UNIVERSITY of WASHINGTON

UW MEDIUM VOLTAGE ELECTRICAL UPGRADE

PROJECT NUMBER: 207163
PROJECT MANUAL
November 6, 2020
UW MV Electrical Upgrades

Project No. 207163
November 6, 2020

UNIVERSITY OF WASHINGTON
Capital Planning & Development

ELECTRICAL ENGINEER
Casne Engineering Inc

CIVIL ENGINEER
Sitts and Hill Engineering

ACOUSTIC ENGINEER
The GreenBusch Group, Inc

MECHANICAL ENGINEER
FSi Engineers
## DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

- **00 11 00** ADVERTISEMENT FOR BIDS
- **00 21 00** INSTRUCTIONS FOR BIDDERS
- **00 41 00** BID FORM
- **00 72 00** GENERAL CONDITIONS FOR WASHINGTON STATE FACILITY CONSTRUCTION
- **00 72 10** MODIFICATIONS TO THE GENERAL CONDITIONS
- **00 73 00** SUPPLEMENTAL CONDITIONS TO THE GENERAL CONDITIONS
- **00 73 20** CONTRACTOR PERFORMANCE EVALUATION PROGRAM

## DIVISION 01 - GENERAL REQUIREMENTS

- **01 11 00** SUMMARY OF WORK
- **01 11 01** SUMMARY OF WORK – REGULATED MATERIALS
- **01 23 00** ALTERNATES
- **01 25 00** SUBSTITUTION PROCEDURES
- **01 26 00** CONTRACT MODIFICATION PROCEDURES
- **01 29 76** PROGRESS PAYMENT PROCEDURES
- **01 31 00** PROJECT MANAGEMENT AND COORDINATION
- **01 31 19** PROJECT MEETINGS
- **01 32 16** CONSTRUCTION PROGRESS SCHEDULE
- **01 33 00** SUBMITTAL PROCEDURES
- **01 35 00** ELECTRONIC COMMUNICATIONS
- **01 35 23** OWNER SAFETY REQUIREMENTS
- **01 35 33** INFECTION CONTROL
- **01 42 00** REFERENCES
- **01 45 00** CONTRACTOR QUALITY CONTROL
- **01 45 23** TESTING AND INSPECTION SERVICES
- **01 50 00** TEMPORARY FACILITIES AND CONTROLS.
- **01 56 39** TEMPORARY TREE AND PLANT PROTECTION
- **01 71 23** FIELD ENGINEERING
- **01 73 29** CUTTING AND PATCHING
- **01 74 00** CONSTRUCTION WASTE MANAGEMENT
- **01 75 00** TEST ENGINEER SERVICES
- **01 77 00** CLOSEOUT PROCEDURES
- **01 78 36** WARRANTIES
- **01 91 00** COMMISSIONING REQUIREMENTS
APPENDIX A - DIVISION 00 AND 01 FORMS

APPENDIX B - PREVAILING WAGE RATES INFORMATION

APPENDIX C - REGULATED MATERIALS SURVEY

DIVISION 02 – EXISTING CONDITIONS
02 80 00 FACILITY REMEDIATION
02 82 00 ASBESTOS REMOVAL
02 83 00 HEAVY METALS CONTROL ACTIVITIES
02 84 00 POLYCHLORINATE BIPHENYL REMEDIATION

DIVISION 26 – ELECTRICAL
26 05 00 COMMON WORK
26 05 13 MV WIRE, CABLE, AND TERMINATIONS
26 05 19 LOW VOLTAGE ELECTRICAL POWER CONDUCTORS
26 05 26 GROUNDING SYSTEM
26 05 33 RACEWAYS
26 05 48 SIESMIC RESTRAINTS AND CONNECTORS
26 05 53 IDENTIFICATION
26 08 00 COMMISSIONING SUPPORT
26 18 36 13.8KV LOAD INTERRUPTER SWITCHES – INSTALLATION
26 22 00 MV PADMOUNTED TRANSFORMER
26 22 01 MV DRY-TYPE TRANSFORMER
26 60 00 INSPECTION CALIBRATION AND TESTING

END OF SECTION
ADVERTISEMENT FOR BIDS

University of Washington
UW MV Electrical Upgrade, 207163
Date of Bid Opening: December 3, 2020
A/E’s estimate: $3,019,000

NOTICE TO CONTRACTORS:

Bid Submittal: Sealed bids will be received by the University of Washington Facilities, Project Delivery Group, electronically.

Bid Submittal: The University of Washington is taking precautions to limit exposure and impacts related to COVID-19. To comply with the Governor’s “Safe Start” plan, the requirement to submit a sealed bid is waived. Bids will be received by the University of Washington, Project Delivery Group, by email at PDGbids@uw.edu.

COVID option: Part I of the Bid Form will be received up to 2:00 p.m. on December 3, 2020, and Part II of the Bid Form will be received up to 3:00 p.m. on December 3, 2020 Bids will then be publicly opened and read aloud via Zoom Version 5.0 (required) https://washington.zoom.us/j/92043515483. Bids received after the date and hour above stated will not receive consideration. Attendance in person is not allowed.

Project Description: The project includes the following work: The project includes the following work: The removal and disposal of three (3) PCB contaminated oil filled transformers in the Schmitz Hall (750KVA), Kristen Wind Tunnel (2500KVA), and Henderson Hall (500KVA). Schmitz Hall and Kristen Wind Tunnel will have new dry type transformers installed inside the building, and Henderson Hall will have a padmounted oil filled transformer outside the building. The project includes the replacement of medium voltage switches in Condon Hall (3 Switches), Bloedel Hall (3 Switches), Bagley Hall (3 Switches), Benson Hall (3 Switches), and The Art Building (3 Switches). The contractor shall receive the owner purchased MV switches, and handle and store the switches until installation of the switches in the UW buildings. Additionally, the project will replace approximately 7,100 linear feet of 500kcmil 15KV MV cable in Feeders WD8/WE8 between vault WT5 and CP3. The cable shall be replaced in the UW tunnels and in 10 vaults in the tunnel. The removal of the existing feeder will require the removal of several splices and link boxes in the tunnels. The installation of the new feeders will require the installation of various in-line splices and 600A dead break splices.

Bid Alternate #1: Project to replace approximately 2,800 linear feet of 500kcmil 15KV MV cable in Feeders WD8/WE8 between vault CP3 and CP7. The cable shall be replaced in the UW tunnels and in 5 vaults in the tunnel.

Bid Alternate #2: Remove and disposal of the PCB contaminated oil filled transformer in John Wallace Hall (1000KVA) and the installation of a new dry type 1000KVA transformer in the building.

All construction operations must comply with the most current Covid 19 related rules and guidance from the Governor’s Office. All activities must also comply with all related and applicable requirements issued by the Washington State Department of Labor and Industries and Public Health Agencies having jurisdiction.

Questions: Questions about this project should be directed to:

A/E Name: Casne Engineering Inc
Contact Person: Russel Jentges
Pre-Bid Site Meeting: The Project site is available for inspection by prospective bidders at a pre-bid site meeting and walk-through at 1:00PM on November 17, 2020 at Henderson Hall. Access to the project site is restricted. This will be the only opportunity for bidders to visit the Project site.

Bid Documents: Bidders may obtain or access plans, specifications, and addenda for this project at https://facilities.uw.edu/projects/business-opportunities/solicitations. Contractors who would like to be included on the Planholder’s list shall either attend a pre-bid meeting or request to be added by emailing PDGbids@uw.edu.

Bid Guarantee: A surety company bid bond on a form acceptable to Owner, a cashier's check or a certified check payable to the order of University of Washington, or cash, shall accompany each bid in an amount not less than five percent (5%) of the Base Bid. No bidder may withdraw its bid after the hour set for the opening thereof, unless the award of the contract is delayed for a period exceeding 60 days.

Apprentice Utilization: Mandatory apprentice utilization of at least 15% of the total labor hours worked on the contract is required. Apprentices must be registered as apprentices with the State Apprenticeship and Training Council. Bidders may contact the Department of Labor & Industries, Apprenticeship Program at 360-902-5320 to obtain information on apprenticeship programs. The Contract includes monetary incentives for meeting the goals, and monetary penalties for not meeting the goals.

BUSINESS EQUITY: The University of Washington is committed to providing optimal opportunity for participation in contracting by Business Equity Enterprises (BEE). The University of Washington defines a Business Equity Enterprise (BEE) as “any entity licensed to do business in the State of Washington, including a corporation, partnership, sole proprietorship, or other legal entity that meets any of the following:”


Lesbian/Gay/Bisexual/Transgender Business Enterprise (LGBTBE): More than 50% owned and controlled by at least one person who is a member of the LGBT community.

Minority Business Enterprise (MBE): More than 50% owned and controlled by at least one person who is a member of one or more of the following minority groups:
- Asian Pacific American
- Black American
- Hispanic American
- Native American
- Subcontinent Asian American

Minority Women’s Business Enterprise (MWBE): More than 50% owned and controlled by at least one woman who is a member of one or more of the above minority groups.

Small Business Enterprise (SBE): A business entity that:
- Can attest that it is owned and operated independently from all other businesses and
- Conforms to the U.S. Small Business Administration Size Standards of the North American Industry Classification System (NAICS) Codes in which it is to be engaged at the UW; or
- Is certified with the OMWBE.

Veteran’s Business Enterprise (VBE): Certified with the Washington State Department of Veteran’s Affairs (DVA)

Women’s Business Enterprise (WBE): More than 50% owned and controlled by one or more women.
The University of Washington has determined that an overall aspirational goal of 20% Business Equity Enterprise (BEE) utilization, inclusive of 15% minority and women-owned business utilization, is practicable and attainable on this construction project; that goal is negotiable based upon the specialized nature of the work and the relative availability of BEE to perform the specific work scopes identified in this project. **The University of Washington welcomes the participation of all BEE, irrespective of gross revenues, including those that are self-designated and those that are state (OMWBE) certified.** Participation may be on a direct basis in response to this invitation to bid, or as a subcontractor or supplier.

**Safety Plans:** Prior to the issuance of the Notice to Proceed, the Contractor will be required to submit to the Owner a copy of its company safety program. See Modifications to the General Conditions, Part 5 for details.

The Owner reserves the right to reject any or all bids and to waive as an informality any irregularities in the bids received.

Date(s) of Publication: November 13, 2020

**END OF SECTION**
1. CONTRACTOR’S REGISTRATION

All bidders must be registered by the Washington State Department of Labor and Industries in accordance with R.C.W. 18.27.020.

2. SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK

A. Bidder acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the Work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the Work or its cost.

B. The Project site is available for inspection for prospective bidders at a pre-bid site meeting and walk-through, as indicated in the Advertisement for Bids, and existing conditions should be examined. This will be the only opportunity for bidders to visit the project site.

C. Bidder acknowledges that it has satisfied itself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by Owner, as well as from the drawings and specifications made a part of these Contract Documents.

D. Bidder acknowledges that adjoining areas will be conducting normal operations during the work. Bidder should anticipate pedestrian and traffic congestion, limited parking, and the requirement that the work be coordinated with ongoing operations.

E. Bidder acknowledges that its bid is based upon a schedule and assumptions which incorporate these conditions.

F. Owner assumes no responsibility for any conclusions or interpretations made by bidder based on the information made available by Owner. Should a bidder find discrepancies or omissions in the drawings or specifications, or should bidder be in doubt as to their meaning, bidder shall at once notify the Owner. If appropriate, Owner will send written instructions to all bidders by addenda. Questions received less than 10 days before the time of bid opening may not be answered. All addenda issued shall be incorporated into these Contract Documents.

3. PREPARATION OF BIDS

Bidder shall comply with the following instructions in preparing its bid.

A. The name, address, and Contractor’s license number of bidder shall be typed or printed on the bid in the space provided. The name must match the name on the bid guarantee.

Bids must be (1) submitted on the forms furnished by Owner or on copies of those forms, and (2) manually signed in ink.

B. Bidders shall submit bids in the format provided in the Bid Form. Only the amounts and information asked for in the Bid Form furnished will be considered as the bid. All blank spaces must be filled in.

C. Bidder shall bid upon all alternates indicated in the Bid Form. When bidding on alternates for which there is no charge, bidder shall write the words “No Charge” in the space provided on the Bid Form. If a bidder fails to bid an alternate, or notes “no bid,” it will be construed as meaning that there will be no change in the Contract Sum and that the alternate is included in the Contract Sum. Alternate bids will not be considered unless requested in the Bid Form.
D. Bidder shall submit with within one hour of the published bid submittal time, Part II of its Bid Form, the names of the subcontractors with whom the bidder, if awarded the contract, will subcontract for performance of the work of heating, ventilation and air conditioning, plumbing as described in chapter 18.106 RCW, and electrical as described in chapter 19.28 RCW, or to name itself for the work; or within 48 hours after the published bid submittal time, the names of the subcontractors with whom the bidder, if awarded the contract, will subcontract for the work of structural steel installation and rebar installation. The Bidder shall not list more than one subcontractor for each category of work identified, unless subcontractors vary with bid alternates, in which case the bidder must indicate which subcontractor will be used for which alternate. Failure of the bidder to submit as part of the bid the names of such subcontractors or to name itself to perform such work or the naming of two or more subcontractors to perform the same work shall render the bidder’s bid nonresponsive and, therefore, void. The requirement of this section to name the bidders’ proposed heating, ventilation and air conditioning, plumbing and electrical subcontractors applies only to proposed heating, ventilation and air conditioning, plumbing, and electrical subcontractors who will contract directly with the Bidder.

E. The cost of trench safety systems for trench excavation that exceeds a depth of four feet must be identified as a lump sum amount on the Bid Form as well as included in the Base Bid amount. The costs of trench safety systems shall not be considered as incidental to any other contract item, and any attempt to include the trench safety systems as an incidental cost is prohibited. Identification of this amount is an acknowledgment that the bidder has considered proper safety provisions in the estimate but does not relieve the bidder of responsibility for full compliance with all laws and statutes regardless of their actual cost. If this project will involve trench excavation in excess of a depth of four feet, bidder must include a lump sum dollar amount. “N/A” and “zero” are not responsive.

F. Bidders shall acknowledge all addenda by identifying the addendum number(s) in the space provided on the Bid Form. Notwithstanding any automatic notification methods utilized by Bidder, Bidder is responsible for checking Owner’s bid posting website for any addenda issued up to and until the bid opening date and time specified in Section 00 11 00.

G. Bidder shall include in the bid all allowances provided in the Bid Form. Owner will pay the difference if the actual cost exceeds the allowance.

4. TAXES

The bid shall include all taxes imposed by law except Washington State Sales Tax. Sales tax shall not be included in the bid price, except that the retail sales tax upon sales and rentals to prime contractors and subcontractors of tools, equipment, and material primarily for use by the Contractor rather than for resale as a component part of the finished structure, shall be included in the bid price. A proportionate amount of State sales tax will be added to each progress payment, collected from Owner, and paid to the State by Contractor.

5. BID GUARANTEE

Bidder shall furnish a bid guarantee in the form of a firm commitment, such as bid bond, postal money order, cash or cashier's check payable to Owner, in the amount of at least 5% of the base bid. Owner reserves the right to hold the bid guarantees of all bidders until the successful bidder has entered into the contract and furnished the required bonds and insurance certificates, or for a period of 60 days, whichever is the shorter time.

6. FILING FEES

Applicable state laws concerning prevailing wages, hours, workers' compensation and other conditions of employment are called to the attention of bidders for their compliance. Bidder shall include in the bid any filing fees required to comply with applicable labor laws.
7. SPECIFIED PRODUCTS

Bids must be based upon use of items named in the specifications, or approved equals or substitutions. In certain cases, specific items have been named because of operational or maintenance considerations; approval of equals or substitutions should not be assumed.

Requests for approval of equals or substitutions must be made in writing and received by the A/E at least 10 days prior to the date of bid opening. Said request must include complete descriptions, technical data, and performance records. Any approval of the proposed equal or substitution will be made by addendum issued to all bidders. See Section 01 25 00, Substitution Procedures, for instructions.

8. SUBMISSION AND WITHDRAWAL OF BIDS

A. Bids and bid modifications shall be submitted in sealed envelopes or packages (1) addressed to the office specified in the advertisement for bids and (2) showing the project title, bid opening date and time, and the name and address of bidder.

B. Part I of the Bid Form may be modified if in writing and received prior to the deadline for submittal of Part I. Part II of the Bid Form may be modified if in writing and received prior to the deadline for submittal of Part II.

C. Receipt of bids and bid modifications by telegraph, facsimile, telephone, or orally will not be considered.

D. A bidder may withdraw its bid by submitting a written request before the bid opening time. Owner will return the bid unopened after Contract award.

9. LATE SUBMISSIONS

A. Any bid, bid modification or request to withdraw a bid which is received after the deadlines set forth herein will not be considered.

B. The only acceptable evidence to establish the time of receipt at the office designated in the advertisement for bid is the time/date stamped or printed by Owner on the bid wrapper or other documentary evidence of receipt maintained by Owner.

10. BID EVALUATION

Bids which are incomplete, or which are conditioned in any way, or which contain erasures, alterations, or items not called for in the Bid Form, or which are not in conformity with the law or with these Instructions, shall be rejected as nonresponsive if the irregularity is material and may be rejected as nonresponsive if the irregularity is not material. Failure to submit either Part I or Part II of the Bid Form within the allotted times as described in the Advertisement for Bid, Section 00 11 00, shall render the entire bid nonresponsive.

After bid opening, bids will be checked for correctness of bid item price extensions and the total bid price. A discrepancy between the bid item price and the extended amount of any bid item shall be resolved by accepting the bid unit price as correct. The summation of extensions, corrected where necessary, will be used for the purposes of determining the low bidder.

The Bid Form identifies line items for unit bid amounts for time and material pricing (Column A). Each line item includes a column (Column B) with estimated quantities to be used for bid evaluation. The final column (Column C) is the cost extension resulting from multiplying the Bidder’s unit bid amounts (Column A) by the estimated quantity (Column B). The bidder shall complete Columns A and C and
total all amounts in Column C to obtain the total base bid amount. All extensions, and the total base bid amount, will be verified and corrected, if required, by the Owner before award.

If the bid includes a supplemental schedule of unit prices for labor and materials, or other items for the purpose of establishing a cost basis for unforeseen contract changes, Owner reserves the right to reject, without impairing the balance of the bid, any or all such predetermined unit prices.

Owner reserves the right to reject any or all bids and to waive any informalities or nonmaterial irregularities in the bids received.

The determination of the low responsive bid shall be made by Owner based upon any combination of the base bid and alternates which, in Owner's sole discretion, is in Owner's best interest considering price, schedule and other factors. The numbering of the alternates in the Bid Form bears no relationship to the order in which the alternates may be selected by Owner.

In accordance with RCW 39.04.380, for a public works bid received from a nonresident contractor from a state that provides an in-state percentage bidding preference, a Comparable Percentage Disadvantage (CPD) will be applied to the bid of that nonresident contractor. The CPD is the percent advantage provided by the nonresident contractor's home state. For the purpose of determining the successful bidder, Owner will multiply the nonresident contractor bid amount by the CPD. The "bid amount" shall be the total of the base bid and all accepted alternate bid items. The CPD shall be added to the nonresident contractor bid amount to establish the Nonresident Disadvantage Total. The Nonresident Disadvantage Total shall be compared to the Washington state contractor bid amounts.

See example below:

<table>
<thead>
<tr>
<th>Alaska Nonresident Contractor Bid Amount</th>
<th>$100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiplied by the Alaska CPD</td>
<td>x 0.05</td>
</tr>
<tr>
<td>Alaska CPD Total</td>
<td>$ 5,000</td>
</tr>
<tr>
<td>Alaska Nonresident Contractor Bid Amount</td>
<td>$100,000</td>
</tr>
<tr>
<td>Alaska CPD Total</td>
<td>+ $5,000</td>
</tr>
<tr>
<td>Nonresident Disadvantage Total</td>
<td>$105,000</td>
</tr>
</tbody>
</table>

If the Nonresident Disadvantage Total is lower than all other Washington contractor bid amounts, the Alaska nonresident contractor is the low bidder and will be awarded a contract for the bid amount of $100,000, provided that they are determined to be a responsive and responsible bidder.

If the Nonresident Disadvantage Total is higher than a Washington contractor bid amount, the Washington bidder will be awarded a contract for the bid amount, provided that they are determined to be a responsive and responsible bidder.

11. LOW RESPONSIBLE BIDDER

A. It is the intent of Owner to award a contract to the low responsible bidder. Before award, the bidder must meet the following bidder responsibility criteria to be considered a responsible bidder. The bidder may be required by the Owner to submit documentation demonstrating compliance with the criteria. The bidder must:

1. Have a current certificate of registration in compliance with chapter 18.27 RCW, which must have been in effect at the time of bid submittal.

2. Have a current Washington Unified Business Identifier (UBI) number.

3. If applicable:
a. Have Industrial Insurance (workers’ compensation) coverage for the bidder’s employees working in Washington, as required in Title 51 RCW;

b. Have a Washington Employment Security Department number, as required in Title 50 RCW;

c. Have a Washington Department of Revenue state excise tax registration number, as required in Title 82 RCW.

4. Not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065(3).

5. If applicable, provide evidence of the required contractor training from Washington State Department of Labor & Industry. Chapter 39.04.350 and 39.06.020 RCW.

6. Within the three-year period immediately preceding the date of the bid solicitation, not have been determined by a final and binding citation and notice of assessment issued by the Washington Department of Labor and Industries or through a civil judgment entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW 49.48.082, any provision of Chapter 49.46, 49.48, or 49.52 RCW.

7. Not have been found out of compliance by the Washington state apprenticeship and training council for working apprentices out of ratio, without appropriate supervision, or outside their approved work processes as outlined in their standards of apprenticeship under chapter 49.04 RCW for the one-year period immediately preceding the first date of advertising for this project.

B. In addition to the bidder responsibility criteria above, the bidder must also meet the following relevant supplemental bidder responsibility criteria applicable to the project:

1. Performance Evaluations: The Bidder shall not have received one or more overall evaluations of “Deficient” or “Inadequate” as part of the Owner’s Contractor Performance Evaluation Program.

2. Debarment by Owner: The Bidder shall not be currently debarred by the Owner from contracting with the Owner for having received overall evaluations of their performance of “Deficient” or “Inadequate” on three or more projects of the Owner physically completed during the preceding five (5) year period.

C. As evidence that the bidder meets the bidder responsibility criteria in paragraph B above, the apparent low bidder must submit documentation as may be required below to the Owner within 48 hours of the bid submittal deadline. The Owner reserves the right to request such documentation from other bidders also.

1. Performance Evaluations: The Owner shall use its own records of the Bidder’s Performance Evaluation Reports on previous projects to evaluate the Bidder’s compliance with this criterion. The bidder is not required to submit any documentation for this item, unless the bidder has information different from the Owner’s records.

2. Debarment by Owner: The Owner shall use its own records of debarment to evaluate the Bidder’s compliance with this criterion. The bidder is not required to submit any documentation for this item, unless the bidder has information different from the Owner’s records.
D. If the Owner determines the bidder does not meet the bidder responsibility criteria in paragraph B above and is therefore not a responsible bidder, the Owner shall notify the bidder in writing with the reasons for its determination. If the bidder disagrees with this determination, it may appeal the determination within 24 hours of receipt of the Owner’s determination by presenting additional information to the Owner. The Owner will consider the additional information before issuing its final determination. If the final determination affirms that the bidder is not responsible, the Owner will not execute a contract with any other bidder until two business days after the bidder determined to be not responsible has received the final determination.

12. CONTRACT AWARD AND EXECUTION

The formal acceptance by the Owner of the lowest responsive bid of a responsible bidder will be in the form of a notice of award of public works contract issued by the Owner to the bidder. Within 7 days of the notice of award date, bidder shall submit an executed Contract (see Appendix A); certificate of insurance and endorsements as required in the Contract Documents; and Payment and Performance Bonds using AIA Document A312, most current edition, or other form acceptable to Owner, in Contract Award Amount plus Washington State Sales Tax. If the successful bidder, after award of the Contract, fails to execute all Contract Documents or provide insurance documentation and bonds as required within the time specified, Owner may revoke award of the Contract and the bid guarantee may be retained by Owner.

END OF SECTION
BID FORM

- **PART I:** (To be submitted no later than 2:00 p.m. on the bid submittal date indicated in Section 00 11 00).

TO: Board of Regents
University of Washington
Seattle, Washington 98195

The undersigned Bidder submits the following bid:

**BASE BID:**

Pursuant to and in compliance with the Contract Documents, including the Advertisement for Bids and Instructions for Bidders, the Bidder hereby certifies that it has carefully examined the Contract Documents entitled:

UW MV Electrical Upgrades
Prepared by Casne Engineering Inc

and the conditions affecting the Work, and being familiar with the site; and having made the necessary examinations, proposes to furnish all labor, materials, equipment, and services necessary to complete the Work in strict accordance with the Contract Documents for the above-named project for the following sum, which is hereby designated as the Base Bid:

<table>
<thead>
<tr>
<th>Base Bid</th>
</tr>
</thead>
</table>

**ALTERNATE BIDS:**

<table>
<thead>
<tr>
<th>Alternate No.:</th>
<th>Description of Alternate Bids</th>
<th>Type of Alternate</th>
<th>Alternate Bid Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>CP3-CP7 MV CABLE REPLACEMENT</td>
<td>Additive</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>JOHN WALLACE TRANSFORMER REPLACEMENT</td>
<td>Additive</td>
<td></td>
</tr>
</tbody>
</table>

**REINSTATEMENT OF ALTERNATE BIDS:**

The undersigned Bidder agrees that the Owner has the right, for a period of 60 days following the bid submittal deadline, to initiate or rescind acceptance of any Alternate Bid in the amount(s) quoted above.
SALES TAX:

None of the sums stated in the foregoing include Washington State Sales Tax, except as designated in Article 4 of the Instructions for Bidders.

TIME OF COMPLETION AND LIQUIDATED DAMAGES:

The undersigned Bidder agrees, if awarded the Contract, to complete the Work of the Contract within the number of calendar days specified in Supplemental Conditions, Section 00 73 00, and also agrees to the amounts specified for Liquidated Damages. It is further agreed that the time for completion of the Work described herein is a reasonable time considering the average climatic range and usual industrial conditions prevailing in the locality.

TRENCH EXCAVATION SAFETY PROVISIONS:

If the Contract Documents contain any work which requires trenching exceeding a depth of four feet, all costs for adequate trench safety systems shall be identified as a separate bid item in compliance with Chapter 39.04 RCW and WAC 296-155-650. The purpose of this provision is to ensure that the Bidder agrees to comply with all the relevant trench safety requirements of Chapter 49.17 RCW. This bid amount shall be considered as part of the Base Bid set forth above. Bidder must include a lump sum dollar amount in blank below (even if the value is $0.00) to be responsive.

Trench Excavation Safety Provisions Only: N/A

CONTRACT AND BONDS:

If the Owner awards a contract based on this bid within sixty (60) days of the bid submittal deadline, the Bidder agrees to execute a contract for the above work, for compensation computed from the above stated sums, on the University of Washington Public Works Contract form, and to furnish Payment and Performance Bonds and acceptable evidence of insurance as required by the Contract Documents.

BID GUARANTEE:

Pursuant to paragraph 5 of the Instruction to Bidders, Section 00 21 00, Bidder hereby certifies that it has furnished a bid guarantee for no less than 5% of the base bid, and that such guarantee accompanies this Bid Form.

The successful bidder shall submit an executed Contract, Payment and Performance Bonds, and acceptable evidence of insurance within seven (7) days after receipt of award notice and Public Works Contract form from the Owner. If the successful bidder, upon award of a contract by the Owner, fails to execute the Public Works Contract or submit the Payment and Performance Bonds and acceptable evidence of insurance as required within the time specified, Owner may revoke the award. Should the successful bidder fail to enter into a contract with Owner, the bid guarantee may be retained by Owner as liquidated damages, not as a penalty.

If a contract is not awarded within sixty (60) days after the bid submittal deadline, or if the bidder delivers a signed Public Works Contract, Payment and Performance Bonds, and acceptable evidence of insurance, then the certified or cashier’s check or cash submitted as the bid guarantee shall be returned to the bidder, or the Bid Bond shall become void.
Bidder’s Business Name:

Type of Business:
- [ ] Sole Proprietorship  [ ] Partnership  [ ] Corporation (State of Incorporation:___)  [ ] Other

Physical Business Address (Must not be a P.O. Box):

City:  State:  Zip Code:

Business Telephone Number:  Business Fax Number:  Business E-mail Address:

State of Washington numbers for the following:

Contractor Registration No.:  UBI No.:  Employment Security Dept. No.:

Receipt is hereby acknowledged of Addenda No(s).: _____   _____   _____   _____   _____   _____

Bidder is in compliance with the responsible bidder criteria requirement of RCW 39.04.350(1)(g).

OFFICIAL AUTHORIZED TO SIGN FOR BIDDER:

"I certify (or declare) under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct":

Signature:  Date:

Print Name and Title  Location or Place Executed: (City, State)

BID FORM:

- **PART II:** (To be submitted no later than 3:00 p.m. on the bid submittal date indicated in Section 00 11 00).

Bidder’s Business Name:

A. Heating, Ventilation and Air Conditioning (HVAC), Plumbing, Electrical, Structural Steel Installation, and Rebar Installation subcontractors

List here the names of the subcontractors with whom the Bidder, if awarded the contract, will subcontract for performance of the work of HVAC, plumbing (as described in chapter 18.106 RCW) and electrical (as described in chapter 19.28 RCW), structural steel installation, rebar installation, or to name itself for the
work. Substitution of any listed subcontractor may only be according to the procedure and parameters set forth in RCW 39.30.060.

<table>
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<tr>
<th>Subcontractor Name</th>
<th>Work To Be Performed</th>
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<td>Rebar Installation</td>
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**B. Structural Steel Installation and Rebar Installation subcontractors.**

RCW 39.30.060.1.b, allows for the bidder to submit within forty-eight hours of the published bid submittal time, the names of the subcontractors with whom the Bidder will subcontract for the performance of the work of structural steel installation and rebar installation. Please indicate whether bidder intends to submit the names of subcontractors for the structural steel installation and rebar installation along with the bid, or will submit within forty-eight hours.

Bidder has included subcontractor names for structural steel installation and rebar installation on this form

- [ ] Yes  
- [ ] No

Bidder intends to submit subcontractor names for structural steel installation and rebar installation within forty-eight hours of the bid submittal date and time as indicated in Section 00 11 00. Failure of the bidder to submit subcontractor names within the time-frame will render the bidder's bid nonresponsive and void.

- [ ] Yes  
- [ ] No

If subcontractors vary with Alternate Bids, Bidder must indicate which subcontractor will be used for which Alternate Bid.

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<tr>
<th>Alternate #</th>
<th>Subcontractor Name</th>
<th>Work to be Performed</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td>Electrical</td>
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<td>Plumbing</td>
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</tr>
</tbody>
</table>

| 2           |                    | Electrical            |
|             |                    | Plumbing              |
|             |                    | HVAC                  |
|             |                    | Structural Steel Installation |
|             |                    | Rebar Installation    |

**END OF SECTION**
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PART 1 – GENERAL PROVISIONS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.01</td>
<td>Definitions</td>
<td>3</td>
</tr>
<tr>
<td>1.02</td>
<td>Order of Precedence</td>
<td>4</td>
</tr>
<tr>
<td>1.03</td>
<td>Execution and Intent</td>
<td>5</td>
</tr>
<tr>
<td><strong>PART 2 – INSURANCE AND BONDS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.01</td>
<td>Contractor’s Liability Insurance</td>
<td>5</td>
</tr>
<tr>
<td>2.02</td>
<td>Coverage Limits</td>
<td>6</td>
</tr>
<tr>
<td>2.03</td>
<td>Insurance Coverage Certificates</td>
<td>6</td>
</tr>
<tr>
<td>2.04</td>
<td>Payment and Performance Bonds</td>
<td>6</td>
</tr>
<tr>
<td>2.05</td>
<td>Alternative Surety</td>
<td>7</td>
</tr>
<tr>
<td>2.06</td>
<td>Builder’s Risk</td>
<td>7</td>
</tr>
<tr>
<td><strong>PART 3 – TIME AND SCHEDULE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.01</td>
<td>Progress and Completion</td>
<td>7</td>
</tr>
<tr>
<td>3.02</td>
<td>Construction Schedule</td>
<td>7</td>
</tr>
<tr>
<td>3.03</td>
<td>Owner’s Right to Suspend the Work for Convenience</td>
<td>8</td>
</tr>
<tr>
<td>3.04</td>
<td>Owner’s Right to Stop the Work for Cause</td>
<td>9</td>
</tr>
<tr>
<td>3.05</td>
<td>Delay</td>
<td>9</td>
</tr>
<tr>
<td>3.06</td>
<td>Notice to Owner of Labor Disputes</td>
<td>10</td>
</tr>
<tr>
<td>3.07</td>
<td>Damages for Failure to Achieve Timely Completion</td>
<td>10</td>
</tr>
<tr>
<td><strong>PART 4 – SPECIFICATIONS, DRAWINGS, AND OTHER DOCUMENTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.01</td>
<td>Discrepancies and Contract Document Review</td>
<td>11</td>
</tr>
<tr>
<td>4.02</td>
<td>Project Record</td>
<td>11</td>
</tr>
<tr>
<td>4.03</td>
<td>Shop Drawings</td>
<td>12</td>
</tr>
<tr>
<td>4.04</td>
<td>Organization of Specifications</td>
<td>13</td>
</tr>
<tr>
<td>4.05</td>
<td>Ownership and Use of Drawings, Specifications &amp; other Documents</td>
<td>13</td>
</tr>
<tr>
<td><strong>PART 5 – PERFORMANCE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.01</td>
<td>Contractor Control and Supervision</td>
<td>13</td>
</tr>
<tr>
<td>5.02</td>
<td>Permits, Fees and Notices</td>
<td>14</td>
</tr>
<tr>
<td>5.03</td>
<td>Patents and Royalties</td>
<td>14</td>
</tr>
<tr>
<td>5.04</td>
<td>Prevailing Wages</td>
<td>15</td>
</tr>
<tr>
<td>5.05</td>
<td>Hours of Labor</td>
<td>15</td>
</tr>
<tr>
<td>5.06</td>
<td>Nondiscrimination</td>
<td>16</td>
</tr>
<tr>
<td>5.07</td>
<td>Safety Precautions</td>
<td>16</td>
</tr>
<tr>
<td>5.08</td>
<td>Operations, Material Handling, and Storage Areas</td>
<td>18</td>
</tr>
<tr>
<td>5.09</td>
<td>Prior Notice of Excavation</td>
<td>19</td>
</tr>
<tr>
<td>5.10</td>
<td>Unforeseen Physical Conditions</td>
<td>19</td>
</tr>
<tr>
<td>5.11</td>
<td>Protection of Existing Structures, Equipment, Vegetation, Utilities, &amp; Improvements</td>
<td>19</td>
</tr>
<tr>
<td>5.12</td>
<td>Layout of Work</td>
<td>19</td>
</tr>
<tr>
<td>5.13</td>
<td>Material and Equipment</td>
<td>20</td>
</tr>
<tr>
<td>5.14</td>
<td>Availability and Use of Utility Services</td>
<td>20</td>
</tr>
<tr>
<td>5.15</td>
<td>Tests and Inspections</td>
<td>20</td>
</tr>
<tr>
<td>5.16</td>
<td>Correction of Nonconforming Work</td>
<td>21</td>
</tr>
<tr>
<td>5.17</td>
<td>Clean Up</td>
<td>22</td>
</tr>
<tr>
<td>5.18</td>
<td>Access to Work</td>
<td>22</td>
</tr>
<tr>
<td>5.19</td>
<td>Other Contracts</td>
<td>23</td>
</tr>
<tr>
<td>5.20</td>
<td>Subcontractors and Suppliers</td>
<td>23</td>
</tr>
<tr>
<td>5.21</td>
<td>Warranty of Construction</td>
<td>24</td>
</tr>
</tbody>
</table>
PART 5 – PERFORMANCE (continued)
5.22 Indemnification........................................................................................................ 25

PART 6 – PAYMENTS AND COMPLETION
6.01 Contract Sum............................................................................................................. 25
6.02 Schedule of Values.................................................................................................... 25
6.03 Application for Payment............................................................................................ 25
6.04 Progress Payments.................................................................................................... 26
6.05 Payments Withheld.................................................................................................... 27
6.06 Retainage and Bond Claim Rights............................................................................ 27
6.07 Substantial Completion............................................................................................. 27
6.08 Prior Occupancy........................................................................................................ 28
6.09 Final Completion, Acceptance, and Payment.......................................................... 28

PART 7 – CHANGES
7.01 Change in the Work................................................................................................... 28
7.02 Change in the Contract Sum....................................................................................... 30
7.03 Change in the Contract Time..................................................................................... 36

PART 8 – CLAIMS AND DISPUTE RESOLUTION
8.01 Claims Procedure....................................................................................................... 38
8.02 Arbitration................................................................................................................ 39
8.03 Claims Audits............................................................................................................ 40

PART 9 – TERMINATION OF THE WORK
9.01 Termination by Owner for Cause.............................................................................. 41
9.02 Termination by Owner for Convenience.................................................................... 42

PART 10 – MISCELLANEOUS PROVISIONS
10.01 Governing Law......................................................................................................... 43
10.02 Successors and Assigns........................................................................................... 43
10.03 Meaning of Words.................................................................................................... 43
10.04 Rights and Remedies............................................................................................... 44
10.05 Contractor Registration............................................................................................. 44
10.06 Time Computations.................................................................................................. 44
10.07 Records Retention..................................................................................................... 44
10.08 Third-Party Agreements......................................................................................... 44
10.09 Antitrust Assignments.............................................................................................. 44
10.10 Headings and Captions.......................................................................................... 44

July 1, 2010
PART 1 – GENERAL PROVISIONS

1.01 DEFINITIONS

A. “Application for Payment” means a written request submitted by Contractor to A/E for payment of Work completed in accordance with the Contract Documents and approved Schedule of Values, supported by such substantiating data as Owner or A/E may require.

B. “Architect,” “Engineer,” or “A/E” means a person or entity lawfully entitled to practice architecture or engineering, representing Owner within the limits of its delegated authority.

C. “Change Order” means a written instrument signed by Owner and Contractor stating their agreement upon all of the following: (1) a change in the Work; (2) the amount of the adjustment in the Contract Sum, if any, and (3) the extent of the adjustment in the Contract Time, if any.

D. “Claim” means Contractor’s exclusive remedy for resolving disputes with Owner regarding the terms of a Change Order or a request for equitable adjustment, as more fully set forth in Part 8.

E. “Contract Award Amount” is the sum of the Base Bid and any accepted Alternates.

F. “Contract Documents” means the Advertisement for Bids, Instructions for Bidders, completed Bid Form, General Conditions, Modifications to the General Conditions, Supplemental Conditions, Public Works Contract, other Special Forms, Drawings and Specifications, and all addenda and modifications thereof.

G. “Contract Sum” is the total amount payable by Owner to Contractor, for performance of the Work in accordance with the Contract Documents, including all taxes imposed by law and properly chargeable to the Work, except Washington State sales tax.

H. “Contract Time” is the number of calendar days allotted in the Contract Documents for achieving Substantial Completion of the Work.

I. “Contractor” means the person or entity who has agreed with Owner to perform the Work in accordance with the Contract Documents.

J. “Day(s):” Unless otherwise specified, day(s) shall mean calendar day(s).”

K. “Drawings” are the graphic and pictorial portions of the Contract Documents showing the design, location, and dimensions of the Work, and may include plans, elevations, sections, details, schedules, and diagrams.

L. “Final Acceptance” means the written acceptance issued to Contractor by Owner after Contractor has completed the requirements of the Contract Documents, as more fully set forth in Section 6.09 B.

M. “Final Completion” means that the Work is fully and finally complete in accordance with the Contract Documents, as more fully set forth in Section 6.09 A.

N. “Force Majeure” means those acts entitling Contractor to request an equitable adjustment in the Contract Time, as more fully set forth in paragraph 3.05A.

O. “Notice” means a written notice which has been delivered in person to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended or, if delivered or sent by registered or certified mail, to the last business address known to the party giving notice.
P. “Notice to Proceed” means a notice from Owner to Contractor that defines the date on which the Contract Time begins to run.

Q. “Owner” means the state agency, institution, or its authorized representative with the authority to enter into, administer, and/or terminate the Work in accordance with the Contract Documents and make related determinations and findings.

R. “Person” means a corporation, partnership, business association of any kind, trust, company, or individual.

S. “Prior Occupancy” means Owner’s use of all or parts of the Project before Substantial Completion, as more fully set forth in Section 6.08 A.

T. “Progress Schedule” means a schedule of the Work, in a form satisfactory to Owner, as further set forth in Section 3.02.

U. “Project” means the total construction of which the Work performed in accordance with the Contract Documents may be the whole or a part and which may include construction by Owner or by separate contractors.

V. “Project Record” means the separate set of Drawings and Specifications as further set forth in paragraph 4.02A.

W. “Schedule of Values” means a written breakdown allocating the total Contract Sum to each principal category of Work, in such detail as requested by Owner.

X. “Specifications” are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services.

Y. “Subcontract” means a contract entered into by Subcontractor for the purpose of obtaining supplies, materials, equipment, or services of any kind for or in connection with the Work.

Z. “Subcontractor” means any person, other than Contractor, who agrees to furnish or furnishes any supplies, materials, equipment, or services of any kind in connection with the Work.

AA. “Substantial Completion” means that stage in the progress of the Work when the construction is sufficiently complete, as more fully set forth in Section 6.07.

AB. “Work” means the construction and services required by the Contract Documents, and includes, but is not limited to, labor, materials, supplies, equipment, services, permits, and the manufacture and fabrication of components, performed, furnished, or provided in accordance with the Contract Documents.

1.02 ORDER OF PRECEDENCE

Any conflict or inconsistency in the Contract Documents shall be resolved by giving the documents precedence in the following order:

1. Signed Public Works Contract, including any Change Orders.

2. Supplemental Conditions.

3. Modifications to the General Conditions.

4. General Conditions.
5. Specifications. Provisions in Division 1 shall take precedence over provisions of any other Division.

6. Drawings. In case of conflict within the Drawings, large scale drawings shall take precedence over small scale drawings.

7. Signed and Completed Bid Form.

8. Instructions to Bidders.

9. Advertisement for Bids.

1.03 EXECUTION AND INTENT

Contractor Representations: Contractor makes the following representations to Owner:

1. **Contract Sum reasonable:** The Contract Sum is reasonable compensation for the Work and the Contract Time is adequate for the performance of the Work, as represented by the Contract Documents;

2. **Contractor familiar with project:** Contractor has carefully reviewed the Contract Documents, visited and examined the Project site, become familiar with the local conditions in which the Work is to be performed, and satisfied itself as to the nature, location, character, quality and quantity of the Work, the labor, materials, equipment, goods, supplies, work, services and other items to be furnished and all other requirements of the Contract Documents, as well as the surface and subsurface conditions and other matters that may be encountered at the Project site or affect performance of the Work or the cost or difficulty thereof;

3. **Contractor financially capable:** Contractor is financially solvent, able to pay its debts as they mature, and possesses sufficient working capital to complete the Work and perform Contractor's obligations required by the Contract Documents; and

4. **Contractor can complete Work:** Contractor is able to furnish the plant, tools, materials, supplies, equipment and labor required to complete the Work and perform the obligations required by the Contract Documents and has sufficient experience and competence to do so.

PART 2 – INSURANCE AND BONDS

2.01 CONTRACTOR’S LIABILITY INSURANCE

General insurance requirements: Prior to commencement of the Work, Contractor shall obtain all the insurance required by the Contract Documents and provide evidence satisfactory to Owner that such insurance has been procured. Review of the Contractor’s insurance by Owner shall not relieve or decrease the liability of Contractor. Companies writing the insurance to be obtained by this part shall be licensed to do business under Chapter 48 RCW or comply with the Surplus Lines Law of the State of Washington. Contractor shall include in its bid the cost of all insurance and bond costs required to complete the base bid work and accepted alternates. Insurance carriers providing insurance in accordance with the Contract Documents shall be acceptable to Owner, and its A.M. Best rating shall be indicated on the insurance certificates.

A. **Term of insurance coverage:** Contractor shall maintain the following insurance coverage during the Work and for one year after Final Acceptance. Contractor shall also maintain the following insurance coverage during the performance of any corrective Work required by Section 5.16.
1. **General Liability Insurance**: Commercial General Liability (CGL) on an Occurrence Form. Coverage shall include, but not be limited to:
   a. Completed operations/products liability;
   b. Explosion, collapse, and underground; and
   c. Employer’s liability coverage.

2. **Automobile Liability Insurance**: Automobile liability

   B. **Industrial Insurance compliance**: Contractor shall comply with the Washington State Industrial Insurance Act and, if applicable, the Federal Longshoremen’s and Harbor Workers’ Act and the Jones Act.

   C. **Insurance to protect for the following**: All insurance coverages shall protect against claims for damages for personal and bodily injury or death, as well as claims for property damage, which may arise from operations in connection with the Work whether such operations are by Contractor or any Subcontractor.

   D. **Owner as Additional Insured**: All insurance coverages shall be endorsed to include Owner as an additional named insured for Work performed in accordance with the Contract Documents, and all insurance certificates shall evidence the Owner as an additional insured.

### 2.02 COVERAGE LIMITS

**Insurance amounts**: The coverage limits shall be as follows:

A. Limits of Liability shall not be less than $1,000,000 Combined Single Limit for Bodily Injury and Property Damage (other than Automobile Liability) Each Occurrence; Personal Injury and Advertising Liability Each Occurrence.

B. $2,000,000 Combined Single Limit Annual General Aggregate.

C. $2,000,000 Annual Aggregate for Products and Completed Operations Liability.

D. $1,000,000 Combined Single Limit for Automobile Bodily Injury and Property Damage Liability, Each Accident or Loss.

### 2.03 INSURANCE COVERAGE CERTIFICATES

A. **Certificate required**: Prior to commencement of the Work, Contractor shall furnish to Owner a completed certificate of insurance coverage.

B. **List Project info**: All insurance certificates shall name Owner’s Project number and Project title.

C. **Cancellation provisions**: All insurance certificates shall specifically require 45 Days prior notice to Owner of cancellation or any material change, except 30 Days for surplus line insurance.

### 2.04 PAYMENT AND PERFORMANCE BONDS

**Conditions for bonds**: Payment and performance bonds for 100% of the Contract Award Amount, plus state sales tax, shall be furnished for the Work, using the Payment Bond and Performance Bond form published by and available from the American Institute of Architects (AIA) – form A312. Prior to execution of a Change Order that, cumulatively with previous Change Orders, increases the Contract Award Amount by 15% or more, the Contractor shall provide either new payment and performance bonds for the
revised Contract Sum, or riders to the existing payment and performance bonds increasing the amount of the bonds. The Contractor shall likewise provide additional bonds or riders when subsequent Change Orders increase the Contract Sum by 15% or more. No payment or performance bond is required if the Contract Sum is $35,000 or less and Contractor agrees that Owner may, in lieu of the bond, retain 50% of the Contract Sum for the period allowed by RCW 39.08.010.

2.05 ALTERNATIVE SURETY

When alternative surety required: Contractor shall promptly furnish payment and performance bonds from an alternative surety as required to protect Owner and persons supplying labor or materials required by the Contract Documents if:

A. Owner has a reasonable objection to the surety; or

B. Any surety fails to furnish reports on its financial condition if required by Owner.

2.06 BUILDER’S RISK

A. Contractor to buy Property Insurance: Contractor shall purchase and maintain property insurance in the amount of the Contract Sum including all Change Orders for the Work on a replacement cost basis until Substantial Completion. For projects not involving New Building Construction, “Installation Floater” is an acceptable substitute for the Builder’s Risk Insurance. The insurance shall cover the interest of Owner, Contractor, and any Subcontractors, as their interests may appear.

B. Losses covered: Contractor property insurance shall be placed on an “all risk” basis and insure against the perils of fire and extended coverage and physical loss or damage including theft, vandalism, malicious mischief, collapse, false work, temporary buildings, debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for A/E’s services and expenses required as a result of an insured loss.

C. Waiver of subrogation rights: Owner and Contractor waive all subrogation rights against each other, any Subcontractors, A/E, A/E’s subconsultants, separate contractors described in Section 5.20, if any, and any of their subcontractors, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this section or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by Owner as fiduciary. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

PART 3 – TIME AND SCHEDULE

3.01 PROGRESS AND COMPLETION

Contractor to meet schedule: Contractor shall diligently prosecute the Work, with adequate forces, achieve Substantial Completion within the Contract Time, and achieve Final Completion within a reasonable period thereafter.

3.02 CONSTRUCTION SCHEDULE

A. Preliminary Progress Schedule: Unless otherwise provided in Division 1, Contractor shall, within 14 Days after issuance of the Notice to Proceed, submit a preliminary Progress Schedule. The Progress Schedule shall show the sequence in which Contractor proposes to perform the Work,
and the dates on which Contractor plans to start and finish major portions of the Work, including dates for shop drawings and other submittals, and for acquiring materials and equipment.

B. **Form of Progress Schedule:** Unless otherwise provided in Division 1, the Progress Schedule shall be in the form of a bar chart, or a critical path method analysis, as specified by Owner. The preliminary Progress Schedule may be general, showing the major portions of the Work, with a more detailed Progress Schedule submitted as directed by Owner.

C. **Owner comments on Progress Schedule:** Owner shall return comments on the preliminary Progress Schedule to Contractor within 14 Days of receipt. Review by Owner of Contractor’s schedule does not constitute an approval or acceptance of Contractor’s construction means, methods, or sequencing, or its ability to complete the Work within the Contract Time. Contractor shall revise and resubmit its schedule, as necessary. Owner may withhold a portion of progress payments until a Progress Schedule has been submitted which meets the requirements of this section.

D. **Monthly updates and compliance with Progress Schedule:** Contractor shall utilize and comply with the Progress Schedule. On a monthly basis, or as otherwise directed by Owner, Contractor shall submit an updated Progress Schedule at its own expense to Owner indicating actual progress. If, in the opinion of Owner, Contractor is not in conformance with the Progress Schedule for reasons other than acts of Force Majeure as identified in Section 3.05, Contractor shall take such steps as are necessary to bring the actual completion dates of its work activities into conformance with the Progress Schedule, and if directed by Owner, Contractor shall submit a corrective action plan or revise the Progress Schedule to reconcile with the actual progress of the Work.

E. **Contractor to notify Owner of delays:** Contractor shall promptly notify Owner in writing of any actual or anticipated event which is delaying or could delay achievement of any milestone or performance of any critical path activity of the Work. Contractor shall indicate the expected duration of the delay, the anticipated effect of the delay on the Progress Schedule, and the action being or to be taken to correct the problem. Provision of such notice does not relieve Contractor of its obligation to complete the Work within the Contract Time.

### 3.03 OWNER’S RIGHT TO SUSPEND THE WORK FOR CONVENIENCE

A. **Owner may suspend Work:** Owner may, at its sole discretion, order Contractor, in writing, to suspend all or any part of the Work for up to 90 Days, or for such longer period as mutually agreed.

B. **Compliance with suspension; Owner’s options:** Upon receipt of a written notice suspending the Work, Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of cost of performance directly attributable to such suspension. Within a period up to 90 Days after the notice is delivered to Contractor, or within any extension of that period to which the parties shall have agreed, Owner shall either:

1. Cancel the written notice suspending the Work; or

2. Terminate the Work covered by the notice as provided in the termination provisions of Part 9.

C. **Resumption of Work:** If a written notice suspending the Work is cancelled or the period of the notice or any extension thereof expires, Contractor shall resume Work.

D. **Equitable Adjustment for suspensions:** Contractor shall be entitled to an equitable adjustment in the Contract Time, or Contract Sum, or both, for increases in the time or cost of performance.
directly attributable to such suspension, provided Contractor complies with all requirements set forth in Part 7.

### 3.04 OWNER’S RIGHT TO STOP THE WORK FOR CAUSE

A. **Owner may stop Work for Contractor’s failure to perform:** If Contractor fails or refuses to perform its obligations in accordance with the Contract Documents, Owner may order Contractor, in writing, to stop the Work, or any portion thereof, until satisfactory corrective action has been taken.

B. **No Equitable Adjustment for Contractor’s failure to perform:** Contractor shall not be entitled to an equitable adjustment in the Contract Time or Contract Sum for any increased cost or time of performance attributable to Contractor’s failure or refusal to perform or from any reasonable remedial action taken by Owner based upon such failure.

### 3.05 DELAY

A. **Force Majeure actions not a default; Force Majeure defined:** Any delay in or failure of performance by Owner or Contractor, other than the payment of money, shall not constitute a default hereunder if and to the extent the cause for such delay or failure of performance was unforeseeable and beyond the control of the party ("Force Majeure"). Acts of Force Majeure include, but are not limited to:

1. Acts of God or the public enemy;
2. Acts or omissions of any government entity;
3. Fire or other casualty for which Contractor is not responsible;
4. Quarantine or epidemic;
5. Strike or defensive lockout;
6. Unusually severe weather conditions which could not have been reasonably anticipated; and
7. Unusual delay in receipt of supplies or products which were ordered and expedited and for which no substitute reasonably acceptable to Owner was available.

B. **Contract Time adjustment for Force Majeure:** Contractor shall be entitled to an equitable adjustment in the Contract Time for changes in the time of performance directly attributable to an act of Force Majeure, provided it makes a request for equitable adjustment according to Section 7.03. Contractor shall not be entitled to an adjustment in the Contract Sum resulting from an act of Force Majeure.

C. **Contract Time or Contract Sum adjustment if Owner at fault:** Contractor shall be entitled to an equitable adjustment in Contract Time, and may be entitled to an equitable adjustment in Contract Sum, if the cost or time of Contractor’s performance is changed due to the fault or negligence of Owner, provided the Contractor makes a request according to Sections 7.02 and 7.03.

D. **No Contract Time or Contract Sum adjustment if Contractor at fault:** Contractor shall not be entitled to an adjustment in Contract Time or in the Contract Sum for any delay or failure of performance to the extent such delay or failure was caused by Contractor or anyone for whose acts Contractor is responsible.

July 1, 2010
E. **Contract Time adjustment only for concurrent fault:** To the extent any delay or failure of performance was concurrently caused by the Owner and Contractor, Contractor shall be entitled to an adjustment in the Contract Time for that portion of the delay or failure of performance that was concurrently caused, provided it makes a request for equitable adjustment according to Section 7.03, but shall not be entitled to an adjustment in Contract Sum.

F. **Contractor to mitigate delay impacts:** Contractor shall make all reasonable efforts to prevent and mitigate the effects of any delay, whether occasioned by an act of Force Majeure or otherwise.

3.06 **NOTICE TO OWNER OF LABOR DISPUTES**

A. **Contractor to notify Owner of labor disputes:** If Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay timely performance in accordance with the Contract Documents, Contractor shall immediately give notice, including all relevant information, to Owner.

B. **Pass through notification provisions to Subcontractors:** Contractor agrees to insert a provision in its Subcontracts and to require insertion in all sub-subcontracts, that in the event timely performance of any such contract is delayed or threatened by delay by any actual or potential labor dispute, the Subcontractor or Sub-subcontractor shall immediately notify the next higher tier Subcontractor or Contractor, as the case may be, of all relevant information concerning the dispute.

3.07 **DAMAGES FOR FAILURE TO ACHIEVE TIMELY COMPLETION**

A. **Liquidated Damages**

1. **Reason for Liquidated Damages:** Timely performance and completion of the Work is essential to Owner and time limits stated in the Contract Documents are of the essence. Owner will incur serious and substantial damages if Substantial Completion of the Work does not occur within the Contract Time. However, it would be difficult if not impossible to determine the exact amount of such damages. Consequently, provisions for liquidated damages are included in the Contract Documents.

2. **Calculation of Liquidated Damages amount:** The liquidated damage amounts set forth in the Contract Documents will be assessed not as a penalty, but as liquidated damages for breach of the Contract Documents. This amount is fixed and agreed upon by and between the Contractor and Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain. This amount shall be construed as the actual amount of damages sustained by the Owner, and may be retained by the Owner and deducted from periodic payments to the Contractor.

3. **Contractor responsible even if Liquidated Damages assessed:** Assessment of liquidated damages shall not release Contractor from any further obligations or liabilities pursuant to the Contract Documents.

B. **Actual Damages**

**Calculation of Actual Damages:** Actual damages will be assessed for failure to achieve Final Completion within the time provided. Actual damages will be calculated on the basis of direct architectural, administrative, and other related costs attributable to the Project from the date when Final Completion should have been achieved, based on the date Substantial Completion is actually achieved, to the date Final Completion is actually achieved. Owner may offset these costs against any payment due Contractor.
PART 4 – SPECIFICATIONS, DRAWINGS, AND OTHER DOCUMENTS

4.01 DISCREPANCIES AND CONTRACT DOCUMENT REVIEW

A. Specifications and Drawings are basis of the Work: The intent of the Specifications and Drawings is to describe a complete Project to be constructed in accordance with the Contract Documents. Contractor shall furnish all labor, materials, equipment, tools, transportation, permits, and supplies, and perform the Work required in accordance with the Drawings, Specifications, and other provisions of the Contract Documents.

B. Parts of the Contract Documents are complementary: The Contract Documents are complementary. What is required by one part of the Contract Documents shall be binding as if required by all. Anything mentioned in the Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Specifications, shall be of like effect as if shown or mentioned in both.

C. Contractor to report discrepancies in Contract Documents: Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by Owner. If, during the performance of the Work, Contractor finds a conflict, error, inconsistency, or omission in the Contract Documents, it shall promptly and before proceeding with the Work affected thereby, report such conflict, error, inconsistency, or omission to A/E in writing.

D. Contractor knowledge of discrepancy in documents – responsibility: Contractor shall do no Work without applicable Drawings, Specifications, or written modifications, or Shop Drawings where required, unless instructed to do so in writing by Owner. If Contractor performs any construction activity, and it knows or reasonably should have known that any of the Contract Documents contain a conflict, error, inconsistency, or omission, Contractor shall be responsible for the performance and shall bear the cost for its correction.

E. Contractor to perform Work implied by Contract Documents: Contractor shall provide any work or materials the provision of which is clearly implied and is within the scope of the Contract Documents even if the Contract Documents do not mention them specifically.

F. Interpretation questions referred to A/E: Questions regarding interpretation of the requirements of the Contract Documents shall be referred to the A/E.

4.02 PROJECT RECORD

A. Contractor to maintain Project Record Drawings and Specifications: Contractor shall legibly mark in ink on a separate set of the Drawings and Specifications all actual construction, including depths of foundations, horizontal and vertical locations of internal and underground utilities and appurtenances referenced to permanent visible and accessible surface improvements, field changes of dimensions and details, actual suppliers, manufacturers and trade names, models of installed equipment, and Change Order Proposals (COP). This separate set of Drawings and Specifications shall be the “Project Record.”

B. Update Project Record weekly and keep on site: The Project Record shall be maintained on the project site throughout the construction and shall be clearly labeled “PROJECT RECORD.” The Project Record shall be updated at least weekly noting all changes and shall be available to Owner at all times.

C. Final Project Record to A/E before Final Acceptance: Contractor shall submit the completed and finalized Project Record to A/E prior to Final Acceptance.
4.03 SHOP DRAWINGS

A. Definition of Shop Drawings: "Shop Drawings" means documents and other information required to be submitted to A/E by Contractor pursuant to the Contract Documents, showing in detail: the proposed fabrication and assembly of structural elements; and the installation (i.e. form, fit, and attachment details) of materials and equipment. Shop Drawings include, but are not limited to, drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, samples, and similar materials furnished by Contractor to explain in detail specific portions of the Work required by the Contract Documents. For materials and equipment to be incorporated into the Work, Contractor submittal shall include the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the item. When directed, Contractor shall submit all samples at its own expense. Owner may duplicate, use, and disclose Shop Drawings provided in accordance with the Contract Documents.

B. Approval of Shop Drawings by Contractor and A/E: Contractor shall coordinate all Shop Drawings, and review them for accuracy, completeness, and compliance with the Contract Documents and shall indicate its approval thereon as evidence of such coordination and review. Where required by law, Shop Drawings shall be stamped by an appropriate professional licensed by the state of Washington. Shop Drawings submitted to A/E without evidence of Contractor's approval shall be returned for resubmission. Contractor shall review, approve, and submit Shop Drawings with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of Owner or separate contractors. Contractor's submittal schedule shall allow a reasonable time for A/E review. A/E will review, approve, or take other appropriate action on the Shop Drawings. Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings until the respective submittal has been reviewed and the A/E has approved or taken other appropriate action. Owner and A/E shall respond to Shop Drawing submittals with reasonable promptness. Any Work by Contractor shall be in accordance with reviewed Shop Drawings. Submittals made by Contractor which are not required by the Contract Documents may be returned without action.

C. Contractor not relieved of responsibility when Shop Drawings approved: Approval, or other appropriate action with regard to Shop Drawings, by Owner or A/E shall not relieve Contractor of responsibility for any errors or omissions in such Shop Drawings, nor from responsibility for compliance with the requirements of the Contract Documents. Unless specified in the Contract Documents, review by Owner or A/E shall not constitute an approval of the safety precautions employed by Contractor during construction, or constitute an approval of Contractor’s means or methods of construction. If Contractor fails to obtain approval before installation and the item or work is subsequently rejected, Contractor shall be responsible for all costs of correction.

D. Variations between Shop Drawings and Contract Documents: If Shop Drawings show variations from the requirements of the Contract Documents, Contractor shall describe such variations in writing, separate from the Shop Drawings, at the time it submits the Shop Drawings containing such variations. If A/E approves any such variation, an appropriate Change Order will be issued. If the variation is minor and does not involve an adjustment in the Contract Sum or Contract Time, a Change Order need not be issued; however, the modification shall be recorded upon the Project Record.

E. Contractor to submit 5 copies of Shop Drawings: Unless otherwise provided in Division 1, Contractor shall submit to A/E for approval 5 copies of all Shop Drawings. Unless otherwise indicated, 3 sets of all Shop Drawings shall be retained by A/E and 2 sets shall be returned to Contractor.
4.04 **ORGANIZATION OF SPECIFICATIONS**

**Specification organization by trade:** Specifications are prepared in sections which conform generally with trade practices. These sections are for Owner and Contractor convenience and shall not control Contractor in dividing the Work among the Subcontractors or in establishing the extent of the Work to be performed by any trade.

4.05 **OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS, AND OTHER DOCUMENTS**

A. **A/E, not Contractor, owns Copyright of Drawings and Specifications:** The Drawings, Specifications, and other documents prepared by A/E are instruments of A/E’s service through which the Work to be executed by Contractor is described. Neither Contractor nor any Subcontractor shall own or claim a copyright in the Drawings, Specifications, and other documents prepared by A/E, and A/E shall be deemed the author of them and will, along with any rights of Owner, retain all common law, statutory, and other reserved rights, in addition to the copyright. All copies of these documents, except Contractor’s set, shall be returned or suitably accounted for to A/E, on request, upon completion of the Work.

B. **Drawings and Specifications to be used only for this Project:** The Drawings, Specifications, and other documents prepared by the A/E, and copies thereof furnished to Contractor, are for use solely with respect to this Project. They are not to be used by Contractor or any Subcontractor on other projects or for additions to this Project outside the scope of the Work without the specific written consent of Owner and A/E. Contractor and Subcontractors are granted a limited license to use and reproduce applicable portions of the Drawings, Specifications, and other documents prepared by A/E appropriate to and for use in the execution of their Work.

C. **Shop Drawing license granted to Owner:** Contractor and all Subcontractors grant a non-exclusive license to Owner, without additional cost or royalty, to use for its own purposes (including reproduction) all Shop Drawings, together with the information and diagrams contained therein, prepared by Contractor or any Subcontractor. In providing Shop Drawings, Contractor and all Subcontractors warrant that they have authority to grant to Owner a license to use the Shop Drawings, and that such license is not in violation of any copyright or other intellectual property right. Contractor agrees to defend and indemnify Owner pursuant to the indemnity provisions in Section 5.03 and 5.22 from any violations of copyright or other intellectual property rights arising out of Owner’s use of the Shop Drawings hereunder, or to secure for Owner, at Contractor’s own cost, licenses in conformity with this section.

D. **Shop Drawings to be used only for this Project:** The Shop Drawings and other submittals prepared by Contractor, Subcontractors of any tier, or its or their equipment or material suppliers, and copies thereof furnished to Contractor, are for use solely with respect to this Project. They are not to be used by Contractor or any Subcontractor of any tier, or material or equipment supplier, on other projects or for additions to this Project outside the scope of the Work without the specific written consent of Owner. The Contractor, Subcontractors of any tier, and material or equipment suppliers are granted a limited license to use and reproduce applicable portions of the Shop Drawings and other submittals appropriate to and for use in the execution of their Work under the Contract Documents.

**PART 5 – PERFORMANCE**

5.01 **CONTRACTOR CONTROL AND SUPERVISION**

A. **Contractor responsible for Means and Methods of construction:** Contractor shall supervise and direct the Work, using its best skill and attention, and shall perform the Work in a skillful manner. Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work, unless the
Contract Documents give other specific instructions concerning these matters. Contractor shall disclose its means and methods of construction when requested by Owner.

B. **Competent Superintendent required:** Performance of the Work shall be directly supervised by a competent superintendent who has authority to act for Contractor. The superintendent must be satisfactory to the Owner and shall not be changed without the prior written consent of Owner. Owner may require Contractor to remove the superintendent from the Work or Project site, if Owner reasonably deems the superintendent incompetent, careless, or otherwise objectionable, provided Owner has first notified Contractor in writing and allowed a reasonable period for transition.

C. **Contractor responsible for acts and omissions of self and agents:** Contractor shall be responsible to Owner for acts and omissions of Contractor, Subcontractors, and their employees and agents.

D. **Contractor to employ competent and disciplined workforce:** Contractor shall enforce strict discipline and good order among all of the Contractor’s employees and other persons performing the Work. Contractor shall not permit employment of persons not skilled in tasks assigned to them. Contractor’s employees shall at all times conduct business in a manner which assures fair, equal, and nondiscriminatory treatment of all persons. Owner may, by written notice, request Contractor to remove from the Work or Project site any employee Owner reasonably deems incompetent, careless, or otherwise objectionable.

E. **Contractor to keep project documents on site:** Contractor shall keep on the Project site a copy of the Drawings, Specifications, addenda, reviewed Shop Drawings, and permits and permit drawings.

F. **Contractor to comply with ethical standards:** Contractor shall ensure that its owner(s) and employees, and those of its Subcontractors, comply with the Ethics in Public Service Act RCW 42.52, which, among other things, prohibits state employees from having an economic interest in any public works contract that was made by, or supervised by, that employee. Contractor shall remove, at its sole cost and expense, any of its, or its Subcontractors’ employees, if they are in violation of this act.

### 5.02 PERMITS, FEES, AND NOTICES

A. **Contractor to obtain and pay for permits:** Unless otherwise provided in the Contract Documents, Contractor shall pay for and obtain all permits, licenses, and inspections necessary for proper execution and completion of the Work. Prior to Final Acceptance, the approved, signed permits shall be delivered to Owner.

B. **Allowances for permit fees:** If allowances for permits or utility fees are called for in the Contract Documents and set forth in Contractor’s bid, and the actual costs of those permits or fees differ from the allowances in the Contract Documents, the difference shall be adjusted by Change Order.

C. **Contractor to comply with all applicable laws:** Contractor shall comply with and give notices required by all federal, state, and local laws, ordinances, rules, regulations, and lawful orders of public authorities applicable to performance of the Work.

### 5.03 PATENTS AND ROYALTIES

Payment, indemnification, and notice: Contractor is responsible for, and shall pay, all royalties and license fees. Contractor shall defend, indemnify, and hold Owner harmless from any costs, expenses, and liabilities arising out of the infringement by Contractor of any patent, copyright, or other intellectual property right used in the Work; however, provided that Contractor gives prompt notice, Contractor shall not be responsible for such defense or indemnity when a particular design, process, or product of a
particular manufacturer or manufacturers is required by the Contract Documents. If Contractor has reason to believe that use of the required design, process, or product constitutes an infringement of a patent or copyright, it shall promptly notify Owner of such potential infringement.

5.04 PREVAILING WAGES

A. Contractor to pay Prevailing Wages: Contractor shall pay the prevailing rate of wages to all workers, laborers, or mechanics employed in the performance of any part of the Work in accordance with RCW 39.12 and the rules and regulations of the Department of Labor and Industries. The schedule of prevailing wage rates for the locality or localities of the Work, is determined by the Industrial Statistician of the Department of Labor and Industries. It is the Contractor’s responsibility to verify the applicable prevailing wage rate.

B. Statement of Intent to Pay Prevailing Wages: Before payment is made by the Owner to the Contractor for any work performed by the Contractor and subcontractors whose work is included in the application for payment, the Contractor shall submit, or shall have previously submitted to the Owner for the Project, a Statement of Intent to Pay Prevailing Wages, approved by the Department of Labor and Industries, certifying the rate of hourly wage paid and to be paid each classification of laborers, workers, or mechanics employed upon the Work by Contractor and Subcontractors. Such rates of hourly wage shall not be less than the prevailing wage rate.

C. Affidavit of Wages Paid: Prior to release of retainage, the Contractor shall submit to the Owner an Affidavit of Wages Paid, approved by the Department of Labor and Industries, for the Contractor and every subcontractor, of any tier, that performed work on the Project.

D. Disputes: Disputes regarding prevailing wage rates shall be referred for arbitration to the Director of the Department of Labor and Industries. The arbitration decision shall be final and conclusive and binding on all parties involved in the dispute as provided for by RCW 39.12.060.

E. Statement with pay application; Post Statements of Intent at job site: Each Application for Payment submitted by Contractor shall state that prevailing wages have been paid in accordance with the prefilled statement(s) of intent, as approved. Copies of the approved intent statement(s) shall be posted on the job site with the address and telephone number of the Industrial Statistician of the Department of Labor and Industries where a complaint or inquiry concerning prevailing wages may be made.

F. Contractor to pay for Statements of Intent and Affidavits: In compliance with chapter 296-127 WAC, Contractor shall pay to the Department of Labor and Industries the currently established fee(s) for each statement of intent and/or affidavit of wages paid submitted to the Department of Labor and Industries for certification.

G. Certified Payrolls: Consistent with WAC 296-127-320, the Contractor and any subcontractor shall submit a certified copy of payroll records if requested.

5.05 HOURS OF LABOR

A. Overtime: Contractor shall comply with all applicable provisions of RCW 49.28 and they are incorporated herein by reference. Pursuant to that statute, no laborer, worker, or mechanic employed by Contractor, any Subcontractor, or any other person performing or contracting to do the whole or any part of the Work, shall be permitted or required to work more than eight hours in any one calendar day, provided, that in cases of extraordinary emergency, such as danger to life or property, the hours of work may be extended, but in such cases the rate of pay for time employed in excess of eight hours of each calendar day shall be not less than one and one-half times the rate allowed for this same amount of time during eight hours of service.
B. **4-10 Agreements:** Notwithstanding the preceding paragraph, RCW 49.28 permits a contractor or subcontractor in any public works contract subject to those provisions, to enter into an agreement with its employees in which the employees work up to ten hours in a calendar day. No such agreement may provide that the employees work ten-hour days for more than four calendar days a week. Any such agreement is subject to approval by the employees. The overtime provisions of RCW 49.28 shall not apply to the hours, up to forty hours per week, worked pursuant to any such agreement.

5.06 **NONDISCRIMINATION**

A. **Discrimination prohibited by applicable laws:** Discrimination in all phases of employment is prohibited by, among other laws and regulations, Title VII of the Civil Rights Act of 1964, the Vietnam Era Veterans Readjustment Act of 1974, Sections 503 and 504 of the Vocational Rehabilitation Act of 1973, the Equal Employment Act of 1972, the Age Discrimination Act of 1967, the Americans with Disabilities Act of 1990, the Civil Rights Act of 1991, Presidential Executive Order 11246, Executive Order 11375, the Washington State Law Against Discrimination, RCW 49.60, and Gubernatorial Executive Order 85-09. These laws and regulations establish minimum requirements for affirmative action and fair employment practices which Contractor must meet.

B. **During performance of the Work:**

1. **Protected Classes:** Contractor shall not discriminate against any employee or applicant for employment because of race, creed, color, national origin, sex, age, marital status, or the presence of any physical, sensory, or mental disability, Vietnam era veteran status, or disabled veteran status, nor commit any other unfair practices as defined in RCW 49.60.

2. **Advertisements to state nondiscrimination:** Contractor shall, in all solicitations or advertisements for employees placed by or for it, state that all qualified applicants will be considered for employment, without regard to race, creed, color, national origin, sex, age, marital status, or the presence of any physical, sensory, or mental disability.

3. **Contractor to notify unions and others of nondiscrimination:** Contractor shall send to each labor union, employment agency, or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice advising the labor union, employment agency, or workers’ representative of Contractor’s obligations according to the Contract Documents and RCW 49.60.

4. **Owner and State access to Contractor records:** Contractor shall permit access to its books, records, and accounts, and to its premises by Owner, and by the Washington State Human Rights Commission, for the purpose of investigation to ascertain compliance with this section of the Contract Documents.

5. **Pass through provisions to Subcontractors:** Contractor shall include the provisions of this section in every Subcontract.

5.07 **SAFETY PRECAUTIONS**

A. **Contractor responsible for safety:** Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Work.

B. **Contractor safety responsibilities:** In carrying out its responsibilities according to the Contract Documents, Contractor shall protect the lives and health of employees performing the Work and other persons who may be affected by the Work; prevent damage to materials, supplies, and equipment whether on site or stored off-site; and prevent damage to other property at the site or adjacent thereto. Contractor shall comply with all applicable laws, ordinances, rules, regulations,
and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss; shall erect and maintain all necessary safeguards for such safety and protection; and shall notify owners of adjacent property and utilities when prosecution of the Work may affect them.

C. **Contractor to maintain safety records:** Contractor shall maintain an accurate record of exposure data on all incidents relating to the Work resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment. Contractor shall immediately report any such incident to Owner. Owner shall, at all times, have a right of access to all records of exposure.

D. **Contractor to provide HazMat training:** Contractor shall provide all persons working on the Project site with information and training on hazardous chemicals in their work at the time of their initial assignment, and whenever a new hazard is introduced into their work area.

1. **Information.** At a minimum, Contractor shall inform persons working on the Project site of:
   a. **WAC:** The requirements of chapter 296-62 WAC, General Occupational Health Standards;
   b. **Presence of hazardous chemicals:** Any operations in their work area where hazardous chemicals are present; and
   c. **Hazard communications program:** The location and availability of written hazard communication programs, including the required list(s) of hazardous chemicals and material safety data sheets required by chapter 296-62 WAC.

2. **Training.** At a minimum, Contractor shall provide training for persons working on the Project site which includes:
   a. **Detecting hazardous chemicals:** Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);
   b. **Hazards of chemicals:** The physical and health hazards of the chemicals in the work area;
   c. **Protection from hazards:** The measures such persons can take to protect themselves from these hazards, including specific procedures Contractor, or its Subcontractors, or others have implemented to protect those on the Project site from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and
   d. **Hazard communications program:** The details of the hazard communications program developed by Contractor, or its Subcontractors, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

E. **Hazardous, toxic or harmful substances:** Contractor’s responsibility for hazardous, toxic, or harmful substances shall include the following duties:

1. **Illegal use of dangerous substances:** Contractor shall not keep, use, dispose, transport, generate, or sell on or about the Project site, any substances now or hereafter designated as, or which are subject to regulation as, hazardous, toxic, dangerous, or
harmful by any federal, state or local law, regulation, statute or ordinance (hereinafter collectively referred to as “hazardous substances”), in violation of any such law, regulation, statute, or ordinance, but in no case shall any such hazardous substance be stored more than 90 Days on the Project site.

2. Contractor notifications of spills, failures, inspections, and fines: Contractor shall promptly notify Owner of all spills or releases of any hazardous substances which are otherwise required to be reported to any regulatory agency and pay the cost of cleanup. Contractor shall promptly notify Owner of all failures to comply with any federal, state, or local law, regulation, or ordinance; all inspections of the Project site by any regulatory entity concerning the same; all regulatory orders or fines; and all responses or interim cleanup actions taken by or proposed to be taken by any government entity or private party on the Project site.

F. Public safety and traffic: All Work shall be performed with due regard for the safety of the public. Contractor shall perform the Work so as to cause a minimum of interruption of vehicular traffic or inconvenience to pedestrians. All arrangements to care for such traffic shall be Contractor’s responsibilities. All expenses involved in the maintenance of traffic by way of detours shall be borne by Contractor.

G. Contractor to act in an emergency: In an emergency affecting the safety of life or the Work or of adjoining property, Contractor is permitted to act, at its discretion, to prevent such threatened loss or injury, and Contractor shall so act if so authorized or instructed.

H. No duty of safety by Owner or A/E: Nothing provided in this section shall be construed as imposing any duty upon Owner or A/E with regard to, or as constituting any express or implied assumption of control or responsibility over, Project site safety, or over any other safety conditions relating to employees or agents of Contractor or any of its Subcontractors, or the public.

5.08 OPERATIONS, MATERIAL HANDLING, AND STORAGE AREAS

A. Limited storage areas: Contractor shall confine all operations, including storage of materials, to Owner-approved areas.

B. Temporary buildings and utilities at Contractor expense: Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be provided by Contractor only with the consent of Owner and without expense to Owner. The temporary buildings and utilities shall be removed by Contractor at its expense upon completion of the Work.

C. Roads and vehicle loads: Contractor shall use only established roadways or temporary roadways authorized by Owner. When materials are transported in prosecuting the Work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by federal, state, or local law or regulation.

D. Ownership and reporting by Contractor of demolished materials: Ownership and control of all materials or facility components to be demolished or removed from the Project site by Contractor shall immediately vest in Contractor upon severance of the component from the facility or severance of the material from the Project site. Contractor shall be responsible for compliance with all laws governing the storage and ultimate disposal. Contractor shall provide Owner with a copy of all manifests and receipts evidencing proper disposal when required by Owner or applicable law.

E. Contractor responsible for care of materials and equipment on-site: Contractor shall be responsible for the proper care and protection of its materials and equipment delivered to the Project site. Materials and equipment may be stored on the premises subject to approval of
Owner. When Contractor uses any portion of the Project site as a shop, Contractor shall be responsible for any repairs, patching, or cleaning arising from such use.

F. **Contractor responsible for loss of materials and equipment:** Contractor shall protect and be responsible for any damage or loss to the Work, or to the materials or equipment until the date of Substantial Completion, and shall repair or replace without cost to Owner any damage or loss that may occur, except damages or loss caused by the acts or omissions of Owner. Contractor shall also protect and be responsible for any damage or loss to the Work, or to the materials or equipment, after the date of Substantial Completion, and shall repair or replace without cost to Owner any such damage or loss that might occur, to the extent such damages or loss are caused by the acts or omissions of Contractor, or any Subcontractor.

5.09 **PRIOR NOTICE OF EXCAVATION**

A. **Excavation defined; Use of locator services:** “Excavation” means an operation in which earth, rock, or other material on or below the ground is moved or otherwise displaced by any means, except the tilling of soil less than 12 inches in depth for agricultural purposes, or road ditch maintenance that does not change the original road grade or ditch flow line. Before commencing any excavation, Contractor shall provide notice of the scheduled commencement of excavation to all owners of underground facilities or utilities, through locator services.

5.10 **UNFORESEEN PHYSICAL CONDITIONS**

A. **Notice requirement for concealed or unknown conditions:** If Contractor encounters conditions at the site which are subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents, or unknown physical conditions of an unusual nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then Contractor shall give written notice to Owner promptly and in no event later than 7 Days after the first observance of the conditions. Conditions shall not be disturbed prior to such notice.

B. **Adjustment in Contract Time and Contract Sum:** If such conditions differ materially and cause a change in Contractor’s cost of, or time required for, performance of any part of the Work, the Contractor may be entitled to an equitable adjustment in the Contract Time or Contract Sum, or both, provided it makes a request therefore as provided in Part 7.

5.11 **PROTECTION OF EXISTING STRUCTURES, EQUIPMENT, VEGETATION, UTILITIES AND IMPROVEMENTS**

A. **Contractor to protect and repair property:** Contractor shall protect from damage all existing structures, equipment, improvements, utilities, and vegetation: at or near the Project site; and on adjacent property of a third party, the locations of which are made known to or should be known by Contractor. Contractor shall repair any damage, including that to the property of a third party, resulting from failure to comply with the requirements of the Contract Documents or failure to exercise reasonable care in performing the Work. If Contractor fails or refuses to repair the damage promptly, Owner may have the necessary work performed and charge the cost to Contractor.

B. **Tree and vegetation protection:** Contractor shall only remove trees when specifically authorized to do so, and shall protect vegetation that will remain in place.

5.12 **LAYOUT OF WORK**

A. **Advanced planning of the Work:** Contractor shall plan and lay out the Work in advance of operations so as to coordinate all work without delay or revision.
B. **Layout responsibilities:** Contractor shall lay out the Work from Owner-established baselines and bench marks indicated on the Drawings, and shall be responsible for all field measurements in connection with the layout. Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the Work. Contractor shall be responsible for executing the Work to the lines and grades that may be established. Contractor shall be responsible for maintaining or restoring all stakes and other marks established.

### 5.13 MATERIAL AND EQUIPMENT

A. **Contractor to provide new and equivalent equipment and materials:** All equipment, material, and articles incorporated into the Work shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in the Contract Documents. References in the Specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard quality and shall not be construed as limiting competition. Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of A/E, is equal to that named in the specifications, unless otherwise specifically provided in the Contract Documents.

B. **Contractor responsible for fitting parts together:** Contractor shall do all cutting, fitting, or patching that may be required to make its several parts fit together properly, or receive or be received by work of others set forth in, or reasonably implied by, the Contract Documents. Contractor shall not endanger any work by cutting, excavating, or otherwise altering the Work and shall not cut or alter the work of any other contractor unless approved in advance by Owner.

C. **Owner may reject defective Work:** Should any of the Work be found defective, or in any way not in accordance with the Contract Documents, this work, in whatever stage of completion, may be rejected by Owner.

### 5.14 AVAILABILITY AND USE OF UTILITY SERVICES

A. **Owner to provide and charge for utilities:** Owner shall make all reasonable utilities available to Contractor from existing outlets and supplies, as specified in the Contract Documents. Unless otherwise provided in the Contract Documents, the utility service consumed shall be charged to or paid for by Contractor at prevailing rates charged to Owner or, where the utility is produced by Owner, at reasonable rates determined by Owner. Contractor will carefully conserve any utilities furnished.

B. **Contractor to install temporary connections and meters:** Contractor shall, at its expense and in a skillful manner satisfactory to Owner, install and maintain all necessary temporary connections and distribution lines, together with appropriate protective devices, and all meters required to measure the amount of each utility used for the purpose of determining charges. Prior to the date of Final Acceptance, Contractor shall remove all temporary connections, distribution lines, meters, and associated equipment and materials.

### 5.15 TESTS AND INSPECTION

A. **Contractor to provide for all testing and inspection of Work:** Contractor shall maintain an adequate testing and inspection program and perform such tests and inspections as are necessary or required to ensure that the Work conforms to the requirements of the Contract Documents. Contractor shall be responsible for inspection and quality surveillance of all its Work and all Work performed by any Subcontractor. Unless otherwise provided, Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. Contractor shall give Owner timely notice of when and
where tests and inspections are to be made. Contractor shall maintain complete inspection records and make them available to Owner.

B. **Owner may conduct tests and inspections:** Owner may, at any reasonable time, conduct such inspections and tests as it deems necessary to ensure that the Work is in accordance with the Contract Documents. Owner shall promptly notify Contractor if an inspection or test reveals that the Work is not in accordance with the Contract Documents. Unless the subject items are expressly accepted by Owner, such Owner inspection and tests are for the sole benefit of Owner and do not:

1. Constitute or imply acceptance;
2. Relieve Contractor of responsibility for providing adequate quality control measures;
3. Relieve Contractor of responsibility for risk of loss or damage to the Work, materials, or equipment;
4. Relieve Contractor of its responsibility to comply with the requirements of the Contract Documents; or
5. Impair Owner’s right to reject defective or nonconforming items, or to avail itself of any other remedy to which it may be entitled.

C. **Inspections or inspectors do not modify Contract Documents:** Neither observations by an inspector retained by Owner, the presence or absence of such inspector on the site, nor inspections, tests, or approvals by others, shall relieve Contractor from any requirement of the Contract Documents, nor is any such inspector authorized to change any term or condition of the Contract Documents.

D. **Contractor responsibilities on inspections:** Contractor shall promptly furnish, without additional charge, all facilities, labor, material and equipment reasonably needed for performing such safe and convenient inspections and tests as may be required by Owner. Owner may charge Contractor any additional cost of inspection or testing when Work is not ready at the time specified by Contractor for inspection or testing, or when prior rejection makes reinspection or retest necessary. Owner shall perform its inspections and tests in a manner that will cause no undue delay in the Work.

5.16 CORRECTION OF NONCONFORMING WORK

A. **Work covered by Contractor without inspection:** If a portion of the Work is covered contrary to the requirements in the Contract Documents, it must, if required in writing by Owner, be uncovered for Owner's observation and be replaced at the Contractor's expense and without change in the Contract Time.

B. **Payment provisions for uncovering covered Work:** If, at any time prior to Final Completion, Owner desires to examine the Work, or any portion of it, which has been covered, Owner may request to see such Work and it shall be uncovered by Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an adjustment in the Contract Sum for the costs of uncovering and replacement, and, if completion of the Work is thereby delayed, an adjustment in the Contract Time, provided it makes such a request as provided in Part 7. If such Work is not in accordance with the Contract Documents, the Contractor shall pay the costs of examination and reconstruction.

C. **Contractor to correct and pay for non-conforming Work:** Contractor shall promptly correct Work found by Owner not to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed, or
completed. Contractor shall bear all costs of correcting such nonconforming Work, including additional testing and inspections.

D. Contractor’s compliance with warranty provisions: If, within one year after the date of Substantial Completion of the Work or designated portion thereof, or within one year after the date for commencement of any system warranties established under Section 6.08, or within the terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, Contractor shall correct it promptly after receipt of written notice from Owner to do so. Owner shall give such notice promptly after discovery of the condition. This period of one year shall be extended, with respect to portions of Work first performed after Substantial Completion, by the period of time between Substantial Completion and the actual performance of the Work. Contractor’s duty to correct with respect to Work repaired or replaced shall run for one year from the date of repair or replacement. Obligations under this paragraph shall survive Final Acceptance.

E. Contractor to remove non-conforming Work: Contractor shall remove from the Project site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by Contractor nor accepted by Owner.

F. Owner may charge Contractor for non-conforming Work: If Contractor fails to correct nonconforming Work within a reasonable time after written notice to do so, Owner may replace, correct, or remove the nonconforming Work and charge the cost thereof to the Contractor.

G. Contractor to pay for damaged Work during correction: Contractor shall bear the cost of correcting destroyed or damaged Work, whether completed or partially completed, caused by Contractor’s correction or removal of Work which is not in accordance with the requirements of the Contract Documents.

H. No Period of limitation on other requirements: Nothing contained in this section shall be construed to establish a period of limitation with respect to other obligations which Contractor might have according to the Contract Documents. Establishment of the time period of one year as described in Section 5.16D relates only to the specific obligation of Contractor to correct the Work, and has no relationship to the time within which the Contractor’s obligation to comply with the Contract Documents may be sought to be enforced, including the time within which such proceedings may be commenced.

I. Owner may accept non-conforming Work and charge Contractor: If Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, Owner may do so instead of requiring its removal and correction, in which case the Contract Sum may be reduced as appropriate and equitable.

5.17 CLEAN UP

Contractor to keep site clean and leave it clean: Contractor shall at all times keep the Project site, including hauling routes, infrastructures, utilities, and storage areas, free from accumulations of waste materials. Before completing the Work, Contractor shall remove from the premises its rubbish, tools, scaffolding, equipment, and materials. Upon completing the Work, Contractor shall leave the Project site in a clean, neat, and orderly condition satisfactory to Owner. If Contractor fails to clean up as provided herein, and after reasonable notice from Owner, Owner may do so and the cost thereof shall be charged to Contractor.

5.18 ACCESS TO WORK

Owner and A/E access to Work site: Contractor shall provide Owner and A/E access to the Work in progress wherever located.
5.19 **OTHER CONTRACTS**

Owner may award other contracts; Contractor to cooperate: Owner may undertake or award other contracts for additional work at or near the Project site. Contractor shall reasonably cooperate with the other contractors and with Owner’s employees and shall carefully adapt scheduling and perform the Work in accordance with these Contract Documents to reasonably accommodate the other work.

5.20 **SUBCONTRACTORS AND SUPPLIERS**

A. **Subcontractor Responsibility:** The Contractor shall include the language of this paragraph in each of its first tier subcontracts, and shall require each of its subcontractors to include the same language of this section in each of their subcontracts, adjusting only as necessary the terms used for the contracting parties. Upon request of the Owner, the Contractor shall promptly provide documentation to the Owner demonstrating that the subcontractor meets the subcontractor responsibility criteria below. The requirements of this paragraph apply to all subcontractors regardless of tier. At the time of subcontract execution, the Contractor shall verify that each of its first tier subcontractors meets the following bidder responsibility criteria:

1. Have a current certificate of registration as a contractor in compliance with chapter 18.27 RCW, which must have been in effect at the time of subcontract bid submittal;

2. Have a current Washington Unified Business Identifier (UBI) number;

3. If applicable, have:
   a. Industrial Insurance (workers’ compensation) coverage for the subcontractor’s employees working in Washington, as required in Title 51 RCW;
   b. A Washington Employment Security Department number, as required in Title 50 RCW;
   c. A Washington Department of Revenue state excise tax registration number, as required in Title 82 RCW;
   d. An electrical contractor license, if required by Chapter 19.28 RCW;
   e. An elevator contractor license, if required by Chapter 70.87 RCW.

4. Not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065 (3).

5. On a project subject to the apprenticeship utilization requirements in RCW 39.04.320, not have been found out of compliance by the Washington state apprenticeship and training council for working apprentices out of ratio, without appropriate supervision, or outside their approved work processes as outlined in their standards of apprenticeship under chapter 49.04 RCW for the one-year period immediately preceding the date of the Owner’s first advertisement of the project.

B. **Provide names of Subcontractors and use qualified firms:** Before submitting the first Application for Payment, Contractor shall furnish in writing to Owner the names, addresses, and telephone numbers of all Subcontractors, as well as suppliers providing materials in excess of $2,500. Contractor shall utilize Subcontractors and suppliers which are experienced and qualified, and meet the requirements of the Contract Documents, if any. Contractor shall not utilize any Subcontractor or supplier to whom the Owner has a reasonable objection, and shall obtain Owner’s written consent before making any substitutions or additions.
C. **Subcontracts in writing and pass through provision:** All Subcontracts must be in writing. By appropriate written agreement, Contractor shall require each Subcontractor, so far as applicable to the Work to be performed by the Subcontractor, to be bound to Contractor by terms of the Contract Documents, and to assume toward Contractor all the obligations and responsibilities which Contractor assumes toward Owner in accordance with the Contract Documents. Each Subcontract shall preserve and protect the rights of Owner in accordance with the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights. Where appropriate, Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. However, nothing in this paragraph shall be construed to alter the contractual relations between Contractor and its Subcontractors with respect to insurance or bonds.

D. **Coordination of Subcontractors; Contractor responsible for Work:** Contractor shall schedule, supervise, and coordinate the operations of all Subcontractors. No Subcontracting of any of the Work shall relieve Contractor from its responsibility for the performance of the Work in accordance with the Contract Documents or any other obligations of the Contract Documents.

E. **Automatic assignment of subcontracts:** Each subcontract agreement for a portion of the Work is hereby assigned by Contractor to Owner provided that:

1. **Effective only after termination and Owner approval:** The assignment is effective only after termination by Owner for cause pursuant to Section 9.01 and only for those Subcontracts which Owner accepts by notifying the Subcontractor in writing; and

2. **Owner assumes Contractor’s responsibilities:** After the assignment is effective, Owner will assume all future duties and obligations toward the Subcontractor which Contractor assumed in the Subcontract.

3. **Impact of bond:** The assignment is subject to the prior rights of the surety, if any, obligated under any bond provided in accordance with the Contract Documents.

### 5.21 WARRANTY OF CONSTRUCTION

A. **Contractor warranty of Work:** In addition to any special warranties provided elsewhere in the Contract Documents, Contractor warrants that all Work conforms to the requirements of the Contract Documents and is free of any defect in equipment, material, or design furnished, or workmanship performed by Contractor.

B. **Contractor responsibilities:** With respect to all warranties, express or implied, for Work performed or materials furnished according to the Contract Documents, Contractor shall:

1. **Obtain warranties:** Obtain all warranties that would be given in normal commercial practice;

2. **Warranties for benefit of Owner:** Require all warranties to be executed, in writing, for the benefit of Owner;

3. **Enforcement of warranties:** Enforce all warranties for the benefit of Owner, if directed by Owner; and

4. **Contractor responsibility for subcontractor warranties:** Be responsible to enforce any subcontractor’s, manufacturer’s, or supplier’s warranties should they extend beyond the period specified in the Contract Documents.

C. **Warranties beyond Final Acceptance:** The obligations under this section shall survive Final Acceptance.
5.22 **INDEMNIFICATION**

A. **Contractor to indemnify Owner:** Contractor shall defend, indemnify, and hold Owner and A/E harmless from and against all claims, demands, losses, damages, or costs, including but not limited to damages arising out of bodily injury or death to persons and damage to property, caused by or resulting from:

1. **Sole negligence of Contractor:** The sole negligence of Contractor or any of its Subcontractors;
2. **Concurrent negligence:** The concurrent negligence of Contractor, or any Subcontractor, but only to the extent of the negligence of Contractor or such Subcontractor; and
3. **Patent infringement:** The use of any design, process, or equipment which constitutes an infringement of any United States patent presently issued, or violates any other proprietary interest, including copyright, trademark, and trade secret.

B. **Employee action and RCW Title 51:** In any action against Owner and any other entity indemnified in accordance with this section, by any employee of Contractor, its Subcontractors, Sub-subcontractors, agents, or anyone directly or indirectly employed by any of them, the indemnification obligation of this section shall not be limited by a limit on the amount or type of damages, compensation, or benefits payable by or for Contractor or any Subcontractor under RCW Title 51, the Industrial Insurance Act, or any other employee benefit acts. In addition, Contractor waives immunity as to Owner and A/E only, in accordance with RCW Title 51.

PART 6 – PAYMENTS AND COMPLETION

6.01 **CONTRACT SUM**

Owner shall pay Contract Sum: Owner shall pay Contractor the Contract Sum plus state sales tax for performance of the Work, in accordance with the Contract Documents.

6.02 **SCHEDULE OF VALUES**

Contractor to submit Schedule of Values: Before submitting its first Application for Payment, Contractor shall submit to Owner for approval a breakdown allocating the total Contract Sum to each principal category of work, in such detail as requested by Owner ("Schedule of Values"). The approved Schedule of Values shall include appropriate amounts for demobilization, record drawings, O&M manuals, and any other requirements for Project closeout, and shall be used by Owner as the basis for progress payments. Payment for Work shall be made only for and in accordance with those items included in the Schedule of Values.

6.03 **APPLICATION FOR PAYMENT**

A. **Monthly Application for Payment with substantiation:** At monthly intervals, unless determined otherwise by Owner, Contractor shall submit to Owner an itemized Application for Payment for Work completed in accordance with the Contract Documents and the approved Schedule of Values. Each application shall be supported by such substantiating data as Owner may require.

B. **Contractor certifies Subcontractors paid:** By submitting an Application for Payment, Contractor is certifying that all Subcontractors have been paid, less earned retainage in accordance with RCW 60.28.011, as their interests appeared in the last preceding certificate of payment. By submitting an Application for Payment, Contractor is recertifying that the representations set forth in Section 1.03, are true and correct, to the best of Contractor’s knowledge, as of the date of the Application for Payment.

July 1, 2010
C. **Reconciliation of Work with Progress Schedule:** At the time it submits an Application for Payment, Contractor shall analyze and reconcile, to the satisfaction of Owner, the actual progress of the Work with the Progress Schedule.

D. **Payment for material delivered to site or stored off-site:** If authorized by Owner, the Application for Payment may include request for payment for material delivered to the Project site and suitably stored, or for completed preparatory work. Payment may similarly be requested for material stored off the Project site, provided Contractor complies with or furnishes satisfactory evidence of the following:

1. **Suitable facility or location:** The material will be placed in a facility or location that is structurally sound, dry, lighted and suitable for the materials to be stored;

2. **Facility or location within 10 miles of Project:** The facility or location is located within a 10-mile radius of the Project. Other locations may be utilized, if approved in writing, by Owner;

3. **Facility or location exclusive to Project’s materials:** Only materials for the Project are stored within the facility or location (or a secure portion of a facility or location set aside for the Project);

4. **Insurance provided on materials in facility or location:** Contractor furnishes Owner a certificate of insurance extending Contractor’s insurance coverage for damage, fire, and theft to cover the full value of all materials stored, or in transit;

5. **Facility or location locked and secure:** The facility or location (or secure portion thereof) is continuously under lock and key, and only Contractor’s authorized personnel shall have access;

6. **Owner right of access to facility or location:** Owner shall at all times have the right of access in company of Contractor;

7. **Contractor assumes total responsibility for stored materials:** Contractor and its surety assume total responsibility for the stored materials; and

8. **Contractor provides documentation and Notice when materials moved to site:** Contractor furnishes to Owner certified lists of materials stored, bills of lading, invoices, and other information as may be required, and shall also furnish Notice to Owner when materials are moved from storage to the Project site.

### 6.04 PROGRESS PAYMENTS

A. **Owner to pay within 30 Days:** Owner shall make progress payments, in such amounts as Owner determines are properly due, within 30 Days after receipt of a properly executed Application for Payment. Owner shall notify Contractor in accordance with chapter 39.76 RCW if the Application for Payment does not comply with the requirements of the Contract Documents.

B. **Withholding retainage; Options for retainage:** Owner shall retain 5% of the amount of each progress payment until 45 Days after Final Acceptance and receipt of all documents required by law or the Contract Documents, including, at Owner’s request, consent of surety to release of the retainage. In accordance with chapter 60.28 RCW, Contractor may request that monies reserved be retained in a fund by Owner, deposited by Owner in a bank or savings and loan, or placed in escrow with a bank or trust company to be converted into bonds and securities to be held in escrow with interest to be paid to Contractor. Owner may permit Contractor to provide an appropriate bond in lieu of the retained funds.
C. **Title passes to Owner upon payment:** Title to all Work and materials covered by a progress payment shall pass to Owner at the time of such payment free and clear of all liens, claims, security interests, and encumbrances. Passage of title shall not, however, relieve Contractor from any of its duties and responsibilities for the Work or materials, or waive any rights of Owner to insist on full compliance by Contractor with the Contract Documents.

D. **Interest on unpaid balances:** Payments due and unpaid in accordance with the Contract Documents shall bear interest as specified in chapter 39.76 RCW.

### 6.05 PAYMENTS WITHHELD

A. **Owner’s right to withhold payment:** Owner may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any payment to such extent as may be necessary to protect Owner from loss or damage for reasons including but not limited to:

1. **Non-compliant Work:** Work not in accordance with the Contract Documents;

2. **Remaining Work to cost more than unpaid balance:** Reasonable evidence that the Work required by the Contract Documents cannot be completed for the unpaid balance of the Contract Sum;

3. **Owner correction or completion Work:** Work by Owner to correct defective Work or complete the Work in accordance with Section 5.16;

4. **Contractor’s failure to perform:** Contractor’s failure to perform in accordance with the Contract Documents; or

5. **Contractor’s negligent acts or omissions:** Cost or liability that may occur to Owner as the result of Contractor’s fault or negligent acts or omissions.

B. **Owner to notify Contractor of withholding for unsatisfactory performance:** In any case where part or all of a payment is going to be withheld for unsatisfactory performance, Owner shall notify Contractor in accordance with chapter 39.76 RCW.

### 6.06 RETAINAGE AND BOND CLAIM RIGHTS

Chapters 39.08 RCW and 60.28 RCW incorporated by reference: Chapters 39.08 RCW and 60.28 RCW, concerning the rights and responsibilities of Contractor and Owner with regard to the performance and payment bonds and retainage, are made a part of the Contract Documents by reference as though fully set forth herein.

### 6.07 SUBSTANTIAL COMPLETION

**Substantial Completion defined:** Substantial Completion is the stage in the progress of the Work (or portion thereof designated and approved by Owner) when the construction is sufficiently complete, in accordance with the Contract Documents, so Owner has full and unrestricted use and benefit of the facilities (or portion thereof designated and approved by Owner) for the use for which it is intended. All Work other than incidental corrective or punch list work shall be completed. Substantial Completion shall not have been achieved if all systems and parts are not functional, if utilities are not connected and operating normally, if all required occupancy permits have not been issued, or if the Work is not accessible by normal vehicular and pedestrian traffic routes. The date Substantial Completion is achieved shall be established in writing by Owner. Contractor may request an early date of Substantial Completion which must be approved by Change Order. Owner’s occupancy of the Work or designated portion thereof does not necessarily indicate that Substantial Completion has been achieved.
6.08 PRIOR OCCUPANCY

A. Prior Occupancy defined; Restrictions: Owner may, upon written notice thereof to Contractor, take possession of or use any completed or partially completed portion of the Work ("Prior Occupancy") at any time prior to Substantial Completion. Unless otherwise agreed in writing, Prior Occupancy shall not: be deemed an acceptance of any portion of the Work; accelerate the time for any payment to Contractor; prejudice any rights of Owner provided by any insurance, bond, guaranty, or the Contract Documents; relieve Contractor of the risk of loss or any of the obligations established by the Contract Documents; establish a date for termination or partial termination of the assessment of liquidated damages; or constitute a waiver of claims.

B. Damage; Duty to repair and warranties: Notwithstanding anything in the preceding paragraph, Owner shall be responsible for loss of or damage to the Work resulting from Prior Occupancy. Contractor’s one year duty to repair any system warranties shall begin on building systems activated and used by Owner as agreed in writing by Owner and Contractor.

6.09 FINAL COMPLETION, ACCEPTANCE, AND PAYMENT

A. Final Completion defined: Final Completion shall be achieved when the Work is fully and finally complete in accordance with the Contract Documents. The date Final Completion is achieved shall be established by Owner in writing, but in no case shall constitute Final Acceptance which is a subsequent, separate, and distinct action.

B. Final Acceptance defined: Final Acceptance shall be achieved when the Contractor has completed the requirements of the Contract Documents. The date Final Acceptance is achieved shall be established by Owner in writing. Prior to Final Acceptance, Contractor shall, in addition to all other requirements in the Contract Documents, submit to Owner a written notice of any outstanding disputes or claims between Contractor and any of its Subcontractors, including the amounts and other details thereof. Neither Final Acceptance, nor final payment, shall release Contractor or its sureties from any obligations of these Contract Documents or the payment and performance bonds, or constitute a waiver of any claims by Owner arising from Contractor’s failure to perform the Work in accordance with the Contract Documents.

C. Final payment waives Claim rights: Acceptance of final payment by Contractor, or any Subcontractor, shall constitute a waiver and release to Owner of all claims by Contractor, or any such Subcontractor, for an increase in the Contract Sum or the Contract Time, and for every act or omission of Owner relating to or arising out of the Work, except for those Claims made in accordance with the procedures, including the time limits, set forth in Part 8.

PART 7 – CHANGES

7.01 CHANGE IN THE WORK

A. Changes in Work, Contract Sum, and Contract Time by Change Order: Owner may, at any time and without notice to Contractor’s surety, order additions, deletions, revisions, or other changes in the Work. These changes in the Work shall be incorporated into the Contract Documents through the execution of Change Orders. If any change in the Work ordered by Owner causes an increase or decrease in the Contract Sum or the Contract Time, an equitable adjustment shall be made as provided in Section 7.02 or 7.03, respectively, and such adjustment(s) shall be incorporated into a Change Order.

B. Owner may request COP from Contractor: If Owner desires to order a change in the Work, it may request a written Change Order Proposal (COP) from Contractor. Contractor shall submit a Change Order Proposal within 14 Days of the request from Owner, or within such other period as mutually agreed. Contractor’s Change Order Proposal shall be full compensation for
implementing the proposed change in the Work, including any adjustment in the Contract Sum or Contract Time, and including compensation for all delays in connection with such change in the Work and for any expense or inconvenience, disruption of schedule, or loss of efficiency or productivity occasioned by the change in the Work.

C. **COP negotiations:** Upon receipt of the Change Order Proposal, or a request for equitable adjustment in the Contract Sum or Contract Time, or both, as provided in Sections 7.02 and 7.03, Owner may accept or reject the proposal, request further documentation, or negotiate acceptable terms with Contractor. Pending agreement on the terms of the Change Order, Owner may direct Contractor to proceed immediately with the Change Order Work. Contractor shall not proceed with any change in the Work until it has obtained Owner’s approval. All Work done pursuant to any Owner-directed change in the Work shall be executed in accordance with the Contract Documents.

D. **Change Order as full payment and final settlement:** If Owner and Contractor reach agreement on the terms of any change in the Work, including any adjustment in the Contract Sum or Contract Time, such agreement shall be incorporated in a Change Order. The Change Order shall constitute full payment and final settlement of all claims for time and for direct, indirect, and consequential costs, including costs of delays, inconvenience, disruption of schedule, or loss of efficiency or productivity, related to any Work either covered or affected by the Change Order, or related to the events giving rise to the request for equitable adjustment.

E. **Failure to agree upon terms of Change Order; Final offer and Claims:** If Owner and Contractor are unable to reach agreement on the terms of any change in the Work, including any adjustment in the Contract Sum or Contract Time, Contractor may at any time in writing, request a final offer from Owner. Owner shall provide Contractor with its written response within 30 Days of Contractor’s request. Owner may also provide Contractor with a final offer at any time. If Contractor rejects Owner’s final offer, or the parties are otherwise unable to reach agreement, Contractor’s only remedy shall be to file a Claim as provided in Part 8.

F. **Field Authorizations:** The Owner may direct the Contractor to proceed with a change in the work through a written Field Authorization (also referred to as a Field Order) when the time required to price and execute a Change Order would impact the Project.

The Field Authorization shall describe and include the following:

1. The scope of work
2. An agreed upon maximum not-to-exceed amount
3. Any estimated change to the Contract Time
4. The method of final cost determination in accordance with the requirements of Part 7 of the General Conditions
5. The supporting cost data to be submitted in accordance with the requirements of Part 7 of the General Conditions

Upon satisfactory submittal by the Contractor and approval by the Owner of supporting cost data, a Change Order will be executed. The Owner will not make payment to the Contractor for Field Authorization work until that work has been incorporated into an executed Change Order.
7.02 **CHANGE IN THE CONTRACT SUM**

A. **General Application**

1. **Contract Sum changes only by Change Order:** The Contract Sum shall only be changed by a Change Order. Contractor shall include any request for a change in the Contract Sum in its Change Order Proposal.

2. **Owner fault or negligence as basis for change in Contract Sum:** If the cost of Contractor’s performance is changed due to the fault or negligence of Owner, or anyone for whose acts Owner is responsible, Contractor shall be entitled to make a request for an equitable adjustment in the Contract Sum in accordance with the following procedure. No change in the Contract Sum shall be allowed to the extent: Contractor’s changed cost of performance is due to the fault or negligence of Contractor, or anyone for whose acts Contractor is responsible; the change is concurrently caused by Contractor and Owner; or the change is caused by an act of Force Majeure as defined in Section 3.05.

   (a) **Notice and record keeping for equitable adjustment:** A request for an equitable adjustment in the Contract Sum shall be based on written notice delivered to Owner within 7 Days of the occurrence of the event giving rise to the request. For purposes of this part, “occurrence” means when Contractor knew, or in its diligent prosecution of the Work should have known, of the event giving rise to the request. If Contractor believes it is entitled to an adjustment in the Contract Sum, Contractor shall immediately notify Owner and begin to keep and maintain complete, accurate, and specific daily records. Contractor shall give Owner access to any such records and, if requested shall promptly furnish copies of such records to Owner.

   (b) **Content of notice for equitable adjustment; Failure to comply:** Contractor shall not be entitled to any adjustment in the Contract Sum for any occurrence of events or costs that occurred more than 7 Days before Contractor’s written notice to Owner. The written notice shall set forth, at a minimum, a description of: the event giving rise to the request for an equitable adjustment in the Contract Sum; the nature of the impacts to Contractor and its Subcontractors of any tier, if any; and to the extent possible the amount of the adjustment in Contract Sum requested. Failure to properly give such written notice shall, to the extent Owner’s interests are prejudiced, constitute a waiver of Contractor’s right to an equitable adjustment.

   (c) **Contractor to provide supplemental information:** Within 30 Days of the occurrence of the event giving rise to the request, unless Owner agrees in writing to allow an additional period of time to ascertain more accurate data, Contractor shall supplement the written notice provided in accordance with subparagraph a. above with additional supporting data. Such additional data shall include, at a minimum: the amount of compensation requested, itemized in accordance with the procedure set forth herein; specific facts, circumstances, and analysis that confirms not only that Contractor suffered the damages claimed, but that the damages claimed were actually a result of the act, event, or condition complained of and that the Contract Documents provide entitlement to an equitable adjustment to Contractor for such act, event, or condition; and documentation sufficiently detailed to permit an informed analysis of the request by Owner. When the request for compensation relates to a delay, or other change in Contract Time, Contractor shall demonstrate the impact on the critical path, in accordance with Section 7.03C. Failure to provide such additional information and documentation within the time allowed or within the format required shall, to the extent Owner’s interests are prejudiced, constitute a waiver of Contractor’s right to an equitable adjustment.
(d) Contractor to proceed with Work as directed: Pending final resolution of any request made in accordance with this paragraph, unless otherwise agreed in writing, Contractor shall proceed diligently with performance of the Work.

(e) Contractor to combine requests for same event together: Any requests by Contractor for an equitable adjustment in the Contract Sum and in the Contract Time that arise out of the same event(s) shall be submitted together.

3. Methods for calculating Change Order amount: The value of any Work covered by a Change Order, or of any request for an equitable adjustment in the Contract Sum, shall be determined by one of the following methods:
   a. Fixed Price: On the basis of a fixed price as determined in paragraph 7.02B.
   b. Unit Prices: By application of unit prices to the quantities of the items involved as determined in paragraph 7.02C.
   c. Time and Materials: On the basis of time and material as determined in paragraph 7.02D.

4. Fixed price method is default; Owner may direct otherwise: When Owner has requested Contractor to submit a Change Order Proposal, Owner may direct Contractor as to which method in subparagraph 3 above to use when submitting its proposal. Otherwise, Contractor shall determine the value of the Work, or of a request for an equitable adjustment, on the basis of the fixed price method.

B. Change Order Pricing – Fixed Price

Procedures: When the fixed price method is used to determine the value of any Work covered by a Change Order, or of a request for an equitable adjustment in the Contract Sum, the following procedures shall apply:

1. Breakdown and itemization of details on COP: Contractor’s Change Order Proposal, or request for adjustment in the Contract Sum, shall be accompanied by a complete itemization of the costs, including labor, material, subcontractor costs, and overhead and profit. The costs shall be itemized in the manner set forth below, and shall be submitted on breakdown sheets in a form approved by Owner.

2. Use of industry standards in calculating costs: All costs shall be calculated based upon appropriate industry standard methods of calculating labor, material quantities, and equipment costs.

3. Costs contingent on Owner’s actions: If any of Contractor’s pricing assumptions are contingent upon anticipated actions of Owner, Contractor shall clearly state them in the proposal or request for an equitable adjustment.

4. Markups on additive and deductive Work: The cost of any additive or deductive changes in the Work shall be calculated as set forth below, except that overhead and profit shall not be included on deductive changes in the Work. Where a change in the Work involves additive and deductive work by the same Contractor or Subcontractor, small tools, overhead, profit, bond and insurance markups will apply to the net difference.

5. Breakdown not required if change less than $1,000: If the total cost of the change in the Work or request for equitable adjustment does not exceed $1,000, Contractor shall not be required to submit a breakdown if the description of the change in the Work or request for equitable adjustment is sufficiently definitive for Owner to determine fair value.
6. **Breakdown required if change between $1,000 and $2,500:** If the total cost of the change in the Work or request for equitable adjustment is between $1,000 and $2,500, Contractor may submit a breakdown in the following level of detail if the description of the change in the Work or if the request for equitable adjustment is sufficiently definitive to permit the Owner to determine fair value:

   a. lump sum labor;
   b. lump sum material;
   c. lump sum equipment usage;
   d. overhead and profit as set forth below; and
   e. insurance and bond costs as set forth below.

7. **Components of increased cost:** Any request for adjustment of Contract Sum based upon the fixed price method shall include only the following items:

   a. **Craft labor costs:** These are the labor costs determined by multiplying the estimated or actual additional number of craft hours needed to perform the change in the Work by the hourly labor costs. Craft hours should cover direct labor, as well as indirect labor due to trade inefficiencies. The hourly costs shall be based on the following:

      (1) **Basic wages and benefits:** Hourly rates and benefits as stated on the Department of Labor and Industries approved "statement of intent to pay prevailing wages" or a higher amount if approved by the Owner. Direct supervision shall be a reasonable percentage not to exceed 15% of the cost of direct labor. No supervision markup shall be allowed for a working supervisor’s hours.

      (2) **Worker’s insurance:** Direct contributions to the state of Washington for industrial insurance; medical aid; and supplemental pension, by the class and rates established by the Department of Labor and Industries.

      (3) **Federal insurance:** Direct contributions required by the Federal Insurance Compensation Act; Federal Unemployment Tax Act; and the State Unemployment Compensation Act.

      (4) **Travel allowance:** Travel allowance and/or subsistence, if applicable, not exceeding those allowances established by regional labor union agreements, which are itemized and identified separately.

      (5) **Safety:** Cost incurred due to the Washington Industrial Safety and Health Act, which shall be a reasonable percentage not to exceed 2% of the sum of the amounts calculated in (1), (2), and (3) above.

   b. **Material costs:** This is an itemization of the quantity and cost of materials needed to perform the change in the Work. Material costs shall be developed first from actual known costs, second from supplier quotations or if these are not available, from standard industry pricing guides. Material costs shall consider all available discounts. Freight costs, express charges, or special delivery charges, shall be itemized.
c. **Equipment costs:** This is an itemization of the type of equipment and the estimated or actual length of time the construction equipment appropriate for the Work is or will be used on the change in the Work. Costs will be allowed for construction equipment only if used solely for the changed Work, or for additional rental costs actually incurred by the Contractor. Equipment charges shall be computed on the basis of actual invoice costs or if owned, from the current edition of one of the following sources:

2. The National Electrical Contractors Association for equipment used on electrical work.
3. The Mechanical Contractors Association of America for equipment used on mechanical work.

The EquipmentWatch Rental Rate Blue Book shall be used as a basis for establishing rental rates of equipment not listed in the above sources. The maximum rate for standby equipment shall not exceed that shown in the AGC WSDOT Equipment Rental Agreement, current edition on the Contract execution date.

d. **Allowance for small tools, expendables & consumable supplies:** Small tools consist of tools which cost $250 or less and are normally furnished by the performing contractor. The maximum rate for small tools shall not exceed the following:

1. 3% for Contractor: For Contractor, 3% of direct labor costs.
2. 5% for Subcontractors: For Subcontractors, 5% of direct labor costs.

Expendables and consumables supplies directly associated with the change in Work must be itemized.

e. **Subcontractor costs:** This is defined as payments Contractor makes to Subcontractors for changed Work performed by Subcontractors of any tier. The Subcontractors’ cost of Work shall be calculated and itemized in the same manner as prescribed herein for Contractor.

f. **Allowance for overhead:** This is defined as costs of any kind attributable to direct and indirect delay, acceleration, or impact, added to the total cost to Owner of any change in the Contract Sum. If the Contractor is compensated under Section 7.03 D, the amount of such compensation shall be reduced by the amount Contractor is otherwise entitled to under this subsection (f). This allowance shall compensate Contractor for all noncraft labor, temporary construction facilities, field engineering, schedule updating, as-built drawings, office costs, B&O taxes, estimating costs, additional overhead because of extended time, and any other cost incidental to the change in the Work. It shall be strictly limited in all cases to a reasonable amount, mutually acceptable, or if none can be agreed upon to an amount not to exceed the rates below:

1. **Projects less than $3 million:** For projects where the Contract Award Amount is under $3 million, the following shall apply:
(a) **Contractor markup on Contractor Work:** For Contractor, for any Work actually performed by Contractor’s own forces, 16% of the first $50,000 of the cost, and 4% of the remaining cost, if any.

(b) **Subcontractor markup for Subcontractor Work:** For each Subcontractor (including lower tier subcontractors), for any Work actually performed by its own forces, 16% of the first $50,000 of the cost, and 4% of the remaining cost, if any.

(c) **Contractor markup for Subcontractor Work:** For Contractor, for any work performed by its Subcontractor(s) 6% of the first $50,000 of the amount due each Subcontractor, and 4% of the remaining amount if any.

(d) **Subcontractor markup for lower tier Subcontractor Work:** For each Subcontractor, for any Work performed by its Subcontractor(s) of any lower tier, 4% of the first $50,000 of the amount due the sub-Subcontractor, and 2% of the remaining amount if any.

(e) **Basis of cost applicable for markup:** The cost to which overhead is to be applied shall be developed in accordance with Section 7.02B 7a. – e.

(2) **Projects more than $3 million:** For projects where the Contract Award Amount is equal to or exceeds $3 million, the following shall apply:

(a) **Contractor markup on Contractor Work:** For Contractor, for any Work actually performed by Contractor’s own forces, 12% of the first $50,000 of the cost, and 4% of the remaining cost, if any.

(b) **Subcontractor markup for Subcontractor Work:** For each Subcontractor (including lower tier subcontractors), for any Work actually performed by its own forces, 12% of the first $50,000 of the cost, and 4% of the remaining cost, if any.

(c) **Contractor markup for Subcontractor Work:** For Contractor, for any Work performed by its Subcontractor(s), 4% of the first $50,000 of the amount due each Subcontractor, and 2% of the remaining amount if any.

(d) **Subcontractor markup for lower tier Subcontractor Work:** For each Subcontractor, for any Work performed by its Subcontractor(s) of any lower tier, 4% of the first $50,000 of the amount due the sub-Subcontractor, and 2% of the remaining amount if any.

(e) **Basis of cost applicable for markup:** The cost to which overhead is to be applied shall be developed in accordance with Section 7.02B 7a. – e.

(g) **Allowance for profit:** Allowance for profit is an amount to be added to the cost of any change in contract sum, but not to the cost of change in Contract Time for which contractor has been compensated pursuant to the conditions set forth in Section 7.03. It shall be limited to a reasonable amount, mutually acceptable, or if none can be agreed upon, to an amount not to exceed the rates below:

(1) **Contractor / Subcontractor markup for self-performed Work:** For Contractor or Subcontractor of any tier for work performed by their forces, 6% of the cost developed in accordance with Section 7.02B 7a. – e.
(2)  Contractor / Subcontractor markup for Work performed at lower tier: For Contractor or Subcontractor of any tier for work performed by a subcontractor of a lower tier, 4% of the subcontract cost developed in accordance with Section 7.02B 7a. – h.

h. Insurance and bond premiums: Cost of change in insurance or bond premium: This is defined as:

(1)  Contractor’s liability insurance: The cost of any changes in Contractor’s liability insurance arising directly from execution of the Change Order; and

(2)  Payment and Performance Bond: The cost of the additional premium for Contractor’s bond arising directly from the changed Work.

The cost of any change in insurance or bond premium shall be added after overhead and allowance for profit are calculated in accordance with subparagraph f. and g above.

C. Change Order Pricing – Unit Prices

1. Content of Owner authorization: Whenever Owner authorizes Contractor to perform Work on a unit-price basis, Owner’s authorization shall clearly state:

   a. Scope: Scope of work to be performed;

   b. Reimbursement basis: Type of reimbursement including pre-agreed rates for material quantities; and

   c. Reimbursement limit: Cost limit of reimbursement.

2. Contractor responsibilities: Contractor shall:

   a. Cooperate with Owner and assist in monitoring the Work being performed. As requested by Owner, Contractor shall identify workers assigned to the Change Order Work and areas in which they are working;

   b. Leave access as appropriate for quantity measurement; and

   c. Not exceed any cost limit(s) without Owner’s prior written approval.

3. Cost breakdown consistent with Fixed Price requirements: Contractor shall submit costs in accordance with paragraph 7.02B and satisfy the following requirements:

   a. Unit prices must include overhead, profit, bond and insurance premiums: Unit prices shall include reimbursement for all direct and indirect costs of the Work, including overhead, profit, bond, and insurance costs; and

   b. Owner verification of quantities: Quantities must be supported by field measurement statements signed by Owner.

D. Change Order Pricing – Time-and-Material Prices

1. Content of Owner authorization: Whenever Owner authorizes Contractor to perform Work on a time-and-material basis, Owner’s authorization shall clearly state:

   a. Scope: Scope of Work to be performed;
b. **Reimbursement basis:** Type of reimbursement including pre-agreed rates, if any, for material quantities or labor; and

c. **Reimbursement limit:** Cost limit of reimbursement.

2. **Contractor responsibilities:** Contractor shall:

   a. **Identify workers assigned:** Cooperate with Owner and assist in monitoring the Work being performed. As requested by Owner, identify workers assigned to the Change Order Work and areas in which they are working;

   b. **Provide daily timesheets:** Identify on daily time sheets all labor performed in accordance with this authorization. Submit copies of daily time sheets within 2 working days for Owner’s review.

   c. **Allow Owner to measure quantities:** Leave access as appropriate for quantity measurement;

   d. **Perform Work efficiently:** Perform all Work in accordance with this section as efficiently as possible; and

   e. **Not exceed Owner’s cost limit:** Not exceed any cost limit(s) without Owner’s prior written approval.

3. **Cost breakdown consistent with Fixed Price requirements:** Contractor shall submit costs in accordance with paragraph 7.02B and additional verification supported by:

   a. **Timesheets:** Labor detailed on daily time sheets; and

   b. **Invoices:** Invoices for material.

### 7.03 CHANGE IN THE CONTRACT TIME

A. **COP requests for Contract Time:** The Contract Time shall only be changed by a Change Order. Contractor shall include any request for a change in the Contract Time in its Change Order Proposal.

B. **Time extension permitted if not Contractor’s fault:** If the time of Contractor’s performance is changed due to an act of Force Majeure, or due to the fault or negligence of Owner or anyone for whose acts Owner is responsible, Contractor shall be entitled to make a request for an equitable adjustment in the Contract Time in accordance with the following procedure. No adjustment in the Contract Time shall be allowed to the extent Contractor’s changed time of performance is due to the fault or negligence of Contractor, or anyone for whose acts Contractor is responsible.

   1. **Notice and record keeping for Contract Time request:** A request for an equitable adjustment in the Contract Time shall be based on written notice delivered within 7 Days of the occurrence of the event giving rise to the request. If Contractor believes it is entitled to adjustment of Contract Time, Contractor shall immediately notify Owner and begin to keep and maintain complete, accurate, and specific daily records. Contractor shall give Owner access to any such record and if requested, shall promptly furnish copies of such record to Owner.

   2. **Timing and content of Contractor’s Notice:** Contractor shall not be entitled to an adjustment in the Contract Time for any events that occurred more than 7 Days before Contractor’s written notice to Owner. The written notice shall set forth, at a minimum, a description of: the event giving rise to the request for an equitable adjustment in the
Contract Time; the nature of the impacts to Contractor and its Subcontractors of any tier, if any; and to the extent possible the amount of the adjustment in Contract Time requested. Failure to properly give such written notice shall, to the extent Owner’s interests are prejudiced, constitute a waiver of Contractor’s right to an equitable adjustment.

3. **Contractor to provide supplemental information:** Within 30 Days of the occurrence of the event giving rise to the request, unless Owner agrees in writing to allow an additional period of time to ascertain more accurate data, Contractor shall supplement the written notice provided in accordance with subparagraph 7.03B.2 with additional supporting data. Such additional data shall include, at a minimum: the amount of delay claimed, itemized in accordance with the procedure set forth herein; specific facts, circumstances, and analysis that confirms not only that Contractor suffered the delay claimed, but that the delay claimed was actually a result of the act, event, or condition complained of, and that the Contract Documents provide entitlement to an equitable adjustment in Contract Time for such act, event, or condition; and supporting documentation sufficiently detailed to permit an informed analysis of the request by Owner. Failure to provide such additional information and documentation within the time allowed or within the format required shall, to the extent Owner’s interests are prejudiced, constitute a waiver of Contractor’s right to an equitable adjustment.

4. **Contractor to proceed with Work as directed:** Pending final resolution of any request in accordance with this paragraph, unless otherwise agreed in writing, Contractor shall proceed diligently with performance of the Work.

C. **Contractor to demonstrate impact on critical path of schedule:** Any change in the Contract Time covered by a Change Order, or based on a request for an equitable adjustment in the Contract Time, shall be limited to the change in the critical path of Contractor’s schedule attributable to the change of Work or event(s) giving rise to the request for equitable adjustment. Any Change Order Proposal or request for an adjustment in the Contract Time shall demonstrate the impact on the critical path of the schedule. Contractor shall be responsible for showing clearly on the Progress Schedule that the change or event: had a specific impact on the critical path, and except in case of concurrent delay, was the sole cause of such impact; and could not have been avoided by resequencing of the Work or other reasonable alternatives.

D. **Cost of change in Contract Time:** Contractor may request compensation for the cost of a change in Contract Time in accordance with this paragraph, 7.03D, subject to the following conditions:

1. **Must be solely fault of Owner or A/E:** The change in Contract Time shall solely be caused by the fault or negligence of Owner or A/E;

2. **Procedures:** Contractor shall follow the procedure set forth in paragraph 7.03B;

3. **Demonstrate impact on critical path:** Contractor shall establish the extent of the change in Contract Time in accordance with paragraph 7.03C; and

4. **Limitations on daily costs:** The daily cost of any change in Contract Time shall be limited to the items below, less the amount of any change in the Contract Sum the Contractor may otherwise be entitled to pursuant to Section 7.02B 7f for any change in the Work that contributed to this change in Contract Time:

   a. **Non-productive supervision or labor:** cost of nonproductive field supervision or labor extended because of delay;

   b. **Weekly meetings and indirect activities:** cost of weekly meetings or similar indirect activities extended because of the delay;
c. **Temporary facilities or equipment rental:** cost of temporary facilities or equipment rental extended because of the delay;

d. **Insurance premiums:** cost of insurance extended because of the delay;

e. **Overhead:** general and administrative overhead in an amount to be agreed upon, but not to exceed 3% of the Contract Award Amount divided by the originally specified Contract Time for each Day of the delay.

### PART 8 – CLAIMS AND DISPUTE RESOLUTION

#### 8.01 CLAIMS PROCEDURE

A. **Claim is Contractor's remedy:** If the parties fail to reach agreement on the terms of any Change Order for Owner-directed Work as provided in Section 7.01, or on the resolution of any request for an equitable adjustment in the Contract Sum as provided in Section 7.02 or the Contract Time as provided in Section 7.03, Contractor's only remedy shall be to file a Claim with Owner as provided in this section.

B. **Claim filing deadline for Contractor:** Contractor shall file its Claim within 120 Days from Owner's final offer made in accordance with paragraph 7.01E, or by the date of Final Acceptance, whichever occurs first.

C. **Claim must cover all costs and be documented:** The Claim shall be deemed to cover all changes in cost and time (including direct, indirect, impact, and consequential) to which Contractor may be entitled. It shall be fully substantiated and documented. At a minimum, the Claim shall contain the following information:

1. **Factual statement of Claim:** A detailed factual statement of the Claim for additional compensation and time, if any, providing all necessary dates, locations, and items of Work affected by the Claim;

2. **Dates:** The date on which facts arose which gave rise to the Claim;

3. **Owner and A/E employee’s knowledgeable about Claim:** The name of each employee of Owner or A/E knowledgeable about the Claim;

4. **Support from Contract Documents:** The specific provisions of the Contract Documents which support the Claim;

5. **Identification of other supporting information:** The identification of any documents and the substance of any oral communications that support the Claim;

6. **Copies of supporting documentation:** Copies of any identified documents, other than the Contract Documents, that support the Claim;

7. **Details on Claim for Contract Time:** If an adjustment in the Contract Time is sought: the specific days and dates for which it is sought; the specific reasons Contractor believes an extension in the Contract Time should be granted; and Contractor's analysis of its Progress Schedule to demonstrate the reason for the extension in Contract Time;

8. **Details on Claim for adjustment of Contract Sum:** If an adjustment in the Contract Sum is sought, the exact amount sought and a breakdown of that amount into the categories set forth in, and in the detail as required by Section 7.02; and
9. Statement certifying Claim: A statement certifying, under penalty of perjury, that the Claim is made in good faith, that the supporting cost and pricing data are true and accurate to the best of Contractor’s knowledge and belief, that the Claim is fully supported by the accompanying data, and that the amount requested accurately reflects the adjustment in the Contract Sum or Contract Time for which Contractor believes Owner is liable.

D. Owner’s response to Claim filed: After Contractor has submitted a fully documented Claim that complies with all applicable provisions of Parts 7 and 8, Owner shall respond, in writing, to Contractor as follows:

1. Response time for Claim less than $50,000: If the Claim amount is less than $50,000, with a decision within 60 Days from the date the Claim is received; or

2. Response time for Claim of $50,000 or more: If the Claim amount is $50,000 or more, with a decision within 60 Days from the date the Claim is received, or with notice to Contractor of the date by which it will render its decision. Owner will then respond with a written decision in such additional time.

E. Owner’s review of Claim and finality of decision: To assist in the review of Contractor’s Claim, Owner may visit the Project site, or request additional information, in order to fully evaluate the issues raised by the Claim. Contractor shall proceed with performance of the Work pending final resolution of any Claim. Owner’s written decision as set forth above shall be final and conclusive as to all matters set forth in the Claim, unless Contractor follows the procedure set forth in Section 8.02.

F. Waiver of Contractor rights for failure to comply with this Section: Any Claim of the Contractor against the Owner for damages, additional compensation, or additional time, shall be conclusively deemed to have been waived by the Contractor unless made in accordance with the requirements of this Section.

8.02 ARBITRATION

A. Timing of Contractor’s demand for arbitration: If Contractor disagrees with Owner’s decision rendered in accordance with paragraph 8.01D, Contractor shall provide Owner with a written demand for arbitration. No demand for arbitration of any such Claim shall be made later than 30 Days after the date of Owner’s decision on such Claim; failure to demand arbitration within said 30 Day period shall result in Owner’s decision being final and binding upon Contractor and its Subcontractors.

B. Filing of Notice for arbitration: Notice of the demand for arbitration shall be filed with the American Arbitration Association (AAA), with a copy provided to Owner. The parties shall negotiate or mediate under the Voluntary Construction Mediation Rules of the AAA, or mutually acceptable service, before seeking arbitration in accordance with the Construction Industry Arbitration Rules of AAA as follows:

1. Claims less than $30,000: Disputes involving $30,000 or less shall be conducted in accordance with the Northwest Region Expedited Commercial Arbitration Rules; or

2. Claims greater than $30,000: Disputes over $30,000 shall be conducted in accordance with the Construction Industry Arbitration Rules of the AAA, unless the parties agree to use the expedited rules.

C. Arbitration is forum for resolving Claims: All Claims arising out of the Work shall be resolved by arbitration. The judgment upon the arbitration award may be entered, or review of the award may
occur, in the superior court having jurisdiction thereof. No independent legal action relating to or arising from the Work shall be maintained.

D. **Owner may combine Claims into same arbitration:** Claims between Owner and Contractor, Contractor and its Subcontractors, Contractor and A/E, and Owner and A/E shall, upon demand by Owner, be submitted in the same arbitration or mediation.

E. **Settlement outside of arbitration to be documented in Change Order:** If the parties resolve the Claim prior to arbitration judgment, the terms of the resolution shall be incorporated in a Change Order. The Change Order shall constitute full payment and final settlement of the Claim, including all claims for time and for direct, indirect, or consequential costs, including costs of delays, inconvenience, disruption of schedule, or loss of efficiency or productivity.

### 8.03 CLAIMS AUDITS

A. **Owner may audit Claims:** All Claims filed against Owner shall be subject to audit at any time following the filing of the Claim. Failure of Contractor, or Subcontractors of any tier, to maintain and retain sufficient records to allow Owner to verify all or a portion of the Claim or to permit Owner access to the books and records of Contractor, or Subcontractors of any tier, shall constitute a waiver of the Claim and shall bar any recovery.

B. **Contractor to make documents available:** In support of Owner audit of any Claim, Contractor shall, upon request, promptly make available to Owner the following documents:

1. Daily time sheets and supervisor’s daily reports;
2. Collective bargaining agreements;
3. Insurance, welfare, and benefits records;
4. Payroll registers;
5. Earnings records;
6. Payroll tax forms;
7. Material invoices, requisitions, and delivery confirmations;
8. Material cost distribution worksheet;
9. Equipment records (list of company equipment, rates, etc.);
11. Contracts between Contractor and each of its Subcontractors, and all lower-tier Subcontractor contracts and supplier contracts;
12. Subcontractors’ and agents’ payment certificates;
13. Cancelled checks (payroll and vendors);
14. Job cost report, including monthly totals;
15. Job payroll ledger;
16. Planned resource loading schedules and summaries;
17. General ledger;
18. Cash disbursements journal;
19. Financial statements for all years reflecting the operations on the Work. In addition, the Owner may require, if it deems it appropriate, additional financial statements for 3 years preceding execution of the Work;
20. Depreciation records on all company equipment whether these records are maintained by the company involved, its accountant, or others;
21. If a source other than depreciation records is used to develop costs for Contractor’s internal purposes in establishing the actual cost of owning and operating equipment, all such other source documents;
22. All nonprivileged documents which relate to each and every Claim together with all documents which support the amount of any adjustment in Contract Sum or Contract Time sought by each Claim;
23. Work sheets or software used to prepare the Claim establishing the cost components for items of the Claim including but not limited to labor, benefits and insurance, materials, equipment, Subcontractors, all documents which establish the time periods, individuals involved, the hours for the individuals, and the rates for the individuals; and
24. Work sheets, software, and all other documents used by Contractor to prepare its bid.

C. Contractor to provide facilities for audit and shall cooperate: The audit may be performed by employees of Owner or a representative of Owner. Contractor, and its Subcontractors, shall provide adequate facilities acceptable to Owner, for the audit during normal business hours. Contractor, and all Subcontractors, shall make a good faith effort to cooperate with Owner’s auditors.

PART 9 – TERMINATION OF THE WORK

9.01 TERMINATION BY OWNER FOR CAUSE

A. 7 Day Notice to Terminate for Cause: Owner may, upon 7 Days written notice to Contractor and to its surety, terminate (without prejudice to any right or remedy of Owner) the Work, or any part of it, for cause upon the occurrence of any one or more of the following events:

1. Contractor fails to prosecute Work: Contractor fails to prosecute the Work or any portion thereof with sufficient diligence to ensure Substantial Completion of the Work within the Contract Time;
2. Contractor bankrupt: Contractor is adjudged bankrupt, makes a general assignment for the benefit of its creditors, or a receiver is appointed on account of its insolvency;
3. Contractor fails to correct Work: Contractor fails in a material way to replace or correct Work not in conformance with the Contract Documents;
4. Contractor fails to supply workers or materials: Contractor repeatedly fails to supply skilled workers or proper materials or equipment;
5. Contractor failure to pay Subcontractors or labor: Contractor repeatedly fails to make prompt payment due to Subcontractors or for labor;

July 1, 2010
6. **Contractor violates laws:** Contractor materially disregards or fails to comply with laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction; or

7. **Contractor in material breach of Contract:** Contractor is otherwise in material breach of any provision of the Contract Documents.

**B. Owner’s actions upon termination:** Upon termination, Owner may at its option:

1. **Take possession of Project site:** Take possession of the Project site and take possession of or use all materials, equipment, tools, and construction equipment and machinery thereon owned by Contractor to maintain the orderly progress of, and to finish, the Work;

2. **Accept assignment of Subcontracts:** Accept assignment of subcontracts pursuant to Section 5.20; and

3. **Finish the Work:** Finish the Work by whatever other reasonable method it deems expedient.

**C. Surety’s role:** Owner’s rights and duties upon termination are subject to the prior rights and duties of the surety, if any, obligated under any bond provided in accordance with the Contract Documents.

**D. Contractor’s required actions:** When Owner terminates the Work in accordance with this section, Contractor shall take the actions set forth in paragraph 9.02B, and shall not be entitled to receive further payment until the Work is accepted.

**E. Contractor to pay for unfinished Work:** If the unpaid balance of the Contract Sum exceeds the cost of finishing the Work, including compensation for A/E’s services and expenses made necessary thereby and any other extra costs or damages incurred by Owner in completing the Work, or as a result of Contractor’s actions, such excess shall be paid to Contractor. If such costs exceed the unpaid balance, Contractor shall pay the difference to Owner. These obligations for payment shall survive termination.

**F. Contractor and Surety still responsible for Work performed:** Termination of the Work in accordance with this section shall not relieve Contractor or its surety of any responsibilities for Work performed.

**G. Conversion of “Termination for Cause” to “Termination for Convenience”:** If Owner terminates Contractor for cause and it is later determined that none of the circumstances set forth in paragraph 9.01A exist, then such termination shall be deemed a termination for convenience pursuant to Section 9.02.

9.02 **TERMINATION BY OWNER FOR CONVENIENCE**

**A. Owner Notice of Termination for Convenience:** Owner may, upon written notice, terminate (without prejudice to any right or remedy of Owner) the Work, or any part of it, for the convenience of Owner.

**B. Contractor response to termination Notice:** Unless Owner directs otherwise, after receipt of a written notice of termination for either cause or convenience, Contractor shall promptly:

1. **Cease Work:** Stop performing Work on the date and as specified in the notice of termination;
Section 00 72 00
GENERAL CONDITIONS
FOR WASHINGTON STATE FACILITY CONSTRUCTION
Page 43 of 44

2. **No further orders or Subcontracts:** Place no further orders or subcontracts for materials, equipment, services or facilities, except as may be necessary for completion of such portion of the Work as is not terminated;

3. **Cancel orders and Subcontracts:** Cancel all orders and subcontracts, upon terms acceptable to Owner, to the extent that they relate to the performance of Work terminated;

4. **Assign orders and Subcontracts to Owner:** Assign to Owner all of the right, title, and interest of Contractor in all orders and subcontracts;

5. **Take action to protect the Work:** Take such action as may be necessary or as directed by Owner to preserve and protect the Work, Project site, and any other property related to this Project in the possession of Contractor in which Owner has an interest; and

6. **Continue performance not terminated:** Continue performance only to the extent not terminated

**C. Terms of adjustment in Contract Sum if Contract terminated:** If Owner terminates the Work or any portion thereof for convenience, Contractor shall be entitled to make a request for an equitable adjustment for its reasonable direct costs incurred prior to the effective date of the termination, plus reasonable allowance for overhead and profit on Work performed prior to termination, plus the reasonable administrative costs of the termination, but shall not be entitled to any other costs or damages, whatsoever, provided however, the total sum payable upon termination shall not exceed the Contract Sum reduced by prior payments. Contractor shall be required to make its request in accordance with the provisions of Part 7.

**D. Owner to determine whether to adjust Contract Time:** If Owner terminates the Work or any portion thereof for convenience, the Contract Time shall be adjusted as determined by Owner.

**PART 10 – MISCELLANEOUS PROVISIONS**

**10.01 GOVERNING LAW**

Applicable law and venue: The Contract Documents and the rights of the parties herein shall be governed by the laws of the state of Washington. Venue shall be in the county in which Owner’s principal place of business is located, unless otherwise specified.

**10.02 SUCCESSORS AND ASSIGNS**

Bound to successors; Assignment of Contract: Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to the other party hereto and to partners, successors, assigns, and legal representatives of such other party in respect to covenants, agreements, and obligations contained in the Contract Documents. Neither party shall assign the Work without written consent of the other, except that Contractor may assign the Work for security purposes, to a bank or lending institution authorized to do business in the state of Washington. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations set forth in the Contract Documents.

**10.03 MEANING OF WORDS**

Meaning of words used in Specifications: Unless otherwise stated in the Contract Documents, words which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings. Reference to standard specifications, manuals, or codes of any technical society, organization, or association, or to the code of any governmental authority,
whether such reference be specific or by implication, shall be to the latest standard specification, manual, or code in effect on the date for submission of bids, except as may be otherwise specifically stated. Wherever in these Drawings and Specifications an article, device, or piece of equipment is referred to in the singular manner, such reference shall apply to as many such articles as are shown on the drawings, or required to complete the installation.

10.04 RIGHTS AND REMEDIES

No waiver of rights: No action or failure to act by Owner or A/E shall constitute a waiver of a right or duty afforded them under the Contract Documents, nor shall action or failure to act constitute approval or an acquiescence in a breach therein, except as may be specifically agreed in writing.

10.05 CONTRACTOR REGISTRATION

Contractor must be registered or licensed: Pursuant to RCW 39.06, Contractor shall be registered or licensed as required by the laws of the State of Washington, including but not limited to RCW 18.27.

10.06 TIME COMPUTATIONS

Computing time: When computing any period of time, the day of the event from which the period of time begins shall not be counted. The last day is counted unless it falls on a weekend or legal holiday, in which event the period runs until the end of the next day that is not a weekend or holiday. When the period of time allowed is less than 7 days, intermediate Saturdays, Sundays, and legal holidays are excluded from the computation.

10.07 RECORDS RETENTION

Six year records retention period: The wage, payroll, and cost records of Contractor, and its Subcontractors, and all records subject to audit in accordance with Section 8.03, shall be retained for a period of not less than 6 years after the date of Final Acceptance.

10.08 THIRD-PARTY AGREEMENTS

No third party relationships created: The Contract Documents shall not be construed to create a contractual relationship of any kind between: A/E and Contractor; Owner and any Subcontractor; or any persons other than Owner and Contractor.

10.09 ANTITRUST ASSIGNMENT

Contractor assigns overcharge amounts to Owner: Owner and Contractor recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by the purchaser. Therefore, Contractor hereby assigns to Owner any and all claims for such overcharges as to goods, materials, and equipment purchased in connection with the Work performed in accordance with the Contract Documents, except as to overcharges which result from antitrust violations commencing after the Contract Sum is established and which are not passed on to Owner under a Change Order. Contractor shall put a similar clause in its Subcontracts, and require a similar clause in its sub-Subcontracts, such that all claims for such overcharges on the Work are passed to Owner by Contractor.

10.10 HEADINGS AND CAPTIONS

Headings for convenience only: All headings and captions used in these General Conditions are only for convenience of reference, and shall not be used in any way in connection with the meaning, effect, interpretation, construction, or enforcement of the General Conditions, and do not define the limit or describe the scope or intent of any provision of these General Conditions.
TABLE OF CONTENTS

PART 1  GENERAL PROVISIONS
   1.01  Definitions

PART 2  INSURANCE AND BONDS
   2.01  Contractor’s Liability Insurance
   2.04  Payment and Performance Bonds

PART 5  PERFORMANCE
   5.01  Contractor Control and Supervision
   5.02  Permits, Fees and Notice
   5.07  Safety Precautions
   5.10  Unforeseen Physical Conditions
   5.13  Material and Equipment
   5.20  Subcontractor and Suppliers
   5.23  Contractor Performance Evaluation

PART 6  PAYMENTS AND COMPLETION
   6.07  Substantial Completion

PART 7  CHANGES
   7.02  Change in the Contract Sum

PART 8  CLAIMS AND DISPUTE RESOLUTION
   8.02  Litigation

PART 10 MISCELLANEOUS PROVISIONS
   10.11 BEE Requirements
These University of Washington Modifications to the General Conditions form a part of, and are incorporated in the Contract Documents and modify, delete, add, and replace provisions of the General Conditions. Provisions not altered remain in effect. All terms defined elsewhere in the Contract Documents shall have the same meaning here.

PART 1 – GENERAL PROVISIONS

1.01 DEFINITIONS

Add the following definitions:

**Certified Business Enterprise (CBE):** Any business enterprise certified with the Washington State Office of Minority and Women’s Business Enterprises (OMWBE), Northwest Mountain Minority Supplier Diversity Council (NWMMSDC), or Women’s Business Enterprise Council (WBEC).

**Lesbian/Gay/Bisexual/Transgender Business Enterprise (LGBTBE):** More than 50% owned and controlled by at least one person who is a member of the LGBT community.

**Minority Business Enterprise (MBE):** More than 50% owned and controlled by at least one person who is a member of one or more of the following minority groups:

- Asian Pacific American
- Black American
- Hispanic American
- Native American
- Subcontinent Asian American

**Minority Women’s Business Enterprise (MWBE):** More than 50% owned and controlled by at least one woman who is a member of one or more of the above minority groups.

**Small Business Enterprise (SBE):** A business entity that:

- Can attest that it is owned and operated independently from all other businesses and
- Conforms to the U.S. Small Business Administration Size Standards of the North American Industry Classification System (NAICS) Codes in which it is to be engaged at the UW; or
- Is certified with the OMWBE.

**Veteran’s Business Enterprise (VBE):** Certified with the Washington State Department of Veteran’s Affairs (DVA)

**Women’s Business Enterprise (WBE):** More than 50% owned and controlled by one or more women.

PART 2 – INSURANCE AND BONDS

2.01 Contractor’s Liability Insurance
• Add the following language to the end of the first paragraph of section 2.01:

“The certificate holder shall be:
UW Facilities, Project Delivery Group
University of Washington
Box 352205
Seattle, WA 98195”

A policy for Commercial General Liability Insurance which includes coverage for bodily injury, property damage, premises operations, independent contracts, and broad-form contractual liability, and Stop Gap, unless as Employer Liability under Part B of Worker’s Compensation Insurance Policy.

Products Completed Operations Additional Insured. The Contractor’s CGL insurance must include the Owner as an additional insured status on ISO CG 20 10 11 85 or CG 20 37 endorsement, or by an equivalent policy or endorsement provisions. The Product Completed Operations additional insured status for the Owner must remain in effect for not less than 3 years following Final Completion.

• Delete subparagraph 2.01A2 and replace it with the following language:

“Automobile Liability Insurance:
Commercial Automobile Liability with a combined single limited of not less than $1,000,000 for each accident. Coverage shall include Bodily Injury and Property Damage Liability for all owned, non-owned, leased, and hired automobiles and contain a Waiver of Subrogation in favor of the Owner. If pollutants are to be transported, MCS 90 and CA 99 48 endorsements are required on the Automobile Liability policy unless the transportation pollution risk covered under a Pollution Liability insurance policy carried by the Contractor.

• Delete paragraph 2.01D and replace it with the following language:

“Owner as Additional Insured: All insurance coverages shall name the Board of Regents of the University of Washington as an additional insured with respect to liability arising out of work performed by Contractor, and an additional insured endorsement to the policy must be provided to the Owner. All insurance coverages shall be endorsed to be primary and non-contributory with any insurance maintained by the University of Washington, provide a waiver of any rights of subrogation against the University of Washington, and contain a severability of interest provision in favor of the University of Washington, and all insurance certificates shall evidence full compliance with the enumerated requirements. If the contract amount, including alternates, is less than $5 million, the primary and non-contributory endorsement is not mandatory.”

The Contractor must provide a Pollution Liability policy for pollutants that are or may be remediated on or off site covering claims, including investigation, defense, or settlement costs and expenses that involve bodily injury and property damage (including natural resources damages and loss of use of tangible property that has not been physically injured) covering:

Pollution conditions caused or made worse by the Contractor, including clean-up costs for a newly caused condition or a historical condition that is made worse the vicarious liability of subcontractors of any tier.

The Pollution Liability insurance must provide a minimum limit of liability of $1,000,000 each claim with a minimum aggregate limit of 200% of the each claim limit. There is no requirement for a dedicated project aggregate limit provided that the Contractor (1) submits to the Owner before the Notice to Proceed Date with its insurance certification a written statement from its authorized insurance representative that the full minimum aggregate limit is available and has
not been impaired by any claims reserved on another project, and (2) thereafter, until the completion of the Work, provides notice in writing to the City within 10 Days of Contractor’s constructive knowledge of any pending or actual impairment of the aggregate limit. If in-Transit Pollution Liability is required but is not provided under the Automobile Liability, the Contractor must provide evidence of transportation coverage under the Contractor’s Pollution Liability policy.

2.04 Payment and Performance Bonds

- Delete the last sentence of section 2.04 and replace it with the following language:
  “No payment or performance bond is required if the Contract Sum is $150,000 or less and Contractor agrees that Owner may, in lieu of the bond, retain 10% of the Contract Sum for the period allowed by RCW 39.08.010.”

PART 5 - PERFORMANCE

5.01 Contractor Control and Supervision

Add a new paragraph 5.01G as follows:

“Work During Off Hours: When work is to be performed during other than normal working hours or on University of Washington holidays, Contractor shall give Owner prior notice so that Owner’s Police Department may be properly notified. Any construction activity between the hours of 10:00 p.m. to 6:00 a.m. is subject to approval of Owner.”

Add a new paragraph 5.01H as follows:

“Contractor to comply with University of Washington’s campus conduct code: Contractor shall ensure that its owner(s) and employees, and those of its Subcontractors, comply with the University’s conduct on campus code, WAC 478-124-020, which, among other things, prohibits the possession or use of firearms or other dangerous weapons or instrumentalities on the University campus, except for authorized University purposes. At the discretion of the University, Contractor shall remove from the University campus, at its sole cost and expense, any of its, or its Subcontractors’ employees, if they are in violation of this code.”

5.02 Permits, Fees and Notice

Add a new paragraph 5.02D as follows:

“For Work within the City of Seattle, Owner shall pay the City of Seattle directly for the cost of the Master Use and Building Permit. Prior to Final Acceptance, the building permit and City-approved drawings, signed inspection card(s), and any appropriate occupancy permits shall be submitted to Owner.”

5.07 Safety Precautions

- Add a new paragraph 5.07I as follows:

  “In order to receive a Notice to Proceed, the Contractor must submit the following to Owner:

  1. A copy of its company Safety Program. The Safety Program shall contain, at a minimum, the following:

     a. Organization, including names of individuals who will perform safety duties, titles, work assignments, authority and reporting relationships.”
b. Training Program. Who, how and when training is provided; method of employee training concerning safety rules and procedures; training in use of protective equipment.

c. Protective Equipment. List of personal protective equipment to be provided to employees.

d. Accident Prevention and Loss Control Plan. Work site inspection and hazard correction procedures; disciplinary procedures for safety infractions; accident response, investigation and reporting procedures.

e. Regular Safety Meetings. On-site weekly or other frequency as appropriate, safety meetings mandatory for all employees."

- Add a new paragraph 5.07J as follows:
  "Prior to commencing any Work on-site, Contractor shall submit an appropriate site specific safety plan for Owner's acceptance. The plan must be tailored to the needs of the particular project and to the types of hazards involved, and be in compliance with WISHA requirements. Contractor shall not begin any on-site Work until the site specific safety plan has been accepted by Owner."

- Add a new paragraph 5.07K
  "With its monthly Application for Payment, the Contractor shall submit the Monthly Safety report on the form in Appendix A.

5.10 Unforeseen Physical Conditions

Add a new paragraph 5.10C as follows:

"If Contractor encounters mold in the course of its work it shall notify Owner to evaluate what action might be necessary. Contractor shall ensure that all building materials used during the work are dry prior to incorporation into the Work. If Contractor encounters water intrusion from any source it shall take immediate steps to ensure that any effected material is dry according to generally accepted industry standards."

5.13 Material and Equipment

Add the following new sentence after the last sentence of paragraph 5.13A:

"Contractor shall ensure that all equipment, materials and articles incorporated into the Work shall be asbestos free."

5.20 Subcontractors and Suppliers

Add the following new subparagraph 5.20A6 as follows:

"For contracts entered into between September 1, 2010 and December 31, 2013, not have violated the reporting requirements of RCW 39.04.370 more than one time, as determined by the Department of Labor and Industries."

5.23 Contractor Performance Evaluation

Add a new section 5.23 as follows:
“CONTRACTOR PERFORMANCE EVALUATION

Owner shall evaluate Contractor for the performance categories as set forth in the “Contractor Performance Evaluation Report” in Appendix A. Section 00 73 20, Contractor Performance Evaluation Program, describes the evaluation process.”

PART 6 – PAYMENTS AND COMPLETION

6.07 Substantial Completion

Delete the second sentence of paragraph 6.07 and replace it with the following language:

“All Work other than incidental corrective and incidental punch list work shall be completed.”

PART 7 – CHANGES

7.02 Change in the Contract Sum

- Add the following new sentence after the second sentence of subparagraph 7.02B7a:

  “When estimating labor hours for electrical work, such hours shall be no greater than the Labor Units for specific items included in the "Normal" project conditions column of the NECA Manual of Labor Units, most recent edition. When estimating labor hours for mechanical work, such hours shall be no greater than 75% of the Labor Units for specific items included in the MCAA Web-Based Estimating Manual (WebLEM), subject to the assumptions and notes in the WebLEM, except that the Labor Units for “Hangers, Sleeves, & Inserts” shall be no greater than 50% of the WebLEM Labor Units. Special exceptions for electrical and mechanical work may be made for work having to be performed under extraordinary conditions. Such exceptions shall be identified and explained in any applicable pricing proposals and shall be subject to approval by Owner.”

- Delete the last sentence of subparagraph 7.02B7a(1) and replace it with the following:

  “No supervision markup shall be allowed in a Change Order that contains direct labor costs for a working supervisor’s hours (including any category of foreman).”

- Replace subparagraph 7.02B7b in its entirety with the following:

  “Material costs: This is an itemization of the quantity and cost of materials needed to perform the change in the Work. Material costs shall be developed first from actual known costs, including, but not limited to, Contractors’ supplier(s)’ actual cost(s) available from the standard industry pricing guide “Trade Service”, second from supplier quotations, or, if these are not available, and third from other standard industry pricing guides.

  Material costs shall include all available discounts. Freight costs, express charges, or special delivery charges, shall be itemized.”

- Add the following new language after the second sentence of subparagraph 7.02B7c:
"The Contractor's cost for utility vehicles and other items such as pickup trucks, vans, flatbed trucks, storage trailers, containers, etc., that are already in use or planned for use on the Project will not be compensated in Change Order work except for the time that, in the opinion of the Owner, such items: (1) are directly and necessarily used for the performance of the change work; and (2) the cost of using such items has not been included within the Contractor's total project overhead costs."

- Add the following new language after the last sentence of subparagraph 7.02B7c(2):
  
  "Equipment pricing shall be no greater than 75% of NECA monthly rates."

- Delete the first sentence of subparagraph 7.02B7d and replace it with the following language:

  "Small tools consist of tools which cost $1,000 or less and are normally furnished by the performing contractor."

PART 8 - CLAIMS AND DISPUTE RESOLUTION

8.02 Replace section 8.02 in its entirety with the following:

"LITIGATION"

A. If Contractor disagrees with Owner's decision rendered in accordance with paragraph 8.01D, Contractor shall serve and file a lawsuit in an appropriate court within 120 days of Owner's decision. This requirement cannot be waived except by an explicit waiver signed by Owner. The failure to file a lawsuit within said 120-day period shall result in Owner's decision rendered in accordance with paragraph 8.01D being final and binding on Contractor and all of its Subcontractors.

B. At any time, either before or after a lawsuit has been commenced by Contractor in accordance with paragraph 8.02A, Owner may require Contractor to participate in further mediation or arbitration, or both, in any forum or format as determined by Owner.

C. Claims between Owner and Contractor, Contractor and its Subcontractors, Contractor and A/E, and Owner and A/E shall, upon demand by Owner, be submitted in a single forum, or Owner may consolidate such Claims or join any of the above-named parties in the same forum."

PART 10 - MISCELLANEOUS PROVISIONS

10.11 Add a new section 10.11 as follows:

"Business Equity Requirements"

A. General Requirements

Contractor shall conduct business in an equitable and inclusive manner. The University of Washington welcomes the participation of all Business Equity Enterprises (BEE), irrespective of gross revenues, including those that are self-designated and those that are state (OMWBE) certified. Participation may be on a direct basis in response to this invitation to bid, or as a subcontractor or supplier. The University of Washington has set an overall aspirational goal of 20% BEE utilization, inclusive of 15% minority and women-owned business utilization across our public works program.
Contractor shall comply with the following requirements:
In accordance with Chapter 39.19 RCW, it is the policy of the State of Washington to provide the maximum practicable opportunity for increased participation by minority and women-owned and controlled businesses (MWBE) in public works.

The Washington State Office of Minority and Women's Business Enterprises (OMWBE) certifies firms that are owned and controlled by minorities or women, and can provide information regarding the certification process. Information about the certification status of a particular firm is available at the following OMWBE website address: http://www.omwbe.wa.gov/biznetwas/, or by contacting OMWBE at (360) 753-9693, 406 South Water, P.O. Box 41160, Olympia, Washington 98504-4611.

B. Inclusion Efforts

1. The identified lowest responsive bidder shall submit, as provided by the Owner, a BEE Contribution Form, along with their Schedule of Values for review. The BEE Contribution Form shall include a project specific BEE inclusion goal and capture the efforts and business practices the Contractor used to ensure that BEEs have the maximum practicable opportunity to participate and be included in the project. The BEE Contribution Form shall be complete and the information in each section shall demonstrate the Contractor's approach to providing these opportunities and the inclusion of BEE. The BEE Contribution Form is subject to review and approval by the Owner. The Owner may request clarification and/or corrections, however, non-responsive or incomplete Forms may be grounds for rejecting the Bidder as not responsible.

2. Contractors shall:
   a. Advertise opportunities for subcontractors or suppliers in a manner reasonably designed to provide BEEs capable of performing the work with timely notice of such opportunities, and all advertisements shall include a provision encouraging participation by BEE firms. Advertising may be done through general advertisements (e.g., newspapers, journals, etc.) or by soliciting bids/proposals directly from BEEs.
   b. Provide BEEs that express interest with adequate and timely information about plans, specifications, schedules, and requirements of the Contract.

3. Contractors are further encouraged to:
   a. Break down work into tasks or quantities that are appropriately sized for the intended subcontractor and/or BEE, in order to permit maximum participation by BEEs and other small businesses.
   b. Establish delivery schedules, where the requirements of this contract permit, that encourage participation by BEEs and other small businesses.
   c. Reduce bonding requirements where practicable.
   d. Utilize the services of available minority community organizations, minority contractor groups, local minority assistance offices and organizations that provide assistance in the recruitment and placement of BEEs and other small businesses.

C. Reporting Requirements
1. With the application for Progress Payment, Contractor shall submit a list of all BEE subcontractors/suppliers paid during the payment period along with any certification or Self-Declaration information. The Owner has provided a BEE Declaration Form, which is to be completed by every subcontractor, supplier, and materialman or similar on the project.

2. Prior to Final Acceptance, Contractor shall submit a report of total dollar amounts paid to BEEs.

D. Non-Discrimination

Contractors shall not create barriers to open and fair opportunities to all businesses including BEEs to participate in University contracts and to obtain or compete for contracts and subcontracts as sources of supplies, equipment, construction and services. In considering offers from and doing business with subcontractors and suppliers, the Contractor shall not discriminate on the basis of race, color, creed, religion, sex, age, nationality, marital status, or the presence of any mental or physical disability in an otherwise qualified disabled person.

E. Sanctions

Failure to comply with any of the mandatory requirements of this part of the contract may subject the Contractor to sanctions or damages as provided for by RCW 39.19.090, or by other applicable laws."

END OF SECTION
These Supplemental Conditions form a part of, and are incorporated in, the Contract Documents and modify, delete, add, and replace provisions of the General Conditions. Provisions not altered remain in effect. All terms defined elsewhere in the Contract Documents shall have the same meaning in these Supplemental Conditions.

**00 73 01 TIME OF COMPLETION AND LIQUIDATED DAMAGES**

The Work shall be commenced on the effective date specified in the Notice to Proceed and shall be substantially complete within a period not to exceed two hundred nine (209) calendar days. For failure to achieve Substantial Completion of the Work within the time provided, Contractor shall pay Owner $530/day for each calendar day from the date when Substantial Completion should have been achieved to the date Substantial Completion is actually achieved. The provisions of the General Conditions section 3.07, for liquidated damages, remain in effect.

**00 73 02 CONTRACTOR’S LIABILITY INSURANCE**

Add item 3 to Section 2.01.A as follows:

3. Contractor’s Pollution Liability (CPL) policy covering against claims for bodily injury, property damage and cleanup costs/environmental damages arising from pollution conditions caused in the performance of covered operations.

   a. If the work involves remediation, abatement, repair, maintenance or other work with asbestos containing lead-containing products (paint, coatings, components), mercury, underground storage tanks, and/or other regulated materials, the CPL policy shall not exclude such coverage, or a specific policy covering such exposure shall be required from the Contractor or the subcontractor performing such work.

   b. If the work involves transporting regulated materials, a separate policy or endorsement to the CPL policy specifically providing coverage for liability and cleanup, arising from an upset or collision during transportation of regulated materials is required from the Contractor or subcontractor performing such work.

Such policy shall name the Owner as an additional insured, be primary and noncontributory, and provide at least 45 days notice of cancellation or non-renewal to the Owner. If the work is performed by a subcontractor and such coverage is provided by the subcontractor, coverage shall name both the Contractor and Owner as additional insureds.

**00 73 03 COVERAGE LIMITS**

Add item E to Section 2.02 as follows:

Revise the General Liability insurance coverage amounts required in the General Conditions section 2.02 to $2,000,000 per occurrence and $5,000,000 in the aggregate.

**00 73 04 BUILDER’S RISK**

Delete Section 2.06 A and B and replace with the following new Section 2.06 A:
Owner will purchase and maintain Builder’s Risk property insurance in the amount of the Contract Sum including all Change Orders for the entire Work on a replacement cost basis until Substantial Completion. Contractor shall be responsible for all losses up to the policy deductible amount of $100,000 per occurrence. A specimen policy is available for inspection. Contractor is not required to obtain Builder’s Risk property insurance. All other provisions of the General Conditions Section 2.06, Builder’s Risk, remain in effect except that Architects and Engineers (A/E’s) and A/E’s Subconsultants are deleted from paragraph C.

If the Contractor believes it has a loss that is covered by Builder’s Risk/Property Insurance, and it is likely to exceed the policy deductible, the Contractor shall notify the Owner within 48 hours.

Owner will purchase and maintain Builder’s Risk property insurance in the amount of the Contract Sum including all Change Orders for the entire Work on a replacement cost basis until Substantial Completion. Contractor shall be responsible for all losses up to the policy deductible amount of $10,000 per occurrence. A specimen policy is available for inspection. Contractor is not required to obtain Builder’s Risk property insurance. All other provisions of the General Conditions Section 2.06, Builder’s Risk, remain in effect except that Architects and Engineers (A/E’s) and A/E’s Subconsultants are deleted from paragraph C.

If the Contractor believes it has a loss that is covered by Builder’s Risk/Property Insurance, and it is likely to exceed the policy deductible, the Contractor shall notify the Owner within 48 hours.

Owner will purchase and maintain Builder’s Risk property insurance in the amount of the Contract Sum including all Change Orders for the entire Work on a replacement cost basis until Substantial Completion. Contractor shall be responsible for all losses up to the policy deductible amount of $250,000 per occurrence. A specimen policy is available for inspection. Contractor is not required to obtain Builder’s Risk property insurance. All other provisions of the General Conditions Section 2.06, Builder’s Risk, remain in effect except that Architects and Engineers (A/E’s) and A/E’s Subconsultants are deleted from paragraph C.

If the Contractor believes it has a loss that is covered by Builder’s Risk/Property Insurance, and it is likely to exceed the policy deductible, the Contractor shall notify the Owner within 48 hours.

Owner will purchase and maintain Builder’s Risk property insurance in the amount of the Contract Sum including all Change Orders for the entire Work on a replacement cost basis until Substantial Completion. Contractor shall be responsible for all losses up to the policy deductible amount of $5,000 per occurrence for projects valued at $500,000 or less; and $10,000 per occurrence for projects valued at more than $500,000. A specimen policy is available for inspection. Contractor is not required to obtain Builder’s Risk property insurance. All other provisions of the General Conditions Section 2.06, Builder’s Risk, remain in effect except that Architects and Engineers (A/E’s) and A/E’s Subconsultants are deleted from paragraph C.

If the Contractor believes it has a loss that is covered by Builder’s Risk/Property Insurance, and it is likely to exceed the policy deductible, the Contractor shall notify the Owner within 48 hours.
In Section 2.06, delete the following from paragraph C: “A/E, A/E’s subconsultants” and renumber paragraph C as paragraph B.

00 73 05 PARTNERING

A. Owner proposes to utilize the "partnering" concept for this Project. Partnering emphasizes a cooperative approach to problem-solving involving all key parties to the Project: Owner, Architect, and Contractor and principal Subcontractors.

B. Participation in partnering will be voluntary. Upon contract award, Contractor will be given the option to participate in partnering.

C. If Contractor decides to participate, workshops to define partnering relationships will be scheduled not-to-exceed Two days or as mutually agreed. The purpose of the workshop will be:

1. To establish mutual understanding of partnering concepts;
2. To develop the mission statement and goals for the Project for all parties; and
3. To develop a process so that critical issues can be quickly resolved.

D. Owner will be responsible for providing the facilities for the workshop, as well as a facilitator and any workshop materials. Contractor is requested to pay 1/3 of the costs for the facilitator and facilities in an amount not-to-exceed $2,000. Contractor and Architect are expected to provide their Project personnel for the workshop at no cost to Owner.

E. At the conclusion of the workshop it is anticipated that a definitive working arrangement for partnering will be agreed upon and committed to in writing by the participants. Parties may withdraw from the partnering arrangement upon written notice to the others. Should the partnering arrangement terminate, claims or disputes settled or changes approved during the existence of the partnering arrangement shall not be affected.

00 73 06 CLAIMS AND DISPUTE RESOLUTION

(Not Used)

00 73 07 PERMITS REQUIRED

Contractor shall be responsible for pulling electrical permit and building permit for the work associated with the project

00 73 08 ENVIRONMENTAL MITIGATION

(Not Used)
00 73 09 FINAL PAYMENT

Requests for final payment will not be processed until the post-job asbestos abatement submittal package has been reviewed and approved by the Owner and the Asbestos A/E.

00 73 10 APPRENTICESHIP UTILIZATION REQUIREMENTS

10.12 APPRENTICE UTILIZATION REQUIREMENTS

A. The Contractor shall ensure that at least 15% of the total labor hours utilized on the project are performed by apprentices registered with the Washington State Apprenticeship and Training Council.

1. Total labor hours include additional hours worked as a result of change orders.

2. Total labor hours exclude hours worked by foremen, superintendents, supervisors, owners, and workers who are not subject to prevailing wage requirements. However, total labor hours shall include the hours worked by supervisors, foremen, and superintendents if it is determined they are subject to prevailing wage requirements pursuant to Washington Administrative Code (WAC) 296-127-015.

3. Total labor hours includes all hours worked by the Contractor and all subcontractors on the Project.

B. The Contractor shall meet or exceed the apprentice utilization requirements of the Contract Documents on all labor hours on the Project. The Owner has determined a monetary incentive of $0.00 for meeting the goals, and a monetary penalty of $0.00 for not meeting the goals.

C. The Contractor shall include the apprentice utilization requirements of Paragraph A, above, in all subcontracts executed for the Project.

D. If, during the term of the Contract, the Contractor determines that it will be unable to meet the percentage utilization requirement in Paragraph A, above, the Contractor may make a written request to the Owner to reduce the required percentage. The request shall include documentation of:

1. The demonstrated lack of availability of apprentices in specific geographic areas; and/or

2. A disproportionately high ratio of material costs to labor hours, which does not make feasible the required minimum levels of apprentice participation; and/or

3. Participating contractors have demonstrated a good faith effort to comply with the requirements of RCW 39.04.300 and 39.04.310.

E. The Owner shall evaluate the request, and if appropriate, a change order shall be prepared by the Owner reducing the utilization requirement.

F. With its monthly Application for Payment, the Contractor shall submit the Apprentice and Journey Level Worker Utilization Report on the form in Appendix A.

END OF SECTION
I. POLICY

The University of Washington through its Capital Planning and Development service group (Owner), is charged with the responsibility of ensuring that all public works improvement projects are awarded to the responsible bidder submitting the lowest responsive bid, and are performed in compliance with the Contract Documents and applicable federal, state, and local laws and regulations. The Owner is responsible to the citizens of the State to oversee the expenditure of public funds, and to secure the best possible results for that expenditure. To assist the Owner in evaluating a Contractor's responsibility, as well as its performance on contracts of the Owner, the Contractor Performance Evaluation Program has been developed. The implementation of a mandatory, standardized system of evaluating Contractors' performance is expected to yield consistency, objectivity, fairness, and accountability.

II. PURPOSE

The purpose of the Contractor Performance Evaluation Program is to better assure that Contractors considered for contract award on public works projects either possess, or will likely possess at the time contract performance is set to begin, all qualifications necessary to successfully complete the project on time. Among other things, the Program is intended to:

- Assist the Owner in exercising its discretion to determine a Contractor's qualifications and abilities to successfully perform a particular contract.
- Provide the Owner with a rational basis for determining that a Contractor is or is not responsible.
- Provide Contractors with a means of enhancing their qualifications and reputation by receiving recognition for high standards of performance.
- Encourage better working relationships between the Owner and Contractors.
- Provide official, verifiable references for Contractors who may be under consideration for award of, or approval on, contracts to be awarded by other public owners.
- Provide a history and an assessment of a Contractor's performance on prior contracts of the Owner for use in suspension or debarment proceedings.

The Contractor Performance Evaluation Program is not intended to determine whether a Contractor has breached a contract with the Owner, or to determine the acceptability of any particular noncompliance with Contract requirements.

III. PERFORMANCE CATEGORY EVALUATION GUIDE

The Performance Category Evaluation Guide establishes criteria to be used in evaluating the Contractor's performance in connection with each Performance Category, and describes five Performance Levels, which range in ascending order of merit from "Inadequate" to "Superior".
The "Standard" Performance Level is considered a baseline; it characterizes the level of acceptable performance normally associated with a reasonably prudent, diligent, and skilled Contractor working on projects of the same general type and size. Both the "Superior" and "Good" Levels characterize performance levels that exceed the baseline; they respectively connote consistent and substantial positive contributions to the overall project. Both the "Deficient" and "Inadequate" Levels characterize levels of performance that fall below the baseline, and respectively connote substantial and serious detriment to the overall project. The "No Evaluation" Level is to be used only where the Contractor had no direct or indirect responsibility for performance.

The five Performance Levels are more specifically described as follows, and the criteria set forth for each shall be applied in evaluating the Contractor's performance in connection with each of the Performance Categories listed in Section III of the Contractor Performance Evaluation Report:

A. **Superior** To merit an evaluation of "Superior" in any Performance Category, the Contractor must have consistently demonstrated:

   (1) Command or virtual mastery of the Contract Documents related to that Performance Category;

   (2) Performance of the work or activity being evaluated under that Performance Category that always exceeded or surpassed the material requirements of the Contract;

   (3) A highly cooperative attitude in dealing with Owner's employees, consultants, and the public in connection with that Performance Category, which attitude made a substantial, positive contribution to the Project; and

   (4) Initiative in carrying out his or her duties in connection with that Performance Category in a responsive, thorough, and timely manner without prompting by the Owner's Representative.

If the Contractor fails to satisfy any one of the Performance Level criteria set out above, then his or her performance will be re-evaluated under the "Good" Level by applying the criteria for that Level.

B. **Good** To merit an evaluation of "Good" in any Performance Category, the Contractor must have demonstrated:

   (1) Thorough knowledge of Contract Documents related to that Performance Category;

   (2) Performance of the work or activity being evaluated under that Performance Category that always met, and often exceeded, the material requirements of the Contract;

   (3) A cooperative attitude in dealing with Owner's employees, consultants, and the public in connection with that Performance Category, which attitude made a positive contribution to the project; and
(4) Initiative in carrying out his or her duties in connection with that Performance Category in a responsive, thorough, and timely manner with only minimal prompting by the Owner's Representative.

If the Contractor fails to satisfy any one of the Performance Level criteria set out above, then his or her performance will be re-evaluated under the "Standard" Level by applying the criteria for that Level.

C. Standard To merit an evaluation of "Standard" in any Performance Category, the Contractor must have demonstrated:

(1) Acceptable knowledge of the Contract Documents related to that Performance Category;

(2) Performance of the work or activity being evaluated under that Performance Category that met all material Contract requirements;

(3) A generally cooperative attitude toward Owner's employees, consultants, and the public in connection with that Performance Category; and

(4) Initiative in carrying out his or her duties in connection with that Performance Category in a responsive, thorough, and timely manner with only moderate prompting by the Owner's Representative.

If the Contractor fails to satisfy any one of the Performance Level criteria set out above, then his or her performance will be re-evaluated under the "Deficient" and "Inadequate" Levels by applying the criteria for those Levels.

D. Deficient To merit an evaluation of "Deficient" in any Performance Category, the Contractor must have demonstrated:

(1) Marginal knowledge of the Contract Documents related to that Performance Category;

(2) Performance of the work or activity being evaluated under that Performance Category that did not always meet the material Contract requirements, and such failures were not excusable as the sole fault and responsibility of one or more other parties;

(3) An occasionally uncooperative attitude toward Owner's employees, consultants, or the public in connection with that Performance Category; or

(4) Performance of his or her duties in connection with that Performance Category in a moderately unresponsive, inattentive, or dilatory manner, or after frequent or repeated prompting by the Owner's Representative.

E. Inadequate To merit an evaluation of "Inadequate" in any Performance Category, the Contractor must have either: (a) failed to satisfy the criteria listed for the Performance Levels of "Superior", "Good", "Standard", and "Deficient" set out above and did not qualify for treatment under Section III.F below; or (b) must have demonstrated:
(1) Inadequate knowledge of the Contract Documents related to that Performance Category;

(2) Performance of the work or activity being evaluated under that Performance Category which seldom met the material Contract requirements, and such failures were not excusable as the sole fault and responsibility of one or more other parties;

(3) A seriously uncooperative attitude toward Owner’s employees, consultants, or the public in connection with that Performance Category; or

(4) Performance of his or her duties in connection with that Performance Category in a seriously unresponsive, inattentive, or dilatory manner, or only after frequent prompting by Owner’s Representative.

F. No Evaluation. This rating should only be used in those circumstances where the Contractor had no contractual responsibility, either directly or through its subcontractors, suppliers, or materialmen, for performance related to that Performance Category.

IV. OVERALL EVALUATION GUIDE

The Contractor's Overall Evaluation can be determined by placing the Overall Percentage Score calculated on the Contractor Performance Evaluation Report within the numerical ranges of the following narrative ratings in the Overall Evaluation Guide:

A. SUPERIOR (Overall Percentage Score of 90% or above)

The Contractor exceeded the Contract requirements and expectations in most or all of the areas evaluated. The Contractor was extremely or completely knowledgeable regarding Contract requirements and applicable laws and regulations. A consistently high level of cooperation, project management, and job site control appreciably contributed to an unusually good result. The Contractor is commended for excellent performance.

B. GOOD (Overall Percentage Score of 70% to 89%)

The Contractor met Contract requirements evaluated, and exceeded them in some areas. The Contractor was generally cooperative, and performed his/her work with a minimum of prompting. The results of the performance were very good.

C. STANDARD (Overall Percentage Score of 50% to 69%)

The Contractor generally satisfied the minimum requirements of the Contract as evaluated. The Contractor occasionally had to be prompted or reminded of Contract requirements, but overall management of the Project was good, producing a good result.

D. DEFICIENT (Overall Percentage Score of 30% to 49%)

Even though the Project may have been accepted, the Contractor's performance as evaluated was marginal overall. While the Contractor
performed some tasks satisfactorily, most elements evaluated reflected a less than satisfactory response to Contract requirements.

E. INADEQUATE (Overall Percentage Score of 29% or below)

The Contractor's performance as evaluated did not meet minimum Contract requirements, or so otherwise detracted from the Project as to seriously call it into jeopardy. While the Project may have been accepted by the Owner, the effort expended by the Owner's Representative in prompting the Contractor to perform was excessive. The Contractor's poor or uncooperative performance created serious unnecessary or avoidable difficulties in achieving contract completion.

A Contractor's Overall Evaluation, being based upon an averaged rate on a discrete number of Performance Categories, should not be read or interpreted as a measure of whether the Contractor did or did not breach the contract in question.

V. PERFORMANCE EVALUATION REPORTS

Each Contractor Performance Evaluation Report shall be prepared by, or at the direction of, the Owner's Representative who will include numerical ratings substantiated, when necessary, by one or more narratives which describe the Contractor's performance.

Every Contractor Performance Evaluation Report containing Performance Level evaluations of "Deficient" or "Inadequate", and all Overall Evaluations on projects the total cost of which is $500,000 or more, shall contain one or more narratives which provide details substantiating the evaluations. Narratives may be provided for other Performance Categories as the evaluator deems necessary.

Narratives provided with a Contractor Performance Evaluation Report shall be based upon documentation prepared during the life of the project, e.g., project diaries, inspectors' reports, and other pertinent documents. Such documentation shall constitute a major portion of the administrative record to be used for any review, appeal, or litigation that may arise from the evaluation process.

Every Contractor Performance Evaluation Report shall be signed by the Owner's Representative and the supervisor of the Owner's Representative before a copy of the Report shall be transmitted to the Contractor. The Report shall not be considered final until such time as the review/appeal periods described in Section VI herein have been completed.

Generally, only one Contractor Performance Evaluation Report shall be issued, following completion of the contract Work. However, in addition to a final Report, one or more interim Reports may be issued at the discretion of the Owner when:

° A contract is of long duration, particularly those in excess of one year.

° An individual charged with primary responsibility for administration of the Contract will cease his or her involvement with the Project prior to completion of the Work.

° Contractor's performance at 50% completion is deficient or inadequate.
Interim Contractor Performance Evaluation Reports shall be considered to be preliminary and shall be designated as such, and shall be processed administratively in the same manner as a Final Report. A Contractor may request review of an Interim Report by the applicable project Director in Capital Planning and Development; and appeal to the Owner’s Associate Vice President for Capital Planning and Development or his/her designee pursuant to the provisions of Section VI below. All Interim Reports shall be attached to, and considered when preparing, the Final Report.

If a Contractor Performance Evaluation Report is an Interim Report, the Report should indicate on its face that it is Interim, and shall contain the following language:

This Performance Evaluation Report is not the final report on this Contractor on this Project. The Contractor may dispute the Report or any part thereof, and need not seek review or appeal until completion and acceptance of the Project.

VI. NOTICE, REVIEW, AND APPEAL

A. Notice. Contractors shall be mailed a copy of their Contractor Performance Evaluation Report within a reasonable time after completion of the Report. A Contractor who is given an Overall Evaluation of "Deficient" or "Inadequate" in connection with a project shall be provided with a copy of the Contractor Performance Evaluation Report via certified mail (return receipt requested).

B. Review. A Contractor who disputes, or is otherwise dissatisfied with, his or her Contractor Performance Evaluation Report may request review of the Report by the applicable project Director in Capital Planning and Development. The request must be submitted in writing within thirty (30) calendar days of receipt by the Contractor of the Final Contractor Performance Evaluation Report. The request must also state, with specificity, all bases for the requested review.

The applicable project Director shall, upon receipt of a proper and timely request, review the Contractor Performance Evaluation Report and any documentation submitted by the Contractor with his or her request. The applicable project Director shall, on the basis of his or her review, issue findings which may affirm, correct, or modify all or any part of the Report. A copy of the findings shall be mailed to the Contractor via certified mail, return receipt requested.

C. Appeal. Within ten (10) calendar days of receipt by the Contractor of the applicable project Director’s findings on review, the Contractor may appeal therefrom to the Owner’s Associate Vice President for Capital Planning and Development or his/her designee. Any such appeal shall be in writing, and shall state with specificity the bases or grounds for the appeal.

The Associate Vice President for Capital Planning and Development or his/her designee shall review and consider the objectivity, accuracy, completeness, and fairness of the Contractor Performance Evaluation Report, together with the applicable project Director’s findings, engineers’ diaries, job records and other documentation, including such documentation as the Contractor may provide with the appeal.

Upon hearing and review of the applicable Director’s findings, the Associate Vice President for Capital Planning and Development or his/her designee shall issue a determination and findings which may affirm or modify the Contractor's Contractor Performance Evaluation Report. The
Associate Vice President for Capital Planning and Development or his/her designee shall notify the Contractor of its determination and findings by certified mail (return receipt requested).

VII. NOT RESPONSIBLE DETERMINATION FOR WORK ON SPECIFIC PROJECT

The Owner’s Associate Vice President for Capital Planning and Development may determine, from Contractor Performance Evaluation Reports and other public documents relating to the project in question, that a Contractor who has received one or more Overall Evaluations of "Deficient" or "Inadequate" is not a responsible bidder and not able to successfully perform a specific project of the Owner for which the Contractor submitted a bid, and is therefore ineligible for award of that contract.

When, on that basis, the Owner’s Associate Vice President for Capital Planning and Development believes that the low bidder is not a responsible bidder and not able to successfully perform a project, the Owner shall notify the low bidder in writing of its determination that the bidder is not a responsible bidder. The bidder may appeal the determination within the time period specified in the Instructions to Bidders by presenting additional information to the Owner. The Owner shall consider the additional information before issuing its final determination. In evaluating the additional information, the Owner may or may not meet with the bidder to hear additional information. If the final determination affirms that the bidder is not responsible, the Owner will not execute a contract with any other bidder until two business days after the bidder determined to be not responsible has received the final determination.

VIII. DEBARMENT OF CONTRACTOR

The Owner’s Associate Vice President for Capital Planning and Development or his/her designee, after conducting a hearing with the Contractor and evaluating the evidence, may debar a Contractor from contracting with the Owner for a period of up to two years if a Contractor has received overall evaluations of their performance of "Deficient" or "Inadequate" on three or more projects of the Owner physically completed during the preceding five (5) year period.

IX. RELEASE OF INFORMATION

Contractor Performance Evaluation Reports are public documents subject to disclosure to other governments and to the public. Because the Reports and the Overall Evaluations they contain may be used as a basis for contract award and may reflect upon the Contractor’s reputation, care must be taken to assure that only accurate, complete, and current information is released.

A. Final Reports. Contractor Performance Evaluation Reports may be released when:

(1) The Report becomes final as set forth in Section V herein; or
(2) The Owner has relied upon the Report for the purpose of taking further action with respect to the Contractor; or
(3) A court has ordered release of the Report.

B. Interim Reports. Interim Contractor Performance Evaluation Reports may only be released when:

(1) The Contractor has consented in writing to the release; or
(2) The Contractor has requested and received final administrative review of an Interim Report; or

(3) The Owner has used or relied upon the Interim Report to take action with respect to the Contractor; or

(4) A court has ordered release of the Report.

C. Termination for Cause and Pending Litigation. In the event that the Contract is terminated by Owner for cause, this fact shall be noted on the Contractor's Contractor Performance Evaluation Report. In the event that a Contractor commences suit against the Owner, that Contractor's Performance Evaluation Report shall not be released without approval from the Washington State Attorney General's Office.

D. Intergovernmental Cooperation. All requests for Contractor references from agencies of foreign, federal, state, or local governments shall be referred to the Owner's applicable project Director or his/her designee. If such a request is honored, the requesting agency shall be provided with copies of all Contractor Performance Evaluation Reports on the Contractor, together with any written objections or refutations filed with the Owner by the Contractor in connection therewith.

X. INSTRUCTIONS FOR COMPLETING EVALUATION FORMS

The Owner's Representative shall complete Sections I (Contractor Data) and II (Project Data), and then evaluate the Contractor's performance in each of the Performance Categories listed in Section III (Performance Data) of the Contractor Performance Evaluation Report, and shall assign points for each category based on the Performance Level applicable for the Contractor's performance.

The descriptions provided on the Contractor Performance Evaluation Report form for each Performance Category will not necessarily match precisely with the Contractor's actual performance of the task(s) on a given portion of the project.

The Owner's Representative should consider the general character of the Contractor's performance for each Performance Category evaluated and select the Performance Level that most closely matches the actual performance.

If the Contractor was not responsible for any performance in connection with a given Performance Category, then the Contractor's evaluation in that Category should be "No Evaluation," and no points should be assigned.

When rating a Contractor, the Owner's Representative should consider all the work performed by the Contractor as well as work performed by all subcontractors, since the Contractor is contractually responsible to the Owner for all of the work under the Contract, whether or not the Contractor actually performs the work. Interim Reports, if issued, shall be attached to the Final Report.

Comments are always encouraged, and may be written on the Contractor Performance Evaluation Report or on an attachment to the Report.

However, for each Performance Category evaluated as "Deficient" or "Inadequate", the Owner's Representative must prepare a written narrative substantiating the facts and circumstances giving rise to the evaluation.
After evaluating the Contractor on Performance Categories listed in Section III of the Contractor Performance Evaluation Report, the Owner’s Representative shall total all of the points assigned and divide that into the total points possible (excluding those Performance Categories evaluated as "No Evaluation"). The evaluator will enter the resulting Overall Percentage Score on the Report, and will enter the appropriate Overall Evaluation on the basis of the following ranges:

- **Superior**: Overall percentage score of 90% or above
- **Good**: Overall percentage score of 70% to 89%
- **Standard**: Overall percentage score of 50% to 69%
- **Deficient**: Overall percentage score of 30% to 49%
- **Inadequate**: Overall percentage score of 29% or below

The Owner’s Representative shall sign the Report and forward it to his or her supervisor for concurrence signature and submission to the Owner’s Contracts Department. The Contracts Department staff shall then forward signed copies of the completed Report to the Contractor.

END OF SECTION 00 73 20
PART 1 - GENERAL

1.1 PROJECT DESCRIPTION

A. The Work of the Contract Documents can be summarized as follows:
   1. The project includes the following work: The removal and disposal of three (3) PCB
      contaminated oil filled transformers in the Schmitz Hall (750KVA), Kristen Wind Tunnel
      (2500KVA), and Henderson Hall (500KVA). Schmitz Hall and Kristen Wind Tunnel will
      have new dry type transformers installed inside the building, and Henderson Hall will
      have a padmounted oil filled transformer outside the building. The contractor shall
      measure the access path of the transformers and verify the new transformers will fit in the
      access path before purchasing transformer. The project includes the replacement of
      medium voltage switches in Condon Hall (3 Switches), Bloedel Hall (3 Switches), Bagley
      Hall (3 Switches), Benson Hall (3 Switches), and The Art Building (3 Switches). The
      contractor shall receive the owner purchased MV switches, and handle and store the
      switches until installation of the switches in the UW buildings. Additionally, the project will
      replace approximately 7,100 linear feet of 500kcmail 15KV MV cable in Feeders
      WD8/WE8 between vault WT5 and CP3. The cable shall be replaced in the UW tunnels
      and in 10 vaults in the tunnel. The removal of the existing feeder will require the removal
      of several splices and link boxes in the tunnels. The installation of the new feeders will
      require the installation of various in-line splices and 600A dead break splices.
   2. Bid Alternate #1: Project to replace approximately 2,800 linear feet of 500kcmil 15KV MV
      cable in Feeders WD8/WE8 between vault CP3 and CP7. The cable shall be replaced in
      the UW tunnels and in 5 vaults in the tunnel.
   3. Bid Alternate #2: Remove and disposal of the PCB contaminated oil filled transformer in
      John Wallace Hall (1000KVA) and the installation of a new dry type 1000KVA transformer
      in the building.

1.2 GENERAL INFORMATION

A. Title of Contract Documents:
   1. University of Washington
      UW MV Electrical Upgrade
      Project Number: 207163

B. Owner and A/E Defined:
   1. Owner:
      University of Washington
      Project Delivery Group
      Seattle, Washington 98195-2205

      Project Manager: Scott Carlson
      E-mail: sjc34@uw.edu
      Phone: 619-278-8554

      Owner’s Representative: The Owner shall designate, in writing, the Owner’s
      Representative for this Project during construction.

   2. A/E:
      Casne Engineering Inc
      3545 Factoria BLVD. SE, Suite 200
      Bellevue, WA 98006
Representative: Russel Jentges  
E-mail: russel.jentges@casne.com  
Phone: 425-629-2943  
Fax: 425-828-2622

3. The Owner, the A/E, and various consultants hereinafter or otherwise listed shall be given access to the Work insofar as their interests are concerned.

C. A/E's Sub-Consultants: The sub-consultants under contract with the A/E in preparation of the Contract Documents are:
   1. Civil Engineering:  
      Sitts and Hill  
      4815 Center St  
      Tacoma, WA 98409  
      Representative: Ray Johnson  
      E-mail: rayj@sittshill.com  
      Phone: 253-474-9449  
      Fax: 253-474-0153

   2. Mechanical Engineering:  
      FSI Engineers  
      506 2nd Ave #700  
      Seattle, WA 98104  
      Representative: Chris Hallock  
      E-mail: chrish@fsi-engineers.com  
      Phone: 206-385-6119

D. Owner's Consultants: The consultants under contract with the Owner in preparation of the Contract Documents are:
   1. Industrial Hygiene:  
      PBS Engineering and Environmental  
      214 Galer Street, Suite 300  
      Seattle, WA 98102  
      Representative: Willem Mager  
      E-mail: willem.mager@pbsusa.com  
      Phone: 206-766-7622

   2. Permit Consultants Northwest:  
      17479 7th Ave SW  
      Normandy Park, WA 98166  
      Representative: Candace Hunter  
      E-mail: candace@permitcnw.com  
      Phone: 206-446-9991

1.3 SPECIAL CONDITIONS

A. Description of special conditions of the Work:  
   1. Parking will not be provided as part of this project  
   2. Contractor will require a lay down/staging area at Kristen Wind Tunnel, staging area will need to be reviewed with Transportation Services.
3. Contractor will be provided keycard and CAAMS to access the building during this project with the exception of Henderson Hall.
4. Contractor and subcontractor employees will adhere to the Contractor’s COVID-19 site specific safety plan at all times on the jobsite.
5. Security protocols at Henderson Hall.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 DESCRIPTION

A. Regulated materials requiring special handling or abatement or protection during construction include hazardous materials and dangerous wastes. The Owner has investigated the Project Site and determined that the following regulated materials could be encountered during construction and may be impacted by the Work:
1. Asbestos-containing materials (ACM)
2. Heavy metals (including lead-containing materials)
3. PCBs in electrical transformers
4. Silica containing materials

B. Related Sections: This Section and the following related Construction Documents were prepared by the Owner’s environmental consultant:
1. Section 02 80 00 “Facility Remediation”
2. Section 02 82 00 “Asbestos Abatement”
3. Section 02 83 00 “Lead/Metal Controls”
4. Section 02 84 00 “PCBs Remediation”

C. Owner’s Environmental Consultant: The Owner’s environmental consultant and the AHERA-certified designer for this Project is:
   Firm Name: PBS Engineering & Environmental
   Project Designer: Willem Mager
   Certification number: 177530
   Expiration date: 3/5/2021

D. Survey: The Owner has included in Appendix C of the Specifications a Regulated Materials “Good Faith” Survey report of the Project site area to be impacted by the Work. The Contractor shall ensure that a copy of this report is provided to all bidders and Subcontractors. A copy of this Survey must be retained and available for review on the Project site at all times throughout the duration of the Project.

1.2 GENERAL REQUIREMENTS

A. Laws, Regulations, Codes and Ordinances: The Contractor shall comply with all applicable laws, regulations, codes, and ordinances concerning the impact, removal, handling, storage, disposal, monitoring and employee protection against exposure or environmental protection against pollution, related to regulated materials requiring special handling or abatement or protection during construction.

B. Supervisory Authority: The Contractor is solely and completely responsible related to the Contractor’s supervisory authority over Subcontractors and personnel performing work of this Section.

C. Asbestos Awareness Training: The Contractor shall provide asbestos awareness training for its onsite employees and the onsite employees of the Contractor’s Subcontractors (of any tier), in accordance with WAC 296-62-07722(6).
D. Access Restrictions: Access to various construction work areas by the general public, Subcontractors, and other individuals is restricted during certain hazardous materials work sequences, as specified in the Contract Documents. The Contractor shall coordinate the Work to facilitate access by Subcontractors while enforcing work area restrictions, and shall minimize disruption to building occupants and services.

E. Hazwoper Training: The Contractor shall provide the appropriate level of HAZWOPER training for its onsite employees and the onsite employees of the Subcontractors (of any Tier) when working on a federal or state-listed contaminated site in accordance with WAC 296-843-100.

F. Working Hours: No hazardous materials work shall occur when building users have access to work areas. All hazardous materials work shall be scheduled to occur in accordance with schedule requirements outlined elsewhere in the Contract Documents, and when work areas have been vacated by building users.

G. Emergency Contacts: Designated qualified representatives of the Contractor and specific hazardous materials Subcontractors are to be available on a 24-hour emergency basis for the duration of the Work. Contact information shall be provided to the Owner’s Representative for inclusion in the Project emergency contact list.

H. Submittals: Contractor shall review the scope of work requirements outlined in the Contract Documents and shall submit, and require all Subcontractors performing the work of handling or disposing of any regulated materials to submit, pertinent information required by the Contract Documents.

I. Regulated, Hazardous, and Dangerous Waste Disposal:
   1. The Owner’s Environmental Consultant will conduct all testing required to designate the waste streams. The Contractor shall not remove any suspect wastes from the site until the test data has been reviewed by the UW EHS, Environmental Programs and they have made a determination on the waste designation.
   2. Transportation and disposal of all hazardous materials and dangerous wastes will be managed by, and the costs will be borne by, the Owner through the Owner’s Environmental Programs Office. The Contractor shall be responsible for packaging and staging hazardous materials and dangerous wastes onsite, and for scheduling pickup through the Owner’s Representative.
   3. Transportation and disposal of PCB-containing ballasts (2 parts per million or greater) and TSCA-Regulated PCB Waste (50 parts per million or greater) will be managed by, and the costs will be borne by, the Owner through the Owner’s UW EH&S Environmental Programs. The Contractor shall be responsible for packaging (in Owner-provided containers) and staging TSCA-Regulated wastes onsite, and for scheduling drop-off of containers and pick up through the Owner’s Representative.
   4. All other regulated waste materials (including asbestos-containing materials) must be disposed of by the Contractor at an Owner audited and approved disposal facility. Approved facilities can be viewed online at http://www.ehs.washington.edu/epowaste/disposalfaclist.pdf.
      a. Lead-containing materials and materials with lead-containing coatings, which are not designated as hazardous or dangerous waste, must be handled and disposed of as a regulated waste and cannot be recycled.
         1) Exception for metal items which contain lead: Metal items which contain lead (e.g., lead flashings, vent caps, lead painted metal) may be recycled at a scrap facility which is permitted to accept and process such materials.
2) Building materials coated with lead-containing paints (including concrete) shall not be recycled.

3) Brick and mortar waste streams that do not designate as a dangerous or hazardous waste may be recycled at a facility which is permitted to accept and process such materials.

J. Regulated Materials - Waste Manifests: Prior to Final Completion, the Contractor shall submit to the Owner copies of all transportation and disposal manifests, including signed landfill receipts and chain-of-custody, for all regulated wastes disposed of by the Contractor during the course of the Project.

1.3 SPECIAL CONDITIONS

A. The following are special conditions which will impact the Work performed under this and related Project Specifications:

1. All construction operations must comply with the most current COVID-19 mitigation related rules and guidance from the Governor’s Office including the “Stay Home, Stay Healthy” addendum, dated April 24, 2020, and additional guidance issued April 29, 2020 (and amendments).

All activities must also comply with all related and applicable COVID-19 mitigation requirements issued by the Washington State Department of Labor and Industries and Public Health Agencies having jurisdiction (and associated amendments).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements of “Alternates.”

B. Definition: An Alternate is an amount proposed by bidders and stated on the Bid Form for certain construction activities defined in the bidding requirements that may be added to or deducted from Base Bid amount and/or a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems or installation methods described in Contract Documents.

C. Coordination: The Contractor shall coordinate all related Work and modify or adjust adjacent Work as necessary to ensure that the Work affected by each accepted Alternate is complete and fully integrated into the Project.
   1. Each Alternate bid shall include all miscellaneous devices, accessory objects and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.

D. Notification: As part of the notice of Contract award, the Owner will designate which Alternates have been accepted and included in the award.

E. Schedule: A “Schedule of Alternates” is included in this Section. Specification sections referenced in the schedule contain requirements for materials and methods necessary to achieve the Work described under each Alternate.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate #1: The alternate is to replace approximately 2,800 linear feet of 500kcmil 15KV MV cable in Feeders WD8/WE8 between vault CP3 and CP7. The cable shall be replaced in the UW tunnels and in 5 vaults in the tunnel. With this bid alternate work, the MV feeders feeding the Condon Hall will have to be reconfigured to accommodate the new feeder replacement.
   1. The Alternate bid amount is the total price for the work of the Alternate.

B. Alternate #2: The alternate is to remove and dispose of the PCB contaminated oil filled transformer in John Wallace Hall (1000KVA) and the installation of a new dry type 1000KVA transformer in the building. With the installation of the dry type 1000KVA transformer, the MV cable from the MV Switch 242-1 will need to be replaced. The new transformer will require the removal of the existing transformer equipment pad and the installation of a new transformer equipment pad.
   1. The Alternate bid amount is the total price for the work of the Alternate.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Contractor’s selection for products for use in the Work, and administrative procedures for handling requests for substitutions made before and after receipt of bid.

B. Owner’s forms referenced in this Section include (see Appendix A):
   1. Substitution Request Form

1.2 DEFINITIONS

A. Definitions used in this Section are not intended to negate the meaning of other terms used in the Contract Documents.
   1. “Products” are items purchased for incorporation in the Work, regardless of whether they were specifically purchased for the Project or taken from previously purchased stock.
   2. “Named Products” are products identified by use of the manufacturer’s name for a product, including such items as a make or model designation, as recorded in the most recent published product literature as of the date of the Contract Documents.
   3. “Materials” are products that must be cut, shaped, 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, and in particular, a product that requires service connections such as wiring or piping.

1.3 QUALITY ASSURANCE

A. Source Limitations: Provide products of same kind, to fullest extent possible, from a single source.

B. Compatibility of Options: 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.

C. Nameplates: Except for labels required by Authorities Having Jurisdiction (AHJ), do not attach or imprint manufacturer’s or producer’s nameplates, trademarks or operating data on surfaces exposed to view in occupied spaces or on the building exterior.
   1. Labels: Locate required product labels and stamps on a concealed surface, or where required by AHJ for observation after installation, on an accessible surface that is not conspicuous.

1.4 PRODUCT SELECTION

A. General Product Requirements: Unless otherwise indicated, provide products that comply with the Contract Documents and that are undamaged and unused at the time of installation.
   1. Provide products complete with all accessories, trim, finish, safety guards and other devices and with details needed for a complete installation for the intended use and effect.
   2. Where available, provide standard products of a type and manufacturer used successfully in similar situations on other projects.

B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations. Procedures governing product selection include the following:
1. Performance Specifications: Performance specifications may be one of the following:
   a. One or more named reference(s) with no accompanying conditioning language such as “or approved equal” or “no substitutions”; or
   b. No named reference is specified, and requirements are specified by means of any of the following:
      1) Descriptive requirements
      2) Design requirements
      3) Performance requirements
      4) Regulatory requirements and/or industry standards

2. References to equipment, material, articles or patented processes by trade name, manufacturer, make or catalog number, are presumed to set a standard of quality so as to encourage competition. The term “equal” is presumed and need not be repeated in the Specifications. Where Specifications set a standard of quality, provide product options complying with or exceeding the provisions of the Contract Documents, and which are recommended by a manufacturer for the applications indicated. No Substitution Request is required. However, Owner may request, and Contractor shall provide, documentation of the manufacturer's recommendations for a particular product application.

3. Closed Proprietary Specifications: Products by one or more manufacturers are specified, and the specification section includes the term “no substitution(s),” “no other(s),” or “no exceptions.” No other product options will be accepted. Provide products and work as specified.

4. Open Proprietary Specifications: Products by one or more manufacturers are specified, and the specification section includes the term “or approved equal,” or “other acceptable.” Submit the Substitution Request Form for other products to Owner under the provisions of this Section.

5. Visual Matching: Where matching an established sample is required, the Owner’s decision will be final on whether a proposed product matches satisfactorily.
   a. Where there is no product available within the specified product category which matches satisfactorily and also complies with other specified requirements, the contractor shall comply with the provisions of the Contract Documents concerning substitutions for the selection of a matching product in another product category.

6. Visual Selection: Where specified product requirements include the phrase “...as selected from the manufacturer’s standard colors, patterns, textures...” or similar phrases, select a product and manufacturer that complies with other specified requirements. Owner will select the color, patterns and texture from the product line selected.

1.5 PRODUCT SUBSTITUTION

A. General:
   1. No substitution request will be considered unless submitted in accordance with the requirements of this Section.
   2. If a bidder or Contractor desires approval of some material or product other than that specified by the Contract Documents, it must submit a written request for approval of the proposed substitute item to the Owner in accordance with the following requirements:
      a. All requests must be made on the Owner’s Substitution Request Form
      b. After receipt of bid, substitution requests shall be prepared, transmitted, and processed in accordance with Section 01 33 00 “Submittal Procedures.”
   3. Final decision as to whether an item is an equal or acceptable substitution rests solely with the Owner.

B. Substitution Requests: Every substitution request must state whether the item offered is equal or superior 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 warranty of the Work described for the specified product is required for the substitution.

C. During Bid Period:
1. Submit Substitution Request Form prior to the date identified in Section 00 21 00 “Instructions to Bidders.”
2. Bidders will be notified by addendum of products accepted in addition to those specified. NO OTHER FORM OF APPROVAL, INCLUDING VERBAL OR IMPLIED, IS ACCEPTABLE AS AN INDICATOR OF ACCEPTED SUBSTITUTION REQUESTS.

D. After Receipt of Bid: Contractor shall indicate one or more reasons why a product substitution is required with a Substitution Request Form. Owner will notify Contractor in writing of decision to accept or reject the Substitution Request. Substitution Requests will not be considered except for the following reasons, which must be substantiated by the Contractor:
1. Unavailability: Specified item has been discontinued or is unavailable in time to meet Construction Schedule through no fault of the Contractor or Subcontractor.
2. Unsuitability: Subsequent information discloses the specified item as unsuitable, inappropriate, or unable to perform properly or fit the designated space.
3. Regulatory Requirements: A substitution is required to comply with code interpretations by AHJ or insurance regulations.
4. Warranty: A manufacturer or fabricator declares the specified item to be unsuitable for the use intended or refuses to certify or warrant the performance of the specified item for the Project.
5. Owner’s Benefit: In the judgment of Contractor, acceptance of the proposed substitution is clearly in Owner’s best interest because of cost, quality, or other consideration.

E. Coordination: In making a Substitution Request, the Contractor certifies that it will coordinate all Subcontractor work required by the substitution and waives all claims for additional costs and/or time which subsequently become apparent as a consequence of the substitution.

F. Re-design: At the Owner’s sole discretion, the Contractor shall bear all Owner costs related to the substitution, including costs of A/E’s services for investigation, evaluation and re-design, if necessary.

G. Owner will not consider:
1. Substitutions, if they are indicated or implied on Shop Drawings or other Project data submittals;
2. Substitutions which, if accepted, will require substantial revisions of Contract Documents; or
3. Substitution Request Forms which do not provide adequate or clearly defined information for complete and timely appraisal.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the administrative and procedural requirements for executing a change in the Work as herein specified and further described in Part 7 of the General Conditions.

B. Owner’s forms references in this Section include (see Appendix A):
   1. Change Order Proposal;
   2. Change Order Transmittal;
   3. COP General Contractor Breakdown Summary;
   4. COP Subcontractor Breakdown Summary;
   5. COP Cost Breakdown;
   6. COP Wage Rates; and
   7. COP Equipment Rates.

1.2 PRELIMINARY REQUIREMENTS:

A. Prior to submitting the Contractor’s first Change Order Request (COR), or responding to the first Change Order Proposal (COP), the Contractor shall submit a breakdown of journeyman and apprentice, where applicable, wage rates using the Owner’s COP Wage Rates form. 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. Medicare;
   6. SUI (State Unemployment Compensation Act);
   7. WC (Workers Compensation).

B. Contractor shall submit verification of the above rates, if requested by Owner’s Representative.

C. Prior to submitting Contractor’s first COR or responding to Owner’s first COP that involves equipment owned by the Contractor, the Contractor shall submit a list of all equipment anticipated to be used on the Project. Contractor shall provide the hourly rate based on the Equipment Watch Rental Rate Blue Book and as modified by the current AGC/WSDOT Agreement or other sources as referenced in the General Conditions. The Contractor shall use the Owner’s COP Equipment Rates form to compute the equipment rate.

1.3 CHANGE ORDER PROCEDURES

A. Owner Change Order Proposal (COP): Changes may be initiated by Owner through a Publics Work Change Order Proposal form submitted to the Contractor. Such a request is for information and pricing only and is not an instruction to execute changes or to stop work in progress, unless issued as a Field Order.
   1. The COP will include:
      a. A detailed description of changes, products, and location of modification in Project and a statement as to whether overtime work is authorized; and
      b. Supplementary or revised Drawings or Specifications.
   2. An updated Construction Progress Schedule may be requested if the COP impacts the existing Construction Progress Schedule.
B. Contractor Change Order Request (COR): The Contractor shall initiate changes by submitting written correspondence, in letter format, signed and dated to the Owner's Representative requesting a Change Order Proposal. The letter shall include:
   1. Description of proposed changes;
   2. Reason for making changes;
   3. A specific period of time during which requested price will be considered valid;
   4. Actions required by Owner;
   5. Effect on Contract Sum and Contract Time;
   6. Documentation consistent with the requirements of Part 7.02 and/or 7.03 of the General Conditions supporting any change in Contract Sum or Contract Time, as appropriate;
   7. Statement of why proposed change is not covered in Contract Documents; and
   8. Date the Work is to be completed.

C. Field Order: In situations where time is of the essence or an emergency condition exists, the Owner's Representative may directly order a change to the Work by a written Field Order signed by Owner's Representative. Field Orders will only be issued on an agreed upon not-to-exceed cost basis, either lump sum or time and materials.

D. Change Order Pricing:
   1. The cost of the change shall be marked-up in accordance with General Conditions and Modifications to the General Conditions. NO ADDITIONAL MARK-UPS SHALL BE ALLOWED.
   2. Contractor shall provide all backup pricing documentation for a change on the following forms (THESE FORMS SHALL ALSO BE THE ONLY ACCEPTABLE DOCUMENTATION FOR ALL SUBCONTRACTORS):
      a. COP General Contractor Breakdown Summary
      b. COP Subcontractor Breakdown Summary
      c. COP Cost Breakdown
   3. Owner's Representative may require Contractor to provide certified payroll.
   4. Provide all other supporting documentation as required to substantiate the requested costs such as invoices for rental equipment and freight cost. Total cost and time shall be brought forward to the COP form and signed and dated by Contractor.

E. Change Order Authorization:
   1. A/E recommendation of COP acceptance to Owner is indicated by A/E's signature.
   2. Upon signature and execution by Owner, the Change Order Proposal becomes a Change Order altering the Contract Sum and/or Contract Time, as indicated.
   3. Contractor may only request payment for changes in the Work against an approved Change Order.
   4. If Owner disapproves the Change Order Proposal, the reason for disapproval will be stated. A request for a revised proposal or cancellation of the proposal will be shown and returned to the Contractor.

F. Correlation with Contractor's Submittals:
   1. Application of Payment forms shall record each Change Order as a separate item of work (see Section 01 29 76, “Progress Payment Procedures”).
   2. Revise Construction Progress Schedule to reflect changes in Contract Time.
   3. Upon completion of Change Order work, record pertinent modifications in the Project Record documents.

G. Distribution:
   1. Upon authorization of a Change Order, Owner will transmit one (1) signed copy to Contractor.
PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the administrative and procedural requirements for Contractor progress payment and release of retainage as herein specified and further described in Part 6 of the General Conditions.

B. Owner’s forms referenced in this Section include (see Appendix A):
   1. Application and Certificate for Payment on Contract (Application for Payment)
   2. Construction Invoice Voucher
   3. Retainage Invoice Voucher
   4. Monthly Subcontractors List and Certifications
   5. Certificate of Payment of Labor and Materials
   7. Apprentice and Journey Level Worker Utilization Report

1.2 PREREQUISITES FOR FIRST APPLICATION FOR PAYMENT

A. Progress Schedule: Submit and receive approval of the "preliminary" Progress Schedule.

B. Prevailing Wage Forms: Submit Statement of Intent to Pay Prevailing Wages form, approved by the Department of Labor and Industries, prior to commencing the Work (see Part 5.04B of the General Conditions). The Owner will not make payment on an Application for Payment until the Contractor has filed with the Owner an approved copy of the form for the Contractor and every Subcontractor of every tier that performed work during the payment period and are included in an Application for Payment. The form shall list every classification of laborer, worker, or mechanic employed by the Contractor and its Subcontractors. THERE ARE NO EXCEPTIONS TO THIS REQUIREMENT.
   1. The website address link to the prevailing wage forms is included in Appendix A.
   2. The website address link to the “Washington State Prevailing Wage Rates for Public Works Contracts” is included in Appendix B.

C. Schedule of Values: Before submitting the first Application for Payment, submit and receive approval of the Schedule of Values allocating the detail of the Contract Award Amount, in a breakdown acceptable to the Owner, which shall be documented on the Application for Payment. The approved Schedule of Values will be used by the Owner as the basis for progress payments. PAYMENT FOR WORK WILL ONLY BE MADE FOR, AND IN ACCORDANCE WITH, THOSE ITEMS INCLUDED IN THE APPROVED SCHEDULE OF VALUES.
   1. Format: On 8-1/2" x 11" paper
   2. Content: Include as a minimum the following:
      a. Individual Items of Work.
      b. Major cost items, which are not directly a cost of actual work-in-place, shall be shown as separate items in the Schedule of Values, and shall include the following items:
         1) General Conditions, mobilization, and distinct temporary facilities shall not exceed 3% of the Contract Award Amount.
         2) Section 01 77 00 “Closeout Procedures” shall not be less than 4% of the Contract Award Amount.
         3) Preparation and submittal to Owner of Construction Baseline Schedule and Submittal Schedule shall not be less than 1/4% of the Contract Award Amount.
4) Preparation of monthly Progress Schedule updates shall not be less than 1/4% of the Contract Award Amount, with the value of each update apportioned equally.

c. For items on which progress payments will be requested for materials or equipment purchased/fabricated/delivered, but not yet installed, show "initial value" for payment request and "value added" for subsequent stage(s) of completion on that unit of work.

d. For each line item of installed value exceeding 10% of Contract Award Amount, show breakdown by major products or operations under each item.

e. Breakdown major work efforts by floor or phases or systems as appropriate for ease of review and confirmation of Work completed.

f. Breakdown mechanical and electrical systems or phases with material and labor as separate items.

3. Round figures to nearest dollar amount.

4. Make sum of total scheduled costs equal to the Contract Award Amount. Do not include State of Washington sales tax.

5. Coordinate items of the Schedule of Values so that there is a corresponding item in the Progress Schedule.

6. Revise as requested by Owner.

D. Subcontractors List: Submit a list of all Subcontractors and major material suppliers consistent with Part 5.20B of the General Conditions.

E. Retainage: Submit instructions for the disposition of retainage funds.

1. In accordance with Part 6.04B of the General Conditions and Chapter 60.28 RCW, the Owner shall reserve a Contract retainage in an amount not-to-exceed 5% of the moneys earned by the Contractor as a trust fund for the protection and payment of:

   a. The claims of any person arising under the Contract Documents;
   b. The State of Washington with respect to taxes imposed pursuant to Titles 50, 51, and 82 RCW which may be due from the Contractor, and;
   c. The Owner for claims it may have against the Contractor.

2. Contractor’s written instructions should be addressed to the University of Washington, UW Facilities, Project Delivery Group, Accounting Department, Box 352205, Seattle, Washington 98195 - 2205.

3. At the option of the Contractor, the moneys reserved by the Owner shall be:

   a. Retained in a fund by the Owner; or
   b. Bonded by the Contractor (if approved by Owner) for all of the Contract retainage in a form acceptable to the Owner; or
   c. Deposited by the Owner in an Owner’s interest bearing account in a bank, mutual savings bank, or savings and loan association; or
   d. Placed in escrow with a bank or trust company by the Owner.

   1) Escrow Agent: If the retained funds are to be placed in escrow, Contractor will select the escrow agent, subject to approval by the Owner. The selected agent must be a bank or trust company in the State of Washington.
   2) Escrow Agreement: Pursuant to electing the escrow option, an escrow agreement shall be executed by Contractor, Owner, and bank. A completed and signed escrow agreement in a form acceptable to the Owner must be on file with the Owner for payment before the Contractor’s first Application for Payment is processed.
   3) Escrow Payments: As each progress estimate is presented for payment, Contractor shall make a voucher request for the retained funds that are to be placed in escrow. Such requests should be prepared on the Owner’s Retainage Invoice Voucher form and submitted with the related Application for Payment. Upon receiving a retainage invoice, the Owner will issue a check payable to the
Contractor and the bank jointly. Such checks will be mailed to the bank and the Contractor will receive copies of check transmittal letters.

4) Escrow Investments: The bank shall invest the retained funds in bonds and other securities selected by the Contractor from the following list approved by the Owner:
   a) Bills, certificates, notes or bonds of the United States;
   b) Other obligations of the United States or its agencies;
   c) Obligations of any corporation wholly owned by the government of the United States;
   d) Indebtedness of the Federal National Mortgage Association;
   e) Time deposits in commercial banks, mutual savings banks, and savings and loan associations in the State of Washington;
   f) Deposits in savings accounts in commercial banks, mutual savings banks, and savings and loan associations in the State of Washington.

5) The investments selected must mature on or prior to the date set for Substantial Completion, including extensions thereof or no later than forty five (45) days following the Final Acceptance of the Work. Interest on such investments shall be paid to the Contractor by the escrow agent as it accrues.

6) Escrow Costs and Fees: All escrow costs and fees shall be paid by the Contractor, in accordance with the escrow agreement.

1.3 DRAFT APPLICATION FOR PAYMENT

A. Submit a draft Application for Payment for Owner’s review and comment. The cutoff date shall be five (5) days prior to actual application or as otherwise agreed. Include projected costs to the end of the month in the pay request. Provide the following documents (draft documents may be marked by hand):

   a. Mechanical and electrical Subcontractor’s draft monthly payment requests shall be submitted, for review and comment, prior to the A/E’s and Owner’s review of the Contractor’s draft monthly Application for Payment.
   b. List Change Orders approved prior to the submission date individually (last on the form). Use Owner's Change Order designation and description (similar to an original component item of work). DO NOT BILL FOR CHANGE ORDER PROPOSALS UNTIL AN APPROVED CHANGE ORDER HAS BEEN RECEIVED FROM THE OWNER INCORPORATING THE PROPOSAL.


3. Stored Materials: The Contractor is solely responsible for the stored materials. Requests for payment on materials stored shall be for materials properly stored on the Project site. In addition to the requirements of the General Conditions, payment for materials stored off-site shall be at the sole option of the Owner and comply with conditions stipulated by the Owner. These conditions may include, but are not limited to:
   a. Provide supplier invoice
   b. Provide insurance or a bond to cover the total loss of material and time impact to Project


5. Monthly Safety Report


B. The A/E and/or Owner and the Contractor shall review the Project Record for completeness and accuracy.
1.4 APPLICATION FOR PAYMENT

A. The Contractor shall submit an electronic copy of the Application for Payment to the Owner after responding to the Owner’s comments to the draft application.

B. The Contractor is cautioned to carefully check all extensions, totals, and required information for accuracy before submittal.

C. Applications are to be signed by a responsible officer of the Contractor.

D. The Application for Payment shall include the following Owner forms and documents:
   1. Application and Certificate for Payment on Contract
   2. Construction Invoice Voucher (for the total amount due)
   3. Retainage Invoice Voucher (for the retainage amount)
   4. Monthly Subcontractors List and Certifications
   5. Invoices for materials stored off-site
   7. Apprentice and Journey Level Worker Utilization Report

E. Contractor, subcontractor, or employer shall file a copy of its certified payroll records directly with the Department of Labor and Industries online system at least once per month.

F. When the Owner’s Representative and A/E find the Application for Payment properly completed and correct, they will sign and transmit all copies of the Application for Payment to the Owner’s accounting office for processing.

G. If the A/E or Owner’s Representative find the Application for Payment improperly or incorrectly executed, an annotated copy will be returned for a new submittal.

H. Only minor corrections are allowed on the original, with approval of Owner.

1.5 PRIOR TO FINAL APPLICATION FOR PAYMENT

A. The final Application for Payment request will be accepted for processing only after providing satisfactory completion of the following:
   1. Application and Certificate for Payment on Contract
   2. Construction Invoice Voucher (for the total amount due)
   3. Retainage Invoice Voucher (for the retainage amount)
   4. Monthly Subcontractors List and Certifications
   5. Invoices for materials stored off-site
   6. Final Completion procedures per Section 01 77 00 "Closeout Procedures"
   7. Final Schedule of Values "Contract Sum"
   8. Monthly Safety Report
   9. Apprentice and Journey Level Worker Utilization Report

1.6 RELEASE OF RETAINAGE

A. Pursuant to the completion of Work performed in accordance with the Public Works Contract and Final Acceptance by the Owner, the following requirements must be satisfied prior to the release of retained Contract funds.
   1. “Notice of Completion of Public Works Contract (REV 31 0020)”: This Department of Revenue form will be completed by the Owner, establishing the date of Final Acceptance. A copy of the notice will be e-mailed to the Department of Revenue, the Employment
Security Department, the Department of Labor and Industries, and a copy will be transmitted to the Contractor.

2. “Certificate of Payment of State Excise Taxes by Public Works Contractor (REV 31 0028)”: Following receipt of the Owner’s Notice of Completion of Public Works Contract form and after determining that all taxes, interest and penalties due from Contractor have been paid, the Department of Revenue will issue this certificate to Owner, thereby notifying the Owner that it has no objection to the release of retainage to the Contractor.

3. “Certificate of Payment of Contributions, Penalties and Interest on Public Work Contract (EMS 8449 760)”: Upon receiving a copy of the Owner’s Notice of Completion of Public Works Contract form 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 Owner, thereby notifying the Owner that it has no objection to the release of retainage to the Contractor.

4. Upon receiving a copy of the Owner’s Notice of Completion of Public Works Contract form and determining that the Contractor is in compliance with the provisions of Chapter 51 RCW for payment of industrial insurance premiums, the Department of Labor and Industries will issue a certificate for the Owner, thereby notifying the Owner that it has no objection to the release of retainage to the Contractor.

5. “Affidavit of Wages Paid on Public Works Contract” (F700-007-000): An Affidavit of Wages Paid, for the Contractor, each Subcontractor, and each sub-tier Subcontractor, approved by the Industrial Statistician of the Department of Labor and Industries, must be submitted by the Contractor to the Owner. Contractors and Subcontractors may file the Affidavit of Wages Paid either on-line at the website link provided in Appendix A or by completing the forms manually.

6. “Certificate of Payment of Labor and Materials”: This Owner’s form shall be completed by the Contractor and returned to the Owner. If the only exception to full payment to all Subcontractors is retainage owed to Subcontractors, the appropriate box on the form should be checked.

7. Invoice Voucher: If the retained funds are on deposit in Owner accounts, the Contractor shall prepare a Retainage Invoice Voucher for the total amount retained and submit to the Owner for payment. If these funds have been placed in escrow at the direction of Contractor, no further invoice is required.

B. Retainage will be paid by the Owner to the Contractor sixty (60) days following the published date of Final Acceptance, contingent upon the Contractor’s compliance with provisions of public works statutes and as stated above. If there are either unpaid taxes or unsatisfied claims of lien against the retained percentage, disbursement of retainage funds will be made in accordance with State of Washington law.

C. Address all transmittal of retainage documents to the Owner’s Representative at: University of Washington, UW Facilities, Project Delivery Group, Box 352205, Seattle, Washington, 98195 - 2205.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for project management and coordination during construction, in addition to the requirements specified elsewhere in the Contract Documents.

B. Owner’s forms referenced in this Section include (see Appendix A):
   1. Request for Information (RFI)
   2. Non-Conformance Report (NCR)

C. The Owner intends to utilize an internet-based construction management system (CMS) for communications and documents controls with the Contractor and A/E on this Project (see Section 01 35 00 “Electronic Controls”).

1.2 GENERAL COMMUNICATION

A. The Owner shall designate, in writing, the Owner’s Representative for this Project.

B. All verbal communications between Owner, A/E, and Contractor shall be for clarification and collaboration purposes and are not binding unless issued in writing through the Owner’s Representative.

C. Contractor communications by and with A/E’s consultants shall be through the A/E, and A/E’s communications by and with the Contractor’s Subcontractors shall be through the Contractor.

D. In case of an emergency:
   1. Contact the Owner’s Representative; and
   2. Follow emergency procedures in accordance with Section 01 35 23 “Owner Safety Requirements.”

1.3 CORRESPONDENCE

A. Address all correspondence to Owner’s Representative.

B. All correspondence to and from Contractor will be routed through the Owner’s Representative.

1.4 CONTRACTOR REQUEST FOR INFORMATION

A. When field conditions or Contract Documents require clarification or verification by the A/E or A/E’s consultants, a written RFI is to be submitted per the following:
   1. Identify the nature and location of each requested clarification and/or verification using the RFI form. Provide as a minimum the following information:
      a. Project name and number
      b. Date
      c. Date response required by
      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

2. Number each RFI sequentially beginning with #001. Submit only one question per RFI. Also, RFI's shall be categorized as ARCH, MECH, ELEC, etc.

1.5 CLARIFICATIONS

A. Clarifications may be discussed with A/E, or A/E’s consultants, with concurrence of Owner. Following the discussion, the Contractor shall document on an RFI form any agreed upon modification which does not require a Change Order. The A/E may provide supplemental information to clarify the Contract Documents. RFIs and A/E supplemental information (ASI) which modify or change the Work will be authorized only by Change Order.

1.6 NON-CONFORMANCE REPORT

A. Non-Conforming Work: Work found defective, or in any way not in accordance with the requirements of the Contract Documents, is defined as non-conforming Work.

B. Procedure: If, after an oral discussion or written notification, the Contractor fails to correct Work that is found defective or not in accordance with the Contract Documents, the Owner will issue a Non-Conformance Report (NCR). Upon receipt of an NCR, the Contractor shall take immediate action to resolve the Work to the Owner's satisfaction, or remove and replace with conforming Work at Contractor's expense and with no increase in Contract Time. Corrective actions for non-conforming Work shall be discussed at construction progress meetings and be completed no later than prior to Final Completion.

1. Where non-conforming Work requires re-design by the A/E, such re-design costs shall be borne by the Contractor.

1.7 COORDINATION

A. General Coordination:

1. The Contractor shall be in charge of this Contract and the Project, as well as directing and scheduling of all Work. Final responsibility for performance, interface, and completion of the Project shall be the Contractor’s.
   a. Anticipate interrelationship of all Subcontractors and their relationship with the total Work.
   b. Resolve differences or disputes between Subcontractors and materials suppliers concerning coordination, interference, or extent of the Work. Contractor's decisions, if consistent with Contract Document requirements, shall be final.

2. Cooperation with other contractors during the term of this Project may be required within the building or other adjacent locations to the construction limits of this Project. The Contractor is to cooperate with the Owner in coordination of all work to prevent impact to this or other Owner sponsored construction projects.

3. Cooperation with building occupants may be required when scheduling construction activities that create excessive noise or structure-borne vibration. The Contractor is to cooperate with the Owner in coordination of all work to minimize these impacts to the Owner's operations (see Section 01 50 00 “Temporary Facilities and Controls”).

B. Special Coordination:

1. The Contractor is responsible for receiving, unloading, storage and handling of Owner Furnished Contractor Installed (OFCI) items from the time of receipt through Substantial Completion.
   a. The Contractor is responsible for protecting OFCI and Owner Existing Contractor Installed (OECI) items from damage, such as: damage from exposure to the elements; or from damage to a warranty due to Contractor’s improper installation
and testing. The costs to repair or replace items damaged while in the Contractor's possession shall be borne by the Contractor.

1) The Contractor shall consult with the Owner to determine the warranty requirements of OFCI and OECI items.

2. Coordination with building occupants for mitigating construction sound in building

3. Coordination with Owner’s operations including, but not limited to:
   a. Escorts in sensitive areas
   b. Owner’s sign-in procedures
   c. Project Site access routes within buildings, including use of Owner’s elevators and any time-of-use or access restrictions

4. Contractor shall provide storage of Owner-Furnished medium voltage switches for the project in a client controlled storage area until the switches are to be installed.

C. Mechanical and Electrical Coordination:
   1. Resolve all tight or restricted conditions involving work of various sections in advance of installation.
   2. Coordinate the Work of all sections to ensure that all fixtures, devices, switches, outlets, ducts, pipes, and similar items can be installed as shown.

D. Job Site Field Measurements and Templates:
   1. Obtain field measurements required for accurate fabrication and installation of work included in the Contract Documents. Exact measurements are the Contractor’s responsibility.
   2. Furnish or obtain templates, patterns, and setting instructions as required for installation of all work. Verify in field.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for meetings during construction in addition to requirements specified elsewhere in the Contract Documents.

B. Contractor and Subcontractor representatives attending meetings must be qualified and authorized to act on behalf of their firms.

C. The Owner will utilize an internet-based construction management system (CMS) for communications and documents controls with the Contractor and A/E on this Project (see Section 01 35 00 “Electronic Communications”).
   1. Meeting minutes, Contractor construction activity data and work plans, A/E field reports and other such communications shall be distributed electronically by e-mail.

D. Related Sections:
   1. Section 01 32 16 “Construction Progress Schedule”

1.2 PRECONSTRUCTION MEETING

A. The Owner will schedule a preconstruction meeting to be held prior to the Contractor mobilizing and beginning any Work. This meeting will review Contract administration requirements and mobilization procedures.

B. Meeting location: To be determined

C. Participants shall include:
   1. Contractor’s Project Manager, Superintendent, CQC Representative, Safety and Health Officer, and for projects with LEED requirements, LEED Coordinator;
   2. Owner’s Representative, Project Manager, and for projects with LEED requirements, the Owner’s Sustainability Manager;
   3. A/E and the A/E’s sub-consultants, as appropriate;
   4. Owner’s consultants, as appropriate; and
   5. Others, including the Contractor’s major Subcontractors as appropriate.

D. Owner’s Representative will: Administer the meeting

E. A/E will: Record and distribute copies of the minutes within seven (7) days of the meeting to all meeting participants.

F. Agenda:
   1. The Work including, but not limited to:
      a. Schedule and phasing requirements
      b. Contractor’s use of premises
      c. Special conditions and coordination
   2. Communications including, but not limited to:
      a. Chain and persons authorized to direct changes
      b. Requests for Information (RFI), field decisions, and clarifications
      c. Non-Conformance Reports
      d. Hazard communication
      e. Project meetings
   3. Contractor’s “Site Specific Safety Plan”
4. Administrative and procedural requirements including, but not limited to:
   a. Contract modification
   b. Progress payment
   c. Submittals - including Contractor’s Progress Schedule
   d. Electronic communications
5. Project LEED requirements and documentation, if any
6. Testing and inspection
7. Contractor quality control
8. Temporary facilities and controls including, but not limited to:
   a. Deliveries and storage
   b. Temporary utilities and enclosures
   c. Security procedures
   d. Noise and vibration control
   e. Cutting, patching, and field engineering
   f. Utility shutdowns
   g. Contractor parking
   h. Housekeeping and waste management
   i. Infection control - for medical facilities projects
9. Closeout procedures - including Project Record requirements
10. Other information as appropriate

G. Contractor shall conduct a like meeting, covering the same body of information, with each Subcontractor’s project manager and foreman supervising the Work prior to the performance of any work on-site by that Subcontractor.

1. Provide Owner copies of meeting minutes prepared by the Contractor with each Subcontractor, when requested by Owner.

1.3 CONSTRUCTION PROGRESS MEETINGS

A. Progress meetings shall occur weekly until Substantial Completion has been achieved.

B. Meeting location: To be determined

C. Participants shall include:
   1. Contractor’s Project Manager, Superintendent, CQC Representative, and Safety and Health Officer as appropriate;
   2. Owner’s Representative and Project Manager;
   3. A/E and the A/E’s sub-consultants, as appropriate; and
   4. Others, including the Owner’s consultants, as appropriate.

D. Owner’s Representative will: Administer the meeting

E. Contractor shall: Provide schedules, logs and other construction activity data to support the issues discussed at the meeting.

F. A/E will: Record and distribute copies of the minutes prior to the next progress meeting to all meeting participants and provide copies at each meeting.

G. Agenda:
   1. Review and approve the minutes of the previous meeting noting exceptions, if any
   2. Review the progress of the Work since the previous meeting
   3. Review the Short Interval Schedule and work plans for progress during the period
      a. Identify pending meetings
      b. Discuss safety activities and job hazards analysis
4. Discuss field observations, problems, and conflicts
   a. Identify problems impeding the construction Progress Schedule
5. Review Quality Control
   a. Non-Conformance Reports - discuss corrective Work actions
   b. Infection control – for medical center projects
6. Review the Submittal Schedule and RFIs - present methods to expedite as required
7. Review off-site fabrication and delivery schedules
8. Review proposed changes in the Work and substitution requests for:
   a. Timely processing
   b. Effect on the Progress Schedule and Substantial Completion
   c. Effect on any other contracts of the Project
9. Review any other business

1.4 PRE-INSTALLATION MEETINGS

A. Pre-installation meetings shall be held prior to the Contractor or Subcontractors beginning work on each definable feature of the Work identified in the Contract Documents to require a pre-installation meeting and/or as required by the Owner’s Representative. Notify Owner’s Representative at least ten (10) working days in advance of each pre-installation meeting.
   1. At the Owner’s discretion, the Owner may conduct this meeting as part of the Construction Progress Meeting.

B. Meeting examples include, but not by way of limitation:
   1. Site clearing and excavation
   2. Demolition and regulated materials remediation
   3. Site utilities
   4. Landscaping and site restoration
   5. Concrete
   6. Masonry
   7. Structural steel
   8. Exterior cladding systems
   9. Water and damp proofing and roofing
   10. Doors, including frames and hardware
   11. Millwork
   12. Finishes
   13. Equipment, including elevators
   14. Mechanical and Electrical systems, such as high voltage, fire alarm, and communications
   15. Specialty items

C. Meeting location: To be determined

D. Participants shall include:
   1. Contractor’s Superintendent, CQC Representative, and Safety and Health Officer as appropriate;
   2. Subcontractor’s project manager or foreman supervising the Work, as appropriate;
   3. Owner's Representative;
   4. A/E and the A/E sub- consultants, as appropriate;
   5. Owner’s consultants as appropriate; and
   6. Others as appropriate.

E. Agenda:
   1. Review of the pre-installation CQC Work Plan and Contract requirements
   2. Materials - available and ready for use
   3. Submittals
   4. Persons responsible for performing the work
5. Tests - required tests, criteria for performance, who samples and how often
6. Safety procedures and requirements
7. Substrate - criteria for substrate
8. Other items as appropriate

F. Contractor shall: Administer the meeting, and record and distribute copies of the minutes within seven (7) days of each meeting to all meeting participants.

1.5 CHANGE ORDER MEETINGS

A. Change order meetings shall be held to review and resolve any Change Order Proposals, change order requests, or other change order issues pertaining to Contract Modification. Meetings shall be held monthly until all Change Order Proposals are resolved.
   1. At the Owner’s discretion, the Owner may conduct this meeting as part of the Construction Progress Meeting.

B. Meeting Location: To be determined

C. Participants shall include:
   1. Contractor’s Project Manager, or cost engineer as appropriate;
   2. Owner’s Representative;
   3. A/E and the A/E’s sub-consultants, as appropriate;
   4. Others, including the Owner’s consultants as appropriate.

D. Owner’s Representative will: Administer the meeting

E. Agenda: Review Change Order Proposals for scope and estimated costs, and negotiate Change Order Proposal prices.

1.6 DRAFT APPLICATION FOR PAYMENT REVIEW MEETINGS

A. Draft Application for Payment review meetings shall occur monthly.
   1. At the Owner’s discretion, the Owner may conduct this meeting as part of the Construction Progress Meeting.

B. Meeting location: To be determined

C. Participants shall include:
   1. Contractor’s Project Manager;
   2. Owner’s Representative;
   3. A/E and A/E’s sub-consultants, as appropriate; and
   4. Owner’s consultants as appropriate.

D. Owner’s Representative will: Administer the meeting

E. Contractor shall: Present the draft monthly Application for Payment together with the required back up information for review and comment by the Owner and A/E.

F. Agenda - Discussion will pertain to items such as:
   1. Percentage of work complete
   2. Off-site storage
   3. Bill of quantities
   4. Percentage of subcontract payment allocations
   5. Apprentice Utilization and Journey Level Report
1.7 SPECIAL MEETINGS

A. Special meetings may be called at the discretion of the Owner or Contractor for the purpose of coordinating specific information or resolving special issues related to the Project.

B. Contractor shall record and distribute minutes within three (3) days of the meeting to all meeting participants.

1.8 COMMISSIONING MEETINGS DURING CONSTRUCTION

A. Commissioning meetings shall occur weekly during the start-up and commissioning phase of the Work.
   1. At the Owner’s discretion, the Owner may conduct this meeting as part of the Construction Progress Meeting.

B. Meeting location: To be determined

C. Participants shall include:
   1. Contractor’s Test Engineer, and Superintendent as appropriate;
   2. Subcontractor representative(s) as appropriate;
   3. Owner’s Representative;
   4. Owner’s Commissioning Authority; and
   5. A/E and the A/E’s sub-consultants, as appropriate.

D. Commissioning Authority will: Administer the meeting

E. Contractor shall: Record and distribute copies of the minutes prior to the next meeting to all participants and provide copies at each meeting.

F. Agenda - Discussion will pertain to items such as:
   1. Coordination of Work of applicable trades, such as balancing, electrical, controls, communications wiring connectivity;
   2. Scheduling of systems shutdown and switch over;
   3. Start-up and functional performance tests acceptance criteria; and

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements, in addition to those defined in the General Conditions, for Baseline Progress Schedule preparation, monthly Progress Schedule updates, change in Contract Time analysis, submittal schedules, and short interval schedules.

B. Related Sections:
   1. 01 26 00, “Contract Modification Procedures”
   2. 01 29 76, “Progress Payment Procedures”
   3. 01 50 00, “Temporary Facilities and Controls”
   4. 01 77 00, “Closeout Procedures”

C. Owner’s forms included by reference for this Section include (see Appendix A):
   1. Short Interval Schedule

D. Total Float 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 on the Progress Schedule. Float is not for the exclusive use of either the Contractor or the Owner unless otherwise identified in the Contract Documents.
   1. Extensions of time for Contract performance will be granted only to the extent that equitable time adjustments to the affected activity or activities exceed the total float time along the affected paths of the current Progress Schedule at the time a Field Order, or Change Order, was issued for the change.

E. All Progress Schedule submittals, including monthly Progress Schedule updates, will be reviewed jointly by the Owner’s Representative 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.

F. As used in this Section, “Progress Schedule” refers collectively to “Baseline Progress Schedule” and “monthly Progress Schedule updates.”

1.2 PROGRESS SCHEDULE

A. Within fourteen (14) calendar days after Notice-to-Proceed, the Contractor shall prepare and submit to the Owner, for review and comment, three (3) copies of a preliminary Progress Schedule utilizing a Critical Path Method (CPM) logic based on the Contract Documents. The Owner will review the preliminary schedule for conformance with the Contract Documents and provide comments within fourteen (14) calendar days of receipt from the Contractor. The Contractor shall respond to all comments and provide the Owner a Baseline Progress Schedule within fourteen (14) calendar days of receipt of the Owner’s comments.

B. Once the Baseline Progress Schedule is submitted to the Owner, the Progress Schedule shall be formally established as the baseline file within the Contractor’s scheduling software. This baseline file shall not be modified without the Owner’s written approval.
   1. The amount specified in Section 01 29 76 shall be withheld from the Contractor’s monthly Application for Payment if the Baseline Progress Schedule and Submittal Schedule, referenced in 1.5 of this Section, are past due and such amount may, at the Owner’s sole judgment and discretion, be reduced from the Contract Sum by unilateral Change Order (see Section 01 29 76, "Progress Payment Procedures").
C. The Baseline Progress Schedule shall be the basis that the Contractor shall use to: plan, organize, and execute the Work; record and report actual performance and progress through updates, and; show how the Contractor plans to complete all remaining Work. The Baseline Progress Schedule and monthly Progress Schedule updates shall be the basis for consideration and analysis of requests for time extensions as specified below. The schedule shall be in the form of an activity based precedence diagram.

D. The Baseline Progress Schedule and monthly Progress Schedule updates shall be constructed to show the order in which the Contractor proposes to carry out the Work, and to indicate the restrictions of access to and availability of the work area, and availability and use of manpower, materials, equipment, and all activities of trade contractors, equipment vendors, and suppliers. The Progress Schedule shall incorporate contractually specified limitations and restrictions, and contractually specified milestones. Construction activities shall match or be correlated with the pay items in the approved Schedule of Values. The Progress Schedule shall be prepared in sufficient detail with the assignment and coding of all activities by the Contractor and Subcontractors in consideration of, but not limited to, the following Work activities:

1. Access and availability to the Project Site, including road closures;
2. Identification of interfaces and dependencies with preceding, concurrent, and succeeding contractors, if applicable;
3. The type of work to be performed and labor trades involved;
4. All procurement, manufacturing, fabrication (both on-site and off-site), and delivery activities for all major materials and equipment;
5. Shutdowns of existing Owner’s equipment and utility services;
6. Required delivery dates of OFCI equipment and materials;
7. Testing, air balancing, and commissioning activities, including submission and approval of test results;
8. Approvals by regulatory agencies or other third parties, including obtaining an Occupancy Permit;
9. Coordination for Owner’s occupancy including Owner’s cleaning, OFOI equipment and furnishings installations;
10. Planning for phased occupancy by the Owner, with intermediate completion dates;
11. Contractor’s preliminary cleaning and final cleaning operations;
12. Contractor’s Final Punch List Report, Owner’s Final Inspection (Punch List), Contractor’s corrections, and Owner’s re-inspection;
13. Substantial Completion and Final Completion activities and milestones, and Final Acceptance.

E. The activities defined in the Progress Schedule shall represent the planned durations in anticipation of normal man-power and equipment utilization in durations of whole working days. No activity durations shall exceed twenty two (22) working days. If approved by the Owner, longer durations may be allowed for non-construction activities such as procurement, delivery, or submittal activities. All durations shall be determined based upon resource planning under contractually defined on-site work conditions. In calculating activity durations, normal inclement weather shall be considered. The Contractor shall schedule the Work to minimize the effect of adverse weather. The Contractor shall also protect the work site from the effects of adverse weather or take other necessary measures such that the Work can be completed within the time established in the Contract Documents and include these provisions in the schedule as appropriate.

F. Schedule activity identification codes shall not be alphanumeric unless approved by Owner.

1. Activity Description: Provide adequate information to readily identify each activity up to 48 characters in the general descriptive format: action, item, location (such as Install Steel Studs 3rd Floor).
2. The Critical Path shall be clearly indicated on all diagrams submitted. An activity is critical when it is part of the longest duration pathway(s) through the CPM network or when total float is less than or equal to zero.

3. Clearly identify activities that are planned to use overtime, double shifts, work on weekends or holidays.

4. Include a listing of activities with open ends and out-of-sequence progress.

G. Certification: When requested by Owner, submit certification that each Subcontractor and major equipment supplier has participated in, reviewed, and concurs with the Progress Schedule as it relates to their Work.

1.3 MONTHLY PROGRESS SCHEDULE UPDATES

A. The Contractor is required to prepare and submit monthly Progress Schedule updates and to participate in monthly schedule update meetings with the Owner as described below.

1. Timely submission of updates is of significant and crucial importance to the management of this Project. Lack of, or late receipt of, updates diminishes their value to the Owner. If a monthly Progress Schedule update is not submitted to and reviewed with the Owner prior to the Contractor submitting its monthly Application for Payment, the monthly Schedule of Values amount for Progress Schedule updates may, at the Owner’s sole judgment and discretion, be reduced from the Contract Sum by unilateral Change Order (see Section 01 29 76, “Progress Payment Procedures”).

B. The Contractor shall prepare a monthly Progress Schedule update to reflect work progress achieved since the previous update. Historical performance data and/or records shall not be changed without the approval of the Owner.

C. The Contractor shall use and maintain a fixed end date when generating the required reports and diagrams for the Owner as specified by this Section. The fixed end date shall be the Substantial Completion date. The fixed end date will be adjusted in subsequent updates only to reflect approved time extensions incorporated by Change Order.

D. The Project shall be rescheduled each reporting period with:

1. An updated data date.
2. Actual start/finish dates.
3. Percent complete.
4. Remaining durations (for each activity) in the “status” or “current” file.

E. Show changes occurring since the previous schedule submission, such as:

1. Any major changes in scope.
2. Activities modified since previous submission including, but not limited to, logic changes.
3. Revised projections for progress and completion, as applicable.
4. Any other identifiable changes.

F. The Contractor shall account for all rain days, for major events, and similar excusable non-compensable delays, during which little or no work is progressed and that are acknowledged by the Owner, in the period within which the events occur.

G. The Construction Progress Meeting shall be held prior to Owner’s review and comment of the Contractors draft Application for Payment, unless otherwise approved by Owner.

1. The Contractor shall provide copies of two tabular reports:
   a. A total float report clearly indicating the current critical path through Substantial Completion.
   b. A report of activities sorted by early start dates commencing with the previous monthly progress update and including all updated activities during the previous
month. Actual progress of the previous month will be recorded and incorporated into the update.

2. The Contractor shall provide copies of a narrative report to include:
   a. A description of the Work that has progressed.
   b. An explanation of the Work that had been scheduled to be performed in the previous period but was not performed, and why it was not performed.
   c. Anticipated delay and impact on the schedule.
   d. Corrective action recommended and its effect.
   e. A discussion of the Work scheduled for the upcoming period noting any issues or events that could impact this Work.
   f. If the Contractor intends to make a logic or original activity duration change(s), the report shall include such changes.

3. The Contractor and Owner shall review these reports and discuss any differences or issues raised.

1.4 CHANGE IN CONTRACT TIME ANALYSIS

A. It is the Owner’s desire and intent to resolve all issues affecting the Substantial Completion date in a timely, efficient, and effective manner. To achieve this goal, the Owner and Contractor shall participate in an analysis of all delays and advances of the schedule.

B. Assessment of impacts due to changes or other events must be performed on the most recent update of the Progress Schedule. Further impacts due to changes or other events shall be assessed utilizing the Progress Schedule update that represents the data date closest to, and just prior to, the date of the impacting event.

C. The logic and planning elements of the Progress Schedule are the Contractor’s responsibility.

1. No Contract Time shall be modified unless directed by an approved Change Order.

D. Submission of a valid monthly Progress Schedule update and the completion of a delay analysis impacting the critical path are conditions precedent to the review and approval of any request for an extension in the Contract Time. Failure to complete monthly Progress Schedule updates and to participate in the analysis will defer consideration of any time extensions by the Owner until the Work is completed and all as-built progress can be analyzed by the Owner. Further, the Owner will assess liquidated damages, if any, regardless of the status of any requests for time extensions pending, until any such requests are resolved.

1.5 SUBMITTAL SCHEDULE

A. General: Within ten (10) calendar days following Owner’s receipt of the Baseline Progress Schedule, the Contractor shall prepare and submit to the Owner a complete schedule of work-related submittals based on the Progress Schedule, as required by the Contract Documents (“Submittal Schedule”). Correlate Submittal Schedule with the listing of principal Subcontractors.

B. Form: Prepare Submittal Schedule in chronological sequence of submittals. Show category of submittal, name of Subcontractor, generic description of work covered, related Specification Section numbers, activity or event code on the Progress Schedule baseline file, scheduled date for first submission, and blank columns for actual date of submittal, re-submittal, and final release or acceptance by the A/E. The Submittal Schedule shall be prepared in sufficient detail and in consideration of, but not limited to, the following:

1. Preparation and submission of shop drawings, layout drawings, product data, material samples, and mock-ups.

C. Update the Submittal Schedule monthly and submit to Owner.
1.6 SHORT INTERVAL SCHEDULE

A. Short Interval Schedule: Prepare and update weekly a four (4) week Short Interval Schedule. Show previous 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 Contractor’s Construction Progress Schedule.
   1. Activities in the Short Interval Schedule shall relate directly to activities in the Progress Schedule.

B. Format for the Short Interval Schedule should be similar to the Owner’s form. The Contractor may submit an alternative format that must first be approved by the Owner. The format shall include comment annotation as necessary.

C. Copies of the Short Interval Schedule shall be provided at the Construction Progress Meetings and will be used as the basis for discussion of progress and planned work at the meetings.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies general administrative and procedural requirements for submittals required by the Contract Documents.

1.2 SUBMITTAL PROCEDURES

A. The Owner intends to utilize an internet-based construction management system (CMS) for submittals (see Section 01 35 00 “Electronic Communications”).

1. The electronic submittal process is not intended to be used for color samples, color charts, or material samples.

B. Coordination: Contractor shall review submittals for completeness, accuracy, and compliance with the Contract Documents, and shall coordinate the transmittal of submittals to ensure there is no delay in the construction Progress Schedule. Submittal sequencing should coincide with the Contractor’s Submittal Schedule.

1. Allow fourteen (14) calendar days turnaround for each submittal, from time of receipt by the Owner. For complex submittals or submittals requiring coordination with subsequent submittals, plan additional turnaround time.

a. Provide a "Priority List" when submitting several submittals within a short time.

2. A/E reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

3. Submittals received from sources other than Contractor will be returned without action.

C. Submittal Preparation: Contractor shall place a label on each submittal for processing. Include the following information on the label:

1. Date
2. Owner’s Project name
3. Name of Contractor and submittal number
4. Name of the entity that prepared the submittal
5. Specification reference number
6. For Shop Drawing submittals, Contractor’s certification that the submittal has been coordinated and reviewed for compliance with the requirements of the Contract Documents, and is approved for A/E’s action

D. Submittal Transmittal: Contractor shall include a transmittal with each submittal package.

1. Address no more than one topic, or related topics, on a single transmittal (i.e., mechanical items shall not be submitted with electrical items; miscellaneous specialties shall not be grouped; shoring shall be submitted separate from foundations).

2. Record relevant information including, but not limited to: the requested review return date (in order to maintain the construction Progress Schedule) and for Shop Drawings, variations from the requirements of the Contract Documents.

3. Provide the minimum number of each required submittal as noted in the Contract Documents and/or as follows:
   a. Shop Drawings: one (1) PDF
   b. Product data: one (1) PDF
   c. Samples: five (5) samples
   d. Mock-ups: As required by the Contract Documents
   e. Reference the Contract Documents for additional submittal requirements

4. Material and Color Samples: Submit samples of actual materials and colors.
a. Where variation in color, pattern, texture or other characteristics are inherent in the material, submit no less than four (4) variations of each sample to show approximate limits of the variations.

E. Portable Document Format (PDF) Requirements:
1. All documents are to be created as PDF files from the original source files, unless approved otherwise in writing by Owner.
2. The CAD printer shall be Autodesk DWG to PDF.pc3 print configuration.
   a. Layer information shall not be included.
3. All documents are to be created with a resolution of not less than 300 dpi.
4. All fonts are to be embedded in the PDF.
5. When compression is used, the algorithm must be LZW, CITT Group 4, or PackBits.
6. The PDF document size must be the same as the original document size if the document were printed (e.g., a 24”x36” print should have a PDF sheet size of 24x36).
7. Each document must be submitted as a single file.
   a. A single O&M product reference is one file.
   b. A single drawing is one file.
   c. A document larger than 11”x17” is defined as single document and is one file.

F. A/E’s Action: Except for submittals provided for the Owner’s information, the A/E will: review each submittal, mark each submittal with a uniform self-explanatory action stamp indicating action taken, and return promptly. Typically action stamps indicate:
1. Accepted without exception;
2. Subject to noted corrections;
3. Returned for re-submittal after correction; and
4. Rejected as non-compliant with the Contract Documents.

G. Compliance with Contract Documents requirements is the Contractor’s responsibility.
1. A/E’s approval of submittals does not relieve the Contractor from responsibility for a proper installation, compliance with applicable codes, or coordination of the Work.
2. All submittals required by the Contract Documents will be reviewed by the Owner for CAD drafting compliance, PDF compliance, and to determine completeness of the documents provided.

1.3 SHOP DRAWINGS

A. General: Shop Drawing submittals are defined in the General Conditions and include, but are not limited to, product data, samples and mock-ups, and layout drawings.
   1. Do not reproduce Contract Documents as Shop Drawings.
   2. For CAD Shop Drawing submittals, see 01 77 00 “Closeout Procedures.”

B. Product Data: Product data includes manufacturer’s printed installation instructions, catalog cuts, standard color charts, rough-in diagrams and templates, standard wiring diagrams, and performance curves.
   1. Submittal of standard product data is acceptable only when specific reference to the requirements of the Contract Documents is included. Submit specially prepared manufacturer’s product data when standard product data is insufficient.
   2. Mark each product data submittal and show the following information:
      a. Compliance with specified product requirements, including LEED requirements
      b. Compliance with any specified industry standards and testing agency standards, with testing agency labels and seals
      c. Manufacturer’s printed recommendations
      d. Applicable choices and options
      e. Notation of coordination requirements
      f. Notation of dimensions established by field measurement, as appropriate
C. Samples and Mock-ups: Samples include, but are not limited to, actual colors, materials and products to be provided. Mock-ups include field installations and partial assemblies of components.
   1. Prepare samples to facilitate review. Provide the following information:
      a. Generic description of the sample
      b. Source of the sample
      c. Confirmation of availability and delivery time
   2. 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.
   3. Maintain sets of approved samples and mock-ups at the Project site for quality comparisons throughout the course of construction.

D. Layout Drawings: Drawings include, but are not limited to, fabrication and installation drawings, layouts, schematics, diagrams, schedules, patterns, and templates.
   1. Submit drawings drawn to accurate scale. Indicate, at a minimum, the following information:
      a. Dimensions
      b. Identification of products and materials included
      c. Compliance with product installation requirements and/or industry standards
      d. Notation of coordination requirements
      e. Notation of dimensions established by field measurement

E. Coordinated Shop Drawings:
   1. Contractor shall coordinate the Work and require the Subcontractors to prepare and submit CAD (Computer Aided Drafting) composite coordinated Shop Drawings at a scale not less than 1/4" = 1'-0". The coordinated Shop Drawings shall clearly show: how the Work is to be installed in relation to the work of the other Subcontractors including, but not limited to, the structural and the suspended ceiling Subcontractors; all systems routings, sizes and components; space for disassembly and/or removal of major equipment requiring maintenance; access to products and equipment that require periodic maintenance including, but not limited to, cable trays, pull boxes, valves, dampers, switches, motors, filters, control components; and that maintenance access is adequate and in accordance with the requirements of Authorities Having Jurisdiction. The requirements of this Section E shall apply to all mechanical and electrical rooms and tunnels.
      a. Contractor, working through the Contractor’s mechanical Subcontractor, shall:
         coordinate the mechanical systems and equipment in relationship with other Subcontractor systems and equipment and the building components; and determine if the scheduling sequence and coordination of installations and movement and positioning of large equipment into the building are important to the efficient flow of the Work. The mechanical Subcontractor will at a minimum prepare drawings indicating the following:
            1) Planned piping layout showing valve locations and valve-stem movement
            2) Clearances for installing and maintaining insulation
            3) Access doors
            4) Equipment and accessory service connections and support details
            5) Fire-rated wall and floor penetrations
            6) Accessories such as sizes and location of concrete pads and bases
            7) Penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations
            8) All equipment requiring maintenance access from ladders six feet or more in height, or from scaffolding
      b. Contractor, working through the Contractor’s HVAC Subcontractor, shall prepare drawings indicating the location, size, and elevation of supply and exhaust systems ductwork and diffusers; fire and smoke dampers; ventilation equipment including
terminal boxes, fans, and motors with VFD’s; seismic bracing; and access doors in
ceilings. Coordinate equipment and dampers to avoid maintenance access conflicts
with built-in work below (e.g., millwork and equipment).

c. Contractor working through the Contractor’s plumbing and piping Subcontractor
shall prepare drawings indicating location, size, and elevation of piping, valves,
controllers and headers, cleanouts, guides and rollers, expansion joints, seismic
bracing, access doors in ceilings, and fixtures and equipment. Avoid routing
plumbing through electrical and data/communications rooms.

d. Contractor, working through the Contractor’s sprinkler Subcontractor, shall prepare
drawings indicating location, size, and elevation of the complete sprinkler system
including supply and cross mains routing, valves, seismic bracing, and standpipes.
Coordinate location of sprinkler heads on the ceiling layout plans.

e. Contractor working through the Contractor’s electrical Subcontractor and fire alarm
Subcontractors, shall prepare drawings indicating the location, size, and elevation of
primary distribution conduit runs, sleeves, pull boxes, junction boxes, CATV boxes,
cable tray, seismic bracing, electrical equipment and panels(with working
clearances), and fixtures including sound system speakers and terminal cabinets.

f. Electrical panels have been purposely located and have priority for indicated
locations. Mechanical and plumbing installations provide shall provide all required
offsets to ensure that electrical panels are installed in the indicated locations.

2. Contractor shall arrange meetings with its Subcontractors to resolve any apparent
conflicts on the coordinated Shop Drawings.

3. For Owner’s information, submit a composite CAD Shop Drawing, showing the work of
each participant Subcontractor at the conclusion of coordination of each logical
component of the Work.

a. CAD backgrounds will be provided by the Owner, as reasonably required by
Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for electronic communications and document control between the Owner, A/E and Contractor in supporting the Work of the Contract Documents.

B. The Owner will provide the Contractor and its Subcontractors access to the Owner’s internet-based integrated construction management system (CMS) which shall be used for communications and document control.
   1. Not all Project documents are tracked in the CMS. For most documents not in the system, the Owner provides electronic forms created with other industry standard software.
   2. Owner’s forms are included in Appendix A of these Specifications.

1.2 ADMINISTRATIVE REQUIREMENTS

A. System Access: The Owner will provide the required access codes necessary for the Contractor’s access to the Owner’s CMS website. The Owner will host the software and administer authority levels and classifications to users to control security access. Access levels will be provided to match only the level necessary to maintain and process electronic documents specified in this Section.
   1. Owner shall not be responsible for temporary or intermittent outages.

B. System Users: The Contractor shall provide a list of all parties from the Contractor’s and Subcontractors’ staffs and others that will be given access to the system. The Owner will provide the Contractor with access for a maximum of four (4) users, unless otherwise requested by the Contractor and approved by the Owner. The Contractor may, at its sole discretion, elect to enter all required data into the system including input from Subcontractors or may require the Subcontractors to enter their own data, but in either case the Contractor will be responsible for the accuracy of the data entered.

C. System Training: The Owner will provide initial training in the use of the CMS website at no cost to the Contractor commensurate with requirements for document control specified in this Section.
   1. The Owner will provide a training seminar for up to four (4) representatives from the Contractor’s organization at no cost to the Contractor. A training location and dates for the training will be provided after the award of the Contract. Training is anticipated to begin within two weeks of Contract execution.
   2. Additional training requested by the Contractor shall be subject to approval by the Owner.

D. Documents Requiring Signatures: All documents requiring signatures for approval shall be processed with the CMS to expedite preliminary concurrence of information only. Receipt of a “hard copy” signature on forms is required prior to implementing action or work as the conditions may require.

E. Equipment and Software Requirements: A computer with high speed internet access will be required in the Contractor’s home office and field office and in the offices of each of its Subcontractors using the CMS. Each computer must utilize Internet Explorer 8 or above and must be equipped to handle current versions of Microsoft Excel and Word documents, as well as pdf and tif files.
F. Information Input: The responsibility of the Owner, A/E, and Contractor to enter information and data into the Owner’s internet-based CMS shall correlate with the responsibilities of the same parties as specified in all other sections within these Contract Documents. Responsibilities include, but are not limited to:

1. The Owner will input Project and cost information from the Contract Award and maintain emergency contact lists, reports, logs, and enter all change documents.
2. The A/E will enter the Contract Documents and design clarifications with attached drawings and details, after Owner’s approval, and field reports.
3. The Contractor will enter all meeting minutes, submittals, utility shutdown requests, Requests for Information and other reports and documents required by the Contract Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies minimum requirements for safety on the construction site including:
   1. Contractor responsibility (regarding safety)
   2. Contractor safety program and plan submittals
   3. Contractor safety requirements
   4. Contractor safety reporting
   5. Construction “fire safety” requirements
   6. Chemical hazard communication
   7. Chemicals of interest reporting
   8. SARS-CoV-2/COVID-19 exposure control, mitigation, and response plan

   Note: Refer to the UW Project Delivery Group (PDG) website for information on current regulatory/agency guidelines and University requirements (https://facilities.uw.edu/unit/project-delivery)

B. Owner’s forms referenced in this Section include (see Appendix A):
   1. Chemicals of Interest – Contractor Declaration and Reporting Form

C. For additional provisions related to safety precautions, refer to the General Conditions.

1.2 CONTRACTOR RESPONSIBILITY

A. The Contractor is solely and completely responsible for compliance with all applicable laws, codes and regulations regarding safety (whether noted in this Section or not) and for creating and maintaining a safe working environment, including safety of all persons and property on the jobsite (whether the requirements of this Section address a particular situation or not).

B. The Contractor shall maintain the jobsite and perform the Work in a manner which meets or exceeds statutory and regulatory requirements for the provision of a safe place to work and which minimizes safety risks to personnel of the Contractor, Subcontractors, Owner, general public or other parties. This obligation shall apply continuously and not be limited to normal working hours.

   1. The Contractor shall ensure that all Contractor and Subcontractor personnel are provided sufficient training, and shall take such actions as are necessary to maintain a safe environment on the construction site. Such training and actions shall include, but not be limited to, ensuring that such employees are familiar with governing construction safety requirements and the requirements for compliance with applicable regulations.

   2. The Contractor shall monitor the jobsite to ensure that employees do not create unsafe conditions for others, and to comply with the provisions of the Site Specific Safety Plan.

   3. The Contractor shall establish and communicate clear expectations to its employees and Subcontractors of any tier (and their employees) of their obligation to notify the Contractor and any at-risk party of any potential health or safety hazard affecting themselves or others.

   4. The Contractor shall conduct on-site safety meetings weekly, or other frequency as appropriate, that shall be mandatory for all employees.

C. The Contractor shall designate a full-time on-site competent individual to be the “Safety and Health Officer” who is qualified and authorized to supervise and enforce compliance with the Contractor’s Site Specific Safety Plan during the performance of the Work. The Contractor is responsible to ensure that all necessary monitoring equipment, protective clothing, and other supplies and equipment are available to implement the Plan.
1. The Contractor shall require each Subcontractor to provide a fulltime on-site safety manager (competent individual) for the duration of work at the Project site. If the man-load is below fifty (50) field workers, the Subcontractor may designate its Superintendent as the safety manager. If the man-load is fifty (50) or above field workers on-site, the Subcontractor shall provide and designate a dedicated competent individual as safety manager whose sole responsibility is Project safety including, but not limited to: review pre-task plans, critical lift plans, rigging and installation means and methods, fall protection, trenching excavations, electrical safety, Occupational Safety and Health Administration (OSHA) and Washington Industrial Safety and Health Act of 1973 (WISHA) regulations compliance, and second tier Subcontractor safety monitoring and compliance.

D. Safety Violations: In the event of WISHA violations by the Contractor or any of its suppliers or Subcontractors of any tier for unsafe practices involving imminent danger to personnel of the Owner, Contractor, Subcontractors, or others, the Contractor shall immediately correct the hazardous situation which caused the violation prior to any work continuing in the affected area. If such violations exist and corrective actions have not been taken by the Contractor, the Owner may order the Contractor to stop work (to be followed up in writing the same day), until satisfactory corrective action has been taken per Article 3.04 of the General Conditions.

1.3 CONTRACTOR SAFETY PROGRAM AND PLAN SUBMITTALS

A. Company Safety Program: The Contractor shall submit a copy of its Company Safety Program to the Owner. The Company Safety Program shall contain, at a minimum, the following elements:
   1. Organizational Structure: Include names of individuals who will perform safety duties, titles, work assignments, authority and reporting relationships.
   2. Training Program: Who, how, and when training is provided; method of employee training concerning safety rules and procedures; and training in use of protective equipment.
   3. Protective Equipment: List of personal protective equipment to be provided to employees.
   4. Accident Prevention and Loss Control Plan: Work site inspection and hazard correction procedures; disciplinary procedures for safety infractions; and accident response (investigation and reporting procedures).

B. Site Specific Safety Plan: The Contractor and each of the Contractor’s Subcontractors shall review the Contract Documents, and the Contractor shall develop and submit a copy of a “Site Specific Safety Plan” to the Owner. The Site Specific Safety Plan shall be tailored to the unique issues of the Project and the specific types of hazards likely to be encountered throughout all phases of the Work, be in compliance with WISHA and all other regulatory requirements, and contain, at a minimum, the following elements:
   1. Application of Company Safety Program: The Site Specific Safety Plan shall address how the elements listed in this Section 1.3A will be specifically applied and modified in addressing the unique issues related to the Project.
   2. Specific Hazards: The Site Specific Safety Plan shall address, as applicable, the following, and other specific hazards for the Project:
      a. Odor notification
      b. Excavation and rescue plans
      c. Pedestrian safety (including on Husky Game and/or other special event days)
      d. Overhead hazards and flying objects
      e. Hot works
      f. Hazardous materials and chemical exposure
      g. Methane abatement
      h. Safety issues related to Owner’s “Prior Occupancy”
      i. Working over water
      j. Rigging - aerial lifts and forklifts
k. Electrical safety
l. Scaffolding and personnel lifts
m. Noise and dust
n. Lockout/Tagout and control of hazardous energy
o. Work in confined spaces
p. Housekeeping and safe access
q. Silica
r. Fall prevention
s. Steel erection activities
t. Crane safety
u. SARS-CoV-2/COVID-19 viruses

1.4 CONTRACTOR SAFETY REQUIREMENTS

A. Safety Training: Contractor shall provide construction site orientation for all employees (including Subcontractor employees) to become familiar with the Site Specific Safety Plan prior to commencing work. Contractor shall, on a weekly basis, perform safety training on hazards specific to the phase of work for all employees. These meetings shall be mandatory for all construction employees.
   1. Subjects should include site specific safety issues and procedures and discussion of corrections resulting from any violation in safety procedures. A log of subjects covered and a copy of the attendance records of each meeting shall be submitted to the Owner's Representative on the day the meeting occurs.

B. Respiratory Equipment: Any personnel performing work requiring the use of respiratory protective equipment shall be fully trained in the use of such equipment. Contractor must have a respiratory protection program and ensure that all workers wearing respirators have medical clearance and fit testing, as appropriate, for the type of respirators used.

C. Personal Protective Equipment: Contractor shall ensure all construction personnel are equipped with and utilize personal protective equipment in accordance with Labor and Industries standards. As a minimum requirement, all personnel working on the construction site shall be required to use approved hardhats, safety glasses, appropriate gloves, and substantially constructed work boots. In addition, high-visibility safety apparel shall be worn in accordance with the American National Standards Institute and the International Safety Equipment Association (ANSI/ISEA) standard 107-2004.

D. First Aid: The Contractor shall maintain at the Contractor's field office, or other well known place at the Project site, all materials (e.g., a first aid kit) necessary for giving first aid to the injured, and shall establish, publish, and make known to all employees procedures for ensuring immediate removal to a hospital or a doctor's care, persons (including personnel) who may have been injured on the construction site. Construction personnel shall not work on the construction site before the Contractor has established, and made known, procedures for removal of injured persons to a hospital or a doctor's care. If the Contractor and/or any Subcontractors work crew consist of five or more employees, the Contractor shall ensure that at least one of such employees has a valid and effective first aid card.

E. Safety Walkthrough: In addition to WISHA requirements, the Contractor shall conduct a safety walkthrough of the Project with the Owner's Representative a minimum of once a month during the course of construction. If a safety manager is required for any Subcontractor, the safety manager shall also attend the safety walkthrough. The Contractor shall:
   1. Document and maintain a written record of the hazards and unsafe practices noted during the walk-through and provide copies to the Owner as requested;
   2. Ensure that corrective action is promptly taken to eliminate the items recorded; and
3. Maintain copies of all inspections performed by other competent individuals on the construction site during the course of construction.

F. Job Hazards Analysis: The Contractor shall plan daily work, considering procedures with the potential for personnel injury and implement appropriate practices to avoid injuries with focus on engineering controls, personal protective equipment needs, and mitigation for exposure to cuts and lacerations. At each construction progress meeting, the Contractor shall present its plan for addressing hazards likely to be encountered in the next week.

1. The Contractor shall develop and implement a program requiring task planning at the foreman level, including at the Subcontractor’s foreman level.

1.5 CONTRACTOR SAFETY REPORTING

A. Reporting Injuries and Incidents: Contractor shall immediately notify the Owner’s Representative of any injury or incident to persons, including personnel, on the construction site. Contractor shall conduct an immediate investigation with an emphasis on preventative actions and lessons learned. The Contractor and its Subcontractor shall document the investigation and submit a hard copy of the report on OSHA Form 301 “Injury and Illness Report,” or equivalent, to the Owner within 24 hours of the incident. The Contractor shall report on a monthly basis the total number of hours worked on-site by the Contractor’s employees and Subcontractors, and the total number of recordable incidents and lost time accidents. Contractor shall submit copies of the Project First Aid Log to the Owner’s Representative on a monthly basis.

B. Reporting Potentially Serious Hazards: Contractor shall immediately notify the Owner’s Representative of any potentially serious hazard to persons, including personnel, on the construction site. Contractor and its Subcontractor shall conduct an immediate investigation and submit a report to the Owner’s Representative within 24 hours of becoming aware of the potentially serious hazard. The report shall describe the potentially serious hazard, the results of the Contractor’s investigation, and any steps the Contractor has taken to prevent an injury or incident from occurring based on the potentially serious hazard.

C. Emergency Procedures:
1. For emergencies requiring an ambulance, fire department, or police assistance, the Contractor shall call emergency services (fire and police at 911).
2. Should the Contractor find it necessary to call for non-emergency police assistance or protection in the exercise of the Contractor’s responsibilities on the Seattle Campus, the Contractor shall call the University Police Department at 206-543-9331.

1.6 CONSTRUCTION FIRE SAFETY REQUIREMENTS

A. Fire Safety During Construction and Demolition: The Contractor shall conform to Chapter 1, “Fire Safety During Construction and Demolition,” of the International Fire Code, as locally amended, and any additional provisions as outlined herein for precautions against fire, flammable and combustible liquids, flammable gases, explosive materials, fire protection, fire reporting, fire fighting access, means of egress, standpipes, fire sprinklers, and roofing operations.
1. The Contractor shall provide adequate separation between Owner-occupied buildings and construction trailers and sheds.

B. Hot Work Procedures:
1. Contractor shall establish a system for documentation and control of "hot work" activities which include the use of portable gas, grinding, or arc welding equipment and conduct operations in a manner that is fire-safe for the work area and adjacent areas. Hot work permits are to be posted at the jobsite in an accessible and conspicuous location.
Maintain the premise clear of rubbish, debris, or other materials constituting a potential fire hazard. The local fire code is incorporated herein by reference; adhere to all applicable provisions as determined by the local fire department. Contractor and Subcontractors shall obtain from the local Fire Department engineering inspection section a permit for all hot work activities prior to performing this Work.

a. Whenever practical, the Contractor shall perform cutting and welding operations off-site.

2. Maintain copies of all hot work related permits for Owner’s review upon request, including, but not limited to:
   a. Cutting and welding;
   b. Roofing / hot-tar kettle; and
   c. Storage of flammable materials (e.g., propane, butane) and/or compressed gases.

3. Prior to conducting hot work activities, the Contractor shall ensure all of the following fire safety precautions have been taken:
   a. Cutting and/or welding equipment must be thoroughly inspected and found to be in good repair, free of damage or defects.
   b. A multi-purpose dry chemical, portable fire extinguisher must be located so that it is immediately available to the area of work and is fully charged and ready for use.
   c. At least one fire alarm pull station or means of contacting the fire department (i.e., site telephone) must be immediately available and accessible to person(s) conducting the cutting/welding operation.
   d. Floor areas under and at least 35 feet around the cutting/welding operation must be swept clean of combustible and flammable materials.
   e. All construction equipment fueling activities and fuel storage must be located at least 35 feet away from cutting/welding operations.
   f. Fire resistant shields (e.g., fire retardant plywood, flameproof tarpaulin, metal, etc.), must cover combustible floors.
   g. Combustible materials and finished surfaces, equipment, electrical cables, and personnel must be provided with protection to prevent damage or injury from molten metal, falling sparks, and welding arcs.
   h. Spark / slag catchers (e.g., fire retardant plywood, flameproof tarpaulin, metal, etc.) must be suspended below any elevated cutting/welding operation.
   i. All floor and wall openings must be covered to prevent sparks/slag from traveling to other unprotected area.
   j. Containers in or on which cutting/welding will take place must be purged of flammable vapors.

C. Fire Systems Shutdowns, Impairments, and Fire Watch

1. When it is necessary to shut down existing fire alarm systems or suppression systems for switch-over purposes, or any other reason that leaves the building unprotected, the Contractor shall provide a continuous Owner-approved “fire watch” in accordance AHJs and the following (unless the Contractor provides an Owner-approved temporary equivalent system or the Contractor is specifically excepted by the Owner):
   a. Person(s) assigned to a fire watch must be trained in the use of the portable fire extinguisher.
   b. Fire watch personnel must have an immediate means of providing notification to the fire department (e.g., cellular phone, land-line phone, two-way radio to a continuously staffed position) and the University Police.
   c. Continuous rounds to cover all areas of the building where the fire protection system is out-of-service are required every 15 minutes.
      1) Exception for Building Code type “B occupancy” buildings: During the hours a B occupancy building is occupied, building occupants performing their duties, including construction personnel, may act as a fire watch in lieu of a designated fire watch, when approved in writing by Owner.
         a) A fire watch is required at all times in unoccupied areas.
b) Other building code occupancy types may be allowed this exception when approved in writing by the Owner.

d. A log of rounds shall be maintained to include the name of the person performing the fire watch, the hours worked (including start and stop times), and comprehensive notes.

2. Fourteen (14) calendar days written notification shall be provided to the Owner’s Representative requesting approval for fire protection system shutdown or functional impairment; receipt of written approval from the Owner’s Representative is required before any system shutdown or functional impairment.
   a. In occupied buildings, include a plan indicating a method to notify all occupants.
   b. Notify the local fire department. In Seattle, the number to report out-of-service systems and equipment is 206-233-7219.

3. The Contractor shall work in cooperation with the Owner to identify fire alarm initiating devices in and adjacent to the Project site that may activate from construction activities (i.e., work that creates dust, smoke, steam, heat, etc.) and develop a plan to temporarily cover, remove, or disable through programming these devices to eliminate the potential for false alarms.
   a. The Owner may authorize in writing some devices to be disabled for the duration of the Work or for a particular activity without requiring a continuous “fire watch” for one shift or several days depending on circumstance.
   b. ONLY OWNER PERSONNEL SHALL DEACTIVATE OR DISABLE EXISTING FIRE DETECTION AND SUPPRESSION SYSTEMS, unless the Contractor is specifically authorized in writing by the Owner to do so.

D. Fire Alarm/Suppression Systems False Activation or Discharge: Most existing Owner buildings have active fire detection and suppression systems. If proper procedures as outlined in the Contract Documents and this Section 1.6C are not followed to ensure the unnecessary activation or deactivation of these systems, the Owner may at its sole discretion impose an emergency response charge of $350 per occurrence to the Contractor and require a fire watch at the Contractor’s cost. The Contract Sum will be amended for such amount by Change Order.

E. Fire Extinguishers Required for Construction: Provide multipurpose dry chemical portable fire extinguishers for the Work in accordance with the International Fire Code Chapter 14, as locally amended, and as required by WISHA and other applicable regulations. Existing building fire extinguishers or new fire extinguishers specified by the Contract Documents for the Project do not alleviate Contractor’s responsibility to provide temporary fire extinguishers for the Work.

F. Standpipes Required for Construction: In new multi-story construction (four or more stories in height) a Class I standpipe shall be provided in accordance with Chapter 14 of the International Fire Code, as locally amended, for use during construction. Fire Department connections at bottom of standpipe shall be clearly marked and accessible at all times for fire department personnel and equipment. This requirement shall be reviewed and approved by the Owner’s Representative.

G. Existing Fire Separations: Existing fire separations, including floor-to-floor separations, shall not be impaired by construction activities.

H. Occupant Egress in Existing Buildings: The Contractor shall not block active exits, exit hallways, exit corridors and the exit access to a public way.
   1. Exits are to remain free of construction materials, equipment, and rubbish at all times, unless approved by Owner.
I. Emergency Access: Outdoor storage and staging operations and construction fencing shall not impede egress, restrict or narrow fire fighting access (including roads or lanes), or present a fire exposure to existing buildings.
   1. Access to emergency services including, but not limited to, fire hydrants, fire department connections, fire command centers, fire alarm panels, valves and similar equipment and systems for emergency vehicles and emergency response personnel must be kept free and unobstructed at all times, unless specifically approved by the Owner.
   2. Temporary obstruction of emergency access may be allowed for special cases (e.g., crane installations and hoisting) on a short-term basis. A written plan must be submitted to the Owner for approval at least two weeks prior to the scheduled date of obstruction.

1.7 CHEMICAL HAZARD COMMUNICATION

A. General: The Owner and the Contractor are responsible under the Washington Administrative Code 296-800-170 through 296-800-18020 (Employer Chemical Hazard Communication) to provide a safe and healthy environment for their employees.

B. Responsibilities:
   1. The Owner maintains a centralized collection of all Material Safety Data Sheets (MSDS) for Owner materials. These MSDS are available to the Contractor if an unknown chemical is discovered in the work area; a worker is concerned about exposure; and the Contractor suspects the material originates with the Owner.
      a. The Contractor shall coordinate with the Owner’s Representative to receive this information.
   2. The Contractor shall establish a Chemical Hazard Communication Program (WAC 296-155-180) which includes multiemployer workplaces (WAC 296-800-17007), and provide hazard communication information and training to its employees and the employees of the Contractor’s Subcontractors (of any tier).
      a. The information shall include: signage demarcating regulated areas and entrances; signage indicating the location of the Contractor’s binder containing all MSDS used for Construction; and prominently posted lists identifying all hazardous chemicals present in the workplace.
      b. In addition to MSDS training which is regulated by the Employer Chemical Hazard Communication standard, training shall include those MSDS that are available for any Owner’s chemical product present at the jobsite.
   3. The Contractor shall provide the Owner chemical hazard information (MSDS) for all chemical products the Contractor and the Contractor’s Subcontractor’s (of any tier) bring onto the jobsite for Owner’s information prior to application including, but not limited to, all paints, glues, mastics, epoxies and cleaning products.
      a. At the jobsite, the Contractor shall establish and maintain a binder(s) of all hazardous chemicals MSDS used for Construction and indicate where utilized.
         1) The MSDS shall be bound in a slant-D, 3-ring, view binder with clear vinyl overlay inserts on the front cover and spine. The binder shall have heavy duty nylon reinforced hinges.
         2) The binder shall have a cover slip sheet and a spine sheet typed with “MSDS used for Construction,” University Project name, University Project number, University Facility number, A/E name, and Contractor name.
         3) The MSDS shall be organized by specification division and section with tabbed dividers between the sections or, when presented in a logical format by Contractor and approved by Owner, between categories.

1.8 CHEMICALS OF INTEREST REPORTING

A. Prior to work being performed by the Contractor and/or the Contractor’s Subcontractors (of any tier), the Contractor shall submit to Owner a completed “Contractor Declaration and
Reporting Form for Department of Homeland Security – Chemicals of Interest” for chemicals listed in 6 CFR (Code of Federal Regulations) Appendix A to Part 27 that will be used on the jobsite. Individual declarations shall be provided by the Contractor and the Contractor’s Subcontractors (see Appendix A of the Specifications for a copy of the form)

1.9 SARS-CoV-2/COVID-19

A. All construction operations must comply with the most current COVID-19 related rules and guidance from the Governor’s Office including the “Stay Home, Stay Healthy” addendum, dated April 24, 2020, and additional guidance issued April 29, 2020. All activities must also comply with all related and applicable requirements issued by the Washington State Department of Labor and Industries and Public Health Agencies having jurisdiction.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies minimum administrative and procedural requirements that the Contractor shall implement for "infection control" as extensions of other provisions in the Contract Documents.

1. All construction work at a medical center is a potential health risk in that mold spores and other microbial organisms that result from the disturbance of dust can become exposed and airborne which may cause disease in sensitive patients. The Contractor shall:
   a. Not allow any dust to escape the work area within the medical center;
   b. Control any dust, due to construction Work, from entering the medical center; and
   c. Minimize dust and debris from construction operations.

1.2 DEFINITIONS OF CONSTRUCTION ACTIVITIES

A. “Inspection and Non-Invasive Activities” (Applies to Low Risk, Medium Risk and High Risk Patient Groups): Lifting of ceiling tiles or opening of hard ceiling access panels for visual inspection only; painting (but not sanding); application of wall coverings; and other Owner approved activities which do not move or mobilize uncontrolled dust or require cutting of walls or floor coverings, such as electrical trim work and minor plumbing. (Inspection and Non-Invasive Activities do not include opening access doors in HVAC ductwork.)
   1. Uncontrolled and uncontained Inspection and Non-Invasive Activities are not permitted in “highest risk” patient areas.

B. “Standard Risk Activities” (Applies to Low Risk, Medium Risk and High Risk Patient Groups): Small scale, short duration activities that are completed in a single work shift and/or that create minimal dust where dust migration is completely contained and controlled from dispersing into the atmosphere, such as installation of energy limited cabling (e.g., telephone, computers), access to chase spaces, cutting of walls or ceilings, and the performance of Inspection and Non-Invasive Activities in “highest risk” patient areas.
   1. Standard Risk Activities are not permitted in “highest risk” patient areas without proper infection control practices to contain dust and debris.
   2. During construction, the Contractor shall ensure:
      a. There is an active means to prevent airborne dust from dispersing into the atmosphere.
      b. Unused enclosure doors are sealed with painter’s tape.
      c. HVAC system air vents (supply and exhaust) within enclosures are sealed shut.
      d. Dust containment (sticky) mats are located at entrance and exit to work area enclosure doors.
   3. Upon completion of the Project, the Contractor shall ensure:
      a. Work surfaces are cleaned and wiped with approved disinfectants.
      b. The work area is damp mopped and/or vacuumed with a HEPA filtered vacuum.
      c. HVAC system isolation is removed and functioning within original conditions or new design standards.

C. “High Risk Activities” (Applies to all Patient Risk Groups): All requirements specified herein apply to any Work that generates or disturbs a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies, such as sanding of walls for painting or wall coverings, removal of floor coverings, ceiling tiles and/or casework, and new wall construction. Also, includes HVAC ductwork and electrical work above ceilings, major cabling work, and any activity that cannot be completed within a single work shift.
1.3 TYPES OF PATIENT “RISK GROUP” AREAS

A. Low Risk Areas
B. Medium Risk Areas
C. High Risk Areas
D. Highest Risk Areas

1.4 PROJECT RISK GROUP

A. The Risk Group(s) for this Project are Low Risk Areas.

1.5 DESCRIPTION OF GENERAL REQUIREMENTS

A. The Contractor shall identify a competent person responsible for establishing, coordinating and maintaining infection control interventions and safety training for the Project who shall be on-site at all times during the Work.

B. The Contractor shall submit a written “Infection Control and Monitoring Plan” for Owner’s review and approval prior to performing Work within the medical center. The plan shall include, but not be limited to, locating dust proof enclosures, HEPA equipment locations and negative air routing, fire safety and security, noise and vibration control, construction access and exit path routing, temporary signage design and locations, odor control, waste management, and proposed cleaning equipment.
   1. Submit temporary facilities drawings showing the locations of dust proof enclosures and negative air machines, with ductwork routing, required for performance of the Work.
      a. For relocations required by the Work, revise and resubmit.
   2. Submit a water control plan for concrete core drilling and saw cutting.
   3. When requested by Owner, the Contractor shall assist in completing the Owner’s “Infection Control Risk Assessment” forms to identify the appropriate interim life safety measures required for the Work.

C. Daily Reports: Contractor shall submit daily infection control reports that document:
   1. A general description of the activities completed during the shift;
   2. Infection Control enclosure checks and modifications, if necessary;
   3. Manometer readings; and
   4. Next-day work plans.

D. Infection Control Training: The Contractor shall provide jobsite orientation for all construction personnel and suppliers of materials to the Project site to become familiar with the Project specific infection control requirements prior to performing any on-site construction activities.
   1. For Projects at the UW Medical Center only: All construction personnel involved in construction activities shall observe a training video “Dust Containment in a Medical Setting” on construction risks in health care facilities as part of their safety training.

E. All infection control requirements shall be in place before commencing Work and shall remain in place and be maintained in good working order until the Work is complete, including but not limited to completing the following work:
   1. Punch List work is fully and finally complete;
   2. Door locks/keys are changed over;
   3. Owner’s air sampling has met infection control completion criteria, and;
4. Contractor’s final cleaning and/or Owner’s transplant cleaning and disinfection is complete.
   a. Contractor’s final cleaning shall occur after Punch List work is complete to the satisfaction of the Owner.

F. Contractor shall not permit its employees, the employees of its Subcontractors of any tier, or delivery personnel to expectorate (spit) inside Owner’s facilities.

1.6 INFECTION CONTROL REQUIREMENTS

A. Dust Proof Enclosures: The Contractor shall provide dust proof enclosures for all Work (except for Owner approved “Inspection and Non-invasive Activities”). Dust proof enclosures shall be constructed per the requirements of Section 01 50 00 “Temporary Facilities and Controls” prior to start of Work. Dust proof enclosures must: enclose the entire work area to completely isolate it from all surrounding areas; cut off any flow of particles from work areas to patient areas; and be functioning continuously. Doors shall remain closed and penetrations or openings to dust proof enclosures shall be tightly sealed at the end of each work shift.
   1. All dust proof enclosures shall be maintained on a daily basis to ensure proper airflow, appearance, and workplace security. Enclosure failure requires immediate corrective action by the Contractor.
      a. Enclosures which are not immediately repaired by the Contractor may be repaired by the Owner and all Owner costs required to repair the failure may, at the Owner’s sole discretion, be back-charged to the Contractor.
   2. When performing construction activities of a “high risk” classification, in highest risk patient areas, an anteroom to the enclosure entrance shall be required.
   3. Portable mini enclosures shall be equipped with a HEPA vacuum for vacuuming the work area prior to removing the enclosure.
   4. On phased projects, where dust proof enclosures are to be relocated as a part of the phasing of the work area, the work area shall be fully cleaned prior to the relocation of any dust proof enclosures to prevent dust from leaving the work area.

B. Work Area Air Pressure Requirements: The Contractor shall use negative air machine equipment to maintain a negative air pressure relationship of the work area from surrounding areas. Negative air pressurization of the work area is required at all times, and constant maintenance of that pressure differential is the responsibility of Contractor, unless exempted in writing by the Owner. A minimum negative pressure relationship of .03” water column must be maintained between areas under construction and surrounding areas.
   1. Appropriate equipment shall be used to constantly monitor the negative air pressure relationship. Acceptable options to visually assure negative air pressure is maintained are: for rigid wall containment (usually in longer duration projects) manometer units shall be employed; for plastic or polypropylene dust proof enclosures (in longer duration projects) flutter strips of light weight ribbons or “survey tape” shall be employed; and for short duration projects involving single shifts the actual visual movement of the plastic or polypropylene dust proof enclosure wall into the construction space is acceptable.
      a. For projects utilizing manometers: The Contractor shall record manometer readings at the beginning and the end of each work shift and shall maintain a log of readings, and any corrective actions taken, to be included in the daily report.
   2. Work area ventilation must be exhausted 100% to the exterior of the building and directed away from building air intakes to an approved location, unless otherwise approved in writing by the Owner.
      a. If the Owner agrees exhausting to the exterior of the building is not feasible, HEPA filtered air may be exhausted to adjacent areas provided existing air relationships remain unchanged and the Contractor provides confirmation with an air balancing report. The air balancing report shall be provided to the Owner prior to the Contractor performing construction work.
1) When exhausting indoors, exhaust near the ceiling through a velocity reducing pre-filter material approved by the Owner. Never exhaust into existing air ducts.

A. Negative Air Machines: The Contractor shall utilize Owner-approved HEPA equipped air filtration "negative air" machines and heavy duty flexible steel reinforced exhaust hoses.
   3. HEPA equipped air filtration machines shall be connected to normal power and ganged to a single switch for emergency shut-off.
   4. Exhaust hoses shall be of adequate size to ensure necessary air flow and be in place and intact at all times.
   5. The Contractor is to take care in maintaining the negative air machines in accordance with the manufacturer’s written instructions, including but not limited to, monitoring and changing all filters and seals as needed to ensure adequate airflow and complete filtering.
   6. The Contractor shall provide all necessary HEPA filters for the negative air machines.

C. Materials and Material Handling: The Contractor shall ensure that all materials, including new materials, construction debris, and tools, are transported clean and contained or wrapped in "dust impermeable" enclosures when transported within the medical center. Containers and/or carts shall be tightly covered and their open surfaces shall be wrapped and taped closed unless there is a solid lid. Wrappings and/or bags shall be hermetically sealed.
   1. Wheels of containers and/or carts shall be wiped clean prior to entering the medical center and entering or leaving the work area.
   2. Debris removal shall occur through approved routes and only at times approved by Owner.

D. Owner Air Monitoring: The Owner will perform periodic field inspections and air quality testing inside and outside the work area and will approve removal of dust proof enclosures based upon air quality testing results. If Owner’s air monitoring indicates failure of negative pressurization of the work area enclosure, or Owner’s measurements and/or observations indicate the construction work is releasing particulates, dust, or vapors outside the work area, upon Owner’s notification to Contractor, Contractor shall implement immediate corrective actions to stop such emissions and to prevent future emissions.
   1. Air sample results require approximately five (5) days. Areas that “fail” air sampling at the end of the Project will require additional visual inspection, assessment and remediation, with possible repeat cleaning. Retesting will be performed until the work area meets “passing” criteria.

E. Housekeeping:
   1. Infection Control Cleaning: The Contractor shall provide infection control cleaning during all construction activities within the medical center.
      a. Construction work areas and access routes shall be clean within the medical center. Contractor shall continuously clean all work areas within the Project site and those work areas outside enclosure containment, including construction access routes, free from dust, debris, and construction materials. Clean and disinfect all existing surfaces and materials outside containment that are impacted by construction immediately upon completion of an activity.
      b. Damp mop, electrostatic cloth sweep, and/or vacuum with HEPA filtration the construction site and construction access routes during the work and before leaving work areas at the end of a shift to eliminate tracking and dust migration. Prior to the removal of any dust proof enclosures the Project site must be damp mopped and/or vacuumed and all surfaces wiped down with disinfectant. Submit disinfectant for Owner’s review and approval.
         1) Quaternary ammonium compounds are required for damp mopping.
2. Maintain sufficient supplies of cleaning equipment on-site including but not limited to: (Owner-approved) HEPA filtered vacuum cleaners; dust attracting mops; wet mops; brooms; buckets; and clean wiping rags.

3. Any materials capable of absorbing moisture must be fully dried within 48 hours of becoming wet. If material, either new or existing, inside or outside the work area, becomes wet as a result of the Contractor’s actions and is unable to be dried to an “as-new” condition within 48 hours, the Contractor shall remove the materials within the same 48 hour period. Any visible mold growth caused by or observed by Contractor inside the work area must be reported to Owner immediately. Owner will determine corrective actions to be taken in consultation with Contractor.
   a. Materials removed from the work area for this reason shall be replaced with new materials at Contractor’s expense.

4. Contractor shall take measures to control vermin and other pest infestations within the Project site. Food waste is to be removed daily and all food is to be stored in tightly sealed containers that are clearly labeled.
   a. Any visible bird or rodent droppings observed by the Contractor inside the work area must be reported to Owner immediately. Owner will determine corrective actions to be taken in consultation with Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PERFORMANCE REQUIREMENTS

A. The Contractor shall implement the following, but not limited to, work procedures for Work in the medical center:
   1. Construction materials stored on-site shall be kept dry.
   2. Immediately remove spills or excess applications of solvent containing products.
   3. Existing supply and exhaust air grills serving the building HVAC system within dust proof enclosures shall be covered and sealed to prevent airflow and contamination of the duct system at all times.
   4. At the end of the work day, all openings in pipes and ductwork shall be covered or sealed.
   5. Work surfaces are misted with wetting agents to control dust during demolition and while cutting.
   6. Vacuum subfloor surfaces prior to the application of resilient flooring materials.
   7. Concealed spaces shall be vacuumed clean before covering or enclosing, including but not limited to: chases; stud tracks; above ceilings (including top surfaces of ductwork and cable trays); and surfaces covered by resilient flooring materials, casework, and accessories.
   8. Immediately replace any ceiling tile briefly lifted for visual inspection outside of dust proof enclosures. Removed tiles shall not be left open and unattended. Limit tile removal to 1 tile per 50 square feet of area, unless otherwise approved by Owner.
   9. Work shall be performed in rooms where patients are not present, and at least five (5) feet from patients or visitors in ambulatory or general public settings, when approved by Owner.
   10. When an anteroom is required for a dust proof enclosure, all personnel must pass thru the anteroom before leaving the work site and they shall vacuum debris from their person using a HEPA vacuum cleaner or they shall wear cloth or paper coveralls that are removed within the anteroom each time they leave the work site. Anterooms shall be negatively pressurized the same as the associated dust proof enclosures.
   11. All construction personnel and material suppliers entering a dust proof enclosure at a “High Risk Activity” work site in a “Highest Risk Area” shall wear shoe covers. Shoe covers must be changed each time the person exits the work site.
12. Dust proof enclosures shall be removed only after receiving Owner’s written approval of the Project site air quality. Remove dust proof enclosure materials carefully to minimize spreading of dirt and debris associated with the Work.
   a. Mini-enclosures shall be cleaned inside prior to dismantling, to prevent dust from escaping into occupied areas.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

   A. The Section further describes basic Contract definitions, specification format and content explanations, and industry standards in the Contract Documents.

1.2 DEFINITIONS

   A. Accepted: The term "accepted" is used in conjunction with the A/E's duties and responsibilities as stated in the conditions of the Contract.

   B. Concealed: Spaces out-of-sight such as above ceilings, below floors, between double walls, furred-in areas, pipe and duct shafts, and similar spaces.

   C. 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.

   D. Exposed: Open to view. For example, pipe installed in a walkway tunnel or pipe installed in a room and not covered by other construction.

   E. Furnish: Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar subsequent requirements.

   F. Indicated: The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as shown, noted, scheduled, and specified are used to help the reader locate the reference.

   G. Install: Operations at Project site to place in position for service or use including unloading, unpacking, assembly, erection, placing, anchoring, applying, working-to-dimension, finishing, curing, protection, cleaning, and similar requirements.

   H. 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, and similar operations. Installers shall be experienced in the operations they are engaged to perform.

   I. 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. Certain construction activities may extend beyond the Project site.

   J. Provide: Furnish and install, complete and ready for intended use.

   K. Regulations: The term “regulations” includes laws, codes, ordinances, statutes, and lawful orders issued by authorities having jurisdiction (AHJ), as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

   L. Trades: 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.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into divisions and sections based on the Construction Specification Institute’s (CSI) MasterFormat.
   1. Title: The Specifications are divided into division and section for the convenience of writing and using. The titles of these are not intended to imply a particular meaning or to fully describe the work of each division, subdivision, or section and are not an integral part of the text which specifies the requirements.
   2. Three Part Section: Each section of Specifications has been subdivided into three parts for uniformity and convenience (Part 1 – GENERAL, Part 2 - PRODUCTS, and Part 3 - EXECUTION). These do not imply a particular meaning and are not an integral part of the text which specifies requirements. Where text for one of the parts is lacking due to project requirements, the part title is included followed by the words "Not Used."

B. Specification Content: This Specification uses certain conventions regarding the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. The conventions are explained as follows:
   1. Abbreviated language: Abbreviated words and meanings used in the Contract Documents shall be interpreted as appropriate. Words implied, but not stated, shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicate.
   2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarify to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
      a. The words ‘shall be’ are implied wherever a colon (:) is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

A. Applicability of Standards: All construction shall be in accordance with industry standards. 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. Publication Dates: Comply with the industry standards in effect as of the Bid date of the Contract Documents.

C. Conflicting Requirements: Where compliance with two (2) or more standards are specified and where the standards may establish, different or conflicting requirements for minimum
quantities or quality levels, the Contractor shall promptly report to the A/E, in writing, requesting a decision before proceeding with the Work.

1. Minimum quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. 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.

D. Copies of Standards: 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 within the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.

E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Acronyms or abbreviations, as referenced in Contract Documents are defined to mean the recognized name of the trade association. Names and addresses are subject to change and are believed, but not assured, to be accurate and up-to-date as of the date of the Contract Documents. Refer to the latest edition of the “Encyclopedia of Associations” published by Thomson Gale for a listing of associations and general standards abbreviations.

F. Federal Government Agencies: Names and titles of federal government standard - or Specification -producing agencies are often abbreviated. Acronyms or abbreviations referenced in the Contract Documents may indicate names of standard - or Specification-producing agencies of the federal government. Names 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.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. General Requirements: Comply with the quality control provisions specified in the Contract Documents and perform quality control testing and inspection, and the surveillance of the Work for quality, unless specifically designated to be performed by Owner.

B. Owner's forms referenced in this Section include (see Appendix A):
   1. Contractor Quality Control Daily Report

C. Contractor Quality Control (CQC) shall consist of plans, procedures, and organization necessary to provide materials, equipment, workmanship, fabrication, construction, and operations that comply with the requirements of the Contract Documents. CQC shall cover construction operations keyed to the Progress Schedule including, but not limited to, fabrication on-site and off-site, and field and factory tested construction mock-ups.

D. Owner’s special inspection and Testing Agency services are specified in Section 01 45 23 "Testing and Inspecting Services" which may be required to ensure the Work is in accordance with the Contract Documents, except where those tests are specifically indicated to be performed by the Contractor in the Contract Documents. These services do not relieve the Contractor of responsibility for compliance with Contract Documents requirements.

1.2 CQC MEETINGS

A. General Work Plan Meeting: Contractor shall meet with Owner’s Representative and A/E to discuss CQC procedures for the Project. Items for discussion shall include, but not be limited to:
   1. Identification of the Contractor’s CQC Representative;
   2. Interrelationship of Contractor, AE and Owner’s Representative;
   3. CQC administrative procedures and pre-installation work plans;
   4. Submittals and persons responsible for Shop Drawing review;
   5. Forms for recording the CQC program;
   6. Testing, inspections and approvals records;
   7. On-site and off-site fabrication and installation procedures; and
   8. Field constructed mock-ups.

B. Pre-installation CQC Work Plan Meetings: Develop a “CQC Work Plan” for each definable feature of the Work. Complete the work plan and submit to Owner with each notification requesting a pre-installation meeting. The work plan shall serve as the basis for discussion and review of the Contract Documents requirements. The work plan will assist to assure that materials and equipment delivered and assembled for construction conform to Contract requirements, and that control testing and CQC procedures are documented.
   1. When requested by the Owner, the Contractor shall revise a CQC Work Plan and provide the Owner a final CQC work plan with changes addressing comments or clarifications from the A/E and/or Owner’s special inspection services or Commissioning Authority.

1.3 CONTRACTOR QUALITY CONTROL REQUIREMENTS

A. Contractor’s Quality Control Organization: Staff the CQC organization, as required, to perform the activities outlined in this Section and elsewhere in the Contract Documents.
   1. Identify a dedicated full-time “CQC Representative” who shall be on the Project site at all times during progress of the Work, and as appropriate for all work subsequent to
Substantial Completion. The CQC Representative shall have complete authority to take those actions necessary to ensure compliance with the Contract Documents.

2. Identify persons responsible for review and approval of Shop Drawings and other submittals required by the Contract Documents.

B. Qualifications of CQC Representative: The Contractor shall propose and Owner shall approve, in writing, the Contractor’s CQC Representative. The CQC Representative must have construction management experience including prior experience with projects of similar construction, size, and complexity.

1. During progress of the Work, the Owner will monitor and evaluate the performance of the CQC Representative based on the conformance of the Work with the Contract Documents and an assessment of the accuracy, timeliness and completeness of the daily QC Report. If the CQC Representative fails to perform to the sole satisfaction of the Owner, the Contractor shall propose a replacement CQC Representative for the Owner’s approval.

C. Daily Quality Control Reports: CQC Representative shall maintain daily Quality Control (QC) Reports. The QC Reports shall be factual records containing numerical data of the Work and quality control activities and observations, including examination of work areas to verify the substrate upon which new work is to be placed. Submit QC Reports on Owner’s form, or another Owner approved form, by the next workday following the day of the report.

1. CQC Representative shall verify and sign all reports. Verification shall contain the statement that all supplies and materials incorporated in the Work are in compliance with the Contract Documents.

D. Control of On-Site and Off-Site Construction: Contractor’s Quality Control procedures shall include the following phases of control and management for each definable feature of the Work:

1. Pre-installation Meeting: A pre-installation meeting shall be held prior to beginning work on each definable feature of the Work specified in the Contract Documents (see Section 01 31 19 “Project Meetings”).

2. In-Progress Inspection Phase: In-progress quality control testing and inspection, and surveillance of the Work for quality shall be performed continuously to verify that quality standards are maintained throughout the Work. Adjustment to quality control procedures and CQC work plans may be required, based upon the results of the inspections and testing.
   a. The Contractor shall:
      1) Discuss quality control procedures at construction progress meetings;
      2) Report the results of the inspections and any changes to quality control procedures in the daily QC Report; and
      3) Revise CQC work plans for Owner’s records, if changes are required.

3. Above-Ceiling Final Inspections: The Contractor shall provide to the Owner a minimum two (2) week notice prior to ceiling installations for the A/E to conduct above-ceiling final inspections.
   a. The Contractor shall perform corrective work and provide reasonable time for the A/E to validate the work complete prior to covering from sight.

4. Contractor’s Final Punch List Report: The CQC Representative shall thoroughly inspect all aspects of the construction (including the Subcontractor’s Work) and produce a final punch list report of work requiring correction and/or incomplete work that shall be issued to the Subcontractors with instructions to complete prior to requesting the Owner’s final inspections. The Contractor’s written request for Owner’s final inspection shall certify that all features of the Work are installed and have been reviewed by the Contractor to determine compliance with the Contract Documents.
a. The Contractor's final punch list report shall be prepared by the Contractor utilizing the Owner's internet-based construction management system (CMS), in a format acceptable to the Owner.

1) The report shall include a comprehensive Project room number list and additional entry listings for site work, building enclosure, roofs, and other items not designated with a room number to document the entire Project.

2) The Owner’s final inspections items will be added to the Contractor's final punch list report by the A/E.

3) The Owner will manage the consolidated listing of all open inspection items until all items are signed-off by the Owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. General Requirements: Comply with the testing and inspection, and correction of Non-Conforming Work provisions specified in this Section and elsewhere in the Contract Documents.

B. Owner’s Responsibilities:
1. The Owner will select and employ an independent “Testing Agency” to conduct the tests and inspections in accordance with applicable standard methods of the American Society for Testing and Materials (ASTM) or other standards as a requirement of the building permit.
2. The Owner may provide other special inspection services to inspect and verify that the Work installed is in accordance with the Contract Documents and construction industry standards.

C. Contractor’s Responsibilities:
1. All other tests and inspections which are required to obtain regulatory approval by Authorities Having Jurisdiction (AHJ) shall be provided by and paid for by the Contractor.
2. The Contractor shall provide other testing services where specified in the Contract Documents.

1.2 DESCRIPTION

A. Definition: For the purpose of this Section, all references made to Testing Agency, or waterproofing and roofing inspections, or geotechnical consulting firm shall be referred to as those tests or inspections which will be conducted by an inspector provided by the Owner.

B. Testing and Inspection: Materials to be tested and inspected are specified by the Contract Documents. In addition, testing and inspection of other materials maybe required by the building permit or as directed by the Owner or AHJ. Quantities and extent of tests and inspections shall be as specified and/or required by the Owner’s inspector or AHJ.

1.3 QUALITY ASSURANCE

A. Qualifications: The inspector for all work of this Section, except for geotechnical and waterproofing and roofing special inspectors, shall be a registered inspector employed by an approved inspection and/or Testing Agency as listed by the Washington Association of Building Officials (WABO) Special Inspection Registration Program. All inspection personnel used on this Project are subject to being disapproved from the Project at the sole discretion of the Owner’s Representative. Minimum levels of qualifications as stated in the WABO Special Inspection Registration Program for various portions of the required Testing Agency inspections and testing must be complied with.
1. The special Inspector for waterproofing and roofing must have the required technical knowledge and experience for the product being installed.
2. The Owner may select a Testing Agency, other than the agency employed by the Contractor, to perform tests required by the building permit.
3. Geotechnical inspection will be performed by a licensed geotechnical consulting firm.
1.4 DUTIES OF OWNER’S TESTING AGENCY

A. General: The Testing Agency shall conduct testing and inspection services, interpret them, evaluate the results for compliance with the building permit and the Contract Documents, and report the findings to the Owner’s Representative, A/E, Contractor, and AHJ. Testing and inspection services shall be in accordance with applicable standard methods of ASTM or other standards specified by AHJ, the Contract Documents, and construction industry standards. The Testing Agency shall reasonably support overtime, second shift, and out-of-area activity if requested by the Contractor and approved at the Owner’s sole discretion.

B. Non-Conforming Work: The Owner’s inspectors will document and immediately notify the Contractor and the Owner’s Representative of any Work found defective or not in accordance with the requirements of the Contract Documents.

C. The Owner’s inspectors are not authorized to:
   1. Release, revoke, alter, or enlarge on the requirements of Contract Documents;
   2. Approve or accept any portion of the Work, except as allowed by the special inspection duties delegated by AHJ for building permit inspections and testing;
   3. Perform any duties of the Contractor; or
   4. Stop the Work.

1.5 COSTS

A. The Owner’s Testing Agency and special Inspector costs for initial testing and inspection as specified in the Contract Documents will be paid for by the Owner. Initial tests and inspections are defined as those required to complete the first tests and inspections specified.

B. Additional tests and inspections not specified but requested by the Owner or A/E shall be paid for by the Owner.
   1. However, if the results of such tests and inspections are found to be not in accordance with the Contract Documents, the Contractor will be back-charged for all costs of this testing and inspection as well as re-testing, re-inspection and Owner's consultants’ services.

C. Costs for additional tests or inspections required because of a Contractor change in products or materials, or source, after a submittal has been reviewed and accepted, shall be borne by the Contractor.

D. Costs of any testing which is required solely for the convenience of the Contractor in its scheduling and performance of the Work shall be borne by the Contractor.

E. Costs for verification testing and inspection of Work done without timely notice, with improper supervision, or contrary to construction practice, shall be borne by the Contractor.

F. Costs for testing of materials for which fabrication and mill reports are required, but not furnished, shall be borne by the Contractor.

G. Costs of any testing which is the responsibility of the Contractor as specified in the Contract Documents shall be borne by the Contractor.

1.6 TESTS AND INSPECTION REPORTS

A. Copies of Test and Inspection Reports: Electronic copies of Owner’s Testing Agency (or other special inspection services) reports and Contractor’s test and inspection reports shall be
exchanged between Owner and Contractor at weekly intervals and shall be provided to AHJ as required. 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 and records of special sampling operations that are required shall also be reported.

1. Submit copies of inspection reports, certifications, notices, correspondence, and similar documents and records established in conjunction with building industry standards bearing upon the Work.

1.7 CONTRACTOR’S RESPONSIBILITIES

A. General: Inspection of the Work by the Owner’s special inspectors and/or Testing Agency shall not relieve the Contractor from responsibility for compliance with Contract Documents requirements. Owner’s special inspectors and/or Testing Agency and Owner's Representative shall have authority to reject Work whenever the provisions of the Contract Documents are not being complied with, and the Contractor shall instruct his employees accordingly.

B. Coordination: The Contractor’s shall initiate, coordinate, and conform to the required tests and inspections of AHJ.

C. Access for the Purpose of Inspection: The Contractor shall ensure the Owner's special inspectors and/or Testing Agency have free access to all parts of the Work and to the shops where the Work is in preparation; are provided proper facilities for safe access for such inspection; and are reasonably furnished equipment, tools, samples, certifications, test reports, design mixes, storage, and assistance as requested by the Owner’s Inspector.

D. Storage Facilities: The Contractor shall furnish adequate facilities for the sole use of the Owner’s Testing Agency to provide safe storage and curing space for test specimens that must remain on-site prior to transport to the laboratory.

E. Data: The Contractor shall furnish accepted submittals and approved Change Orders, certificates, and similar data as may be required by Owner’s inspectors to perform their work to assure compliance with the Contract Documents.

F. Notice: Furnish notice to Owner's Representative and coordinate with Owner’s inspectors. Provide a minimum of five (5) working days notice in advance of all required tests and a minimum of forty eight (48) hours in advance of all required inspections, unless otherwise specified.

G. Cancellations: Contractor shall give sufficient advance notice to Owner’s Representative and Inspectors to allow rescheduling of their work load in the event of cancellation or time extension of any scheduled test or inspection.

1. Any charges from an Inspector due to insufficient advance notice of cancellations or time extensions shall be borne by the Contractor, at the Owner's sole discretion.

1.8 TEST FAILURES

A. General: The Owner's Representative may require a re-test of a sampled material when a sample or procedure has failed to pass the required tests. In such cases, two samples shall be tested and the material shall be rejected if either sample fails.

1. In the event any test or inspection indicates failure of a material or procedure to meet the requirements of the Contract Documents, all costs for re-testing or re-inspection shall be borne by the Contractor.
1.9 REPORTING TEST FAILURES

A. General: Immediately upon determination of a test failure, the Owner’s inspector shall telephone the test results to the Owner’s Representative and Contractor. By the end of the following day, the Owner’s inspector shall send written test results to those named on the distribution list.

B. Contractor shall similarly report test failures to Owner’s Representative resulting from work of testing agencies provided by the Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. Minimum temporary facilities and controls requirements are specified in this Section. Nothing in this Section is intended to limit the types and amounts of necessary temporary facilities required to perform the Work, and no omission from this Section will be recognized as an indication that a necessary temporary facility is not required for successful completion of the Project, and compliance with the requirements of the Contract Documents and all applicable codes.

B. Included in this Section are the following headings:
   1. Product Delivery, Storage and Handling
   2. Project Site - Work Area
   3. Protection of Existing Utilities
   4. Shutdowns of Existing Equipment and Utility Services
   5. Temporary Support Facilities
   6. Temporary Enclosures and Miscellaneous Construction
   7. Noise and Vibration Control
   8. Construction Parking and Staging
   9. Construction Traffic

C. Owner's forms referenced in this Section include (see Appendix A):
   1. UW or HMC Utility Shutdown Request form, as appropriate.

D. Behavior:
   1. The Owner will not tolerate inappropriate behavior by any worker on a jobsite toward a student, staff, patient, visitor, neighbor or employee.
   2. The Contractor shall not allow obscene, offensive or otherwise inappropriate material to be displayed at the Project site, or at remote construction staging and parking areas, including job offices and trailers. If such material is displayed, it shall be immediately removed by the Contractor and/or when requested by the Owner's Representative.
   3. Gratuities to Owner's employees by a Contractor are not allowed per Washington Administrative Code, Chapter 42.52 RCW.

E. Conservation: The Contractor shall install and operate temporary facilities and perform construction activities in a manner which reasonably will be conservative and avoids waste of energy and materials, including water.

F. Pest Control: The Contractor shall rid the Project site of rodents, birds, insects, and other pests which may have entered buildings under construction as a result of the work.

G. Pollution Control: The Contractor shall perform the Work so as to prevent water, soil, and air pollution.
   1. The Contractor shall not discharge volatile, harmful, or dangerous materials into the Owner's sanitary sewer and storm water drainage systems.
      a. Non-storm water discharge into the Owner's storm water system is prohibited, including the following types of discharge, unless the stated conditions are met:
         1) Discharges of potable water for, but not limited to, water line flushing, hyper-chlorinated water line flushing, fire hydrant system flushing, and hydrostatic test water must be de-chlorinated to a concentration of 0.1 parts per million or less, pH-adjusted if necessary, and volumetrically and velocity controlled to prevent re-suspension of sediments in the storm water system.
      b. Street sweeping must be performed prior to washing the street at construction sites.
c. All discharges to the sanitary sewer require Owner’s prior approval.

2. The Contractor shall not cause or allow visible emissions of fugitive dust from the construction site, unless reasonable precautions are employed to minimize the emissions. Reasonable precautions include, but are not limited to, the following:
   a. During high winds, the use of control equipment and/or enclosures, the reduction of construction vehicle speeds, and the curtailment of all dust creating construction procedures shall be implemented.
   b. When demolition, excavation, and construction activities generate dust, the construction site shall be sprinkled with water or chemical stabilizers to minimize dispersion.
   c. Truck under-carriages shall be brushed to minimize the transporting of dirt off construction sites.
   d. Truckloads shall be covered, wetted, or allowed adequate freeboard to prevent the escape of dust-bearing materials.

H. Silica Dust Control: The Contractor shall use best engineering and work practice controls to reduce exposure to silica dust at or below the Washington State Permissible Exposure Limit defined in the latest regulations from the Washington State Department of Labor and Industries (L&I), Puget Sound Clean Air Agency (PSCAA) and any other applicable federal, state, and local government regulations.

1. The Contractor shall assume that silica is present in all concrete, mortar, terrazzo flooring, plaster, sheetrock, fireproofing and other related building products.
   a. The Contractor shall conduct air sampling for respirable crystalline silica in accordance with the National Institute for Occupational Safety and Health (NIOSH) method 7500.

1.2 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle specified products in accordance with the manufacturer’s recommendations and use means and methods that will prevent damage, including, but not limited to, moisture damage of materials, deterioration, and loss or theft.

1. Store materials and products off the ground and protect from weather.

B. Furnish products in the manufacturer’s original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

C. Include a waste reduction provision in purchasing agreements requiring that materials and equipment be delivered in packaging made of recyclable material, that the amount of packaging be minimized, and that packaging be taken back for reuse or recycling.

1. The Contractor shall require the same provisions in its Subcontractor’s purchasing agreements.

D. Inspect products upon delivery to ensure compliance with Contract Documents, and to ensure that products are dry and mold free, undamaged, and properly protected.

E. Store products at the Project site in a manner that will facilitate inspection and measurement of quantity or counting of units.
F. Store heavy products away from the Project structure in a manner that will not endanger the supporting construction.

G. Protect building products subject to damage, under cover in a clean and weather-tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer’s instructions.

H. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
   1. Ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.

1.3 PROJECT SITE - WORK AREA

A. Confine operations, equipment, and storage to the designated work area.
   1. Maintain the Project site, including adjacent areas and properties, in a clean and orderly manner free from accumulations of combustible materials and construction waste, including rubbish and debris resulting from construction operations. Clean indoor work areas daily of construction waste, dirt, and dust. Do not store construction materials and equipment in Owner-occupied areas unless approved by the Owner. Immediately clean up any spilled material and/or fugitive construction spoils or debris from adjacent properties and vehicle travel ways. Keep streets, fire lanes, and walks clean and free from obstructions.
   2. Mechanical rooms shall not be used for construction storage, unless approved by Owner.
   3. All masonry cutting is to be done outdoors. Cut stations for all other work shall be located outdoors or within well ventilated dustproof enclosures or other approved containment.

B. Security:
   1. General:
      a. Protect work and stored products from theft and vandalism and protect premises from entry by unauthorized persons. At the end of workday, close temporary enclosures and lock exterior doors and/or gate. Secure all openings at any time the Project site is left unoccupied.
      b. Owner’s Keys: Owner’s Representative will issue keys, as required, for the Contractor to perform the Work. Prior to Substantial Completion, the Contractor will return all issued keys. Contractor’s responsibility shall include, but not be limited to, the following:
         1) Arrange for the issuance of access keys on a daily basis, or as mutually agreed with Owner.
            a) Owner’s costs associated with re-keying a system, including an entire tunnel system, due to lost keys shall be the responsibility of the Contractor.
         2) Lock all access doors when not attended and at the end of each shift.
         3) Provide security barriers, acceptable to Owner, at all utility openings which are created by the removal of gratings and/or the opening of utility tunnels or shafts.
         4) Coordinate Work to minimize need for access to restricted areas.
      c. Many buildings and spaces on Campus are high security areas, such as building mechanical and electrical equipment rooms, certain lab spaces, and computer facilities. Contractor shall use due care to maintain an equivalent level of security of Owner’s property, where appropriate, and as it normally exists (i.e., secure areas when not actively working). Normally locked or closed doors shall not be propped open.
d. Contractor is advised to lock its gang boxes and secure them to the construction. Owner will not reimburse Contractor for any lost or stolen tools, material or equipment.

2. Tunnel System: Owner maintains rigid controls for persons entering the Owner’s tunnel systems. All tunnel doors and certain utility access gratings are equipped with special security locks. The remaining utility access gratings are secured by tack welding.

3. Criminal Background Checks: All construction personnel working in medical centers shall be subject to criminal background checks in accordance with Washington Administrative Code, RCW 43.43.830, et seq.
   a. On the first day of work, each worker shall fill out a Washington State Patrol Request for Criminal History Information form and a Request for Criminal History Record form and submit them to the Contractor’s superintendent who shall submit the collected forms to the Owner’s Representative.
   b. The Owner will request the background check from the Washington State Patrol.
   c. A worker may be conditionally employed on the Project pending results of the criminal background inquiry.
   d. Any worker who does not pass the criminal background check will not be permitted to work on the Project and the Contractor shall immediately remove, or cause the worker to be removed, from the Project.

C. Construction Waste: Remove construction collected materials from the Project site at a frequency acceptable to the Owner and dispose of in a lawful manner. Do not burn waste material, stockpile waste material, or bury waste material on Owner’s property. Do not use Owner’s waste containers for construction waste of any kind, unless approved by Owner. Dispose of all refuse and waste material, including excess earth from excavation, off of Owner’s property.
   1. See Section 01 74 00 “Construction Waste Management” and, when specified, Section 01 11 01 “Summary of Work – Regulated Materials” for additional requirements.

D. Odor Control:
   1. General: Adjacent Owner areas and/or neighboring buildings may be occupied during construction. The use of solvents and materials producing noxious fumes or any product or equipment that adversely impacts air quality shall be subject to the approval of Owner. Isolate odor-causing work away from building air intakes, private properties and pedestrian traffic areas. Where solvents are used within enclosed structures, vent to outside areas.
   2. Emissions Control Plan: The Contractor shall submit a written procedure for control of emissions prior to any use.
      a. The plan shall at a minimum consist of the following items:
         1) Products to be used/Material Safety Data Sheets
         2) Location of Work
         3) Application
         4) Ventilation plan
         5) Hours of operation
         6) Materials handling/storage
      b. Considerations shall include, but are not limited to:
         1) Concrete curing
         2) Roofing and waterproofing
         3) Welding
         4) Exterior painting
         5) Adhesive and/or stripping or paint removal
         6) Adhesive and/or stripping or paint removal
         7) Soil remediation
   3. Equipment and trucks producing fumes shall not be parked or located in the vicinity of building air intakes, entrances, and operable windows, unless approved by the Owner.
a. Trucks that are idling for more than a few minutes shall shut off their engines. If trucks are queued and idling, there must be at least 20 feet between each truck or the exhaust shall be piped to have a 20-foot separation between each exhaust.

b. All diesel-powered construction equipment shall utilize ultra-low sulfur diesel fuel.

c. All diesel-powered construction equipment and trucks must be: 2007 model year or later (for vehicles); or Tier II heavy duty (for stationary engines); or equipped with 3-CARB verified oxidation catalyst-based particulate emissions control devices, operating at 600 degrees F or above.

E. Smoking: The University of Washington and Harborview Medical Center have restricted smoking policies. The Contractor shall not permit its employees or the employees of its Subcontractors of any tier to smoke on the Owner’s property, except in the areas indicated below:

1. Smoking is permitted on University of Washington campuses where shown on maps: https://www.ehs.washington.edu/system/files/resources/smokingareas_seattle.jpg

2. For the Harborview Medical Center: Contact Owner’s Representative for information.

3. If the Project site includes a fenced construction area, the Contractor shall establish an outside area, within the fenced area, where its employees and the employees of its Subcontractors may smoke, provided that the area is in compliance with the requirements of Chapter 70.160 RCW. The Contractor shall communicate the location of the permitted smoking area to its employees and Subcontractors, and shall require Subcontractors (of any tier) to communicate the location of the smoking area to its employees.

1.4 PROTECTION OF EXISTING UTILITIES

A. The existing concealed utilities shown on the Drawings are not necessarily exact with respect to location or completeness. Therefore, the Contractor shall take the following steps:

1. Notify Owner in writing, with a minimum two (2) week notice for each occasion, of the intent to work near existing known underground utility services or structures or when a new excavation operation is about to begin. Submit procedure for approval to assure safe and continuous operation of the services.

2. Proceed with sufficient caution to preclude damaging any known utilities (i.e., hand digging or probing). In the event unidentified utilities are encountered, notify Owner’s Representative immediately.

3. In the event utilities are damaged during construction, temporary services and/or repairs must be made immediately to maintain continuity of services.

a. Utilities installed by the Contractor, and damaged by the Contractor, shall be repaired at the Contractor’s sole expense.

1.5 SHUTDOWN OF EXISTING EQUIPMENT AND UTILITY SERVICES

A. It is generally critical that all building systems remain operational within occupied buildings, except for brief shutdowns that might be required to integrate or connect new Work. Similarly, continuity of equipment and utility services to adjacent buildings and Owner’s site infrastructure shall also be reasonably maintained at all times.

B. Equipment or utility shutdowns required to facilitate the Work shall be accomplished in accordance with the following requirements:

1. Submit a schedule of equipment and utility shutdowns (see Section 01 32 16 “Construction Progress Schedule”).

2. Submit a Utility Shutdown Request form to schedule all equipment and utility shutdowns not less than fourteen (14) days prior to the proposed date. Include, as a minimum, the following information:

   a. Equipment or utility services affected
b. Reason shutdown is required
c. Work to be accomplished during the shutdown
d. Proposed date and time
e. Duration of the shutdown
f. Proposed method of providing back-up service during shut down

3. The actual time and date of all shutdowns will be subject to approval of Owner. Shutdowns normally will be scheduled for nights, weekends, school vacations or other low intensity use periods.

4. The duration of all shutdowns shall be held to a reasonable minimum as determined by Owner.

5. Materials and equipment required for the Work to be accomplished during shutdown shall be complete and available on the job for review by Owner three days prior to the shutdown, if requested. If Contractor is not adequately prepared, the shutdown will be canceled and rescheduled.

6. ONLY OWNER’S PERSONNEL WILL SHUT DOWN AND RESTART OWNER’S 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 service. In that event, additional shutdown requirements shall be rescheduled in accordance with the preceding requirements. Restarting shall not be construed as acceptance of the Work as complete.

7. 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.

C. For building electrical shutdowns involving de-energization of equipment on the campus high-voltage distribution system, including main breakers for a given building, the following enhancements to the requirements listed above apply. The Owner’s Representative will determine which shutdowns proposed by the Contractor require such enhancement.

1. A minimum of 6 weeks before the proposed shutdown, the Contractor shall submit a Proposed Shutdown Plan to the Owner’s Representative. This Shutdown Plan shall include the following information:
   a. A description of Contractor tasks and safety measures (such as lock-out/tag-out), necessary to install or otherwise create the project improvements. Include specific names of devices to be switched and a complete list of equipment to be de-energized.
   b. Inspections by the engineer of record, the high voltage shop, and/or the authority having jurisdiction, as applicable. Indicate what inspections are requested and where in the sequence of work they occur.
   c. Proposed dates(s) and time(s) with duration(s) of the shutdown. Alternate dates may be proposed but the earliest of the proposed dates shall be no sooner than 6 weeks from the date of submittal of the Shutdown Plan.
   d. A draft “UTILITY SHUTDOWN REQUEST” on the standard form in Appendix A.

2. At the Owner’s request, participate in a meeting with the Owner’s Representative and the University’s High Voltage Shop to explain and discuss the Proposed Shutdown Plan. This meeting shall occur at the time of plan submittal or within 2 business days of plan submittal. Insofar as the Shutdown Plan would necessitate tasks to be performed by the High Voltage Shop, the University’s high voltage electricians will use the information as an aid in formulating their approach to the actual switching, and in determining the level of effort and feasibility of the schedule and shutdown in general.

3. At the Owner’s request, check/verify that plans by the University’s zone electricians and others to mitigate building impacts are coordinated with, and safely support, the proposed construction activities.
4. If the Proposed Shutdown Plan is approved or approved with conditions, proceed as follows in paragraph 5. If rejected, work with the Owner's Representative to reschedule the shutdown.

5. A minimum of 2 weeks before the proposed shutdown, review status with the Owner's Representative and submit the final UTILITY SHUTDOWN REQUEST. If deemed necessary by the Owner's Representative, also submit a final Shutdown Plan. These documents shall include, at a minimum, the following information:
   a. The final proposed date, time and duration of the shutdown.
   b. Responses to any conditions imposed on the shutdown by the University's review and approval process.
   c. Any Contractor-proposed changes to the original (draft) plan.

1.6 TEMPORARY SUPPORT FACILITIES

A. Temporary support facilities include: construction power and lighting and heating and water, toilet and hand washing facilities, mobile communications, cranes and hoists, field offices, and field office communications; and similar miscellaneous facilities (i.e., storage sheds, first aid facilities, clean-up facilities, fire protection, waste disposal) as may be reasonably required for proficient performance of the Work and accommodation of personnel at the Project site, including Owner's and A/E's personnel. Locate temporary support facilities for convenience of users, and for minimum interference with construction activities. Placement of all temporary support facilities shall be subject to review and approval by the Owner's Representative.

1. Do not block Owner's access to adjoining buildings and occupied spaces through the use of temporary support facilities.

2. Keep temporary support facilities clean and neat in appearance and do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on the site. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload temporary facilities or permit them to interfere with progress.

3. Erection and dismantling of cranes shall occur only on weekends, unless otherwise approved in writing by the Owner.

B. Remove all temporary support facilities including, but not limited to, power and water infrastructure, hoist foundations, and communications cabling and pathway, unless indicated otherwise in the Contract Documents. Restore the Project site to original or new conditions, patching and filling as required to match adjacent surfaces.

C. All connections to Owner utilities must be made in accordance with 1.5 of this Section, "Shutdowns of Existing Equipment and Utility Services."
   1. Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of the permanent service.

D. Electrical Power and Service: Contractor shall pay for, provide, and install all necessary Owner-approved temporary equipment required for use of the Owner's electrical power for minor renovations and/or alterations construction work within the Project site of an Owner-occupied facility. Temporary equipment shall be installed and maintained in accordance with all applicable safety regulations and the Owner's requirements.
   1. Electrical power for the operation of small tools and equipment required for work outside of the Project site will be provided by the Owner as reasonably available from approved existing sources.

E. Lighting: Provide and maintain LED (light-emitting diode) type construction lighting to provide adequate general illumination of the work area and trade task lighting. Shield construction lighting from adjacent residential areas.
F. Heating and Ventilation: Provide temporary heat as required to protect materials and equipment from dampness, cold, and mold growth. Method of heating is subject to approval of Owner’s Representative. Fuel fired “salamander type” heaters are not permitted, unless approved by Owner.
   1. Owner’s HVAC system shall not be utilized for construction in the UW Medical Center. Supply and return–air grills shall be completely sealed-off within the Project site.
   2. New building HVAC systems shall not be operated or used for construction until such time the Contractor has submitted the Contractor’s final punch list report, unless otherwise approved by Owner.
   3. Renovations of Owner’s facilities may utilize existing ducted ventilation supply diffusers but shall not utilize exhaust systems, including return-air grills or fans. Un-ducted plenums over a construction work area must have all ceiling tiles in place, unless otherwise indicated in the Contract Documents or approved by the Owner.
      a. If Owner’s HVAC system is utilized for construction, the Contractor shall:
         1) Protect the HVAC system from construction dust contamination and provide cleaning of the components exposed to contamination prior to Owner’s occupancy.
         2) Install filter media having a minimum efficiency reporting value of 8 (MERV 8) according to the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standard 52.2-1999 at each supply and return-air grill used during construction.
         3) Replace Owner’s filtration on any return air fan system with a minimum 85% filtration media (as determined by ASHRAE 52.1-1992) prior to Substantial Completion.

G. Water: For construction purposes, will be furnished by Owner.
   1. Contractor shall pay all costs of temporary piping, including pressure reducing station, double backflow preventer, removal of piping and restoration of Owner’s utilities at the completion of the Work. Piping of temporary water service shall not exceed the capacity of the Owner’s system and shall be limited to 1-1/2” pipe size.
   2. Contractor shall provide drinking water from a proven safe source for all those connected with the Work.
      a. The Owner’s “potable” water drinking facilities may be used, if available and approved by Owner.

H. Toilet and Hand Washing Facilities: Contractor shall provide self-contained properly ventilated single-occupant toilet units of the chemical or aerated circulation type that are fully enclosed with a glass fiber reinforced polyester shell, or similar nonabsorbent material, and portable hand washing facilities.
   1. The Owner’s toilet facilities may be used if available and provided they remain in a clean condition, as approved by Owner.
   2. The Contractor shall provide alcohol hand sanitizers or hand gel dispensers for workers in medical centers, if restrooms and/or similar hand washing facilities are not available within the Project site.

I. Elevators: Use of Owner’s elevators is subject to approval of the Owner, unless indicated for construction use in the Contract Documents.
   1. Use requires temporary protection and, if indicated in the Contract Documents, restricted hours of use apply.

J. Mobile Communications: The Contractor shall provide cellular phones with e-mail capability for its key on-site personnel.

K. Contractor’s Field Office: Contractor is to provide and pay all costs related to installation, removal, and site restoration of temporary office space within the Project site.
1.7 TEMPORARY ENCLOSURES AND MISCELLANEOUS CONSTRUCTION

A. Temporary enclosures include, but not by way of limitation, fire-rated barriers, dustproof enclosures, and site fences to protect the Work and to provide for public protection as required by law and ordinance.

1. Provide one-hour fire-rated barriers of gypsum sheetrock and metal studs with taped joints where shown on the Drawings or when removing and/or compromising existing fire safety partitions indicated on the Drawings, such as corridor walls and/or occupancy separations, to completely isolate the construction area from other occupied building areas. Remove and repair finishes to match existing at completion of Work.
   a. Fire Safety during construction, alteration, or demolition must be provided as indicated by the current edition of the International Fire Code with local amendments and applicable rules. Combustible materials are not permitted to be used as barriers.

2. Provide dustproof enclosures within occupied buildings to enclose the entire work area and completely isolate it from surrounding areas, unless otherwise approved by Owner. At a minimum, construct dustproof enclosures on metal studs from one layer of: 5/8 inch gypsum sheetrock; 1/4 inch fire retardant low VOC (volatile organic compounds) shiny surface materials (such as melamine); 6-mil fire retardant plastic sheathing; or 4-mil fire retardant polypropylene. Tape all joints smoke tight and continuously seal all connection points to existing construction utilizing painters tape for existing surfaces to be retained, melamine tape for melamine enclosures, and duct tape for existing surfaces not to be retained. Enclosures must extend above ceilings to the structure above except when the entire work area ceiling is completely sealed from the above ceiling space, in which case, the seal may occur at the ceiling. If the Contractor employs a combination of temporary enclosures and existing construction to enclose the work area, the Contractor shall seal any penetrations found in the existing construction, including supply and exhaust HVAC duct grills that shall be blocked off and sealed shut.
   a. All existing finishes damaged by construction are to be repaired to their original condition and ceiling tiles damaged by the Contractor are to be replaced with equivalent undamaged tiles at completion of the Work.
   b. An Owner-approved portable mini-enclosure shall be utilized outside the containment area for ceiling work: that will be completed within one shift; with limited dust disturbance/creation; with little anticipated noise; and with no "hot work."
      1) Portable mini-enclosures shall be constructed of 6-mil fire-retardant plastic sheathing with zipper openings. Completely seal all joints and connection points with smooth vinyl tape. All ceiling tiles removed by Contractor must be placed back into position before the mini-enclosure is removed.

3. Fire barrier and/or dustproof enclosure doors are to be installed in rigid frames and be self-closing and fitted with a gasket or other material to restrict closing noise and inhibit airflow, except for plastic sheathing enclosures which shall have zipper wall doors for personnel access. The door and its frame shall be painted in medical centers.
   a. All interior Project site entrances and exits shall have dust containment walk-off mats (sticky mats) present at all times. Provide 24” x 36” minimum size with layers to be peeled off when fully loaded. Secure mats to floor and install snug to enclosure entrances.
      1) Mats must be clean, intact and maintained on a constant basis. Avoid locating adhesive walk-off mats in public walking areas and patient transport areas in medical centers.

4. All elevator openings within the work area of occupied buildings, except working construction elevators, shall be sealed airtight from the work area.

5. Site Fences: Provide temporary six (6) foot high chain link fence panels with top rail fastened to tubular metal posts set in heavy concrete bases to prevent ready relocation, unless otherwise indicated, to enclose exterior areas of the Project site and off-site lay-down and Contractor parking areas provided by the Owner. Panels are to be anchored
together to prevent entry between panels. Provide gates or equal to facilitate access to fire hydrants, pumper connections and standpipes. No barbwire is permitted.

B. Provide miscellaneous construction to protect the Work. Furnish, install, and maintain for the duration of construction all required tarpaulins, barricades, security barriers, canopies, warning signs, steps, bridges, platforms and other temporary construction necessary for the safe and proper completion of the Work. Maintain the temporary construction in compliance with all pertinent safety and other regulations. Temporary barricades that obstruct exit paths from occupied areas shall not be installed unless approved by Owner.

1. Egress Signage: Provide and install temporary exit signs, as needed, to insure a clear direction or emergency exit travel in occupied areas adjacent to the construction project. Review the temporary exiting routes and signage design and location with Owner’s Representative.

2. Other Signage: Provide informational signs, warning signs, and any other sign required by AHJ for the Project.

1.8 NOISE AND VIBRATION CONTROL

A. Construction shall not exceed the maximum permissible sound levels defined by the local AHJ and shall meet the special conditions of the Project.

B. Exterior Construction Noise: Maintain the sound pressure level of exterior construction noise from exceeding decibels with a frequency rating function A (60 dBA) inside adjacent facilities with windows closed between the hours of 8:00 a.m. and 5:00 p.m. weekdays.

1. If required, the Contractor shall meet this criterion by erecting barriers between work equipment and adjacent facilities.

C. Limited Hours of Use With-in Buildings: Noise-producing equipment exceeding 60 DB(A) and/or vibration-producing equipment is subject to approval of Owner and in general will be allowed only before 7 a.m. and after 6 p.m. except within medical centers where use will be allowed from 8 a.m. - 7 p.m., unless otherwise approved by the Owner.

1. When possible, combine noisy and vibration-producing operations into one time period.

2. Specific scheduling is required for Work within the UWMC, HMC and the UW Health Sciences Center. Contractor shall provide its work schedule to Owner for approval no later than three (3) weeks prior to commencing any noisy and/or vibration-producing work.

D. Noise and Vibration Control Plan: Contractor shall submit a written procedure to minimize construction vibration and noise prior to performing physical impacts to, or demolitions of, existing structural components.

E. Machinery & Equipment: Equipment shall be as quiet as feasible for the work being performed. Electric-driven or hydraulically drawn is preferred to gas, diesel, or pneumatic powered machinery. If noise levels on any gear cannot meet the criteria of this Section, either that gear will not be allowed on the job or use times will have to be scheduled subject to approval of the Owner. Conformance to this requirement shall be included in the Contract price and no compensation will be allowed for special equipment or overtime that may be required.

1. Construction personnel shall limit the extent of unnecessary equipment idling.

F. Outdoor Vehicle and Internal Combustion Engine Noise: In addition to the requirements applicable to exterior construction noise in this Section, the sound pressure level of each piece of equipment shall not be greater than 85 dBA when measured at the property line of adjacent real property of another person, and when measured at a distance of 50 feet from the emission source under noisiest operating conditions.
1. Rubber-tired equipment shall be used whenever possible instead of equipment with metal tracks.
2. When required, mufflers for stationary engines shall be “hospital-area” quality of silencing.
   a. Contractor is to routinely verify equipment mufflers and/or noise barriers are intact and operational.

G. Air Compressors: Equip air compressors with silencing packages--electric-driven preferred.

H. 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.

I. Jack Hammers and Rotary Hammer Drills: May be used where no other alternative is available, if permitted by the Owner. The use of core-drilling and saw cutting equipment, or electric driven drills is preferred. Time of use is subject to approval by Owner.

1.9 CONSTRUCTION PARKING AND STAGING:

A. Parking permits are required for all vehicles parking on campus. Parking without a valid parking permit will result in citation and possible impound of vehicle.
   1. Parking on or near University of Washington and Harborview Medical Center campuses is congested. To minimize disruptions to campus operations and the impact on the adjacent neighborhoods, Contractor shall limit the number of vehicle trips to the Project site and encourage carpooling. In addition, the Contractor shall advise construction workers not to park on city streets and in neighboring residential areas.
      a. Parking on the University of Washington campus, outside a fenced Project site, is not available or permitted for Contractor and Subcontractor vehicles on the dates of graduation, convocation, and on Husky football game days.
      b. This information shall be posted at the Project site along with bus pass/ticket information.
   2. The Contractor is responsible for advising all parties on the Project of their designated parking area and ensuring that all workers park there. If parking needs change for any reason, Contractor shall advise the Owner’s Representative so, to the extent possible, necessary accommodations can be made.
   3. A designated parking area, outside the Project site, is for workers’ personal vehicles only and not for the storage of construction equipment or materials.

B. The Contractor shall limit construction parking to area(s) indicated in the Contract Documents.
   1. Daily construction parking is available for purchase at the E-1 and E-4 parking lots.
   2. Parking permits for construction parking within a staging lay-down area or within a temporary parking area with site fencing will be issued at no cost to the Contractor. Specific responsibilities include:
      a. Contractor shall provide Owner's Representative with the projected number of permits required two weeks prior to the month required.
      b. Owner's Representative will provide to Contractor the requested number of monthly parking permits no later than the 25th day of the preceding month prior to the month for which permits are to be used.

C. For, Seattle campus parking and traffic regulations and parking rates, visit: http://www.washington.edu/facilities/transportation/
1.10 CONSTRUCTION TRAFFIC

A. The Contractor and the Contractor’s Subcontractors and suppliers shall minimize negative traffic impacts on city streets for construction. Scheduled truck traffic shall avoid the peak hours of 7:00 – 9:00 AM and 3:00 – 6:00 PM, Monday through Friday.

B. Deliveries on the Seattle campus: If a Contractor, Subcontractor, or supplier needs to make a delivery, the driver must stop at a Campus gatehouse upon entry during the posted hours of operation for UW Parking Services and obtain a commercial delivery permit.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies minimum requirements for protection from damage as a result of the Contractor’s operations and for maintenance of existing trees, shrubs, and other plant materials including lawn surfaces indicated to remain on the Project site.

B. The Contractor shall ensure all labor, equipment, and materials are provided for temporary tree, plant, and lawn protection during the work including, but not limited to:
   1. Marking of clearing limits;
   2. Protection signage and fencing;
   3. Tree trunk boxing;
   4. Tree and root pruning; and
   5. Maintenance of trees and landscaping.

C. Definitions:
   1. Landscape Requiring Protection and Maintenance: All existing on-site trees, plants, and lawn areas which are not identified for Contractor’s lay down or parking use, including tree canopies and root zones extending within the Project site.
   2. Critical Root Zone (CRZ): The area around a tree equal to one (1) foot radius for every inch of tree diameter measured at four (4) feet above grade.
   4. Dripline: The dripline of a tree is the imaginary line on the ground beneath the tree’s canopy.

1.2 SUBMITTALS

A. Tree and Landscape Protection Plan: Prior to any site disturbance, the Contractor shall submit for Owner’s approval a “Tree and Landscape Protection Plan” developed in consultation with a certified arborist for all trees, plants, and lawn indicated to remain. The Contractor shall submit the name and credentials of the certified arborist with the plan.
   1. The Tree and Landscape Protection Plan shall include:
      a. Proposed protection fence locations;
      b. The location of all on-site trees requiring protection (For the Seattle campus, identify by UW tree inventory tag-number);
      c. Identification of the CRZ for each tree requiring protection; and
      d. Temporary irrigation and fertilization schedule.

1.3 CONTRACTOR RESPONSIBILITY

A. The Contractor shall assume all landscape shall be protected, unless indicated to be removed in the Contract Documents, and shall be responsible for all damage and/or disturbance within the CRZ of trees indicated to remain such as, cutting or skinning of roots, skinning or bruising of bark, compaction of root zones, and breaking of branches.
   1. Damage and/or disturbance which, at the Owner’s sole discretion, can be remedied by corrective maintenance shall be immediately repaired by the Contractor upon written notice by Owner.
      a. The Contractor shall employ a certified arborist to repair damage to trees.
   2. Trees or shrubs which are injured or irreparably damaged shall, at the Owner’s sole discretion, be replaced by the Contractor with new trees or shrubs of the same size and type. However, the Owner is not bound to have the trees or shrubs replaced in the same location and may request the Contractor provide the tree or shrub for installation by Owner.
a. Trees which fail to fully foliate in the spring following Substantial Completion shall be presumed to have been injured or irreparably damaged due to construction.

3. If, in the Owner’s sole opinion, replacement of damaged trees is determined impracticable, the full replacement cost shall be borne by the Contractor at values based upon the square inches of cross sectional area of trunk measured at four (4) ft. above grade, in accordance with the following criteria:
   a. $75.00/square inch for trees less than or equal to six (6) inch diameter
   b. $50.00/square inch for trees greater than six (6) inch and less than eighteen (18) inch diameter
   c. $40.00/square inch for trees greater than or equal to eighteen (18) inch diameter

B. Trees or shrubs which require removal and/or replacement due to damage by construction shall be removed to a depth of two (2) feet below grade and include the refilling and repair of the ground surface, with such costs to be borne by the Contractor.

C. Protection and maintenance shall include, but not be limited to, replacement of damaged protection fencing; aeration of compacted soils; control of temporary irrigation water runoff; pruning and treatment of damaged roots, limbs, and branches; and replacement of wood chips within tree protection areas.

D. Site damage and/or disturbance caused by the Contractor outside the Project site shall be repaired or replaced, and all costs shall be borne by the Contractor.
   1. Repairs shall include, but are not limited to, pruning or removing damaged vegetation, replacement of damaged vegetation and/or lawn restoration, soil remediation to alleviate over-compaction, and temporary irrigation to establish new plantings.

PART 2 - PRODUCTS

2.1 PROTECTION FENCING

A. Protection fencing shall be six (6) feet high, 11 gauge-galvanized, 2-inch mesh chain link fencing with nominal 2 1/2 inch diameter galvanized steel posts, or approved equal.
   1. The Contractor shall post weather-resistant 8 1/2" x 11" fluorescent green or yellow signage on protection fencing at twenty (20) foot intervals warning construction personnel to keep out of protective zones.

2.2 TREE TRUNK BOXING

A. Existing trees that are not protected with fencing and are to remain shall be protected by boxing constructed with 4 x 4 inch posts at corners with 2 x 4 inch horizontal top, middle, and bottom rails on each side. Box shall be approximately 8 x 8 feet in size centered on the tree trunk to a height of approximately six (6) feet.

2.3 WOOD CHIPS

A. Wood chips shall be composted for a minimum of one (1) year prior to use.

2.4 FERTILIZER

A. Fertilizer shall be Osmocote Plus 15-9-12, or approved equal.
PART 3 - EXECUTION

3.1 ON-SITE PRE-INSTALLATION MEETING

A. Prior to on-site mobilization, the Contractor shall arrange a pre-installation meeting with the Owner’s Representative to identify and stake out all areas of trees, plants, and lawn that are to be protected or removed. The Contractor shall be responsible for all damage to landscape features that results from the failure to schedule and attend the pre-installation meeting.

3.2 PROTECTION OF EXISTING TREES AND SHRUBS

A. Trees indicated to remain within the Project site shall have protection fencing located at the CRZ drip line that shall be maintained by the Contractor in good condition until Substantial Completion. Tree trunk boxing may be permitted by approval of owner.

B. When no ground cover, lawn or shrubs exist within the CRZ of a tree indicated for protection, the ground shall be protected with a minimum of twelve (12) inches of wood chips extending from a three (3) foot radius clear zone around each truck to the protection fencing.

C. All site work within the CRZ shall be performed by hand. However, the use of heavy equipment to perform work within the CRZ may be requested by the Contractor for approval by the Owner. The Contractor shall perform approved heavy equipment work from angles and directions that minimize compaction to tree roots in the protection area.

D. The Contractor shall utilize a certified arborist to tie back all flexible limbs and overhead branches which may be damaged by the passage or activity of construction equipment.

E. Materials shall not be stored and equipment shall not be operated under the branches of existing trees which are to remain, except as approved by the Owner.

3.3 INSTALLATION OF TREE PROTECTION FENCING

A. Install posts a minimum of two (2) feet below grade and spaced ten (10) feet on center maximum. Provide diagonal bracing to posts at corners of enclosures and whenever needed to ensure rigidity of the fencing.

B. Install fencing tight to grade at the bottom edge and stretched uniformly between posts.

C. Provide one gate into each fenced area.

D. Take care not to damage roots or to compact soil inside the fence line during placement of posts. Do not use heavy equipment within the protection area for this operation.

3.4 USE OF AREA ADJACENT TO PROTECTION FENCING

A. Do not store materials potentially harmful to tree roots within twenty (20) feet of protection fencing. Potentially harmful materials include, but are not limited to, petroleum products, cement and concrete materials, cement additives, lime, paints and coatings, waterproofing products, concrete forms coatings, detergents, acids, and cleaning agents.

3.5 FERTILIZING AND IRRIGATING DURING CONSTRUCTION

A. All trees and landscape requiring protection shall be fertilized and watered by the Contractor until Substantial Completion, per the approved Tree and Landscape Protection Plan.
1. Water used for irrigation shall be potable water.

3.6 ROOT PRUNING

A. Root pruning is the intentional cutting of tree roots to minimize root damage and promote healing. (Any construction operation which pulls and/or tears roots is unacceptable.)
   1. All root pruning shall be performed by a certified arborist.
   2. For all roots smaller than one (1) inch diameter, use a sharpened spade.
   3. For all roots greater than one inch (1) diameter, use an ax or chainsaw.
   4. A backhoe bucket, or any other excavating machine, should not be used to root prune.

B. When construction is in close proximity to existing trees to remain, and roots are encountered, the roots shall be pruned.
   1. Root pruning shall be performed as early as possible before trenching or tunneling operations.
      a. Hand-dig trenches in areas with extensive roots.
   2. Leave roots larger than two (2) inches in diameter intact and undamaged.
      a. Keep roots moist with wet mulch and burlap or equivalent during exposure.

C. Backfill trenches that require root pruning with existing soil mixed with peat moss to a mixture of approximately 75% loam and 25% humus by volume. Tamp soil in six-inch lifts. Each lift shall be compacted to a point at which a foot print makes only a 1/16 inch impression.

D. Apply mulch to a depth of four (4) inches at a minimum ten (10) to fifteen (15) foot radius around tree to reduce compaction and increase moisture retention.

3.7 PRUNING OF EXISTING TREES

A. Limbs and branches broken by construction shall be cut off cleanly above the nearest crotch in accordance with good horticultural practice.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies the administrative and procedural requirements for field engineering, in addition to requirements specified elsewhere in the Contract Documents, requiring the Contractor to employ a registered “Structural Engineer” and/or “Land Surveyor.”

B. Related Sections:
   1. Section 01 73 29 “Cutting and Patching”

1.2 QUALITY ASSURANCE

A. Contractor shall employ a registered Structural Engineer (Contractor’s Structural Engineer) experienced in construction techniques and sequences, and temporary structural support systems, who is licensed in the State of Washington.

B. The Contractor shall employ a registered Land Surveyor (Contractor's Surveyor) who is registered in the State of Washington, and acceptable to Owner, to perform survey work of this Section.

C. Submit the name, address, and telephone numbers of the Contractor’s Structural Engineer and Land Surveyor for Owner’s records, prior to their performance of Work.

1.3 CONTRACTOR’S STRUCTURAL ENGINEER

A. The Contractor’s Structural Engineer shall advise the Contractor as to the safety and adequacy of all temporary structural provisions necessary for cranes and hoisting, erection and/or alteration of the building structure and shall assume the responsibilities and duties as it relates to means and methods for these items (e.g., erection sequence, temporary bracing, cutting).
   1. Temporary bracing shall be coordinated with other trades to permit continuous operation of construction.
   2. Should it be necessary to modify the structural design to accommodate construction means and methods, the Structural Engineer shall advise the Contractor who shall immediately notify the A/E and await his/her direction.
   3. Proposed changes or modifications to the structural design shall be submitted to the A/E for approval prior to the Contractor incorporating changes or modifications into the Work.

1.4 OWNER’S PROPERTY SURVEY

A. Owner’s property survey for the Project is included in the Contract Documents.

B. The Owner will provide the services of a public land surveyor to locate the property corners noted on the Contract Documents and establish benchmarks for use by the Contractor.

1.5 PROJECT SURVEY REQUIREMENTS

A. Before proceeding with layout of actual work, the Contractor, working through the Contractor’s Surveyor, shall verify the layout information shown on Contract Documents and the Owner’s property survey.
B. As work proceeds, the Contractor shall check every major element for line, level and plumb, and shall require the Contractor's Surveyor to maintain a complete and accurate record book log of control of such checks and upon request shall make this log of control available for the Owner's and A/E's reference.

1. Record deviations from required lines and levels and promptly advise the Owner's Representative upon detection of any discrepancies including, but not limited to, conflicts, errors, inconsistencies, or deviations that exceed the Contract specified or indicated or industry recognized tolerances.

2. If discrepancies are found, no work shall be done until the Owner's Representative has been so notified and has provided the Contractor with written direction and/or drawings which correct and clarify the discrepancy.

3. All work which is determined to be incorrectly located will be rejected by the Owner. Any additional corrective work caused by discrepancies that should reasonably have been known to the Contractor and were not called to the attention of the Owner's Representative, shall be borne at the Contractor's expense.

C. Protect Owner's benchmarks and survey control points prior to starting site work and preserve during construction. Do not change or relocate benchmarks or control points without Owner's written approval. Promptly report lost or destroyed benchmarks or control points.

1.6 PROJECT RECORD SURVEY

A. Contractor working through the Contractor's Surveyor shall perform the following:

1. Upon completion of new foundation walls, prepare and submit a certified survey showing that dimensions, elevations, angles, and location of the building are in accordance with the Contract Documents.

2. Upon completion of the below grade site work, certify that the Project Record site survey represents the actual dimensions, elevations, lines, grades, and levels, including invert elevations, constructed in the field for all below grade installations and existing services located during the Work referenced to Owner's benchmarks. This shall include the locations of all below grade site improvements including, but not be limited to, civil, electrical and mechanical services, utility tunnels, duct banks and vaults, and irrigation system.

3. The above documentation shall be submitted to the Owner under provisions of Section 01 77 00 for CAD As-built Shop Drawings.

1.7 PROJECT LAYOUT REQUIREMENTS

A. The Contractor shall be responsible for laying out the Work utilizing recognized engineering survey practices. Establish elevations, grades, lines and levels for:

1. Site improvements, including pavements, walks and retaining walls, stakes for grading, fill and topsoil placement, utility locations including slopes and invert elevations, and irrigation system.

2. Grid and axis of building structures.

3. Building foundations, column locations, ground floor elevations, elevations and levelness for floors and roofs.

4. Other elevations, grades, lines and levels, as needed to properly locate each element of the Project.

B. Calculate and measure required dimensions as shown within recognized tolerances. Do not scale drawings to determine dimensions.

C. Advise entities performing work of marked elevations, grades, lines and levels, provided for their use.
PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the administrative and procedural requirements for cutting and patching and general alterations of the Project including, but not limited to, preparations, products, transitions and adjustments, and repairs and disposal.

B. Related Sections:
   1. 01 11 01 “Summary of Work – Regulated Materials”
   2. 01 35 23 “Owner’s Safety Requirements”
   3. 01 71 23 “Field Engineering”

1.2 CONTRACTOR RESPONSIBILITY

A. The Contractor shall bear all cost of correcting damaged or destroyed work, indicated to remain on the Contract Documents, which is caused from failure to comply with the requirements of the Contract Documents or failure to exercise reasonable care by the Contractor and/or the Subcontractors’ work.

1.3 SUBMITTALS

A. Notice:
   1. Submit written request two (2) weeks in advance of cutting or alteration which affects:
      a. Structural integrity of any element of the Project;
      b. Integrity of weather-exposed or moisture-resistant elements;
      c. Efficiency, maintenance, or safety of any operational element;
      d. Visual qualities of sight exposed elements; and
      e. Work of Owner or separate contractor.
   2. Include in request:
      a. Project name
      b. Location and description of affected work
      c. Description of proposed work
      d. Reason for cutting or alteration
      e. Alternatives to cutting and patching
      f. Effect on work of Owner or separate contractor
      g. Written permission to affect separate contractor
      h. Date and time work will be executed, including duration of work
      i. Utility Shutdown Request form, as appropriate
   3. Owner will respond in writing to the submitted request.

    B. Visual Matching: When indicated to “match existing,” submit products and/or finishes to match existing adjacent finishes for Owner’s review and approval or, for patching new work, use the specified materials and finishes in the Contract Documents.

PART 2 - PRODUCTS

2.1 PATCHING AND EXTENDING WORK

A. The Contractor shall provide products specified in the Contract Documents and/or match existing products with an alternate product of the most suitable grade for the intended purpose.
B. The Contractor shall determine the type and quality of existing products and finishes by inspection and/or testing, where necessary.
   1. Remove samples of existing installed work for testing only when approved by Owner.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to commencing work:
   1. The Contractor shall inspect existing conditions to ascertain elements subject to damage or movement and to determine the need for temporary bracing during cutting and patching work; and
   2. Verify that materials to be worked-on or removed have been evaluated in the Owner’s Regulated Materials “Good Faith” Survey report.

B. Beginning of cutting or patching means acceptance of existing conditions.

C. After cutting and/or removing existing work:
   1. The Contractor shall inspect conditions affecting performance of new work and notify Owner of any unforeseen physical conditions; and
   2. Verify that demolition is complete and areas are ready for installation of new work.

3.2 PREPARATION

A. Move, or remove, items as necessary for access to cutting and patching work.

B. For Owner occupied facilities, prepare a noise and vibration control plan in accordance with Section 01 50 00 “Temporary Facilities and Controls.”

C. Schedule shut-downs and obtain permits required for performance of the Work.

D. Provide temporary supports to ensure structural integrity of the Work.

E. Provide temporary enclosures, shielding devices and/or other methods to protect the following from damage:
   1. Existing conditions that are to remain
   2. Owner occupied areas
   3. Owner’s building systems, including HVAC systems

F. Establish “hot-works” fire safety precautions required for performance of the Work.

3.3 PERFORMANCE

A. Execute cutting and patching work in a manner to:
   1. Avoid damage to other work;
   2. Provide proper surfaces for installation of new work; and
   3. Provide a neat transition from existing finishes to new work.
      a. Fit new work to existing pipes, sleeves, ducts, conduit and other penetrations through surface

B. For all new work made to existing work under warranty, employ original installer or fabricator to perform cutting and patching unless otherwise approved by the Owner.
C. For additional cutting and patching requirements in medical centers, see Section 01 35 33 “Infection Control.”

D. Prepare surfaces to provide for the specified installation of new work and finishes.
   1. Remove and replace or repair unsuitable substrate materials (e.g., rotted wood, water damaged materials, corroded metals and deteriorated concrete) for new applications.

E. Restore existing building systems that are impacted by cutting and patching work to original operating conditions.

F. For penetrations cut in existing fire-rated separations, completely seal new work with fire-stopping materials to full thickness of the penetrated element.
   1. Replace existing fire-stopping materials when disturbed by new work.

G. Unless otherwise indicated in the Contract Documents, cut concrete and masonry materials using a diamond saw in accurately located straight lines. Pneumatic tools are not allowed without Owner’s prior approval.
   1. Concrete walls: Core drill pipe penetrations. Saw both sides of wall and break out remainder. Minimize overcuts.
   2. Concrete floors: Provide temporary support of elevated floor areas requiring removal and saw-cut. Core-drill pipe penetrations.
   3. Masonry walls: Saw-cut along mortar joints. Remove all mortar adhering to edges. Overcuts are not allowed.
   4. Wood and/or metal frames walls: Cut wall finish materials in straight uniform lines and remove wall framing as required.

H. Remove debris and abandoned items from the work area, including from concealed spaces.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This section includes administrative and procedural requirements for construction waste management activities.

B. Related Sections:
   1. 01 50 00 “Temporary Facilities and Controls”

1.2 GOALS AND PROCEDURES

A. The Owner has established waste management goals for this Project with the minimum requirement of diverting 50% of non-hazardous and non-regulated construction and demolition waste, including recycled or donated materials, by weight in tons, from landfill disposal and/or incinerator.
   1. For materials which contain lead or have lead-containing coatings, see Section 01 11 01 “Summary of Work – Regulated Materials.”

B. Waste classified as hazardous materials or dangerous waste will be disposed of by the Owner (see Section 01 11 01 “Summary of Work – Regulated Materials,” if applicable).
   1. If the Contractor suspects that an unidentified hazardous or dangerous material may exist in the Project area, the Contractor shall inform the Owner of this possibility. Owner will investigate and test the material to determine the extent and nature of the material and to decide on appropriate procedures.

1.3 CONTRACTOR RESPONSIBILITY

A. To the maximum extent possible, the Contractor shall separate recyclable materials from construction, demolition, and land clearing waste to be disposed of as garbage.

B. The Contractor shall designate an on-site construction “waste management coordinator” responsible for instructing the Contractor’s workers and Subcontractors in the requirements of the construction waste management plan and for overseeing and documenting results.
   1. When on-site dumpsters and recycling bins are required by the Contract Documents, the waste management coordinator shall conduct regular visual inspections of dumpsters and recycling bins to ensure materials are being separated properly and to remove contaminants.

1.4 DEFINITIONS

A. Construction, Demolition, and Land Clearing (CDL) Waste: Includes all non-hazardous solid wastes including material that is recycled, reused, salvaged, and/or disposed of as garbage.

B. Salvage: Recovery of materials for reuse.

C. Reuse: Making use of a material without altering its form for reuse on-site or reuse on other projects off-site (e.g., grinding of concrete for use as sub-base material and chipping of land clearing debris for use as mulch).

D. Recycling: The process of sorting, cleaning, treating, and reconstituting materials for use in the manufacture of a new product.
E. Source-Separated CDL Recycling: The process of providing on-site separation of recyclable materials into separate containers as they are generated. The separated materials are hauled directly to a recycling facility or a transfer station.

F. Co-mingled CDL Recycling: The collection of mixed recyclable materials in one on-site container. The container is taken to a material recovery facility where materials are separated for recycling.

G. Material Recovery Facility (MRF): A facility used to sort and recover CDL waste materials for recycling.

H. Transfer Station: A facility where waste is moved from collection vehicles to larger trucks for longer distance transport to a landfill, source-separated recycling facilities, or MRF.

I. Approved Recycling Facility: A facility that can legally accept CDL waste materials for the purpose of recycling into a new product where the method of recording and calculating the recycling rate is regulated by local or state government.

1.5 PERFORMANCE REQUIREMENTS

A. General: Divert CDL waste from landfills by one, or by a combination, of the following activities:
   1. Salvage
   2. Reuse
   3. Source-separated CDL recycling
   4. Co-mingled CDL recycling

B. CDL waste materials to be salvaged, reused, or recycled include, but are not limited to, the following:
   1. Acoustical ceiling tiles
   2. Asphalt
   3. Asphalt shingles
   4. Brick
   5. Cardboard
   6. Carpet and pad
   7. Concrete
   8. Drywall
   9. Insulation
   10. Metals
   11. Paint
   12. Porcelain
   13. Wood
   14. Plastic film such as sheeting, shrink wrap, and packaging
   15. Window glass
   16. Field office waste such as paper, aluminum cans, glass, plastic, and office cardboard

1.6 CONSTRUCTION WASTE MANAGEMENT (CWM) PLAN

A. Prior to performing any on-site work, the Contractor shall develop and submit a CWM plan for Owner’s review and comment. The CWM plan shall include a reuse and salvage plan, identification of waste types by quantity and weight in tons, methods of disposal, and handling and transportation procedures. Include separate sections in plan for construction demolition, land clearing debris and construction waste.

B. The reuse and salvage plan shall include:
CONSTRUCTION WASTE MANAGEMENT

1. A list of items being reused in place or elsewhere on the Project;
2. A list of items for reuse off-site through salvage, resale or donation; and
3. A plan for protecting, dismantling, handling, storing and transporting the reused items.

C. The Contractor shall organize the CWM plan to include the following information:
   1. Types and estimated quantities, by weight in tons, of CDL waste expected to be generated during demolition and construction.
   2. Proposed methods for CDL waste salvage or reuse during demolition including, but not limited to, one or more of the following:
      a. Contracting with a deconstruction specialist to salvage materials
      b. Selective salvage as part of the demolition Subcontractor’s work
      c. Reuse of materials on-site, or sale or donation to a third party for reuse
   3. For this Project, there is no on-site space available for source-separated CDL recycling and waste collection. The Contractor shall contract with a recycling hauler, who accepts commingled construction and demolition debris, for hauling to an approved MRF.
   4. Name of recycling facility or MRF receiving the CDL wastes.
   5. On-site Handling Plan: Proposed locations for collecting CDL waste and/or separating recyclable waste into containers including, but not limited to, types and sizes of containers, and frequency of removal.
   6. CWM Communication Procedures: Describe how the CWM plan will be communicated to the Contractor’s workers and the Contractor’s Subcontractor’s workers (of any tier).

1.7 CONSTRUCTION WASTE MANAGEMENT (CWM) REPORT

A. CWM Report: The Contractor shall submit a cumulative CWM report on an Owner-approved form as a requirement of Final Completion with the following attachments:
   1. A record of the type and quantity, by weight in tons, of each material salvaged, reused, recycled or disposed of
      a. Dirt and land debris must be documented separately
   2. Total quantity of waste recycled as a percentage of total waste
   3. Disposal Receipts: Copy of receipts issued by a disposal facility for CDL waste that is disposed in a landfill
   4. Recycling Receipts: Copy of receipts issued by an approved recycling facility
      a. For co-mingled materials, include weight tickets from the recycling hauler or MRF and verification of the recycling rate for co-mingled loads at the facility.
   5. Salvaged Materials Documentation: Types and quantities, by weight, for materials salvaged for reuse on-site, or sold or donated to a third party

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT MEETING

A. The Contractor shall schedule and administer a construction waste management meeting prior to construction activities and shall record and distribute copies of meeting minutes to all attendees (The Contractor may conduct this meeting as part of the first pre-installation meeting).
   1. Attendees:
      a. Owner’s Representative
      b. A/E
      c. Contractor’s superintendent and waste management coordinator
      d. Major Subcontractors
      e. Business and Industry Resource Venture representation, as appropriate
2. Agenda Items: Review methods and procedures related to waste management including, but not limited to the following:
   a. Review and discuss CWM plan, including identification of and responsibilities of the Contractor’s waste management coordinator
   b. Review requirements for documenting quantities of each type of waste and its disposition.
   c. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays
   d. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
   e. Review waste management requirements for each trade.

3.2 SOURCE-SEPARATED CDL RECYCLING
   A. Provide containers for separating CDL waste that is to be recycled, clearly labeled with a list of acceptable and unacceptable materials.
   B. For managing on-site stockpiled recyclable materials until removed, stockpile without intermixing with other materials, place and shape to drain surface water, and cover to prevent windblown dust.
      1. Stockpile materials away from demolition areas. Do not store within drip line of existing trees.

3.3 CO-MINGLED CDL RECYCLING
   A. Do not put CDL waste that will be disposed of in a landfill into a co-mingled CDL waste recycling container.

3.4 LANDFILL AND/OR INCINERATOR WASTE
   A. Provide containers for CDL waste that is to be disposed of in a landfill or by incineration, clearly labeled as such.

3.5 REMOVAL OF CONSTRUCTION WASTE MATERIALS
   A. Transport CDL waste materials off Owner’s property and legally dispose of them.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies minimum administrative and procedural requirements for mechanical and electrical systems functional performance testing required by the Contract Documents.

B. Related Sections:
   1. 01 91 00 “General Commissioning Requirements”

1.2 SERVICES

A. Test Engineer - provided by Contractor.

B. Commissioning Authority - provided by Owner.

C. Electrical Testing Contractor (ETC) - provided by Electrical Subcontractor (working through the Contractor’s Test Engineer).

1.3 REQUIREMENTS FOR TEST ENGINEER

A. The Contractor shall provide the services of a “Test Engineer” experienced in commissioning including the troubleshooting of equipment and systems. The Test Engineer shall be qualified to develop and write, coordinate and schedule, and manage and document mechanical systems functional performance tests (FPT). The Test Engineer shall also coordinate the work of the ETC and assemble the required electrical commissioning documentation.

   1. Qualified personnel experienced in the technical aspects of each system to be commissioned shall be provided, if necessary, to augment the expertise of the Test Engineer.

1.4 TEST ENGINEER DUTIES

A. The Test Engineer shall prepare and submit all FPT and commissioning documentation required by the Contract Documents for the actual equipment and systems installed, including but not limited to, start-up plans, installation verification audit reports, start-up and FPT deficiency report forms, test equipment identification lists, FPT procedures, FPT data forms, and one-line system and riser diagrams.

   1. Maintain separate mechanical and electrical (M&E) systems “Commissioning Binders,” indexed and tabbed according to the equipment or systems requiring commissioning, to compile the start-up and FPT documentation. Blank start-up forms, approved by the Commissioning Authority, shall populate the initial binders and be replaced with completed forms that shall be submitted in final M&E systems Commissioning Binders, as a requirement of Final Completion. The binders shall be on-site during the work (see Section 01 91 00 for the Commissioning Binders documentation requirements).

   2. Prior to testing, the Test Engineer shall have applicable Subcontractor’s and manufacturer’s representatives review the test and commissioning documentation to identify personnel safety issues, equipment protection issues, and to validate relevance to the actual equipment provided.

B. Prepare and submit a “Commissioning Plan” for Owner’s review and comment before developing the FPT procedures and prior to any equipment or systems testing and/or start-up required by the Contract Documents.
C. Develop a commissioning schedule for all FPT and commissioning activities required by the Contract Documents and integrate into the construction Progress Schedule. Identify:
   1. Commissioning Plan preparation, submittal, and review;
   2. Each required functional performance test;
   3. Sequence of testing, including commissioning activity start-up prerequisites, point-to-point testing, and balancing activities; and
   4. Submission and approval of test results.

D. Develop and write FPT procedures for all equipment tests, and systems and cross-systems tests required by the Contract Documents. Test procedures shall be in accordance with equipment manufacturer's recommendations, where applicable. Test procedures shall fully describe the equipment or system configuration and steps required for each test. The procedures shall be appropriately documented so that another party can repeat the identical test.
   1. Maintain a set of drawings for recording the sign-off of each component of the plumbing and piping system pressure testing, heating, ventilation, and air conditioning (HVAC) system duct work pressure testing, and the completed flushing/cleaning and treatment activities.

E. Coordinate the participation of each Subcontractor, including the ETC, specific to their start-up and testing responsibilities. Inform each Subcontractor as to what their test and expected results will be prior to commissioning.

F. Observe the progress of the work to assure that all installations requiring commissioning are being made in accordance with the Contract Documents. Prepare and submit installation verification audit reports prior to the start-up of equipment or systems for which a formal start-up is specified in the Contract Documents.

G. Coordinate all cross-systems testing such as HVAC, environmental controls, fire alarm, emergency power, life safety, elevators, and chiller controls.

H. Manage and observe the start-up testing and all final tests of equipment and systems required by the commissioning plan and document test results.

I. Report any deficiency in equipment or systems and either enforce compliance with the Contract Documents or provide Owner with technical expertise to recommend modifications to the equipment or systems to correct the deficiency. Oversee and direct the correction of deficiencies found during commissioning.

J. Coordinate the required Commissioning Authority, A/E or other Owner-witness participant for all test/approval procedures, after verifying that pretests have been satisfactorily conducted and final tests are ready to be performed.
   1. Notify the Owner’s Representative in writing of the date, time, location, and anticipated duration of start-up and test activities, with a minimum of five (5) working days advance notice.
   2. Obtain the signature of the designated witness on all data forms. If the witness is unavailable at the scheduled time and location of the activity, so note, and proceed per schedule without the witness.

K. Compare operation and maintenance information provided by the various Subcontractors and vendors with the Project Record documents and report any discrepancies to the Owner’s Representative.
L. Oversee and provide Owner with operating instruction and training for the mechanical and electrical equipment and systems specified in the Contract Documents, with coordination by the M&E Subcontractors.

M. Provide as-built information to update the commissioning basis-of-design criteria.

1.5 TEST FAILURES

A. In the event that a functional test fails, the Contractor shall determine the cause of failure, rectify the failure as soon as possible, and then retest. If more than two (2) functional tests of the same system are required, all costs for additional testing shall be borne by the Contractor, at the Owner's sole discretion.

1.6 CANCELLATIONS

A. The Test Engineer shall give at least 48 hours advance notice to the Owner's Representative of cancellation of any scheduled test.

1. Any costs incurred by Owner due to insufficient advance notice of cancellations shall be borne by the Contractor, at the Owner's sole discretion.

1.7 WARRANTY TESTS

A. In the event a product fails during the warranty period, the Contractor shall determine the cause of failure, rectify the failure as soon as possible, and then retest. All warranty testing shall be borne by the Contractor.

1.8 TEST ENGINEER QUALIFICATIONS

A. The Contractor shall propose a Test Engineer, who is competent in the Project's M&E systems design and intent, for the Owner to evaluate and approve or reject in writing, based upon the following criteria which shall be documented in the Test Engineer resume.

1. The Test Engineer shall have extensive experience in start-up and troubleshooting of HVAC, hot water heating, chilled water, steam, plumbing, electrical, emergency power, fire alarm, lighting controls, life safety systems and other systems of similar complexity to those contained in the Contract Documents that are required to be commissioned.

2. The Test Engineer shall:
   a. Be familiar with the Project's control operating system(s);
   b. Be capable of troubleshooting control code and recommending necessary modifications;
   c. Be knowledgeable in testing and balancing of both air and hydronic systems;
   d. Have an excellent working knowledge of complex fire alarm, environmental and electric power control systems;
   e. Have excellent communication and writing skills, be highly organized, and be able to work well with the Project's Subcontractors; and
   f. Have a Bachelor's degree in mechanical engineering, PE certifications, and related field experience.

1) However, in lieu of a Bachelor's degree and PE certifications, other technical training with extensive practical field experience may be considered.

B. Test Engineer Resume - The Contractor shall submit the Test Engineer’s resume, including the following documentation:

1. Present or most recent employment:
   a. Company name and address
   b. Present title and job description
   c. Dates of employment
2. Other relevant work experience:
   a. Company name and address
   b. Job title and description
   c. Dates of employment
3. For a minimum of three (3) similar projects, description of commissioning experience and roles performed in commissioning activities that demonstrate working knowledge of complex systems.
4. Samples of a commissioning plan, a start-up plan, and a FPT with data forms written by the Test Engineer.
5. References from a minimum of three (3) project owners and/or commissioning authorities.
6. Description of education, certifications, and other technical training or field experience.

1.9 COMMISSIONING AUTHORITY

A. The Owner will provide a “Commissioning Authority,” or appoint an Owner-designated witness, to act as the commissioning authority.
   1. The Commissioning Authority will provide no labor or equipment in the commissioning process.

B. The duties of the Commissioning Authority are to:
   1. Provide commissioning basis-of-design criteria, for Contractor’s information;
   2. Ascertain that the Project commissioning processes and information provided is in accordance with the requirements of the Contract Documents;
   3. Review the Contractor’s Commissioning Plan, start-up plans, installation verification audit reports, start-up and FPT deficiency report forms, and FPT data forms;
   4. Review the Contractor’s equipment, systems and cross-systems FPT procedures;
   5. Witness, verify, and approve satisfactory completion of equipment, systems and cross-systems FPT, based upon the Contract Documents requirements;
   6. Review for accuracy, comment on, and approve specified close-out documentation;
   7. Recommend Substantial Completion when commissioning and training has been successfully completed; and
   8. Provide final commissioning reports to the Owner.

C. The Commissioning Authority will communicate as follows:
   1. The Commissioning Authority will formally communicate with the Contractor via approved project channels. It is expected, however, that informal communication and coordination will be conducted directly with the Test Engineer. As the Owner’s commissioning representative, it is expected that the Commissioning Authority will communicate directly with A/E, as may be appropriate.
   2. The Commissioning Authority will keep the Owner’s Representative advised regarding commissioning activities and progress, equipment and systems performance, and any problems and solutions thereto.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for Contract closeout including, but not limited to:
   1. Project Record
   2. Operation and Maintenance Manuals
   3. Warranties and Bonds Manual
   4. Operating Instructions and Training
   5. Cleaning
   6. Owner's Final Inspection
   7. Substantial Completion
   8. Final Completion, and
   9. Final Acceptance

B. For additional specific construction Work, closeout requirements are described in Divisions 02 thru 49 of the Specifications.

1.2 PROJECT RECORD

A. General: Project Record documents include the Contractor's as-built Drawings, as-built Specifications, and as-built Shop Drawings required by the Contract Documents. Project Record documents must be protected from deterioration and stored in a secure fire-resistant location.

B. As-built Drawings: Maintain black line prints of the bid set Contract Drawings and approved Shop Drawings. Mark the drawings to show new information that was not shown on the bid set Drawings, and on the approved Shop Drawings, including the actual installation where the installation varies substantively from the work as originally shown. Mark drawings to show conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
   1. Organize as-built Drawings in manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on the cover of each set.
   2. Mark with reproducible pencil and distinguish between variations in separate categories of the Work. Text size is to be 1/8" minimum. Good basic drafting practice must be applied.
   3. Show bid addenda items, Change Orders, and Request for Information (RFI) responses by their number, and date the revisions with a "cloud" around the revision.
   4. Keep accurate measurements of below-grade site work, including permanent shoring, in accordance with Section 01 71 23 "Field Engineering."
   5. Show mechanical dampers, valves, reheat boxes, cleanouts, and other equipment and items that require maintenance.
   6. Show location of construction-concealed mechanical, electrical and plumbing (MEP) riser installations including, but not limited to, piping, ductwork, and conduits referenced to visible and accessible features.
   7. Show field changes of dimensions and details.
   8. X-out conditions not constructed and appropriately annotate "not constructed" to convey the actual as constructed condition.

C. As-built Specifications: Maintain one (1) copy of the bid set Contract Specifications showing all addenda, substitutions, Change Orders, and RFIs. Give particular attention to the selection of options, changes in product data, and information on elements engineered by the Contractor.
and note related as-built Drawing information, as appropriate. Clear, legible documentation must be applied.

D. As-built Shop Drawings: The Contractor shall comply with the following CAD (Computer-Aided Drafting), BIM (Building Information Modeling) and PDF (Portable Document Format) standards and requirements when preparing as-built record Shop Drawings required by the Contract Documents.

1. SUBMITTAL CONTENT
   A. Transmission
      1. Drawing package to be submitted using Owners’ construction management system (CMS).
   B. Included Drawings
      1. Submittal must include one Master Sheet Index on a single sheet that lists all drawing files submitted for all disciplines, including the sheet containing the Master Sheet Index. Only if the Master Sheet Index cannot fit on a single sheet may it be split over multiple sheet.
         a. For each file listed on the Master Sheet Index there must be one matching .DWG and one .PDF.
         b. Each drawing file provided in the submittal must be listed on the Master Sheet Index.
      2. If the Master Sheet Index is an OLE object, the index must also be submitted as an Excel .XLS or Text (.txt, .csv, etc.) file.

2. SHEET TITLEBLOCKS
   Sheets must contain a title block on the right or bottom side of the sheet. Title blocks must include labels and the following information:
      a. Date
      b. UW Project Name
      c. UW Project Number
      d. UW Facility Number (FACNUM)
         1. Every title block must include all FACNUMs affected by the project.
      e. Sheet Name
      f. Sheet Number
      g. Consultant Company Name
      h. Jurisdiction Seal where required by jurisdiction.
         1. Example: Within the City of Seattle

3. BIM STANDARDS
   A. Format
      1. BIM models must be submitted in Revit .RVT format.
   B. Packaging for Submission
      1. Models must be detached from central
      2. All worksets must be relinquished
      3. On final export dialog box, UNCHECK the box saying “Export views of sheets and links as external references.”
      4. Use eTransmit to package model and related files.
   C. File Names
4. CAD STANDARDS
   A. Format
      1. CAD files must be submitted in AutoCAD .dwg format.
   B. File Organization
      1. Each CAD drawing file must represent a single printed sheet.
   C. File Names
      1. Drawing and PDF file names must be titled <Sheet Number> <Sheet Name>.
         a. Examples: A-101 1ST FLOOR PLAN.dwg; A-101 1ST FLOOR PLAN.pdf
   D. Image and .PDF References
      1. Unreferenced and Unloaded images must be detached from the drawing.
         a. No Unreferenced or Unloaded images or PDF underlays should appear in the Xref Manager
   E. External References (XREFs)
      1. External drawing references are not allowed.
      2. External references used during the project must be bound using the ‘Bind’ option (instead of the ‘Insert’ option) before submitting.

5. PDF STANDARDS
   A. Single Sheet .PDF
      1. Each .PDF file must represent a single sheet and must not contain multiple pages.
   B. File Names
      1. .PDF file names must match the corresponding .DWG file names except for the file extension.
   C. File Creation
      1. .PDF files are to be created by printing from the native CAD/BIM format by printing to PDF. Scanning is not permissible.
   D. Layer Content
      1. .PDF files must not contain layers.
   E. Image Resolution (if applicable).
      1. All documents must be created with a resolution of no less than 300 dpi.
   F. Fonts
      1. All fonts must be embedded in the .PDF.
   G. Compression
      1. When compression is used, the algorithm must be LZW, CITT Group 4, or PackBits.
   H. Page Size
      1. The .PDF page size must be the same as the original page size if the page were printed.
         a. Example: ANSI D sized sheet must have a .PDF sheet size of 22 x 34.

1. CAD Compliance Submittal Review Requirements: CAD Shop Drawings shall be electronically submitted for Owner’s CAD compliance review and approval prior to submitting as-built record Shop Drawings. The Contractor may request a compliance review at any time during the work prior to Substantial Completion.
2. Project Record submittal: Provide all record as-built Shop Drawings required by the Contract Documents in CAD, BIM and PDF format (per the requirements of Section 01 33 00 “Submittal Procedures”).
a. CAD files shall be submitted in latest release of AutoCAD .dwg format.
   1) Custom menus or arx applications are not allowed if they create a requirement
      for the drawing to be used. No menus, custom user interface files or arx
      applications are to be submitted.
   2) Each CAD drawing shall represent a single printed sheet where the file name
      conspicuously identifies the sheet number (e.g. sheet A2.1 CAD file name
      might be A2-1.dwg).
   3) For all disciplines in a submittal, the CAD drawings shall be in a single folder.
      All supporting files (font files, line types, plot configurations, plot style tables,
      etc.) are to be in a subfolder.

1.3 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. Separate manuals shall be provided by the Mechanical and Electrical (M&E) Subcontractors
   titled MECHANICAL or ELECTRICAL and an additional manual provided by the General
   Contractor titled ARCHITECTURAL for all other information. The preliminary manuals shall be
   labeled “Preliminary” and comply with all requirements.

B. The O&M Manuals shall contain all the information needed to operate, maintain and repair all
   systems, equipment, and product finishes provided in the Project. They shall be presented
   and arranged logically for efficient use by Owner's operation personnel. As a minimum, the
   information provided shall include, but not be limited to, the following: (see Architectural,
   Mechanical and Electrical Divisions for additional requirements)
   1. Product description including, but not limited to, manufacturer, product name or
      equipment make and model number (and other nameplate data), size and dimensions,
      color, Material Safety Data Sheets (and related product information), and other pertinent
      information
   2. Supplier's name, address, e-mail address, phone, and reference order numbers
   3. Product finishes maintenance and cleaning instructions
   4. Performance and calibration data for specific product provided (extraneous catalog data
      must be eliminated)
   5. Descriptions and diagrams of system assembly and configuration (including components
      and interrelations)
   6. Manufacturer's recommended equipment operating and maintenance instructions,
      including routine lubrication and servicing data, start-up and shutdown procedures, and
      any seasonal or emergency procedures
   7. Manufacturer's checklists and methods for troubleshooting
   8. Complete parts list with parts numbers indicating common replacement parts and
      anticipated useful life
   9. Copies of: digitally signed warranties; any certificates from respective manufacturers,
      suppliers, and Subcontractors; permits and/or licenses, and; equipment maintenance and
      service contracts.

C. The O&M Manuals shall contain the following information for specified items, when the item is
   specified elsewhere in the Contract Documents:
   1. As-built door hardware schedule and submittal documentation
   2. Elevator systems documentation
      a. Wiring/equipment locations diagrams
   3. Refrigeration controls schematics/sequence of operation documentation
   4. Motors data and variable frequency drives (VFDs) documentation
      a. Final settings programmed into the VFDs
   5. Fan and pump curves documentation
   6. HVAC filters schedule
   7. Environmental controls systems (ECS) documentation including hardware and software
      manuals
8. Electrical--Short Circuit Coordination and Arc Flash Study Report
9. Pull calculations documentation for MV wire, cable, and terminations
10. Electrical transformer factory test reports documentation

D. Drawings included in the manual shall not exceed 11” x 17.”

E. Hard copy manuals shall be bound in a slant-D, 3-ring, view binder with a clear overlay insert on the front cover and spine.
   1. Provide a cover slip sheet and a spine sheet typed with ARCHITECTURAL, MECHANICAL, and (or) ELECTRICAL OPERATIONS AND MAINTENANCE MANUAL, University Project name, University Project number, University Facility number, A/E name, and Contractor name. Label manuals consecutively (ex., Mechanical 1 of 3).
   2. Each manual shall have a typed index and tabbed dividers between specification divisions and sections or, when presented in a logical format by Contractor and approved by Owner, between systems/equipment categories.
   3. Contents of the manual shall be printed on 8-1/2” x 11” acid free, recycled copy paper.

F. ARCHITECTURAL, MECHANICAL, and ELECTRICAL manuals may be combined into one manual, with approval of Owner.

1.4 WARRANTIES AND BONDS MANUAL

A. Assemble executed warranties and bonds, and any certificates from the respective manufacturers, suppliers, and Subcontractors. Provide preliminary review copies of all warranties and bonds and a final manual with the original documents, titled “Warranties and Bonds Manual.” Manuals shall be assembled in the same format as the O&M Manuals and include a table of contents in complete and orderly sequence.

1.5 OPERATING INSTRUCTIONS AND TRAINING

A. The Contractor shall provide on-site instruction and training for Owner's personnel in all aspects of the philosophy, operation and maintenance of equipment and systems. Instruction and training shall be provided by a qualified trainer from the Contractor or Subcontractor who supplied and installed the equipment and systems and/or a manufacturer's training representative who is familiar with all aspects of the design, operation, maintenance, and troubleshooting of the specified equipment and systems. Training shall be conducted in a classroom setting with appropriate schematics, handouts, and audio/visual aids. All training shall also be digitally recorded in video, cataloged, and provided to Owner in a DVD/container labeled with session identification and date. Attendance shall be recorded. For work requiring commissioning, see Section 01 91 00 “General Commissioning Requirements” for further training session agenda requirements.
   1. Prepare and submit a training plan for Owner's information and coordination. For each training session, the training plan shall include the following:
      a. Dates, start and finish times, and locations
      b. Outline of the information to be presented
      c. Names and qualifications of the presenters
      d. List of texts and other materials required to support training

1.6 CLEANING

A. Contractor clean up during construction is specified in the Contract Documents.
   1. If Contractor fails to clean as specified in the Contract Documents, and after reasonable notification from Owner, Owner may do so and the cost thereof shall be charged to the Contractor.
2. For work in medical centers, reference housekeeping in Section 01 35 33 “Infection Control.”
3. Contractor shall employ continuous housekeeping cleaning during construction to minimize interior construction dust and particulates during the Work.

B. Preliminary Cleaning: Perform the following preliminary cleaning operations as a prerequisite for Owner’s Final Inspection. The following are examples, without limitation, of minimum cleaning requirements:
   1. Remove labels that are not permanent.
   2. Remove temporary protective coatings and wrappings from all products.
   3. Remove glazing compounds and other vision obscuring substances from transparent and reflective materials provided by the Contractor including, but not limited to, mirrors, glass in doors and interior construction, glass canopies and skylights, and windows inside and out.
   4. Clean all exposed building interior surfaces, including cabinet interiors, and new exterior surfaces to be free of foreign substances including, but not limited to, stains and films.
   5. Leave floors broom-clean. Vacuum carpeted surfaces and clean consistent with manufacturer’s recommendations for installation.
   6. Remove and clean all construction debris and refuse from:
      a. Roofs, mechanical and electrical rooms, tunnels and equipment vaults
      b. Limited access spaces, including above ceiling areas and shafts
      c. Physically inaccessible components of the Work including wall and chase cavities, gutters and downspouts, floor drains and other drainage systems
   7. Wipe surfaces of M&E equipment, including elevator equipment and similar Architectural equipment. Remove excess lubrication and other substances.
   8. Clean the Project site of construction waste, rubbish, and litter. Sweep paved areas broom clean and remove stains, spills, and other foreign deposits.

C. Final Cleaning: Prior to Substantial Completion, employ experienced workers or professional cleaners for final cleaning of the Work. Clean to a condition expected of a normal commercial building cleaning and maintenance program. Comply with manufacturer’s instructions.
   1. Leave entire Project clean and ready for occupancy. All new interior, including cabinet interiors, and exterior building surfaces, fixtures and equipment shall be turned over to the Owner in a new condition, free of all damage, dust, dirt, spots, stains, encrustations, and other blemishes.
   2. Clean transparent materials including mirrors, glass in doors and interior construction, glass canopies and skylights, and windows inside and out.
   3. Clean plumbing fixtures to a sanitary condition.
   4. Clean light fixtures and lamps.
   5. Apply floor finishes.

D. Compliance: The Contractor shall:
   1. Use non-toxic Green Seal Certified cleaning products, or products with low-volatile organic compounds (VOC), and cleaning paper with a post-consumer recycled content;
   2. Employ equipment with high efficiency particulate filtration and sweep compound to keep dust down; and
   3. Comply with current regulations and standards of authorities having jurisdiction and the safety standards for cleaning specified in the manufacturer’s instructions.

1.7 OWNER’S FINAL INSPECTION

A. Prior to Final Inspection: The Contractor shall satisfactorily complete the following actions prior to the Owner’s final inspection of the Project.
   1. Submit written notice that the Project is ready for final inspection. Include a copy of the Contractor’s final punch list report (see Section 01 45 00 “Contractor Quality Control”)
and list all incomplete work items that have been reviewed with the Owner, and which the Owner has agreed are not necessary prior to Substantial Completion.

a. Include: a written plan/schedule outlining all actions necessary to achieve Substantial Completion, without requiring extra ordinary participation by Owner and A/E.

2. Complete preliminary cleaning operations.

3. Submit a list of all equipment and systems requiring instruction and training with a proposed schedule of times and locations for the instruction, for Owner’s review and comment.

B. Owner’s Final Inspection: Upon satisfactory completion of the actions in 1.7A, Owner will determine if the Project is complete and ready for final inspection and, at Owner’s sole discretion, commence final inspection, or provide a written deficiency list of items to the Contractor of work that must be completed to the satisfaction of the Owner prior to the Owner’s final inspection. Final inspection is performed by the A/E and Owner’s representatives.

1. After the Owner has issued the final inspection list of corrective work items, the Contractor shall make the required corrections and/or identify items that the Contractor feels are not required by the Contract Documents, and resolve these items with the Owner.

C. Re-inspection: Contractor shall request, in writing, re-inspection after completing the Owner’s final inspection list of corrective work items and providing the Owner the final inspection report notated with a signed-off approval for each of the corrected items. Those items whose completion is delayed due to circumstances acceptable to the Owner will be exceptions. The Owner’s Representative will back check the items or have the A/E perform a re-inspection.

1. If the A/E is required to perform more than one re-inspection, the costs for additional inspections may be borne by the Contractor, at the Owner’s sole discretion.

1.8 SUBSTANTIAL COMPLETION

A. Substantial Completion: Substantial Completion (for either the entire Work or portions thereof) shall be achieved when all Work, other than incidental corrective and incidental punch list work, is complete including, but not limited to, the following actions:

1. Complete final cleaning operations.

2. Submit the “Preliminary” Operations and Maintenance Manual for Owner’s review and comment in one (1) hard copy and in PDF format, on Owner’s CMS.

3. Submit all sign-offs, releases, jurisdictional settlements, judgments, and other records from AHJ allowing the Owner’s full and unrestricted use and benefit of the facilities including, but not limited to, a temporary or permanent certificate of occupancy permit, operating permits and/or licenses for the use of building equipment such as elevators, boilers, paint booths, etc. and similar necessary certificates and releases.
   a. Provide a list of any outstanding work required by AHJ.

4. Submit the current Project Record as-built Drawings and Specifications identified “Preliminary” Project Record (marked with the date of submission) in PDF format, on Owner’s CMS.

5. Submit the Project Record as-built Shop Drawings required by the Contract Documents in accordance with this Section 1.2D, on Owner’s CMS.

6. Remove all construction tools and temporary facilities not required for Final Completion work from the Project site including, but not limited to, storage sheds, samples and mock-ups, Project identification signage, site fences, crane and hoist base foundation construction, temporary enclosures, and construction electrical power and service.

7. Complete Owner’s personnel operating instructions and training and submit training DVD’s.
8. Complete final change-over of locks, transmit new keys to Owner, and return Owner’s loaned construction keys.

B. Substantial Completion: Upon a satisfactory completion of the actions in 1.8A above and the General Conditions requirements for Substantial Completion, the Owner will prepare a letter of Substantial Completion and forward to Contractor. The letter will identify the date of Substantial Completion and include the final punch list report and the commissioning deficiencies list, listing all remaining incomplete work. Contract warranties will begin as of the date of Substantial Completion, as specified in Section 01 78 36 “Warranties,” or as otherwise indicated in the Contract Documents.

1. Substantial Completion and the start of warranties for incomplete items will be established in writing by the Owner when the item is determined complete.

1.9 FINAL COMPLETION

A. Prior to Final Completion: Final Completion shall be achieved when the Work is fully and finally complete, to the Owner’s satisfaction in accordance with the Contract Documents including, but not limited to, the following:

1. All Work, including incidental corrective or punch list work, and air balancing and commissioning work (if included in the scope of the Work) is complete and correct to the satisfaction of the Owner.

2. All remaining temporary facilities are removed from the Project site and the site (including landscape) is restored to original conditions or Contract Documents requirements.

3. All final permits, originally issued as temporary permits, have been submitted.

4. The final marked-up Project Record as-built Drawings and Specifications identified Final Project Record (marked with the date of submission) have been submitted using Owner’s construction management system (CMS).

5. The complete Operations and Maintenance Manual and Warranties and Bonds Manuals have been submitted in PDF format, on Owner’s CMS, and a hard copy of the Warranties and Bonds Manual with original documents has been submitted.

6. The Contractor’s final 3-ring binder of all MSDS used for construction, marked with the date of submission, has been submitted in PDF format, on Owner’s CMS.

7. The Contractor’s final cumulative Construction Waste Management Report (marked with the date of submission) has been submitted in PDF format, on Owner’s CMS.

8. All Change Orders are approved and signed by both parties.

9. A draft of the Final Application for Payment has been submitted to Owner for review and approval.

10. The final Schedule of Values and the Building Componentization Report in hard and electronic copies (see Section 01 29 76 “Progress Payment Procedures”) have been submitted.

11. The software file used to calculate the power systems studies (Power Tools – SKM®) has been submitted.

12. Specified spare parts, extra stock of materials, and extra materials of value to the Owner, with itemized summary list, have been submitted.

13. The “Regulated Materials – Waste Manifests” (marked with date of submission) have been submitted in PDF format, on Owner’s CMS.

B. Final Completion: Upon satisfactory completion of the requirements in 1.9A above to achieve Final Completion, the Owner will approve and process the final Application for Payment and establish the date of Final Completion thereon.

1.10 FINAL ACCEPTANCE

A. Final Application for Payment has been approved by Owner and payment made to the Contractor.
B. The Owner will establish the date of Final Acceptance and issue the letter of Final Acceptance after the Contractor has completed the requirements of the Contract Documents.
   1. The Contractor shall follow the requirements outlined in the General Conditions and Section 01 29 76 “Progress Payment Procedures” for release of retainage.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies general administrative and procedural requirements for warranties required by the Contract Documents, including manufacturer’s standard warranties on products and special warranties.
   1. Refer to the following General Conditions for terms of the Contractor’s warranty of Work:
      a. Part 5.16 “Correction of Non-conforming Work”
      b. Part 5.21 “Warranty of Construction”

   1) If there is any discrepancy in the Contract Documents regarding the warranty period or its date of commencement, the specified passage granting the Owner the longest warranty period ending on the latest date shall govern.

B. Disclaimers 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, nor does it relieve suppliers, manufacturers, and Subcontractors that are required to countersign special warranties with the Contractor.

1.2 DEFINITIONS

A. “Standard Product Warranties” are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. “Special Warranties” are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.3 WARRANTY REQUIREMENTS

A. General: Upon determination that Work covered by a warranty has failed, correct or replace the Work to an acceptable condition complying with requirements of Contract Documents.

B. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

C. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected or replaced and retested and/or re-commissioned reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

D. Costs: The Contractor is responsible for the cost of correcting or replacing including the cost for retesting and/or re-commissioning defective Work, regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
E. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

2. Right to Refuse Work: The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

1.4 SUBMITTALS

A. Submit written warranties to the Owner's Representative. Provide a draft for Owner's review and comment prior to final execution. Warranties shall identify:
   1. Scope description of what is covered (indicate labor and/or materials requirements);
   2. The Specification reference stating the warranty;
   3. The date of the warranty's start and finish (indicate the specified warranty duration);
   4. Service and maintenance contracts, when specified in the Contract Documents;
   5. Supplier's name, address, e-mail address, and telephone number;
   6. Proper procedure in case of failure; and
   7. Instances which might affect validity of warranty.

B. When a special warranty is required to be executed by the Contractor, or the Contractor and a Subcontractor, supplier, or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties.
   1. Refer to individual sections of the Specifications for specific content requirements, and particular requirements for submittal of special warranties.

C. Include warranties in the Operations and Maintenance Manual (see Section 01 77 00 “Closeout Procedures”).

D. Review and acceptance, by the A/E or Owner's Representative, of submitted warranties does not relieve the Contractor of the warranty requirements of the Contract Documents.

E. The Owner may generate and keep electronic copies of original executed warranties, certifications, and other similar commitments and such copies shall be considered as originals.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Comply with the commissioning provisions specified in this Section and elsewhere in the Contract Documents.

B. General:
   1. Unless noted otherwise, functional performance tests (FPT) apply to all equipment and systems identified to be tested in the Contract Documents.
   2. Submittals shall be in accordance with Section 01 33 00 “Submittal Procedures” and for CAD (Computer Aided Drafting) Record Drawings, in accordance with Section 01 77 00 “Closeout Procedures.”
   3. The duties of the Contractor’s “Test Engineer” and Owner’s “Commissioning Authority” are described in Section 01 75 00 “Test Engineer Services.”
   4. The Contractor shall ensure that the Commissioning Authority, or other Owner-designated witness, is provided safe access to witness the performance of the equipment or systems being commissioned and is reasonably furnished ladders, scaffolding, and staging, if required, for witnessing.

1.2 COMMISSIONING DOCUMENTATION

A. Commissioning Plan: The Contractor shall prepare and submit a “Commissioning Plan” that identifies how commissioning activities will be integrated into the construction Progress Schedule and how commissioning responsibilities are distributed. Include, as a minimum, the following:
   1. An organizational chart showing lines of communication and authority of the Test Engineer relative to key Contractor positions and to key Subcontractors
   2. Who will be responsible for producing the various procedures, reports, Owner notifications, and forms required by the Contract Documents
   3. list of all control systems software required by the Contract Documents
   4. The commissioning schedule
   5. Commissioning forms and other documentation
   6. Description of start-up and test procedures
   7. list of Subcontractors who will participate in each of the tests
   8. The instrumentation required for each test and who will provide the instrumentation
   9. Operational description for each test  (This shall include, for example, the commissioning basis-of-design criteria provided by the commissioning authority, code requirements, the specifics of the equipment to be provided, sequences of operation, operating priorities, and other necessary information.)
   10. One-line system and riser diagrams

B. Mechanical and Electrical Commissioning Binders (M&E): The M&E “Commissioning Binders” shall include the submittals, test equipment, commissioning procedures, installation verification audits, and FPT procedures documentation described in this Section.

1.3 SUBMITTALS

A. Start-up plans: Submit start-up plans, with start-up test procedures and documentation forms, for the equipment and systems for which a start-up is specified in the Contract Documents. Start-up plans shall include the following:
   1. Start-up schedule
   2. Names of firms/individuals required to participate
   3. Detailed start-up procedures
4. Start-up forms
5. Operations and maintenance product data

B. Start-up installation verification audit report: Submit installation verification audit reports prior to start-up of equipment and systems for which a start-up is specified in the Contract Documents. Identify:
   1. Equipment and/or systems, to be started-up;
   2. Prestart-up tests performed, including manufacturer’s factory tests;
   3. Deficiencies noted;
   4. Corrective action taken; and
   5. Dates and initials of persons making the entries.

C. Start-up deficiency report form: Submit start-up deficiency report forms within five (5) days following the start-up of each equipment or system to report any deficiencies discovered in conjunction with start-up. Identify:
   1. Equipment and/or systems started-up;
   2. Location and identification of the deficient equipment and/or materials;
   3. Date of observation and initials of observer;
   4. Deficiencies noted;
   5. Corrective action taken; and
   6. Date of correction and initials of the person making the correction.

D. Test equipment identification list: Submit a list of all test equipment used in commissioning, sorted according to intended use. Provide an updated list, if any equipment is added to the commissioning, while testing is in progress. The list shall include the following information:
   1. Manufacturer
   2. Model number
   3. Serial number
   4. Date of most recent calibration
   5. Range
   6. Accuracy
   7. Resolution
   8. Intended use

E. Testing, Adjusting and Balancing (TAB) progress reports: Submit weekly TAB progress reports after TAB activities have begun. Identify the following:
   1. Systems or subsystems for which preliminary balancing is complete
   2. Systems or subsystems for which final balancing is complete
   3. Status of deficiencies and balancing problems encountered, including corrective actions taken
   4. Updated schedule of remaining TAB activities

F. FPT procedure documentation: Submit FPT procedure documentation for FPT specified in the Contract Documents. The documentation shall include the following:
   1. FPT procedure description
   2. Procedures that are based upon the actual equipment and/or systems configuration
   3. The value for all set points and inputs, positions of adjustable devices, valves, dampers and switches
   4. The acceptable test range for each FPT
   5. Updated one-line system and riser diagrams
   6. An alphanumeric designator for each procedure
   7. Reference to the applicable Specifications section upon which the procedure is based

G. FPT data forms: Submit FPT data forms to document the equipment or systems FPT specified in the Contract Documents.
1. Identify each FPT data form by a unique designator, consisting of an applicable FPT procedure designator followed by a dash and digit suffix to distinguish multiple repetitions of the same procedure.

2. The FPT data form shall identify:
   a. Who needs to be in attendance for the tests, including but not limited to, Subcontractors, Commissioning Authority or other Owner-designated witness, regulatory agencies, and others as appropriate; and
   b. The sequence of the tests to be performed.

3. Include space to record the following:
   a. Description of the procedure
   b. Whether the form is for a retest of a failed procedure
   c. Identification and location of the equipment being tested
   d. Identification of instrumentation used, by type and serial number
   e. Observed conditions at each step of the procedure
   f. Acceptable results, as specified
   g. Date of the test
   h. Names of technicians performing the procedure
   i. Name and signature of the Contractor’s Test Engineer
   j. Name and signature of the Commissioning Authority or Owner-designated witness
      1) Signature of witness shall only indicate concurrence with reported results and observations. Acceptance of the results will be reported separately by the Commissioning Authority after review of the FPT data forms.

H. FPT deficiency report forms: Submit FPT deficiency report forms at the end of each day for all tests in which acceptable results were not achieved during the day. When corrections have been completed, update the FPT deficiency report form. FPT deficiency report forms shall record the following:
   1. Associated FPT data form number and description
   2. Equipment identification and location
   3. Date of test
   4. Name of person reporting the deficiency
   5. Description of the observations associated with the failure of the test
   6. Cause of the failure, if apparent at the time of the test
   7. Date and description of corrective action take
   8. Name and signature of person taking corrective action
   9. Schedule for retest

I. One-line system and riser diagrams: Submit one-line system and riser diagrams with the Commissioning Plan, updated one-line system and riser diagrams with the FPT procedure documentation, and as-built one-line system and riser diagrams with the final M&E Commissioning Binders. One-line system and riser diagrams shall be submitted for the following, when included in the work of the Contract Documents:
   1. Owner-provided one-line system and riser diagrams in CAD format for Contractor’s use:
      a. Hot water heating
      b. Domestic water
      c. Steam and condensate
      d. Chilled water
      e. Condenser water
      f. Supply air
      g. Return air
      h. Exhaust air
      i. Electrical normal and emergency power
   2. Subcontractor-provided one-line system and riser diagrams CAD Shop Drawings, for Contractor’s use:
      a. Environmental control systems (ECS)
b. Fire alarm/smoke evacuation/life safety graphics and riser diagrams

c. Lighting control system diagrams

d. Electrical distribution equipment and spot or network substations schematic diagrams

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

A. Provide industry standard test equipment required for performing the tests specified in the Contract Documents.

B. Instrumentation shall meet the following standards:
   1. Be of sufficient quality and accuracy to test and measure system performance within the tolerances required to determine adequate performance
   2. Be calibrated on the manufacturer’s recommended intervals with calibration tags permanently affixed to the instrument being used
   3. Be maintained in good repair and operational condition throughout the duration of use on this Project
   4. Be recalibrated/repaired if dropped or damaged in any way since last calibrated

C. For all temperature measurements, including air, liquids, and surfaces of pipes and components, use appropriate probes that meet the following requirements:
   1. Range: Minimum +14°F to 248°F
   2. Type: Thermometer, digital electronic
   3. Minimum accuracy: +/- 0.5°F
   4. Calibration Interval: Per manufacturer instruction, not to exceed every twelve (12) months.

D. For hydronic systems pressure and differential pressure measurement instruments, the test equipment shall meet the following requirements:
   1. Range: 0 to 30 psi (1 pound per square inch), 0 to 60 psi, and 0 to 200 psi
   2. Type: Calibrated test gauges, 3 inch, or electronic digital device (TSI Performance Measurement Tools or similar) meeting accuracy and calibration interval requirements.
   3. Minimum accuracy: 2% with a gauged scale; 3% with an electronic reading
   4. Calibration interval: Per manufacturer's recommendation, not to exceed every twelve (12) months.
   5. Note: Use lowest range instrument or scale

E. For air pressure measurement instruments, the test equipment shall meet the following requirements:
   1. Range: 0 to 1 inch WC (water column), 0 to 4 inch WC, 0 to 10 inch WC
   2. Type: Use properly leveled and zeroed manometer, magnehelic or electronic instrument meeting accuracy requirements
   3. Minimum accuracy for electronic devices: 2% with a magnehelic reading; 3% with an electronic reading
   4. Calibration interval for electronic devices: Per manufacturer’s recommendation, not to exceed every twelve (12) months
   5. Note: Use lowest range instrument or scale

F. Refer to electrical inspection, calibration, and testing requirements for instrumentation related to electrical systems and equipment.
PART 3 - EXECUTION

3.1 COMMISSIONING PROCEDURE

A. Sequence of testing: Commissioning shall proceed from lower to higher levels of complexity. For each system, testing at the lower level shall be completed prior to starting the next higher level of tests. In general, the order of testing, from lowest to highest is as follows:
   1. Static tests (e.g., duct leakage tests)
   2. Motors, actuators, sensors, and other system components requiring start-up and FPT
   3. Point-to-point (PTP) testing
   4. Balancing
   5. System functional performance tests
   6. Cross-systems functional performance tests

B. Retesting: Repeat, at no additional cost to the Owner, the complete functional test procedure for each test in which acceptable results are not achieved. Repeat tests until acceptable results are achieved. Fill out a new FPT data form for each retest.

C. Correction of deficiencies:
   1. Correct FPT deficiencies promptly and schedule retest.
      a. Corrections during FPT are generally prohibited to avoid consuming the time of personnel waiting for the test, but not involved in making the correction. Exceptions will be allowed if the cause of the failure is obvious and corrective action can be completed in less than five (5) minutes. If corrections are made under this exception, the failure shall be noted on the FPT data form. A new FPT data form, marked "retest", shall be submitted after the correction has been made. The entire FPT procedure shall be repeated.

3.2 INSTALLATION VERIFICATION AUDIT

A. Conduct an installation verification audit before equipment or system start-up begins. The audit shall include, but not be limited to, a check of the following equipment or systems:
   1. Piping specialties, including balance, control, and isolation valves
   2. Ductwork specialty items, including turning devices; balance, fire, smoke and control dampers; and access doors
   3. Control sensors by type and locations
   4. Piping, valves, starters, gauges, thermometers, and other components of the Work specified for formal start-up in the Contract Documents
   5. Accessibility to equipment in 1 - 4 above
   6. Verification of final programmed variable frequency drives (VFD) settings

B. If any part of the Work is found to be incomplete, inaccessible, incorrect, or non-functional, the Contractor shall make note of deficiencies, and correct deficiencies before system start-up work proceeds.

C. Coordinate with the electrical testing contractor (ETC) for the audit of electrical systems required by the Contract Documents.

3.3 TESTING, ADJUSTING, AND BALANCING (TAB)

A. Complete all PTP testing prior to start of TAB.

B. Coordinate and perform air and hydronic balancing. Advise the TAB firm when systems are complete and ready for balancing. Start TAB as early as possible following system start-ups.
and component FPT, in order to be essentially complete prior to system FPT. Coordinate TAB activities with other construction schedule activities.

C. Verify completion of PTP testing and the accuracy of the TAB work prior to commencing any FPT activities which may be adversely affected by incomplete PTP testing and improper balancing.

3.4 FUNCTIONAL PERFORMANCE TEST PROCEDURES

A. FPT procedures must confirm the performance of systems to the extent required by the Contract Documents.
   1. Emphasis shall be placed on testing procedures which will conclusively determine actual system performance and compliance with the design.

B. FPT procedures shall demonstrate the actual performance of specified safety shut-offs in a real or closely simulated condition of failure. Failure conditions shall include adequate oil pressure, proof-of-flow, non-freezing conditions, maximum head pressure, and other conditions common to the equipment.

C. Systems may include safety devices and components that control a variety of equipment operating as a system. Interlocks may be hard-wired or installed via software. FPT procedures shall demonstrate these interlocks.

3.5 ECS SOFTWARE REVIEW

A. Review ECS software and required ECS cross-systems software routines prior to the installation of control devices. The review shall include:
   1. Obtaining ECS program documentation
   2. Review of the programming approach
   3. Interface with other systems, including but not limited to:
      a. Lighting
      b. Fire alarm
      c. Security
      d. Clock
      e. Emergency generator monitoring
      f. Sump pumps
      g. Distributed and mechanical utility metering

B. Discrepancies in programming approaches shall be resolved with the Owner to provide the most appropriate, simple, and straightforward approach to software routines.

3.6 COMMISSIONING MEETINGS

A. The Contractor shall participate in the following meetings with the Commissioning Authority. Other Subcontractors may, at Owner’s sole discretion, be required to attend as necessary.
   1. Pre-commissioning kick-off meeting
   2. Commissioning meetings described in Section 01 31 19 “Project Meetings”
   3. ECS software review, and design intent clarification meeting
   4. Preliminary O&M Manual review meeting

3.7 EQUIPMENT OPERATING INSTRUCTIONS AND TRAINING AGENDA

A. Each training session shall include an agenda addressing the following:
   1. Introduction of presenters
2. Using the O&M information:
   a. What is the equipment
   b. Basic operating procedures (including start-up/shut-down)
   c. Preventative maintenance procedures
   d. Troubleshooting procedures
3. What does it do, or serve
4. Any special features
5. Safety precautions
6. Maintaining warranties, guarantees, and warranty periods
7. Instruction on how to use proprietary instrumentation or operating equipment
8. Recommended spares
9. Review of start-up reports and FPT results
10. Jobsite walk-through

END OF SECTION
PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The Contractor shall perform all planning, notifications, administration and execution necessary to safely remove, dispose and/or handle the regulated materials listed within this Section in accordance with local, state and federal regulations. Refer to other sections for Covid-19 mitigation process while conducting projects at the UW.

1.2 RELATED WORK

A. Drawings, General Conditions, Modifications to the General Conditions, and Supplemental Conditions to the General Conditions, and other Divisions apply to this Section.

1.3 WORK INCLUDED

A. The Contractor shall supply all labor, equipment, notifications, services, insurance, special permits and equipment necessary for the following regulated materials:

1. Asbestos:

   a. Asbestos abatement is included in this Project. Asbestos-containing fireproofing is present at Schmitz Hall and in vicinity of electrical rooms.

   b. Contractor shall refer to the Hazardous Materials Survey Report (Attached in Appendix C and prepared by PBS Engineering and Environmental). This document lists suspect asbestos-containing materials (ACM) sampled and analyzed for asbestos content, or presumed to exist, at the areas of the buildings included in the Work. The Contractor shall ensure that copies of this information are made available to and retained at the project site by all subcontractors.

   c. Contractor shall be aware that suspect-ACMs may exist in inaccessible locations of the spaces included in the Work and in areas not included in the Work.

   d. Contractor is advised that, should additional ACMs not included in the Hazardous Materials Survey Report be encountered, the Owner may elect to include the abatement of such materials in the work at a mutually agreed upon price. Work impacting such materials is not to occur prior to the Contractor receiving explicit written authorization from the Owner, and any Work performed without such approval is performed at the Contractor’s own risk and expense.

   e. The disturbance or impact of ACMs may cause asbestos fibers to be released into the building’s atmosphere, thereby creating a potential health hazard to building and tunnel occupants. Contractor is to apprise all workers, supervisory personnel, subcontractors and consultants who will be at the jobsite of the seriousness of this potential hazard and of proper Work procedures that must be followed, should it occur.

   f. Where in the performance of the Work, workers, supervisory personnel, subcontractors, or consultants encounter, disturb, or otherwise function in the immediate vicinity of any identified ACMs, Contractor shall take appropriate
continuous measures, as necessary, to protect its employees, sub-contractors, building occupants from the potential hazard of exposure to airborne asbestos. Such measures shall include the procedures and methods described herein, and compliance with applicable local, state and federal regulations.

g. Damage of Asbestos by the Contractor: Damage to asbestos-containing materials to remain caused by the Contractor shall be repaired to the satisfaction of the Owner by the Contractor using certified asbestos workers according to these specifications, and at the sole expense of the Contractor.

h. Remove and dispose of the following asbestos-containing materials (ACM) according to Section 02 82 00 and review all project related construction/demolition plans.

i. Less than 1% of Asbestos: Wallboard Assemblies (joint compound and gypsum wallboard): Impact of referenced materials that were identified to contain less than 1% of asbestos shall be undertaken according to WISHA Regional Directive (WRD) 23.30. Refer to Electrical plans for location of wall penetration and wall impact. At a minimum, requirements include, but are not limited to, the following:

   i. Worker training must include asbestos awareness and hands-on training per WAC 296-62-0772(5).

   ii. Work must be supervised by a Competent Person per WAC 29-62-07728 (asbestos certified supervisor).

   iii. Worker respiratory protection is to be based on overall dust levels and comply with WAC 296-62 including the provision of personnel exposure assessment and monitoring during work.

   iv. Use of wet method, non-aggressive techniques and prompt cleanup of debris with HEPA-equipped vacuums.

   v. All dust remaining in the work areas must be cleaned-up following impact of wall system using vacuuming and wet-wiping. Protect finishes, equipment and items remaining in work areas as necessary.

   vi. Owner reserves the right to collect asbestos air samples from the work areas related to wall coring and penetration impacting less than 1% of asbestos.

   vii. Provide to Owner for review the above work plan general requirements and all training certificates of workers.

j.

2. Metals/Lead:

   a. Lead/metals-containing items and health and safety controls are in the scope of work.

   b. The Owner’s consultant has conducted a survey of representative areas in the Building to be impacted by the Work for the presence of lead-containing components. Findings and related analytical data are included in the attached Appendix C Hazardous Materials Survey Report.
c. Contractor shall comply with all applicable regulations, laws and ordinances concerning the impact, removal, handling, storage, disposal, monitoring and protection against exposure or environmental pollution related to building components containing lead coatings or lead products. Impacts to lead that may be required by the Work include, but are not limited to: product installation, manual demolition, mechanical demolition, cutting, sawing, drilling, sanding, scraping, welding or torch-cutting. Confirm required impacts with other applicable specification sections and drawing sheets. In addition, provide all infection controls and engineering controls per contract requirements.

d. Work impacting lead-containing painted coatings and lead-containing items and products within this contract is the responsibility of the Contractor, and all affected Sub-Contractors, and shall be performed in accordance with all applicable local, state and federal regulations and the requirements outlined specification Section 02 83 00, Metals/Lead Control Activities.

i. Based on paint chip testing data, historical waste characterization data and the Environmental Consultant’s calculations of lead concentrations in the anticipated waste stream, it is anticipated that disposal of the waste stream generated by the Work will not require waste characterization or disposal according to WAC 173-303, Dangerous Waste Regulations.

ii. The Contractor is to submit a description of actual waste stream constituents, including approximate volumes, to be generated by the Work for review by the Environmental Consultant. Include approximate volumes and types of waste stream constituents to be disposed of as solid waste, accounting for any waste minimization or recycling. Lead-containing items must be handled and be disposed of as general construction debris (landfill) at a UW approved landfill and cannot be recycled even if TCLP lead results are below 5 parts per million.

iii. Provide submittal information outlined in Section 02 83 00 for all trades impacting lead-containing painted surfaces and substrates.

iv. Contractor is responsible for the handling of all dust, debris, disposable protective equipment, cleaning rags, wash water, and any other materials contaminated with residues from activities impacting lead-containing painted coatings or lead components, such as surface preparation, sanding, scraping, etc. Owner will disposed-off all dangerous waste (construction solid debris that failed waste profiling for lead and other regulated metals). Dangerous waste will be drummed or properly packaged and containerized by contractor for Owner disposal.

3. Polychlorinated Biphenyls (PCBs)

a. PCB-containing Transformer Oil: Remove PCB-containing oil and Link Boxes and remediate spilled oil from concrete footprint and steel grading/walls surface areas.

b. Provide submittals outlined per Section 02 84 00 PCBs Remediation.

4. Mercury

a. Fluorescent Lighting Tubes/Bulbs and Thermostats.
i. Work includes handling and removing of light tubes and thermostats for Owner to properly dispose. Fluorescent lighting tubes/bulbs and thermostats may not be disposed of as construction debris because they contain mercury. Thermostats and whole/intact fluorescent and undamaged light tubes/bulbs are much cheaper to dispose of than broken light tubes, contractor to ensure these items remain intact during removal, storage, and transport.

ii. Thermostats, whole fluorescent light tubes/bulbs and light ballast from the project on the Seattle campus are recycled through UW Recycling Program. Coordinate with the Owner’s representative for the recycling program. To initiate this process, the Owner will contact UW Recycling by calling the Recycle Information Line at 206.685.2811 or sending an email to recycle@u.washington.edu at a minimum one week prior to the scheduled removal of lamps.

iii. The Owner’s fluorescent tube recycling vendor will drop off and subsequently pick up the appropriate number of fiber drums at the project location on specified dates – coordinate with Owner for logistics. The project will be billed directly for tube recycling. Fluorescent tubes must be managed under the state Universal Waste rules. This means that all fluorescent tube drums must be labeled as Universal Waste (usually the recycling contractor does this, but it is the ultimate responsibility of the Owner to label them). The drums must also be under the generator’s control at all times and must be stored at a covered or indoor site.

iv. Damaged and broken tubes/bulbs are disposed of as hazardous waste through the UW Environmental Program Office (EPO) as well. Contractor to provide to Owner for review their work plan to address handling and removal of light tubes and light ballast including all appropriate worker protection and environmental controls.

5. Refrigerants – Not Used – Not in the Scope


8. Contaminated Ductwork - Not Used – Not in the Scope

9. Biological Hazards - Not Used – Not in the Scope

10. Silica and Fugitive Dust

   a. Presumed silica-containing building materials such as in structural and finish assemblies of concrete slab (walls, floor, columns and ceiling assemblies) are present in the areas of work.

   b. Contractor is responsible for proper handling, removal, storage, and proper recycling of silica-containing materials according to all applicable regulation, employee and environment protection. Refer other section for engineering requirements for dust and particulate controls during all work including demolition activities.
c. Construction activities including but not limited to chipping, drilling, sawing and jack hammering and other general construction or demolition require control of potentially airborne silica dust from contaminating the environment within the facility. Impact of these building materials with detectable concentrations of silica shall be performed according to Washington Labor and Industries regulations for Silica in Construction (WAC 296-840 and 841 Airborne Contaminants) including all applicable employee exposure assessment.

d. All employers of personnel performing work related to the above are to address the following information related to all tasks to be performed by their personnel: Work Safety Plan to address Silica in building materials to be impacted, including: personal protective equipment and engineering controls (to limit and control dust) to be implemented during the work, decontamination procedures, access restriction procedures and controlled/restricted areas, enclosures, debris clean-up procedures, exposure assessments and any related air monitoring.

11. Contaminated Soil Remediation – Not Used – Not in the Scope


PART 2 - PRODUCTS

2.1 MATERIALS

A. Not Used

2.2 EQUIPMENT

A. Not Used

PART 3 - EXECUTION

3.01 WORK PERFORMED BY ENVIRONMENTAL CONSULTANT

A. All necessary sampling such as post-remediation clearance, determination of hazardous and regulated materials or dangerous waste profiling for disposal will be performed by the Owner’s Environmental Consultant.

END OF SECTION 02 80 00
PART 1 - GENERAL

1.01 SCOPE

A. This section covers the removal and disposal, or other impact, of asbestos-containing materials (ACM) at the areas included in the Work as defined by these Contract Documents. See Sections 01 11 01 (Summary of Work - Regulated Materials) and 02 80 00 (Facility Remediation).

B. Provide all labor, materials, equipment, services, permits and insurance required to complete asbestos-related procedures as indicated in the Contract Documents.

C. Abatement in the medical center shall be under full-enclosure containment work areas under negative pressure. Refer to infection control section for containment preparation.

D. Field identify the location and amount of all asbestos-containing materials to be impacted as indicated in this section. All abatement in the medical center shall be under containment/enclosure under negative pressure. As well refer to other section for infection controls and enclosure requirements.

E. The Contractor shall refer to the Hazardous Materials Survey Report that lists suspect materials sampled in areas included in the Work and analysis for asbestos content. The Contractor shall ensure that a copy of this information is made available to and retained at the project site by all subcontractors.

F. The Contractor shall be responsible for all air sampling requirements including personnel and area monitoring (pre-abatement, during abatement and post abatement clearance sampling).

G. Abatement/Removal: Provide all labor, coordination, materials, equipment, services, permits and insurance required to complete ACM removal/abatement and disposal as indicated in the Contract Documents and the following scope:

i. Schmitz Hall: Remove ACM fireproofing as necessary to facilitate the transfer removal project. (Assumed 200 SF). ACM is found on ceiling deck of electrical and mechanical rooms and loading dock as well as throughout the building.

ii. Owner reserve the right to conduct confirmation bulk sampling to determine asbestos content in the assumed material.

1.02 RELATED SECTIONS

A. Drawings, General Conditions, Modifications to the General Conditions, and Supplemental Conditions to the General Conditions, and other Divisions apply to this Section.

1.03 DEFINITIONS

A. Wherever the terms below occur in this contract document, they will have the meanings which follow:

1. Abatement: Procedures to control fiber release from asbestos-containing building materials. Includes encapsulation, enclosure, removal, repair and related activities.

2. Adequately wet: sufficiently mixed, saturated, or coated with water or an aqueous solution to prevent emissions.


4. Amended Water: Water containing a surfactant additive.

5. Asbestos: Asbestiform varieties of actinolite, amosite, (Cummingtonite - grunerite, tremolite, chrysotile, crocidolite and anthophylite.)

6. Asbestos-containing Material (ACM): Any material containing more than one percent (1%) asbestos as defined under NESHAPS CFR 40 Part 61, and OSHA 29 CFR Part 1926.1101, or at least one percent (1%) asbestos as defined under Regulation III of the Puget Sound Clean Air Agency.

7. Asbestos-containing Waste Material: Asbestos-containing materials, materials used to control the work area during the asbestos project, debris, containers, bags, protective clothing and HEPA filters.
8. Authorized Visitor: The Owner or designated representative, or a representative of any regulatory or other agency having jurisdiction over the project, and having required training, medical, fit test, etc.


10. Certified Asbestos Supervisor: person certified by WAC Chapter 296-65-012, whose duties include at least: establishing negative pressure, mini-enclosure, glove bag or other engineering controls, ensure integrity of those controls, supervise employee monitoring, protective equipment, training, hygiene and decontamination procedures.

11. Certified Industrial Hygienist (CIH): An industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene.

12. Class I Asbestos Work: Activities involving the removal of TSI, surfacing ACM and presumed asbestos-containing materials as defined by OSHA. Materials include those otherwise regulated by WISHA including, but not limited to, pipe insulation.

13. Class II Asbestos Work: Activities involving the removal of ACM which is not thermal system insulation or surfacing material as defined by OSHA. This also includes, but is not limited to, the removal of asbestos-containing floor tile, cement asbestos board, roofing and siding.

14. Critical Barrier: Barrier constructed of two layers of six-mil plastic sheeting and sealed at the edges with duct tape and, as appropriate, spray adhesive. Critical barriers constructed in exterior areas shall utilize reinforced plastic sheeting.

15. Decontamination Area: Enclosed area adjacent and connected to regulated area and consisting of equipment room, shower area, and clean room, which is used to decontaminate workers, materials, and equipment.

16. Disposal: Procedures necessary to transport and deposit the asbestos-contaminated material in an approved waste disposal site in compliance with EPA and other applicable regulations.

17. Disposal Site: EPA and UW approved landfill for asbestos-containing waste.

18. EPA: U. S. Environmental Protection Agency.

19. Encapsulant (Sealant): A liquid material which can be applied to asbestos-containing material and which controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant), or by penetrating into the material and binding its components together (penetrating encapsulant).

20. Environmental Consultant: Environmental consultant specializing in asbestos abatement and retained by the Owner.

21. Fiber: A particulate form five micrometers or longer, with a length to diameter ratio of at least 3:1.

22. Fibers/cc: Fibers per cubic centimeter of air.

23. Fixed Object: Fixtures which are attached to the building or are too heavy or bulky to remove from the work area.

24. Glove bag: A manufactured device consisting of a transparent plastic bag with inward projecting sleeves, an internal tool pouch, provisions for fastening and sealing at the top and sides, and a receptacle in the bottom to hold asbestos waste. The glove bag is installed so as to surround the material to be removed and contain all fibers released during the process. Glove bags are used to remove insulation from small sections of pipe and fittings.

25. HEPA Filter: A High Efficiency Particulate Air (absolute) filter capable of trapping and retaining 99.97% of asbestos fibers greater than 0.3 microns in length.

26. HEPA Vacuum Equipment: High Efficiency Particulate Air (absolute) filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers. Filters of 99.97% efficiency for retaining fibers of 0.3 microns in length or larger shall be installed for filtering discharge air.


28. Independent Testing Laboratory: A laboratory financially independent from and hired by the Owner or Contractor which is either AIHA-accredited for asbestos with demonstrated proficiency via the AIHA PAT program, or has analysts proficient in the AIHA AAR program for air sample analysis.

29. Industrial Hygienist: An employee of the Independent Testing Laboratory who is experienced and trained in asbestos sampling and analysis as specified.


31. Mini-enclosure: An enclosure fabricated to effectively contain a small work area conforming to EPA, AHERA, 40 CFR 763 Subpart E, Appendix B.

32. Movable Object: Furnishings which are not attached to the building structure and can be removed from the work area.

33. Non-Isolated, Regulated Area: Work area where Class II asbestos abatement work is performed as defined by OSHA 29 CFR 1910.

34. NVLAP: National Voluntary Laboratory Assurance Program.
35. PACM: Presumed asbestos-containing materials.
36. PAT: Proficiency Analytical Testing program performed for NIOSH method 7400.
37. PCM: Phase Contrast Microscopy analytic method applied to air samples to determine airborne fiber concentrations, NIOSH method 7400.
38. PLM: Phase Light Microscopy analytic method applied to bulk material samples to determine asbestos content, EPA method 40 CFR 763, Subpart F, Appendix A.
39. Public Area: Any area outside the isolated work area. When work area isolation measures are removed, the work area becomes a public area.
40. Regulated Area: Area which only certified asbestos workers and other persons authorized by Regulation I of the Washington Industrial Health Act have access, where asbestos materials to be removed exist, or where airborne fiber concentrations are expected to exceed 0.01 f/cc.
41. Removal: All operations where ACM and/or PACM are taken out or stripped from structures or substrates, and include demolition activities.
42. Surfactant: A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.
43. Thermal System Insulation (TSI): ACM applied to pipes, fittings, boilers, breaching, tanks, ducts or other structural components to prevent heat loss or gain.
44. Transport: Hauling of asbestos-containing waste from a work site to a disposal site and deposit of the waste by a firm in compliance with the EPA, Washington State and PSCAA.
45. Waste Load-out Area: A two chamber system adjacent to the negative pressure enclosure used for the final preparation and external decontamination of waste containers, and short term storage waste containers prior to transport from the jobsite.
46. Waste Shipment Records: Form similar to that shown in EPA NESHAP 40 CFR 61.150(d)(1), or an EPA approved state or local form.
47. Worksite Entry Logbook: A logbook kept in the clean room which must be signed by everyone entering or leaving the work area.

1.04 DOCUMENTS INCORPORATED BY REFERENCE

A. The current issue of each document shall govern. Where conflict among requirements or with these Specifications exists, the most stringent requirements shall apply.


3. U.S. Department of Labor Occupational Safety and Health Administration (OSHA):


6. Title 29 Code of Federal Regulations Section 1910 et al.--Occupational Exposure to Asbestos; Final Rule.


8. Title 29 Code of Federal Regulations Section 1910.2--Access to Employee Exposure and Medical Records.


13. CERCLA, Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601 et.seq.)


17. Washington Industrial Safeties and Health Act (WISHA).


19. Electrical work shall be performed in accordance with the National Electrical Code.

20. All local ordinances, regulations, or rules pertaining to asbestos, including its storage, transportation, and disposal.

1.05 SUBMITTALS AND NOTICES

A. Contractor shall provide electronic documents of the "Pre-Job Submittals" as indicated below for review by the Environmental Consultant and Owner. No asbestos-related work will be permitted prior to submittals being approved by the Environmental Consultant. Allow ten (10) days for review.

B. Additional requirements for submittals are also described in other sections of these specifications. The requirements in this section pertain to asbestos-containing materials removal.

C. Submit the "Contractor Acknowledgment of Asbestos Hazard Training, Respirator Training and Agreement to Undertake All Required Precautions", Form 028200-1. (attached to this Section) completed and signed by the Abatement Contractor in conjunction with pre-job submittals.

D. Contractor shall submit to the Environmental Consultant the following information prior to beginning work on the project:

1. Work Plan: Include a detailed plan of the procedures proposed for use in complying with the requirements, including the following:

   a. A description of all special equipment, techniques, and methods to be used on the Project, including description of work area layout(s) citing entries/exits, HEPA exhausts through open windows, decon units, waste load-outs, emergency spill controls SOP, etc.

   b. A detailed project schedule, including proposed clearance monitoring schedule and progression of abatement through the work areas.

   c. Specific information relating to handling, transport and disposal of asbestos-containing waste. Identify any disposal site (must be Owner approved site) at which any waste material generated during the project will be disposed and furnish evidence of all necessary government approvals to dispose of the waste.

2. Laboratory Qualification Information: Submit information pertaining to the proposed Air Monitoring Program for this project. Air monitoring shall include employee exposure monitoring, area air sampling and post abatement air sampling. This information shall include the name(s) of the on-site Industrial Hygiene Technician working under the foreman's supervision, types of equipment, sampling schedule, sampling procedures, calibration record keeping, name and
address of proposed Independent Testing Laboratory, and evidence of analyst's NIOSH 582 course completion and AIHA PAT program participation.

3. Notifications and Permits: Submit copy of all required notifications and permits obtained by the contractor (Washington State Department of Labor and Industries, and PSCAA) and copies of all types of specified bonds and insurance. Submit upon receipt any approved amendments to notifications or re-notifications for multi-phase activities. See Permits and Notifications for additional requirements.

4. Asbestos Supervisor: Submit the name, Asbestos Supervisor Certification, Certificate of Worker Acknowledgment and resume of experience of the assigned on-site foreman. At a minimum, the foreman shall have successfully completed a supervisor training course in compliance with WAC Chapter 296-65-007. References and work on similar projects will also be reviewed. The Owner reserves the right to reject the foreman from the work at any time during the project. The Contractor shall then submit another on-site foreman for approval as described above.

5. Emergency Cleanup and Control Plan: Contractor shall submit for review a comprehensive plan detailing procedures to be implemented in the event of an asbestos spill. Information shall include the name of the Contractor’s supervisory personnel responsible for identifying spills, detailed procedures of cleanup of spills, communication procedures, and methods to expedite response time.

E. Periodic Job Submittals:

1. Personal Air Monitoring: Submit copies of all personal air monitoring data sheets, chain-of-custody and analytical results to the Owner and Environmental Consultant on a daily basis prior to the start of the next work shift following sample collection.

2. Daily Logs: Submit daily logs to the Owner and Environmental Consultant daily prior to the start of the next work shift. Daily logs shall indicate the ACM quantity removed, date, time, identity, company or agency represented, and reason for entry of all persons entering the work area, and the type, amount and location(s) of all ACMs removed.

3. Provide documentation of training (and current certification identification numbers), medical monitoring and fit test records of employees as required by applicable regulations. Such documentation will be maintained on the project site as required by applicable regulations.

F. Post-Job Submittals shall be delivered to the Owner within 15-days of completion of work and shall include the following:

1. Certification: Provide the completed Certification of Clearance that Contractor has fully inspected the work area and completed work in strict accordance with the Specifications.

2. Air Monitoring: Submit documentation of all employee personal air monitoring results relative to OSHA and WISHA respiratory protection level compliance. Include copies of all air monitoring data sheets, chain-of-custody documentation and analysis reports for sampling conducted at the site.

3. Project Record Documents: Provide project records including documentation of all contract changes, and copies of worksite entry log books, safety logs, sign-in sheets, and supervisor’s daily field reports.

4. Disposal Manifests: Submit copies of all asbestos waste disposal transportation and disposal manifests including signed receipts from the landfill (shall be Owner approved landfill), and chain-of-custody.

1.06 PERSONNEL PROTECTION

A. Training: All personnel accomplishing removal of asbestos-containing materials shall have received the minimum training as required by the Washington State Department of Labor and Industries for the work to be performed. At a minimum, the supervisor shall be the bearer of a current "Certified Asbestos
Supervisor Certificate" issued by the Washington State Department of Labor and Industries. Prior to commencement of work, Contractor shall ensure all workers have been trained as specified in WAC Chapter 296-65.

1. The Contractor shall provide and post decontamination, respirator, and work procedures for abatement crew.

2. The Contractor shall ensure that all employees have been trained as to emergency evacuation procedures specific to each work area.

B. Personnel Protective Equipment for Asbestos Removal: Provide protective clothing and equipment per WAC 296-62 and Protective Clothing and Equipment.

1.07 AIR MONITORING BY CONTRACTOR (PERSONNEL AND CLEARANCE)

A. Laboratory Analysis: An Independent Testing Laboratory shall be retained by the Contractor for PCM sample analysis. All analysis shall be performed by an analyst experienced and trained in asbestos sampling and analysis. At a minimum, documentation of prior asbestos sampling and analysis experience, plus satisfactory completion of the NIOSH 582 course or equivalent will be required. Air sample collection may be performed by an Industrial Hygienist or the Contractor's foreman at the Contractor's option. The Contractor shall perform sampling and analysis of air samples for asbestos in compliance with WAC Chapter 296-62-07735, Appendix A-WISHA reference method.

B. Sample Documentation: Documentation shall be kept for each filter sample procured as to worker sampled, activity, work area location, date and time taken, volume of air drawn through filter, pump identification number and calibration. Documentation shall indicate in what areas tests were taken and shall clearly indicate the specified maximum allowable fiber levels for each area tested. Report all data on copies of the Asbestos Air Sample Data Sheet bound in these Specifications or similar approved form within 48 hours. Fill in all information on every form. Submit chain-of-custody records along with all samples.

C. Analysis Procedures: The samples shall be collected on 25 mm filters and analyzed within 12 hours using the membrane filter method at 400-500x magnification with phase contrast illumination—NIOSH Analytical Method No. 7400—for laboratory and field analysis. The analyst shall sign and submit permanent records of all samples analyzed directly to the Environmental Consultant. The Independent Testing Laboratory shall seal the unused portion of all filters in airtight containers so that individual samples can be re-analyzed at a later date if necessary. The containers shall be clearly labeled with Project Name and Sample Number and shall become property of the Owner at work completion at the Owner's request.

D. Controls: The Contractor's testing laboratory shall submit sample analysis results, chain-of-custody and equipment calibration records to the Owner prior to the start of the next work shift following collection.

E. Contractor's Sampling During Abatement.

1. Sample Collection: Air monitoring shall be performed to determine worker exposure during the period of asbestos abatement in each work area. Begin sampling when asbestos removal commences. Contractor shall determine which worker(s) in each work area is probably experiencing the most severe exposure. This is the "Most Contaminated Worker(s)". 8-hour TWA and 30-minute excursion samples shall be collected on this worker(s). This worker shall wear a personal sampling pump and the sample shall be drawn from the breathing zone of this worker.

2. The number of air samples collected shall be in accordance with the Contractor's approved work plan, however, a minimum of one sample per work area must be collected daily.

F. Quality Assurance: See Quality Assurance for additional requirements related to air monitoring.

1.08 AIR MONITORING BY OWNER

A. Industrial Hygienist: The Environmental Consultant may collect and analyze asbestos air samples prior to abatement, inside the work area, outside the work area, at HEPA exhaust, and work area
clearance/post abatement, and conduct visual inspection at the Owner's discretion and expense. See Section 1.14, Quality Assurance, for additional requirements related to air monitoring.

B. Sampling and analysis of asbestos samples shall be performed in compliance with WAC Chapter 296-62-07735, Appendix A--WISHA reference method.

C. The Owner reserves the right to monitor Contractor's performance via air samples on abatement workers in addition to the Contractor's air monitoring responsibility.

1.09 OWNER OCCUPANCY

A. The area of abatement shall be occupied only by properly trained and protected personnel during abatement activities. Construct the abatement control areas and perform the work so as not to interfere with the Owner's site and facility operations. Owner will temporary vacate the Work Areas during abatement. All existing furnishing, equipment, medical devices, computers etc. remaining at the work areas shall be protected and covered with 6-mil plastic sheeting during asbestos abatement.

1.10 WORKING HOURS

A. No asbestos abatement shall occur when University staff or building users have access to the work area(s). Refer to other Section for work hours and all restriction.

1.11 PERMITS AND NOTIFICATIONS

A. The Contractor is responsible for obtaining and maintaining all permits and notifications as required for the completion of the work by the Washington State Department of Labor and Industries, the U.S. E.P.A., the Puget Sound Clean Air Agency and any other permitting agency involved with the completion of the work included herein.

B. Puget Sound Clean Air Agency (PSCAA)

1. At least 15 days before undertaking an Asbestos Project, the Contractor shall submit to the Owner a copy of the Notice of Intent to Remove Asbestos that the Contractor has filed with PSCAA. Prior to the start of any abatement work, the Contractor shall post the Notice of Intent to Remove Asbestos with PSCAA's case number and signature of reviewing officer to prove that the Notification has been processed by PSCAA.

2. The Contractor shall participate in PSCAA's Contractor Job Scheduling program whereby a daily fax is sent to PSCAA informing them of the Contractor's work schedule. A copy of this document shall be faxed to the Owner at the same time it is faxed or emailed to PSCAA. This PSCAA notification shall remain open until the entire general contract work has been completed, in case additional asbestos should be encountered.

1.12 LIABILITY

A. The Contractor is an independent contractor and not an employee of the Owner, Architect or Environmental Consultant. The Owner, Architect and the Environmental Consultant shall have no liability to the Contractor or any third persons for Contractor's failure to faithfully perform and follow the provisions of these Specifications and the requirements of the governing agencies. Notwithstanding the failure of the Owner, Architect or the Environmental Consultant to discover a violation by the Contractor of any of the provisions of these Specifications, or to require the Contractor to fully perform and follow any of them, such failure shall not constitute a waiver of any of the requirements of these Specifications which shall remain fully binding upon the Contractor.

1.13 SUBCONTRACTORS

A. Contractor performing work of this section shall be bound to all the work and safety standards specified and contractor's personnel shall meet requirements as specified.

1.14 QUALITY ASSURANCE
A. Qualifications for Performance of Work

1. Contractor performing the work of this section shall have a record of successful experience in asbestos removal and related Work similar in scope and magnitude to this Project. Contractor shall have valid licenses and certifications as a Contractor and an Asbestos Abatement Contractor in the State of Washington.

2. Maintain on site a full-time Certified Asbestos Supervisor approved by the Owner per pre-job submittals.

3. Provide one experienced Foreman for every ten asbestos workers, or portion thereof, utilized on the Project.

B. On-Site Observation

1. Pre-Removal: Contractor and Environmental Consultant shall perform observations regarding: demarcation of regulated area, installation of critical barriers, integrity of negative pressure enclosures, waste load-out facilities, and other conditions affecting abatement work. Contractor shall request pre-removal observations a minimum of two hours prior to desired removal commencing. No abatement work shall be performed prior to pre-removal observation by the Environmental Consultant.

2. Observation: Contractor and Environmental Consultant shall perform observations regarding: integrity of isolation barriers, decontamination facilities, worker protection, Contractor's air monitoring program, performance of abatement operations, and conformance to the Specification, EPA, OSHA, WISHA and PSCAA regulations.

3. Post Removal: Contractor and Environmental Consultant shall perform visual inspections after the removal of asbestos-containing materials and cleaning of work area(s) is complete.

   a. Following abatement and cleaning of work area(s), the abatement superintendent shall inspect the work area(s), and notify the Environmental Consultant that the scheduled post-abatement inspection may commence.

   b. Visual Inspections will be considered acceptable when no dust, debris or other refuse of any kind exists within the work area(s).

   c. Upon completion of the post-abatement inspection, the Environmental Consultant shall indicate acceptance of the work area for compliance, as appropriate.

   d. Should additional cleaning of the work area be required to meet the standards set forth in paragraph b of this section, the Environmental Consultant shall indicate deficiencies on the "Daily Log" report and notify the Contractor of such deficiencies.

   e. The Contractor shall not proceed with post abatement sampling until post-removal visual inspection by the Environmental Consultant has determined work area(s) acceptable and completes the "Certificate of Clearance Form" found in the end of this Section. Both contractor and Environmental Consultant shall sign this form for submittal to the Owner.

4. Daily Work Area Inspection/Cleaning: Inspect all work areas prior to the end of each work shift. Personnel performing such inspections shall have proper training per (minimum of Class III asbestos training). Daily work area inspections shall identify any dust, debris or other refuse existing in areas to be occupied by building staff or users subsequent to the Contractor’s work shift.

   a. Any suspect asbestos debris (<1 SF) is to be cleaned using HEPA vacuums, wet-wiping and appropriately trained personnel;

   b. Any other debris identified is to be cleaned using wet-wiping and/or HEPA vacuuming;
c. Document location(s) and type(s) of debris identified, cleaning procedures, and the time of completion of cleanup in each area.

d. Any identified suspect asbestos spills in excess of 1 localized SF are to be reported immediately to the Owner and Environmental Consultant, and the affected area is to be restricted pending cleanup in compliance with the Contractor’s emergency cleanup and control plan required under Item below.

5. Stop Work: Owner shall notify the Contractor in writing to stop abatement work if the Owner determines that work practices are in violation of regulations, these Specifications or that work is endangering workers or occupants of the building. The Contractor shall continue work when conditions and actions are corrected and when written authorization is received from the Owner.

6. Schedule of Inspections: The Contractor shall schedule pre-removal and post-removal visual inspections with the Environmental Consultant a minimum of forty-eight (48) hours in advance of the desired inspection occurring.

a. Any delay in the completion of the Work caused by a lack of proper scheduling of inspections shall not be sufficient cause for any extension of time or extension of the project completion date.

C. Air Monitoring

1. Notification: If, at any time during the work, analysis of an air sample taken by the Contractor, Owner, or Environmental Consultant, indicates a fiber concentration in excess of the applicable Maximum Allowable Fiber Concentration, the laboratory that analyzed the air sample shall immediately notify the Contractor, Owner and Environmental Consultant.

2. Maximum Allowable Fiber Concentrations:

   a. Outside all Regulated Work Areas: 0.01 f/cc (fibers per cubic centimeter by PCM) or below pre-abatement.
   b. Inside Non-Isolated Regulated Work Area: 0.01 f/cc or below pre-abatement levels.
   c. Post-Abatement/Clearance: 0.01 f/cc or below pre-abatement levels.

3. Procedures: Immediately upon being notified of fiber concentration in excess of the Maximum Allowable Fiber Concentration, the Contractor shall perform the following steps in the order presented, at no additional cost to the Owner:

   a. Stop abatement work and identify source of high fiber counts.
   b. Corrective Actions: Immediately correct containment breaches, pressure differential changes and potential cause of high fiber counts. The Environmental Consultant will determine the affected area considered to be contaminated and the proper cleaning to be performed by the Contractor at no additional cost to the Owner.
   c. Clean the affected area. Cleaning will include wet methods and HEPA vacuuming.
   d. Re-sample air until fiber counts are determined to be below the specified maximum levels.
   e. Secure and repair containment barriers, repair or add equipment, modify work procedures, and make other changes to reduce fiber counts.
   g. Resume work and air monitoring.

4. Post-Abatement Sampling: The Contractor is responsible for all post abatement and/or clearance sampling using PCM sample collection and analysis. Provide to Owner and Environmental Consultant all air clearance sampling data. Analysis of PCM air clearance samples shall be posted by the contractor within four hours upon completion of clearance sampling. Upon review and found to be acceptable (and as compared to Environmental Consultant’s QA/QC clearance sampling data), the work area can be considered “cleared for re-
occupancy”. If there are conflicts with PCM sampling results, the best air quality results shall be used and applied in the field.

D. Performance: Work shall be performed in a skillful manner representing industry standards. Environmental Consultant shall require Contractor to remove from the work site employees and subcontractors the Environmental Consultant deems incompetent, careless or objectionable.

E. Additional Costs: The Contractor shall be responsible for costs of any testing, cleanup, repair, down time loss, etc. that is a result of the Contractor's negligence, poor maintenance of isolated areas, improper procedures or airborne fiber concentrations above the Maximum Allowable Fiber Concentrations.

PART 2 - PRODUCTS

2.01 PROTECTIVE CLOTHING AND EQUIPMENT

A. Provide approved clothing per WAC 296-62 for all workers and all official representatives of the Owner, State or other governmental entity, and the Environmental Consultant who may inspect or visit the project. Work clothes shall consist of disposable full-body coveralls and head and foot covers ("Tyvek" or approved equal), boots, or sneakers. Eye, hearing, fall protection, gloves and hard hats shall be available, as required by job site conditions.

B. Respirators: At a minimum, respiratory protection shall be approved by NIOSH/MSHA (National Institute for Occupational Safety and Health/Mine Safety and Health Administration), United States Department of Labor, and U.S. Department of Health, Education and Welfare, Centers for Disease Control, in accordance with WAC Chapter 296-62-071 and WAC 298-841/842. Respiratory protection shall provide workers with a maximum calculated fiber level inside the mask of 0.01 f/cc.

1. Selection: As part of the Contractor's Respiratory Protection Program, all workers shall be provided with a selection of brands and sizes of respirators to choose from. At a minimum, all workers shall be quantitatively or qualitatively fit-tested at the time of respirator selection per WAC Chapter 296-62-07715 and WAC 298-841/842.

2. Contractor shall supply replacement filter cartridges as required. Cartridges which have become wet or clogged shall be replaced immediately.

3. Contractor shall provide personal protective equipment and supplies to the Environmental Consultant and authorized visitors for use on the site.

C. Air-purifying Equipment: Air-purifying equipment shall consist of High-efficiency Particulate Air (HEPA) filtration systems. No air movement system or air equipment shall discharge asbestos fibers outside the work area. Each unit shall be capable of variable volume from a minimum of 500 CFM to at least 1700 CFM under load and shall have at least 2 stages of prefiltration ahead of the HEPA final filter. Each unit shall be equipped with an elapsed time indicator (hour meter), static pressure gauge with low flow alarm, and be overload protected. At the Contractor's option, each unit shall be equipped with heat and smoke sensors which will visually and audibly warn workers and shut unit fan down within 30 seconds. The units shall be: Micro-Trap Portable Air Filtration System manufactured by Asbestos Control Technology, Inc. or Owner approved equal.

D. Water-purifying Equipment: Capable of removing all fibers longer than 5 microns or as required by local regulations from water used in abatement work and decontamination showers. Control Resource Systems, Inc. "AQUA-HOG" or Owner approved equal.

E. Vacuum Equipment: all vacuum equipment utilized in the work area shall be High-efficiency Particulate Air (HEPA) equipment, and suitable for wet/dry usage.

F. Transportation Equipment: Transportation equipment, as required, shall be suitable for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property. Equipment shall have a hard bottom and sides. If equipment is rented, notify rental agency in advance, in writing, of intended use of equipment.
G. Electrical: Electrical tools, equipment and lighting shall meet all applicable codes and regulations, including WAC Chapter 296-155-426 to 462. Ground fault protection as required by OSHA, shall be in effect at all times. Contractor shall take all additional precautions and measures necessary to ensure a safe working environment during wet removal.

H. Remote Filter Housing: Stainless steel housing with pre-filters and HEPA filter sealed to cabinet flanges by Century Equipment "Advance Guard II" or approved equal.

I. Other Tools and Equipment: Provide other suitable tools for the removal, glovebags, enclosure, encapsulation, patching, and disposal activities including but not limited to: hand-held scrapers, wire brushes, sponges, and rounded-edge shovels.

J. Lighting: Provide adequate lighting for safe execution of work and for Environmental Consultant to perform visual inspections of work areas.

K. Pre-manufactured Remote Decontamination Facility: Remote decontamination facilities shall be in compliance with all applicable state, federal and local codes and regulations and function in accordance with these specifications.

2.02 MATERIALS

A. Plastic Sheet: Plastic sheet shall be flame-retardant polyethylene material, minimum thickness of 6-mil, sized in lengths and widths to minimize the frequency of joints. Exterior applications require reinforced plastic sheeting.

B. Plastic Bags: Plastic bags shall be 6-mil polyethylene printed with warning labels with waterproof print and permanent adhesive in accordance with WAC Chapter 296-62-07721, OSHA, DOT and EPA regulations. Permanently mark the label with the date the material was collected for disposal, the name of the waste generator, the name and affiliation of the certified asbestos supervisor, and the location at which the waste was generated.

C. Tape: Tape shall be capable of sealing joints of adjacent sheets of plastic and for attachment of plastic sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under dry and wet conditions, including use of amended water. Minimum of 2" wide tape must be used. Do not use polyethylene tape.

D. Disposal Containers: Disposal containers shall be suitable to receive and retain any asbestos-containing or contaminated materials until disposal at an approved site. The containers shall be labeled with waterproof print and permanent adhesive in accordance with WAC Chapter 296-62-07721, OSHA, DOT and EPA regulations. Permanently mark the label with the date the material was collected for disposal, the name of the waste generator, the name and affiliation of the certified asbestos supervisor, and the location at which the waste was generated. Containers must be both airtight and watertight, and have hard top, bottom and sides.

E. Warning Labels: Warning labels on plastic bags and disposal containers shall include the following information:

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DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST
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F. Warning Signs: Warning signs shall be provided and displayed at each regulated area in accordance with WAC Chapter 296-62-07721. Warning signs shall include the following information:

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DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
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AVOID BREATHING AIRBORNE ASBESTOS FIBERS

G. Amended Water: Clean potable water containing a surfactant additive. The surfactant additive shall be 50% polyoxyethylene ether and 50% polyethylene ester, or equivalent, and shall be mixed with water at a concentration of one ounce surfactant to 5 gallons of water, or as recommended by the manufacturer in the case of an equivalent.

H. Encapsulants (Sealants): Encapsulants shall be of the bridging or penetrating variety and shall be listed as "satisfactory" by the EPA. Penetrating Encapsulant: No. 207 Special Sealer #33775-27A as manufactured by Makus-Cincinnatus, Inc.; "Asbestop 30B-2" as manufactured by Asbesco Corp.; "Cable Coating 22-P" as manufactured by American Coatings Corp., or approved. Bridging Encapsulant: Decadex Firecheck, manufacturer's standard color "Magnolia", as manufactured by Pentagon Plastics, Inc.; "Cable Coating 2-B", manufacturer's standard color gray, as manufactured by American Coatings Corp.; or Owner approved equal.

I. Other Materials: Provide materials such as lumber, nails and hardware, which may be required to construct and dismantle the decontamination area and barriers isolating the work area.

J. Spray Glue: Spray glue shall be a heavy duty adhesive in aerosol can, "CDC Spray Glue" as manufactured by AMREP, Inc., or Owner approved equal.

PART 3 - EXECUTION

3.01 WORK AREA PREPARATION

A. Worker Decontamination Facilities

1. Modified Worker Decontamination Enclosure System

a. At entrances to non-isolated work areas the Contractor shall construct a personnel decontamination enclosure system or area consisting of plastic sheeting barriers with a HEPA vacuum and a water source. The system shall include a decontamination area where workers can remove contaminated protective clothing, decontaminate themselves and change into street clothing.

b. Contractor shall not begin asbestos abatement work unless this system is functional, in good repair, and has been found acceptable for specification compliance by the Environmental Consultant.

B. Access to Work Area by Others

1. Except for emergency personnel, the Contractor shall limit access to the work area to authorized visitors.

2. The Contractor shall provide protective clothing, respirators and equipment for all authorized visitors, as specified.

3. All authorized visitors shall be subject to the personnel protection provisions specified above, and shall sign in and out on the Worksite Entry Logbook.

C. Personnel Protection During Work in Non-Isolated Work Areas

1. Work clothes per 2.01-A and respiratory protection per 2.01-B.

2. Clothing: Workers shall wear two layers of coveralls after removal of street clothes. Worker decontamination will consist of personal decontamination in a regulated area over drop plastic sheeting with HEPA vacuum and wet methods. The first layer of coveralls must be removed when exiting the work area.

3. Workers shall not eat, drink or chew gum at the worksite except in the established clean room. Smoking or using other tobacco products is prohibited.
4. Workers shall be fully protected with respirators and protective clothing immediately prior to the first disturbance of asbestos-containing or contaminated material and until final cleanup is completed.

D. Emergency Precautions

1. Emergency Exits: The Contractor shall establish emergency and fire exits from the work area. Contractor shall ensure these exits are well marked and remain unobstructed.

2. First Aid: The Contractor shall be prepared to administer first aid to injured personnel after decontamination. Seriously injured personnel shall be treated immediately or evacuated without delay for decontamination.

3. Fire Department: Contractor shall notify the local fire department of the asbestos abatement project prior to beginning work area preparation.

4. Contractor shall provide fire extinguishers at all abatement work areas.

5. Emergency Clean-up: Contractor to submit to the Environmental Consultant for review an emergency control and cleanup plan to be followed in the event of asbestos contamination during work in non-isolated work areas. Contractor shall ensure all workers are thoroughly familiar with approved plan.

E. Building Security and Protection

1. The Contractor shall post adequate warning signs at all potential entrances to work areas.

2. Building Protection: Contractor shall protect all existing fixed equipment, existing building finishes that are to remain, and existing systems and functions from damage during the abatement process. Extra precautions are to be taken in protecting existing electrical panels, light fixtures, etc. Any damage to existing building, services, and/or equipment shall be remedied by the Contractor at his expense.

3. Power Failure: Contractor shall notify Environmental Consultant and Owner immediately when a power failure occurs. Asbestos abatement work will stop and the work area will be misted with water. If power failure exceeds 15 minutes, workers shall use appropriate personnel decontamination procedures and shall seal the work area. Precautions to prevent visible emissions will be performed under the direction of the Environmental Consultant.

4. Contractor shall maintain access and use of existing fire lanes and maintain security measures to prevent unauthorized access, theft or vandalism.

3.02 NON-ISOLATED WORK AREA PREPARATION

A. Performance: Contractor shall perform the following procedures in the order in which they are presented for work in non-isolated work areas according to the approved work plan. Any alternative control measures considered for Class II asbestos abatement work involving the removal of ACM that is not TSI, surfacing or sheet flooring materials shall be reviewed by the Environmental Consultant and performed in accordance with 29 CFR 1926.1101.

1. Coordinate to ensure shut down and isolation of any HVAC equipment near work areas. Allow for fourteen (14) day notification period required for shut-downs. Coordinate regarding all electrical, safety and other service connections, requirements and equipment. Contractor is responsible to detect operation of systems intended to be shut down during abatement.

2. Completely pre-clean visible accumulation of any debris in work area using HEPA vacuum equipment and use wet cleaning methods.

3. Set up a modified worker decontamination enclosure system as described above. Once this system is installed and abatement commences, it shall be utilized in the specified manner for decontamination of only personnel. All personnel shall sign the Worksite Entry Logbook each
time they enter or exit the work area. Work performed outdoors in excavated areas shall be performed wearing two disposable suits.

4. Have emergency cleanup equipment and supplies, including HEPA vacuum, amended water, disposal bags, buckets, towels and sponges, on hand prior to start of abatement work.

B. Compliance: No asbestos abatement work shall occur unless the work area has been found acceptable for Specification compliance by the Environmental Consultant. Notifications to perform asbestos abatement and the Hazardous Materials Inspection Summary shall be posted at the work site.

3.03 ISOLATED WORK AREA PREPARATION

A. Coordinate to ensure shut down and isolation of any HVAC equipment near work areas. Allow for fourteen (14) day notification period required for shut-downs. Coordinate all electrical, safety and other service connections, requirements and equipment. Contractor is responsible to detect operation of systems intended to be shut down during abatement.

B. Remove all uncontaminated removable equipment, fixtures, and supplies from the Work Area before commencing Work. If equipment and furnishing remain completely pre-clean and cover all unmovable furnishings or equipment with two layers of polyethylene sheeting, securely taped in place with duct tape. Such fixtures and equipment shall be considered outside the Work Area unless covering plastic or seal is breached. Contractor is responsible for any damage that these items incur while working in these areas.

C. Install critical barriers as follows:

1. Individually clean and seal all ventilation openings (supply and exhaust), doorways, lighting fixtures, floor drains and all other openings into the Work Area with two layers of reinforced polyethylene sheeting, taped securely in place with duct tape. Maintain seal until all Work is completed. Provide scaffolding and rigid post as necessary for proper structure integrity when negative pressure is applied.

2. Clean and seal all lighting fixtures and HVAC diffusers with duct tape, and plastic sheeting to provide an airtight and watertight seal. Take care to avoid wrapping plastic sheeting on light fixtures, which may generate heat. Ensure that all electrical conduit connections and other electrical devices inside the Work Area that are exposed to moisture are sealed.

3. Use duct tape to seal all seams of HVAC ductwork or other system components that extend through Work Area.

4. Completely pre-clean visible accumulation of any debris in work area using HEPA vacuum equipment or wet cleaning methods.

5. Seal all openings through the floor at columns and piping risers with a fire-stop sealant to provide an airtight and watertight separation between the Work Area and the floor below.

6. Seal all doorways and openings into work areas with hard rigid barriers and cover with a layer of reinforced plastic sheeting for dust controls.

D. Construct separate Decontamination Units in compliance with EPA, OSHA, and WISHA guidelines concerning number, size and placement of airlocks, etc. Shower in worker Decontamination Unit shall open into airlock on both contaminated and uncontaminated sides. Construct Decontamination Units of appropriate materials (including black plastic sheeting). Shower in personnel Decontamination Unit shall contain both hot and cold running water. Supply sufficient shower units to comply with OSHA regulations. Post OSHA decontamination procedures in Change Room and Equipment Room for duration of Project. Water for the showers shall be plumbed from an Owner-designated source.

E. Trap shower waste water using filters having a maximum pore size of 5.0 microns, and drain into a sanitary sewer. Replace contaminated filters when they become clogged but not less than every third day. Dispose of filters as contaminated waste.
F. Submit the proposed route of exhaust of negative air pressure to Environmental Consultant prior to initiating its use. Coordinate with Owner for location to exhaust (to outside the building) all negative pressure air from work areas. Place Work Area under negative air pressure utilizing negative air equipment. Allow no air movement system or air filtering equipment to discharge unfiltered air outside the Work Area. Maintain a negative pressure in the Work Area continuously (24 hours per day) from the start of removal of asbestos-containing material until the area is decontaminated and certified as such by the required air testing. Ensure that the air within the Work Area is changed at least once every 15 minutes, and maintain a pressure differential of at least -0.02 inches of water between the air within the Work Area and the air outside the Work Area. Provide manometer devise with paper read-out for all full enclosure/isolation Work Areas.

G. Notify Environmental Consultant for observation and acceptance of all critical barriers, HEPA filtration systems, and Decontamination Units before proceeding with installation of Primary Barrier.

H. Install Primary Barrier as follows:
   1. Clean all surfaces in Work Area using a HEPA filtered vacuum and by wet wiping prior to the installation of the Primary Barrier.
   2. Cover floor of Work Area with one layer of reinforced polyethylene sheeting, turned up walls at least 12 inches. Form a sharp right angle bend at junction of floor and wall so that there is no radius that could be stepped on causing the wall attachment to be pulled loose. Use spray cement and duct tape to seal all seams in floor covering.
   3. Cover all walls in Work Area with one layer of polyethylene sheeting, mechanically supported and sealed with duct tape and spray cement. Seal all joints, including the joining with the floor, with duct tape.

I. Install Secondary Barrier as follows:
   1. Cover floor of Work Area with a second layer of polyethylene sheeting, turned up walls at least 12 inches. Form a sharp right angle bend at junction of floor and wall so there is no radius of sheeting that could be stepped on causing the wall attachment to be pulled loose. Locate seams at least six feet from, or at right angles to, seams in Primary Barrier layer. Use spray cement and duct tape to seal entire length of all seams in floor covering.
   2. Cover all walls in Work Area with a second layer of polyethylene sheeting. Support polyethylene sheeting on wall with duct tape; seal top of Secondary Barrier to Primary Barrier with duct tape so debris cannot get behind it.
   3. Install sheeting so Secondary Barrier can be removed independently of the Primary Barrier.
   4. Notify Environmental Consultant for visual review and acceptance of Secondary Barrier before proceeding with any abatement activities.

J. Maintain emergency and fire exits from the Work Areas, or establish alternative exits satisfactory to fire officials.

K. Ensure that all barriers remain effectively sealed and taped for the duration of abatement activities and subsequent cleaning. Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect enclosure at the beginning of each Work period. Repair damaged barriers and remedy defects immediately upon discovery.

3.04 CEILING PLENUM CLEANING (NOT USED)

3.05 REMOVAL OF ASBESTOS-CONTAINING MATERIALS IN ISOLATED WORK AREAS

A. Contractor shall remove all asbestos-containing materials intact and non-aggressive measures as defined in these Contract Documents. Contractor shall apply spray coat of amended water to asbestos
materials to be removed. Keep material damp during entire removal process. Immediately place asbestos-containing materials in properly labeled asbestos waste bags following removal.

B. Contractor shall maintain a safe and uncluttered work site including staging area, work area, worker decontamination system, and waste load-out area.

D. Contractor shall promptly remove waste bags to the waste load-out area.

E. All dust and debris remaining in the work areas must be cleaned-up following asbestos-related work using HEPA vacuuming and wet-wiping. Protect finishes and items remaining in work areas as necessary.

H. Ensure proper cleaning of boots and equipment is performed prior to exiting such work areas.

I. Contractor shall clean external surfaces of contaminated containers and equipment thoroughly by wet sponging and HEPA vacuum.

J. Encapsulate the work area upon visual observation by Consultant and prior to final air clearance sampling.

K. See requirements under 1.14-B-3 for procedures regarding post-abatement inspection.

3.06 REMOVAL/IMPACT OF ASBESTOS-CONTAINING MATERIALS IN NON-ISOLATED AREAS

A. Contractor shall remove all asbestos-containing materials as defined in these Contract Documents. Contractor shall apply spray coat of amended water to asbestos materials to be removed. Keep material damp during entire removal process. Immediately place asbestos-containing materials in properly labeled asbestos waste bags following removal.

B. Contractor shall maintain a safe and uncluttered work site including staging area, work area, worker decontamination system, and waste load-out area.

D. Contractor shall promptly remove waste bags to the waste load-out area.

E. All dust and debris remaining in the work areas must be cleaned-up following asbestos-related work using HEPA vacuuming and wet-wiping. Protect finishes and items remaining in work areas as necessary.

F. Ensure proper cleaning of boots and equipment is performed prior to exiting such work areas.

G. Contractor shall clean external surfaces of contaminated containers and equipment thoroughly by wet sponging and HEPA vacuum. Encapsulate the work area upon visual observation by Consultant and prior to final air clearance sampling.

H. See requirements under 1.14-B-3 for procedures regarding post-abatement inspection.

I. Not In Scope - Chemicals and solvents shall not be used to remove ACM floor mastic. ACM floor mastic shall be removed with mechanical means until the floor substrate (concrete slab) is smooth.

J. Glovebag Abatement: Glovebag work shall be completed within mini-enclosures in all areas. All removal using the glovebag method shall be performed strictly according to regulations, manufacturer's printed instructions, and as demonstrated by the manufacturer's representative or as further specified in this section. A minimum of two workers are required during glovebag operations. Workers are not to smoke or wear hand or wrist jewelry while using glove bags.

1. Contractor shall coordinate with the Owner to ensure the shutoff of all sources of heat to objects to be worked on. Do no work on objects above 150 °F.

2. Contractor shall install port for hose of HEPA vacuum to create reduced pressure inside glove bag. Installing of fresh air intake and/or bridging to prevent collapse of bag are acceptable. Contractor shall use the smoke test method to check for leaks in each glovebag.
3. During the removal phase, Contractor shall utilize amended water to reduce potential for airborne fibers.

4. After completion of insulation removal and cleaning, but prior to removal of glove bag, Contractor shall apply a single “tack” coat of penetrating encapsulant to surface of pipe and any remaining non-asbestos insulation, within the glove bag. In addition properly seal and cap all abated openings per regulatory requirements.

5. After the pipe has been encapsulated, but prior to removal of glove bag, Contractor shall thoroughly wash the upper chamber of the glove bag and seal the contents of the bag in the lower chamber.

6. Contractor shall remove all contaminated air in the glovebag using a HEPA vacuum.

7. Contractor shall promptly double-bag the glove bag after removal is complete, place into a sealed container and remove to the bag holding enclosure.

8. Contractor shall not reuse glovebag, slide glovebag or join multiple glovebags to perform additional removal.

9. Asbestos-containing material remaining in wall and floor penetrations shall be wetted and placed in asbestos waste bag. Area shall be HEPA vacuumed cleaned.

3.07 DISPOSAL

A. Regulations: The Contractor shall determine current waste handling, transportation, and disposal regulations for the work site and for each waste disposal landfill. The Contractor must comply with these regulations and U.S. Department of Transportation, PSCAA Regulation III, Article 4 and EPA requirements.

B. Waste Load-Out:

1. Contractor shall coordinate activities to ensure that all asbestos-containing waste is properly containerized and removed from all work areas prior to the end of each work shift. Contractor shall prevent the accumulation of waste containers within work areas and shall ensure that all waste containers are stored in lockable, properly sealed storage container(s) at the end of each work shift.

2. Contractor shall perform waste load-out activities during pre-approved time periods via pre-approved routes through the building per Work Plan approved by Owner and Environmental Consultant.

C. Transport: Contractor shall remove all properly labeled asbestos waste from the site at the end of each work shift for disposal at Owner approved waste disposal site operated in accordance with the provisions of 40 CFR 61.156. Notify disposal site in advance of delivery to ensure immediate disposal. Maintain chain-of-custody until accepted by the landfill.

1. The University of Washington currently approves disposal of asbestos-containing waste at the following sites:
   a. Rabanco Regional Disposal Facility in Roosevelt, Washington
   b. Eastmont Transfer Station in Seattle, Washington
   c. Cedar Hills Landfill in Maple Valley, Washington
   d. Waste Management Columbia Ridge Landfill in Arlington, Oregon
   e. WCI Finley Butte Landfill, in Boardman, Oregon
   f. CWM Landfill in Kettleman Hills, California
D. Submit disposal receipts and chain-of custody for waste as specified. Contractor shall make available all disposal manifests and receipts upon request from the Environmental Consultant or Owner.
028200 FORM -1

CONTRACTOR ACKNOWLEDGMENT OF ASBESTOS HAZARD TRAINING, RESPIRATOR TRAINING AND AGREEMENT TO UNDERTAKE ALL REQUIRED PRECAUTIONS

Date:______________

To: UNIVERSITY OF WASHINGTON
Re: MV Electrical Upgrade

CONTRACTOR'S FIRM NAME: _______________________________ Print

I am an asbestos contractor and hereby warrant that I have complied with the following requirements:

1. All workers employed in the above project understand that this project includes removal and disposal of asbestos. All workers are advised and they understand the dangers inherent in handling asbestos. All workers have been informed that breathing asbestos fibers can cause Asbestosis, Mesothelioma, lung cancer and other cancers.

2. All workers and I are familiar with all Local, State and Federal requirements relating to asbestos and agree faithfully to take all required precautions and comply with these regulations.

3. All asbestos workers have had a medical examination within the past twelve months, which was paid for by the employer. This examination included: health history, pulmonary function tests and may have included an evaluation of a chest x-ray. The results of the physician’s medical examination and any limitations workers may have regarding the wearing of respiratory protection, exposure to heat stress, or any other health risks discovered during this exam are being followed. All protective equipment required by regulations and as a result of the Worker’s medical examination has been supplied.

4. All workers requiring Personal Protective Equipment have been trained in the use of each type of respiratory protective equipment and all other equipment required on this project. This training included an explanation of dangers related to misuse of this equipment and instruction on fitting, testing, inspection, donning, wearing, cleaning and maintaining this respiratory equipment.

I certify that I am a principal of the above firm and, under penalty of perjury under the laws of the State of Washington that the “Asbestos Contractor Information Form” and the foregoing is true and correct.

Name: _______________________________
Print

Title: _______________________________
Print

____________________________
Signature

This form shall be completed and submitted with the Pre-Job Submittals
CERTIFICATE OF CLEARANCE FORM

CONTRACTOR’S CERTIFICATION OF VISUAL INSPECTION
In accordance with Section 02 82 00, the Contractor’s Supervisor hereby certifies that he/she has visually inspected all surfaces within the work area and has found no dust, debris or residue.

Work Area: ____________________________________________________________

ACM Removed: _________________________________________________________

ACM Remaining: _________________________________________________________

Signature of Supervisor: _______________________ Date: _________________

Print Name: __________________________ Certificate #: ___________ Expiration Date: ___________

Company Name: ________________________________________________________

THE OWNER’S REPRESENTATIVE CERTIFICATION OF VISUAL INSPECTION
In accordance with Section 02 82 00, the Owner’s Representative hereby certifies that he/she has visually inspected all surfaces within the work area and has found no dust, debris or residue. The Owner’s Representative certifies that final clearance air sampling has met the criteria established in the specifications. All clearance air sample data and supporting paperwork is to be submitted to Owner.

Signature: __________________________ Date: __________ Pass / Fail (see punch list)

Print Name: __________________________ Certificate # & Expiration Date: __________________

Company: __________________________________________________________

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY OF WORK

A. General work items include, but are not limited to:

1. Compliance: Activities and performance requiring compliance with this Section include the impact of painted coatings or building components containing lead and other regulated heavy metals as defined in these Specifications. Impacts may include, but are not limited to: manual demolition, mechanical demolition, new work installation, grinding, tuck-pointing, cutting, sawing, scraping, surface preparation, surface cleaning, drilling, sanding, welding or torch-cutting. Refer to Section 01 11 01 and 02 80 00, for information regarding lead/metals-containing items in areas of the Work.

2. Handling: Conduct activities involving lead-containing paint (or metals-containing building materials) under Work of this Contract in accordance with this Section and current applicable state and federal regulations including: "Lead"; WAC 296-155-176: "Occupational Health and Environmental Control"; and 29 CFR 1926.62: "Lead Exposure in Construction - Interim Final Rule" and WAC 296-841 "Airborne Contaminants" rule.

3. Lead-containing paint was identified or assumed on the following building components:

   - Kirsten Wind Tunnel Building - paint on sheet metal ducts, equipment (transformers) and concrete walls.
   - Henderson Hall, John Wallace Hall, Schmitz Hall, Condon Hall, Bagley Hall, Benson Hall, and Bloedel Hall - paint on sheet metal ducts, equipment (transformers) and concrete/wallboard walls.
   - Gray and silver paint on steel Transformer housing, Link Box and Switchgears (assumed on all electrical equipment).
   - Tunnels: Gray and silver coatings on steel piping, steel pipe racks, unistrut supports and brackets and paint on tunnel walls.

4. Waste Disposal: Disposal of waste as "dangerous" according WAC 173-303 is required for debris or items failing characterization (waste profiling requirements related to lead). Dangerous waste will be separated and segregated from the general construction/demolition debris, properly packaged and disposed through UW EH&S Environmental Program Office (EPO).

5. Initial waste stream characterization of the site indicates demolition debris will not require special handling related to lead/metals, and may be disposed-off as solid waste (construction demolition and land clearing debris) using Owner approved facilities and landfill.

6. Upon waste profiling, metals-containing items and lead painted building materials must be segregated and handled as regulated waste without regard to waste stream characterization and must be disposed of as general construction debris (for landfill) and cannot be recycled. Exception, paint on metals can be recycled as scrap metal.

7. Monitoring: Monitoring of airborne concentrations of lead in accordance with WAC 296-155-176 and this Section (contractor’s responsibility). The intent of this Section is to reduce and maintain employee exposure to lead and surrounding environmental airborne concentrations at or below the permissible exposure limit.
1.2 RELATED WORK

A. Drawings, General Conditions, Modifications to the General Conditions, Supplemental Conditions to the General Conditions, and other Divisions apply to this Section.

1.3 SUBMITTALS

A. Submit electronic documentation of the following "Pre-Work Submittals" prior to start of work. The Work may not proceed until complete Pre-Work Submittal package has been reviewed and approved by the Environmental Consultant. Allow ten days for Owner review.

1. Metals Compliance Program: Submit a site-specific lead/metals compliance program in accordance with WAC Chapter 296-155 and this section. The plan shall be developed and implemented to provide engineering, work practice and administrative controls to reduce and maintain employee exposure to lead/metals at or below the permissible exposure limit. The plan will include at a minimum task-specific descriptions of activities; engineering (such as and not limited to negative pressure enclosure) and dust controls; personnel; procedures; method of compliance; technology used to meet compliance; air monitoring plan; detailed schedule; work practice program; administrative controls and other relevant information. Implementation of work practices not described in the Metals Compliance Plan will not be permitted until an amendment to the submittal is reviewed by the Environmental Consultant and Owner.

2. Medical Program: Submit written proof medical exam program complies with OSHA Lead Regulations 29 CFR 1910.2 and 1926.62, and WAC Chapter 296-155. Initial medical surveillance consisting of biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels shall be submitted for each employee occupationally exposed to lead at or above the action level.

3. Worker Training Program: Submit written proof indicating that all employees impacting lead-containing materials have received training per 29 CFR 1926.62 and WAC Chapter 296-155. Proof shall include a signature from the Contractor's Principal indicating that all employees performing lead related activities have completed such a program.


5. Waste Stream Calculations: Submit a detailed breakdown of waste stream constituents and associated volumetric calculations for review by the Environmental Consultant to determine the need for additional waste stream calculation or further waste characterization.

B. Final Submittals:

1. Project Record Documents: Provide record of metals control activities including disposition of each type of metals-containing item and products removed from the site.

2. Air Monitoring: Submit copies of all air monitoring data (including sample data sheets), chain-of-custody documentation and calibration records related to the initial exposure assessment for workers impacting metals-containing materials.

1.4 AIR MONITORING

A. Testing Laboratory: An Independent Testing Laboratory shall be retained by the Contractor for all metals air analysis. All personnel exposure monitoring analysis shall be performed in accordance
with 29 CFR Part 1926.62 and WAC Chapter 296-155. The laboratory must participate in the ELPAT Program and be a member of AIHA. Air sample collection may be performed by an Industrial Hygienist or the Contractor's trained supervisor at the Contractor's option.

B. Sample Documentation: Documentation shall be kept for each filter sample procured as to worker sampled, social security number, activity, work area location, date and time taken, volume of air drawn through filter, pump identification number and calibration. Documentation shall indicate in what areas tests were taken and shall clearly indicate the specified maximum allowable levels for each area tested. Report all data. Complete laboratory chain-of-custody records.

C. Analysis Procedures: The samples shall be collected on 37 mm filters and analyzed within 24 hours using NIOSH Analytical Method No. 7105 or 7082. The containers shall be clearly labeled with project name and Sample Number and shall become property of the Owner at work completion at the Owner's request.

D. Contractor's Sampling During Metals Related Activities:

1. Initial exposure: Personnel exposure monitoring shall be performed by the Contractor during impact of representative metals-painted building components per WAC 296-155.

2. Most Contaminated Worker: The Contractor shall determine which worker(s) in each work area is probably experiencing the most severe exposure. This is the "Most Contaminated Worker(s)". An 8-hour TWA samples shall be collected on this worker(s). Worker shall wear a personal sampling pump and the sample shall be drawn from the breathing zone of this worker.

3. Number of samples: The number of air samples collected shall be as defined in the approved Metals Compliance Program. Historical measurements per WAC 296-155 may be used to satisfy continuing exposure assessment requirements.

E. Work Area Monitoring

1. Monitoring: The Owner reserves the right to monitor Contractor's performance via air, dust wipe and TCLP samples during metals related activities, in addition to the Contractor's exposure monitoring and testing. Sampling by the Owner will not be available for use as the Contractor's Initial Exposure Assessment.

2. Quality Control

   a. Maximum allowable airborne concentrations: Contractor shall ensure that at all times airborne concentrations of metals outside lead or metals related work areas are maintained at or below the OSHA Action Level of 30 µg/m³ (for Lead), 0.5 mg/m³ (for Barium/Chromium) and 0.05 mg/m³ (for Mercury).

   b. Immediately upon being notified of concentrations exceeding the specified maximum allowable levels, the Contractor shall perform the following steps in the order presented, at no additional cost to the Owner: Stop lead/metals related activities work, identify source of high metals concentrations, develop plan with Environmental Consultant and Owner to complete metals related activities in a manner to prevent visible emissions and elevated metals levels.

1.5 SUBCONTRACTORS

A. Subcontractors employed by the Contractor shall be bound to all the work and safety standards specified. Subcontractor's personnel shall meet requirements as specified, and shall be supervised
by the Contractor during performance of this work.

1.6 LIABILITY

A. The Contractor is an independent contractor and not an employee of the Owner, Architect or Environmental Consultant. The Owner and the Environmental Consultant shall have no liability to the Contractor or any third persons for Contractor's failure to faithfully perform and follow the provisions of these Specifications and the requirements of the governing agencies. Notwithstanding the failure of the Owner or the Environmental Consultant to discover a violation by the Contractor of any of the provisions of these Specifications, or to require the Contractor to fully perform and follow any of them, such failure shall not constitute a waiver of any of the requirements of these Specifications which shall remain fully binding upon the Contractor.

PART 2 - PRODUCTS

2.1 PROTECTIVE CLOTHING AND EQUIPMENT

A. Personnel Protective Equipment and materials (not limited to negative air equipment equipped with HEPA filters, flex-ductwork for exhaust, 6-mil plastic sheeting, duct tape, rigid barriers, wood studs, etc.) for Lead/metals-related activities shall be provided per WAC 296-155.

PART 3 - EXECUTION

3.1 WORK PRACTICES

A. Restrictions:

1. Use of mechanical methods including, but not limited to power sanding, grinding, sand-blasting, etc. shall be performed within a negative pressure enclosure (NPE) pending approval of negative exposure assessment by the Owner.

B. Negative Exposure Assessment: The Contractor may waive the requirement of a negative pressure enclosure when using mechanical methods upon approval by the Environmental Consultant of data indicating a negative exposure assessment has been completed per WAC 296-155 and paragraph 1.6, Air Monitoring. The Contractor shall allow 48-hours for review of such data.

C. Housekeeping: Maintain all surfaces as free as practicable of accumulations of metals and perform clean-up and wet wipe down of work areas as necessary according to WAC 296-155-17617.

D. Work Practices:

1. Set-up Activities: Prior to impact of metals-containing painted components, Contractor shall cover the ground below the work area with 6-mil plastic sheeting or equivalent. The drop-sheeting shall extend outward a minimum of 6 feet from the location of item(s) being removed. Any tears that occur in the drop-sheeting shall be immediately repaired with duct tape or other acceptable seal. Debris shall be collected with a wet/dry vacuum to avoid escape from the drop-sheeting. Wash water shall be retained on the drop-sheeting and removed by mops or wet/dry vacuums. The residue/debris and water shall be placed in storage drums for testing prior to disposal. See paragraph 3.1-E for testing requirements.

2. Perform work impacting metals-containing items and painted components in accordance with approved metals work plan. Use procedures and equipment required to limit occupational and environmental exposure to metals when lead-containing paint is impacted. The procedures employed by the Contractor shall not create the potential for contaminating surrounding areas
or materials with lead-containing dust. Dust generation shall be minimized at all times.

3. At completion of the above operations, HEPA vacuum drop-sheeting to remove any paint particles or debris and wet-wipe or mop-up plastic sheeting to remove all dust.

E. Debris Testing

1. It is recommended that the water collected with wet/dry vacuums be filtered to remove paint and debris chips and then stored in drums for testing prior to disposal. The paint and debris chips shall be placed in a separate drum for disposal at the Contractor’s expense. If appropriate, no rinse water shall be discharged without testing by the Environmental Consultant.

2. Debris Testing: Representative sample of debris shall be collected for TCLP testing by the Environmental Consultant. The method/location of general debris disposal will be established by test results - less than 5 parts per million (ppm) for Lead/Chromium. See paragraph 3.1-F for disposal requirements.

F. Disposal Procedures:

1. Waste characterization of the anticipated general waste stream will be performed by the Owner as necessary. Results of such characterization will be provided to the Contractor as appropriate. The Owner anticipates that disposal of demolition debris can be performed as general construction waste and subject to Owner approved Subtitle D landfill.

2. Metals or Lead-Containing Building Materials Disposal: Any waste failing TCLP and categorized as hazardous and regulated waste will be separated and segregated from the general construction/demolition debris, packaged and disposed through UW’s Environmental Programs Office.

3. Construction debris containing lead and regulated metals: Refer to Section 01 11 01 for exceptions (recycling of metals is allowed such as steel radiators and steel door casing). Construction and demolition debris generated from the project site will be treated as construction/demolition and land clearing debris (CDL) for landfill even if TCLP test analysis for metals are below acceptable levels. CDL solid waste will be disposed of at an Owner approved Subtitle D landfill listed below:

   a. Rabanco Regional Disposal Facility in Roosevelt, Washington
   b. Eastmont Transfer Station in Seattle, Washington
   c. Cedar Hills Landfill in Maple Valley, Washington
   d. Waste Management Columbia Ridge, Landfill in Arlington, Oregon
   e. WCI Finley Butte Landfill, in Boardman, Oregon
   f. Waste Management, Greater Wenatchee Landfill, East Wenatchee, Washington

END OF SECTION 02 83 00
PART 1 - GENERAL

1.1 SCOPE

A. Provide all labor, materials, coordination with Owner, equipment, services, power shutdowns, permits and insurance required to complete the handling, cleanup, removal, transportation and proper disposal of PCB-containing oil, transformers, concrete pads, link boxes building walls.

B. Impacted equipment listed in the following areas is not limited to transformers, cables, link/feeder boxes, switchgears and other electrical equipment to be impacted and demolished as indicated in the Contract Documents and drawings. Initial representative sampling of these equipment revealed that PCB-containing product (in low concentration) and oil is present in transformer equipment and on concrete slab within the following areas:

<table>
<thead>
<tr>
<th>Building Room No./ Transformer or Link Box</th>
<th>Transformer Oil PCB concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kirsten Wind Tunnel Room 101</td>
<td>2 ppm</td>
</tr>
<tr>
<td>Henderson Hall, Room 014</td>
<td>86 ppm</td>
</tr>
<tr>
<td>John Wallace Hall, Transformer Room</td>
<td>9 ppm</td>
</tr>
<tr>
<td>Schmitz Hall, Transformer Room</td>
<td>9 ppm</td>
</tr>
<tr>
<td>Link Box (LB) 1 and 2, Tunnel CP 5 to Condon Hall</td>
<td>62 ppm</td>
</tr>
</tbody>
</table>

( ppm = parts per million)

C. Scope of Work:

1. Transformers and Link Box (LB 1 and 2): Purge all oil filled transformers (containing low levels of PCBs) and Link Box 1 and 2. Upon completion of removal of the transformers and Link Box, remediate and decontaminate equipment (transformer and LBs), concrete floor slab and steel grading (below Link Box 1 and 2) and tunnel concrete walls. Owner’s consultant shall provide post cleanup sampling to determine completeness of remediation of concrete slab.

1.2 DEFINITIONS

A. Authorized Visitor: The Owner or designated representative, or a representative of any regulatory or other agency having jurisdiction over the project, and having required training, medical approval, fit test, etc.

B. Controlled Area: Area that only qualified and properly protected workers or authorized visitors has access.

C. Decontamination Area: enclosed area adjacent and connected to controlled/ regulated work area, consisting of an equipment room and clean room, which is used to decontaminate workers, materials, and equipment. Where PCB removal is done in conjunction with asbestos or lead abatement the decontamination area for asbestos or lead may be used for this purpose.
D. Disposal: Procedures necessary to transport and deposit the PCB materials in an approved waste disposal site in compliance with EPA and other applicable regulations. Disposal Site shall be an Owner approved and designated landfill, incinerator or recycling company for PCB-containing waste.

E. Owner’s Environmental Consultant: Environmental consultant specializing in hazardous materials abatement - PBS Engineering and Environmental - or any subcontractor designated by PBS.

F. Incineration: The destruction of PCBs by an EPA-approved facility. The facility must be a TSCA-permitted incinerator and a licensed TSDF, Transportation Storage and Disposal Facility. All operating permits must be current.

G. MSDS: Material Safety Data Sheet supplied by manufacturer provides information on a product listed in OSHA 29 CFR 1910.1200(g)(2).

H. Polychlorinated Biphenyls (PCBs): A class of chlorinated hydrocarbon compounds containing a variable number of chlorine atoms. Commercially available products contain mixtures of as many as 40 to 70 PCB compounds (isomers). A compound containing more than 50 ppm of PCBs is considered to be PCB-containing. PCBs range from oily liquids to white, crystalline solids to hard, noncrystalline resins or waxy solids.

I. Waste Shipment Records: Form similar to Uniform Hazardous Waste Manifest, or an EPA approved state form.

1.3 DOCUMENTS INCORPORATED BY REFERENCE

A. The current issue of each document shall govern. Where conflict among requirements or with these Specifications exists, the most stringent requirements shall apply.

1. U.S. Environmental Protection Agency Toxic Substance Control Act, TSCA, (Code of Federal Regulations Title 40, Part 761)
3. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), 40 CFR 1910.120.

1.4 SUBMITTALS AND NOTICES

A. Contractors shall submit three copies of the following information 10 days prior to beginning work:

1. WORK PLAN. Submit a written "work plan" satisfactory to the Owner and Environmental Consultant describing the schedule for PCB abatement, methods and work practices, worker protection, and worker training (minimum 40-hours Hazwopper certification). The work plan shall also include methods to be employed for draining equipment containing PCB oil, worker PPE, decontamination and cleanup procedures for designated surface areas in the scope. Include emergency control measures and cleanup procedures (in event of spills) and emergency phone number(s) of key personnel.
2. **DISPOSAL PLAN.** Contractor shall be responsible to coordinate with the Owner for waste disposal requirements and sequencing of the remediation. The Owner will manage the transportation and disposal of PCB waste generated from this project and submit waste shipment records to the Environmental Consultant.

3. Coordination lead time: The Owner requires 7 calendar days to ship drums containing PCB waste and 14 calendar days to ship transformer carcasses/equipment.

B. The UW EHS will provide the proper notification to EPA regarding PCB activity and waste disposal as required.

C. Refer to EPA, OSHA, and other standards referenced herein for further information and regulatory requirements not included above.

1.5 **PERSONNEL PROTECTION**

A. Personnel Protective Equipment for PCB Removal

1. Worker personal protective equipment (PPE) shall consist of PCB-resistant gloves and clothing, eye, hearing, head and fall protection as necessary.

2. Half-face mask, negative-pressure respirator with disposable chemical vapor cartridge (P-100). Protection factor: 10. Additional HEPA filter cartridges for particulates including asbestos and lead shall be available for use in areas where these materials are present.

3. Provide additional personnel and respiratory protection to minimize any possible exposure from inhalation.

B. Worker Decontamination Area

1. Where PCB abatement is performed in conjunction with asbestos, lead abatement or other hazardous materials abatement, a multiple use decontamination area shall be established.

2. The Contractor shall provide a decontamination/emergency clean up area consisting of PCB-resistant sheeting (drop cloth) with absorbent material and other necessary equipment. Washing facilities with hot water and cleanser that is capable of removing oily compounds without injury to human skin.

1.6 **SAFETY**

A. With regard to the work of this contract, the safety of the Contractor’s employees, the Owner’s employees, and the public is the sole responsibility of the Contractor.

1.7 **LIABILITY**

A. The Contractor is an independent contractor and not an employee of the Owner, Architect or Environmental Consultant. The Owner, Architect and the Environmental Consultant shall have no liability to the Contractor or any third persons for Contractor’s failure to faithfully perform and follow the provisions of these Specifications and the requirements of the governing agencies. Notwithstanding the failure of the Owner, Architect or the Environmental Consultant to discover a violation by the Contractor of any of the provisions of these Specifications, or to require the Contractor to fully perform and follow any of them, such failure shall not constitute a waiver of
any of the requirements of these Specifications which shall remain fully binding upon the Contractor.

1.8 QUALITY ASSURANCE

A. Environmental Consultant shall perform periodic inspections to observe work, handling and packaging procedures. Environmental Consultant may perform surface wipe, bulk and air testing for PCBs to determine possible contamination and environmental exposure, and verify that PCB levels are not exceeded.

B. Environmental Consultant shall notify the Contractor in writing to stop work if the Environmental Consultant determines that work practices are in violation of the Specifications or work is endangering workers and occupants of the building. The Contractor shall continue work when conditions and actions are corrected and when written authorization is received from the Environmental Consultant.

1.9 TESTING LIMITS

A. PCB levels for airborne, decontaminate, cleanup and hazardous waste disposal are as follows:

1. Worker airborne concentrations below 1 \( \text{ug/m}^3 \) (microgram per cubic meter) or pre-abatement background levels, where available.

2. Concentrations below 10 \( \text{ug/100cm}^2 \) (microgram per square centimeter) on building surfaces - standard for concrete surface areas to be considered cleaned.

3. Concentrations below 2 parts per million for general construction solid waste disposal.

B. Following the clean-up of suspect PCB-containing oils and when a covered container becomes full, the Contractor is to inform the Owner and the Environmental Consultant. The Environmental Consultant will provide the analytical data to the Contractor and the UW EHS. Based on the results of the analysis, EHS will notify the Contractor of debris/waste designation as described in the following table:

<table>
<thead>
<tr>
<th>PCB level in (ppm)</th>
<th>Waste Designation</th>
<th>Labeling</th>
<th>Handling or Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2</td>
<td>“Construction Debris”</td>
<td>Contractor shall label drums with sign stating date and “awaiting analytical results.” Following receipt of waste testing results and upon Owner review and approval, Contractor shall label the drum as “construction debris”.</td>
<td>Municipal Landfill; Contractor is responsible for handling and disposal of construction debris.</td>
</tr>
</tbody>
</table>

| >2 to <50         | “Special Waste”   | Contractor shall label drums with sign stating date and “awaiting analytical results.” Following receipt of results, Owner shall label the drum with a “special waste” designation to ensure proper management and disposal. | Hazardous waste landfill (to be arrange and specified by Owner); Contractor shall coordinate with Owner and Owner to handle the disposal of the waste. |

| ≥50               | “TSCA Waste”      | Contractor shall label drums with sign stating date and “awaiting analytical results.” Following receipt of results, | Incineration (to be arranged by Owner); Contractor shall coordinate with Owner and Owner to handle the disposal of the waste. |
Owner shall label the drum in accordance with Federal TSCA regulations. disposal of the waste.

TSCA = Toxic Substances Control Act

PART 2 - PRODUCTS

2.1 Plastic Sheet: Plastic sheeting shall be flame-retardant polyethylene material. It shall not dissolve on contact with PCB compounds or any chemicals used by the contractor for abatement/decontamination. The minimum thickness shall be 6-mil.

2.2 Storage Containers: Storage containers shall be suitable to receive and retain any PCB-containing or contaminated materials until disposal or incineration at an approved site. They shall comply with container specifications set forth in 49 CFR 178.80, 178.82, 178.102 or 178.116. Containers shall be labeled with waterproof print and permanent adhesive in accordance with WAC, OSHA, DOT, UN and EPA regulations.

2.3 Warning labels on all disposal containers/drums shall be according to EPA Region 10 Toxic Substances Section, PCB Regulations. The UW EHS may provide waste containers and labels for this project.

2.4 Warning Signs: Unless other signs or security access is provided, and for a temporary measure, warning signs shall be provided and displayed at each regulated area during Work to warn of the presence of PCBs. Upon completion of cleanup and clearance, these barriers and warning signs shall be removed.

2.5 Cleaning detergent or degreaser: Owner approved product – Simple Green Industrial Cleaners and Degreasers (biodegradable) or TSP solution to remove staining on concrete substrate, electrical equipment, steel grading, cables and other surfaces. Provide in the submittal package all MSDS for products to be used to complete the project.

2.6 All necessary tools and equipment to complete the remediation and cleanup efforts.

PART 3 - EXECUTION

3.1 WORK AREA PREPARATION

A. Where the work area containment requirements are determined by abatement of other hazardous materials, the Contractor shall perform PCB abatement within existing containments.

B. Where no other hazardous materials abatement is performed in conjunction with the PCB abatement prepare the work area as follows:

1. Contractor shall isolate the work area from unauthorized, unqualified and unprotected persons. At a minimum, warning signs indicating the presence of PCBs and danger tape shall be used. Whenever possible doors should be closed and tunnels or areas sealed to further reduce unauthorized access.

2. An approved disposable floor covering (i.e. plastic sheeting) shall be kept beneath the work and in areas of dismantling, consolidation or packaging.
3. An appropriate worker decontamination area shall be established.

3.2 REMOVAL OF PCB-CONTAINING OIL, EQUIPMENT AND CONCRETE PAD CLEANUP

A. Contractor will isolate work area and perform work at times and in a manner that will not result in the release or discharge of PCBs or the exposure to employees or other building occupants. The designated work area shall be regulated and restricted from entry. Electrical rooms and Transformers in Kirsten Wind Tunnel Building, Henderson Hall, John Wallace Hall and Schmitz Hall. LB 1 and 2 PCB oil in equipment and associated cleanup of steel grading and tunnel walls.

B. Contractor will account for all coordination and interface with other trades and with Owner's High Voltage Electrical Shop for all necessary shutdown requests. Allow for approximately 7 workdays for shutdown request lead-time. In addition, refer to other Section for all necessary project coordination and shut-down.

C. Contractor will be responsible for worker and environmental protection during remediation procedures. Owner and other trades will temporarily vacate from the work area during remediation.

D. Carefully handle equipment and shall not break, drop, throw, or otherwise damage the equipment.

E. Remove and drain PCB-containing oil from transformer to be demolished or impacted. Place oil in covered 55-gallon UN approved drums or other approved vessel. Provide all necessary cleanup and spill response measures.

F. Decontaminate Concrete Pads: In the above listed work areas, thoroughly clean the equipment (transformers and LB) and concrete substrate surface area using Owner approved industrial detergent (degreaser) and according to the Contractor’s Work Plan included in the pre-work submittals. Cleaning of concrete surfaces will include the footprint below the removed transformer and an additional 5 feet beyond the transformer footprint (on all sides). **LB 1 and 2:** upon removal of PCB oil from Link Box 1 and 2, decontaminate and cleanup steel grading and concrete walls approximately 100 SF in surface area in tunnel CP 5.

G. Where removal of concrete slab is indicated, contractor will use all necessary engineering controls to limit noise and dust emissions during demolition. Vacuum machines shall be equipped with HEPA filters that are approved for hazardous materials remediation operation. All debris and worker protection equipment associated with PCB remediation shall be placed into covered 55-gallon drums.

H. Contractor shall account for down-time (not to exceed 48 hours) for environmental sampling to determine cleanup levels and waste stream profiling.

I. Sampling of the footprint where the transformer or equipment was removed shall be completed by the Environmental Consultant for confirmation of remediation and/or cleanup efforts. Additional round of cleanup or demolition (of concrete slab or concrete pad) may be required if results are above the referenced standards (10 \( \mu g/100cm^2 \)).

J. If necessary, sampling of the vessel containing oil and worker protection equipment shall be completed by the Environmental Consultant for confirmation waste disposal requirements.

L. Refer to other Sections for concrete floor slab repair and replacement including application of epoxy coatings (two coats) in areas where PCB remediation occurred.
3.3 DISPOSAL

A. The Owner (UW EHS) and the Environmental Consultant shall determine current waste handling, transportation, and disposal regulations for the work site and for waste disposal (either regular construction waste or TSCA waste). The Owner’s Environmental Consultant in conjunction with UW protocols shall perform testing to designate the waste stream. Refer to section under Testing Limits.

B. Contractor shall deliver the packaged and drummed (UW approved covered containers) PCB oils and waste materials as directed by the University of Washington’s Environmental Health and Safety (UW EHS) and the Environmental Consultant. Coordinate with the Owner to schedule transportation and shipment of all waste and transformer equipment.

END OF SECTION 02 84 00
PART 1 GENERAL

1.01 DESCRIPTION

A. Purpose
   1. This section covers common work results for use in the Owner's primary and secondary power distribution systems.

1.02 QUALIFICATIONS

A. Approved manufacturers
   1. Medium voltage 5 and 15kV wire and cables
      a. 5 and 15kV single conductor: Prysmian, Southwire, Okonite
      b. 5 and 15kV armored cable: Prysmian, Southwire, Okonite
         1) Service Wire or Aetna for short lengths of steel, interlock, armored cable (< 500 feet)
      c. Or approved equal

1.03 RELATED SECTIONS

A. Electrical Identification
B. Inspection, Calibration and Testing

1.04 REFERENCES

A. Applicable codes, standards, and references codes, regulations and standards
   1. National Electrical Testing Association – NETA
   3. National Electrical Code - NEC
   4. AEIC CS6-96 (ethylene propylene rubber)
   5. ICEA S-68-516 (ethylene propylene rubber)
   6. IEEE STD 400-1991 (DC Testing)
   7. IEEE STD 48
   8. UL 1072 for physical requirements for the armor
   9. UL 1008 – Automatic Transfer Switches
   10. State and local codes and ordinances

1.05 COORDINATION

A. Coordinate Operations and Maintenance training times with the Owner.

1.06 SUBMITTALS

A. General
1. Submittals shall be in accordance with Conditions of the Contract and Division 01 Specification Sections.
2. Submit detailed maintenance manuals and drawings, which include catalog information indicating the complete electrical and mechanical characteristics.
3. Submit current manufacturer’s AEIC pre-qualification data.
4. Submit dimensioned cross-sectional drawings (manufacturer’s data sheets are acceptable).
5. Submit finished cable tests – Manufacturer’s Certified Test Reports showing compliance with ICEA S-68-516, Part 3, and UL 1072 for physical requirements of the armor and all AEIC final tests, including x-y plots of corona discharge for the actual cable furnished.
6. Submit pulling calculations and plan for each medium voltage cable length.
7. Submit data sheet on crimping tools to be used.
8. Submit for approval the résumés of the medium voltage cable splicers. Qualifications should include certification, recent work history on similar splice type and knowledge of the “Safety Standards for Electrical Workers” (WAC 296-45).

1.07 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. Operations and Maintenance Manuals shall be in accordance with Conditions of the Contract and Division 01 Specification Sections.

B. Operations and Maintenance Manuals shall include but not be limited to pull calculations and catalog information indicating complete electrical and mechanical characteristics.

C. Manufacturer’s Certified Test Reports

D. Manufacturer’s AEIC Pre-qualification Data

1.08 MEETINGS

A. Pre-installation conference
   1. The Contractor shall request a pre-installation conference with the UW Engineering Services and UW Physical Plant High Voltage Shop for projects with medium and high voltage work.

B. Attend meetings with the Owner and/or Owner’s Representative as required to resolve any installation or functional problems.

PART 2 PRODUCTS

2.01 GENERAL

A. These cable and terminations specifications are in accord with the Owner’s policy to construct permanent installations with long life, coupled with maximum reliability and safety.
2.02 MEDIUM VOLTAGE WIRE AND CABLE

A. The following shall apply to both 5kV and 15kV medium voltage power conductors used as single conductors or assembled into 3/c armored cable:

1. Single conductors
   a. Conductors: Class B stranded, concentric, soft or annealed copper per Part 2 of ICEA S-68-516
   b. Strand screen: Extruded semi-conducting thermosetting compound applied over the conductor. The material shall be compatible with the conductor metal, shall be uniformly and firmly bonded to the overlying insulation, and be free of stripping from the conductor.
   c. Insulation: High quality heat, moisture, ozone and corona resistant Ethylene Propylene Rubber (EPR) compound.
      1) The insulation shall contrast in color with the strand screen and insulation shield per AEIC CS 6.
      2) Insulation level shall be 133% (115 mils for 5kV, 220 mils for 15kV).
      3) The minimum thickness of the insulation at any point shall not be less than 90% of the specified nominal thickness.
      4) The insulation shall contain no more than 2% polyethylene.
   d. Insulation shield: Extruded semi-conducting thermosetting compound applied directly over the insulation. The material shall be compatible with the insulation and overlying metallic shield. The insulation shield shall be clean and free of stripping from the insulation and comply with Paragraph D.1 of AEIC CS 6.
   e. Manufacturing process: The strand screen, insulation, and insulation shield shall be applied with a triple-tandem process providing a virtual corona-free core. The EPR insulation system shall not be exposed to the atmosphere during manufacture.
   f. Metallic shield and individual jacket: .005 inch thickness of copper tape helically applied over the insulation shield material with a 25% overlap, covered with an extruded PVC outer jacket meeting the requirements of ICEA S-68-516 Paragraph 4.4.10
   g. Identification: The following information shall be surface-printed on the overall jacket: Manufacturer’s name, cable size, cable type, year of manufacture and voltage rating.

2. Armored cable (in addition to single conductors)
   a. Size: see drawings.
   b. Grounding conductors: Bare copper, stranded in accordance with ICEA S-68-516, Part 2. Size shall be in accordance with UL 1072, Table 11A; or sized to handle fault current as specified on drawings.
      1. IMPORTANT: #2/0 cable requires larger ground conductors to meet ground current protection requirements of 500KCM cable. Provide ground conductors in #2/0 cable equal to that of 500KCM cable.
      2. Filler material: Non-hygroscopic material, fine fiber, completely filling center and peripheral interstices
   c. Binder tape: Applied over assembly to provide a solid core
d. Armor: Galvanized steel, interlocked armor in accordance with ICEA S-68-516, Part 4 and UL 1072, Part 25.11

e. Overall jacket: Polyvinyl Chloride (PVC) in accordance with ICEA S-68-516 paragraph 4.4.10. Industry standard color by voltage class (Red for 13.8kV).

f. Identification: The following information shall be surface printed on the overall jacket: Manufacturer’s name, cable size, cable type, year of manufacture and voltage rating.

g. Listings: Finished cable shall be UL listed as Type MC, MV-90 and "For CT USE."

3. Cable rejection

a. Cable shall be subject to inspection by the University at delivery and installation and subject to rejection for shipping and/or installation damage including, but not limited to, jacket penetration, armor denting, or other indications that cable integrity has been compromised.

b. Hi-pot and Megger testing will not be the sole determining factor in the Owner accepting or rejecting damaged cable.

2.03 SPLICES AND TERMINATIONS

A. Medium voltage

1. Medium voltage connections and terminations ( armored cable and single conductor)
   - Long barrel, 2-hole hydraulic crimp lugs, with Raychem "HVT" or 3M "Quick Term" series 5600 termination kits, or approved equal.

2. Splices other than cold shrink are to be housed in a listed enclosure: OZ Gedney Series SPKJR, G&W #E74, Adalet 3AS manufactured by PLM, or approved equal, with fittings to suit cable.

3. 5kV cable may be connected in a link box (GW type "WH" or Gran-Cal with proper cable fittings.) 15kV cable may terminate in existing link boxes.

4. Method of crimp termination for #8 awg and larger shall be performed with correctly sized hexacentric die only.
   a. Manufacturers: 3M, Elastimold; or approved equal.

PART 3 EXECUTION

3.01 REQUIREMENTS

A. General installation

1. Identification
   a. Reference section 26 05 53 Identification

2. Installation
   a. Only personnel qualified and experienced in this type of work shall make connections.

   b. The installation of cables shall be done with care to avoid damage.
      1) Cables showing damage after installation shall be replaced.
2) Rollers and spools shall be used in adequate numbers for pulling in cables.

3) The tension limitations, side wall pressure, and minimum bending radius as given by the cable manufacturer shall be adhered to.

c. Cable pulling

1) In no case will strands be removed to attach pulling eyes.

2) Tension is limited to 1000 lbs. using basket grips.

3) Lubrication shall be as approved for the insulation and raceway material.

4) Prior to pulling, calculations of pulling tension and side wall pressure shall be submitted.

5) A dynamometer shall be used and tension recorded for all MV pulls.

6) Use no mechanical means for pulling #8 and smaller AWG conductors.

d. Cable pulling setups and operations shall be witnessed by the UW Physical Plant High Voltage Shop and Engineering Services.

e. Interlocked armor cable shall be pulled only when both the armor and conductors are gripped. Remove cable similarly.

f. All cable that leaves a tray shall be taped/wrapped with Scotch 77, MAC AP30, or Quelcor “Quelpyre” fireproofing tape.

g. All new cable not routed in cable tray shall be taped/wrapped with Scotch 77, MAC AP30, or Quelcor “Quelpyre” fireproofing tape.

h. Cable Supports when cable is not in cable tray:

1) Supports shall consist of all thread hangers to a unistrut bar and Kindorf strap clamps.

2) Cables shall be padded with two layers of insulation stripped from the termination end of the armored cable.

B. Medium voltage cable terminations

1. Phase mark each conductor, secure conductors adequately and observe cable bend radius limitations. Owner will identify the West Receiving Station phase rotation convention.

2. System Phase Sequence is C-B-A.

3. MV switch phase terminations shall be A-B-C left to right when facing the front of the switch.

4. Junction box phase terminations are A-B-C left to right.

5. Standard link box phase terminations are A-B-C left to right, top to bottom, front to back. Some existing link box phase terminations are not standard, especially on the 2.4kV normal and emergency power system.

6. UW's Physical Plant Department High Voltage Shop will identify the phase designation of the existing primary distribution system conductors to which the Contractor is to make a connection.

a. The shop will also check the Contractor's work to ensure the accuracy of the connections.
b. The Contractor shall arrange with the Owner for the times when their services will be required, and under no circumstances shall the Contractor connect to the existing system without Owner's knowledge.

c. The proper connection of the wires and cables to other systems as specified is entirely the responsibility of the Contractor.

d. In the event the connections cannot be made as specified, the Contractor shall make the necessary corrections at his own expense.

7. Install cable terminations per manufacturer's recommendations.

8. Medium voltage cable splices shall be made only when absolutely necessary. When necessary, splices shall be made only by personnel qualified and experienced in this type of work.

9. Each high voltage splice or connection shall be permanently labeled with the following information:
   a. Contract or project designation
   b. Contractor doing work
   c. Name of splicer and date

10. Do not score the conductor when stripping insulation and always pare or pencil when using a blade. Use of a stripping tool is preferable.

11. All terminations shall be secure and tightened in accordance with the manufacturer's recommendations.

C. Mounting and electrical connections
   1. In accordance with manufacturer's installation instructions.
   2. Coordinate remote control and annunciation with the Owner.

D. Testing
   1. Provide testing as required per 26 60 00 Inspection, Calibration and Test.

END OF SECTION
PART 1  GENERAL

1.01  DESCRIPTION

A. Purpose
   1. This section covers medium voltage cable and terminations for use in the Owner's primary and secondary power distribution systems.

1.02  QUALIFICATIONS

A. Approved manufacturers
   1. Medium voltage 5 and 15kV wire and cables
      a. 5 and 15kV single conductor: Prysmian, Southwire, Okonite
      b. 5 and 15kV armored cable: Prysmian, Southwire, Okonite
         1) Service Wire or Aetna for short lengths of steel, interlock, armored cable (< 500 feet)
      c. Or approved equal

1.03  RELATED SECTIONS

A. Electrical Identification
B. Inspection, Calibration and Testing

1.04  REFERENCES

A. Applicable codes, standards, and references codes, regulations and standards
   1. National Electrical Testing Association – NETA
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   4. AEIC CS6-96 (ethylene propylene rubber)
   5. ICEA S-68-516 (ethylene propylene rubber)
   6. IEEE STD 400-1991 (DC Testing)
   7. IEEE STD 48
   8. UL 1072 for physical requirements for the armor
   9. UL 1008 – Automatic Transfer Switches
   10. State and local codes and ordinances

1.05  COORDINATION

A. Coordinate Operations and Maintenance training times with the Owner.

1.06  SUBMITTALS

A. General
1. Submittals shall be in accordance with Conditions of the Contract and Division 01 Specification Sections.
2. Submit detailed maintenance manuals and drawings, which include catalog information indicating the complete electrical and mechanical characteristics.
3. Submit current manufacturer’s AEIC pre-qualification data.
4. Submit dimensioned cross-sectional drawings (manufacturer’s data sheets are acceptable).
5. Submit finished cable tests – Manufacturer’s Certified Test Reports showing compliance with ICEA S-68-516, Part 3, and UL 1072 for physical requirements of the armor and all AEIC final tests, including x-y plots of corona discharge for the actual cable furnished.
6. Submit pulling calculations and plan for each medium voltage cable length.
7. Submit data sheet on crimping tools to be used.
8. Submit for approval the résumés of the medium voltage cable splicers. Qualifications should include certification, recent work history on similar splice type and knowledge of the “Safety Standards for Electrical Workers” (WAC 296-45).

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C. Manufacturer’s Certified Test Reports
D. Manufacturer’s AEIC Pre-qualification Data

1.08 MEETINGS
A. Pre-installation conference
   1. The Contractor shall request a pre-installation conference with the UW Engineering Services and UW Physical Plant High Voltage Shop for projects with medium and high voltage work.
B. Attend meetings with the Owner and/or Owner’s Representative as required to resolve any installation or functional problems.

PART 2 PRODUCTS

2.01 GENERAL
A. These cable and terminations specifications are in accord with the Owner’s policy to construct permanent installations with long life, coupled with maximum reliability and safety.
2.02 MEDIUM VOLTAGE WIRE AND CABLE

A. The following shall apply to both 5kV and 15kV medium voltage power conductors used as single conductors or assembled into 3/c armored cable:

1. Single conductors
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   b. Strand screen: Extruded semi-conducting thermosetting compound applied over the conductor. The material shall be compatible with the conductor metal, shall be uniformly and firmly bonded to the overlying insulation, and be free of stripping from the conductor.
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      1) The insulation shall contrast in color with the strand screen and insulation shield per AEIC CS 6.
      2) Insulation level shall be 133% (115 mils for 5kV, 220 mils for 15kV).
      3) The minimum thickness of the insulation at any point shall not be less than 90% of the specified nominal thickness.
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   e. Manufacturing process: The strand screen, insulation, and insulation shield shall be applied with a triple-tandem process providing a virtual corona-free core. The EPR insulation system shall not be exposed to the atmosphere during manufacture.
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   g. Identification: The following information shall be surface-printed on the overall jacket: Manufacturer’s name, cable size, cable type, year of manufacture and voltage rating.

2. Armored cable (in addition to single conductors)
   a. Size: see drawings.
   b. Grounding conductors: Bare copper, stranded in accordance with ICEA S-68-516, Part 2. Size shall be in accordance with UL 1072, Table 11A; or sized to handle fault current as specified on drawings.
      1. IMPORTANT: #2/0 cable requires larger ground conductors to meet ground current protection requirements of 500KCM cable. Provide ground conductors in #2/0 cable equal to that of 500KCM cable.
      2. Filler material: Non-hygroscopic material, fine fiber, completely filling center and peripheral interstices
   c. Binder tape: Applied over assembly to provide a solid core
d. Armor: Galvanized steel, interlocked armor in accordance with ICEA S-68-516, Part 4 and UL 1072, Part 25.11

e. Overall jacket: Polyvinyl Chloride (PVC) in accordance with ICEA S-68-516 paragraph 4.4.10. Industry standard color by voltage class (Red for 13.8kV).

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a. Cable shall be subject to inspection by the University at delivery and installation and subject to rejection for shipping and/or installation damage including, but not limited to, jacket penetration, armor denting, or other indications that cable integrity has been compromised.

b. Hi-pot and Megger testing will not be the sole determining factor in the Owner accepting or rejecting damaged cable.

2.03 SPLICES AND TERMINATIONS

A. Medium voltage

1. Medium voltage connections and terminations (armored cable and single conductor)
   - Long barrel, 2-hole hydraulic crimp lugs, with Raychem “HVT” or 3M “Quick Term” series 5600 termination kits, or approved equal.

2. Splices other than cold shrink are to be housed in a listed enclosure: OZ Gedney Series SPKJR, G&W #E74, Adalet 3AS manufactured by PLM, or approved equal, with fittings to suit cable.

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4. Method of crimp termination for #8 awg and larger shall be performed with correctly sized hexacentric die only.
   a. Manufacturers: 3M, Elastimold; or approved equal.

PART 3 EXECUTION

3.01 REQUIREMENTS

A. General installation

1. Identification
   a. Reference section 26 05 53 Identification

2. Installation
   a. Only personnel qualified and experienced in this type of work shall make connections.
   b. The installation of cables shall be done with care to avoid damage.
      1) Cables showing damage after installation shall be replaced.
2) Rollers and spools shall be used in adequate numbers for pulling in cables.

3) The tension limitations, side wall pressure, and minimum bending radius as given by the cable manufacturer shall be adhered to.

c. Cable pulling
   1) In no case will strands be removed to attach pulling eyes.
   2) Tension is limited to 1000 lbs. using basket grips.
   3) Lubrication shall be as approved for the insulation and raceway material.
   4) Prior to pulling, calculations of pulling tension and side wall pressure shall be submitted.
   5) A dynamometer shall be used and tension recorded for all MV pulls.
   6) Use no mechanical means for pulling #8 and smaller AWG conductors.

d. Cable pulling setups and operations shall be witnessed by the UW Physical Plant High Voltage Shop and Engineering Services.

e. Interlocked armor cable shall be pulled only when both the armor and conductors are gripped. Remove cable similarly.

f. All cable that leaves a tray shall be taped/wrapped with Scotch 77, MAC AP30, or Quelcor “Quelpyre” fireproofing tape.

g. All new cable not routed in cable tray shall be taped/wrapped with Scotch 77, MAC AP30, or Quelcor “Quelpyre” fireproofing tape.

h. Cable Supports when cable is not in cable tray:
   1) Supports shall consist of all thread hangers to a unistrut bar and Kindorf strap clamps.
   2) Cables shall be padded with two layers of insulation stripped from the termination end of the armored cable.

B. Medium voltage cable terminations
   1. Phase mark each conductor, secure conductors adequately and observe cable bend radius limitations. Owner will identify the West Receiving Station phase rotation convention.
   2. System Phase Sequence is C-B-A.
   3. MV switch phase terminations shall be A-B-C left to right when facing the front of the switch.
   4. Junction box phase terminations are A-B-C left to right.
   5. Standard link box phase terminations are A-B-C left to right, top to bottom, front to back. Some existing link box phase terminations are not standard, especially on the 2.4kV normal and emergency power system.
   6. UW's Physical Plant Department High Voltage Shop will identify the phase designation of the existing primary distribution system conductors to which the Contractor is to make a connection.
      a. The shop will also check the Contractor's work to ensure the accuracy of the connections.
b. The Contractor shall arrange with the Owner for the times when their services will be required, and under no circumstances shall the Contractor connect to the existing system without Owner's knowledge.

c. The proper connection of the wires and cables to other systems as specified is entirely the responsibility of the Contractor.

d. In the event the connections cannot be made as specified, the Contractor shall make the necessary corrections at his own expense.

7. Install cable terminations per manufacturer's recommendations.

8. Medium voltage cable splices shall be made only when absolutely necessary. When necessary, splices shall be made only by personnel qualified and experienced in this type of work.

9. Each high voltage splice or connection shall be permanently labeled with the following information:
   a. Contract or project designation
   b. Contractor doing work
   c. Name of splicer and date

10. Do not score the conductor when stripping insulation and always pare or pencil when using a blade. Use of a stripping tool is preferable.

11. All terminations shall be secure and tightened in accordance with the manufacturer's recommendations.

C. Mounting and electrical connections
   1. In accordance with manufacturer's installation instructions.
   2. Coordinate remote control and annunciation with the Owner.

D. Testing
   1. Provide testing as required per 26 60 00 Inspection, Calibration and Test.

END OF SECTION
SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.
3. Sleeves and sleeve seals for cables.

1.2 SUBMITTALS

A. Refer to Section 01 33 00, “Submittal Procedures” for types of submittals and procedures.
B. Product Data: For each type of product indicated.
C. Field quality-control test reports.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

2. General Cable Corporation.
5. Or approved equal. Refer to 01 25 00, “Substitution Procedures.”

B. Conductor Material: Copper complying with NEMA WC 70.
C. Conductor Insulation: Comply with NEMA WC 70 for Types THWN or XHHW. Type THHN for sizes 1/0 and smaller.

D. Multiconductor Cable: Comply with NEMA WC 70 for armored cable, Type AC or metal-clad cable, Type MC with ground wire.

2.2 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division.
5. Or approved equal. Refer to 01 25 00, “Substitution Procedures.”

B. 600 Volt Splices:

1. Solderless type only
2. Preinsulated “twist-on” type permitted on solid conductor size #10 and smaller
3. Hydraulic compression long barrel type with application preformed insulated cover, heat shrinkable tubing or plastic insulated tape for all stranded conductors.
4. Stranded conductors: Terminations designed for use with stranded conductors.
5. Control cable: Splices shall be pre-insulated crimp pigtail or butt splice connectors.

C. 600V Terminations

1. 2-hole long barrel compression lugs - 250 kcmil and above
2. Single hole compression lug - Below 250 kcmil
3. Conductors #12 and smaller: Provide eye or forked tongue compression lugs at bolted or screw connections; no lugs required for compression style terminal blocks
4. Cable ties: Nylon or equivalent, locking type. Use a torque limiting tool for installation of ties.
5. Control cable: Terminations shall be locking spade, insulated, compression lugs.

2.3 SLEEVE SEALS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Advance Products & Systems, Inc.
2. Calpico, Inc.
3. Metraflex Co.
4. Pipeline Seal and Insulator, Inc.
5. Or approved equal. Refer to 01 25 00, “Substitution Procedures.”
C. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and cable.

1. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
2. Pressure Plates: Stainless steel. Include two for each sealing element.
3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper, stranded, 98% conductivity.

B. Branch Circuits: Copper, 98% conductivity. #12 AWG minimum. Solid for #10 and #12 AWG lighting and receptacle circuits. Stranded for #8 AWG and larger. Stranded for motor and equipment circuits and where vibration is a consideration.

C. Control Cable: Copper, stranded, #14 AWG minimum.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type THHN-THWN, single conductors in raceway.

B. Feeders Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.

C. Exposed Branch Circuits, including in Crawlsspaces: Type THHN-THWN, single conductors in raceway.

D. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.

E. Branch Circuits Concealed in Concrete and below Slabs-on-Grade: Type THHN-THWN, single conductors in raceway.

F. Fire Alarm Circuits: Type THHN-THWN, in raceway

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

E. Support cables according to Sections 26 05 29, "Hangers and Supports for Electrical Systems."

F. Identify and color-code conductors and cables according to Section 26 05 53, "Electrical Identification."

G. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

H. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

I. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

J. Provide cable ties (limit torque on ties) in panelboards, cabinets, and other unconfined, spaces. Group and lace wiring neatly, and do not tie to factory-installed wiring in equipment. Bundle and tag multi-pole circuits in laboratory surface metal raceway.

K. Branch circuits:
   1. Homeruns greater than 75 feet to first outlet shall be #10 minimum.
   2. Use no mechanical means for pulling wires, no lubricant except powdered soapstone or approved substitute.
   3. Splices in homeruns are not permitted.
   4. Wiring from separate raceway systems shall not be combined unless specifically permitted by the Engineer.

L. Terminate conductors so that conductor information is easily visible on at least one termination per feeder or within panel or switchboard pulling space.

M. Observe cable bend radius limitations and follow lug manufacturer's installation procedure.

N. Remove unterminated wiring unless noted otherwise or specifically approved to remain. Consult with the Engineer for instructions.

3.4 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Coordinate sleeve selection and application with selection and application of firestopping specified in Section 07 84 13, "Penetration Firestopping."

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
C. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and cable unless sleeve seal is to be installed.

D. Seal space outside of sleeves with grout for penetrations of concrete and masonry.

E. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and cable, using joint sealant appropriate for size, depth, and location of joint according to Section 07 72 00, "Joint Sealants."

F. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at cable penetrations. Install sleeves and seal with firestop materials according to Section 07 84 13 "Penetration Firestopping."

G. Aboveground Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeves to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

3.5 SLEEVE-SEAL INSTALLATION

A. Install to seal underground exterior-wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for cable material and size. Position cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports in accordance with Section 26 05 93, “Electrical Testing.”

END OF SECTION 26 05 19
PART 1  GENERAL

1.01  DESCRIPTION

A. General: Provide grounding systems, complete, as indicated, specified and required per Contract Documents. Principal items include:

1. System grounding.
2. Equipment grounding.
3. Metallic pipe system grounding.
4. Grounding to structural steel.
5. Raceway grounding.

B. Other Applicable Sections: Requirements of Division 01 apply to work of this Section.

C. Provide all grounding and/or bonding conductors, connectors, ground rods and terminations as required to meet these specifications and to comply with Article 250 of the National Electric Code.

D. All electrical devices, motors, etc. shall be grounded.

E. Provide an equipment bonding wire or UL listed couplings, connectors, locknuts, etc to provide electrical continuity between all metallic enclosures and conduits for connection to the grounding system as required by the National Electric Code.

F. Provide an equipment bonding wire, sized per Table 250.122 of the National Electric Code, to provide continuity around all non-metallic conduits.

G. Provide an equipment bonding wire, sized per Table 250.122 of the National Electric Code, to provide continuity around all flexible conduit connections.

H. Provide an equipment bonding wire, sized per Table 250.66 of the National Electric Code to bond all metallic enclosures including conduit to the grounding system.

I. A separate green (with yellow stripes) ground wire shall be used with all isolated ground circuits. This conductor shall be terminated in panelboards or cabinets on isolated bus bar. The isolated ground system shall not be in contact with other surface or conductors except at the service ground. This conductor is in addition to any equipment grounding conductor required to be pulled in the raceway. Conductor size shall be same as the phase conductors.

J. A separate green insulated ground wire shall be used with all connections to exterior electrical devices: pole lighting, exterior receptacles, exterior building and landscape lighting, etc. (Size per Table 250.122 of the National Electric Code).
PART 2 PRODUCTS

2.01 CONDUCTORS

A. Insulated: Conductors shall be green, 600-volt TW insulation, annealed copper, as per Section 16121. Conductors shall be sized per NEC.

B. Grounding conductors shall be copper only. Use bare or green insulated in sizes #10 AWG or larger. Use green insulated for size #12 AWG.

C. Bare: Conductors shall be medium-hard drawn stranded copper.

2.02 GROUND RODS

A. Ground rods shall be copper-clad, 3/4" X 10' - 0" connections to ground rods shall be with exothermic welds. Connections to ground rods shall be made below grade.

2.03 CONNECTORS AND LUGS

A. Connectors and lugs for grounding shall be bronze. Ground clamps and service post connectors shall be designed to accommodate the number of conductors terminated. Ground lugs shall be solderless type, copper/aluminum, designed for the number of conductors to be terminated.

B. Ground connections and ground cable splices shall be thermal welding or copper compression set type connectors UL listed for grounding purposes. Ground lugs, where provided as standard manufacturer’s items on equipment furnished, may be used.

2.04 LOCKNUTS AND COUPLINGS

A. All devices used to provide electrical continuity for metallic portions of the grounding system shall be UL listed for such use and shall be steel.
2.05 CONNECTING MATERIALS AND METHODS

A. Inaccessible Locations: Make connections by isothermic welding.

B. Accessible Locations: Make connections with bolted-through approved solderless bronze grounding device.

PART 3 EXECUTION

3.01 SYSTEM GROUNDING

A. Grounding Electrode System shall consist of building steel, underground metal water piping, and ground rods. Provide bond conductors for each of these components per NEC 250 and as required by the drawings.

B. System neutrals shall be connected to the grounding system. Neutrals for diesel generators and transformers, shall be connected to grounding system or to ground bus in feeder bus ducts connected to the generators or the transformers.

C. Resistance: Ensure maximum 5 ohm ground resistance at all transformers.

3.02 EQUIPMENT GROUNDING

A. Non-Current Carrying Metal Parts: Ground non-current carrying metal parts of electrical apparatus and equipment provided under this contract.

B. Raceways: Connect interrupted metallic raceways with insulated ground conductors. Provide insulated ground conductors in non-metallic raceways and connect to metallic terminations at each end.

C. Piping Systems: Bond all metallic pipe systems to building steel to ensure ground continuity. Provide jumpers at all isolating fittings.

D. Provide an equipment grounding conductor in every conduit.

3.03 TEST AND CERTIFICATES

A. Test: Contractor shall perform grounding tests in accordance with IEEE 81-1983 to certify resistance to ground of 5 ohms or less. Tests shall be performed in the presence of Owner's Representative if desired. Notify Owner one week in advance of scheduled tests. Test for continuity and resistance.

B. Certificates: Continuity and resistance test reports shall be certified by witness. Submit Certificates of Compliance to the Engineer.

END OF SECTION
PART 1 GENERAL

1.01 DESCRIPTION

A. General: Provide conduits, complete, as shown, specified or required per Contract Documents. Principal items include:

1. Rigid aluminum conduit.
2. Rigid galvanized steel conduit (RGS).
3. Intermediate metal conduit (IMC).
4. Electric metallic tubing (EMT).
5. Flexible metal conduit (FLEX).
6. Polyvinyl chloride conduit (PVC).
7. Cable Tray

B. Other Applicable Sections: Requirements of Division 1 apply to work of this Section.

PART 2 PRODUCTS

2.01 GENERAL

A. Minimum size shall be 1/2" except that conduits in earth shall be 3/4" minimum size.

B. All raceways and fittings shall be new and bear UL label.

C. Supplement all raceways with a separate equipment grounding conductor sized per NEC section 250.

D. All medium voltage conduits shall be painted yellow.

2.02 RIGID CONDUIT

A. Conduits used in utility tunnels, electrical rooms, mechanical rooms, areas subject to physical damage, etc. shall be rigid galvanized steel. They shall be hot dipped inside and out.

B. Conduit: Rigid conduit, including couplings, locknuts, bushings, and nipples shall be galvanized steel, thick wall, threaded. No running thread will be accepted; use nipples, unions or other fittings.

C. Fittings: Conduit fittings shall be galvanized steel or aluminum, threaded type, compatible with conduit material.
2.03 INTERMEDIATE METAL CONDUIT (IMC)

A. Conduit: IMC conduit shall be galvanized.

B. Fittings: Couplings shall be galvanized steel with threads on one end and swivel fitting on other end. Locknuts, bushings and nipples shall be galvanized steel, threaded type.

2.04 CABLE TRAY

A. Cable trays for medium voltage applications shall be hot dipped after fabrication, galvanized steel, ventilated, trough type. Side rails shall be rolled, non-cutting edges. If the inside flanges of cable tray fittings (corners, reducers, etc.) are not extruded or rolled then they shall be fitted with trim pieces made of vinyl with a metal core. The trim piece shall be fastened in a way that it is not likely to come loose over the lifetime of the cable tray and is acceptable to the Owner. At a minimum, this shall include mechanically fastening at the ends of each strip. All hardware used to assemble and support cable tray shall be hot dipped galvanized after fabrication.

B. All cable trays shall be provided with non-asbestos liner sized to fit within less than 1/2 inch of each cable tray wall.

C. Cable trays shall be sized as defined on the plans and may range from 6”, 9”, to 12”.

D. Cable tray for one armored cable in tunnels shall be minimum 9” wide, except that cable trays in vaults or electrical/mechanical rooms shall be 12” minimum.
   1. Cable tray for two armored cables shall be minimum 12” wide and shall be provided with a divider.

E. Cable tray ends shall be provided with a “Trough Drop Out” (waterfall) providing for a rounded surface as the cable(s) exit.

F. Cable Tray Liner: HARDIBACKER, EZGRID ¼” thick underlayment, or approved equal. Installed liner shall be stenciled as “NON-ASBESTOS” at intervals not to exceed 10 feet in length.

G. Cable Tray Wall Supports: 1-5/8” Galvanized steel welded “C” channel. Bolt front and back of cable tray to support bracket; Unistrut #P2945 or approved equal. Ends shall be capped for safety.

H. Cable tray Trapeze: back to back 1-5/8” Galvanized steel welded “C” channel; Unistrut #P1001 or approved equal.

2.05 FLEXIBLE METAL CONDUIT (FLEX)

A. Conduit: Flexible metal conduit shall be galvanized steel.

B. Fittings: Connectors shall be galvanized and shall give positive continuity of ground by a squeeze or setscrew method. When flex is cut square, ”jake” type connectors properly
screwed into the convolutions of the conduit will be approved. Angle connectors shall be accessible at all times.

C. Where exposed to moisture or weather, flex and fittings shall be watertight.

2.06 POLYVINYL CHLORIDE CONDUIT (PVC)

A. Conduit: Polyvinyl chloride conduit shall be PVC, schedule 80 only, with round smooth bore for direct burial.

B. Fittings: Couplings, bends, elbows, adapters and other fittings and materials, including jointing cement, shall be the product of, or as approved by, the conduit manufacturer. Fittings shall be of same basic material as conduit.

PART 3 EXECUTION – CABLE TRAY

3.01 SUPPORTS

A. Same as conduit supports in item 4.08 of this spec section.

3.02 INSTALLATION

A. Cable trays shall be braced for the seismic zone where this project is located.

B. Cable trays shall hold only one 15kv power cable circuit each unless shown otherwise on the drawings. Tray-dividing barriers shall be provided when more than one cable circuit is installed in the same tray. This barrier shall be at least as tall as the medium voltage cable diameter and securely fastened to the tray.

C. Coordinate installation of cable tray with mechanical ductwork, piping, structural members, fireproofing and sprinkler system piping so that tray remains accessible after installation.

D. Cable trays shall not penetrate smoke and fire rated walls and floors. Use conduit sleeves for penetrations. Seal all openings in walls and floors around raceways with an approved product to maintain smoke and fire integrity and watertightness.

E. Provide a 2/0 bare copper wire running the length of the cable tray, bond to every tray section, and connect to the grounding electrode system in that electrical room, vault, or manhole. Only one 2/0 bare copper ground, in one cable tray, will be required in each tunnel section.

F. Bends: Cable tray vertical and horizontal bends shall have a minimum radius of 36” as measure from the inside of the bend.
PART 4  EXECUTION CONDUITS

4.01  LOCATIONS

A. Rigid steel or IMC conduit above 3/4" shall be used for installation in concrete or where exposed to physical injury in all sizes. All power and lighting feeders shall be in rigid conduit or IMC.

B. Polyvinyl chloride conduit may be used for underground installation for exterior branch circuit or feeder wiring and communications. They shall be concrete encased. Provide an equipment grounding conductor in all power and lighting conduit per NEC Table 250.122.

C. Electric metallic tubing may be installed for wiring above ground in dry places, where not subject to physical damage.

D. Flexible Metallic Conduit: Short wiring connections to motor and equipment shall be installed in flexible metallic conduit. Connections for fixed motors and other fixed equipment installed under this and other Sections affected by vibration or expansion due to heat shall be made with a short, suitable run of flexible metallic conduit. Install separate green ground conductor in all flexible conduits supplying motors or equipment.

E. For raceways that penetrate building exterior, the section of the raceway within the wall shall be sealed inside and around raceway exterior using approved sealant. Where portions of an interior raceway system are exposed to widely different temperatures, as in cold rooms, circulation of air from a warmer to a colder section through raceway shall be prohibited. This sealing is also to be done at penetrations between normal and controlled temperature laboratories.

4.02  PREPARATION

A. Conduit runs shall be clean and dry before pulling in conductors.

B. Provide nylon pull-line in all empty conduits.

4.03  INSULATED BUSHINGS

A. All conduits entering panels, junction boxes, outlets and devices shall be provided with insulated bushings or insulated throat connectors. Bushings for conduits 2" and larger shall be O.Z. Gedney Type "B" or approved equal.

4.04  BUSHINGS

A. Where a data, telephone, intercom, control, etc., conduit terminates in space, that is, not attached to a box or other fitting, a bushing shall be provided to the end of the conduit to protect the future wire from abrasion.
4.05 CAPPING

A. Conduit shall be capped during construction by means of manufactured conduit seals or caps to prevent entrance of water or debris, and shall remain closed until ready for use.

B. All spare conduits shall be capped and labeled with “SPARE” and its destination.

4.06 JOINTS

A. Conduit joints in concrete, masonry walls, or where exposed to weather or moisture, shall be made with an approved joint compound. RGS and IMC connections shall be watertight. Provide expansion fittings for conduits passing through building construction expansion joints.

4.07 PENETRATIONS OF WALLS BELOW GRADE

A. Conduit penetrations of walls below grade shall be made using O.Z. Gedney Type WSK through-wall waterproofing fittings, or approved equal.

4.08 SUPPORTS

A. General: Fastenings for raceways shall be made by means of not smaller than 3/16” diameter bolts, expansion bolts, or toggle bolts; or by equivalent approved fastenings. Fastenings, where exposed to weather or moisture, shall be galvanized. Nails or wooden or fiber inserts in masonry shall not be used. Multiple conduit runs shall be racked on galvanized Unistrut. Ceiling suspension systems and mechanical ductwork or equipment shall not be used for raceway system support.

B. Masonry and Concrete: On masonry or concrete walls, columns or flooring, fastenings shall be made by means of lead expansion shields not smaller than 3/8” diameter by 5/8” long for use with No. 10-24 round head machine screws. Machine screws shall be not less than 1-1/4” long for installation on ceiling and not less than 1” long elsewhere.

C. Steel Expansion Shield: Shall be Tampins Union Catalog Stock #2M5275 or an equivalent as manufactured by Star, Phillips, or approved equal. Holes for shields shall be carefully and accurately drilled, using sharp drills, to a depth which will afford the maximum practical engagement of threads (depth no less than 1-1/4” into solid concrete) and installation shall develop full strength for screws.

D. Exposed or Accessible Locations: In accessible spaces or where exposed, rigid steel conduit smaller than 1", and EMT smaller than 1-1/4” shall be supported by means of approved galvanized clamps and fastenings. Conduit shall be secured so that it cannot be moved without use of tools.

E. Exposed Raceways: Exposed wireway runs shall be made horizontal and vertical and parallel to structural members and lines of building. Bends shall be neat and of not less than minimum radii permitted by Code, or fittings shall be used to obtain a neat appearance.
4.09 INSTALLATION OF CONDUIT

A. General: All bends should be made to conform with NEC Table 2, chapter 9.

B. Risers Into Equipment: All risers including bends or sweeps from PVC conduit into pull boxes or panelboards shall be coated rigid steel conduit and suitable adapters shall be furnished and installed as required for such transition. Risers outside of partitions and equipment enclosures shall terminate with threaded steel coupling flush with floor.

4.10 EXCAVATION, TRENCHING AND BACKFILLING

A. General: All excavations, trenching, backfilling and compacting for raceways shall be performed under the work of this Section and shall conform to the requirements of Division 2.

B. Record Drawings: Accurately locate and dimension all underground runs on the record drawings.

4.11 OPENINGS IN WALLS, CEILINGS AND FLOORS

A. General: Openings in existing walls, partitions, ceilings and floors shall be made under this Section. Care shall be taken to avoid piping and equipment and unnecessary damage. Holes shall be a practicable minimum in size and number. Patch, repair and paint in workmanlike, approved manner. Penetrations shall be sealed to maintain existing fire rating.

B. Approval: Request written approval from the Owner prior to any core drilling.

4.12 CONNECTIONS TO VIBRATION-ISOLATED EQUIPMENT

A. All wiring (conduit and conductors) shall be arranged to avoid short circuiting of the vibration isolation system.

B. Transformer:
   1. When terminating conduit on transformer enclosure, provide a minimum of 36" of flexible conduit with grounding conductor.

C. Substations:
   1. When transformer core and coil is separated from enclosure frame by Mason vibration isolators, conduit may terminate on substation enclosure.
   2. Where Mason vibration isolators do not separate transformer core and coil from enclosure frame, provide a minimum of 36" of flexible conduit with grounding conductor where conduit terminates on substation enclosure.

D. Rotating Equipment:
   1. When feeding from floor stub-up locations, locate the stub-up so as to provide not less than 12 diameters of flexible conduit length with green ground wire, both parallel to, and at right angles to, the equipment rotational centerline.
2. When feeding from an overhead drop, where conduit is supported below an occupied floor, provide maximum length of flexible conduit with green ground wire in the drop and support the rigid horizontal conduit on spring hangers, similar to Mason Industries, Type 30N, within 30’ of the vibrating equipment.

3. Circuits to mechanical or electrical equipment in roof penthouses shall be overhead, not through floor below or in conduit buried in slab.

4.13 CONNECTIONS TO MECHANICAL DUCTS

A. There shall be no connection to, or contact with, supply or return ducts or the insulation thereon, in any way. Violation will require removal.

4.14 CONNECTIONS TO PLUG-IN BUS DUCT

A. Provide minimum of 36 inches of flexible conduit length for connection to plug-in device. Provide separate green grounding conductor in all flexible conduits.

END OF SECTION
PART 1   GENERAL

1.01 DESCRIPTION

A. Scope of work under this section includes all required seismic restraints and connectors. Seismic restraints and connectors shall include all anchorage to structures, clamps, rods, channels, struts and accessories. Seismic restraints for electrical equipment shall sustain vertical and horizontal loads within the stress limitations specified in the International Building Code in effect on the date of the Contract Documents. Fixed floor mounted electrical equipment shall be anchored to the structure to resist displacement vertically and on both horizontal axis due to seismic motion. Suspended electrical equipment and associated raceways shall have rigid vertical hangers and be braced in both horizontal directions. Connections by raceways shall not be considered acceptable as equipment anchors.

B. Anchorage of electrical equipment and associated raceways shall conform to the International Building Code, National Electrical code, and all local amendments to these codes in effect on the date of the Contract Documents.

C. Total design lateral seismic force: In accordance with IBC in effect on the date of the Contract Documents. For anchorage of electrical equipment required for life-safety systems, the importance factor shall be taken as 1.5. For electrical equipment that is not required for life-safety the importance factor shall be taken as 1.5.

D. Life safety systems shall include, but not be limited to the following:

1. Emergency system switchboards, panelboards and associated raceways.
2. Fire alarm system equipment and raceways.
3. Cable trays.
4. UPS system and batteries, raceways and distribution equipment.
5. Raceway support system.

1.02 SUBMITTALS

A. Submittals shall be in accordance with conditions of contract and Division 01.

B. Product Data: Submit manufacturer’s product data in conformance. Include product data for all materials to be used for seismic restraints and connectors. Include International Conference of Building Officials Evaluation Reports for expansion bolts.

C. Shop drawings and Calculations: Submit shop drawings and calculations for anchorage of electrical equipment and raceway systems. Design calculations for anchor bolt selection shall be prepared by the manufacturer of the equipment following submittal approval of the equipment. Shop drawings shall include anchor bolt layouts, templates,
sizes and specifications. Submit shop drawings indicating the routing of single raceways, trapeze systems, and cable trays requiring bracing. Indicate on the shop drawings the type and location of bracing to be used and the attachments to be provided. Design calculations and anchor bolt selections shall be performed by a structural engineer licensed to practice in the state of Washington. Design calculations shall not be required for floor mounted equipment weighing less than 400 pounds and for raceways employing pre-approved seismic restraint systems specified herein.

PART 2 PRODUCTS

2.01 MATERIALS

A. Bracing and supplementary steel: Structural steel per ASTM A36. Welding shall conform with AWS D1.1. Sizes shall be as determined by the design calculations.

B. Hanger rods: Continuously threaded hot rolled steel, electro-galvanized or cadmium-plated, ½” minimum diameter.

C. Manufactured seismic restraint systems and accessories: Superstrut seismic restraint system pre-approval No. R-0003, Kinline pre-approval No. R-0071, B-Line pre-approval No. R-0114, or approved equal.

D. Metal framing channel shall be No. 12 gage formed steel, 1-5/8” square minimum, prime painted or chromatic dip finish. Use fittings, brackets and hardware, same manufacturer as channel. Manufacturer: Superstrut, B-Line or approved equal.

E. Anchor Bolts:

1. Anchor Bolts (Cast-in-Place): Steel bolts to ASTM A307. Nuts shall conform to ASTM A194. Design values for shear and tension shall comply with the values for cast-in-place bolts in Uniform Building Code Table 26-G.

2. Anchor (Expansion) Bolts: Steel bolts to ASTM A307. Nuts shall conform to ASTM A194. Shall be drilled-in type, Hilti “Kwik-Bolt”, Molly “Parabolt”, or approved equal, as described in ICBO-Evaluation Report. Design values for shear and tension shall be in accordance with the ICBO Evaluation Report for the specific anchor (expansion).

PART 3 EXECUTION

3.01 GENERAL

A. All electrical equipment and associated raceways shall be braced or anchored to resist a lateral force acting in any direction in accordance with the UBC, NEC and all local amendments to these codes.

B. Individually hung conduits less than 2- ¼” inside diameter shall not require bracing.
C. Conduits hung by hangers so that the top of the conduit is 12" or less from the bottom of the support for the hanger shall not require bracing.

D. Drilling into concrete shall not cut reinforcing steel or pre-stressing tendons.

E. All facilities shall be considered critical with an importance factor of 1.5.
PART 1 GENERAL

1.01 DESCRIPTION

A. Purpose
   1. The purpose of this section is to provide electrical identification for electrical equipment, raceway, and conductors.

B. General
   1. Provide labels, nameplates, panel directories and color-coding as specified herein and according to attached electrical identification drawings.

1.02 REFERENCES

A. American National Standards Institute (ANSI)
   1. ANSI A13.1 Operational and Warning signs

1.03 SUBMITTALS

A. General
   1. Submittals shall be in accordance with Conditions of the Contract and Division 01 Specification Sections.
   2. Prior to making nameplates, submit a complete schedule indicating nameplate size, lettering size, color, and actual nameplate information.

1.04 MEETINGS

A. Within one month after “Notice to Proceed”, schedule a meeting with Owner Representatives to review electrical identification requirements.

PART 2 PRODUCTS

2.01 EQUIPMENT NAMEPLATES AND DEVICE LABELS

A. Materials
   1. Provide nameplates constructed of 1/16-inch thick plastic laminated material. Engrave through colored surface material to contrasting colored sub-layer.
   2. Use receptacle labels by electronic labeler Brother P-Touch, model PT-20/25, Dymo-Tape or approved equal.

B. Provide nameplates with the font size, spacing of text, and label size as indicated in samples provided near the end of this section.

C. Provide labels with the syntax as indicated for transformers and primary switches as indicated on the last page of this section.
   1. For splices, coordinate naming convention with UW Engineering Services.
D. Provide nameplates for the following:
1. Equipment identification labels for all electrical equipment including, but not limited to, splices, cable tray, 15kv switches, switchgear, switchboards, panelboards, transfer switches, disconnect switches, transformers, capacitors, fixed equipment, motor starters, MCC's, motors, etc.
2. Subclassification labels for all emergency power system equipment as listed for equipment identification labels, and all junction and pull boxes
3. Fire Alarm equipment per the Fire Alarm specification
4. Cubicle/space labels for all MCCs, substations, and distribution switchboards
5. Identify fuse type and size on the cover of fusible equipment.
6. Special equipment outlet labels (¼-inch letters)
7. GFCI receptacles: "Series GFCI Protected"
8. Time delays: Provide ¼-inch lettering at the control location to identify a motor having a time delay relay - "Time Delay Start to Limit System Inrush."
9. Cover plate receptacle labels shall indicate panel and circuit identification for all receptacles.
10. In addition to receptacle labels, provide labels for fixed equipment at a visible location mounted on or near the equipment. Examples of fixed equipment are refrigerators, water fountains, hoods, ranges, dishwashers, etc. Coordinate location of labels with the Owner.
11. Pathway Lighting: indicate power source (bldg name, panel and circuit number).

2.02 RACEWAY LABELS

A. Identify medium/high voltage conduits within buildings and electrical rooms by painting on its full length the following:
1. Stenciling in 2-inch black letters: Stencil to be placed once in each room and at a minimum of every 50 feet. Place where convenient for tracing. Exception: Stencil not required if conduit does not exit room.
2. Stencil to include source equipment name, voltage, load equipment name (e.g. PCU-BB01-E01/4160V/TR-SW01-E01)
3. Paint medium voltage conduits: Emergency system conduit, (4.16 kV and 2.4 kV) - red; normal system conduit, (13.8 kV) - yellow. For other medium or high voltage systems, contact UW Engineering Services for color scheme.

B. Feeder and branch circuit conduits
1. No labeling required for raceways with readily identifiable terminations within the same room
2. In accessible ceiling spaces and exposed in unfinished areas, label conduit with panel and circuit numbers of conductors routed through the conduit. Label conduit at all wall penetrations and connections to all panels, junction boxes, and equipment served.
3. Use a black indelible marker and hand print label in a clear workmanlike manner, or use stencil and black paint to provide a clearly legible label.
C. Empty conduits
   1. Provide labels with description of purpose, and location of opposite end, on each end of conduits provided for future.
   2. Equipment or those conduits abandoned as a result of this contract: Cardboard or plastic handwritten tags are permissible. Note accurately on as-built drawings.

2.03 BRANCH CIRCUIT PANELBOARD DIRECTORIES

A. Provide neatly typed schedule under plastic jacket or protective cover for protection from damage or dirt.
   1. Number each single pole space: Odd-numbered circuits on left side or top, even on right side or bottom.
   2. Securely mount on inside face of panelboard door.
   3. When no cover, provide individual nameplates for each overcurrent and other device.
   4. Define briefly, but accurately, nature of connected load (e.g., Lighting Office, Receptacles, Mechanical/Electrical Room, etc.) as approved.
   5. Provide room locations for all loads and indicate panel name on schedule.
   6. Multipole circuits to utilize first pole space number as its circuit number

B. Confirm room numbers with Owner’s Representative prior to noting on schedules.

C. Spare circuit breakers and space positions shall be noted in pencil.

D. Panel schedules and as-built circuit numbers shall agree.

2.04 WIRE AND CABLE LABELING

A. Control wiring
   1. All control-wire terminations are to be identified by tubular sleeve heat shrink-type markers to agree with wire marking identification on manufacturer's equipment drawings.

B. Power conductor wire, cable and buses
   1. Buses, feeders, branch circuit conductors and medium voltage cables shall be properly phased and identified throughout. Individual conductors shall be color coded as noted below:

<table>
<thead>
<tr>
<th>Conductor</th>
<th>102/208V &amp; Medium Voltage</th>
<th>277/480V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase A</td>
<td>Black</td>
<td>Brown</td>
</tr>
<tr>
<td>Phase B</td>
<td>Red</td>
<td>Orange</td>
</tr>
<tr>
<td>Phase C</td>
<td>Blue</td>
<td>Yellow</td>
</tr>
<tr>
<td>Neutral</td>
<td>White</td>
<td>Gray</td>
</tr>
<tr>
<td>Ground</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>Isolated Ground</td>
<td>Green/Yellow</td>
<td>Green/Yellow</td>
</tr>
</tbody>
</table>
a. Buses and connections shall be identified left to right, top to bottom, or front to rear; shall read A-B-C; and shall be color-coded per the table above.

b. Feeders for all new construction shall have color-coded phase identification at all junction boxes and wherever feasible, and shall have solid color-coded insulation for phase designation. Where the proper color wire insulation cannot be obtained, black insulation shall be used and the conductors shall be coded with plastic vinyl tape, 3M #190-A, 3/4-inch or equal.

c. Identify color-coded conductors with appropriately colored plastic vinyl tape (3m #190-A) in the panel when branch circuits are reconnected for balancing panel load.

C. "Low voltage" cable and special systems
1. See individual functional specification sections.

2.05 COLOR SCHEME FOR LABELS

A. Provide labels with the color scheme identified below:

<table>
<thead>
<tr>
<th>System</th>
<th>Label Color</th>
<th>Letter Color</th>
<th>Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4kV &amp; 4.16kV Emergency</td>
<td>Red</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>13.8kV Normal</td>
<td>Yellow</td>
<td>Black</td>
<td></td>
</tr>
<tr>
<td>2.4kV Normal</td>
<td>Orange</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>Normal Power and Control</td>
<td>White</td>
<td>Black</td>
<td></td>
</tr>
<tr>
<td><strong>Emergency Power and Control:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency - Life Safety</td>
<td>Red</td>
<td>White</td>
<td>&quot;EM - LS&quot;</td>
</tr>
<tr>
<td>Emergency – Critical</td>
<td>Red</td>
<td>White</td>
<td>&quot;EM - CR&quot;</td>
</tr>
<tr>
<td>Emergency - Legally Required Standby</td>
<td>Red</td>
<td>White</td>
<td>&quot;EM - LRS&quot;</td>
</tr>
<tr>
<td>Emergency - Optional Standby</td>
<td>Red</td>
<td>White</td>
<td>&quot;EM – OS&quot;</td>
</tr>
<tr>
<td>Fire Alarm</td>
<td>Red</td>
<td>White</td>
<td>&quot;FA&quot;</td>
</tr>
<tr>
<td>Halon</td>
<td>Dk. Blue</td>
<td>White</td>
<td>&quot;FP&quot;</td>
</tr>
<tr>
<td>Security</td>
<td>Green</td>
<td>Black</td>
<td>&quot;SEC&quot;</td>
</tr>
<tr>
<td>Intercom, Public Address, Nurse Call</td>
<td>Orange</td>
<td>Black</td>
<td>&quot;IC&quot;, &quot;PA&quot;, or &quot;NC&quot; (as app.)</td>
</tr>
<tr>
<td>Clock</td>
<td>Lt. Blue</td>
<td>Black</td>
<td>(Symbol for Clock)</td>
</tr>
<tr>
<td>TV</td>
<td>Yellow</td>
<td>Black</td>
<td>&quot;TV&quot;</td>
</tr>
<tr>
<td>Communication Data</td>
<td>Black</td>
<td>White</td>
<td>&quot;C/D&quot;</td>
</tr>
</tbody>
</table>

PART 3 EXECUTION

3.01 REQUIREMENTS - EQUIPMENT SHALL NOT BE ENERGIZED OR OPERATED UNTIL PERMANENT LABELING IS INSTALLED.

A. Attachment
1. Securely attach engraved labels and nameplates with rivets, screws, 3M tape, or suitable epoxy cement.
2. Clean surfaces thoroughly before attaching all labels. Use solvent on device plates before attaching electronic or Dymo-tape labels. (Without proper cleaning, electronic or Dymo-tape labels will soon curl off.)

3. Drill hole in nameplate and attach to motor flexible conduit with plastic tie-wrap.

B. No temporary markings permitted to remain on equipment. Remove all temporary markings where possible. Where markings cannot be removed, repaint trims, housing, etc. to cover markings. Refinish defaced finishes.

C. Labeling abbreviations permitted only as approved.
Equipment "Fed From" Label
### COLOR SCHEME NOTES

<table>
<thead>
<tr>
<th>POWER</th>
<th>BACKGROUND</th>
<th>LETTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMERGENCY</td>
<td>RED</td>
<td>WHITE</td>
</tr>
<tr>
<td>15KV NORMAL</td>
<td>YELLOW</td>
<td>BLACK</td>
</tr>
<tr>
<td>2.4KV NORMAL</td>
<td>ORANGE</td>
<td>WHITE</td>
</tr>
</tbody>
</table>

1. USE BLOCK LETTERS WITH BOLD TYPE.
2. CENTER ALL LINES ON LABEL.
3. BEVEL EDGES.
4. USE 3M VHB ADHESIVE OR EQUIVALENT.
5. CLEAN SURFACE WITH ALCOHOL PRIOR TO APPLICATION.

SD−E−166
Arc Flash and Shock Hazard
Appropriate PPE Required

<table>
<thead>
<tr>
<th>Dist in Ft &amp; In</th>
<th>Flash Hazard Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>XX</td>
<td>cal/cm² Flash Hazard at 1 Ft 6 In</td>
</tr>
<tr>
<td>Category</td>
<td>List of PPE Required</td>
</tr>
<tr>
<td>XXX VAC</td>
<td>Shock Hazard when cover is removed</td>
</tr>
<tr>
<td>XX</td>
<td>Glove Class</td>
</tr>
<tr>
<td>Dist in Ft &amp; In</td>
<td>Limited Approach Dist (Fixed Circuit)</td>
</tr>
<tr>
<td>Dist in Ft &amp; In</td>
<td>Restricted Approach</td>
</tr>
<tr>
<td>Dist in Ft &amp; In</td>
<td>Prohibited Approach</td>
</tr>
<tr>
<td>MM/DD/YYYY</td>
<td>Arc Flash Study Date (IEEE 1584-2004a)</td>
</tr>
</tbody>
</table>

Equipment ID (Name): (Place Panel Name Here)
Protective Device: (Name of Upstream Protective Device)

Scenario 1 – Utility (In most cases)

Study Performed By: Firm Name, Telephone #, Date

Sample Arc Flash Warning Label
PART 1 GENERAL

1.01 DESCRIPTION

A. Purpose

1. The purpose of this section is to specify Contractor responsibilities and participation in the commissioning process.

B. General

1. Commissioning support is the responsibility of the Contractor (including subcontractors and vendors).
   a. The commissioning process requires Contractor participation to ensure all portions of the work have been completed in a satisfactory and fully operational manner. The Contractor is responsible to provide all support required for start-up, testing, and commissioning.

2. Work of this section includes the following:
   a. Start-up and testing of the equipment
   b. Assistance in testing, adjusting and balancing
   c. Operating equipment and systems as required for commissioning tests
   d. Providing qualified personnel for participation in commissioning test, including seasonal testing required after the initial commissioning
   e. Providing equipment, materials, and labor necessary to correct deficiencies found during the commissioning process, which fulfill contract and warranty requirements
   f. Providing operation and maintenance information and as-built drawings to the Owner for verification.
   g. Providing training for the systems specified in this Division with the Owner’s Representative.

1.02 RELATED SECTIONS

A. All start-up and testing procedures and documentation requirements specified within Division 26.

1.03 REFERENCES

A. Applicable codes, standards, and references – All inspections and tests shall be in accordance with the following applicable codes and standards except as provided otherwise herein:

1. International Electrical Testing Association - NETA
2. National Electrical Manufacturer's Association - NEMA
4. Institute of Electrical and Electronic Engineers - IEEE
5. American National Standards Institute - ANSI
7. State and local codes and ordinances
8. Insulated Power Cable Engineers Association - IPCEA
9. Association of Edison Illuminating Companies - AEIC
11. National Fire Protection Association - NFPA
   a. ANSI/NFPA 70: National Electrical Code
   b. ANSI/NFPA 70B: Electrical Equipment Maintenance
   c. NFPA 70E: Electrical Safety Requirements for Employee Workplaces
   d. ANSI/NFPA 78: Lightning Protection Code
   f. NFPA 99: Health Care Facilities

B. All inspections and tests shall utilize the following references:
   1. Project design drawings and specifications
   2. Shop drawings and submittals
   3. Approved manufacturer's instruction manuals applicable to each particular apparatus
   4. Applicable NETA acceptance testing work scope sections per NETA ATS 1999

1.04 COORDINATION

A. Coordinate the completion of all electrical testing, inspection, and calibration prior to the start of commissioning activities.

B. Coordinate factory field-testing and assistance per the requirements of this section.

C. The Contractor shall coordinate and cooperate in the following manner:
   1. Allow sufficient time before final commissioning dates to complete electrical testing, inspection, and calibration to avoid delays in the commissioning process.
   2. During the commissioning activities, provide labor and material to make corrections when required, without undue delay.
1.05 SUBMITTALS

A. General
   1. Submittals shall be in accordance with all Contract Documents and Division 01 Specification Sections.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. Operations and Maintenance Manuals shall be in accordance with Conditions of the Contract and Division 01 Specification Sections.

1.07 SCHEDULE

A. Complete and make fully functional all phases of electrical work pertinent to the Commissioning Tests, prior to the testing date.

1.08 MEETINGS

A. Attend Commissioning Meetings as required by the Owner.

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

A. Provide test equipment as necessary for start-up and commissioning of the electrical equipment and systems.

2.02 TEST EQUIPMENT - PROPRIETARY

A. Proprietary test equipment required by the manufacturer, whether specified or not, shall be provided by the manufacturer of the equipment.
   1. Manufacturer shall demonstrate its use, and assist the Contractor in the commissioning process.
   2. Proprietary test equipment shall become the property of the Owner upon completion of commissioning.

B. Identify the proprietary test equipment required in the test procedure submittals and in a separate list of equipment to be included in the Operations and Maintenance Manuals.

PART 3 EXECUTION

3.01 REQUIREMENTS

A. Work prior to commissioning:
1. Complete all phases of work so the system can be started, tested, adjusted, balanced, and otherwise commissioned.
   a. Contractor has primary start-up responsibilities with obligations to complete systems, including all sub-systems so they are fully functional.
   b. This includes the complete installation of all equipment, materials, conduit, wire, controls, etc., per the contract documents and related directives, clarifications, change orders, etc.

2. A commissioning plan will be developed by the Contractor and approved by the Owner.
   a. If system modifications/clarifications are in the contractual requirements of this and related sections of work, they will be made at no additional cost to the Owner.
   b. If Contractor-initiated system changes have been made that alter the commissioning process, the Contractor will notify the Owner’s Representative for approval.

3. Specific pre-commissioning responsibilities of the Contractor are as follows:
   a. Transformers
   b. Power Meters setup and calibration.
   c. Ground tests/verifications
   d. Conductor continuity
   e. Electrical distribution systems - Panelboards

4. Normal start-up services required to bring each system into a fully operational state:
   a. These include cleaning, testing, phase rotation check, control sequences of operation, full and part load performance, etc.
   b. The Contractor will not begin the commissioning process until each system is complete, including normal Contractor start-up and the power meter programming has been completed.

5. Commissioning is intended to begin upon completion of a system.
   a. Commissioning may proceed prior to the completion of systems, or sub-systems, and will be coordinated by the Contractor with the Electrical Contractor and Electrical Testing Contractor.
   b. Start of commissioning before system completion will not relieve Contractor from completing those systems as per the schedule.

3.02 PARTICIPATION IN COMMISSIONING

A. Provide skilled technicians to start up all systems within Division 26.
   1. Contractor will ensure that the qualified technician(s) are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustment, and/or problem resolutions.
B. System problems and discrepancies may require additional Contractor time, redesign and/or reconstruction of systems and system components. The additional Contractor time shall be made available for the subsequent commissioning periods until the required system performance is obtained.

C. The Owner's Representative reserves the right to judge the appropriateness and qualifications of the Contractor's technicians relative to each item of equipment or system. Qualifications of Contractor's technicians include expert knowledge relative to the specific equipment involved, adequate documentation and tools to service/commission the equipment, and an attitude/willingness to get the job done in a timely manner.

3.03 WORK TO RESOLVE DEFICIENCIES

A. In some systems, misadjustments, misapplied equipment and/or deficient performance under varying loads will result in additional work being required to commission the systems.

1. This work will be completed by the contractor under the direction of the Engineer and Owner's Representative.

2. Whereas all members will have input and the opportunity to discuss the work and resolve problems, the Engineer will have final jurisdiction over the work necessary to achieve performance.

B. Corrective work shall be completed in a timely fashion to permit timely completion of the commissioning process.

1. Experimentation to render system performance will be permitted.

2. If the Owner's Representative deems the experimentation work to be ineffective or untimely as it relates to the commissioning process, the Contractor shall schedule a meeting with the Owner to discuss the nature of the problem, expected steps to be taken, and the deadline for completion of activities.

3. If deadlines pass without resolution of the problem, the Owner reserves the right to obtain supplementary services and/or equipment to resolve the problem.

4. Costs incurred to solve the problems in an expeditious manner shall be the Contractor's responsibility.

3.04 SYSTEMS DOCUMENTATION

A. In addition to the requirements of Division 1, update contract documents to incorporate field changes and revisions to system designs to account for actual constructed configurations.

1. All drawings shall be red-lined on two sets.

2. Contractor as-built drawings shall include architectural floor plans, elevations and details, and the individual electrical systems in relation to actual building layout. Dimensions from a wall or permanent structure shall be shown for any equipment,
conduit, cable, etc. installed in a different location than identified in the Contract documents.

B. Maintain as-built red-lines as required by Division 01.
   1. Given the size and complexity of this project, red-lining of drawings at completion of construction, based on memory of key personnel, is not satisfactory.
   2. Continuous and regular red-lining is considered essential and mandatory.

3.05 MISCELLANEOUS SUPPORT

A. Contractor shall remove and replace covers of electrical equipment, open access panels, etc., to permit Engineer and/or Owner’s Representative to observe equipment and controllers provided.

B. Furnish ladders, flashlights, tools and equipment as necessary.

END OF SECTION
PART 1 GENERAL

1.01 DESCRIPTION

A. The metal-enclosed switchgear (13.8KV load interrupter switches) shall be installed to the following specification.

B. The contractor shall receive and store the metal-enclosed switchgear from the manufacture.

C. The metal-enclosed switchgear assembly shall be in accordance with the plans and drawings.

D. The manufacturer shall furnish, with each metal-enclosed switchgear assembly, a set of drawings complete with a bill of material and showing: typical front views and open side views for each bay as well as typical components, their positions, and available space for cable termination; an anchor bolt plan with dimensions; a one-line diagram; and appropriate wiring diagrams.

E. The contractor shall install the switch adhering to the manufacture comprehensive instruction manual covering installation of the switchgear assembly and operation of the various components.

F. The metal-enclosed switchgear shall consist of one or more indoor self-supporting bays, containing interrupter switches and SM5SS fuses with the necessary accessory components, all completely factory-assembled and operationally checked.

1.02 SUBMITTALS

A. Contractor shall supply a receiving update on the metal-enclosed switchgear, when manufacture delivers the gear.

B. Contractor shall submit red-lines of design drawings to the owner upon installation of the gear.

C. Procedures: Refer to Division 01.
PART 2  PRODUCTS

NOT USED

PART 3  EXECUTION

3.01  INSTALLATION

A. Switches shall be stored in a dry, secure area free from dust and debris.

B. A category A enclosure is to be provided for equipment installed on non-secured locations.

C. Provide features and requirements for enclosures similar to medium voltage switchgear requirements.

D. Each bay is to be furnished with laminated plastic nameplates.

E. Indoor enclosures shall be drip-proof.

F. All enclosures shall be of compact height: 90” for indoor installations and 93” for outdoor installations.

G. For outdoor installations, provide features and requirements for enclosure ventilation, lifting eyes, gasketing and sealing, and space heaters similar to medium voltage switchgear requirements. A thermostat and low-voltage circuit breaker is to be provided in the heater circuit on outdoor equipment.

H. Load connections may be direct (transformer throat) or via cable. Note: Phase rotation is a concern at transformer terminals and may require transition space.

I. Campus phase sequence is C-B-A. Cable termination positions in switches shall be A-B-C left to right, top to bottom, or front to back when viewed from the front of the switch.

END OF SECTION
PART 1 GENERAL

1.01 DESCRIPTION

A. Purpose

1. Specification covers padmounted oil-filled transformers, with primary voltage above 600 V, For use as shown on plans

2. Contractor shall verify transformer size, voltage, and physical dimensions will fit in proposed path to the final location of the transformer before purchasing.

B. REFERENCE STANDARDS

1. ANSI C57.12.28 - Switchgear and Transformers - Pad-Mounted Equipment - Enclosure Integrity

2. IEEE C57.12.00 - General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers


5. IEEE C57.121 - Guide for Acceptance and Maintenance of Less Flammable Hydrocarbon Fluid in Transformers

6. IEEE 386 - Separable Insulated Connector Systems for Power Distribution Systems Above 600 V

7. NEMA 260 (National Electrical Manufacturers Association) - Safety Labels for Padmounted Switchgear and Transformers Sited in Public Areas


9. NFPA 70 (National Fire Protection Association) - National Electrical Code

C. SUBMITTALS

1. Submit Shop Drawings for equipment provided under this Section.

2. Acoustical Sound and Vibration Test Data

3. Acoustical sound and vibration test data on manufactured unit.

4. Test data sheets shall be submitted for review and approval by Owner and Architect/Engineer prior to shipment to job site.

5. Current Manufacturer’s AEIC pre-qualification
PART 2 PRODUCTS

2.01 MANUFACTURERS


B. Description: Comply with IEEE C57.12.26 and ANSI C57.12.28 for deadfront applications.

C. Insulating Liquid: Mineral oil, complying with ASTM D 3487, Type II, tested according to ASTM D 117.

D. Insulating Liquid: FR3 oil, natural ester derived from vegetable oil, and listed as less-flammable type.

2.02 RATINGS:

A. kVA Rating: 75 kVA through 2500 kVA at 65°C.

B. Impedance: Varies with kVA rating (2.20% to 5.75%).

C. Nominal Primary Voltage: 12.47 Delta.

D. Nominal Secondary Voltage: 480Y/277 Volts, 3-phase, 4-wire, 208Y/120 Volts, 3-phase, 4-wire

E. MV BIL: 95 kV at 12,470V.

F. LV BIL: 30 kV.

2.03 CONSTRUCTION:

A. Compartmental type, self-cooled and tamper resistant for mounting on a pad, designed to restrict entry of water into the compartments.

B. Full-Capacity Voltage Taps: Four 2-1/2% taps; 2 above and 2 below rated high voltage, with externally operable tap changer for de-energized use and with a position indicator and padlock hasp.

C. Features:

1. Configuration: Full-height, bolt-on, high- and low-voltage cable terminating compartments side-by-side separated with a rigid metal barrier, with the high-voltage compartment on the left. Each compartment shall have separate doors.

2. Locking and Access: The low-voltage compartment door equipped with a steel rod handle with provisions for padlocking. Both compartment doors must be capable of being secured with a single padlock. Doors so arranged that accessibility to the

4. Lifting: Lifting attachments to carry the full weight of the transformer in accordance with ANSI.

5. Jacking and Rolling: Provide removable door sill on compartments to permit rolling or skidding of unit into place over conduit studs in pad.

6. Grounding: Provide grounding in both the high-voltage and low-voltage compartments.

7. Secondary Bushings: Low-voltage bushings shall be tin-plated spade type arranged for vertical takeoff of outgoing cables.

8. Finish: Painted ANSI 61 olive-green color, 3-mil paint thickness required. All hardware corrosion resistant stainless steel. Underside of enclosure including channels, skids, beams and plates undercoated.

D. Primary Fusing by Manufacturer:

1. High Voltage Terminations and Equipment: Dead-front with universal-type bushing well inserts. Include the following: bushing well inserts, lightning arrestors, parking stands, portable insulated bushings.

2. Internal Isolation Link: Each transformer shall be supplied with a coordinated internal isolation link in series with bayonet type expulsion/ELSP fuses for protection during transformer switching and refusing operations.

3. Overload and Short Circuit Protection:
   a. Provide under oil current-limiting fuses in series with load-sensing bayonet expulsion fuses.

E. Radial Feed Primary Connections:

1. Transformer primary connections shall be deadfront, 600A non-load-break, separable insulated high-voltage connector bushings.

F. High-Voltage Terminations and Equipment: Deadfront with universal-type bushing wells inserts. Include the following:

1. Bushing-Well Inserts: One for each high-voltage bushing well.

2. Parking Stands: One for each high-voltage bushing well.

3. Portable Insulated Bushings: Arranged for parking insulated, high-voltage, load-break cable terminators; one for each primary feeder conductor terminating at transformer.

   a. External distribution-type piggyback behind load-break elbows.
5. Pressure-relief device: Self-sealing with indicator.

2.04ENERGY EFFICIENCY

A. Minimum 98% efficiency or as required by the Department of Energy minimum transformer efficiency requirements (CFR 43192 & DOE 78FR23335), whichever is greater.

2.05CORE AND COIL

A. Coil:
   1. Windings shall be copper.

B. Core:
   1. Constructed of high grade, grain oriented, non-aging silicon steel.

C. Finish:
   1. Transformer enclosure and rails shall be finished with manufacturer's standard finish.
   2. Outdoor transformers shall have outdoor paint finish.

2.06NAMEPLATE

A. Nameplates shall be:
   1. Secured to transformer enclosure with screws.
   2. Diagrammatic nameplate listing all information as required by NEMA standards.

B. Transformer:
   1. Transformer shall have nameplate with:
      a. Manufacturer's name and drawing number.
      b. Transformer identification tag as indicated on drawings
      c. Electrical connection diagram
      d. Primary and secondary voltage rating
      e. kVA rating
      f. Basic Impulse Level

C. Submit identification to Owner/Architect/Engineer for approval.

2.07ACCESSORIES

A. Transformer shall include:
   1. Provisions for lifting and jacking
2. Removable panel for access for de-energized tap changing
3. Two ground pads using Salisbury ground ball studs.
4. A continuous 1/4” x 2” ground bus for connection to adjacent compartment's switchgear.
5. One-inch globe type drain valve with sampling device.
6. Dial-type thermometer.
7. Liquid-level gauge.
8. Pressure-vacuum gauge.

2.08 QUALITY ASSURANCE

A. Transformers to be of the highest quality manufactured by a firm that has manufactured such apparatus for at least 25 years.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine conditions for compliance with enclosure- and ambient-temperature requirements for each transformer.

B. Verify that field measurements are as needed to maintain working clearances required by NFPA 70 and manufacturer's written instructions.

C. Examine floors and equipment pads for suitable mounting conditions where transformers will be installed.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Construct concrete bases and anchor floor-mounting transformers according to manufacturer's written instructions, seismic codes applicable to Project, and structural requirements.

3.03 CONNECTIONS

A. Ground equipment according to Division 26 Section "Grounding and Bonding."

B. Connect wiring according to Division 26 Section "Conductors and Cables."

C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
3.04 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:
   1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
   2. Infrared Scanning: Two months after Substantial Completion, perform an infrared scan of transformer connections.
      a. Use an infrared-scanning device designed to measure temperature or detect significant deviations from normal values. Provide documentation of device calibration.
      b. Perform 2 follow-up infrared scans of transformers, one at 4 months and the other at 11 months after Substantial Completion.
      c. Prepare a certified report identifying transformer checked and describing results of scanning. Include notation of deficiencies detected, remedial action taken, and scanning observations after remedial action.

3.05 ADJUSTING

A. Record transformer secondary voltage at each unit for at least 48 hours of typical occupancy period. Adjust transformer taps to provide optimum voltage conditions at secondary terminals. Optimum is defined as not exceeding nameplate voltage plus 10 percent and not being lower than nameplate voltage minus 5 percent at maximum load conditions. Submit recording and tap settings as test results.

B. Connect buck-boost transformers to provide nameplate voltage of equipment being served, plus or minus 5 percent, at secondary terminals.


END OF SECTION 26 22 00
PART 1  GENERAL

1.01  DESCRIPTION

A. Purpose

1. Specification covers dry type transformers, with primary voltage above 600 V, for use as shown on plans.

2. Contractor shall verify transformer size, voltage, and physical dimensions will fit in proposed path to the final location of the transformer before purchasing.

B. REFERENCE STANDARDS

1. ANSI C57.12.50- Requirements for Dry-Type Distribution Transformers, 1-500 kVA 1-phase and 15-500 kVA 3-phase, with high voltage 601 - 34,500 V, low voltage 120-1000 V

2. ANSI C57.12.51 - Dry-Type Power Transformers 501 kVA and Larger, 3-Phase with High-Voltage 601 to 34 500 V, Low-Voltage 208Y/120 to 4160 V, Requirements for Ventilated

3. ANSI C57.12.55 - Dry-Type Transformers in Unit Installations, Including Unit Substations - Conformance Standard

4. ANSI C57.12.70 - Terminal Markings and Connections for Distribution and Power Transformers

5. IEEE C57.12.01 - General Requirements for Dry-Type Distribution and Power Transformers Including Those with Solid Cast and/or Resin Encapsulated Windings

6. NEMA 5T20- Dry Type Transformers for General Applications

7. UL 1561 - Dry Type General Purpose and Power Transformers

C. SUBMITTALS

1. Submit Shop Drawings for equipment provided under this Section.

2. Acoustical Sound and Vibration Test Data

3. Acoustical sound and vibration test data on manufactured unit.

4. Test data sheets shall be submitted for review and approval by Owner and Architect/Engineer prior to shipment to job site.

5. Current Manufacturer's AEIC pre-qualification

PART 2  PRODUCTS

2.01  MANUFACTURERS

A. Acceptable Manufacturers: ABB, General Electric, Square D, Siemens, Eaton
B. Approved equal.

2.02 RATINGS AND STANDARDS COMPLIANCE

A. Show ratings and Impedance of transformer on drawings. Where impedance is not specified elsewhere provide 7% impedance for transformers in three transformer networks and 5.75% for non-networked transformers.

B. Ventilated dry type transformers shall comply with ANSI 57.12.51

2.03 CONSTRUCTION

A. Refer to drawings for cooling transformer type.

B. Transformer shall be cooled by natural air and forced air convection (AA/FA).
   1. Units shall include fans to increase kVA rating by 33%
   2. Fan motors shall be 120 V with individual fusing.
   3. Temperature monitor and fan control unit includes:
      a. Temperature monitor with digital readout.
      b. GREEN- power on, YELLOW- fan on, RED- high temperature indicating lights.
      c. Audible high temperature alarm with alarm silence pushbutton.
      d. Maximum temperature memory with read and reset switch.
      e. Auto/manual fan control switch.
      f. System test switch.
      g. Auxiliary alarm contact for remote control and temperature monitoring.
      h. Acceptable manufacturer: Temptrol

4. Temperature sensing in each coil.

5. Sequence of Operation
   a. Transformer operating below natural air convection cooling (M) rating.
   b. GREEN light is activated
   c. Temperature rises to above natural air convection cooling (M) rating
   d. Relay is energized, fans and YELLOW light activate.
   e. Temperature rises to higher set point, relay energizes and audible alarm, RED light, and circuit for remote alarms activates.

6. Control power shall be provided from control power transformer self-contained in equipment.

7. Emergency Unit Substation transformers shall be pre-wired for future fan cooling, including RTD’s or thermocouples embedded in the windings for temperature control.
2.04 INSULATION TYPE VPI

A. Electrical Insulation
   1. Class H Insulation system shall be rated 220•c.
   2. Temperature rise based on a 30•c ambient with a maximum 40•c.
   3. Insulation shall be inorganic materials such as porcelain, glass fiber, electrical grade glass polyester, or Nomex.
   4. Coil assembly shall be Vacuum Pressure Impregnated (VPI) polyester.
   5. Transformer shall be:
      a. Designed for temperature rise of 150•c and shall be capable of operating at 33% above base nameplate kVA capacity continuously.
      b. Designed to meet sound level standards for dry-type transformers.
      c. Basic Impulse Insulation Level: 95kV for 15kV; 60 BIL for 5kV (emergency system); 30kV for 600V and below.

2.05 ENERGY EFFICIENCY

A. Minimum 98% efficiency or as required by the Department of Energy minimum transformer efficiency requirements (CFR 43192 & DOE 78FR23335), whichever is greater.

2.06 CORE AND COIL

A. Coil:
   1. Windings shall be copper.

B. Core:
   1. Constructed of high grade, grain oriented, non-aging silicon steel.

2.07 TAPS

A. Taps:
   1. Rigidly support
   2. Mark for connections
   3. Accessible from front or back by panel removal
   4. Four 2 Y. % full capacity taps; two above and two below rated voltage.

2.08 ENCLOSURES

A. Transformer enclosure shall:
   1. Be constructed of 12 ga sheet steel.
   2. Be equipped with removable panels for access to core and coils.
3. Include front and rear panels with ventilated grills.
4. Include rubber isolation pads to isolate core from case. There shall be no metal-to-metal contact.
5. Base suitable for skidding in all directions.

B. Finish:
   1. Transformer enclosure and rails shall be finished with manufacturer's standard finish.
   2. Outdoor transformers shall have outdoor paint finish.

C. Ventilation Openings - Louvered or fine mesh screened. Punched holes are unacceptable to guard against insertion of foreign objects.

2.09 NAMEPLATE
A. Nameplates shall be:
   1. Secured to transformer enclosure with screws.
   2. Diagrammatic nameplate listing all information as required by NEMA standards.

B. Transformer:
   1. Transformer shall have nameplate with:
      a. Manufacturer's name and drawing number.
      b. Transformer identification tag as indicated on drawings
      c. Electrical connection diagram
      d. Primary and secondary voltage rating
      e. kVA rating
      f. Basic Impulse Level

C. Doors:
   1. Provide external doors and hinged bolted panels with “Caution - High Voltage - Keep Out” signs.

D. Submit identification to Owner/Architect/Engineer for approval.

2.10 ACCESSORIES
A. Transformer shall include:
   1. Provisions for lifting and jacking
   2. Removable panel for access for de-energized tap changing
   3. Two ground pads using Salisbury ground ball studs.
4. A continuous 1/4" x 2" ground bus for connection to adjacent compartment's switchgear.

2.11 TERMINAL COMPARTMENTS

A. Transformer shall include HV terminal compartment and LV terminal compartment.
   1. Air filled primary terminal chamber adequately sized stress cone termination of 3 to 6 single conductors as indicated.

B. Connections between:
   1. Primary device and transformer shall be bus.
   2. Transformer and secondary shall be Bus.
   3. Connections between the transformer and the switchgear shall be provided by the switchgear manufacturer.

C. Secondary neutral connection shall be brought out for bonding to ground bar.
   1. Provide fully insulated secondary neutral bushing (externally groundable) to permit the use at a neutral conductor or CT or GF sensing.

D. Provide removable link between neutral point and ground bar.

E. Distribution class surge arresters, rated at 15kV, located in HV terminal chamber.

F. Terminal markings shall be provided on the transformer terminals and shall clearly identify each terminal when doors or covers are opened.
   1. Transformers will have high voltage (primary) terminal markings:
      a. "H1" to "N" Phase
      b. "H2" to "C" Phase
      c. "H3" to "B" Phase
   2. Low voltage switchgear normally connected to the building power service transformers will be constructed in accordance with industry standards and will have their buses identified "1", "2", "3", "N". Transformers will have low voltage (secondary) terminal markings "X1", "X2", "X3", "XO" from left to right or top to bottom when facing the low voltage terminals and the switchgear shall be as follows:
      a. "X1" to "1" (BUS)
      b. "X2" to "2" (BUS)
      c. "X3" to "3" (BUS)
   3. Noted: transformer connections as indicated above results in a rotation sequence at the low voltage switchgear of "1", "2", "3".
2.12 QUALITY ASSURANCE

A. Transformers to be of the highest quality manufactured by a firm that has manufactured such apparatus for at least 25 years.

2.13 VIBRATION ISOLATION

A. Mounting type - Unit DNP (Double Neoprene Pad): Neoprene pad isolators shall be formed by two layers of 1/4-inch to 5/6-inch thick ribbed or waffled neoprene, separated by a stainless steel or aluminum plates. These layers shall be permanently adhered together.

1. Neoprene shall be 40 to 50 durometer. The pads shall be sized so that they will be loaded within the manufacturer’s recommended range.

2. Provide steel top plate equal to the size of the pad. This is provided to transfer the weight of the supported unit to the pads.

3. Acceptable manufacturers: Amber/Booth
   a. Korfund Dynamics
   b. Mason Industries
   c. Peabody Noise Control
   d. Vibration Mountings Control
   e. Kinetics Noise Control

B. Provide vibration control devices, materials and related items. Perform all work as specified in this section to provide complete vibration isolation systems in proper working order.

1. Coordinate the size, location, and special requirements of vibration isolation equipment and systems with other trades. Coordinate plan dimensions with size of housekeeping pads.

2. Size isolators to meet the specified loading requirements.

3. Should equipment cause excessive noise or vibrations, the Contractor shall be responsible for remedial work required reducing noise and vibration levels. "Excessive" is defined as exceeding the manufacturer's specifications for the unit in question.

4. Upon completion of the work, the Owner's Representative shall inspect the installation and shall inform the installing contractor of any further work that must be completed. Make all adjustments as directed. This work shall be done before vibration isolation systems are accepted.
PART 3 EXECUTION

3.01 EXAMINATION

A. Examine conditions for compliance with enclosure- and ambient-temperature requirements for each transformer.

B. Verify that field measurements are as needed to maintain working clearances required by NFPA 70 and manufacturer's written instructions.

C. Examine walls and floors for suitable mounting conditions where transformers will be installed.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install wall-mounting transformers level and plumb with wall brackets fabricated by transformer manufacturer.

   1. Brace wall-mounting transformers as specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

B. Construct concrete bases and anchor floor-mounting transformers according to manufacturer's written instructions, seismic codes applicable to Project, and requirements in Division 26 Section "Hangers and Supports for Electrical Systems."

3.03 CONNECTIONS

A. Ground equipment according to Division 26 Section "Grounding and Bonding."

B. Connect wiring according to Division 26 Section "Conductors and Cables."

C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.04 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

   1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

   2. Infrared Scanning: Two months after Substantial Completion, perform an infrared scan of transformer connections.
a. Use an infrared-scanning device designed to measure temperature or detect significant deviations from normal values. Provide documentation of device calibration.

b. Perform 2 follow-up infrared scans of transformers, one at 4 months and the other at 11 months after Substantial Completion.

c. Prepare a certified report identifying transformer checked and describing results of scanning. Include notation of deficiencies detected, remedial action taken, and scanning observations after remedial action.

3.05 ADJUSTING

A. Record transformer secondary voltage at each unit for at least 48 hours of typical occupancy period. Adjust transformer taps to provide optimum voltage conditions at secondary terminals. Optimum is defined as not exceeding nameplate voltage plus 10 percent and not being lower than nameplate voltage minus 5 percent at maximum load conditions. Submit recording and tap settings as test results.

B. Connect buck-boost transformers to provide nameplate voltage of equipment being served, plus or minus 5 percent, at secondary terminals.


END OF SECTION 26 22 00
PART 1 GENERAL

1.01 DESCRIPTION

A. Purpose

1. The purpose of this section is to assure that all electrical equipment, both Contractor and Owner-supplied and existing equipment that is to be reused (such as transformers, network protectors, etc.), is operational, within industry and/or manufacturer's tolerances, calibrated per the Power System Studies, complies with all applicable codes, installed in accordance with design specifications, and functioning in the system in the manner designed by the A/E. This effort should minimize damage and limit outages caused by electrical failures, assure proper personnel protection, and will determine suitability for reliable operation.

B. General

1. Inspections, calibrations, and acceptance tests for all equipment/systems shall be performed. The inspections and testing activities shall be divided among the following groups as specified in this section:

   a. The Contractor shall engage the services of an ETC (Electrical Testing Contractor). The ETC shall be a recognized firm specializing in performing inspections, calibrations and acceptance tests specified in this section. The Contractor, working through the ETC, shall provide all material, equipment, labor and technical supervision to perform the inspection, calibration and testing.

   b. The Contractor shall engage the services of the original equipment manufacturer's authorized service representative to provide special equipment, labor, and technical supervision, when required, in addition to what is supplied by the contractor, working through the ETC.

   c. The Contractor shall perform any Inspections, calibrations, and acceptance tests for equipment and systems not requiring the services of the ETC, and manufacturer's representative.

2. In cases where equipment and systems require the involvement of two or all of the above mentioned parties, the Contractor, through his subcontractors, shall coordinate and perform all inspection and testing requirements. The Contractor shall be responsible for coordination of the work and ensuring that the requirements of this section are met.

1.02 QUALIFICATIONS

A. The Contractor shall retain the services of a third party ETC that is qualified to test electrical equipment, and is an approved testing company by the State of Washington Department of Labor and Industries. The ETC shall not be associated with the manufacture of equipment or systems under test.
B. The contractor, working through the ETC, shall have the inspections, calibration, and acceptance tests performed by or under the supervision, review and approval of a professional Electrical Engineer holding a current license from the State of Washington.

C. The ETC shall be an employee of the testing company with at least 5 years of field experience testing electrical apparatus.

D. The testing company's site lead engineer shall be a degreed electrical engineer, who is a full time employee of the testing company, with at least 5 years of experience testing electrical equipment, troubleshooting and identifying power system and equipment deficiencies.

E. The following companies are pre-approved, subject to the qualifications, third party requirements and association restrictions stated in this section. Other companies will be considered:
   1. Sigma Six Solution, Inc.
   2. Siemens Technical Services
   3. Electrotest, Inc.
   4. Lagers' E.T. & M

1.03 RELATED SECTIONS

A. Refer to Commissioning Support section for Contractor requirements in support of the commissioning process.

1.04 REFERENCES

A. Applicable codes, standards, and references:
   1. All inspections and tests shall be in accordance with the following applicable codes and standards except as provided otherwise in this section.
      b. National Electrical Manufacturer's Association – NEMA
      d. Institute of Electrical and Electronic Engineers – IEEE
      e. American National Standards Institute – ANSI
      g. State and local codes and ordinances
      h. Insulated Power Cable Engineers Association – IPCEA
      i. Association of Edison Illuminating Companies – AEIC
      j. Occupational Safety and Health Administration - OSHA 29CFR Part 1910.269
      k. National Electrical Code – NEC
I. National Fire Protection Association – NFPA
   m. ANSI/NFPA 70: National Electrical Code
   n. ANSI/NFPA 70B: Electrical Equipment Maintenance
   o. NFPA 70E: Electrical Safety Requirements for Employee Workplaces
   p. ANSI/NFPA 78: Lightning Protection Code
   r. NFPA 99: Health Care Facilities

B. All inspections and tests shall utilize the following references:
   1. Project design drawings and specifications
   2. Shop drawings and submittals
   3. Manufacturer's instruction manuals applicable to each particular apparatus
   4. Applicable NETA acceptance testing work scope sections per NETA ATS 1999

1.05 COORDINATION

   A. Coordinate the Acceptance Testing with the Owner.

   B. Coordinate the ETC, and factory field-testing and assistance per the requirements of this section.

1.06 SUBMITTALS

   A. General
       1. Submittals shall be in accordance with Conditions of the Contract and Division 01 Specification Sections.
       2. Submit the ETC qualifications according to this section for approval.
       3. Submit the coordinated test schedule for approval.
       4. Submit detailed test procedures corresponding to the requirements in this section for approval. The test procedures shall be detailed test instructions, written with sufficient step-by-step information to allow a test to be repeated under identical conditions. List the value for all setpoints and acceptable results for each condition tested.
       5. Submit a preliminary copy of the hand-written field test results to the Owner’s Representative no longer than one week after the test is completed.
       6. Prior to energization of equipment submit a letter certifying that the electrical installation being energized complies with contract documents, code and proper system operation.
       7. The test reports shall be compiled and submitted in formal form with a summary. The report shall be reviewed and stamped by the Professional Electrical Engineer.
1.07 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. Operations and Maintenance Manuals shall be in accordance with Conditions of the Contract and Division 01 Specification Sections.

1.08 SCHEDULING

A. Perform all testing after installation and before energizing. All systems shall pass tests prior to being put into service.

B. The Contractor in coordination with ETC, and the equipment manufacturer’s representatives shall submit to the Owner’s Representative a schedule of all tests to be performed one month prior to the scheduled performance of the first test.

C. Confirm the test schedule with the Owner’s Representative one week prior to the test. The Contractor, working through the ETC, shall coordinate the test schedule so that the UW Engineering Services and/or Physical Plant, at their discretion, can witness the testing.

D. The Contractor, working through the ETC, shall deliver the test results to the Owner within 7 working days of test. The Owner shall have the tests results for a two-week review prior to equipment energization.

E. Testing and calibration of electrical equipment shall be completed prior to the start of commissioning activities. Refer to the commissioning specification to determine which systems are to be commissioned. When required during commissioning, the Contractor, working through the ETC, shall retest and recalibrate equipment to support the commissioning activities.

1.09 MEETINGS

A. Pre-testing conference: The Contractor shall request a pre-testing conference with the Owner. For projects with medium/high voltage testing, the group shall include the UW Campus Operations High Voltage Shop.

1.10 SAFETY AND PRECAUTIONS

A. Safety practices shall include, but are not limited to, the following requirements:
   1. Occupational Safety and Health Act of 1970 – OSHA
   2. Applicable state and local safety operating procedures
   3. National Fire Protection Association - NFPA 70E

B. Tests shall be performed with apparatus de-energized unless otherwise specified (e.g. rotation, phasing).

C. Power circuits shall have conductors shorted to ground by a hotline grounded device approved for the purpose.
D. In all cases, work shall not proceed until the Contractor’s safety representative has determined that it is safe to do so.

E. The Contractor, working through the ETC, shall have available sufficient protective barriers and warning signs, where necessary, to conduct specified tests safely.

F. The Owner's safety procedures shall be reviewed and understood by the Contractor and communicated to it's employees, subcontractors and subcontractor's employees.

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

A. All test equipment, except manufacturer's proprietary test equipment, shall be furnished by and remain the property of the Contractor.

B. Test instrument calibration
   1. The Contractor shall insure that it's electrical testing contractor has a calibration program, which maintains all applicable test instrumentation within rated accuracy.
   2. The accuracy shall be traceable to the National Bureau of Standards in an unbroken chain.
   3. Up-to-date calibration labels shall be visible on all test equipment.

C. Use of torque wrenches
   1. Use calibrated torque wrenches for all bolted connections on buses and power cable terminations. Mark the head of the bolt with a colored marker pen after its being torqued to manufacturer's recommended value.

PART 3 EXECUTION

3.01 REQUIREMENTS

A. Perform acceptance tests in accordance with manufacturer's recommendations, NFPA 70B and International Electrical Testing Association (NETA) testing specifications NETA ATS-1999.

B. Voltage adjustments shall be in accordance with SCL Standard E1-4.1.

C. The test plan, procedures, test results and reports shall be reviewed, under the supervision of and approved by a Professional Electrical Engineer.

D. Division of responsibility
   1. The Contractor shall torque down all accessible bolts, perform routine insulation resistance and continuity tests on branch and feeder circuits and rotational tests for
all distribution and utilization equipment, prior to and in addition to tests performed by the Contractor, working through the ETC, specified in this section.

2. The Contractor shall supply a suitable and stable source of test power to the ETC, at each test site.

3. The Contractor shall coordinate the work to expedite the project scheduling, including coordination with the ETC on when equipment is available for electrical testing.

4. The Contractor shall clean all the electrical equipment prior to testing by the Contractor, working through the ETC.

5. The Contractor, working through the ETC, shall be responsible for implementing all final settings and adjustments on protective devices and electrical equipment in accordance with the Power System Protective Device Studies.

E. Any questions or concerns identified shall be promptly addressed to the Owner’s Representative.

F. Any system, material, or workmanship which is found defective on the basis of electrical inspections and tests shall be reported directly to the Owner’s Representative.

G. If a test reveals a fault or problem, the entire test will be repeated until the problem is corrected. Submit additional written test reports.

H. Maintain a written record of all tests, and upon completion of the project, assemble and certify a final test report. The field test reports shall be compiled and signed by the individual performing the testing.

I. Power systems protective device calibration
   1. Adjustments, settings and modifications
      a. The Contractor, working through the ETC, shall calibrate necessary field settings, adjustments and minor modifications to conform to the coordination study without additional cost. (Examples of minor modifications are trip sizes within the same frame, the time curve characteristics of induction relays, ranges etc.)
         1) Adjust protective devices to the values provided in the coordination study.
         2) Test the minimum pickup and delay, ground fault pickup and delay.
         3) The trip characteristics, when adjusted to setting parameters, shall fall within the manufacturer’s published time-current characteristic tolerance.
   2. The Contractor, working through the ETC, shall verify that the protective devices have been adjusted and set in accordance with the approved protective device study.

J. Acceptance criteria
1. Each function and test shall be performed under conditions which simulate actual operating conditions as closely as possible.
   a. To that end the Contractor shall provide all necessary materials and equipment and temporary system voltages and currents to simulate fault conditions on the system being tested in order to prove and verify proper operation.
   b. At satisfactory completion of all verified tests, the building electrical system being tested shall be returned to the condition required by the contract documents as a complete and operational system.

2. The Contractor, working through the ETC, shall perform general inspections at the job site and shall also review the following:
   a. Assembly of the accessory equipment, and the interconnecting wiring for control circuits and fire alarm interface.
   b. General Inspection of the following: Appearance, finish, alignment of doors, covers and similar parts; quality of workmanship; possible shipping and other damage; missing, broken or incorrectly applied devices; loose or missing accessories, bushings or hardware; loose or broken wires; proper installation of all equipment; verify that shop drawings and instructions have been shipped with all equipment and are available.
   c. Support of electrical equipment: Inspect and check all electrical equipment for support and seismic bracing.
   d. Spare fuses: The Contractor, working through the ETC, and it’s Engineer shall inspect and verify spare fuse inventory as specified by Division 26.

3. Testing requirements and procedures
   a. The following equipment and systems shall be inspected and tested by the Contractor, working through the ETC, per NETA, manufacturer’s instructions, and additional requirements noted.
      1) Transformers
         (a) All dry type greater than 600 Volt
         (b) Dry type 600 Volt and below
            i. All transformers greater than or equal to 167 KVA single-phase and 225 KVA 3-phase
         (c) All liquid-filled transformers.
         (d) Tests
            i. Inspect for physical damage, proper installation, anchorage and grounding.
            ii. Verify transformer is supplied and connected in accordance with contract documents.
            iii. Verify that the transformer secondaries have a clockwise phase rotation sequence.
            iv. Adjust the transformer taps to the nominal system voltages per ANSI C84.1-1989.
2) Instrument transformers and current transformers

3) Medium voltage vacuum and air circuit breakers

4) Cables
   (a) Medium voltage cable (greater than 600V)
      i. Apply grounds for a time period adequate to drain all insulation-stored charge - minimum of 24 hours.
      ii. VLF AC Withstand test in accordance with IEEE 400.2-2013 on all new cables.

5) AC and DC motors 10 hp and larger

6) DC battery systems

7) Surge arrestors

8) Reactors

9) Other utilization equipment

10) Switches (air and oil)
    (a) Verify correct wire bending radii at terminations per wire manufacturer’s recommendations and NEC.

11) Circuit breakers
    (a) Low voltage power circuit breakers (all) and insulated case/molded case circuit breakers 400a and larger and all with adjustable instantaneous trip adjustments.
       i. Calibrate and set all breaker settings per the Protective Device Coordination Study.

12) Protective relays and devices
    (a) Modify NETA tests according to manufacturer’s recommended testing procedures.
    (b) Calibrate and set all relay settings according to the Protective Device Coordination Study.

13) Ground fault systems
    (a) Calibrate and set all ground fault settings according to the Protective Device Coordination Study.

14) Metering
    (a) Modify NETA tests according to manufacturer’s recommended testing procedures.
    (b) Calibrate and set all meter configuration settings.
       i. Settings:
          * Set Vars to + to the load.
          * Remote programming enabled
• Request the device address from Owner’s Representative and set it accordingly.
• Setup PT and CT ratios, system voltage and all other programmable parameters to make the meter and its features fully functional.

15) Emergency off switches
(a) Test all emergency off switches and verify shut down and reset of equipment.

16) Motor control
(a) Motor starters - medium and low voltage

17) Motor control centers
(a) Verify correct overload heaters are installed.

18) Variable frequency drives
(a) Electrical tests and inspections to be performed by the manufacturer
(b) Measure and document harmonics at main switchgear or a designated point of common coupling.

19) Capacitors
(a) Verify that 97% power factor correction has been reached at full equipment load.

b. The following equipment shall be calibrated, inspected and tested by the manufacturer’s authorized service representative in coordination with the contractor, working through the ETC. Inspect and test according to NETA, manufacturer’s recommended procedures and the operational testing procedure described herein.

1) Spot or distributed network substations
2) Special testing requirements are detailed below for power substations that are configured as spot or distributed networks. These procedures are based on the typical “Network Control” and “Network Control Power” schematic drawings. Modify procedures as needed to suit the actual network protector system provided. Items a through c shall be completed before scheduling the test procedure with Owner detailed in items d through dd.

(a) Complete the entire installation for the unit substation including the bus tie to the other two unit substations so the entire substation is functional.

(b) Set all breaker trip unit functions per the coordination study. Remember to configure the spot network relay.

(c) The testing agency shall complete all the required testing and calibration for the entire substation and associated equipment/devices. This includes breakers, relays, and other devices set according to the Short Circuit and Coordination study.
(d) Arrange for the following testing with the UW High Voltage Shop, Engineering Services and the Owner's Representative. The network relay and/or switchgear manufacturer representative should be present to assist in the commissioning process. Only the original equipment manufacturer’s authorized service representative shall perform all testing associated with network protector relays. No exceptions to this requirement shall be permitted.

(e) The UW High Voltage Shop shall inspect the primary switch and unit substation for proper connection and verify phasing.

(f) Place the network Auto/Off/Manual selector switch into the off position.

(g) With the main and tie breaker open and racked out, close the primary switch to energize the transformer.

(h) The UW High Voltage Shop shall verify phasing, rotation and voltage at both the transformer and across the open tie breaker.

(i) Verify control voltage is present.

(j) Rack in the main breaker.

(k) Place the network Auto/Off/Manual selector switch into the manual mode. The main breaker should charge but not close.

(l) Make sure the 86 lock-out relay is reset.

(m) Close the main breaker with the breaker control switch. Check the bus and control voltage.

(n) Trip the main breaker with the breaker control switch. The main breaker should open and the breaker should recharge.

(o) Open the primary switch and discharge the main breaker spring.

(p) Place the network Auto/Off/Manual selector switch into the off position.

(q) Rack in and close the network tie breaker. Check the bus and control voltage.

(r) Place the network Auto/Off/Manual selector switch into the manual position. The main breaker should charge but not close.

(s) Attempt to close the main breaker with the breaker control switch. The breaker should not close since the primary switch is open.

(t) Place the network Auto/Off/Manual selector switch into the Auto position. The main breaker should not close since the primary switch is open.

(u) Close the primary switch. The main breaker should automatically reclose.

(v) Place the network protector Auto/Off/Manual selector switch into the manual mode.

(w) Trip the main breaker with the breaker control switch.
(x) With the main breaker NAC contact on the breaker control switch tripped (green flag), place the network Auto/Off/Manual selector switch into the auto mode. The main breaker should not reclose.

(y) Close the main breaker with the breaker control switch, resetting the NAC switch (red flag). The main breaker should automatically reclose.

(z) Trip the 86 lockout relay which should open the main breaker and lock it out.

(aa) Reset the 86 lockout relay. The main breaker should automatically reclose.

(bb) Open the primary switch. The main breaker should trip and recharge.

(cc) Close the primary switch. The main breaker should reclose.

(dd) Repeat the last two steps with the tie breaker open and also the network Auto/Off/Manual selector switch in the off and manual modes.

c. Emergency systems

1) Emergency generator systems

(a) Inspect and test per NETA and manufacturer’s recommended start-up and testing procedures

(b) Perform resistive and reactive load testing at .8 pf (lagging).

(c) Test phase rotation to determine compatibility with load requirements.

2) Automatic transfer switches

(a) Coordinate with Automatic Transfer Switches Section.

(b) Verify clockwise phase rotation and in-phase transfer between the two sources of power.

(c) Adjust all timers and other parameters as recommended by the manufacture and the Engineer. A set-up sheet of final parameter settings, which includes spare columns for future modifications, shall be provided inside the enclosure.

(d) Test all the standard and optional features specified for the transfer switches.

(e) Test load management contacts, both block transfer and load shed. Simulate a load-shed signal from the CMCS (Central Monitoring and Control System) for this purpose.

3) Uninterruptible power supplies

d. The following equipment shall be inspected and tested by the Contractor, working through the ETC, with the manufacturer’s authorized service representatives.

1) General power system tests
(a) Load balance tests: Check all panelboards for proper load balance between phase conductors, and make adjustments as necessary to bring unbalanced phases to within 15% of average load.

(b) Motor tests: Check all motors for proper rotation and measure actual load current. Submit tabulation of motor currents for all motors 10 HP and larger after the HVAC system has been balanced.

(c) Phase relationship tests: Check connections to all new and existing equipment for proper phase relationship. During such check, disconnect all devices which could be damaged by the application of voltage or reversed phase sequence.

2) Metal enclosed ducts

   (a) Inspect bus for physical damage and proper connection. Clean interior and insulators where applicable.

   (b) Inspect for proper bracing, suspension, alignment and enclosure grounding.

   (c) Measure insulation resistance of each bus phase-to-phase and phase-to-ground (1 minute minimum).

   (d) Inspect all accessible bus joints and cable connections by infrared scanner to detect loose or high-resistance connections and other circuit anomalies.

3) Low voltage feeder and branch circuit conductors 4/0 and larger (600V and below)

   (a) Test for continuity of each circuit.

   (b) Test for grounds in each circuit; test shall consist of the physical examination of the installation to ensure that all required ground jumpers, devices, and appurtenances do exist and are mechanically firm.

   (c) Perform a 500 volt megohm meter test on each circuit between the conductor and ground. The insulation resistance shall not be less than 2 megohms for circuits under 115V, 6 megohms between conductor and ground on those circuits (115V-600V) with total single conductor length of 2500 feet and over, nor less than 8 megohms for those circuits (115V-600V) with single conductor length of less than 2500 feet. If conductor fails test, replace wiring or correct defect and retest.

   (d) Perform torque test for every conductor tested and terminated in an overcurrent device or bolted type connection; torque all connections per manufacturer’s recommendations and tabulate the results on a tabular form.

4) Panelboards

   (a) Inspect for physical damage, proper installation, supports and grounding.

   (b) Verify that neutrals are grounded only at the main service.
(c) Load balance tests: Checks all panelboards for proper load balance between phase conductors and make adjustments as necessary to bring unbalanced phases to within 15% of average load.

5) Grounding systems

(a) Perform fall-of-potential test on main grounding electrode system per IEEE Standard No. 81. Maximum resistance to ground shall be less than 5 Ohms for commercial or industrial systems and less than 1 ohm for generating or transmission station grounds. If this resistance cannot be obtained with the ground system, notify Owner’s Representative for further instruction.

(b) Verify that neutrals are grounded only at the main service by removing the service neutral grounding conductor and meggering the neutral bus.

(c) Perform point-to-point tests to determine the resistance between the main grounding system and all major electrical equipment frames, system-neutral, and/or derived neutral points. Investigate resistance values, which exceed .5 ohm. If this resistance cannot be obtained with the ground system, notify Owner’s Representative for further instruction.

6) Convenience receptacles

(a) Receptacle polarity test: Randomly test one receptacle in each room or hallway installed or re-connected by this project. Test for open ground, reverse polarity, open hot, open neutral, hot and ground reversed, hot on neutral and hot open. For Hospital areas add retention (pull out) test of Ground Blade per NFPA99. Rewire receptacles as required.

(b) Ground-fault receptacle circuit interrupter tests: The Test engineer shall test each receptacle or branch circuit breaker having ground-fault circuit protection to ensure that the ground-fault circuit interrupter will not operate when subjected to a ground-fault current of less than 4 milliamperes and will operate when subjected to a ground-fault current exceeding 6 milliamperes.

7) Special Systems

(a) Service column for operating rooms

(b) Test each electrical and communication device to insure proper connections. If device does not work, find the problem and correct it. This work shall include correcting wiring inside the patient service column. Demonstrate correct polarity and show that neutral to “hot” does not exceed 68 volts AC.

8) Isolated Power System For Operating Rooms

(a) After the installation of the isolated power system and equipotential grounding system has been completed, an independent testing agency with assistance from the Contractor shall perform the following tests in accordance with NFPA 56 A.
i. Measure the impedance (capacitive and resistive) to ground of all conductors with the connection between the line isolation monitor and reference grounding point open. Replace wiring that measures less than 500,000 ohms.

ii. Measure the potential difference and resistances between the isolated power panel ground bus and the grounding pole of each receptacle and the patient ground point.

iii. Also measure the potential between the grounding pole of each one of the receptacles and each of the other receptacles. The potential difference shall not exceed 10 millivolts with the system both energized and not energized.

(b) Measure system voltage.

(c) Measure readings of ungrounded system components, including isolation transformer and line isolation monitor.

(d) Measure system leakage with line isolation monitor connected in circuit.

(e) Measure system leakage with surgery track light and film viewers energized.

9) Equipotential grounding system for operating rooms

(a) After the equipotential grounding system has been installed and prior to the walls being enclosed, the Contractor shall perform the following tests:

i. Measure the potential difference between the grounding wire to the patient ground jack and any of the bonded exposed conductive surfaces. Correct bonding of any items with a reading over 100 millivolts.

ii. Measure the resistance between the grounding wire to the patient ground jack and any of the bonded exposed conductive surfaces. Correct bonding of any items with a reading over 0.1 ohms.

(b) After the rooms are finished and all devices are installed, the equipment manufacturer with assistance from the Contractor shall perform the same tests described above, including any items that were not installed prior to the previous tests.

(c) Record all test values and include them in the maintenance manual information. The tests shall be witnessed by the Owner’s Representative. Schedule tests with Owner and Engineer at least one month prior to test date.

K. Labels

1. Upon completion of the inspection, calibration and testing, attach a label to all devices tested. These labels shall indicate the date tested, the ETC company name and tester’s initials.
L. Retesting

1. Any fault in material or in any part of the installation revealed by these tests shall be investigated, replaced or repaired by the Contractor and the same test repeated by the Contractor, working through the ETC, at the Contractor's expense until no fault appears.

3.02 REPORTS

A. The Contractor, working through the ETC, shall prepare test reports on the systems tested. Include a copy of each test report in the Operation and Maintenance Manuals.

1. The Contractor, working through the ETC, shall prepare test reports including the following:
   a. Summary of project
   b. Description of equipment tested
   c. Description of test
   d. Test results including retesting results
   e. Test dates
   f. Tester's name
   g. Witnesses (when required)
   h. Corrective work
   i. Acceptance criteria
   j. Conclusions and recommendations
   k. Appendix, including appropriate test forms