover. Number of contacts and operational function shall be as required.

K. Solid State Relays (SSR): Input/output isolation shall be greater than IOE 9 ohms with a breakdown voltage of 1500V root mean square or greater at 60 Hz. The contact life shall be 10 x 10 E6 operations or greater. The ambient temperature range of SSRs shall be -20 to + 140F. Input impedance shall not be less than 500 ohms. Relays shall be rated for the application. Operating and release time shall be for 100 milliseconds or less. Transient suppression shall be provided as an integral part of the relay.

L. Contactors: Contactors shall be of the single coil, electrically operated, and mechanically held type. Positive locking shall be obtained without the use of hooks, latches, or semi permanent magnets. Contactors shall be double-break-silver-to-silver type protected by arcing contacts. The number of contacts and rating shall be selected for the application. Operating and release times shall be 100 milliseconds or less. Contactors shall be equipped with coil transient suppression devices.

2.9 ENGINEER ALARM AND MESSAGE REPORTING SYSTEM

A. General: Provide auto dial modem and communications software to manage alarm and message reporting from the User Interface workstation to operating personnel. Alarms shall be annunciated audibly at the central workstation.

B. Auto-Dial Modem:

1. The auto-dial modem shall use analog phone lines and standard 56K baud phone line communications.
2. The auto-dial modem shall reside on the LonWorks Network.
3. The auto-dial modem shall place calls as follows:
   a. Retry same number a programmable number of times in fixed intervals.
   b. Retry successive numbers arranged in sequence by priority at fixed intervals a finite number of times.
4. The auto-dial modem software shall have password protection for User Interface security purposes.
5. The auto-dial modem shall have a minimum capacity of 8-14 digit phone numbers stored in memory. The auto-dialer shall retry a number a fixed number of times. If no connection is made in a specified number of retries, the number will be blacklisted and no longer contacted. Blacklisted numbers can be reset manually by the system operator, or the system can be programmed to allow a blacklisted number to be re-enlisted after a user-defined period of time.

C. Pager Messages:

1. The telephone numbers programmed into the communications software shall be defined as pager messages.
2. The pager shall indicate a site number and alarm type on numeric pagers.

2.10 BAS HARDWARE IDENTIFICATION

A. Automatic Control Valve Tags

1. For valves, etc., use metal tags with a 2-inch minimum diameter, fabricated of brass, stainless steel, phenolic or aluminum. Attach tags with chain of same materials. For lubrication instructions, use linen or heavy duty shipping tag.
2. Tag valves with identifying number and system. Number valves by floor level, column location and system served.
3. Prepare lists of all tagged valves showing location, floor level, and tag number, use. Prepare separate lists for each system. Include copies in each maintenance manual.

B. Wire Tags

1. All multi-conductor cables in all pull boxes and terminal strip cabinets shall be tagged.
2. Provide wire Tags as per Division 16.

C. Conduit Tags

1. Provide tagging or labeling of conduit so that it is always readily observable which conduit was installed or used in implementation of this Work.

D. Miscellaneous Equipment Identification

1. Screwed-on, engraved black lamicoid sheet with white lettering on all control panels and remote processing panels. Lettering sizes subject to approval.
2. Inscription, subject to review and acceptance, indicating equipment, system numbers, functions and switches. For panel interior wiring, input/output modules, local control panel device identification.

2.11 USER INTERFACE SOFTWARE

A. Basic Operators Workstation software:

1. The Operators Workstation shall be equipped with Windows XP or Windows 2000 as the user terminal operating software.
2. The Operators Workstation software is installed to provide basic operator interface (i.e., non-facility management/color graphics) shall use pull down menu navigation as the basis of program execution, operating feature penetration, and local or remote site access.
3. As a minimum, the operating software shall permit the operator to perform the following tasks with a minimum knowledge of the HVAC Control System provided and basic computing skills.
   a. View data (temperature, flowrate, etc.) on HVAC equipment, and/or lighting, card access, and intrusion detection equipment.
   b. Locate potentially faulty equipment through audible or visible alarms.
   c. Select points to be alarmable and define the alarm state.
   d. Select points to be trended over a period of time and initiate the recording of values automatically.

4. Manual Database Save and Restore. A system operator with the proper password clearance shall be able to archive the database from any system panel and store on magnetic media. The operator shall also be able to clear a panel database and manually initiate a download of a specified database to any panel in the system.
5. System Configuration. If required for the customer, the workstation software shall provide a method for advanced configuration of the system. This shall allow for future system changes or additions.
6. On-Line Help. Provide a context sensitive, on-line help system to assist the operator in operation and editing of the system. On-line help shall be available for all applications and shall provide the relevant data for that particular screen.
7. Security. Each operator shall be required to log on to the system with a user name and password in order to view, edit, add, or delete data. System security shall be selectable for each operator. The system supervisor shall have the ability to set passwords and security levels for all other operators. Each operator password shall be able to restrict the operator's access for viewing and/or changing each system application, full screen editor, and object.
8. System Diagnostics. The system shall automatically monitor the operation of network connections, building management panels, and controllers. The failure of any device shall be annunciated to the operator.
9. Alarm Processing. Any object in the system shall be configurable to alarm in and out of normal state. The operator shall be able to configure the alarm limits, warning limits, and reactions for each object in the system.

B. Alarm Reactions. The operator shall be able to determine what actions, if any, are to be taken, by object (or point), during an alarm. Actions shall include logging, providing audible annunciation or displaying specific system graphics. Each of these actions shall be configurable by workstation and time of day.

C. Binary Alarms shall be set to alarm based on the operator specified state.

D. Analog Alarms. Each analog object shall have both high and low alarm limits and warning limits. Alarming must be able to be automatically and manually disabled.

E. Trend Logs. The operator shall be able to define a custom trend log for any data in the system. This definition shall include interval. Trend intervals of 1, 5, 15, 30, and 60 minutes as well as once a shift (8 hours), once a day, once a week, and once a month shall be selectable. The system operator with proper password shall be able to determine how many samples are stored in each trend. Trend data shall be sampled and archived on the operator workstation hard disk. Trend data shall be able to be viewed and printed from the operator interface software. They shall also be storable in a tab delimited ASCII format for use by other industry standard word processing and spreadsheet packages. Trend information shall also be stored on the individual CU for transmitting to the workstation. Trends shall also be established for third party LonWorks devices.

F. Alarm and Event Log. The operator shall be able to view all logged system alarms and events from any location in the system. Events shall be listed chronologically. An operator with the proper security level may acknowledge and clear alarms. All that have not been cleared by the operator shall be archived to the hard drive on the workstation. The system shall be capable of establishing alarms for all LonWorks devices in the system. Alarms shall be able to be annunciated audibly at the workstation.

G. Object and Property Status and Control. Provide a method for the operator with proper password protection to view, and edit if applicable, the status of any object and property in the system. These statuses shall be available by menu, on graphics, or through custom programs.

H. Clock Synchronization. The real time clocks in the building panels and workstations shall be synchronized on command of an operator if desired: The system shall automatically adjust for daylight savings and standard time if applicable.

I. Applications Editors. Each Operator Workstation shall support full screen editing of all system applications via Lonmaker Network Editing software. Provide editors for each application at Control Unit(s). The applications shall be downloaded and executed at the appropriate Control Unit(s).

1. Controller. Provide a full screen editor for each type controller and application that shall allow the operator with proper password to view and change the configuration, name, control parameters, and system setpoints.

2. Scheduling. Provide the capability to schedule each LON object or group of objects in the system, regardless of the manufacturer. Each of these schedules shall include the capability for start, stop, optimal start, optimal stop, and night economizer actions. Each schedule shall consist of the following:

   a. Weekly Schedule. Provide separate schedules for each day of the week.

   b. Exception Schedules. Provide the ability for the operator to designate any day of the year as an exception schedule for holidays or other purposes. The system operator will be presented with a calendar screen that can be browsed at least two years ahead. Exception schedules shall be dragged onto the calendar from exception day type menus on the calendar. This exception schedule shall override the standard schedule for that day. Exception schedules may be defined up to one year in advance. Once an exception schedule is executed it will be discarded and replaced by the standard scheduled for that day of the week.

   c. Optimal Start/Stop. The scheduling application outlined above shall support an optimal start/stop algorithm. This shall calculate the thermal characteristics of a zone and start the equipment prior to occupancy to achieve the desired space temperature at the specified occupancy time. Provide the ability to modify the start/stop algorithm based on outdoor air temperature. Provide an early start limit in minutes to prevent the system from starting before an operator determined time limit.

3. Equipment Coordination. Provide means to allow equipment to be grouped for proper operation as specified in the sequence of operations. This shall include the coordination of airflow valves with their associated Air Handling Equipment.

J. Custom Application Programming Features.

1. Provide the tools to create, modify, and debug custom application programming. The operator shall be able to create, edit, and download custom programs at the same time that all other system applications are operating. The system shall be fully operable while custom routines are edited, compiled, and downloaded. The programming language shall have the following features:

2. The language shall be English language oriented and be based on the syntax of programming languages such as BASIC. It shall allow for free form or fill-in-the blank programming. Alternatively, the programming language can be graphically based using function blocks as long as blocks are available that directly provide the functions listed below, and that custom or compound function blocks can be created.

3. A full screen character editor/programming environment shall be provided. The editor shall be cursor/mouse-driven and allow the user to insert, add, modify, and delete code from the custom programming. It shall also incorporate word processing features such as cut-paste and find/replace.

4. The programming language shall allow independently executing program tasks to be developed

5. The editor/programming environment shall have a debugging/simulation capability that allows the user to step through the program and to observe any intermediate values and/or results. The debugger shall also provide error messages for syntax and execution errors.
6. The programming language shall support conditional statements (IF/THEN/ELSE/ELSE-IF) using compound Boolean (AND, OR and NOT) and/or relations (EQUAL, LESS THAN, GREATER THAN, NOT EQUAL) comparisons.
7. The programming language shall support floating-point arithmetic using the following operators: +, -, /, x, square root, and xy. The following mathematical functions shall also be provided: absolute value and minimum/maximum value from a list of values.
8. The programming language shall have pre-defined variables that represent clock time, day of the week, and date. Variables that provide interval timing shall also be available. The language shall allow for computations using these values.
9. The programming language shall have the ability to pre-defined variables representing the status and results of the System Software, and shall be able to enable, disable, and change the values of objects in the system.
10. On-Line Help. Provide a context sensitive, on-line help system to assist the operator in operation and editing of the system. On-line help shall be available for all applications and shall provide the relevant data for that particular screen.

K. Network Management

1. Provide network management software tool that will permit the individual network nodes to be configured. This tool shall manage a database, all system controllers by type and revision, and shall provide a software mechanism for identifying each controller on the network. This tool shall also be capable of defining network data controllers on the network.
2. The network configuration tool shall also be capable of performing the above stated functions for other 3rd party LonWorks devices that may be added to the network.
3. The Network configuration tool shall also provide diagnostics to identify system controllers on the network, to reset controllers, and to view health and status counters within controllers.
4. On-Line Help. Provide a context sensitive, on-line help system to assist the operator in operation and editing of the system. On-line help shall be available for all applications and shall provide the relevant data for that particular screen.

L. Graphical User Interface Software.

1. General: Provide a Windows XP or Windows 2000 based, object oriented, graphical user interface, which shall allow the generation of custom dynamic graphics for graphical representation of system design and system parameters. The graphics editor shall allow zones of the building, mechanical systems, floor plans, etc., to be custom generated for the project. The graphics editor shall allow for the direct support of configuration plug-ins.
2. Graphics Creation: The editing menu shall provide help menus for selecting graphics, choosing colors, copying previous graphics, deleting data points in the graphics. A set of standard HVAC graphics shall be provided to allow operators to select from the graphics library for graphic generation.
3. Display: Information on the color graphic display shall be dynamic and automatically updated.
4. Manual Control: A manual control option shall also be provided which allows the operator to turn points on or off, start or stop, set points to local mode or release points to automatic mode.
5. Graphic Size: The graphic definition mode of operation shall allow the creation of oversized graphics that are up to 3 video screens wide and 3 video screens high. The operator shall be able to pan and scroll around the oversized graphic to view areas of interest.

6. Object Oriented Graphics: Objects shall be provided to simplify operation and allow special functions to be performed. Custom or canned objects shall be able to modified using third party drawing tools. Objects shall be able to be rotated, scaled, filled, and moved based on a change in the process value.
7. Graphics Generation: Default system graphics shall be self-generating. A library of custom graphics shall be supplied for each control unit. In the case where a custom graphic is required (built up air handling units) the operator shall be able to specify a default graphic to a control device to generate a template so that it becomes self-generating. Graphic objects shall be able to be developed using any third party software package, such as AutoCAD, VISIO, Corel, or Designer.
8. Trending: The software shall allow analog, digital values and calculations to be graphically plotted in real-time or historical format. Refer to Database management for specific requirements on historical format requirements. The software shall able to generate trend information for LonWorks devices not provided by the primary supplier.
9. System Documentation: All system documentation, such as wiring diagrams, points lists, and sequences of operations shall be viewable on line through the graphics browser. Any file conforming to Microsoft Active Document shall -be viewable in this manner.
10. Alarms: Alarm directives shall be prominently annunciated and displayed at the operator wokstations. Alarms shall also be provided in a separate window for ease of interpretation. Indication of an alarm state on a monitored control point shall be by a change in color of the data display. An alarm history for each individual control device shall also be available.
11. Navigation: The system operator shall have the capability to navigate the graphics browser through designated buttons on the graphic (hyperlinks) or alternately in a tree view similar to that of Microsoft Windows Explorer. Site names, floor plans, zones, and individual devices shall be indicated in the tree view.
12. Scheduling: The system operator shall be able to use "drag and drop" functionality in a calendar style window to drag new exception events that will change the operation of the system for the specified day The operator shall be able to specify exception days at least 18 months in advance. The system shall also be able to provide scheduling for third party LonWorks devices not supplied by the primary manufacturer.
13. Network Diagnostics: The system operator shall be able to view and perform basic network diagnostics for each individual control device. This will allow the system user to verify faults or communications problems with the specified device.
14. Maintenance Notes: If required the system operator shall be able to type in comments regarding maintenance or other data for each individual controller.
15. On-Line Help. Provide a context sensitive, on-line help system to assist the operator in operation and editing of the system. On-line help shall be available for all applications and shall provide the relevant data for that particular screen.
16. Database Management: Trended data shall be capable of automatically being retrieved from control devices and stored on the hard drive as a data file retrievable from Excel for Windows. The spread sheet shall be configured to display the time, increment of the trended data, the engineering units, total over the listed time, average, minimum and maximum values over the listed time.

M. Remote Connectivity.

1. The system shall be able to connect to remote sites via standard telephone lines or Ethernet LAN.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that systems are ready to receive work.

B. Beginning of installation means installer accepts existing conditions.

C. The project plans shall be thoroughly examined for control device and equipment locations, and any discrepancies, conflicts, or omissions shall be reported to the Architect/Engineer for resolution before rough-in work is started.

D. The contractor shall inspect the site to verify that equipment is installable as shown, and any discrepancies, conflicts, or omissions shall be reported to the Architect/Engineer for resolution before rough-in work is started.

E. The BAS Contractor shall examine the drawings and specifications for other parts of the work, and if head room or space conditions appear inadequate or if any discrepancies occur between the plans and his work and the plans for the work of others, he shall report such discrepancies to the Architect/Engineer and shall obtain written instructions for any changes necessary to accommodate his work with the work of others.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Install all control components in accordance with manufacturer's instructions and recommendations.

B. If the controls contractor is responsible for providing the damper then provide mixing dampers of parallel blade construction arranged to mix streams. Provide separate minimum outside air damper section adjacent to variable outside air damper.

C. Mount control panels adjacent to associated equipment on vibration-free walls or freestanding angle iron supports. One cabinet may accommodate more than one system in same equipment room. Provide nameplates for instruments and controls inside cabinet and nameplates on cabinet face.

D. After completion of installation, test and adjust control equipment. Submit data showing setpoints and final adjustments of controls.

E. Install equipment, piping, wiring/conduit parallel to building lines (i.e., horizontal, vertical, and parallel to walls) wherever possible.

F. Provide sufficient slack and flexible connections to allow for vibration of piping and equipment.

G. Verify integrity of all wiring to ensure continuity and freedom from shorts and grounds.

H. All equipment, installation, and wiring shall comply with acceptable industry specifications and standards for performance, reliability, and compatibility and be executed in strict adherence to local codes and standard practices.

3.3 ELECTRICAL SYSTEM INSTALLATION

A. Comply with all Division 16 Installation Requirements.

B. Install low voltage power, LonWorks, and LAN communication trunks in conduit in the following locations regardless of local building code allowances otherwise.

1. Mechanical rooms.
2. Electrical rooms.
3. Vertical risers (exception: fire rated continuous closet such as a telephone closet).
4. Open Areas where the wiring will be exposed to view or tampering.

C. Conceal conduit within finished shafts, ceilings and wall as required. Install exposed conduit parallel or at right angles with the building walls.

D. Where Class 2 wires are in concealed and accessible locations including ceiling return air plenums, approved cables not in raceway may be used provided that:

1. Circuits meet NEC Class 2 (current-limited) requirements. (Low-voltage power circuits shall be sub-fused when required to meet Class 2 current-limit.)
2. All cables shall be UL listed for application, i.e., cables used in ceiling plenums shall be UL listed specifically for that purpose.

E. Do not install Class 2 wiring in conduit containing Class 1 wiring. Boxes and panels containing high voltage may not be used for low voltage wiring except for the purpose of interfacing the two (e.g., relays and transformers).

F. Where Class 2 wiring is run exposed, wiring to be run parallel along a surface or perpendicular to it, and NEATLY tied at 3m (10 ft.) intervals.

G. All wire-to-device connections shall be made at a terminal blocks or terminal strip. All wire-to-wire connections shall be at a terminal block, or with a crimped connector. All wiring within enclosures shall be neatly bundled and anchored to permit access and prevent restriction to devices and terminals.

H. Plug or cap all unused conduit openings and stub-ups. Do not use caulking compound.

I. Route all conduit to clear beams, plates, footings and structure members. Do not route conduit through column footings or grade beams.

J. Set conduits as follows:

1. Expanding silicone fire stop material sealed watertight where conduit is run between floors and through walls of fireproof shaft.
2. Oakum and lead, sealed watertight penetration through outside foundation walls.

K. Cap open ends of conduits until conductors are installed.

L. Where conduit is attached to vibrating or rotating equipment, flexible metal conduit with a minimum length of 18 inches and maximum length of 36 inches shall be installed and anchored in such a manner that vibration and equipment noise will not be transmitted to the rigid conduit.

M. Where exposed to the elements or in damp or wet locations, waterproof flexible conduit shall be installed. Installation shall be as specified for flexible metal conduit.

3.4 SEQUENCE OF OPERATIONS

A. Refer to drawings for normal operating mode sequences of operations.

B. General

1. Provide automatic control for system operation as described herein, although word "automatic" or "automatically", is not used.

2. Provide control devices, control software and control wiring as required for automatic operation of each sequence specified.

3. Manual operation is limited only where specifically described; however, provide manual override for each automatic operation.

4. Where manual start-up is called for, also provide scheduled automatic start-stop capabilities.

5. Functions called for in sequence of operations are minimum requirements and not to limit additional capabilities the DDC system can be provided with.

6. Provide following functions, which are not specifically mentioned in each Sequence of Operation

C. For each item of equipment:

1. Start-Stop, manual, and scheduled
2. On-Off status of each piece of equipment
3. Run-time
4. All setpoints shall be adjustable
5. Sequenced starting of all motors:
   a. At initial start-up
   b. For automatic starting on emergency power after power blackout

3.5 TEMPERATURE SENSORS

A. Temperature sensor assemblies shall be readily accessible and adaptable to each type of application in such manner as to allow for quick, easy replacement and servicing without special tools or skills.

B. Strap-on mountings shall not be permitted.

C. Outdoor installations shall be; of weatherproof construction or in appropriate NEMA enclosures. These installations shall be protected from solar radiation and wind effects. Protective shield shall be stainless steel.

D. Sensors shall be with enclosure where located in finished space.

E. Sensors in ducts shall be mounted in locations to sense the correct temperature of the air only and shall not be located in dead air spaces or positions obstructed by ducts, equipment, and so forth. Locations where installed shall be within the vibration and velocity limit of the sensing element. Ducts shall be securely sealed where elements or connections penetrate ducts to avoid measuring false conditions.

F. All sensors measuring temperatures in pipes larger than 2 inches in diameter or in pressure vessels shall be supplied with wells properly fabricated for the service. Wells shall be noncorrosive to the medium being measured and shall have sufficient physical strength to withstand pressures and velocities to which they are subjected. Wells shall be installed in the

piping at elbows where piping is smaller than the length of the well to effect proper flow across the entire area of the well.

3.6 ACTUATORS

A. Mount and link control damper actuators per manufacturer's instructions.

B. Valves - Actuators shall be mounted on valves with adapters approved by the actuator manufacturer. Actuators and adapters shall be mounted following manufacturer's recommendations.

3.7 IDENTIFICATION OF HARDWARE AND WIRING

A. All wiring and cabling, including that within factory-fabricated panels shall be labeled at each end within 2" of termination with a cable identifier and other descriptive information.

B. Permanently label or code each point of field terminal strips to show the instrument or item served.

C. Identity control panels with minimum 1 inch letters on nameplates.

D. Identity all other control components with permanent labels. Identifiers shall match record documents.

E. Identity room sensors relating to terminal box or valves with nameplates.

3.8 PROGRAMMING

A. Provide sufficient internal memory for the specified control sequences and trend logging.

B. Point Naming: System point names shall be modular in design, allowing easy operator interface without the use of a written point index.

DEFINE THE POINT NAMING NOMENCLATURE FOR ABOVE. COORDINATE WITH OWNER'S OPERATING STAFF.

C. Software Programming

1. Provide programming for the system as per specifications and adhere to the strategy algorithms provided. The BAS Contractor shall also provide all other system programming necessary for the operation of the system but not specified in this document. Embed into the control program sufficient comment statements to clearly describe each section of the program. The comment statements reflect the language used in the sequence of operations.

3.9 CLEANING

A. This contractor shall clean up all debris resulting from his or her activities daily. The contractor shall remove all cartons, containers, crates, etc. under his control as soon as their contents have been removed. Waste shall be collected and placed in a location designated by the Construction Manager or General Contractor.

B. At the completion of work in any area, the Contractor shall clean all of his/her work, equipment, etc., making it free from dirt and debris, etc.

C. At the completion of work, all equipment furnished under this Section shall be checked for paint damage, and any factory-finished paint that has been damaged shall be repaired to match the

adjacent areas. Any metal cabinet or enclosure that has been deformed shall be replaced with new material and repainted to match the adjacent areas.

3.10 PROTECTION

A. The Contractor shall protect all work and material from damage by his/her work or workers, and shall be liable for all damage thus caused.

B. The Contractor shall be responsible for his/her work and equipment until finally inspected, tested, and accepted. The Contractor shall protect his/her work against theft or damage, and shall carefully store material and equipment received on-site that is not immediately installed. The Contractor shall close all open ends of work with temporary covers or plugs during storage and construction to prevent entry of foreign objects.

3.11 FIELD QUALITY CONTROL

A. All work, materials and equipment shall comply with the rules and regulations of applicable local, state, and federal codes and ordinances as identified in Part 1 of this Section.

B. Contractor shall continually monitor the field installation for code compliance and quality of workmanship. All visible piping and/or wiring runs shall be installed parallel to building lines and properly supported.

C. Contractor shall arrange for field inspections by local and/or state authorities having jurisdiction over the work.

3.12 CHECK OUT, START UP AND TESTING

A. The control system shall be properly commissioned prior to acceptance. The Contractor shall coordinate with others (including mechanical, electrical and test and balance) to properly start up and verify the operation of the system. Provide as-built documentation as detailed in Part 1 of this Section.

3.13 ACCEPTANCE

A. The control systems will not be accepted as meeting the requirements of Completion until all tests described in this specification have been performed to the satisfaction of both the Engineer and Owner. Any tests that cannot be performed due to circumstances beyond the control of the Contractor may be exempt from the Completion requirements if state as such in writing by the Owner's representative. Such tests shall then be performed a part of the warranty.

3.14 SCHEDULE OF RESPONSIBILITIES

A. The following schedule identifies the responsible Division for the installation of the building automation system. This schedule should be used as a general guide. The General Contractor is the central authority governing the total responsibility of all trade contractors. Therefore, deviations and clarifications of this schedule are permitted provided the General Contractor assumes responsibility to coordinate the trade contractors different than as indicated herein. If deviations or clarifications to this schedule are implemented, submit a record copy to the Architect.

---INSERT SCHEDULE OF RESPONSIBILITIES HERE---

END OF SECTION 15900

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes testing, adjusting, and balancing HVAC systems to produce design objectives, including the following:

1. Balancing airflow and water flow within distribution systems, including submains, branches, and terminals, to indicated quantities according to specified tolerances.
2. Adjusting total HVAC systems to provide indicated quantities.
3. Measuring electrical performance of HVAC equipment.
4. Setting quantitative performance of HVAC equipment.
5. Verifying that automatic control devices are functioning properly.
6. Measuring sound and vibration.
7. Duct air leakage test.
8. Reporting results of the activities and procedures specified in this Section.

1.2 DEFINITIONS

A. Adjust: To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.

B. Balance: To proportion flows within the distribution system, including submains, branches, and terminals, according to design quantities.

C. DALT: Duct Air Leakage Test.

D. Draft: A current of air, when referring to localized effect caused by one or more factors of high air velocity, low ambient temperature, or direction of airflow, whereby more heat is withdrawn from a person's skin than is normally dissipated.

E. Procedure: An approach to and execution of a sequence of work operations to yield repeatable results.

F. Report Forms: Test data sheets for recording test data in logical order.

G. Static Head: The pressure due to the weight of the fluid above the point of measurement. In a closed system, static head is equal on both sides of the pump.

H. Suction Head: The height of fluid surface above the centerline of the pump on the suction side.

I. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.

J. System Effect Factors: Allowances used to calculate a reduction of the performance ratings of a fan when installed under conditions different from those presented when the fan was performance tested.

K. Terminal: A point where the controlled medium, such as fluid or energy, enters or leaves the distribution system.

L. Test: A procedure to determine quantitative performance of a system or equipment.

M. Testing, Adjusting, and Balancing Agent: The entity responsible for performing and reporting the testing, adjusting, and balancing procedures.

N. AABC: Associated Air Balance Council.

O. AMCA: Air Movement and Control Association.

P. NEBB: National Environmental Balancing Bureau.

Q. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association.

1.3 SUBMITTALS

A. Quality-Assurance Submittals: Within 30 days from the Contractor's Notice to Proceed, submit 2 copies of evidence that the testing, adjusting, and balancing Agent and this Project's testing, adjusting, and balancing team members meet the qualifications specified in the "Quality Assurance" Article below.

B. Contract Documents Examination Report: Within 45 days from the Contractor's Notice to Proceed, submit 2 copies of the Contract Documents review report as specified in Part 3 of this Section.

C. Strategies and Procedures Plan: Within 60 days from the Contractor's Notice to Proceed, submit 2 copies of the testing, adjusting, and balancing strategies and step-by-step procedures as specified in Part 3 "Preparation" Article below. Include a complete set of report forms intended for use on this Project.

D. Certified Testing, Adjusting, and Balancing Reports: Submit 2 copies of reports prepared, as specified in this Section, on approved forms certified by the testing, adjusting, and balancing Agent.

E. Sample Report Forms: Submit 2 sets of sample testing, adjusting, and balancing report forms.

1.4 PRE-FIELD DALT PRELIMINARY NOTIFICATION

A. Notification: On completion of the duct installation for each system, the Contractor shall notify the Architect/Engineer in writing within 7 days after completion.

B. Duct Testing: The Architect/Engineer shall randomly select sections of the completed duct system for testing by the Contractor. The sections selected shall not exceed more than 50 percent of the total measured linear footage of supply, return, exhaust or plenum duct length. Sections of main ducts, branch main ducts, branch ducts and plenums are subject to testing. From time of receipt of the Contractor’s notification of system completion, the Contracting officer shall provide the contractor within 7 working days selected locations of duct sections which are to be tested.

C. DALT testing: All DALT testing shall be in accordance with SMACNA HVACADLTM.

D. System Performance: Duct systems as defined in Specification Section 15891H metal Ductwork shall be leak-tested in accordance with the SMACNA HVAC air duct leakage test manual with the rate of air leakage less than or equal to L max. as determined in accordance with the following Equation:

$$L_{max} = C_L P^{0.65}$$

Where: L_{max} = the maximum permitted leakage in cfm per 100 ft^2 duct surface.
C_L = 6 for square/rectangular sheetmetal or fibrous ducts, 3 for round/oval sheetmetal, fibrous or flexible ducts.
P = test pressure which shall be equal to the design duct pressure class rating in inches w.g.

1.5 CERTIFIED DALT REPORT

A. Report Form: Submit report data on Air Duct Leakage Test Summary Report Forms as shown on Page 6-2 of SMACNA HVACADLTM. In addition, submit in the report, a marked duct shop drawing which identifies each section of duct tested with assigned node numbers for each section. Node numbers shall be included in the completed report forms to identify each duct section. The report shall be reviewed and certified by the TAB supervisor.

B. The TAB supervisor shall include a copy of all calculations prepared in determining the duct surface area of each duct test section. In addition, the Certified DALT report shall contain copy(s) of the calibration curve for each of the DALT test orifices used for testing. C. Instruments: List the types of instruments actually used to measure the data. Include in the listing each instrument's unique identification number, calibration date, and calibration expiration date. Instruments shall have been calibrated within one year of the date of use in the field. Instrument calibration shall be traceable to the measuring standards of the National Institute of Standards and Technology.

D. Certification: Include the typed name of the TAB supervisor and the dated signature of the TAB supervisor.

1.6 QUALITY ASSURANCE

A. Comply with Uniform Mechanical Code-1997, State of Washington, State Building Code 2000 State-Wide Amendments to the 1997 Uniform Mechanical Code, Olympia Fire Department Ordinance Standards and the Olympia Municipal Code.

B. Agent Qualifications: Engage a testing, adjusting, and balancing agent certified by either AABC or NEBB.

C. Testing, Adjusting, and Balancing Conference: Meet with the Owner's and the Architect's representatives on approval of the testing, adjusting, and balancing strategies and procedures plan to develop a mutual understanding of the details. Ensure the participation of testing, adjusting, and balancing team members, equipment manufacturers' authorized service representatives, HVAC controls Installer, and other support personnel. Provide 21 days' advance notice of scheduled meeting time and location.

1. Agenda Items: Include at least the following:
   a. Submittal distribution requirements.
   b. Contract Documents examination report.
   c. Testing, adjusting, and balancing plan.
   d. Work schedule and Project site access requirements.
   e. Coordination and cooperation of trades and subcontractors.
   f. Coordination of documentation and communication flow.

D. Certification of Testing, Adjusting, and Balancing Reports: Certify the testing, adjusting, and balancing field data reports. This certification includes the following:

1. Review field data reports to validate accuracy of data and to prepare certified testing, adjusting, and balancing reports.
2. Certify that the testing, adjusting, and balancing team complied with the approved testing, adjusting, and balancing plan and the procedures specified and referenced in this Specification.

E. Testing, Adjusting, and Balancing Reports: Use standard forms from AABC's "National Standards for Testing, Adjusting, and Balancing", or standard forms from NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems."

F. Instrumentation Type, Quantity, and Accuracy: As described in AABC national standards or as described in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems," Section II, "Required Instrumentation for NEBB Certification."

G. Instrumentation Calibration: Calibrate instruments at least every 6 months or more frequently if required by the instrument manufacturer.

H. ASHRAE Compliance: Unless otherwise specified, comply with the minimum requirements as stated in ASHRAE Standard “90.1-1999, Energy Standard for Buildings Except Low-Rise Residential Buildings”.

I. Responsibilities:

1. Advance Notice: Furnish to the Architect/Engineer with advance written notice for each event, the commencement of the DALT field work and for the commencement of the TAB field work.
2. Insulation Work: If DALT work is required, ensure that no insulation is installed on ducts to be DALT’d until DALT work on the subject ducts are complete. Later, ensure that openings for TAB test ports in insulation covering HVAC ducts and machinery are closed and sealed.

1.7 PROJECT CONDITIONS

A. Partial Owner Occupancy: The Owner may occupy completed areas of the building before Substantial Completion. Cooperate with the Owner during testing, adjusting, and balancing operations to minimize conflicts with the Owner's operations.

1.8 COORDINATION

A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, HVAC controls installers, and other mechanics to operate HVAC systems and equipment to support and assist testing, adjusting, and balancing activities.

B. Notice: Provide 7 days' advance notice for each test. Include scheduled test dates and times.

C. Perform testing, adjusting, and balancing after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

1.9 WARRANTY

A. National Project Performance Guarantee: Provide a guarantee on AABC'S "National Standards" forms stating that AABC will assist in completing the requirements of the Contract Documents if the testing, adjusting, and balancing Agent fails to comply with the Contract Documents. Guarantee includes the following provisions:

B. Special Guarantee: Provide a guarantee on NEBB forms stating that NEBB will assist in completing the requirements of the Contract Documents if the testing, adjusting, and balancing Agent fails to comply with the Contract Documents. Guarantee includes the following provisions:

1. The certified Agent has tested and balanced systems according to the Contract Documents.
2. Systems are balanced to optimum performance capabilities within design and installation limits.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine Contract Documents to become familiar with project requirements and to discover conditions in systems' designs that may preclude proper testing, adjusting, and balancing of systems and equipment.

1. Contract Documents are defined in the General and Supplementary Conditions of the Contract.
2. Verify that balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are required by the Contract Documents. Verify that quantities and locations of these balancing devices are accessible and appropriate for effective balancing and for efficient system and equipment operation.

B. Examine approved submittal data of HVAC systems and equipment.

C. Examine equipment performance data, including fan and pump curves. Relate performance data to project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system. Calculate system effect factors to reduce the performance ratings of HVAC equipment when installed under conditions different from those presented when the equipment was performance tested at the factory. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," Sections 7 through 10; or in SMACNA's "HVAC Systems--Duct Design," Sections 5 and 6. Compare this data with the design data and installed conditions.

D. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting, and commissioning specified in individual Specification Sections have been performed.

E. Examine system and equipment test reports.

F. Examine HVAC system and equipment installations to verify that indicated balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are properly installed, and their locations are accessible and appropriate for effective balancing and for efficient system and equipment operation.

G. Examine systems for functional deficiencies that cannot be corrected by adjusting and balancing.

H. Examine air-handling equipment to ensure clean filters have been installed, bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.

I. Examine terminal units, such as variable-air-volume boxes and mixing boxes, to verify that they are accessible and their controls are connected and functioning.

J. Examine plenum ceilings, utilized for supply air, to verify that they are airtight. Verify that pipe penetrations and other holes are sealed.

K. Examine strainers for clean screens and proper perforations.

L. Examine 3-way valves for proper installation for their intended function of diverting or mixing fluid flows.

M. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

N. Examine open-piping-system pumps to ensure absence of entrained air in the suction piping.

O. Examine equipment for installation and for properly operating safety interlocks and controls.

P. Examine automatic temperature system components to verify the following:

1. Dampers, valves, and other controlled devices operate by the intended controller.
2. Dampers and valves are in the position indicated by the controller.
3. Integrity of valves and dampers for free and full operation and for tightness of fully closed and fully open positions. This includes dampers in multizone units, mixing boxes, and variable-air-volume terminals.
4. Automatic modulating and shutoff valves, including 2-way valves and 3-way mixing and diverting valves, are properly connected.
5. Thermostats and humidistats are located to avoid adverse effects of sunlight, drafts, and cold walls.
6. Sensors are located to sense only the intended conditions.
7. Sequence of operation for control modes is according to the Contract Documents.
8. Controller set points are set at design values. Observe and record system reactions to changes in conditions. Record default set points if different from design values.
9. Interlocked systems are operating.
10. Changeover from heating to cooling mode occurs according to design values.

Q. Report deficiencies discovered before and during performance of testing, adjusting, and balancing procedures.

3.2 PREPARATION

A. Prepare a testing, adjusting, and balancing plan that includes strategies and step-by-step procedures.

B. Complete system readiness checks and prepare system readiness reports. Verify the following:

1. Permanent electrical power wiring is complete.
2. Hydronic systems are filled, clean, and free of air.
3. Automatic temperature-control systems are operational.
4. Equipment and duct access doors are securely closed.
5. Balance, smoke, and fire dampers are open.
6. Isolating and balancing valves are open and control valves are operational.
7. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.

8. Windows and doors can be closed so design conditions for system operations can be met.

3.3 GENERAL TESTING AND BALANCING PROCEDURES

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC national standards and this Section or according to the procedures contained in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and this Section.

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to the insulation Specifications for this Project.

C. Mark equipment settings with paint or other suitable, permanent identification material, including damper-control positions, valve indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

3.4 FUNDAMENTAL AIR SYSTEMS' BALANCING PROCEDURES

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. For variable-air-volume systems, develop a plan to simulate diversity.

C. Determine the best locations in main and branch ducts for accurate duct airflow measurements.

D. Check the airflow patterns from the outside-air louvers and dampers and the return- and exhaust-air dampers, through the supply-fan discharge and mixing dampers.

E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

F. Verify that motor starters are equipped with properly sized thermal protection.

G. Check dampers for proper position to achieve desired airflow path.

H. Check for airflow blockages.

I. Check condensate drains for proper connections and functioning.

J. Check for proper sealing of air-handling unit components.

3.5 FUNDAMENTAL PROCEDURES FOR HYDRONIC SYSTEMS

A. Prepare test reports with pertinent design data and number in sequence starting at pump to end of system. Check the sum of branch-circuit flows against approved pump flow rate. Correct variations that exceed plus or minus 5 percent.

B. Prepare hydronic systems for testing and balancing according to the following, in addition to the general preparation procedures specified above:

1. Open all manual valves for maximum flow.
2. Check expansion tank liquid level.
3. Check makeup-water-station pressure gage for adequate pressure for highest vent.

4. Check flow-control valves for specified sequence of operation and set at design flow.
5. Set differential-pressure control valves at the specified differential pressure. Do not set at fully closed position when pump is positive-displacement type, unless several terminal valves are kept open.
6. Set system controls so automatic valves are wide open to heat exchangers.
7. Check pump-motor load. If motor is overloaded, throttle main flow-balancing device so motor nameplate rating is not exceeded.
8. Check air vents for a forceful liquid flow exiting from vents when manually operated.

3.6 TEMPERATURE TESTING

A. During testing, adjusting, and balancing, report need for adjustment in temperature regulation within the automatic temperature-control system.

B. Measure indoor wet- and dry-bulb temperatures every other hour for a period of 2 successive 8-hour days, in each separately controlled zone, to prove correctness of final temperature settings. Measure when the building or zone is occupied.

C. Measure outside-air, wet- and dry-bulb temperatures.

3.7 TEMPERATURE-CONTROL VERIFICATION

A. Verify that controllers are calibrated and commissioned.

B. Check transmitter and controller locations and note conditions that would adversely affect control functions.

C. Record controller settings and note variances between set points and actual measurements.

D. Verify operation of limiting controllers (i.e., high- and low-temperature controllers).

E. Verify free travel and proper operation of control devices such as damper and valve operators.

F. Verify sequence of operation of control devices. Note air pressures and device positions and correlate with airflow and water-flow measurements. Note the speed of response to input changes.

G. Confirm interaction of electrically operated switch transducers.

H. Confirm interaction of interlock and lockout systems.

I. Verify main control supply-air pressure and observe compressor and dryer operations.

J. Record voltages of power supply and controller output. Determine if the system operates on a grounded or non-grounded power supply.

K. Note operation of electric actuators using spring return for proper fail-safe operations.

3.8 TOLERANCES

A. Set HVAC system airflow and water flow rates within the following tolerances:

1. Supply, Return, and Exhaust Fans: Plus or minus 5 percent.
2. Air Outlets and Inlets: 0 to minus 5 percent.
3. Heating-Water Flow Rate: 0 to minus 10 percent.
4. Cooling-Water Flow Rate: 0 to minus 10 percent.

3.9 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article above, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

B. Status Reports: As Work progresses, prepare reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.10 FINAL REPORT

A. General: Typewritten, or computer printout in letter-quality font, on standard bond paper, in 3-ring binder, tabulated and divided into sections by tested and balanced systems.

B. Include a certification sheet in front of binder signed and sealed by the certified testing and balancing engineer.

1. Include a list of the instruments used for procedures, along with proof of calibration.

C. Final Report Contents: In addition to the certified field report data, include the following:

1. Pump curves.
2. Fan curves.
3. Manufacturers' test data.
4. Field test reports prepared by system and equipment installers.
5. Other information relative to equipment performance, but do not include approved Shop Drawings and Product Data.

D. General Report Data: In addition to the form titles and entries, include the following data in the final report, as applicable:

1. Title page.
2. Name and address of testing, adjusting, and balancing Agent.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.
7. Contractor's name and address.
8. Report date.
9. Signature of testing, adjusting, and balancing Agent who certifies the report.
10. Summary of contents, including the following:
    a. Design versus final performance.
    b. Notable characteristics of systems.
    c. Description of system operation sequence if it varies from the Contract Documents.
11. Nomenclature sheets for each item of equipment.
12. Data for terminal units, including manufacturer, type size, and fittings.
13. Notes to explain why certain final data in the body of reports vary from design values.
14. Test conditions for fans and pump performance forms, including the following:
    a. Settings for outside-, return-, and exhaust-air dampers.
    b. Conditions of filters.
    c. Cooling coil, wet- and dry-bulb conditions.
    d. Face and bypass damper settings at coils.
    e. Fan drive settings, including settings and percentage of maximum pitch diameter.

f. Inlet vane settings for variable-air-volume systems.
g. Settings for supply-air, static-pressure controller.
h. Other system operating conditions that affect performance.

E. Instrument Calibration Reports: For instrument calibration, include the following:

1. Report Data: Include the following:
   a. Instrument type and make.
   b. Serial number.
   c. Application.
   d. Dates of use.
   e. Dates of calibration.

3.11 DALT PROCEDURES

A. DALT Field Work: Leak test the HVAC air ducts and sections of each system as selected by the Contracting Officer. Accomplish leak tests in accordance with SMACNA HVACADLTM, except as modified by this section. Use the duct class, seal class, leakage class and the leak test pressure data indicated on the drawings, to comply with the procedures specified in SMACNA HVACADLTM. Test all ductwork indicated on the drawings to be DALT tested, including ductwork of pressure class 3 inches WG, or less, if indicated to be DALT'd. Testing shall be in accordance with the procedures specified in SMACNA HVACADLTM, except as supplemented and modified by this section. Provide instruments and consumables required to accomplish the DALT field work. Follow the same basic, procedure specified below in SMACNA HVACADLTM, except as supplemented and modified by this section. Provide instruments and consumables required to accomplish the DALT field work. Follow the same basic, procedure specified below in paragraph titled "TAB Field Work," which include maintenance of and calibration of instruments, accuracy of measurements, preliminary procedures, field work, workmanship and treatment of deficiencies. DALT field work shall be monitored by the QC representative. If any of the duct sections selected by the Government for testing exceed the leakage class during testing, an additional duct section shall be tested at no cost to the Government for each test section that fails initial testing.

B. Data from DALT Field Work: After completion of the DALT work, prepare a pre-final DALT report using the reporting forms specified. Data required by those data report forms shall be furnished by the TAB team. Prepare the report neatly and legibly; the pre-final DALT report shall be the final DALT report minus the TAB supervisor's review and certification. Verbally notify the Architect/Engineer TAB representative that the field check of the pre-final DALT report data can commence; give this verbal notice 48 hours in advance of when the field checking shall commence.

C. Quality Assurance for DALT Field Work:

1. Field Check:
   a. Pre-final DALT report data: Field check for accuracy, in the presence of the Architect/Engineers TAB representative, the pre-final DALT report data for each system. Pre-final report field checks may be conducted separately for each system to allow phased testing.
   b. Additional system field check: If any data on the DALT report form for a given duct section is out-of-tolerance, then data for one more duct section will be checked. The additional duct section to be checked shall be in addition to the original 50 percent of duct sections to be checked.
   c. Out-of-Tolerance: If any of the duct sections checked for a given system are determined to be out-of-tolerance, testing shall be terminated and the pre-final DALT report data for the given system shall be disapproved.
2. Additional Field Checks: If during the random field checks of the pre-final DALT report data is determined to be out-of-tolerance, the contractor shall make the necessary

corrections and prepare a revised pre-final DALTS report. A field check of the revised report data shall then be rescheduled with the Contracting Officer's TAB representative.

3. Final Certified DALT Report: On successful completion of all field checks of the pre-final DALT report data for all systems, the TABS Supervisor shall assemble, review, certify and submit the final certified DALT Report.

3.12 ADDITIONAL TESTS

A. Within 90 days of completing testing, adjusting, and balancing, perform additional testing and balancing to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

B. Seasonal Periods: If initial testing, adjusting, and balancing procedures were not performed during near-peak summer and winter conditions, perform additional inspections, testing, and adjusting during near-peak summer and winter conditions.

END OF SECTION 15990

Basis of Design

- This section applies to the general electrical requirements for all Division 16 work.

Scope

- These standards and procedures contain the design criteria for electrical systems and apply to all sections of Division 16. This information is intended to help the electrical engineer during the design process. Alternate solutions may be discussed with the Project Manager.

Design Criteria

- The Capitol Campus construction is permanent and electrical systems must be designed for an anticipated 30 to 40 year life span before major repairs or replacement is required.
- The primary electrical system is owned by the State. Include all required primary services revisions to the project scope.
- Locate all electrical equipment in dedicated electrical rooms or closets. Unless otherwise exempted by code, provide two means of egress from electrical rooms containing equipment rated 1200 amperes or more and over 6 feet in width containing overcurrent devices, switching devices, control devices, relays, and similar equipment. Provide four-inch concrete housekeeping pads for all electrical equipment.
- Provide sumps with duplex pump stations for below grade electrical rooms.
- Where transformers are located indoors, provide mechanical ventilation to maintain ambient air temperature below 30 degrees C.
- Capitol Campus loads are largely non-linear with a relatively poor power factor. Design the electrical system with the following features:
  a. Maintain source impedance as low as possible with large, low impedance transformers and high capacity conductors and busses.
  b. Provide separate raceways to lighting, motors and drives, and receptacle loads.
  c. Provide 120 and other higher voltages in separate conduits to eliminate potential for unidentified hot neutral. In addition, provide separate conduit for power and low voltage wiring.
  d. Provide separate neutral and equipment grounding conductors for each 120 volt or 277 volt branch circuit. Do not share neutral on a 3 phase, 4 wire circuit.
  e. Provide minimum 100% rated neutral conductors and neutral busses in feeders, switchboards and panelboards, except size neutrals one size larger to accommodate heat load due to harmonics. Require Contractor to coordinate termination lug sizes required with the equipment supplier prior to submitting for approval.
  f. Provide insulated ground conductors and busses.
  g. Consider K-rated distribution transformers for significant non-linear loads.
- As part of the as-built drawing package, provided updated one-line diagram of entire building electrical system, clearly identifying existing and proposed new equipment and connection. Color code the various electrical systems as follows:

Black	Normal Power (480Y/277 and 280Y/120V)
Red	Emergency Power
Green	60 Hertz UPS
Purple	240 Volt System

- Provide minimum (seven) 7 days advance notice of delivery, and access to staging area, for Owner inspection of the following equipment: Medium voltage switchgear; Transformers; Switchboards; Panelboards; Motor Control Centers; and Lighting Control Panels.
- All electrical equipment shall be U.L. listed.
- Threaded rod and/or a trapeze supported with threaded rod shall be used to support overhead raceways. Above suspended ceilings, wires attached to the ceiling grid shall not be used for support. Keep equipment and supports well above ceiling grid to facilitate acoustical panel removal and access.
- Outlet and Switch Heights:
  a. The maximum height AFF for all general use switches shall be 46 inches to center of switch plate.
  b. The minimum height AFF for all outlet receptacles shall be 18 inches to center of receptacle.
- Outlets: It is desired that electrical outlets be provided at regular intervals in hallways including adjacent to elevators, as well as in stairwells at each landing.

Power Outages

- Refer to Guide Specifications Section 01500, Temporary Facilities & Controls, paragraph 1.9J.

Demolition

- The Office of Capitol Planning and Management shall have first right of refusal for all removed electrical equipment and materials.
- All disconnected wiring, cable, telephone and computer wiring shall be completely removed from conduits, wireways, and underfloor raceways, except leave one wire in conduit run as a future pull wire.
- Conduit may be left in place if not damaged.

Grounding and Bonding

- Grounding shall be in accordance with NEC Article 250 and related sections of other NEC Articles. Soares book on grounding shall be used as a guide.

Underfloor Wiring Systems

- Underfloor raceway systems shall be wired and identified in accordance with Wiring requirements specified below. Unused wiring shall be removed.
- Receptacles shall be installed with separate wiring taps from the branch circuit. Do not daisy chain wiring from receptacle.
- Provide spare underfloor raceway system parts to OCPM.
- Use of flat cable is discouraged. If it must be used, flat cable systems shall be AMP (no exception). Installation tools shall be turned over to OCPM at completion.
- Carpet squares or other approved covering shall be used to cover access openings. Floor coverings shall not be run continuous over access openings.

Boxes

- Branch circuit outlet and junction boxes in dry, concealed locations shall be zinc-coated steel with steel mud rings and covers. Mark each box and cover with the panelboard and branch circuit number.
- Boxes in exposed and wet locations shall be cast metal with gasketed, weatherproof covers.

Power Generation

- Emergency and standby power systems shall be provided to supply life/safety loads (egress and emergency exit lighting, fire alarm systems, smoke fans, elevators) and Owner-specified optional loads (e.g. computers, HVAC, etc.). HVAC systems shall be capable of being load shed from emergency power system.
- Emergency sources shall be diesel engine generators. Standby sources may be engine generators or fuel cells.
- Engine generator and accessories shall be located indoors in a clean, dry area accessible for maintenance and service. Provide adequate measures to isolate engine vibration and sound from occupied building areas.
- Provide for connection of Owner's portable load bank.

Service and Distribution

- Provide phase loss / phase unbalance / phase reversal protection.

Lightning Arresters and Transient Voltage Surge suppression

- Provide arresters in medium voltage switchgear.
- Provide Transient Voltage Surge Suppression (TVSS) units in distribution panels which serve lighting (electronic ballasts) and computers.

Primary Load Interrupters

- Medium voltage switchgear shall be equipped with a viewing window to provide visible break of all phases.
- Provisions shall be made for grounding disconnected portions of the medium voltage system.

Panelboards

- Locate panelboards in electrical closets to allow for maintenance and for future changes. Leave space in enclosure end walls for future conduit additions.
- Provide full-rated feeder to match panelboard bus capacity. (E.G. 4/0 AWG feeder to serve 225A panelboard.)
- Identify circuit breaker mounting positions with industry- standard Odd (left) - Even (right) system. Multi-pole circuit breakers shall be identified by the positions they occupy (E.G. 38/40/42). Newly installed panels shall have a minimum of 20% spare breaker space for future use.
- Provide typewritten or computer printed panel schedules with specific room and equipment identification for each circuit breaker.

Busway

- Busway shall be copper, not aluminum, with separate 200 percent rated neutral buss and 50% housing and 50% internal ground busses. Voltage rating shall be 600 volts ac, regardless of whether application voltage is 208 or 480 volts.
- Disconnect switch covers shall open a full 90 degrees or be removeable for service. Disconnects shall be provided with phenolic labels stating the name(s) of equipment served.

Lighting

- Lighting controls shall be supplied with Horton (G.E.) "Complete" model control panels. Each zone in an office (maximum of 2200 square feet) shall have its own bypass switch located within its area. If multiple after hours access approaches lead into a lighting zone, bypass switches shall be installed at each access point.
- Emergency egress and exit lighting shall be supplied with separate emergency branch circuits from the engine generator and its distribution system. Identify fixtures with an orange label with black letter "EMERGENCY" visible from the floor. Identify emergency branch circuits conduit and junction boxes by applying similar labels at ten foot intervals.
  a. All exit lighting shall be provided and installed in accordance with and meet the minimum standards of the Uniform Building Code, ADA, and U.L. 924.
  b. Whenever possible, exit light signage shall be connected to the building emergency lighting electrical panel. If not possible, battery pack lighting may be used. In extreme cases, self-illuminating signage may be installed.
  c. Exit light signage shall have a light source that has a rated life of at least 10 years without replacement and shall meet the minimum standards stated above for the entire 10 year period.
  d. Exit signage shall consume 5 watts or less of electrical energy.
  e. Whenever an area is renovated and existing exit lighting is proposed to be re-used, exit lights shall be retrofit or replaced to meet this standard.
  f. Exit lights shall utilize LED's as a light source.
- Where engine generator emergency power is not available, provide emergency egress and exit lighting with sealed lead acid batteries and integral battery chargers with external test switch.
- Provide emergency lighting in all electrical, mechanical, penthouse, generator rooms and bathrooms.
- Locate lighting fixtures such that maintenance can be accomplished with standard step and extension ladders.

Closeout Submittals

- All sub-consultants to the prime consultant are not to include their own requirements regarding close-out submittals. Division 16 specification sections regarding closeout submittals including project record documents, operation and maintenance manuals, warranties, bonds, extra stock, etc., are only to reference seeing Section 01780. If the consultant has specific criteria they need beyond Section 01780, they can specifically identify it at the same time as being in addition to requirements of Section 01780.

Products, Materials and Equipment

Wiring

- All wiring shall be stranded copper, aluminum shall not be used. Solid conductors shall not be accepted. Minimum size 12 AWG for power circuits, 14 AWG for controls.
- Insulation shall be Type THHN/THWN for branch circuits. Feeder conductor insulation shall be THHN/THWN or XHHW-2.
- Identify wiring in each accessible location with panelboard and branch circuit number, and color code each phase according to the following table:

	Voltage		
Phase	**480Y/277V**	**208Y/120V**	**208Y/120V Computer Branch Circuits**
A	Brown	Black	Black w/ Yellow Stripe
B	Orange	Red	Red w/ Yellow Stripe
C	Yellow	Blue	Blue w/ Yellow Stripe
Neutral	Gray	White	White w/ Yellow Stripe
Ground	Green	Green	Green w/ Yellow Stripe

- Provide a separate neutral conductor for each single phase branch circuit which supplies a non-linear load.
- Provide dedicated branch circuits to high-inrush non-linear loads, including:
  a. Photo Copiers.
  b. FAX Machines.
  c. Laser Printers.

Conduit

- PVC conduit (Schedule 80) shall only be used underground. Elbows and vertical conduit risers shall be Galvanized Rigid steel Conduit (GRC).
- GRC conduit shall be used above ground outdoors and in areas subject to damage from vehicles or equipment.
- EMT conduit shall be used indoors where not subject to damage. Couplings and connectors shall be steel compression-type only. Zinc-die-cast, malleable, set-screw, and indentor couplings and connectors shall not be used.

Underfloor Wiring Systems

- Refer to requirements specified in individual Electrical Sections.

Boxes

- Refer to requirements specified in individual Electrical Sections.

Wiring Devices

- General: Wiring devices shall be premium specification grade with molded nylon body and cover, locked-in metal strap, heavy duty power contacts and large head terminal screws able to accept up to 10 AWG conductors. Color shall be ivory for utility circuits and orange with isolated ground

for computer circuits. Stainless steel cover plates or cover plates matching building décor shall be used.

- Switches shall be 20 ampere specification grade, 120/277 volts ac, quiet operation.
- Receptacles shall be 20 ampere specification grade, 125 volt ac.
- Label receptacles, switches, and furniture whips with panel and circuit number. Use labeler to produce small letters and numbers in colors easily legible on cover plate.

Motors and Motor Controls

- New and replacement motors shall be premium efficiency with copper windings and 1.15 service factors. Aluminum windings shall not be used. Motors shall have sealed bearings.
- Motor starters shall be installed in a Motor Control Center. Minimum starter size shall be size one. Maximum starter control voltage shall be 120 volts ac. Starters shall be equipped with motor circuit protectors with adjustable magnetic-only trip.
- Provide neon indicating lights and Hand-Off-Automatic switch for each motor starter. Provide metering package (current, etc.) at each motor starter serving a 5 HP or larger motor.
- Motors 50 HP and larger shall be equipped with a solid state soft start or Variable Speed Drive (VSD) as appropriate to the application. A complete spare parts package and spare fuses for each type and size of VSD or soft starter shall be provided to OCPM.
- Motor fuses shall be class RK5 time delay type.

Power Generation

- Engine generator systems shall be manufactured by Cummins/Onan (no exceptions). All electrical and control components shall be supplied with the generator.
- Provide critical grade silencer and Schedule 10 stainless steel exhaust system. Wrap exhaust and silencer with industrial grade thermal insulation and lagging with grommets, hooks and wire lacing. Locate exhaust outlet a sufficient distance from building to avoid infiltration and induction into HVAC system.
- Above ground or underground fuel storage tanks shall comply with all U.S.T. regulations for installation and monitoring. Tank shall be sized for 72 hours generator run time at full load fuel consumption rate. Provide dial type fuel gauge and calibrated dip stick.

Transformers

- Transformers shall be ANSI/NEMA ST20 dry type in accordance with UL Specification 1561.
- Insulation system shall be 220 degrees C with 150 degrees C temperature rise (above 40 degrees C ambient) at rated KVA.
- Windings shall be copper. Aluminum is not acceptable.
- Enclosure temperature shall not exceed 35 degrees C above ambient.
- Provide winding taps per ANSI/NEMA ST 20.
- Sound levels shall not exceed 35 dB.
- Basic Impulse Level of windings shall be 10 kV.
- Core and Coil assembly shall be grounded to enclosure by means of a visible flexible copper strap. Isolate core and coil from enclosure using vibration-absorbing mounts.

- Enclosure shall be constructed of 14 GA. steel finished with zinc coating, primer and gray epoxy paint. Enclosure shall be ventilated and rodent-resistant, suitable for anchoring to a concrete pad. Include lifting eyes or brackets bolted to the enclosure sides.
- Engraved metal nameplate with transformer ratings and connection diagrams shall be provided.
- K-rated transformers shall be used where applicable for non-linear loads.

Panelboards

- Panelboards shall be commercial quality circuit breaker type in accordance with NEMA PBI.
- Bus shall be copper. Aluminum shall not be allowed. Provide separate insulated copper neutral and ground busses; size neutrals to one size larger than 100% rating to accommodate heat load due to harmonics. Require Contractor to coordinate termination lug sizes required with the equipment supplier prior to submitting for approval.
- Molded case circuit breakers shall be bolt-on for all 208Y/120V and 480Y/277V applications.
- Panelboards shall be Square D, Cutler Hammer, or GE with hinged door-in-door construction, Backnet and LonWorks compatible.
    a. Finish shall be gray epoxy paint over galvanized sheet metal. Cover shall have concealed hardware and locking door.
    b. Provide hinged door-in-door construction for all panelboards.

Switchboards

- Switchboards shall be factory-assembled, dead front distribution switchboards in accordance with NEMA PB 2, U.L. labeled and listed, suitable for use as service entrance (SUSE).
- Voltage rating shall be 600 volts ac, regardless of whether application voltage is 208 or 480 volts.
- Line and load terminations shall be accessible from the front. Rear access shall not be required.
- Bus shall be copper, not aluminum, sized in accordance with NEMA PB2. Bus connections shall be welded or bolted with Belleville washers, accessible from the front for maintenance. Aluminum bus shall not be allowed. Provide separate 100% rated neutral and ground busses.
- Main circuit breakers shall be molded case, individually mounted. Main circuit breakers for 480 volt systems shall be equipped with ground fault protection. If electronic trip units are used, provide test set and software to Owner at project completion.
- Feeder circuit breakers shall be molded case, group mounted.
- Switchboards shall be equipped with multi-function electronic meters, such as Square D PowerLogic, including communication module to interface directly to the Capitol Campus energy management system.

Lighting

- General lighting fixtures shall be premium specification grade to provide long service life and high efficiency.
- Fluorescent Lighting: Fixtures shall be lensed or parabolic type to suit application and existing building. Ballasts shall be electronic, high power factor and listed on the Lighting Design Lab's approved ballast list. Lamps shall be four foot T8, 3500 Kelvin color temperature, minimum 75 color rendering index. Specialty lamps beyond normal equipment stocked by DCF shall have the approval of the Electrical Technical Superintendent.

- Compact Fluorescent Lighting: Compact fluorescent fixtures shall utilize magnetic or electronic ballasts and lamps which are currently available under the state lamp and ballast contract. The "2D' lamps manufactured by General Electric Company shall not be used.
- HID Lighting: High intensity discharge lighting shall be high pressure sodium, used only outdoors and in parking garages. Metal halide fixtures utilized indoors shall be rated for a maximum of 45dB sound at 45 feet distance 3 feet from floor, and avoid direct contact of the eye with the lamps to avoid glare.

Installation, Fabrication and Construction

- Refer to requirements specified in individual Electrical Sections.

END OF GENERAL ELECTRICAL REQUIREMENTS SECTION

GUIDE SPECIFICATIONS

The following specification is intended to be used, generally verbatim, in the contract documents. ***[Specifier notes]*** shall be deleted during the editing process. Where [ ] appear in this document, this indicates requirements which are optional depending upon the project scope and conditions. Edit as appropriate for the project. The A/E consultant shall take ownership and responsibility for the contents of this section and is expected to modify other portions as necessary to accurately reflect conditions of the project. For draft copies during the design process, annotate any deletions by lining through the proposed change, and use bold lettering for any proposed additions.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes specifications for variable frequency drives (VFD) for use in HVAC applications using Lonworks and N2 bus.

1.3 SUBMITTALS

A. Submit in accordance with Section 01330.

B. Product Date: Manufacturer's data and product information for all manufactured materials and products.

C. Operations and Maintenance Manuals: Indicating parts lists and maintenance requirements for all equipment, indicating proper procedures and equipment for safe operation of the system. Refer to Section 01780 for submittal requirements.

1.4 DELIVERY STORAGE AND HANDLING

A. Deliver manufactured materials in manufacturer's original, unopened protective packaging.

B. Store manufactured materials in manufacturer's original, unopened protective packaging. Prevent soiling, physical damage or wetting.

PART 2 - PRODUCTS

2.1 APPROVED PRODUCTS

A. Manufactures shall supply products that are Lonworks compatible or have N2 communication capability.

2.2 CONSTRUCTION

A. The adjustable speed drive and all equipment shall be UL rated.

1. All VFD's shall a have built in by-pass in case of failure or maintenance.
2. All VFD's shall use one type of common user interface.
3. Provide complete programming software for use in a laptop PC so that changes to the VFD program can be made by directly connecting the laptop to the VFD.
4. Primary control of ON/OFF, speed and failure annunciation shall be through a hardware connection to the environmental control system. Provide (1) a dry contact output

enunciating VFD failure, (2) an ON/OFF input which responds to a remote dry contact closure and (3) a speed control input which responds to a remote 4-20 ma. And 0-10 VDC signal.

5. The environmental control system will be used to diagnose VFD conditions and to reconfigure resident VFD software. Provide all hardware, software, and connecting cables as necessary to communicate and exchange information with the Environmental Control System using Lonworks and the N2 bus or equal interface appropriate for use with the installed control system/equipment. The exchanged information shall include motor speed, electric load in KW, Volts, Amps, VFD fault description, Hand/Off/Auto/Bypass mode and network point address; control system override shall only tie into the 'Auto' mode. It shall be possible to modify the VFD settings including acceleration and deceleration time and skip frequency ranges using the Environmental Control System operator work station.
6. Fire alarm interface
   a. Provide an override input so that opening dry contacts will absolutely stop the motor under any operating conditions.
   b. Provide an override input so that closing dry contacts will cause the motor to operate at a speed predetermined by VFD programming.
   c. Provide a summary alarm dry contact, for connection to the fire alarm system, indicating that the VFD is not operable.

2.3 PERFORMANCE

A. The VFD shall not create a voltage rate of change greater than 1000 volts/microsecond nor a peak voltage greater than 1000 volts to ground at the motor when the motor is connected to the VFD by less than 60 feet of wire.

B. The carrier frequency of pulse width modulated VFD's shall be variable and adjusted so motor noise resulting from the VFD, measured at 3 feet from the motor, is less than 3 db greater than motor noise when operating across the line. Carrier frequency adjustment shall be available such that the average carrier frequency can be maintained at less than 9 kHz while meeting acoustical noise requirements.

C. Configure the VFD so, when turned ON, it will accommodate for motor rotation in either direction and drive the motor to Control setpoint.

PART 3: EXECUTION

3.1 INSTALLATION

A. The VFD shall be sized to continually operate at greater or equal to 105% of the nameplate load of the motor to which it is applied.

B. Installation and field wiring
   1. Mounting and control wiring shall be mounted so power wires connecting the VFD to the motor are less than 60 feet in length.
   2. The VFD shall be mounted to ridged unistrut type channel and/ or building structures.
   3. Wiring shall be in accordance with the NEC and the Division of Capital Facilities boiler plate.

3.2 FIELD START UP AND TESTING

A. Start up and testing shall be provided at the installation site by the manufacturer or other agent deemed acceptable by the Division of Capital Facilities. The appropriate person or persons from the Division of Capital Facilities shall witness the final operational demonstration.

B. Verify all installation connections and controls.

C. Field adjust all safety controls.

D. Field adjust VFD parameters as follows.

1. Acceleration time- 60 seconds for fans and 10 seconds for pumps.
2. Deceleration time-65 seconds for fans and 20 seconds for pumps.
3. Minimum fan speed- 12 Hz for supply fans and 6 Hz for return/exhaust fans.
4. Minimum pump speed – as stated by pump manufacturer or 450 RPM as default.
5. Program the VFD so that, upon reapplication of power after a power failure, the VFD shall automatically reapply power and drive the motor to the control set point.
6. Program the VFD so that no more than 3 automatic restart attempts will be made within one hour after a shutdown due to input power problems.
7. Adjust the carrier frequency to provide optimum efficiency while not increasing motor noise more than 3 dB measured at 3 feet from the motor.

3.3 TRAINING

A. Provide on site operation and maintenance training for (2) identical 4-hour sessions.

B. Provide six sets of operating, troubleshooting, repair, and maintenance manuals.

3.4 SERVICE DURING THE WARRANTY PERIOD

A. A representative located within 60 miles of the installed location shall service the VFD.

B. Qualified technical support shall be available on site within 24 hours of request.

3.5 REPAIR PARTS

A. During the warranty period, replacement parts shall be available on site within 48 hours of initial request for service.

END OF SECTION 16260

Basis of Design

This section applies to the installation and maintenance of fire alarm, data, telecommunications, signaling, and control cable on the Capitol Campus.

Design Criteria

- All cable installations shall conform to these standards. All wiring and cabling for data and telecommunications shall be installed in accordance with Computing and Telecommunications Architecture Standards – Building Wiring as published by the Department of Information Services which incorporates by reference various applicable standards as prepared by the Electronic Industries Alliance (EIA) and the Telecommunications Industry Association (TIA), in addition to the currently adopted National Electric Code, Labor & Industries regulations, FCC regulations, and other pertinent and applicable regulations. Prior approval for installation is required.
- Once installed, conduit or raceways shall become part of the campus infrastructure and will be managed by DCF. The owner of the cable shall be totally responsible for the maintenance, repair and removal of the cabling system. Any cabling taken out of service shall be removed from the conduit. NEC Article 300-11-b requires that cable not be tie wrapped to the outside of conduit or used as support.
- All cabling shall be identified at 50 foot intervals and at all cable entrance and exit points. Labeling shall identify 1) cable owner, 2) type of cabling, 3) cable size, and 4) destination.
- Cabling system owner shall be responsible for any FCC testing and reporting requirements.
- All cable installations shall be planned to complement the Department of Information Systems (DIS) long-range plan for cabling on the campus. Installations shall be reviewed and approved by DIS.
- As-builts for cabling installations shall be submitted to DCF, detailing the cable route, location of cabling within duct bank, labeling legend, and the name and phone number of person(s) to assist DCF in utility locations. The as-built documents shall be submitted as an AutoCAD file on 3.5" disk or CD-ROM. All costs of the submittals shall be borne by the installer/tenant involved in the project.

Standards for Cabling External to Buildings

- All cabling shall be installed in the existing campus duct bank.
- The first user to occupy an empty duct shall fill the conduit with inner duct prior to the installation of any cabling. Inner duct sizing shall be coordinated with DCF.
- No cable shall be installed within the campus steam tunnels without prior express written permission from DCF.
- If permission is granted to install cable within a steam tunnel, cable shall be installed within an approved raceway. Raceway shall be securely fastened to the tunnel wall or ceiling as approved by DCF.

Standards for Cabling Internal to Buildings

- All exposed cabling shall be installed in EMT conduit. Installation shall comply with NEC requirements and AT&T or DIS (TIA/EIA) standards for fiber optic conduit systems, except all couplings and connectors shall be steel compression-type only. Zinc-die-cast, malleable, set-screw, and indentor couplings and connectors shall not be used..

- Where physical protection is not required, plenum rated cabling shall be installed.
- Where inner duct or cabling is run in an air plenum, it shall be secured every six feet using bridal ring or equivalent type hooks. Securement shall not be to ceiling panels or suspended ceiling grid.
- Where cabling is run under raised floor (except computer rooms) it shall be run with the building lines to ensure continuity with existing voice/data cabling.
- Where cabling is run in floor raceway systems (e.g. Walker Duct) special attention shall be given to the physical protection of the cable at the hand hole points and at the entry and exit points.

Products, Materials and Equipment

- Refer to requirements specified in individual Electrical Sections.

Installation, Fabrication and Construction

- Refer to requirements specified in individual Electrical Sections.

END OF CABLE SECTION