ALSC Architects, P.S.
203 North Washington, Suite 400
Spokane, WA 99201

ADDENDUM NO. 1

The additions, omissions, clarifications and corrections contained herein shall be made to drawings and specifications for the project and shall be included in scope of work and proposals to be submitted. References made below to specifications and drawings shall be used as a general guide only. Bidder shall determine the work affected by Addendum items.

General and Bidding Requirements:

1.	Pre-Bid Meeting	Pre-Bid Meeting notes and sign in sheet attached
2.	Summary of Changes	Summary of Changes for bidder reference. It does not go into the Project Manual. It is simply a reference of the changes made in the frontal documents. It is not a part of the construction documents.

In the Specifications:

1.	**Section 00 30 00** Instruction to Bidders	**REPLACED** section in its entirety. See Summary of Changes for description of changes
2.	**Section 00 60 00** General and Supplementary Conditions	**REPLACED** section in its entirety. See Summary of Changes for description of changes
3.	**Section 00 73 10** Liquidated Damages Checklist	**DELETE** section in its entirety.

4.	**Section 23 09 00** Instrumentation and Control Systems	Section 2.3.F **CHANGED** paragraph to read "All controllers shall have a communication port for connections with the operator interfaces using the LonWorks Data Link/Physical layer protocol." A. Section 2.6.H.6 **CHANGED** paragraph to read "ASHRAE 135 Compliance: Communicate using read (execute and initiate) and write (execute and initiate) property services defined in ASHRAE 135. Reside on network using LonWorks datalink/physical layer protocol and have service communication port for connection to diagnostic terminal unit." B. Section 2.16.A **CHANGED** paragraph to read "Ebtron Model GTC116 or approved equal. Thermal dispersion airflow measurement. UL listed, airflow accuracy +/- 2% of reading, 6063 gold anodized aluminum probe, 304 ss brackets, RS-485 output with LonWorks." 1. Section 2.16.D.10 **CHANGED** paragraph to read "The transmitter shall be provided with two field selectable (0-5/0-10 VDC or 4-20mA), scalable, isolated and over-current protected analog output signals and [select one or both of the following] one isolated RS-485 LonWorks network connection; or one isolated RS-485 LonWorksnetwork connection; or one isolated Ethernet network connection. "
5.	**Section 23 82 16** Air Coils	**ADDED** section in its entirety.
6.	**Section 26 27 26** Wiring Devices	**ADDED** section 2.8 Extra material. **ADDED** sections to 3.01. **ADDED** section 3.02 Identification and 3.03 Field Quality Control.

In the Drawings:

1.	Sheet M-201	**REPLACE** sheet in its entirety.
2.	Sheet ET-110	**REPLACE** sheet in its entirety.
3.	Sheet E-722	**REPLACE** sheet in its entirety.

Department of Enterprise Services
Facilities Division, Engineering & Architectural Services
Meeting Minutes for Pre-Bid Walk-Through

Date: Tuesday, 1-7-20

Project Number:	2019-167	
Project Name:	SCC Lair Remodel	
Location:	Spokane, Washington	
Project Manager:	Gloria Miller	
PM Phone & Email:	509-389-5819	Email: gloria.miller@des.wa.gov

1. Project Team Members

A. Gloria Miller, DES Project Manager

B. Clint Brown, CCS, Director of Capital Construction

C. Dean Wilson, CCS, Construction Coordinator & Owner's On-Site Representative

D. John Nuess, CCS Project Coordinator

E. Jeff Warner, ALSC Architects, Principal

F. Robin Pecka, ALSC Architects (ALSC Primary Contact)

G. Alexandra Gramling, Coffman Engineers, Mechanical Engineer

H. Ricardo Munoz, Coffman Engineers, Electrical Engineer

Note: During the pre-bid walk-through meeting, all conversations are considered informal and are not contractually binding unless stated in the contract manual, drawings, or modified by a written addendum. The order of precedence is written addendum, project manual, and lastly contract drawings.

2. General Description of Scope

A. Site Preparation

1. All work is within Building No. 6, Lair- Student Center

B. Infrastructure Improvements

1. None

C. Project Description was provided during the walk through.

D. Other Issues

1. Permit:
    a. Building Permit fee is paid by Owner, all others by Contractor
    b. Permit is ready for Contractor pick up and the City Building Department.

2. Construction Waste Management Plan, Section 01-74-19

    a. Salvage or recycle as much as economically feasible

    b. Waste Management plan required to be submitted prior to the first application for payment.

3. Construction Site Access and Lay-Down Area

A. Shown on Drawings, (west loading dock area)

B. Staging area is limited. Contractor staging area is located in the loading dock area. Contractor shall leave sufficient clear area for delivery vehicles to access the loading dock.

4. Security Requirements

A. Contractor responsible for securing building if working after Owner's regular hours.

B. ID Badges

1. An ID badge issued by the Owner must be worn and visible at all times.

2. Badges can be obtained at the CCS Facilities office. Contractor to bring photos of staff requiring badges. Background checks are not part of the badging process.

5. Personal Behavior

A. Items: tobacco

1. On campus, smoking is only allowed in designated areas.

B. Respectful conduct

1. At all times

2. Sexual harassment of any kind is cause for removal from the job

6. Work Hours

A. Contractor normal work hours are defined in specification Section 01 11 00 Summary of Work to by 7:00 am to 6:00 pm, Monday through Friday.

B. Advance arrangements required for staying late, coming in early, or working weekends or holidays.

C. Institutional holidays include: MLK Day on January 15, Presidents Day on February 19, and Memorial Day on May 25.

7. Work Operations

A. Contractor and subcontractor (marked or unmarked) vehicles parking in campus parking areas must have purchased parking passes. See https://ccs.nupark.com/portal for parking information. Parking will be on a first come first serve basis.

B. All equipment and materials must be kept within the construction boundary.

C. Delivery procedures will be determined by the Owner's Site Representative.

D. Dumpsters are the responsibility of the contractor and must be kept within the construction staging area.

E. Utility outage must be coordinated with the Owner's site Representative at least 48 hours prior to shut down.

F. The Contractor is required to submit a Safety Plan specific to this project and construction site.

G. Replacement of MZU-5 (Alt. #4) must occur when the building is unoccupied.

H. The cafeteria is available for contractor's employees to use.

8. Other Projects Currently Occurring on Site

A. No other contractors are currently scheduled to be in the building during the time of this work.

9. Project Schedule, Bid Submittal Process, Contracts, etc.

A. Supplemental Bidder Responsibility Criteria to be submitted by low bidder within 2 days of the bid opening.

B. MWBE Requirements

1. See advertisement for voluntary goals

2. DES Diversity Compliance Program will require contractors to confirm payments on the State B2GNow web site.

C. There are no Apprenticeship requirements on this project.

D. Prevailing Wage requirements apply to this project.

E. Updated General Conditions of the Contract and Supplementary General Conditions will be issued by addendum.

F. Schedule

1. Base Bid (and Alternates No. 1, 2 & 3 if accepted) within 112 calendar days, Liquidated damages apply

   If Alternate No. 4, New Rooftop Unit - MZU-5 is accepted Substantial Completion shall be within 147 calendar days

2. Phasing: Phase-2 work shall not proceed until Phase-1 work is Substantially Complete and occupied by Owner.

3. NTP approximately 3 to 4 weeks after bid opening.

10. Bid Opening and Addendum Release:

A. Bid Opening: 3:00 P.M., Tuesday, January 21, 2020

   CCS Esmeralda Center 3939 N. Freya, MA1035 (see attached map)

B. Last day for questions is Tuesday, January 14, 2020

   Submit questions in writing to: Robin Pecka: rpecka@alscarchitects.com

11. Site Walk was conducted after the meeting

CCS Esmeralda Center
3939 N. Freya, Spokane

DES, Facilities Division, Engineering & Architectural Services

2019-167 SCC Lair Remodel

January 7, 2020 Prebid Meeting Sign in Sheet (Please print)

PROJECT NO. 2019-167	PROJECT: SCC Lair Remodel	PURPOSE: Prebid Meeting & Walkthrough	DATE: 1/7/2020
NAME	ORGANIZATION & POSITION	E-MAIL ADDRESS	PHONE/CELL NUMBER
JEFF WARNER	ALSC ARCHITECTS	jwarner@alscarchitects.com	(T) 838-8568 (C)
SAM RYKKEN + JOHN LIDENOW	SWINERTON	SRYKKEN@SWINERTON.COM	(T) 509 818 6983 (C)
KEEN MEEKS	DARDAN Enterprises	keen@dardanine.com	(T) 208 773 5418 (C)
HAC OPHUS	MJ TAKISAKI	ophus@takisaki.com	(T) 509.244.7080 (C)
ALEX GRAMLING & RICARDO MUNOZ	COFFMAN	alexandra.gramling@coffman.com ricardo.munoz@coffman.com	(T) 509.328.2994 (C)
Roy A. Wargi	AirTech Mechanical	con@airtechme.com	(T) 1-208-972-6096 (C) 1-208-661-2130
David McPherson ANDREW McPherson	DMCPC	david@dmcpc.com	(T) 509-951-1997 (C) 760 468 8891
Frank Lukas	MT STATES Electric	frank@mtnst.com	(T) 509-510-0110 (C) 509 710-0030
			(T) (C)

DES, Facilities Division, Engineering & Architectural Services
2019-167 SCC Lair Remodel

January 7, 2020 Prebid Meeting Sign in Sheet (Please print)

PROJECT NO. 2019-167	PROJECT: SCC Lair Remodel	PURPOSE: Prebid Meeting & Walkthrough	DATE: 1/7/2020
NAME	ORGANIZATION & POSITION	E-MAIL ADDRESS	PHONE/CELL NUMBER
Dave Stephenson	CSN	dave.stephenson@controlsolutionsNW.com	(T) 509-892-1121 (C) 509-981-0904
Jeremy Addington	J. Addington GC.	jeremy@j-addington.com	(T) 208-765-5000 (C)
Randy Gayler	J. Addington G.C.	randyg@j-addington.com	(T) 208-765-5000 (C)
Gloria Miller	DES	gloria.miller@des.wa.gov	(T) (C) 509-389-5819
Maynard Davis	Western Steam Corp	WSC@Air-pipe.com	(T) 509-892-0600 (C)
Chris Peterson	Conley Electric Inc	conley-electric@windwireless.net	(T) (C) 509-993-5204
David Battaglia	MNAC Construction	david.battaglia@macinc.com	(T) (C) 208-635-5400
Ben Glass	Arc Electric	Ben@Arcelectriccorp.com	(T) (C) 509-688-5266
Joseph Sokil	ARC Electric	joseph@arcelectriccorp.com	(T) (C) 509-979-9935

DES, Facilities Division, Engineering & Architectural Services
2019-167 SCC Lair Remodel

January 7, 2020 Prebid Meeting Sign in Sheet (Please print)

PROJECT NO. 2019-167	PROJECT: SCC Lair Remodel	PURPOSE: Prebid Meeting & Walkthrough	DATE: 1/7/2020
NAME	ORGANIZATION & POSITION	E-MAIL ADDRESS	PHONE/CELL NUMBER
BRIAN BELL	JACKSON CONTRACTOR GROUP	brianb@jacksoncontractorgroup.com	(T) 504-992-2531 (C)
John Ness	CCS		(T) 509 714 8679 (C)
DEAN WILSON	CCS	dean.wilson@ccs.spokane.edu	(T) (509) 533-4813 (C) (509) 850-8797
			(T) (C)
			(T) (C)
			(T) (C)
			(T) (C)
			(T) (C)
			(T) (C)

Summary of Changes

In an effort to improve the readability, overall effectiveness and understanding as well as respond changes to statute, Facility Professional Services has made the following changes to the Instructions to Bidders, General and Supplemental Conditions, collectively known as the *Construction Manual*.

Theses changes will eliminate the entirety of the Supplemental Conditions.

Updated, replaced in the Instructions to Bidders

The following sections in the Instruction to Bidders have been updated.

- **0.00.D.1**- Replaced references to B2GNow and/or DES Diversity Compliance System with DES Public Work Diversity Tracking & Management System powered by B2GNow.
- **0.00.D.2**- Replaced references to B2GNow and/or DES Diversity Compliance System with DES Public Work Diversity Tracking & Management System.
- **0.00.D.3**- Replaced references to B2GNow and/or DES Diversity Compliance System with DES Public Work Diversity Tracking & Management System. Replaced possessive language (i.e. "your contract", "You must") with the contract, the Contractor.
- **0.00.E** - Updated entire section to reflect changes in RCW 39.04.320.

Replaced Directly from Supplemental into General Conditions

The following sections in the General Conditions were previously REPLACED by a section in the Supplemental Conditions. The language that currently appears in Supplemental Conditions has been implanted with no change into the corresponding section in the General Conditions.

- Section 2.02 – INSURANCE COVERAGE LIMITS and CERTIFICATES
- Section 2.04 - PAYMENT AND PERFORMANCE BONDS
- Section 3.02.B – CONSTRUCTION SCHEDULE
- Section 5.01.B - CONTRACTOR CONTROL AND SUPERVISION
- Section 5.01.D - CONTRACTOR CONTROL AND SUPERVISION
- Section 5.02.B – PERMITS, FEES AND NOTICES
- Section 5.04.A – PREVAILING WAGES
- Section 5.06.A – NONDISCRIMNATION
- Section 5.07.A – SAFETY PRECAUTIONS
- Section 5.20.B – SUBCONTACTORS AND SUPPLIERS
- Section 7.02.B.7.c – CHANGES IN THE CONTRACT SUM, Change Order Pricing – Fixed Price, Components of Increased Cost

Added to General Conditions for Supplemental Conditions

The following sections in the Supplemental Conditions previously ADDED a new section to the General Conditions. The language that currently appears in Supplemental Conditions has been implanted with no change into the corresponding section in the General Conditions.

- Section 5.02.D – PERMITS, FEES, AND NOTICES
- Section 5.20.A.6 – SUBCONTRACTORS AND SUPPLIERS

- Section 10.13 – SPECIAL CONDITIONS

Updated to meet statutory, policy, or procedural requirements

Section 5.04.G – Certified Payroll

This section is currently replaced in the General Conditions by the same section in the Supplemental Conditions and reads as follows:

> 5.04.G. Certified Payrolls: Consistent with WAC 296-127-320, the Contractor and any subcontractor shall submit a certified copy of payroll records if requested. If applicable, the Contractor shall comply with all Federal Funding requirements of the Davis Bacon Act that will be addressed in a separate "DIVISION 00 SPECIAL CONDITIONS" specification section that will be based on the specific requirements of the funding source.

This section will now appear as Section 5.04.G and Section 5.04.H. in the General Conditions.

> 5.04.G. Certified Payrolls: Consistent with RCW 39.12.120, contractors, subcontractors, or employers shall keep accurate payroll records for three years from the date of acceptance of the project and file a copy of its certified payroll records using the Department of Labor and Industries' online system at least once per month. If the Department of Labor and Industries' online system is not used, a contractor, subcontractor, or employer shall file a copy of its certified payroll records directly with the Department of Labor and Industries in a format approved by the Department of Labor and Industries at least once per month. A contractor, subcontractor, or employer's noncompliance with this section constitutes a violation of RCW 39.12.050.
>
> 5.04.H Compliance with Federal Funding requirements: If applicable, the Contractor shall comply with all Federal Funding requirements of the Davis Bacon Act that will be addressed in a separate "DIVISION 00 SPECIAL CONDITIONS" specification section that will be based on the specific requirements of the funding source.

Section 10.11 – DIVERSE BUSINESS INCLUSION PARTICIPATION

This section is currently added to the General Conditions as a new section via the Supplemental Conditions and reads as follows:

> Section 10.11 – DIVERSE BUSINESS PARTICPATION
>
> The state of Washington encourages participation in all of its contracts by Diverse Businesses as found in RCW Chapters 39, 43, and WAC 326. The voluntary Diverse Business goal of 26%, which is an aggregate of: 10% Minority Business Enterprises (MBE), 6% Women Business Enterprises (WBE), 5% Veteran-owned Business, and 5% Washington Small Businesses self-identified in the Washington Electronic Business Solution (WEBS) http://www.des.wa.gov/services/ContractingPurchasing/Business/Pages/WEBSRegistration.aspx . Contractors are encouraged to meet or exceed the project goals in the advertisement by any level of participation, regardless of category.
>
> DES reserves the right to adjust the voluntary participation goals.

Businesses are encouraged to register in WEBS, as well as registering as a state certified M/WBE/Veteran Business.

For reporting, Contractor is required to register and create an account in the DES Diversity Compliance Program (B2GNow) at https://des.diversitycompliance.com/.

Every month for the duration of your contract, and while your contract is active in the B2Gnow system, submit and accurately maintain the following information through B2Gnow:

a. Payments received by the prime contractor from the Agency

b. Payments paid to each first tier subcontractor

c. Payments paid to each first tier supplier

You must also ensure the following information is reported in the B2Gnow system by your first tier subcontractors and suppliers for the duration of your contract:

a. Confirmation of payments from the prime contractor to the first tier subcontractor
b. Confirmation of payments from the prime contractor to first tier suppliers

This section will appear in the General Conditions as Section 10.11 and read as follows:

Section 10.11 – DIVERSE BUSINESS PARTICPATION

The state of Washington encourages participation in all of its contracts by Diverse Businesses as found in RCW Chapters 39, 43, and WAC 326. The voluntary Diverse Business goal of 26%, which is an aggregate of: 10% Minority Business Enterprises (MBE), 6% Women Business Enterprises (WBE), 5% Veteran-owned Business, and 5% Washington Small Businesses self-identified in the Washington Electronic Business Solution (WEBS). Contractors are encouraged to meet or exceed the project goals in the advertisement by any level of participation, regardless of category.

DES reserves the right to adjust the voluntary participation goals.

Businesses are encouraged to register in WEBS, as well as registering as a state certified M/WBE/Veteran Business.

For reporting, Contractor is required to register and create an account in the DES Public Works Diversity Tracking & Management System powered by B2GNow.

Every month for the duration of the contract, and while the contract is active in the DES Public Works Diversity Tracking & Management System, Contractor shall submit and accurately maintain the following information:

1. Payments received by the prime contractor from the Agency

2. Payments paid to each first tier subcontractor

3. Payments paid to each first tier supplier

Contractor shall also ensure the following information is reported in the DES Public Works Diversity Tracking & Management System by the first tier subcontractors and suppliers for the duration of your contract:

1. Confirmation of payments from the prime contractor to the first tier subcontractor

2. Confirmation of payments from the prime contractor to first tier suppliers

---

Section 10.12 – MINIMUM APPRENTICESHIP PARTICAPTION

This section is currently added to the General Conditions as a new section via the Supplemental Conditions and reads as follows:

10.12 MINIMUM APPRENTICESHIP PARTICAPTION

In accordance with RCW 39.04.320, the State of Washington requires 15% apprenticeship participation for projects estimated to cost one million dollars or more.

A. Apprentice participation, under this contract, may be counted towards the required percentage (%) only if the apprentices are from an apprenticeship program registered and approved by the Washington State Apprenticeship and Training Council (RCW 49.04 and WAC 296-05).

B. Bidders may contact the Department of Labor and Industries, Specialty Compliance Services Division, Apprenticeship Section, P.O. Box 44530, Olympia, WA 98504-4530 by phone at (360) 902-5320, and e-mail at Apprentice@Lni.wa.gov, to obtain information on available apprenticeship programs.

C. For each project that has apprentice requirements, the contractor shall submit a "Statement of Apprentice and Journeyman Participation" on forms provided by the Department of Enterprise Services, with every request for progress payment. The Contractor shall submit consolidated and cumulative data collected by the Contractor and collected from all subcontractors by the Contractor. The data to be collected and submitted includes the following:

1. Contractor name and address
2. Contract number
3. Project name
4. Contract value
5. Reporting period "Beginning Date" through "End Date"
6. Name and registration number of each apprentice by contractor
7. Total number of apprentices and labor hours worked by them, categorized by trade or craft
8. Total number of journeymen and labor hours worked by them, categorized by trade or craft
9. Cumulative combined total of apprentice and journeymen labor hours

10. Total percentage of apprentice hours worked

D. No changes to the required percentage (%) of apprentice participation shall be allowed without written approval of the Owner. In any request for the change, the Contractor shall clearly demonstrate a good faith effort to comply with the requirements for apprentice participation.

E. Any substantive violation of the mandatory requirements of this part of the contract may be a material breach of the contract by the Contractor. The Owner may withhold payment pursuant to Part 6.05, stop the work for cause pursuant to Part 3.04, and terminate the contract for cause pursuant to Part 9.01.

This section will appear in the General Conditions as Section 10.12 and read as follows:

10.12 MINIMUM APPRENTICESHIP PARTICAPTION

In accordance with RCW 39.04.320, the State of Washington requires 15% apprenticeship participation for projects estimated to cost one million dollars or more. Contractors who meet or exceed minimum participation requirement are eligible for monetary incentive. Contractors failing to meet minimum apprenticeship participation requirement are subject to monetary penalty.

A. Apprentice participation, under this contract, may be counted towards the required percentage (%) only if the apprentices are from an apprenticeship program registered and approved by the Washington State Apprenticeship and Training Council (RCW 49.04 and WAC 296-05).

B. Bidders may contact the Department of Labor and Industries to obtain more information about apprenticeship programs.

C. No changes to the required percentage (%) of apprentice participation shall be allowed without written approval of the Owner. In any request for the change, the Contractor shall clearly demonstrate a good faith effort to comply with the requirements for apprentice participation.

D. Any substantive violation of the mandatory requirements of this part of the contract may be a material breach of the contract by the Contractor. The Owner may withhold payment pursuant to Part 6.05, stop the work for cause pursuant to Part 3.04, and terminate the contract for cause pursuant to Part 9.01.

Instructions to Bidders – January 1, 2020

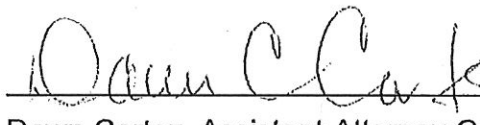
General Conditions – January 1, 2020

For Washington State Facility Construction

Effective: January 1, 2020

Approved by:

William J. Frare, Assistant Director
Facilities Professional Services



Dawn Cortez, Assistant Attorney General
Washington State Office of the Attorney General

Washington State Department of
Enterprise Services

Facility Professional Services, Engineering & Architectural Services
PO Box 41476
Olympia, Washington 98504-1476
(360) 902-7272

INSTRUCTIONS TO BIDDERS
FOR WASHINGTON STATE FACILITIES CONSTRUCTION
January 1, 2020

PART 0 – GENERAL CONDITIONS

0.00 EXPLANATION TO PROSPECTIVE BIDDERS

A. In accordance with RCW 39.04.380 effective *March 30, 2012*, the State of Washington is enforcing a **Reciprocal Preference for Resident Contractors**. Any public works bid received from a nonresident contractor from a state that provides an in-state percentage bidding preference, a comparable percentage disadvantage must be applied to the bid of that nonresident contractor.

A nonresident contractor from a state that provides a percentage bid preference means a contractor that:

1. Is from a state that provides a percentage bid preference to its resident contractors bidding on public works contracts.

2. At the time of bidding on a public works project, does not have a physical office located in Washington.

The state of residence for a nonresident contractor is the state in which the contractor was incorporated or, if not a corporation, the state where the contractor's business entity was formed.

All nonresident contractors will be evaluated for out-of-state Bidder preference. If the state of the nonresident contractor provides an in-state contractor preference, a comparable percentage disadvantage will be applied to their bid prior to contract award.

This section does not apply to public works procured pursuant to RCW 39.04.155, 39.04.280, or any other procurement exempt from competitive bidding.

B. Any prospective Bidder desiring an explanation or interpretation of the solicitation, drawings, specifications, etc., must submit a request in writing to the Architect/Engineer (A/E) seven (7) calendar days before the bid due date. Oral explanations or instructions given before the award of a contract will not be binding. Any information given a prospective Bidder concerning a solicitation will be furnished promptly to all other prospective Bidders by addendum to the solicitation, if that information is necessary in submitting bids or if the lack of it would be prejudicial to other prospective Bidders.

C. In accordance with the legislative findings and policies set forth in RCW 39.19 the State of Washington encourages participation in all of its contracts by MWBE firms certified by the Office of Minority and Women's Business Enterprises (OMWBE). Participation may be either on a direct basis in response to this invitation or as a subcontractor to a Bidder. However, unless required by federal statutes, regulations, grants, or contract terms referenced in the contract documents, no preference will be included in the evaluation of bids, no minimum level of MWBE participation shall be required as a condition for receiving an award, and bids will not be rejected or considered non-responsive on that basis. Any affirmative action requirements set forth in federal regulations or statutes included or referenced in the contract documents will apply.

D. The State of Washington encourages participation in all of its contracts by Veteran-owned businesses (defined in RCW 43.60A.010) and located at

http://www.dva.wa.gov/program/certified-veteran-and-servicemember-owned-businesses and Small, Mini and Micro businesses (defined in RCW 39.26.010) which have registered in WEBS at https://pr-webs-vendor.des.wa.gov/

1. In order to report payment detail, the Contractor must create an account in the DES Public Works Diversity Tracking & Management System powered by B2GNow or verify if an account has already been created on behalf of the Contractor: https://des.diversitycompliance.com. The DES Public Works Diversity Tracking & Management System is designed to streamline and automate compliance reporting requirements, empowering vendors to maintain accurate contact information and submit contract payment details online.

2. For account login or account creation details, go to the DES Public Works Diversity Tracking & Management System home page by clicking on the URL listed above and clicking on Information for Vendors.

3. Every month for the duration of the contract, and while the contract is active in the DES Public Works Diversity Tracking & Management System, submit and accurately maintain the following payment information through the DES Public Works Diversity Tracking & Management System:

   (a) Payments received by the prime contractor from the Agency
   (b) Payments paid to each first tier subcontractor
   (c) Payments paid to each first tier supplier

4. The Contractor must also ensure the following information is reported in the DES Public Works Diversity Tracking & Management System by first tier subcontractors and suppliers for the duration of the contract:

   (a) Confirmation of payments from the prime contractor to the subcontractor
   (b) Payment reporting to each supplier

E. In accordance with RCW 39.04.320, for all public works estimated to cost one million dollars or more, the State of Washington requires no less than **15% of the labor hours be performed by apprentices.** A contractor or subcontractor may not be required to exceed the 15% requirement. On applicable projects, the bid advertisement and Bid Form shall establish a minimum required percentage of apprentice labor hours compared to the total labor hours.

1. **Incentives** - The Contractor who meets or exceeds this utilization requirement on eligible contracts, will be awarded a monetary incentive described in the Apprentice Utilization Requirements section of the Bid Form.

2. **Penalties** - The Contractor who fails to meet the utilization requirement and fails to demonstrate a Good Faith Effort, as outlined below, is subject to penalties described in the Apprentice Utilization Requirements section of the contract Bid Form. Contractor will receive an invoice payable to the Owner within 30 days.

3. **Cost Value** - The expected cost value associated with meeting the goal is included in the Base Bid as described on the Bid Form.

4. **Utilization Plan** - The Contractor shall provide an **Apprentice Utilization Plan** (Plan) demonstrating how and when they intend to achieve the Apprenticeship Utilization Requirement. The Plan shall have enough information to track the Contractor's progress in meeting the utilization requirement. The Contractor shall submit the Plan on the Apprentice Utilization Plan template (on the DES Public Works Forms website)

within 30 days of Notice to Proceed of the contract and prior to submitting the first invoice. The Contractor shall provide an updated Plan during the course of construction when there are significant changes to the Plan which may affect their ability to meet the requirement.

(a) The Plan shall be uploaded to the Department of Labor & Industries' (L&I) ***Prevailing Wage Intents and Affidavit (PWIA) system on L&I's website.***

(b) The Plan is not submitted for approval.

(c) It is expected that the Contractor will actively seek out opportunities to meet the Apprentice Utilization Requirement during construction even if the Plan indicates a shortfall in meeting the requirement.

(d) If the Plan indicates that the Contractor will not attain the Apprentice Utilization Requirement, then Contractor must submit "Good Faith Effort" (GFE) documentation with their Plan to L&I's PWIA system.

5. **Good Faith Effort (GFE)**

(a) Good Faith Effort (GFE) documentation shall describe in detail why the Contractor is not or was not able to attain the Apprentice Utilization Requirement.

1. Contractors may submit Good Faith Effort (GFE) documentation at any time during the construction.

2. All GFE documentation must be submitted no later than 30 days before substantial completion.

(b) Good Faith Effort (GFE) documentation must be in signed letter format uploaded to the PWIA system and include:

1. The contract number, title and the apprentice utilization requirements,

2. The amount of apprentice labor hours the contract can or did attain along with the percentage of labor hours,

3. Contractors may receive a GFE credit for graduated Apprentice hours through the end of the calendar year for all projects worked on as long as the Apprentice remains continuously employed with the same Contractor they were working for when they graduated. If an Apprentice graduates during employment on a project of significant duration, they may be counted towards a GFE credit for up to one year after their graduation or until the end of the project (whichever comes first). Determination of whether or not Contract requirements were met in good faith will be made by subtracting the hours from the journeyman total reported hours for the project and adding them to the apprentice hour total. If the new utilization percentage meets the Contract requirement, the Contractor will be reported as meeting the requirement in good faith,

4. Anticipated or actual shortfall (in apprentice labor hours and percentage) and the reason(s) for not attaining the required apprentice labor hours,

5. Information from one or more of the following areas:

(a) Names of any State-Approved Apprentice Training Programs contacted with the name(s) of person(s) contacted and dates of contacts, and a copy of each response from the Training Program(s),

(b) Reference Contract Specifications or documents that affected the Contractor's ability to attain apprentice utilization,

(c) Discuss efforts the Contractor has taken to require Subcontractors to solicit and employ apprentices,

6. Backup documentation to the letter consisting of the following:

Letters, emails, phone logs including names dates and outcomes, posters, photos, payrolls, time cards, schedules, copies or references to other contract specifications or documents.

Additional Resource Information

(a) For questions regarding how to complete the Apprentice Utilization Plan template or Good Faith Effort documentation, please contact the Project Manager listed in the Bid Advertisement.

(b) Step-by-step instructions on how to access and navigate the L&I's PWIA system, including uploading required documents can be found on the L&I website.

(c) Additional information about apprentice utilization on Public Works Project can be found on the L&I website.

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C. If the solicitation includes alternate bid items, failure to bid on the alternates may disqualify the bid. If bidding on all items is not required, Bidders should insert the words "no bid" in the space provided for any item on which no price is submitted.

D. Substitute bid forms will not be considered unless this solicitation authorizes their submission

0.02 BID GUARNTEE

A. When the sum of the base bid plus all additive bid alternates is $35,000.00 or less, bid security is not required.

When the sum of the base bid plus all additive alternates is greater than $35,000.00, a bid guarantee in the amount of 5% of the base bid amount is required. Failure of the Bidder to provide bid guarantee when required shall render the bid non-responsive.

B. Acceptable forms of bid guarantee are: A bid bond or postal money order, or certified check or cashier's check made payable to the Washington State Treasurer.

The Owner will return bid guarantees (other than bid bond) to unsuccessful Bidders as soon as practicable, but not sooner than the execution of a contract with the successful Bidder. The successful Bidder's bid guarantee will be returned to the successful Bidder with its official notice to proceed with the work of the contract.

C. The Bidder will allow 60 days from bid opening date for acceptance of its bid by the Owner.

The Bidder will return to the Owner a signed contract, insurance certificate and bond or bond waiver within 15 days after receipt of the contract. If the apparent successful Bidder fails to sign all contractual documents or provide the bond and insurance as required or return the documents within 15 days after receipt of the contract, the Owner may terminate the award of the contract.

D. In the event a Bidder discovers an error in its bid following the bid opening, the Bidder may request to withdraw its bid under the following conditions:

1. Written notification is received by the Owner within 24 hours following bid opening.

2. The Bidder provides written documentation of the claimed error to the satisfaction of the Owner within 72 hours following the bid opening.

3. The Owner will approve or disapprove the request for withdrawal of the bid in writing. If the Bidder's request for withdrawal of its bid is approved, the Bidder will be released from further obligation to the Owner without penalty. If it is disapproved, the Owner may retain the Bidder's bid guarantee.

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The low Bidder, for purposes of award, shall be the responsive Bidder offering the low aggregate amount for the base bid item, plus additive or deductive bid alternates selected by the Owner, and within funds available for the project.

The Bidder agrees to hold all bid alternate prices for sixty (60) days from date of bid opening.

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Bidders shall acknowledge receipt of all addenda to this solicitation by identifying the addenda numbers in the space provided for this purpose on the Bid Form. Failure to do so may result in the bid being declared non-responsive.

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The Bidder acknowledges that it has taken steps 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, including but not limited to; (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and road; (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during the work. The Bidder also acknowledges that it has satisfied itself as to 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 exploratory work done by the Owner, as well as from the drawings and specifications made a part of this contract. Any failure of the

Bidder to take the actions described and acknowledged in this paragraph will not relieve the Bidder from responsibility for estimating properly the difficulty and cost of successfully performing the work.

0.06 BID AMOUNTS

A. The bid prices shown for each item on the Bid Form shall include all labor, material, equipment, overhead and compensation to complete all of the work for that item.

B. The actual cost of building permit (only) and the public utility hookup fees will be a direct reimbursement to the Contractor or paid directly to the permitting agency by the Owner. Fees for these permits should not be included by the Bidder in the bid amount.

C. The Bidder agrees to hold the base bid prices for sixty (60) days from date of bid opening.

0.07 TAXES

The bid amounts shall not include Washington State Sales Tax (WSST). All other taxes imposed by law shall be included in the bid amount. The Owner will include WSST in progress payments. The Contractor shall pay the WSST to the Department of Revenue and shall furnish proof of payment to the Owner if requested.

[NOTE: Contractor must bond for contract amount plus the WSST.]

0.08 SUBMISSION OF BIDS

A. Bids must be submitted on or before the time specified in the Advertisement for Bids.

B. Subcontractor Listing: If the base bid and the sum of the additive alternates is one million dollars or more, the Bid Form shall comply with the following requirements:

1. Pursuant to RCW 39.30.060, if the base bid and the sum of the additive alternates is one million dollars or more, the Bidder shall provide names of the Subcontractors with whom the Bidder will subcontract for performance of heating, ventilation and air conditioning (HVAC), plumbing, and electrical.

2. The Bidder can name itself for the performance of the work.

3. The Bidder shall not list more than one Subcontractor for each category of work identified UNLESS Subcontractors vary with bid alternates, in which case the Bidder must indicate which Subcontractor will be used for which alternate.

4. Failure of the Bidder to submit as part of the bid the NAMES of such Subcontractors or to name itself to perform such work shall render the Bidder's bid nonresponsive and, therefore, void.

C. The Bid Form shall be submitted in a sealed envelope addressed to the office specified in the Advertisement for Bids. The envelope shall have printed on the outside:

1. The project number and description.
2. The name and address of the Bidder.
3. Identification as Bid Form.

D. Prior to the bid opening, the Owner’s representative will designate the official bid clock. Any part of the Bid Form, or in the rare situation of a bid modification, not received prior to the

times specified, per the designated bid clock, will not be considered and the bid will be returned to the Bidder unopened.

E. A bid may be withdrawn in person by a Bidder's authorized representative before the opening of the bids. Bidder(s) representative will be required to show ID and sign on bid summary sheet before it will be released.

F. People with disabilities who wish to request special accommodation, (e.g., sign language interpreters, braille, etc.) need to contact the Owner ten (10) working days prior to the scheduled bid opening.

0.09 BID RESULTS

After the Bid Opening, Bidders may obtain bid results from the office of E&AS by calling (360) 902-7272 or by logging on to E&AS' web site: https://apps.des.wa.gov/EASbids/BidResult.aspx. Bid results may also be obtained from the A/E.

0.10 LOW RESPONSIBLE BIDDER

A. **Mandatory Responsibility Criteria:** Before award of a public works contract, a Bidder must meet the following mandatory responsibility criteria under RCW 39.04.350 (1) & (2) to be considered a responsible Bidder and qualified to be awarded a public works project. The Bidder must:

1. At the time of bid submittal, have a certificate of registration in compliance with RCW 18.27;

2. Have a current state unified business identifier number;

3. If applicable, have industrial insurance coverage for the Bidder's employees working in Washington as required in RCW 51; an employment security department number as required in RCW 50; and a state excise tax registration number as required in RCW 82;

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

5. If bidding on a public works 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 RCW 49.04 for the one-year period immediately preceding the date of the bid solicitation;

6. Public Works and Prevailing Wage Training/Exemption. Bidders shall have received training on the requirements related to public works and prevailing wage under this chapter and chapter 39.12 RCW. The bidder must designate a person or persons to be trained on these requirements. The training must be provided by the department of labor and industries or by a training provider whose curriculum is approved by the department. The department, in consultation with the prevailing wage advisory committee, must determine the length of the training. Bidders that have completed three or more public works projects and have had a valid business license in Washington for three or more years are exempt from this subsection. The department of labor and industries must keep records of entities that have satisfied the training requirement or are exempt and make the records available on its website. Responsible parties may rely on the records made available by the department regarding satisfaction of the training requirement or

exemption. https://lni.wa.gov/licensing-permits/public-works-projects/contractors-employers/contractor-training

7. 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 Department of Labor and Industries or through a civil judgement entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW 49.48.082, any provision of RCW 49.46, 49.48, or 49.52. A bidder shall submit a signed Contractor Certification form with the bid or within two (2) business days of request by Owner regarding this wage theft prevention responsible bidder criteria.

B. **Supplemental Responsibility Criteria**: In addition to the mandatory Bidder responsibility, the Owner may adopt relevant supplemental criteria for determining Bidder responsibility applicable to a particular project which the Bidder must meet (RCW 39.04.350 (3)).

1. If applicable, the Owner shall consider an overall accounting of the attached supplemental criteria for determining Bidder responsibility "DIVISION 00 SUPPLEMENTAL RESPONSIBILITY CRITERIA".

2. At least seven (7) days prior to the bid submittal deadline, a potential Bidder may request that the Owner modify the supplemental responsibility criteria. The Owner will evaluate the information submitted by the potential Bidder and respond before the bid submittal deadline. If the evaluation results in a change of the criteria, the Owner will issue an addendum to the bidding documents identifying the new criteria.

3. Upon Owner's request, the apparent low Bidder must supply the requested responsibility information within two (2) business days of request by Owner. Withholding information or failure to submit all the information requested within the time provided may render the bid non-responsive

4. If the Owner determines that the apparent low Bidder is not responsible, the Owner will notify the Bidder of its preliminary determination in writing.

5. Within three (3) days after receipt of the preliminary determination, the Bidder may withdraw its bid or request a hearing where the Bidder may appeal the preliminary determination and present additional information to the Owner.

6. The Owner will schedule a hearing within three (3) working days of receipt of the Bidder's request. The hearing members will include a Client Agency Representative, EAS Assistant Director or designee, Deputy Assistant Director or designee, and Project Manager.

7. The Owner will issue a Final Determination after reviewing information presented at the hearing.

8. If the Owner determines a Bidder to be not responsible, the Owner will provide, in writing, the reasons for the 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 (2) business days after the Bidder determined to be not responsible has received the final determination.

9. The Owner's Final Determination is specific to this project, and will have no effect on other or future projects.

0.11 CONTRACT AWARD

A. The Owner will evaluate bids responsiveness and responsibility.

1. A bid will be considered responsive if it meets the following requirements:

(a) It is received at the proper time and place.

(b) It meets the stated requirements of the Bid Form.

(c) It is submitted by a licensed/registered contractor within the state of Washington at the time of bid opening and is not banned from bidding by the Department of Labor and Industries,

(d) It is accompanied by a bid guarantee, if required.

2. A bid will be considered responsible if it meets the following requirements:

(a) It meets the mandatory responsibility criteria established in RCW 39.04.350 and an overall accounting of the supplemental responsibility criteria established for the project.

(b) The bidder completes, signs, and submits the "Contractor Certification Wage Theft Prevention – Responsible Bidder Criteria" form **with their bid or within two (2) business days of request by the Owner.**

B. The Owner reserves the right to accept or reject any or all bids and to waive informalities.

C. The Owner may negotiate bid price adjustments with the low responsive Bidder, including changes in the contract documents, to bring the bid within the available funding per RCW 39.04.015.

D. The apparent low Bidder, for purpose of award, shall be the responsive and responsible Bidder offering the low aggregate amount for the base bid plus selected additive or deductive bid alternates and meeting all other bid submittal requirements.

E. **Reciprocal Preference for Resident Contractors.** 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 in-state contractor percent advantage provided by the contractor's home state.

For the purpose of determining the successful Bidder, 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 which equates to the Nonresident Disadvantage Total. The Nonresident Disadvantage Total shall be compared to the Washington contractor bid amounts. The Bidder with the lowest total shall be the successful Bidder. See example below:

EXAMPLE:

Alaska Nonresident Contractor Bid Amount	$100,000
Multiplied by the Alaska CPD	x 0.05
Alaska CPD Total	$ 5,000
Alaska Nonresident Contractor Bid Amount	$100,000

Alaska CPD Total	$ 5,000
Nonresident Disadvantage Total	$105,000*

* Note – If the Nonresident Disadvantage Total is lower than all other Washington contractor bid amounts, the Alaska Nonresident Contractor is the successful Bidder and will be awarded a contract for the bid amount of $100,000.

If the Nonresident Disadvantage Total is higher than a Washington contractor bid amount, the successful Washington Bidder will be awarded a contract for the bid amount.

F. The Contract will only become effective when signed by the Owner. Prior to the Owner's signature, any and all costs incurred shall be the sole responsibility of the Bidder.

0.12 DOCUMENTS (ATTACHED)

A. Advertisement for Bids
B. Bid Form
C. Supplemental Bidder Responsibility Criteria (if applicable)
D. Certificate of Insurance form
E. Special Conditions (if applicable)

Note: AIA Payment Bond and Performance Bond current forms (A312) are required, when applicable. These forms will not be provided by the Owner.

Instructions to Bidders – January 1, 2020

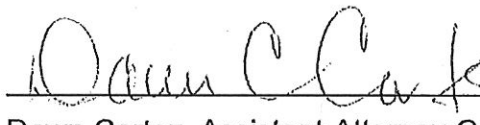
General Conditions – January 1, 2020

For Washington State Facility Construction

Effective: January 1, 2020

Approved by:

William J. Frare, Assistant Director
Facilities Professional Services



Dawn Cortez, Assistant Attorney General
Washington State Office of the Attorney General

Washington State Department of
Enterprise Services

Facility Professional Services, Engineering & Architectural Services
PO Box 41476
Olympia, Washington 98504-1476
(360) 902-7272

INSTRUCTIONS TO BIDDERS
FOR WASHINGTON STATE FACILITIES CONSTRUCTION
January 1, 2020

PART 0 – GENERAL CONDITIONS

0.00 EXPLANATION TO PROSPECTIVE BIDDERS

A. In accordance with RCW 39.04.380 effective *March 30, 2012*, the State of Washington is enforcing a **Reciprocal Preference for Resident Contractors**. Any public works bid received from a nonresident contractor from a state that provides an in-state percentage bidding preference, a comparable percentage disadvantage must be applied to the bid of that nonresident contractor.

A nonresident contractor from a state that provides a percentage bid preference means a contractor that:

1. Is from a state that provides a percentage bid preference to its resident contractors bidding on public works contracts.

2. At the time of bidding on a public works project, does not have a physical office located in Washington.

The state of residence for a nonresident contractor is the state in which the contractor was incorporated or, if not a corporation, the state where the contractor's business entity was formed.

All nonresident contractors will be evaluated for out-of-state Bidder preference. If the state of the nonresident contractor provides an in-state contractor preference, a comparable percentage disadvantage will be applied to their bid prior to contract award.

This section does not apply to public works procured pursuant to RCW 39.04.155, 39.04.280, or any other procurement exempt from competitive bidding.

B. Any prospective Bidder desiring an explanation or interpretation of the solicitation, drawings, specifications, etc., must submit a request in writing to the Architect/Engineer (A/E) seven (7) calendar days before the bid due date. Oral explanations or instructions given before the award of a contract will not be binding. Any information given a prospective Bidder concerning a solicitation will be furnished promptly to all other prospective Bidders by addendum to the solicitation, if that information is necessary in submitting bids or if the lack of it would be prejudicial to other prospective Bidders.

C. In accordance with the legislative findings and policies set forth in RCW 39.19 the State of Washington encourages participation in all of its contracts by MWBE firms certified by the Office of Minority and Women's Business Enterprises (OMWBE). Participation may be either on a direct basis in response to this invitation or as a subcontractor to a Bidder. However, unless required by federal statutes, regulations, grants, or contract terms referenced in the contract documents, no preference will be included in the evaluation of bids, no minimum level of MWBE participation shall be required as a condition for receiving an award, and bids will not be rejected or considered non-responsive on that basis. Any affirmative action requirements set forth in federal regulations or statutes included or referenced in the contract documents will apply.

D. The State of Washington encourages participation in all of its contracts by Veteran-owned businesses (defined in RCW 43.60A.010) and located at

http://www.dva.wa.gov/program/certified-veteran-and-servicemember-owned-businesses and Small, Mini and Micro businesses (defined in RCW 39.26.010) which have registered in WEBS at https://pr-webs-vendor.des.wa.gov/

1. In order to report payment detail, the Contractor must create an account in the DES Public Works Diversity Tracking & Management System powered by B2GNow or verify if an account has already been created on behalf of the Contractor: https://des.diversitycompliance.com. The DES Public Works Diversity Tracking & Management System is designed to streamline and automate compliance reporting requirements, empowering vendors to maintain accurate contact information and submit contract payment details online.

2. For account login or account creation details, go to the DES Public Works Diversity Tracking & Management System home page by clicking on the URL listed above and clicking on Information for Vendors.

3. Every month for the duration of the contract, and while the contract is active in the DES Public Works Diversity Tracking & Management System, submit and accurately maintain the following payment information through the DES Public Works Diversity Tracking & Management System:

   (a) Payments received by the prime contractor from the Agency
   (b) Payments paid to each first tier subcontractor
   (c) Payments paid to each first tier supplier

4. The Contractor must also ensure the following information is reported in the DES Public Works Diversity Tracking & Management System by first tier subcontractors and suppliers for the duration of the contract:

   (a) Confirmation of payments from the prime contractor to the subcontractor
   (b) Payment reporting to each supplier

E. In accordance with RCW 39.04.320, for all public works estimated to cost one million dollars or more, the State of Washington requires no less than **15% of the labor hours be performed by apprentices.** A contractor or subcontractor may not be required to exceed the 15% requirement. On applicable projects, the bid advertisement and Bid Form shall establish a minimum required percentage of apprentice labor hours compared to the total labor hours.

1. **Incentives** - The Contractor who meets or exceeds this utilization requirement on eligible contracts, will be awarded a monetary incentive described in the Apprentice Utilization Requirements section of the Bid Form.

2. **Penalties** - The Contractor who fails to meet the utilization requirement and fails to demonstrate a Good Faith Effort, as outlined below, is subject to penalties described in the Apprentice Utilization Requirements section of the contract Bid Form. Contractor will receive an invoice payable to the Owner within 30 days.

3. **Cost Value** - The expected cost value associated with meeting the goal is included in the Base Bid as described on the Bid Form.

4. **Utilization Plan** - The Contractor shall provide an **Apprentice Utilization Plan** (Plan) demonstrating how and when they intend to achieve the Apprenticeship Utilization Requirement. The Plan shall have enough information to track the Contractor's progress in meeting the utilization requirement. The Contractor shall submit the Plan on the Apprentice Utilization Plan template (on the DES Public Works Forms website)

within 30 days of Notice to Proceed of the contract and prior to submitting the first invoice. The Contractor shall provide an updated Plan during the course of construction when there are significant changes to the Plan which may affect their ability to meet the requirement.

(a) The Plan shall be uploaded to the Department of Labor & Industries' (L&I) ***Prevailing Wage Intents and Affidavit (PWIA) system on L&I's website.***

(b) The Plan is not submitted for approval.

(c) It is expected that the Contractor will actively seek out opportunities to meet the Apprentice Utilization Requirement during construction even if the Plan indicates a shortfall in meeting the requirement.

(d) If the Plan indicates that the Contractor will not attain the Apprentice Utilization Requirement, then Contractor must submit "Good Faith Effort" (GFE) documentation with their Plan to L&I's PWIA system.

5. **Good Faith Effort (GFE)**

(a) Good Faith Effort (GFE) documentation shall describe in detail why the Contractor is not or was not able to attain the Apprentice Utilization Requirement.

1. Contractors may submit Good Faith Effort (GFE) documentation at any time during the construction.

2. All GFE documentation must be submitted no later than 30 days before substantial completion.

(b) Good Faith Effort (GFE) documentation must be in signed letter format uploaded to the PWIA system and include:

1. The contract number, title and the apprentice utilization requirements,

2. The amount of apprentice labor hours the contract can or did attain along with the percentage of labor hours,

3. Contractors may receive a GFE credit for graduated Apprentice hours through the end of the calendar year for all projects worked on as long as the Apprentice remains continuously employed with the same Contractor they were working for when they graduated. If an Apprentice graduates during employment on a project of significant duration, they may be counted towards a GFE credit for up to one year after their graduation or until the end of the project (whichever comes first). Determination of whether or not Contract requirements were met in good faith will be made by subtracting the hours from the journeyman total reported hours for the project and adding them to the apprentice hour total. If the new utilization percentage meets the Contract requirement, the Contractor will be reported as meeting the requirement in good faith,

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(a) Names of any State-Approved Apprentice Training Programs contacted with the name(s) of person(s) contacted and dates of contacts, and a copy of each response from the Training Program(s),

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6. Backup documentation to the letter consisting of the following:

Letters, emails, phone logs including names dates and outcomes, posters, photos, payrolls, time cards, schedules, copies or references to other contract specifications or documents.

Additional Resource Information

(a) For questions regarding how to complete the Apprentice Utilization Plan template or Good Faith Effort documentation, please contact the Project Manager listed in the Bid Advertisement.

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The Owner will return bid guarantees (other than bid bond) to unsuccessful Bidders as soon as practicable, but not sooner than the execution of a contract with the successful Bidder. The successful Bidder's bid guarantee will be returned to the successful Bidder with its official notice to proceed with the work of the contract.

C. The Bidder will allow 60 days from bid opening date for acceptance of its bid by the Owner.

The Bidder will return to the Owner a signed contract, insurance certificate and bond or bond waiver within 15 days after receipt of the contract. If the apparent successful Bidder fails to sign all contractual documents or provide the bond and insurance as required or return the documents within 15 days after receipt of the contract, the Owner may terminate the award of the contract.

D. In the event a Bidder discovers an error in its bid following the bid opening, the Bidder may request to withdraw its bid under the following conditions:

1. Written notification is received by the Owner within 24 hours following bid opening.

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Bidder to take the actions described and acknowledged in this paragraph will not relieve the Bidder from responsibility for estimating properly the difficulty and cost of successfully performing the work.

0.06 BID AMOUNTS

A. The bid prices shown for each item on the Bid Form shall include all labor, material, equipment, overhead and compensation to complete all of the work for that item.

B. The actual cost of building permit (only) and the public utility hookup fees will be a direct reimbursement to the Contractor or paid directly to the permitting agency by the Owner. Fees for these permits should not be included by the Bidder in the bid amount.

C. The Bidder agrees to hold the base bid prices for sixty (60) days from date of bid opening.

0.07 TAXES

The bid amounts shall not include Washington State Sales Tax (WSST). All other taxes imposed by law shall be included in the bid amount. The Owner will include WSST in progress payments. The Contractor shall pay the WSST to the Department of Revenue and shall furnish proof of payment to the Owner if requested.

[NOTE: Contractor must bond for contract amount plus the WSST.]

0.08 SUBMISSION OF BIDS

A. Bids must be submitted on or before the time specified in the Advertisement for Bids.

B. Subcontractor Listing: If the base bid and the sum of the additive alternates is one million dollars or more, the Bid Form shall comply with the following requirements:

1. Pursuant to RCW 39.30.060, if the base bid and the sum of the additive alternates is one million dollars or more, the Bidder shall provide names of the Subcontractors with whom the Bidder will subcontract for performance of heating, ventilation and air conditioning (HVAC), plumbing, and electrical.

2. The Bidder can name itself for the performance of the work.

3. The Bidder shall not list more than one Subcontractor for each category of work identified UNLESS Subcontractors vary with bid alternates, in which case the Bidder must indicate which Subcontractor will be used for which alternate.

4. Failure of the Bidder to submit as part of the bid the NAMES of such Subcontractors or to name itself to perform such work shall render the Bidder's bid nonresponsive and, therefore, void.

C. The Bid Form shall be submitted in a sealed envelope addressed to the office specified in the Advertisement for Bids. The envelope shall have printed on the outside:

1. The project number and description.
2. The name and address of the Bidder.
3. Identification as Bid Form.

D. Prior to the bid opening, the Owner’s representative will designate the official bid clock. Any part of the Bid Form, or in the rare situation of a bid modification, not received prior to the

times specified, per the designated bid clock, will not be considered and the bid will be returned to the Bidder unopened.

E. A bid may be withdrawn in person by a Bidder's authorized representative before the opening of the bids. Bidder(s) representative will be required to show ID and sign on bid summary sheet before it will be released.

F. People with disabilities who wish to request special accommodation, (e.g., sign language interpreters, braille, etc.) need to contact the Owner ten (10) working days prior to the scheduled bid opening.

0.09 BID RESULTS

After the Bid Opening, Bidders may obtain bid results from the office of E&AS by calling (360) 902-7272 or by logging on to E&AS' web site: https://apps.des.wa.gov/EASbids/BidResult.aspx. Bid results may also be obtained from the A/E.

0.10 LOW RESPONSIBLE BIDDER

A. **Mandatory Responsibility Criteria:** Before award of a public works contract, a Bidder must meet the following mandatory responsibility criteria under RCW 39.04.350 (1) & (2) to be considered a responsible Bidder and qualified to be awarded a public works project. The Bidder must:

1. At the time of bid submittal, have a certificate of registration in compliance with RCW 18.27;

2. Have a current state unified business identifier number;

3. If applicable, have industrial insurance coverage for the Bidder's employees working in Washington as required in RCW 51; an employment security department number as required in RCW 50; and a state excise tax registration number as required in RCW 82;

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

5. If bidding on a public works 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 RCW 49.04 for the one-year period immediately preceding the date of the bid solicitation;

6. Public Works and Prevailing Wage Training/Exemption. Bidders shall have received training on the requirements related to public works and prevailing wage under this chapter and chapter 39.12 RCW. The bidder must designate a person or persons to be trained on these requirements. The training must be provided by the department of labor and industries or by a training provider whose curriculum is approved by the department. The department, in consultation with the prevailing wage advisory committee, must determine the length of the training. Bidders that have completed three or more public works projects and have had a valid business license in Washington for three or more years are exempt from this subsection. The department of labor and industries must keep records of entities that have satisfied the training requirement or are exempt and make the records available on its website. Responsible parties may rely on the records made available by the department regarding satisfaction of the training requirement or

exemption. https://lni.wa.gov/licensing-permits/public-works-projects/contractors-employers/contractor-training

7. 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 Department of Labor and Industries or through a civil judgement entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW 49.48.082, any provision of RCW 49.46, 49.48, or 49.52. A bidder shall submit a signed Contractor Certification form with the bid or within two (2) business days of request by Owner regarding this wage theft prevention responsible bidder criteria.

B. **Supplemental Responsibility Criteria**: In addition to the mandatory Bidder responsibility, the Owner may adopt relevant supplemental criteria for determining Bidder responsibility applicable to a particular project which the Bidder must meet (RCW 39.04.350 (3)).

1. If applicable, the Owner shall consider an overall accounting of the attached supplemental criteria for determining Bidder responsibility "DIVISION 00 SUPPLEMENTAL RESPONSIBILITY CRITERIA".

2. At least seven (7) days prior to the bid submittal deadline, a potential Bidder may request that the Owner modify the supplemental responsibility criteria. The Owner will evaluate the information submitted by the potential Bidder and respond before the bid submittal deadline. If the evaluation results in a change of the criteria, the Owner will issue an addendum to the bidding documents identifying the new criteria.

3. Upon Owner's request, the apparent low Bidder must supply the requested responsibility information within two (2) business days of request by Owner. Withholding information or failure to submit all the information requested within the time provided may render the bid non-responsive

4. If the Owner determines that the apparent low Bidder is not responsible, the Owner will notify the Bidder of its preliminary determination in writing.

5. Within three (3) days after receipt of the preliminary determination, the Bidder may withdraw its bid or request a hearing where the Bidder may appeal the preliminary determination and present additional information to the Owner.

6. The Owner will schedule a hearing within three (3) working days of receipt of the Bidder's request. The hearing members will include a Client Agency Representative, EAS Assistant Director or designee, Deputy Assistant Director or designee, and Project Manager.

7. The Owner will issue a Final Determination after reviewing information presented at the hearing.

8. If the Owner determines a Bidder to be not responsible, the Owner will provide, in writing, the reasons for the 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 (2) business days after the Bidder determined to be not responsible has received the final determination.

9. The Owner's Final Determination is specific to this project, and will have no effect on other or future projects.

0.11 CONTRACT AWARD

A. The Owner will evaluate bids responsiveness and responsibility.

1. A bid will be considered responsive if it meets the following requirements:

(a) It is received at the proper time and place.

(b) It meets the stated requirements of the Bid Form.

(c) It is submitted by a licensed/registered contractor within the state of Washington at the time of bid opening and is not banned from bidding by the Department of Labor and Industries,

(d) It is accompanied by a bid guarantee, if required.

2. A bid will be considered responsible if it meets the following requirements:

(a) It meets the mandatory responsibility criteria established in RCW 39.04.350 and an overall accounting of the supplemental responsibility criteria established for the project.

(b) The bidder completes, signs, and submits the "Contractor Certification Wage Theft Prevention – Responsible Bidder Criteria" form **with their bid or within two (2) business days of request by the Owner.**

B. The Owner reserves the right to accept or reject any or all bids and to waive informalities.

C. The Owner may negotiate bid price adjustments with the low responsive Bidder, including changes in the contract documents, to bring the bid within the available funding per RCW 39.04.015.

D. The apparent low Bidder, for purpose of award, shall be the responsive and responsible Bidder offering the low aggregate amount for the base bid plus selected additive or deductive bid alternates and meeting all other bid submittal requirements.

E. **Reciprocal Preference for Resident Contractors.** 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 in-state contractor percent advantage provided by the contractor's home state.

For the purpose of determining the successful Bidder, 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 which equates to the Nonresident Disadvantage Total. The Nonresident Disadvantage Total shall be compared to the Washington contractor bid amounts. The Bidder with the lowest total shall be the successful Bidder. See example below:

EXAMPLE:

Alaska Nonresident Contractor Bid Amount	$100,000
Multiplied by the Alaska CPD	x 0.05
Alaska CPD Total	$ 5,000
Alaska Nonresident Contractor Bid Amount	$100,000

Alaska CPD Total	$ 5,000
Nonresident Disadvantage Total	$105,000*

* Note – If the Nonresident Disadvantage Total is lower than all other Washington contractor bid amounts, the Alaska Nonresident Contractor is the successful Bidder and will be awarded a contract for the bid amount of $100,000.

If the Nonresident Disadvantage Total is higher than a Washington contractor bid amount, the successful Washington Bidder will be awarded a contract for the bid amount.

F. The Contract will only become effective when signed by the Owner. Prior to the Owner's signature, any and all costs incurred shall be the sole responsibility of the Bidder.

0.12 DOCUMENTS (ATTACHED)

A. Advertisement for Bids
B. Bid Form
C. Supplemental Bidder Responsibility Criteria (if applicable)
D. Certificate of Insurance form
E. Special Conditions (if applicable)

Note: AIA Payment Bond and Performance Bond current forms (A312) are required, when applicable. These forms will not be provided by the Owner.

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

A. Insurance Coverage Certificates and Policies

The Contractor shall furnish acceptable proof of insurance coverage on the state of Washington Certificate of Insurance form SF500A, dated 07/02/92 or ACORD form, as well as copies of insurance policies.

B. Required Insurance Coverages

1. For a contract less than $100,000.00, the coverage required is:

a. Comprehensive General Liability Insurance – The Contractor shall at all times during the term of this contract, at its cost and expense, carry and maintain general public liability insurance, including contractual liability, against claims for bodily injury, personal injury, death or property damage occurring or arising out of services provided under this contract. This insurance shall cover claims caused by any act, omission, or negligence of the Contractor or its officers, agents, representatives, assigns or servants. The limits of liability insurance, which may be increased as deemed necessary by the contracting parties, shall be:

Each Occurrence	$1,000,000.00
General Aggregate Limits (other than products – commercial operations)	$1,000,000.00
Products – Commercial Operations Limit	$1,000,000.00
Personal and Advertising Injury Limit	$1,000,000.00
Fire Damage Limit (any one fire)	$50,000.00
Medical Expense Limit (any one person)	$5,000.00

b. If the contract is for underground utility work, then the Contractor shall provide proof of insurance for that above in the form of Explosion, Collapse and Underground (XCU) coverage.

c. Employers Liability on an occurrence basis in an amount not less than $1,000,000.00 per occurrence.

2. For contracts over $100,000.00 but less than $5,000,000.00 the contractor shall obtain the coverage limits as listed for contracts below $100,000.00 and General Aggregate and Products – Commercial Operations Limit of not less than $2,000,000.00.

3. Coverage for Comprehensive General Bodily Injury Liability Insurance for a contract over $5,000,000.00 is:

Each Occurrence	$2,000,000.00
General Aggregate Limits (other than products – commercial operations)	$4,000,000.00
Products – Commercial Operations limit	$4,000,000.00
Personal and Advertising Injury Limit	$2,000,000.00
Fire Damage Limit (any one fire)	$50,000.00
Medical Expense Limit (any one Person)	$5,000.00

4. For all Contracts – Automobile Liability: in the event that services delivered pursuant to this contract involve the use of vehicles or the transportation of clients, automobile liability insurance shall be required. If Contractor-owned personal vehicles are used, a Business Automobile Policy covering at a minimum Code 2 "owned autos only" must be secured. If Contractor employee's vehicles are used, the Contractor must also include under the Business Automobile Policy Code 9, coverage for non-owned autos. The minimum limits for automobile liability is: $1,000,000.00 per occurrence, using a combined single limit for bodily injury and property damage.

5. For Contracts for Hazardous Substance Removal (Asbestos Abatement, PCB Abatement, etc.)

   a. In addition to providing insurance coverage for the project as outlined above, the Contractor shall provide Pollution Liability insurance for the hazardous substance removal as follows:

EACH OCCURRENCE	AGGREGATE
$500,000.00	$1,000,000.00

   or $1,000,000.00 each occurrence/aggregate bodily injury and property damage combined single limit.

      i. Insurance certificate must state that the insurer is covering hazardous substance removal.
      ii. Should this insurance be secured on a "claims made" basis, the coverage must be continuously maintained for one year following the project's "final completion" through official completion of the project, plus one year following.

   For Contracts where hazardous substance removal is a subcomponent of contracted work, the general contractor shall provide to the Owner a certificate of insurance for coverage as defined in 5a. above. The State of Washington must be listed as an additional insured. This certificate of insurance must be provided to the Owner prior to commencing work.

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 $150,000 or less and the Contractor or General Contractor/Construction Manager agrees that Owner may, in lieu of the bond, retain 10% 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: The Progress Schedule shall be in the form of a Critical Path Method (CPM) logic network or, with the approval of the Owner, a bar chart schedule may be submitted. The scheduling of construction is the responsibility of the Contractor and is included in the contract to assure adequate planning and execution of the work. The schedule will be used to evaluate progress of the work for payment based on the Schedule of Values. The schedule shall show the Contractor's planned order and interdependence of activities, and sequence of work. As a minimum the schedule shall include:

1. Date of Notice to Proceed;
2. Activities (resources, durations, individual responsible for activity, early starts, late starts, early finishes, late finishes, etc.);
3. Utility Shutdowns;
4. Interrelationships and dependence of activities;
5. Planned vs. actual status for each activity;
6. Substantial completion;
7. Punch list;
8. Final inspection;
9. Final completion, and
10. Float time

The Schedule Duration shall be based on the Contract Time of Completion listed on the Bid Form. The Owner shall not be obligated to accept any Early Completion Schedule suggested by the Contractor. The Contract Time for Completion shall establish the Schedule Completion Date.

If the Contractor feels that the work can be completed in less than the Specified Contract Time, then the Surplus Time shall be considered Project Float. This Float time shall be shown on the Project Schedule. It shall be available to accommodate changes in the work and unforeseen conditions.

Neither the Contractor nor the Owner have exclusive right to this Float Time. It belongs to the project.

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, at no cost to the Owner for delay or any other claim, if Owner reasonably deems the superintendent incompetent, negligent, or otherwise objectionable, provided Owner has first notified Contractor in writing and allowed a reasonable period for transition. Noncompliance with the Owner's request to remove and replace the superintendent for a material reason shall also be grounds for terminating the Contract for cause.

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, require

Contractor to remove from the Work or Project site, at no cost to the Owner for delay or any other claim, any employee Owner reasonably deems incompetent, negligent, or otherwise objectionable. Noncompliance with the Owner's request to remove and replace personnel at any level for a material reason shall also be grounds for terminating the Contract for cause.

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: The actual cost of the general building permit (only) and the public utility hook-up fees will be a direct reimbursement to the Contractor or paid directly to the permitting agency by the Owner. ***Fees for these permits should not be included by the Contractor in his bid amount.***

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.

D. Contractor to submit copies: The General Contractor shall submit copies of each valid permit required on the project to the Owner's representative. Nothing in this part shall be construed as imposing a duty upon the Owner or A/E to secure permits.

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 or applicable Federal 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 (L&I). 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. If applicable, the Contractor shall comply with all Federal Funding requirements of the Davis

Bacon Act that will be addressed in a separate "DIVISION 00 SPECIAL CONDITIONS" specification section that will be based on the specific requirements of the funding source.

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 L&I, 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 L&I, 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 L&I. 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 prefiled 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 L&I 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 L&I the currently established fee(s) for each statement of intent and/or affidavit of wages paid submitted to the L&I for certification.

G. Certified Payrolls: Consistent with RCW 31.12.120, contractors, subcontractors, or employers shall file a copy of its certified payroll records using the L&I' online system at least once per month. If the L&I' online system is not used, a contractor, subcontractor, or employer shall file a copy of its certified payroll records directly with the L&I in a format approved by the L&I at least once per month. A contractor, subcontractor, or employer's noncompliance with this section constitutes a violation of RCW 39.12.050.

H. Compliance with Federal Funding requirements: If applicable, the Contractor shall comply with all Federal Funding requirements of the Davis Bacon Act that will be addressed in a separate "DIVISION 00 SPECIAL CONDITIONS" specification section that will be based on the specific requirements of the funding source.

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: The Contractor and all Subcontractors shall comply with all applicable federal and state non-discrimination laws, regulations, and policies. No person shall, on the grounds of age, race, creed, color, sex, sexual orientation, religion, national origin, marital status, honorably discharged veteran or military status, or disability (physical, mental, or sensory) be denied the benefits of, or otherwise be subjected to discrimination under any project, program, or activity, funded, in whole or in part, under this Agreement

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. In performing this contract, the Contractor shall provide for protecting the lives and health of employees and other persons; preventing damage to property, materials, supplies, and equipment; and avoid work interruptions. For these purposes, the Contractor shall:

1. Follow Washington Industrial Safety and Health Act (WISHA) regional directives and provide a site-specific safety program that will require an accident prevention and hazard analysis plan for the contractor and each subcontractor on the work site. The Contractor shall submit a site-specific safety plan to the Owner's representative prior to the initial scheduled construction meeting.

2. Provide adequate safety devices and measures including, but not limited to, the appropriate safety literature, notice, training, permits, placement and use of barricades, signs, signal lights, ladders, scaffolding, staging, runways, hoist, construction elevators, shoring, temporary lighting, grounded outlets, wiring, hazardous materials, vehicles, construction

processes, and equipment required by all applicable state, federal, and local laws and regulations.

3. Comply with the State Environmental Policy Act (SEPA), Clean Air Act, Shoreline Management Act, and other applicable federal, state, and local statutes and regulations dealing with the prevention of environmental pollution and the preservation of public natural resources.

4. Post all permits, notices, and/or approvals in a conspicuous location at the construction site.

5. Provide any additional measures that the Owner determines to be reasonable and necessary for ensuring a safe environment in areas open to the public. Nothing in this part shall be construed as imposing a duty upon the Owner or A/E to prescribe safety conditions relating to employees, public, or agents of the Contractors.

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

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

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

1. Information. At a minimum, Contractor shall inform persons working on the Project site of:

   a. WAC: The requirements of chapter 296-62 WAC, General Occupational Health Standards;

   b. Presence of hazardous chemicals: Any operations in their work area where hazardous chemicals are present; and

   c. Hazard communications program: The location and availability of written hazard communication programs, including the required list(s) of hazardous chemicals and material safety data sheets required by chapter 296-62 WAC.

2. Training. At a minimum, Contractor shall provide training for persons working on the Project site which includes:

   a. Detecting hazardous chemicals: Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

b. Hazards of chemicals: The physical and health hazards of the chemicals in the work area;

c. Protection from hazards: The measures such persons can take to protect themselves from these hazards, including specific procedures Contractor, or its Subcontractors, or others have implemented to protect those on the Project site from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and

d. Hazard communications program: The details of the hazard communications program developed by Contractor, or its Subcontractors, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

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

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

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

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

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

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

5.08 OPERATIONS, MATERIAL HANDLING, AND STORAGE AREAS

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

B. Temporary buildings and utilities at Contractor expense: Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be provided by Contractor only with the consent of Owner

and without expense to Owner. The temporary buildings and utilities shall be removed by Contractor at its expense upon completion of the Work.

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

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

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

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

5.09 PRIOR NOTICE OF EXCAVATION

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

5.10 UNFORESEEN PHYSICAL CONDITIONS

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

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

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

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

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

5.12 LAYOUT OF WORK

A. Advanced planning of the Work: Contractor shall plan and lay out the Work in advance of operations so as to coordinate all work without delay or revision.

B. Layout responsibilities: Contractor shall lay out the Work from Owner-established baselines and bench marks indicated on the Drawings, and shall be responsible for all field measurements in connection with the layout. Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the Work. Contractor shall be responsible for executing the Work to the lines and grades that may be established. Contractor shall be responsible for maintaining or restoring all stakes and other marks established.

5.13 MATERIAL AND EQUIPMENT

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

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

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

5.14 AVAILABILITY AND USE OF UTILITY SERVICES

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

Owner, at reasonable rates determined by Owner. Contractor will carefully conserve any utilities furnished.

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

5.15 TESTS AND INSPECTION

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

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

1. Constitute or imply acceptance;

2. Relieve Contractor of responsibility for providing adequate quality control measures;

3. Relieve Contractor of responsibility for risk of loss or damage to the Work, materials, or equipment;

4. Relieve Contractor of its responsibility to comply with the requirements of the Contract Documents; or

5. Impair Owner's right to reject defective or nonconforming items, or to avail itself of any other remedy to which it may be entitled.

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

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

5.16 CORRECTION OF NONCONFORMING WORK

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

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

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

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

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

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

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

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

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

5.17 CLEAN UP

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

5.18 ACCESS TO WORK

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

5.19 OTHER CONTRACTS

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

5.20 SUBCONTRACTORS AND SUPPLIERS

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

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

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

3. If applicable, have:

    a. Industrial Insurance (workers' compensation) coverage for the subcontractor's employees working in Washington, as required in Title 51 RCW;

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

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

    d. An electrical contractor license, if required by Chapter 19.28 RCW;

    e. An elevator contractor license, if required by Chapter 70.87 RCW.

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

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

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 L&I 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. Provide names of Subcontractors and use qualified firms: 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 if the request for equitable adjustment is sufficiently definitive to permit the Owner to determine fair value:

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

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

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

        (1) Basic wages and benefits: Hourly rates and benefits as stated on the L&I 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 L&I.

(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:

(1) The National Electrical Contractors Association for equipment used on electrical work.

(2) The Mechanical Contractors Association of America for equipment used on mechanical work.

(3) The EquipmentWatch Fleet Manager Estimator Package (digital). The maximum rate for standby equipment shall not exceed that shown in the Associated General Contractors Washington State Department of Transportation (AGC WSDOT) Equipment Rental Agreement, current edition on the Contract execution date.

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.);

10. Vendors', rental agencies', Subcontractors', and agents' invoices;

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.

10.11 DIVERSE BUSINESS PARTICIAPTION

The state of Washington encourages participation in all of its contracts by Diverse Businesses as found in RCW Chapters 39, 43, and WAC 326. The voluntary Diverse Business goal of 26%, which is an aggregate of: 10% Minority Business Enterprises (MBE), 6% Women Business Enterprises (WBE), 5% Veteran-owned Business, and 5% Washington Small Businesses self-identified in the Washington Electronic Business Solution (WEBS). Contractors are encouraged to meet or exceed the project goals in the advertisement by any level of participation, regardless of category.

DES reserves the right to adjust the voluntary participation goals.

Businesses are encouraged to register in WEBS, as well as registering as a state certified M/WBE/Veteran Business.

For reporting, Contractor is required to register and create an account in the DES Public Works Diversity Tracking & Management System powered by B2GNow.

Every month for the duration of your contract, and while your contract is active in the DES Public Works Diversity Tracking & Management System, submit and accurately maintain the following information:

1. Payments received by the prime contractor from the Agency
2. Payments paid to each first tier subcontractor
3. Payments paid to each first tier supplier

You must also ensure the following information is reported in the DES Public Works Diversity Tracking & Management System by your first tier subcontractors and suppliers for the duration of your contract:

1. Confirmation of payments from the prime contractor to the first tier subcontractor
2. Confirmation of payments from the prime contractor to first tier suppliers

10.12 MINIMUM LEVELS OF APPRENTICESHIP PARTICIPATION

In accordance with RCW 39.04.320, the State of Washington requires 15% apprenticeship participation for projects estimated to cost one million dollars or more. Contractors who meet or exceed minimum participation requirement are eligible for monetary incentive. Contractors failing to meet minimum apprenticeship participation requirement are subject to monetary penalty.

A. Apprentice participation, under this contract, may be counted towards the required percentage (%) only if the apprentices are from an apprenticeship program registered and approved by the Washington State Apprenticeship and Training Council (RCW 49.04 and WAC 296-05).

B. Bidders may contact the L&I to obtain more information about apprenticeship programs.

C. No changes to the required percentage (%) of apprentice participation shall be allowed without written approval of the Owner. In any request for the change, the Contractor shall clearly demonstrate a good faith effort to comply with the requirements for apprentice participation.

D. Any substantive violation of the mandatory requirements of this part of the contract may be a material breach of the contract by the Contractor. The Owner may withhold payment pursuant to Part 6.05, stop the work for cause pursuant to Part 3.04, and terminate the contract for cause pursuant to Part 9.01.

10.13 SPECIAL CONDITIONS

The Owner may have Federal Funding or other special requirements for this project. If applicable, the Contractor will be required to comply with the "DIVISION 00 SPECIAL CONDITIONS" section in the specifications that will be based on the specific requirements of the funding source.

SECTION 23 09 00

INSTRUMENTATION AND CONTROLS SYSTEMS

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.

B. Division 23, Section 230500, "Common Work Results for HVAC" is directly related to work included in this section. Other sections are indirectly related and shall be reviewed.

1.2 SUMMARY

A. A complete Energy Management and Control System (EMCS) shall be provided to control and/or to monitor building systems as outlined in the sequences of operation, drawings and this specification. The EMCS shall employ direct digital control (DDC).

1. Provide all software, hardware and cabling necessary for communication between operator stations, controllers, sensors, actuators and other devices.
2. Provide all miscellaneous software, wiring, parts and labor required in establishing a complete and working system that is an interoperable network capable of communicating with the existing EMCS.

1.3 APPROVED MANUFACTURERS

A. Provide an HVAC control system with distributed processing units, input/output units, firmware and standard operating software.

1. Design, component selection, installation, custom programming, documentation, testing, training and warranty service shall be the direct responsibility of the manufacturer or their local representative.
2. New equipment and software shall be selected for compatibility with systems that might be presently installed at the site.

1.4 DEFINITIONS

A. DDC: Direct digital control.

B. I/O: Input/output.

C. LonWorks: A control network technology platform for designing and implementing interoperable control devices and networks.

D. MS/TP: Master slave/token passing.

E. PC: Personal computer.

F. PID: Proportional plus integral plus derivative.

G. RTD: Resistance temperature detector.

1.5 SYSTEM PERFORMANCE

A. Comply with the following performance requirements:

1. Graphic Display: Display graphic with minimum 20 dynamic points with current data within 10 seconds.
2. Graphic Refresh: Update graphic with minimum 20 dynamic points with current data within eight seconds.
3. Object Command: Reaction time of less than two seconds between operator command of a binary object and device reaction.
4. Object Scan: Transmit change of state and change of analog values to control units or workstation within six seconds.
5. Alarm Response Time: Annunciate alarm at workstation within 45 seconds. Multiple workstations must receive alarms within five seconds of each other.
6. Program Execution Frequency: Run capability of applications as often as five seconds but selected consistent with mechanical process under control.
7. Performance: Programmable controllers shall execute DDC PID control loops, and scan and update process values and outputs at least once per second.
8. Reporting Accuracy and Stability of Control: Report values and maintain measured variables within tolerances as follows:

    a. Water Temperature: Plus or minus one degree F.
    b. Water Flow: Plus or minus five percent of full scale.
    c. Water Pressure: Plus or minus two percent of full scale.
    d. Space Temperature: Plus or minus one degree F.
    e. Ducted Air Temperature: Plus or minus one degree F.
    f. Outside Air Temperature: Plus or minus two degrees F.
    g. Dew Point Temperature: Plus or minus three degrees F.
    h. Temperature Differential: Plus or minus 0.25 degrees F.
    i. Relative Humidity: Plus or minus five percent.
    j. Airflow (Pressurized Spaces): Plus or minus three percent of full scale.
    k. Airflow (Measuring Stations): Plus or minus five percent of full scale.
    l. Airflow (Terminal): Plus or minus 10 percent of full scale.
    m. Air Pressure (Space): Plus or minus 0.01-inch wg.
    n. Air Pressure (Ducts): Plus or minus 0.1-inch wg.
    o. Carbon Monoxide: Plus or minus five percent of reading.
    p. Carbon Dioxide: Plus or minus 50 ppm.
    q. Electrical: Plus or minus five percent of reading.

1.6 SUBMITTALS

A. Provide a complete set of reproducible control drawings using computer aided design and drafting (CADD) technology. Include the following information:

1. Show general physical arrangement of component devices installed in the panels. Indicate applicable detailed drawing reference.
2. Provide a typical schematic drawing of each control circuit.
3. Identify equipment and devices by the reference designations shown on the drawings and by unique point identification used in system software. Provide material list with or on each drawing.
4. Supply block diagrams and schematics showing riser diagrams, the layout of equipment, communication cabling, and wire type.
5. Provide system diagrams showing the general mechanical system layout with all sensors/devices of each mechanical system.
6. Supply floor plan drawings showing the location of all controlled equipment and devices used for sensing and control.

7. Provide a schematic drawing of each control circuit, complete with individual wire identifications. Typical drawings are acceptable.
8. Provide LAN truck riser diagram showing cable routing and location of all repeaters.

B. Provide sequences of operation detailing all control strategies, including initial setpoints and referencing all points by the point name used in the BAS programming. These sequences of operation shall also be provided in the record drawings.

C. Provide a complete list of equipment to be furnished, which includes a manufacturer's catalog sheet for each item on the material list.

1. DDC System Hardware: Bill of materials of equipment indicating quantity, manufacturer, and model number. Include technical data for operator workstation equipment, interface equipment, control units, transducers/transmitters, sensors, actuators, valves, relays/switches, control panels, and operator interface equipment.
2. Control System Software: Include technical data for operating system software, operator interface, color graphics, and other third-party applications.
3. Controlled Systems: Instrumentation list with element name, type of device, manufacturer, model number, and product data. Include written description of sequence of operation including schematic diagram.
4. Provide a damper schedule with one line per damper. Provide for each damper: The project TAG, the size, the model of the damper, the type and model of the actuator, and whether the damper fails open, closed, or in place.
5. Provide a valve schedule with one line per valve. Provide for each valve: The project TAG, the size, the model of the valve, the pressure rating, the model and type of the actuator, the valve Cv, and whether the valve fails open, closed, or in place.

D. Provide a test plan describing the procedures used to complete and document the "Owner-witnessed Testing" described in the Final Acceptance requirement.

1. Test plans shall include a schedule for tracking each phase of the testing, e.g. zone testing by floor, fan testing by system, chiller interface testing, heating system testing, etc.
2. The vendor is required to supplement the planned work effort to meet the progress dates given in the schedule.
3. Show initial setpoints.
4. Provide all documentation necessary to interpret programming related submittals.

E. As part of the submittal process, the vendors shall meet with representatives of the Owner's engineering and operations divisions, giving them a thorough briefing on the BAS programming design. This briefing shall describe in detail the methods the control programmer has used to meet the requirements of the sequence of operations.

F. Submit the point-to-point (PTP) and sequence-of-operation verification test plans for acceptance prior to the scheduled beginning of testing. PTP testing shall be part of the construction schedule.

G. Asbestos-Free Materials: The contractor shall submit asbestos-free documents (MSDS and/or, manufacturer certification,) to certify that all suspect asbestos containing materials as defined in the Puget Sound Clean Air Agency, Regulation III, Article 4 to be used in construction are asbestos-free.

H. Data Communications Protocol Certificates: Certify that each proposed DDC system component complies with ASHRAE 135.

1.7 QUALITY ASSURANCE

A. All materials and equipment used shall be new, standard components, regularly manufactured and not custom-designed or fabricated specifically for this project.

B. All components and software shall have been previously tested and proven in regular use. Minimum in-use requirements are 24 months for hardware and 12 months for major software (whole number revision) releases.

C. Modularity. The HVAC control system shall possess a modular architecture, permitting expansion through the addition of more distributed processing units, input/output units, sensors, actuators and operator stations.

D. Installer Qualifications: Automatic control system manufacturer's authorized representative who is trained and approved for installation of system components required for this Project.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

F. Comply with ASHRAE 135 for DDC system components.

G. System Software: Update to latest version of software at Project completion.

H. Approval - Vendor shall submit and receive approval for all submittals including materials, floor plan, schematics and programming prior to installation.

1.8 COORDINATION

A. Coordinate location of thermostats, carbon dioxide sensors, and other exposed control sensors with plans, owner, or owner’s representative, Division 26, and room details before installation.

B. Coordinate equipment with Division 26 and Division 28, Section 283111, "Fire Detection and Alarm" to achieve compatibility with equipment that interfaces with that system.

C. Coordinate supply of conditioned electrical branch circuits for control units and operator workstation.

D. Coordinate equipment with Division 26:

1. Section "Electrical Power Monitoring and Control" to achieve compatibility of communication interfaces.
2. Section 260913, "Panelboards" to achieve compatibility with starter coils and annunciation devices.
3. Section 262419, "Motor-Control Centers" to achieve compatibility with motor starters and annunciation devices.

1.9 FINAL ACCEPTANCE REQUIREMENTS

A. Provide corrected documentation to show changes made to correct deficiencies discovered during commissioning tests. Reassemble manuals and drawing packages to reflect corrected documentation records.

B. Drawings and software:

1. Submit shop drawings reflecting final “as-built” condition.

a. Provide record drawings on owners preferred version of AutoCAD. Deliver two copies of data on two Flash drives.
b. Provide 3 copies of reproducible record drawings.
c. These record drawings shall accurately depict the final as-built conditions and shall be on Architectural/Mechanical backgrounds provided by the A/E.
d. These drawings shall include accurate depiction of location of sensors and controlled equipment (motor starters, valves, chillers, dampers, AHUs, etc.)
e. Insert one copy of applicable shop drawings, panel layout drawing, and points list at each enclosure's documentation holder.
f. Furnish one original set of application software on flash drives. Disks shall bear the manufacturer's label. Field copies are not acceptable. Application software includes operating system, controls application generation, graphic support, maintenance support and all other utilities provided in support of the installed system.

C. Operation and Maintenance (O&M) Manuals: Provide two paper copies of material required and five copies on flash drives in MS Word format. Describe operation, maintenance and servicing requirements of the HVAC control system and associated equipment. Provide the following information in separate sections, each with an index.

1. Technical literature for all equipment, including catalog sheets, calibration, adjustments and operation instructions, and installation instructions
2. Hardware and software manuals, including information supplied by the original product developer, on the application programs and on the computers and controllers provided by vendor
3. System description and complete sequence of operation
4. Reduced size (11" x 17") copies of record drawings
5. Input/Output (I/O) summary forms for the system, listing all connected analog and binary input and output functions and the number and types of points. Indicate spare input/output capacity
6. Control programs specific to this system
7. Completed point-to-point checkout plan used in Owner-witnessed testing, and the completed data sheets showing the results of the point-to-point testing.

D. Owner-Witnessed Testing

1. All parts of the testing described in this section are to be performed as point-to-point tests and control sequence verification. The Owner may choose to have this testing witnessed by a member of the Owner's staff, by an independent commissioning agent, by a member of the A/E team, or otherwise.

a. One copy of the preliminary as-built documents shall be provided to support this testing.
b. After receipt of all system documentation by the Owner, notify Owner 10 working days before testing begins.
c. Testing shall be performed by the manufacturer or its local representative. The procedure for the test must provide a format for documenting the results, comments, vendor repair activity, vendor's initials, and retest witnessing. Provide data sheets with one line for each physical point on the system, and columns to record the results, dates, and initials of witnesses for both pretests and witness tests.
d. The Contractor shall perform point-to-point pretests before the witnessed tests and shall fill out data sheets during pretests to demonstrate successful performance prior to witnessed tests.

E. Installation verification tests:

1. Verify operation, location and identification of power sources, including circuit breakers and control power transformers.

2. Start/stop points: Issue start and stop commands from an operator station. Verify that controlled equipment responds appropriately and that the start/stop status is accurately reflected at the operator station.
3. Analog points: Analog inputs and outputs shall be verified at both extremes of their ranges and at the midpoint. Verify tight shutoff and full opening of dampers and valves.
4. Binary points: Verify that both commanded conditions (on/off, open/closed, etc.) are accurately reflected at the operator station.
5. Test fan and pump failure alarms by turning off the motor at the HOA switch and observing the run-state indication at the operator station.
6. Temperature points: Verify calibration of sensors by comparing displayed temperature values with the reading of an independent measuring device located in the same flow. Test liquid temperature sensors as installed in piping thermowells to verify effectiveness of heat conducting compound.
7. Pressure points: Verify calibration of sensors by comparing displayed pressure with the reading of an independent measuring device located in the same flow stream. Retain the services of the balancer as required to confirm readings.
8. Control valves: Verify tight shutoff by comparing water or air temperatures entering and leaving the heat transfer device.
9. Operator response and sequencing: Demonstrate that sequenced or modulated valves and dampers position accurately in response to posit multiple operators to provide simultaneous modulation of parallel dampers or valve assemblies.
10. Control signal stability, general: Demonstrate that control loops are tuned so that the output does not change until the controlled system has had time to respond to the last output signal.
11. Control signal stability, response to step input: Demonstrate that control loops are tuned so that they are stable without excessive hunting following a step input of not less than 20% of the operating/reset range of the controlled variable.
12. Control signal stability, floating point devices: Verify that minimum pulse output duration is no less than the value required to assure repositioning of the controlled device.
13. Demonstrate the capability of the controls system to execute the complete sequence of operation as given in the mechanical design documents.
14. Verify tight shut-off of all actuated control valves (for three-way valves, demonstrate capacity for 100% by-pass of coil).

F. Operator station tests:

1. Override test: Verify manual override capability for start/stop and modulated point types.
2. Control logic:
    a. Exercise all control logic packages.
    b. Check response to upset, change in setpoint.
3. Supervisory function:
    a. Verify content of time clock schedules.
    b. Verify alarm’s reporting capabilities.
4. Failure modes:
    a. Verify all stand-alone operation by disconnecting communication lines between stand-alone control units and verifying continued operation.
    b. Disconnect and reconnect controller power to confirm proper recovery from power failure (sample).

G. Other software tests:

1. Trend logging
2. Report generation
3. Remote access

4. Test the ability of the control system to automatically restart all the connected systems following a power restoration and fire alarm recovery.

1.10 SERVICE AND GUARANTEE

A. The complete control system shall be warranted to be free of defects in manufacturing, workmanship and materials for one year. Temperature sensor accuracy shall be warranted for three years. Software and documentation shall be revised to reflect system changes required to meet warranty obligations.

B. During the warranty period, provide a 24-hour emergency service telephone number where a qualified service technician, familiar with the installed system, may be reached.

1. This technician shall have the capability of remote communication with the control system for troubleshooting and program alterations.
2. The vendor shall pay all costs to provide communications for remote access.
3. A fully equipped, qualified repair technician shall be at the job site within four hours of a request for emergency service.

C. All replacement parts must be available on site within 48 hours during the term of the warranty.

D. Provide free of charge during the warranty period four DDC software sequence modifications (up to 24 hours engineering time) as instructed by the Owner. Modification shall be in software only.

1.11 POST-INSTALLATION TRAINING AND MATERIALS

A. The manufacturer and control contractor shall train operating personnel (FOMs) in the operation and maintenance of the system as follows:

1. The controls subcontractor shall provide the Owner's system operators complete training for proper control of the system under all modes of operation. These modes shall include but not be limited to summer/winter, energy management and alarm event sequences. The training shall be conducted during normal working hours, Monday through Friday at the job site. Training shall consist of both classroom and hands-on training. Provide a minimum of 4 hours of on-site training for a total of three people. Provide each trainee with a copy of the sequence of operations and the graphics during each training session. Training will be refined based on the successful bidder and may address the following subjects:

    a. Sensor/actuator operation.
    b. System architecture and basic theory of operation.
    c. Operator level (password level 1) interface to system for password access, alarm handling, point addressing, manual commands and statistical data acquisition.
    d. Program level (password level two) operation for command control and definition of energy management parameters.
    e. Configuration level (password level three) for all database entry and modification.
    f. Review of sequence of operations.
    g. System troubleshooting.
    h. Emergency service support.
    i. Fire alarm interface.
    j. System restart after power failure.
    k. Replacement procedures of each system component.
    l. Calibration and initialization procedures.
    m. Regeneration procedures on all installed programming at operator’s control stations.

2. Provide one each of the following:

a. Complete reference materials (manuals) that would be used by a factory trained master technician
b. Test instruments, and software manufactured or modified by the manufacturer for use in the installation, troubleshooting, and repairs of installed devices. Include unique portable test terminal, test boxes, circuit card extenders, calibration modules, etc.

3. The Owner will be allowed to video tape any or all of the training sessions.

B. Provide all of the training and materials that a control contractor service employee would receive in order to become a Master Technician. Training and materials will be provided for three Owner representatives on separate schedules. Provide a complete description of this training with the submittals. Include the cost of training, travel, lodging and transportation between lodging, airport and training location.

1.12 SYSTEM COMMISSIONING

A. Provide assistance, staff and materials to support the commissioning activities.

1. This includes all testing apparatus in use by the BAS contractor to test and calibrate or verify calibration of the control system.
2. Assistance includes but is not limited to reviewing test procedures and providing software enhancements to accommodate testing methods.

B. Provide staff and materials to support the point-to-point testing, also referred to as Owner-witnessed Testing and described under Final Acceptance Requirements.

C. Operate the control system for any commissioning tests specified in other specification sections.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide as required for a complete and operating building automation system, all software, hardware, input/output devices, wiring and control power not shown in electrical bid documents, actuated dampers, actuated valves, actuators, operation and maintenance training, special maintenance tools and aids, supervision of labor, and warranty.

B. The system shall be built only of standard components kept in stock by the supplier.

1. All replacement parts shall be available on site within 48 hours.
2. The components shall not require customizing other than setting jumpers and switches, or adding firmware or software modules, or on-site software programming to do required functions.

C. System display should meet the following requirements:

1. The system is to be fully menu-driven.
2. All system titles, prompts, and instructions are to be in the English language.
3. All entries to be in natural units, i.e., a setpoint value shall be entered in its actual control unit of value, such as 74º F.
4. The primary means of information display and system management shall be by graphic display. Use the same style of display as is currently used throughout the facility.
5. Each display will contain comment sections to indicate area served (if area-specific) and contain a graphical presentation for all other interlocked systems.

2.2 BASIC SYSTEM FEATURES

A. Zone-by-zone control of space temperature, usage scheduling, and equipment failure reporting (A zone is the area served by one HVAC terminal unit, fan coil, heat pump, air terminal, etc.)

B. For all controllers and other devices that do not automatically and immediately resume normal operation after loss of power and then restoration of power, provide Werner Electric Stabiline UPS (Uninterruptable Power Supply) model SW1500 (or approved equal having five year battery life and battery hot swappable capability) for all cabinets having a mounting area over 120 square inches and containing controllers. These cabinets shall be provided with a fused duplex receptacle to be used a source for UPS power. Cabinet shall draw power from the UPS. Provide shelf for UPS.

C. All control power shall be provided from 120 VAC emergency power sources located in the “low voltage” closets on each floor and in the mechanical rooms.

D. Tamper-proof room wall mounted sensors installed with Allen, Bristol or similar hardware with local temperature setpoint adjustment (limited range). The maximum allowed temperature range shall be set from an operator’s station. Program the local control ranges as follows:

1. Standard thermostats - 70°F to 75°F
2. Mechanical and electrical rooms - 50°F to 85°F

E. Space temperature control in specifically identified locations will use return/exhaust duct mounted sensors and setpoint will be adjusted with computer interface.

F. Individually assignable priority password security system to prevent unauthorized use. Provide at least four levels including the following: Information only, change of setpoint & ON/OFF, programmer, and a fourth master level for assigning appropriate local access.

G. Equipment monitoring and alarm function including information for diagnosing equipment problems.

1. All system points shall be programmed to report alarm conditions by fully expanded point names that are tailored and specific to this project.
2. Assign alarm limits at 10% above highest expected level and at 10% below lowest expected level (subject to control sequence design) or as requested by Owner.
3. Interlock all alarm points to system status to lock out alarms when the system is not operational by schedule or operator command.

H. Auto-restart, without operator intervention, the operator stations and all controlled equipment to the control state that would be in effect if the power failure or fire alarm event had not occurred. Start/stop outputs shall continue to command the affected device while motor power is unavailable and allow for equipment restart, as previously commanded or scheduled, upon restoration of motor power.

I. Equipment run-time totalization of motor driven equipment.

J. Interactive displays of all input and output points: As a minimum, each screen on the monitor shall be able to display 25 interactive points and custom text.

K. Operator shall be able to, through keyboard interface, disable any control logic for any output or setpoint, temporarily substitute the value for any input/output, and introduce a different value or state for all inputs, outputs and setpoints.

L. Individual controllers shall be programmed with nonvolatile stand-alone control logic necessary to maintain appropriate HVAC equipment operation. While in temporary stand-alone mode, energy efficiency can be sacrificed to maintain temperature control and operational conditions that will not damage equipment or compromise health and safety.

M. Controllers shall, upon loss of valid programming, be capable of requesting and receiving a programming download of all required program code from the system management server.

N. Owner personnel shall be able to create and modify control software in any facility computer utilizing menu-driven programming. Owner personnel shall be able to store the programming on a removable computer disk and preprogram a nonvolatile, transportable memory storage device, which can be used for replacement of the programming in system controllers.

2.3 SYSTEM ARCHITECTURE

A. The BAS shall consist of a network of controllers providing full stand-alone operation of the building. The controllers shall contain the necessary programming to accomplish the sequence of operations for building control.

B. Controllers shall normally execute the control strategy to use peer-to-peer communication capabilities. Upon loss of communication, the stand-alone control unit shall be able to execute its own stand-alone programming. This distribution of control authority is mandated so that the lost communications capability shall not cause a complete loss of control for affected systems.

C. Operator station shall not be necessary to sustain building operation.

D. All EMCS equipment installed in this project shall be interoperable to interface with the existing campus EMCS. All control products provided for this project shall comprise a LonWorks internetwork.

E. The Contractor shall provide all communication media, connectors, repeaters, hubs, and routers necessary for the internetwork.

F. All controllers shall have a communication port for connections with the operator interfaces using the LonWorks Data Link/Physical layer protocol.

G. Communication services over the internetwork shall result in operator interface and value passing that is transparent to the internetwork architecture as follows:

1. Connection of an operator interface device to any one controller on the internetwork will allow the operator to interface with all other controllers as if that interface were directly connected to the other controllers. Data, status information, reports, system software, custom programs, etc., for all controllers shall be available for viewing and editing from any one controller on the internetwork.
2. All database values (e.g., objects, software variables, custom program variables) of any one controller shall be readable by any other controller on the internetwork. This value passing shall be automatically performed by a controller when a reference to a object name not located in that controller is entered into the controller's database. An operator/installer shall not be required to set up any communication services to perform internetwork value passing.

H. Dedicated Controllers: All sensing points and controlled outputs associated with a sub-system or piece of equipment shall be wired to and processed within one controller. A sub-system is defined as a group of equipment items that are directly controlled together, such as the components associated with an air handler. A “reset” signal may come from another

subsystem controller. When supply terminal units are to be tracked by an exhaust terminal unit, all supply and exhaust monitoring and control points shall be processed by the same controller.

2.4 GRAPHICS

A. General: Provide complete graphics for all systems. Graphic completeness, appearance and quality shall be the best available from the approved manufacturer. All system shall be diagrammed in the graphics with measured values indicated at the appropriate location on the diagrammatic graphic. Setpoint, on-off-auto and similar adjustable shall be at the appropriate location on the diagrammatic graphic.

B. Graphic display requirements:

1. Provide a Microsoft Windows-based software package for the preparation of system graphics.
2. Include with this software a library of HVAC symbols such as fans, pumps, chillers, etc.
3. This section establishes standards for graphic displays as follows:

    a. All operator stations shall be programmed to display dynamic color graphic representations of the mechanical systems and floor areas for which this system has control.
    b. Systems to be displayed include the air handlers (including all monitored and controlled components), air terminal units, fans, chillers and towers, heat converters and exchangers, pumping systems and similar mechanical devices.
    c. Show the mechanical equipment components on a single graphic. Example: Chilled and condenser water pumps, cooling towers, chillers, differential pressure control valves, etc.
    d. Displays shall automatically update with current real time data.
    e. Room floor plan displays are required and shall indicate the approximate positions of controlled mechanical system elements.
    f. All displays shall show real time data to include temperatures, actuator positions, and motor run status.
    g. All system input, output and setpoint points shall be displayed on an appropriate graphic.

2.5 DDC EQUIPMENT

A. OPERATOR STATIONS

1. Local Access: Operator interface with the installed EMCS equipment and the entire campus BAS shall be performed with portable computers and desktop computers using site licensed software.
2. WEB Access: It shall be possible to interface with the EMCS from remote computers equipped with Microsoft Internet Explorer (web browser) via the Internet.

    a. Operators shall be able to access information through user interfaces at the application controller and the plant controller levels, as well as at the master display.
    b. System shall be an open, interoperable system supporting LonWorks®, BACnet® and/or other protocols.

3. Operator interface with the EMCS includes the ability to operate and program all campus EMCS equipment. The ability to look, adjust/override and program will be controlled using access levels.
4. Overall management of the EMCS, storage of programs, data, trends, access control, graphics.
5. Application Software:

    a. I/O capability from operator station.

b. System security for each operator via software password and access levels.
c. Automatic system diagnostics; monitor system and report failures.
d. Database creation and support.
e. Automatic and manual database save and restore.
f. Dynamic color graphic displays with up to 10 screen displays at once.
g. Custom graphics generation and graphics library of HVAC equipment and symbols.
h. Alarm processing, messages, and reactions.
i. Trend logs retrievable in spreadsheets and database programs.
j. Alarm and event processing.
k. Object and property status and control.
l. Automatic restart of field equipment on restoration of power.
m. Data collection, reports, and logs. Include standard reports for the following:

1) Current values of all objects.
2) Current alarm summary.
3) Disabled objects.
4) Alarm lockout objects.
5) Logs.

n. Custom report development.
o. Utility and weather reports.
p. Workstation application editors for controllers and schedules.
q. Maintenance management.

6. Custom Application Software:

a. English language oriented.
b. Full-screen character editor/programming environment.
c. Allow development of independently executing program modules with debugging/simulation capability.
d. Support conditional statements.
e. Support floating-point arithmetic with mathematic functions.
f. Contains predefined time variables.

B. Control Units: Modular, comprising processor board with programmable, nonvolatile, random-access memory; local operator access and display panel; integral interface equipment; and backup power source.

1. Units monitor or control each I/O point; process information; execute commands from other control units, devices, and operator stations; and download from or upload to operator workstation or diagnostic terminal unit.
2. Stand-alone mode control functions operate regardless of network status. Functions include the following:

a. Global communications.
b. Discrete/digital, analog, and pulse I/O.
c. Monitoring, controlling, or addressing data points.
d. Software applications, scheduling, and alarm processing.
e. Testing and developing control algorithms without disrupting field hardware and controlled environment.

3. Standard Application Programs:

a. Coordinate

4. Local operator interface provides for download from or upload to operator workstation or diagnostic terminal unit.

C. Local Control Units: Modular, comprising processor board with electronically programmable, nonvolatile, read-only memory; and backup power source.

1. Units monitor or control each I/O point, process information, and download from or upload to operator workstation or diagnostic terminal unit.
2. Stand-alone mode control functions operate regardless of network status. Functions include the following:
    a. Global communications.
    b. Discrete/digital, analog, and pulse I/O.
    c. Monitoring, controlling, or addressing data points.
3. Local operator interface provides for download from or upload to operator workstation or diagnostic terminal unit.

D. I/O Interface: Hardwired inputs and outputs may tie into system through controllers. Protect points so that shorting will cause no damage to controllers.

1. Binary Inputs: Allow monitoring of on-off signals without external power.
2. Pulse Accumulation Inputs: Accept up to 10 pulses per second.
3. Analog Inputs: Allow monitoring of low-voltage (0- to 10-V dc), current (4 to 20 mA), or resistance signals.
4. Binary Outputs: Provide on-off or pulsed low-voltage signal, selectable for normally open or normally closed operation.
5. Analog Outputs: Provide modulating signal, either low voltage (0- to 10-V dc) or current (four to 20 Ma).
6. Tri-State Outputs: Provide two coordinated binary outputs for control of three-point, floating-type electronic actuators.
7. Universal I/Os: Provide software selectable binary or analog outputs.

E. Power Supplies: Transformers with Class 2 current-limiting type or overcurrent protection; limit connected loads to 80 percent of rated capacity. DC power supply shall match output current and voltage requirements and be full-wave rectifier type with the following:

1. Output ripple of 5.0 mV maximum peak to peak.
2. Combined one percent line and load regulation with 100-mic.sec. response time for 50 percent load changes.
3. Built-in overvoltage and overcurrent protection and be able to withstand 150 percent overload for at least three seconds without failure.

F. Power Line Filtering: Internal or external transient voltage and surge suppression for workstations or controllers with the following:

1. Minimum dielectric strength of 1000 V.
2. Maximum response time of 10 nanoseconds.
3. Minimum transverse-mode noise attenuation of 65 dB.
4. Minimum common-mode noise attenuation of 150 dB at 40 to 100 Hz.

2.6 UNITARY CONTROLLERS

A. Each controller shall operate as part of the control system and as an independent unit when not in communication with other controllers or an operator station. Global controllers shall be able to share Global information on a peer-to-peer basis without relying on an operator station.

B. It shall be possible to define control strategies at each controller from any operator station. Each controller shall be able to interface directly with an operator station.

C. Each controller shall include its own microprocessor, power supply, and, if necessary, battery with automatic charger. Upon loss of system power, the controller memory shall be maintained

for a minimum of 72 hours with no external source of power. Upon restoration of system power, the control unit shall resume full operation without operator intervention.

D. Provide control programming logic at each controller for proportional and/or proportional plus integral control capabilities as necessary to assure complete and stable control of each controlled variable.

E. Each controller shall maintain and perform its own stand-alone control strategy upon communications failure. The controller stand-alone control program shall be adequate to maintain the basic control function and provide protection from inappropriate equipment operation. The controller shall retain its programming during a power failure and resume operation without program reloading from another device.

F. The controllers shall be powered by 24 VAC.

G. Each controller shall be isolated (optically or by other means) from communication trunk and have fuse or overload protection.

H. The controller point monitoring and control capabilities shall include but not be limited to the following:

1. Binary inputs (contact closures)
2. Analog inputs (use only resistive, 0-10 volt, and 4-20 ma. inputs; provide A/D conversion of 10 bits, minimum)
3. Binary output (start/stop or latching and momentary contacts)
4. Floating point control
5. Analog outputs (must include 4-20 ma. @ 10 VDC minimum, 0 -10 VDC; provide A/D conversion of 12 bits, minimum).
6. ASHRAE 135 Compliance: Communicate using read (execute and initiate) and write (execute and initiate) property services defined in ASHRAE 135. Reside on network using LonWorks datalink/physical layer protocol and have service communication port for connection to diagnostic terminal unit.

2.7 ALARM PROGRAM

A. For each alarm input, provide the following assignable alarm responses:

1. Display English language point description in addition to system point identification.
2. Print out alarm description and operator-created alarm message.
3. Require acknowledgment by operator and print occurrence if directed by Owner.

2.8 LOGS

A. Trend log: As a minimum, provide capacity for 50 trend logs. Provide for review of data on monitor and printer. Each trend log shall have assignable start/stop times/dates.

B. Current alarm log: Display all points currently in alarm. Operator activity log: Record operator activity by operator account identification and work performed during a minimum of the last 10 log-in sessions or last 20 commands.

2.9 ANALOG CONTROLLERS

A. Step Controllers: 6- or 10-stage type, with heavy-duty switching rated to handle loads and operated by electric motor.

B. Electric, Outdoor-Reset Controllers: Remote-bulb or bimetal rod-and-tube type, proportioning action with adjustable throttling range, adjustable set point, scale range minus 10 to plus 70-degree F, and single- or double-pole contacts.

C. Electronic Controllers: Wheatstone-bridge-amplifier type, in steel enclosure with provision for remote-resistance readjustment. Identify adjustments on controllers, including proportional band and authority.

D. Fan-Speed Controllers: Solid-state model providing field-adjustable proportional control of motor speed from maximum to minimum of 55 percent and on-off action below minimum fan speed. Controller shall briefly apply full voltage, when motor is started, to rapidly bring motor up to minimum speed. Equip with filtered circuit to eliminate radio interference. Remote-control-point adjustment shall be plus or minus 20 percent of sensor span, input signal of 3 to 13 psig.

2.10 FAILURE MODE

A. Upon failure of any global controller, the operator station shall display off-line occurrence for each affected point and provide communication verification to each controller for each I/O channel.

B. In the event of communication failure, controller shall continue to operate equipment using appropriate backup values for missing global information. If sensor information is necessary for proper stand-alone function, then that sensor shall be attached directly to the appropriate controller. Provide failure mode programming to accomplish safe operation of equipment in case of communications failure on local trunk.

C. Upon return of primary power after a power failure of up to 72 hours, the system shall automatically return to completely normal operation with no action required from operating personnel.

D. Unless otherwise indicated in the design documents, provide the following failure modes, (that is, the position that the controlled device attains under failure due to loss of power, loss of air pressure, or loss of communications) for valves and dampers:

1. All Fan cooling water valves shall fail closed.
2. All central cooling water differential pressure control valves shall fail closed.
3. All fan exhaust air and outside air dampers shall fail closed.
4. All fan recirculation dampers shall fail open.
5. Zone-level air terminal unit dampers may fail in place.

2.11 ENERGY REDUCTION AND SPECIAL OPERATION SOFTWARE

A. The system shall be designed to control energy-consuming loads. Provide engineering, consulting, and programming to develop and set up the following energy reduction software:

1. Time schedules: Software should provide at least 16-time schedules. Each schedule is to be an 8-day type, capable of six entries minimum per day. Time program shall provide ON/OFF commands and reset SETPOINT capabilities.
2. Holiday time programs: Provide a holiday time schedule capability.
3. Optimal start/stop: Provide the ability to optimize start/stop times to attain and maintain temperature setpoint only during occupied times. The system shall be self tuning, with compensation for weekends and holidays.
4. Setpoint reset: Provide a means of automatically resetting heating water, chilled water and ventilation air temperatures, volumes and pressures.

5. Provide a program to automatically restart all DDC controlled equipment upon the resumption of power or return from fire alarm condition. Equipment shall be restarted according to a prearranged, prioritized and staggered restart schedule.
6. For loads that have been turned off at the Motor Control Center, either by positioning of the HOA switch or the line disconnect; provide a restart strategy that automatically restarts load upon the reset of switches to their normal on-line positions.
7. Provide capability to adjust the setpoints of main mechanical systems from an operator station using simple 'point and click' command windows.

2.12 ELECTRONIC SENSORS

A. Temperature sensors:

1. Sensors shall be completely pre-calibrated with no electrical adjustments or calibration required for standard installation conditions.
2. The temperature displayed at an operator station shall be accurate to within 1º F. This accuracy shall be warranted (parts and labor) for a minimum of three years.
3. Wall-mounted sensors shall be tamperproof. Wall mounted sensors for zone controls shall provide jack for operations laptop connection. That connection shall allow communication with system for monitoring and adjusting at least the zone-level equipment serving that zone. Wall sensors shall include temperature readout and shall provide basic control sequence diagnostic and reset features and local setpoint adjust and after-hours override
4. Freeze protection sensors shall be non-averaging.
5. Thermowells shall be bronze, brass, or stainless steel with 1-inch NPT threads.
6. Install piping temperature sensors adjacent to temperature gauge or test port.
    a. Use heat-conducting compound in thermowells.
    b. Strap-on fluid temperature sensors will not be allowed.
7. Mount outside air sensors inside the outside air intake as to avoid solar influence and directly sense the average temperature of the air entering the air handling unit(s).

B. Air velocity transmitter: Shall provide air velocity information independent of the effects of static pressure. Transmitter shall operate at rated accuracy from 0º F to 120° F. The minimum accuracy of displayed value at an operator station shall be 95% through the range of 20% to 100% of sensed airflow, with a drift rate no greater than one percent per year. The proportional output shall be 4 to 20 mA.

C. Differential and static pressure transmitter: Transmitter shall operate from 50% of minimum to 150% of maximum anticipated pressure. The maximum error of displayed value at an operator station shall be 2% through the range of 20% to 150% of the intended maximum setpoint. Minimum pressure tolerance shall be 150% of the maximum pressure expected in normal operation. The maximum drift rate shall be no greater than one percent per year. The proportional output shall be 4 to 20 ma. Provide designed pressure pitot sensor Dwyer type A-301/A 302 or approved equal.

D. Current sensors shall convert AC to proportional DC (4 to 20 ma). Response time: 300 milliseconds to 99% of final value. Manufacturer: Neilson-Kuljian or approved equal. Controls will be programmed to indicate equipment failure if motor current goes above or below normal conditions.

E. Averaging elements shall be mounted so as to cross a minimum of 80% of the plenum width and shall be located to provide an indication of temperature within +/- 1° F. Provide support at 36 inches maximum such that there will be no metal to metal contact between the sensing element and other equipment.

F. Outside air sensors shall be a waterproof assembly protected from solar radiation. Span shall cover the range of 0º F to 100° F or better and not exceed a 150° F span. Typically, mount sensor inside an outside air intake that draws air 24/7.

G. Pressure Transmitters/Transducers:

1. Static-Pressure Transmitter: Nondirectional sensor with suitable range for expected input, and temperature compensated.

    a. Accuracy: Two percent of full scale with repeatability of 0.5 percent.
    b. Output: 4 to 20 mA.
    c. Building Static-Pressure Range: 0- to 0.25-inch wg (0 to 62 Pa).
    d. Duct Static-Pressure Range: 0- to 5-inch wg (0 to 1240 Pa).
    e. Manufacturer:

        1) Tek-air Systems Inc., Ultra low series
        2) Setra Systems
        3) Veltron
        4) Modus “low flow T” series
        5) Ultratech Inc.

2. Water Pressure Transducers: Stainless-steel diaphragm construction, suitable for service; minimum 150-psig (1034-kPa) operating pressure; linear output 4 to 20 mA.
3. Water Differential-Pressure Transducers: Stainless-steel diaphragm construction, suitable for service; minimum 150-psig (1034-kPa) operating pressure and tested to 300-psig (2070-kPa); linear output 4 to 20 mA.
4. Differential-Pressure Switch (Air or Water): Snap acting, with pilot-duty rating and with suitable scale range and differential. Manufacturer:

    a. Tek-air Systems Inc., Ultra low series
    b. Veltron
    c. Modus “low flow T” series
    d. Ultratech Inc

5. Pressure Transmitters: Direct acting for gas, liquid, or steam service; range suitable for system; linear output 4 to 20 mA.

2.13 STATUS SENSORS

A. Status Inputs for Fans: Differential-pressure switch with pilot-duty rating and with adjustable range of 0- to 5-inch wg.

B. Status Inputs for Pumps: Differential-pressure switch with pilot-duty rating and with adjustable pressure-differential range of 8 to 60 psig, piped across pump.

C. Status Inputs for Electric Motors: Comply with ISA 50.00.01, current-sensing fixed- or split-core transformers with self-powered transmitter, adjustable and suitable for 175 percent of rated motor current.

D. Voltage Transmitter: Comply with ISA 50.00.01, single-loop, self-powered transmitter, adjustable, with suitable range and one percent full-scale accuracy.

E. Power Monitor: Three-phase type with disconnect/shorting switch assembly, listed voltage and current transformers, with pulse kilowatt hour output and 4- to 20-mA kW output, with maximum 2 percent error at 1.0 power factor and 2.5 percent error at 0.5 power factor.

F. Current Switches: Self-powered, solid-state with adjustable trip current, selected to match current and system output requirements.

G. Electronic Valve/Damper Position Indicator: Visual scale indicating percent of travel and 2- to 10-V dc, feedback signal.

2.14 THERMOSTATS

A. Thermostats shall be low-voltage, thermistor sensor, touch screen operated, with 55 to 85-degree F set-point range, minimum. Thermostats shall be programmed so the user can adjust temperature higher or lower a pre-determined range (coordinate range with owner). A 5-degree deadband between heating and cooling shall be programmed.

2.15 GAS DETECTION EQUIPMENT

A. Carbon Dioxide Sensor and Transmitter: Single detectors using solid-state infrared sensors; suitable over a temperature range of 23 to 130 degree F and calibrated for 0 to 2 percent, with continuous or averaged reading, 4- to 20-mA output; for wall mounting. Manufacturer: Ventostat model 8001.

B. Occupancy Sensor: Passive infrared, with time delay, daylight sensor lockout, sensitivity control, and 180-degree field of view with vertical sensing adjustment; for flush mounting.

2.16 ELECTRONIC AIRFLOW MEASUREMENT STATIONS:

A. Ebtron Model GTC116 or approved equal. Thermal dispersion airflow measurement. UL listed, airflow accuracy +/- 2% of reading, 6063 gold anodized aluminum probe, 304 ss brackets, RS-485 output with LonWorks.

B. General

1. Provide one airflow measurement device (AMD) for each measurement location provided on the plans, schedules and/or control diagrams to determine the average airflow rate and temperature at each measurement location.
2. Each AMD shall be provided with a microprocessor-based transmitter and one or more sensor probes.
    a. Devices that have electronic signal processing components on or in the sensor probe are not acceptable.
3. Airflow measurement shall be field configurable to determine the average actual or standard mass airflow rate.
    a. Actual airflow rate calculations shall have the capability of being adjusted automatically by the transmitter for altitudes other than sea level.
4. Temperature measurement shall be field configurable to determine the velocity weighted temperate or simple arithmetic average temperature.

C. Sensor Probes

1. Sensor probes shall be constructed of gold anodized, 6063 aluminum alloy tube [insert 316 stainless steel tube in lieu of 6063 aluminum alloy tube, when required].
2. Sensor probe mounting brackets shall be constructed of 304 stainless steel.
3. Probe internal wiring between the connecting cable and sensor nodes shall be Kynar coated copper.
    a. PVC jacketed internal wiring is not acceptable.
4. Probe internal wiring connections shall consist of solder joints and spot welds.
    a. Connectors of any type within the probe are not acceptable.

b. Printed circuit boards within the probe are not acceptable.

5. Probe internal wiring connections shall be sealed and protected from the elements and suitable for direct exposure to water.
6. Each sensor probe shall be provided with an integral, FEP jacket, plenum rated CMP/CL2P, UL/cUL Listed cable rated for exposures from -67°F to 392°F and continuous and direct UV exposure.

   a. Plenum rated PVC jacket cables are not acceptable.

7. Each sensor probe cable shall be provided with a connector plug with gold plated pins for connection to the transmitter.
8. Each sensor probe shall contain one or more independently wired sensing nodes.
9. Sensor node airflow and temperature calibration data shall be stored in a serial memory chip in the cable connecting plug and not require matching or adjustments to the transmitter.
10. Each sensor node shall be provided with two bead-in-glass, hermetically sealed thermistors potted in a marine grade waterproof epoxy.

    a. Devices that use epoxy or glass encapsulated chip thermistors are not acceptable.

11. Each thermistor shall be individually calibrated at a minimum of 3 temperatures to NIST-traceable temperature standards.
12. Each sensor node shall be individually calibrated to NIST-traceable airflow standards at a minimum of 16 calibration points.
13. The number of independent sensor nodes provided shall be as follows:

Area ft^2	# Sensor Nodes
≤ 0.5	1
> 0.5 & ≤ 1	2
> 1 & ≤ 2	4
> 2 & ≤ 4	6

Area ft^2	# Sensor Nodes
> 4 & ≤ 8	8
> 8 & ≤ 12	12
> 12 & ≤ 14	14
> 14	16

    a. A total of 4 probes shall be required for openings with an aspect ratio ≤ 1.5 and with an area ≥ 25 ft^2.

D. Transmitter

1. A remotely located microprocessor-based transmitter shall be provided for each measurement location.
2. The transmitter shall be comprised of a main circuit board and interchangeable interface card.
3. All printed circuit board interconnects, edge fingers, and test points shall be gold plated.
4. All printed circuit boards shall be electroless nickel immersion gold (ENIG) plated.
5. All receptacle plug pins shall be gold plated.
6. The transmitter shall be capable of determining the average airflow rate and temperature of the sensor nodes.

   a. Separate integration buffers shall be provided for display airflow output, airflow signal output (analog and network) and individual sensor output (IR-interface).

7. The transmitter shall be capable of providing a high and/or low airflow alarm.
8. The transmitter shall be capable of identifying an AMD malfunction via the system status alarm and ignore any sensor node that is in a fault condition.
9. The transmitter shall be provided with a 16-character, alpha-numeric, LCD display.

a. The airflow rate, temperature, airflow alarm and system status alarm shall be visible on the display.

10. The transmitter shall be provided with two field selectable (0-5/0-10 VDC or 4-20mA), scalable, isolated and over-current protected analog output signals and [select one or both of the following] one isolated RS-485 LonWorks network connection; or one isolated RS-485 LonWorksnetwork connection; or one isolated Ethernet network connection.
11. Analog output signals shall provide the total airflow rate and be field configurable to output one of the following:

    a. temperature
    b. airflow alarm; or
    c. system status alarm

12. Network communications shall provide the average airflow rate, temperature, airflow alarm, system status alarm, individual sensor node airflow rates and individual sensor node temperatures.
13. Provide an infra-red I/O card mounted on the transmitter PCB for communication to a handheld retrieval device that can download individual sensor node airflow and temperature data in real time.
14. The transmitter shall be powered by 24 VAC and use a switching power supply that is over-current and over-voltage protected.
15. The transmitter shall use a “watchdog” timer circuit to ensure continuous operation in the event of brown-out and/or power failure.

E. Performance

1. Each sensing node shall have an airflow accuracy of ±2% of reading over an operating range of 0 to 5,000 FPM.

    a. Accuracy shall include the combined uncertainty of the sensor nodes and transmitter.
    b. Devices whose overall accuracy is based on individual accuracy specifications of the sensor probes and transmitter shall demonstrate compliance with this requirement over the entire operating range.

2. Each sensing node shall have a temperature accuracy of ±0.15° F over an operating range of -20°F to 160°F.

F. Listings and Certifications

1. The AMD shall be UL873 Listed as an assembly.

    a. Devices claiming compliance with the UL Listing based on individual UL component listing are not acceptable.

2. The AMD shall be BTL Listed.
3. The AMD shall carry the CE Mark for European Union Shipments.

2.17 ACTUATORS

A. Actuator type: Electronic actuators shall be used for all water control valves and air dampers.

B. Electronic actuators shall be Belimo, Delta, or approved equal selected from the vendor‘s standard product line.

1. Sized for torque required for damper seal at load conditions.
2. All electronic actuators shall be powered by 24 VAC (smoke damper are powered by 120 volts as per specification 233300).
3. Direct-coupled type designed for minimum 60,000 full-stroke cycles at rated torque.

4. Proportional electronic actuators shall use 0 to 10 VDC, 4 to 20 mA. or floating-point control.
5. Floating point actuators shall have position indicated by potentiometer so control system will know exact position at all times.
6. Temperature Rating: Minus 22 to plus 122-degree F**,** (Minus 22 to plus 250-degree F for smoke dampers).
7. Multiple electronic actuators may be powered by one separately fused 24 VAC transformer, providing the transformer size does not exceed 100 VA.
8. No more than two electronic actuators may drive a common shaft.
9. All electronic actuators shall have field manual positioning capability to allow manual positioning of valve or damper in absence of control power.
10. Two integral built-in auxiliary end switches.
11. Actuator shall have positioning feedback.

C. Actuators shall be capable of providing 150% of the minimum valve or damper manufacturer's published torque requirements for complete shutoff.

D. Actuators shall 'Fail in Last Position' unless otherwise noted.

E. Valve actuators shall have clutch and manual positioning handle/wheel at all locations where a separate isolation valve is not provided immediately adjacent to the controlled valve.

2.18 CONTROL VALVES

A. Control valves shall be selected to meet CV and pressure requirements.

1. Two-way pressure independent water control valves shall be sized for a pressure drop of approximately 3 psi. Higher pressure drop shall be provided if allowed or directed by the A/E (during shop drawing review) where branch pressure to a controlled equipment is felt to be significantly more than the equipment pressure drop.
2. Three-way water control valves shall be sized for a pressure drop of approximately 2.5 psi.
3. Steam valves for equipment having condensate draining to near-atmospheric pressure shall be sized for a pressure drop of approximately 50% of the normal steam supply pressure.
4. Valve body and actuator selection shall be sufficient to handle system pressure and shall close against the system differential pressures.
5. Valve service rating shall be 125 psig. or greater.
6. The shafts to which the actuators are coupled shall be square or hexagonal or round with one side flattened to insure tight coupling.
7. Install valves in the orientation recommended, or stated as preferred, in manufacturer's literature.

B. Provide valves with rotating control stems except where "lift and lay" valves are specifically identified. Use the following valves unless they are unsuited for a specific application:

1. Use Belimo or Delta characterized ball valves with actuators for sizes ranging from ¼" to 2" full port. Where valves are for open-close application only, the "characterized" feature shall not be provided, provide full port size.
2. Zone valves: Valves shall be constructed with a cast brass body and stainless-steel balls. The valve shall provide for 100% shut-off and silent operation.

C. Use butterfly valves when characterized ball valves do not provide necessary CV. Butterfly valves with disks attached to the stem with screws, bolts or rivets are not acceptable. Use Demco, Victaulic or approved equal. Butterfly Valves: 150-psig maximum pressure differential, ASTM A 126 cast-iron or ASTM A 536 ductile-iron body and bonnet, extended neck, stainless-steel stem, field-replaceable EPDM or Buna N sleeve and stem seals.

D. Steam valves shall be Siemens 599 or approved equal.

E. Hydronic system globe valves shall have the following characteristics:

1. NPS 2 (DN 50) and Smaller: Class 125 bronze body, bronze trim, rising stem, renewable composition disc, and screwed ends with back-seating capacity repackable under pressure.
2. NPS 2-1/2 (DN 65) and Larger: Class 125 iron body, bronze trim, rising stem, plug-type disc, flanged ends, and renewable seat and disc.
3. Internal Construction: Replaceable plugs and stainless-steel or brass seats.
    a. Single-Seated Valves: Cage trim provides seating and guiding surfaces for plug on top and bottom.
    b. Double-Seated Valves: Balanced plug; cage trim provides seating and guiding surfaces for plugs on top and bottom.
4. Sizing: 5-psig maximum pressure drop at design flow rate or the following:
    a. Two Position: Line size.
    b. Two-Way Modulating: Either the value specified above or twice the load pressure drop, whichever is more.
    c. Three-Way Modulating: Twice the load pressure drop, but not more than value specified above.
5. Flow Characteristics: Two-way valves shall have equal percentage characteristics; three-way valves shall have linear characteristics.
6. Close-Off (Differential) Pressure Rating: Combination of actuator and trim shall provide minimum close-off pressure rating of 150 percent of total system (pump) head for two-way valves and 100 percent of pressure differential across valve or 100 percent of total system (pump) head.

F. Steam system globe valves shall have the following characteristics:

1. NPS 2 (DN 50) and Smaller: Class 125 bronze body, bronze trim, rising stem, renewable composition disc, and screwed ends with back-seating capacity repackable under pressure.
2. NPS 2-1/2 (DN 65) and Larger: Class 125 iron body, bronze trim, rising stem, plug-type disc, flanged ends, and renewable seat and disc.
3. Internal Construction: Replaceable plugs and stainless-steel seats. Single-Seated Valves: Cage trim provides seating and guiding surfaces for plug on top and bottom of guided plugs.
4. Sizing: For pressure drop based on the following services:
    a. Two Position: 20 percent of inlet pressure.
    b. Modulating 15-psig Steam: 80 percent of inlet steam pressure.
    c. Modulating 16- to 50-psig Steam: 50 percent of inlet steam pressure.
    d. Modulating More Than 50-psig Steam: As indicated.
5. Flow Characteristics: Modified linear characteristics.
6. Close-Off (Differential) Pressure Rating: Combination of actuator and trim shall provide minimum close-off pressure rating of 150 percent of operating (inlet) pressure.

G. Self-Contained Control Valves: Bronze body, bronze trim, two or three ports as indicated, replaceable plugs and seats, and union and threaded ends.

1. Rating: Class 125 for service at 125 psig and 250-degree F operating conditions.
2. Thermostatic Operator: Liquid filled remote sensor with integral adjustable dial.

2.19 DAMPERS

See Section 233300 - Air Duct Accessories.

2.20 Variable Frequency Drives (VFDs)

A. VFDs for division 23 equipment shall be provided by the controls system subcontractor as per section 230915.

B. Division 26 contractor shall install field mounted VFDs and provide power wiring to the VFDs and from the VFDs to their controlled motors.

C. The controls system subcontractor shall provide control wiring for VFDs. The controls system subcontractor shall provide VFDs for packaged and custom air handling units to the respective manufacturers specified in Section(s) [237000, 237012] for installation and wiring at the factory. Division 26 contractor shall provide power to factory mounted VFDs once they are installed in the field.

2.21 ENCLOSURES

A. All enclosures to be NEMA 1, unless otherwise required for intended service. All controls and instruments shall be logically assembled at one or more panels, have hinged doors and be marked with engraved melamine labels.

B. All enclosures used as a mounting site for control devices shall also contain a documentation holder located on the inside of the door.

C. All enclosures shall be provided with locks.

D. Label each equipment panel furnished with 120 VAC power with power source label showing identification of power panel and breaker.

2.22 WIRING AND CONDUIT

A. Install wiring and conduit in accordance with Division 26 requirements.

B. Minimum wire size shall be based on the manufacturer's recommendations based on the specific application. Single conductor wire insulation shall be THHN. All wires shall be sized in accordance with the NEC for the load serviced. A single conductor shall not be used for more than one leg of an input or output device circuit (no "common" conductors) unless approved by Owner.

C. All wiring shall be stranded. Exceptions will be made for wiring used in preassembled factory crimped cables, 20 g and smaller, where connectors provide support to the insulated cable jacket at the point of connection.

D. All low voltage energy limited wiring (except 24 VAC power), installed in open tray or installed as open wiring, shall be in jacketed cables dedicated to individual devices.

E. Junction box covers shall be labeled "DDC" or show the vendor logo.

F. Splicing shall be minimized and shall be done only in accessible outlet, junction, or cabinet boxes that are clearly shown on the "as-built" record drawings. Splicing shall be made with 3M

"Scotchloc" spring connectors with steel cap and PVC insulation, Thomas & Betts, or a crimp on butt-splice, or approved equal. When splicing is necessary, the insulation colors shall match, and the conductors shall be mechanically secured to each other so that no stress is applied to the splice. Splicing of long runs shall be accomplished by means of a fully insulated crimped barrel connector.

G. Wire pulls by powered mechanical means will not be permitted. Conduit shall be cleaned of foreign material just before pulling the wire or cable. Lubricants shall be compounds specifically prepared for cable pulling and shall not contain petroleum or other products that will affect cable insulation.

H. Wire that has scrapes, nicks, gouges, or crushed insulation shall not be used and shall be removed when present.

I. Groups of conductors, where installed in cabinets and wire trays, shall be neatly grouped with wire ties or equal.

J. All wiring contained in metal wireways shall be in wireways dedicated to low voltage service.

K. Low voltage energy-limited wiring shall not be run in the same wireways with, or closely parallel to, high voltage or switched power wiring. Interposing relays shall be used for all switched power loads and shall be located so that the switched power conductors do not run in the same wireway as the interposing relay coil power or any other energy-limited low voltage conductors.

L. All wire shall be new and brought on the jobsite in original packages bearing Underwriter's label and the date of manufacture.

M. Aluminum wire is prohibited.

N. No conduit shall be filled so that the maximum bundled cross-sectional dimension exceeds 40 % of conduit inside diameter. No raceway shall be filled to more than 40% and maximum fill for "wiremold" (surface raceway) shall be 20%.

O. No wire run or circuit shall be longer than 80% of the maximum allowable length or power consumption for the wire size and application. No output circuit shall exceed 80% of the maximum load capacity specified by the manufacturer.

P. Wiring and conduit shall comply with Division 26 specifications.

1. The basic wiring method shall be in conduit unless otherwise permitted in this section.
2. Where conduit direct connection is not possible, all permitted open wiring shall be plenum rated.
3. Permitted open wiring is limited to the following applications:
    a. Wiring from a zone airflow control unit to a nearby temperature sensor not to exceed 50 feet
    b. Wiring from a zone airflow terminal control unit to a nearby water control valve not to exceed six feet

Q. Wiring from any controller to a device which has otherwise been approved for installation and cannot accept conduit connection shall meet the following requirements:

1. Conduit shall be used to within 12 inches of the device.
2. Install in wireway all trunk communication wiring between the operator station and the controllers, and between controllers. Open wiring is not otherwise permitted.

R. Conduits shall be provided with appropriate bushings and end fittings to protect cabling from sharp conduit edges.

S. Conduit size shall be ¾-inch minimum for all wiring groups consisting of six or more conductors. NEC requirements shall apply as though conductors were used to their full current carrying and thermal capacity.

T. Wireway runs shall be level, plumb, parallel or perpendicular to walls, pipes and sides of openings. Wireways shall follow the contours of the support surface. Passageways for access and servicing shall not be blocked.

U. All wiring between global controllers and trunk, N2 and LAN cables longer than 300 feet shall be 100% backed up with spare conductors.

V. All conductors that become bundled or pass from an enclosure shall be identified with typed or machine lettered labels, Briade or approved equal. Tag numbers shall agree with wire numbers assigned on wiring diagrams and the installation drawings.

W. Wires shall be labeled with mechanically prepared labels at their connection point to each apparatus point of connection.

X. UL/ULC Listed Flexible Metal Conduit shall be used for vibration isolation and shall be limited to 3 feet in length when terminating to vibrating equipment. Flexible Metal Conduit may be used within partition walls and for final connection to equipment.

Y. Open wiring, when permitted, shall be installed in compliance with WAC 296-46-725 with reference to NEC 336-15 and shall also be installed as follows:

1. All open wiring that penetrates through walls and crosses structural ceilings shall do so within 18 inches of the structural ceiling surface.
2. Wiring shall be attached to vertical supports at attachment points prepared by a protective wrap of electrical tape around the support. This wrap shall create a surface free of sharp edges.
3. Absolutely no wire is to be attached to pipe work or conduit of any kind.
4. Wire ties, if used, shall be trimmed so as to reduce sharp edges.
5. The vendor shall provide required cabling attachment points for control's use if the ceiling structure does not provide acceptable attachment points.

2.23 CONTROL RELAYS

A. Panel relays shall be plug-in type with contacts rated at twice the amperage rating of circuit requirements: Minimum temperature range –25º C to +70º C. Enclosure: Clear dust cover and shock resistant, rated for minimum of 2.5 million mechanical operations and 100,000 electrical operations at full load.

B. Remote/interposing relays shall be used for all remote switched loads.

1. They shall be housed in a NEMA-rated enclosure. Where two or more relays are mounted in the same enclosure, provide a hinged cover.
2. Besides meeting panel relay requirements, relays shall have 24 VDC coils and form C dry contacts with a minimum rating of 5 amperes @ 240 VAC.
3. Relays controlling inductive loads shall be equipped with coil transient suppression devices to limit transients to 150% of rated coil voltage.

2.24 TRANSFORMERS

A. 120V AC to 24V AC transformers shall be supplied to provide control voltage to the control system. The incoming 120V AC power shall be fused. Transformers shall be supplied with suitable mounting plates and mounted in separate electrical panel boxes with hinged covers adjacent to control system panels.

2.25 SPARE PARTS

A. Replacement Materials: Provide one replacement for each unique controller, damper motor, valve motor, thermostat, relay, etc.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS.

A. General: All work under this section shall be a subcontract by an authorized agent of the manufacturer.

B. Install software in control units and operator workstation(s). Implement all features of programs to specified requirements and as appropriate to sequence of operation.

C. Notations at Instruments: A typewritten notation shall be provided at each instrument stating its use; at thermostats, the proper setting. In finished spaces these notations shall be secured to the inside of the case; in other areas, shall be secured by adhesive to the duct or other adjacent surface and shellacked over. Instruments and equipment, whose use is self-evident, such as ordinary room thermostats, radiator valves, or similar unitary equipment valves, will not require such notations.

D. Penetrations of Ducts: All penetrations shall be properly sealed to prevent leakage around the opening; shall include a stuffing box type of closure or similar approved method.

E. Pipe Wells: Provide pipe wells for insertion of temperature sensors in water lines. Temperature sensing wells shall be of sufficient length to reach midway into pipe, with extension necks where installed or insulated piping. Wells shall be brass or stainless steel; installed in lines using tees or thread-o-lets.

F. Insertion Thermostats: Provide for all duct and water temperature sensing; capillary connected if averaging bulb type; capillary or rod and tube type for other units; non-bleed; throttling range as required for service; on water circuits, separable socket type; remote readjusting type where specified, adjustable ratio, straight line action, adjustable limit stops.

G. The freezestats used on fan shut-down control shall be wired to stop the fan in both the Auto and Hand positions of the HOA switch. Freezestats shall be overridden by the fire alarm controls.

H. Wall mounted temperature sensors shall be mounted on electrical boxes, and all wire penetrations shall be sealed to prevent thermal convection.

I. It is the responsibility of the controls vendor to ensure that all sensors are placed in the measurable flow path to accurately measure the sensed variable. As a minimum, water flow sensors shall be installed with a straight section of piping 10 diameters upstream and four diameters downstream.

J. Sensors installed for outside air measurement and pressurization shall be located to optimize the accuracy of the measurement. Coordinate with Mechanical Consultant.

K. Valve operators shall be installed directly above the controlled valve whenever possible (with the exception of steam control valves where actuator is rotated to about 30 degrees to avoid hot zone directly above valve) unless rotation is needed to permit maintenance access. However, in no case shall the operator be rotated to or beyond horizontal.

L. Freezestats shall be installed with capillaries supported by non-metallic standoffs. No part of the capillary shall otherwise touch the coil or frame.

1. Provide mounting support for the capillary at least every 36 inches and at the capillary end, within 6 inches.
2. Freezestats shall be mounted to the upstream face of the first coil that they are designed to protect, usually the cooling coil.
3. Locate reset head on outside of plenum wall.
4. Install such that the temperature-sensing element is sloped continuously downward from the sensing head.

M. Freezestats' capillary length shall provide one foot of capillary for each four-square feet of coil surface (by multiple freezestat units if necessary to meet this requirement). In all cases the coil face shall be completely crossed from corner to corner, with the freezestat control head mounted at the highest capillary point to maintain calibration.

N. Dual Duct Terminal unit discharge temperature sensor shall be mounted a minimum of 36 inches downstream from the unit.

O. All devices shall be mounted within enclosures. Cable trays and external cabinet surfaces shall not be used as mounting surfaces. Proof of run for both fans and pumps shall be by current sensing devices rather than differential pressure switches.

P. All pressure indicating/measuring devices shall be installed with capped tee devices to permit attachment of test meters.

Q. Controls Mounting: Controls shall be grouped by systems, areas, or other appropriate basis concealed in locking-type wall-mounted cabinets, with proper labeling as to functions and settings marked on the front thereof, located no more than 6'-0" above the floor unless specifically approved by Owner. Control cabinets shall not be installed on ductwork or plenum walls. Mount all relays, switches, contacts, etc., in common panels. Tag each instrument by use of approved labels corresponding to symbols used on control drawings.

R. Location of Room Sensors: Where sensors are mounted at light switches, locate on centerline of the electrical outlet box, as directed. Sensors shall not be located above dimmer switches. Exact location of sensors shall be verified with final casework and furniture layouts.

S. Verify location of thermostats, CO2 sensors and other exposed control sensors with Drawings and room details before installation. Install devices 48 inches or 60 inches above the floor. Install averaging elements in ducts and plenums in crossing or zigzag pattern.

T. Install guards on thermostats in the following locations:

1. Entrances.
2. Public areas.

U. Install automatic dampers according to Division 23, Section 233300, "Air Duct Accessories."

V. Install damper motors on outside of duct in warm areas, not in locations exposed to outdoor temperatures.

W. Install labels and nameplates to identify control components according to Division 23, Section 220550, "Identification for HVAC Piping and Equipment."

X. Install hydronic instrument wells, valves, and other accessories according to Division 23, 232113, Section "Hydronic Piping."

Y. Install steam and condensate instrument wells, valves, and other accessories according to Division 23, Section 232312, "Steam and Condensate Heating Piping."

Z. Install duct volume-control dampers according to Division 23 Sections specifying air ducts.

3.2 CONTROL SOFTWARE PROGRAMMING

A. Control of equipment as described in the sequence of operations and shall include:

1. Time and holiday schedules
2. Alarm limits and histories
3. Summary of data for each zone
4. Trend logs and historical data
5. All setpoints
6. Master menu
7. Dynamic color graphic Interface

B. The following Points Descriptions and Sequences of Operation shall be enhanced as necessary and included as part of the control drawings to expand and clarify information shown in the drawings.

1. Points information shall be displayed and organized by system in dynamic graphic form at the operator stations.
2. The energy reduction software and miscellaneous functions shall manage all points.
3. It shall be possible to “disconnect” any output or setpoint from the AUTOMATIC control logic and enter a MANUAL value or state from any Operator Station.
4. It shall be possible to replace any input with a MANUAL value from any Operator Station.
5. All control loop parameters for each loop shall be displayed on one display.

C. Where a point or device is indicated on a drawing, it shall be provided even if not required in a sequence of operation (sequence). Where a point or device is required for a sequence, it shall be provided even if it is not shown on a diagram or plan.

D. All setpoints indicated in the sequences are suggested initial setpoints. Actual setpoints shall be determined and programmed during system balancing and commissioning process. If actual setpoint determined during this process is substantially different from the initial suggested setpoint, request confirmation of acceptability from the A/E.

E. All setpoints and values indicated in the sequences shall be adjustable with authorized access. Owner shall determine/confirm the appropriate access level during Owner training. It shall be possible to have multiple access levels with limited range of adjustability for each level.

F. All sequences shall apply when the Operator (with proper access) allows automatic control via an Operators Station. It shall be possible to override to prevent automatic operation and take manual control of any system or equipment item. If automatic start-stop operation is not discussed in sequence for a particular device, then there shall be a manual “on-off” command feature at the Operators Station.

G. Displays: Every control device indicated on the drawings or specifications and every point required in the sequences of operation shall have information displayed at the Operators Station(s). All information displayed shall have a simple and concise description of what the information is and means. Certain display requirements are indicated in the sequences. To avoid unnecessary duplication, other more typical display requirements are not indicated in every sequence but shall be provided for every device or point as follows:

1. Every device or equipment item that has a start-stop, open-closed, on-off or similar binary output from the BAS shall have an operational status display. Display shall include multiple pieces of information, as follows:

    a. Current “on-off” command from EMCS
    b. Current “on-off” condition as sensed by proof switch (where available).
    c. Virtual “on-off” condition if a proof switch is not available, but other sensors can provide a reasonable verification of equipment operation. For example, such a reasonable verification may include using an analog pressure sensor downstream of a fan where a sensed value above a certain level could only occur if the fan was in operation.
    d. Indication as to if control is in automatic mode (controlled per sequence) or in manual mode.

2. Every device or equipment item that has a binary (open-closed contact) input to the BAS shall have an operational status display. Display shall include:
3. Current condition.
4. Every device or equipment item that has an analog control output from the BAS shall have an operational status display. Display shall include multiple pieces of information, as follows:

    a. Current setpoint.
    b. Commanded output (percent of maximum).
    c. Display of the measured value at the controlling sensor or VFD.
    d. Indication as to if control is in automatic mode (controlled per sequence) or in manual (override) mode.

5. Every device or equipment item that has an analog input to the BAS shall have an operational status display. Display shall include:

    a. Current measured condition.
    b. Whether alarm feature is active.
    c. Current setpoint for high and low alarm conditions.

6. Unless indicated otherwise in the sequences, all stated values shall be assumed to use units of measurement displayed (at operator workstations) as follows:

    a. Temperature in degree F.
    b. Humidity in relative humidity (percent).
    c. Air pressure (and differential pressure) in inches water column.
    d. Water or steam pressure (and differential pressure) in PSIG.
    e. Water flow rate in GPM.
    f. Air flow rate in CFM.
    g. Speed as percent of maximum RPM (when motor is driven at 60 hertz by VFD).

7. The following points shall be displayed using calculated values based upon commanded position unless exact values, as indicated by a feedback signal, are required by control strategy:

    a. Fan speed (per cent of full speed)
    b. Damper positions (per cent of full open)
    c. Heating and cooling valve position (per cent of full open)

H. Trend Logs: Provide trend log programming and setup for individual points as requested by the Owner up to a maximum of three percent of all inputs provided on the project.

I. Alarms: Certain special alarm requirements are indicated in the sequences. To avoid unnecessary duplication, all necessary alarm requirements are not indicated in every sequence. In addition to the listed alarms, every point shall be equipped to (potentially) have the following alarms. Each alarm shall include specific text (on screen) describing the nature of the alarm, and the source of the alarm information (such as “current sensing relay”, “differential pressure switch”, etc.) Each point shall be capable (with only programming and setup required) to alarm as follows:

1. Every device or equipment item that has a start-stop, open-closed, on-off or similar command from the BAS shall have an alarm to identify failure to operate as commanded. This alarm shall use available proof switches or other sensors that can be used as a “virtual proof”. Provide suitable delays to accommodate equipment startup times, etc.
2. Every device that has a binary (open-closed) input to the BAS that would normally be used as an alarm or service-requirement indicator (such as a differential pressure switch at a filter) shall provide suitable alarm annunciation.
3. Every device or equipment item that has an analog control output from the BAS shall have an alarm to identify failure of system to maintain setpoint at the controlling sensor. Provide suitable delays to accommodate equipment startup times, etc. Establish reasonable high and low condition alarm trigger points to accommodate normal and reasonable variations in system output.
4. Every VFD shall have an alarm contact monitored by the EMCS to acknowledge any faults. It shall also have an additional alarm contact monitored by the BAS to acknowledge if it is in the bypass mode.

J. Alarm Programming: Provide alarm programming and setup for all alarms specifically indicated in the sequences of operation, and at additional points as requested by the Owner up to a maximum of 20% of all inputs provided on the project. Assign operator high and low alarm limits according to design data or as Owner requests. It is assumed that Owner will want alarms to be set up for all filter switches and at all inputs indicated, but not addressed in the sequences.

K. Additional Control Requirements: Auxiliary Air Conditioning Units: Provide all control work required for all auxiliary air conditioning units. Include field wiring for any remote devices provided with each unit. Systems shall be controlled per manufacturer's recommendations and as follows: Provide DDC temperature sensor except where sensors are furnished with equipment.

3.3 ELECTRICAL WIRING AND CONNECTION INSTALLATION

A. All electrical control wiring and terminations for the control system shall be provided by the controls subcontractor,

B. Install raceways, boxes, and cabinets according to Division 26, Section 260533, "Raceway and Boxes for Electrical Systems."

C. Install building wire and cable according to Division 26, Section 260519, "Low-Voltage Electrical Power Conductors and Cables."

D. Install signal and communication cable according to Division 27, Section 271500, "Communications Horizontal Cabling."

1. Conceal cable, except in mechanical rooms and areas where other conduit and piping are exposed.

2. Install exposed cable in raceway.
3. Install concealed cable in raceway.
4. Bundle and harness multiconductor instrument cable in place of single cables where several cables follow a common path.
5. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.
6. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.
7. Install wire and cable with sufficient slack and flexible connections to allow for vibration of piping and equipment.

E. Connect manual-reset limit controls independent of manual-control switch positions. Automatic duct heater resets may be connected in interlock circuit of power controllers.

F. Connect hand-off-auto selector switches to override automatic interlock controls when switch is in hand position.

3.4 WORK BY OTHERS

A. The mechanical subcontractor shall install all wells, pressure tappings for flow sensors, etc., and shall set all control valves in place under the manufacturer's supervision. Pressure taps shall include service valves and calibration taps.

B. The sheet metal subcontractor shall approve or correct the submitted schedule of required control damper quantities and sizes before dampers are ordered from the factory. Sheet metal Contractor shall receive dampers at the job site, set dampers in place under the manufacturer's supervision and provide an access door for each damper. Dampers shall be mounted square within the duct without twisting or distortion to insure proper damper operation. The damper shaft shall be extended at a location that provides space for the actuator.

C. Patching and painting required for the control system installation will be accomplished by the General Contractor.

D. All line voltage wiring required for control panels, alternators, motor starters are to be furnished and installed by the electrical subcontractor.

3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect test, and adjust field-assembled components and equipment installation, including connections. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:

1. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove and replace malfunctioning units and retest.
2. Test and adjust controls and safeties.
3. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
4. Pressure test control air piping at 30 psig or 1.5 times the operating pressure for 24 hours, with maximum 5-psig loss.
5. Test each point through its full operating range to verify that safety and operating control set points are as required.
6. Test each control loop to verify stable mode of operation and compliance with sequence of operation. Adjust PID actions.

7. Test each system for compliance with sequence of operation.
8. Test software and hardware interlocks.

C. DDC Verification:

1. Verify that instruments are installed before calibration, testing, and loop or leak checks.
2. Check instruments for proper location and accessibility.
3. Check instrument installation for direction of flow, elevation, orientation, insertion depth, and other applicable considerations.
4. Check instrument tubing for proper fittings, slope, material, and support.
5. Check installation of air supply for each instrument.
6. Check flow instruments. Inspect tag number and line and bore size and verify that inlet side is identified and that meters are installed correctly.
7. Check pressure instruments, piping slope, installation of valve manifold, and self-contained pressure regulators.
8. Check temperature instruments and material and length of sensing elements.
9. Check control valves. Verify that they are in correct direction.
10. Check air-operated dampers. Verify that pressure gages are provided and that proper blade alignment, either parallel or opposed, has been provided.
11. Check DDC system as follows:

    a. Verify that DDC controller power supply is from emergency power supply, if applicable.
    b. Verify that wires at control panels are tagged with their service designation and approved tagging system.
    c. Verify that spare I/O capacity has been provided.
    d. Verify that DDC controllers are protected from power supply surges.

D. Replace damaged or malfunctioning controls and equipment and repeat testing procedures.

3.6 ADJUSTING

A. Calibrating and Adjusting:

1. Calibrate instruments.
2. Make three-point calibration test for both linearity and accuracy for each analog instrument.
3. Calibrate equipment and procedures using manufacturer's written recommendations and instruction manuals. Use test equipment with accuracy at least double that of instrument being calibrated.
4. Control System Inputs and Outputs:

    a. Check analog inputs at 0, 50, and 100 percent of span.
    b. Check analog outputs using milliampere meter at 0, 50, and 100 percent output.
    c. Check digital inputs using jumper wire.
    d. Check digital outputs using ohmmeter to test for contact making or breaking.
    e. Check resistance temperature inputs at 0, 50, and 100 percent of span using a precision-resistant source.

5. Flow:

    a. Set differential pressure flow transmitters for 0 and 100 percent values with 3-point calibration accomplished at 50, 90, and 100 percent of span.
    b. Manually operate flow switches to verify that they make or break contact.

6. Pressure:

    a. Calibrate pressure transmitters at 0, 50, and 100 percent of span.

b. Calibrate pressure switches to make or break contacts, with adjustable differential set at minimum.

7. Temperature:

a. Calibrate resistance temperature transmitters at 0, 50, and 100 percent of span using a precision-resistance source.
b. Calibrate temperature switches to make or break contacts.

8. Stroke and adjust control valves and dampers without positioners, following the manufacturer's recommended procedure, so that valve or damper is 100 percent open and closed.
9. Stroke and adjust control valves and dampers with positioners, following manufacturer's recommended procedure, so that valve and damper is 0, 50, and 100 percent closed.
10. Provide diagnostic and test instruments for calibration and adjustment of system.
11. Provide written description of procedures and equipment for calibrating each type of instrument. Submit procedures review and approval before initiating startup procedures.

B. Adjust initial temperature and humidity set points.

C. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions.

3.7 DEMONSTRATION AND ACCEPTANCE.

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain HVAC instrumentation and controls. Refer to Division 01, Section 017900, "Demonstration and Training."

B. The building controls system subcontractor shall submit a proposed Acceptance Test Agreement for testing the system's functionality and the accuracy of all sensors and actuators.

C. The system installation shall be complete in all respects and tested for proper operation prior to acceptance testing for the Owner's authorized representative. A letter shall be submitted to the Engineer requesting system acceptance. This letter shall certify all controls are installed and the software programs have been completely exercised for proper equipment operation. Acceptance testing will commence at a mutually agreeable time within 30 calendar days of the request. When the system has been deemed satisfactory in whole or in part by the Owner's representative, the system will be accepted for beneficial use which will start the warranty period for the commissioned portion.

3.8 COMMISSIONING

A. Notify the Commissioning Agent one week prior to start-up of equipment.

B. Submit to the Commissioning Agent a Verification of Completion form with the pre-functional check off sheet for each component when it is ready for functional testing.

C. Assist the Commissioning Agent as required to perform the functional testing on the system components and the system as a whole.

END SECTION 23 09 00

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following types of air coils that are not an integral part of air-handling units:

1. Electric.

B. Related Sections include the following:

1. Division 23 Sections for air coils that are integral to air-handling units.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each air coil. Include rated capacity and pressure drop for each air coil.

B. Shop Drawings: Diagram power, signal, and control wiring.

C. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which coil location and ceiling-mounted access panels are shown and coordinated with each other.

D. Field quality-control test reports.

E. Operation and Maintenance Data: For air coils to include in operation and maintenance manuals.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 2 - PRODUCTS

2.1 ELECTRIC COILS

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

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

C. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:

1. Brasch Manufacturing Co., Inc.
2. Chromalox, Inc., Wiegand Industrial Division; Emerson Electric Company.
3. Dunham-Bush, Inc.
4. INDEECO.
5. Trane.

D. Coil Assembly: Comply with UL 1995.

E. Heating Elements: Coiled resistance wire of 80 percent nickel and 20 percent chromium; surrounded by compacted magnesium-oxide powder in tubular-steel sheath; with spiral-wound, copper-plated, steel fins continuously brazed to sheath.

F. Heating Elements: Open-coil resistance wire of 80 percent nickel and 20 percent chromium, supported and insulated by floating ceramic bushings recessed into casing openings, and fastened to supporting brackets.

G. High-Temperature Coil Protection: Disk-type, automatically reset, thermal-cutout, safety device; serviceable through terminal box without removing heater from duct or casing.

1. Secondary Protection: Load-carrying, manually reset or manually replaceable, thermal cutouts; factory wired in series with each heater stage.

H. Frames: Galvanized-steel channel frame, minimum 0.052 inch for flanged mounting.

I. Control Panel: Remote mounted with disconnecting means and overcurrent protection. Include the following controls:

1. Magnetic contactor.
2. Mercury contactor.
3. Toggle switches; one per step.
4. Step controller.
5. Time-delay relay.
6. Pilot lights; one per step.
7. Airflow proving switch.

J. Refer to Division 23 Section "Instrumentation and Control for HVAC" for thermostat.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine ducts, plenums, and casings to receive air coils for compliance with requirements for installation tolerances and other conditions affecting coil performance.

B. Examine roughing-in for piping systems to verify actual locations of piping connections before coil installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install coils level and plumb.

B. Install coils in metal ducts and casings constructed according to SMACNA's "HVAC Duct Construction Standards, Metal and Flexible."

C. Straighten bent fins on air coils.

D. Clean coils using materials and methods recommended in writing by manufacturers, and clean inside of casings and enclosures to remove dust and debris.

3.3 CONNECTIONS

A. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

B. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. Operational Test: After electrical circuitry has been energized, operate electric coils to confirm proper unit operation.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

END OF SECTION 23 82 16

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SECTION 26 27 26

WIRING DEVICES

PART 1 – GENERAL

1.1 SCOPE

A. Provide all wiring devices complete with device plates shown on the drawings or specified within the specifications.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Hubbell, Pass & Seymour, Eaton, or Leviton. All part numbers refer to Hubbell to establish minimum standards for quality and performance.

2.2 GENERAL

A. All devices shall be specification grade. Color shall be white for normal services and red for all services automatically fed from the emergency generator.

2.3 SWITCHES

A. Single-Pole: 20-ampere, 120/277-volt, Hubbell No. 1221 Series, white.

B. Three-Way: 20-ampere, 120/277-volt, Hubbell No. 1223 Series, white.

C. Four-Way: 20-ampere, 120/277-volt, Hubbell No. 1224 Series, white.

D. Locking: 20-ampere, 120/277-volt, Hubbell No. 1221L (1-pole)Series or No. 1223L (3-way) series. Provide two keys with each switch. Cover plate shall be stainless steel with on/off labels.

E. Occupancy Sensor: 277V, 1800W, 900 sq. ft. coverage, passive infrared, white, Hubbell No. WS277I.

2.4 RECEPTACLES

A. Duplex Receptacles, Specification-Grade: 20-ampere, 125-volt, 2-pole, 3-wire grounding, NEMA Type 5-20R Hubbell No. CR5352I (White Color).

B. Duplex Receptacles originating from emergency panels, Specification-Grade: 20-ampere, 125-volts, 3-wire grounding. NEMA Type 5-20R Hubbell No. CR5352R (Red Color).

C. Duplex Receptacles originating from surge protected panels, Specification-Grade: 20-ampere, 125-volts, 3-wire grounding. NEMA Type 5-20R Hubbell No. CR5352GY (Gray Color).

D. Duplex Receptacles, Tamper Resistant, Specification-Grade: Safety-type, specification-grade device, rated at 20-ampere, 125-volt, grounded type, NEMA Type 5-20R; Hubbell No. SG-62 or approved equal. Receptacles must be capable of accepting double bladed plugs without ground pin.

E. Ground Fault Interruption Receptacles: Specification grade, 20-ampere, 125-volt, Class A, 5-milliampere sensitivity, standard or feed-through model and as shown on the drawings. Hubbell No. GF 5252 or approved equal.

F. Controlled Duplex Receptacles, Specification-Grade: 20-ampere, 125-volt, 2-pole, 3-wire grounding, NEMA Type 5-20R, with the two receptacles separately connected and one receptacle marked “controlled” (White Color).

G. Faceless GFI Module: Specification-grade, 20 ampere, 125 volt, Class A, 5 milliampere sensitivity. Hubbell No. GF53501A or approved equal.

H. Clock Receptacles: 15-ampere, 125-volt,2-pole, 3-wire grounding,NEMA type 5-15R clock Hubbell No. 5235.

I. Weatherproof Receptacles: 20-ampere duplex grounding type, wether resistant, with gasket and hinged metal cover with locking provisions.

J. Special Receptacles: For other special receptacles, see drawings.

K. Cord Caps: Cord caps on all cords shall be plastic insulated type.

L. Cord Reels: Industrial cord reel, white housing, 20A, 120V, 25-foot 12/3 cord, with black portable outlet box and (2) duplex receptacles. Hubbell #HBLI25123R220MI

2.5 SURFACE RACEWAY ASSEMBLIES

A. Assemblies shall be as manufactured by Wiremold, of type 700, 2000 or 4000 series (including devices) as noted on the drawings. Color shall be ivory.

B. Provide all required mounting hardware, miscellaneous fittings, end caps, etc. ans manufactured by Wiremold.

C. One gang device boxes for use with Wiremold 700 product shall be Wiremold part #V5748. Two gang device boxes for use with Wiremold 700 product shall be Wiremold part #V5748-2.

D. One gang device boxes for use with Wiremold 2000 product shall be Wiremold part #V2048. Two gang device boxes for use with Wiremold 2000 product shall be Wiremold part #V2048-2.

E. One gang device boxes for use with Wiremold 4000 product shall be Wiremold part #V4007C-1. One gang GFCI receptacle mounting cover for Wiremold 4000 product shall be Wiremold part #V4007C-1R.

2.6 VERITCAL MULTI-OULETS

A. Free-standing multi-outlet assemblies shall be Walkerduct#5PA 10-4, equipped with single grounded type receptacles.

B. Each unit shall be equipped with T-bar hangers, carpet or tile pad as required, power fed junction box, and ceiling trim plate.

C. All receptacles shall be pre-wired (with ground wire) to power fed junction box.

D. Length of each unit shall be selected to match ceiling height.

E. Color of unit shall be ivory.

F. Acceptable Manufacturers

G. Wiremold equipment which is the approved equal of the equipment specified above is considered acceptable.

H. Substitutions may be considered only when submitted in conformance with Section 26 05 00.

2.7 DEVICE PLATES

A. Prohibited materials

B. Sectional plates shall not be utilized.

C. All devices shall be equipped with stainless steel 0.04” thick with #302 satin finish, except for audiovisual devices which may be plastic Leviton model.

D. All junction boxes in finished areas shall be provided with stainless steel plates.

E. Acceptable Manufactures:

F. Plates shall be Sierra type, S-Line.

G. Substitutions may be considered only when submitted in conformance with Section 26 05 00.

2.8 EXTRA MATERIALS

A. Furnish and install the extra materials described in subparagraphs below that match products provided. This material shall be installed as directed during construction. The contractor shall consider normal installation conditions with the extra material being installed prior to cover. It shall be assumed that this work will occur below 12’-0” AFF.

B. Extra materials that are not installed during construction shall be turned over to the owner at the end of construction (closeout). Products that are not installed shall be packaged in their original containers with protective covering for storage and identified with labels describing contents.

C. The contractor shall include the following in their bid:

1. 8 additional standard duplex receptacles per these specifications.

2. 2 additional GFCI duplex receptacles per these specifications

3. 8 rough-ins including (1) 4” square, deep box with single gang ring and 30’ of 2#12, 1#12G. (THHN) in 3/4" EMT conduit with (2) sweeps. Note: cut-in boxes and flex will be used if extra devices are to be located after wall finish.

4. Labor for installing all extra materials.

D. Submit a fair cost value for these materials and labor with the Division 26 post bid submittals, on the form following this specification section. This fair cost estimate shall include all direct job expenses such as equipment rental, small tool expense, layout and supervision, etc. for a complete installation as if the material were shown on the drawings and taken off for bid. Breakout material and labor costs for each extra material indicated. Unused labor will be Architect or Engineer’s option. This fair cost value may be applied to other work not included in the bid documents.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install two or more wiring devices shown in one location under a common plate except when outlets are of a different voltages such as telephone and duplex receptacles. Install plates with all edges in continuous contact with finished wall surfaces. Install plates vertically with alignment tolerance of 1/16 inch. Sectional plates are not permitted. No more than one device shall be installed in a single-gang position.

B. Wiring: Branch circuit conductors shall be terminated either in side of or in back of specification-grade devices with screw clamped terminations. Spring-type pressure connections not approved. Wiring devices are not to be used for maintaining circuit continuity. Wiring devices are not to be used for maintaining circuit continuity. Removal of wiring device shall not effect downstream devices.

C. Barrel type key switch shall be used to control lighting in corridors, gyms, cafeterias and restrooms (not required for single occupant restrooms).

D. Orient receptacles so that ground pin is at bottom, to the right for horizontally-mounted devices. Ground pin at the top is acceptable for switched receptacles.

E. Outlet height to meet ADA requirements or 16 inches minimum above floor.

F. Attach surface raceway assemblies to wall surface by method recommended by manufacturer for the particular wall construction. Use anchos similar to Powers Poly-toggle, catalog #2305 with 1-1/2” screw minimum.

G. Wiremold raceway shall be ivory factory color and shall not be painted. Any raceway attached to the Wiremold product in an unconcealed area which does not come pre-painted from the manufacturer shall properly be prepared for painting and shall be Wiremold #IWE-S ivory spray enamel.

H. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.

I. Coordination with Other Trades:
   1. NECA 1 referenced in paragraph below includes device mounting-height requirements. See "Product Selection and Application Considerations" Article in the Evaluations for device mounting heights in that standard.
      a. See Editing Instruction No. 4 in the Evaluations for timing and sequencing of construction to assist in avoiding contamination of devices during construction.
      b. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
      c. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
      d. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
      e. Install boxes flush with finish wall surface to provide proper fit of device and plate tight to wall with no gaps.
      f. Install wiring devices after all wall preparation, including painting, is complete.

J. Conductors:

   1. Do not strip insulation from conductors until just 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 pigtails.

   4. Conductors:
      a. Cut back and pigtail, or replace all damaged conductors.
      b. Straighten conductors that remain and remove corrosion and foreign matter.
      c. Pigtailing conductors is permitted provided the outlet box is large enough.

K. Device Installation:

   1. Replace all devices that have been in temporary use during construction or that show signs that they 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 pigtails that are not less than 6 inches (152 mm) in length.

   5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.

   6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.

7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails 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.

10. The self-grounding feature of receptacles shall not be used as the primary ground return. All receptacles shall have a green ground conductor installed to the ground screw from the circuit grounding conductor.

11. Mounting Heights: All mounting heights indicated are the distances from the finished floor level to the bottom of the device box.

Maximum Switch Height	+44”
Minimum Receptacle Height	+16”

12. Receptacles, located outdoors, kitchens, rooftops, within 6’-0” of sinks in restrooms and locker rooms, garages, shops, vehicle maintenance areas and any other area required by the NEC or local codes shall be GFCI type whether indicated on the drawings or not.

L. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the left.

M. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

N. Heavy Duty Cast Aluminum Weatherproof Covers:

2. Cover flange exceeds box dimensions. Rough-in of flange is required during wall construction.

3. Install cover per manufacturer’s instructions.

O. All exterior receptacles shall be GFCI, WR.

P. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multi-gang wall plates.

Q. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

R. Provide deep, 2-gang box with 2-gang ring. Mount the non-GFCI controlled receptacle adjacent to GFCI module in the common 2-gang box.

S. The contractor shall ensure that interior receptacles are located greater than 6’-0” from sink, water coolers, etc. Receptacles located within 6’ of water sources shall be GFCI type. GFCI receptacles shall be readily accessible. Devices located under sinks, behind appliances, etc. in locations that GFCI protection is required shall be protected by circuit breaker.

3.02 IDENTIFICATION

E. Comply with Division 26 Section "Identification for Electrical Systems."

1. Receptacles: Identify panelboard and circuit number from which served. Use self-adhesive labeling machine, clear tape with 12 Pt black lettering on face of plate.

3.03 FIELD QUALITY CONTROL

F. 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 not acceptable.

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. The 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.

END OF SECTION 26 27 26