South Campus S1 Parking Garage Repairs – Electrical Systems

Project No. 207036
November 20, 2020

UNIVERSITY OF WASHINGTON
Capital Planning & Development

CIVIL ENGINEERING
Reid Middleton, Inc.

ELECTRICAL ENGINEERING
Sazan Group
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END OF SECTION
ADVERTISEMENT FOR BIDS

University of Washington
South Campus S1 Parking Garage Repairs – Electrical Systems, 207036
Date of Bid Opening: December 22, 2020
A/E’s estimate: $595,000

NOTICE TO CONTRACTORS:

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.

The Bid Form will be received up to 3:00 p.m. on December 22, 2020. Bids will then be publicly opened and read aloud via Zoom Version 5.0 (required) Join Zoom Meeting https://washington.zoom.us/j/96428504358

Meeting ID: 964 2850 4358
One tap mobile
+12063379723,,96428504358# US (Seattle)
+12532158782,,96428504358# US (Tacoma)

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 scope of work for this project is the complete replacement of the degraded electrical systems of the S1 Parking Garage, located at the South Campus of the University of Washington in Seattle. The electrical systems were originally embedded inside the 1966 concrete structure. Years of water penetration into the steel conduits and junction boxes has resulted in failure of the electrical system on all levels of the structure. More specifically, the project scope consists of the replacement of all branch circuiting that is currently encased in the concrete structure with new surface-mounted conduit and conductors, replacement of all garage and stair lighting fixtures with new LED fixtures, and replacement of the existing garage main service distribution panel and lighting branch circuit panels. The project also includes removal of existing conductors, surface-mounted conduits, lighting fixtures, main service, and other components of the existing electrical systems.

The S1 Parking Garage is one of the parking facilities serving the UW Medical Center. It is an occupied and busy parking garage. The garage will need to stay open during construction. Phasing or sequencing construction work to minimize interruption to daily operation of the garage is required.

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: Reid Middleton, Inc.
Contact Person: Ding Ye
Pre-Bid Site Meeting: The Project site is available for inspection by prospective bidders at a pre-bid site meeting and walk-through. All prospective bidders should attend one of the following meetings:

1. 9:00 AM on December 9, 2020 at the top deck of S1 Parking Garage.
2. 11:00 AM on December 15, 2020 at the top deck of S1 Parking Garage.

The parking garage is not restricted. Bidders are welcome to perform additional site visits by themselves.

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.

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 30, 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.

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. 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.

E. 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.

F. 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. Bids may be modified if in writing and received before bid opening time.

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 bid opening time 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.

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>
</tbody>
</table>
Alaska Nonresident Contractor Bid Amount  $100,000  
Alaska CPD Total + $5,000  
Nonresident Disadvantage Total $105,000  

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.

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
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:

South Campus S1 Parking Garage Repairs – Electrical Systems  
Prepared by Reid Middleton, 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>
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<tr>
<th>Base Bid</th>
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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>Electrical Conduits and Wires for Future Garage Control Gates</td>
<td>Additive</td>
<td>$</td>
</tr>
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</table>

REINSTALLMENT 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:

<table>
<thead>
<tr>
<th>Type of Business:</th>
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<tbody>
<tr>
<td>☐ Sole Proprietorship  ☐ Partnership  ☐ Corporation (State of Incorporation:__)  ☐ Other</td>
</tr>
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Physical Business Address (Must not be a P.O. Box):

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<tr>
<th>City:</th>
<th>State:</th>
<th>Zip Code:</th>
</tr>
</thead>
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<table>
<thead>
<tr>
<th>Business Telephone Number:</th>
<th>Business Fax Number:</th>
<th>Business E-mail Address:</th>
</tr>
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</table>

State of Washington numbers for the following:

<table>
<thead>
<tr>
<th>Contractor Registration No.:</th>
<th>UBI No.:</th>
<th>Employment Security Dept. No.:</th>
</tr>
</thead>
</table>

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":

<table>
<thead>
<tr>
<th>Signature:</th>
<th>Date:</th>
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<table>
<thead>
<tr>
<th>Print Name and Title</th>
<th>Location or Place Executed: (City, State)</th>
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<tr>
<th>Section</th>
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<th>Page</th>
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<td>1.02 Order of Precedence</td>
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<td></td>
<td>1.03 Execution and Intent</td>
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<td>2.05 Alternative Surety</td>
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<td>3.02 Construction Schedule</td>
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<td>3.05 Delay</td>
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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.
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 benchmarks 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.
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 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 7.03D, 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, home office cost, B&O taxes, office engineering, 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;
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;
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.
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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 section10.11 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 one hundred eighty (180) calendar days. For failure to achieve Substantial Completion of the Work within the time provided, Contractor shall pay Owner $500 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:

$2,000,000 each claim, $2,000,000 aggregate, Contractor’s Pollution Liability
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 $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. $25,000 for all water damage from rain, sleet, snow or ice entering the building. 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.

END OF SECTION
CONTRACTOR PERFORMANCE EVALUATION PROGRAM

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".

Last Revised April 20, 2016
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 scope of work for this project is the complete replacement of the degraded electrical systems of the S1 Parking Garage, located at the South Campus of the University of Washington in Seattle. The electrical systems were originally embedded inside the 1966 concrete structure. Years of water penetration into the steel conduits and junction boxes has resulted in failure of the electrical system on all levels of the structure. More specifically, the project includes the replacement of all branch circuiting that is currently encased in the concrete structure with new surface-mounted conduit and conductors, replacement of all garage and stair lighting fixtures with new LED fixtures, and replacement of the existing garage main service distribution panel and lighting branch circuit panels.

2. All existing conductors shall be removed from the abandoned conduits, all existing surface-mounted conduits and lighting fixtures shall be demolished. The existing flush-mounted panelboards and flush-mounted lighting fixtures shall have all internal components removed and the enclosures abandoned in place with a new cover plate installed. The new main service distribution panel shall be installed inside the existing electrical room, with a new surface-mounted feeder connected to the distribution located inside the I-Wing main electrical room. The existing main service shall be completely demolished after the new system is installed and energized.

3. The existing pole-mounted lighting fixtures located on the top deck of the parking garage shall remain, with new branch circuits run to each pole and a new junction box mounted to the pole base. The pole base shroud shall be modified for a new surface-mounted conduit connection.

4. The existing emergency panel shall remain in place and shall serve the new emergency lighting fixtures located inside the garage.

5. A new low voltage relay panel shall be installed inside the electrical room to serve the top deck pole lights, existing street lights, and exterior stair star lights with an astronomical time switch.

6. All new garage LED light fixtures and interior stair LED light fixtures shall have integral occupancy and daylight sensors to meet the Seattle Energy Code controls requirements.

7. A bid alternate is included for providing electrical conduits and wires for future extension.

1.2 GENERAL INFORMATION

A. Title of Contract Documents:

1. University of Washington
   South Campus S1 Parking Garage Repairs – Electrical Systems
   Project Number: 207036

B. Owner and A/E Defined:

1. Owner:
   University of Washington
   Project Delivery Group
   Seattle, Washington 98195-2205

   Project Manager: Reginald Hampton
   E-mail: regihamp@uw.edu
   Phone: 206-685-6389
   Fax: 206-543-3959
Owner’s Representative: The Owner shall designate, in writing, the Owner’s Representative for this Project during construction.

2. A/E:
Reid Middleton, Inc.
728 134th Street SW, Suite 200
Everett, WA 98204

Representative: Ding Ye
E-mail: dye@reidmiddleton.com
Phone: 425-741-3800
Fax: 425-741-3900

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. Electrical Engineering:
Sazan Group
600 Steward Street, Suite 1400
Seattle, WA 98101

Representative: Thomas Childs
E-mail: tchilds@sazan.com
Phone: 206-276-2161
Fax: N/A

D. Owner’s Consultants: The consultants under contract with the Owner in preparation of the Contract Documents are: NONE

1.3 SPECIAL CONDITIONS

A. Description of special conditions of the Work:
1. S1 Parking Garage is one of the parking facilities serving the UW Medical Center. It is an occupied and busy parking garage. The garage will need to stay open during construction.
2. Phasing or sequencing construction work to minimize interruption to daily operation of the garage is required. A block of fifty (50) parking stalls maximum is allowed to be shut down for construction activities each time. The shut-down duration for each block cannot exceed four (4) weeks continually.
3. Contractor shall prepare a construction phasing/sequencing plan for Owner review and approval prior to mobilization and construction. Owner will help Contractor prepare the phasing/sequencing plan by providing the garage operation information and requirements after the contract is awarded.
4. Contractor shall schedule and sequence Work to maintain access to adjacent buildings during business hours.
5. Work on weekends is allowed with an approval from Owner.

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. Polychlorinated Biphenyls (PCBs) in light ballasts
4. Mercury-containing fluorescent light tubes
5. Mercury in electrical switches

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”
3. Section 02 83 00 “Heavy Metals Related Activities”
4. Section 02 84 00 “PCB Ballast and Mercury Light Tube Removal”

C. Owner’s Environmental Consultant: The Owner’s environmental consultant and the AHERA-certified designer for this Project is:
Firm Name: AECOM Technical Services, Inc.
Project Designer: Mike Kosoff
Certification number: 177835
Expiration date: April 14, 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. 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.

F. 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.

G. 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.

H. 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/system/files/resources/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.

I. 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.

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: Electrical Conduits and Wires for Future Garage Control Gates.
   1. Provide electrical conduits, junction boxes, and wires for future garage control gate connections.
   2. Locations: East and West entrances on the Minus 2 level (bottom floor) of the garage.
   3. See Drawings E2.05, E2.06, E2.07, and E2.08.
   4. The Alternate work is not included in Base Bid.
   5. 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 comply 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

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

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

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.

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.

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 weekdays 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 Contractor’s 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 manufacture’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

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
   9. 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
   2. Monthly Safety Report

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 full-time 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

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.

Template Last Revised July 5, 2020
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.

D. With its monthly Application for Payment, the Contractor shall submit the Monthly Safety Report on the form in Appendix A.

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.

1. 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. 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.

1.9

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

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 “CQC Representative” (who is not the superintendent) who shall be on the Project site during progress of the Work as required. 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 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, hypochlorinated 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.

2. The Contractor shall implement controls to contain and clean-up silica dust generated by cutting and demolition work and shall provide worker and equipment decontamination provisions. At no time is silica dust from the construction permitted beyond the “work area.”
   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) Asbestos abatement
         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: http://www.ehs.washington.edu/psosmoking/index.shtml

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 SHUTDOWNS 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. Shuddowns 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.
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 laydown 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. There is generally no staging area available at the University of Washington Medical Center and Health Sciences Center areas. Only limited loading and unloading of tools and material will be allowed at the loading docks and for restricted time limits.

D. 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 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:
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
genenerated 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. Proposed methods for recycling and disposal during construction including, but not
limited to, one or more of the following:
      a. Contracting with a recycling hauler, who accepts commingled construction and
demolition debris, for hauling to an approved MRF
      b. Separating recyclables on-site into containers, for a recycling hauler to haul to a
recycler or transfer station
      c. Separating recyclables on-site into piles or containers, for self-hauling by the
Contractor or the Contractor’s Subcontractors to a recycler or transfer station
         1) Identify requirements for Subcontractor self-hauling.
   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
1. Revit model file names must start with the UW CPD Project Number

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 audiovisual 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.

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.

4. Complete start up and functional performance testing of all systems required by the Contract Documents and AHJ including, but not limited to: electrical testing; environmental control systems point-to-point testing; emergency eyewash and safety shower testing; fume hood face velocity testing; and HVAC air balancing (if included in the scope of the Work).

5. Submit one (1) hard copy each of the current air balancing report and the M&E Commissioning Binders labeled “Preliminary,” listing all deficiencies, 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. Deliver specified maintenance equipment and tools to Owner, with itemized summary list.

9. Complete all air balancing, testing and commissioning work required by the Contract Documents, allowing the Owner to fully occupy the Work for the use for which it is intended. Incidental Work, that is not life safety or occupational safety commissioning work, whose completion is delayed due to circumstances excused by the Owner, will be the exception.

   a. Submit one (1) hard copy each of the current air balancing report and M&E Commissioning Binders (marked with the date of submission) noting the corrections for deficiencies listed in the “Preliminary” report and binders and indicating any incomplete Work.

10. Submit all controls systems software files required by the Contract Documents including, but not limited to, lighting and environmental controls.

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 final air balancing report and the final M&E Commissioning Binders (marked with the date of submission) have been submitted in PDF format, on Owner’s CMS.
   a. For Projects with a Test Engineer, the as-built information updating the A/E commissioning basis-of-design has been submitted with the Commissioning Binders.

12. The software file used to calculate the power systems studies (Power Tools – SKM®) has been submitted.

13. Specified spare parts, extra stock of materials, and extra materials of value to the Owner, with itemized summary list, have been submitted.

14. 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.

   2. General closeout requirements are included in Section 01 77 00 "Closeout Procedures."

   3. Specific requirements for warranties for the Work and products and installation that are specified to be warranted are included in the individual sections of the Specifications.

   4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.

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 taken
   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/repairs 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, administration, execution, and cleaning necessary to safely remove, dispose and/or handle the regulated materials listed within this Section.

1.2 RELATED WORK

A. Section 02 82 00 – Asbestos Removal
B. Section 02 83 00 – Heavy Metal Controls Activities
C. Section 02 84 00 – PCB Ballast and Mercury Light Tube Removal

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: Refer to Section 02 82 00 for descriptions and quantities of Asbestos-Containing Materials (ACMs) or presumed ACMs.
2. Lead (or Heavy Metals): Refer to Section 02 83 00 for descriptions of and locations of heavy metals.
   a. Based on the results of the lead sampling, the building materials waste stream for this project is not anticipated to designate as Dangerous Waste; however, lead-containing items must still be handled as regulated waste.
3. Polychlorinated biphenyls (PCBs): Refer to Section 02 84 00 for descriptions of and quantities of PCB-containing light fixture ballasts.
   a. Ballasts labeled as containing PCBs, or unlabeled ballasts, may exist within fixtures to be impacted by the Work.
4. Mercury: Refer to Section 02 84 00 for descriptions and quantities of fluorescent light tubes.
   a. Work includes removal and packaging of mercury-containing fluorescent light bulbs.
5. Silica and Fugitive Dust:
   a. All Construction work will potentially generate fugitive dust. It is the responsibility of the Contractor to control the release of all fugitive dust.
   b. Construction site work that requires control of silica and fugitive dust shall include chipping, sanding, sawing, jack hammering, drilling, and grinding concrete materials.

B. Damages caused during the performance of abatement or remediation activities shall be repaired by the Contractor (including, but not limited to, paint peeled off by barrier tape, nail holes, water damage, broken glass) at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Polyethylene Sheet: Provide flame-retardant polyethylene film that conforms to requirements set forth by the NFPA Standard 701 (Small Scale Fire Test for Retardant Textiles and Films). Provide 6-mil thick, frosted or black TRM Manufacturing Brand, or equivalent, of the largest size practicable to minimize seams.
B. Reinforced Polyethylene Sheet: Provide translucent, nylon reinforced, laminated, flame-retardant polyethylene film that conforms to requirements set forth by NFPA Standard 701. Provide 6-mil thick Permalon Brand, or equivalent, of the largest size practicable to minimize seams.

C. Duct Tape: Provide duct tape with an adhesive that is formulated to stick securely to sheet polyethylene, Nashua Brand or equivalent. Do not use polyethylene tape.

D. Painters Tape: Provide painters tape, Shurtape brand or 3M Scotch or equivalent. To be used in locations where there may be damage to wall finishes.

E. Spray Cement: Provide spray adhesive in aerosol cans that is specifically formulated to stick securely to sheet polyethylene, Abatement Technologies, AS-100, or equivalent. Contractor shall not use spray cement containing methylene chloride.

F. Lumber: Provide kiln dried, fire-retardant lumber and plywood, in accordance with ASTM D245.

G. Other Materials: Provide all other materials, such as lumber, nails, and hardware that may be required to construct work platforms, decontamination units, and the barriers that isolate the Work Area(s).

2.2 EQUIPMENT

A. HEPA Filter Vacuum Cleaners:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

   a. Nilfisk of America, Inc. HEPA Filtered Vacuums
      300 Technology Drive
      Malvern, PA 19355
      (610) 647-6420

   b. Minuteman International Minuteman HEPA Vacuums
      14N845 U.S. Route 20
      Pinegree, IL 60140
      (800) 323-9420

   c. Pullman-Holt (White) Corp. HEPA Filtered Vacuums
      10702 N. 46th Street
      Tampa, FL 33617
      (813) 971-6090

B. HEPA Filtered Fan Units: Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. The following machines are standard 2000 CFM machines.

      900 Truman Parkway
      P.O. Box 189
      Bay City, Michigan 48707
      (517) 684-2121

   b. Abatement Technologies "HEPA-AIRE 1990 and HEPA-AIRE 2000"
      3305 Breckinridge Blvd. #118
      Deluth, GA 30136
      (800) 634-9091 or (404) 925-2761

   c. Global Consumer Services, Inc.
      4615-1U E. Industrial St.
Simi Valley, CA 93063
(805) 579-0230

d. M-Tec Corp. Micro-Trap
1300 W. Steel Rd. Alumina II
Unit #2
Morrisville, PA 19067
(215) 295-8208

C. Manometer: With a built-in alarm and continuous hard copy readout to continuously monitor pressure differential between the Work Area and outside areas. This shall be a non-mercury device. This shall be accurate to the nearest 0.005 inches of water.

D. Scaffolding: Provide all scaffolding, ladders, and staging, etc., as necessary to accomplish the Work of this Contract. The type, erection, and use of all scaffolding shall comply with all applicable DOSH and OSHA provisions. No workers shall remain on rolling scaffolding as it is being moved; the wheels shall be locked when workers are climbing the scaffolding or working from the platform.

E. Communication equipment suitable for inter-room communications, if required.

F. Holding Carts: Watertight wheeled carts with doors or tops that can be closed and secured.

PART 3 - EXECUTION

3.1 ASBESTOS

A. Refer to Specification Section 02 82 00.

3.2 LEAD (OR HEAVY METALS) CONTAINING PAINT/COATINGS

A. Refer to Specification Section 02 83 00.

3.3 POLYCHLORINATED BIPHENYLS (PCB) CONTAINING LIGHT FIXTURE BALLASTS

A. Refer to Specification Section 02 84 00.

3.4 MERCURY CONTAINING LIGHT TUBES

A. Refer to Specification Section 02 84 00.

3.5 SILICA AND FUGITIVE DUST

A. All construction work will potentially generate fugitive dust. It is the responsibility of the Contractor to control the release of all fugitive dust.

B. Construction site work that requires control of silica and fugitive dust shall include, but is not limited to, chipping, sanding, sawing, jack hammering, drilling, grinding on mortars, terrazzo, plaster, gypsum, and concrete building materials associated with this contract.

C. In addition to meeting these requirements, the Contractor shall meet the Infection Control requirements specified in 01 35 33 of the project documents when working in the UWMC, HSC, and HMC.

D. Furnish all labor, materials, facilities, equipment, services, employee training and testing, and agreements necessary to perform the work required for fugitive dust and potential silica-generating construction dust control activities in accordance with the latest regulations from DOSH, Puget Sound Clean Air Agency (PSCAA), and any other applicable federal, state, and local government
regulations. Whenever there is a conflict or overlap of the above references, the most stringent provisions are applicable.

E. Competent persons, trained, knowledgeable, and qualified in both fugitive and silica dust evaluation and control methods, shall perform the Work specified herein.

F. In all cases where potential silica dust exposures may occur, the Contractor shall use any and all feasible engineering and work practice controls to reduce and maintain employee exposure below the DOSH Permissible Exposure Levels (PELs). It shall be assumed that the workers generating the silica dust are exposed above the PELs until Contractor air monitoring data demonstrates silica concentrations below the PELs.

G. Controls shall be implemented to contain dust generated during demolition of walls, concrete sawing, coring, chipping, etc. At no time will any dust from the work area be permitted beyond the “Limit of the Work Area” as stated in the contract and/or as established by the Contractor. Visible emissions will be grounds for the Owner to request that work practices be stopped and revised.

H. When wet sawing or coring concrete, the water shall be cleaned and vacuumed prior to drying. If dust remains after the area dries, the Contractor shall use wet methods to clean residual dust.

I. If visible fugitive dust emissions or respirable crystalline silica dust concentrations exceed 0.05 mg/m³ beyond the perimeter of the work area, the Owner is authorized to stop work. The Contractor shall perform all necessary corrective actions to eliminate visible dust and reduce respirable crystalline silica concentrations to less than 0.05 mg/m³ before resuming work. The Owner may visually monitor for fugitive dust and collect air samples for silica at any time.

END OF SECTION
PART 1 - GENERAL

1.1 DESCRIPTION OF REQUIREMENTS
   A. Perform all planning, administrative, execution, and cleaning requirements necessary to safely remove the Asbestos-Containing Materials and Asbestos-Contaminated Materials, exercising care and taking safety precautions and protective measures as necessary to prevent damage to the Owner's property.

1.2 RELATED WORK
   A. Section 02 80 00 – Facilities Remediation
   B. Section 02 83 00 – Heavy-Metals Related Activities
   C. Section 02 84 00 – PCB Ballasts and Light Tube Removal

1.3 WORK INCLUDED
   A. The Contractor is to furnish all labor, materials, services, training, insurance, special permits, and equipment necessary to remove and dispose of asbestos-containing materials (ACM) and debris within the work areas. The Contractor shall follow all federal, state and local ordinances, and regulations or rules pertaining to hazardous building materials, including storage, transportation, and disposal.
   B. Personal air monitoring required for the safety of the Abatement Contractor's workers.
   C. Removal of asbestos-containing materials may include impacting heavy-metal containing materials. Refer to Specification Section 02 83 00.
   D. Refer to the following documents for survey information: Targeted Regulated Building Materials Assessment Report, S1 Parking Garage Electrical Systems Project (207036), prepared by AECOM Technical Services, Inc., dated November 13, 2020
   E. A copy of the referenced Regulated Materials Survey Report, including sample data, is included in Appendix C.
   F. Remove and properly dispose of the following asbestos-containing materials as needed to conduct the demolition work. The Contractor shall field verify site conditions to access ACMs, quantities of ACMs, and conditions of ACMs. The Contractor shall be responsible for the removal of the listed ACM quantities plus or minus 10%. For ACMs not quantified, the Contractor shall provide unit pricing on the Bid Form. Materials listed in the table below are asbestos containing unless otherwise noted.

<table>
<thead>
<tr>
<th>HSA ID, Material Description, and AHERA Classification</th>
<th>Material Location</th>
<th>HSA Quantity (approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6: Asbestos-containing brown crumbly sealant (M)</td>
<td>At perimeter of door frame to garage main electric room on Minus 1 Level</td>
<td>20 LF</td>
</tr>
<tr>
<td>10: Assumed asbestos-containing older electrical panels (M)</td>
<td>Electrical panels in places throughout the Project Area</td>
<td>6 EA</td>
</tr>
</tbody>
</table>

HSA: material that is uniform in color, texture, general appearance, and construction and application date, M: Miscellaneous material per AHERA, LF: Linear feet; EA: Each

1.4 WORK NOT INCLUDED
   A. Quality Assurance air monitoring by the Owner. Owner’s Representative: AECOM Technical Services, Inc., 1111 3rd Avenue, Suite 1600, Seattle, WA 98101
1.5 GENERAL REQUIREMENTS

A. The Contractor shall exercise general supervisory authority over the asbestos-related work as required by WAC 296-62-07706. As supervisor of the Work, the Contractor shall ascertain whether any and all other subcontractors are in compliance with the asbestos regulations, and shall require such subcontractor to come into compliance with the asbestos regulations when necessary.

B. Contractor is responsible to notify and provide all necessary communications to the responsible regulatory agencies for all required work.

C. All required permits and notifications shall be kept valid for the duration of the work. This includes any permit and/or notification revisions, such as changes of abatement dates, shift times, work locations, Contractor personnel, etc.

D. The Contractor is responsible to take appropriate measures ensuring that the work site will be safeguarded from contamination during the asbestos abatement work.

E. All work is to be performed in accordance with applicable codes, standards, regulations, and accepted industry practices. This includes compliance with regulatory requirements applicable at the time the work is performed and is not limited to requirements at the time of bid. All work, including work practices, is to be craftsman-like and is subject to inspection by the Owner or their designated representative.

F. All employees involved in asbestos abatement activities shall be the bearers of a Certified Asbestos Worker cards issued by the Washington State Department of Labor and Industries (L&I) Division of Occupational Safety and Health (DOSH). Cards or training records shall be available for inspection at the jobsite. The Contractor shall also provide, as a minimum, one (1) person certified by L&I as an Asbestos Abatement Supervisor and this person shall be responsible for overall abatement activities. This person shall be immediately available on-site when any work is done. If abatement work is performed on multiple shifts, each shift shall have a certified Asbestos Abatement Supervisor.

G. Use of the Site: Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed.

H. Keep public areas such as hallways, stairs, elevator lobbies, and restrooms free of accumulation of waste, rubbish, and construction debris.

I. Smoking or open fires will not be permitted within the building enclosure or on the premises.

J. Site Conditions: The removal area may have domestic water and sewer lines in the Work Area. The Contractor shall verify location of all equipment and protect and maintain it as required.

K. Contractor is responsible for all air sampling for compliance with DOSH and other local, state, and federal compliance.

L. On-site Observation:
   1. The safety and protection of the Contractor's employees, sub-contractor's employees, Owner's employees, consultant, the facility, and the public are the sole responsibility of the Contractor.
   2. The Owner or representatives of local, state, or federal agencies may make unannounced visits to the site during the work. The Contractor shall provide two (2) complete sets of clean, protective clothing and respirators with the same protection factor as required in the regulated area available daily for such visitor use. It is the visitor’s responsibility to ensure all necessary medical qualification, training, and respirator fit test certificates are current prior to using any respirator or protective clothing provided by the Contractor.

M. If the Owner, or representatives of local, state, or federal agencies visitor determines that practices are in violation of applicable regulations, or are endangering workers, the general public or the facility, they will immediately notify the Owner’s Construction Manager verbally that operations must cease until corrective action is taken.
1.6 DEFINITIONS:

A. Definitions in General Use:

1. Approved: Where used in conjunction with Owner's response to submittals, requests, applications, inquiries, reports and claims by Contractor or subcontractors, the meaning of term "approved" will be held to limitations of Owner's responsibilities and duties as specified in Division 00. In no case will "approval" by Owner be interpreted as a release of Contractor or subcontractors from responsibilities to fulfill the requirements of the Contract Documents.

2. Directed, Requested, etc.: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by Owner," "requested by Owner," and similar phrases. However, no such implied meaning will be interpreted to extend Owner's responsibility into subcontractor's or Contractor's responsibility for construction supervision.

3. Equivalent: Except as otherwise defined in greater detail, term "equivalent" is used to mean substitution for substantially the same product with approval by Owner and Owner.

4. Furnish: Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to Work Site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.

5. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on drawings, to other paragraphs or schedules in the Specifications, and to similar means of recording requirements in Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used in lieu of "indicated," it is for the purpose of helping reader locate cross-reference, and no limitation of location is intended, except as specifically noted.

6. Install: Except as otherwise defined in greater detail, term "install" is used to describe operations at Work Site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.

7. Installer: The term "installer" is defined as the entity (person or firm) engaged by Contractor, or subcontractor for performance of a particular unit of Work at the Work Site, including installation, erection, application and similar required operations. It is a general requirement that such entities (Installers) be experts in operations they are engaged to perform.

8. Provide: Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.

B. Definitions Relative to Asbestos Abatement:

1. Abatement: Procedures to control fiber release from asbestos-containing materials. Includes removal, enclosure, repair, demolition, and renovation activities.

2. ACGIH: American Conference of Governmental Industrial Hygienists www.acgih.org.

3. Aerosol: A system consisting of particles, solid or liquid, suspended in air.


5. Air Cell: Insulation normally used on pipes and ductwork that is comprised of a corrugated cardboard that frequently contains asbestos.

6. Airlock: A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways separated by a distance of at least three feet.

7. Air Monitoring: The process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure most commonly utilized in industry for asbestos follows the WISHA reference method outlined in WAC 296 62 07735, Appendix A, and WAC 296 62 07737, Appendix B.

8. Air Sampling Firm (ASF): A professional firm providing specialized services by trained and certified or qualified personnel in the field of asbestos abatement and project management, contracted with or employed by the Contractor or tenant to supervise and/or conduct inspection, monitoring, and analysis services.

9. Amended Water: Water to which a surfactant has been added in order to accomplish more thorough penetration and saturation of the asbestos-containing material.
11. Asbestos: The mineral varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite (amosite), anthophyllite, actinolite, and tremolite. For purposes of determining respiratory and worker protection, both the asbestiform and non-asbestiform varieties of the above minerals and these minerals that have been chemically treated and/or altered shall be considered as asbestos.
12. Asbestos-Containing Material (ACM): Material composed of asbestos of any type in an amount greater than 1 percent by weight, either alone or mixed with other fibrous or non-fibrous materials.
13. Asbestos-Containing Waste Material: Any material, which is or is suspected of being or any material contaminated with an asbestos-containing material, which is to be removed from a work area for disposal.
14. Asbestos-Containing Waste: Asbestos-containing or contaminated materials or objects requiring disposal.
16. Authorized Visitor: The Owner's team members, emergency personnel, or a representative of any federal, state and local regulatory agency having jurisdiction over the Work.
17. Barrier: Any surface that seals off the Work Area to inhibit the movement of asbestos fibers.
18. Breathing Zone: A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches.
19. Bridging Encapsulant: The application of a sealant over the surface of asbestos-containing material to prevent the release of asbestos fibers.
20. Certified Asbestos Contractor: A Contractor licensed by the State of Washington and certified by the Department of Labor and Industries in accordance with Chapter 296-65 of the Washington Administrative Code (WAC).
21. Certified Asbestos Supervisor: The Certified Asbestos Contractor's representative at the Work Site who is certified by the Washington Department of Labor and Industries in accordance with Chapter 296-65 of the WAC.
22. Certified Asbestos Worker: An individual who is certified by the Washington Department of Labor and Industries in accordance with Chapter 296-65 of the WAC.
23. Certified Industrial Hygienist (CIH): An industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene.
24. Class I Asbestos Work: Activities involving the removal of thermal system insulation (TSI) or surfacing ACM or PACM.
25. Class II Asbestos Work: Activities involving the removal of ACM, which is not TSI or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.
26. Class III Asbestos Work: Repair and maintenance operations where "ACM", including TSI and surfacing ACM and PACM, may be disturbed.
27. Class IV Asbestos Work: Maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities.
28. Clean Room: An uncontaminated area or room, which is a part of the worker decontamination enclosure system with provisions for storage of worker's street clothes and clean protective equipment.
29. Contained Work Area: A Work Area that has been isolated, plasticized, and equipped with a negative air pressure system and a Decontamination Enclosure System.
30. Containment: An enclosure system.
31. Competent Person: The individual onsite (a representative of the Contractor) who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, and who has the authority to take prompt corrective measures to eliminate them as specified in WAC 296-62-07728. The competent person shall meet all requirements specified in WAC 296-62-07728. The competent person shall be certified as an asbestos supervisor in compliance with WAC 296-65-030(3) and 296-65-012.
32. Critical Barrier: Seal applied to openings connecting the abatement area with adjacent spaces that will not be included in the containment. Critical barriers shall not be exposed to the gross...
removal environment. Examples of openings requiring critical barriers include, but are not limited to: HVAC vents and diffusers; doorways; windows; floor, wall, and ceiling penetrations; and air plenums.

33. Curtained Doorway: A device to allow ingress or egress from one room to another, typically constructed by placing three overlapping sheets of plastic over an existing or temporarily framed doorway.

34. Decontamination Enclosure System: A series of connected rooms, with airlocks or curtained doorways between any two adjacent rooms, for the decontamination of workers or of materials and equipment. A Decontamination Enclosure System always contains at least one air lock to the Work Area.

35. Demolition: The wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations or the intentional burning of any facility.


37. Disposal Bag: 6 mil thick leak-tight plastic bags used for transporting asbestos waste from the work site and to the disposal site.


39. Encapsulant: A material which is applied to asbestos-containing material to reduce or control the potential 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).

40. Encapsulation: All herein-specified procedures necessary to apply an encapsulant to Asbestos-Containing Materials to control the possible release of asbestos fibers into the ambient air.

41. Enclosure: A semi-airtight system used to segregate and isolate an asbestos abatement area, and which is continuously served by a negative pressure ventilation system once abatement activities start.

42. EPA: U.S. Environmental Protection Agency www.epa.gov .

43. Equipment Decontamination Enclosure: That portion of a Decontamination Enclosure System designed for controlled transfer of materials, waste containers and equipment, typically consisting of a Washroom and a Holding Area.

44. Equipment Room: An area or room, which is part of the worker decontamination enclosure system with provisions for storage of contaminated clothing and equipment.

45. Excursion Limit: The maximum personal exposure concentration of asbestos fibers in air for any 30-minute period (1.0 fiber per cubic centimeter of air [f/cc]).

46. Fixed Object: A unit of equipment or furniture or other building component that cannot be detached from the building or can be detached only by destructive methods resulting in irreparable damage to the item.

47. Friable Asbestos Material: Any material containing more than 1 percent asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763 Section 1, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

48. Friable Upon Removal: A non-friable material, which becomes friable when disturbed during removal.

49. Glovebag Method: A method for removing small amounts of friable asbestos-containing material from fireproofed beams, HVAC ducts, short piping run, valves, joints, elbows, and other non-planar surfaces in a non-contained (plasticized) work area. The glovebag assembly is a manufactured or fabricated device consisting of a bag (typically constructed of plastic), two inward projecting long sleeve gloves, an internal tool pouch and an attached or pre-printed label. The glovebag is constructed and installed in such a manner that it surrounds the object or area to be decontaminated and contains all the asbestos fibers released during the removal process. All workers who are permitted to use the glovebag technique must be trained, experienced, and skilled in this abatement method.

50. Grinding: To reduce to powder or small fragments and includes mechanical chipping or drilling.

51. HEPA Filter: A high efficiency particulate air filter capable of removing particles greater than 0.3 microns in diameter with 99.97% efficiency using DOP testing methodology.
52. HEPA Vacuum: A vacuum system equipped with HEPA filtration.

53. HEPA Machine: Negative air machine.

54. HVAC: Heating, ventilating, and air conditioning system.


56. Leak-Tight: Solids or liquids cannot escape or spill out. It also means dust tight.

57. Malfunction: Any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner so that emissions of asbestos are increased. Failures of equipment shall not be considered malfunctions if they are caused in any way by poor maintenance, careless operation, or any other preventable upset conditions, equipment breakdown, or process failure.

58. Manometer: An instrument used to measure the pressure difference between two areas.

59. Maximum Acceptable Level: An exposure of airborne concentrations of fibers of 0.08 fibers per cubic centimeter of air at any time. This level is a contractual standard for this Work.

60. Mini-enclosure: Typically, a two-chambered enclosure consisting of a Work Area connected and contiguous to a Change Room, separated by a curtain doorway.

61. Movable Object: A piece of equipment or furniture in the work area, which can be removed from the work area.

62. Negative Air Machine: A specially designed fan mounted in a cabinet that draws air from the contaminated space into pre-filters and a HEPA filter.

63. Negative Pressure Respirator: A respirator in which the air pressure inside the respirator is negative during inhalation in relation to the air pressure outside the respirator.

64. Negative Pressure Enclosure: The negative pressure/local exhaust system, utilizing HEPA filtration capable of maintaining a negative pressure of 0.02 inches of water inside the work area and a minimum of four (4) air exchanges per hour from adjacent areas into the work area and exhausting clean, filtered air outside work area.

65. Negative Pressure: Air pressure lower than surrounding areas, generally caused by exhausting air from within the containment work area. A sufficient volume or air shall be exhausted to create a minimum pressure of -0.02 inches of water within the enclosure with respect to the area outside of the containment work area.


67. Non-Friable Asbestos-Containing Material: Any material containing more than 1 percent asbestos as determined using the method specified in appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

68. NIOSH: The National Institute for Occupational Safety and Health, Building “J” N.E., Room 3007, Atlanta, GA 30333.


70. Outside Air: The air outside the building, structure, negative air enclosure, or containment.

71. Owner or Operator of a Demolition or Renovation Activity: Any person, who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person, who owns, leases, operates, controls, or supervises the demolition or renovation operation or both.

72. PCM: Phase Contrast Microscopy.

73. PLM: Polarized Light Microscopy.

74. Penetrating Encapsulant: Liquid material applied to asbestos-containing material to control airborne fiber release by penetrating into the material and binding its components together.

75. Permissible Exposure Limit (PEL): An airborne concentration of asbestos in excess of 0.1 fibers per cubic centimeter of air as an eight (8)-hour time-weighted average (TWA).

76. Personal Monitoring: Sampling the asbestos fiber concentrations within the breathing zone of an employee during representative operations as required by applicable regulations.

77. Pipe Fitting: For purposes of this Specification, a pipe fitting is considered one lineal foot and is defined as elbow, tee, coupling, etc.

78. Protection Factor: The ratio of the concentration of a substance outside the respirator to the concentration inside the respirator at the breathing zone of the wearer.

79. Prior Experience: Experience required of the Contractor on asbestos projects of similar nature and scope to insure the capability of performing asbestos abatement in a satisfactory manner. Similarities shall be in areas related to material composition, project size, abatement methods
required, number of employees and the engineering, work practice and personal protection
controls required.


81. Regulated Area: An area established by the Contractor to demarcate areas where airborne concentrations of asbestos exceed, or can reasonably be expected to exceed the PEL. The regulated area may take the form of (a) a temporary enclosure, as required by WAC 296 62 07711, or (b) an area demarcated in any manner that minimizes the number of employees exposed to asbestos.

82. Removal: All herein-specified procedures necessary to remove Asbestos-Containing Materials from the designated areas and to dispose of these materials at an acceptable site.

83. Renovation: Altering a facility or one or more facility components in any way, including the stripping or removal of ACM or presumed ACM (PACM) from a facility component. Operations in which load-supporting structural members are wrecked or taken out are defined as demolitions.

84. Respirator: A device designed to protect the wearer from the inhalation of harmful substances.

85. SDS: Safety Data Sheet.

86. Shower Room: A room between the clean room and the equipment room within the worker decontamination system supplied with hot and cold running water controllable at the tap and suitably arranged for complete showering.

87. Staging Area: Either the holding area or some areas near the waste transfer airlock where containerized asbestos waste has been placed prior to removal from the work area.

88. Structural Member: Any load-bearing member of a facility, such as beams and load-bearing walls or any non-load supporting member, such as ceilings and non-load supporting walls.

89. Surfactant: A chemical wetting agent added to water to improve penetration.

90. µm: Microns or micrometers.

91. Time Weighted Average (TWA): The average exposure to a contaminant in air measured during a specific time period, usually a shift, adjusted to eight hours.

92. Visible Emissions: An emission, containing particulate asbestos material that is visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

93. WAC: Washington Administrative Code as enforced by the Washington State Department of Labor and Industries, Division of Occupational Safety and Health.

94. Waste Generator: Any owner or operator of a source covered by Department of Transportation regulations whose act or process produces asbestos-containing waste material. All demolition debris materials, including ACM, except those containing substances classified as hazardous or dangerous by controlling local, state or federal regulatory agencies, shall upon their demolition became the property of the Contractor.

95. Waste Shipment Record: The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

96. Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with water and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.

97. WISHA - Washington Industrial Safety and Health Act as enforced by the Washington State Department of Labor and Industries, Division of Occupational Safety and Health.

98. Work Area: The area where asbestos-related Work or removal operations are performed. It is isolated to prevent the spread of asbestos dust, fibers or debris and entry by unauthorized personnel.

99. Worker Decontamination System: A series of connected rooms, consisting of a clean room, a shower room and an equipment room separated from each other and from the work area by curtained doorways. This system is used for all worker entries and exits from the work area.

100. WSDOT: Washington State Department of Transportation www.wsdot.wa.gov.
1.7 REFERENCE STANDARDS:

A. All work under this Contract shall be done in strict accordance with all applicable regulations, standards, and codes governing asbestos abatement and in accordance with the “Standards of the Industry”. This includes any other work, including trade work conducted in conjunction with the Work.

B. The most recent edition of any relevant regulation, standard, document, or code shall be in effect during the work, regardless of the effective date of this specification’s governing contract. Where conflict among the requirements or with these specifications exists, the most stringent requirements shall be utilized. All regulatory revisions and requirements relating to this Work after the contract is signed shall, nonetheless, be incorporated at no additional cost to the Owner.

C. Copies of Standards: The Contract Documents require that each entity performing Work be experienced in that part of the Work being performed. Each entity is also required to be familiar with recognized industry standards applicable to that part of the Work. Copies of applicable standards are not bound within the Contract Documents. Where copies of standards are needed for proper performance of the Work, the Contractor is required to obtain such copies directly from the publication source.

D. Standards: Which govern asbestos abatement work or hauling and disposal of asbestos waste materials include the following:


   b. Safety and Health Requirements Relating to Occupational Exposure to Asbestos E 849-82.

3. EPA Guidance Documents: These documents discuss asbestos abatement work or hauling and disposal of asbestos waste materials and are listed below for the Contractor’s information only. These documents do not describe the work and are not a part of the work of this Contract.
   d. Evaluation of the EPA Asbestos-in-Schools Identification and Notification Rule. EPA 560/5-84-005.
   g. Asbestos Waste Management Guidance. EPA 530-SW-85-007.
   i. Asbestos in Buildings. Simplified Sampling Scheme for Friable Surfacing Materials.
   j. Commercial Laboratories with Polarized Light Microscopy Capabilities for Bulk Asbestos Identification.

1.8 CODES AND REGULATIONS:

A. Contractor Responsibility: Contractor shall be fully responsible and liable for compliance with all applicable federal, state, and local regulations pertaining to Work practices, hauling and disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. Contractor shall provide medical examinations and maintain medical records of personnel as required by the applicable federal, state, and local regulations. Contractor shall hold the Owner and Owner harmless for failure to comply with any applicable Work, hauling, disposal, safety, health or other regulation on the part of it, its employees, or its Contractors.

B. Federal Requirements: The following federal requirements govern asbestos abatement work or hauling and disposal of asbestos waste materials including but not limited to the following:

1. U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA), including but not limited to:
   d. Access to Employee Exposure and Medical Records Title 29, Part 1910, Section 2 of the Code of Federal Regulations.

C. U.S. Environmental Protection Agency (EPA), including but not limited to:


D. Department of Transportation (DOT) including, but not limited to the following:

2. 49 CFR part 107, et seq., Performance-Oriented Packaging Standards; Changes of Classification, Hazard Communication, Packaging and Handling Requirements Based on UN Standards and Agency Initiative; Final Rule.

E. National Fire Protection Association (NFPA) including, but not limited to:

1. Installation of Air Conditioning and Ventilation Systems Standard 90A

F. International Fire Code, 2006 edition, including, Seattle amendments

G. Underwriters Laboratories, Inc. (UL) Publications including, but not limited to:

1. Test Performance of High Efficiency, Particulate, Air Filter Units 586-77 (R1982)

H. National Institute of Occupational Safety and Health (NIOSH) Publications including, but not limited to:
1. Physical and Chemical Analysis Method (P&CAM)  
 Method 239 Asbestos Fibers in Air  
 Method 7400 Fibers (N1, 3rd Ed., Vol. 1.)

2. NIOSH Publication No. 87-108

3. 42 CFR 84

4. 30 CFR 11

I. Applicable Washington State requirements that govern Asbestos Abatement Work or hauling and disposal of asbestos or hazardous waste materials include, but are not limited to, the following:

1. Washington State Department of Labor and Industries
   a. General Occupational Health Standards Chapter WAC 296 62.
   b. Asbestos Removal and Encapsulation Chapter WAC 296 65.
   d. Part S, Demolition WAC 296.155.775.
   e. WISHA Regional Directives 23.30 Asbestos-Containing Joint Compound in Wallboard Systems, and 23.10 Occupational Exposure to Asbestos

2. Washington State Department of Ecology

3. WAC 173-303, Dangerous Waste Regulations, including all amendments and/or revisions.

J. Applicable Local Requirements that govern Asbestos Abatement Work or hauling and disposal of hazardous waste materials include, but are not limited to, the following:

1. Regulation III, Articles 1 and 4, General Requirements and Asbestos Control Standards, Puget Sound Clean Air Agency (PSCAA).

2. Local landfill requirements.

1.9 NOTICES

A. Perform all required notifications prior to beginning any Work on Asbestos-Containing Materials. Contractor shall be responsible for sending written notifications to PSCAA and DOSH, as required by local regulations, prior to beginning any Work on Asbestos-Containing Materials.

B. Contractor shall cooperate with Owner in providing all necessary information at least five calendar days prior to starting Abatement, to enable Owner to coordinate other work at the University of Washington. In addition, during the Work, the Contractor is responsible to inform the Owner of work hour changes, and start and stop days of Work. The Contractor is responsible to notify PSCAA regarding these changes and shall participate in PSCAA’s email notification program.

C. Owner has performed a regulated building materials assessment (which is considered an asbestos good faith inspection) to determine whether the materials to be disturbed or removed contain Asbestos. Contractor shall not commence Work without receiving a copy of the regulated building materials assessment report.

D. Contractor shall keep the regulated building materials assessment report on Site throughout the course of the Work.

1.10 PERMITS

A. Obtain all required permits for demolition, and for transport and disposal of asbestos-containing or contaminated materials, supplies, etc.
1.11 LICENSES

A. Maintain current licenses for the Contractor performing the work and certifications for workers as required by applicable state or local jurisdictions for the removal, transportation, disposal or other regulated activity relative to the Work.

1.12 ASBESTOS ABATEMENT SUBMITTALS:

A. Submit "Pre-Job Submittals" to the Owner, prior to the preconstruction meeting. The Work may not proceed until the complete pre-job submittal package has been reviewed by the Owner and the Owner. Submit Pre-Job Submittals including:

1. A copy of all notifications (such as PSCAA and DOSH), licenses, permits, etc. For PSCAA notification, submit copy that shows it has been received and reviewed by PSCAA.

2. Detailed plan of the procedures proposed for use in complying with the requirements to include:
   a. The location and layout of decontamination areas, including a drawing showing such, the sequencing of Work, the interface of trades involved in the performance of Work, methods to be used to assure the safety of building occupants and visitors to the site, disposal plan including identity of asbestos waste hauler, location of approved disposal site, and a detailed description of the methods to be employed to control the release of asbestos fibers.
   b. Describe in detail the proposed design of the negative air pressure system, including the distance to the building air intake system, methods for closing the building's HVAC system, method of removal to prohibit visible emissions from Work Area, and packaging of removed asbestos debris. Include descriptions of all special equipment, techniques, and methods to be used during the course of the Work.
   c. Provide a detailed plan for safely working around active piping including engineering and administrative controls to prevent heat stress. Plan should also include a description of all PPE to be used to prevent heat stress and burns (e.g., cooling vests, gloves, protective arm sleeves).
   d. Work plan shall include contingency plan for emergencies including fire, accident, power failure, negative pressure system failure, supplied air system failure, or any other event that may require modification or abridgment of decontamination or Work Area isolation procedures.
   e. Include in plan specific procedures for decontamination and Work Area isolation.

3. Copy of the Asbestos Worker Certificate issued by DOSH for each employee to be utilized on the Work.

4. Copy of the completed University of Washington's Form No. 3, “Contractor Acknowledgement of Asbestos Hazard”, contained in Appendix A.

5. Copy of the Contractor's Asbestos License certified by the Department of Labor and Industries, as applicable.

6. Names of supervisor for this work and his/her qualifications (resume showing that he/she has similar experience and at least five years of supervisory experience), training and certificates.

7. Certification from the Contractor that all workers participate in a medical evaluation program and are approved to perform asbestos work. Copies of medical evaluations are not to be submitted.

8. Certification from the Contractor that all workers have current fit tests for the respirators to be worn for the project. Copies of fit tests are not to be submitted.


10. Certification that the negative air pressure system to be utilized meets the requirements of the Contract Documents.
11. Sample copy of daily log form and sign in/out log to be used. The sign in/out log shall contain the following information: date, printed name and signature, entering and leaving time, company or agency represented, and reasons for entry for all persons entering the Work Area.

12. Safety Data Sheets (SDS) for all products to be used in the course of the Work.

13. Copy of all applicable certificates/licenses for personnel and testing laboratory performing the analysis of personal air samples. Include evidence of successful participation within the PAT program for the previous two rounds or registration with the AIHA AAR Registry Program.

14. List of emergency telephone numbers (pagers, mobile phones, home telephones if possible) for Abatement Contractor’s supervisory personnel.

1.13 JOB SUBMITTALS

A. Submit "Job Submittals" to the Owner following the initiation of the Work including:

1. Copies of the certification from DOSH or training provider for all new employees hired during the course of the Work, prior to the first day of Work for each employee (for employees not included in the Pre-Job Submittal).

2. Copies of all personal air monitoring results. Submit copies to Owner on a daily basis prior to start of next Work Shift after samples were collected.

3. Submit daily logs and sign in/out logs to Owner daily prior to start of the next Work Shift. Emailed copies are preferred.

4. Updated progress schedule. Submit to Owner at each weekly progress meeting.

5. Copies of the preceding week’s manifests and disposal site receipts with chain of custody. Submit to Owner at each weekly progress meeting. Receipts shall include date, quantity of material delivered, and signature of authorized representative of landfill.

6. Abatement Supervisor shall sign form contained in Appendix A stating that each Work Area is clean and then immediately provide to the Owner for a concurrence signature.

B. Submit "Post-Job Submittals" to the Owner following completion of the Work. Requests for final payment will not be processed until the post-job submittal package has been reviewed and accepted by the Owner. Submit Post-Job Submittals including:

1. Documentation of all employee personal air monitoring results relative to OSHA and WISHA respiratory protection level compliance.

2. Copies of all Contractor’s daily logs including sign in/out logs, and disposal/landfill site receipts with chain of custody.

3. Compile and submit Contractor’s insurance certificates, DOSH notices, and PSCAA Notice of Intent to Remove or Encapsulate Asbestos notifications. The Contractor shall also submit any amendments made to these documents during the Work.

C. Unless otherwise specified, make submittals in groups, as described herein, containing all associated items to ensure that the information is available for quality control, checking each item when it is received.

D. Partial submittals may be rejected as not complying with the provisions of the Contract.

1.14 AIR MONITORING:

A. Owner may monitor inside and outside the Work Area, as well as collect personal samples used for quality control. Note: The purpose of the Owner air monitoring and inspection activities is to provide quality assurance only, not to replace any air monitoring and/or inspections required of the Contractor by federal, state, or local regulations or by this Section.
B. In addition to the air monitoring requirements described elsewhere in this section, the Contractor shall be responsible for all air monitoring as required by DOSH, including pre-abatement, personal time-weighted average and short-term excursion limit samples, daily area monitoring, post-abatement clearance monitoring, and “other” sampling as required by federal, state, or local regulations.

C. In addition, the Contractor shall be responsible for post-abatement final inspection to determine that all required asbestos has been removed and that the area is sufficiently clean. The Owner shall be held harmless from any legal action taken as a result of such sampling. The Contractor shall also indemnify, hold harmless, and defend the Owner, its agents, and employees for the use of any Owner supplied air-monitoring data.

D. The Contractor is required by DOSH to take his own air samples, at his own expense, per the following regulations:
   1. WAC 296-62-07709 (Exposure Monitoring)
   2. WAC 296-62-07735 (Appendix A)

E. The air samples must be analyzed by a laboratory in accordance with the following:
   1. Personnel conducting on site asbestos air sample analysis shall be listed on AIHA’s Registry of Proficiency or an equivalently recognized program and shall have successfully completed NIOSH 582 (or equivalent) training.
   2. The laboratory conducting analysis of air samples shall be satisfactory participants in the NIOSH Proficiency Analytical testing (PAT) program and shall produce their PAT number and results on request.

F. Air Monitoring Requirements:
   1. Outside Work Area Air Monitoring: The Contractor shall conduct daily air monitoring to document acceptable conditions or detect faults in the work procedures and engineering controls. Samples will be collected outside the Work Area at building entrance.
   2. Personal Samples: The Contractor shall conduct representative personal air monitoring in each abatement Work Area for each representative work activity as required by WAC 296-62-077. In addition to those samples required to be collected by the Contractor, the Owner reserves the right to monitor airborne fiber levels produced by some workers to determine the effectiveness of work practices. This implies no agency relationship with the Contractor’s employees.
   3. Visual Clearance: The containment or regulated area (where a containment is not required) will remain in place until the Owner certifies visual clearance.
   4. Where feasible, samples shall be collected according to the WISHA Reference Method (WAC 296 62 07735, Appendix A) and Detailed Procedure for Asbestos Sampling and Analysis (WAC 296 62 07737, Appendix B) and NIOSH Method 7400 (as revised). All samples shall be collected at a height of approximately 60 inches above the working floor for projects with 8-10 foot ceiling heights, unless otherwise directed.

G. Airborne Fiber Concentrations:
   1. Inside Work Area:
      a. Maintain an average airborne concentration in the Work Area of less than 0.08 fibers per cubic centimeter (f/cc) of air. If the fiber concentration rises above this figure for any sample taken, revise Work procedures to lower fiber concentration to a value below 0.08 f/cc of air.
      b. If airborne fiber concentration exceeds 0.1 f/cc of air for any period of time, cease removal Work and revise Work Procedures. Do not recommence removal Work until an airborne concentration in the Work Area of less than 0.08 f/cc of air has been achieved and revised Work Procedures have been reviewed and approved by the Owner.
   2. Outside Work Area:
a. If any air sample taken inside the outside and immediately adjacent to the Work Area exceeds 0.01 fibers per cubic centimeter, immediately stop all abatement activities, locate source of contamination, and correct any faults in the Work Area isolation or ventilation systems. Do not recommence abatement Work until corrective measures have been reviewed and approved by the Owner.

H. Analytical Methods: The following methods will be used for analyzing filters used to collect air samples other than clearance:

1. Twenty-five-millimeter (25 mm) cellulose ester filters with fifty (50) mm conductive cowl extensions will be used for all sampling. Sampling and analysis for personal samples will be conducted according to the OSHA/WISHA Reference Method. Area clearance samples will be analyzed according to the NIOSH 7400 Method using airflow rates between 1 – 10 liters per minute. At least 1,200 liters of air will be collected. All inside and outside air sampling shall be continuous throughout work shift.

2. Where used, TEM analysis will be NIOSH 7402 method.

I. Sample Volumes: Sample volumes shall be sufficient to establish the quantification limit (QL) necessary for the type of sample collected. The formulas listed in the WISHA Reference Method will be used to calculate sample volumes and/or flow rates. Sample volumes will be sufficient to collect between 100-1,300 fibers per square millimeter (f/mm²) of filter area. At a minimum, for Pre-abatement and outside samples, the QL will be 0.005 f/cc based on the EPA suggested minimum filter loading of 10 fibers in 100 fields counted. For personal samples, the QL will be 0.05 f/cc.

J. Laboratory Testing: The Contractor shall have a qualified laboratory perform analysis of the air samples required to monitor abatement procedures. The laboratory results, signed by the lab manager, shall be returned to the site prior to the start of abatement for the same work shift the following day. A complete record of inspections and all air monitoring tests and results will be furnished to the Owner and the Contractor daily.

K. Written Reports: All air monitoring test results and daily inspection logs will be posted at the job site on a daily basis.

L. Conflicts in air monitoring analytical results: QA/QC discrepancies identified in any of the reported analytical results will be resolved by TEM analysis (NIOSH 7402 method).

1. The Owner will not be charged for any and all costs associated with any additional sampling resulting from QA/QC air monitoring conflicts.

1.15 ASBESTOS ABATEMENT - SPECIAL REPORTS:

A. Except as otherwise indicated, the Contractor must submit special reports directly to Owner and others affected by occurrence within twenty-four (24) hours of occurrence requiring special report.

B. Reporting Unusual Events: When an event of unusual and significant nature occurs at site (examples: failure of negative pressure system, rupture of temporary enclosures), the Contractor must prepare and submit a special report listing chain of events, persons participating, response by Contractor’s personnel, evaluation of results or effects, and similar pertinent information. When such events are known or predictable, the Contractor must advise the Owner in advance at earliest possible date.

C. Reporting Accidents: The Contractor must prepare and submit reports of significant accidents, at the site and anywhere else work is in progress. Record and document data and actions; comply with industry standards. For this purpose, a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.

1.16 WORKSITE CONDITIONS

A. Worker and Authorized Visitor Procedures: The Contractor is hereby advised that asbestos has been determined by the U.S. Government to be a CANCER-CAUSING AGENT. Contractor shall provide workers and authorized visitors with respirators that, at a minimum, meet the requirements of OSHA and
DOSH, and protective clothing during preparation of enclosures, prior to commencing Work, during actual asbestos removal, and until final air tests are accepted by the Owner.

1.17 PERSONNEL PROTECTION

A. Contractor acknowledges and agrees that he or she is solely responsible for enforcing worker protection requirements at least equal to those specified in this section.

B. Training Program as follows:
   1. Prior to commencement of Work, all workers shall receive training in the proper handling of materials that contain asbestos, including all aspects of Work procedures and protective measures, use of protective clothing and respiratory protection, use of showers, entry and exit procedures from Work Areas, and in DOSH and OSHA regulations.
   2. Each worker shall understand the health implications and risks involved, including the illness possible from exposure to airborne asbestos fibers, and understand the use and limits of the respiratory equipment to be used. Each worker shall also understand the purpose of medical surveillance and the monitoring of airborne asbestos as related to health and respiratory equipment.
   3. Emergency evacuation procedures to be followed in the event of worker injury or compressor failure or other emergencies shall be included in the worker training program. The training program shall comply with federal, state, and local regulations.

C. Respirators as follows:
   1. Contractor shall provide workers with respiratory equipment approved by NIOSH and OSHA for the type of Work being performed. Respiratory equipment instructions shall be posted in the Clean Room.
   2. Where respirators with disposable filters are used, provide sufficient filters for replacement as necessary by the workers, or as required by applicable regulations.
   3. Provide respiratory protection as appropriate and needed from the time of the first operation involving contact with asbestos-containing materials (including construction of airtight barriers/barricades and placing of polyethylene sheeting on walls) until acceptance of final air test results by the Owner.
      a. Provide a minimum of half-face dual cartridge respirators for workers during "poly preparation" phases of the Work, causing no disturbance of the asbestos-containing material to occur.
      b. Provide a minimum of half-face dual cartridge respirators for workers during removal of non-friable asbestos-containing materials or during glovebag removal and after passing pre-encapsulation testing.
      c. Provide a minimum of Type C, Supplied Air Respirators operated in the pressure demand mode from the first stage involving disturbance of friable asbestos-containing material, until passing pre-encapsulation testing.
      d. Workers shall always wear a respirator, properly fitted on their face, in the Work Area, from the initiation of preparation Work until all areas have been given written clearance by the Owner.

D. Personal Protective Equipment as follows:
   1. Work clothes shall consist of disposable full-body coveralls, head covers, boots, rubber gloves, or equivalent. Sleeves at wrists and cuffs at ankles shall be secured. Fire retardant full-body coveralls are required in areas of open flame, or where required by local regulations.
   2. Eye protection and hard hats shall be available as appropriate or as required by applicable safety regulations.
3. Provide workers with sufficient sets of protective disposable clothing, consisting of full-body coveralls, head covers, gloves, and foot covers, of sizes to properly fit individual workers.

E. Contractor shall be solely responsible for scheduling all necessary air sampling by an independent testing laboratory for compliance of his or her respiratory protection with DOSH and OSHA regulations. Contractor shall pay for all costs associated with such testing.

F. Permit no visitors, except for governmental inspectors having jurisdiction, or as authorized by the Owner, in the Work Areas after commencement of asbestos disturbance. Provide authorized visitors with suitable respirators and protective equipment.

G. Leave reusable equipment, apparel, and protection devices (excluding respirators) in the Equipment Room until the end of the asbestos abatement Work, at which time such items shall be disposed of as contaminated waste or decontaminated for reuse.

H. Provide authorized visitors with a set of suitable protective disposable clothing, headgear, eye protection, and footwear of sizes to properly fit visitors whenever they are required to enter the Work Area.

I. Provide, in addition to respirators and protective clothing for authorized visitors, protective clothing and a Type C respirator with extra air hoses for use by the Owner. Furnish protective clothing in as many sets as required for full-time monitoring by the Owner.

J. Provide and post in the Equipment Room and the Clean Room the asbestos removal decontamination and work procedures to be followed by workers.

1.18 NOTICES

A. Perform all required notifications prior to beginning any Work on Asbestos-Containing Materials. Contractor shall be responsible for sending written notifications to PSCAA and DOSH, as required by local regulations, prior to beginning any Work on Asbestos-Containing Materials.

B. Contractor shall cooperate with the Owner in providing all necessary information prior to starting Abatement to enable the Owner to coordinate other work at the site. Notice shall be provided prior to starting Abatement and at least 36 hours in advance for normal work orders and at least two hours in advance in the cases of Emergency Work. In addition, during the Work, the Contractor is responsible to inform the Owner of work hour changes and start and stop days of Work. The Contractor is responsible to notify PSCAA regarding these changes and shall participate in PSCAA's online notification program.

C. The Owner has performed a regulated materials survey (which is considered an asbestos good faith inspection) to determine whether the materials to be disturbed or removed contain Asbestos. Contractor shall not commence Work without receiving a copy of the regulated materials survey report.

D. Contractor shall keep the regulated materials survey report on Site throughout the course of the Work.

1.19 PERMITS

A. Obtain all required permits for demolition, and for transport and disposal of asbestos-containing or contaminated materials, supplies, etc.

1.20 LICENSES

A. Maintain current licenses for Contractor and certifications for workers as required by applicable state or local jurisdictions for the removal, transportation, disposal or other regulated activity relative to the Work.

1.21 OBSERVATIONS

A. The Owner will observe the status and progress of the Work for completeness and general compliance with the requirements stated in the Contract Documents at the following times:

1. At designated times during the cleaning phases; and
2. As appropriate during the Work outlined elsewhere in the Contract Documents.
B. Contractor shall notify the Owner at least 48 hours in advance of the need and readiness for such observations. The Owner will make reasonable efforts to comply with time of requested observations should advance notice not be given to the Owner. Do not proceed until such observations by the Owner are performed.

C. Any delay in the completion of the Work caused by lack of advance notice given by Contractor to the Owner shall not be cause for any extension of time or extension of the project completion deadline.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:
   1. Damaged, deteriorating or previously used materials shall not be used and shall be removed from the work site and disposed of properly.
   2. Polyethylene sheeting for walls and stationary objects shall meet the requirements of UL Ratings and ASTM standards D-2898-81 and D-3201-79.
   3. Disposal bags shall meet the requirements of EPA regulation 40 CFR 61.150 (a) (i) (iv) (v) or WAC Chapter 296 62 0072.
   4. Warning signs as required by WAC Chapter 296 62 07721.
   5. Other materials: The Contractor shall provide all other materials such as lumber, nails, and hardware, which may be required to construct and dismantle the decontamination area and the barriers that isolate the work area, and as required to complete the work as specified.

B. Glovebag: Provide glovebags sufficient in size to perform the Work.

C. Polyethylene Sheet: Provide flame-retardant polyethylene film that conforms to requirements set forth by the NFPA Standard 701 (Small Scale Fire Test for Retardant Textiles and Films). Provide 6-mil thick, frosted or black TRM Manufacturing Brand, or equivalent, of the largest size practicable to minimize seams.

D. Reinforced Polyethylene Sheet: Provide translucent, nylon reinforced, laminated, flame-retardant polyethylene film that conforms to requirements set forth by NFPA Standard 701. Provide 6-mil thick Permalon Brand, or equivalent, of the largest size practicable to minimize seams.

E. Duct Tape: Provide duct tape with an adhesive that is formulated to stick securely to sheet polyethylene, Nashua Brand or equivalent. Do not use polyethylene tape.

F. Spray Cement: Provide spray adhesive in aerosol cans that is specifically formulated to stick securely to sheet polyethylene, Abatement Technologies, AS-100, or equivalent. Contractor shall not use spray cement containing methylene chloride.

G. Lumber: Provide kiln dried fire-retardant lumber and plywood in accordance with ASTM D245.

H. Wetting materials - For wetting prior to disturbance of ACMs, use amended water, a solution of surfactant and water that results in wetting of the ACMs and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant mixed with five gallons of water. Surfactant shall consist of resin materials in water base that have been tested to ensure material is non-toxic and non-irritating to skin and eyes, and non-carcinogenic. An approved manufacturer and material is Matheson Chemical Corporation - Dust-Set Amended Water Base.

I. Sealant (encapsulant) - Provide encapsulant manufactured by reputable, established manufacturer and approved specifically for use in asbestos-contaminated environments. It is the responsibility of the Contractor to document compatibility of the encapsulant with replacement materials. The following products have been approved for use in asbestos-contaminated areas:
   1. International Protective Coatings Corp. - Serpliflex Shield.
2. American Coating Corporation - Cable Coating No. 22P.
5. Matheson Chemical Corporation - Dust-Set Asbestos Encapsulant.
7. American International Services - Formula 360 FE.
8. Fiberlock Products.

J. Expandable Foam Fire Stop Material: Provide UL-listed material that contains no urea formaldehyde.


L. Disposal Bags: Provide 6-mil thick leak-tight polyethylene bags affixed with three labels with text as follows:
   1. First Label: Provide in accordance with 29 CFR 1910.1200(f) of OSHA's Hazard Communication standard:
      
      DANGER  
      ASBESTOS  
      MAY CAUSE CANCER  
      CAUSES DAMAGE TO LUNGS  
      AUTHORIZED PERSONNEL ONLY  
      WEAR RESPIRATORY PROTECTION  
      AND PROTECTIVE CLOTHING IN THIS AREA

   2. Second Label: Provide in accordance with U.S. Department of Transportation regulations on hazardous waste marking (49 CFR Parts 171 and 172):
      
      RQ HAZARDOUS SUBSTANCE  
      SOLID, NOS,  
      ORM-E, NA 9188  
      (ASBESTOS)

   3. Third Label: Provide permanent label for each bag listing name of the Owner, date, the location where the waste was generated, and the Owner's work order number.

M. Fiberboard Drums: Provide heavy duty, leak-tight fiberboard drums with tight sealing locking metal tops, if necessary.

N. Paper Board Boxes: Provide heavy duty corrugated paper board boxes coated with plastic or wax to retard deterioration caused by exposure to moisture. Provide in sizes that will easily fit in disposal bags.

O. Other Materials: Provide all other materials, such as lumber, nails, and hardware, which may be required to construct Work Platforms, Decontamination Units, and the barriers that isolate the Work Area(s).

P. The Owner will consider equivalent products by other manufacturers for approval if submitted with appropriate information to the Owner not later than five days prior to the scheduled time for the product to be used. Minimum information shall include Material Safety Data Sheet (MSDS) and application recommendations for use on ACMs.

2.2 TOOLS AND EQUIPMENT

A. Water Sprayer: Airless or other low-pressure sprayer for amended water application.

B. Negative Air Pressure Equipment: High-efficiency particulate air (HEPA) filtration systems shall have filtration equipment that complies with ANSI Z9.2-1979 (R1991), local exhaust ventilation.
C. Manometer: It shall have a built-in alarm and produce a continuous hard copy readout to continuously monitor maintenance of required pressure differential between the Work Areas and outside areas.


E. Scaffolding: Provide all scaffolding, ladders and staging, etc., as necessary to accomplish the Work of this Contract. The type, erection and use of all scaffolding shall comply with all applicable DOSH and OSHA regulations. No workers shall remain on rolling scaffolding as it is being moved; the wheels shall be locked when workers are climbing the scaffolding or working from the platform.

F. Communication Equipment: It shall be suitable for inter-room communications, if required.

G. Holding Carts: Watertight wheeled carts with doors or tops that can be closed and secured.

H. Transportation: As required for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property. Use only enclosed or hard-covered trucks to transport waste containers to prevent loss or damage of containers in route to the landfill. Polyethylene sheeting or tarps are not considered to be hard covers.

I. Fire Extinguisher: Provide and maintain fire department certified 30-pound “ABC” fire extinguisher for each Work Area.

J. Hand tools: Provide scrapers, stiff nylon bristle hand brush, and other suitable hand tools for asbestos removal.

K. General (all abatement work):
   1. Full body disposable protective clothing, including head, body, and foot coverings consisting of material impenetrable by asbestos fibers (Tyvek or equivalent) shall be provided to all workers and authorized visitors in sizes adequate to accommodate movement without tearing.
   2. Additional safety and fall protection equipment (e.g., hard hats, eye protection, and disposable PVC gloves meeting the requirements of ANSI Standard Z87.1-2003 and safety shoes meeting the requirements of ANSI Standards F2414-05 and F2413-05) as necessary shall be provided to all workers and authorized visitors and shall be sized to fit the wearer.
   3. Non-skid footwear shall be provided to all abatement workers. Disposable clothing shall be adequately sealed to the footwear to prevent body contamination.
   4. For mini-enclosures and glove bags, a HEPA filtered vacuum system shall be used to provide negative air.

L. Type C Respirator Systems:
   1. Provide equipment capable of producing a continuous, sufficient supply of Grade D breathing air. Electrical compressor is required.
   2. Compressed air systems shall be designed to provide air volumes and pressures to accommodate respirator manufacturer’s specifications.
   3. The compressed air systems shall have a receiver of adequate capacity to allow escape of all respirator wearers from contaminated areas in the event of compressor failure.
   4. Compressors must have an in-line carbon monoxide monitor; periodic inspection of the carbon monoxide monitor must be evidenced.
   5. Provide full-face piece and hose by same manufacturer that has been certified by NIOSH/MSHA as an approved Type C respirator assembly operating in pressure demand mode with a positive pressure face-piece. Maximum hose length shall be 300 feet.

M. Provide other equipment as needed to accomplish this Work.
PART 3 - EXECUTION

3.1 INSPECTIONS:

A. Pre-abatement: The abatement work shall not begin until:
   1. Pre-abatement air monitoring has been conducted by the Contractor and the results have been reviewed and approved by the Owner.
   2. The Contractor and Owner have inspected the site to ensure that work can begin.
   3. Negative pressure ventilation and supplied air systems, if used, are functioning adequately. Contractor must test all systems.
   4. All required pre-work submittals, notifications, postings, and permits have been provided and are satisfactory to Owner.
   5. All equipment for abatement cleanup and disposal are on hand.
   6. All worker and supervisor training, certification, and medical monitoring are current, and documentation is available on the job site.

B. Throughout the Work: Owner may perform routine inspections of the site to assure compliance with applicable regulations and the plans and specifications.

C. Post-Abatement: The Clearance process is discussed in Paragraph 3.12 of this specification.

3.2 SITE SECURITY:

A. The Work Area is to be restricted only to authorized, trained, and protected personnel. These may include the Contractor’s employees; employees of subcontractors; and Owner’s employees and representatives; federal, state, and local inspectors and other authorized or designated individuals.

B. Secure the Work Area from access by occupants, staff, or users of the building. Accomplish this where possible by locking doors, windows, or other means of access to the work area, or by constructing temporary framing with plywood or gypsum board barriers. All emergency exits/corridors must be kept open.

C. Entry into the Work Area by unauthorized individuals shall be reported immediately by the Contractor to the Owner’s security and the Owner.

D. For work requiring the use of a negative pressure enclosure, a logbook shall be maintained in the clean room area of the worker decontamination system. Everyone who enters the work area must sign in, recording: name, affiliation (Contractor, Owner, regulatory agency, etc.), work phone number, purpose of entry, acknowledge existence, review and understanding of the emergency contingency plan, and time in and time out for each entry.

E. Contractor shall be responsible for site security during abatement operations.

3.3 EMERGENCY PLANNING:

A. Emergency contingency plans shall be developed by the Contractor prior to initiation of any work. These plans shall be a component of the Contractor’s Health and Safety Plan.

B. Emergency procedures shall be in written form and prominently posted at the jobsite.

C. Telephone numbers of all emergency response personnel shall be prominently posted in the clean room, adjacent to the containment in the Work Area, or as directed by the Owner. To assist the Contractor, the Owner will provide a list of phone numbers for emergency response.

3.4 GENERAL REQUIREMENTS:

A. If at any time after barriers or enclosures have been erected, any visible material is observed outside of the Work Area or if damage to the barrier or enclosure occurs, work shall immediately stop, repairs shall
be made and debris and residue shall immediately be cleaned up using appropriate HEPA vacuuming and wet cleaning procedures. Area air monitoring shall be started immediately in the public space to measure the asbestos concentration in the public area as a result of breaching the enclosure.

B. The Contractor must provide a minimum of two (2) phone numbers at which its supervisory personnel may be contacted on or off site at any time during the length of the Work.

3.5 TRAINING REQUIREMENTS:

A. Training: All personnel conducting asbestos abatement shall be the bearer of current “Certified Asbestos Worker or Supervisor Certificate” issued by the Washington State Department of Labor and Industries.

1. Special on-site training specific to equipment and procedures unique to this job site shall be performed as required.

3.6 PREPARATION OF THE WORK AREA:

A. Post barrier tape and caution signs meeting the specifications of WISHA Chapter 296 62 07711 at the locations and approaches to a location where airborne concentrations of asbestos may be expected to exceed the pre-abatement concentration. Signs shall be posted at a distance sufficiently far enough away from the Work Area to permit an employee to read the sign and take the necessary protective measures to avoid exposure. Additional signs may need to be posted following construction of workplace enclosures or barriers.

B. All conduit joints, junction boxes, motor connections, motors, control panels, and associated equipment in the work areas shall be protected from amended water. Wire in conduit that passes through the work area may remain energized. The Contractor is responsible for all electrical safety.

C. Control panels, gauges, etc., in the work area may require Owner access during abatement. Contractor shall coordinate with the Owner to identify which items/areas must remain accessible to Owner’s personnel. Provide access for those items/areas without the need for personnel to enter the abatement enclosure.

3.7 GENERAL REMOVAL PROCEDURES:

A. Wet all ACM with amended water solution using equipment capable of providing a fine spray mist as required by WAC 296-62-077 and PSCAA. Do not allow excessive water to accumulate in the work area. Keep all removed material saturated until it can be containerized for disposal. Saturated ACM shall be removed in manageable sections. Containerize removed material immediately and prior to moving it to a new location for continuance of work. Adjacent areas shall be periodically sprayed and maintained in a saturated condition until all visible material is sealed and removed from the barrier or enclosure.

B. Removed material shall not be dropped or thrown. Remove material intact or as components whenever possible and carefully lower to the floor. If this cannot be feasibly accomplished, a dust-tight chute shall be constructed to transport the material to containers on the floor, or the material may be containerized at elevated levels (e.g., on scaffolds) and carefully lowered to the ground by mechanical means.

C. Double bag all waste material prior to removal from the enclosure system or immediately upon removal of the barrier.

D. Disposal bags shall not be overfilled. Waste containers or materials shall be raised and securely transported and shall not be dropped or slid.

E. Disposal containers shall be securely sealed to prevent accidental opening and leakage by taping in a gooseneck fashion.

F. Large components removed intact may be wrapped in two (2) layers of 6 mil polyethylene sheeting secured with tape for transport to the landfill.

G. Disposal bags, containers, and wrapped components shall be labeled according to OSHA, DOSH, PSCAA, and WSDOT requirements.
H. The work area shall be cleaned of all suspect ACM prior to the visual inspection by the Owner. If any accumulation of residue is observed, it will be assumed to be asbestos containing. Re-cleaning may be required, at no additional cost to the Owner, until all suspect material is removed. Re-cleaning and inspection will continue until no visible suspect material remains.

I. Refer to Paragraph 3.9 of this specification for Work Area clearance process.

J. Where NPEs are used, vent to outside of the building and away from building air intakes, unless authorized in writing by the Owner.

K. Where NPEs are used, provide a minimum of one back-up negative air unit for every four (4) primary negative air units used. A minimum of one (1) back-up negative air unit will be required if less than four (4) primary units are used. The back-up negative air unit(s) shall be of equal capacity to primary unit(s).

L. Clearly identify and maintain emergency and fire exits from the containment area.

3.8 REMOVAL OF NON-FRIABLE MATERIALS – REGULATED, NON-CONTAINED WORK AREA

A. Prepare the Work Area as a regulated, non-contained work area as previously specified. These procedures are for locations where non-friable materials are being removed independent of other abatement work. If the non-friable materials are being removed as part of other abatement work, the Work Area shall be prepared as specified for the other materials. If mechanical means are going to be used for the removal of non-friable materials, Contractor shall perform the Work in a full enclosure as previously specified, the exception being for outdoor work. Each case of outdoor work with mechanical means will be addressed by the Owner.

B. When removing materials in an intact state (e.g., fire doors and sinks), the Contractor shall wet the material and remove the entire material in an intact state. The material is to be removed and wrapped in two layers of 6-mil polyethylene, labeled, and disposed of as asbestos waste. The use of a drop cloth shall be employed for these applications.

C. Remove flooring and mastic for occupied buildings as follows:
   1. Spray flooring and mastic with a mist of amended water.
   2. Remove flooring and mastic using manual methods and maintain material in wet condition.
   3. Place removed material in properly labeled, 6-mil disposal bags.
   4. Remove residual mastic by hand scrapping using razor scarpers and spud bars. The mastic shall be removed until there is no visible thickness and it passes the “fingernail” inspection method.
   5. Care shall be taken to ensure that adjacent materials such as plaster and gypsum wallboard do not become damaged.
   6. Ensure that no debris passes through floor cracks to the next floor below Work Area. Place all debris in 6-mil disposal bags.
   7. After removal of ACM, wet-clean the floor surface to remove all residual debris.
   8. If using a drop cloth, Contractor shall clean the drop cloth and place it in a disposal bag.
   9. Notify the Owner for visual observation.

3.9 CLEAN UP AND CLEARANCE TESTING FOR REGULATED, NON-CONTAINED AREAS AND MINI-ENCLOSURES

A. Provide general cleanup of Work Areas concurrent with the removal of all ACMs. Do not permit accumulation of debris on workspace floor.
   1. Clean all surfaces of the Work Area using wet methods and HEPA vacuums.
   2. Upon completion of cleaning, the Owner shall perform visual observation.
3. If Work Area passes visual observation, encapsulate all surfaces in the Work Area.
4. After 1/2-hour waiting period, the Owner shall collect final clearance air samples.
5. If airborne fiber concentrations are greater than specified, subsequent cleanings will be conducted at Contractor’s expense; this sequence will continue until specified airborne fiber concentrations are achieved. When final clearance air samples are less than 0.01 f/cc, or the background levels, whichever are lower, the Work Area can be dismantled.

B. Upon notification from the Owner that final clearance samples indicate acceptable airborne levels have been achieved, dismantle Decontamination Enclosure System. Thoroughly HEPA-vacuum and wet clean immediate areas and remove all critical barriers.

C. Dispose of debris resulting from removal operation, used cleaning materials, unsalvageable materials used for sturdy barriers, and any other remaining materials. Consider the materials to be contaminated and dispose of them accordingly.

3.10 PROCEDURES FOR EMERGENCY SPILLS AND UNCONTROLLED RELEASES OF ASBESTOS OR PACM

A. This procedure shall be used in any situation involving an uncontrolled release of ACM or PACM such as, but not limited to, dislodging of asbestos materials by accident, a rupture in a containment, breaking of a glove bag, tearing open of previously wrapped material, spills of drums for disposal, the use of asbestos contaminated clothing, tools or equipment in an unregulated area, or similar event where ACM or PACM may be or has the potential to be introduced into the air in an uncontrolled manner.

B. Specific Work Procedure:
   1. Evacuate the immediate area of all unprotected personnel.
   2. Establish a regulated area. The work area shall be identified, and access restricted in any manner that minimizes the number of persons within the Work Area and protects persons outside the work area from exposure above the action level in accordance with WAC 296 0771. Seal all openings into Work Area including drains.
   3. Use caution to assure personnel are not tracking asbestos-containing debris to areas outside the regulated area and spreading the contamination.
   4. Wet down, encapsulate, and pick up large chunks and place in a properly labeled asbestos disposal bag. Asbestos disposal bags shall meet the requirements of WAC 296 62 07721.
   5. Vacuum the entire area using a HEPA equipped vacuum.
   6. Wet wipe the entire contaminated area with clean wet rags and/or mops.
   7. Encapsulate all surfaces within the work area. Protect equipment, furnishings, and other items in work area during encapsulation.
   8. The clean-up procedures shall include the entire affected area.
   9. Provide the Owner with a detailed written report of the causes of the accident, the Contractor’s response, the results of actions taken, and steps to be implemented to avoid future occurrences within 24 hours of the spill.
   10. All work performed under this procedure shall be undertaken by Certified Asbestos Workers in protective clothing with half face respirators as a minimum.

3.11 RE-ESTABLISHMENT OF THE WORK AREA AND SYSTEMS:

A. Re-establishment of the work area shall occur following the completion of cleanup procedures and after clearance air monitoring has been performed and documented per contract documents.

B. Refer to Clearance procedures listed in Paragraph 3.12 of this specification.
C. Following satisfactory clearance of the work area, remaining polyethylene barriers may be removed and disposed of in accordance with these specifications.

D. Comply with safety standards and governing regulations for cleaning operations. Remove waste materials from the site and dispose of in a lawful manner.

E. Following this section is an example of "Certificate of Clearance". This certification is to be completed by the Contractor and the Owner during the clearance process.

3.12 DISPOSAL PROCEDURES:

A. Double-bag all adequately wet asbestos-containing waste and contaminated debris: bags shall not be over-filled and shall be securely sealed to prevent accidental opening or leakage. Bags shall be placed in fiberboard drums for transportation to the landfill if sharp objects are included in the asbestos-containing waste.

B. Labeling: Each bag of asbestos waste shall be pre-labeled in accordance with 29 CFR 1910.1200 (f) of OSHA's Hazard Communication Standard and a second pre-printed label must be present on each bag in accordance with 49 CFR Parts 171 and 172 of U.S. Department of Transportation regulations.

C. Remove bagged or drummed materials from buildings on a daily basis. Coordinate with Owner's Representative to schedule after-hours removal of materials from buildings. Contractor is responsible for protecting interior finishes along designated route of transport through buildings. Enclosed carts shall be utilized for transport of materials through Owner's Buildings.

D. Do not store containerized waste outside of the Work Areas. Containerized materials can be stored for no more than eight hours within the Work Areas. Take containers from the Work Areas directly to Transportation. Carefully load waste into Transportation. Exercise care before and during transport, to ensure that no unauthorized persons have access to the material.

E. At disposal site, carefully unload sealed containers from Transportation. If bags are intact and drums are not contaminated, the drums may be reused. Treat any drums that have been contaminated as asbestos-containing waste and dispose of them in accordance with instructions contained in this section.

F. At completion of hauling of each load, submit copy of waste manifest, chain of custody form, and landfill receipt to the Owner and Owner’s Representative. Comply with all paperwork and response times stipulated in applicable regulations.

G. Disposal must occur at an authorized site in accordance with regulatory requirements of PSCAA and applicable state and local guidelines and regulations.

H. Waste shipment, waste manifest, and disposal records shall be delivered to the Owner within forty-five (45) days of completion of the abatement work. This information shall document the pickup site and disposal site, the quantity of the asbestos waste and the type of containers used. The Contractor and the Disposal Site Operator shall sign waste manifest. If a separate hauler is employed, their name, address, telephone number and signature shall also appear on the manifest.

I. Transportation to the Landfill:

1. All transportation of asbestos containing waste material shall adhere to federal, state, and local regulations, including, but not limited to:
   b. 49 CFR part 107.
2. Once drums, bags, and wrapped components have been removed from the work areas, they shall be loaded into an enclosed or covered truck for transportation.
3. Containers shall not be dragged, dropped, or thrown.
4. Personnel transferring or loading asbestos containing waste shall be protected by disposable clothing (including head, body; and foot protection) and, at a minimum, half face respirators using HEPA filters.
5. Any debris or residue observed on containers or surfaces outside the work area shall be immediately cleaned up using HEPA filtered vacuum equipment, or wet methods.

6. Large metal dumpsters are sometimes used for asbestos waste disposal. These shall have doors or tops that can be closed and locked to prevent vandalism or other disturbances. Containers shall be placed, not thrown, into these containers to avoid rupture.

7. Asbestos-containing or-contaminated wastes shall be segregated and transferred separately from non-asbestos wastes.

J. Waste shall be disposed only at UW audited and approved facilities, which can be found at the following location: [http://www.ehs.washington.edu/system/files/resources/disposalfaclist.pdf](http://www.ehs.washington.edu/system/files/resources/disposalfaclist.pdf).

   i. Upon reaching the landfill, trucks are to approach the dump location as closely as possible for unloading of the asbestos-containing waste.
   ii. Personnel off-loading containers at the disposal site shall wear protective equipment consisting of disposable head, body, and foot protection, and at a minimum, half-face piece, air-purifying respirators equipped with high-efficiency filters.
   iii. Bags, drums, and components may be inspected, as they are off-loaded at the disposal site. Material in damaged containers shall be repacked in empty drums or bags as necessary.
   iv. Waste containers shall be placed on the ground at the disposal site, not pushed, thrown or dumped out of trucks.
   v. Following the removal of all containerized waste, the truck cargo shall be decontaminated using HEPA vacuums or wet methods to meet the no visible residue criteria. Polyethylene sheeting shall be removed and discarded along with contaminated cleaning materials and protective clothing in bags or drums at the disposal site.

3.13 FIELD QUALITY CONTROL

   A. The Owner shall conduct air monitoring prior to, and throughout, removal and cleaning operations.
   B. A preliminary visual observation will be performed in the Work Area by the Owner following notification by Contractor that said areas have been properly cleaned and are ready for final clearance testing. Area will be observed for the presence of visible dust, dirt, and debris.
   C. Tests will be performed in the Work Area after final clean up, if necessary, as previously specified in this section.
   D. Tests will be reported in terms of total fiber count per cubic centimeter (f/cc); samples will be collected in accordance with EPA-recommended sampling volumes for appropriate detection limits.
   E. Visual observations will be made by the Owner and Contractor’s Supervisor after final clean-up to determine the presence of visible dust, dirt, debris, and areas of damage.
   F. The Contractor shall perform additional cleaning at no additional expense to Owner if, in the opinion of the Owner, based upon the final visual observation, previous clean-up operations are determined to be inadequate.
CERTIFICATE OF CLEARANCE

Project Name: ____________________________  UW Project #: ____________

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.

Identity of Work Area: ____________________________________________________________

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.

Identity of Work Area: __________________________________________________________________

Signature: ____________________________ Date: _______________  Pass / Fail (see punch list)

Print Name: ____________________________ Certificate #: __________ Expiration Date: __________

CONTRACTOR’S FINAL AIR CLEARANCE CERTIFICATION
The Contractor hereby certifies that he/she has conducted clearance air sampling in accordance with the specifications and that this sampling is valid to the best of his/her knowledge and belief. In addition, the Contractor 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.

Identity of Work Area: ____________________________ Air Sample Identification #: __________

Signature of Supervisor: __________________________________ Date: _______________

THE OWNER’S REPRESENTATIVE FINAL QA/QC AIR CLEARANCE CERTIFICATION
The Owner’s Representative hereby certifies that he/she has conducted clearance air sampling in accordance with the specifications and that this sampling is valid to the best of his/her knowledge and belief. In addition, 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.

Identity of Work Area ____________________________ Air Sample Identification #: __________

Signature: ____________________________ Date: _______________

THE OWNER’S REPRESENTATIVE APPROVAL FOR RE-OCCUPANCY
Visual Only* _______________  or  Visual & Air Clearance Sampling* _______________

*initialed by Owner’s Representative.

Signature: ____________________________ Date: _______________

Company Name: __________________________________________________________________

END OF SECTION
PART 1 - GENERAL

1.1 DESCRIPTION

A. Perform all planning, administration, execution, and cleaning necessary to safely remove heavy metal-containing materials.

B. The procedures employed by the Contractor shall not create the potential for contaminating surrounding areas or materials with paints or materials containing heavy metals. Dust generation will be kept to a minimum. Dry scraping, dry sanding, or dry grinding on heavy metal-containing materials will not be permitted without a full enclosure.

C. This Section addresses heavy metal-containing materials such as lead-containing materials (ceramic tile, lead lined walls, paints, and coatings), arsenic-containing materials such as brick mortar, and mercury-containing materials such as laboratory sink traps.

1.2 RELATED WORK

A. Section 02 80 00 – Facilities Remediation

B. Section 02 82 00 – Asbestos Removal

C. Section 02 84 00 – PCB Ballasts and Mercury Light Tube Removal

1.3 WORK INCLUDED

A. Based on the Owner’s review of the field investigations, and the nature and scope of work of this Project, it has been determined that lead is present in paints that may be impacted by installation as well as removal. Necessary precautions must be taken to prevent or minimize worker exposure to heavy metals during disturbance of heavy metals-containing materials, as outlined in Washington Administrative Code (WAC) 296-155-176 (Lead Standard for Construction Work), 296-62-07521 (Lead Standard for General Industry) and 296-841 (Airborne Contaminants). Heavy metals-containing materials also require disposal classification in accordance with the State of Washington Department of Ecology (Ecology) Dangerous Waste Regulation, WAC 173-303. The following materials in the Work Area were determined to contain detectable levels of lead:

<table>
<thead>
<tr>
<th>Sample Number and Description</th>
<th>Paint Location</th>
<th>Sample Result in parts per million (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pb1: Beige paint on CMU</td>
<td>Walls in F-Wing Level 2 electrical room</td>
<td>300</td>
</tr>
<tr>
<td>Pb2: White paint on concrete</td>
<td>Ceilings at entrances to tunnels on Minus 1 Level</td>
<td>67</td>
</tr>
<tr>
<td>Pb3: White paint on concrete</td>
<td>Ceilings and lower walls throughout Minus 2 Level</td>
<td>65</td>
</tr>
</tbody>
</table>

B. Implementation of measures to prevent contamination of the surrounding environment with metals.

C. Prevent employee exposure to heavy metals above the applicable permissible exposure limits.

D. The Contractor shall be aware that heavy metals exist in some of the materials to be impacted by the Work and employ measures to prevent contamination of the surrounding environment with heavy metals, dust, debris or other waste generated by the work. Engineering controls shall be adequate to prevent spillage of heavy metals-containing materials, heavy metals-contaminated items or any debris into the surrounding environment.

E. The Contractor is responsible for all costs associated with testing, engineering controls, decontamination and personal protection.

F. The Contractor shall remove, segregate, package and properly dispose of all dust, removed material, disposable protective equipment, cleaning rags, wash water, and any other materials contaminated with
dust from these materials in accordance with Washington State Department of Ecology regulations for general construction debris. Toxicity Characteristic Leaching Procedure (TCLP) samples of the representative waste stream (to characterize heavy metals-containing wastes as either dangerous/hazardous or non-dangerous/hazardous) shall be taken by the Owner prior to actual disposal. If the Contractor wishes to segregate specific items in the waste stream, further evaluation and sampling may be required to determine if it would designate as a dangerous/hazardous waste.

G. The Contractor shall assume full responsibility and liability for compliance with all federal, state, and local regulations pertaining to work practices; hauling and disposal of waste non-hazardous or dangerous waste; and protection of workers, visitors to site and building occupants in areas adjacent to Work Areas. Activities conducted under the scope of work of this contract that involve metals-containing materials shall be conducted in accordance with this Section and current applicable state and federal regulations.

H. Proper disposal of all wastes generated during the work if the waste is classified as non-dangerous/hazardous waste by Toxicity Characteristic Leaching Procedure (TCLP) test results. Waste materials (including concrete) that are coated with lead-containing paints, but have been classified as non-dangerous/hazardous waste by TCLP test results, shall not be recycled. The Contractor is allowed to recycle painted metal at a licensed metal recycling facility as long as the presence of lead in the paint is communicated to the facility. As long as the recycling meets the requirements of WAC 173-303-017(2)(a)(iii), asphalt may be recycled at an Owner approved off-site asphalt recycler or reformulated for use on-site.

I. There is a potential for exposure to heavy metals and heavy metals-containing dust during the Work. The Contractor is responsible for monitoring work activities and determining when work involves hazardous materials and conditions that require conformance with specified regulatory requirements. Applicable regulations regarding exposure to heavy metals apply to this Project. The site-specific Health and Safety Plan required by this Section is to address the pertinent health and safety issues associated with potential exposure to heavy metals during the Work.

J. The Scope of Work includes demolition that will impact heavy metals-containing materials. This Work will not be considered Abatement Work and the cost for heavy metals controls for these activities will be incidental to the construction activities.

1.4 WORK NOT INCLUDED

A. Replacement of removed paint, coating or material.

B. Area air monitoring as this will be performed by the Owner, as needed. However, Contractor is still responsible to perform personnel air monitoring for the safety of its employees.

C. The Owner will perform TCLP Testing.

D. Disposal of waste designated as hazardous or dangerous waste.

1.5 CODES AND REGULATIONS

A. Due to the potential health and environmental hazards associated with the Work at this site as described in this Section, the Work shall be performed in compliance with the applicable provisions of the Washington Industrial Safety and Health Act (WISHA) and the Washington State Hazardous Waste Management Act, as well as other applicable federal, state, and local codes and regulations governing hazardous materials and hazardous waste. The Contractor is fully responsible for planning and executing all the Work under this Contract in a manner that meets the requirements of the DOSH for protecting the health and safety of employees, protects the public, and protects the environment.

B. The following federal and state regulations and applicable guidance documents are pertinent to this Work. Other applicable regulations not specifically identified herein also apply.

1. U.S. Occupational Safety and Health Administration (OSHA):
   a. 29 CFR 1910, Occupational Safety and Health Standards
   b. 29 CFR 1910.134, Respiratory Protection
1.6 DEFINITIONS

A. Whenever the terms below occur in this Section, they will have the meanings which follow:

1. Action Level (Lead): Employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air calculated as an 8-hour time
weighted average. As used in this Section, "30 micrograms per cubic meter of air" refers to the action level.

2. Air Monitoring: The process of measuring the concentration of specific heavy metals in a specific volume of air in a stated period of time. Air samples shall be collected and analyzed in accordance with the methods specified by NIOSH Method 7082 or equivalent.

3. Area Monitoring: Sampling of airborne heavy metals concentrations inside or outside the physical boundaries of the control area that are representative of the airborne heavy metals concentrations that may reach the breathing zone of individuals (i.e., workers, the public, tenants, etc.) potentially exposed to heavy metals.

4. Characteristics: EPA has identified four characteristics of hazardous waste: (a) Ignitability, (b) Corrosivity, (c) Reactivity and (d) EP Toxicity. Any solid waste that exhibits one or more of these characteristics is classified as a hazardous waste under the Federal Resource Conservation and Recovery Act (RCRA).

5. Eight-Hour Time Weighted Average (TWA): Airborne concentration of a heavy metal averaged over an 8-hour workday.

6. EP Toxicity: A test, called the extraction procedure, which is designed to identify wastes likely to leach hazardous concentrations of particular toxic constituents into the ground water as a result of improper management. It is characteristic of hazardous waste. See TCLP.

7. Hazardous and Dangerous Waste: As defined in RCRA, the term “hazardous waste” means a solid waste or combination of solid wastes which, because of its quantity, concentration or physical, chemical or infectious characteristics, may:
   a. Cause, or significantly contribute to any increase in mortality or an increase in serious irreversible or incapacitating reversible ill, or;
   b. Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported or disposed of or otherwise managed;
   c. Be as described in the regulations, under one of the following four conditions:
      1) Exhibits a characteristic of a hazardous waste (40 CFR Sections 261.20 through 261.33).
      2) Has been listed as hazardous (40 CFR Section 261.31 through 261.33).
      3) Is a mixture containing a listed hazardous waste and a non-regulated solid waste (unless the mixture is specifically excluded or no longer exhibits any of the characteristics of hazardous waste).
      4) Is not excluded from regulation as a hazardous waste.

8. Heavy Metals: Shall consist of the following: lead.

9. Heavy Metals Awareness Training: Shall, at a minimum, consist of the following:
   a. The content of WAC 296-155-176 (Lead), 296-841 (Airborne Contaminants), 296-842 (Respirators) and their appendices
   b. The specific nature of the operations which could result in exposure to heavy metals above their respective action levels and permissible exposure limits
   c. The purpose, proper selection, fitting, use, and limitations of respirators
   d. The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to heavy metals (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant)
   e. The engineering and work practices associated with the employee’s job assignment including training of employees to follow relevant good work practices
f. The contents of any compliance plan in effect

g. Instructions to employees that chelating agents should not routinely be used to remove heavy metals from their bodies and should not be used at all except under the direction of a licensed physician

h. The employee’s right of access to records.

10. Heavy Metal Dust: Shall mean dust that contains heavy metals generated by the deterioration of a given material or by environmental factors.

11. Lead: Metallic lead, inorganic lead compounds, and organic lead soaps. Excluded from this definition are other organic lead compounds.

12. Lead-Containing Paint: Shall mean paint, varnish, shellac or similar coating containing more than the analytical detection limit of lead by weight in the final dried solid.

13. Micrograms: The prefix “micro” means $1/1,000,000$ of (one millionth of). A microgram is $1/1,000,000$ of a gram.

14. Permissible Exposure Limit (PEL) – Lead: Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 50 micrograms per cubic meter of air as an 8-hour time weighted average.

15. Personal Monitoring: Sampling of airborne heavy metals concentrations within the breathing zone of an employee to determine the 8-hour TWA concentration. Samples shall be representative of the employee’s work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 6 to 9 inches and the center at the nose or mouth of an employee.


18. Work Area: Designated rooms, spaces, or areas of the project in which heavy metals control and/or abatement actions are to be undertaken or which may become contaminated as a result of such actions.

1.7 QUALITY ASSURANCE

A. The Environmental Consultant may perform periodic observation of the site work to ensure that it is being performed in a manner consistent with the approved Work Plan and this Specification Section. The Owner will have the authority to issue a “Stop Work” order for contract and or regulatory non-compliance.

1.8 SUBMITTALS

A. Contractors shall provide complete submittals for review by the Owner according to Section 01 33 00 – Submittal Procedures. Following receipt of review comments from the Owner, submit additional complete sets of revised submittals to the Owner. No heavy metals-related work will be permitted prior to submittals being approved by the Owner.

B. Pre-Work Submittals. Providing detailed information concerning the following items, at a minimum, in the order listed below:

1. Work Plan: Provide a site-specific Work Plan which demonstrates the methods by which demolition/renovation and disposal of heavy metals-containing structures/components will be performed. At a minimum, the Work Plan shall include:
   a. A general description of heavy metals demolition/renovation work to be performed, discussing anticipated chemical and/or physical hazards associated with the work
b. A step-by-step description of the heavy metals demolition/renovation work to be performed and procedures which will be used

c. Qualification/certification/training certificates and the role of each member of the Contractor’s personnel, including at least one (1) proposed competent person

2. Health and Safety Plan: Provide a site-specific Health and Safety Plan including a worker protection program demonstrating the methods by which all applicable health and safety requirements, including WAC 296-155-176, will be met. The Health and Safety Plan shall be available at all times on the job site. At a minimum, the Health and Safety Plan shall include the following components:

a. Air Monitoring Plan: Including initial determination, area quality monitoring and personnel exposure monitoring

b. Respiratory Protection Plan

c. Personal Protective Equipment (PPE)

d. Personal hygiene practices

e. Employee training

f. Signage

g. Decontamination of equipment and areas

h. Record keeping

i. Respirator fit test records: Provide a statement that personnel handling heavy metals have current fit tests. Do not submit detailed fit tests.

j. Medical Examinations: Provide a statement that personnel handling heavy metals have current medical examinations for workers to be used on this project as required by DOSH. Include a written statement from Contractor that employees have current exams and are approved to wear proper respiratory protection. Do not submit detailed medical exams.

k. Procedures for dust control

l. Procedures for personnel and equipment cleanup/decontamination

m. Heavy Metals Waste Management and Disposal Plan including:

   1) Description of waste streams (i.e., liquid and solids, including PPE) which will be generated during the site work

3. Job Submittals

a. The following records are to be completed daily and submitted to the Owner on a weekly basis:

   1) Area monitoring logs and laboratory results

   2) Personnel monitoring logs and laboratory results

   3) Site work/daily logs, safety meeting reports and other site-specific documentation

4. Final Submittals

a. Report of completion including:

   1) All monitoring information

   2) Documentation of final heavy metals waste and decontamination waste disposition. Submit copies of disposal documentation to Owner.

1.9 PERSONAL AIR MONITORING

A. Testing Laboratory: An Independent Testing Laboratory shall be retained by the Contractor for all lead and heavy metal air analysis. All 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 for lead. 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 Lead and other heavy metal related activities:
   1. Initial exposure: The Contractor shall perform Exposure monitoring during impact of representative lead-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)". 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 Lead 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 lead 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 lead outside lead work areas are maintained at or below the Action Levels listed in the definitions.
      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 related activities work, identify source of high lead concentrations, develop plan with the Owner to complete lead related activities in a manner to prevent visible emissions and elevated lead levels.

PART 2 - PRODUCTS

2.1 PERSONAL PROTECTIVE EQUIPMENT

A. Provide Personal Protective Equipment, at a minimum as follows:
   1. Half-face respirator for use during the performance of the Project.
   2. Gloves: neoprene rubber gloves for workers. Dispose of gloves with waste upon completion of the Project.
   3. Protective Eyewear: face shields, vented goggles and other protective eyewear as necessary for the performance of the Project.
   4. Protective clothing - Work clothes shall consist of disposable full-body coveralls, head covers, boots, rubber gloves or equivalent. Sleeves at wrists and cuffs at ankles shall be secured.
   5. Hard hats suitable for respirator wear.
2.2 MATERIALS

A. Provide filter fabric for ground coverage.

B. Polyethylene Sheet: Provide flame-retardant polyethylene film that conforms to requirements set forth by the NFPA Standard 701 (Small Scale Fire Test for Retardant Textiles and Films). Provide 6-mil thick, frosted or black TRM Manufacturing Brand, or equivalent, of the largest size practicable to minimize seams.

C. Reinforced Polyethylene Sheet: Provide translucent, nylon reinforced, laminated, flame-retardant polyethylene film that conforms to requirements set forth by NFPA Standard 701. Provide 6-mil thick Permalon Brand, or equivalent, of the largest size practicable to minimize seams.

D. Duct Tape: Provide duct tape with an adhesive that is formulated to stick securely to sheet polyethylene, Nashua Brand or equivalent. Do not use polyethylene tape.

E. Provide 20-inch by 14-inch warning signs surrounding the Work Area, reading as follows for lead:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

2.3 EQUIPMENT

A. Water Sprayer: Airless or other low-pressure sprayer for amended water application.

B. HEPA Vacuums: They shall comply with ANSI Z9.2-1979 (R1991)

C. Provide power tools that are HEPA shrouded.

D. Hand tools: Provide scrapers, stiff nylon bristle hand brush and other suitable hand tools for this work.

PART 3 - EXECUTION

3.1 WORK AREA PREPARATION

A. Perform the following preliminary steps to prepare the Work Areas prior to demolition of heavy metals containing building systems:

1. Establish a Control Area that includes a perimeter sufficient to perform the work around each building or area that contains heavy metals-containing materials. The Control Area shall also include the pathway for transport of any heavy metals-contaminated material to a stockpile or storage receptacle and the heavy metals waste storage area itself, if the demolition debris is not immediately transported from the site. Provide and display caution signs, in clearly visible areas, at entrances indicating that hazardous material work is being conducted and that unauthorized persons should not enter. Signs shall comply with DOSH regulations.

2. Log-in Sheet: Restrict access to work sites by maintaining a daily log of personnel entering Work Area, including workers and other authorized personnel and their start/stop times.

3. Heavy Metals Waste Accumulation Area: Prepare the heavy metals waste storage area as described in the approved Work Plan.

4. Decontamination Unit: Prepare the decontamination unit for use as described in the approved Work Plan.

3.2 WORK PROCEDURE

A. General Procedures: Perform all Work and comply with the safety and health provisions in the site-specific Health and Safety Plan. The Work includes all measures necessary to adequately protect workers, authorized personnel, the Owner’s staff and the public from heavy metals exposures during the general demolition/renovation process and surface preparation activities.
B. Coordination of Work of all Trades: Coordinate the work of all trades to assure that work is performed in accordance with the applicable regulations and that the control limits are maintained at all times both inside and outside the Control Area.

C. Access to Work Area: Access to Work Areas shall be through decontamination areas. Only the Contractor, authorized Owner personnel, and the Owner’s Environmental Consultant shall have access to the Work Area.

D. Means of Egress: Establish and maintain emergency and fire exits from the Work Area. Prevent dust generation at all times to the maximum extent practicable.

E. The use of water shall be restricted to the smallest quantity necessary to minimize dust and to avoid the potential of contaminant migration through run-off or ponding.

F. Demolition Procedures: Perform demolition in areas of heavy metals-containing materials in accordance with approved site-specific Health & Safety Plans. Use procedures and equipment required to limit occupational and environmental exposure to heavy metals when heavy metals-containing materials are impacted or when building components are demolished. The procedures employed by the Contractor shall not create the potential for contaminating surrounding areas or materials with heavy metals-containing dust. Dust generation shall be kept to a minimum. Dry scraping, dry sanding, or dry grinding on heavy metals-containing materials or heavy metals-contaminated surfaces will not be permitted without a full negative pressure enclosure.

G. All heavy metals-containing demolition debris shall be handled, stored and disposed of as to meet applicable federal, state and local requirements.

H. Personnel and equipment decontamination shall occur whenever people or equipment leave the Work Area as described in the approved Work Plan. Decontamination waste shall be packaged, stored, labeled and disposed of according to all applicable requirements at the cost of the Contractor. All contaminated equipment, tools or materials that cannot be decontaminated shall be stored and disposed of by the Contractor in accordance with all federal, state and local regulations.

I. Grossly inadequate health, safety or environmental precautions on the part of the Contractor, or the belief that the Contractor’s personnel, the general public or the environment are or may be exposed to an immediate hazard, may be cause for the Owner to suspend the Contractor’s site work and ask the Contractor’s personnel to evacuate the hazard area.

J. The Owner may inspect the Contractor’s operations and Work Areas daily for job site cleanliness and conformance with the Specifications.

3.3 SEQUENCE OF WORK

A. Carry out Work of this part sequentially. Complete each activity before proceeding to the next.

3.4 SITE QUALITY ASSURANCE AND MONITORING

A. Site Inspection: While performing the Work, the Contractor may be subject to onsite inspection by DOSH, OSHA, EPA/Ecology inspectors and/or local building or health officials. If found to be in violation of pertinent regulations, the Contractor shall cease all work immediately and may not resume work until the violation is resolved. Complete sets of equipment (such as respirators and disposable clothing) that may be required for entry to the Control Area shall be made available at all times by the Contractor to the Owner and/or agency inspectors for inspection of the Control Area. Such requests will only be made during working hours.

B. Quality Control

1. Restrict the spread of dust and debris from being distributed over the Work Area.

2. Prevent dust generation at all times to the maximum extent practicable. The use of water shall be restricted to the smallest quantity necessary to minimize dust and to avoid the potential of run-off or ponding.
3. Area air quality monitoring and personal monitoring shall be conducted throughout the work as appropriate.

4. Air Monitoring: Monitoring of airborne concentrations of heavy metals shall be in accordance with WAC 296-155-176 (Lead) and 296-841 (Airborne Contaminants), and as specified herein. Air monitoring, testing, and reporting shall be performed in accordance with an Air Monitoring Plan. The Plan shall include personal monitoring in accordance with regulatory requirements and area monitoring outside the Heavy Metals Control Area.
   a. Submit analytical results of air monitoring samples within 24 hours after the air samples were taken.
   b. Notify the Owner immediately of the corrective action taken if the exposure to heavy metals is at or in excess of the appropriate action level or PEL for the specified heavy metals outside of the Heavy Metals Control Area.
   c. If the area air monitoring results are above the action level or PEL, the Owner shall have the option of stopping all work until the work procedures and heavy metals hazard controls are revised to Owner’s satisfaction.

3.5 CLEAN-UP, TESTING, AND DISPOSAL

A. Contractor shall label the waste for the Housekeeping: Housekeeping and clean-up procedures are essential tasks for contamination control. Maintain all surfaces throughout the Work Area free of contaminated debris to the maximum extent practicable. Equip personnel engaged in cleaning up activities with necessary respiratory equipment and protective clothing.

B. Cleanup: Maintain surfaces of the Heavy Metals Control Area free of accumulation of heavy metals-containing debris and dust as practicable. Restrict the spread of dust and debris and keep waste from being distributed over the Work Area. At the end of each shift, clean the Work Area of visible heavy metals contamination by vacuuming with a high efficiency particulate air (HEPA)-filtered vacuum cleaner, wet mopping the area, and/or cleanup by other appropriate means.

C. If the waste is classified as dangerous/hazardous waste by TCLP test results, the Owner will dispose of the waste.

D. Owner as follows:
   1. Package and label all waste for transport in accordance with the United States DOT regulations on packaging.
   2. In addition to the requirements set forth in United States DOT 49 CFR 172.304, mark each package containing dangerous/hazardous waste with the following, words and information:

   "HAZARDOUS WASTE – State and federal law prohibits improper disposal. If found, contact the nearest police or public safety authority, and the Washington State Department of Ecology or the United States Environmental Protection Agency.

   Generator’s Name and Address

   __________________________________________
   __________________________________________
   __________________________________________
   __________________________________________

   Manifest Document Number

   __________________________________________"

3. The Contractor shall placard or offer to the Owner all appropriate placards in accordance with United States DOT regulations, 49 CFR Part 172, Subpart F.
E. Waste materials that are not classified as hazardous waste or dangerous waste, as specified by federal, state, and local regulations, shall be disposed of as non-contaminated, general construction debris by the Contractor. Heavy metal-contaminated waste not classified as hazardous or dangerous waste must be disposed by the Contractor at an Owner-approved landfill. Approved facilities can be viewed online at http://www.ehs.washington.edu/epowaste/disposalfaclist.pdf.

F. Disposal documentation is required for all waste streams. At a minimum, provide a disposal receipt or manifest for all non-hazardous waste streams.

3.6 FIELD QUALITY ASSURANCE

A. Environmental Consultant may conduct air monitoring throughout the removal and cleaning operations, as needed.

B. Environmental Consultant may conduct air monitoring as follows:
   1. Daily Work Area air samples for lead and other metals, as necessary.
   2. Outside ambient monitoring for lead and other metals, as necessary.
   3. Lead and other metals dust levels as determined by Environmental Consultant.

C. Debris Testing: A representative sample from debris shall be collected for TCLP testing by the Owner or the Environmental Consultant. The method/location of disposal will be established by test results. The Owner shall make all determinations regarding waste classification(s).

D. Water Testing: The Owner or Environmental Consultant will conduct any necessary water testing required to make disposal determinations. Any discharge to the Sanitary Sewer system must be reviewed and approved by the Owner.

3.7 HAZARDOUS WASTE TEMPORARY STORAGE

A. Provide securable area pre-approved by the Owner for the temporary storage of all solid, hazardous or contaminated wastes and wastewater generated during the performance of the Project.

B. The purpose of this temporary storage is to allow the Contractor to accumulate enough drums of waste so that the Waste Hauler may pick up full loads of waste from the site.

C. Employ spill protection materials to protect against spillage or leaks in temporary storage area.

D. Contractor shall use precautions necessary to minimize the generation of hazardous, or contaminated waste.

E. Place all hazardous and potentially hazardous waste in drums lined with two polyethylene bags.

F. Do not store wastes that could react to cause fire, leaks or other releases in same container.

G. Each drum shall be clearly labeled as to its exact contents, including the date when the drum was sealed.

H. Store all solid and hazardous waste with drum lids on wooden pallets at site until disposal provisions have been determined. Use drum lid covers on all drums to prevent accumulation of water on top of drums. Contractor shall place temporary fencing around stored drums.

I. Store all solid, hazardous, and liquid waste in full compliance with federal, state, and local requirements and do not allow hazardous waste generated by a Project to be stored at the site for more than 90 days.

J. Inspect containers for leaks or corrosion every week and keep written records of inspections on site in accordance with WAC 173-303-320.

3.8 WASTE DISPOSAL

A. If the waste is classified as dangerous/hazardous waste by TCLP test results, the Owner will dispose of the waste.

B. Contractor shall label the waste for the Owner as follows:
1. Package and label all waste for transport in accordance with the United States DOT regulations on packaging.

2. In addition to the requirements set forth in United States DOT 49 CFR 172.304, mark each package containing dangerous/hazardous waste with the following, words and information:

   "HAZARDOUS WASTE - State and federal law prohibits improper disposal. If found, contact the nearest police or public safety authority, and the Washington State Department of Ecology or the United States Environmental Protection Agency.

   Generator's Name and Address
   ____________________________________
   ____________________________________
   ____________________________________
   ____________________________________

   Manifest Document Number
   ____________________________________

3. The Contractor shall placard or offer to the Owner all appropriate placards in accordance with United States DOT regulations, 49 CFR Part 172, Subpart F.

C. Waste materials that are not classified as hazardous waste or dangerous waste, as specified by federal, state, and local regulations, shall be disposed as general construction debris 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.

3.9 FIELD QUALITY ASSURANCE

A. The Owner shall conduct air monitoring throughout the removal and cleaning operations, as needed.

B. The Owner shall conduct air monitoring as follows:
   1. Daily Work Area air samples for lead and other metals, as necessary.
   2. Outside ambient monitoring for lead and other metals, as necessary.

C. Lead and other metals dust levels as determined by the Owner.

D. Debris Testing: A representative sample from debris shall be collected for TCLP testing by the Owner. The method/location of disposal will be established by test results. The Owner shall make all determinations regarding waste classification(s).

E. Water Testing: The Owner will conduct any necessary water testing required to make disposal determinations. Any discharge to the Sanitary Sewer system must be reviewed and approved by the Owner.
PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section applies to all PCB-containing ballasts and mercury-containing lights and lamps to be removed, handled, transported and recycled/disposed of during execution of the Work. The following Table details the items to be removed.

<table>
<thead>
<tr>
<th>Sample Number and Description Material</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury-containing fluorescent light tubes (4’ length)</td>
<td>62 Each</td>
</tr>
<tr>
<td>HID lamps</td>
<td>472 Each</td>
</tr>
<tr>
<td>PCB-containing light ballasts</td>
<td>534 Each</td>
</tr>
</tbody>
</table>

B. Refer to the following documents for survey information: *Targeted Regulated Building Materials Assessment Report, HS B170 Renovation Project, University of Washington, UW Project Number 205898 dated April 6, 2017 prepared by AECOM*, see Appendix C.

C. The Contractor will be responsible for removing and containerizing the following items as specified above and defined in Paragraph 1.4:

1. PCB light ballasts – intact and leaking (if discovered)
2. Magnetic ballasts with “No PCBs” labels – intact and leaking (if discovered)
3. PCB-contaminated items
4. Mercury-containing lights and lamps

D. The Contractor shall segregate and package all removed items, disposable personal protective equipment (PPE), cleaning rags, wash water, and any other materials contaminated with PCBs in accordance with Washington State Department of Ecology regulations.

E. The Owner will be responsible for disposal of State-Regulated PCB Waste and TSCA-Regulated PCB Waste.

F. Light fixtures that will be impacted by the Project shall be removed prior to demolition, and the ballasts shall be inspected for “No PCBs” labeling. Magnetic ballasts without “No PCBs” labels will be considered to be PCB ballasts. Handling, packaging and transport of PCB light ballasts must be in accordance with EPA PCB Regulations (40 CFR 761) and Washington State Department of Ecology Dangerous Waste Regulations (WAC 173-303). PCB light ballasts are considered TSCA-Regulated PCB Waste and will be disposed of by the Owner.

G. A “No PCB” label on a magnetic means there are less than 50 parts per million (ppm) PCBs in the ballast. However, magnetic ballasts with “No PCBs” labels may still contain more than 2 ppm PCBs, making them State-Regulated PCB Waste. Magnetic ballasts with “No PCBs” labels may also have the potential to contain Bis(2-ethylhexyl)phthalate (DEHP), a hazardous substance listed under the federal Resource Conservation and Recovery Act (RCRA). Handling, packaging and transport of magnetic light ballasts with “No PCBs” labels must be in accordance with EPA PCB Regulations (40 CFR 761) and Washington State Department of Ecology Dangerous Waste Regulations (WAC 173-303). Magnetic light ballasts with “No PCBs” labels are considered State-Regulated PCB Waste and will be disposed of by the Owner.

H. Mercury-containing lights and lamps that will be impacted during execution of the Work will be removed intact and containerized by the Contractor. Intact lights and lamps will be managed and recycled in accordance with federal (40 CFR 273), state (WAC 173-303-573) regulations, and Owner protocols. Owner will provide containers.
I. All mercury-containing lights and lamps shall be transported and recycled by the Owner at a universal waste recycling facility. The Contractor must label the containers.

1.2 RELATED WORK

A. Section 02 80 00 – Facility Remediation
B. Section 02 82 00 – Asbestos Removal
C. Section 02 83 00 – Heavy Metal Controls Activities

1.3 CODES AND REGULATIONS

A. The applicable sections, latest editions and addenda of the following government regulations, codes, industry standards and recommended practices, form a part of these Specifications.

1. U.S. Environmental Protection Agency (EPA)
   a. 40 CFR 761: PCB Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions

2. U.S. Department of Transportation (DOT)
   a. 49 CFR 100 through 180: Hazardous Materials Transportation Act Regulations

3. National Electric Code (NEC)
   a. National Fire Protection Association (NFPA) 70

4. National Electrical Manufacturers Association (NEMA)
   a. Various Standards

5. Washington State Department of Labor & Industries (L&I)
   a. WAC 296-800: Safety and Health Core Rules

   a. WAC 173-303: Dangerous Waste Regulations
   b. WAC 173-303-573: Universal Waste Regulations
   c. WAC 173-350: Solid Waste Handling Standards

7. All other applicable federal, state and local regulations

8. All applicable industry standards

9. All applicable Owner protocols

B. The Contractor is cautioned that it is responsible for ascertaining the extent to which these regulations affect the operations and to comply therewith.

1.4 DEFINITIONS

A. Whenever the terms below occur in this Section, they will have the meanings which follow:

1. Mercury-Containing Lights and Lamps: Fluorescent, compact fluorescent, neon and high intensity discharge (HID) lights and lamps, as defined by the Washington State Department of Ecology.

2. No PCBs Label: A "No PCB" label means there are less than 50 ppm PCBs in the equipment/material. However, the equipment/material may still be regulated by the Washington State Department of Ecology, which starts regulation of PCBs at 2 ppm.
3. PCBs: Polychlorinated biphenyls
4. PCB Light Ballasts: All magnetic light ballasts without “No PCBs” labels.
5. PCB-Contaminated Items: Light fixture components that cannot be cleaned, personal protective equipment, cleaning materials and any other materials contaminated with PCBs at any concentration.
6. State-Regulated PCB Waste: Magnetic ballasts or other materials that have been shown to contain 2 parts per million (2 ppm) or greater PCBs by laboratory analysis. State-regulated PCB waste also includes magnetic light ballasts with “No PCBs” labels. A "No PCB" label means there are less than 50 ppm PCBs, but the Washington State Department of Ecology starts regulation of PCBs at 2 ppm.
7. TSCA: The federal Toxic Substances Control Act, which is enforced by the U.S. Environmental Protection Agency.
8. TSCA-Regulated PCB Waste: All magnetic light ballasts without “No PCBs” labels other PCB-containing materials that have been shown to contain 50 parts per million (50 ppm) or greater PCBs by laboratory analysis.
9. Universal Waste: Batteries, mercury-containing lamps (fluorescent, compact fluorescent, neon, HID), mercury-containing thermostats and mercury-containing equipment, as defined by the Washington State Department of Ecology.

1.5 SUBMITTALS

A. Each Contractor performing work that will impact PCB-containing materials or mercury-containing lights and lamps shall provide a complete set of submittals for review by the Owner. Contractors shall provide complete submittals for review by the Owner according to Section 01 33 00 – Submittal Procedures. Following receipt of review comments from the Owner, the Contractor shall submit additional versions of revised submittals to the Owner until each submittal is accepted by the Owner. No work that will impact PCB-containing materials or mercury-containing lights and lamps will be permitted prior to submittals being reviewed and accepted by the Owner.

B. Pre-Work Submittals: The Contractor shall submit a Work Plan, Health and Safety Plan and Waste Management and Disposal Plan to the Owner for review and acceptance as a prerequisite to issuance of the Notice to Proceed. The Plan must be suitably titled and indexed, providing detailed information concerning the following items, at a minimum, in the order listed below:

1. Work Plan: Provide a site specific Work Plan which demonstrates the methods by which removal and disposal of PCB-containing materials and mercury-containing lights and lamps will be performed. At a minimum, the Work Plan shall include:
   a. Complete list of all materials and equipment proposed for use in the work. The list shall include such items as waste containers, protective clothing, breathing apparatus, sorbents and solvents. The Owner will provide waste containers for State-Regulated PCB Waste and TSCA-Regulated PCB Waste.
   b. Listing of addresses for Hazardous Materials Cleanup Agencies, 24-hour manned telephone numbers and home telephone numbers for personnel working on the Project.
   c. Method of removal, segregation, handling, containerization and labeling of all waste streams.
   d. Method for coordinating pickup of State-Regulated PCB Waste and TSCA-Regulated PCB Waste by the Owner.
   e. Statement of Qualifications. The Contractor shall submit the statement sufficiently far in advance of the performance of the work as to permit adequate time for the Owner to review and accept a firm to perform the work. The statement shall provide sufficient data and information to prove to the satisfaction of the Owner that the firm performing the work is fully experienced in the removal, handling, transportation and storage of PCB-containing and PCB-contaminated articles and items.
2. Health and Safety Plan: Provide a site specific Health and Safety Plan, including a worker protection program, demonstrating the methods by which all applicable health and safety requirements will be met. The Health and Safety Plan shall be available at all times on the job site. At a minimum, the Health and Safety Plan shall include the following components:

   a. Written Respiratory Protection Program per WAC 296-842
   b. Personal Protective Equipment (PPE), including respiratory protection
   c. Personal hygiene practices
   d. Employee training
   e. Emergency Plan
   f. Site housekeeping procedures
   g. Engineering controls/equipment
   h. Decontamination of equipment and areas
   i. Record keeping
   j. Respirator Fit Test Records: Submit a written statement certifying that all Contractor employees with the potential to be exposed to PCBs or mercury will have respirator fit testing records showing passing results. The statement shall include the Contractor’s signature. For the purpose of maintaining worker information privacy, do not submit individual fit testing records with the pre-work submittal package.
   k. Medical Examinations: Submit a written statement certifying that all Contractor employees with the potential to be exposed to PCBs or mercury have received medical examinations as required by L&I, are medically fit to perform the work, and are medically fit to wear a respirator. The statement shall include the Contractor’s signature. For the purpose of maintaining health information privacy, do not submit individual medical clearance certificates with the pre-work submittal package.
   l. Site inspection process/logs/documents
   m. Procedures for personnel and equipment cleanup/decontamination

3. Waste Management and Disposal Plan including:
   a. Description of waste streams (i.e., liquid and solids, including PPE) which will be generated during the site work
   b. Methods for managing/storing waste materials on-site
   c. Waste minimization efforts
   d. Method of coordinating with Owner for container selection and labeling

C. Prior to commencement of work, the Contractor shall make copies of respirator fit test records showing passing results available for review by the Environmental Consultant or Owner at the job site.

D. Final Submittals: The Contractor shall submit a report of completion to the Owner within two weeks of completion of the work. The report shall include the following:
   1. Certification that the work has been completed pursuant to this Specification Section.

1.6 COORDINATION

A. Coordinate light ballast removal with a Certified Electrician for disconnect and lockout of electrical service.

B. Coordinate all waste shipments with the Owner.

1.7 SAFETY PROCEDURES AND WORKER PROTECTION

A. Work Area Protection and Marking: Prior to commencing any PCB- or mercury-related work activities, provide barricades and warning signs to clearly identify and effectively guard against unauthorized entry into the Work Area.

B. Protective Clothing and Equipment
1. At all times when PCB-containing materials in any volume are not sealed in drums, containers or electrical equipment, workers shall wear:
   a. Disposable non-porous protective gloves
   b. Disposable whole body protective clothing impermeable to PCBs
   c. Respiratory protection (NIOSH/MSHA-approved) against organic vapors and particles (at least the level of particulate protection required at that stage of work for asbestos protection)
   d. Eye protection

2. At all times when mercury-containing lights and lamps are not sealed in drums, containers or electrical equipment, workers shall wear:
   a. Disposable non-porous protective gloves
   b. Disposable whole body protective clothing impermeable to PCBs
   c. Eye protection

C. The Contractor shall provide protective clothing, eye protection and respiratory protection as required for regulatory personnel monitoring work activities within the Work Area and for firefighters responding to incidents.

D. Personnel Protection and Procedures: The PCB Work Area shall at no time be left unattended after procedures have been implemented and shall be attended until all ballasts and incidentals have been sealed in approved containers. During procedures and at all times when PCB ballasts or PCB-containing materials in any volume are not sealed in drums, containers or electrical equipment, all personnel entering the Work Area must don protective clothing and equipment listed herein. Upon exiting the Work Area, all disposable protective clothing shall be placed in open-top drums, sealed and removed from building property when other materials in same areas are removed. If there is not immediate transportation off-site, waste containers shall be stored in the Work Area or secured on-site until shipment. Coordinate all waste shipments with the Owner.

PART 2 - PRODUCTS

2.1 MATERIAL AND EQUIPMENT

A. Storage Containers
   1. All removed equipment/material shall be stored in sealed waste containers in accordance with applicable regulations and the Owner’s protocols. The Owner will provide waste containers for State-Regulated PCB Waste and TSCA-Regulated PCB Waste.
   2. All PCB solid wastes and items, including disposable items used in the course of the work (i.e., rags, sorbents and protective clothing), shall be stored in sealed waste containers in accordance with applicable regulations and the Owner’s protocols.

B. Solvents, Sorbents and Cleaners
   1. Solvents: Diesel fuel, deodorized kerosene or other solvents recognized for a high degree of PCB solubility
   2. Sorbents: Material recognized for a high degree of absorption
   3. Liquid Cleaners: Concentrated liquid alkaline base cleaner
   4. Unless there is a spill, the Work Plan shall be amended to limit and avoid this type of cleanup.

PART 3 - EXECUTION

3.1 SPILL CLEANUP, CONTAINERIZATION AND MARKING

A. Cleanup of Work Area, PCB Articles and Spills
1. Equipment and Tools: After the last ballast is removed from its fixture and removal of other PCB-containing materials (e.g., caulk) is complete, all tools and equipment used in the work shall be decontaminated and properly stored for reuse. If building surfaces have been contaminated, PCB sampling to identify the extent of contamination will be conducted by the Owner.
   a. Where work surfaces have contacted PCB fluids, they shall be scraped clean, flushed with solvent, wiped clean and all debris placed in open type drums.
   b. All tools that may have come in contact with PCBs at any concentration shall be thoroughly flushed with solvent, wiped clean and properly stored.

2. PCB Articles (Electrical Equipment): All exterior surfaces of electrical equipment to be removed that may have come in contact with PCBs or PCB-contaminated oils or fluids either during the course of work activities or due to past leaks, shall be thoroughly cleaned with solvent and wiped clean.

3. Slabs, Floors and Walls: All surfaces which have come in contact with PCBs or PCB mixtures in the course of the work, or as a result of past leaks, shall be thoroughly cleaned using a combination of sorbent, solvent and cleaners.

4. All contaminated fixtures will be containerized by the Contractor and shipped off site by the Owner.

B. Containerization and Marking

1. All liquids generated as a result of work activities and cleanup operations shall be placed in closed top drums and sealed.
2. All solids such as sorbents, rags, disposable protective clothing and other incidentals shall be placed in open top drums and sealed.
3. The Owner will provide waste containers and labels for State-Regulated PCB Waste and TSCA-Regulated PCB Waste. Waste streams shall be properly segregated in accordance with the Work Plan; Waste Management Plan; federal, state and local regulations; and Owner’s protocols. Drums/containers shall be packed in accordance with the Work Plan; Waste Management Plan; federal, state and local regulations; and Owner’s protocols.

3.2 ON-SITE MANAGEMENT, TRANSPORTATION AND OFF SITE RECYCLING/DISPOSAL

A. On-site Management:

1. All mercury-containing light tubes will be managed by the Owner. The Owner will coordinate pick-up, transportation and recycling/disposal of mercury-containing light tubes and mercury-contaminated piping. The Owner coordination includes obtaining TSCA EPA Identification number, completing and signing manifests, inspecting packaging, and preparing packaging for shipment.

B. Transportation to Off-Site Recycling/Disposal Facility:

1. No mercury-containing light tubes or other wastes will leave the site without the Owner’s authorization. The Owner will manage all waste shipments, off-site disposal, and required documentation. Contractor is responsible for packing, labeling, and identifying drums. Contractor will also load waste containers onto trucks for transport and disposal.

C. Waste materials that are not classified as hazardous waste or dangerous waste, as specified by federal, state, and local regulations, shall be disposed as general construction debris by the Contractor at an Owner audited and approved disposal facility. Approved facilities can be viewed online at [http://www.ehs.washington.edu/system/files/resources/disposalfacilist.pdf](http://www.ehs.washington.edu/system/files/resources/disposalfacilist.pdf).

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Copper building wire rated 600 V or less.
   2. Metal-clad cable, Type MC, rated 600 V or less.
   3. Connectors, splices, and terminations rated 600 V and less.

1.3 DEFINITIONS

A. RoHS: Restriction of Hazardous Substances.

B. Product Schedule: Indicate type, use, location, and termination locations.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Alpha Wire Company.
   2. American Bare Conductor.
   3. Belden Inc.
   4. Cerro Wire LLC.
   5. Encore Wire Corporation.
   6. General Cable Technologies Corporation.
   7. Okonite Company (The).
   8. Service Wire Co.
   10. WESCO.

C. Standards:
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
   2. RoHS compliant.
   3. Conductor and Cable Marking: Comply with wire and cable marking according to UL’s "Wire and Cable Marking and Application Guide."

D. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

E. Conductor Insulation:
1. Type THHN and Type THWN-2: Comply with UL 83.
2. Type THW and Type THW-2: Comply with NEMA WC-70/ICEA S-95-658 and UL 83.
3. Type UF: Comply with UL 83 and UL 493.
4. Type XHHW-2: Comply with UL 44.

2.2 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. All connectors shall be UL Listed to 486G for Use in Damp/Wet Location or Direct Burial.

C. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. 3M Electrical Products.
   2. AFC Cable Systems; a part of Atkore International.
   5. Ideal Industries, Inc.
   6. ILSCO.
   7. NSi Industries LLC.
   8. O-Z/Gedney; a brand of Emerson Industrial Automation.
   10. TE Connectivity Ltd.
   11. Thomas & Betts Corporation; A Member of the ABB Group.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Feeders: Copper for feeders smaller than No. 4 AWG; copper for feeders No. 4 AWG and larger. Conductors shall be solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

C. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

D. Branch Circuits: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.


3.2 CONDUCTOR INSULATION AND WIRING METHODS

A. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.

B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN/THWN-2, single conductors in raceway.
C. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

D. Exposed Branch Circuits, Including in Crawls spaces: Type THHN/THWN-2, single conductors in raceway.

E. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to Section 26 0533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

C. 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.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

3.4 CONNECTIONS

A. 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-486B.

B. Make splices, terminations, and taps that are compatible with conductor material.

C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 26 0553 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 0544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.
3.8 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections.
   1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
   2. Perform each of the following visual and electrical tests:
      a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
      b. Test bolted connections for high resistance using one of the following:
         1) A low-resistance ohmmeter.
         2) Calibrated torque wrench.
         3) Thermographic survey.
      c. Inspect compression-applied connectors for correct cable match and indentation.
      d. Inspect for correct identification.
      e. Inspect cable jacket and condition.
      f. Insulation-resistance test on each conductor for ground and adjacent conductors. Apply a potential of 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable for a one-minute duration.
      g. Continuity test on each conductor and cable.
      h. Uniform resistance of parallel conductors.
   3. Initial Infrared Scanning: After Substantial Completion, but before Final Acceptance, perform an infrared scan of each splice in conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner. Correct deficiencies determined during the scan.
      a. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
      b. Record of Infrared Scanning: Prepare a certified report that identifies switches checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
   4. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switch 11 months after date of Substantial Completion.

D. Cables will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports to record the following:
   1. Procedures used.
   2. Results that comply with requirements.
   3. Results that do not comply with requirements, and corrective action taken to achieve compliance with requirements.

END OF SECTION 26 0519
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes grounding and bonding systems and equipment.

B. Section includes grounding and bonding systems and equipment, plus the following special applications:
   1. Underground distribution grounding.
   2. Foundation steel electrodes.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans showing dimensioned locations of grounding features specified in "Field Quality Control" Article, including the following:
   1. Test wells.
   2. Ground rods.

B. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.
   1. In addition to items specified in Section 01 77 00 "Closeout Procedures," include the following:
      a. Plans showing as-built, dimensioned locations of grounding features specified in "Field Quality Control" Article, including the following:
         1) Ground rods.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Certified by NETA.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.
2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Advanced Lightning Technology, Ltd.
2. Burndy; Part of Hubbell Electrical Systems.
3. Dossert; AFL Telecommunications LLC.
4. ERICO International Corporation.
5. Fushi Copperweld Inc.
6. Galvan Industries, Inc.; Electrical Products Division, LLC.
7. Harger Lightning & Grounding.
8. ILSCO.
10. Robbins Lightning, Inc.
12. Thomas & Betts Corporation; A Member of the ABB Group.

2.3 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:
4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.4 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

C. Cable-to-Cable Connectors: Compression type, copper or copper alloy.

D. Conduit Hubs: Mechanical type, terminal with threaded hub.

E. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt.

F. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt.

G. Lay-in Lug Connector: Mechanical type, copper rated for direct burial terminal with set screw.
H. Service Post Connectors: Mechanical type, bronze alloy terminal, in short- and long-stud lengths, capable of single and double conductor connections.

I. Signal Reference Grid Clamp: Mechanical type, stamped-steel terminal with hex head screw.

J. Straps: Solid copper, copper lugs. Rated for 600 A.

K. Tower Ground Clamps: Mechanical type, copper or copper alloy, terminal one-piece clamp.

L. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.

2.5 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad 3/4 inch by 10 feet.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Underground Grounding Conductors: Install bare copper conductor, No. 3/0 AWG minimum.
   1. Bury at least 24 inches below grade.
   2. Duct-Bank Grounding Conductor: Bury 12 inches above duct bank when indicated as part of duct-bank installation.

C. Conductor Terminations and Connections:
   1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
   2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
   3. Connections to Ground Rods at Test Wells: Bolted connectors.

3.2 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Comply with IEEE C2 grounding requirements.

B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.

C. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields according to written instructions by manufacturer of splicing and termination kits.
3.3 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
   1. Feeders and branch circuits.
   2. Lighting circuits.
   3. Receptacle circuits.
   4. Flexible raceway runs.
   5. Armored and metal-clad cable runs.

C. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.4 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.

C. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
   1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
   2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

D. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Section 26 05 43 "Underground Ducts and Raceways for Electrical Systems," and shall be at least 12 inches deep, with cover.
   1. Install at least one test well for each service unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.

E. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
   1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
   2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
   3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

D. Perform tests and inspections.

E. Tests and Inspections:
   1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
   2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
   3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal. Make tests at ground rods before any conductors are connected.
      a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
      b. Perform tests by fall-of-potential method according to IEEE 81.
   4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

F. Grounding system will be considered defective if it does not pass tests and inspections.

G. Prepare test and inspection reports.

H. Report measured ground resistances that exceed the following values:
   1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
   2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
   3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.

I. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 26 05 26
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Steel slotted support systems.
   2. Conduit and cable support devices.
   3. Support for conductors in vertical conduit.
   4. Structural steel for fabricated supports and restraints.
   5. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
   6. Fabricated metal equipment support assemblies.

B. Related Requirements:
   1. Section 26 0548.16 "Seismic Controls for Electrical Systems" for products and installation requirements necessary for compliance with seismic criteria.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
      a. Slotted support systems, hardware, and accessories.
      b. Clamps.
      c. Hangers.
      d. Sockets.
      e. Eye nuts.
      f. Fasteners.
      g. Anchors.
      h. Saddles.
      i. Brackets.
   2. Include rated capacities and furnished specialties and accessories.

B. Shop Drawings: Signed and sealed by a qualified professional engineer. For fabrication and installation details for electrical hangers and support systems.
   2. Slotted support systems.
   3. Equipment supports.
   4. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.

C. Delegated-Design Submittal: For hangers and supports for electrical systems.
   1. Include design calculations and details of hangers.
   2. Include design calculations for seismic restraints.
1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
   1. Suspended ceiling components.
   2. Ductwork, piping, fittings, and supports.
   3. Structural members to which hangers and supports will be attached.
   4. Size and location of initial access modules for acoustical tile.
   5. Items penetrating finished ceiling, including the following:
      a. Luminaires.
      b. Air outlets and inlets.
      c. Speakers.
      d. Sprinklers.
      e. Access panels.
      f. Projectors.

B. Seismic Qualification Data: Certificates, for hangers and supports for electrical equipment and systems, accessories, and components, from manufacturer.
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
   2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Welding certificates.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M or AWS D1.2/D1.2M.

B. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M.
   2. AWS D1.2/D1.2M.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 4000 "Quality Requirements," to design hanger and support system.

B. Seismic Performance: Hangers and supports shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
   1. The term "withstand" means "the supported equipment and systems will remain in place without separation of any parts when subjected to the seismic forces specified."
   2. Component Importance Factor: 1.5.

C. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame Rating: Class 1.
2. Self-extinguishing according to ASTM D 635.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches o.c. in at least one surface.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allied Tube & Conduit; a part of Atkore International.
   b. B-line, an Eaton business.
   c. ERICO International Corporation.
   d. Flex-Strut Inc.
   e. Gripple Inc.
   f. GS Metals Corp.
   g. G-Strut.
   h. Haydon Corporation.
   i. Metal Ties Innovation.
   j. Thomas & Betts Corporation; A Member of the ABB Group.
   k. Unistrut; Part of Atkore International.
   l. Wesanco, Inc.
2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
4. Channel Width: Selected for applicable load criteria.
5. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
6. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
7. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
8. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.

D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.

E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
1. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
   a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1) B-line, an Eaton business.
      2) Empire Tool and Manufacturing Co., Inc.
2. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
3. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
4. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
5. Toggle Bolts: All-steel springhead type.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

B. Materials: Comply with requirements in Section 05 5000 "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
1. NECA 1.
2. NECA 101
3. NECA 102.
4. NECA 105.
5. NECA 111.

B. Comply with requirements in Section 07 8413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.

C. Comply with requirements for raceways and boxes specified in Section 26 0533 "Raceways and Boxes for Electrical Systems."

D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
1. Secure raceways and cables to these supports with two-bolt conduit clamps.

F. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.
3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT and RMC may be supported by openings through structure members, according to NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
   1. To Wood: Fasten with lag screws or through bolts.
   2. To New Concrete: Bolt to concrete inserts.
   3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
   4. To Existing Concrete: Expansion anchor fasteners.
   5. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
   6. To Light Steel: Sheet metal screws.
   7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

E. Scan and locate rebar and any embedded items prior to drilling or coring concrete deck. Field-adjust drilling location. Provide 4" clearance minimum between rebar and drilled hole. Do not cut, damage, or remove existing rebar and embedded items.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Section 05 5000 "Metal Fabrications" for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
   1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Touchup: Comply with requirements in Section 09 9123 "Interior Painting" for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 26 0529
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Metal conduits, tubing, and fittings.
   2. Boxes, enclosures, and cabinets.

B. Related Requirements:
   1. Section 27 0528 "Pathways for Communications Systems" for conduits, wireways, surface pathways, innerduct, boxes, faceplate adapters, enclosures, cabinets, and handholes serving communications systems.

1.3 DEFINITIONS

A. GRC: Galvanized rigid steel conduit.

B. IMC: Intermediate metal conduit.

1.4 ACTION SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
   1. Structural members in paths of conduit groups with common supports.
   2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

B. Seismic Qualification Certificates: For enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
   2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
   4. Detailed description of conduit support devices and interconnections on which the certification is based and their installation requirements.
C. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. AFC Cable Systems; a part of Atkore International.
   2. Allied Tube & Conduit; a part of Atkore International.
   3. Anamet Electrical, Inc.
   4. Cal conduit.
   5. Electri-Flex Company.
   6. FSR Inc.
   11. Picoma Industries, Inc.
   12. Plasti-Bond.
   15. Thomas & Betts Corporation; A Member of the ABB Group.
   16. Topaz Electric; a division of Topaz Lighting Corp.
   17. Western Tube and Conduit Corporation.
   18. Wheatland Tube Company.

B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. GRC: Comply with ANSI C80.1 and UL 6.

D. IMC: Comply with ANSI C80.6 and UL 1242.

E. EMT: Comply with ANSI C80.3 and UL 797.

F. FMC: Comply with UL 1; zinc-coated steel.

G. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

H. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
   1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.
   2. Fittings for EMT:
      a. Material: Steel or die cast.
      b. Type: compression.
   3. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

I. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.
2.2 METAL WIREWAYS AND AUXILIARY GUTTERS

A. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
   1. B-line, an Eaton business.
   2. Hoffman; a brand of Pentair Equipment Protection.
   3. MonoSystems, Inc.
   4. Square D.

B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 unless otherwise indicated, and sized according to NFPA 70.
   1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Wireway Covers: Screw-cover type unless otherwise indicated.

E. Finish: Manufacturer's standard enamel finish.

2.3 BOXES, ENCLOSURES, AND CABINETS

A. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
   1. Adalet.
   3. EGS/Appleton Electric.
   5. FSR Inc.
   6. Hoffman; a brand of Pentair Equipment Protection.
   8. Hubbell Incorporated; Wiring Device-Kellems.
   10. Milbank Manufacturing Co.
   11. MonoSystems, Inc.
   12. Oldcastle Enclosure Solutions.
   15. RACO: Hubbell.
   16. Spring City Electrical Manufacturing Company.
   17. Stahlin Non-Metallic Enclosures.
   18. Thomas & Betts Corporation; A Member of the ABB Group.
   19. Topaz Electric; a division of Topaz Lighting Corp.
   20. Wiremold / Legrand.

B. General Requirements for Boxes, Enclosures, and Cabinets: All Boxes, enclosures, and cabinets installed in this project shall be listed for use in wet locations.

C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
D. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

E. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.

F. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.

G. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.

H. Gangable boxes are prohibited.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Indoors: Apply raceway products as specified below unless otherwise indicated:
   1. Exposed, Not Subject to Physical Damage: EMT.
   2. Exposed, Not Subject to Severe Physical Damage: EMT.
   3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
      a. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
      b. Mechanical rooms.
   4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
   5. Exterior Wet Locations: GRC.
   6. Boxes and Enclosures: NEMA 250, Type 4 cast in damp or wet locations.

B. Minimum Raceway Size: 3/4-inch trade size.

C. Raceway Fittings: Compatible with raceways and suitable for use and location.
   1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
   2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
   3. EMT: Use compression, steel or cast-metal fittings. Comply with NEMA FB 2.10.
   4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

D. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

3.2 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Comply with requirements in Section 26 0529 "Hangers and Supports for Electrical Systems" for hangers and supports.

E. Arrange stub-ups so curved portions of bends are not visible above finished slab.

F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.

G. Install conduits parallel or perpendicular to building lines.

H. Support conduit within 12 inches of enclosures to which attached.

I. Stub-ups to Above Recessed Ceilings:
   1. Use EMT, IMC, or RMC for raceways.
   2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

J. Threaded Conduit Joints, for all fittings: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

K. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

L. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

M. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of cabinets only. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

N. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

O. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

P. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

Q. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

R. Surface Raceways:
   1. Install surface raceway with a minimum 2-inch radius control at bend points.
2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

S. Install raceway Tee fittings with listed drain fittings at accessible locations as shown on the contract documents.

T. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
   1. Where conduits enter a cabinet, gutter or panel.
   2. Where otherwise required by NFPA 70.

U. Comply with manufacturer's written instructions for solvent welding RNC and fittings.

V. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for luminaires, equipment subject to vibration, noise transmission, or movement, and across building expansion joints; and for transformers and motors.
   1. Use LFMC in all locations.

W. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

X. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.

Y. Locate boxes so that cover or plate will not span different building finishes.

Z. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.3 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 07 8413 "Penetration Firestopping."

3.4 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.
   1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
   2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

   A. Section Includes:
      1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
      2. Sleeve-seal systems.
      5. Silicone sealants.

   B. Related Requirements:
      1. Section 07 8413 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.3 ACTION SUBMITTALS

   A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

   A. Wall Sleeves:
      2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral water stop unless otherwise indicated.

   B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

   C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

   D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

   E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

   F. Sleeves for Rectangular Openings:
      2. Minimum Metal Thickness:
         a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Advance Products & Systems, Inc.
   b. CALPICO, Inc.
   c. Metraflex Company (The).
   d. Pipeline Seal and Insulator, Inc.
   e. Proco Products, Inc.
2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Stainless steel.
4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. HOLDRITE.

2.4 GROUT

A. Description: Non-shrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
C. Design Mix: 5000-psi, 28-day compressive strength.
D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, non-shrinking foam.
PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
   1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
      a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 07 9200 "Joint Sealants."
      b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
   2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
   3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.

C. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
   1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
   2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

D. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

E. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

3.2 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position water stop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 26 0544
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Restraint channel bracings.
   2. Restraint cables.
   4. Mechanical anchor bolts.
   5. Adhesive anchor bolts.

B. Related Requirements:
   1. Section 26 0529 "Hangers and Supports for Electrical Systems" for commonly used electrical supports and installation requirements.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.
      a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by [an agency acceptable to authorities having jurisdiction.
      b. Annotate to indicate application of each product submitted and compliance with requirements.

B. Delegated-Design Submittal: For each seismic-restraint device.
   1. Include design calculations and details for selecting seismic restraints complying with performance requirements, design criteria, and analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
   2. Design Calculations: Calculate static and dynamic loading caused by equipment weight, operation, and seismic forces required to select seismic restraints and for designing vibration isolation bases.
      a. Coordinate design calculations with wind load calculations required for equipment mounted outdoors. Comply with requirements in other Sections for equipment mounted outdoors.
   3. Seismic-Restraint Details:
a. Design Analysis: To support selection and arrangement of seismic restraints. Include calculations of combined tensile and shear loads.

b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.

c. Coordinate seismic-restraint and vibration isolation details with wind-restraint details required for equipment mounted outdoors. Comply with requirements in other Sections for equipment mounted outdoors.

d. Preapproval and Evaluation Documentation: By an agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval (tests or calculations).

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Show coordination of seismic bracing for electrical components with other systems and equipment in the vicinity, including other supports and seismic restraints.

B. Qualification Data: For professional engineer and testing agency.

C. Welding certificates.

D. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a nationally recognized testing laboratory as defined by OSHA in 29 CFR 1910.7 and that is acceptable to authorities having jurisdiction.

B. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

D. Seismic-restraint devices shall have horizontal and vertical load testing and analysis. They shall bear anchorage preapproval from OSHPD in addition to preapproval, showing maximum seismic-restraint ratings, by ICC-ES or another agency acceptable to authorities having jurisdiction. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) that support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

E. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic-Restraint Loading:
1. Site Class as Defined in the IBC: F.
2. Assigned Seismic Use Group or Building Category as Defined in the Seattle Building Code.
   a. Component Importance Factor: 1.5.
   b. Component Response Modification Factor: 2.5.
   c. Component Amplification Factor: 2.5.
3. Design Spectral Response Acceleration at Short Periods (0.2 Second): Per structural design.

2.2 RESTRAINT CHANNEL BRACINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. B-line, an Eaton business.
   2. Hilti, Inc.
   3. Mason Industries, Inc.
   4. Unistrut; Part of Atkore International.

B. Description: MFMA-4, shop- or field-fabricated bracing assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end, with other matching components, and with corrosion-resistant coating; rated in tension, compression, and torsion forces.

2.3 RESTRAINT CABLES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Kinetics Noise Control, Inc.
   2. Vibration & Seismic Technologies, LLC.
   3. Vibration Mountings & Controls, Inc.

B. Restraint Cables: ASTM A 492 stainless-steel cables. End connections made of steel assemblies with thimbles, brackets, swivel, and bolts designed for restraining cable service; with a minimum of two clamping bolts for cable engagement.

2.4 SEISMIC-RESTRAINT ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. B-line, an Eaton business.
   2. Kinetics Noise Control, Inc.
   3. Mason Industries, Inc.
   4. TOLCO; a brand of NIBCO INC.

B. Hanger-Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod.
C. Hinged and Swivel Brace Attachments: Multifunctional steel connectors for attaching hangers to restraint cables.

D. Bushings for Floor-Mounted Equipment Anchor Bolts: Neoprene bushings designed for rigid equipment mountings and matched to type and size of anchor bolts and studs.

E. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings and matched to type and size of attachment devices used.

F. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.

2.5 MECHANICAL ANCHOR BOLTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   
   1. B-line, an Eaton business.
   2. Hilti, Inc.
   4. Mason Industries, Inc.

B. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

2.6 ADHESIVE ANCHOR BOLTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   
   1. Hilti, Inc.
   2. Kinetics Noise Control, Inc.
   3. Mason Industries, Inc.

B. Adhesive Anchor Bolts: Drilled-in and capsule anchor system containing PVC or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and equipment to receive seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for reinforcement and cast-in-place anchors to verify actual locations before installation.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.

B. Hanger-Rod Stiffeners: Install hanger-rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods caused by seismic forces.

C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.3 SEISMIC-RESTRAINT DEVICE INSTALLATION

A. Coordinate the location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork specified in Section 03 3053 "Miscellaneous Cast-in-Place Concrete."

B. Equipment and Hanger Restraints:
   1. Install resilient, bolt-isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
   2. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction providing required submittals for component.

C. Install cables so they do not bend across edges of adjacent equipment or building structure.

D. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

E. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

F. Drilled-in Anchors:
   1. Scan and locate rebar and any embedded items prior to drilling or coring concrete deck. Field-adjust drilling location. Provide 4” clearance minimum between rebar and drilled hole. Do not cut, damage, or remove existing rebar and embedded items.
   2. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons located in beams and embedded electrical conduit.
   3. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
   4. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
5. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.

6. Set anchors to manufacturer's recommended torque using a torque wrench.

7. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.4 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

A. Install flexible connections in runs of raceways, cables, wireways, cable trays, and busways where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where connection is terminated to equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform the following tests and inspections:

1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.

2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless post connection testing has been approved), and with at least seven days' advance notice.


4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.

5. Test to 90 percent of rated proof load of device.

C. Seismic controls will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.6 ADJUSTING

A. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION 26 0548.16
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Color and legend requirements for raceways, conductors, and warning labels and signs.
2. Labels.
4. Tapes and stencils.
5. Tags.
7. Cable ties.
9. Fasteners for labels and signs.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.

B. Samples: For each type of label and sign to illustrate composition, size, colors, lettering style, mounting provisions, and graphic features of identification products.

C. Identification Schedule: For each piece of electrical equipment and electrical system components to be an index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.

D. Delegated-Design Submittal: For arc-flash hazard study.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with ASME A13.1.

B. Comply with NFPA 70.


D. Comply with ANSI Z535.4 for safety signs and labels.

E. Comply with NFPA 70E and City of Seattle requirements for arc-flash warning labels.
F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

2.2 COLOR AND LEGEND REQUIREMENTS

A. Raceways and Cables Carrying Circuits at 600 V or Less:
   1. Legend: Indicate voltage.

B. Color-Coding for Phase- Identification, 600 V or Less: Use colors listed below for ungrounded feeder and branch-circuit conductors.
   1. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.
   2. Colors for 208/120-V Circuits:
      a. Phase A: Black.
      b. Phase B: Red.
      c. Phase C: Blue.
   3. Colors for 240-V Circuits:
      a. Phase A: Black.
      b. Phase B: Red.
   4. Colors for 480/277-V Circuits:
      b. Phase B: Orange.
      c. Phase C: Yellow.
   7. Colors for Isolated Grounds: Green with white stripe.

C. Raceways and Cables Carrying Circuits at More Than 600 V:
   1. Black letters on an orange field.
   2. Legend: "DANGER - CONCEALED HIGH VOLTAGE WIRING."

D. Warning Label Colors:
   1. Identify system voltage with black letters on an orange background.

E. Warning labels and signs shall include, but are not limited to, the following legends:
   1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
   2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."
2.3 LABELS

A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.

1. **Manufacturers**: Subject to compliance with requirements, provide products by one of the following:
   a. **Brady Corporation**.
   b. **Champion America**.
   c. **emedco**.
   d. **Grafoplast Wire Markers**.
   e. **HellermannTyton**.
   f. **LEM Products Inc.**
   g. **Marking Services, Inc.**
   h. **Panduit Corp.**
   i. **Seton Identification Products**.

B. Snap-around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters and that stay in place by gripping action.

1. **Manufacturers**: Subject to compliance with requirements, provide products by one of the following:
   a. **Brady Corporation**.
   b. **HellermannTyton**.
   c. **Marking Services, Inc.**
   d. **Panduit Corp.**
   e. **Seton Identification Products**.

C. Self-Adhesive Wraparound Labels: Preprinted, 3-mil-thick, polyester or vinyl flexible label with acrylic pressure-sensitive adhesive.

1. **Manufacturers**: Subject to compliance with requirements, provide products by one of the following:
   a. **A’n D Cable Products**.
   b. **Brady Corporation**.
   c. **Brother International Corporation**.
   d. **emedco**.
   e. **Grafoplast Wire Markers**.
   f. **Ideal Industries, Inc.**
   g. **LEM Products Inc.**
   h. **Marking Services, Inc.**
   i. **Panduit Corp.**
   j. **Seton Identification Products**.

2. **Self-Lamination**: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized such that the clear shield overlaps the entire printed legend.
3. Marker for Labels: Permanent, waterproof, black ink marker recommended by tag manufacturer.
4. Marker for Labels: Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.

D. Self-Adhesive Labels: Polyester or Vinyl, thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.

1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
   a. A'n D Cable Products.
   b. Brady Corporation.
   c. Brother International Corporation.
   d. emedco.
   e. Grafoplast Wire Markers.
   f. HellermannTyton.
   g. Ideal Industries, Inc.
   h. LEM Products Inc.
   i. Marking Services, Inc.
   j. Panduit Corp.
   k. Seton Identification Products.

2. Minimum Nominal Size:
   a. 1-1/2 by 6 inches for raceway and conductors.
   b. 3-1/2 by 5 inches for equipment.
   c. As required by authorities having jurisdiction.

2.4 BANDS AND TUBES

A. Snap-around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches long, with diameters sized to suit diameters and that stay in place by gripping action.

1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
   a. Brady Corporation.
   b. HellermannTyton.
   c. Marking Services, Inc.
   d. Panduit Corp.

B. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tubes with machine-printed identification labels, sized to suit diameter and shrunk to fit firmly. Full shrink recovery occurs at a maximum of 200 deg F. Comply with UL 224.

1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
   a. Brady Corporation.
   b. Panduit Corp.
2.5 TAPES AND STENCILS

A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

1. **Manufacturers**: Subject to compliance with requirements, provide products by one of the following:

   a. Carlton Industries, LP.
   b. Champion America.
   c. HellermannTyton.
   d. Ideal Industries, Inc.
   e. Marking Services, Inc.
   f. Panduit Corp.

B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.

1. **Manufacturers**: Subject to compliance with requirements, provide products by one of the following:

   a. Brady Corporation.
   b. Carlton Industries, LP.
   c. emedco.
   d. Marking Services, Inc.

C. Tape and Stencil: 4-inch-wide black stripes on 10-inch centers placed diagonally over orange background and is 12 inches wide. Stop stripes at legends.

1. **Manufacturers**: Subject to compliance with requirements, provide products by one of the following:

   a. HellermannTyton.
   b. LEM Products Inc.
   c. Marking Services, Inc.
   d. Seton Identification Products.

D. Floor Marking Tape: 2-inch-wide, 5-mil pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.

1. **Manufacturers**: Subject to compliance with requirements, provide products by one of the following:

   a. Carlton Industries, LP.
   b. Seton Identification Products.

2.6 TAGS

A. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.
1. **Manufacturers**: Subject to compliance with requirements, provide products by one of the following:
   
   a. **Brady Corporation**.
   
   b. **Carlton Industries, LP**.
   
   c. **emedco**.
   
   d. **Marking Services, Inc**.
   
   e. **Seton Identification Products**.

B. Nonmetallic Preprinted Tags: Polyethylene tags, 0.015 inch thick, color-coded for phase and voltage level, with printed permanent designations; punched for use with self-locking cable tie fastener.

1. **Manufacturers**: Subject to compliance with requirements, provide products by one of the following:
   
   a. **Brady Corporation**.
   
   b. **Carlton Industries, LP**.
   
   c. **emedco**.
   
   d. **Grafoplast Wire Markers**.
   
   e. **LEM Products Inc**.
   
   f. **Marking Services, Inc**.
   
   g. **Panduit Corp**.
   
   h. **Seton Identification Products**.

C. Write-on Tags:

1. **Manufacturers**: Subject to compliance with requirements, provide products by one of the following:
   
   a. **Carlton Industries, LP**.
   
   b. **LEM Products Inc**.
   
   c. **Seton Identification Products**.

2. Polyester Tags: 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment.

3. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

4. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.7 SIGNS

A. Laminated Acrylic or Melamine Plastic Signs:

1. **Manufacturers**: Subject to compliance with requirements, provide products by one of the following:
   
   a. **Brady Corporation**.
   
   b. **Carlton Industries, LP**.
   
   c. **emedco**.
2. Engraved legend.

3. Thickness:
   a. For signs up to 20 sq. in., minimum 1/16 inch.
   b. For signs larger than 20 sq. in., 1/8 inch thick.
   c. Engraved legend with black letters on white face.
   d. Punched or drilled for mechanical fasteners with 1/4-inch grommets in corners for mounting.
   e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.8 CABLE TIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. HellermannTyton.
   2. Ideal Industries, Inc.
   3. Marking Services, Inc.
   4. Panduit Corp.

B. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.
   2. Tensile Strength at 73 Deg F according to ASTM D 638: 12,000 psi.
   3. Temperature Range: Minus 40 to plus 185 deg F.

C. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.
   2. Tensile Strength at 73 Deg F according to ASTM D 638: 12,000 psi.
   3. Temperature Range: Minus 40 to plus 185 deg F.

D. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, and self-locking.
   2. Tensile Strength at 73 Deg F according to ASTM D 638: 7000 psi.
   3. UL 94 Flame Rating: 94V-0.
   4. Temperature Range: Minus 50 to plus 284 deg F.
   5. Color: Black.
2.9 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 PREPARATION

A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

B. Install identifying devices before installing acoustical ceilings and similar concealment.

C. Verify identity of each item before installing identification products.

D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

E. Apply identification devices to surfaces that require finish after completing finish work.

F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.

G. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.

1. Secure tight to surface of conductor, cable, or raceway.


I. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.

J. Vinyl Wraparound Labels:

1. Secure tight to surface of raceway or cable at a location with high visibility and accessibility.
2. Attach labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.

K. Snap-around Labels: Secure tight to surface at a location with high visibility and accessibility.

L. Self-Adhesive Wraparound Labels: Secure tight to surface at a location with high visibility and accessibility.

M. Self-Adhesive Labels:

1. On each item, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.

N. Snap-around Color-Coding Bands: Secure tight to surface at a location with high visibility and accessibility.

O. Heat-Shrink, Preprinted Tubes: Secure tight to surface at a location with high visibility and accessibility.

P. Marker Tapes: Secure tight to surface at a location with high visibility and accessibility.

Q. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.

1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.

R. Tape and Stencil: Comply with requirements in painting Sections for surface preparation and paint application.

S. Floor Marking Tape: Apply stripes to finished surfaces following manufacturer's written instructions.

T. Nonmetallic Preprinted Tags:

1. Place in a location with high visibility and accessibility.
2. Secure using general-purpose cable ties.

U. Write-on Tags:

1. Place in a location with high visibility and accessibility.
2. Secure using general-purpose cable ties.

V. Laminated Acrylic or Melamine Plastic Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high sign; where two lines of text are required, use labels 2 inches high.
W. Cable Ties: General purpose, for attaching tags, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

3.3 IDENTIFICATION SCHEDULE

A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

C. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits.; Identify with self-adhesive raceway labels.

1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

D. Accessible Fittings for Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive labels containing the wiring system legend and system voltage.

E. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use vinyl wraparound labels to identify the phase.

F. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive labels with the conductor or cable designation, origin, and destination.

G. Control-Circuit Conductor Termination Identification: For identification at terminations, provide self-adhesive labels with the conductor designation.

H. Locations of Underground Lines: Underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.

I. Concealed Raceways and Duct Banks, More Than 600 V, within Buildings: Apply floor marking tape to the following finished surfaces:

1. Floor surface directly above conduits running beneath and within 12 inches of a floor that is in contact with earth or is framed above unexcavated space.
2. Wall surfaces directly external to raceways concealed within wall.
3. Accessible surfaces of concrete envelope around raceways in vertical shafts, exposed in the building, or concealed above suspended ceilings.

J. Workspace Indication: Apply floor marking tape to finished surfaces. Show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
K. Instructional Signs: Self-adhesive labels, including the color code for grounded and ungrounded conductors.

L. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive labels.
   1. Apply to exterior of door, cover, or other access.


N. Equipment Identification Labels:
   1. Indoor Equipment: Self-adhesive label.
   2. Outdoor Equipment: Stenciled legend 4 inches high.
   3. Equipment to Be Labeled:
      a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of a self-adhesive, engraved, laminated acrylic or melamine label.
      b. Enclosures and electrical cabinets.
      c. Access doors and panels for concealed electrical items.
      d. Switchboards.
      e. Transformers: Label that includes tag designation indicated on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
      f. Emergency system boxes and enclosures.
      g. Enclosed switches.
      h. Enclosed circuit breakers.
      i. Variable-speed controllers.
      j. Push-button stations.
      k. Contactors.
      l. Remote-controlled switches, dimmer modules, and control devices.
      m. Battery-inverter units.

O. Examples:
IDENTIFICATION FOR ELECTRICAL SYSTEMS

SECTION 26 05 53

PRELIMINARY IDENTIFICATION FOR SYSTEMS

TYPE:
- PCD = POWER CENTER MAIN
- PCB = DISTRIBUTION PANEL
- PCB = BRANCH PANEL
- MCC = MOTOR CONTROL CENTER
- TR = TRANSFORMER
- SWA = NON-FUSED SWITCH
- LDF = FAN LOAD
- LDC = COMPRESSOR LOAD

1st TWO DIGITS = AREA DESIGNATION
2nd TWO DIGITS = FLOOR DESIGNATION
3rd DIGIT = ITEM NUMBER

ITEM DESIGNATION:
- N = NORMAL
- E = EMERGENCY

CIRCUIT OR CUBICLE #
- e.g. (5), (4,6,8), 1A, 3C

SEE SD-E-141 FOR PLACEMENT AND SIZING

EQUIPMENT CIRCUIT DESIGNATION EXAMPLES*

<table>
<thead>
<tr>
<th>Type</th>
<th>Circuit</th>
<th>Fed From</th>
</tr>
</thead>
<tbody>
<tr>
<td>EA04-N03-9,11</td>
<td>SF-1 LDF-SE07-E03</td>
<td>MCC-SE02-E05-3C</td>
</tr>
<tr>
<td>GG03-N32-4</td>
<td>EF-14 LDF-SW08-E02</td>
<td>SW01-E11-6,8,10</td>
</tr>
<tr>
<td>NE02-N15-5,7,9</td>
<td>SF-1 LDF-SE07-E03</td>
<td>MCC-SE02-E05-3C</td>
</tr>
<tr>
<td></td>
<td>EF-14 LDF-SW08-E02</td>
<td>SW01-E11-6,8,10</td>
</tr>
</tbody>
</table>

SD-E-154

Equipment “Fed From” Label
WARNING

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

END OF SECTION 26 05 53
SECTION 260923 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Standalone daylight-harvesting switching and dimming controls.
2. Indoor occupancy and vacancy sensors.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.
B. Sample Warranty: For manufacturer's warranties.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each type of lighting control device to include in operation and maintenance manuals.

1.5 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace lighting control devices that fail(s) in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Faulty operation of lighting control devices.

2. Warranty Period: Two year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 DAYLIGHT-HARVESTING DIMMING CONTROLS, ANALOG

A. Refer to the lighting fixture schedule on the contract drawings. Sensor shall be integral to the light fixture.
B. Description: Sensing daylight and electrical lighting levels, the system adjusts the indoor electrical lighting levels. As daylight increases, the lights are dimmed.

1. Lighting control set point is based on two lighting conditions:
   a. When no daylight is present (target level).
   b. When significant daylight is present.

2. System programming is done with two hand-held, remote-control tools.
   a. Initial setup tool.
   b. Tool for occupants to adjust the target levels by increasing the set point up to 25 percent, or by minimizing the electric lighting level.

C. Fixture-Mounted Dimming Controls: Solid-state, light-level sensor unit, with integrated power pack mounted on luminaire, to detect changes in indoor lighting levels that are perceived by the eye.

D. Electrical Components, Devices, and Accessories:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Sensor Output: 0- to 10-V dc to operate luminaires. Sensor is powered by controller unit.
3. Light-Level Sensor Set-Point Adjustment Range: 20 to 60 fc (120 to 640 lux).

2.2 HIGH-BAY OCCUPANCY SENSORS

A. Refer to the lighting fixture schedule on the contract drawings. Sensor shall be integral to the light fixture.

B. Description: Solid-state unit. The unit is designed to operate with the lamp and ballasts indicated.

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Operation: Turn lights on when coverage area is occupied, and to half-power when unoccupied; with a time delay for turning lights to half-power that is adjustable over a minimum range of 1 to 16 minutes.
3. Continuous Lamp Monitoring: When lamps are dimmed continuously for 24 hours, automatically turn lamps on to full power for 15 minutes for every 24 hours of continuous dimming.
5. Operating Ambient Conditions: 32 to 149 deg F (0 to 65 deg C).
7. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
8. Detector Technology: PIR.
9. Power and dimming control from the luminaire ballast that has been modified to include the dimming capacitor.

C. Detector Coverage: User selectable by interchangeable PIR lenses, suitable for mounting heights from 12 to 50 feet (3.7 to 15.2 m).
D. Accessories: Obtain manufacturer's installation and maintenance kit with laser alignment tool for sensor positioning and power port connectors.

2.3 EXTREME-TEMPERATURE OCCUPANCY SENSORS

A. Refer to the lighting fixture schedule on the contract drawings. Sensor shall be integral to the light fixture.

B. Description: Fixture-mounted, solid-state, extreme-temperature occupancy sensors with a separate power pack.

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended application in damp locations.
2. Operation: Turn lights on when coverage area is occupied, and turn them off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 30 minutes.
3. Operating Ambient Conditions: From minus 40 to plus 125 deg F (minus 40 to plus 52 deg C).
4. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor is powered from the power pack.
5. Power Pack: Dry contacts rated for 20-A ballast or LED load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Sensor has 24-V dc, 150-mA, Class 2 power source, as defined by NFPA 70.
6. Mounting:
   a. Sensor: Suitable for mounting in any position on a standard outlet box.
   b. Relay: Externally mounted through a 1/2-inch (13-mm) knockout in a standard electrical enclosure.
   c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind cover.
7. Bypass Switch: Override the "on" function in case of sensor failure.
8. Automatic Light-Level Sensor: Adjustable from 2 to 10 fc (21.5 to 108 lux); keep lighting off when selected lighting level is present.

C. Detector Technology: PIR. Fixture mounted; detect occupants in coverage area by their heat and movement.

1. Detector Sensitivity: Detect occurrences of 6-inch- (150-mm-) minimum movement of any portion of a human body that presents a target of not less than 36 sq. in. (232 sq. cm).
2. Detection Coverage (Room): Detect occupancy anywhere in a circular area of 1500 sq. ft. (139 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.
3. Detection Coverage (High Bay): Detect occupancy within 25 feet (7.6 m) when mounted on a 25-foot- (7.6-m-) high ceiling.

2.4 LIGHTING CONTACTORS

A. Description: Electrically operated and electrically held, combination-type lighting contactors with nonfused disconnect, complying with NEMA ICS 2 and UL 508.
1. Current Rating for Switching: Listing or rating consistent with type of load served, including tungsten filament, inductive, and high-inrush ballast (ballast with 15 percent or less THD of normal load current).
2. Fault Current Withstand Rating: Equal to or exceeding the available fault current at the point of installation.
3. Enclosure: Comply with NEMA 250.
4. Provide with control and pilot devices as indicated on Drawings, matching the NEMA type specified for the enclosure.

2.5 CONDUCTORS AND CABLES

A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine lighting control devices before installation. Reject lighting control devices that are wet, moisture damaged, or mold damaged.

B. Examine walls and ceilings for suitable conditions where lighting control devices will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SENSOR INSTALLATION

A. Comply with NECA 1.

B. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.

C. Install and aim sensors in locations to achieve not less than 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.3 CONTACTOR INSTALLATION

A. Comply with NECA 1.

B. Mount electrically held lighting contactors with elastomeric isolator pads to eliminate structure-borne vibration unless contactors are installed in an enclosure with factory-installed vibration isolators.
3.4 WIRING INSTALLATION

A. Comply with NECA 1.

B. Wiring Method: Comply with Section 260519 "Low-Voltage Electrical Power Conductors and Cables." Minimum conduit size is 1/2 inch (13 mm).

C. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.

D. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.

E. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.5 IDENTIFICATION

A. Identify components and power and control wiring according to Section 260553 "Identification for Electrical Systems."

1. Identify controlled circuits in lighting contactors.
2. Identify circuits or luminaires controlled by photoelectric and occupancy sensors at each sensor.

B. Label time switches and contactors with a unique designation.

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

B. Perform the following tests and inspections:

1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Lighting control devices will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.7 ADJUSTING

A. Occupancy Adjustments: When requested within 6 months from date of Substantial Completion, provide on-site assistance in adjusting lighting control devices to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.
1. For occupancy and motion sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.
2. For daylighting controls, adjust set points and deadband controls to suit Owner's operations.
3. Align high-bay occupancy sensors using manufacturer's laser aiming tool.

3.8 DEMONSTRATION

A. Coordinate demonstration of products specified in this Section with demonstration requirements for low-voltage, programmable lighting control systems specified in Section 260943.23 "Relay-Based Lighting Controls."

B. Train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION 260923
SECTION 260943.23 - RELAY-BASED LIGHTING CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section Includes: Lighting control panels using mechanically held relays for switching.

1.3 DEFINITIONS
A. Monitoring: Acquisition, processing, communication, and display of equipment status data, metered electrical parameter values, power quality evaluation data, event and alarm signals, tabulated reports, and event logs.

1.4 ACTION SUBMITTALS
A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for control modules, power distribution components, relays, manual switches and plates, and conductors and cables.
   2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
   3. Sound data including results of operational tests of central dimming controls.
   4. Operational documentation for software and firmware.

B. Shop Drawings: For each relay panel and related equipment.
   1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
   2. Detail enclosure types and details for types other than NEMA 250, Type 1.
   3. Detail wiring partition configuration, current, and voltage ratings.
   4. Short-circuit current rating of relays.
   5. Address Drawing: Reflected ceiling plan and floor plans, showing connected luminaires, address for each luminaire, and luminaire groups. Base plans on construction plans, using the same legend, symbols, and schedules.
   6. Point List and Data Bus Load: Summary list of all control devices, sensors, ballasts, and other loads. Include percentage of rated connected load and device addresses.
   7. Wire Termination Diagrams and Schedules: Coordinate nomenclature and presentation with Drawings and block diagram. Differentiate between manufacturer-installed and field-installed wiring.
8. Block Diagram: Show interconnections between components specified in this Section and devices furnished with power distribution system components. Indicate data communication paths and identify networks, data buses, data gateways, concentrators, and other devices to be used. Describe characteristics of network and other data communication lines.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Field quality-control reports.

C. Software licenses and upgrades required by and installed for operation and programming of digital and analog devices.

D. Sample Warranty: For manufacturer's special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For lighting controls to include in emergency, operation, and maintenance manuals.

B. Software and Firmware Operational Documentation:
   1. Software operating and upgrade manuals.
   2. Program Software Backup: Username and password for manufacturer's support website.
   3. Device address list.
   4. Printout of software application and graphic screens.
   5. Testing and adjusting of panic and emergency power features.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

   1. Lighting Control Relays: Equal to 10 percent of amount installed.

1.8 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.

   1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Handle and prepare panels for installation according to NECA 407.
1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of standalone multipreset modular dimming controls that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Damage from transient voltage surges.

2. Warranty Period: Cost to repair or replace any parts for two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Sequence of Operations: Input signal from field-mounted daylight sensor, shall open or close one or more lighting control relays in the lighting control panels. Any combination of inputs shall be programmable to any number of control relays.

B. Surge Protective Device: Factory installed as an integral part of control components or field-mounted surge suppressors complying with UL 1449, SPD Type 2.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Comply with 47 CFR 15, Subparts A and B, for Class A digital devices.

E. Comply with UL 916.

2.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Lighting control panels shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts when subjected to the seismic forces specified.

2.3 LIGHTING CONTROL RELAY PANELS

A. Description: Standalone lighting control panel using mechanically latched relays to control lighting and appliances.

B. Lighting Control Panel:

1. A single enclosure with incoming lighting branch circuits, control circuits, switching relays, and on-board timing and control unit.
2. A vertical barrier separating branch circuits from control wiring.

C. Control Unit: Contain the power supply and electronic control for operating and monitoring individual relays.

1. Timing Unit:
   a. 365-day calendar, astronomical clock, and automatic adjustments for daylight savings and leap year.
   b. Clock configurable for 12-hour (A.M./P.M.) or 24-hour format.
   c. Four independent schedules, each having 24 time periods.
   d. Schedule periods settable to the minute.
   e. Day-of-week, day-of-month, day-of-year with one-time or repeating capability.

2. Sequencing Control with Override:
   a. Automatic sequenced on and off switching of selected relays at times set at the timing unit, allowing timed overrides from external switches.
   b. Sequencing control shall operate relays one at a time, completing the operation of all connected relays in not more than 10 seconds.

3. Nonvolatile memory shall retain all setup configurations. After a power failure, the controller shall automatically reboot and return to normal system operation, including accurate time of day and date.

D. Relays: Electrically operated, mechanically held single-pole switch, rated at 20 A at 277 V. Short-circuit current rating shall be not less than 5 kA. Control shall be three-wire, 24-V ac.

E. Power Supply: NFPA 70, Class 2, sized for connected equipment, plus 20 percent spare capacity. Powered from a dedicated branch circuit of the panelboard that supplies power to the line side of the relays, sized to provide control power for the local panel-mounted relays, bus system, low-voltage inputs, field-installed occupancy sensors, and photo sensors.

F. Operator Interface:
   1. Integral alphanumeric keypad and digital display, and intuitive drop-down menus to assist in programming.
   2. Log and display relay on-time.
   3. Connect relays to one or more time and sequencing schemes.

2.4 FIELD-MOUNTED SIGNAL SOURCES

A. Daylight Harvesting Switching Controls: Comply with Section 260923 "Lighting Control Devices." Control power may be taken from the lighting control panel, and signal shall be compatible with the relays.

2.5 CONDUCTORS AND CABLES

A. Power Wiring to Supply Side of Class 2 Power Source: Not smaller than No. 12 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
B. Classes 2 and 3 Control Cables: Multiconductor cable with copper conductors not smaller than No. 18 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Receive, inspect, handle, and store panels according to NECA 407.

B. Examine panels before installation. Reject panels that are damaged or rusted or have been subjected to water saturation.

C. Examine elements and surfaces to receive panels for compliance with installation tolerances and other conditions affecting performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 WIRING INSTALLATION

A. Comply with NECA 1.

B. Wiring Method: Install cables in raceways.
   1. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."

C. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

3.3 PANEL INSTALLATION

A. Comply with NECA 1.

B. Install panels and accessories according to NECA 407.

C. Comply with mounting and anchoring requirements specified in Section 260548.16 "Seismic Controls for Electrical Systems."

D. Mount panel cabinet plumb and rigid without distortion of box.

E. Install filler plates in unused spaces.

3.4 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
B. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Section 260553 "Identification for Electrical Systems."

C. Create a directory to indicate loads served by each relay; incorporate Owner's final room designations. Obtain approval before installing. Use a PC or typewriter to create directory; handwritten directories are unacceptable.

D. Lighting Control Panel Nameplates: Label each panel with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

D. Perform tests and inspections with the assistance of a factory-authorized service representative.

E. Tests and Inspections:

   1. Perform each visual and mechanical inspection and electrical test for low-voltage air circuit breakers described below. Certify compliance with manufacturer's test parameters.

      a. Circuit-Breaker Tests:

         1) Compare nameplate with Drawings and Specifications.
         2) Inspect physical and mechanical conditions.
         3) Inspect anchorage and alignment.
         4) Verify that the units are clean.
         5) Operate the circuit breaker to ensure smooth operation.
         6) Inspect bolted electrical connections for high resistance using one or more of the following methods:

            a) A low-resistance ohmmeter.
            b) Verify tightness of bolted electrical connections by calibrated torque wrench.

         7) Inspect operating mechanism, contacts, and arc chutes in unsealed units.

   2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

F. Lighting control panel will be considered defective if it does not pass tests and inspections.

G. Prepare test and inspection reports, including a certified report that identifies lighting control panels and describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations made after remedial action.
3.6 STARTUP SERVICE
   A. Perform startup service.
      1. Complete installation and startup checks according to manufacturer's written instructions.

3.7 SOFTWARE SERVICE AGREEMENT
   A. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.

3.8 DEMONSTRATION
   A. Train Owner's maintenance personnel to adjust, operate, and maintain the control unit and operator interface.

END OF SECTION 260943.23
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes: Distribution, dry-type transformers rated 600 V and less, with capacities up to 1500 kVA.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type and size of transformer.

2. Include rated nameplate data, capacities, weights, dimensions, minimum clearances, installed devices and features, and performance for each type and size of transformer.

B. Shop Drawings:

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

2. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment.

3. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Seismic Qualification Certificates: For transformers, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.

3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

B. Qualification Data: For testing agency.

C. Source quality-control reports.

D. Field quality-control reports.
1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For transformers to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.
   1. Testing Agency’s Field Supervisor: Certified by NETA to supervise on-site testing.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Temporary Heating: Apply temporary heat according to manufacturer’s written instructions within the enclosure of each ventilated-type unit, throughout periods during which equipment is not energized and when transformer is not in a space that is continuously under normal control of temperature and humidity.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

2. Controlled Power Company; an Emerson company.
4. Eaton.
5. Federal Pacific.
7. Hammond Power Solutions Inc.
9. Lincoln Electric Products Co., Inc.
10. Mag-Trap; a division of Quality Transformer & Electronics.
11. Marcus Transformer LTD.
12. MGM Transformer Company.
14. Mirus International Inc.
15. Powersmiths International Corp.
19. Square D; by Schneider Electric.
20. TEMCo Transformers.

B. Source Limitations: Obtain each transformer type from single source from single manufacturer.

2.2 GENERAL TRANSFORMER REQUIREMENTS

A. Description: Factory-assembled and -tested, air-cooled units for 60-Hz service.
B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Transformers Rated 15 kVA and Larger: Comply with NEMA TP 1 energy-efficiency levels as verified by testing according to NEMA TP 2.

D. Cores: Electrical grade, non-aging silicon steel with high permeability and low hysteresis losses.

E. Coils: Continuous windings without splices except for taps.
   1. Internal Coil Connections: Brazed or pressure type.
   2. Coil Material: Copper.

F. Encapsulation: Transformers smaller than 30 kVA shall have core and coils completely resin encapsulated.

G. Shipping Restraints: Paint or otherwise color code bolts, wedges, blocks, and other restraints that are to be removed after installation and before energizing. Use fluorescent colors that are easily identifiable inside the transformer enclosure.

2.3 IDENTIFICATION DEVICES

A. Nameplates: Engraved, laminated-plastic or metal nameplate for each distribution transformer, mounted with corrosion-resistant screws. Nameplates and label products are specified in Section 26 0553 "Identification for Electrical Systems."

2.4 SOURCE QUALITY CONTROL

A. Test and inspect transformers according to IEEE C57.12.01 and IEEE C57.12.91.
   1. Resistance measurements of all windings at the rated voltage connections and at all tap connections.
   2. Ratio tests at the rated voltage connections and at all tap connections.
   3. Phase relation and polarity tests at the rated voltage connections.
   4. No load losses, and excitation current and rated voltage at the rated voltage connections.
   5. Impedance and load losses at rated current and rated frequency at the rated voltage connections.
   6. Applied and induced tensile tests.
   7. Regulation and efficiency at rated load and voltage.
   8. Insulation Resistance Tests:
      a. High-voltage to ground.
      b. Low-voltage to ground.
      c. High-voltage to low-voltage.
   9. Temperature tests.
PART 3 - EXECUTION

3.1 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, floors, roofs, and concrete bases for suitable mounting conditions where transformers will be installed.

D. Verify that ground connections are in place and requirements in Section 26 0526 "Grounding and Bonding for Electrical Systems" have been met. Maximum ground resistance shall be 5 ohms at location of transformer.

E. Environment: Enclosures shall be rated for the environment in which they are located.

F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install wall-mounted transformers level and plumb with wall brackets fabricated by transformer manufacturer.

1. Coordinate installation of wall-mounted and structure-hanging supports with actual transformer provided.

2. Brace wall-mounted transformers as specified in Section 26 0548.16 "Seismic Controls for Electrical Systems."

B. Install transformers level and plumb on a concrete base with vibration-dampening supports. Locate transformers away from corners and not parallel to adjacent wall surface.

C. Construct concrete bases according to Section 03 3053 "Miscellaneous Cast-in-Place Concrete" and anchor floor-mounted transformers according to manufacturer's written instructions and requirements in Section 26 0529 "Hangers and Supports for Electrical Systems."

1. Coordinate size and location of concrete bases with actual transformer provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

D. Secure transformer to concrete base according to manufacturer's written instructions.

E. Secure covers to enclosure and tighten all bolts to manufacturer-recommended torques to reduce noise generation.

F. Remove shipping bolts, blocking, and wedges.
3.3 CONNECTIONS

A. Ground equipment according to Section 26 0526 "Grounding and Bonding for Electrical Systems."

B. Connect wiring according to Section 26 0519 "Low-Voltage Electrical Power 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-486B.

D. Provide flexible connections at all conduit and conductor terminations and supports to eliminate sound and vibration transmission to the building structure.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

D. Perform tests and inspections.

E. Tests and Inspections:
   1. Perform each visual and mechanical inspection and electrical test stated in NETA ATS for dry-type, air-cooled, low-voltage transformers. Certify compliance with test parameters.

F. Remove and replace units that do not pass tests or inspections and retest as specified above.

G. Infrared Scanning: Two months after Substantial Completion, perform an infrared scan of transformer connections.
   1. Use an infrared-scanning device designed to measure temperature or detect significant deviations from normal values. Provide documentation of device calibration.
   2. Perform two follow-up infrared scans of transformers, one at four months and the other at 11 months after Substantial Completion.
   3. 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.

H. Test Labeling: On completion of satisfactory testing of each unit, attach a dated and signed "Satisfactory Test" label to tested component.

3.5 ADJUSTING

A. Record transformer secondary voltage. Adjust transformer taps to provide optimum voltage conditions at secondary terminals. Optimum is defined as not exceeding nameplate voltage plus
5 percent and not being lower than nameplate voltage minus 3 percent at maximum load conditions. Submit recording and tap settings as test results.

B. Output Settings Report: Prepare a written report recording output voltages and tap settings.

3.6 CLEANING

A. Vacuum dirt and debris; do not use compressed air to assist in cleaning.

END OF SECTION 26 2200
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Lighting and appliance branch-circuits.

1.3 DEFINITIONS

A. ATS: Acceptance testing specification.
B. GFCI: Ground-fault circuit interrupter.
C. GFEP: Ground-fault equipment protection.
D. HID: High-intensity discharge.
E. MCCB: Molded-case circuit breaker.
F. SPD: Surge protective device.
G. VPR: Voltage protection rating.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of circuit breaker.
   1. Include materials, switching and overcurrent protective devices, SPDs, accessories, and components indicated.

B. Shop Drawings: For each panelboard and related equipment.
   1. Show tabulations of installed devices with nameplates, conductor termination sizes, equipment features, and ratings.
   2. Short-circuit current rating of panelboards and overcurrent protective devices.
   3. Include evidence of NRTL listing for series rating of installed devices.
   4. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
   5. Include wiring diagrams for power, signal, and control wiring.
   6. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards. Submit on translucent log-log graph paper; include selectable ranges for each type of overcurrent protective device. Include an Internet link for electronic access to downloadable PDF of the coordination curves.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.
B. Panelboard Schedules: For installation in panelboards.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 01 77 00 "Closeout Procedures," include the following:

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: ISO 9001 or 9002 certified.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace circuit breakers that fail in materials or workmanship within specified warranty period.

1. Breaker Warranty Period: 18 months from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANELBOARDS AND LOAD CENTERS COMMON REQUIREMENTS

A. Fabricate and test panelboards according to IEEE 344 to withstand seismic forces defined in Section 26 0548.16 "Seismic Controls for Electrical Systems."

B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Comply with NEMA PB 1.

E. Comply with NFPA 70.

F. Enclosures: Surface-mounted, dead-front cabinets.

1. In the electrical room and garage locations: NEMA 250, Type 3R.

2. Height: 84 inches maximum.

3. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box. Trims shall cover all live parts and shall have no exposed hardware.

4. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims shall cover all live parts and shall have no exposed hardware.
5. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure, separate and connected to panel with threaded rigid conduit. Arrange to isolate individual panel sections.

6. Finishes:
   a. Panels and Trim: Steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
   c. Fungus Proofing: Permanent fungicidal treatment for overcurrent protective devices and other components.

G. Incoming Mains:

1. Location: Convertible between top and bottom.

H. Phase, Neutral, and Ground Buses:

   a. Plating shall run entire length of bus.
   b. Bus shall be fully rated the entire length.

2. Interiors shall be factory assembled into a unit. Replacing switching and protective devices shall not disturb adjacent units or require removing the main bus connectors.

3. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.

4. Isolated Ground Bus: Adequate for branch-circuit isolated ground conductors; insulated from box.

5. Full-Sized Neutral: Equipped with full-capacity bonding strap for service entrance applications. Mount electrically isolated from enclosure. Do not mount neutral bus in gutter.

6. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and listed and labeled by an NRTL acceptable to authority having jurisdiction, as suitable for nonlinear loads in electronic-grade panelboards and others designated on Drawings. Connectors shall be sized for double-sized or parallel conductors as indicated on Drawings. Do not mount neutral bus in gutter.

7. Split Bus: Vertical buses divided into individual vertical sections.

I. Conductor Connectors: Suitable for use with conductor material and sizes.


2. Terminations shall allow use of 75 deg C rated conductors without derating.

3. Size: Lugs suitable for indicated conductor sizes, with additional gutter space, if required, for larger conductors.

4. Main and Neutral Lugs: Mechanical type, with a lug on the neutral bar for each pole in the panelboard.

5. Ground Lugs and Bus-Configured Terminators: Mechanical type, with a lug on the bar for each pole in the panelboard.

6. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.

7. Subfeed (Double) Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
8. Gutter-Tap Lugs: Mechanical type suitable for use with conductor material and with matching insulating covers. Locate at same end of bus as incoming lugs or main device.

J. NRTL Label: Panelboards or load centers shall be labeled by an NRTL acceptable to authority having jurisdiction for use as service equipment with one or more main service disconnecting and overcurrent protective devices. Panelboards or load centers shall have meter enclosures, wiring, connections, and other provisions for utility metering. Coordinate with utility company for exact requirements.

   1. Panelboards rated 240 V or less shall have short-circuit ratings as shown on Drawings, but not less than 10,000 A rms symmetrical.
   2. Panelboards rated above 240 V and less than 600 V shall have short-circuit ratings as shown on Drawings, but not less than 14,000 A rms symmetrical.

L. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed by an NRTL for 100 percent interrupting capacity.
   1. Panelboards and overcurrent protective devices rated 240 V or less shall have short-circuit ratings as shown on Drawings, but not less than 10,000 A rms symmetrical.
   2. Panelboards and overcurrent protective devices rated above 240 V and less than 600 V shall have short-circuit ratings as shown on Drawings, but not less than 14,000 A rms symmetrical.

2.2 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Eaton.
   4. Square D; by Schneider Electric.

B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.

C. Mains: Circuit breaker or lugs only.

D. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

E. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike. Latches shall be of all metal construction.

F. Doors: Door-in-door construction with concealed hinges; secured with multipoint latch with tumbler lock; keyed alike. Outer door shall permit full access to the panel interior. Inner door shall permit access to breaker operating handles and labeling, but current carrying terminals and bus shall remain concealed.
   1. Doors: Concealed hinges secured with multipoint latch with tumbler lock; keyed alike.
2.3 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Panelboards shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

   1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   1. Eaton.
   4. Square D; by Schneider Electric.

B. MCCB: Comply with UL 489, with series-connected rating to meet available fault currents.

   1. Thermal-Magnetic Circuit Breakers:

      a. Inverse time-current element for low-level overloads.
      b. Instantaneous magnetic trip element for short circuits.
      c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

   2. MCCB Features and Accessories:

      a. Standard frame sizes, trip ratings, and number of poles.
      b. Breaker handle indicates tripped status.
      c. UL listed for reverse connection without restrictive line or load ratings.
      d. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.

2.5 IDENTIFICATION

A. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles shall be located on the interior of the panelboard door.

B. Breaker Labels: Faceplate shall list current rating, UL and IEC certification standards, and AIC rating.


   1. Circuit directory shall identify specific purpose with detail sufficient to distinguish it from all other circuits.

D. Circuit Directory: Computer-generated circuit directory mounted inside panelboard door with transparent plastic protective cover.

   1. Circuit directory shall identify specific purpose with detail sufficient to distinguish it from all other circuits.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify actual conditions with field measurements prior to ordering panelboards to verify that equipment fits in allocated space in, and comply with, minimum required clearances specified in NFPA 70.

B. Receive, inspect, handle, and store panelboards according to NECA 407 or NEMA PB 1.1.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Comply with NECA 1.

C. Install overcurrent protective devices and controllers not already factory installed.
   1. Set field-adjustable, circuit-breaker trip ranges.
   2. Tighten bolted connections and circuit breaker connections using calibrated torque wrench or torque screwdriver per manufacturer's written instructions.

D. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.

E. Install filler plates in unused spaces.

F. Arrange conductors in gutters into groups and bundle and wrap with wire ties.

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; install warning signs complying with requirements in Section 26 05 53 "Identification for Electrical Systems."

B. Create a directory to indicate installed circuit loads; incorporate Owner's final room designations. Obtain approval before installing. Handwritten directories are not acceptable. Install directory inside panelboard door.

C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

D. Device Nameplates: Label each branch circuit device in power panelboards with a nameplate complying with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."
E. Install warning signs complying with requirements in Section 26 05 53 “Identification for Electrical Systems” identifying source of remote circuit.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Perform tests and inspections.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Acceptance Testing Preparation:
   1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
   2. Test continuity of each circuit.

3.5 ADJUSTING

A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

END OF SECTION 26 24 16
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

   A. Section Includes:
      1. GFCI receptacles.

1.3 DEFINITIONS

   A. Abbreviations of Manufacturers' Names:
      1. Cooper: Cooper Wiring Devices; Division of Cooper Industries, Inc.

   B. BAS: Building automation system.

   C. EMI: Electromagnetic interference.

   D. GFCI: Ground-fault circuit interrupter.

   E. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

   F. RFI: Radio-frequency interference.

   G. SPD: Surge protective device.

   H. UTP: Unshielded twisted pair.

1.4 ACTION SUBMITTALS

   A. Product Data: For each type of product.

   B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

   C. Samples: One for each type of device and wall plate specified, in each color specified.

1.5 INFORMATIONAL SUBMITTALS

   A. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

   A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.
PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:

1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
2. Devices shall comply with the requirements in this Section.

D. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 GFCI RECEPTACLES

A. General Description:

1. 125 V, 20 A, straight blade, non-feed-through type.
2. Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 943 Class A, and FS W-C-596.
3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.

B. GFCI, Tamper-Resistant and Weather-Resistant Convenience Receptacles: Square face, 125 V, 15 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-15R, UL 498, and UL 943 Class A.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Eaton (Arrow Hart).
   b. Hubbell Incorporated; Wiring Device-Kellems.
   c. Pass & Seymour/Legrand (Pass & Seymour).

2. Description: Labeled to comply with NFPA 70, "Receptacles, Cord Connectors, and Attachment Plugs (Caps)" Article, "Tamper-Resistant Receptacles in Dwelling Units" Section.

2.3 FINISHES

A. Device Color:

1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.

B. Wall Plate Color: For plastic covers, match device color.
PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtailed.
4. Existing Conductors:
   a. Cut back and pigtail, or replace all damaged conductors.
   b. Straighten conductors that remain and remove corrosion and foreign matter.
   c. Pigtailling existing conductors is permitted, provided the outlet box is large enough.

C. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtailed that are not less than 6 inches in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtailed for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

3.2 GFCI RECEPTACLES

A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

A. Comply with Section 26 05 53 "Identification for Electrical Systems."

B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.
3.4 FIELD QUALITY CONTROL

A. Test Instruments: Use instruments that comply with UL 1436.

B. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

C. Perform the following tests and inspections:
   1. Test Instruments: Use instruments that comply with UL 1436.
   2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

D. Tests for Convenience Receptacles:
   1. Line Voltage: Acceptable range is 105 to 132 V.
   2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
   3. Ground Impedance: Values of up to 2 ohms are acceptable.
   4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
   5. Using the test plug, verify that the device and its outlet box are securely mounted.
   6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

E. Wiring device will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION 26 27 26
SECTION 265116 - GARAGE LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section Includes:
   1. Interior luminaires and lamps.
   2. Luminaire supports.
B. Related Requirements:
   1. Section 260923 "Lighting Control Devices" for automatic control of lighting, including photoelectric relays, occupancy sensors, and lighting relays.

1.3 DEFINITIONS
A. CAD: Computer-aided design.
B. CCT: Correlated color temperature.
C. CRI: Color Rendering Index.
D. Fixture: See "Luminaire."
E. IP: International Protection or Ingress Protection Rating
F. Lumen: Measured output of lamp and luminaire, or both.
G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.4 ACTION SUBMITTALS
A. Product Data: For each type of product.
   1. Arrange in order of luminaire designation.
   2. Include data on features, accessories, and finishes.
   3. Include physical description and dimensions of luminaires.
   4. Include life, output (lumens, CCT, and CRI), and energy efficiency data.
   5. Include photometric data and adjustment factors based on laboratory tests, complying with IESNA Lighting Measurements Testing and Calculation Guides, of each luminaire.
type. The adjustment factors shall be for lamps, ballasts, and accessories identical to those indicated for the luminaire as applied in this Project.

a. Retain or "Manufacturers' Certified Data" or "Testing Agency Certified Data" Subparagraph below. Retain first subparagraph if photometric data, based on testing by accredited manufacturers' laboratories, is considered adequate for luminaires in this Project. Retain second subparagraph if photometric data for one or more luminaires are based on independent laboratory tests; coordinate with the Interior Lighting Fixture Schedule on Drawings to indicate which units shall meet this requirement. See the Evaluations. Manufacturers' Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program (NVLAP) for Energy Efficient Lighting Products.

b. Testing Agency Certified Data: For indicated luminaires, photometric data certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.

B. Product Schedule: For luminaires and lamps. Use same designations indicated on Drawings.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires and lighting systems to include in maintenance manuals.

1. Provide a list of all lamp types used on Project; use ANSI and manufacturers' codes.

1.6 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturer's laboratory is accredited under the NVLAP for Energy Efficient Lighting Products.

B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7, accredited under the NVLAP for Energy Efficient Lighting Products, and complying with the applicable IES testing standards.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.8 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Two year(s) from date of Substantial Completion.
PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Seismic Performance: Luminaires and lamps shall be labeled vibration and shock resistant.
   1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified.

2.2 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.

C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

D. UL Compliance: Comply with UL 1598.

E. Nominal Operating Voltage: 277 V ac.

2.3 LED LAMPS

A. LED T8 Linear Replacement lamps, rated 10.5-W maximum, nominal length of 48 inches (1220 mm), 1600 initial lumens (minimum), CRI of 80 (minimum), color temperature of 3500K, and average rated life of 50,000 hours unless otherwise indicated.

2.4 PARKING GARAGE

A. Low-profile housing and heat sink.

B. Fully gasketed and sealed. IP 65 rated.

C. Stainless-steel latches.

D. Integral pressure equalizer.

2.5 MATERIALS

A. Metal Parts:
   1. Free of burrs and sharp corners and edges.
2. Sheet metal components shall be steel unless otherwise indicated.
3. Form and support to prevent warping and sagging.

B. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

C. Diffusers and Globes:
   1. Clear, UV-stabilized acrylic.

D. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

2.6 METAL FINISHES

A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

2.7 LUMINAIRE SUPPORT COMPONENTS

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.

B. Rod Hangers: 3/16-inch (5-mm) minimum diameter, cadmium-plated, threaded steel rod.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before fixture installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with NECA 1.

B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.

C. Install lamps in each luminaire.
D. Coordinate layout and installation of luminaires and suspension system with other construction that penetrates ceilings or is supported by them.

E. Supports:
   1. Sized and rated for luminaire weight.
   2. Able to maintain luminaire position after cleaning and relamping.
   3. Provide support for luminaire without causing deflection of ceiling or wall.
   4. Luminaire mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and vertical force of 400 percent of luminaire weight.

F. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" and Section 260533 "Raceways and Boxes for Electrical Systems" for wiring connections and wiring methods.

3.3 IDENTIFICATION
A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL
A. Perform the following tests and inspections:

B. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
   1. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation.

C. Luminaire will be considered defective if it does not pass operation tests and inspections.

3.5 ADJUSTING
A. Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the sensors to suit occupied conditions. Some of this work may be required during hours of darkness.
   1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
   2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

END OF SECTION 265116
SECTION 26 51 19 – LED INTERIOR LIGHTING

PART 1 - GENERAL

1.1 LUMINAIRE TYPES
   A. Furnish products as indicated in Luminaire Schedule on drawings.

1.2 DEFINITIONS
   A. CCT: Correlated color temperature.
   B. CRI: Color Rendering Index.
   C. Fixture: See "Luminaire."
   D. IP: International Protection or Ingress Protection Rating.
   E. LED: Light-emitting diode.
   F. Lumen: Measured output of lamp and luminaire, or both.
   G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product.
      1. Arrange in order of luminaire designation.
      2. Include data on features, accessories, and finishes.
      3. Include physical description and dimensions of luminaires.
      4. Include emergency lighting units, including batteries and chargers.
      5. Include life, output (lumens, CCT, and CRI), and energy efficiency data.
      6. Photometric data and adjustment factors based on laboratory tests, complying with IES Lighting Measurements Testing and Calculation Guides, of each luminaire type.
         a. Manufacturers' Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
         b. Testing Agency Certified Data: For indicated luminaires, photometric data certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.
   B. Product Schedule: For luminaires and lamps.

1.4 INFORMATIONAL SUBMITTALS
   A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
1.5 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturer’s laboratory that is accredited under the NVLAP for Energy Efficient Lighting Products.

B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7, accredited under the NVLAP for Energy Efficient Lighting Products, and complying with the applicable IES testing standards.

C. Provide luminaires from a single manufacturer for each luminaire type.

D. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.7 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.

B. Warranty Period: Five year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Standards include:

1. ENERGY STAR certified.
2. California Title 24 compliant.
3. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.
4. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
5. UL Listing: Listed for damp location.
6. Recessed luminaires shall comply with NEMA LE 4.

C. CRI of a minimum of 80 and max of 90. CCT between 1900K and 3000 K.

D. Rated lamp life of 50,000 hours.

E. Lamps dimmable from 100 percent to 0 percent of maximum light output.

F. Internal and external driver.
G. Nominal Operating Voltage includes: 277 V ac.

H. Metal Parts:
   1. Free of burrs and sharp corners and edges.
   2. Sheet metal components shall be steel unless otherwise indicated.
   3. Form and support to prevent warping and sagging.

I. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

J. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
   1. Label shall include the following lamp characteristics:
      a. Include specific lamp type.
      b. Lamp diameter, shape, size, wattage, and coating.
      c. CCT or CRI for all luminaires.

2.2 METAL FINISHES

A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1.

B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.

C. Install lamps in each luminaire.

D. Supports:
   1. Sized and rated for luminaire weight.
   2. Able to maintain luminaire position after cleaning and relamping.
   3. Provide support for luminaire without causing deflection of ceiling or wall.
   4. Luminaire mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and vertical force of 400 percent of luminaire weight.

E. Comply with requirements in Section 26 0519 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

END OF SECTION 26 5119
SECTION 26 56 19 – LED EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Exterior solid-state luminaires that are designed for and exclusively use LED lamp technology.
   2. Luminaire supports.

1.3 DEFINITIONS

A. CCT: Correlated color temperature.
B. CRI: Color rendering index.
C. Fixture: See "Luminaire."
D. IP: International Protection or Ingress Protection Rating.
E. Lumen: Measured output of lamp and luminaire, or both.
F. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
   1. Luminaires.
   2. Structural members to which luminaires will be attached.
   3. Vertical and horizontal information.
B. Qualification Data: For testing laboratory providing photometric data for luminaires.
C. Seismic Qualification Data: For luminaires, accessories, and components, from manufacturer.
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.

3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

D. Product Certificates: For each type of the following:

1. Luminaire.

E. Product Test Reports: For each luminaire, for tests performed by a qualified testing agency.

F. Source quality-control reports.

G. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires to include in operation and maintenance manuals.

1. Provide a list of all lamp types used on Project. Use ANSI and manufacturers’ codes.

2. Provide a list of all photoelectric relay types used on Project; use manufacturers’ codes.

1.6 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturers' laboratory that is accredited under the NVLAP for Energy Efficient Lighting Products.

B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7, accredited under the NVLAP for Energy Efficient Lighting Products and complying with applicable IES testing standards.

C. Provide luminaires from a single manufacturer for each luminaire type.

D. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering prior to shipping.

1.8 FIELD CONDITIONS

A. Verify existing and proposed utility structures prior to the start of work associated with luminaire installation.
B. Mark locations of exterior luminaires for approval by Architect prior to the start of luminaire installation.

1.9 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures, including luminaire support components.
   b. Faulty operation of luminaires and accessories.
   c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Period: 2 year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Seismic Performance: Luminaires and lamps shall be labeled vibration and shock resistant.

1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified and the luminaire will be fully operational during and after the seismic event."

2.2 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. NRTL Compliance: Luminaires shall be listed and labeled for indicated class and division of hazard by an NRTL.

C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

D. UL Compliance: Comply with UL 1598 and listed for wet location.

E. CRI of minimum 70. CCT of 4000 K.

F. L70 lamp life of minimum 50,000 hours.

G. Internal driver.
H. Nominal Operating Voltage: **277 Vac.**

I. In-line Fusing: **On the primary for each luminaire.**

J. Source Limitations: Obtain luminaires from single source from a single manufacturer.

K. Source Limitations: For luminaires, obtain each color, grade, finish, type, and variety of luminaire from single source with resources to provide products of consistent quality in appearance and physical properties.

2.3 LUMINAIRE TYPES

A. Refer to Luminaire schedule on sheet E1.2.

2.4 MATERIALS

A. Metal Parts: Free of burrs and sharp corners and edges.

B. Sheet Metal Components: **Corrosion-resistant aluminum.** Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses.

D. Lens and Refractor Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

E. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.

F. Housings:

1. Rigidly formed, weather- and light-tight enclosure that will not warp, sag, or deform in use.
2. Provide filter/breather for enclosed luminaires.

G. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp characteristics:
   a. "USE ONLY" and include specific lamp type.
   b. Lamp diameter, shape, size, wattage and coating.
   c. CCT and CRI for all luminaires.
2.5 FINISHES

A. Variations in Finishes: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

C. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20 requirements; and seal aluminum surfaces with clear, hard-coat wax.
3. Class I, Clear-Anodic Finish: AA-M32C22A41 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
4. Class I, Color-Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker), complying with AAMA 611.

   a. Color: To be confirmed by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for luminaire electrical conduit to verify actual locations of conduit connections before luminaire installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 TEMPORARY LIGHTING

A. If approved by the Architect, use selected permanent luminaires for temporary lighting. When construction is substantially complete, clean luminaires used for temporary lighting and install new lamps.
3.3 GENERAL INSTALLATION REQUIREMENTS

A. Comply with NECA 1.

B. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

C. Fasten luminaire to structural support.

D. Supports:
   1. Sized and rated for luminaire weight.
   2. Able to maintain luminaire position after cleaning and relamping.
   3. Support luminaires without causing deflection of finished surface.
   4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.


F. Install luminaires level, plumb, and square with finished grade unless otherwise indicated. Install luminaires at height and aiming angle as indicated on Drawings.

G. Coordinate layout and installation of luminaires with other construction.

H. Adjust luminaires that require field adjustment or aiming.

3.4 INSTALLATION OF INDIVIDUAL GROUND-MOUNTED LUMINAIRES

A. Aim as indicated on Drawings.

B. Install on concrete base with top 3'-6” above finished grade or surface at luminaire location. Refer to E1.2 for Pole Base Detail. Cast conduit into base, and finish by troweling and rubbing smooth.

3.5 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

3.6 FIELD QUALITY CONTROL

A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.

B. Perform the following tests and inspections:
   1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
   2. Verify operation of photoelectric controls.

C. Luminaire will be considered defective if it does not pass tests and inspections.
D. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

END OF SECTION 26 56 19