

SPECIFICATIONS, PROPOSAL AND CONTRACT DOCUMENTS

Contract No. 2023-01; Building "A" Improvements

Northshore Utility District
King County, Washington

MARCH 2023
C1813

**NORTHSHORE UTILITY DISTRICT
King County, Washington**

District Commissioners

**Suzanne Greathouse, President
Trudy C. Rolla, Secretary
Matt Breysse
D. Bruce Gardiner
Tom Mortimer**

Acting General Manager

Amanda Campbell

District Office

**6830 NE 185th Street
Kenmore, WA 98028
Phone (425) 398-4400
Fax (425) 398-4430
www.nud.net**

CERTIFICATE OF ENGINEER



Unless noted otherwise, these Contract Documents have been prepared or assembled by Northshore Utility District under the direction of the following registered professional engineers, licensed in accordance with the laws of the State of Washington, to practice in the State of Washington.



The Specification Section(s) listed below were developed by, or under the direct supervision of Aaron Pease, P.E. and Eric Delfel, P.E., of Gray and Osborne, Inc.

- 1.1 Project Description
- 2.2 Contract Plans
- 2.3 Permits, Franchises and Easements
- 3.0 Engineering Specifications
- 4.0 Measurement and Payment
- 5.0 Proposal



NORTHSHORE UTILITY DISTRICT

**6830 NE 185TH STREET
KENMORE, WASHINGTON 98028-2684**

SPECIFICATIONS, PROPOSAL AND CONTRACT DOCUMENTS

**FOR
CONTRACT 2023-01
Building "A" Improvements**

TABLE OF CONTENTS

Call for Bids

Section 1 Instructions to Bidders

Section 2 Special Provisions

Section 3 Engineering Specifications

Division 1 – General Technical Requirements

Division 2 – Sitework

Division 5 – Metals

Division 6 – Wood and Plastics

Division 7 – Thermal and Moisture Protection

Division 8 – Doors and Windows

Division 9 – Finishes

Division 10 – Specialties

Division 12 – Furnishings

Division 15 – Mechanical

Division 16 - Electrical

Section 4 Measurement and Payment

Section 5 Proposal & Bid Bond

Section 6 Contract & Performance, Payment, and Guaranty Bond

Section 7 Definitions and Abbreviations

Section 8 General Conditions

Appendices

Appendix A – City of Kenmore Permits

Appendix B – Wage Rates

Washington State Prevailing Wage Rates

Federal Wage Rates



NORTHSHORE UTILITY DISTRICT

6830 NE 185TH STREET
KENMORE, WASHINGTON 98028-2684

CALL FOR BIDS

Notice is hereby given that Northshore Utility District ("District") will receive sealed bids for the following construction project. Bids will be received at the District office, located at 6830 NE 185th Street, Kenmore, Washington, by mail or other courier up to the hour of **3:00 P.M. on Tuesday, March 28, 2023**, after which all bids will be publicly opened and read aloud.

A prebid walkthrough will be by appointment only and will be held on Saturday, March 18, 2023 in 45-minute time slots during the hours of 8:00 a.m. to 5:00 p.m. Each time slot will accommodate a total of 8 outside individuals and shall be scheduled in advance with the District Project Manager, Brandon Humphrey, P.E. Walkthroughs will also be attended by one District staff member and the Engineer. All questions and answers will be published by addendum at the conclusion of the walkthroughs.

PROJECT DESCRIPTION

Contract 2023-01; Building "A" Improvements

The project consists of the following work:

Schedule A - The Building "A" Remodel consists of revisions to an existing 27,500± square foot cement concrete tilt-up building originally constructed in 1980 and then extensively remodeled in 1998/1999. This remodel project includes, but is not necessarily limited to: demolition; full lobby reconstruction; security improvements; remodeling of offices, restrooms, locker rooms, and work rooms; revisions to walls, flooring, and ceilings; replacement of inventory room ceiling; reroofing of the building; HVAC improvements and modifications; and electrical system improvements and modifications.

Schedule B - The Building "A" Seismic Retrofit consists of seismic improvements to the structure and utilities of the building and site. This retrofit includes, but is not necessarily limited to: seismic response retrofitting to a tilt-up wall and interior masonry walls; seismic support upgrades to interior fire sprinkler piping and gas piping; and seismic support upgrades to exterior utility building connections for water, sewer, electrical, and gas.



The Engineer's construction cost estimate is \$4,444,444.00 to \$3,750,000.00 including sales tax.

Free-of-charge access to project bid documents (plans, specifications, addenda, and Bidders List) is provided to Prime Bidders, Subcontractors, and Vendors by going to www.bxwa.com and clicking on "Posted Projects", "Public Works", and "Northshore Utility District". This online plan room provides Bidders with fully usable online documents with the ability to: download, view, print, order full/partial plan sets from numerous reprographic sources, and a free online digitizer/take-off tool. It is recommended that Bidders "Register" in order to receive automatic email notification of future addenda and to place themselves on the "Self-Registered Bidders List". Bidders that do not register will not be automatically notified of addenda and will need to periodically check the on-line plan room for addenda issued on this project. Contact Builders Exchange of Washington at (425) 258-1303 should you require assistance with access or registration.

Bid documents (in PDF format) are also directly available from the District's website at the following address:

<https://www.nud.net/permits-construction/rfp-posts-list/>

Each bid must be submitted on the "Proposal" forms provided in Section 5 of the "Specifications, Proposal and Contract Documents" and shall be accompanied by a bid proposal deposit in the form of a surety bond, postal money order, cashier's check or certified check made payable to King County Treasurer, King County, Washington for a sum of not less than 5 percent of the total bid. A bid shall not be considered unless accompanied by such bid proposal deposit.

CONTRACT AWARD

A contract, if awarded, will be based upon the lowest responsive and responsible bid or bids as defined in more detail in the bid documents.

Northshore Utility District reserves the right to reject any and all bids, to delete portions or all of the work, to substitute alternative bid item prices for base bid item prices, to waive any informality in bidding, and to make the award deemed to be in the best interest of the District.

Proposals received after the time announced for the opening will not be considered. No Bidder may withdraw its bid after the time announced for the opening or before the award and execution of the contract(s) unless the award is delayed for a period exceeding sixty (60) calendar days.



Advertised in the Daily Journal of Commerce on Tuesday, March 7, 2023, and Tuesday, March 14, 2023.

Financing of this Project has been provided by the Northshore Utility District and by the Washington State Military Department Hazard Mitigation Grant Program.

NORTHSHORE UTILITY DISTRICT
Trudy C. Rolla, Secretary
Board of Commissioners

INSTRUCTIONS TO BIDDERS

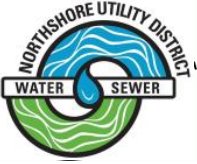
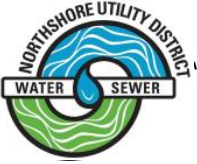


TABLE OF CONTENTS

SECTION 1

INSTRUCTIONS TO BIDDERS

1.0	GENERAL.....	1
1.1	PROJECT DESCRIPTION.....	1
1.2	EXAMINATION OF PLANS, SPECIFICATIONS AND SITE	2
1.3	PROPOSALS.....	2
1.4	BID PROPOSAL DEPOSIT	3
1.5	BIDDING ERRORS	3
1.6	COMPLETION TIME AND LIQUIDATED DAMAGES	3
1.7	AWARD OF CONTRACT AND NOTICE TO PROCEED	5
1.8	FAILURE TO EXECUTE CONTRACT	5
1.9	CORRECTIONS, INTERPRETATIONS AND ADDENDA	6
1.10	ENGINEER AND NOTICES	6
1.11	BIDDER RESPONSIBILITY CRITERIA	6
1.12	SUB-CONTRACTORS	6
1.13	SUBCONTRACTOR RESPONSIBILITY CRITERIA	7
1.14	NON-COLLUSION DECLARATION	8



Section 1 - Instructions to Bidders

1.0 GENERAL

Plans and specifications are on file at:

Northshore Utility District
6830 NE 185th Street
Kenmore, WA 98028

Free-of-charge access to Project bid documents (plans, specifications, addenda, and Bidders List) is provided to Prime Bidders, Subcontractors, and Vendors by going to Builders Exchange of Washington's web site at the following address: http://www.bxwa.com/bxwa_toc/pub/827.html. This online plan room provides Bidders with fully usable online documents with the ability to: download, view, print, order full/partial plan sets from numerous reprographic sources, and a free online digitizer/take-off tool. It is recommended that Bidders "Register" in order to receive automatic email notification of future addenda and to place themselves on the "Self-Registered Bidders List". Bidders that do not register will not be automatically notified of addenda and will need to periodically check the online plan room for addenda issued on this Project. Contact Builders Exchange of Washington at (425) 258-1303 should you require assistance with access or registration.

Bid documents (in PDF format) are also directly available from the District's website at the following address:

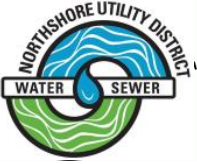
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1.1 PROJECT DESCRIPTION

Contract 2023-01; Building "A" Improvements

The project consists of the following work:

Schedule A - The Building "A" Remodel consists of revisions to an existing 27,500± square foot cement concrete tilt-up building originally constructed in 1980 and then extensively remodeled in 1998/1999. This remodel project includes, but is not necessarily limited to: demolition; full lobby reconstruction; security improvements; remodeling of offices, restrooms, locker rooms, and work rooms; revisions to walls, flooring, and ceilings; replacement of inventory room ceiling; reroofing of the building; HVAC improvements and modifications; and electrical system improvements and modifications.



Schedule B - The Building "A" Seismic Retrofit consists of seismic improvements to the structure and utilities of the building and site. This retrofit includes, but is not necessarily limited to: seismic response retrofitting to a tilt-up wall and interior masonry walls; seismic support upgrades to interior fire sprinkler piping and gas piping; and seismic support upgrades to exterior utility building connections for water, sewer, electrical, and gas.

1.2 EXAMINATION OF PLANS, SPECIFICATIONS AND SITE

Bidders shall satisfy themselves as to construction conditions by personal examination of the plans, specifications and site of the proposed work and by any other examination and investigation, which they may desire to make as to the nature of the work, estimate of quantities and difficulties to be encountered. Bidders shall consider Federal, State, and local laws and regulations that may affect cost, progress, or performance of the work.

The original 1997 build-out plans for this building are available as a digital download upon request. Submit requests to the District Project Manager, Brandon Humphrey, P.E.

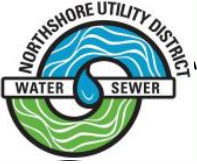
Bidders are hereby notified that geotechnical investigations were not conducted by the District for this Project.

Before submitting a bid, each Bidder will, at the Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface, and underground utilities) at or contiguous to the site or otherwise which may affect cost, progress, or performance of the work in which the Bidder deems necessary to determine its bid for performing the work in accordance with the time, price, and other terms and conditions of the Specifications, Proposal and Contract Documents. The Bidder shall be responsible for all costs associated with these additional examinations including all restoration work and damages which may be a result of such investigation.

1.3 PROPOSALS

Proposals shall be made on the forms included herewith under the "Proposal" section and shall be provided to the District in a sealed envelope addressed as follows:

Northshore Utility District
6830 NE 185th Street



Kenmore, WA 98028
Attention: Proposal Enclosed

Proposals shall arrive not later than Tuesday, March 28, 2023, at 3:00 P.M., at which time and place they will be opened and publicly read aloud. No proposal may be withdrawn after the time stated above or before award of contract unless said award is delayed for a period exceeding sixty (60) calendar days.

1.4 BID PROPOSAL DEPOSIT

As a guarantee of good faith and as required by law, each bid shall be accompanied by a bid proposal deposit in the form of a certified check, cashier's check, postal money order or surety bond payable to the order of the King County Treasurer, King County Washington for an amount not less than five percent (5%) of the total amount of the bid. The deposits of the three low bidders will be retained until a contract has been entered into between the successful Bidder and the District and until a performance bond in an amount of 100 percent of the contract price has been filed as required under these contract documents. The deposits of other Bidders will be returned as soon as it is determined that they are not one of the three low bidders.

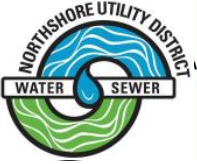
1.5 BIDDING ERRORS

The District will not consider a claim of error in a proposal unless such claim is made to the District within eight (8) business hours after the time of bid opening as stated in the "Call for Bids" and unless supporting evidence of such claim, including cost breakdown sheets, is delivered to the District within ten (10) business hours after the time of bid opening as stated in the "Call for Bids."

If the District is, at its sole determination, convinced that the Bidder has committed an unintentional error, the Bidder will be allowed to withdraw, but not correct, its bid.

1.6 COMPLETION TIME AND LIQUIDATED DAMAGES

Completion of the Project is a high priority for the District; however, the District understands procurement for long lead items may impact the Project construction schedule. As a result, the intent of this Contract is to allow some contract time flexibility to accommodate volatility in material procurement that is known to exist in sectors of the industry.



Once the Contract is executed and delivered to the Contractor, the Contractor shall develop and submit a list of critical path submittals, as well as proceed with all other material submittals. All initial critical path material submittals shall be provided to the District within twenty (20) calendar days. The District will endeavor to return the submittal reviews of these submittals within seven (7) calendar days and all critical path materials shall be ordered within seven (7) calendar days of receipt of District approved submittal reviews. The Contractor shall track delivery date of all materials and provide updates to the District.

Subject to time lost due to inclement weather and delay in delivery of materials, should such delay not be the result of the Bidder's actions, the Bidder must agree to complete all of the work in 240 calendar days, all beginning with the date of written "Notice to Proceed" with the work.

In summary, the District's intended schedule for the Project is as follows:

Contract Award	Monday, April 3, 2023
Execute Contract	Thursday, April 13, 2023
Preconstruction Conference	Thursday, April 20, 2023
Notice to Proceed	Monday, May 1, 2023
Receive & Review Critical Path Material Submittals	Wednesday, May 3, 2023
Approval & Ordering of Critical Path Materials	Wednesday, May 10, 2023
Complete Construction	Wednesday, December 27, 2023

The Bidder agrees to complete the work within the contract time as above specified plus any Extension as provided for herein ("Completion Time"). Such Extension and events producing them shall not be grounds for claim by the Bidder of damages or for additional costs, expenses, overhead, profit or other compensation. It is the responsibility of the Bidder to complete the work within the Completion Time. The District makes no promise or representation that this can or will be done.

The District and the Bidder recognize that time is of the essence of this Contract and that the District will suffer financial loss if the work is not completed within Completion Time. They also recognize the delays, expense, and difficulties in proving the actual loss suffered by the District if the work is not completed on time. Accordingly, instead of requiring any such proof, the District and the Bidder agree that as liquidated damages for delay (but not as a penalty) the Bidder shall pay the District \$1,400.00 for each day that expires after Completion Time.



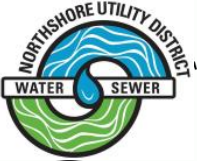
1.7 AWARD OF CONTRACT AND NOTICE TO PROCEED

A contract will not be awarded until the District is satisfied that (1) the successful Bidder is reasonably familiar with the class of work contemplated and has the necessary capital, tools and experience to satisfactorily perform the work within the time stated, (2) the successful Bidder meets the mandatory responsibility criteria identified in RCW 39.04.350 (for prime contractors) and RCW 39.06.020 (for first tier subcontractors and subcontractors of any tier that are hired by other subcontractors), and (3) the successful Bidder demonstrates its compliance with any Supplemental Bidder Responsibility Criteria or requirements identified herein. Completion of the work within Completion Time is essential and prior commitments of the Bidder, failure to complete other work on time, or reasonable doubt as to whether the Bidder would complete the work on time, would also be cause for the rejection of any bid as not responsible.

The right is reserved by the District to waive any immaterial bid errors or irregularities in the bidding and reserves the right to correct arithmetical errors or discrepancies between unit prices and extended amounts if the intended bid is ascertainable from the face of the bid. Bidders are also advised that the District may reject any bid or proposal or all bids or proposals for any or no reason, including (1) any bid or proposal that in the opinion of the District is unbalanced or that contains unit prices that fail to reflect the actual cost of construction, (2) any bid or proposal that lacks necessary detail or specificity or is otherwise found to be non-responsive, and (3) any bid that violates the terms of these instructions. Bidders acknowledge that they are not entitled to any compensation, costs or damages related to bid preparation or resulting from District's decision to cancel the procurement, reject any or all bids or otherwise refuse to execute a contract. District, in its sole discretion, may re-advertise for new proposals or to otherwise carry out the work. The District further reserves the right to delete portions or all of the work or schedules of the work in its sole discretion and thereafter to award a contract to the successful Bidder on the remaining portions of the work.

1.8 FAILURE TO EXECUTE CONTRACT

In the event the successful Bidder fails to furnish an approved bond and to sign the contract within ten days after notification by the District, an amount equal to 5 percent of the amount of the bid shall be forfeited to the District as liquidated damages. Said liquidated damages shall be paid from the certified check or bid bond submitted with the bid. Other proposals will then be reconsidered for award by the District.



1.9 CORRECTIONS, INTERPRETATIONS AND ADDENDA

Any omissions, discrepancies or need for interpretations or explanations of the Contract Documents shall be in the form of an addendum and no oral statements by the District, District Engineer, District's Consulting Engineer, or other representative of the District shall, in any way, modify these contract documents, whether made before or after letting the contract.

1.10 ENGINEER AND NOTICES

Notices as required shall be mailed to the attention of the Owner as follows:

Northshore Utility District
Attention: Brandon Humphrey, P.E.
6830 NE 185th Street
Kenmore, WA 98028

1.11 BIDDER RESPONSIBILITY CRITERIA

Bidder must meet the following Bidder Responsibility Criteria (RCW 39.04.350) to be considered a responsible Bidder. Bidder will be required to complete and submit the Bidder Responsibility Checklist, included with the "Proposal" section of this document, with the bid. The Bidder must:

- (a) 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 bid submittal;
- (b) Have a current Washington Unified Business Identifier (UBI) number;
- (c) Have Industrial Insurance (workers' compensation) coverage for the Bidder's employees working in Washington, as required in Title 51 RCW;
- (d) Have a Washington Employment Security Department number, as required in Title 50 RCW;
- (e) Have a Washington Department of Revenue state excise tax registration number, as required in Title 82 RCW.
- (f) Not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065(3).

1.12 SUB-CONTRACTORS

Consistent with RCW 39.30.060, each Bidder on a project in excess of \$1,000,000 is required to submit the completed "Proposed Subcontractors" list included in the "Proposal" section either with the bid or within one hour of



the required bid submittal time as stated in the Call for Bids or by written addendum. The completed list must identify each subcontractor who will perform heating, ventilation and air-conditioning, or plumbing as described in Chapter 18.106 RCW, and electrical as described in Chapter 19.28 RCW, or the contractor must name itself for the work. The form may be submitted in person or by facsimile (FAX number (425) 398-4430) to:

Northshore Utility District
Attention: Brandon Humphrey, P.E.
6830 NE 185th Street
Kenmore, WA 98028

Receipt of the form by Northshore Utility District within the time prescribed is the responsibility of the Bidder.

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 alternates.

Failure of the Bidder to submit as part of the bid the names of such subcontractors, or name itself to perform such work, or the naming of two or more subcontractors to perform the work, shall render the Bidder's bid as nonresponsive and therefore void.

1.13 SUBCONTRACTOR RESPONSIBILITY CRITERIA

To comply with RCW 39.06.020, the following is required:

- (a) The successful Bidder shall provide documentation to District demonstrating that the first-tier subcontractor meets the Subcontractor Responsibility Criteria below. The requirements of this subsection apply to all subcontractors regardless of tier.
- (b) At the time of subcontract execution, the successful Bidder to whom the Contract is to be awarded shall verify that each of its first tier subcontractors meets the following Bidder responsibility criteria:
 1. Have a current certificate of registration 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. Have Industrial Insurance (workers' compensation) coverage for the subcontractor's employees working in Washington, as required in Title 51 RCW;
 4. A Washington Employment Security Department number, as required in Title 50 RCW;
 5. A Washington Department of Revenue state excise tax registration number, as required in Title 82 RCW;
 6. An electrical contractor license, if required by Chapter 19.28 RCW;
 7. An elevator contractor license, if required by Chapter 70.87 RCW.
 8. Not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065 (3).
- (c) Bidder will be required to complete and submit the "Subcontractor Responsibility Criteria" form, included in the "Proposal" section of this document, either with the bid or within two hours of the required bid submittal time.

1.14 NON-COLLUSION DECLARATION

The non-collusion declaration is included in the submission of a bid. No person, firm, or corporation shall be allowed to make, file, or be interested in more than one proposal for the same work, unless alternative proposals are invited. A person, firm, or corporation who has submitted a sub-proposal to a Bidder, or who has quoted prices on materials to a Bidder, is not thereby disqualified from submitting a proposal, or quoting prices to other Bidders.

Reasonable grounds for believing that any Bidder is interested in more than one proposal for the work will cause the rejection of all proposals in which said Bidder is interested. If there is reason to believe that collusion exists among the Bidders, none of the participants in such collusion will be considered.

SPECIAL PROVISIONS

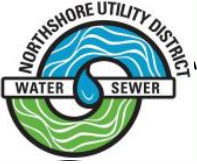


TABLE OF CONTENTS

SECTION 2

SPECIAL PROVISIONS

2.1	OBSERVATION OF THE WORK.....	1
2.2	THE CONTRACT PLANS	1
2.3	PERMITS.....	4
2.4	CERTIFICATE OF INSURANCE	4
2.5	CHANGES IN THE WORK.....	4
2.6	FUNDING REQUIREMENTS	6
	INSURANCE COVERAGE QUESTIONNAIRE	10



Section 2 – Special Provisions

2.1 OBSERVATION OF THE WORK

Work on this Project will be allowed on Saturdays and Sundays with written approval of the District a minimum of 2 weeks in advance.

Work will not be allowed on legally recognized holidays without written approval from the District. If the Contractor is granted permission for such work, then the District may, at the District’s sole discretion, deduct moneys from the Contractor in the amount of One Thousand Four Hundred Dollars (\$1,400) per day or fraction thereof for reimbursement to the District for its reasonable inspection and engineering fees.

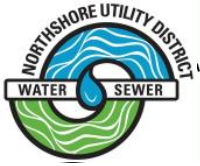
District Holidays

- New Year’s Day January 1
- Martin Luther King Day Third Monday in January
- President’s Day Third Monday in February
- Memorial Day Last Monday in May
- Juneteenth June 19
- Independence Day July 4
- Labor Day First Monday in September
- Veteran’s Day November 11
- Thanksgiving Day Fourth Thursday in November
- Day After Thanksgiving Fourth Friday in November
- Christmas Day December 25

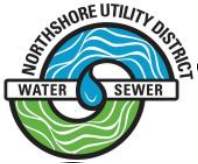
2.2 THE CONTRACT PLANS

The Contract Plans consist of the following sheets:

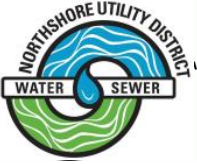
Sheet Number	Sheet Title
C-1	COVER
C-2	LEGEND AND NOTES
C-3	TESC DETAILS
C-4	DEMOLITION SITE PLAN
C-5	CONTRACTOR STAGING AREAS
C-6	PROPOSED SITE PLAN
C-7	BUILDING A - EAST AND WEST UTILITY CONNECTIONS
C-8	BUILDING B - WEST UTILITY CONNECTIONS
C-9	DETAILS 1
C-10	DETAILS 2
C-11	DETAILS 3



C-12	RESTORATION SITE PLAN
C-13	RESTORATION DETAILS 1
C-14	RESTORATION DETAILS 2
A-1	ARCHITECTURAL BUILDING DATA, NOTES, AND FINISH SCHEDULE
A-1.1	ARCHITECTURAL DOOR SCHEDULE, BORROWED LITE SCHEDULE, AND WALL DETAILS
A-1.2	ARCHITECTURAL BUILDING DETAILS 1
A-1.3	ARCHITECTURAL BUILDING DETAILS 2
A-2	EXISTING FLOOR PLAN
A-3	GENERAL DEMOLITION FLOOR PLAN
A-3.1	FLOORING FINISHES DEMOLITION PLAN
A-3.2	REFLECTED CEILING DEMOLITION PLAN
A-3.3	DEMOLITION ROOF PLAN
A-3.4	DEMOLITION PHOTO DETAILS
A-4	PROPOSED FLOOR PLAN
A-5	PROPOSED FLOORING PLAN
A-6	PROPOSED FURNISHINGS PLAN
A-7	PROPOSED REFLECTED CEILING PLAN
A-8	PROPOSED ROOF PLAN
A-8.1	ROOFING DETAILS 1
A-8.2	ROOFING DETAILS 2
A-9	ENLARGED FLOOR PLAN - SOUTHEAST
A-10	ENLARGED FLOOR PLAN - NORTHEAST
A-11	ENLARGED FLOOR PLAN - NORTHWEST
A-12	ENLARGED FLOOR PLAN - SOUTHWEST
A-13	ENLARGED FLOOR PLAN - LOBBY
A-14	INTERIOR ELEVATIONS 1
A-15	INTERIOR ELEVATIONS 2
A-16	INTERIOR ELEVATIONS 3
A-17	INTERIOR ELEVATIONS 4
A-18	INTERIOR ELEVATIONS 5
A-19	INTERIOR ELEVATIONS 6
A-20	INTERIOR ELEVATIONS 7
A-21	INTERIOR ELEVATIONS 8
A-22	INTERIOR ELEVATIONS 9
A-23	INTERIOR ELEVATIONS 10
A-24	ARCHITECTURAL CASEWORK DETAILS
H-1	HVAC NOTES
H-2	HVAC EQUIPMENT SCHEDULES
H-3	HVAC EQUIPMENT SCHEDULES AND DETAILS
H-4	EXISTING HVAC PLAN
H-5	HVAC DEMOLITION PLAN
H-6	HVAC PROPOSED PLAN



P-1	PLUMBING NOTES AND DETAILS
P-2	PLUMBING DEMOLITION PLAN 1
P-3	PLUMBING DEMOLITION PLAN 2
P-4	PLUMBING PROPOSED PLAN 1
P-5	PLUMBING PROPOSED PLAN 2
S-1	GENERAL STRUCTURAL NOTES, SPECIAL INSPECTION SCHEDULE, SUPPLEMENTAL ABBREVIATIONS, & STRUCTURAL LEGEND
S-2	DEMOLITION PLAN
S-3	STRUCTURAL FLOOR PLAN
S-4	STRUCTURAL UPPER PLAN
S-5	BUILDING DETAILS
S-6	BUILDING DETAILS AND EAST SHEAR WALL INTERIOR ELEVATIONS
E-0.0	SYMBOL SCHEDULE
E-0.1	CONDUIT SCHEDULE AND DEVICE TAG LIST
E-1.0	ELECTRICAL SITE PLAN
E-1.01	SITE ELECTRICAL CONNECTION PLAN
E-1.11	BUILDING A - WEST ELECTRICAL POWER PLAN
E-1.12	BUILDING A - EAST ELECTRICAL POWER PLAN
E-1.13	BUILDING A - CENTRAL LIGHTING PLAN
E-1.14	BUILDING A - EAST LIGHTING PLAN
E-1.20	BUILDING B ELECTRICAL PLAN
E-1.21	BUILDING B ENLARGED ELECTRICAL PLANS
E-1.31	BUILDING C - FUELING STATION GENERATOR RECEPTACLE
E-5.0	ELECTRICAL DETAILS
E-6.0	REVISED ONELINE DIAGRAM
E-6.1	PANEL SCHEDULES
E-6.2	PANEL SCHEDULES
E-6.3	PANEL SCHEDULES
E-6.4	PANEL SCHEDULES
E-6.5	LIGHTING SCHEDULES AND CONTROL WIRING
E-6.6	REVISED MAIN GROUNDING NETWORK
T-1.1	LOW VOLTAGE PLAN
T-5.1	LOW VOLTAGE SCHEDULES AND DETAILS
ED-1.11	BUILDING A - WEST ELECTRICAL DEMOLITION PLAN
ED-1.12	BUILDING A - EAST ELECTRICAL DEMOLITION PLAN
ED-1.13	BUILDING A - LIGHTING DEMOLITION PLAN
ED-1.21	BUILDING B - WEST ELECTRICAL DEMOLITION PLAN
ED-6.0	EXISTING ONELINE DIAGRAM
TD-1.1	LOW VOLTAGE DEMOLITION PLAN



2.3 PERMITS

The District has obtained a Building Permit from the following public agency:

- City of Kenmore

This permit is included in Appendix A.

The Contractor shall obtain the following permits from the City of Kenmore:

- Roofing Permit (submitted and paid for by District; obtained by Contractor)
- Plumbing Permit (to be submitted, paid and obtained by Contractor)
- Mechanical Permit (to be submitted, paid and obtained by Contractor)
- Fire Alarm and Protection Permit (to be submitted, paid and obtained by Contractor)
- Electrical Permit via L&I (to be submitted, paid and obtained by Contractor)

The Contractor shall comply with the requirements of the permits. The Contractor shall confirm that all permits have been obtained and are in effect prior to commencing work on the portion of the Project covered by such instruments.

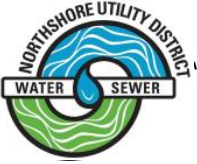
2.4 CERTIFICATE OF INSURANCE

The Contractor shall specifically note and comply with the limits of liability amounts, additional insured named and terms of cancellation included in Subsection 8.9 of the General Conditions. Additional insureds shall include Northshore Utility District, its agents and representatives, and the City of Kenmore.

The Insurance Questionnaire and Endorsement included at the end of this section must be completed in addition to the Certificate of Insurance.

2.5 CHANGES IN THE WORK

The cost to be included in an adjustment for any changes to the Work shall meet the notice provisions of the General Conditions, and will be determined strictly by one or a combination of the following methods:

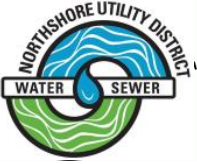


- (a) Contract unit bid prices previously agreed upon; or
- (b) If there are no unit bid prices, an agreed lump sum; or
- (c) If the amount of the adjustment cannot be agreed upon in advance or in the manner provided in subparagraph a or b above, the cost will be determined by the actual cost of:
 1. Labor including working foremen. Labor rates will only include the basic wage and fringe benefits, the current rates for Federal Insurance Compensation Act (FICA), Federal Unemployment Tax Act (FUTA) and State Unemployment Tax Act (SUTA), and the company's present rates for medical aid and industrial insurance premiums. Labor reimbursement calculations will be based on a "Labor List" (List) prepared and submitted by the Contractor and any Subcontractor before the Contractor commences force account Work. The Engineer may compare the List to payrolls and other documents and may at any time, require the Contractor to submit a new List.

In the event that an acceptable List is not received by the time that force account calculations are begun, the Engineer will develop a List unilaterally, utilizing the best data available; plus

2. Materials incorporated permanently into the Work; plus
3. The ownership or rental cost of equipment during the time of use on the extra work. Equipment rates shall be as set forth in the then current AGC/WSDOT Equipment Rental Agreement. These rates shall be full compensation for all costs incidental to furnishing and operating the equipment. The Contractor shall submit copies of the applicable portions of the AGC/WSDOT Equipment Rental Agreement to the Engineer. The rates listed in the Rental Rate Blue Book (as modified by the current AGC/WSDOT Equipment Rental Agreement) shall be full compensation for all fuel, oil, lubrication, ordinary repairs, maintenance, and all other costs incidental to furnishing and operating the equipment except labor for operation; plus
4. Overhead and Profit as follows:

For Work performed by the Contractor, an amount to be agreed upon but not to exceed 15 percent of the labor, material, and equipment cost agreed to by the Engineer as compensation for supervision, small tools, provisions for safety, home office and field overhead, profit and other general conditions expenses, including, but not limited to, insurance, bond and business and occupation taxes.



For Subcontractor Work, the Subcontractor will be allowed an amount to be agreed upon but not to exceed 15 percent of the labor, material, and equipment cost agreed to by the Engineer as compensation for supervision, small tools, provisions for safety, home office and field overhead, profit and other general conditions expenses, including, but not limited to, insurance, bond and business and occupation taxes. The Contractor will be allowed an additional markup of 10 percent to compensate the Contractor for all administrative costs, including home office and field overhead, profit, bonding, insurance, business and occupation taxes and any other costs incurred.

In no case will the total fixed fee for the Contractor and all Subcontractors of all tiers exceed 30 percent.

2.6 FUNDING REQUIREMENTS

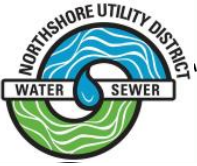
The District has secured funding from the Washington State Military Department (WSMD) through a Hazard Mitigation Grant. The grant-funded portion of the project is identified as Schedule "B": Building "A" Seismic Retrofit and has the following funding conditions that must be followed as part of the project.

- (a) Davis-Bacon or Prevailing Wage Rates, whichever is larger, shall apply to the entire project.
- (b) Receipts and/or backup documentation must be maintained as a condition of the funding agreement. The Contractor shall provide this documentation to the Owner upon request.
- (c) Change Orders may require WSMD approval prior to acceptance.
- (d) The project shall meet the requirements of 41 CFR Part 60 as an "Equal Employment Opportunity".

During the performance of this Contract, the Contractor agrees as follows:

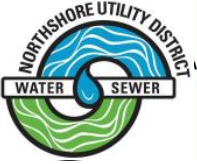
1. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other



forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
3. The Contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
4. The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
5. The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
6. The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
7. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of the said rules,



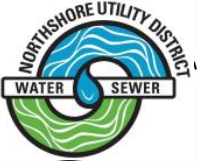
regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

8. The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor.

The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

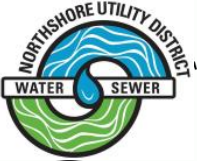
- (e) Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all Contracts awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each Contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.
- (f) Byrd Anti-Lobbying Amendment (31 U.S.C. 1352). Contractors that apply or bid for an award exceeding \$100,000 must file the required certification.



Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

(g) Utilization of Minority and Women Business Enterprises (MWBE). The Contractor shall comply with 2 CFR §200.321 and will take all necessary affirmative steps allowed by law to assure that minority firms, women's business enterprises, and labor surplus area firms are used when possible and will take all necessary affirmative steps allowed by law to utilize business firms that are certified as minority-owned and/or women-owned in carrying out the purposes of this Agreement. The following steps are required by the Contractor if any sub-contractors are entered into under the original contract award:

1. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
2. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
3. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
4. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises; and
5. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.



INSURANCE COVERAGE QUESTIONNAIRE

This Questionnaire must be completed and attached to Certificate of Insurance.

Name of Contractor: _____

Contract Number: Contract 2023-01; Building "A" Improvements

Project Owner: Northshore Utility District

Are the following coverage's and/or conditions in effect?

Please circle "yes" or "no" regarding the applicable policy		
This Policy Form is ISO Commercial General Liability form CG 00 01 or CG 00 02 (circle one). If no, attach a copy of the policy with required coverage clearly identified.	Yes	No
Products and Completed Operation Coverage	Yes	No
Cross Liability Clause (or equivalent wording)	Yes	No
Personal Injury Liability Coverage (with Employee Exclusion Deleted)	Yes	No
Broad Form Property Damage with X, C, U Hazards Included	Yes	No
Blanket Contractual Liability Coverage Applying to this Contract	Yes	No
Employers Liability - Stop Gap	Yes	No

	GL	AL	Excess
Deductibles or SIR's			
Insurer's A.M. Best Rating			

This Questionnaire is issued as a matter of information. This questionnaire is not an insurance policy and does not amend, extend or alter the coverage afforded by the policies indicated on the attached Certificate of Insurance.

Agency/Broker

Completed by (print name)

Address

Completed by (signature)

Name of Person to Contact

Phone Number

ENGINEERING SPECIFICATIONS

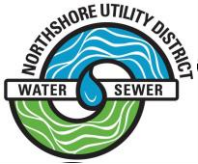
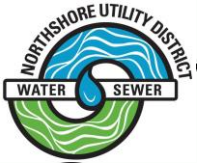


TABLE OF CONTENTS

SECTION 3

ENGINEERING SPECIFICATIONS

SECTION	DESCRIPTION	PAGE
Division 1 General Technical Requirements		
01110	Summary of Work.....	01110-1
01290	Schedule of Values.....	01290-1
01300	Submittals.....	01300-1
01310	Project Meetings.....	01310-1
01385	Documentation of Existing Conditions	01385-1
01400	Quality Control.....	01400-1
01500	Temporary Facilities	01500-1
01520	Field Offices and Storage Sheds.....	01520-1
01720	Record Drawings	01720-1
01740	Cleanup	01740-1
01900	Salvage and Demolition.....	01900-1
Division 2 Sitework		
02050	Locate Existing Utilities.....	02050-1
02240	Dewatering	02240-1
02250	Temporary Shoring and Bracing.....	02250-1
02300	Earthwork	02300-1
02305	Wet Weather Earthwork	02305-1
02370	Erosion Control.....	02370-1
02500	Water Distribution	02500-1
02535	Sanitary Sewer	02535-1
02700	Gravel Materials	02700-1
02740	Asphalt	02740-1
02950	Site Restoration and Rehabilitation	02950-1
Divisions 3 through 4		
Not Used		
Division 5 Metals		
05120	Structural Steel.....	05120-1
05400	Cold Formed Metal Framing.....	05400-1
05500	Miscellaneous Metal Fabrications	05500-1
Division 6 Wood and Plastics		
06100	Rough Carpentry	06100-1



SECTION	DESCRIPTION	PAGE
---------	-------------	------

Division 7 Thermal and Moisture Protection

07210	Batt and Rigid Insulation.....	07210-1
07900	Caulking and Sealants.....	07900-1

Division 8 Doors and Windows

08110	Hollow Metal Doors and Frames	08110-1
08200	Wood Doors	08200-1
08312	Roof Access Hatches	08312-1
08630	Aluminum Ballistics Resistant Window Assembly	08630-1
08810	Glazing	08810-1

Division 9 Finishes

09250	Gypsum Wallboard	09250-1
09260	Laminated Wall Ceiling Panels	09260-1
09280	Translucent Resin Panels.....	09280-1
09510	Acoustical Ceilings	09510-1
09653	Resilient Wall Base.....	09653-1
09775	Fiberglass Wall Finish	09755-1
09800	High Pressure Plastic Laminate	09800-1
09900	Painting	09900-1

Division 10 Specialties

10040	Ballistics Resistant Fiberglass Sheet.....	10040-1
10165	Laminated Plastic Toilet Compartments	10165-1
10500	Metal Lockers	10500-1
10800	Toilet and Bath Accessories	10800-1

Division 11 Equipment

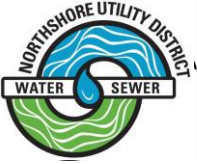
Not Used

Division 12 Furnishings

12356	Plastic Laminate Faced Casework	12356-1
12360	Simulated Stone Countertops.....	12360-1
12400	Furnishings and Accessories.....	12400-1
12452	Appliances.....	12452-1

Divisions 13 through 14

Not Used



SECTION	DESCRIPTION	PAGE
Division 15 Mechanical		
15066	Pipe and Conduit Support System	15066-1
15400	Plumbing	15400-1
15700	Heating, Ventilation, and Air Conditioning	15700-1
15720	Energy Management Control System (EMCS)	15720-1
Division 16 Electrical		
16050	Basic Electrical Materials and Methods	16050-1
16060	Grounding and Bonding.....	16060-1
16120	Conductors and Cables	16120-1
16130	Raceway and Boxes.....	16130-1
16140	Wiring Devices	16140-1
16410	Enclosed Switches and Circuit Breakers	16410-1
16440	Panelboards	16440-1
16510	Interior Luminaires.....	16510-1
16740	Communications Horizontal Cabling.....	16740-1

DIVISION 1

GENERAL TECHNICAL REQUIREMENTS

SECTION 01110

SUMMARY OF WORK

PART 1 GENERAL

1.1 SCOPE OF WORK

The work specified in this Section consists of furnishing all labor, materials, and equipment necessary for modifications to the existing Building “A” District Headquarters building, as shown on the Plans, and hereinafter specified. Work shall include, but not be limited to, the items listed below.

- A. Provide and install temporary Owner’s mobile office trailers. Provide and install temporary Contractor mobile office trailer.
- B. Perform build-out of additional temporary work space in Rooms 70 and 71 for Owner’s staff relocation during construction.
- C. Perform necessary demolition wastehaul of project elements.
- D. Provide and install seismic retrofits of building walls, suspended utilities, and suspended equipment as required.
- E. Provide and install all renovations to Lobby, offices, general spaces, and other identified rooms or spaces throughout the building.
- F. Perform re-roofing of entire Building “A”, including new skylights, replacement curbs, replacement existing penetration flashings, and new antennae bases.
- G. Provide and install all necessary plumbing modifications and revisions.
- H. Provide and install all necessary HVAC modifications and revisions, including updated controls programming through the District’s preferred vendor.
- I. Provide and install all necessary electrical modification and revisions including power, communications, security, and controls.
- J. Provide and install all site utility seismic upgrades for water, sewer, gas, and electrical.

- K. Remove all temporary office spaces and trailers for District staff relocation during construction. Restore existing outdoor areas to pre-construction condition. Restore indoor areas as scheduled.
- L. Provide and install all site restoration.
- M. All carpeting and tile work will be provided and installed by the District's preferred vendor, the Legacy Group, under separate contract. The Contractor shall be responsible for direct coordination for scheduling of this work to be complete under this Contract.
- N. New furniture will be provided and installed by the District's preferred vendor, the Legacy Group, under separate contract. The Contractor shall be responsible for direct coordination for scheduling of this work to be complete under this Contract.

1.2 PROJECT INFORMATION

The Contract Documents show the location, arrangement, and type of work to be performed under the proposed project.

The Contractor shall be responsible for proper notification to and coordination with all outside utilities, and all other persons and services that will be affected by this project at least one week in advance of beginning any construction that affects them.

It is the intent and purpose of these Contract Documents to have constructed complete facilities in good working order for the least practical cost to the Owner. Suggestions, recommendations, as well as inquiries from the Contractor that will serve this purpose are welcome and will be given consideration by the Owner and the Engineer.

1.3 WEB-BASED PROJECT COMMUNICATION SYSTEM

The Contractor shall install and use the necessary computer hardware and software to receive and transmit project communications through the Engineer's web-based, online project communications system. This website will be used by the Engineer, Field Representative, Owner and Contractor to communicate online between these parties to clarify design and construction requirements, to provide information concerning construction issues, and to post certain project documents.

The web-based project communication system will use the secure website and programming developed by the Engineer. The Engineer will provide the Contractor with the instructions and credentials for access and use of the website.

The website shall be used for posting and responding to the following communications and documents:

- Submittals
- Request to Sublet
- Progress Estimates
- Requests for Information
- Construction meeting minutes
- Job photos
- Change order proposals
- Weekly Working Day Reports
- Material Testing Reports

No hard copy submittals will be accepted without the Engineer's prior approval. All other reporting requirements shall remain in effect for this project.

1.4 CONTRACTOR USE OF SITE AND PREMISES

Construction operations shall be limited to the areas noted on the Plans and subject to the approval of the Engineer.

The Contractor shall allow representatives of the Owner, funding, and regulatory agencies access to the project site at all times.

1.5 ORDER OF WORK

The order of work will be at the option of the Contractor, except as may be noted within the Contract Documents, in keeping with good construction practice, and the time restrictions or requirements of the permits applicable to this project, all costs of which shall be included in the various bid amounts.

The Contractor shall conduct the order of work to allow the existing facilities to remain operational during the construction of the Project and shall coordinate all of their activities through the Engineer and the Owner. The Contractor shall provide a written plan of activities to the Engineer and Owner each Thursday for the following week, for review and coordination with existing facility operations.

The implementation of any measure required to protect the environment shall supersede any order of work designated within these Specifications. The Contractor shall meet the conditions as outlined in any and all permits and requirements of the Federal, State, County, and City regulatory agencies.

***** END OF SECTION *****

SECTION 01290

SCHEDULE OF VALUES

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section establishes the procedures for preparing the schedule of values used for preparation of the Contractor's progress pay estimates.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
Section 4	Measurement and Payment
01300	Submittals

1.3 DESCRIPTION

Within 14 calendar days following receipt of Notice to Proceed, the Contractor shall submit to the Engineer, for review and approval, a complete breakdown of components of all lump sum bid items showing the value assigned to each portion of the work. The schedule of values shall be prepared in such form, and supported by data that substantiates its accuracy as may be required by the Engineer. This schedule of values shall, once approved by Engineer, be used as the basis for reviewing and determining each monthly progress payment estimate and as such shall be subject to periodic review by the Engineer to assure that the schedule of values reasonably represents, in the opinion of the Engineer, the actual value of the individual items of work to be performed. No payments shall be made until the schedule of values has been approved.

***** END OF SECTION *****

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes requirements that apply to all equipment and materials supplied on the Project.

The Contractor shall be responsible for the accuracy and completeness of the information contained in each submittal and shall assure that the material, equipment or method of work shall be as described in the submittal. The Contractor shall verify that all features of all products conform to the requirements of the Contract Documents. Submittal documents shall be clearly edited to indicate only those items, models, or series of equipment that are being submitted for review. All extraneous materials shall be crossed out or otherwise obliterated. The Contractor shall ensure that there is no conflict with other submittals and notify the Engineer in each case where their submittal may affect the work of another contractor or the Owner. The Contractor shall ensure coordination of submittals among the related crafts and subcontractors and shall verify such coordination on all submittals.

Where noted in the Contract Documents, the structural, mechanical, and electrical designs associated with the indicated equipment items are specific to the manufacturer and model number specified. Any structural, mechanical, or electrical modifications required to utilize an approved substitution to the specified equipment shall be made by the Contractor at no additional cost to the Owner. Where approved substitutions of specified equipment affect other materials or equipment, mechanical, structural, or electrical work, the Contractor shall note in the equipment submittal any necessary changes to accommodate the substituted equipment. It shall also be the responsibility of the Contractor to coordinate other mechanical, structural, or electrical equipment submittals to make sure that all changes necessary to accommodate the substituted equipment are addressed in these submittals as well. See General Condition 3.04.3.

1.2 WORK INCLUDED

Submittals required for this work shall include any or all of the following as required by the particular specification section and the submittal schedule:

- A. Schedules and Plans

B. PRODUCT SUBMITTALS

1. Manufacturer's Literature
2. Shop Drawings
3. Color and Material Samples
4. Design Calculations
5. Test Reports

C. Equipment Operation and Maintenance Manuals

D. Record Drawings

1.3 SUBMITTAL INFORMATION

Shop, catalog, and other appropriate drawings and information shall be submitted to the Engineer for review prior to fabrication or ordering of all equipment and materials specified. The number of copies of submittal information to be submitted shall be as indicated below.

All submittal information shall be sent to the Engineer through the Contractor. The Contractor shall assign a separate submittal number to each item or group of items that relate to each specification section. Submittal numbers shall be assigned in consecutive ascending order, with the first project submittal assigned the number "1." Resubmittals shall be numbered using the same number followed by an alphabetical suffix. All submittals shall bear the Contractor's certification that they have reviewed, checked, and approved the submittal information prior to transmitting to the Engineer. The submittal number and related specification section shall be marked on each submittal.

PART 2 PRODUCTS

2.1 GENERAL

The Contractor shall submit all submittals on the Web-Based Project Communication System. The Contractor shall submit the specified information as PDF files on the web-based project communication system, with a table of contents bookmarked to provide a navigation link to each section of the submittal. The PDF shall consist of one submittal for each submittal number and shall not be broken up into separate documents. Four hard copies of all final equipment manuals shall be submitted.

2.2 PRODUCT SUBMITTALS

A. GENERAL

When indicated in the Contract Documents, the contractor shall submit product data for review by the Engineer. Unless otherwise specified, within 14 calendar days after receipt of the submittal, the Engineer shall review the submittal and return three copies of the marked-up submittal. The reproducible original will be retained by the Engineer. The returned submittal shall indicate one of the following actions:

1. If the review indicates that the material, equipment, or work method complies with the project Specifications, submittal copies will be marked “NO EXCEPTIONS TAKEN.” In this event, the Contractor may begin to implement the work method or incorporate the material or equipment covered by the submittal.
2. If the review indicates limited corrections are required, copies will be marked “MAKE CORRECTIONS NOTED.” The Contractor may begin implementing the work method or incorporating the material and equipment covered by the submittal in accordance with the noted corrections. Where submittal information will be incorporated in operation and maintenance data, a corrected copy shall be provided.
3. If the review reveals that the submittal is insufficient or contains incorrect data, copies will be marked “AMEND AND RESUBMIT.” Except at their own risk, the Contractor shall not undertake work covered by this submittal until it has been revised, resubmitted, and returned marked either “NO EXCEPTIONS TAKEN” or “MAKE CORRECTIONS NOTED.”
4. If the review indicates that the material, equipment, or work method does not comply with the project Specifications, copies of the submittal will be marked “REJECTED - SEE REMARKS.” Submittals with deviations that have not been identified clearly may be rejected. Except at their own risk, the Contractor shall not undertake the work covered by such submittals until a new submittal is made and returned marked either “NO EXCEPTIONS TAKEN” or “MAKE CORRECTIONS NOTED.”

B. MANUFACTURER’S LITERATURE

Where the contents of submitted literature include data not pertinent to the submittal, the portion(s) of the contents being submitted for the Engineer’s review shall be clearly indicated.

C. SHOP DRAWINGS

Shop drawings shall be submitted in the form of blue-line or black-line prints of each sheet. Blueprint submittals will not be acceptable.

All shop drawings shall be accurately drawn to a scale sufficiently large enough to show pertinent features and method of connection or joining. On all shop drawings, figure dimensions shall be used as opposed to scaled dimensions.

D. COLOR AND MATERIAL SAMPLES

All material samples shall be of the exact article proposed to be furnished for the work and shall be submitted in the quantity required. Samples shall be returned to the Contractor, with one retained by the Engineer.

Unless the precise color is specifically described in the Contract Documents, or whenever a choice of color or pattern is available in a specified product, accurate color charts shall be submitted to the Engineer for their review and selection.

E. DESIGN CALCULATIONS

Where required in the Specifications, design calculations shall be submitted to the Engineer. Design calculations shall be complete, concise, and in an easy-to-read format. All design calculations shall be stamped by a Professional Engineer licensed in the State of Washington.

F. TEST REPORTS

Copies of all test reports shall be submitted to the Engineer.

2.3 EQUIPMENT MANUALS

A. GENERAL

For all items of equipment, manufacturer’s equipment operation and maintenance manuals shall be submitted to the Engineer for review. One copy will be returned to the Contractor with comments.

The following information shall be furnished for all items of equipment installed on the project requiring operational and/or maintenance procedures, and for any additional items indicated by the Engineer.

1. Lubrication Information

This shall consist of the manufacturer's recommendations regarding the lubricants to be used and the lubrication schedule to be followed.

2. Electrical and Control Diagrams

Diagrams shall show internal and connection wiring.

3. Startup Procedures

These instructions consist of equipment manufacturer's recommendations for installation, adjustment, calibration, and troubleshooting.

4. Operating Procedures

These instructions consist of the equipment manufacturer's recommended step-by-step procedures for starting, operating, and stopping the equipment under specified modes of operation.

5. Preventive Maintenance Procedures

These instructions consist of the equipment manufacturer's recommended steps and schedules for maintaining the equipment.

6. Overhaul Instructions

These instructions consist of the manufacturer's directions for the disassembly, repair, and reassembly of the equipment and any safety precautions that must be observed while performing the work.

7. Parts List

This list consists of the generic title and identification number of each component part of the equipment.

8. Spare Parts List

This list consists of the manufacturer's recommendations of number of parts, which should be stored by the Owner and any special storage precautions, which may be required.

9. Exploded View

Exploded or cut views of equipment shall be provided if available as a standard item of the manufacturer's information. When exploded or cut views are not available, plan and section views shall be provided with detailed callouts.

10. Test Documentation

Reports, records, data and forms documenting the results of equipment factory tests, including pump and blower performance curves, shall be provided, with the operating points for the specific equipment designated. When a special factory test of the supplied equipment is not performed, the manufacturer's standard performance reports and curves, with specified operating points, shall be provided for the supplied equipment.

11. Specific Information

Where items of information not included in the above list are required, they will be provided as described in the specifications for the equipment.

12. Warranty Information

All operation and maintenance information shall be comprehensive and detailed, and shall contain information adequately covering all normal operation and maintenance procedures.

For ease of identification, each manufacturer's brochure and manual shall be appropriately labeled with the equipment name and equipment specification number as it appears in the project Specifications. The information shall be organized in binders. The binders shall be provided with a table of contents and tab sheets to permit easy location of desired information.

Lubricants shall be described in detail, including type, recommended manufacturer, and manufacturer's specific compound to be used.

It shall be the responsibility of the Contractor to ensure that all operation and maintenance materials are obtained. Material submitted must meet the approval of the Engineer prior to project acceptance.

B. EXTRANEOUS DATA

Where the contents of the manuals include manufacturers' standard brochures or catalog pages, the exact item(s) used in this installation shall be clearly indicated and all manufacturers' data which is extraneous shall be clearly deleted.

C. FINAL EQUIPMENT MANUALS

The Contractor shall be responsible for tracking and coordinating each separate manufacturer's equipment operation and maintenance manual submittal and shall resubmit, as necessary, until the Engineer's review indicates that the submittal is acceptable. The Contractor shall maintain equipment manual files until final approval copies are delivered to the Engineer. The Contractor shall be responsible for collating the approved operation and maintenance submittal sections into complete final manufacturers' equipment operation and maintenance manuals bound in post binders which are indexed to the Specifications. The Contractor shall deliver the complete final operation and maintenance manuals to the Engineer prior to project completion. All copies final manufacturers' equipment manuals submitted will be retained by the Engineer or Owner.

PART 3 EXECUTION

3.1 IDENTIFICATION OF SUBMITTALS

A. GENERAL

Each submittal shall be accompanied by a letter of transmittal showing the date of transmittal, specification section, or drawing number to which the submittal pertains, submittal number, and a brief description of the material submitted.

B. RESUBMITTALS

When material is resubmitted for any reason, it shall be submitted under a new letter of transmittal and referenced to the previous submittal.

3.2 REVIEW OF SUBMITTALS

The Engineer will review all submittals for general conformance with the design and other requirements of the Contract Documents. Markings or comments shall not be construed as relieving the Contractor from compliance with the Contract Documents. Submittals may be rejected based on inadequate information and/or not meeting the requirements of the Contract Documents. Rejection of submittals requires action on the part of the Contractor to correct the reason for the rejection. The Contractor remains responsible for details and accuracy, for confirming and correlating all quantities and dimensions, for selecting fabrication processes, and for techniques of assembly and installation.

3.3 COORDINATION OF PRODUCT SUBMITTALS

A. GENERAL

Prior to submittal for review by the Engineer, all data shall be fully coordinated, including the following:

1. All field dimensions and conditions.
2. All trades and public agencies involved, including necessary approvals.
3. All deviations from the Contract Documents.

B. GROUPING OF SUBMITTALS

1. All submittals shall be grouped with associated items, unless otherwise specifically permitted by the Engineer.
2. The Engineer may reject the submittals in their entirety or any part thereof, if not in accordance with the Contract Documents.

C. CERTIFICATION

Submittals shall bear the Contractor's certification that they has reviewed, checked, and approved the shop drawings prior to forwarding them to the Engineer.

3.4 TIMING OF PRODUCT SUBMITTALS

A. GENERAL

1. All submittals shall be made far enough in advance of installation to provide all required time for reviews and securing necessary approvals.
2. In scheduling, the Contractor shall allow for the time indicated in Part 2.2A for the Engineer's review following their receipt of the submittal.

B. DELAYS

No additional or separate payment will be made for costs of delays occasioned by tardiness of submittals on the part of the Contractor.

3.5 EQUIPMENT MANUALS

The preliminary copies of the manufacturer's equipment manuals shall be delivered to the Engineer for review not later than the time of equipment delivery to the project site.

Final copies of the manufacturer's equipment manuals shall be delivered to the Engineer at least 14 calendar days prior to requesting payment in excess of 90 percent completion for the project. Prior to submittal of the final equipment manuals, the Contractor shall check the manuals for accuracy and completeness and shall verify that prior review comments have been addressed.

***** END OF SECTION *****

SECTION 01310

PROJECT MEETINGS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes information pertaining to the various meetings that will be held during the course of constructing this project.

1.2 PRECONSTRUCTION CONFERENCE

As soon as possible following the award of the Contract, a preconstruction conference shall be scheduled for representatives of the Owner, the Contractor, the Engineer, funding agencies, regulatory agencies, and affected utilities.

1.3 PROJECT PROGRESS MEETINGS

The Owner and the Engineer will schedule and attend regular weekly meetings with the Contractor for coordination, administrative, and procedural requirements of the project. The Contractor shall provide a meeting room with table and chairs at the site for project progress meetings.

1.4 CONSTRUCTION MEETINGS

The Contractor shall schedule and hold regular meetings during the project:

- A. Safety Meetings (Contractor's subcontractors shall attend if they are working onsite.)
- B. Project Progress Meetings
- C. Equipment Installation Meetings
- D. Coordination Meetings
- E. Startup and Testing Meetings

The Contractor shall notify the Owner and Engineer in advance of all meetings. The meetings may or may not be attended by the Owner and Engineer.

***** END OF SECTION *****

SECTION 01385

DOCUMENTATION OF EXISTING CONDITIONS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes all photography requirements for the project.

The Contractor shall provide comprehensive preconstruction photographs of the entire construction area and adjacent properties. The photographs shall provide complete coverage of all features of the project.

Prior to construction, photographs shall be taken in the project area where work is to be done. The photographs shall be of commercial quality and must be submitted to the Engineer prior to the initiation of construction.

The Contractor shall submit digital photographs on an electronic storage device (flash/thumb drive). Three copies of each storage device shall be submitted to the Engineer. Each photograph shall be of good quality, sufficiently large to distinguish unique features captured in the photograph, and should be at least 4 MB in size. Each electronic storage device shall be labeled, and shall, at a minimum include the name of the Owner, name of the Contractor, Date, Project Name, and the title, "Pre-Construction Photographs" in sufficiently legible text.

The photographs shall be arranged in a continuous fashion from one end of the project to the other. The Contractor shall invite the Engineer to the site while collecting these photographs.

Following construction, the Contractor shall provide post-construction photographs of the entire construction area and adjacent properties in a similar format to the preconstruction photographs.

***** END OF SECTION *****

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the control tests, test sample collection, required field-testing, and special inspections as specified herein, and indicated on the Plans.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
02300	Earthwork
02700	Gravel Materials
02710	Gravel Surfacing
02740	Hot Mix Asphalt
Division 5	Metals

1.3 PAYMENT

All testing as required by this Section shall be coordinated and scheduled by the Contractor with the Owner's designated testing agency. The Owner will contract with, and pay for, a testing agency to conduct all field and laboratory tests and special inspections as designated herein.

Retesting and reinspection required because of defective work and testing performed for the convenience of the Contractor shall also be paid for by the Contractor. Costs for retesting (beyond that which is required herein) will be reimbursed to the Owner in the form of a credit on a change order at the time of project acceptance.

All costs for scheduling, sampling, coordinating, and retesting of defective work shall be considered as incidental to the work and merged into the respective unit and lump sum prices bid.

PART 2 PRODUCTS

2.1 SOILS AND GRANULAR MATERIALS

A. COMPACTION CONTROL

Optimum moisture content and maximum density tests shall be determined by the following method:

ASTM D1557 – Laboratory Compaction Characteristics of Soil Using Modified Effort

B. IN-PLACE TESTS

In-place density and moisture content tests shall be made by an independent testing laboratory according to the following methods:

ASTM D1556 – Density and Unit Weight of Soil in Place by the Sand Cone Method

ASTM D6938 – Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

2.2 AGGREGATES

All aggregates shall be tested in accordance with applicable WSDOT test methods:

<u>Title</u>	<u>Test Method</u>
Sampling	AASHTO T2
Sieve Analysis of Fine and Coarse Aggregates	104A
Material Finer than No. 200 Sieve in Aggregates	102A
Percentage of Particles Smaller than 0.025 mm and 0.005 mm	603A
Organic Impurities	111A
Abrasion of Coarse Aggregates by Use of the Los Angeles Machine	101A
Sand Equivalent	109A

2.3 HOT MIX ASPHALT

Paving asphalt shall be tested in accordance with the current version of WSDOT Standard Specification Section 9-02.

PART 3 EXECUTION

3.1 SAMPLING AND TESTING FREQUENCY

A. GENERAL

The Contractor shall be responsible for the coordination and scheduling of a certified independent testing laboratory employed by the Owner to provide the following quality control tests at the number and frequency described herein. The precise location of the tests shall be designated by the Engineer. The Contractor shall cooperate with laboratory personnel employed to conduct the density testing, sampling of material(s), and special inspections. The Contractor shall provide safe access within the work site for laboratory personnel such that density testing and visual inspection can be performed. The Contractor shall provide samples of materials to be tested in the quantities required and herein specified to the appropriate laboratory personnel. The Contractor shall furnish all labor, equipment, tools, and materials necessary to obtain and deliver samples as herein designated. He shall also provide and repair any test holes required in order to facilitate the testing and sampling and to provide for the testing laboratory's exclusive use for storage and curing of test samples until removed to the laboratory.

Any areas tested and further failing compliance with the Specifications shall be recompacted and retested at the Contractor's expense, until a successful density test indicating compliance with these Specifications has been achieved.

B. SOIL TESTING

The Contractor shall schedule and coordinate with the Owner-employed independent testing laboratory to conduct the following quality control tests at the given frequency:

<u>Material</u>	<u>Test</u>	<u>Minimum Sampling & Testing Frequency</u>
Backfill for foundations, walls, trenches and roads ¹	Gradation	One for every 500 cy or one per day, whichever is more frequent, for each type of soil or fill material with quantities exceeding 25 cy. For trenches, one per day and one every 250 feet of trench.
	In-Place Density ^{2,3,4}	One every 500 cy or one per day for each type of soil or fill material with quantities exceeding 25 cy. For trenches, one per day and one every 250 feet of trench.
	Moisture-Density Relationship ³	One prior to start of backfilling operation, one every 20 densities and any time material type changes.
Pipe Bedding ¹	Gradation	One every 750 feet of trench.
Subgrade and Fills ¹	In-Place Density ^{2,3}	One every 500 cy of each type material.
	Moisture-Density Relationship	One for every 20 densities for each material.
	Gradation	One for every moisture-density.

1. All acceptance tests shall be conducted from in-place samples.
2. Additional tests shall be conducted when variations occur due to the Contractors, operations, weather conditions, site conditions, etc.
3. The nuclear densometer, if properly calibrated, may be used but only to supplement the required testing frequency and procedures. The densometer shall be calibrated and is recommended for use when the time for complete results becomes critical.
4. Depending on soil conditions, it is anticipated that compaction tests shall be required at depths of 2 feet above the pipe and at each additional 5 feet to the existing surface plus a test at the surface.

C. **HOT MIX ASPHALT AND ASPHALT TREATED BASE TESTING FREQUENCY**

The Contractor shall schedule and coordinate with the Owner-employed testing laboratory to conduct the following quality control tests at the stated frequency:

Hot Mix Asphalt

Material	Test	Minimum Sampling & Testing Frequency
Commercial HMA	Rice Density	1 – project.

Hot Mix Asphalt Aggregate⁽³⁾

Material	Test	Minimum Sampling & Testing Frequency
Aggregate	SE, Fracture	1 – 2,000 TN.

- (1) All acceptance tests shall be conducted from in place samples.
- (2) A minimum of three samples, on a random basis, shall be taken and tested.

D. **SPECIAL INSPECTIONS**

Contractor shall coordinate and schedule all required Special Inspections per WABO requirements (Chapter 17 of the IBC) with the Owner designated testing agency. Special inspections include cast-in-place concrete, concrete reinforcement, structural welded connections, bolted connections, concrete masonry units (CMU), compaction testing for building and structure foundations, and epoxy adhesive bolting.

***** END OF SECTION *****

SECTION 01500

TEMPORARY FACILITIES

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the temporary facilities required for this project, but not necessarily limited to:

- A. Temporary utilities such as water, electricity, telephone, off-site staging, and off-site parking.
- B. Temporary piping, pumps, valves, fittings, manholes, vaults, and appurtenances necessary to keep existing facilities fully operational during construction.
- C. Sanitary facilities.
- D. Temporary enclosures such as fences, tarpaulins, barricades, and canopies.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01520	Field Offices and Storage Sheds

PART 2 PRODUCTS

2.1 TEMPORARY ELECTRICITY

As required, the Contractor shall provide temporary power for construction at the project site. They shall make arrangements with the electrical utility (to obtain temporary power) and shall pay all costs and fees charged by the utility associated with connection of temporary power. The Contractor shall provide all special connections, receptacles, panelboards, etc., which are required for temporary service, and are not provided by the utility.

The Contractor shall furnish and install all temporary wiring and associated equipment required to keep all portions of the existing facilities in operation at all times.

Area distribution boxes shall be furnished, installed, and so located that the individual trades may use their own construction-type extension cords to obtain proper power and artificial lighting at all points where required. The Contractor

shall provide a main disconnect on all temporary wiring panels, labeled “MAIN DISCONNECT,” to ensure the safety of personnel using extension cords and hand tools. Panels shall also be properly grounded and equipped with GFCI breakers in accordance with WISHA requirements.

The Contractor shall provide the Engineer single line diagrams of the temporary wiring showing all circuit breakers. These diagrams shall be provided prior to installation of this wiring. These diagrams are necessary to provide information to Owner personnel for off-hours operation.

The Contractor shall pay all demand, consumption, taxes, and fees associated with the temporary electrical service.

2.2 SANITARY FACILITIES

The Contractor shall provide toilet and wash-up facilities for their workforce and the Engineer at the site of work. They shall comply with applicable laws, ordinances, and regulations pertaining to the public health and sanitation of dwellings and camps.

2.3 OFF-SITE STAGING AND PARKING

The Contractor shall note that space is limited throughout the construction site. Employees of the Contractor, all subcontractors, vendors, suppliers, and associated personnel shall not be allowed to park onsite during the course of construction without prior approval from the Owner. It shall be the responsibility of the Contractor to provide sufficient parking facilities in authorized area(s) other than the construction site for the above-mentioned personnel.

The Contractor shall not be allowed to stockpile and store equipment and materials throughout the construction site. The Contractor shall coordinate their schedule so that all equipment and materials shall be brought to the construction site only when they are to be installed/utilized.

The Contractor shall provide storage of equipment and materials at an offsite, bonded warehouse, to be approved by the Engineer. The Contractor shall pay all costs associated with off-site delivery, storage, and transfer to the construction site.

2.4 ENCLOSURES

The Contractor shall furnish, install, and maintain during the project time all required scaffolds, tarpaulins, barricades, canopies, warning signs, steps, bridges, platforms, and other temporary construction necessary for proper completion of the work in compliance with all pertinent safety and other regulations.

PART 3 EXECUTION

All temporary facilities and controls shall be maintained as long as required for the safe and proper completion of the work. The Contractor shall remove such temporary facilities and controls as rapidly as progress of the work will permit or as directed by the Owner.

***** END OF SECTION *****

SECTION 01520

FIELD OFFICES AND STORAGE SHEDS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section describes the requirements for field offices on this project.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01500	Temporary Facilities

PART 2 PRODUCTS

2.1 CONTRACTOR FIELD OFFICE

During the performance of the Contract, the Contractor shall maintain a suitable office at the site of the work, which shall be the headquarters of the Contractor's representative. Office location on the site shall be approved by the Owner and Engineer.

2.2 OWNER'S TEMPORARY STAFF FIELD OFFICES

Contractor shall provide two (2) additional field office trailers to allow for relocation of District staff during the course of construction. Trailers shall meet the following minimum requirements:

1. One 12' x 56' minimum office trailer with one work space office at each end and a central open meeting/work area for a total of five occupants.
2. One 10' x 30' minimum office trailer with three work space offices for a total of three occupants.
3. Trailers shall be complete with power, lighting, heating, and air conditioning.
4. Trailers shall be clean and in like-new condition.
5. Contractor shall be responsible for bringing temporary power to the trailers.

6. The District will provide their own furnishings and communications connections.

2.3 OWNER'S TEMPORARY INTERIOR WORK SPACES

Contractor shall provide design, layout, and build-out of temporary offices and cubicle style work spaces to allow for additional relocation of District staff during the course of construction. The temporary office spaces will be built out in Rooms 70 and 71. Some general key parameters are shown on the Plans, but final layout shall be developed and refined by the Contractor in cooperative coordination with the District based on their identified staffing needs.

Temporary space build out can be by third-party services such as “Portafab Modular Building Systems” or “Swiftwall.” Alternatively, it is suitable if the built out space is done with rapid, traditional framing methods and suitable prefinished wall paneling or semi-finished and painted gypsum wallboard. The means of construction shall be suitable and safe to last for the duration of the project, while providing the necessary work spaces.

The Contractor shall be responsible to extend temporary power to the temporary offices and workspaces. Receptacles and loads shall be representative of typical office uses.

The District will provide for the necessary communications associated with the temporary offices and works spaces.

2.4 STORAGE SHEDS

The Contractor shall provide any required storage for the protection of equipment, materials, supplies, and tools and shall ensure that a building be used for the storage of materials that deteriorate when exposed to moisture. Workshops and storage buildings shall be located in the general area of the work and shall be clean and in proper order. Storage of materials at the project sites shall not obstruct access or use by the Owner's employees of existing facilities.

PART 3 EXECUTION

All storage sheds shall be maintained as long as required for the safe and proper completion of the work. The Contractor shall remove such temporary facilities as rapidly as progress of the work will permit or as directed by the Engineer. The Engineer's field office and accessories shall remain in service until the project is accepted by the Owner.

***** END OF SECTION *****

SECTION 01720

RECORD DRAWINGS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the record drawings, which shall be maintained and annotated by the Contractor during construction.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals

1.3 INFORMATION PROVIDED BY THE OWNER

The Contractor will be provided with the following items to maintain record drawings for the project:

- A. One full size paper set of Plans.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall maintain the following record drawings for the project:

- A. A neat and legibly marked set of Contract Plans showing the final location of piping, equipment, electrical conduits, outlet boxes and cables;
- B. Additional documents such as schedules, lists, drawings, and electrical and instrumentation diagrams included in the Contract Documents; and
- C. Contractor layout and installation drawings.

Unless otherwise specified, record drawings shall be full size and maintained in a clean, dry, and legible condition. Record documents shall not be used for construction purposes and shall be available for review by the Engineer during normal working hours at the Contractor's field office. At the completion of the

work, prior to final payment, a paper copy and a scanned pdf of all record drawings shall be submitted to the Engineer.

Marking of the drawings shall be kept current and shall be done at the time the material and equipment are installed. Annotations to the record documents shall be made with an erasable colored pencil conforming to the following color code:

- A. Additions - Red
- B. Deletions - Green
- C. Comments - Blue
- D. Dimensions - Graphite

Legibly mark drawings to record actual depths, horizontal and vertical location of underground raceways, cables, and appurtenances referenced to permanent surface improvements.

The Contractor's record drawings (full-size hard-copy) will be reviewed monthly for completeness by the Engineer prior to preparing the progress estimate for payment. If the record drawings do not reflect the work performed, payment for that item of work will not be included in the progress estimate.

***** END OF SECTION *****

SECTION 01740

CLEANUP

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the maintenance of the building, structures, and site(s) in a standard of cleanliness throughout the construction period as described herein.

Throughout the construction period, the Contractor shall maintain the cleanliness of the site and structures as described herein. The Contractor is also to maintain access to all existing, operating equipment such that the equipment may be serviced and operated.

Dust of all kinds, including concrete dust produced by construction activities, shall be controlled to avoid damage to existing, operating equipment. Enclosures, ventilation, and air scrubbing may be required where significant potential for damage is determined by the Engineer.

1.2 RELATED WORK SPECIFIED ELSEWHERE

In addition to standards described in this Section, comply with all requirements for cleaning up when described in other sections of these Contract Documents.

1.3 QUALITY ASSURANCE

A. INSPECTION

The Contractor shall conduct daily site inspections, and more often if necessary, to verify that requirements are being met.

B. CODES AND STANDARDS

In addition to the standards described in this Section, comply with all pertinent requirements of governmental agencies having jurisdiction.

PART 2 PRODUCTS

2.1 CLEANING MATERIALS AND EQUIPMENT

Provide all required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

2.2 COMPATIBILITY

Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material or as approved by the Engineer.

PART 3 EXECUTION

3.1 PROGRESS CLEANING

A. GENERAL

Retain all stored materials and equipment in an orderly fashion allowing maximum access, not impeding drainage or traffic, and providing protection.

Do not allow the accumulation of scrap, debris, waste material, and other items not required for this work.

At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the project site.

Provide adequate storage for all materials awaiting removal from the project site, observing all requirements for fire protection and protection of the environment.

B. SITE

Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Move these items into a place designated for their storage until disposal becomes available.

Weekly, and more often if necessary, inspect all arrangements of materials stored on the site, restack, arrange, or otherwise service all arrangements to meet the requirements above.

Maintain the site in a neat and orderly condition at all times so as to meet the approval of the Engineer.

C. STRUCTURES

Weekly, and more often if necessary, inspect the structures and pick up all scrap, debris and waste material. Move these items into a place designated for their storage until disposal becomes available.

Weekly, and more often if necessary, sweep clean all interior spaces. “Clean” shall be interpreted to mean free from dust and other materials that can be swept with a broom using reasonable diligence.

In preparing to install succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material. Use all equipment and materials required to achieve the required cleanliness.

D. STREETS

All paved and unpaved streets in the vicinity of the project shall be kept free of material tracked from the project site(s) or dropped from vehicles entering and leaving the site(s). The Contractor shall inspect roads in each active area daily, and all material deposited on the road from the Contractor’s activities shall be removed prior to the end of the workday. This shall include sweeping, as required, to collect any mud, dirt and dust from the surface. All catch basins and culverts in the work area shall be inspected before completion and cleaned as directed by the Engineer.

3.2 FINAL CLEANING

A. DEFINITION

Except as otherwise specifically provided, “clean” shall be interpreted as meaning the level of cleanliness generally provided by commercial building maintenance equipment and materials.

B. GENERAL

Prior to final inspection, remove from the jobsite all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final project cleaning as described below.

C. STRUCTURES

1. Exterior

Visually inspect all exterior surfaces and remove all traces of soil, waste, smudges, and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. If necessary to achieve a uniform degree of exterior cleanliness, hose down the exterior of the structure. In the event of stubborn stains not removable with

water, the Engineer may require light sandblasting or other cleaning at no additional cost to the Owner.

2. Interior

Visually inspect all interior surfaces and remove all traces of soil, waste, smudges, and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. Remove all paint droppings, spots, stains, and dirt from finished surfaces. Use only appropriate cleaning materials and equipment.

3. Glass

Clean all glass inside and outside.

D. TIMING

Schedule final cleaning as approved by the Engineer to enable the Owner to accept a completely clean project, ready for occupancy.

***** END OF SECTION *****

SECTION 01900

SALVAGE AND DEMOLITION

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section covers the demolition of existing structures, piping, equipment, and sitework, and the salvage of existing materials and equipment as indicated on the Plans and as specified herein.

All areas of the existing facility which are not affected by this Project must remain in continuous operation during the work.

The Plans show the major items and general project elements to be demolished and removed. In addition to these items, the Contractor shall remove all incidental items which are not to be used in the completed project.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
Division 1	General

1.3 SALVAGE

Salvageable equipment and material shall be removed with care so as not to impair future uses and shall include all equipment and material so indicated on the Plans. Salvaged equipment and material not reused or rejected by the Owner shall be cleaned and protected from corrosion and weather and provided to the Owner.

Reuse of salvageable equipment and material by the Contractor will not be permitted except where specifically indicated on the Plans and in the Specifications or where approved by the Engineer and Owner. Salvageable equipment and materials rejected in writing by the Owner shall become the property of the Contractor and shall be disposed of away from the site without additional cost to the Owner.

1.4 DEMOLITION

The Contractor shall be responsible for compliance with current City, County, State, and Federal codes and regulations related to demolition.

The Contractor shall notify all affected utilities and comply with their respective requirements for abandonment of such utilities including power, telephone, natural gas, water, sanitary sewer, and storm sewer utilities.

The Contractor shall maintain access for the Owner's employees during the demolition period and provide barricades, fences, etc., as required for job site safety.

Demolition of concrete, masonry, metals, roofing, asphalt, and other materials shall be done so as to avoid damage to existing structures intended to remain. Demolition or cutting required to add to or modify existing structures shall be done in such a manner that the appearance and utility of the existing structure is not impaired and so that a neat transition from new to old material may occur.

All piping and appurtenances located less than 4 feet below finished grade shall be removed and hauled to an approved disposal site. All piping and appurtenances located four feet or more below finished grade may be abandoned in place, unless shown otherwise on the Plans, as long as Contractor fully seals all pipe and appurtenance openings with grout.

All waste materials from demolition or cutting shall become the property of the Contractor and shall be removed from the site and hauled to an approved waste disposal site, if declared surplus by the Owner. All materials and equipment, however, are property of the Owner unless declared surplus. Some equipment and materials scheduled for salvage and delivery to the Owner are noted on the Plans.

***** END OF SECTION *****

DIVISION 2

SITWORK

SECTION 02050

LOCATE EXISTING UTILITIES

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the anticipated conflicts, which may exist with existing utilities. A reasonable attempt has been made to locate the existing utilities; however, the exact location, and/or depth are unknown in most instances. Locations and dimensions shown in the Plans for existing facilities are in accordance with available information obtained without uncovering, measuring, or other verification. It shall be the responsibility of the Contractor to locate existing utilities and their depth.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
02250	Temporary Shoring and Bracing
02300	Earthwork

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall determine the difficulties to be encountered in constructing the Project and his locate effort based upon the information provided on the Plans, field investigation, and the Contractor's contacts with the existing utility companies. The Contractor shall determine the extent of exploration required to first prevent damage to those existing utilities, and secondly to determine if the proposed improvements are in conflict with existing utilities.

The Contractor shall locate existing utilities sufficiently ahead of construction so that the Engineer can modify the alignment, or grade prior to construction. Where underground utilities are found to be in the way of construction, such condition shall not be deemed to be a changed or differing site condition. If necessary, pipe alignment or grade shall be modified at the Contractor's expense.

The Contractor shall call the Utility Location Request Center (One Call Center), for field location, not less than 2 nor more than 10 business days before the

SECTION 02240

DEWATERING

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes dewatering excavations of any kind and location, including but not limited to groundwater, surface water, and precipitation, until backfilling has been completed to finished grade.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
02300	Earthwork
02370	Erosion Control

1.3 SUBMITTALS

Prior to the start of construction, the Contractor shall submit a dewatering plan in accordance with these Specifications containing both a graphical and narrative presentation identifying proposed methods, equipment sizes and contingency plans should dewatering cause settlement of any adjacent facilities. The dewatering plan shall show specific locations, in plan and section, where dewatering is expected as well as a general discussion of methods to be employed should water be encountered in other locations. The plan shall detail the depth, diameter and anticipated flow for dewatering wells, well points or sumps.

Acceptance by the Owner of the method, installation, and operation and maintenance details submitted by the Contractor shall not in any way be considered to relieve the Contractor from full responsibility for errors therein or from the entire responsibility for complete and adequate design and performance of the system in controlling the water level in the excavated areas, and for control of the hydrostatic pressures to the depths specified herein. The Contractor shall be solely responsible for the proper design, installation, proper operation, maintenance, and any failure of any component of the dewatering system.

1.4 QUALITY CONTROL

It shall be the sole responsibility of the Contractor to control the rate and effect of the dewatering efforts to avoid all objectionable settlement and subsidence. The Contractor shall comply with local codes and ordinances of governing authorities with regard to disposal of water pumped from dewatering operations.

Proposed discharge points shall be approved by the Owner prior to implementation of dewatering. The Contractor shall be responsible for taking all reasonable precautions necessary to ensure continuous, successful operation of the system.

PART 2 PRODUCTS

The Contractor shall have sufficient pumping equipment and/or other machinery available onsite before operations begin to assure that the operation of the dewatering system can be maintained. This shall include providing backup pumps of similar capacity and a standby generator of the capacity required to continuously operate the Contractor's dewatering system.

PART 3 EXECUTION

3.1 INSTALLATION AND APPLICATION

During excavation, the installation of piping, conduits and structures and during the placing of backfill, excavations shall be kept free of water, subsurface or otherwise. The Contractor shall furnish all equipment necessary to dewater the excavations and shall dispose of the water so as not to cause a nuisance or menace to the public. The dewatering system shall be installed and operated by the Contractor so that the groundwater level outside the excavation is not reduced to the extent that would damage or endanger adjacent structures or property. The release of groundwater to its static levels shall be performed so as to maintain the undisturbed state of the foundation soils, prevent disturbance of backfill and prevent movement of all structures and pipelines.

Design implementation and maintenance of any dewatering system shall be the responsibility of the Contractor.

The Contractor shall design filters and screen slot sizes for all sumps, wells and well points which prevents the movement of fines during pumping. The Contractor shall develop the wells such that they produce no more than 10-ppm silica as measured with a Rossum Sand Tester (Rossum, 1954) or equivalent.

3.2 MONITORING

The Contractor shall install water level observation wells in dewatered areas sufficient to determine whether groundwater levels are maintained as per Part 3.1 of this Section.

3.3 FIELD QUALITY CONTROL

A continual check by the Contractor shall be maintained to ensure that the subsurface soil is not being removed by the dewatering operation. The Contractor shall test all dewatering discharge using a Rossum Sand Tester or equivalent to determine the silica content of the discharge. The Contractor shall notify the Owner at least 24 hours prior to testing. Where critical structures or facilities exist immediately adjacent to areas of proposed dewatering, reference points shall be established and observed at frequent intervals to detect any settlement that could develop.

Should settlement be observed, the Contractor shall cease dewatering operations and implement contingency plans as outlined in the Contractor's approved dewatering plan. The responsibility for conducting the dewatering operation in a manner that protects adjacent structures and facilities rests solely on the Contractor. The cost of repairing any damage to adjacent structures and restoration of facilities shall be the responsibility of the Contractor. Permanent piping systems, existing or new, shall not be incorporated into the Contractor's dewatering system.

***** END OF SECTION *****

SECTION 02250

TEMPORARY SHORING AND BRACING

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the temporary shoring and bracing for excavations including the trench excavation safety systems as shown on the Plans and as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
02300	Earthwork
02500	Water Distribution
02535	Sanitary Sewers

1.3 WORK INCLUDED

The extent of temporary shoring and bracing work includes, but is not limited to:

- A. Temporary shoring and bracing necessary to protect the following against loss of ground or caving embankments: existing structures, buildings, roads, walkways, utilities, electrical transmission towers and support wiring, other facilities and improvements where required to comply with codes and authorities having jurisdiction.
- B. Trench excavation safety systems, pursuant to RCW Chapter 49.17 and WAC 296-155-655.
- C. Maintenance of shoring and bracing.

1.4 QUALITY ASSURANCE

A. SHORING CONSULTANT

The Contractor shall engage the services of a qualified geotechnical engineer and qualified structural engineer registered in the State of Washington to design temporary shoring and bracing when required by applicable regulations.

B. SHORING DESIGN

The Contractor shall provide layout and design drawings and specifications for shoring and bracing when a trench box is inadequate for the purpose or will not be used and trench depth exceeds 4 feet and back sloping will not be used. Temporary shoring and bracing system design and calculations shall be prepared, stamped, and signed by a Professional Engineer registered in the State of Washington.

C. REGULATIONS

The Contractor shall design sheeting, shoring and bracing in accordance with the Washington State Safety Code and any local codes and ordinances of governing authorities having jurisdiction

1.5 SUBMITTALS

The Contractor shall submit shoring and bracing layout and design drawings, calculations and other backup data to the Owner for review in accordance with Section 01300 prior to the start of construction.

1.6 PROJECT CONDITIONS

A. SITE SURVEY

The background survey information provided on the Plans is shown for clarity only. The Contractor shall determine, before commencing work, the exact location of all existing features that may be disrupted by new construction, including existing underground utilities. The Contractor shall be fully responsible for any and all damages, which might be caused by the Contractor's failure to exactly locate and/or preserve existing site features. Prior to commencing work, the Contractor shall check and verify governing dimensions and elevations.

The Contractor shall survey adjacent structures and facilities, establishing exact elevations at fixed points to act as temporary bench marks to monitor potential settlement from the contractor's ongoing operations. Clearly identify temporary bench marks and record existing elevations from the control points shown on the Plans.

During excavation, the Contractor shall resurvey bench marks weekly. The Contractor shall maintain and make available at the job site an accurate log of surveyed elevations for comparison with original elevations, and promptly notify the Owner if changes in elevations occur or if cracks, sags or other damage is evident.

1.7 EXISTING UTILITIES

The Contractor shall protect existing active sewer, water, gas, electrical, and other utility services and structures that may be present. This shall also include all pipelines, services, and structures that are the property of the Owner.

PART 2 PRODUCTS

The Contractor shall provide suitable shoring and bracing materials, which shall support loads imposed. Materials for shoring systems need not be new, but shall be in serviceable conditions.

PART 3 EXCAVATION

3.1 VERIFICATION OF CONDITIONS

The Contractor shall notify the Owner immediately if, during construction, subsurface conditions are different from those encountered in the exploratory holes.

3.2 INSTALLATION AND APPLICATION

The Contractor shall provide shoring systems adequately anchored and braced to resist earth and hydrostatic pressures at locations as needed to support excavations during construction. The Contractor shall locate required bracing to clear all permanent work. Bracing which must be relocated shall be installed prior to the removal of original bracing. The Contractor shall not place bracing where it will be cast into or included in permanent concrete work, except as otherwise acceptable to the Owner. The Contractor shall maintain bracing until structural elements are rebraced by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.3 REMOVAL

The Contractor shall remove shoring and bracing in stages to avoid disturbances to adjacent and underlying soils and damage to structures, pavements, facilities and utilities. The Contractor shall repair or replace, as acceptable to the Owner, adjacent work damaged or displaced through the installation or removal of shoring and bracing work.

SECTION 02300

EARTHWORK

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the earthwork, including trench excavation and backfill for piping, excavation and backfill for structures, and finish grading.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
02240	Dewatering
02305	Wet Weather Earthwork
02700	Gravel Materials

PART 2 PRODUCTS

2.1 GRAVEL MATERIALS

All gravel materials shall conform to Section 02700.

PART 3 EXECUTION

3.1 PREPARATION

Excavation may commence once all erosion control measures are in place in accordance with the Plans and Section 02370 and to the satisfaction of the Owner.

3.2 GENERAL REQUIREMENTS

Excavation, compaction and backfill for structures, pipelines and the final site contours shall be formed by either excavating or compacting fill, as required, to provide the elevations and/or cross-sections as shown on the Plans.

All excavation performed on this Project shall be considered unclassified. Excavation shall consist of the removal of any and all material encountered, including debris, rubble, concrete, metal, topsoil, cutting and removal of existing surfacing, tree stumps, trees, logs, abandoned rail ties, abandoned piping, piling, riprap, etc.

Excavations shall be kept free of water, both surface water and groundwater, during the excavation, installation of pipelines and structures, and the placement of backfill. For additional requirements see Section 02240.

The Contractor's attention is also called to the depth of the structures and piping; for this reason, special shoring and bracing may be required. All shoring and bracing or sheeting required to perform and protect the excavation and to safeguard the employees, shall be furnished by the Contractor. For additional requirements see Section 02250.

No timber bracing, lagging, sheathing or other lumber shall be left in any excavation except with permission of the Engineer and in the event such permission is granted, no separate payment shall be allowed for burying such material.

All stockpiles shall be covered with plastic and no stockpile shall be higher than 6 feet above existing grade.

3.3 PROTECTION OF FOUNDATION SURFACES

Care shall be taken to preserve the foundation surfaces shown on the Plans in an undisturbed condition. If the Contractor unnecessarily over excavates or disturbs the foundation surfaces shown on the Plans or specified herein without written authorization of the Engineer the Contractor shall replace such foundations with concrete fill or other suitable material approved by the Owner in a manner which will show by test an equal bearing capacity with the undisturbed foundation material. No additional payment shall be made for the added quantity of concrete fill or other suitable material used because of unnecessary over excavation caused by the Contractor or their operations.

3.4 EXCAVATION AND BACKFILL FOR TRENCHES

Excavation and backfill for trenches shall be in conformance with Sections 7-08 and 7-09 of the WSDOT Standard Specifications, and as further described herein.

Upon completion of work each day, all pipeline open trenches shall be completely backfilled, leveled, and temporarily patched or graveled, as herein specified. Under certain conditions, the trench may be left open at the last length of pipe laid during the day to avoid re-excavation the following morning, provided that the opening is adequately plated or covered for vehicle traffic. Special attention shall be given to barricading to keep vehicular traffic away from newly-backfilled trench areas until restored for traffic.

Backfilling shall proceed as follows:

A. SUBGRADE PREPARATION

The subgrade for piping is defined as the elevation of the bottom of the pipe bedding material as shown on the Plans.

B. PIPE BEDDING

Pipe bedding material shall be Gravel Backfill for Pipe Bedding, as specified in Section 02700. This material shall be placed in lifts of approximately 8 inches up to a point 12 inches above the pipe. This material shall be hand shoveled in place and carefully worked under and around the pipe.

C. BACKFILL FOR TRENCHES

Partial backfill to protect the pipe will be permitted immediately after the pipe has been properly laid in accordance with the Plans and these Specifications. Complete backfilling of trenches will not be permitted until the section of pipe installed has been inspected by the Engineer.

From the point 12 inches above the top of the pipe barrel, the backfill material to be used in the trench section shall be Bank Run Gravel, as specified in Section 02700, except where required or shown on the Plans to use other material. The Contractor shall place backfill in horizontal lifts not to exceed 8 inches in thickness.

The Contractor shall remedy, at their expense, any defects that appear in the backfill prior to final acceptance of the work. Cleanup operations shall progress immediately behind backfilling to accommodate the return to normal use of the trench area.

During placement of the initial lifts, the backfill material shall not be bulldozed into the trench or dropped directly over the pipe with less than 3 feet of backfill material above the top of the pipe.

3.5 REUSE AND DISPOSAL OF EXCAVATED MATERIAL

Excavated materials shall be properly protected and reused where possible. Excavated materials not used for fill shall be hauled to an approved waste site(s), as selected by the Contractor. The Contractor shall submit a list of approved waste haul site(s) to the Owner prior to the commencement of hauling of waste materials. Any permits required for waste haul and disposal shall be the responsibility of the Contractor.

3.6 FINAL SITE GRADING

The site shall be graded consistent with the elevations shown on the Plans. The slopes between elevations shall be uniform or as shown on the Plans. Excavations and backfill shall be to the elevations required for the placement of all surface restorations, such as asphalt, concrete, gravel surfacing, or landscaping. All areas shall be graded to provide proper drainage. The final ground surface shall be smooth, raked free of debris and stones, and prepared for restoration as specified in Section 02900.

3.7 TRENCH COMPACTION

Trench backfill materials shall be moisture conditions to within three percent of optimum moisture content. Water settlement is not allowed for compaction.

Pipe bedding materials shall be compacted to at least 95 percent of the maximum dry density, using the Modified Proctor, per ASTM D1557.

Backfill materials above the bedding material in all trenches shall be compacted to at least 95 percent of the maximum dry density, using the Modified Proctor, per ASTM D1557.

***** END OF SECTION *****

SECTION 02305

WET WEATHER EARTHWORK

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the procedures to be followed if earthwork is to be accomplished in wet weather or in wet conditions where control of soil moisture is difficult.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
02300	Earthwork
02700	Gravel Materials

PART 2 PRODUCTS

The size or type of construction equipment shall be selected as required to prevent soil disturbance. In some instances, it may be necessary to limit equipment size or to excavate soils with a backhoe, Gradall, or equivalent type of equipment to minimize subgrade disturbance caused by construction traffic.

Material used as structural fill during wet weather earthwork shall generally consist of clean granular material containing less than 5 percent fines (material passing the U.S. Standard No. 200 sieve), based on wet sieving the fraction passing the 3/4-inch sieve. The fines shall be non-plastic.

PART 3 EXECUTION

3.1 WET WEATHER EXCAVATION AND FILL PLACEMENT QUALITY CONTROL

Excavation and placement of fill or backfill material will be observed on a full-time basis by the Owner, to determine that all work is being accomplished in accordance with these Specifications.

3.2 WET WEATHER EARTHWORK PROTECTION

The ground surface shall be sloped away from construction areas to promote the rapid runoff of precipitation and prevent ponding of water.

Earthwork shall be accomplished in small sections to minimize exposure to wet weather. Excavation or the removal of unsuitable soil shall be followed immediately by the placement and compaction of a suitable thickness (generally 8 inches or more if approved by the Owner) of clean foundation gravel.

No soil shall be left uncompacted and exposed to moisture. A smooth drum vibratory roller, or equivalent, shall be used to seal the ground surface after placement of fill or backfill materials.

All wet weather work shall meet local, state and federal codes as specified herein and as indicated on the Plans.

***** END OF SECTION *****

SECTION 02370

EROSION CONTROL

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the temporary erosion and sedimentation control (TESC) in and around the site caused by the actions of the Contractor as shown on the Plans and as specified herein.

Work under this Section shall be directed towards site areas disturbed during construction as well as any off-site storage and parking areas maintained by the Contractor.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
02240	Dewatering
02300	Earthwork

1.3 SUBMITTALS

In addition to material submittals, a Stormwater Pollution Prevention Plan (SWPPP) shall be prepared by the Certified Erosion and Sediment Control Lead (CESCL) for the project and submittal in accordance with these Specifications. The SWPPP shall be submitted to the Owner for approval at the preconstruction conference. No work shall begin until the Contractor's SWPPP, as approved by the Owner, is implemented.

1.4 CERTIFIED EROSION AND SEDIMENT CONTROL LEAD (CESCL)

The Contractor shall designate a CESCL for this project. The CESCL shall have, for the life of this Contract, a current Certificate of Training in Construction Site Erosion and Spill Control signed by the WSDOT Water Quality Program Manager.

Duties of the CESCL shall include, but are not limited to:

- A. Inspecting temporary erosion and spill control Best Management Practice (BMPs) for proper location, installation, maintenance, and repair. Inspections shall be made as noted on the Plans and after each significant precipitation event, including those that occur during weekends and after working hours. A Temporary Erosion and Spill Control (TESC)

Inspection Report shall be prepared for each inspection and shall be included in the TESC file. The inspection report shall include, but not be limited to:

1. When BMPs are installed, removed or changed;
 2. Repairs needed or made;
 3. Turbidity monitoring results;
 4. Observations of BMP effectiveness and proper placement;
 5. Recommendations for improving performance of BMPs.
- B. Prepare and maintain a TESC file on site that includes but is not limited to:
1. Temporary Erosion and Spill Control Inspection Reports;
 2. Contractor's SWPPP;
 3. Spill Prevention, Control, and Countermeasures (SPCC) Plan;
 4. All project permits, including but not limited to grading permits and Hydraulics Project Approval;
 5. Manufacturer instructions for all products used for TESC BMPs;
 6. Washington State Department of Ecology's Stormwater Management Manual for Western Washington, Chapter 4, Volume II, current edition.

1.5 STORMWATER POLLUTION PREVENTION PLAN

The CESCL Contractor shall be responsible for preparing a SWPPP. The intent of the SWPPP is to reflect the Contractor's operations to provide comprehensive pollution control at the construction site, staging areas, stockpiles, and borrow sites. The SWPPP shall address, at least, the following items:

- Identification of construction haul routes and location of BMPs (e.g., stabilized construction entrance, silt fences, storm drain inlet protection).
- Waste disposal methods and locations.

- Detailed construction sequence and schedule, including identifying dates scheduled for BMP installation, removal, clearing, grading, seeding, and landscaping.
- Details for any temporary flow diversions, dewatering systems, and BMPs (in accordance with the current edition of the Washington State Department of Ecology’s Stormwater Management Manual for Western Washington) proposed by the Contractor.
- A list of products to be used, including Material Safety Data Sheets.
- Identification of stockpile and staging areas, and BMPs to be implemented at these locations.

The SWPPP shall be prepared in accordance these Specifications and Chapter 4, Volume II Chapter 7 – BMPs from the current edition of the Washington State Department of Ecology’s Stormwater Management Manual for Western Washington, which are hereby referenced and made a part of the Contract Documents. Only those sections of the Stormwater Management Manual for Western Washington that address preparation, implementation, and maintenance of permanent and temporary erosion and sedimentation control BMPs are applicable.

PART 2 PRODUCTS

2.1 SILT FENCES

Silt fences shall meet the requirements of Geotextile for Temporary Silt Fence of Section 9-33 of the WSDOT Standard Specifications.

2.2 STORM DRAIN INLET (CATCH BASIN) PROTECTION

Storm drain inlet protection shall be with a “silt sack,” as manufactured by ACF Environmental or equal.

PART 3 EXECUTION

3.1 PREPARATION

Site preparation work shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture or other unsatisfactory conditions prevail, the work shall be stopped.

3.2 BEST MANAGEMENT PRACTICES (BMPs)

Silt fences, catch basin inserts, straw bale dams, and other BMPs shall be used to control erosion and migration of soils disturbed during construction.

All areas or drainage ways downstream of the construction site shall have BMPs installed prior to the beginning of any clearing activities. Runoff from cleared or disturbed area shall be directed through the BMPs. Disturbed ground shall be stabilized at the end of each work day. Permanent soil stabilization and erosion and sedimentation control shall be implemented upon reaching finish grade. Slope protection shall be immediately implemented upon any soils showing signs of erosion. This shall be done in a manner approved by the Owner.

All BMPs shall be inspected, maintained and kept in a condition sufficient to provide effective erosion and sedimentation control at all times. The site shall be inspected to ensure the BMPs are properly located, constructed and operating as designed during the first storm. Any necessary adjustments or repairs shall be made immediately and be approved by the Owner. The BMPs shall be inspected regularly thereafter and after all significant storm events.

All BMPs shall be removed no later than 30 consecutive calendar days after final site stabilization has been achieved as determined by the Owner. BMPs such as storm drain inlet protection, straw bales, silt fences and supports and plastic coverings shall be removed and properly disposed of offsite by the Contractor. Areas disturbed by removal of these BMPs shall be immediately stabilized in a manner approved by the Owner.

***** END OF SECTION *****

SECTION 02500

WATER DISTRIBUTION

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes water pipe, valves, fittings and accessories described herein and as required for a complete installation as shown on the Plans.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
02240	Dewatering
02250	Temporary Shoring and Bracing
02300	Earthwork

PART 2 PRODUCTS

2.1 GENERAL

Pipe sizes are nominal inside diameter unless otherwise noted.

All materials delivered to the job site shall be new, free from defects, and marked to identify the material, class, and other appropriate data such as thickness for piping.

Acceptance of materials shall be subject to strength and quality testing in addition to inspection of the complete product. Acceptance of installed piping systems shall be based on inspection and leakage tests as specified in Part 3 of this Section.

All water piping shall be certified under NSF 61 for potable water use.

2.2 DUCTILE IRON PIPE

All ductile iron water pipe shall be delivered to the site with the ends wrapped or with pipe plugs and these shall remain in place until the pipe is installed in the trench.

Ductile iron pipe shall be centrifugal cast pipe conforming to AWWA C151, Class 52, unless otherwise noted. The exterior shall be bituminous coated and the interior cement mortar lined in accordance with, AWWA C104, lined to a

minimum thickness of 1/16-inch meeting NSF standards for potable water. Ductile iron pipe for fire hydrant assemblies shall be Class 53. All flanged spools shall be Class 53.

Each length shall be plainly marked with the manufacturer's identification, year, cast, thickness, class of pipe and weight. The pipe shall be furnished with mechanical joint or push-on joint, except where plans call for flanged ends.

Mechanical joints shall comply with AWWA C111. Flanges shall comply with ANSI B16.1, Class 125. Flange gaskets shall be full face.

Fittings shall be short-bodied, ductile iron and shall comply with AWWA C110 or AWWA C153, bituminous-coated exterior and cement mortar lined, 350-psi minimum pressure.

When indicated on the plans, pipe and/or fittings shall be provided with restrained joints.

Mechanical Joint restrainer shall utilize the full circumference of the pipe for restraining and utilize standard MJ gasket and bolts. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1. The restrainer shall be Grip Ring as manufactured by Romac Industries, Mega-Lug, EBAA Iron, Inc., or equal.

Restrained joint pipe shall be push-on joint pipe with FIELD LOK® or TR FLEX® gaskets as furnished by U.S. Pipe, or equal.

All bolts, buried and unburied, shall be coated with Armite Anti-Seize Compound No. 609, or equal, prior to installation.

2.3 HIGH DENSITY POLYETHYLENE (HDPE) FOR WATER SERVICE

All HDPE shall be NSF-61 certified, continuous, butt welded PE 3608 or 4710 HDPE pipe conforming to STM D3350 having a cell classification of PE 345634C or better (for 3608) or PE445574 of better (for 4710). Pipe dimensions and workmanship shall conform to ASTM F714. HDPE pipe shall have an SDR of 11.

2.4 COPPER PIPE

Copper pipe and fittings shall be Type K (buried) or Type L or M (above ground), when used as water service lines.

2.5 FLEXIBLE EXPANSION PIPE JOINTS

The flexible expansion pipe joint shall be installed at the location indicated on the drawings. Flexible connections equal or larger than 3-inches in diameter shall be manufactured of ductile iron conforming to the material properties of AWWA C153.

The flexible expansion joint shall consist of an expansion joint designed and cast as an integral part of a ball and socket type flexible joint, having a minimum of 15 degrees deflection per ball and provisions for contraction/expansion and self-restrained at full expansion. The flexible expansion fitting shall not expand or exert an axial imparting thrust under internal water pressure. The flexible expansion fitting shall not increase or decrease the internal water volume as the unit expands or contracts.

The flexible expansion joint shall be hydrostatically tested to the manufacturer's published pressure rating prior to shipment. All pressure containing parts shall be lined with a minimum of 15 mils of Fusion Bonded Epoxy conforming to the applicable requirements of AWWA C213 and shall be holiday tested with a 1,500-volt spark test conforming to said specification.

The flexible expansion pipe joints shall be force-balanced "Flex-Tend" as manufactured by EBAA Iron, Inc., or approved alternate.

2.6 MISCELLANEOUS FITTINGS

A. FLEXIBLE COUPLINGS

Flexible couplings shall be Romac 501 or approved equal. Middle ring and follower shall have fusion bonded epoxy coating. All buried flexible couplings shall be furnished with stainless steel bolts and nuts.

B. FLANGED COUPLING ADAPTERS

Flanged coupling adapters shall be Smith-Blair Type 912 Dresser Style 127, or equal.

C. ADAPTER FLANGES

Adapter flanges for ductile iron pipe shall be manufactured of high strength ductile iron, ASTM A536, Grade 65-45-12. Flange dimensions shall be in accordance with ANSI B16.1, 125-pound pattern. Gasket shall be Buna-N. Setscrews shall be AISI 4140, high strength, low alloy steel. The adapter flanges shall be Uni-Flange Series 400, or equal.

D. RESTRAINED FLANGED COUPLING ADAPTERS

Restrained flanged coupling adapters shall comply with AWWA C219 and shall be manufactured of high-strength ductile iron, ASTM A536, Grade 64-45-12. Gaskets shall be compounded for water service in accordance with ASTM D2000. Restrained flanged coupling adapters shall be Smith-Blair Type 911, Romac RFCA, or equal.

E. DIELECTRIC INSULATED UNIONS

Dielectric insulated unions shall be used to connect dissimilar metals. They shall separate the metals so that the passage of more than one percent of the galvanic current, which would exist with metal to metal contact, is prevented. Unions shall be of the same material as the pipe to which attached, and pressure and temperature ratings shall be no lower than that of the piping system in which it is installed.

PART 3 INSTALLATION

3.1 PIPE HANDLING

All types of pipe shall be handled in a manner that will prevent damage to the pipe, pipe lining, or coating.

Pipe and fittings shall be loaded and unloaded using hoists and slings in a manner to avoid shock or damage, and under no circumstances shall they be dropped, skidded, or rolled against other pipe. If any part of the coating or lining is damaged, repair thereof shall be made by the Contractor at no additional expense to the Owner and in a manner satisfactory to the Owner. Damaged pipe shall be rejected, and the Contractor shall immediately place damaged pipe apart from the undamaged and shall remove the damaged pipe from the site within 24 hours. Methods of pipe handling and storage shall be corrected by the Contractor should the Owner determine that these methods are damaging to the pipe.

Pipe shall be stacked in such a manner as to prevent damage to the pipe, to prevent dirt and debris from entering the pipe, and to prevent any movement of the pipe. The bottom tiers of the stack shall be kept off the ground on timbers, rails, or other similar supports.

Pipe shall not be strung across driveways, in ditches, or in the construction zone without specific on-site Owner approval.

Valves and fittings shall be stored on pallets or similar materials to keep them off the ground and prevent dirt and debris from entering them.

3.2 HIGH DENSITY POLYETHYLENE (HDPE) FOR WATER SERVICE

HDPE pipe shall be installed in accordance with the manufacturer's instructions and as shown on the Plans and as specified herein.

3.3 EXCAVATION

All earthwork, excavation, bedding, backfill and compaction shall meet the requirements of Section 02300.

3.4 DEWATERING

Dewatering of excavations, if necessary, shall meet the requirements of Section 02240.

3.5 TEMPORARY SHORING AND BRACING

Temporary shoring and bracing, including trench excavation safety systems, shall meet the requirements of Section 02250.

3.6 MECHANICAL JOINT PIPING

Mechanical joint piping shall be installed in best trade practice with torque wrenches used to avoid overstressing bolts. Piping shall be installed using recommended procedures outlined in "Handbook of Cast Iron Pipe" as published by Cast Iron Research Association which in part requires that all contact surfaces of rubber seal with pipe be wire brushed, spigot be centrally located in bell. When tightening bolts, it is essential that the gland be brought up toward pipe flange evenly, maintaining approximately same distance between gland and face of flange at all points around socket.

3.7 FLEXIBLE COUPLINGS

Flexible couplings shall be installed in accordance with recommendations of manufacturer and used where shown on the Plans. Where flexible couplings are called for the space between pipe ends shall not exceed 1/4 inch. When the space between the pipe ends is excess, a short section of pipe may be inserted as space ring to limit pipe movement with the coupling to obtain the 1/4-inch limitation

3.8 PRESSURE TESTING

All pipelines shall be tested and disinfected prior to acceptance of work. All pumps, gauges, plugs, saddles, corporation stops, double check valve assemblies miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished, installed and operated by the Contractor.

The Contractor shall provide an oil-filled pressure gauge with a range of 0 to 300 psi.

All temporary connection to the existing water lines for filling or flushing new pipe lines shall be equipped with double check valve assemblies to prevent backflow into the existing waterline.

The pipeline shall be backfilled sufficiently to prevent movement of the pipe under pressure. All thrust blocks shall be in place and time allowed for the concrete to cure before testing.

All piping systems shall be tested to demonstrate leak tightness prior to acceptance. The Contractor shall provide all equipment and labor necessary to perform all testing required herein. Gauges used in testing shall be certified by an approved laboratory.

All water lines and appurtenances shall be tested at a pressure of 225 psi. Testing is to be done in sections between valves with no back pressure against the valves to ensure water tightness of the valves in either direction. Maximum differential allowed across closed butterfly valves is 150 psi.

The pipeline shall be backfilled sufficiently to prevent movement of the pipe under pressure. All thrust blocks shall be in place for at least 24 hours to allow concrete to cure before testing.

Prior to the acceptance test, the lines shall be filled and allowed to stand under pressure for a sufficient length of time to allow the escape of entrapped air and to allow any pipe lining to absorb water.

Testing will be done by pumping up the line to 225 psi and closing a valve between the pump and the line. The line shall be pumped back up to 225 psi at 15-minute intervals. The test shall be conducted for a period of two hours.

The quantity of water lost during the test period shall not exceed the number of gallons as determined by the following formula:

$$L = \frac{SD\sqrt{P}}{266,400}$$

Where

L=allowable leakage, gallons/hour

S=gross length of pipe tested, feet

D=nominal diameter of the pipe, inches

P=test pressure during the leakage test, psi

Make-up water shall be pumped from a container that will allow the amount of water pumped to be easily computed or verified.

There should be no appreciable loss of pressure during the 15-minute test intervals.

All leaks shall be repaired or defective material replaced and the test repeated as directed by the Engineer.

The Contractor shall be responsible for repair of any damage resulting from or caused by leak testing.

3.9 FLUSHING

Flushing shall be done through hydrants or temporary taps. Water for flushing will be available from the Owner's system.

The pipes shall be flushed at a minimum velocity of at least 2.5 fps for a sufficient time to insure a minimum of 3 turnouts of water through the pipe.

The Contractor shall be responsible for the disposal of treated water flushed from the pipelines. The treated water shall be neutralized in accordance with the provisions of AWWA C651, Appendix B.

3.10 WATER PIPE DISINFECTION

Before pipelines are placed into service, the water mains and appurtenances shall be disinfected in accordance with AWWA C651 and in conformance with the requirements of the State of Washington Department of Health.

The Contractor shall install a Washington State approved double check valve type backflow prevention device to protect the potable water supply while filling, flushing, and disinfecting the water main.

Before being placed into service, all new and modified potable water pipe and appurtenances shall be sterilized and a satisfactory bacteriological report obtained in accordance with Section 7-09.3(24) of the WSDOT Standard Specifications, latest edition.

During the process of sterilizing, all valves, hydrants, and/or other appurtenances shall be operated to insure complete contact.

All closure fittings shall be swabbed with a very strong chlorine solution at least as strong as liquid household bleach (five to six percent chlorine).

Following chlorination, all pipes shall be flushed to remove any solids until a test shows no more than 0.1 parts per million available chlorine. If no hydrant is installed at the end of the main, then a tap shall be provided large enough to develop a velocity of at least 2.5 fps in the main.

Before placing the lines into service, a satisfactory report shall be received from the local or state health department on samples collected from representative points in the new pipe after the 24-hour sterilization period has elapsed.

Should the initial treatment result in an unsatisfactory bacteriological test or should corrective work be required because of testing, then the chlorination procedure shall be repeated by the Contractor at his own expense until satisfactory results are obtained. These repeat procedures shall follow Section 7-09.3(24) of the WSDOT Standard Specifications, as appropriate and as necessary for the addition of chlorine. The cost of disposal of water used for disinfection shall be borne by the Contractor.

Only the Owner's staff will be allowed to operate existing and new tie-in valves. The Contractor's personnel are expressly forbidden to operate any valve on any section of line which is part of the Owner's potable water system.

***** END OF SECTION *****

SECTION 02535

SANITARY SEWERS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes pipe, fittings, and accessories described herein and as required to completely install sanitary sewers and side sewers by open trench excavation as shown on the Plans.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
02240	Dewatering
02250	Temporary Shoring and Bracing
02300	Earthwork

PART 2 PRODUCTS

2.1 GENERAL

All materials delivered to the job site shall be new, free from defects, and marked to identify the material, class, and other appropriate data such as thickness for piping.

Acceptance of materials shall be subject to strength and quality testing in addition to inspection of the complete product. Acceptance of installed piping systems shall be based on inspection and leakage tests as specified in Part 3 of this Section.

2.2 DUCTILE IRON SEWER PIPE AND FITTINGS

- A. Ductile iron pipe shall be new, Class 52, cement-lined, conforming to AWWA C151.
- B. Ductile iron pipe shall be push-on joint. Pipe shall be furnished with a single rubber ring gasket lubricated to effect the seal.
- C. Restrained joint pipe shall be push-on joint pipe with FIELD LOK® or TR FLEX® gaskets as furnished by U.S. Pipe, or equal. Each length of pipe shall be clearly marked with the manufacturer's identification, year, thickness, class of pipe and weight.

- D. The Contractor shall furnish certification from the manufacturer of the pipe and gasket being supplied that the inspection and all of the specified tests have been made and the results thereof comply with the requirements of this standard.
- E. Ductile iron fittings shall be short body with a 350-psi pressure rating for mechanical joint fittings and 250-psi for flanged fittings. All fittings shall be cement lined and shall be in conformance with AWWA C153. All fittings shall be domestic and made in the United States of America.
- F. Mechanical Joint restrainer shall utilize the full circumference of the pipe for restraining and utilize standard MJ gasket and bolts. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1. The restrainer shall be Grip Ring as manufactured by Romac Industries, Mega-Lug, EBAA Iron, Inc., or equal.

2.3 FLEXIBLE EXPANSION PIPE JOINTS

The flexible expansion pipe joint shall be installed at the location indicated on the drawings. Flexible connections equal or larger than 3-inches in diameter shall be manufactured of ductile iron conforming to the material properties of AWWA C153.

The flexible expansion joint shall consist of an expansion joint designed and cast as an integral part of a ball and socket type flexible joint, having a minimum of 15 degrees deflection per ball and provisions for contraction/expansion and self-restrained at full expansion. The flexible expansion fitting shall not expand or exert an axial imparting thrust under internal water pressure. The flexible expansion fitting shall not increase or decrease the internal water volume as the unit expands or contracts.

The flexible expansion joint shall be hydrostatically tested to the manufacturer's published pressure rating prior to shipment. All pressure containing parts shall be lined with a minimum of 15 mils of Fusion Bonded Epoxy conforming to the applicable requirements of AWWA C213 and shall be holiday tested with a 1,500-volt spark test conforming to said specification.

The flexible expansion pipe joints shall be "Flex-Tend" as manufactured by EBAA Iron, Inc., or approved alternate.

2.4 MISCELLANEOUS FITTINGS

Flexible couplings shall be Calder-type where specifically indicated on the Plans. Calder-type flexible couplings shall consist of all elastomeric PVC sleeve secured to the pipes with stainless steel clamping bands. Adapter couplings shall be

furnished for transitions between piping of different outside diameters as necessary.

Calder-type flexible couplings shall be as manufactured by Calder Co., Fernco, or equal.

PART 3 INSTALLATION

3.1 PIPE HANDLING

All types of pipe shall be handled in a manner that will prevent damage to the pipe.

Dirt or other foreign material shall be prevented from entering the pipe or pipe joint during handling or laying operations, and any pipe or fitting that has been installed with dirt or foreign material in it shall be removed, cleaned, and relayed. A clean whiskbroom shall be used for this purpose and for brushing to remove foreign matter prior to joining of pipe ends. At times when pipe laying is not in progress, the open ends of the pipe shall be closed by a watertight plug or by other means approved by the Owner to ensure cleanliness inside the pipe.

Pipe shall be stacked in such a manner as to prevent damage to the pipe, to prevent dirt and debris from entering the pipe, and to prevent any movement of the pipe. The bottom tiers of the stack shall be kept off the ground on timbers, rails, or other similar supports.

3.2 INSTALLATION

Minimum horizontal and vertical separation shall be maintained between water and sewer utilities as required by the Washington State Department of Ecology Criteria for Sewage Works Design.

The Contractor shall limit his excavation to the limits of the maximum payment width shown on the Plans. If the contractor purposely or neglectfully excavates trenches to width beyond the neat line payment limit of the trench as shown on the Plans, the expenses associated with any additional trenching, wastehaul, trench backfill, compaction and testing and surface restoration as a result of excavating beyond the neat line payment limits shall be borne by the contractor.

All pipe shall be laid in straight lines and at a uniform rate for grade between manholes. Variation in the invert elevation between adjoin ends of pipe due to non-concentricity of joining surface and pipe interior surfaces shall not exceed 1/64 inches per inch of pipe diameter, or 1/2-inch maximum.

3.3 EXCAVATION

All earthwork, excavation, bedding, backfill and compaction shall meet the requirements of Section 02300.

3.4 DEWATERING

Dewatering of excavations, if necessary, shall meet the requirements of Section 02240.

3.5 TEMPORARY SHORING AND BRACING

Temporary shoring and bracing, including trench excavation safety systems, shall meet the requirements of Section 02250.

3.6 BELL AND SPIGOT PIPING

All bell and spigot connections shall be made up in strict compliance with the manufacturer's recommendations and all sewer pipe manufacture and handling shall meet or exceed the ASTM and SPAW recommended specifications, current revisions.

Pipe handling after the gasket has been affixed shall be carefully controlled to avoid disturbing the gasket and knocking it out of position, or loading it with dirt or other foreign material. Any gaskets so disturbed shall be removed, cleaned, relubricated if required, and replaced before the rejoining is attempted.

Care shall be taken to properly align the pipe before joints are entirely forced home. During insertion of the tongue or spigot, the pipe shall be partially supported by hand, sling or crane to minimize unequal lateral pressure on the gasket and to maintain concentricity until the gasket is properly positioned. Since most flexible gasketed joints tend to creep apart when the end pipe is deflected and straightened, such movement shall be held to a minimum once the joint is home.

Sufficient pressure shall be applied in making the joint to assure that it is home, as described in the installation instruction provided by the pipe manufacturer. Sufficient restraint shall be applied to the line to assure that joints once home are held so, until fill material under and alongside the pipe has been sufficiently compacted.

***** END OF SECTION *****

SECTION 02700

GRAVEL MATERIALS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the various types of granular materials that are to be used in trenches and other excavations as shown on the Plans and as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
02300	Earthwork
02305	Wet Weather Earthwork

1.3 SUBMITTALS

The Contractor shall provide certificates of laboratory tests in accordance with Section 01300, indicating particle size distribution for review for each type of granular material furnished and proctor test reports for all material to be placed as pipe bedding material, trench backfill, backfill under and around structures and underneath crushed surfacing and asphalt concrete pavements.

The certificates and proctor test reports shall be provided to the Owner at least 5 calendar days prior to placement.

PART 2 PRODUCTS

2.1 GRAVEL BACKFILL FOR PIPE BEDDING

Gravel backfill for pipe bedding shall meet the requirements of Section 9-03.12(3) of the WSDOT Standard Specifications.

2.2 BANK RUN GRAVEL FOR TRENCH BACKFILL

Bank run gravel for trench backfill shall be free from organic matter or other deleterious materials and in conformance with Section 9-03.19 of the WSDOT Standard Specifications.

2.3 CRUSHED SURFACING

Crushed surfacing base course and top course shall conform to Section 9-03.9(3) of the WSDOT Standard Specifications.

2.4 PEA GRAVEL

Pea gravel shall be relatively round, processed, washed rock conforming to ASTM C33 with the following sieve analysis.

Sieve Analysis (% Passing by Weight)	
Sieve Size	Percent Passing
1/2"	100
3/8"	85-100
No. 4	10-30
No. 8	0-10
No. 16	0-5

PART 3 EXECUTION

3.1 GRAVEL BACKFILL FOR PIPE BEDDING

Bedding material shall be placed simultaneously on both sides of the pipe for the full width of the trench in lifts not exceeding 6 inches. To assure uniform support, the material shall be carefully worked underneath the pipe haunches with a tool capable of preventing the formation of void spaces around the pipe. In the event the Contractor overexcavates the pipe trench, or if the width of the pipe trench becomes wider than the pay limit shown on the Plans, all material so placed shall be at the Contractor's sole expense.

3.2 BANK RUN GRAVEL FOR TRENCH BACKFILL

Bank run gravel for trench backfill shall be used where excavated material is unsuitable or unavailable for the backfill of trenches as approved by the Owner.

In the event the Contractor overexcavates the pipe trench, or if the width of the pipe trench becomes wider than the pay limit shown on the Plans, all material so placed shall be at the Contractor's sole expense.

3.3 CRUSHED SURFACING

Crushed surfacing base course and/or top course shall be placed underneath asphalt paving, to the lines and grades shown on the Plans or as required by the Plans and shall be compacted to a dense, unyielding state of at least 95 percent of the maximum dry density, using the modified Proctor, per ASTM D1557.

3.4 PEA GRAVEL

Pea gravel shall be placed underneath concrete slabs for buildings or structures where shown on the Plans. The minimum depth of pea gravel shall be 6 inches.

***** END OF SECTION *****

SECTION 02740

HOT MIX ASPHALT PAVING

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the construction of hot mix asphalt paving. This Section also includes temporary asphalt cold-mix repairs as required.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
02300	Earthwork
02700	Gravel Materials

1.3 SUBMITTALS

The Contractor shall provide certificates of laboratory tests indicating current sieve analysis data and mix design for asphalt-treated base and hot mix asphalt pavement mix designs in accordance with Section 01300 and as further specified herein. The certificates shall be provided to the Owner at least 5 consecutive calendar days prior to placement of any materials

PART 2 PRODUCTS

2.1 HMA PAVEMENT

Hot mix asphalt pavement, HMA, CL. 1/2" PG 58-22, shall conform to Section 5-04.2 of the WSDOT Standard Specifications. Prior to the production of HMA, the Contractor shall determine a design aggregate structure and asphalt binder content in accordance with WSDOT Standard Operating Procedure 732. Mix designs shall be accepted by commercial evaluation. Once the design aggregate structure and asphalt binder content have been determined, the Contractor shall submit the HMA mix design on DOT form 350-042 demonstrating the design meets the requirements of Sections 9-03.8(2) and 9-03.8(6) of the WSDOT Standard Specifications. The contractor shall only complete the first page of the form. The contractor shall provide verification of mix design in one of the following processes:

- A. Submit samples to WSDOT State Materials Lab for WSDOT verification testing in accordance with WSDOT Standard Specifications.

- B. Reference a mix design that has been previously verified by the WSDOT Field Verification Testing Process or verified by WSDOT State Materials Lab on a previous project.

Mix design verification is valid for one year from the date of verification. At the discretion of the Engineer, the District may accept mix designs verified beyond the verification year with certification from the Contractor that the materials and sources are the same as those shown on the original mix design.

In no case shall the paving begin before the determination of anti-strip requirements has been made. Anti-strip requirements will be determined by:

- A. Testing by Contractor in accordance with WSDOT TM 718.
- B. Historical aggregate source anti-strip use provided by WDOT.
- C. If the determination of anti-strip requirements has not been made through Item a. or b. above, then a minimum of 0.25 percent anti-strip will be used.

The mix design will be the initial Job Mix Formula (JMF) for the HMA being produced. Any additional adjustments to the JMF will require the approval of the Engineer and may be made per WSDOT Standard Specifications Section 9-03.8(7

PART 3 EXECUTION

3.1 GENERAL

The contractor shall maintain access to the facility at all times. The Contractor shall coordinate all work with the District to insure his paving plan does not interfere with the Districts ongoing operations.

The Contractor shall provide, place and maintain all temporary markings and signage as required to warn and direct facility traffic as necessary during his paving operations.

3.2 ASPHALT CONCRETE PAVEMENT PLACEMENT

Asphalt concrete pavement materials shall be placed on compacted subgrade materials, as shown on the Plans, as indicated elsewhere in these Specifications, and in conformance with Sections 5-04.3(1), 5-04.3(2), 5-04.3(3), 5-04.3(4), 5-04.3(9), 5-04.3(10), 5-04.3(11), 5-04.3(12), 5-04.3(13), 5-04.3(14) 5-04.3(16) and 5-04.3(20) of the WSDOT Standard Specifications.

3.3 ASPHALT JOINTS

All joints of hot mix asphalt pavement shall be sealed with hot poured sealant meeting the requirements of WSDOT Standard Specification 9-04.2

3.4 QUALITY CONTROL

The Contractor shall be responsible for testing the ATB and HMA paving in accordance with the WSDOT Standard Specifications as specified herein, and with Section 01400. Testing shall include asphalt content and grading testing of hot mix asphalt mix samples, aggregate void content, fracture, and equivalence testing, and in-place density testing.

3.5 SAWCUTTING

Where shown on the Plans or where directed in the field by the Contracting Agency, the Contractor shall make a neat vertical sawcut at the boundaries of the area to be removed. Care shall be taken during sawcutting so as to prevent damage to the existing HMA or cement concrete pavement, to remain in place. Any pavement or cement concrete surface that is damaged by the Contractor outside the area scheduled for removal due to the Contractor's operations or negligence shall be repaired or replaced to the Contracting Agency's satisfaction by the Contractor at no additional cost to the Contracting Agency.

All cuts shall be continuous, full depth, and shall be made with saws specifically equipped for this purpose. No skip cutting, wheel cutting or jack hammering will be allowed unless specifically approved otherwise in writing by the Contracting Agency. However, even if preapproved as a method of cutting, no payment will be made for this type of work, and it shall be considered incidental and included in the various unit contract and lump sum prices listed in the Proposal.

The location of all pavement cuts shall be preapproved by the Contracting Agency in the field before cutting commences.

All water and slurry material resulting from sawcutting operations shall not be allowed to enter the storm drainage or sanitary sewer system and shall be removed from the site and disposed of in accordance with the Washington State Department of Ecology regulations.

All existing pavement edges shall be saw cut back to sound material, in uniform lines immediately prior to paving operations. Any edges broken between the time of cutting and placement of new paving shall be recut to the satisfaction of the Contracting Agency at no additional cost to the Contracting Agency. All excess excavated materials shall be hauled to waste.

3.6 ASPHALT TRENCH PATCH

This work shall consist of the preparation, placing and compaction of asphalt trench sections, in accordance with the details included on the plans and the requirements outlined herein. The work shall be in conformance with Sections 3.3 herein unless specifically directed otherwise by the Owner.

The Contractor shall restore all asphalt surfaces excavated or disturbed to a condition acceptable to the Owner.

The trench section shall be patched as indicated on the Plans. Crushed rock/ATB/temporary asphalt shall be removed to the depth of existing pavement or to the depth of the asphalt section specified on the Plans, whichever is thicker. The trench shall be paved to match the existing pavement surface.

Before any HMA material is placed, all pavement cuts shall be trued so that marginal lines of the patch will form a rectangle with straight edges and vertical faces a minimum of 1 foot back from the maximum trench width.

The asphalt shall be placed and compacted in 2-inch lifts. The asphalt trench patch thickness shall match existing asphalt thickness or the minimum pavement repair section indicated on the plans whichever is thicker.

Seal all joints scheduled to not receive an asphalt overlay

***** END OF SECTION *****

SECTION 02950

SITE RESTORATION AND REHABILITATION

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes areas requiring restoration or rehabilitation as shown on the Plans or specified herein, including those areas that shall be graded, restored with seeding, areas restored with concrete, and areas containing landscaping.

Particular care shall be taken to minimize damage to landscaped areas within and adjacent to construction areas. In the event that construction is to be carried out in landscaped areas, appropriate measures shall be taken to restore such areas to conditions existing prior to construction.

Surface restoration type and location are shown on the Plans.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
02300	Earthwork
02710	Gravel Surfacing
02740	Hot Mix Asphalt Paving

1.3 QUALITY ASSURANCE

A. PLANT MATERIAL

Quality, size, and conditions as determined by standards set forth in the American Association of Nurserymen Standard ANSI Z60.1.

B. FERTILIZER

Conform to Washington State Department of Agriculture Laws and Federal Specification O-F-241D pertaining to commercial fertilizers.

PART 2 PRODUCTS

2.1 TOPSOIL

Topsoil shall have a pH value between 6 and 8, shall be fertile, friable, natural loam, containing 5 to 8 percent of humus, and shall be capable of sustaining vigorous lawn growth. Topsoil shall be free of any admixtures of subsoil, stones

2 inches in diameter or larger, clods of earth, plants or their roots, sticks, or other extraneous material. All topsoil shall be furnished as necessary and approved by the Owner to complete the required restoration and seeding.

2.2 CONCRETE

Concrete for concrete curb and gutter shall meet the requirements of Section 8-04 of the WSDOT Standard Specifications. Concrete for driveway entrances shall meet the requirement of Section 8-06 of the WSDOT Standard Specification. Concrete for sidewalks shall be the requirements of section 8-14 of the WSDOT standard Specification.

2.3 LANDSCAPE BARK

Bark shall be derived from Douglas fir, pine or hemlock species. The bark shall not contain resin, tannin or compounds in quantities that would be hazardous plant life. Bark shall be large size with greater than 50 percent larger than 4 inches in size.

PART 3 EXECUTION

3.1 SOIL PREPARATION

Verify that planting bed grades are in accordance with those indicated on the Plans before proceeding with work. Verify that soil conditions are satisfactory for soil preparation work.

Prepare soil no closer than 3 feet from existing tree trunks up to 6 inches in diameter; no closer than 4 feet from existing tree trunks up to 12 inches in diameter; no closer than 6 feet from existing tree trunks larger than 12 inches in diameter.

Loosen compacted soils to a depth of 12 inches. Rake and remove all material larger than 1-1/2 inches in diameter.

Place 2 to 3 inches of topsoil over existing soil, mix and till to a depth of 6 inches. This material shall be suitable topsoil from the site or imported material.

3.2 TOPSOIL

Those areas to receive topsoil shall have the trenched backfilled to within 6 inches of the finished grade. A compacted 6-inch depth of topsoil shall then be applied to the subgrade. The Contractor may elect to utilize and stockpile existing and excavated topsoil material; however, no separate payment will be made for its use.

3.3 CONCRETE

Concrete Curbs and Gutters shall be constructed per WSDOT Standard Specifications section 8-04. Sidewalks shall be constructed per WSDOT Standard Specifications 8-14.

Any curb, gutter, sidewalk or driveway entrance damaged, defaced, cracked, chipped, or determined to be of poor workmanship, in the opinion of the Owner, shall be removed, wastehailed and replaced by the Contractor, at the Contractor's expense. Sacking and grinding shall not be considered an acceptable means for repairing unacceptable sections.

At locations where the new sidewalk is to abut existing concrete, saw concrete for a depth of 2 inches and chip the old concrete back to sound material on a straight line, clean the surface, and apply a neat cement paste just prior to pouring the new sidewalk.

Place preformed asphalt expansion joints in the adjacent curb, where the sidewalk ends at a curb, and around posts, poles, or other objects protruding through the sidewalk.

Provide contraction joints transversely to the walks at locations opposite the contraction joints in the curb. These joints shall be 3/16-inch by 1-inch weakened plane joints. They shall be straight and at right angles to the surface of the walk. Walk areas wider than 20 feet shall have longitudinal contraction joints at spacings not to exceed 15 feet.

Place, process, finish, and cure concrete in conformance with the applicable requirements of ACI 614 and this Specification. Where the requirements differ, the higher requirement shall govern.

Broom the surface with a fine-hair broom at right angles to the length of the walk and tool at all edges, joints, and markings. Mark the walks transversely at 5-foot intervals with a joining tool. Upon completion of the finishing, apply an approved curing compound to exposed surfaces. Protect the sidewalk from damage for a period of 7 days.

3.4 LANDSCAPE BARK

The bark shall be placed to a depth of 4 inches.

3.5 FINISHING AND CLEANUP

Before acceptance of the Project, all areas shall be cleaned of all debris and foreign material. After all other work on the Project is completed and before final acceptance, the entire roadway, including the roadbed, planting, sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades and cross-sections shown on the Drawings and as hereinafter specified.

Upon completion of the cleaning and dressing, the Project shall appear uniform in all respects. All graded areas shall be true to line and grade as shown on the typical sections and as required by the Owner.

All rocks in excess of 1-inch diameter shall be removed from the entire construction area and shall be disposed of the same as required for other waste material. In no instance, shall the rock be thrown onto private property.

All excess excavated material within the limits of the Project shall be removed entirely. All debris resulting from clearing and grubbing or grading operations shall be removed and disposed.

Drainage facilities, such as inlets, catch basins, culverts, and open ditches, shall be cleaned of all debris resulting from the Contractor's operations.

All pavements and oil mat surfaces, whether new or old, shall be thoroughly cleaned. Existing improvements, such as Portland cement concrete curbs, curb and gutters, walls, sidewalks, and other facilities which have been sprayed by the asphalt cement shall be cleaned to the satisfaction of the Owner.

Castings for manholes, monuments, water valves, lamp poles, vaults, and other similar installations which have been covered with the asphalt material shall be cleaned to the satisfaction of the Owner.

3.6 CONSTRUCTION ACCEPTANCE

The Contractor shall protect and care for all planted areas until fully established and healthy. Care shall include equipment and labor necessary to provide sufficient and continuous watering of all planted areas until final acceptance.

The Contractor shall guarantee landscaping materials and workmanship for a period of 2 years following the date of project acceptance. During the 2-year guarantee period, should any planted areas show signs of failure such as dead or dying material, the Contractor shall replace all deficient areas to the satisfaction of the Owner.

3.7 ADJUSTMENT OF NEW AND EXISTING STRUCTURES TO GRADE

This work consists of constructing and/or adjusting all new and existing utility structures encountered on the Project to finished grade.

Prior to commencing manhole adjustments, a plywood and visqueen cover, as approved by the Owner, shall be placed over the manhole base and channel to protect them from debris.

The castings shall not be adjusted until the contractor has completed his paving operations. The asphalt concrete pavement around the casting shall be cut and removed to a neat circle, the diameter of which shall not exceed 6 inches from the outside diameter of the casting frame. The casting frame shall be brought up to the desired grade. Adjustment of manholes, catch basins and precast concrete vaults shall be made with the use of concrete adjustment rings or bricks. No iron adjustment rings will be allowed. An approved class of mortar (one part cement to two parts of plaster sand) shall be placed between adjustment rings or bricks and casting frame to completely fill all voids and to provide a watertight seal. No rough or uneven surfaces will be permitted inside or out. Adjustment rings or brick shall be placed and aligned so as to provide vertical sides and vertical alignment of ladder steps (if steps are necessary).

***** END OF SECTION *****

DIVISION 5

METALS

SECTION 05120

STRUCTURAL STEEL

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes structural steel work as shown on the Plans, including schedules, notes, and details to show size and location of members, typical connections, and type of steel required. Miscellaneous metal fabrications are specified elsewhere in Division 5.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
05500	Miscellaneous Metal Fabrications

1.3 REFERENCES

This Section references the latest revisions of the following documents:

<u>Reference</u>	<u>Title</u>
ASTM A36	Structural Steel
ASTM A53	Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe
ASTM A123	Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products
ASTM A153	Zinc Coating (Hot Dip) on Iron and Steel Hardware
ASTM A276	Stainless Steel Bars and Shapes
ASTM A307	Carbon Steel Externally Threaded Standard Fasteners
ASTM A325	High Strength Bolts for Structural Steel Joints
ASTM A490	Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints
ASTM A500	Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes
ASTM A501	Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
ASTM A572	High-Strength Structural Steel
ASTM A992	High-Strength Structural Steel
AWS A2.4	Standard Welding Symbols
AWS D1.1	Structural Welding Code
AISC	Specification for Structural Steel Buildings
SSPC	Steel Structures Painting Council

1.4 SUBMITTALS

Submit under provisions of Section 01300.

A. SHOP DRAWINGS

Indicate profiles, sizes, spacing, locations, and complete details of structural members, to include openings, cuts, camber, fasteners, connections, and other pertinent data. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed as work of other sections.

B. MANUFACTURER'S MILL CERTIFICATE

Submit under provisions of Section 01300 certifying that products meet or exceed specified requirements.

C. MILL TEST REPORTS

Submit under provisions of Section 01300 Manufacturer's Certificates, indicating structural strength, destructive and non-destructive test analysis.

D. WELDERS' CERTIFICATES

Submit under provisions of Section 01300 Manufacturer's Certificates, certifying welders employed on the Work, verifying AWS qualifications within the previous 12 months.

1.5 QUALITY ASSURANCE

Codes and Standards: Comply with the provisions of the following, except otherwise indicated:

<u>Standard</u>	<u>Title</u>
AISC	"Code of Standard Practice for Steel Buildings and Bridges"
AISC	"Specifications for Structural Steel Buildings," including "Commentary" and Supplements thereto as issued
AISC	"Specifications for Structural Joints using ASTM A325 or A490 Bolts" approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.

American Welding Society (AWS) D1.1 “Structural Welding Code – Steel”

ASTM A6 “General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use”

1.6 DELIVERY, STORAGE, AND HANDLING

Deliver material to site at such intervals to ensure uninterrupted progress of work.

Deliver anchor bolts and anchorage devices that are to be embedded in cast-in-place concrete or masonry in ample time as to not delay work.

Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration.

Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

PART 2 PRODUCTS

2.1 MATERIALS

A. STRUCTURAL STEEL SHAPES

ASTM A992, High-Strength Structural Steel.

B. STRUCTURAL STEEL PLATES AND BARS

ASTM A36, unless noted otherwise.

C. STRUCTURAL TUBING

Cold-Formed: ASTM A500, Grade B, $F_y=46\text{KSI}$

Hot-Formed: ASTM A501, $F_y=36\text{KSI}$

D. STEEL PIPE

ASTM A53, Type E or S Grade B.

E. HEADED STUD-TYPE CONNECTORS

ASTM A108, Grade 1015, forged steel, uncoated.

F. HIGH-STRENGTH THREADED FASTENERS

Heavy hexagon structural bolts, as follows:

Quenched and tempered medium carbon steel bolts, nuts and washers complying with ASTM A325.

Quenched and tempered alloy steel bolts, nuts and washers complying with ASTM A490 where indicated.

Heavy hexagon nuts complying with ASTM A563.

Hardened washers complying with ASTM F436.

Provide and install bolts with load indicator devices (load indicator washers or snap-off heads).

G. ANCHOR BOLTS AND THREADED RODS

ASTM F1554, Grade 36, unless noted otherwise. Heavy hexagon nuts complying with ASTM A563 and hardened washers complying with ASTM F436.

ASTM A193 Grade B8, where stainless steel is noted in the plans. Heavy hexagon nuts complying with ASTM A194 Grade 8 and type 304 stainless steel washers.

H. UNFINISHED THREADED FASTENERS

ASTM A307, Grade A, regular low-carbon steel bolts and nuts. Provide hexagonal heads and nuts for all connections.

I. EXPANSION ANCHORS

Provide size and type indicated. Expansion anchors shall be one piece stud type, wedge-style anchor.

Carbon steel expansion anchors shall meet the following:

- Stud: ASTM A108 and zinc plated in accordance with ASTM B633
- Wedge: AISI 1010 carbon steel
- Nut: ASTM A563 Grade A
- Washer: SAE 1005-1020

Stainless steel expansion anchors shall meet the following:

- Stud: ASTM F593, AISI 304 or 316
- Wedge: AISI 304 or 316
- Nut: ASTM F594
- Washer: AISI 304 or 316 conforming to ASTM A240

Subject to compliance with the requirements, products which may be incorporated in the work include, but are not limited to, the following:

KWIK Bolt 3, Hilti, Inc.
Strong-Bolt 2, Simpson Strong Tie, Inc.
Power-Stud+ SD1, Powers Fasteners, Inc.

J. FLUSH TYPE EXPANSION ANCHORS

Provide size to match fastener indicated, conforming to AISI 12L14, meeting ASTM A108, and zinc plated in accordance with ASTM B633, SC1, Type III.

Subject to compliance with the requirements products, which may be incorporated in the work include, but are not limited to, the following:

HDI Anchor, Hilti, Inc.
Drop-In Anchor, Powers Fasteners, Inc.

K. ADHESIVE ANCHORS

1. Adhesive capsules shall be self-contained two-part component consisting of a vinyl urethane resin with a Dibenzoyl Peroxide Hardener.

Subject to compliance with the requirements products, which may be incorporated in the work include, but are not limited to the following:

HVU Adhesive capsule, Hilti, Inc.
Chem-Stud Capsule, Powers Fasteners, Inc.

2. Injection adhesive system shall consist of a dual-cylinder adhesive refill pack, a mixing nozzle, and dispenser. The adhesive shall be formulated to include resin and hardeners.

Subject to compliance with the requirements products, which may be incorporated in the work include, but are not limited to, the following:

HIT RE 500 V3 Injection Adhesive Anchor, Hilti, Inc.
SET-XP, Simpson Strong Tie, Inc.
PE1000+, Powers Fasteners, Inc.

3. For hollow-base materials such as concrete masonry units (CMU), provide galvanized screen tubes as required by the manufacturer.

Subject to compliance with the requirements products, which may be incorporated in the work include, but are not limited to, the following:

HIT HY 70 Adhesive Anchor System for Unreinforced Masonry, Hilti, Inc.
Pure 110+, Powers Fasteners, Inc.

L. WELDING MATERIALS

AWS A5.1 or A5.5, E70XX; AWS A5.17, E70S-X; AWS A5.20, E70XT-X. Comply with AWS code.

M. STRUCTURAL STEEL PRIMER PAINT

Epoxy Primer per Section 09900, SSPC SP-10.

2.2 FABRICATION

A. SHOP FABRICATION AND ASSEMBLY

Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.

Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence, which will expedite erection and minimize field handling of materials.

Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

B. CONNECTIONS

Weld or bolt shop connections, as indicated on the Plans or as specified.

Bolt field connections, except where welded connections or other connections are indicated.

Provide high-strength threaded fasteners for all bolted connections, except where unfinished bolts are indicated.

C. HIGH-STRENGTH BOLTED CONSTRUCTION

Install high-strength threaded fasteners in accordance with AISC “Specifications for Structural Joints using ASTM A325 or A490 Bolts.”

D. WELDED CONSTRUCTION

Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work. Assemble and weld built-up sections where indicated by methods which will produce true alignment of axes without warp.

E. SHEAR CONNECTORS

Prepare steel surfaces as recommended by manufacturer of shear connectors. Shop weld shear connectors, spaced as shown, to beams and girders in composite construction. Use automatic end welding of headed stud shear connectors in accordance with manufacturer’s printed instructions.

2.3 SHOP PAINTING

A. GENERAL

Shop paint structural steel, except those members or portions of members to be embedded in concrete or mortar. Paint embedded steel that is partially exposed, or the exposed portions and initial two inches of embedded areas only. Do not paint surfaces that are to be welded or are high-strength bolted with friction-type connections. Apply two coats of paint complying with Section 09900 to surfaces that are inaccessible after assembly or erection.

B. SURFACE PREPARATION

After inspection and before shipping, clean steelwork to be painted. Remove loose rust, loose mill scale, and spatter, slag or flux deposits. Clean steel in accordance with Steel Structures Painting Council (SSPC) as follows: SP-10 “Near-White Blast Cleaning.”

C. PAINTING

Immediately after surface preparation, apply structural steel primer paint in accordance with Section 09900 and manufacturer’s instructions and at a rate to provide dry film thickness of not less than 1.5 mils DFT. Use painting methods, which result in full coverage of joints, corners, edges and exposed surfaces.

D. ZINC COATING

Unless noted otherwise, where structural steel (ferrous metal) is exposed to weather, it shall be zinc coated or galvanized by the “hot-dip” method in accordance with ASTM A123. Provide the following minimum coating weight per square foot of actual surface.

- | | | |
|-----|---------------------------------|--|
| (a) | Steel 1/8 inch
and 3/16 inch | 2.0 Ounces Average
1.8 Ounces Minimum |
| (b) | Steel 1/4 inch
and heavier | 2.3 Ounces Average
2.0 Ounces Minimum |

Provide galvanized fasteners with zinc-coated items.

2.4 SOURCE QUALITY CONTROL AND TESTS

Testing and analysis of components will be performed under provisions of Section 01400.

PART 3 EXECUTION

3.1 ERECTION

A. GENERAL

Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.

B. SETTING BASES AND BEARING PLATES

Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of base and bearing plates.

Set loose and attached base plates and bearing plates for structural members on wedges or other adjusting devices.

Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.

Pack non-shrink grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure. For proprietary grout materials, comply with manufacturer's instructions.

C. FIELD ASSEMBLY

Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces that will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment. Level and plumb individual members of structure within specified AISC tolerances.

Splice members only where indicated and accepted on shop drawings.

D. ERECTION BOLTS

On exposed welded construction, remove erection bolts, fill holes with plug welds, and grind smooth at exposed surfaces.

Comply with AISC Specification for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing member. Ream holes that must be enlarged to admit bolts.

E. GAS CUTTING

Do not use gas-cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members, which are not under stress, as acceptable to the Engineer.

F. TOUCHUP PAINTING

Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting. Apply by brush or spray to provide minimum dry film thickness of 1.5 mils. Painting shall conform to the requirements of Section 09900.

Cleaning and touchup painting of field welds, bolted connections and abraded areas of shop paint on structural steel is included in Section 09900.

G. REPAIR OF GALVANIZED WORK

Galvanized work damaged during installation shall be repaired with a “hot stick method” using “galv-bar.”

3.2 QUALITY CONTROL

A. GENERAL

Comply with Section 01400 for independent testing and inspection agency to inspect high-strength bolted connections and welded connections and to perform tests and prepare test reports.

Testing agency shall conduct and interpret tests and state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.

Provide testing agency access to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.

Testing agency may inspect structural steel at plant before shipment; however, the Engineer reserves right, at any time before final acceptance, to reject material not complying with specified requirements.

Correct deficiencies in structural steel work that inspections and laboratory test reports indicate as not in compliance with requirements.

The performance of additional tests, at the Contractor's expense, may be necessary to reconfirm any non-compliance of original work, as well as to show compliance of corrected work.

B. SHOP-BOLTED CONNECTIONS

Inspect or test in accordance with AISC specifications.

C. SHOP WELDING

Inspect and test during fabrication of structural steel assemblies, as follows:

Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.

Perform visual inspection of all welds.

Perform tests of welds as follows. Inspection procedures listed are to be used at Contractor's option.

CONTRACTOR'S OPTION

Liquid Pentrant Inspection: ASTM E165

Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration not acceptable.

Radiographic Inspection: ASTM E94

Ultrasonic Inspection: ASTM E164

D. FIELD-BOLTED CONNECTIONS

Inspect in accordance with AISC specifications.

E. FIELD WELDING

Inspect and test during erection of structural steel as follows:

Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.

Perform visual inspection of all welds.

Perform tests of welds as follows:

Liquid Pentrant Inspection: ASTM E165

Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration not acceptable.

Radiographic Inspection: ASTM E94

Ultrasonic Inspection: ASTM E164

***** END OF SECTION *****

SECTION 05400

COLD FORMED METAL FRAMING

PART 1 GENERAL

1.1 SCOPE

The extent of cold-formed metal framing is shown on the Plans, including schedules, notes, accessories and details to show size, type and location of members.

Types of cold-formed framing units include, but not limited to, the following:

- A. Load-bearing punched channel studs.
- B. C-shaped load-bearing steel studs.
- C. C-shaped steel joists.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals

1.3 REFERENCES

This Section references the latest revisions of the following documents:

<u>Reference</u>	<u>Title</u>
AISI	American Iron and Steel Institute. "North American Specification for the Design of Cold-Formed Steel Structural Members"
AWS	American Welding Society
ASTM A1003	Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members
ASTM A780	Practice for Repair of Damaged Hot-Dip Galvanized Coatings

1.4 SUBMITTALS

Comply with provision in Section 01300.

Product data and installation instructions for each items of cold-formed metal framing and accessories. Indicate supplemental strapping, bracing, splices, bridging, accessories, and details required for proper installation.

1.5 QUALITY ASSURANCE

A. WELDING

Use qualified welders and comply with American Welding Society (AWS) D1.3, “Structural Welding Code - Sheet Steel.”

B. PREINSTALLATION CONFERENCE

Prior to start of installation of metal framing systems, meet at project site with installers of other work including door and window frames and mechanical and electrical work. Review areas of potential interference and conflicts, and coordinate layout and support provisions for interfacing work.

1.6 DELIVERY, STORAGE, AND HANDLING

Deliver materials to site to insure uninterrupted progress of work. Store materials in a manner to permit easy access for inspection and identification, and to avoid deforming members. Keep members off ground, using pallets, platforms or other supports. Protect and package materials from erosion and deterioration.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include but are not limited to the following:

SCAFCO, Steel Stud Mfg.Co.
Superior Steel Studs, Inc.
USG Industries
United States Steel
Wheel Corrugating Co.

2.2 METAL FRAMING

A. SYSTEM COMPONENTS

Manufacturers’ standard load-bearing steel studs and joists of type, size, shape, and gauge as indicated on the Drawings. With each type of metal framing required, provide manufacturer’s standard steel runners (tracks), blocking, lintels, clip angles, shoes, reinforcements, fasteners, and accessories for applications indicated, as needed to provide a complete

metal framing system. Top and bottom track units shall be one gauge heavier than framing components.

All framing components to meet ASTM A1003, Structural Grade, Type H, metallic coated.

Provide galvanized finish to metal framing components complying with minimum G60 coating.

Metal clips to meet A653, Grade 50, with minimum G60 coating.

Finish of installation accessories to match that of main framing components, unless otherwise indicated.

B. FASTENERS

Provide nuts, bolts, washers, screws, and other fasteners with corrosion-resistant plated finish.

C. ELECTRODES FOR WELDING

Comply with AWS Code and as recommended by stud manufacturer.

D. GALVANIZED REPAIR

Where galvanized surfaces are damaged, prepare surfaces and repair in accordance with procedures specified in ASTM A780.

2.3 FABRICATION

A. Framing components may be prefabricated into assemblies before erection. Fabricate panels plumb, square, true to line, and braced against racking with joints welded. Perform lifting of prefabricated units to prevent damage or distortion.

B. Fabricate units in jig templates to hold members in proper alignment and position and to assure consistent component placement.

C. Attach similar components by welding. Attach dissimilar components by welding, bolting, or screw fasteners, as standard with manufacturer.

D. Wire tying of framing components is not permitted.

PART 3 EXECUTION

3.1 GENERAL

Install metal framing systems in accordance with manufacturer's printed or written instructions and recommendations.

3.2 RUNNER TRACKS

Install continuous tracks sized to match studs except gauge shall be one gauge heavier. Align tracks accurately to layout at base and tops of studs. Unless noted otherwise, secure tracks as recommended by stud manufacturer for type of construction involved, except do not exceed 16-inches on center spacing for nail or power-driven fasteners. Provide two pairs of fasteners at 6-inch on center at corners and ends of tracks.

3.3 INSTALLATION OF WALL STUDS

Unless noted otherwise on the Drawings, secure studs to top and bottom runner tracks by either welding or screw fastening at both inside and outside flanges. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structures.

Install supplementary framing, blocking, and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering weight or loading resulting from item supported.

Frame wall openings larger than 2 feet square with double stud at each jamb of frame except where more than two are either shown or indicated in manufacturer's instructions. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall. Secure stud system wall opening frame in manner indicated.

For expansion and control joints frame both sides with separate studs; do not bridge the joint with components of stud system.

Install horizontal stiffeners (blocking) in stud system, spaced (vertical distance) at not more than 48-inches on center. Weld at each intersection.

3.4 ERECTION TOLERANCES

Bolt or weld wall panels (at both horizontal and vertical junctures) to produce flush, even, true-to-line joints. Maximum variation in plane and true position between prefabricated assemblies should not exceed 1/16 inch.

3.5 JOIST FRAMING

Install joists level, straight, and plumb, complete with bracing and reinforcing as indicated on the Drawings. Provide not less than 1-1/2-inch end bearing. Unless noted otherwise, reinforce ends with end clips, steel hangers, steel angle clips, steel stud section, or as otherwise recommended by joist manufacturer.

Reinforce joists at interior supports with single short length of joist section located directly over interior support, snap-on shoe, 30 percent side-piece lapped reinforcement, or other method recommended by joist manufacturer. Provide solid blocking of joists to interior support systems to prevent lateral movement of bottom flange.

Touch up damaged shop-applied protective coatings. Use compatible primer for prime-coated surfaces; use galvanizing repair system for galvanized surfaces.

***** END OF SECTION *****

SECTION 05500

MISCELLANEOUS METAL FABRICATIONS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the miscellaneous metal fabrication work including, but is not limited to, the following: preassembled stairs, ladders, handrails, railings, grating, including stair treads and nosings; floor plates and covers, custom fabricated pipe brackets, supports, and pipe sleeves.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
05120	Structural Steel
09900	Painting

1.3 REFERENCES

This section references the latest revisions of the following documents:

<u>Reference</u>	<u>Title</u>
ASTM A36	Structural Steel
ASTM A53	Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe
ASTM A123	Zinc (Hot-Galvanized) Coatings on Products Fabricated From Rolled, Pressed and Forged Steel Shapes, Plates, Bars, and Strip
ASTM A153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A240	Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels
ASTM A283	Carbon Steel Plates, Shapes, and Bars
ASTM A307	Carbon Steel Externally Threaded Standard Fasteners
ASTM A325	High Strength Bolts for Structural Steel Joints
ASTM A500	Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes
ASTM A501	Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
ASTM A653	Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM B221	Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes

ASTM B241	Aluminum-Alloy Seamless Pipe and Seamless Extruded Steel Tube
NAAMM	National Association of Architectural Metal Manufacturers, "Metal Bar Grating Manual"
AISC	American Institute of Steel Construction
AWS D1.1	Structural Welding Code - Steel
AWS D1.2	Structural Welding Code - Aluminum
SSPC	Steel Structures Painting Council

1.4 SUBMITTALS

Submit under provisions of Section 01300.

Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

PART 2 PRODUCTS

2.1 MATERIALS

A. STRUCTURAL STEEL

Structural steel members and sections as defined in the AISC "Code of Standard Practice" are specified in Section 05120.

B. STEEL CASTINGS

Comply with ASTM A27. Grade 65-35, medium strength carbon steel.

C. CAST IRON

Comply with ASTM A48, Class 20.

D. STAINLESS STEEL

Comply with ASTM A276, Type 316.

E. ALUMINUM ALLOY EXTRUDED BARS, RODS, WIRE, SHAPES AND TUBES

Comply with ASTM B221, Alloy 6061-6.

F. WELDING MATERIALS

As specified in Section 05120.

G. ZINC COATING

Comply with ASTM A123 or ASTM A153.

H. FASTENERS, ANCHORS, AND ANCHOR BOLTS

As specified in Section 05120.

I. PAINTING

Comply with Section 09900.

2.2 FABRICATION

Fit and shop assemble components in the largest practical size for delivery and installation at site.

A. STRUCTURAL STEEL MEMBERS AND SECTIONS

Fabrication of structural steel members and sections shall comply with Section 05120.

Provide galvanized fasteners with zinc coated items except as noted below. For all items installed in submerged, intermittently submerged, or areas subject to splash and spill, or corrosive atmospheres, fasteners shall be 316 stainless steel. The term fasteners includes nut, bolts, washers, leveling nuts, and U-bolts.

B. ACCESSORIES

Provide necessary accessories as required for complete installation of products. Provide anchors, anchor bolts, plates, angles, hangers, struts, and other items required for connecting stairs to structure.

C. ANCHORAGE TO SUPPORTING STRUCTURES

For anchorage to supporting structures, provide 316 stainless steel fasteners for all aluminum items. Provide tapered washers where required to avoid point loading of structural members.

PART 3 EXECUTION

3.1 EXAMINATION

Verify that field conditions are acceptable and are ready to receive the work.

Northshore Utility District

2023-01 – Building “A” Improvements

G&O #18601

05500-3 – Miscellaneous Metal Fabrications

3.2 PREPARATION

Clean and strip primed steel items to bare metal where site welding is required. Supply items required to be cast into concrete or embedded in masonry with setting templates.

Paint embedded aluminum items in accordance with Section 09900.

3.3 INSTALLATION

A. TOLERANCES

Install items plumb and level, accurately fitted, free from distortion or defects. Comply with the following tolerances:

Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-accumulative.

Maximum Offset From True Alignment: 1/4 inch (6 mm).

Allow for erection loads, and provide sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments. Handrail installation shall be sturdy and without play.

B. BOLTING AND WELDING

Field bolt and weld to match shop bolting and welding. Conceal bolts and screws whenever possible. Field weld components as indicated on the Drawings. Perform field welding in accordance with AWS D1.1 or AWS D1.2.

Obtain Owner's approval prior to field cutting or making adjustments not scheduled on the shop drawings.

C. COATINGS

After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete complying with Section 09900. Field galvanizing shall be done by the hot-stick method utilizing Galv-bar, or equal. Spray-on zinc paint is not acceptable.

D. DISSIMILAR MATERIALS

Avoid direct fastening of dissimilar metals to one another. Connections shall include means as required to isolate dissimilar metals from one another. Possible methods of isolation include, but are not limited to, non-metallic bushings/washers at bolts, and epoxy paint coating of contact surfaces. Intended means of isolation shall be noted on the submitted shop drawings. See Section 09900 for epoxy paint requirements.

***** END OF SECTION *****

DIVISION 6

WOOD AND PLASTICS

SECTION 06100

ROUGH CARPENTRY

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the extent of rough carpentry work on the Plans, including, but not limited to, the following: wood framing, rooftop equipment bases and support curbs, wood nailers and blocking, wood furring, sheathing, etc.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals

1.3 REFERENCES

This Section references the latest revisions of the following documents:

<u>Reference</u>	<u>Title</u>
ALSC PS 20	American Lumber Standards Committee (ALSC): American Softwood Lumber Standard
APA PRP-108	American Plywood Association (APA): Performance Standards and Qualification Policy for Structural-Use Panels
APA PS 1	American Plywood Association (APA): Product Standard for Construction and Industrial Plywood
ASTM A153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM D226	Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
AWC NDS	American Wood Council (AWC): National Design Specification for Wood Construction
AWC WFCM	American Wood Council (AWC): Wood Frame Construction Manual for one- and two-family dwellings
AWPA U1	American Wood-Preservers' Association (AWPA) Standard
WCLIB 17	West Coast Lumber Inspection Bureau (WCLIB): Standard Grading and Dressing Rules for Douglas Fir, Western Hemlock, Western Red Cedar, White Fir, Sitka Spruce Lumber

1.4 SUBMITTALS

Comply with provisions of Section 01300.

Submit a certificate of compliance from the supplier certifying that the materials provided meet or exceed specified requirements. Certificate shall itemize materials provided on the Project and refer to pertinent specifications.

1.5 DELIVERY, STORAGE AND HANDLING

Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and underneath temporary coverings including polyethylene and similar materials. For lumber and plywood that is pressure treated with waterborne chemicals, provide a sticker between each course to provide air circulation.

PART 2 PRODUCTS

2.1 GENERAL

Lumber shall comply with ALSC PS 20 and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.

Each piece of lumber shall be factory marked with Grade Stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill that produced the product.

Nominal sizes are indicated on the Drawings, except as shown by detailed dimensions. Provide actual sizes as required by ALSC PS 20, with moisture content specified for each use.

Provide dressed lumber, S4S, unless otherwise indicated. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment for sizes 2 inches or less in nominal thickness, unless otherwise indicated.

2.2 FRAMING LUMBER

Unless noted otherwise, provide Douglas Fir - Larch No. 2 or better, or Hem-Fir No. 1 or better.

2.3 TRIM BOARDS

Unless noted otherwise, at painted trim provide No. 2 Common Boards or better complying with WWPA rules. Where boards are exposed to finish work, provide 19 percent maximum moisture content. Exterior trim shall be cedar, Grade A or better.

2.4 MISCELLANEOUS LUMBER

Provide wood for support or attachment of other work including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, wood trim, stripping and similar members. Provide lumber of sizes indicated, worked into shapes shown or required. Provide Standard Grade Hem-Fir or better. Provide 19 percent maximum moisture content for lumber items not specified to receive wood preservative treatment.

2.5 PLYWOOD/SHEATHING

Provide APA-rated Exposure 1 unless noted otherwise, span rating and thickness as noted on the Plans.

Comply with PS 1 “Product Standard for Construction and Industrial Plywood” for plywood panels and for products not manufactured under PS 1 provisions, comply with APA PRP-108. Factory-mark each panel with APA trademark evidencing compliance with grade requirements.

2.6 MISCELLANEOUS MATERIALS

A. FASTENERS AND ANCHORAGES

Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable federal specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommended fasteners.

Where rough carpentry work is exposed to the weather, in ground contact, or in an area of high relative humidity, provide fasteners and anchorages with a hot-dip zinc coating per ASTM A153.

B. BUILDING PAPER

ASTM D226, Type I; asphalt saturated felt, non-perforated, 30-lb. type.

C. SILL SEALER GASKETS

Glass fiber resilient insulation fabricated in strip form for use as a sill sealer; 1-inch nominal thickness compressible to 1/32 of an inch; selected from manufacturer's standard width to suit width of sill members.

2.7 WOOD TREATMENT BY PRESSURE PROCESS

Where lumber or plywood is indicated as "P.T." or "Treated," or is specified herein to be treated, comply with applicable requirements of American Wood Preserver's Association (AWPA) Standard U1.

Pressure-treat above-ground items with waterborne preservatives to comply with AWPA Standard U1. After treatment, kiln dry lumber and plywood to a maximum moisture content, respectively, of 19 percent and 15 percent. Pressure treat items indicated on the Plans and all of the following: wood cants, nailer, curbs, top plates, equipment support bases, equipment curbs, plywood, blocking, stripping, and similar members utilized in connection with roofing, flashing, vapor barriers and waterproofing. All wood items including plywood used for or around roof penetrations shall be pressure treated.

PART 3 EXECUTION

3.1 GENERAL

Discard units of material with defects that could impair the quality of the work or with units too small to use in fabricating work with minimum joints or optimum joint arrangement. Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, and similar supports to allow attachment of other work.

Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards. Countersink nail heads on exposed carpentry work and fill holes.

Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

3.2 WOOD NAILERS AND BLOCKING

Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated.

3.3 WOOD FURRING

Install plumb and level with closure strips at edges and openings. Shim with wood as required to obtain specified tolerance for finished work.

A. FURRING FOR PLYWOOD PANELING

Unless otherwise indicated, provide 1-inch x 3-inch furring at 2 feet on center, horizontally and vertically. Select furring for freedom from knots capable of producing bent over nails and resulting damage to paneling.

B. FURRING FOR GYPSUM DRYWALL

Unless otherwise indicated, provide 1-inch x 2-inch furring at 16-inch on center, vertically.

C. SUSPENDED FURRING

Provide size and spacing shown, including hangers and attachment devices. Level to a tolerance of 1/8 inch in 10 feet.

3.4 WOOD FRAMING, GENERAL

Provide framing members of sizes and on spacings shown, and frame openings as shown, or if not shown, comply with recommendations of the AWC WFCM. Do not splice structural members between supports. Anchor and nail as shown, and to comply with the AWC NDS.

Firestop concealed spaces of wood framed walls and partitions at each floor level and at the ceiling line of the top story. Where firestops are not automatically provided by the framing system used, use closely fitted wood blocks of nominal 2-inch-thick lumber of the same width as framing members.

3.5 INSTALLATION OF SHEATHING

A. GENERAL

Comply with applicable recommendations contained in the APA “Engineered Wood Construction Guide,” for types of construction panels and applications indicated.

B. FASTENING METHODS

Fasten panels as indicated on the Plans. Include metal H clips between sheathing panels.

C. PLYWOOD BACKING PANELS

Nail to supports with minimum 10d at 6-inches on center edge nailing and 12-inches on center at intermediate framing.

***** END OF SECTION *****

DIVISION 7

THERMAL AND MOISTURE PROTECTION

SECTION 07210

BATT AND RIGID INSULATION

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the furnishing of all labor, materials, tools, and equipment required to install batt and rigid insulation, as indicated on the Plans and as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
05400	Cold Formed Metal Framing

1.3 REFERENCES

This Section references the latest revisions of the following document:

<u>Reference</u>	<u>Title</u>
ASTM C578	Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
ASTM C665	Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
ASTM C1320	Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.

1.4 PERFORMANCE REQUIREMENTS

Materials of this Section shall provide continuity of thermal and vapor and air barriers at building enclosure elements.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

Owens Corning, Johns Manville, CertainTeed, DOW, or approved equal.

2.2 MATERIALS

A. BATT INSULATION

Type III preformed, foil-faced, glass fiber batt or roll conforming to ASTM C665, to the thicknesses needed to meet the R-values shown on the Plans and as required by code.

B. RIGID INSULATION

Type 1, Class 1 rigid, closed cell Polyisocyanurate foam board insulation conforming to ASTM C1289, to the thicknesses needed to meet the R-values shown on the Plans and as required by code.

C. VAPOR BARRIER

Polyamide (nylon) vapor retarding, 2 mil, sheeting with a variable permeance ranging from 1 perm, or less, up to 10 perms, or greater, based on varying levels of ambient humidity; MemBrain Continuous Air Barrier & Smart Vapor Retarder by Certainteed, or equal.

D. TAPE

Pressure sensitive, aluminum foil tape; Specialty Tape #425 by 3M, or equal.

E. INSULATION FASTENERS

Galvanized steel impale spindles and clips on 2-inch square flat bases with self adhering backing and length to suit insulation thickness. Include galvanized steel retaining washer(s) of not less than 1-1/2-inches in diameter capable of securely and rigidly fastening insulation in place; by Gemco, or equal.

F. BUILDING WRAP

Mechanically attached water-resistive, vapor permeable air barrier membrane system including primary sheet membrane, self-adhered flashing tape, and flashing primer (as needed). Entire system shall be provided by a single manufacturer. Tyvek CommercialWrap by DuPont, WrapShield IT by VaproShield, or equal.

PART 3 EXECUTION

3.1 EXAMINATION

Verify site conditions before beginning installation. Verify that substrate and adjacent materials are ready to receive insulation, and free of all projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 GENERAL

Comply with insulation manufacturer's written instructions applicable to products and applications.

Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

Extend insulation to envelop entire area to be insulated with vapor barriers placed to face the interior (warm) side of the envelope. Fill all voids with insulation, fit tightly around all obstructions and tight to the exterior side of mechanical and electrical services within the plane of the insulation. Remove projections that interfere with placement. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-values.

All miscellaneous voids shall have insulation installed to prevent gaps in insulation using either fiberglass batt compacted to approximately 75 percent of normal maximum volume, or spray polyurethane foam applied according to the manufacturer's written instructions.

Prior to installation of finished surfaces, all vapor-retarder joints and ruptures shall be taped and sealed in each continuous area of insulation to ensure an airtight installation.

Stagger any insulation joints and butt all panels together for tight fit.

3.3 INSTALLATION IN FRAMED CONSTRUCTION

Install blanket insulation in all cavities formed by framing members. Use insulation widths and lengths that fully fill the cavities. If more than one length is required to fill cavities, provide lengths that will produce a snug fit between ends. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members, and lap all ends and side flanges of facings over framing members.

For metal-framed wall cavities, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs. For unfaced blankets, locate vapor barrier joints over member faces and extend vapor barrier tight to the full perimeter of adjacent window and door frames, as well as other items interrupting the plane of membrane. Fully tape seal in place. Provide airspace at exterior plane of insulation for ventilation as recommended by manufacturer.

***** END OF SECTION *****

SECTION 07900

CAULKING AND SEALANTS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the furnishing of all labor, materials, tools, and equipment required to install caulking and sealants, as indicated on the Plans and as specified herein.

All exterior wall joints and interior and exterior joints between all differing or dissimilar materials and at windows, doors, roof penetrations, louvers and similar types of openings shall receive sealants to make the joint air and watertight. This includes concrete to CMU, concrete to wood, CMU to wood, concrete to sheet metal, CMU to sheet metal, etc.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals

1.3 REFERENCE STANDARDS

This Section references the latest revisions of the following documents:

<u>Reference</u>	<u>Title</u>
AAMA 800	Sealant Manual, Specifications and Test Methods for Sealants
ASTM C834	Standard Specification for Latex Sealants
ASTM C920	Standard Specification for Elastomeric Joint Sealants
ASTM C1193	Standard Guide for Joint Sealants
ASTM C1311	Standard Specification for Solvent Release Sealants
ASTM D5249	Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints

ASTM D7174 Standard Specification for Preformed Closed-Cell Polyolefin Expansion Joint Fillers for Concrete Paving and Structural Construction

NSF/ANSI 61 Drinking Water System Components – Health Effects

PART 2 PRODUCTS

2.1 POLYURETHANE SEALANTS

Provide a one-component, gunnable grade, non-sag, solvent-free polyurethane sealant. The sealant shall cure under the influence of atmospheric moisture. Sealant shall meet ASTM C920, Type S, Grade NS, Class 35, under uses NT, T, M, G, I, A, and O. Performance characteristics shall include a 175 psi 21-day tensile strength, a minimum 500-percent ultimate elongation, and a maximum Shore “A” Hardness of 45.

Polyurethane sealants shall be Sikaflex-1a, as manufactured by the Sika Corporation, or equal by Tremco, Inc. or BASF Corporation.

2.2 SILICONE SEALANTS

Provide a one-component, gunnable grade, neutral cure, silicone sealant. Sealant shall meet ASTM C920, Type S, Grade NS, Class 50, under uses NT, M, G, A and O. Performance characteristics shall include a 200 psi 21-day tensile strength, a minimum 700-percent ultimate elongation, and a maximum Shore “A” Hardness of 25.

Silicone sealants shall be Sikasil WS-295, as manufactured by the Sika Corporation, or equal by Tremco, Inc. or BASF Corporation.

2.3 ACRYLIC LATEX CAULK

Provide a one-component, gunnable grade, pure acrylic latex sealant. Sealant shall meet ASTM C834, Type OP, Grade -18 °C. Performance characteristics shall include a maximum 25-percent shrinkage, and a movement capability of plus/minus 12.5-percent.

Acrylic latex sealants shall be Tremflex 834, as manufactured by the Tremco, Inc. or equal by BASF Corporation.

2.4 TAPE SEALANT

Provide a 100-percent solid, isobutylene preformed sealant tape. Tape sealant shall meet the American Architectural Manufacturer's Association AAMA 807.3 standard. Performance characteristics shall include a density of 1.5 and a minimum peel adhesion of 8 pounds per inch.

Tape sealant shall be Sikalastomer-95, as manufactured by the Sika Corporation, or equal by Tremco, Inc. or BASF Corporation.

2.5 PREFORMED FLEXIBLE JOINT MATERIAL

Provide a closed-cell, polyolefin preformed foam joint material. Foam joint material shall meet ASTM D7174. Performance characteristics shall include an expansion recovery greater than 99-percent, a maximum 50-percent compression strength of 15 psi, and a maximum water absorption of 0.25-percent by volume.

Foam joint material shall be Ceramar, as manufactured by W.R. Meadows, or equal.

2.6 PREFORMED FLEXIBLE JOINT BACKER MATERIAL

Provide a closed-cell, polyolefin preformed foam backer rod material. Backer rod material shall meet ASTM D5249 and shall be compatible with the proposed cold-applied sealant.

Backer rod material shall be Kool-Rod, as manufactured by W.R. Meadows, or equal.

2.7 PRIMERS

Provide primer materials made by or recommended by the sealant manufacturer for the conditions of the application, including the materials to be sealed at the joints and the type of sealant or caulking material to be used.

PART 3 EXECUTION

3.1 GENERAL

All sealant and primer work shall comply with ASTM C1193 and with the manufacturer's written instructions.

The Contractor shall confirm that the proposed sealant and primer materials are compatible with any concrete curing compound used, or the Contractor shall

lightly sandblast and thoroughly clean concrete joint surfaces prior to application of sealant materials.

All priming and sealant work shall be done under temperature and moisture conditions that are within the requirements of the manufacturer's written instructions.

All exterior dissimilar materials shall be sealed with elastomeric sealants at the joints between the different materials.

3.2 APPLICATION OF SEALANTS

A. PREPARATION OF JOINTS

Inspect profiles and surfaces of all joints prior to application. Verify joint dimensions are adequate for development of the sealant movement capability. All joints shall be solvent cleaned, dry, and free of dust, oils and grease before receiving backing materials and sealant. Floor joints shall be wire brushed, free of laitance or other residues. Aluminum or other metal surfaces to be in contact with sealants shall be wiped clean with xylol or an MEK solvent to remove any coatings or contamination. Joint sealants shall be installed before other surface finishes are applied. Proceed with joint sealant work only once conditions meet the manufacturer's requirements.

B. BACKINGS

Install filler and backer materials in as long of lengths as practicable. Stretch and force into joints with tool designed for that purpose, to a uniform depth, as indicated on the Plans or as required by the manufacturer, allowing for installation of sealant and caulking. Provide filler material in slab shapes for joints 1/2 inch or more in depth, and in 3/4 inch or more wide joints to receive sealing material. Provide extruded rod backer material in all other joints to receive sealant. Filler or backer material shall be of a depth as required to bring the top surface to within 1/2 inch of the slab surface, or as indicated on the Plans. All joints shall include a suitable bond breaker between backing materials and sealant.

C. MASKING

Both sides of joints shall be masked with tape to prevent soiling floor, slab, or wall beyond limits of the joint.

D. PRIMING

Apply primer to all surfaces of joints in contact with sealant materials. Apply full strength and undiluted in a uniform coating of surface. Allow to set or cure prior to proceeding. Do not prime surfaces at back of joint.

E. APPLICATION

Sealant shall be gun applied, giving the joint a full bead of sealant. Skin beads are not acceptable. Tool the bead immediately after application to ensure a firm and full contact with the inner faces of the joint. Joints in sills and other wash surfaces shall be filled slightly convex to obtain a flush joint when dry. Entire perimeter of openings in concrete surfaces shall be sealed. Do not apply sealants to wet or damp surfaces nor in temperatures below 50 degrees F, and as required by the manufacturer. Strike off excess sealant with tooling stick or a knife so that finished bead is slightly below surface. Remove excess sealant as work progresses. Sealants in masonry wall joints are to be a maximum of 1/2-inch deep and not less than 1/4 inch in each dimension. When applying sealant, do not permit thickness of sealant to exceed 1/2 of the width of the joint. Any joints over 1/2-inch wide shall be reported to the Owner and instructions for correcting the applications will be given.

3.3 CLEANUP

Upon completion, the Contractor shall remove and dispose of masking materials. Remove any excess materials and clean adjacent surfaces free from any soiling or staining resulting from the sealing and caulking operations.

***** END OF SECTION *****

DIVISION 8

DOORS AND WINDOWS

SECTION 08110

HOLLOW METAL DOORS, BORROWED LITES, AND FRAMES

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section covers furnishing and installing hollow metal doors, frames, and glazing, as well as hollow metal frames for borrowed lites, as indicated on the Plans and as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
08200	Wood Doors
08700	Finish Hardware
08810	Glazing

1.3 REFERENCES

This Section references the latest revisions of the following documents:

<u>Reference</u>	<u>Title</u>
ANSI/SDI A250.8	Specifications for Standard Steel Doors and Frames
ANSI/SDI A250.11	Recommended Erection Instructions for Steel Frames
ANSI Z97.1	Safety Glazing Materials Used in Buildings – Safety Performance Specifications and Methods of Test
ASTM A653	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM C1048	Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass
ASTM E2190	Standard Specification for Insulating Glass Unit Performance and Evaluation
HMMA 840	Guide Specification for Installation and Storage of Hollow Metal Doors and Frames
NFPA 80	Standard for Fire Doors and Other Opening Protectives
NFPA 252	Standard Methods of Fire Tests of Door Assemblies
UL 10B	Standard for Fire Tests of Door Assemblies

1.4 QUALITY ASSURANCE

Hollow metal doors and frames shall conform to applicable requirements of ANSI/SDI A250.8.

Fire rated door and frame construction shall conform with NFPA 252, and UL 10B.

Fire rated door and frame installation shall conform to NFPA 80 for the fire rated class indicated in the Door Schedule on the Plans.

1.5 SUBMITTALS

Submit shop drawings and product data under provisions of Section 01300.

Indicate frame configuration, anchor types and spacing, location of cutouts for hardware, reinforcement, and finish.

Indicate frame and door elevations and internal reinforcement.

1.6 REGULATORY REQUIREMENTS

Conform to applicable Building Code for frame and door requirements.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

The hollow metal doors, borrowed lites and frames shall be as manufactured by Curries, Ceco, Amweld, Republic, Steelcraft, or any other SDI member.

2.2 DOORS AND FRAMES

<u>Location</u>	<u>Material</u>
Exterior Doors, Borrowed Lites and Frames	ANSI/SDI A250.8, Level 3, Model 2
Interior Doors, Borrowed Lites and Frames	ANSI/SDI A250.8, Level 3, Model 2

Provide door and frame types and sizes as shown on the Plans.

2.3 DOOR, FRAME AND BORROWED LITE CONSTRUCTION

Insulated doors and insulated borrowed lites shall contain a polyurethane core with a minimum U-value as shown on the Plans.

Non-insulated doors and non-insulated borrowed lites shall contain a honeycomb core.

2.4 DOOR AND FRAME FABRICATION

Provide fully welded frames for all new construction. Provide fabricated frames of knock down field assembly type for retrofit applications or for existing door openings.

Mullions for double doors shall be removable type. Provide metal T shaped astragals for double doors.

Fabricate frames and doors with hardware reinforcement plates welded in place. Provide mortar guard boxes.

Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.

Prepare frame for silencers. Provide three single rubber silencers for single doors and mullions of double doors on strike side, and two single silencers on frame head at double doors without mullions.

Close top edge of exterior doors flush with inverted steel channel closure. Seal weld all door joints watertight. Caulking of door seams is not acceptable.

2.5 BORROWED LITE FABRICATION

All borrowed lite frames shall be of knock down assembly type. Framing members shall be manufacturer's standard profile with a typical 2" sight line. Material shall be 16 gauge cold rolled A60 galvanized steel. Form fixed glazing stops integral with frame members. Provide removable 18 gauge galvanized steel glazing stops with pre-punched screw holes complete with installation screws.

Provide concealed field applied million clips for securing mullions to jamb members where required.

2.6 FINISH

Interior and exterior doors, frames, and borrowed lite frames shall be made from galvanized zinc coating per ASTM A653 or A60 material, with a minimum application rate of 0.60 oz/ft². Finish painting shall be in accordance with Section 09900 of these Specifications.

The inside of the metal frame profile shall be coated per Section 09900 of these Specifications. Provide dissimilar metals system. Coating may be shop or field applied.

2.7 GLAZING

Doors and frames with glass relites shall be furnished with formed steel glazing strip frame with attachment screws allowed only on the non-secure side.

PART 3 EXECUTION

3.1 INSTALLATION

Frames shall be installed plumb, level, and rigid in accordance with ANSI/SDI A250.11 and with HMMA 840. Doors shall be installed in accordance with HMMA 840.

Coordinate with all wall construction types for proper anchor placement.

Install roll formed steel reinforcement channels between two abutting frames and anchor frames to structure and floor.

Contractor shall protect doors and frames as necessary during construction of the Project.

3.2 CLEARANCES AND TOLERANCES

Clearances between the door and frame head and jambs shall be 1/8 of an inch. Clearances between the meeting edges of pairs of doors shall be 3/16 of an inch plus or minus 1/16. Maximum diagonal distortion shall be 1/8 of an inch, measured with straight edge, from corner to corner. Clearance between the face of the door and the door frame stops shall be 1/16 to 1/8 of an inch.

3.3 ADJUSTING DOORS

Adjust hardware for smooth and balanced door movement.

***** END OF SECTION *****

SECTION 08200

WOOD DOORS AND FRAMES

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section covers furnishing and installing wood doors as indicated on the Drawings and as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
06100	Rough Carpentry
07900	Caulking and Sealants
08700	Finish Hardware

1.3 REFERENCES

This Section references the latest revisions of the following documents:

<u>Reference</u>	<u>Title</u>
ANSI/WDMA I.S. 1A-21	Interior Architectural Wood Flush Doors

1.4 QUALITY ASSURANCE

Wood doors shall conform to the applicable requirements of the Window and Door Manufacturer's Association publication I.S. 1A-21.

1.5 REGULATORY REQUIREMENTS

Conform to applicable Building Codes for frame and door requirements.

1.6 SUBMITTALS

- A. Guarantee: Prior to Acceptance of the Work, furnish a duly executed Manufacturer's door guarantee for the "life of the original installation" for interior doors, including provisions for replacement plus re-hanging and re-finishing of defective doors, at no additional cost to the Owner.
- B. Shop Drawings: Submit shop drawings in accordance with the General Conditions. Show construction, dimensions, cutouts, preparation for hardware and preparation for glazing and louvers, where indicated or

scheduled. Identify doors by both Door Schedule and Hardware Schedule numbers. Provide manufacturer's brochures describing maintenance recommendations.

- C. Certificate: Submit letter from Fabricator stating that doors have been tested and conform with the specified standards of the WDMA.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

The wood doors shall be as manufactured by Vancouver Door Company, Lynden Door Company, or approved.

2.2 FLUSH SOLID CORE DOORS

- A. Provide Vancouver Door Company "520P," or approved. Provide doors fabricated in 5 ply or 7-ply constructions to meet or exceed NWWDA IS 1 A 97 and Architectural Woodwork Institute Quality Standard 1300 PC5 or PC7. Provide edge members in species to match veneers. No exposed "finger" joints or splices shall be allowed at any exposed side edges.
- B. FACE VENEERS
 - 1. Provide NWWDA IS 1 "Premium" Grade veneers of rotary cut Red Oak flitches matched for uniform color and similar figure; minimum 1/50-inch thick after sanding, unless otherwise noted.
- C. FINISH
 - 1. CLEAR SANDING SEALER: Alkyd-based clear wood sealer. Benjamin Moore Sanding Sealer No. 413, Kelly-Moore 2164 EZ Sand Alkyd Q D Sealer, Sherwin-Williams Sanding Sealer B26V43, or equal.
 - 2. CLEAR SATIN VARNISH: Acrylic-based polyurethane varnish. Benjamin Moore Polyurethane No. 423, Kelly-Moore 2097 Acrylic Urethane, Sherwin-Williams Polyurethane A68, or equal.

PART 3 EXECUTION

3.1 FABRICATION

Fabricate doors specified hereinbefore and scheduled on the drawings to accurate sizes with the following tolerances: thickness within a tolerance of plus or minus 1/16-inch; squareness within a tolerance of 1/8-inch when all corners are

measured on a diagonal, in accordance with NWWDA I.S. 1. Allow no bow or twist exceeding 1/4-inch in the plane of the door when measured in accordance with NWWDA IS 1.

3.2 PRE-FITTING

Prefit swinging doors in frames within plus or minus 1/32 inch to standard clearance allowances of 1/8 inch at the top and on each side, and 1/2 inch at the bottom, except where thresholds, undercuts or other deviations from standard fit are noted.

Install fire-rated doors in accordance with NFPA 80.

3.3 EDGE MATCHING

Bevel lock and hinge edges 1/8-inch in 2-inches on all single acting doors.

3.4 PREPARATION FOR HARDWARE

Locations for hardware are specified elsewhere. Make all hinge mortises 1/32 inch larger in height and width than actual hardware information, with a depth tolerance of plus 1/32 inch, minus 0. Make mortises for locking and latching device plates 1/64 inch larger in width and height, with a tolerance of plus 1/64 inch, minus 0. Make depth of face plate mortises sufficient to furnish flush or slightly below flush surface when installed. Make clearances for mortise lock cases 1/16 inch overall in width and height and 1/8 inch in depth. In addition, mortising machining radius shall be permitted at the top and bottom. Make notching in height for unit, mono, or slot-type locks similar to other locks to furnish a snug fit. Make depth of cut within a tolerance of plus 1/4 inch, minus 0. Make borings for cylindrical or cross-bored type locks to furnish 1/16 inch clearance of latch bolt and 1/8 inch for lock case. Make mortises for door control hardware within a tolerance of plus 1/16 inch, minus 0. Machine stile and rail edges of doors scheduled for door bottoms and seals as required for installation of hardware specified elsewhere.

3.5 CUTOUTS

Make all cutouts in door faces required for installation of glazing and louvers, as scheduled on the drawings. Provide steel stops, moldings and accessory items required for installation of glazing.

3.6 FINISHING

After fabrication, premachining, prefittting and preparing doors for hardware, fine sand and clean all surfaces including cutouts and moldings. Seal all four edges of each door and all edges of cutouts. Provide clear finish on doors, pre-finished in the plant of the Manufacturer, or in a shop specializing in the application of finishes for architectural woodwork. Wipe wood filler at open grain species, apply clear sanding sealer, finish with 2 coats satin varnish.

***** END OF SECTION *****

SECTION 08312

ROOF ACCESS HATCHES

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section consists furnishing and installing roof access hatches and accessories as shown on the Plans and as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
05500	Miscellaneous Metal Fabrications
07900	Caulking and Sealants

1.3 QUALITY ASSURANCE

Access hatches shall be guaranteed against defects in material and/or workmanship for a period of 10 years by the manufacturer.

1.4 EQUIPMENT LIST

The metal access hatches to be installed are as follows:

<u>Location</u>	<u>Clear Opening</u>
Inventory Room	36" x 36"

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

Metal access hatches shall be as manufactured by Bilco, Babcock Davis, or equal.

2.2 ROOF ACCESS HATCH

Roof access hatches shall be the Bilco E-50 series, or equal. Hatch covers shall be 11-gauge aluminum with a minimum 3" beaded flange and a heavy extruded EPDM rubber gasket bonded to the cover interior. Cover shall be rigid, true and flat to assure a continuous seal when gasket is compressed to the top surface of the curb.

Cover insulation shall be 1" thick fiberglass; fully covered and protected by an 18-gauge aluminum liner.

Curb shall be 12" in height and of 11-gauge aluminum with a 3-1/2" flange with 7/16" holes provided for securing to the roof deck. The curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners.

Lifting mechanisms shall include compression spring operators enclosed in telescopic tubes to control cover operation throughout the entire arc of opening and closing.

All hardware shall be Type 316 stainless steel. Covers shall be equipped with a spring latch with interior and exterior turn handles and hatches shall be equipped with interior and exterior padlock hasps. Covers shall automatically lock in the open position with a rigid hold open arm equipped with a 1" diameter red vinyl grip handle to permit easy release for closing.

Roof access hatches shall be provided with the manufacturer's safety railing system and a retractable safety post with a minimum extension length of 42-inches, equipped with a pull up loop and release rod with a vinyl lift handle.

PART 3 EXECUTION

3.1 EXAMINATION

Prior to the work, the Contractor shall be responsible to examine the substrates and openings for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected based on manufacturer's requirements.

3.2 INSTALLATION

Install products in strict accordance with manufacturer's instructions and approved submittals. Locate units level, plumb, and in proper alignment with adjacent work.

Test units for proper function and adjust until proper operation is achieved. Repair finishes damaged during installation and restore finishes so no evidence remains of corrective work.

3.3 ADJUSTING AND CLEANING

Clean exposed surfaces using methods acceptable to the manufacturer which will not damage finish.

***** END OF SECTION *****

SECTION 08630

ALUMINUM BALLISTICS RESISTANT WINDOW ASSEMBLY

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section consists of furnishing and installing Level 3 ballistics resistant window assemblies complete with related components as shown on the Plans and as specified herein.

1.2 RELATED SECTIONS

<u>Section</u>	<u>Item</u>
01300	Submittals
07900	Caulking and Sealants

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. STANDARDS

Provide bullet resistant framing and Level 3 bullet resistant acrylic glazing as designated by UL 752.

Aluminum framing members shall be certified to ASTM B221 per the Associated Laboratories Incorporated (ALI) guidelines.

B. TESTING

Provide test reports from an independent testing laboratory certifying performance of framing system for rate of air infiltration (ASTM E283), water resistance (ASTM E331) and structural performance (ASTM E330) indicated in AAMA Publication 101. Test samples shall comply with requirements in AAMA 101 for test samples size and methods.

Provide test reports from an independent testing laboratory certifying performance of window system for ballistic resistance rating (UL 752).

1.4 SUBMITTALS

A. PRODUCT DATA

Provide product data for each type of product required.

B. SHOP DRAWINGS

Submit shop drawings that include plans, window schedule, sections, and details. Identify and label all proposed components, including those that are not supplied by the window manufacturer.

C. TEST REPORTS

Test reports that show compliance with specified performance requirements.

1.5 STORAGE AND HANDLING

Store materials and accessories away from exposure to environmental conditions that may be harmful to materials.

Store products off ground and in an upright position. Provide cover from weather and construction activity.

1.6 WARRANTIES

The Contractor shall submit a written warranty, executed by the window framing manufacturer, agreeing to repair or replace units that fail in materials or workmanship for a period of 10 years. Materials and labor are to be covered in full by the manufacturer.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

The ballistics resistant window assemblies shall be as manufactured by Armortex, Quikserv, or approved equal.

2.2 FIXED FRAME WINDOWS

A. ALUMINUM EXTRUSIONS

Framing members shall be of 6061-T6 aluminum per ASTM B221. Sight lines shall be a maximum of 2”.

B. FINISH

All exposed areas of aluminum windows and components shall be finished with electrolytically deposited color in accordance with Aluminum

Designation AA-M12-C22-A42/44. Color shall be clear anodized.

C. GLASS AND GLAZING MATERIALS

Provide the manufacturer's high visible light transmission acrylic glass coated with their standard abrasion resistant finish. The certified ballistic protection shall be rated as Level 3 in compliance with UL 752. Overall thickness shall be at minimum 1-1/4-inch.

2.3 INTERIOR TRANSACTION WINDOWS

A. ALUMINUM EXTRUSIONS

Framing members shall be of 6061-T6 aluminum per ASTM B221. Sight lines shall be a maximum of 2".

B. FINISH

All exposed areas of aluminum windows and components shall be finished with electrolytically deposited color in accordance with Aluminum Designation AA-M12-C22-A42/44. Color shall be clear anodized.

C. GLASS AND GLAZING MATERIALS

Provide the manufacturer's high visible light transmission acrylic glass coated with their standard abrasion resistant finish. The certified ballistic protection shall be rated as Level 3 in compliance with UL 752. Overall thickness shall be at minimum 1-1/4-inch.

D. ACRYLIC SPACERS

1-inch acrylic spacers shall be provided between overlapping acrylic sections. The quantity and spacing shall be determined by the manufacturer.

E. CUSTOM DEAL TRAYS

Provide stainless steel deal trays at each baffle interior transaction window. Custom deal trays shall be per the dimensions shown on the Plans and shall be recessed 1-3/4-inches deep into countertops.

2.4 FABRICATION

Fabricate ballistics resistant assemblies to comply with specified standards. Fixed window assemblies shall ship from factory as a fully fabricated units. Framing members for transaction style windows shall ship from factory as knock-down and ready for installation. Field glaze frame assemblies as required in accordance with reviewed shop drawings.

PART 3 EXECUTION

3.1 INSTALLATION

Comply with manufacturer's specifications and recommendations for installation of framing assembly, hardware, accessories, and other window components.

Install assemblies in framed walls generally in accordance with AAMA 2400 and/or AAMA 2410 as appropriate and as recommend by the manufacturer.

Plumb and align window faces in a single plane for each wall and erect windows and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

Furnish and apply sealants to provide a weathertight installation at all joints and intersections and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.

The Contractor shall not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and after installation of sealants.

The Contractor shall use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.

3.2 ADJUSTING

After completion of window installation, windows shall be inspected, adjusted, and put into working order.

3.3 CLEANING

Protect glass from contact with contaminating substances resulting from construction operations. Remove any such substances by method approved by glass manufacturer.

Wash glass on both faces not more than four days prior to date scheduled for inspections intended to establish date of substantial completion. Wash glass by method recommended by glass manufacturer.

***** END OF SECTION *****

Northshore Utility District

2023-01 – Building “A” Improvements

G&O #18601

08630-5 – Aluminum Ballistics

Resistant Window Assembly

SECTION 08810

GLAZING

PART 1 GENERAL

1.1 SCOPE

The Contractor shall furnish and install glazing in door relite frames and borrowed lite frames as shown on the Plans and as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
08110	Hollow Metal Doors and Frames

1.3 REFERENCES

“Glazing Sealing Systems Manual and Glazing Manual,” issued by the Flat Glass Marketing Association, latest edition, hereinafter called “FGMA.”

1.4 STANDARDS

Insulated glass units shall be certified to ASTM E2188/E2190 per the Associated Laboratories Incorporated (ALI) guidelines. Units shall be NFRC certified with a temporary U-factor label applied to the glass and an NFRC tab added to the permanent AAMA frame label.

Tempered glazing shall meet the requirements of ASTM C1048 and ANSI Z97.1

1.5 LABELS

Except where cutting of glass makes this requirement impossible, labels showing manufacturer’s name, quality of glass, and thickness of glass required, shall be furnished on each piece of glass.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

Glass manufacturers shall be Pilkington, Vitro Architectural Glass, Guardian Glass, or equal.

2.2 GENERAL

Except as specifically noted herein, the Contractor shall furnish glass conforming to Federal Specifications DD-G-00451b (GSA-FSS).

2.3 TEMPERED PLATE GLASS

Provide 1/2-inch-thick double pane, 1/2-inch argon filled gap, Low-e (0.1) clear type tempered plate glass of glazing quality for all exterior vertical applications. Interior glass shall be 1/4-inch-thick double pane, 1/4-inch gap clear type tempered plate glass. Exterior and interior glazing shall comply with all requirements of the International Building Code.

2.4 SAFETY AND SECURITY FILM

Provide a security glazing film at existing interior doors and relites as shown on the Plans. Films shall be certified to protect against break and entry in accordance with UL 972. The film construction shall be single ply and at have a minimum thickness of 4 mil. Protective window films shall be of S40 type as manufactured by 3M, or approved equal.

2.5 SETTING MATERIALS AND ACCESSORIES

The Contractor shall provide setting blocks, gaskets, clips, shims, and beads, as applicable; and provide tapes, compressible foam, and glazing sealants, as recommended by the Window Manufacturer, and in accordance with FGMA Standards.

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall install glazing in accordance with manufacturer's directions and FGMA Standards. Do not glaze in rainy weather without adequate overhead cover, nor at temperatures below 40 degrees F.

3.2 PREPARATION

The Contractor shall measure carefully prior to any cutting and fabricating and shall remove all rivet, screw, bolt or nail heads, welding fillets, or other projections from specified clearances in glazing rabbet.

3.3 GLASS POSITIONING

Center in rabbet to maintain noted clearances on all four sides, indoors and out. Set sheet glass with waves or draw horizontally. Clearance shall be in accordance with manufacturer's recommendations for size and thickness.

3.4 GLAZING

A. GENERAL

Sizes necessary to provide the required edge clearances shall be determined by measuring the actual opening to receive glass. Labels shall be left in place until the installation is approved. Movable items shall be secured, fixed, or in a closed and locked position until glazing compound has set. Preparation of surrounds and glazing, unless otherwise indicated or approved, shall be in conformance the FGMA Glazing Manual and the sealing methods recommended for the application in the FGMA Glazing Sealing Systems Manual.

Apply heal bead of sealant continuously at sill and not less than 5 inches up each jamb. Install compression gasket on interior or exterior, and apply removable stop. Complete sealant application in accordance with manufacturer's recommendations.

B. TEMPERED GLASS

Premeasure and cut tape to lengths required. Adhere to fixed stops, setting tape at heads and sills before jambs. Install tape with butt joints; no overlaps shall be permitted. Set tapes straight and level with sight line of interior or exterior stops, as required. Position glass against tapes forming uniform seals.

***** END OF SECTION *****

DIVISION 9

FINISHES

SECTION 09250

GYPSUM WALLBOARD

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section consists of all labor, materials, and equipment for all gypsum wallboard, zinc-coated trim, taping, spackling, and texturing necessary to complete all the work indicated on the Plans and as specified. The work shall include installation of gypsum board, exterior and interior grounds, corner beads, taping, spackling, sanding, and texturing of all joints and screw heads to obtain finished walls ready for painting.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals

1.3 REFERENCES

This Section references the latest revisions of the following documents:

<u>Reference</u>	<u>Title</u>
ASTM C36	Specification for Gypsum Wallboard
ASTM C79	Test Method for Gypsum Wallboard
ASTM C514	Specification for Nails for the Application of Gypsum Wallboard
ASTM C630	Specification for Water-Resistant Gypsum Backing Board
ASTM C840	Specification for Application and Finishing of Gypsum Wallboard
ASTM C1002	Specification for Steel Drill Screws for the Application of Gypsum Wallboard
ASTM C1047	Specification for Accessories for Gypsum Wallboard
UL752	Standard for Bullet Resisting Equipment

1.4 QUALITY ASSURANCE

Unless otherwise noted, all gypsum wallboard products and joint treatment products shall be obtained from a single manufacturer.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

Gypsum wallboard products and joint treatment products shall be as manufactured by the National Gypsum Company, Georgia Pacific, the USG Group, or approved equal.

2.2 GYPSUM WALLBOARD

Gypsum wallboard shall ASTM C1396, Type X. Thickness shall be 5/8 inch.

2.3 TRIM ACCESSORIES

Provide manufacturer's standard trim accessories of types indicated for drywall work, formed of galvanized steel unless otherwise indicated, with either knurled and perforated or expanded flanges for fastening and beaded for concealment of flanges in joint compound. Provide corner beads, L-type edge trim-beads, U-type edge trim-beads, and one-piece control joint beads. Unless specifically noted as "exposed," all trim accessories shall be beaded type to be concealed with joint compound.

2.4 JOINT TREATMENT MATERIALS

Provide materials complying with ASTM C475, ASTM C840 and recommendations from the Manufacturer for the applications indicated. Provide 2-1/2-inches wide, perforated tape for joints. Provide two separate grades of ready-mixed, vinyl-type joint compound. One type shall be for bedding tapes and filling depressions. The second type shall be for taping and sanding.

2.5 FASTENERS

Screws shall conform to ASTM C1002 with heads, threads, points, and finish as recommended by the manufacturer.

PART 3 EXECUTION

3.1 GENERAL

All workmanship and materials shall be of the best quality and any defective work shall be removed and replaced by the Contractor at no additional expense to the Owner. Keep the premises free of accumulations of debris and dust connected with this work and protect adjacent finished surfaces from damage by this work. The Contractor shall establish and maintain application and finishing environment

in accordance with ASTM C840. For non-adhesive attachment of gypsum wallboard to framing, maintain not less than 40 degrees F.

3.2 INSTALLATION

All drywall sheets shall be set with staggered joints and screws set deep enough to receive a cover of spackle, spaced in accordance with Wallboard Manufacturer's standard specifications. Install approved zinc-coated trim beads at all openings, corners, and terminations of wallboards. Cut all wallboard close to and around wall penetrations and electrical outlets. Provide a complete, covered installation in all areas where gypsum wallboard is to be installed.

3.3 FINISHING

After the wallboard has been installed, it shall be finished. Apply joint compound or bedding compound and embed tape leaving uniform thickness of materials underneath tape. Cover screw heads smooth with finished surface of board after each application of joint material. After initial application has been complete, it shall be allowed to dry and then sanded smooth.

Additional coats of joint compound shall be applied and finish sanded until a Level 5 finish has been achieved in accordance with ASTM C840.

Obtain Owner's approval prior to applying paint.

3.4 ESCUTCHEONS

Provide escutcheons around all pipe, conduit, and similar types of penetrations through gypsum wallboard walls and ceiling.

***** END OF SECTION *****

SECTION 09260

LAMINATED WALL AND CEILING PANELS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the laminated ceiling panels and necessary fasteners and accessories shown on the Plans and as specified herein. The work shall include all labor, materials, and equipment for the complete installation and finished appearance of the laminated panels.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
07900	Caulking and Sealants

1.3 REFERENCES

This Section references the latest revisions of the following documents:

<u>Reference</u>	<u>Title</u>
ASTM E84	Flame Spread
ASTM D570	Water Absorption
ASTM D648	Heat Deflection temperature
ASTM D695	Compressive Strength
ASTM D696	Coefficient of lineal thermal expansion
ASTM D790	Flexural modulus
ASTM D2240	Shore hardness
ASTM D3029	Dart drop impact Strength

1.4 QUALITY ASSURANCE

All laminated products and accessories, shall be obtained from a single manufacturer.

1.5 SUBMITTALS

Comply with provisions of Section 01300.

A. **PRODUCT DATA**

Submit manufacture's technical data and installation sheets for project compliance.

B. **PRODUCT SAMPLES**

Submit available product finishes and color for Owner's selection.

1.6 DELIVERY, STORAGE, AND HANDLING

Handle and store product with care, and in accordance with manufacturer's instructions to avoid warps, gouges and scratches to panels. Panels shall be stored on a clean, dry surface.

Time delivery and installation of product to avoid extended on-site storage and to avoid delaying work of other trades.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

Subject to compliance with requirements, manufacturers which may be incorporated in the work include, but are not limited to, the following:

Crane Composites; www.cranecomposites.com

2.2 PRODUCT

Laminated ceiling panels shall be Kemply fluted polypropylene clad with a glasbord smooth textured skin.

The plastic laminate shall comply with the following:

Flame Spread, ASTM E84: Class C
Water Absorption, ASTM D570: .75%
Heat Deflection Temperature, ASTM D648: 130 degrees F
Tensile Strength, ASTM D638: 7,000 psi
Flexural Modulus, ASTM D790: 75,000

Thickness and Size: Nominal panel thickness shall be 0.32"; 24 x 48 minimum size

Texture and Color: Texture: Glasboard smooth
 Color: Matte/Bright White

Owner may change finish and color based on available finish and color samples submitted.

2.3 TRIM ACCESSORIES

Provide manufacturer's standard moldings: inside corner (isc); outside corner (osc); divider; and cap, as required for a complete finished appearance.

Utilize manufacturer's two-piece molding at all abutting panel seams.

Provide necessary caulking and sealants in conjunction with moldings per manufacturer's recommendations.

2.4 FASTENING/SUPPORT

Panels shall be fastened with nylon rivet mechanical fasteners or per Manufacturer's requirements spanning over grid of 7/8" deep, 20 gauge hat channel installed a minimum of 16-inches on center.

Hat channel shall be by Clark Dietrich, or equal.

PART 3 EXECUTION

3.1 GENERAL

All workmanship and materials shall be of the best quality and any defective work shall be removed and replaced by the Contractor at no additional expense to the Owner. Keep the premises free of accumulations of debris and dust connected with this work and protect adjacent finished surfaces from damage by this work.

3.2 INSTALLATION

Prior to installation, panels shall be preconditioned for 24 hours at temperature and moisture level typical for the area of installation. Install panels directly over framing with maximum spacing at 16-inch o.c. Provide additional framing as required. Support Framing shall be structurally sound, level and true. Provide 1/8-inch to 3/16-inch clearance between the top and bottom of panels to allow for movement. Cut and prefit panels as required.

For adhesives, fasteners, and sealants follow manufacture's instructions. After panels are installed with adhesive, install rivets starting from the center of panel.

Work outwards securing the perimeter last. Arrange fasteners on 16-inch centers with outer fasteners placed about 1 inch from panel edges. Stagger rivet rows on 8-inch centers.

***** END OF SECTION *****

SECTION 09280

TRANSLUCENT RESIN PANELS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section consists of furnishing and installing translucent resin panel systems complete with related components as shown on the Plans and as specified herein.

1.2 RELATED SECTIONS

<u>Section</u>	<u>Item</u>
01300	Submittals
07900	Caulking and Sealants

1.3 REFERENCES

This Section references the latest revisions of the following documents:

<u>Reference</u>	<u>Title</u>
ASTM D638	Plastics Tensile Strength
ASTM D790	Flexural Test of Plastics and Composites
ASTM D256	Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics

1.4 QUALITY ASSURANCE

The materials of the resin panels shall allow for a minimum light transmission of 92 percent through the clear resin portion. The resin shall not yellow or degrade with exposure to sunlight.

Panels shall exhibit a minimum tensile modulus of 490,000 psi and a minimum tensile strength of 11,000 psi. Provide test reports from an independent testing laboratory certifying performance of resin panels for tensile strength and modulus (ASTM D638).

1.5 SUBMITTALS

Submit shop drawings and product data under provisions of Section 01300.

Indicate panel configuration, anchor types and spacing, trim pieces locations, reinforcement, and finish.

1.6 STORAGE AND HANDLING

Deliver no components to project site until areas are ready for installation. All materials shall be handled in a manner which prevents damage to finished surfaces and edges.

Store components indoors where conditions are controlled to avoid exposure to moisture and ultraviolet light. Allow the resin fabrications to reach room temperature before installation.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

The translucent resin panel systems shall be as manufactured by Lumicor (Renton, WA). No others will be allowed.

2.2 SYSTEMS

A. NATURAL RESIN DECOR PANELS

Natural-style panels consist of colorful grasses and reeds that have been harvested and utilized in the resin panel design.

Panels shall be 1/4-inch thick. Pattern shall be “Madagascar”.

B. METALLIC RESIN DECOR PANELS

Metallic-style panels consist of repeating pattern of open ovals thru aluminum.

Panels shall be 1/4-inch thick. Pattern shall be “Large Ovalesque”.

Metallic resin panels shall be installed over Arborite plastic laminate color “Pewter”, P999, in standard finish Cashmere (CA).

2.3 ACCESSORIES

Manufacturer’s standard aluminum trim profiles for top cap, inside and outside corners, and divider bars. 3M contact adhesive and clear silicone caulk.

PART 3 EXECUTION

3.1 INSTALLATION

Comply with manufacturer's specifications and recommendations for installation of panel assemblies, anchorage, hardware, and trim accessories.

3.2 CLEANING

Protect panels from contact with contaminating substances resulting from construction operations. Remove any such substances by method approved by manufacturer.

Wash exposed face not more than four days prior to date scheduled for inspections intended to establish date of substantial completion. Wash method recommended by manufacturer.

***** END OF SECTION *****

SECTION 09510

ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section shall include all labor, material, equipment, and incidentals as required furnishing and installing the following:

- A. Acoustical ceiling panels.
- B. Exposed grid suspension system including, but not necessarily limited to, wire hangers, fasteners, main runners, cross tees and wall angle moldings.
- C. Coordinate acoustical ceiling and wall work with related work including, but not necessarily limited to, building insulation, gypsum wallboard, mechanical systems and electrical systems.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals

1.3 REFERENCES

This Section references the latest revisions of the following documents:

<u>Reference</u>	<u>Title</u>
ASTM C423	Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
ASTM C635	Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings
ASTM C636	Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels
ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM E413	Standard Classification for Determination of Sound Transmission Class
ASTM E1264	Standard Classification for Acoustical Ceiling Products

1.4 QUALITY ASSURANCE

To ensure proper interface and color match, all acoustical panel units and grid components shall be produced and supplied by a single manufacturer. Provide acoustical panel units that are identical to those tested for the following fire performance characteristics, per ASTM test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting agency. The acoustical panel units shall be tested per ASTM E84, comply with ASTM E1264 for Class A products and have the following surface burning characteristics:

- A. Flame Spread: 25 or less
- B. Smoke Developed: 50 or less

PART 2 PRODUCTS

2.1 GENERAL

Provide Manufacturer's standard units of configuration, as shown on the Plans that comply with ASTM E1264 classifications as designated by reference to types, patterns, acoustical ratings and light reflectance, unless otherwise indicated.

2.2 ACOUSTICAL CEILING PANELS

For all office areas, acoustical ceiling panels shall match the Owner's existing standard and shall be the Radar Basic Panel (R2310) with standard square edge profile as manufactured by USG Interiors, LLC. No others will be allowed.

For Lobby Ceilings, acoustical ceiling panels shall be the Radar Basic Panel (R2320) with the shadowline tapered edge profile as manufactured by USG Interiors, LLC. No others will be allowed.

Panel sizes shall be nominally 24" x 48" x 5/8" with partial panels as shown on reflected ceiling Plans and/or as required for optimized grid layouts. Field panels shall not be less than one-half full size. Panel ASTM E1264 classification shall be Type III, Form 2.

Color shall be white, unless otherwise indicated on the Plans.

2.3 EXPOSED CEILING SUSPENSION SYSTEM

The suspension system shall be DX series exposed tee grid as manufactured by USG Interiors, LLC. All grid components shall be electro-galvanized or hot dipped galvanized, then protective conversion-coated. Tees shall be double-web steel construction with 15/16 inch type exposed flange design, conforming to ASTM C635 for direct hung installation.

The Structural Classification of the suspension system shall be intermediate duty and shall carry a minimum of 12 lbs. per linear foot. The web heights on main beams shall be 1-1/2 inch with a minimum 1-3/8 inch on the cross tees. Each exposed bottom flange shall be continuous with unbroken roll-formed caps, made from steel, running the length of the member. Cross tees shall be rotary stitched for added column strength. Wall moldings shall be angle molding having a nominal 15/16-inch exposed flange, made from 0.019-inch nominal steel. Hanger wire shall be galvanized carbon steel per ASTM A641, soft temper, prestretched, with a yield stress load of at least three times the design loads, but not less than 12-gauge (0.106-inch) diameter.

2.4 EXTRA MATERIALS

The Contractor shall furnish the extra materials described below to match the products installed, packaged with a protective coating for storage, and identified with appropriate labels.

A. ACOUSTICAL CEILING PANELS

Provide additional quantity of full-size units equal to 2 percent of the amount installed.

B. SUSPENSION SYSTEM

Provide twenty pieces each of 4-foot-long tees and 2-foot-long tees.

PART 3 EXECUTION

3.1 GENERAL

All acoustical materials and suspension systems shall be installed in strict accordance with the Manufacturer's printed instructions and current recommendations, and in compliance with ASTM C636 and the governing code of jurisdiction.

3.2 INSTALLATION

Arrange acoustical panels and orient directionally patterned panels (if any) in a manner shown by reflected ceiling plan. Install panels with pattern running in one direction.

Suspend main beams from overhead construction with 12-gauge hanger wires spaced 4 feet on center along the length of the main runner, leveling to a tolerance of 1/8 inch in 12 feet. Install hangers plum and free from contact with insulation or other objects within the ceiling space that are not part of the supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

Secure wire hangers by looping and wire-tying, either directly to structures that are secure and appropriate for substrate and in a manner that will not cause them to deteriorate, or otherwise fail due to age, corrosion or elevated temperatures.

Install edge moldings at the intersection of the suspended ceiling and all vertical surfaces. Screw-attach moldings to substrate at intervals not over 16-inch on center, leveling with the suspended ceiling to a tolerance of 1/8 inch in 12 feet. Miter corners where wall moldings intersect or install corner caps.

***** END OF SECTION *****

SECTION 09653

RESILIENT WALL BASE

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the resilient base material and accessories as shown on the Plans and as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
09250	Gypsum Wall Board

1.3 SUBMITTALS

A. PRODUCT DATA

Rubber Wall Base.

B. SAMPLES FOR INITIAL SELECTION

Manufacturer's standard sample sets consisting of sections of units showing the full range of colors and patterns available for each type of product indicated.

C. SAMPLES FOR VERIFICATION

In manufacturer's standard sizes, but not less than 12 inches (300 mm) long, of each product color and pattern specified.

1.4 QUALITY ASSURANCE

A. INSTALLER QUALIFICATIONS

Engage an experienced installer to perform work of this Section who has specialized in installing resilient products similar to those required for this Project and with a record of successful in-service performance.

B. SOURCE LIMITATIONS

Obtain each type and color of product specified from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to Project site in manufacturer's original, unopened cartons and containers, each bearing names of product and manufacturer, Project identification and shipping and handling instructions.
- B. Store products in dry spaces protected from the weather, with ambient temperatures maintained between 50 and 90 degrees F (10 and 32 degrees C).
- C. Move products into spaces to lay flat where they will be installed at least 48 hours before installation with HVAC systems active, unless longer conditioning period is recommended in writing by manufacturer.

1.6 PROJECT CONDITIONS

- A. Maintain a temperature of not less than 70 degrees F (21 degrees C) or more than 95 degrees F (35 degrees C) in spaces to receive resilient products for at least 48 hours before installation, during installation, and for at least 48 hours after installation, unless manufacturer's written recommendations specify longer time periods. After post-installation period, maintain a temperature of not less than 55 degrees F (13 degrees C) or more than 95 degrees F (35 degrees C).
- B. Do not install products until they are at the same temperature as the space where they are to be installed.

PART 2 PRODUCTS

2.1 RESILIENT WALL BASE

A. RUBBER WALL BASE

Products complying with ASTM F1861, Type TP, Group 1.

2.2 MANUFACTURERS

A. AVAILABLE PRODUCTS

Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:

1. Products

- a. Roppee Corporation
- b. Burke
- c. Tarkett

2. Color and Pattern

As selected by Owner from manufacturer's full range of colors and patterns produced for rubber wall base complying with requirements indicated.

- a. Allow one color.

3. Style: Cove with top-set toe.

4. Minimum Thickness: 1/8 inch (3.2 mm).

5. Height: 4 inches (101.6 mm).

6. Lengths: Coils in lengths standard with manufacturer, but not less than 96 feet (29.26 m).

7. Outside Corners: Formed on job.

8. Inside Corners: Formed on job.

9. Ends: Premolded.

10. Surface: Smooth.

2.3 RESILIENT ACCESSORIES

A. RUBBER ACCESSORIES

Provide necessary accessories as required per manufacturer's recommendations.

2.4 INSTALLATION ACCESSORIES

A. TROWELABLE LEVELING AND PATCHING COMPOUNDS

Latex-modified, portland-cement-based formulation provided or approved by resilient product manufacturer for applications indicated.

B. ADHESIVES

Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

PART 3 EXECUTION

3.1 EXAMINATION

Examine substrates, areas, and conditions where installation of resilient products will occur, with Installer present, for compliance with manufacturer's requirements, including those for maximum moisture content. Verify that substrates and conditions are satisfactory for resilient product installation and comply with requirements specified. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. GENERAL

Comply with manufacturer's written installation instructions for preparing substrates indicated to receive resilient products.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.

C. Remove coatings, including curing compounds and other substances that are incompatible with adhesives and that contain soap, wax, oil or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

- D. Broom and vacuum clean substrates to be covered immediately before installing resilient products. After cleaning, examine substrates for moisture, alkaline salts, carbonation or dust. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. GENERAL

Install resilient products according to manufacturer's written installation instructions.

- B. Apply resilient wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas as scheduled.
 - 1. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned. Minimum length for fill-in pieces along a run of wall shall be 48-inches.
 - 2. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
 - 3. Do not stretch base during installation.
 - 4. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
 - 5. Form outside corners on job, from straight pieces of maximum lengths possible, without whitening at bends. Shave back of base at points where bends occur and remove strips perpendicular to length of base that are only deep enough to produce a snug fit without removing more than half the wall base thickness.
 - 6. Form inside corners on job, from straight pieces of maximum lengths possible, by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate.

- C. Place resilient products so they are butted to adjacent materials and bond to substrates with adhesive. Install reducer strips at edges of flooring that would otherwise be exposed.

3.4 CLEANING AND PROTECTING

- A. Perform the following operations immediately after installing resilient products:
 - 1. Remove adhesive and other surface blemishes using cleaner recommended by resilient product manufacturers.
 - 2. Sweep or vacuum horizontal surfaces thoroughly.
 - 3. Do not wash resilient products until after time period recommended by resilient product manufacturer.
 - 4. Damp-mop or sponge resilient products to remove marks and soil.
- B. Protect resilient products against mars, marks, indentations and other damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods recommended in writing by resilient product manufacturer.
- C. Clean resilient products not more than 4 days before dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean products according to manufacturer's written recommendations.

***** END OF SECTION *****

SECTION 09775

FIBERGLASS WALL FINISH

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes, but is not necessarily limited to, furnishing and installation of all fiberglass wall finish, and accessories as indicated on the Drawings and specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
09250	Gypsum Board

1.3 REFERENCES

This Section references the latest revisions of the following documents:

<u>Reference</u>	<u>Title</u>
ASTM D2583	Standard Test Method for Indentation Hardness of Rigid Plastics by Means of Barcol Impressor; 2013a
ASTM D5319	Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels; 2017
ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a
NSF 53	High Pressure Decorative Laminates for Surfacing Food Surface Equipment; 2017
UL (GGG)	GREENGUARD Gold Certified Products

1.4 DELIVERY AND STORAGE OF MATERIALS

All materials shall be inspected immediately upon delivery and defects rejected. Remove panels from shipping skid and restack on a solid, flat, dry surface. Do not stack on fresh concrete floors or other surfaces that may emit moisture. Lay panels flat. Do not store on edge. Panels should be acclimated at least 24 hours in temperature and humidity conditions approximating the operating environment of the finished room.

1.5 SUBMITTALS

Submit brochures indicating all specified products including accessory items proposed for use. Include manufacturer's current installation instruction with submittal.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

Crane Composites, Inc., Koroseal Wall Protection Systems, Marlite, Inc., Panolam Surface Systems, or approved equal.

2.2 MATERIALS

Fiberglass reinforced plastic (FPR), complying with ASTM D5319. Maximum flame spread index of 200 and smoke developed index of 450; when tested in accordance with ASTM E84. Scratch resistance; Barcol hardness greater than 25 when tested in accordance with ASTM D2583.

Textured on one side. 0.028 inch normal thickness.

Color as selected by Owner from manufacturer's standard palette.

2.3 MOLDING AND TRIM

All exposed panel edges shall be finished with appropriate one-piece or two-piece brushed stainless steel trim profiles.

2.4 CAULKS AND ADHESIVES

Use only high construction grade adhesive and clear silicone sealant in accordance with manufacturers recommended installation procedures.

2.5 FASTENERS

Non-corroding mechanical truss head nylon drive rivets or stainless steel screws. Fastener holes must be predrilled slightly oversize.

PART 3 EXECUTION

3.1 INSTALLATION

A. WALL PREPARATION

Subwalls must be flat, clean, dry, and free of all dirt, dust, or grease. Prepare wall surfaces in accordance with manufacturer's recommendations.

B. EXPANSION

1/8-inch gap between wall panels for normal expansion and contraction. Allow not less than 1/8-inch gap around pipes, electrical fittings, and other projection. Fill gaps with flexible, silicone based caulking to complete moisture seal.

C. INSTALLATION

Install at wall surfaces as scheduled and otherwise shown on interior elevations, using factory approved panel adhesive and molding trim strips. Use supplemental fasteners only as necessary. Spread adhesive and hang panels in strict accordance with manufacturer's recommendations. Install division strips as work proceeds, installed as directed by Architect; use fasteners at top and bottom edges of panels only as required by panel manufacturer for adhesive application. Properly install panels to achieve a uniformly smooth surface, free from warps and with all paneling firmly attached to substrate. Caulk all corner seams, base junctures, and fastener holes. If defective material is discovered, discard the defective portions.

D. CLEANING UP

After hanging, immediately clean all wall panel surfaces, removing all traces of adhesive and soil and thoroughly washing with clean water. Do not use any other cleaning agent not specifically recommended by manufacturer of wall paneling.

***** END OF SECTION *****

SECTION 09800

HIGH PRESSURE PLASTIC LAMINATE

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes, but is not necessarily limited to, the furnishing and installation of all plastic faced laminate and accessories as indicated on the Drawings and specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
09250	Gypsum Board
09280	Translucent Resin Panels
12356	Plastic Laminate Faced Casework

1.3 REFERENCES

This Section references the latest revisions of the following documents:

<u>Reference</u>	<u>Title</u>
ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials
ISO 4586	High-Pressure Decorative Laminates – Sheets Based on Thermosetting Resins
NEMA LD-3	High Pressure Decorative Laminates
NSF 35	High Pressure Decorative Laminates for Surfacing Food Surface Equipment
UL (GGG)	GREENGUARD Gold Certified Products

1.4 DELIVERY AND STORAGE OF MATERIALS

All materials shall be inspected immediately upon delivery and defects rejected. Remove plastic laminate materials from shipping skid and restack on a solid, flat, dry surface. Do not stack on fresh concrete floors or other surfaces that may emit moisture. Sheets should be acclimated at least 24 hours in temperature and humidity conditions approximating the operating environment of the finished room.

1.5 SUBMITTALS

Submit brochures indicating all specified products including accessory items proposed for use. Include manufacturer's current installation instruction with submittal.

For Owner's color selection, Manufacturer's fan decks of full color and pattern palettes shall be provided on loan. Fan decks shall be returned to Contractor upon selection.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

Arborite, Formica, Wilsonart, or equal.

2.2 MATERIALS

Plastic faced laminate composition shall consist of decorative surface papers impregnated with melamine resins and pressed over kraft paper core sheets formed with phenolic resin. Finished sheets are bonded together under high temperature/pressure with a final sanding of backings to facilitate bonding to substrate. High pressure plastic laminate shall conform to UL GGG sustainable design standards.

Provide the manufacturers color options for each color designation as scheduled on the Plans for selection by Owner.

A. GENERAL PURPOSE (HGS)

All general purpose plastic laminate shall conform to NEMA LD 3. Laminate shall be smooth faced with a minimum nominal thickness of 0.048 inches.

B. VERTICAL SURFACE (VGP)

All vertical surface plastic laminate shall conform to NEMA LD 3. Laminate shall be smooth faced with a minimum nominal thickness of 0.028 inches.

2.3 EDGE BAND

High-pressure decorative laminate complying with NEMA LD 3, Grade VGS.

2.4 ADHESIVES

Use only high construction grade contact adhesive and clear silicone sealant in accordance with manufacturers recommended installation procedures.

PART 3 EXECUTION

3.1 INSTALLATION

A. SURFACE PREPARATION

Surfaces must be flat, clean, dry, and free of all dirt, dust, or grease. Prepare walls, counters, and all other surfaces in accordance with manufacturer's recommendations.

B. INSTALLATION

Install plastic faced laminate at all surfaces as scheduled and otherwise shown on interior elevations, using factory approved contact adhesive. Spray or brush adhesive and secure sheets in strict accordance with manufacturer's recommendations. Properly install laminate to achieve a uniformly smooth surface, free from warps and with all plastic laminate firmly attached to substrate. Caulk all corner seams, base junctures, and fastener holes. If defective material is discovered, discard the defective portions.

C. CLEANING UP

After application, immediately clean all plastic laminate surfaces, removing all traces of adhesive and soil and thoroughly washing with clean water. Do not use any other cleaning agent not specifically recommended by manufacturer of high pressure plastic laminate.

***** END OF SECTION *****

SECTION 09900

PAINTING

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section covers the furnishing and installation of protective coatings, complete-in-place. Regardless of the number of paint coats previously applied, at least two field coats of paint shall be applied to all surfaces unless otherwise specified herein. Field painting is not required for factory prefinished equipment items, however touchup of the factory applied coatings will be required to address any imperfections that result from construction activities.

The word “paint” as used herein shall be taken to include all protective coatings and incidental materials as required with the exception that anodized aluminum or zinc galvanized coatings shall not be considered as paint.

Unless specifically noted otherwise in these Specifications or on the Plans, all work performed under this Contract (both new work and modifications to existing facilities) shall be painted. If an existing wall or ceiling (or similar surface) is modified in some way, the entire wall or ceiling surface is to be painted.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
07900	Caulking and Sealant
08100	Hollow Metal Doors and Frames
09250	Gypsum Wallboard

1.3 REFERENCED STANDARDS

The following standards are referenced and shall be considered a part of these Specifications:

American National Standards Institute (ANSI):

A159.1, Surface Preparation Specifications;

Z53.1, Safety Color Code for Marking Physical Hazards

American Society for Testing and Materials (ASTM):

D4263, Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method

E84, Standard Test Method for Surface Burning Characteristics of Building Materials

National Fire Protection Association (NFPA):

101, Life Safety Code

Steel Structures Painting Council (SSPC):

SP-1, Solvent Cleaning

SP-2, Hand Tool Cleaning

SP-3, Power Tool Cleaning

SP-5, White Metal Blast Clearing

SP-6, Commercial Blast Cleaning

SP-7, Brush-off Blast Cleaning

SP-10, Near-White Blast Cleaning

SP-11, Power Tool Cleaning

SP-13 Surface Preparation for Concrete Surfaces

VIS-89, Visual Standard

1.4 DEFINITIONS

A. PAINT

Includes fillers, primers, sealers, emulsions, oils, alkyds, latex, enamels, thinners, stains, epoxies, vinyls, urethanes, shellacs, varnishes and any other applied coating specified within these Specifications or shown on the Plans.

B. FINISHED ROOM OR SPACE

One that has a finish called for on Room Finish Schedule, or is indicated on the Plans, or is specified herein, to be painted.

C. PAINTING COVERAGE RATE

Coverage's expressed in SF/GAL/coat are the manufacturer's published theoretical coverage's in square feet per gallon per coat.

1.5 SUBMITTALS

In addition to the general submittal requirements listed in Section 01300, the following shall be submitted:

1. Written acknowledgment and certification that products submitted meet requirements of standards referenced in this Section.

2. Manufacturer's application instructions for primer and finish coats.
3. Manufacturer's surface preparation instructions.
4. Manufacturer's full line of color samples for color selection by Owner.
5. If products being used are manufactured by a company other than the specified reference standard, the Contractor must provide a complete comparison of the proposed products with the specified reference products per Part 2.1 requirements, including application procedure, coverage rates, and verification that product is designed for intended use. Information must be provided that demonstrates that manufacturer's products are equal to the performance standards of products manufactured by the Tnemec Company, which is the reference standard.
6. Manufacturer's approval of protective coating systems applicator.
7. List of Applicator's experience and qualifications. A minimum of 5-years of experience in the painting of architectural and commercial facilities required.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

The following is an approved coating systems manufacturers list subject to compliance with the Specifications contained herein:

1. Ameron Protective Coatings Division.
2. Sherwin Williams.
3. Tnemec Company.
4. Or equal.

The specified coating shall be understood as establishing the type and quality of coating desired. Other manufacturers' products will be accepted provided sufficient information is submitted to allow the Engineer to determine that the coatings proposed are equivalent to those named. Proposed coatings shall be submitted for review in accordance with these Specifications. Requests for review of equivalency will not be accepted from anyone except the Contractor, and such requests shall not be considered until after the Contract has been awarded.

No substitutions shall be allowed that change the number of coats, thickness or generic type of paint required. All materials shall be brought to the jobsite in the

original sealed and labeled containers of the paint manufacturer and shall be subject to inspection by the Engineer.

No coating materials other than those specified shall be brought to the jobsite. Thinners, driers and oils brought to the jobsite shall be only those recommended and approved by the paint manufacturer.

All paint shall conform to the applicable air quality regulations at the point of application. Any paint material which cannot be guaranteed by the manufacturer to comply, whether specified by product designation or not, shall not be used.

It shall be the responsibility of the Contractor to ensure the compatibility of the field painting products which will be in contact with each other or which will be applied over shop painted or previously painted surfaces. Paint used in successive field coats shall be produced by the same manufacturer. Paint used in the first field coat over shop painted or previously painted surfaces shall cause no wrinkling, lifting, or other damage to the underlying paint.

Paint shall be lead-free and mercury-free.

Tnemec Company products are the reference standard and Tnemec designations for product type are used herein. Requirements for an approved equal product are listed below:

1. For approval of an equal manufacturer. The Contractor shall provide to the Owner in writing a detailed side-by-side comparison of the proposed equal Products Characteristics, Performance Characteristics, and Application Conditions for each Tnemec coating specified in this specification. For consideration for approval this written comparison shall be certified and notarized by an officer of the proposed manufacturer as true and correct.
2. For Products Characteristics this detailed side-by-side comparison shall include for example, but not limited to, Volume Solids, Weight Solids, VOC, Mix Ratio, Zinc Content in Dry Film (by Weight), Spreading Rate per coat, Drying Schedule, Shelf Life and Flash Point.
3. For Performance Characteristics this detailed side-by-side comparison shall include for example, but not limited to, Abrasion Resistance, Corrosion Weathering, Direct Impact Resistance, Dry Heat Resistance, Flexibility, Moisture Condensation Resistance, Pencil Hardness, Salt Fog Resistance, Slip Coefficient and Wet Heat Resistance
4. In addition to the detailed side-by-side comparison for approval of an equal manufacturer, The Contractor shall provide to the Owner in writing five similar installations that have had the proposed or equal coating

system and date coating system was put into service. In addition the installations names, locations, and owner's name with contact person and telephone number shall be provided.

5. For consideration for approval as an equal coating system the detailed side-by-side comparison shall be submit, with successful bidder's Shop Drawing at the time of the Preconstruction Conference, along with any proposed monetary adjustments to the contract price. As with all shop drawings, final approval rests with the Owner.
6. As a minimum standard any equal coating system shall have a 5-year service history on its coating system.

2.2 PAINT SYSTEMS

A. GYPSUM WALLBOARD

1. Scope

This Section shall apply to all exposed gypsum wallboard surfaces.

2. Surface Preparation

Sandpaper smooth, dust and contaminant free.

3. Coatings

Primer System:

Coat One

Product: Elasto-Grip FC, Tnemec Series 151-1051

MDFT: 1.5 to 2.5 mils

Finish System:

Coat One

Product: Endura-Tone, Tnemec Series 1029

MDFT: 2.0 to 4.0 mils

Coat Two

Product: Endura-Tone, Tnemec Series 1029

MDFT: 2.0 to 4.0 mils

Total MDFT: 5.5 mils

B. METAL DOORS AND WINDOWS, FRAMES, TRIM, AND OTHER METAL FEATURES

1. Scope

This Section shall apply to all interior and exterior hollow metal doors and windows, frames and trim.

This Section shall apply to all other exposed to view metal surfaces including, but not limited to, existing interior metal wall paneling systems and existing interior structural steel columns.

2. Surface Preparation

All hollow metal doors, windows and frames shall be bonderized, pickled or phosphatized, which will serve as the primer for and shall be compatible with the finish coats to be applied in the field. Prior to field coat application, surfaces shall be solvent cleaned per SSPC SP-1, and shall be clean, dry and free of all dirt, oil, grease and any other contaminants. Other exposed to view metal surfaces shall be sanded per SSPC SP-2 and solvent cleaned per SSPC SP-1.

3. Coatings

Primer System:

Coat One

Product: Typoxy, Tnemec Series 27

MDFT: 3.0 to 5.0 mils

Finish System:

Coat One

Product: Endurashield, Tnemec Series 73

MDFT: 3.0 to 5.0 mils

Total MDFT: 6.0 mils

C. GLAZED CMU BLOCK

1. Scope

This Section shall apply to the exposed existing glazed CMU block surfaces in the Women's Restroom.

2. Surface Preparation

Remove glaze by abrading with grinder, being careful to keep head flat to minimize tooling marks. Grout should be tight and in good condition. Substrate should be dull with multiple directional and rough profile to replicate a ICRI CSP-2. Final surface shall be dry and dust free.

3. Coatings

Primer System:

Coat One

Product: Tneme-Glaze, Tnemec Series 280
MDFT: 6.0 to 8.0 mils

Finish System:

Coat One

Product: Tneme-Glaze, Tnemec Series 280
MDFT: 6.0 to 8.0 mils

Coat Two

Product: Enviro-Glaze, Tnemec Series 297
MDFT: 2.0 to 3.0 mils

Total MDFT: 16.0 mils

D. CONCRETE RESIN FLOOR COATING

1. Scope

This Section shall apply to concrete floor surfaces as indicated on the Plans.

2. Surface Preparation

Clean, dry, and free of contaminants.

3. Coatings

Finish System:

Coat One

Product: Deco-Tread, Tnemec Series 222
MDFT: 1/16"

Coat Two
Product: Deco-Tread, Tnemec Series 222
MDFT: 1/16"

Note: Apply a 6" integral rolled radius cove at floor-to-wall conditions.

Total MDFT: 1/8" or 125 mils

2.3 COLORS

Paint colors used shall be selected by the Owner. Color samples shall be submitted to the Owner/Engineer for approval prior to application of any field coatings.

PART 3 EXECUTION

3.1 GENERAL

It is the intent of these Specifications that materials and workmanship be provided such that the highest quality job is obtained. The completed work, prior to acceptance, must be free from runs, skips, mars and any other disfiguring mark due to faulty workmanship or care of the completed work.

It is the responsibility of the Contractor to ensure that all surfaces are prepared in accordance with the written recommendations and directions of the paint manufacturer whose paint is applied.

Approval of conditions shall be obtained from the Engineer prior to applying any or all coats of paint; however, such approval shall not relieve the Contractor of their responsibility of conformance with these Specifications and conformance with the manufacturer's recommendations.

It shall be the responsibility of the Contractor to prevent settling of dust or the occurrence of other conditions detrimental to the finished quality of the job and to repair any damaged paint at no additional cost to the Owner.

Materials or equipment delivered with prime coats shall be touched up as required prior to the application of additional coating(s).

The Contractor shall apply each coating at the rate and in the manner specified by the paint manufacturer. If material has thickened or must be diluted for application by spray gun, the coating shall be built-up to the same thickness achieved with undiluted material. Deficiencies in film thickness shall be corrected by the application of an additional coat(s) of paint. Film thickness shall

be determined when dry by the Engineer with a magnetic dry film thickness gauge. The thickness gauge shall be calibrated with test shims.

Where thinning is necessary, only the products of the manufacturer furnishing the paint and for the particular purpose shall be allowed. All thinning shall be done strictly in accordance with the manufacturer's instructions as well as with the full knowledge and approval of the Engineer.

No paint shall be applied when the surrounding air temperature, as measured in the shade, is below 40 degrees F. No paint shall be applied when the temperature of the surface to be painted is below 35 degrees F. Paint shall not be applied to wet or damp surfaces and shall not be applied in rain, snow, fog or mist or when the relative humidity exceeds 85 percent. No paint shall be applied when it is expected that the relative humidity will exceed 85 percent or that the air temperature will drop below 40 degrees F within 18 hours after the application of the paint. Dew or moisture condensation should be anticipated and if such conditions are prevalent, painting shall be delayed until conditions improve to be certain that the surfaces are dry prior to application of paint. No paint shall be applied when the ambient temperature is less than 5 percent F. above the dewpoint. Further, the day's painting shall be completed well within advance of the probable time of day when condensation will occur, in order to permit the paint film an appreciable drying time prior to the formation of moisture.

Manufacturer's recommended drying time shall be construed to mean "under normal conditions." Where conditions are other than normal because of the weather or because painting must be done in confined spaces, longer drying times shall be necessary. The manufacturer's recommendations for recoating time intervals shall be strictly adhered to.

Adequate ventilation, which will effectively remove solvents, shall be provided for proper drying of paints on interior surfaces. A minimum of 7-consecutive calendar days at 70 degrees F following the application of the final coat on submerged surfaces shall be required before submergence. Longer periods shall be allowed prior to submergence if recommended by the paint manufacturer or if weather conditions require a longer curing time.

3.2 MIXING AND THINNING

Paint shall be thoroughly mixed each time any is withdrawn from the container. Paint containers shall be kept tightly closed except while paint is being withdrawn.

Paint shall be factory mixed to proper consistency and viscosity for hot weather application without thinning. Thinning will be permitted only as necessary to obtain recommended coverage at lower application temperatures. Only thinners

approved by the paint manufacturer shall be used. In no case shall the wet film thickness of applied paint be reduced, by addition of paint thinner or otherwise, below the thickness recommended by the paint manufacturer.

3.3 SURFACE PREPARATION

A. GENERAL

Surfaces shall be dry and thoroughly cleaned of foreign materials with all defects filled or removed. All trades employed shall leave the surfaces of their work in such a condition that only minor cleaning, sanding and filling is required of the painting trade for surface preparation.

Hardware, switchplates, machined surfaces, nameplates, lighting fixtures and all other surfaces not to be painted shall be removed or otherwise protected. Drop cloths shall be provided, where necessary, to avoid spotting of surfaces adjacent to the item being painted. Working parts of electrical equipment shall be protected from damage during surface preparation and painting operations.

B. FERROUS METAL, GALVANIZED METAL AND HOLLOW METAL SURFACES

The Contractor shall assure that fabrication, welding or burning is completed prior to the sandblasting operation. The Contractor shall chip or grind off flux, splatter, slag or other laminations left from welding. The Contractor shall remove all mill scale. The Contractor shall grind smooth rough welds and other sharp projections.

The Contractor shall power tool or hand clean in accordance with SSPC SP-2 or SSPC SP-3. The Contractor shall apply prime coat on cleaned surfaces within 2 hours of cleaning. The Contractor shall solvent clean galvanized surfaces in accordance with SSPC SP-1.

C. GYPSUM WALLBOARD

The Contractor shall repair minor irregularities left by finishers, avoid raising the nap of the paper and verify that the moisture content is less than 8 percent before painting. Contractor shall install sealant as required at edges of wallboard where it abuts different materials prior to painting.

3.4 APPLICATION

A. GENERAL

The Contractor shall mix and apply coatings by brush, roller or spray in accordance with the manufacturer's installation instructions. Spraying equipment shall be inspected and approved in writing by the coating manufacturer. The Contractor shall provide complete coverage's to the mil thickness specified. The thickness specified shall be dry film mil thickness. All paint systems are "to cover." In situations of discrepancy between the manufacturer's square footage coverage rates and mil thickness, mil thickness requirements govern. When color or undercoats show through, the Contractor shall apply additional coats until paint film is of uniform finish and color. The Contractor shall not apply consecutive coats until the Engineer has had an opportunity to observe and approve previous coats.

The Contractor shall apply materials under adequate illumination, shall evenly spread and flow on to provide full, smooth coverage, shall work each application of material into corners, crevices, joints and other difficult to work areas, shall avoid degradation and contamination of blasted surfaces and avoid intercoat contamination, shall clean contaminated surfaces before applying next coat and shall immediately smooth out runs or sags, or remove and recoat entire surfaces. The Contractor shall assure that preceding coats are dry before recoating, shall recoat within the time limits specified by the coating manufacturer and shall allow coated surfaces to cure prior to allowing traffic or other work to proceed.

The Contractor shall coat all aluminum surfaces in contact with dissimilar materials. All fabricated and structural steel shall have prime coat(s) applied in the shop and finish coat(s) applied in the field.

During application of either prime or finish coats, brush coat all weld seams, edges, angles, fasteners and other irregular surfaces to insure a monolithic film, pinhole free surface. Finish coats of paint shall be uniform in color and sheen without streaks, laps, runs, drips, sags or missed areas.

All submerged or intermittently submerged materials shall have surface preparation and coatings applied prior to installation unless otherwise approved by the Engineer. All pipe, pipe supports, and pipe hangers that will be painted shall have surface preparation and coatings applied prior to installation.

B. PRIME COAT INSTALLATION

The Contractor shall prime all surfaces indicated to be painted, shall touch-up damaged primer coats prior to finish coats and shall assure field-applied coatings are compatible with factory-applied coatings. If coatings are not compatible, and if approved in writing by the Engineer, the Contractor shall apply a 2-mil-thick universal barrier coat recommended by the paint manufacturer prior to applying field coats or completely remove factory coatings and reprime.

C. FINISH SCHEDULE

All work performed under this Contract (both new work and modifications to existing facilities) shall be painted. If the finish schedule requires wall surfaces to be painted in a particular space, the Contractor shall paint all appurtenant surfaces unless specifically noted not to be painted on the Plans.

3.5 FIELD QUALITY CONTROL

The Contractor shall be responsible for performing, testing and assuring conformance with all requirements of these Specifications.

The Contractor shall maintain daily records showing:

- Start date of work in each area.
- Date of application for each following coat.
- Moisture content and surface temperature of substrate. Also record weather conditions, ambient air temperature and dew point.
- Provisions utilized to maintain temperature and humidity of work area within paint manufacturer's recommended ranges.

The Contractor shall measure the surface temperature of items to be painted with surface temperature gauges specifically designed for such use. The Contractor shall measure substrate humidity with humidity gauges specifically designed for such use. The Contractor shall measure wet paint with wet film thickness gauges. The Contractor shall measure paint dry film thickness with a Mikrotest gauge calibrated against the National Bureau of Standards "Certified Coating Thickness Calibration Standards." The Engineer may direct measurement of paint thickness at any time during the project to ensure conformance with these Specifications. A sufficient number of dry film thickness measurements shall be made so that there

is approximately one measurement for each 100 square feet of surface area painted.

Where a wall or ceiling or other type of surface is disturbed and patched, the Contractor shall repaint entire wall or ceiling. The Contractor shall provide wet paint signs as necessary. The Contractor shall touch up damaged finish coats using the same material as specified for the finish coat.

At the conclusion of all painting activities, Contractor shall submit a painting field test report to the Engineer showing the above information plus results of wet film and dry film thickness tests. Provide four copies of final test report.

3.6 PAINTING SITE

Either shop painting or field painting and surface preparation shall be acceptable when painting work is performed in conformance with this Section, unless the painting is activity specified elsewhere in these Specifications.

3.7 PAINT THICKNESS

All paint thicknesses specified herein are minimum dry film thickness (MDFT). The thickness of paint over metallic surfaces shall be measured with a magnetic thickness gauge; paint thickness over wood or masonry shall vary in accordance with surface texture, but in no case shall the manufacturer's recommended coverage rate be exceeded. The minimum thicknesses given are total coating thickness for the coating specified, including multiple coats of the same material, where applicable.

***** END OF SECTION *****

DIVISION 10

SPECIALTIES

SECTION 10040

BALLISTICS RESISTANT FIBERGLASS SHEET

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section consists of furnishing and installing Level 3 ballistics resistant panels complete with related components as shown on the Plans and as specified herein.

1.2 RELATED SECTIONS

<u>Section</u>	<u>Item</u>
01300	Submittals
05400	Cold Formed Metal Framing
09250	Gypsum Wallboard

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. STANDARDS

Provide Level 3 bullet resistant fiberglass panels as designated by UL 752.

B. TESTING

Provide test reports from an independent testing laboratory certifying performance of panel system for ballistic resistance rating (UL 752).

1.4 SUBMITTALS

Submit shop drawings and product data under provisions of Section 01300.

Indicate panel configuration, anchor types and spacing, trim pieces locations, reinforcement, and finish.

1.5 STORAGE AND HANDLING

Deliver materials to project with manufacturer's UL listed labels intact and legible. Store materials and accessories away from exposure to environmental conditions that may be harmful.

Store products off ground and in an upright position. Provide cover from weather and construction activity.

1.6 WARRANTIES

The Contractor shall submit a written warranty, executed by the fiberglass panel manufacturer, agreeing to repair or replace units that fail in materials or workmanship for a period of 10 years. Materials and labor are to be covered in full by the manufacturer.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

The ballistics resistant fiberglass panels shall be as manufactured Armortex, Covenant Security Equipment, Quikserv, or approved equal.

2.2 MATERIALS

Bullet resistant fiberglass panels shall be “non ricochet type” and rated as Level 3 per UL752.

Panels shall be made of multiple layers of woven roving ballistic grade fiberglass cloth impregnated with a thermoset polyester resin and compressed into flat rigid sheets. The minimum nominal thickness of fiberglass panels shall be 7/16”, and the minimum nominal weight shall be 4.8 lbs per sq. ft.

Joint reinforcement batten strips shall be of the same material.

PART 3 EXECUTION

3.1 INSTALLATION

Install ballistics resistant panels in accordance with manufacturer’s installation instructions. Joints shall be reinforced with a back-up layer of bullet resistive material. Secure the fiberglass sheets with screws, bolts, or industrial adhesive. The method of application shall minimize vulnerabilities by fitting panels tightly to each other and to all adjacent surfaces.

The exposed surface shall be flush and free of imperfections as required by the finish surface(s) to be applied.

***** END OF SECTION *****

SECTION 10165

LAMINATED PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes furnishing and installing laminated plastic toilet compartments and accessories, as shown on the Plans and as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals

1.3 REFERENCES

This Section references the latest revisions of ANSI A117 - *Accessible and Usable Buildings and Facilities*.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

The laminated plastic toilet compartments shall be the 1040 Traditional Partitions Series by Bobrick Washroom Equipment, Inc., or equal.

2.2 MATERIALS

A. STILES, PANELS, DOORS, AND SCREENS

1. Surfaces

All surfaces shall be NEMA LD-3 high pressure laminated plastic with a minimum thickness of 0.050 inches. Color and patterns shall be as selected by Owner from manufacturer's standard colors.

2. Core

The panels, doors, screens and wall posts shall be 45 pound resin impregnated particle board. The stiles shall include an 11-gauge steel reinforcing core.

3. Edge

Edge trim shall be 18-8, Type 304 stainless steel with a satin finish.

B. HARDWARE

All hardware shall be 18-8, type 304 stainless steel with a satin finish. All hardware shall be concealed inside compartments with the exception of out-swinging doors.

C. LATCH

The sliding door latch shall be 16-gauge stainless steel and shall require less than 5 lbs. force to operate. A twisting latch operation shall not be acceptable. The latch handle shall have a rubber bumper to act as door stop and shall allow the door to be lifted over the 11-gauge keeper for emergency access.

D. HINGES

Stainless steel hinges shall have self-lubricating Dupont “Delrin” cams to ensure notice-free operation. The cams shall be adjustable in the field to permit the door to be fully closed or partially opened when the compartment is unoccupied.

E. COAT HOOK

Backside of doors shall contain a stainless steel coat hook projecting no more than 1-1/8 inch from the face of the door.

F. MOUNTING BRACKETS

Stainless steel mounting brackets shall be mounted inside compartment. Mounting brackets exposed on the exterior of the compartment will not be acceptable.

G. LEVELING DEVICE

The leveling device shall be a steel bar welded to the steel reinforcing core and shall be chromate treated and double zinc plated.

H. STILE SHOE

The stile shoe shall be one piece, 4-inch high, 22-gauge Type 304 stainless steel with satin finish. Top shall have 90 degree return to stile.

I. HEADRAIL (OVERHEAD BRACED)

The headrail shall be extruded anodized aluminum with satin finish.

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall check areas scheduled to receive compartments for correct dimensions, plumbness of walls and soundness of surfaces that would affect installation of mounting brackets. Verify spacing of plumbing fixtures to assure compatibility with installation of compartments. Do not begin installation of compartments until conditions are satisfactory.

3.2 ERECTION

The Contractor shall install compartments rigidly, straight, plumb, and level and in accordance with manufacturer's installation instructions. Installation methods shall conform to manufacturer's recommendations for backing and proper support. Conceal evidence of drilling, cutting, and fitting to room finish. Maintain uniform clearance at vertical edge of doors.

3.3 ADJUSTMENT

The Contractor shall adjust hardware for proper operation after installation. Set hinges on in-swinging doors to hold doors open approximately 15 degrees from closed position when unlatched. Set hinges on out-swinging doors to hold unlatched doors in closed position.

***** END OF SECTION *****

SECTION 10500

METAL LOCKERS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes furnishing and installing metal lockers as shown on the Plans, and as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals

PART 2 PRODUCTS

2.1 APPROVED WET GEAR LOCKERS

“Flexo” Series fire service style wet gear lockers by C+P Germany (thru Club Resource Group, Tracy, California), or equal.

2.2 LOCKERS

20-inches wide by 72-inches tall by 20-inches deep open front, single compartment lockers with one open shelf at the top and rubber boot mat at bottom. Main compartment shall have clothes rod and side mounted hook rail.

Lockers shall include Manufacturer’s moisture proof fabrication option and sub-frames shall be prepped for on-site built-up base.

2.3 FINISH

Baked enamel finish. Color to be selected from the manufacturer’s full line of standard colors.

PART 3 EXECUTION

The Contractor shall provide a pressure treated wood platform for mounting the lockers. All lockers shall be installed plumb and level and shall be securely and rigidly anchored to the substrate.

*** END OF SECTION ***

SECTION 10800

TOILET AND BATH ACCESSORIES

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes furnishing and installing all toilet, bath, and restroom accessories as shown on the Plans, and as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
15400	Plumbing

1.3 REFERENCES

This Section references the latest revisions of the following documents:

<u>Reference</u>	<u>Title</u>
ANSI A117	Accessible and Usable Buildings and Facilities
ASTM A123	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A167	Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A269	Seamless and Welded Austenitic Stainless Steel Tubing for General Service
ASTM A366	Steel, Carbon, Cold-Rolled Sheet, Commercial Quality

1.4 REGULATORY REQUIREMENTS

Conform to ANSI A117 code for access for the handicapped.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

All toilet and bath accessories shall be as manufactured by Bobrick Washroom Equipment Inc., or equal.

2.2 FIXTURE SCHEDULE

<u>Fixture</u>	<u>Type and Location</u>
Toilet Tissue Dispenser	Bobrick B-2840
Toilet Seat Cover Dispenser	Bobrick B-221, Surface-mounted
Grab Bars	Bobrick B-6897, two-wall wheelchair toilet compartment
Shower Ct. Rod	Bobrick B-6047
Shower Curtain	Bobrick B-204-2
Shower Ct. Hooks	Bobrick B-201-1, Provide complete set for each curtain
Sanitary Receptacle	Bobrick B-353
Hand Towel Dispenser/ Receptacle	Bobrick B-369
Soap Dispenser	Toto TES100
Mirror	Bobrick B-165
Hook Strip	Bobrick B-232
Paper Towel Dispenser/ Waste Receptacle	Bobrick B-3944
Tampon Dispenser	Bobrick B-2706C
Diaper Changing Station	Koala Kare KB300

2.3 MATERIALS

A. SHEET STEEL

ASTM A366.

B. STAINLESS STEEL SHEET

ASTM A167, Type 304.

C. TUBING

ASTM A269, stainless steel.

D. ADHESIVE

Contact type, waterproof.

E. FASTENERS, SCREWS, AND BOLTS

Hot dip galvanized, tamper-proof, and security type.

2.4 FABRICATION

Weld and grind joints of fabricated components, smooth. Exposed surfaces shall be formed from single sheet of stock, free of joints. Form surfaces flat without distortion. Maintain surfaces without scratches or dents.

Grab bars shall be fabricated of tubing, free of visible joints and shall return to wall with end attachment flanges.

Components shall be shop assembled and packaged, complete with anchors and fittings.

Provide steel anchor plates, adapters, and anchor components as required for installation.

2.5 FINISHES

All stainless steel shall have a No. 4 satin luster finish. All components in contact with building finishes shall receive back paint to prevent electrolysis.

PART 3 EXECUTION

The Contractor shall install all accessories in accordance with the manufacturer's instructions and ANSI A117. All toilet and bath accessories shall be installed plumb and level and shall be securely and rigidly anchored to the substrate.

***** END OF SECTION *****

DIVISION 12
FURNISHINGS

SECTION 12356

PLASTIC LAMINATE FACED CASEWORK

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes furnishing and installing plastic laminate faced casework and accessories as shown on the Plans, and as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
05400	Cold Formed Metal Framing
06100	Rough Carpentry
09800	High Pressure Plastic Laminate
12452	Appliances

1.3 SUMMARY

A This Section includes the following:

1. Plastic-laminate-faced cabinets
2. Plastic-laminate-faced countertops and worktops.
3. Plastic-laminate-faced windowsills.
4. Plastic-laminate-faced shelves.
5. Hardware.
6. All accessory items noted on details or specified in manufacturer's latest specifications to provide a complete assembly.

1.4 DEFINITIONS

A EXPOSED SURFACES OF CABINETS

Surfaces visible when doors and drawers are closed, including visible surfaces in open cabinets or behind glass doors.

B SEMI-EXPOSED SURFACES OF CABINETS

Surfaces behind opaque doors or drawer fronts, including interior faces of doors and interiors and sides of drawers. Bottoms of wall cabinets are defined as “semi-exposed.”

C CONCEALED SURFACES OF CABINETS

Surfaces not usually visible after installation, including sleepers, web frames, dust panels, bottoms of drawers, and ends of cabinets installed directly against and completely concealed by walls or other cabinets. Tops of wall cabinets and utility cabinets are defined as “concealed.”

1.5 SUBMITTALS

A PRODUCT DATA

For the following:

1. Cabinets.
2. Plastic-laminate countertops, worktops, shelves, sills
3. Hardware.

B SHOP DRAWINGS

For all plastic laminate fabrications, include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, hardware, edge and backsplash profiles, methods of joining countertops, grommets, and cutouts for plumbing fixtures.

C SAMPLES FOR INITIAL SELECTION

Manufacturer’s color charts consisting of units or section of units showing the full range of colors. Textures and patterns available for each type of material exposed to view.

1.6 QUALITY ASSURANCE

A SOURCE LIMITATIONS FOR CABINETS

Obtain cabinets through one source from a single manufacturer.

1.7 PROJECT CONDITIONS

A ENVIRONMENTAL LIMITATIONS

Do not deliver or install casework until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B ESTABLISHED DIMENSIONS

Where casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Provide fillers and scribes to allow for trimming and fitting.

1.8 COORDINATION

Coordinate layout and installation of blocking and reinforcement in partitions for support of casework.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A MANUFACTURERS

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

1. Casework
 - a. Pacific Cabinets.
 - b. Northwest Woodworks.
 - c. Genothen Casework.
 - d. Valley Cabinets, Inc.
 - e. Fremont Millwork Co.
 - f. Specialty Wood Manufacturing.
 - g. Approved equal.

2.2 COLORS, TEXTURES AND PATTERNS

- A Colors, Textures and Patterns: As selected by Engineer from manufacturer's full range of laminates including premium grades.
- B Allow for a selection of up to seven plastic laminates of distinct color, texture and pattern.

2.3 CABINET MATERIALS

A EXPOSED MATERIALS

1. Plastic Laminate

High-pressure decorative laminate complying with NEMA LD 3, Grade VGS.

B SEMI-EXPOSED MATERIALS

Unless otherwise indicated, provide the following:

1. Plastic Laminate

High-pressure decorative laminate complying with NEMA LD 3, Grade VGS.

2. Cabinet Liners

High pressure melamine laminate .027 thickness.

C CONCEALED MATERIALS

Solid wood or plywood, of any hardwood or softwood species, with no defects affecting strength or utility.

D EDGE BAND

High-pressure decorative laminate complying with NEMA LD 3, Grade VGS.

2.4 COUNTERTOP MATERIALS

A PLASTIC LAMINATE

High-pressure decorative laminate complying with NEMA LD 3, Grade HGS.

Select subparagraph above for flat countertops; below for post-formed.

B PLYWOOD

Exterior softwood plywood complying with PS 1, Grade C-C Plugged, touch sanded.

2.5 CABINET HARDWARE

A GENERAL

Manufacturer's standard units complying with BHMA A156.9, of type, size, style, material, and finish as selected by Engineer from manufacturer's full range.

B DRAWER AND DOOR PULLS

Manufacturer's standard brushed stainless steel wire pull.

C HINGES

Concealed, 170 degree, European-style hinges. Blum #75M5580.

D DRAWER GUIDES

Epoxy-coated-metal, self-closing drawer guides; designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers. Accuride #3832, 100 lb rating typical.

E HARDWARE

Concealed where possible.

F GROMMETS

Two and one half-inch diameter vinyl with removable cap. Color as selected from manufacturer's standard colors.

G SHELF PINS

All shelf pins to be seismic double pin with captive shelf support.

H SUPPORT BRACKETS

Extra heavy duty 18"x24" t-bar countertop support brackets. Rakks "EH" Series by the Rangine Corporation or equal. Colors as selected from manufacturer's standard colors.

2.6 CABINET CONSTRUCTION

A FACE STYLE

Flush overlay; door and drawer faces cover cabinet body members or face frames with only enough space between faces for operating clearance.

B DOOR AND DRAWER FRONTS

11/16-inch-thick particleboard with plastic-laminate faces, backs and 3mm PVC edge banding. Provide same grade, pattern, color and texture of plastic laminate for backs as for faces.

C EXPOSED CABINET ENDS

Plastic-laminate-faced plywood.

D CABINET ENDS

3/4-inch thick plywood.

E CABINET TOPS AND BOTTOMS

3/4-inch thick plywood.

F WALL-HUNG UNIT BACK PANELS

1/2-inch thick plywood. Back panel to receive plastic laminate.

G BASE UNIT BACK PANELS

1/2-inch thick plywood. Back panel to receive plastic laminate.

H DRAWERS

Fabricate with exposed fronts fastened to sub-front with mounting screws from interior of body.

1. Bottoms: 1/2-inch thick plywood.
2. Top of drawer boxes to be 3-mm PVC edge banding.

I SHELVES

1. 3/4-inch thick plywood.
2. All shelves shall have 3-mm PVC edge banding.

J FACTORY FINISHING

To greatest extent possible, finish casework at factory. Defer only final touchup until after installation.

K SEISMIC

All upper and tall casework construction to meet seismic requirements per WIC (Woodworking Institute of California).

2.7 PLASTIC LAMINATE COUNTERTOPS

A CONFIGURATION

Provide countertops with the following front, cove (intersection of top with backsplash), backsplash, and end-splash style:

1. Front

Rolled edge at Administration building lunch room and restroom locations. Premium grade square edge at other locations.
2. Cove

Butt splash typical. Integrally coved splash at lunch room and restroom locations.
3. Backsplash

Butt splash.

4. End Splash

Butt splash.

B PLASTIC-LAMINATE SUBSTRATE

Plywood not less than 3/4-inch thick.

1. For countertops at sinks and lavatories, use phenolic-resin particleboard or exterior-grade plywood.

2.8 PLASTIC LAMINATE SILLS

A WINDOWSILLS

Formed plastic laminate sills.

PART 3 EXECUTION

3.1 INSTALLATION

- A** Install cabinets with no variations in flushness of adjoining surfaces; use concealed shims. Where cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match cabinet face.
- B** Install cabinets without distortion so doors and drawers fit openings and are aligned. Complete installation of hardware and accessories as indicated.
- C** Install cabinets and countertop level and plumb to a tolerance of 1/8 inch in 8 feet.
- D** Fasten cabinets to adjacent units and to backing.
1. Fasten wall cabinets through back, near top and bottom, at ends and not less than 24-inches o.c. with No. 10 wafer-head screws sized for 1-inch penetration into wood framing, blocking, or hanging strips.
 2. Fasten wall cabinets through back, near top and bottom, at ends and not less than 24-inches o.c., with toggle bolts through metal backing behind gypsum board.

E Fasten plastic-laminate countertops by screwing through corner blocks of base units into underside of countertop. Form seams using splines to align adjacent surfaces, and secure with glue and concealed clamping devices designed for this purpose.

1. Provide cutouts for sinks and lavatories, including holes for faucets and accessories.

2. Seal edges of cutouts by saturating with varnish.

F WINDOWSILLS

Anchor securely to framing as required. Caulk space between window/gypsum wallboard and sill/cap ends with laminate.

G Verify all appliance sizes prior to fabrication.

3.2 ADJUSTING AND CLEANING

A Adjust cabinets and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

B Clean casework on exposed and semi-exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

***** END OF SECTION *****

SECTION 12360

SIMULATED STONE COUNTERTOPS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes, but is not limited to, furnishing and installing solid surface countertops within the Lobby as shown on the Drawings and specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
08630	Aluminum Ballistics Resistant Window Assembly

1.3 SUBMITTALS

A. PRODUCT DATA

Submit product data under the provisions of Section 01300.

B. SHOP DRAWINGS

The Contractor shall submit shop drawings in accordance with provisions of Section 01300. Include plans, elevations, details, and attachments to other work. Show materials, finishes, edge profiles, methods of joining countertops, grommets, and cutouts for associated fixtures.

C. SAMPLES FOR VERIFICATION

The Contractor shall submit actual product samples for the Owner's verification. Samples shall include 8-inch by 10-inch fabrications of all proposed finished surfaces.

1.4 QUALITY ASSURANCE

A. SINGLE SOURCE LIMITATIONS FOR COUNTERTOPS

Obtain solid surface countertop material through one source from a single manufacturer.

SECTION 12400

FURNISHINGS AND ACCESSORIES

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section consists of furnishings and accessories, as shown on the Plans and as specified herein.

1.2 RELATED SECTIONS

<u>Section</u>	<u>Item</u>
01300	Submittals

PART 2 PRODUCTS

2.1 CELLULAR SHADES

Window shades shall consist of 3/4-inch honeycomb cells made from crush resistant fabrics. The headrail and bottom rail shall be formed steel or extruded aluminum. The shades shall be mounted on the inside of the window opening and shall be equipped with cordless lift control. Shade type shall accommodate both bottom up and top down lifting. Size to fit between jambs and between head and sill. The Contractor shall submit color/texture samples for approval and selection by the Owner. Shades shall be as manufactured by Bali, or approved equal.

Provide shades at spaces noted below:

A New Conference 03, All inside Windows

2.2 MOBILE WORK TABLES

Provide Formaspace "Basix" Work Benches as shown on the Drawings. Mobile work tables shall be as dimensioned below and shall have maple tops, lockable caster feet, and two lower laminate-finished storage shelves.

<u>Dimensions</u>	<u>Quantity</u>
72" W x 30" D x 36" H	2
72" W x 36" D x 36" H	1
36" W x 24" D x 36" H	1

2.3 STORAGE RACKS

Provide Lyon Products storage racks as shown on the Drawings. Storage shelves shall be as dimensioned below with adjustable side-to-side beams and wire mesh decking.

All racks and shelves shall include manufacturer's floor and wall/ceiling anchors.

<u>Dimensions</u>	<u>Quantity</u>
48" W x 24" D x 84" H	4
60" W x 24" D x 84" H	2
72" W x 24" D x 84" H	2
48" W x 36" D x 84" H	3
72" W x 36" D x 84" H	2

2.4 WOODEN BENCH

Provide two "Ventwood" benches sized 18" W x 48" L for each Locker Room. The bench shall be furnished with Douglas Fir slats, Oak doweling, clear satin finish, and permanent pedestal bases. All slat edges shall be eased.

2.5 GLASS DRY-ERASE BOARDS

Provide Quartet Brilliance glass dry-erase boards as shown on the Drawings. Each dry-erase board shall be furnished with an accessory tray, one dry-erase marker, and two high power glass board magnets.

All glass dry-erase boards shall include manufacturer's pass through mounting hardware. Metal anchors and standoffs shall have a polished silver finish.

<u>Dimensions</u>	<u>Location</u>
96" W x 48" H	New Conference Room #03
96" W x 48" H	New Conference Room #41

2.6 LITERATURE RACKS

Literature racks shall be of the multi-tiered adjustable type. The supporting fixture shall be black acrylic with transparent acrylic inserts furnished with adjustable pocket dividers. Pocket dividers shall snap into place and accommodate 18 brochure stacks or 9 magazine stacks. Provide Displays2Go 2RP9BLK series, or equal as shown on the Drawings.

2.7 ILLUMINATED MODULAR ART RAIL

Wall mounted illuminated art rail systems and all related components shall be STAS multirail as manufactured by STAS Picture Hanging Systems, or approved equal.

A RAILING

Provide railing members with a maximum sight line of 1-1/2-inches. Framing material shall be aluminum with a clear anodized finish. The railing members shall be integrated with 12V power supply wires that allow light fixtures to be clipped in to any location. Rail lengths shall be sized to span entire width of wall minus 6 inches from edges at locations listed below and as shown on the Plans.

Location

Lobby #01
New Conference Room #03
Hall #26
Staff #31

B SPOTLIGHT FIXTURES

Spotlights shall be 3.5 watt LED type and shall provide 95° flood light beam in 2700K color. Fixtures shall be mounted on adjustable arm that clips directly into the supporting railing members. The minimum length of each fixture shall be 27-inches.

C ADAPTERS

120 volt U.S. power supplies shall be sized for the number of spotlights and length of rails at each occurrence.

D HOOKS AND CORDS

Hooks shall be zipper style and cords shall be steel cables. The combined capacity of the hook and cord shall accommodate at least 40-pounds.

2.8 WASTE AND RECYCLING RECEPTACLES

A TRASH CONTAINERS

Trash containers shall be constructed from rigid plastic resistant to cracking and denting. The size of each receptacle shall not exceed 22-inches long or 11-inches wide. Containers minimum capacity shall be 23-

gallons. Provide Rubbermaid Slim Jim in color black, or equal as shown on the Drawings.

B RECYCLING CONTAINERS

Recycling containers shall be constructed from rigid plastic resistant to cracking and denting. The size of each receptacle shall not exceed 22-inches long or 11-inches wide. Containers minimum capacity shall be 23-gallons. Provide Rubbermaid Slim Jim in color blue, or equal as shown on the Drawings.

C LIDS

Receptacle lids shall be of the swing type and conceal the containers contents from view. The lids shall extend a minimum of 5-inches in depth. Provide a lid for each container in the corresponding color as defined above. Receptacle lids shall be Rubbermaid Slim Jim Swing Top Lid, or equal.

PART 3 EXECUTION

3.1 GENERAL

Mount surface mounted accessories on concealed backplates, except where shown otherwise. Accessory backplates shall have concealed fasteners. Install accessories except if indicated otherwise, with sheet metal screws or wood screws in teflon or neoprene sleeves and expansion shields with toggle bolts, or other approved fasteners. Install on back plates in same manner. All accessories mounted on gypsum board walls without solid backing shall be fastened into metal backplates secured to studs.

Exact locations for fixtures and equipment shall be determined on the job to suit the actual conditions.

Any discrepancies between the Drawings and actual field conditions shall be brought to the attention of the Engineer for a decision. Changes in the work because of failure to do so shall be made by the Contractor at no additional cost to the Owner.

3.2 FURNISHINGS

The furnishings specified herein and shown on the Drawings shall be installed in locations shown, and in accordance with the Manufacturer's recommendations.

***** END OF SECTION *****

SECTION 12452

APPLIANCES

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section consists of furnishings and accessories, as shown on the Plans and as specified herein.

1.2 RELATED SECTIONS

<u>Section</u>	<u>Item</u>
01300	Submittals

PART 2 PRODUCTS

2.1 UNDER COUNTER ICE MAKERS

Provide Scotsman UN324 Nugget Ice Machine, or approved equal. Ice makers shall be under counter model with top access door. Provide the manufacturer's floor mount kit. Ice makers shall be capable of producing at least 340 lbs of ice per day and have a storage capacity of at least 80 lbs. Units shall be UL listed and meet US Safe Drinking Act requirements. Power shall be 120 volt, 60 hertz, single phase, 9.5 amps total load.

2.2 OVERHEAD DOCUMENT CAMERAS

Provide Vaddio DocCAM 20 HDBT, or approved equal. Overhead document cameras shall be ceiling-recessed with 20x optical zoom capabilities. The horizontal field of view shall be a minimum of 60°. Provide the manufacturer's connector panel interface to supply power and facilitate control to the camera. Power shall be 120 volt, 60 hertz, single phase, 1.4 amps total load.

PART 3 EXECUTION

The furnishings specified herein and shown on the Plans shall be installed in locations shown, and in accordance with the Manufacturer's recommendations.

Mount appliances in locations as shown on the Plans; fully connect to mechanical and electrical services. The accessory manufacturer's mounting details shall be coordinated with other trades as the work progresses. All brackets, plates, anchoring devices and similar items used for mounting in wet areas shall be

bedded in a silicone or other sealant as they are set to provide a watertight installation.

Mount surface mounted accessories on concealed backplates, except where shown otherwise. Accessory backplates shall have concealed fasteners. Install accessories except if indicated otherwise, with sheet metal screws or wood screws in teflon or neoprene sleeves and expansion shields with toggle bolts, or other approved fasteners. Install on back plates in same manner. All accessories mounted on gypsum board walls without solid backing shall be fastened into metal backplates secured to studs.

Exact locations for fixtures and equipment shall be determined on the job to suit the actual conditions.

Any discrepancies between the Plans and actual field conditions shall be brought to the attention of the Engineer for a decision. Changes in the work because of failure to do so shall be made by the Contractor at no additional cost to the Owner.

***** END OF SECTION *****

DIVISION 15
MECHANICAL

SECTION 15066

PIPE AND CONDUIT SUPPORT SYSTEM

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

The work specified in this Section includes the design, fabrication, and installation of all pipe and conduit hangers, brackets, and supports. Pipe and conduit support systems shall be furnished complete with all necessary inserts, bolts, nuts, rods, washers, structural attachments, and other accessories as shown on the Plans and specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
15400	Plumbing

1.3 REFERENCES

All pipe and conduit support materials and methods shall conform to the latest, applicable requirements of documents listed hereafter. In case of conflict between this section and the listed documents, the requirements of this Section shall prevail.

ASME B31.3	Process Piping
ASME BPVC	Boiler and Pressure Vessel Code
ANSI/MSS SP-58	Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation
SMACNA	Seismic Restraint Manual Guidelines for Mechanical Systems
IBC	International Building Codes

1.4 SUBMITTALS

Submit in accordance with provisions of Section 01300.

A. SHOP DRAWINGS

Provide shop drawings accurately drawn, and to a scale sufficiently large enough, to show locations and types of pipe and conduit supports as well

as pertinent features and methods of connections. On all shop drawings, figure dimensions shall be used as opposed to scaled dimensions.

B. DESIGN CALCULATIONS

Provide design calculations for all pipe and conduit support systems. Design calculations shall be complete, concise, and in an easy to read format. A licensed Professional Engineer shall stamp and sign all design calculations.

C. MANUFACTURER’S LITERATURE

Provide manufacturer’s literature for all catalog-style supports. Where the contents of submitted literature includes data not pertinent to the submittal, the portion(s) of the contents being submitted for the Engineer’s review shall be clearly indicated and extraneous information shall be crossed out.

1.5 SEISMIC REQUIREMENTS

The pipe and conduit support system design shall comply with the requirements of the *2018 International Building Code (IBC) Section 1613* and *ASCE 7-16 Minimum Design Loads for Buildings and Other Structures, Chapter 13 Seismic Design for Nonstructural Components*, as referenced and amended by the IBC. Seismic design parameters shall be as shown on Contract Drawings S-1 and S-5.

PART 2 PRODUCTS

2.1 GENERAL

The Contractor shall design, provide, and install pipe and conduit support systems, which may include, but not be limited to, hangers, racks, clamps, brackets, supports, anchors, expansion joints, and structural attachments, as specified herein. The support system shall be designed in conjunction with the pipe and conduit to be supported. Support systems and seismic restraints shall be provided in accordance with Building Codes and the SMACNA Manual.

In certain locations, pipe and conduit supports, anchors, and/or expansion joints may have been indicated on the Plans, but no attempt has been made to indicate every pipe and conduit support, anchor, and/or expansion joint. It shall be the Contractor’s responsibility to provide a complete system of pipe and conduit supports.

2.2 MATERIAL

All pipe and conduit supports, including all accessories, shall be galvanized steel for indoor use and shall be Type 316 stainless steel for outdoor use.

2.3 SUPPORT, CLAMPS AND HANGERS

Pipe and conduit clamps and hangers shall be as manufactured by Anvil, Tolco, or equal, and shall include the typical supports as follows:

Type	Pipe Size (In.)	Pipe Material	Anvil Figure
Swivel Ring, Split Type	3/4 to 8	All type	104
Split Clamp	1/2 to 3	All type	138R
Adjustable Ring	1/2 to 6	All type	69
Adjustable Ring	1/2 to 4	Copper	CT-69
Adjustable Clevis	3 to 24	All type	260/590
Pipe Clamp	3 to 42	All type	216
Socket Clamp	4 to 24	Cast Iron	595
Pipe Stanchion	4 to 24	All Type	63
Stanchion Saddle	4 to 36	All type	259
Adjustable Saddle Support	3 to 36	All type	264
Riser Clamp	2 to 24	All type	40

2.4 RACKS AND TRAPEZE HANGERS

Pipe and conduit racks and trapeze hangers shall be constructed of steel channels, rods, posts, post base, clamps, brackets, fittings, and accessories. All components for pipe and conduit racks and trapeze hangers shall be by Unistrut, Anvil International, or equal.

2.5 STRUCTURAL ATTACHMENTS

Structural attachments shall be concrete insert channels or individual inserts for new concrete, surface-mounted channel or individual inserts for existing concrete or where applicable, steel, roof plate supported attachments in the control building, complete with all accessories required. All structural attachments including all accessories shall be galvanized steel for indoor use and stainless steel for outdoor use, and shall be provided by a single manufacturer. Structural attachments shall be by Unistrut Corporation or approved equal.

2.6 PIPE SUPPORT ATTACHMENTS TO CONCRETE

All pipe support attachment to concrete shall be in adhesive anchors unless noted otherwise.

Products which may be incorporated in the work include, but are not limited to, the following:

- A. HIT RE 500 Injection Adhesive Anchor, Hilti, Inc.
- B. HIT HY 150 Injection adhesive Anchor, Hilti, Inc.
- C. Power-Fast, Powers Fasteners, Inc.

2.7 PROTECTION SADDLES

Protection saddles shall be used for protecting pipe insulation against damage at pipe supports or as shown on the Plans. The nominal thickness of covering shall be the same as that of pipe insulation. The protection saddles shall be curved carbon steel plate and shall be Anvil Figure 160 through Figure 166, Tolco, or equal.

2.8 SPACING

Maximum support spacing shall conform to the following table:

Pipe Size (Inches)	Pipe Material	Maximum Spacing (Feet)
1 & Smaller	Iron or Steel	6
	Copper	4-1/2
	Plastic	continuous
	Tubing	continuous
1-1/4 to 2	Iron or Steel	8
	Copper or Plastic	5
2-1/2 to 4	Iron or Steel	10
	Copper or Plastic	6
6 to 8	Iron or Steel	12
	Plastic	8

PART 3 EXECUTION

3.1 DESIGN

Pipe and conduit support systems shall be designed in accordance with the applicable Codes and reference standards specified herein. Pipe and conduit supports shall be designed and selected to withstand the Project specific seismic loads and shall adhere to the following conditions:

- A. Weight balance calculations shall be made to determine the required supporting force at each pipe support location and the pipe weight at each equipment location. Design loads for inserts, clamps, and other support items shall not exceed the manufacturer's recommended loads.
- B. Pipe supports shall be able to support the pipe in all conditions of operation. They shall allow free expansion and contraction of the piping, and prevent excessive stress resulting from transferred weight being induced into the pipe or connected equipment. Allow clearances for pipe expansion and contraction.
- C. Wherever possible, pipe attachments for horizontal piping shall be pipe clamps, or as shown on the pipe support detail sheet. Horizontal or vertical pipes should be supported preferably at locations of least vertical movement.
- D. All pipe supports shall provide a means of vertical adjustment after erection.
- E. Where practical, riser pipe shall be supported independently of the connected horizontal piping. Pipe support attachments to the riser piping shall be riser clamps.

3.2 INSTALLATION

Pipe support system shall be installed strictly in accordance with standards and codes referenced herein and with piping support system manufacturer and piping manufacturer's recommendations.

In addition, all piping shall be rigidly support and anchored so that there is no movement or visible sagging between supports.

Contact between dissimilar metals, including contact between stainless steel and carbon steel, shall be prevented. Supports for brass or copper pipe or tubing shall be copper-plated. Those portions of pipe supports, which contact other dissimilar metals, shall be rubber or vinyl coated.

In areas where pipe racks and trapezes are not used, pipe shall be supported with clamp hangers and stanchion saddle support system. The clamps and hangers shall be fastened to threaded rods hanging from structural attachments

Threaded rods shall have sufficient threading to permit the maximum adjustment available in the support item.

Anchorage shall be provided to resist thrust due to temperature changes, changes in diameter or direction, or dead-ending. Anchors shall be located as required to force expansion and contract movement to occur at expansion joints, loops, or elbows, and as required to prevent excessive bending stresses and opening of mechanical couplings. Anchorage for temperature changes shall be centered between elbows and mechanical joints used as expansion joints. Anchorage for bellows type expansion joints may be located adjacent to the joint.

Pipe supports and expansion joints are not required in buried piping, but concrete thrust blocking or other approved anchorage shall be provided as indicated on the Plans or specified in other sections.

*****END OF SECTION *****

SECTION 15400

PLUMBING

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section shall consist of plumbing to include interior water systems, drain and waste systems, and fixtures and trim as shown on the Plans and specified herein.

All permits shall be obtained in accordance with these Specifications.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
10800	Toilet and Bath Accessories

1.3 REFERENCES

ASTM B62	Specification for Composition Bronze or Ounce Metal Castings
ASTM B88	Specification for Seamless Copper Water Tube
ASTM B371	Specification for Copper-Zinc Silicon Alloy Rod

1.4 MANUFACTURERS

Use products of a single manufacturer where two or more units of the same class of equipment are required.

1.5 QUALITY ASSURANCE

All plumbing shall be performed in accordance with the current edition of the Uniform Plumbing Code. The Plans do not detail all items such as complete venting, etc.; however, it is understood that this work shall be included as part of this Project.

1.6 DELIVERY, STORAGE, AND HANDLING

Material shall be delivered to the project site in its original unopened containers with labels informing manufacturer and product name. Material shall be stored and handled in compliance with manufacturer's recommendation to prevent damage.

1.7 NAMEPLATES

Provide major components of equipment with manufacturer's name, address, catalog number, capacity, and equipment designation securely affixed in a conspicuous place.

PART 2 PRODUCTS

2.1 PIPE AND FITTINGS - WATER SYSTEM

A. ABOVE GROUND PIPING

1. Pipe

- a. Type "K" copper, ASTM B88, silver solder.

2. Fittings

- a. Wrought copper; ANSI B16.22, silver solder.

2.2 PIPE AND FITTINGS - DRAIN AND WASTE SYSTEM

A. ABOVE GROUND PIPING

All drain, waste and vent pipe shall be hubless, cast iron, standard weight pipe conforming to the requirements of the latest issue of CISPI Standard #301, ASTM 888, or ASTM A74, as manufactured by AS&I, Charlotte, Tyler or equal.

B. FITTINGS

All fittings and pipe joints shall be hubless, conforming to the requirements of the latest issue of CISPI Standard #301.

C. COUPLINGS

Hubless coupling gaskets shall be the heavy-duty type with dual stainless steel pipe clamps on each side, and shall conform to ASTM C1540, as manufactured by Anaco, Tyler or equal.

2.3 NATURAL GAS SERVICE CONNECTION

A. PIPING

All above ground piping shall be threaded black steel, schedule 40, conforming to the requirements of ASTM A53/A53M.

B. FITTINGS

All fitting shall be black steel, schedule 40 fittings with threaded joints

C. FLEXIBLE PIPING AND CONNECTIONS

All flexible pipe shall be metallically shielded corrugated stainless steel tubing (CSST) complying with the ANSI LC 1/CSA 6.26 standard '*Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing*', and ICC-ES, and IAPMO listing indicating compliance with the ICC-ES PMG LC1027 testing criteria, '*Listing Criteria for Protective Jacketed Corrugated Stainless Steel Tubing (Minimum 36 Coulumb Charge Transfer)*.' Materials shall be manufactured from ASTM A240 Type-304 stainless steel. A protective jacket system over the CSST consisting of an electrically insulative polymer cover, a metallic shield layer, and a semi-conductive inner polymer layer. The piping system being UV-Resistant, and achieving ASTM E84 rating of 25 for flame spread and 50 for smoke density. Mechanical fitting are to be manufactured from ASTM B16 Type-360 brass. Brass fitting include jacket-lock feature to provide circumferential contact between the fitting assembly and outer polymer layer of the CSST. Flexible gas piping shall be FlashShield

2.4 VALVES

A. BALL VALVES

Ball valves 2 inches and smaller shall be bronze, full port, two-piece, lever handle, 200-pound service, meeting standard MSS SP-110, Apollo Series 77-100, or equal.

2.5 PIPING SPECIALTIES

A. UNIONS

2 inches and smaller; ground joint, malleable iron type. Crane, Walworth, Syspac.

B. INSULATING UNION

EpcO, Capitol.

C. ACCESS PANELS

Milcor, Type "DW" with screwdriver operated lock. Stainless steel access panels in tile walls.

D. ESCUTCHEON

Grinnell Fig. 2 or 13, nickel plated.

2.6 FIXTURES AND TRIM

A. TOILET

Furnish and install toilets as shown on the Plans. The toilet shall meet the American Disabilities Act guidelines and ANSI A117.1 requirements for people with disabilities.

The toilet shall be Vitreous China with a 15-inch rim height. The toilet shall be American Standard Products AFWALL FloWise Toilet, Model No. 2856.128, or equal.

Provide an electronic sensor activated flushometer at each toilet. Units shall flush a full cycle at 1.6 gpf and a reduced cycle at 1.1 gpf. The flushometer shall be Sloan ECOS Electronic Dual Flush Flushometer, or equal.

B. ONE BASIN SINKS

Furnish and install stainless steel one basin sinks as shown on the Contract Drawings. Basin dimensions shall be 24" x 22" x 8" or 15" x 17" x 8" as shown on the Plans. The rectangular sink shall be an 18-gauge, stainless steel Type 304 top-mount basin with 1-3/4 inch radius cove corners. Exposed surfaces shall have a brushed finish and basin underside shall be coated with sound deadening material.

One sink shall be an Elkay Model LR1517, or equal. The sink shall be complete with an LK810 chrome plated 8 inch gooseneck spout facet with aerator and 4 inch wristblade handles, LK99 drain fitting, and satin chrome tubing P-trap with cleanout and waste arm to wall.

One sink shall be an Elkay Model LR2522, or equal. The sink shall be complete with an LKAV1061 Avado chrome plated spring gooseneck spout facet with aerator, LK99 drain fitting, and satin chrome tubing P-trap with cleanout and waste arm to wall.

C. STAINLESS STEEL UTILITY SINKS

Furnish and install one stainless steel single compartment scullery sink as shown on the Plans. The rectangular hand wash-up sink shall be a 14 gauge stainless steel Type 304 basin with mitered corners, and a full length 8-inch-high backsplash. Exposed surfaces shall have a buffed finish. Furnished with four tubular legs and bullet shaped feet adjustable up to 1-inch.

The sink shall be an Elkay Model SS81242, or equal. The fittings furnished shall be: LK-940 chrome plated gooseneck spout faucet with aerator, LK-8 drain fitting, LK-500 satin chrome tubing "P" trap with cleanout, waste arm to wall, and wall flange, or equal.

D. TROUGH SINKS

Furnish and install two custom stainless steel trough sinks as shown on the Plans. The rectangular troughs shall be drop-in style, formed from 16 gauge stainless steel Type 304 with 1-3/4" radius coved corners, and 10" in depth. All exposed surfaces shall have a brushed finish.

Four of the six trough fixtures shall include double pedal foot valves with wall mounting flanges and deck-mount 10-3/4" gooseneck spout; a pop-up drain with a 1-1/4" tailpiece, and satin chrome tubing P-trap with cleanout and waste arm to wall.. The fixtures shall be Elkay, Double Pedal Valve, Model No. LK398C and gooseneck Model No. LK396A, or equal.

E. LAVATORY AND FIXTURES

A lavatory with fixtures shall be provided for installation as shown on the Plans. The lavatory shall meet the American Disabilities Act guidelines and ANSI 117.1 requirements for people with disabilities.

The lavatory unit shall be Vitreous China, with front overflow and nominal dimensions of 21" W x 18" L. The lavatory shall be American Standard, Aqualyn Countertop Sink, Model No. 0475.047, or equal.

The lavatory fixtures shall include a hands free sensor activated faucet, 7-inch spout, electronic control module valve; an aerator with 1-1/2-gpm flow restrictor; and a pop-up drain with a 1-1/4-inch tailpiece. The

fixtures shall be Elkay, Electronic Sensor Deck Mount Faucet, Model No. LKB721C, or equal.

F. DRINKING FOUNTAINS

Furnish and install drinking fountains in the locations shown on the Plans. Drinking fountains shall be constructed of stainless steel and include a bottle filling station. Drinking fountains shall include cooling unit with capacity to chill up to 8 gph of drinking water to 50 degrees F. The drinking fountains shall be wall mounted, touchless and be ADA compliant. Provide Elkay Model LZO8WSLK ezH2O series drinking fountains, or equal.

2.7 OUTLET BOXES

A. WASHING MACHINE OUTLET BOXES

Outlet box shall be wall recessed valve box for washing machine connection. Outlet box construction shall be 20 gauge steel box and faceplate with white powder coat with overall dimensions which fit within a 16" stud wall. Outlet box shall include two valves for hot and cold water service connections. Valves shall be 1/2", quarter turn, which comply with ASME A112.18.1. Washing machine outlet boxes shall be Guy Gray IPS Corporation MWB series, or equal.

B. DRYER VENT OUTLET BOXES

Outlet box shall be wall recessed box for dryer vent connection. Outlet box construction shall be 22 gauge aluminized steel box and faceplate with overall dimensions which fit within a 16" stud wall. Dryer outlet boxes shall be Guy Gray IPS Corporation DB series, or equal.

C. REFRIGERATOR OUTLET BOXES

Outlet box shall be wall recessed valve box for refrigerator/ice maker connection. Outlet box construction shall be 20 gauge steel box and faceplate with white powder coat with overall dimensions which fit within a 16" stud wall. Outlet box shall include valves water service connection. Valves shall be 3/8" outlet, quarter turn, and water hammer arrester which comply with ASME A112.18.1. Refrigerator outlet boxes shall be Guy Gray IPS Corporation MIB series, or equal.

PART 3 EXECUTION

3.1 PIPE AND PIPE FITTINGS – WATER SYSTEM

A. BURIED WATER PIPE

Install with not less than 1 foot of cover, measured from top of pipe to approved finish floor. Install pipe in accordance with the manufacturer's recommendations. Construct water lines under other utilities where necessary to meet the minimum cover requirements.

B. PIPES

Remove burrs by reaming. Use Teflon tape on male threads only.

C. OPENINGS IN PIPES

Keep closed during progress of work.

D. COORDINATION

Install so as not to interfere with light fixtures or other trade components.

E. CLOSE NIPPLES

Not permitted on any part of work. Use standard short nipples for short pipe connections. Use of bushings not permitted.

F. PIPING OF COPPER TUBING

Continuous. Copper tubing inserts in runs of steel pipe not permitted. Solder joints in copper piping. Do not lay copper tubing on rocks or gravel.

G. CONNECTIONS BETWEEN PIPES OF DISSIMILAR METALS

Make with insulating union (Dielectric). Include cast iron valve connections to adapters for copper pipe. Does not apply to waste piping.

H. CUTTING OF COPPER PIPE

Use a cutter. Smooth sharp edges with emery cloth.

I. EQUIPMENT ISOLATION

Provide isolation valves (gate or ball valve) and unions at piping connections to all equipment.

J. CONCEALED PIPING

Conceal all piping in finished areas unless otherwise noted.

3.2 PIPE AND PIPE FITTINGS – NATURAL GAS

The flexible gas piping system shall be installed per the manufacturers recommendations and local codes. Flexible gas piping installation shall be performed by individuals trained and certified by the manufacturer.

3.3 PIPING SPECIALTIES

A. UNIONS

Install at final connections to all equipment items and on control side of all valves in mains, branches and risers.

B. ESCUTCHEONS

Install at all places where exposed piping passes through walls, floors or ceilings.

C. ACCESS PANELS

When not specifically shown on the Plans, provide in walls, ceilings, etc., to provide adequate access for service and maintenance of concealed valves, dampers, motors, air vents or any other concealed equipment or accessories. Minimum size 12" x 12".

D. EQUIPMENT, VALVES, AND PIPING

Tag for identification, indicating equipment, zone and area served. Provide nameplates for access doors and removable ceiling panels to areas containing mechanical equipment, valves, etc. Submit to Engineer for approval proposed list of nameplates. Run all drips and drains for pumps, pans, reliefs, etc., to the drain. Discharge onto floor not permitted.

E. EXPOSED PIPING, VALVES, HANGERS, ETC., AT FIXTURE

Chromium-plated finish.

F. ROUGH-IN AND CONNECTION FOR FIXTURES AND EQUIPMENT

Connect fixtures and equipment furnished and installed by General Contractor, Owner, or others. It is the Contractor's responsibility to obtain from supplier sufficient information to rough-in properly and connect all fixtures in accordance with manufacturer's recommendation. Furnish all traps, valves tailpieces and other trim not furnished with equipment.

G. SHUT-OFF VALVES

Provide shut-off valves on all water lines to fixture groups.

H. LOCATION OF FIXTURES

Locate in accordance with details and dimensions on Plans.

I. INSTALLATION OF FIXTURES AND EQUIPMENT

Support and fasten wall hung fixtures with concealed floor support type carriers. Align fixtures and equipment installed in batteries in accord with architectural drawings. Fit fixtures on finished walls without noticeable warpage on either the wall or fixture and grout with G.E. silicone or similar approved material.

J. VACUUM BREAKERS

Locate and install on water supply to all fixtures which have water connection located below rim. Install on all hose bibs.

K. WATER CONNECTION STOPS

Install individual loose key stops on all fixtures. If water connections are concealed, install valves in lieu of stops.

3.4 EXISTING UTILITIES

Locate well enough in advance of the excavation to prevent damage during construction. The Contractor is responsible for any damage whatsoever resulting from his operations on the project.

3.5 CONTAMINATION

Prevent contamination of the pipeline during construction from any operation or source.

3.6 SYSTEM DRAINING

Grade domestic water piping so that it can be drained from low points. Provide a valved drain run to nearest floor drain or approved terminus.

3.7 TESTING AND STERILIZATION

A. WATER SYSTEM (POTABLE AND NON-POTABLE)

Clean piping prior to testing by thoroughly flushing with water until all dirt and foreign materials have been removed. Maintain flushing operations for not less than 1 hour and until piping is clean. Not less than 80-psi flushing pressure.

Conduct for a period of not less than 8 hours at 150-percent operating pressure, 125 psig minimum.

Potable water piping shall be sterilized with calcium hypochlorite at 50 mg/L chlorine for 24 hours prior to line acceptance. Contractor shall furnish hypochlorite. The cost of disposal of water used for sterilization shall be borne by the Contractor.

B. DRAIN AND WASTE SYSTEM

Subject all work to hydrostatic test of 10-feet head of water or as directed by local plumbing inspection authority. Obtain approval for all work or portions of work as tested, in writing, prior to covering or concealment in any manner. Notify Engineer at least two normal working days prior to testing any portion of work and do not conceal any work until so directed by the Engineer.

3.8 INSPECTION

It shall be the Contractor's responsibility to contact the Owner and arrange for final inspection.

***** END OF SECTION *****

SECTION 15700

HEATING, VENTILATION, AND AIR CONDITIONING

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section shall consist of the heating, ventilation, and air conditioning equipment and other associated items as shown on the Plans, and as further specified herein.

All permits shall be obtained in accordance with these Specifications.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
15720	Energy Management Control System (EMCS)
Division 16	Electrical

1.3 QUALITY ASSURANCE

Submittals shall be in accordance with Section 01300.

All equipment supplied in this Section shall be provided to produce complete, operable systems with all elements properly interconnected as shown in schematic diagrams or to provide specified operations. If a specific dimensioned location is not shown for interconnections or smaller system elements, the Contractor shall select appropriate locations and show them on shop drawing submittal for review.

Equipment and material shall be new and without imperfections and shall be erected in a neat and workmanlike manner; aligned, leveled, cleaned and adjusted for satisfactory operation; installed in accordance with the recommendations of the manufacturers and the best standard practices for this type of work to ensure connecting and disconnecting accessories can be readily made and so that all parts are easily accessible for inspection, operation, maintenance and repair. Oil and lubrication fittings shall be located clear of and away from guards, base, and equipment and within reach from the operating floor whenever possible. In order to meet these requirements with equipment as furnished, minor deviation from the Plans may be made as approved by the Owner.

The manufacturer's recommendations and instructions of products used in the work are hereby made part of these Specifications, except as they may be superseded by other requirements of these Specifications.

1.4 PROJECT MEETINGS

Attend a minimum of two site meetings, each up to 2 hours in duration. The first site meeting will be held after 95 percent of the HVAC equipment and controls have been installed. Any required training should be scheduled and performed at this first site meeting. A follow up site meeting shall be scheduled 6 months after the complete installation of the HVAC and controls to ensure proper operation. Any additional training required should be scheduled and performed at the follow up site meeting.

1.5 EQUIPMENT LIST

Refer to Heating, Ventilation and Air Conditioning Schedules shown on the Plans.

1.6 SUBMITTALS

Submit manufacturer product data on HVAC equipment, as listed in this Section, under the provisions of Section 01300.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

Equipment manufacturers and model numbers shall be as shown on the Plans except where indicated herein.

2.2 DAMPERS

Damper air performance data shall be developed in accordance with the latest edition of AMCA Standard 500-D.

A. ROUND MANUAL BALANCING DAMPERS

Dampers shall be suitable for pressures up to 1-inch w.g., velocities to 2,000 ft/min and temperatures to 180 degrees F. Dampers shall consist of: a 20 gauge galvanized steel frame with 6-inch depth; blades fabricated from 20-gauge galvanized steel; 0.375 in square plated steel axles turning in acetal bearings. The damper shall be complete with a locking manual quadrant. A standoff bracket shall be provided for installations using insulated duct. Round manual balancing dampers shall be Greenheck MBDR-50, or equal.

2.3 DIFFUSERS

Diffusers shall be tested in accordance with ASHRAE Standard 70, current edition.

A. RETURN DIFFUSERS

Return diffusers shall be of steel construction. Diffuser back cone shall be of one-piece seamless construction, which incorporates a perforated face panel. The round inlet collar shall be of sufficient length for connecting rigid or flexible duct. The inner assembly shall be completely removable from the diffuser face for access to dampers and duct components. Diffusers shall be finished in a powder coat. Return diffusers shall be Price PDR series, or equal.

B. SUPPLY DIFFUSERS

1. Square Directional Diffusers

Diffusers shall be of steel construction. Diffusers shall consist of an outer frame assembly, which facilitates mounting as shown on the Plans. A collar that allows connection to the duct size shall be an integral part of the frame assembly. An inner core assembly consisting of fixed louver directional modules that may be easily field adjusted and capable of producing the airflow discharge pattern as indicated on the Plans. Louver modules shall be fully removable from the installed diffuser frame. Diffusers shall be finished in a powder coat. Square directional supply diffusers shall be Price SMCD series, or equal.

2. Slot Diffusers

Slot supply diffusers shall be of extruded aluminum construction and be compatible for surface mounting. Diffusers shall be modular, include multiple discharge slots, and include a round inlet. Discharge slots shall include pattern controllers which allow for individual slot airflow adjustment. Diffusers shall be finished in a powder coat. Provide specific configuration and accessories as described in the Plans and Equipment Schedules. Slot supply diffusers shall be Price SDS series, or equal.

C. COLOR SELECTION

Diffuser color to be selected by Owner from the manufacturer's standard palette.

2.4 CO2 SENSORS

Carbon dioxide (CO2) sensors shall be wall mounted sensing/transmitting device for controlling HVAC equipment. Sensor shall be non-dispersive infrared optical sensor for detecting CO2 levels in air. Sensor shall have a measurement range of at least 0-2000 ppm with an accuracy of $\pm 1\%$ of measured range plus 3% of measured value. Sensor shall be self-calibrating and not require calibrating for a minimum life of 15 years. The device shall be capable of providing dual, simultaneous outputs of both current and voltage; 4-20 mA and 0-10 V respectively. Power supply shall be 24 VAC, 60 Hz. Device shall include plastic enclosure, display, and be wall mounted. CO2 sensors shall be Air Test TR9200 series, or equal.

2.5 REMOTE DAMPER OPERATORS

Brass rod, universal joint and flush cover.

2.6 AIR EXTRACTORS

Adjustable blades, push-pull operator. Krueger EX-88A, or equal.

2.7 ELBOWS

Standard radius or vaned square, as per SMACNA Standards.

2.8 TAPE

Non-combustible, three inches in size, foil backing, pressure-sensitive lap of facing material. NASHUA 322, NASHUA FSK (High Pressure) or equal.

2.9 DUCT SEALANT

Duct sealant shall be Foster 32-19 Duct-Fas, or equal.

2.10 ADHESIVE

Adhesive shall be Foster 85-60 Quick-Tack, or equal.

2.11 METAL DUCTWORK

Metal ductwork for air supply and return air shall be fabricated in accordance with ASTM A527 (galvanized sheet metal) or ASTM A167, ANSI Type 302/304 (stainless steel sheets) if S.S. ductwork is shown on the Plans. Metal ductwork shall be rigidly constructed and installed. Slip joints shall be in the direction of

air flow. All joints shall be sealed tight. Bonding materials for sealing duct system and attaching insulation shall be supplied by manufacture. Ducting shall be United McGill, SMACNA or equal.

Hangers shall be secured to the ceiling or walls and shall be adequate to support ductwork. Where ducts go through walls, there shall be 1/4-inch clearance left and this area shall be sealed tight with compatible mastic and foam rubber and the penetration area covered over with flanges that are secured to the ductwork only. Volume dampers shall be located as shown on the Plans, and at a minimum of one damper for each branch duct installed. Dampers are to be of the same material as the ducts they are installed in. Fire dampers shall be installed in ductwork as directed by the Building Permit or required by the Owner.

Ductwork shall be installed and supported to comply with the requirements and recommendations of Sheet Metal and Air Conditioning Contractors National Association (SMACNA) HVAC Duct Construction Standards. Sheet metal plenum shall be constructed of not lighter than 18-gauge galvanized steel and reinforced with 1-1/2-inch by 1-1/2-inch by 1/8-inch angles as required to prevent drumming or breathing. Access openings and covers shall be provided for cleaning, wiring and servicing motors, filters, fans and dampers located within or blocked by sheet metal work.

2.12 FLEXIBLE DUCTWORK

Flexible ductwork for air supply and return shall be a double lamination of tough polyester encapsulating a steel wire helix to form an air-tight inner layer, a middle layer of wrapped fiberglass insulation, and an outside layer of a durable polyethylene jacket. Flexible ductwork shall be suitable for pressures up to 6" w.g. for 4" to 12" diameter duct and 4" w.g. for 12" to 20" diameter duct, air velocities up to 5,000 fpm, and continuous operating temperatures of -20 °F to 140 °F. Insulation shall have a minimum R-value of 4.2. The materials shall have a flame spread index of less than 25 and a smoke-developed index of less than 50 when tested in accordance with ASTM E 84, latest revision. Flexible ductwork shall be Atco 80 series, or equal.

2.13 DUCT HANGERS AND SUPPORTS

Comply with requirements and recommendations of Sheetmetal and Air Conditioning Contractors National Association (SMACNA) HVAC Duct Construction Standards.

Conform to requirements of SMACNA "Seismic Restraint Manual Guidelines for Mechanical Systems."

Furnish standard and fabricated hangers and supports complete with necessary inserts, bolts, nuts, rods, washers and other accessories.

Hanger straps and rods shall be in accord with SMACNA Duct Construction Standards.

Fasten bracing to ductwork, including riveting, bolting, and tack welding per SMACNA.

Provide galvanized steel band or fabricated angle iron brackets for wall supports, except in wet well area where stainless steel components are required.

A. HANGER RODS

Carbon Steel, with hex nuts and flat washers.

B. CONCRETE INSERTS

1. Continuous channel - Unistrut.
2. Universal, malleable iron - Type 18, FS WW-H-171.

Beam Clamps and Attachments as required.

2.14 SEISMIC SUPPORTS

All HVAC supports, tie rods, bracing, brackets or other types of supports shall be designed in accordance with the current edition of the International Building Code (IBC) and ASCE 7-10. Evaluate the seismic loads in accordance with IBC and Chapter 13 of ASCE 7-10 for the seismic design parameters shown on the Plans.

PART 3 EXECUTION

3.1 INSTALLATION

All materials shall be installed as shown on the Plans and according to manufacturer's recommendations. Adjust all dampers to provide tight seal when closed and unobstructed flow when open. Provide all necessary controls, and coordinate all control wiring with Division 16. All installed equipment shall function in manner intended.

The heating/cooling system shall be installed as shown on the Plans and shall be connected to any ductwork with flexible connections. The Contractor shall be responsible for the installation of any condensate drain piping and conduit/wire runs for controllers/thermostats.

3.2 TESTING, ADJUSTING AND BALANCING

Testing, adjusting, and balancing shall be performed on the existing systems as indicated within the Plans. TAB is required for new terminals and for relocated existing terminals connected to an existing system which has been modified.

Testing, adjusting, and balancing shall also be performed on HP-18 and ERV-1 to ensure that these systems are working as outlined within the March 2011 “Test, Adjust, & Balance Report” by Neudorfer Engineers Inc. and the Plans. This TAB report is available upon request.

A. QUALIFICATIONS

All work shall be performed under the direct supervision of an AABC Certified Test and Balance Engineer. Resumes including education, experience, and certification of each person on the project shall be submitted for review and approval by the Owner. Notify the Owner 10 days prior to testing. The Owner shall witness the testing and balancing.

B. INSTRUMENTATION

All instruments used will be currently calibrated and listed in the TAB report showing instrument description, serial number, and date of calibration.

C. AIR BALANCE

When systems are complete and ready for operation, the TAB Agency will perform a final air balance for all air systems and record the results. The volume of air for the supply, return, exhaust, and outside air equipment and terminals will be tested and balanced within the tolerances of the AABC Standard. The general scope of balancing by the TAB Agency will include, but is not limited to, the following:

1. Filters

Check air filters and filter media and balance only systems with essentially clean filters and filter media.

2. Voltage and Amperage Readings

Measure and record the final operating amperages and voltage for each motor.

3. Static Pressure Profile

Static pressure profiles shall be measured and recorded across each supply fan, cooling coil, heating coil, return air fan, air handling unit filter, and exhaust fan, and at the furthest air device or terminal unit from the air handler supplying that device. Static pressure profiles shall also be provided for systems, which do not perform as designed.

4. Equipment Air Flow

Adjust and record exhaust, return, outside, and supply air CFM and temperatures, as applicable, at each fan and coil.

5. Outlet Air Flow

Adjust each exhaust inlet and supply diffuser, register and grille to within the tolerances shown in the AABC Standard. Include all terminal points of air supply and all points of exhaust.

6. Pitot Tube Traverses

For use in future troubleshooting by maintenance personnel, all exhaust ducts, main supply ducts, outside air, and return ducts shall have air velocity and volume measured and recorded by the Pitot tube traverse method shown in the AABC Standard. Locations of these traverse test stations shall be described on the sheet containing the data.

D. REPORTS

The report will contain all required information as described within this specification, including the information formatted and shown in the AABC Standard. Include with the data the date tested, personnel present, records of test instruments used, and a list of all measurements taken. All measurements and recorded readings (of air, water, electricity, etc.) that appear in the reports shall be certified by the Agency's Test and Balance Engineer. Copies of the final report shall be submitted to the Owner indicating a summary of actual operating data and any abnormal operating conditions.

E. EXECUTION

1. Provide additional dampers, and clean filters as specified herein and shown on the Plans.
2. Put all system and equipment into operation and continue operation until all adjusting, balancing, testing, demonstrations, instructions, and cleaning of systems have been completed.
3. Do not begin testing and balancing until systems are completed and in good working order.
4. Check motors for proper rotation, coupling and drive alignment, belt tension, and freedom from vibration, etc.
5. Make all changes to drives and dampers as necessary to accomplish specified airflows.

*****END OF SECTION*****

SECTION 15720

ENERGY MANAGEMENT CONTROL SYSTEM (EMCS)

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section shall consist of the new, retrofitted, and existing instrumentation, temperature, ventilation controls, and energy management control for all HVAC units and equipment as well as any required operator training, installation labor, warranty, and all other necessary material and labor to provide a complete workable system. The control system consists of a Windows based PC, Remote System Controllers (RSC), sensors, automatic valves and dampers with actuators, and operating software.

1.2 RELATED WORK SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
15700	HVAC
Division 16	Electrical

1.3 SYSTEM DESCRIPTION

A. BASIC SYSTEM

The existing EMCS is a distributed processing system including Direct Digital Control (DDC) and Direct Analog Control (DAC) software. This system is controlling all HVAC equipment (heat pumps, pumps, cooling tower, heat recovery ventilators, fans, dampers, radiant heat panels, etc.) and other specified equipment directly, without intervening conventional controls.

The existing system uses Command Center software operating on a Windows PC. This uses the Central Processing Unit for routine office tasks simultaneously with building energy management. Remote System Controllers (RSC) each communicate directly with the Command System and are also stand-alone, maintaining its own control strategy in the event of communication failure with the Command Center. Each RSC includes the required control algorithms preprogrammed for all the existing Equipment Schedules. The RSCs contain built in RAM and ROM and can control any type of HVAC device. The program can be changed by simply repositioning dip switches and all RSCs are interchangeable. The RSCs each contain at least eight analog inputs, eight digital inputs, four

analog outputs, and eight digital outputs. Each RSC is linked by a single pair of wires. All RSCs also have default control software which is dip switch selectable.

The EMCS monitors and controls all functions relating to Building Automation, Temperature Control and Energy Management. The system RSCs directly control all HVAC units, duct damper actuators, valve actuators, pumps, cooling tower, boiler, exhaust fans, and other HVAC equipment. The sequence of operation identifies all points of monitoring and control. The point monitoring and controlling functions performed by the system include eight digital inputs (contact closures), eight analog inputs (varying voltage/current/resistance/pneumatic signals), four analog outputs (varying voltage/current/resistance/pneumatic signals), and eight digital outputs (start/stop or 3 point floating using digital timing). Any failure of an RSC displays offline occurrence for each individual affected point at the Command Center.

The existing system has a minimum of 7680 point capacity and up to 1024 HVAC zones. Additions to the system can be accomplished by adding subsequent RSCs while the system is online.

The existing system is fully menu-driven. All system titles, prompts, and instructions are in English and user friendly. All entries are in natural units. All operator commands, changes, and data displays identified in the sequence of operation are available and executable at the single operator's station. All system configuration and reconfiguration is done via the menus with user prompted dialog boxes and without the need for programming experience or modifications/additions to the system.

All functions of the Command Center are available by remote control via standard modem communications using a telephone line and/or via the Internet using an Ethernet LAN connection. The system Command Center automatically inform the remote central system of alarm conditions and report unit identifier and alarm status upon occurrence. The remote Command Center exactly duplicates all capabilities provided by the local Command Center.

B. ENERGY REDUCTION SOFTWARE

The EMCS is designed to control all equipment for which significant energy savings can be achieved, equipment which is involved in building temperature control, and other HVAC equipment. The EMCS software includes the following capabilities:

1. Scheduling

Up to 32 different weekly schedules, 8-day type, 4 entries per day, in 24 hour format, displayed and editable from the Command Center. Editable holiday scheduling for up to 20 years in advance.

2. Demand Limiting

Up to eight kW demand meters, software for limiting the operation of controlled equipment, control of maximum and minimum temperatures, and duty cycling of shed equipment.

3. Setback Recovery with Adaptive Optimum Start

The system calculated the optimal start cycle of individual HVAC units based on the outdoor air temperature, zone temperature, and past start cycles. HVAC equipment operates in economizer cooling mode when available and as required to reduce space temperature.

4. Economizer Control

The system monitors outdoor air enthalpy at a single point and the return air enthalpy for each zone. On a call for cooling from the zone, the system compares the enthalpy of the outside air with the enthalpy of the zone. If the enthalpy of the outside air is lower, the economizer dampers are modulated so the outside air and relief dampers are open and return air damper is closed. If enthalpy of outside air is higher, the economizer outside air damper is maintained at the minimum position.

5. Outdoor Air Reset Control

Reset of controlled temperature based on outside air temperature.

C. MISCELLANEOUS FUNCTIONS

Other functions of the EMCS include automatic configuration, automatic restart in the case of power failure, system modifications without programming, alarms, dynamic graphics, temperature control, logs, dynamic data exchange, password security, and real-time clock with battery backup.

D. CONTROL COMPONENTS

The control components included within the system are temperature sensors, enthalpy sensors, control dampers, control valves, damper and valve actuators, control relays/contactors, airflow switches, and CO2 sensors.

1.4 EMCS CONTRACTOR

The reconfiguration of the EMCS shall be performed by PSR Mechanical. The EMCS Contractor shall provide components for a complete building automation system and provide factory authorized and trained technicians for installation, system reconfiguration, and reprogramming as described herein and within the Plans. No alternatives will be allowed.

1.5 QUALITY ASSURANCE

Submittals shall be in accordance with Section 01300.

All equipment supplied in this Section shall be provided to produce complete, operable systems with all elements properly interconnected as shown in schematic diagrams or to provide specified operations. If a specific dimensioned location is not shown for interconnections or smaller system elements, the Contractor shall select appropriate locations and show them on shop drawing submittal for review.

Equipment and material shall be new and without imperfections and shall be erected in a neat and workmanlike manner; installed by trained mechanics under direct supervision of the Energy Management Control System (EMCS) Contractor, in accordance with the recommendations of the manufacturers, and the best standard practices for this type of work to ensure connecting and disconnecting accessories can be readily made and so that all parts are easily accessible for inspection, operation, maintenance and repair. All automatic dampers and other air control devices furnished by the EMCS Manufacturer shall be installed by the Mechanical Contractor, or the Sheet Metal Contractor, under the EMCS Contractor's supervision. Dampers shall be linked to the damper motor by the EMCS Contractor. In order to meet these requirements with equipment as furnished, minor deviation from the Plans may be made as approved by the Owner.

The manufacturer's recommendations and instructions of products used in the work are hereby made part of these Specifications, except as they may be superseded by other requirements of these Specifications.

1.6 POST INSTALLATION INSTRUCTION

Upon completion, the Energy Management Control Contractor, in conjunction with the HVAC representative, shall instruct operating personnel in the operation of the system. The EMCS Contractor shall provide 16 hours of on-site training in the operation of the system for maintenance personnel and other employees as deemed necessary by the administration.

1.7 SUBMITTALS

A. EQUIPMENT LIST

Furnish a complete list of equipment to be furnished including a manufacturer's catalog sheet for each item on the material list.

B. ENGINEERING DRAWINGS

Provide a complete set of engineering drawings, prior to installation, for approval that will include the following information:

1. Interconnect drawings; show all field wiring and interconnecting equipment and devices, identify the type and size of wire, assign unique numbers or colors to every wire, and identify equipment and devices by the reference designators shown on the plan drawings.
2. Wiring diagrams; show internal wiring of all panels, show general physical arrangement of component devices installed in the panels, and provide partial elementary ladder diagrams to show the function of circuits employing switching logic.
3. As-built drawings; update the engineering drawings to reflect the actual "as-built" conditions and deliver three copies to the Mechanical Contractor within 10 days prior to Final Acceptance.

1.8 SERVICE AND GUARANTEE

A. TWO YEAR WARRANTY

The control system herein specified shall be free from defects and workmanship and material under normal use and service. If within 12 months from the date of completion any of the equipment herein described is proved to be defective in workmanship or materials, it will be repaired or replaced free of charge.

B. ADJUSTMENTS AND SERVICE

After completion of the installation the EMCS Contractor shall regulate and adjust all thermostats, control valves, control dampers and other equipment provided under the EMCS contract. The EMCS Contractor shall provide any service incidental to the proper performance of the control system under guarantees outlined above for the period of one year. Normal maintenance of the system or adjustments or components is not to be considered part of the guarantee.

PART 2 PRODUCTS

2.1 CONTROL COMPONENTS

New equipment shall be completely pre-calibrated with no controller setpoint adjustments or calibration required. All new system components shall be UL listed. UL recognized controllers are only acceptable if included as a component of a UL certified control panel.

PART 3 EXECUTION

3.1 SYSTEM RECONFIGURATION

A. GENERAL

Relocate, provide and/or install devices, relays, switches, sensors, dampers, conduit, and wiring as shown on the Plans and as required to provide a complete and operating DDC system. Reuse existing components wherever possible. Operational programs and schedules for each type of system are already present within the Command Center. Coordinate all control wiring with Division 16.

B. EACH HVAC UNIT

Each HVAC unit shall be controlled via a wall mounted electronic sensor with override push-button. Sensors shall provide associated RSC with current temperature status. RSC shall directly and individually control all necessary HVAC components.

C. RECONFIGURE RSC

Zones which are being altered shall have the associated RSC reconfigured via the dip switches as required to provide the appropriate operation. This includes the connection or disconnection of CO2 sensors and the operation of economizer dampers.

3.2 TESTING

Provide authorized startup technician to perform functional performance testing. Conduct functional tests on complete systems, or individual portions as approved. Start up and test each system, or portion thereof, to determine that each control device function reliably and as specified to attain operation sequence. Conduct operational tests; set controls to operating conditions, record settings and reading of each control device. Work in close coordination with the Testing, Adjusting, and Balancing Agency to set up control devices, set damper flow rates, and provide control system in perfect operating order. See Section 15700.

*****END OF SECTION*****

DIVISION 16

ELECTRICAL

SECTION 16050

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the requirements and methods for furnishing and installing the basic electrical materials, and other associated items as shown on the Plans, and as further specified herein.

1.2 RELATED WORKS SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
02300	Site Earthwork
09900	Painting
Division 15	Mechanical
Division 16	Electrical

1.3 DEFINITIONS

A. ADJUSTABLE SPEED DRIVE CONTROLLERS

Adjustable speed drives are variable frequency AC drives used to power AC squirrel-cage induction motors at variable frequencies, which relate directly to variable speed. These drives are also commonly known as Variable Frequency Drives (VFDs).

Basic design typically consists of AC to DC conversion followed by AC output wave simulation using pulse-width modulation (PWM). This simulated output power signal will appear to the motor as a representation of an adjustable frequency sine wave. This output may be electrically noisy.

B. ANALOG I/O

Analog I/O are PLC input/output electronic signals that are contiguous over time. Analog signals represent a large number of values within a specific range.

C. ATTICS

Attics shall be considered those closed environments between ceilings and roofing that allow full entry of personnel by use of ladders, pull-down stairs, or other special means.

ATTICS are considered dry crawl spaces (see CRAWL SPACES).

Tight spaces between ceilings and roofs that do not allow full entry of personnel are considered concealed areas (see CONCEALED AREAS).

D. CHEMICAL AREAS

Locations where process chemicals are stored or used within a process in either a confined or open manner. Chemical areas may be exposed to chemical solids, liquids, or gases as a result of normal operation, system maintenance, or spills/leaks.

E. CONCEALED AREAS

Locations that are underground, within walls, or within other areas that do not allow full entry of personnel are considered concealed. Concealed areas are not exposed (see EXPOSED AREAS) or accessible (see ATTICS and CRAWL SPACES).

F. CONTROL PANELS

Control Panels shall be defined as enclosures that contain electrical devices capable of controlling, altering, indicating or displaying the function or conditions of electrical circuits. Unlike junction boxes, Control Panels are not just used for the redirection or reconnection of electrical circuits.

G. CONVENIENCE RECEPTACLES

120 Vac general-purpose receptacles that are not dedicated to a specific function or piece of equipment. Receptacles dedicated to computers, heat tracing, fans, louvers, and etc., are not considered convenience receptacles.

H. CRAWL SPACES

Crawl spaces shall be considered those closed environments that are not normally accessible to personnel, but that allow full entry of personnel by special means.

Crawl spaces are considered exposed areas and may be dry or wet (see ATTICS).

I. DAMP AREAS

Damp areas are considered wet (see WET AREAS).

J. DEDICATED RECEPTACLES

Dedicated receptacles are provided for a specific receptacle load such as computers, heat tracing, fans, louvers, metering pumps, sump pumps, and etc. Dedicated receptacles are not intended for general use.

K. DIGITAL I/O

A digital I/O point consists of a single input or output binary bit at one of two possible states, which may be represented as 1's or 0's, ON or OFF, YES or NO, TRUE or FALSE, etc. Digital I/O may also be called "discrete" I/O. Within these specifications, both terms are synonymous.

L. DRY AREAS

Locations not normally subject to dampness or wetness. A location classified as dry may be temporarily subjected to dampness or wetness, as in the case of a building under construction (see FINISHED AREAS).

Rooms containing process water, chemical piping, or related equipment are not considered DRY. Areas that are not considered DRY are considered WET.

M. EXPOSED AREAS

Locations that are visible, outdoors, or exposed to a process or room environment. Exposed areas are not concealed (see CONCEALED AREAS).

N. FINISHED AREAS

Indoor confined areas that are not directly exposed to a process or process chemicals. They typically include closed offices, bathrooms, laboratories, lunch/break rooms, etc. Finished areas are considered DRY.

O. HAZARDOUS AREAS

Class I, Divisions 1, and 2; Class II, Divisions 1 and 2; Class III, Divisions 1 and 2 locations where fire or explosion hazards may exist due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or flyings (reference National Electrical Code, Article 500).

P. HIM

Human Interface Module – A programmable operator interface directly associated with, or integral to, an electrical control device (such as a VFD or Soft Start drive). This interface displays device setpoints and status with a keypad for data entry.

Q. HMI

Human Machine Interface – The way a person interacts with a computer or electronic device. It comprises the screen menus and icons, keyboard shortcuts, command language, and help functions. Peripheral support devices, such as a mouse, keyboard, touch screen, and remote controls are also included. The HMI system is typically PC based, located in an office or lab environment.

R. HOT SPARE

A “Hot Spare” is a PLC analog or digital channel in a PLC card that is powered but the channel is unassigned. Hot spares are connected to fused field I/O terminal block groups per Specification 16940.

S. INDOOR AREAS

Confined locations where the equipment is normally protected from wind, dust, rain, snow, and other natural elements. INDOOR areas are not the same as DRY areas.

T. I/O

Inputs/Outputs – Input and output signals into and out of a PLC or RTU.

U. LEGALLY REQUIRED STANDBY SYSTEMS

Those systems required and so classed as legally required to have standby power by Government requirements.

V. OIU

Operator Interface Unit – A graphical display of industrial plant system variables and status. It may also allow for process control adjustments. Navigation of its programming may be via keypad, touch screen, or a combination of both. An OIU is typically located on a field control panel or control panel in an electrical equipment room.

An Operator Interface Unit is considered a possible extension of a PLC, like an I/O or network card. PLC installations may or may not include an OIU.

W. OUTDOOR AREAS

Locations where the equipment is normally exposed, or partially exposed, to weather in the form of wind, dust, rain, snow, and other natural elements.

X. PROCESS AREAS

Process areas are those areas that are directly exposed to process moisture, or that may be subjected to moisture in the event of a process leak or failure. They typically include pump rooms, chemical rooms, and direct process-exposure areas such as clearwells, open filters, and reservoirs. Process areas are considered WET.

Y. PLC

Programmable Logic Controller – A device used to monitor and control system process. It can be used stand-alone or in conjunction with other systems such as SCADA. It may provide telemetric functions or interface with telemetric equipment.

Z. RTU

Remote Telemetry Unit/Remote Terminal Unit – A device that reads the status of process devices and transmits them to another telemetric unit. RTUs may transmit a command from another source but will not alter or interpret the command. RTUs differ from PLCs in that they do not control a process.

AA. SCADA

Supervisory Control and Data Acquisition (SCADA) systems are data monitoring and control stations that allow operators to visualize and adjust

live process conditions at a centralized HMI. These systems often include process historical data tracking and alarming capabilities. SCADA systems can be used for data monitoring locally, remotely, or both.

BB. SHOP FABRICATED

Manufactured or assembled equipment for which a UL test procedure has not been established.

CC. SOFT START MOTOR CONTROLLERS

See SOLID STATE MOTOR CONTROLLERS in this Section.

DD. SOLID STATE MOTOR CONTROLLERS

Solid State motor controllers provide an electronically controlled acceleration and deceleration of AC squirrel-cage induction motors. Once the motor has reached full speed, the electronics are switched off and replaced with a motor drive contactor that connects the motor directly to line power, thus assuring continuous full voltage to the motor. Solid State motor controllers are also referred to Soft Start motor controllers.

Unlike VFD drives, Solid State motor controllers do not alter the sine wave *frequency* to the motor; instead they alter the portion of the sine wave that reaches the motor. This controls the amount of power sent to the motor and affects the motor's ability to create torque. The electronic Solid State control is only used during acceleration and deceleration. During acceleration the controller switches the waveform from 0 up to 100 percent (full voltage) and during deceleration switches the waveform from 100 down to 0 percent (no voltage).

EE. TELEMETRY

Telemetry is the transfer of data between remote sites. Typical methods of data transfer are utility phone lines, radio transmission, and fiber optics.

FF. VARIABLE FREQUENCY DRIVES (VFDs)

See ADJUSTABLE SPEED CONTROLLERS in this Section.

GG. VIBRATING EQUIPMENT

Equipment that is subject to vibration under normal operating conditions, such as motors, transformers, electrically operated valves, etc.

HH. WET AREAS

Locations outdoors, underground, directly or indirectly exposed to the process, in concrete slabs or masonry in direct contact with the earth, or in any other way subject to saturation with water or other liquids.

1.4 REFERENCES

Unless otherwise noted, the requirements of the following code-making authorities and standard organizations apply:

<u>References</u>	<u>Title</u>
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society of North America
ISA	Instrument Society of America
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NRTL	National Recognized Testing Laboratory
OSHA	Occupational, Health, and Safety Administration
UL	Underwriters Laboratories, Inc.
UL 508	Safety Industrial Control Equipment
UL 698	Industrial Control Equipment for Use in Hazardous Locations
WAC 296-46B	Washington Administrative Code, Electrical Safety Standards, Administration, and Installation

In case of conflict or disagreement between codes, standards, laws, ordinances, rules, regulations, plans, and specifications, the more stringent condition shall govern.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Prior to submittal of shop plans, coordinate all electrical equipment, particularly motor control equipment, process and control panels, and instrumentation, with related manufacturers and with other applicable equipment and systems specified in other divisions of the Specifications.
- C. Provide submittals in the following manner:
 1. Organize the submittals by CSI code type.

2. Clearly show the Tag Number associated with each submittal within each CSI grouping.
 3. Include non-tagged devices such as grounding systems, conduits, wireway, ductbank details, wire, cable, boxes, fittings, switches and receptacles.
 4. Clearly show the specific part, part number, order code, etc. associated with the device. Use pointers, highlights, circles, etc. to clearly identify the specific part.
 5. Submit on distribution equipment, including but not limited to: Unit substations, Medium voltage switching equipment, motor control centers and control equipment, low voltage switchboards, safety switches, dry-type (specialty) transformers, panelboards, and grounding.
 6. Submit on generators and automatic transfer switches.
 7. Submit on lamps, lighting, site lighting, and wiring devices.
- D. Provide manufacturer's product technical data including, but not limited to:
1. Manufacturer's name, address, and contact number.
 2. Manufacturer's product descriptive bulletin.
 3. Nameplate data, current, voltage, load, impedance, and other electrical data pertinent to the Project and necessary to assure compliance with the Specifications and Plans.
- E. Provide elementary wiring diagrams for the electrical control systems showing the wiring of electrical control items, such as starters, control systems, interlocks, switches, and relays as they apply to this Contract.
- F. Provide schematic interconnection diagrams and/or PID diagrams for each control system and each control panel. Each control diagram shall show a schematic representation of the process equipment and the locations of the switches, meters, automatic valves, indicators, controllers, and recorders. Show correct operating settings and ranges for each control instrument on the diagrams.

- G. Use diagrams and symbols in shop plans, which conform to JIC Electrical Standards for Industrial Equipment and/or NEMA, ICS, ANSI, and IEEE standards, latest revisions. Prepare plans on 22" x 34", or ANSI size A, B, or D in a format similar to the Contract Documents or other nationally recognized drawing standard.
- H. Clearly, indicate on submittals that the equipment or material is NRTL listed or is constructed of listed or recognized components. Where a NRTL standard has not been established, clearly identify that no NRTL standard exists for that equipment.
- I. **OPERATION AND MAINTENANCE MANUALS**

Reference base requirements in specification 01300.

Manuals for the electrical system shall also include:

1. Manuals for Motor Control Centers. MCC wiring diagrams shall include updated title block showing the date redline field changes were incorporated into the documentation.
2. Manuals for fabricated control panels. Wiring diagrams shall include updated title block showing the date redline field changes were incorporated into the documentation.
3. In each section, compile a spare parts list and supplier index.
4. Assemble records of all tests, measurements, and calibration settings made for each device.
5. The Contractor shall supply three USB copies of the final equipment manuals in a tabbed, searchable, .pdf format, with a table of contents bookmarked to provide a navigation link to each section of the manual(s).

1.6 SYSTEM DESCRIPTION

- A. Provide the labor, materials, and equipment necessary to furnish, install, and place into operation complete power, lighting, control, alarm, communications, and instrumentation electrical system of this Contract as shown on the Plans or Specifications herein.
- B. Provide a functioning system(s) in compliance with manufacturer's instructions, performance requirements as specified or indicated, and

modifications resulting from reviewed shop plans and field coordinated plans.

- C. Provide complete wiring and controls for all equipment specified under other divisions and that comply with Division 16.
 - 1. Connect motors, controls, meters, and any other electrical device installed or provided as part of the project.
- D. Pay and make arrangements for necessary permits, licenses, and inspections.

1.7 QUALITY ASSURANCE

A. TESTING AGENCY QUALIFICATIONS

A “Nationally Recognized Testing Laboratory” (NRTL) recognized and approved by the State of Washington.

- 1. Testing Agency Field Supervision: Use persons currently certified by NETA or the National Institute for Certification in Engineering Technologies, or equal, to supervise onsite testing specified in Part 3.

- B. Comply with NFPA 70 (NEC) for components and installation.

C. LISTING AND LABELING

Provide products specified in this Section that are listed and labeled.

- 1. The Terms “Listed and Labeled:” As defined in the National Electrical Code, Article 100.
- 2. Listing and Labeling Agency Qualifications
 - a. A NRTL recognized and approved by the State of Washington.

1.8 DELIVERY, STORAGE AND HANDLING

Ensure that equipment is not used as steps, ladders, scaffolds, platforms, or for storage – either inside or on top of enclosures. Protect nameplates on electrical equipment from being defaced. Repair or replace damaged, corroded, and rejected items at no additional cost to the Owner.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Refer to individual Division 16 sections.
 - 1. Similar equipment shall be provided by only one manufacturer throughout the project unless otherwise noted in the Specifications.
- B. Submit requests for substitution in accordance with Section 01300.
- C. Trade names and catalog numbers may be used in the Plans or Specifications to establish quality standards and basis of design:
 - 1. Other listed manufacturers in the applicable specification sections with equal equipment may be acceptable.

2.2 GENERAL PRODUCT REQUIREMENTS

- A. Except as otherwise indicated, provide new materials and equipment, which are standard products of manufacturers, regularly engaged in production of such equipment. Provide material or equipment approved and labeled for the purpose for which it is to be used by NRTL or other organizations acceptable to the State of Washington Department of Labor and Industries.
- B. Where voltage, current, power, temperature or other ratings are specified that do not correspond to standard ratings of the manufacturer selected by the Contractor, furnish the next rating level which is more conservative or increases the capacity of the device or material in question.
- C. Furnish materials, devices, and equipment that are non-corrosive or coat them in a manner that renders them non-corrosive and acceptable to the Engineer. Do not provide materials, which contain polychlorinated biphenyls, asbestos, or other hazardous or detrimental materials. Do not install materials in a location or construction manner that produces galvanic action or do not install material combinations with corroding or eroding action.
- D. Where changes in the work, or substitutions in material are proposed, ensure that sizes, weights, openings, etc., are provided that do not require changes in the work outside this Division.
- E. All terminals shall be suitable for 75 degrees C rated copper conductors.

2.3 FABRICATION

- A. When equipment is shop fabricated specifically for this Project, use electrical devices and enclosures, which are NRTL, listed and labeled or recognized.
- B. **SHOP OR FACTORY FINISHES**
 - 1. See Division 11 and Section 09900.
 - 2. Interiors of other painted electrical equipment shall be either white or light gray.
- C. Fabricate equipment or devices in the field equivalent in every respect to manufactured items used for the same purpose. Where cutting, drilling, grinding, etc., is done to galvanize or painted metal, regalvanize, or paint to match original finish.

2.4 SUPPORTING DEVICES

- A. Channel and angle support systems, hangers, anchors, sleeves, brackets, fabricated items, and fasteners are designed to provide secure support from the building structure for electrical components.
 - 1. **Material**

Steel, except as otherwise indicated, protected from corrosion with zinc coating, or with treatment of equivalent corrosion resistance using approved alternative finish or inherent material characteristics.
 - 2. **Metal Items for Use Outdoors or in Damp Locations**

Hot-dip galvanized steel, or stainless steel, except as otherwise indicated.
- B. **ANCHORS**

Galvanized steel in dry areas; stainless steel or hot dipped galvanized steel in wet areas.

 - 1. Lag screws or Type A tapping screws for wood.
 - 2. Rockwell “well-nut” for light loads in masonry.

3. Thru-bolt with fender washers for heavy loads in masonry.
4. Toggle bolts with springhead for hollow partitions.
5. Self-drilling anchors with threaded studs for concrete.
6. Clamps or U-bolts for structural steel.
7. Self-drilling anchors with extension rods for hollow tile over concrete.

C. SHEET-METAL SLEEVES

0.0276 of an inch or heavier galvanized sheet steel, round tube, closed with welded longitudinal joint.

D. PIPE SLEEVES

ASTM A53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.

2.5 ELECTRICAL IDENTIFICATION

A. MANUFACTURER'S STANDARD PRODUCTS

Where more than one type is listed for a specified application, selection is Installer's option but provide single type for each application category. Use colors prescribed by ANSI A13.1, NFPA 70, and Specifications.

B. COLORED ADHESIVE MARKING TAPE FOR RACEWAYS, WIRES, AND CABLES

Self-adhesive vinyl tape, not less than 3 mils thick by 1 inch wide.

C. UNDERGROUND LINE WARNING TAPE

Provide bright-colored, vinyl tape not less than 3-mils thick by 6-inches wide compounded for direct-burial service with permanent and continuous print.

D. TAPE MARKERS

Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.

E. COLOR-CODING CABLE TIES

Type 6/6 nylon, self-locking type. Colors to suit coding scheme.

F. FASTENERS FOR PLASTIC-LAMINATED AND METAL SIGNS

Self-tapping stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

G. FLASH PROTECTION WARNING

Provide Arc Flash Warning Label on all equipment as required by 110.16 NEC (2014). The label is to contain the following text:

WARNING or DANGER
Arc Flash Hazard!
Follow requirements in NFPA 70E
for safe work practices and
appropriate PPE. Failure to comply
can result in death or injury.

2.6 TOUCHUP PAINT

Use touchup paint on equipment provided by equipment manufacturer and select color to match existing equipment finish.

A. FOR NON-EQUIPMENT SURFACES

Matching type and color of undamaged, existing adjacent finish.

B. FOR GALVANIZED SURFACES

Zinc-rich paint recommended by equipment manufacturer.

PART 3 EXECUTION

3.1 ELECTRICAL SUPPORTING METHODS

A. WET AREAS

1. For pullboxes and equipment vaults, reference Specification Section 16130.
2. For wet areas which are not pullboxes or equipment vaults, hot-dip galvanized materials, stainless steel materials, or nonmetallic,

U-channel system components unless otherwise noted on the Plans.

B. DRY AREAS

Hot-dip galvanized materials unless otherwise noted on the Plans.

C. METHODS

Support raceway, equipment, and devices from framing members or building structure with sufficient clearance for maintaining and servicing. Provide backing plates, and/or framing material to support equipment, devices, and materials, which are located between the building or facility structure-framing members.

3.2 RECORDS

- A. Maintain and annotate on the job at all times a separate set of Record Drawings in accordance with the General Conditions. Show changes from the Contract Documents, routing of hidden raceways, actual fixture and equipment locations, equipment sizes and dimensions and building outline changes. At the end of the Project, provide the Engineer a complete set of Plans marked in red pencil in a manner consistent with the Contract Plans, indicating the changes made on the job.
- B. Record voltage, current, and megohmmeter and ground ohmic resistance test measurements made on the electrical work, the trip units, fuses, and overload relay elements installed in the equipment and the setting of all pressure, flow, level, etc., control devices. When the Project is completed and operating, turn over these records to the Owner.
- C. Equipment and raceways installed under this contract for future work shall be dimensioned on the Record Drawings.

3.3 COORDINATION

- A. Arrange for chases, slots, and openings in building structure during progress of construction to allow for electrical installations. Obtain approval from structural Engineer for penetration of structural components prior to penetrating the component.
- B. Coordinate installation of supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.

- C. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the work. Coordinate installation of large equipment requiring positioning prior to closing in the building.
- D. Coordinate the location of motors, switches, panel connections, and other points of connection with the equipment manufacturers or vendors prior to conduit installation. Route circuits to the actual connection point. Even if removal and reinstallation of building materials is necessary, remove and reinstall conduit, outlet boxes, and other electrical connections, if initial electrical connections are not made to the appropriate equipment location.
- E. Coordinate and schedule connecting electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.
- F. Coordinate and verify work under Division 16 with work under other Divisions, cooperate in locating equipment to avoid interference with work of others, and plan work to harmonize with the work of other trades so that all work may proceed as expeditiously as possible. Coordinate the installing of built-in work, attaching items to buildings, and cutting and patching. Coordinate connecting electrical circuits to components furnished under other Divisions. (Portions of the electrical design are based upon the equipment specified in other Divisions.) No extras are allowed because of moving work required to avoid interference with work of other Contractors.
- G. Coordinate the interruption of electrical systems to any part of the facility in use by the Owner at least 2 working days before interruption of the system.
- H. Coordinate installing electrical identification after completion of finishing work where identification is applied to field-finished surfaces.
- I. Where changes in the work, or substitutions in material are proposed, ensure that sizes, weights, openings, etc., are provided that do not require changes in the work outside this Division.
- J. Legally required standby system(s) overcurrent devices shall be selectively coordinated with all supply side overcurrent devices per NEC 701.18. Do an engineering coordination study of all overcurrent devices and provide copies for review by the Engineer and retention by Owner.

3.4 INSTALLATION

A. ENCLOSURES FOR USE WITH ELECTRICAL EQUIPMENT

Unless specifically called out otherwise on the Plans, electrical enclosures shall meet the following specification:

1. Dry Areas

NEMA 1.

2. Wet Areas

a. Indoors

NEMA 3R with HVAC equipment.

NEMA 4 where the enclosure will be subjected to splashing water or hose-directed water.

NEMA 12 where the enclosure will not be subjected to splashing water or hose-directed water.

b. Outdoors

NEMA 3R where the enclosure will not be subjected to splashing water, hose-directed water, or windblown dust.

NEMA 4 where the equipment is not HVAC and where the enclosure will be subjected to splashing water, hose-directed water, or windblown dust.

3. Corrosive Locations

NEMA 4X.

4. Exceptions

a. As otherwise indicated on the Plans.

b. As modified in other Division 16 sections.

5. Standards

- a. NEMA ICS-6, Enclosures for Industrial Controls and Systems.
- b. UL 508A, Standard for Industrial Control Panels.
- c. UL 698, Industrial Control Equipment for use in Hazardous Locations.

B. WORKMANSHIP

Install the equipment and materials in a neat and workmanlike manner employing workers skilled in the particular trade and in accordance with the manufacturer's instructions, the National Electric Code, National Electric Safety Code, applicable local regulations, ordinances, and industry standards. A person in charge at the site shall maintain adequate supervision of the work under this division when necessary for coordination with other work.

C. SELF-SUPPORTED EQUIPMENT

Install self-supporting equipment in a level and plumb manner, shimming with full width stainless steel shims, as necessary. Bolt units to the floor with stainless steel expansion anchors and bolts, or weld units to embedded steel channels. Floor or pad shall be level within plus or minus 1/8 of an inch in a square yard before installing equipment. Grout or caulk enclosure to floor or pad. Provide bushings on conduits entering from above or at the side. For conduits entering from below, install grounded insulating bushings bonded to the ground bus or pad.

Install concrete pads and bases according to requirements of Section 03300.

Provide concrete foundations or pads required for electrical equipment as indicated or specified:

1. Floor-mounted equipment shall be mounted on a 4-inch-high concrete housekeeping pad. Pad shall be poured on top of the finished floor or slab.

D. MOUNTING HEIGHT

Install components and equipment to provide the maximum possible headroom where mounting heights or other location criteria are not indicated. Mount enclosures for individual units at 54 inches above floors to centerline of controls unless otherwise indicated in the Plans.

E. ACCESSIBILITY

Install equipment to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, while minimizing interference with other installations.

F. EQUIPMENT ORIENTATION

Install items parallel and/or perpendicular to other building systems and components, except where otherwise indicated.

G. EQUIPMENT MOUNTED ENCLOSURES

Attach enclosures mounted on equipment with machine screws or clamps as required. Do not drill equipment frames or sheets without permission of supplier/manufacturer or the Engineer.

Do not mount safety switches and external equipment to other equipment enclosures, unless enclosure mounting surface is properly braced to accept mounting of external equipment.

H. COORDINATION

Give right of way to raceways and piping systems installed at a required slope.

I. WALL MOUNTED ENCLOSURES

Stand equipment off wall surfaces a minimum of 1/4 of an inch where enclosures are mounted on walls in WET AREAS with neoprene or plastic shim washers.

J. MISCELLANEOUS SUPPORTS

Install metal channel racks for mounting cabinets, panelboards, disconnects, control enclosures, pull boxes, junction boxes, transformers, and other devices, except where components are mounted directly to a structural member of adequate strength.

K. SLEEVES

Install for cable and raceway penetrations of concrete slabs and walls, except where core-drilled holes are used. Install for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.

L. FASTENING

Unless otherwise indicated, securely fasten electrical items and their supporting hardware to the building structure.

1. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or any other items.
2. Select fasteners so the load applied to any fastener does not exceed 25 percent of the proof-test load.

M. FIREPROOFING

1. Do not remove or damage fireproofing materials.
2. Install hangers, inserts, supports, and anchors prior to installation of fireproofing.
3. Repair or replace fireproofing removed or damaged.

N. PENETRATIONS

Make all penetrations of electrical work through walls and roofs water and weather-tight.

O. MISCELLANEOUS REQUIREMENTS

1. Screen or seal all openings into outdoor equipment to prevent the entrance of rodents and insects.
2. Equipment fabricated from aluminum shall not be placed in direct contact with earth or concrete.
3. Do not exceed the dimensions indicated for equipment except as approved in writing by the Engineer.

4. Do not use equipment or arrangements for equipment that reduce the required clearance or exceed the space allocations.

P. DIMENSIONS

Dimensions indicated for electrical equipment and dimensions indicated for the installation of electrical equipment are restrictive dimensions.

1. Field measurements take precedence over dimensioned plans.

3.5 IDENTIFICATION

A. LABELS

Install labels where indicated and at locations for best convenience of viewing without interference with operation and maintenance of equipment. Conduit labeling is further described in section 16130. The labeling of conductors is further described in section 16120.

B. NOMENCLATURE

Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated on the Contract Documents or required by codes and standards. Use consistent designations throughout the Project.

C. SELF-ADHESIVE IDENTIFICATION PRODUCTS

Clean surfaces of dust, loose material, and oily films before applying.

D. IDENTIFY PATHS OF UNDERGROUND ELECTRICAL LINES

During trench backfilling, for exterior underground power, control, signal, and communication lines, install continuous underground plastic line marker located directly above power and communication lines. Where multiple lines installed in a common trench or concrete envelope, do not exceed an overall width of 16 inches, use a single line marker.

E. ENGRAVED, PLASTIC-LAMINATED LABELS, SIGNS, AND INSTRUCTION PLATES

Engraving stock shall be melamine plastic laminate punched for mechanical fasteners with a minimum thickness of 1/16 of an inch for signs up to 20 square inches, and 1/8 of an inch thick for larger sizes. Engraved legend in white letters on black face. Provide nameplates on

equipment enclosures giving the name and circuit identification of the enclosed device/equipment in 1/4 of an inch lettering.

F. PANELBOARD SCHEDULES

For panelboards, provide framed, typed circuit schedules with explicit description and identification of items controlled by each individual breaker.

G. ARC FLASH HAZARD

Provide and install warning labels for arc flash hazard on all switchboards, panelboards, control panels, motor control centers, and other equipment per the requirements of the NEC and Washington State Administrative Code (WAC).

3.6 DEMOLITION

A. EQUIPMENT TO BE DEMOLISHED

Demolish all existing electrical devices and circuits, which are noted for demolition. Demolition includes, but is not limited to:

1. Removing all conduit, conductors, fittings, device boxes, hangers, panels, devices, etc., which are not concealed in the building structure or below grade/slab.

B. TEMPORARY POWER

Provide temporary power to existing branch circuit panels, branch circuits, and/or directly to electrical devices as required to keep all portions of the existing facility, which are occupied by the Owner, or required for operation, in operation at all times. Obtain approval by all appropriate code authorities, including the Department of Labor & Industries Electrical Inspection Department, or the local jurisdiction having authority, for any temporary connections required.

C. DAMAGED ELECTRICAL EQUIPMENT

Where remaining electrical work is damaged or disturbed in the course of the work, remove damaged portions, and install new products of equal capacity, quality, and functionality.

D. ABANDONED WORK

Remove existing conductors from conduits, unless otherwise indicated. Cut and cap buried raceway indicated to be abandoned in place 2 inches below the surface. Cap and patch surface to match existing surface finish.

E. REMOVAL

See section 01900.

F. TEMPORARY DISCONNECTION

Remove, disconnect, store, clean, reinstall, reconnect, and make operational those components that are indicated for relocation and/or reconnection. Coordinate the process, mechanical, HVAC, and other equipment scheduled to be relocated and/or reused with other Divisions.

3.7 CUTTING AND PATCHING

Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces necessary for electrical installations. Perform cutting by skilled mechanics of the trades involved.

Repair disturbed surfaces to match adjacent undisturbed surfaces.

3.8 TOUCHUP PAINTING

Thoroughly clean damaged areas and provide primer, intermediate, and finish coats to suit the degree of damage at each location.

Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.

3.9 EXTRA MATERIALS

Extra materials in this Section cover all spare parts for electrical devices under this contract and are centrally listed here for clarification and completeness. Spares shall match products installed, and shall be packaged with protective covering for storage and identified with labels describing the contents within.

A. No extra materials are required.

3.10 TESTING NOT REQUIRING THIRD PARTY

Test electrical equipment before energization and placing into service. Report all test results in writing. Where tests disclose a defect in the work, rework, or repair the work at no additional expense to the Owner and retest to confirm the rework or repair until testing confirms that the defect has been corrected. Test in accordance with the manufacturer's installation and testing instructions and the applicable electrical standards (i.e., NEMA, NFPA, IEEE, ISA, ANSI) for the class of equipment

A. CONDUCTOR MEGGER TEST

1. Power Conductor Testing

After pulling and prior to connection perform a Megger test between all power conductors (including the equipment ground) and between each power conductor and earth ground in the following manner:

- a. Perform megger tests at 600 V.
- b. Record ambient temperature and humidity during testing.
- c. Cables or conductors with a steady-state value less than 100 megohms shall be considered "failed".
- d. Failed cables and conductors shall be removed and replaced with new and retested per these specifications.
- e. Provide a Power Conductor Megger Testing Report. A blank copy of this report, specifically associated with this contract, is available from Engineering on request. A copy of these signed test results shall be submitted to the Engineer for approval prior to startup and shall be included in the O&M Manual.

2. Control Conductor Testing

- a. Control conductor insulation testing is not required.

3. Instrumentation Conductor Testing

- b. Instrumentation conductor insulation testing is not required.

B. CONDUCTOR INSPECTION

On installation of wires and cables and before electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Procedures
 - a. Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Section 7.3.2. Certify compliance with test parameters.
 - b. Remove and replace conductors with visible insulation damage on conductor ends due to installation in an incomplete or damaged conduit system such as, but not limited to, missing bushings or burrs on conduit ends.

3.11 GENERAL TESTING AND INSPECTION

A. PRIOR TO ENERGIZATION

1. After installing disconnect switches and circuit breakers, perform visual and mechanical inspection of enclosures and devices.
2. Test the equipment and electrical circuits for proper connection, tightness, and absence of undesirable shorts and grounds.
3. Check for continuity, visual damage, marking, and proper phase sequence.
4. Remove any burrs, filings, or other foreign materials from all enclosures; completely wipe down and vacuum.
5. Run a magnet around the bottom of each enclosure and around surfaces that may have collected metal shavings during manufacturing or construction.

B. AFTER ENERGIZATION

1. After electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
2. Correct malfunctioning units on site where possible and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

3. Test operation, calibration, and settings of the meters, relays, and indicating devices.
4. Test all operating controls for proper operation.
5. Test all auxiliary equipment, i.e., heaters, thermostats, lights, all illuminated indicating devices and lamps, and all audible alarm devices which are an integral part of transformers and panels to verify that they function properly.
6. Check fuses with an ohmmeter. Ring out wiring and busing. Check operation of control and safety interlocks. Check grounding of potential transformers, current transformers, and surge protective devices. Check control connections and tightness at terminal blocks, relays, meters, switches, etc. Tug on each connection to verify a tight connection.
7. Check field connections to field devices, PLCs, and motor starters..
8. Verify proper communication reliability and data transfer speed on local networks.
9. Rework or repair equipment, which performs unsatisfactorily during, or as a result of, testing at no additional expense to the Owner.
10. Additional testing requirements specific to other sections are specified in those sections.

3.12 TEST DOCUMENTS

Test documents, as described above, shall be signed and submitted to Engineering for review prior to energizing associated electrical circuits.

3.13 DEMONSTRATION

Demonstrate to the Owner that the electrical installation is working by operating all electrical systems and equipment. Simulate control and emergency conditions, artificially where necessary, for complete system tests. Demonstrate equipment in accordance with each section in Division 16.

3.14 CLEANING

Clean dirt and debris from all internal and external surfaces. Vacuum out the interior of electrical panels.

Apply touchup paint as required to repair scratches, etc.

Replace nameplates damaged during installation. Thoroughly vacuum the interior of all enclosures to remove dirt and debris.

***** END OF SECTION *****

SECTION 16060

GROUNDING AND BONDING

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes grounding of electrical systems, equipment, and basic requirements for grounding, and protection of life, equipment, circuits, and systems. Grounding requirements specified in this Section may be supplemented in other Sections of these Specifications.

1.2 RELATED WORKS SPECIFIED ELSEWHERE

<u>Sections</u>	<u>Items</u>
01300	Submittals
16050	Basic Electrical Materials and Methods
16120	Conductors and Cables
16130	Raceway and Boxes
WAC 296-46B-250	Grounding and Bonding

1.3 DEFINITIONS

- A. BONDING JUMPER (from NEC 2017, Article 100 - Definitions, Bonding Jumper, Main)

The connection between the GROUNDED CIRCUIT CONDUCTOR and the EQUIPMENT GROUNDING CONDUCTOR at the service.

- B. EQUIPMENT GROUNDING CONDUCTOR (from NEC 2017, Article 100 - Definitions)

The conductive path installed to connect normally non-current-carrying metal parts of equipment together and to the SYSTEM GROUNDED CONDUCTOR or to the GROUNDING ELECTRODE CONDUCTOR, or both. Code requirements associated with equipment grounding is referenced to NEC 250, Section VI – Equipment Grounding and Equipment Grounding Conductors.

- C. GROUNDED SERVICE CONDUCTOR

Also called “utility neutral.” A conductor used to connect the neutral point of the utility transformer to the neutral point of the service entrance.

See SUSE, SYSTEM GROUNDING.

D. GROUNDING ELECTRODE (from NEC 2017, Article 100 - Definitions)

A conducting object through which a direct connection to earth is established.

E. GROUNDING ELECTRODE CONDUCTOR (from NEC 2017, Article 100 - Definitions)

A conductor used to connect the SYSTEM GROUNDED CONDUCTOR or the equipment to a GROUNDING ELECTRODE or to a point on the grounding electrode system.

F. GROUNDING ELECTRODE SYSTEM

See SYSTEM GROUNDING.

G. SUSE

The term SUSE is an acronym for “SUITABLE FOR USE AS SERVICE EQUIPMENT.” It is the point in the electrical grounding system where the SYSTEM GROUNDING CONDUCTORS connect to the EQUIPMENT GROUNDING CONDUCTORS, or the GROUNDED SERVICE CONDUCTOR, or both. For each separately-derived source, this shall occur at the SUSE point. These two points are connected by a BONDING JUMPER.

H. SYSTEM GROUND GRID

The SYSTEM GROUND GRID refers to all portions of SYSTEM GROUNDING. It may be as simple as a pair of ground rods and their associated GROUNDING ELECTRODE CONDUCTORS or a complex ground system with multiple types of GROUNDING ELECTRODES.

I. SYSTEM GROUNDED CONDUCTOR

See GROUNDING ELECTRODE CONDUCTOR.

J. SYSTEM GROUNDING

System Grounding (also referred to as a GROUNDING ELECTRODE SYSTEM) consists of all GROUNDING ELECTRODES, GROUNDING ELECTRODE CONDUCTORS, and associated connecting devices. The GROUNDED SERVICE CONDUCTOR, typically referred to as the “utility neutral”, is also associated with the system ground. Code

requirements associated with system grounding is referenced to NEC 250.50 – Grounding Electrode System.

1.4 SUBMITTALS

Submit under provisions of Section 01300, and Section 16050.

1.5 QUALITY ASSURANCE

See Section 16050.

PART 2 PRODUCTS

2.1 GROUNDING AND BONDING PRODUCTS

Where types, sizes, ratings, and quantities indicated are in excess of National Electrical Code (NEC) requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.

2.2 WIRE AND CABLE GROUNDING CONDUCTORS

Comply with Section 16120.

A. EQUIPMENT GROUNDING CONDUCTORS

1. Insulated Conductors

Color coded green, per section 16120.
2. Sized in compliance with NEC Table 250.122 or as shown on the Plans, whichever is larger.

PART 3 APPLICATION

There are two types of grounding systems covered in this specification;
(1) Grounding Electrode Systems and (2) Equipment Grounding Circuits.

1. Grounding Electrode Systems shall comply, as a minimum, to the requirements of NEC Sections 250.50 through 250.104, including Table 250.66, “Grounding Electrode Conductor for Alternating-Current Systems.”
2. Equipment Grounding Circuits shall comply, as a minimum, to the requirements of NEC Sections 250.110 through 250.148, including Table 250.122, “Minimum Size Equipment Grounding Conductors for Grounding Raceway and Equipment.”

3.1 EQUIPMENT GROUNDING

Comply with NEC Article 250, Section VI for sizes of Equipment Grounding Conductors, except where specific larger sizes are shown on the Cable and Conduit Schedule in the Plans.

A. EQUIPMENT GROUNDING CIRCUITS

Install insulated Equipment Grounding Conductors with circuit conductors in the manner listed below and in compliance with Code.

1. Service and Feeders.

Bond the Equipment Grounding Conductor to the equipment to which the circuit connects and to the raceway if it is metallic.

2. Single-phase motor or appliance branch circuits.

3. Three-phase motor or appliance branch circuits.

4. Flexible raceway runs.

B. EQUIPMENT GROUNDING CONDUCTORS

Equipment Grounding Conductors shall be insulated and color-coded green.

C. ISOLATED GROUNDING-RECEPTACLE CIRCUITS

Install a separate insulated Equipment Grounding Conductor connected to the receptacle grounding terminal. Isolate grounding conductor from raceway and from panelboard grounding terminals. Terminate at the Equipment Grounding Conductor terminal of the applicable derived system or service, except as otherwise indicated.

D. NONMETALLIC RACEWAYS

Install an Equipment Grounding Conductor in nonmetallic raceways unless they are designated for telephone or data cables. Bond the conductor at each end to grounded metallic raceway or equipment.

E. METALLIC RACEWAYS

Install grounding bushings at the end of each conduit and connect to the equipment ground or GROUNDING ELECTRODE SYSTEM.

F. WATER HEATER, HEAT-TRACING, AND ANTIFROST HEATER CIRCUITS

Install a separate Equipment Grounding Conductor to each electric water heater, heat-tracing assembly, and antifrost heating cable. Bond conductor to heater units, piping, connected equipment, and components.

3.2 FREE-STANDING ELECTRICAL SUPPORT STRUCTURES

Metal support structures used to support electrical equipment, devices, cabinets, panels, or enclosures shall be connected to the GROUNDING ELECTRODE SYSTEM by Grounding Electrode Conductors sized as shown on the Plans or per NEC Table 250.66, whichever is larger. Provide a ground conductor to each vertical support member within 6 inches after rising out of the concrete pad.

3.3 METAL FRAME BUILDING AND SIMILAR STRUCTURES

The metal frame of a building, metal roofs, and other large metal surfaces on buildings shall be bonded to the grounding electrode conductor sized in accordance with NEC Table 250-66. Use a heavy-duty clamp or lug bolted to the metal. Welded metal frame members will be considered to be bonded together. Bolted metal frame members will be considered bonded together under all of the following conditions:

- A. Members are cleaned and a conductive corrosion inhibitor is applied between the mating surfaces.
- B. Bolts are fully torque.
- C. It is proved that from no point on the framework there is more than 5-ohms measured from it to the attachment point of the grounding electrode.

PART 4 EXECUTION

4.1 CONNECTIONS

A. GENERAL

Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to assure high conductivity and to make contact points closer in order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to the contact surfaces.

B. EQUIPMENT GROUNDING-WIRE TERMINATIONS

Make the grounding conductor connections to motors or equipment 10 hp and above or 20 amperes and above, with conductor termination and a 5/16 of an inch minimum bolt tapped to the motor frame or equipment housing. Ground connection to smaller motors and equipment may be made by fastening the conductor termination to a connection box.

C. METAL RACEWAY TERMINATIONS

Where metallic raceways terminate at metallic or non-metallic enclosures, panels, or housings, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at both entrances and exits with grounding bushings and bare grounding conductors, except as otherwise indicated.

D. CONNECTION TORQUE

Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. Where these requirements are not available, use those specified in UL 486A and UL 486B.

E. COMPRESSION-TYPE CONNECTIONS

Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by manufacturer of connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

***** END OF SECTION *****

SECTION 16120

CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes building wires, cables, and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

1.2 RELATED WORKS SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
16050	Basic Electrical Materials and Methods
RCW 19.28.261	Revised Code of Washington, Exemptions from RCW 19.28.161 through RCW 19.28.271

1.3 SUBMITTALS

See Section 01300.

Indicate Field Test Reports and interpret their results for compliance with performance requirements.

1.4 QUALITY ASSURANCE

See Section 16050.

PART 2 PRODUCTS

2.1 BUILDING WIRES AND CABLES

A. STRANDING

1. All power, control, and instrumentation conductors larger than #20 AWG shall be stranded.
2. All equipment ground conductors larger than #16 AWG shall be stranded.
3. All grounding electrode conductors larger than #10 AWG shall be stranded.

B. POWER AND CONTROL WIRE

All power and control wire and conductors in raceways shall be rated 600 VAC.

1. XHHW, XHHW-2

a. Conductor

Class B, stranded, annealed, uncoated copper. Conductors shall comply with:

- i. UL Standard 44.
- ii. ASTM-B3, ASTM-B8, and ASTM-B7B8.

b. Insulation

Cross-Linked Polyethylene (XLP) High Heat Water Resistant. Insulation shall comply with:

- i. UL-83 Thermoplastic-Insulated Wires and Cables.
- ii. UL-1063 Machine-Tool Wires and Cables.

c. The cable shall meet the following Standards and Agency approvals:

- i. NEMA WC70/ICEA S-95-658.
- ii. ASTM Stranding Class B3, B8, B7B8
- iii. Federal Specification A-A-59544

2. THHN, THWN, THHN/THWN-2

a. Conductor

Copper, annealed, uncoated. Conductors shall comply with:

- i. ASTM-B3, ASTM-B8, and ASTM-B7B8.

b. Insulation

Polyvinyl Chloride (PVC), Nylon jacket. Insulation shall comply with:

- i. UL-83 Thermoplastic-Insulated Wires and Cables.
- ii. UL-1063 Machine-Tool Wires and Cables.

c. The cable shall meet the following Standards and Agency approvals:

- i. NEMA WC70/ICEA S-95-658.

C. INSTRUMENTATION, COMMUNICATION, AND NETWORKING CABLES

All instrumentation, communication, and networking cables and conductors in raceway shall be rated 600 VAC.

Exceptions:

- *Telephone cables.*
- *Antenna cables.*
- *Fiber optic cables.*

1. Analog Instrument Cables

Paired and triad analog instrument cables shall be #18 AWG stranded tinned copper 600 V tray cable, rated for wet applications at 75 degrees C in a sunlight resistant PVC jacket. Cables shall be plenum and direct burial rated, and shall be provided with individual pair/triad isolated 100 percent foil shields with independent drain wires and an overall isolated shield with drain wire.

These cables shall also be used for totalizing pulse signals from flow meters.

The following cables shall be used for multiple conductor applications:

- a. 2-Conductor, 1 twisted pair, 100 percent overall shield. Belden #9341 or #1120A or equivalent.
- b. 3-Conductor, 1 twisted triad, 100 percent overall shield. Belden #1121A or equivalent.
- c. 4-Conductor, 2 twisted pairs, 100 percent individual shields plus 100 percent overall shield. Belden #1048A or equivalent.

2. Ethernet Copper Cables

Ethernet cables shall be 600 V, bonded pair, shielded.

- a. Enhanced Category 6 (6e).
 - i. 600 V, polypropylene insulation, with inner PVC jacket and Industrial Grade, Sunlight and Oil Resistant, Black, PVC outer jacket.
 - ii. 8-Conductor, 4 twisted bonded pairs, #23 AWG, solid bare copper, 100% overall foil shield.
 - iii. 19.8 dB attenuation per 100 meters at 100 MHz.
 - iv. Belden #7953A or equivalent.
- b. Enhanced Category 5 (5e).
 - i. 600 V, polyolefin insulation, with inner PVC jacket and Industrial Grade, Sunlight and Oil Resistant, Black, PVC outer jacket.
 - ii. 8-Conductor, 4 twisted bonded pairs, #24 AWG, solid bare copper, 100 percent overall foil shield plus 70 percent overall braided tinned copper shield.
 - iii. 22.0 dB attenuation per 100 meters at 100 MHz.
 - iv. Belden #7957A or equivalent.

D. CONTROL AND POWER CABLE/CORDS

1. HVAC Cables

HVAC cables shall only be used as control cables between HVAC equipment and thermostats or other controlling devices.

- a. 4-Conductor, #16 AWG, stranded, 600V, tinned copper, cabled, PVC insulation, and PVC jacket. Beldon #8620 or equivalent.
- b. 5-Conductor, #16 AWG, stranded, 600V, tinned copper, cabled, PVC insulation, and PVC jacket. Beldon #9620 or equivalent.
- c. 9-Conductor, #16 AWG, stranded, 600V, tinned copper, cabled, PVC insulation, and PVC jacket. Beldon #9621 or equivalent.
- d. 12-Conductor, #16 AWG, stranded, 600V, tinned copper, cabled, PVC insulation, and PVC jacket. Beldon #8622 or equivalent.

2. Power Cords

- a. Type SO, 600 Vac, size #14 or larger.

3. Specialty Wire

As shown specifically on the Plans.

E. CONTROL AND INSTRUMENTATION CABLE CONNECTORS

1. Open Cable to Enclosure Connectors

Open cable to enclosure connectors for interior and exterior applications shall be 316 stainless steel control receptacle cord connector sets: Panel Receptacle = Turck #P-RKV series; field cable termination plug = Turck #P-RSV series. Provide separate pins for each cable shield.

2.2 SPLICES, TAPS AND TERMINAL BLOCKS

Splices are only allowed under the conditions of Section 4.2.E.

A. SPLICES TO POWER CONDUCTORS

1. Splices in Outdoor Areas, Handholes, Vaults, or Direct Buried
 - a. For inline butt splices, use inline resin splice kits for non-shielded cables, 600 V; 3M Scotchcast 82-A series or equal. UL listed 486D.
 - b. For odd-shaped and odd sized splices, use multi-mold resin splice kits for non-shielded cables, 600 V; 3M Scotchcast 85-14CP or equal. UL listed 486D
2. Indoor Splices and Taps for Receptacles and Lighting
 - a. Use quick spin, wing torque Electrical Spring and Grounding Connectors; 3M 312, 412, 512, and 512G or equal.
3. Motor Lead Connectors
 - a. Motor terminal connectors shall be insulated multiple tap connectors rated for 600 Vac; N.S.I. Polaris or equal.
4. Power Terminal Blocks
 - a. All power terminals shall be 600 Vac, suitable for 75 degrees C rated copper conductor.
 - b. Power terminal blocks may be copper or aluminum and shall have a short circuit current withstand rating following the guidelines described in UL 1059 and shall meet or exceed the available bolted fault current at the point of application.

B. SPLICES TO CONTROL CONDUCTORS

1. In Junction Boxes and Handholes

Splices to control conductors in junction boxes and handholes shall be made with 600 V, UL486D certified, water-proof direct bury connectors with strain relief, pre-filled with waterproof and corrosion-proof, non-hardening, silicone dielectric sealant; DRYCONN DBSR Series or equal.

2. In Pull Boxes

- a. For inline butt splices, use inline resin splice kits for non-shielded cables, 600 V; 3M Scotchcast 82-A series or equal. UL listed 486D.
- b. For odd-shaped and odd sized splices, use multi-mold resin splice kits for non-shielded cables, 600 V; 3M Scotchcast 85-14CP or equal. UL listed 486D.

3. Terminal Blocks in Panels

Reference Specification 16940 for terminations in Control Panels.

C. SPLICES TO INSTRUMENTATION CABLES AND CONDUCTORS

1. In Junction Boxes

Strip back the cable outer sheath exposing cable conductors and shield lengths to 1-inch or less. Twist the wires together and solder. Insert and engage into 600 V, UL486D certified, waterproof connectors, pre-filled with waterproof and corrosion-proof, non-hardening, silicone dielectric sealant; DRYCONN Aqua Series or equal.

2. In Pull Boxes and Handholes

Instrument cables and conductors are always passed through a junction box inside pull boxes and handholes. Reference “In Junction Boxes” (above) and Specification 16130, Section 4.

3. Terminal Blocks in Panels

Reference Specification 16940 for terminations in Control Panels.

2.3 INSULATING MATERIALS

A. ELECTRICAL INSULATION PUTTY

Scotchfill, or equal.

B. INSULATING ELECTRICAL TAPE

7 Mil/0.18 mm Plasticized PVC, rubber-based adhesive, 200 percent elongation, 26 N/cm tensile strength, 8 kV breakdown voltage, meeting CE, CSA, UL certifications.

C. CONDUCTOR COLOR-MARKING TAPE

7 Mil/0.18 mm Plasticized PVC, rubber-based adhesive, 200 percent elongation, 26 N/cm tensile strength, 8 kV breakdown voltage, meeting CE, CSA, UL certifications, in required color.

D. ELECTRICAL HEAT SHRINK TUBING

Heat shrink tubing shall be dual-wall polyolefin, 3-1 shrink ratio, 600 Vac, -55 to 110 degrees C operating range meeting UL 224 600V, 125 degrees C.

PART 3 APPLICATIONS

3.1 WIRE APPLICATIONS

A. CABLE AND CONDUIT SCHEDULE

The Cable and Conduit Schedule shall be considered absolute. No changes to wire sizes, wire count, insulation type, or circuit type shall be allowed without approval from the Engineer.

B. WIRES IN RACEWAYS

Wires installed in raceways shall be considered “FIELD” wiring and shall be installed and terminated by qualified and licensed electrical contractors.

Exceptions:

- *Installation and termination may be by the owner under the provisions of “RCW 19.28.261, Exemptions from RCW 19.28.161 through RCW 19.28.271.”*
- *If the raceway is installed inside a control panel fabricated by a certified UL 508 shop, then these wires may be installed and terminated per the provisions of WIRES IN CONTROL PANELS as listed below.*

1. Power Wire

a. Insulation

All service, feeder, and branch circuit conductors shall be XHHW-2.

Exceptions:

- *Unless called out otherwise in the Cable and Conduit Schedule.*
- *Unless approved in writing by the Electrical Engineer.*
- *Unless both ends of wire are installed in the same control panel.*

2. Class 1 and 2 Control Wire

a. Insulation

All control circuits in raceways shall be XHHW-2.

Exceptions:

- *Unless called out otherwise in the Cable and Conduit Schedule.*
- *Unless approved in writing by the Electrical Engineer.*

b. Minimum control wire size in conduits and raceways

The minimum control wire size in conduits and raceways shall be #14 AWG.

C. CONDUCTORS DIRECT BURIED

Refer to the Plans for specifications regarding directly buried conductors and cables.

D. POWER CORDS

SO power cords shall be allowed in control panels for circuits not greater than 120 Vac or 48 Vdc. Such applications require installation by a UL 508 shop.

E. SPECIALTY WIRE

Refer to the Plans for specifications regarding “Specialty Wire”.

PART 4 EXECUTION

4.1 EXAMINATION

Examine raceways and surfaces receiving wires and cables for compliance with requirements for installation tolerances and other conditions affecting performance of wires and cables. Do not proceed with installation until unsatisfactory conditions have been corrected.

4.2 INSTALLATION

A. GENERAL INSTALLATION METHODS

1. Install wires and cables in raceway system, according to manufacturer’s written instructions and NECA’s “Standard of Installation,” after raceway system is complete.
2. Tighten electrical connectors and terminals according to manufacturer’s published torque-tightening values. If manufacturer’s torque values are not indicated, use those specified in UL 486A and UL 486B.
3. Install cables and conductors neatly in all enclosures. Bend or form wires in neat runs from conduits to terminals. Arrange wires so that they may be grouped by conduit or function in the enclosure. Install cable ties and straps to support and bundle wires in enclosures. Arrange wires to allow wire tags and numbers to be easily read without bending or flexing wiring.
4. Leave 6 inches or more of free conductor at each connected device or equipment terminal and 9 inches of free conductor at each unconnected outlet. Tape free ends of conductors at unconnected outlets and coil neatly in outlet box.

5. Install wiring to equipment neutral and grounding blocks on the bottom or furthest back row first. Leave unconnected blocks accessible for future neutral or grounding connections.
6. Provide individual neutral conductors for each associated circuit. Common neutral conductors for multi branch circuits are not permitted.
7. All power distribution raceways shall contain at least one continuous copper grounding conductor with a minimum size as per NEC 250.122. Larger sizes shall be used if identified in the Cable and Conduit Schedule on the Plans.

B. CONDUCTORS SHARING RACEWAYS

1. Power conductors shall not be run in the same raceway with control conductors.

Exception:

- *Unless specifically shown otherwise in the Cable and Conduit Schedule.*

2. Power conductors shall not be run in the same conduit or raceway with instrumentation cables/conductors.
3. Control conductors shall not be run in the same conduit or raceway with instrumentation cables/conductors.

Exception:

- *Unless specifically shown otherwise in the Cable and Conduit Schedule.*

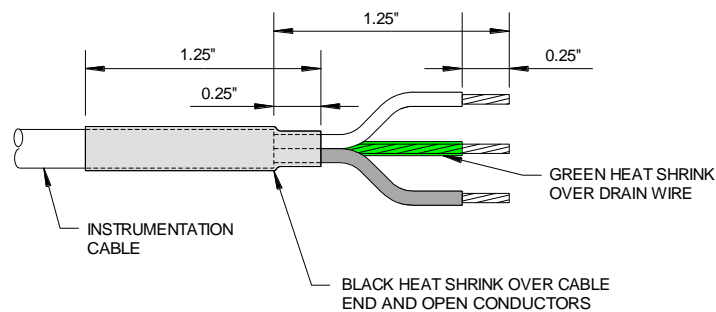
C. CONDUCTORS IN CONTROL PANELS

1. Control Panel Instrumentation (Signal) Wiring
 - a. Signal cables between analog input and output field terminals and a PLC shall be connected to the field terminals as shown in Specification 16940.
 - b. All cables shields shall be terminated at the field terminal end. Connections to the PLC analog input and output terminals shall not land the shield.

- c. Signal cable conductors and their shields/drains shall not be separated greater than as described below.
2. Control Panel Communication and Networking Wiring
- a. All communication and networking cables inside control panels shall have their ends made up with terminal connectors. No cables shall be left open-ended.
 - b. Cables shall be routed inside Panduit™ or neatly tied to other conductor bundles.

D. INSTRUMENTATION (SIGNAL) CABLES

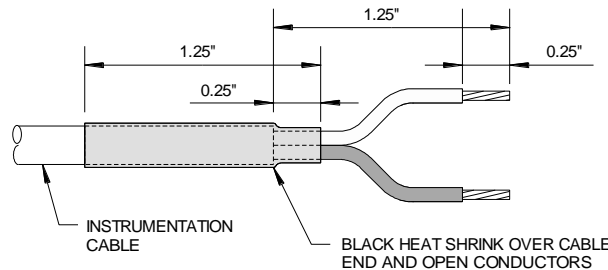
1. Preparing the Shielded End



- a. Neatly trim the end of the cable.
- b. Strip back 1.25 inch of the outer jacket taking care not to cut into the conductor insulation.
- c. Neatly trim the foil back to the edge of the outer jacket taking care not to damage the drain wire.
- d. For signal cables with a braided shield over a foil shield, carefully cut the braid back to the edge of the outer jacket.
- e. Provide a green heat shrink tube over the drain wire, leaving 0.25 inch of exposed conductor.
- f. Provide a 1.25-inch black heat shrink over the jacket, covering 0.25 inch of the exposed conductors. This properly insulates and protects the ends of the shields and the outer jacket.

- g. Strip the signal conductors exposing 0.25 inch of conductor.

2. Preparing the Unshielded End



- a. Neatly trim the end of the cable.
- b. Strip back 1.25 inch of the outer jacket taking care not to cut into the signal conductor insulation.
- c. Neatly trim the foil back to the edge of the outer jacket.
- d. Cut the drain wire at the edge of the outer jacket taking care not to damage the signal conductor insulation.
- e. For signal cables with a braided shield over a foil shield, carefully cut the braid back to the edge of the outer jacket.
- f. Provide a 1.25-inch black heat shrink over the jacket, covering 0.25 inch of the exposed conductors. This properly insulates and protects the ends of the shields and the outer jacket.
- g. Strip the signal conductors exposing 0.25 inch of conductor.

E. SPLICING CONDUCTORS

- 1. Install service, feeder, and motor circuits continuous without splices from equipment terminal to equipment terminal or motor lead.

Exceptions:

- *Service entry feeders at weatherheads.*

- *Branch circuits at taps for convenience receptacles and lighting.*
 - *As specifically called out.*
 - *With written permission from the Engineer.*
2. Install instrumentation and control circuits continuous without splices or terminations from source equipment terminal to destination equipment terminal.

Exceptions:

- *On terminal strips in control panels.*
 - *On terminal strips in termination panels.*
 - *As specifically called out.*
 - *With written permission from the Engineer.*
3. Where splicing is allowed, or specifically called out, install in the following manner:

- a. Splicing Inside Vaults, Handholes, Outdoor J-Boxes, or J-Boxes in Wet Areas

Power and control conductors shall be spliced per Section 2.2.A. Provide a minimum of 24 inches of length on both wires for future re-splicing.

- b. Splicing Inside Motor J-Boxes

Power connections inside motor j-boxes shall be made using insulated multiple tap connectors rated for 600 Vac; N.I.S. Polaris or equal. Cover the splice with a minimum of three layers of black insulating electrical tape. Provide a single band with a minimum of two wraps of the appropriate phase color tape to the entry T-lead. Bend the connections away from the sides of the j-box and motor frame to prevent abrasion from motor vibration.

Control connections inside motor j-boxes shall be made with crimped butt-splices with heat shrink covers. The heat shrink shall overlap the butt barrel ends by a minimum of

1/2 inch on each side. Cover the splice with a minimum of three layers of black insulating electrical tape.

c. Splicing in J-Boxes and Control Panels Mounted Indoors in Dry Rooms

i. Conductors size #12 AWG through #6 AWG:

For conductors less than #6 AWG, provide crimped butt-splice with heat shrink cover. The heat shrink shall overlap the butt barrel ends by a minimum of 1/2 inch. Cover the splice with a minimum of three layers of black electrical tape. Provide a 2-wrap (minimum) single band of the appropriate phase color tape.

Exception:

- *For receptacles and lighting, reference Section 2.2.B.*

ii. Conductors size #4 AWG and larger:

(1) Terminal Connectors

For conductors larger than #6 AWG, connections shall be made using insulated multiple tap connectors rated for 600 Vac; N.S.I. Polaris or equal.

Cover the splice with a minimum of three (3) layers of black electrical tape. Provide a 2-wrap (minimum) single band of the appropriate conductor color tape.

(2) Terminal Blocks

All power terminals shall be 600 Vac, suitable for 75 degrees C rated copper conductor.

Connect using properly sized terminal blocks.

Exception:

- *If splices are allowed by the Engineer, then use plated copper alloy compression splicing sleeves installed by high-pressure compression tools and insulated with heat shrink Raychem sleeves.*

F. REPLACING FAULTY CONDUCTORS

When replacing a faulty conductor or cable that shares a raceway with other conductors or cables, all conductors and cables must be removed and replaced with new.

Exceptions:

- *If the raceway is straight and without bends or offsets and its length is less than 30 feet, and the conductors are not bound together in the raceway, then only the faulty cable must be pulled and replaced with new. A manufacturer-approved pulling compound or lubricant must be used to minimize degradation to the remaining conductors. The contractor is responsible for the integrity of the remaining conductors.*
- *With specific approval by the Engineer.*

G. CONDUCTOR LABELLING

All conductors shall be labeled in the following manner.

Exceptions:

- *Conductors supplying power to lighting and convenience receptacles.*
- *Non-insulated ground conductors.*
- *At each motor tag for winding lead numbers. Make all phase rotation changes for motor direction changes at the motor to maintain correct color phase sequence in equipment.*
- *In each enclosure or box where more than one ungrounded power conductor is spliced or connected, tag for panelboard identification and pole number (reference Section 3.3C.).*

1. Conductors shall be labeled the same at each end in a place where the label can be clearly read without moving other wires or rotating the label.
2. Conductor labels shall reference the device (destination) tag as provided on the “TAG LIST” in the Plans. For example, conductors from panelboard [01 PB 01] to dedicated receptacle [01 DREC 05] shall be labeled as follows:

Line:	01DREC05.L
Neutral:	01DREC05.N
Ground:	01DREC05.G

3. Conductor labels shall each be unique for each circuit. For example, 10 control conductors from Main Control Panel [02 CP 01] (source) to Automatic Transfer Switch [02 ATS 01] (destination) shall be labeled as follows:

Wire #1:	02ATS01.01
Wire #2:	02ATS01.02
Wire #9:	02ATS01.09
Wire #10:	02ATS01.10

4. The labels shall be white heat shrink sized appropriately for the associated conductor with typed lettering in black indelible ink.
5. Label each conductor. When terminating cables, if there is insufficient room to provide a label on each conductor, then label the cable sheath.
6. Tag for phase rotation at each power connection.

Exception:

- *At motor connections.*

H. CONDUCTOR COLORS

1. For conductor colors inside control panels, reference Section 3.1.C.1.

2. Do not use white, gray, green, or green with yellow stripes color for any power, lighting, or control conductor not intended for neutral or equipment grounding purposes.

Exception:

- *Instrumentation and control multi-conductor cables may use white, gray, or green singly or as part of a trace color in addition to the base color.*

3. Equipment grounding conductors: Green or green with yellow stripes.

4. 480/277 volt, 3-phase systems:

Phase A	Phase B	Phase C	Neutral
Brown	Orange	Yellow	Gray

5. 208/120 or 240/120 volt, 3-phase systems:

Phase A	Phase B	Phase C	Neutral
Black	Red	Blue	White

6. 240/120 volt, single phase systems:

Phase A	Phase B	Neutral
Black	Red	White

7. Use wire with insulation of required color for conductors of #6 AWG and smaller. For wire larger than #6 AWG, where not available in specified colors, use conductor color marking tape per Section 2.3.C. When conductors are marked in this manner, mark each conductor at all accessible locations such as panelboards, junction boxes, pullboxes, auxiliary gutters, outlets, switches, and control centers.

8. Connect power conductors of the same color to the same phase throughout the installation. Viewing all equipment from the front, make connections so phase color sequence is in the same order as that for panelboards, switchboards, motor control centers, etc.

I. PULLING CONDUCTORS

1. Instrumentation, Communication, Networking, and Fiber Cables

Make all cable pulls by hand using a manufacturer-approved pulling compound or lubricant where necessary.

2. Power and Control Conductors

- a. Make all cable pulls by hand where possible. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, or wrapping extra conductor into an eye, that will not damage cables or raceway.
- b. On mechanically-assisted pulls use a manufacturer-approved pulling compound or lubricant where necessary. The compound used must not deteriorate the conductors or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values. Install pullboxes where necessary to prevent exceeding manufacturer's recommendations.

3. Cut cable or conductor ends off after pulling and clean all pulling compound from exposed conductors before terminating.

J. CABLE SUPPORTS

Support cables according to Section 16050.

Provide vertical conductor support per NEC Table 300.19(A).

K. WIRING AT OUTLETS

1. Install conductor at each outlet, with at least 6 inches of slack. Connect only to receptacle screw terminals using insulated spade-type lugs.
2. Connect outlets and components to wiring and to ground as indicated and instructed by manufacturer, and in compliance with other Sections of Division 16.

4.3 FIELD QUALITY CONTROL

A. TESTING

1. Provide conductor megger testing per Specification 16050, Section 3.

***** END OF SECTION *****

SECTION 16130

RACEWAY AND BOXES

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.2 RELATED SECTIONS SPECIFIED ELSEWHERE

<u>Sections</u>	<u>Items</u>
01300	Submittals
02530	Utility Structures
16050	Basic Electrical Materials and Methods
16060	Grounding and Bonding
16120	Conductors and Cables
16140	Wiring Devices

1.3 DEFINITIONS

A. 100 PERCENT CONTINUOUS

100 percent continuous means that electrical continuity shall be maintained over a conduit's entire length and that such conduits shall consist of only RGS (whether PVC-coated or not), LFMC, or combinations of these types. There can be no break in the electrical continuity by non-metallic components.

EMT conduits are not considered 100 percent continuous.

B. CONDUIT BODIES

A separate portion of a conduit system that provides access through a removable cover to the interior of the system at a junction of two or more sections of the system.

C. CONTROL CONDUITS

Control conduits typically contain cables or conductors in the range of 12 Vdc to 120 Vac. These cables/conductors are used to provide discreet field inputs and outputs to motor drives, PLC controllers, operator stations, etc. They typically connect to discreet I/O field devices like local

panel pushbuttons, indicating lights, selector switches, field limit switches, relay circuits, etc.

D. CONTROL PANELS

Control panels are enclosures in which one or more circuits are changed, unlike junction boxes where circuits are simply routed through the panel. Control panels may be as simple as an enclosure with a pilot light or they may be very complicated with hundreds of I/O terminations. For Control Panel considerations, reference Specification 16940.

E. CONVENIENCE RECEPTACLES

Reference Section 16140, Definitions.

F. DEVICE BOXES

Device boxes are electrical boxes used for receptacles, light switches, dimmers, and other similar devices. Selector switches, indicating lights, displays, etc., are mounted in control panels and equipment enclosures, not in device boxes.

G. DRIP FITTINGS

Drip fittings are used to drain water from conduit entry points, junction boxes, or other enclosures where accumulation of moisture must be removed. They are also intended to disable the entry of foreign materials, including tools and fingers, through the drain.

H. DRY LOCATIONS

Reference Section 16050, Definitions.

I. EMT

Electrical Metallic Tubing (a type of RMC).

J. EQUIPMENT VAULT

An Equipment Vault is a VAULT that contains one or more electrical devices that are terminated within the vault; such as flow meters, control valves, control or power panels, lighting, and etc.

SEE VAULTS

K. FINISHED AREAS

Reference Section 16050, Definitions.

L. FMC

Flexible Metal Conduit (a type of RMC).

M. FRP

Fiberglass Reinforced Plastic (a type of RNC).

N. HANDHOLES

A handhole is a pullbox that is not sufficiently sized for entrance of personnel (reference PULLBOXES).

O. INSTRUMENTATION CONDUITS

Instrumentation conduits contain cables and conductors that carry low-power modulated or communication signals. They may include 4-20 mA current loops, 0–10 volt analog signals, 5 to 12 Vdc digital (TLL) data, analog or digital communications signals, etc. They may also include low-voltage compliance power to instruments such as 5 Vdc, ± 15 Vdc, or 24 Vdc.

P. INTRINSICALLY SAFE CIRCUIT

A circuit in which any spark or thermal effect, produced either normally or in specified fault conditions, is incapable of releasing sufficient electrical or thermal energy to cause ignition of a specific hazardous atmospheric mixture in its most easily ignitable concentration.

Q. JUNCTION BOXES

Junction boxes are electrical enclosures used for combining, splitting, pulling, or redirecting electrical circuits. Junction boxes may terminate one conduit or join multiple conduits. Circuits are not *altered* inside a junction box. Enclosures where circuits are altered are called CONTROL PANELS. With the exception of terminal strips, junction boxes do not contain electrical devices.

1. Junction Boxes, Type J1

Junction boxes identified as TYPE J1 can contain only non-linear power circuits.

2. Junction Boxes, Type J2

Junction boxes identified as TYPE J2 can contain only intrinsically safe circuits.

3. Junction Boxes, Type J3

Junction boxes identified as TYPE J3 can contain only instrumentation circuits that are not intrinsically safe.

Junction boxes not containing circuits of the types identified for TYPE J1, TYPE J2, or TYPE J3 are simply called “junction boxes” (without a TYPE identifier).

R. LFMC

Liquidtight Flexible Metal Conduit (a type of RMC).

S. LINEAR POWER LOADS

Linear power loads are those that are not VFD circuits (both line or load), and are not UV ballast circuits. Although actually non-linear, fluorescent lighting circuits shall be considered linear power loads.

T. NON-LINEAR POWER LOADS

Non-linear power loads shall include all VFD circuits (both line or load) and all UV ballast circuits. Although actually non-linear, fluorescent lighting circuits shall be considered linear.

U. POWER CONDUITS

Power conduits contain branch and feeder conductors with voltages 120 Vac and above. These conductors provide operating power to MCCs, panels, motors, lighting, receptacles, HVAC, etc. Conductors can be of #12 AWG wire gauge and larger, either separate or in power cables.

V. PROCESS AREAS

Reference Section 16050, Definitions.

W. PULLBOXES

Pullboxes are underground electrical enclosures, sufficiently sized to allow the entrance of personnel, used for combining, splitting, pulling, or redirecting electrical circuits. Pullboxes may terminate one conduit or join multiple conduits. A pullbox can be considered an underground junction box.

Circuits are not altered or terminated inside a pullbox. Pullboxes do not contain electrical equipment or devices.

Exception:

- *Pull boxes may include a sump pump.*

Handholes are types of pull boxes but are not sufficiently sized to allow the entrance of personnel (reference HANDHOLES).

X. PVC

Polyvinyl Chloride Conduit (a type of RNC).

Y. PVC-RGS

Polyvinyl chloride, externally coated RGS (a type of RMC).

Alias: May be called or shown on Plans and elsewhere in specifications as PVC-Coated RGS or PVC-RMC.

Z. PVC-RMC

Reference PVC-RGS.

AA. RGS

Rigid Galvanized Steel (a type of RMC).

BB. RMC

Rigid Metal Conduit (General NEC Category).

CC. RNC

Rigid Nonmetallic Conduit (General NEC Category).

DD. SURFACE RACEWAYS

A metallic raceway that is intended to be mounted to the surface of a structure, with associated couplings, connectors, boxes, and fittings for the installation of electrical conductors.

EE. VAULTS

A vault is an underground structure, serviceable or accessible only from the top. Handholes, Equipment Vaults, and Pullboxes are considered vaults.

FF. WET LOCATIONS

Reference Section 16050, Definitions.

GG. WIREWAYS

Sheet metal troughs with hinged or removable covers for housing and protecting electric wires and cable in which conductors are laid in place after the wireway has been installed as a complete system.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Provide data for surface raceways, wireways and fittings, hinged-cover enclosures, and cabinets.

1.5 QUALITY ASSURANCE

See Section 16050.

1.6 COORDINATION

Coordinate layout and installation of raceways and boxes with other construction elements to ensure adequate headroom, working clearance, and access.

Coordinate electrical work with outside utilities associated with the project.

Non electrical piping and structural has priority over underground conduit routing.

Exception:

- *Unless specifically coordinated otherwise with the General Contractor.*

PART 2 PRODUCTS

2.1 METALLIC CONDUIT TYPES

A. EMT

1. Conduit

Galvanized steel tubing meeting ANSI C80.3.

2. Conduit bodies shall be galvanized, or epoxy coated cast iron or aluminum one piece with galvanized, or epoxy coated cast cover, gasket, and threaded hubs. Use stainless steel screws or other approved non-corroding screws to hold cover in place.

3. EMT connectors shall be compression type only. Set screw connectors shall not be allowed.

4. Conduit clamps for EMT shall be stamped galvanized steel.

B. FMC

1. Conduit

Flexible, galvanized steel convolutions forming a continuous raceway.

2. Connectors

Galvanized steel, screw in, approved for grounding.

C. LFMC

1. Conduit

Flexible, galvanized steel convolutions forming a continuous raceway, covered by a liquid tight PVC layer. Electri-Flex Type LA or American Sealtite, Type UA.

2. Connectors

Galvanized steel, screw in, grounding type with a ferrule, which covers the end of the inside and outside of the conduit.

D. RGS

1. Conduit

Hot dipped galvanized with threaded ends meeting ANSI C80.1.

2. Couplings

Steel, cast iron, or malleable iron compression type employing a split, corrugated ring and tightening nut, with integral bushings and locknuts. No indent or set screw type.

a. Couplings

Unsplit, NPT threaded steel cylinders with galvanizing equal to the conduit.

b. Nipples

Factory made through 8 inches, no running threads.

c. Conduit bodies shall be galvanized, or epoxy coated cast iron or aluminum one piece with galvanized, or epoxy coated cast cover, gasket, and threaded hubs. Use stainless steel screws or other approved non-corroding screws to hold cover in place.

3. Conduit Clamps

Conduit clamps for RGS shall be cast iron.

E. PVC-COATED RGS, PVC-RMC

1. General

a. A proprietary colored urethane coating shall be uniformly and consistently applied to the interior of all conduit and fittings. This internal coating shall be a nominal 2 mil

thickness. Conduit or fittings having areas with thin or no coating shall be unacceptable.

- b. The PVC exterior and urethane interior coatings applied to the conduit shall afford sufficient flexibility to permit field bending without cracking or flaking at temperatures above 30 degrees F (-1 degrees C).
- c. All male and female threads on conduit, elbows, and nipples shall be protected by application of an electronically conducting corrosion resistant compound.
- d. Installation of the PVC coated conduit system shall be performed in accordance with the manufacturer's installation manual.
- e. Conduits and fittings shall meet the following standards:
 - i. ASTM D870
 - ii. ASTM D1151
 - iii. ASTM D3359
 - iv. ASTM D1308
 - v. NEMA RN1

2. Conduit

- a. The PVC coated rigid metal conduit must be UL listed. The PVC coating must have been investigated by UL as providing the primary corrosion protection for the rigid metal conduit. Ferrous fittings for general service locations must be UL listed with PVC as the primary corrosion protection. Hazardous location fittings, prior to plastic coating must be UL listed. All conduit and fittings must be new, unused material. Applicable UL standards may include: UL 6 Standard for Safety, Rigid Metal Conduit, UL 514B Standard for Safety, Fittings for Conduit and Outlet Boxes.
- b. The conduit shall be hot dip galvanized inside and out with hot dipped galvanized threads.

3. Fittings and Accessories

The design shall be equipped with a positive placement feature to ease and assure proper installation. Certified results confirming seal performance at 15 psig (positive) and 25 inches of mercury (vacuum for 72 hours shall be available).

- a. A PVC sleeve extending one pipe diameter or 2 inches, whichever is less, shall be formed at every female fitting opening except unions. The inside sleeve diameter shall be matched to the outside diameter of the conduit.
- b. The PVC coating on the outside of conduit couplings shall have a series of longitudinal ribs 40 mils in thickness to protect the coating from tool damage during installation.
- c. Conduit Form 8 Bodies shall be 1/2 inch through 2-inch diameter, shall have a tongue-in-groove “V-Seal” gasket to effectively seal against the elements. Conduit bodies shall be Form 8 and shall be supplied with plastic encapsulated stainless steel cover screws.
- d. Right angle beam clamps and U bolts shall be specially formed and sized to snugly fit the outside diameter of the coated conduit. All U bolts will be supplied with plastic encapsulated nuts that cover the exposed portions of the threads.
- e. Conduit clamps and fittings for PVC-Coated RGS conduits shall be 316L stainless steel.

4. Approved Material

- a. Plasti-Bond REDH2OT, Perma-Cote, or KorKap manufactured by Robroy Industries.
- b. Ocal-Blue Steel conduit and fittings as manufactured by Ocal, Inc.
- c. Any deviation from the above approved materials must be approved by the Engineer.

2.2 NONMETALLIC CONDUIT TYPES

A. PVC

1. Conduits

NEMA TC 2, Schedule 40 or 80 PVC.

2. Fittings and Accessories

NEMA TC 3; match to conduit type and material, but elbows shall be RMC.

3. Conduit bodies

Where allowed, shall match type, material, and gauge of conduit.

B. FIBERGLASS/REINFORCED THERMOSETTING RESIN (RTR) ELBOWS

1. General

- a. Listed by UL to the UL 2420 Below Ground standard. The resin system shall be epoxy based, with no fillers. The fiberglass shall consist of continuous E-glass Grade "A" roving.
- b. Carbon black shall be used as ultra violet inhibitor to protect the elbows and fittings during storage and exposure to the outdoors. Elbows shall be black in color.
- c. The internal elbow walls shall be smooth with all fibers embedded in the epoxy.
- d. All shall meet the nominal radius of + or - 2°. The wall thickness shall meet the tolerances as shown in NEMA TC 14.
- e. Elbows shall meet the following standards
 - i. Volume and Surface Resistivity: ASTM D257
 - ii. Dielectric Constant and Dissipation Factor: ASTM D150

iii.	Dielectric Strength:	ASTM D149
iv.	Tensile Strength, Axial:	ASTM D2105
v.	Compressive Strength:	ASTM D695
vi.	Modulus of Elasticity and Thermal Conductivity:	ASTM D2105
vii.	Thermal Conductivity:	ASTM D5930-1
viii.	Specific Gravity:	ASTM D792
ix.	Glass Content:	AP1 15LR
x.	Water Absorption:	ASTM D570
xi.	Barcol Hardness:	ASTM D2583
xii.	Coefficient of Thermal Expansion:	ASTM D696
xiii.	Impact Resistance:	ASTM D2444
xiv.	Stiffness at 5 Percent Deflection:	ASTM D2412

2.3 OUTLET AND DEVICE BOXES

A. STANDARD METAL BOXES

Assembled from stamped steel hot dipped zinc galvanized coated flat pieces, welded or mechanical assembled into a device box, with knockouts for conduit or connector entrance, meeting NEMA OS 1, with plaster or extension rings and necessary mounting appurtenances to suite construction and application.

B. CAST BOXES

1. Cast Aluminum

Epoxy coated cast aluminum box, one piece, with mounting lugs, with threaded holes or hubs, with internal green ground screw and with neoprene gaskets.

2. Cast Iron

Cast iron with electro-galvanized and aluminum acrylic paint finish, one piece, with mounting lugs, with threaded holes or hubs, with internal green ground screw and with neoprene gaskets.

C. DEVICE COVERS

1. Plastic: Thermoplastic nylon, device-mount, ivory.

2. Aluminum: Sheet Aluminum.

3. Cast Iron: Iron alloy.

D. SWITCH ACTUATORS

1. Aluminum: Lever-arm type, raintight, cast aluminum matching the metallurgy of the device box.

2. Cast Iron: Lever-arm type, raintight, cast iron alloy matching the metallurgy of the device box.

E. WEATHERPROOF COVERS AND PLATES

Weather proof, self-closing, die-cast aluminum, UL listed.

F. IN-SERVICE COVERS

Shall be weather proof and hinged from top with removable cord slots.

2.4 JUNCTION BOXES, HANDHOLES, AND VAULTS

A. JUNCTION BOXES

1. Standard

Stamped steel, deep drawn one piece (without welds or tab connections), galvanized, with knockouts for conduit or connector entrance, meeting NEMA OS 1. Boxes 6" x 6" x 4" or larger may be code gauge fabricated steel continuously welded at seams and painted after fabrication.

2. Cast

Cast iron with electrogalvanized and aluminum acrylic paint finish, one piece, with threaded cover of the same metallurgy and finish, with mounting lugs, with threaded holes or hubs, with internal green ground screw and with neoprene gaskets; explosion-proof, dust-ignition-proof, raintight, rated for Class I, Division 1 and 2, Groups C, D.

3. Stainless Steel

NEMA 4X 316L stainless steel with gasketed screw down cover.

B. HANDHOLES

1. Material and Strength

Handholes shall be made from Concrete or Polymer Concrete. The boxes and covers are required to conform to all test provisions of ANSI/SCTE 77 2002 “Specification For Underground Enclosure Integrity” for Tier 15 applications (Design Load Vertical 22,500 lbs. and Lateral 800 lbs/sq. ft.) and to be Listed and Labeled. The boxes must physically accommodate and structurally support compatible covers, which possess the Tier rating. In no assembly can the cover design load exceed the design load of the box. All components in an assembly (box and cover) are to be manufactured by the same manufacturer. All covers are required to have a minimum coefficient of friction of 0.50 in accordance with ASTM C1028. Independent third-party verification or test reports stamped by a registered Professional Engineer certifying that all test provisions of this specification have been met are required with each submittal. The cover is to have an identifying function descriptor imprinted on it. The Descriptor shall be ELECTRICAL, CONTROL, SIGNAL, TELEPHONE, STREET LIGHT, or similar approved by the Engineer.

Handholes with metallic lids shall be grounded per Specification Section 16060.

Handhole lid assemblies comprised of steel shall have a factory-applied galvanized finish.

Exception:

- *Unless the assembly is fabricated from stainless steel.*

2. Manufacturers

Quazite (Strongwell Corp.)
Carson Industries

C. PULLBOXES AND VAULTS

Precast concrete structures with preformed knockout holes for conduit entrance. Reference Section 02530, Utility Structures.

Pullboxes and vaults with metallic lids shall be grounded per Specification Section 16060.

Pullbox lid assemblies comprised of steel shall have a factory-applied galvanized finish.

Exception:

- *Unless the assembly is fabricated from stainless steel.*

PART 3 APPLICATION

3.1 CONDUIT BODIES

This section describes the types of raceways, junction boxes, and device boxes that can be used for different circuits and different environments. Reference Section 4.1 for methods and practices required for installation.

A. CABLE AND CONDUIT SCHEDULE

The Cable and Conduit Schedule shall be considered absolute. No changes to wire sizes, wire count, insulation type, circuit type, or conduit size shall be allowed without approval from the engineer.

The Cable and Conduit Schedule does not indicate conduit type (PVC, EMT, RGS, etc.) since, in many cases, a conduit's type may change between its source and destination. The rules stated in this specification define the necessary and allowed conduit type(s) for various applications and routes.

B. RACEWAY REQUIREMENTS

The term "RGS conduits" refers to a type of conduit body and does not imply whether the conduit is PVC-coated or not. Certain applications

require RGS conduits with PVC coating, others do not. Reference Section 3.2, “RGS RACEWAY PROTECTIVE COATINGS” for these requirements.

1. Circuit Types and Categories

a. Circuit Types

Conduits are broken into three general circuit types; 1) Power, 2) Control, and 3) Instrumentation (see Definitions).

On the Cable and Conduit Schedule, Power conduits are those starting with the letter "P", Control conduits are those starting with the letter "C", and Instrumentation conduits are those starting with the letter "S".

b. Circuit Categories

Power circuits are broken into two categories, those that contain linear loads and those that contain non-linear loads (see Definitions).

Control and Instrumentation circuits are broken into two categories, those that contain intrinsically safe circuits and those that do not (see Definitions).

These types and categories are listed below in Table 3.1.B.1 below.

c. Relationships Between Circuit Categories and Conduit Types

Many electrical circuit types do not require special conduit routing considerations. However, Table 3.1.B.1 shows the circuit types where the conduit route must be 100 PERCENT CONTINUOUS (reference Definitions).

Table 3.1.B.1

Circuit		
Type	Category	100% Continuous?
Power	Linear	No
Power	Non-linear	Yes
Control	Non-intrinsic	No
Control	Intrinsic	Yes
Instrumentation	Non-intrinsic	Yes
Instrumentation	Intrinsic	Yes

2. Conduit Shape

Wiring shall be routed in pipe or tubular conduits, NOT in fabricated wireways or gutters.

Exception:

- *Unless specifically called out otherwise in the Plans.*

C. PVC SCHEDULE 40 RACEWAY APPLICATIONS

1. All straight portions of conduits completely concealed in walls, attics, concrete, or below ground (not exposed) shall be PVC Schedule 40.

Exceptions:

- *Power conduits containing non-linear loads shall be 100 percent continuous over their entire length.*
- *Control conduits containing intrinsically safe circuits shall be 100 percent continuous over their entire length.*
- *All Instrumentation conduits shall be 100 percent continuous over their entire length.*
- *All conduits containing grounding electrode conductors shall be PVC Schedule 80 over their entire length.*
- *PVC conduit areas under roads or heavy traffic areas shall be Schedule 80.*

- *Where specifically called out otherwise in the Cable and Conduit Schedule.*
2. All portions of power and control conduits completely concealed inside a reservoir shall be PVC Schedule 40.

D. PVC SCHEDULE 80 RACEWAY APPLICATIONS

1. All portions of conduits which contain grounding electrode conductors shall be PVC Schedule 80 and shall contain no metal fittings, connectors, or devices. Such conduits containing grounding electrode conductors shall contain no other types of conductors.
2. PVC conduit areas under roads or heavy traffic areas.
3. As stated in the Cable and Conduit Schedule.

E. RGS RACEWAY APPLICATIONS

1. All conduits requiring 100 percent continuity per Section 3.1.B.1 shall be RGS over their entire length. For coating requirements, reference Section 3.2.

Exception:

- *LFMC conduit shall be allowed per the “LFMC Raceway Applications” section herein.*
2. Underground factory or bent elbows and offsets greater than or equal to 30 degrees shall be RGS.

Exceptions:

- *Where the radius of a conduit bend is greater than or equal to 15 feet per inch of trade size.*
- *Raceways used for the containment and protection of bare grounding electrode conductors shall be PVC Schedule 80. Reference PVC Schedule 80 raceway applications.*

3. All portions of conduits exposed outdoors shall be RGS.

Exception:

- *All conduits containing grounding electrode conductors shall be PVC Schedule 80 over their entire length.*

4. All portions of conduits under covered structures open on any side shall be RGS.

Exception:

- *All conduits containing grounding electrode conductors shall be PVC Schedule 80 over their entire length.*
- *LFMC conduit shall be allowed per the “LFMC Raceway Applications” section herein.*

5. All portions of conduits exposed on the inside of below-ground pullboxes, equipment vaults, wet wells, and dry wells (vaults) shall be RGS.

Exceptions:

- *All conduits immediately terminating after penetrating a vault wall, that are allowed to be PVC Schedule 40 underground, shall terminate as a PVC conduit bell-end.*

If the conduit is connected inside the vault to any device, conduit body, junction box, control panel, or any other conduit, then all portions of the conduit inside the vault, through the wall penetration, and 24 inches outside the vault shall be RGS and shall be grounded.

- *All conduits containing grounding electrode conductors shall be PVC Schedule 80 over their entire length.*

6. All portions of conduits penetrating concrete floors, walls, or ceilings shall be RGS.

Exception:

- *In below ground vaults as described above.*

7. All conduit penetrations from grade shall be RGS.

Exception:

- *All conduits containing grounding electrode conductors shall be PVC Schedule 80 over their entire length.*

8. All portions of exposed conduits inside closed buildings shall be RGS.

Exceptions:

- *EMT conduit shall be allowed per the “EMT Raceway Applications” section herein.*
- *LFMC conduit shall be allowed per the “LFMC Raceway Applications” section herein.*
- *All conduits containing grounding electrode conductors shall be PVC Schedule 80 over their entire length.*
- *Unless otherwise specifically called out on a separate plan or detail.*

F. LFMC RACEWAY APPLICATIONS (REFERENCE DEFINITIONS)

1. LFMC conduit shall be used for the last 18 inches of connection to motors, transformers and other vibrating equipment.
2. LFMC conduit shall be used for the last 18 inches of connection to field instruments such as flow meters in vaults and ultrasonic level transducers.
3. LFMC conduit shall be used for the last 18 inches of connection to any device that may require minor movement during maintenance or repair or that may require physical adjustment.
4. LFMC conduit may be used in pull vaults for connections between conduit penetrations and junction boxes inside the vault where space is limited.

G. EMT RACEWAY APPLICATIONS (REFERENCE DEFINITIONS)

1. Exposed conduits may be EMT in completely enclosed dry (see Definitions) rooms.

2. EMT conduits may be used in attics and where concealed in walls.

Exception to the use of EMT:

- *Where conduit is required to 100 percent continuous.*

H. FIBERGLASS/RTR ELBOW APPLICATIONS

1. Fiberglass conduit shall not be used.
2. Fiberglass elbows may be used in underground applications with or without concrete encasement.

Exception to the use of fiberglass elbows:

- *Where raceway is required to 100 percent continuous.*

3.2 RGS RACEWAY PROTECTIVE COATINGS

Protected RGS conduits are used to minimize conduit degradation from moisture and chemicals.

Where called in the Plans or Specifications as “Protected RGS,” “PVC-Coated RGS,” “PVC-Coated,” “PVC-RGS,” or “PVC-RMC,” all such conduits, elbows, and fittings shall be factory coated PVC as defined in Section 2.1.

A. PVC-COATED RGS CONDUIT APPLICATIONS

1. All portions of RGS elbows, bends, straight pipes, couplings, and fittings buried underground shall be PVC-Coated.
2. All portions of RGS elbows, bends, straight pipes, couplings, and fittings encased in concrete shall be PVC-Coated.
3. All portions of RGS elbows, bends, straight pipes, couplings, and fittings exposed outdoors shall be PVC-Coated.
4. All portions of RGS elbows, bends, straight pipes, couplings, and fittings inside underground vaults, pullboxes, wet wells, and dry wells shall be PVC-Coated.
5. All portions of RGS elbows, bends, straight pipes, couplings, and fittings exposed in Chemical Rooms (reference Definitions) shall be PVC-Coated.

6. All portions of RGS conduits penetrating concrete floors and below-ground walls and ceilings shall be PVC-Coated at least 12" into the exposed area and extending at least 24" underground.

Exceptions:

- *Where specifically noted to be otherwise in the Plans.*
- *Non-metallic conduits that terminate at the wall of a pullbox.*

3.3 JUNCTION AND DEVICE BOX APPLICATIONS

A. JUNCTION BOXES

1. Junction boxes for Instrumentation, Intrinsically Safe, and Non-Linear Power circuits (see Definitions) shall be hinged steel, 6" x 6" x 4" minimum.
2. Dry Areas (see Definitions).
 - a. Flush-mounted junction boxes may be the standard type.
 - b. Wall-mounted junction boxes shall be the NEMA 1 gasketed.
3. Wet Areas (see Definitions).
 - a. NEMA 4X 316L stainless steel.

Exceptions:

- *Except in pullboxes, cast junction boxes shall be allowed for applications where three conduits or less approach from three different directions and no terminations are made inside the junction box.*
- *Unless called out otherwise on the Plans*

B. DEVICE BOXES, ACTUATORS, AND COVERS

All exposed boxes shall be of cast construction.

All aluminum and cast iron covers shall be provided with a weatherproof gasket.

1. Outdoors, In Pullboxes, In Equipment Vaults

a. Receptacles

Cast iron device box body with cast aluminum gasketed cover and top-opening “in-service” cover.

Exception:

- *Cast aluminum device box bodies may be used if specifically called out on the Plans or approved by the Engineer.*

b. Light Switches

Cast iron device box body with cast iron gasketed cover and lever-arm actuator.

Exception:

- *Cast aluminum device box bodies with gasketed die cast aluminum covers and lever arm actuators may be used if specifically called out on the Plans or approved by the Engineer.*

2. Indoor, Wet Areas (see Definitions).

Flush-mounted (recessed) junction boxes may be the standard metal type.

These boxes will usually be mounted in wood or steel stud framed walls with gypsum plasterboard or similar surfacing cover. Boxes mounted in Concrete Masonry Unit (Block) walls shall be Masonry type boxes.

a. Receptacles

- i. Recessed (flush-mount) – standard device box body with gasketed die cast aluminum, snap-action, weatherproof cover.

- ii. Surface-mounted – cast aluminum device box body with gasketed die cast aluminum, snap-action, weatherproof cover.
 - b. Light Switches
 - i. Recessed (flush-mount) – standard device box body with gasketed cast aluminum switch cover.
 - ii. Surface-mounted – die cast aluminum device box body with gasketed cast aluminum switch cover.
- 3. Indoor, Dry Areas (See Definitions)
 - a. Receptacles
 - i. Recessed (flush-mount) – standard device box body with plastic cover.
 - ii. Surface-mounted – cast aluminum device box body with plastic cover.
 - b. Light Switches
 - i. Recessed (flush-mount) – standard device box body with plastic switch cover.
 - ii. Surface-mounted – cast aluminum device box body with plastic switch cover.

3.4 PULLBOX AND HANDHOLE APPLICATIONS

A. PULLBOXES

Pullboxes shall be provided as shown on the Plans and as required by the Utility Companies.

1. Pullboxes shall be 6' x 6' x 4' deep minimum.

Exceptions:

- *Pullboxes with less than 2 TYPE J1, TYPE J2, or TYPE J3 junction boxes (reference Definitions) shall be allowed to be 4' x 4' x 4' minimum.*

- *Unless specifically called out otherwise on the Plans.*
 - *Unless called out otherwise by a Utility Company.*
2. Pullboxes shall be provided with metal H30 hatch lids.

Exceptions:

- *If pullboxes are located where only light load vehicular traffic is present, then the hatch lids shall be rated at H25.*
 - *If pullboxes are located where no vehicular load traffic is present, then the hatch lids shall be rated at H20.*
3. Pullbox lids shall be cast, engraved, or otherwise permanently marked with the legend “ELECTRICAL.”

B. HANDHOLES

Handholes are used as pull and splice points in underground installations and are typically installed in driveways, parking lots, and off-roadway applications subject to occasional non-deliberate heavy vehicular traffic.

1. Handholes shall be set adjacent to each pole light pedestal.

Exception:

- *Unless specifically shown or called out otherwise on the Plans.*

PART 4 EXECUTION

4.1 EXAMINATION

Examine surfaces and spaces to receive raceways, boxes, for compliance with installation tolerances and other conditions affecting performance of raceway installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

4.2 INSTALLATION, GENERAL

A. COORDINATION WITH OTHER WORK

Wherever practical, route conduit with adjacent ductwork or piping.

1. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes or other heat sources operating at temperatures above 100 degrees F.
2. When installing utility conduits, comply with the spacing and depth requirements of the utilities.
3. Non-electrical buried piping has routing priority over electrical burials.

B. MOUNTING PRACTICES

1. All conduits in process areas shall be surface mounted unless specifically called out otherwise on the Plans.
2. Install raceways, boxes, enclosures, and cabinets as indicated, according to manufacturer's written instructions.
3. Where several conduits follow a common route, stagger pull boxes, junction boxes, pulling sleeves, and fittings.

C. DEVICE BOX INSTALLATION

1. Coordinate box locations with building surfaces and finishes to avoid bridging wainscots, joints, finish changes, etc.
2. Recess boxes in the wall, floor, and ceiling surfaces in finished areas. Set boxes plumb, level, square and flush with finished building surfaces within 1/16 of an inch for each condition. Set boxes so that box openings in building surfaces are within 1/8 of an inch of edge of material cut-out and fill tight to box with building materials. Back boxes with structural material to prevent rotation on studs or joists. Use gang boxes wherever more than one device is used at one location.
3. Surface mount boxes to building structures with a minimum of 1/4-inch spacing and with a minimum of two fasteners. Provide attachments to withstand an additional force of 100 pounds applied vertically or horizontally.

4. Set recessed boxes at the following heights to the bottom of the box, except where noted otherwise in the Plan Set:
 - a. Convenience outlet receptacles in finished areas at 18 inches above floor.
 - b. Lighting switches, dimmers, etc., at 42 inches above floor.
 - c. Wall mounted telephones at 60 inches above floor.
 - d. Boxes for outlets on cabinets, countertops, shelves, and above countertops at 2 inches above the finished surface or 2 inches above the back splash. Verify size, style, and location with the supplier or installer of these items before installation.
5. Set surface-mounted receptacle and lighting boxes in wet areas 42 inches above the finished floor to the center of the box, unless called out otherwise in the Plan Set.
6. Set surface-mounted boxes for lighting switches within 12 inches of the door opening on the strike or lock side of the door or on the side closing last unless indicated otherwise in the Plan Set.
7. Arrange boxes used in wet areas to drain moisture away from devices or enclosures for equipment and make conduit connections from below.
8. Set floor boxes level and adjust to finished floor surface.

D. CONDUIT INSTALLATION

Install conduit as a complete and continuous system without wires. Mechanically secure to boxes, fittings, and equipment. Electrically connect conduits to all metal boxes, fittings, and equipment.

1. All field or manufactured ferrous metal threaded connections of conduits and fittings shall be installed with a coating of electrically conductive, corrosion resistant, copper colloidal compound such as “Shamrock Kopr-Shield™ Compound” or equivalent.
2. Keep conduits clean and dry. Close each exposed end.

3. Properly ground each metallic box, cover, lid, hatch, conduit, etc., in compliance with the National Electrical Code and Specification Section 16060.
4. When blowing through conduits, cover electrical components installed in enclosures to avoid blowing dirt, shavings, or moisture into equipment.
5. Install pull wires in empty raceways. Use No. 14 AWG zinc-coated steel, monofilament plastic line, or woven polyester pull line with not less than 200-lb tensile strength. Leave at least 8 inches of slack at each end of the pull wire.
6. Install exposed raceways in lines parallel or perpendicular to the building or structural member's lines except if structure is not level then follow the surface contours as much as practical. Do not crossover or use offsets if they can be avoided by installing the raceway in a different routing.
7. Run parallel or banked conduits together, on common supports where practical.
8. Make bends in parallel or banked runs concentric (common radius point, expanding radius). Use factory elbows only where elbows can be installed concentrically; otherwise, provide field bends for parallel raceways.
9. Select surface raceway outlet boxes to which lighting fixtures are attached of sufficient diameter to provide a seat for the fixture canopy.
10. Provide surface metal raceway outlet box and the backplate and canopy at the feed-in location of each end-stem suspension fluorescent lighting fixture.
11. Labeling

With the exception of conduits supplying power to lighting and convenience receptacles, all conduits shall be labeled in the following manner.

- a. Conduits shall be labeled at each entrance and exit of a raceway, box, and device. Labels shall be placed no more than 3 inches from the relevant entrance or exit and shall be

positioned in a manner where they can best be read by technicians and maintenance personnel.

Exception:

- *Only one label shall be required for conduits less than 6 feet in length where the entire conduit can be seen from a single point.*
- b. The labels used shall be permanent items manufactured specifically for tagging conduits in direct sunlight and wet environments.
 - c. The conduit label shall be the full conduit number as listed on the Cable and Conduit Schedule.
 - d. The conduit label shall be attached near the ends of conduit stub ups through floors and penetrations into vaults even if equipment is set over the conduit.

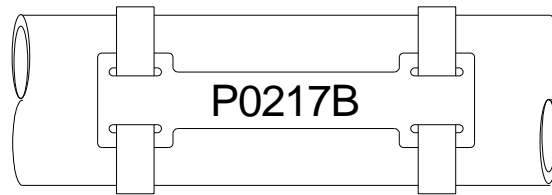


Figure 4.2.D.11

Example of a Conduit Label

E. RACEWAY TERMINATIONS AND CONNECTIONS

1. Join raceways with fittings designed and approved for the purpose and make joints tight.
2. Make connections waterproof and rustproof by application of a watertight, conductive thread compound. Clean threads of cutting oil before applying thread compound.
3. PVC–RMC Conduits

Use only fittings approved for use with that material. Patch all nicks and scrapes in PVC coating after installing conduits.

4. Apply PVC adhesive by brush.
5. Make raceway terminations tight. Use bonding bushings or wedges at connections subject to vibration. Use bonding jumpers where joints cannot be made tight.
6. Cut ends of conduit square with hand or power saw or pipe cutter. Ream cut ends to remove burrs and sharp ends. Make conduit threads cut in the field with the same effective length and same thread dimensions and taper as specified for factory-cut threads.

7. Flexible Connections

Use maximum of 18 inches of flexible conduit for equipment subject to vibration, noise transmission, removal, or movement; and for all motors. Do not use flexible conduit in place of elbows, offsets, or fittings to attach to fixed equipment. Recessed and semirecessed lighting fixtures may use up to 6 feet of flexible conduit, or 11 feet of premanufactured lighting “whips.” Use LFMC in wet or damp locations. Do not strap flexible conduit to structures or other equipment.

8. Provide double locknuts and insulating bushings at conduit connections to boxes and cabinets. Align raceways to enter squarely and install locknuts with dished part against the box. Use grounding type bushings where connecting to concentric or eccentric knockouts.

Exception:

- *In wet areas, use Myers hubs.*

9. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align raceways so the coupling is square to the box and tighten the chase nipple so no threads are exposed.
10. Support conduit connections to motors or other equipment independently of the motor or equipment. Raise or drop vertically to the nearest practicable point of connection to the unit. Run vertical drops to the floor and fasten with a floor flange. Unsupported drops are not permitted. Horizontal runs on the floor or on equipment are not permitted. Drop or raise at the appropriate closest location. Run conduit on equipment frames or supports to

closely follow the contours of the equipment. Locate conduit to maintain access to all equipment services and adjustment points and so as not to interfere with operation of the equipment.

11. Connect conduit to hubless enclosures, cabinets, and boxes with double locknuts and with insulating type bushings. Use grounding type bushings where connecting to concentric or eccentric knockouts. Make conduit connections to enclosures at the closest point possible where the devices are located to which the circuits contained in the conduit will connect.

Exception:

- *In wet areas, connect to enclosures, boxes, and devices from the bottom side using Myer-type hubs.*

F. EXPANSION FITTINGS

Where conduits cross building expansion joints, use suitable sliding or offsetting expansion fittings. Unless specifically approved for bonding, use a suitable bonding jumper.

Exception:

- *For 100 percent continuous conduits, provide an LFMC loop to compensate for expansion. Include conduit outlet boxes for maximum bend compliance.*

G. RACEWAY SUPPORT

Support raceways as specified in Section 16050.

1. Provide anchors, hangers, supports, clamps, etc., to support the raceways from the structures in or on which they are installed. Do not space supports further apart than 10 feet.
2. Provide sufficient clearance to allow conduit to be added to racks, hangers, etc., in the future.
3. Support raceway within 3 feet of every outlet box, junction box, panel, fitting, etc.
4. Support raceway and boxes in an approved manner by:
 - a. Expansion shields in concrete or solid masonry;

- b. Toggle bolts on hollow masonry units;
 - c. Wood screws on wood;
 - d. Metal screws on metal.
5. Raceway in wet areas shall have clamp backs or other appropriate spacers to hold them a minimum of 1/2 inch off the surface. Horizontal runs on the roof surface shall be blocked at every 5 feet to hold them a minimum of 2 inches above roof surface.

H. INSTALLING PVC-COATED RGS CONDUITS

- 1. Follow the manufacturer's requirements and recommendations when installing PVC-Coated RGS conduits.
- 2. Seal the connections to protect the conduit.
- 3. Provide manufacturer's PVC repair compound where the thickness of the conduit coating has been reduced or damaged (from bending, threading, nicking, etc.)

I. BENDS AND OFFSETS

- 1. Fabricated bends and offsets shall be made with manufacturer-approved bending tools, by manufacturer-certified personnel.
- 2. Where possible, use standard elbows, conduit fittings, or junction boxes to avoid fabricated bends.
- 3. Make bends and offsets uniform and symmetrical. Make bends and offsets so that the inner diameter is not reduced. Use expanding plugs for bends in PVC conduit of 2-inch trade size or larger. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.

J. PENETRATIONS FOR RACEWAYS

- 1. Do not bore holes in floor and ceiling joists outside center third of member depth or within 2 feet of bearing points. Holes shall be 1-inch diameter maximum.

Exception:

- *Unless specifically approved by Structural Engineer.*
2. Penetrate through roofs with core drill hole 1/2 to 1 inch larger than conduit, flash with neoprene, caulk conduit in place and seal with silicone sealant under flashing. Sleeve roof opening where non-concrete roof construction occurs.

4.3 PULLBOXES

A. PULLBOX STRUCTURAL INSTALLATION

Strict compliance must be followed regarding the installation of conduits, conductors, junction boxes, and grounding inside pullboxes.

1. Install pullboxes outside of classified areas. Field verify measurements to assure compliance.

Exception:

- *Unless specifically called out otherwise in the Plans.*

B. PULLBOX CONDUIT, CONDUCTOR, JUNCTION BOX, AND GROUNDING INSTALLATION

The six types/categories of electrical circuits as defined in Section 3.1.B.1 shall be installed as described herein (reference Figure 4.3.B).

1. Installing circuits in conduits NOT Identified As 100 percent Continuous in Pullboxes
 - a. Conduits NOT identified as 100 percent continuous shall terminate at the penetration into the pullbox with a PVC Schedule 40 bell-end.
 - b. Cables and conductors shall be open-wire within the pullbox.
 - c. Coil 2 wraps at 24 inches per wrap of each open wire. Bind the wraps with Ty-Rap® cable fasteners.
 - d. Support open wires a minimum of 18 inches above the pullbox floor on 316L stainless supports mounted near the edges of the pullbox, leaving room in the center for safe

entry, work, and exit. Secure wires with Ty-Rap® cable fasteners.

- e. Physically separate power and control circuits as much as possible.
 - f. Plug the ends of all open conduits with a removable filler to minimize water entry into and out of the pullbox. Repair plugging after the movement of open wiring.
 - g. Seal around all conduit penetrations with non-shrink grout.
2. Installing Conduits Identified As 100 Percent Continuous in Pullboxes
- a. All conduits identified as 100 percent continuous passing through, or terminating in, a pullbox shall terminate in a TYPE J1, TYPE J2, or TYPE J3 junction box for pulling purposes, termination, and rerouting.
 - b. Provide separate junction boxes for the types of circuits listed below. Under no circumstance shall these circuit types be combined in a common junction box.
 - i. Non-linear power circuits (TYPE J1).
 - ii. Intrinsically safe circuits (TYPE J2). Note: intrinsically safe instrumentation and control circuits may be combined in TYPE J2 junction boxes.
 - iii. Instrumentation circuits, not intrinsically safe (TYPE J3).
 - c. All conduit entries into junction boxes shall be watertight, made with Myer-type hubs.
 - d. All conduits shall be mounted and supported with 316L stainless steel hardware.
 - e. Conduit composition and protective coating shall be per Sections 3.1 and 3.2.

3. Installing Junction Boxes in Pullboxes
 - a. Junction boxes shall be NEMA 4X, 316L stainless steel, 18" x 18" x 6" (minimum) and shall comply with NEC 314.28(A)(1) and 314.28(A)(2).
 - b. Junction boxes shall be mounted with 316L stainless steel hardware at a height of 24 inches minimum from the bottom of the junction box to the floor of the pullbox.
 - c. Junction boxes shall be mounted on separate walls.
 - d. Junction boxes shall be provided with a water drip fitting mounted to the bottom of the box.
 - e. Coil 4 wraps at 12 inches per wrap of each cable and conductor in a junction box.
 - f. Splicing shall not be allowed in junctions boxes.

Exception:

- *Unless specifically called out otherwise in the Plans.*

4. Installing Grounding in Pullboxes

Reference Specification 16060.

4.4 HANDHOLES

A. HANDHOLE INSTALLATION

Install handholes for underground raceway systems true to line and grade. Provide a compacted foundation of fine sand or 3/8 minus crushed rock for the bearing surface edges of the handholes.

The handholes shall be installed per the NEC sections 314, and other applicable sections of the NEC.

B. HANDHOLE CONDUIT INSTALLATION

1. End all conduits with a vertical riser.

- Conduits NOT identified as 100 percent continuous shall be allowed to extend into the handhole as a PVC conduit. Provide a PVC bell-end in each conduit as shown in Figure 4.5.B.2. Provide a removable filler at the end of each conduit to eliminate the possibility of water entry.

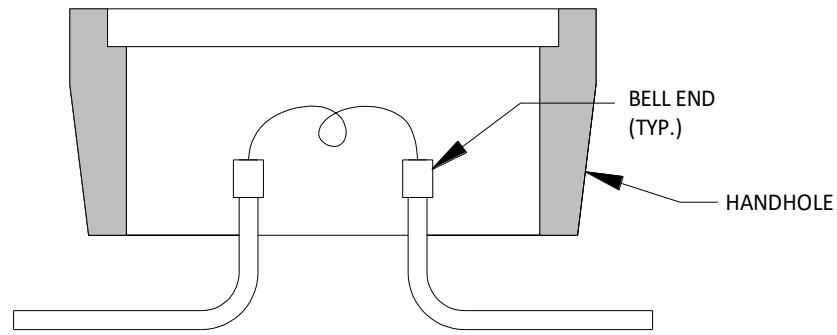


Figure 4.5.B.2

Typical PVC Conduit Terminations in a Handhole

- Conduits identified as 100 percent continuous shall terminate into the bottom of a TYPE J1, TYPE J2, or TYPE J3 junction box, with Myer-type hubs, in PVC-Coated RGS conduit as shown in Figure 4.5.B.3. The door of the J-Box shall face upwards.

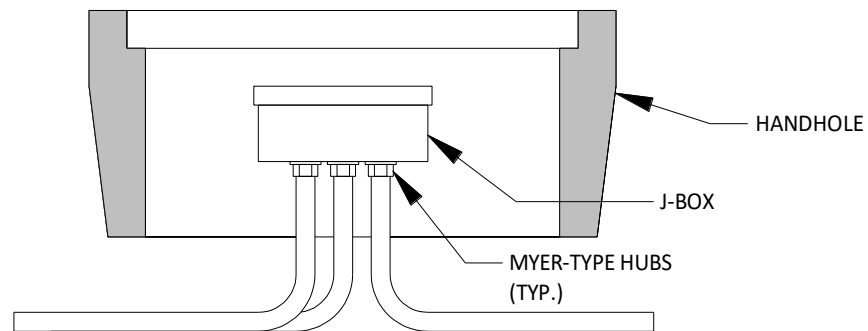


Figure 4.5.B.3

Typical 100 Percent Continuous Conduit Terminations in a Handhole

Exception:

- Where a handhole contains only two conduits, and is being used solely as a pulling point, where one conduit is simply an extension of the other, a junction box may be replaced with a PVC-Coated RGS conduit pulling body.*

C. HANDHOLE GROUNDING

1. All handholes with metal conduits or with metal lids shall be grounded per Section 16060-3.

4.5 INSTALLATION OF CONDUITS UNDERGROUND AND IN CONCRETE

A. UNDERGROUND RACEWAYS

1. The minimum conduit depth shall be 24 inches.

Exceptions:

- *Electrical utility conduit depth shall be 36 inches.*
 - *Unless required otherwise by utility company.*
 - *Unless required to be shallower due to physical constraints (see requirements below).*
 - *Unless under a concrete slab (see requirements below).*
 - *Conduits contains a grounding electrode conductor shall be 30-inches deep.*
2. Conduits that require a buried depth of less than 18 inches shall require a 6-inch-thick concrete covering over that portion of such conduits. Such concrete covers need not be formed but shall be colored red or shall be painted red on top.
 3. Conduits under a concrete slab-on-grade shall be separated from the slab and from the supporting soil by at least 3 inches with soft sand on all sides.
 4. Provide separation of underground instrumentation conduits from power and control conduits by a minimum of 12 inches. Avoid parallel runs of instrumentation conduits with power and control conduits as much as possible. Where instrumentation conduits are required to crossover power or control conduits, maintain the 12-inch separation using depth and make the crossover as close to 90 degrees as possible.

Exception:

- *Provide 18 inches of separation between instrumentation conduits and non-linear power conduits.*

5. Run conduits as straight as practicable. Make changes in direction and/or grade of sufficient length to allow a gradual change (3-foot radius minimum). Make slight offsets with 5-degree couplings.
6. Run trenches true and clear of stones or soft spots. Place 4-inches of fine sand in the trench bottom and tamp into place. Provide preformed plastic spacers on top of sand spaced 5-feet on center.

After the raceway is placed in the trench, backfill 6 inches with sand, then with native earth backfill passing a No. 8 sieve, free of stones. Do not tamp on top of the conduit until the final backfill is placed. Tamp or water-settle the final backfill to finish the grade. Compact the backfill as specified under Section 02300 "Site Earthwork."

7. Mark direct buried conduit by placing a red marking tape a minimum of 12 inches below grade during backfilling of the trench.
8. Seal conduit connections to eliminate leakage.

B. CONDUITS UNDER SLABS ON GRADE

1. No conduits will be encased in slabs less than 8 inches in depth.
2. For slabs-on-grade, all conduits larger than 3/4-inch trade size must be run underground below the slab.
3. All conduits desired to be installed within slabs on grade shall be submitted to the Engineer for approval and design as defined in this Section.

Exceptions:

- *Conduits shown on the Plans as being designed into slabs on grade do not require further Engineering approval.*

C. CONDUIT TRANSITIONS

Where raceway exits from grade or concrete, provide the following:

1. All conduits exiting grade or concrete shall be PVC-Coated RGS.

Exception:

- *Raceways used for the containment and protection of bare grounding electrode conductors shall be PVC Schedule 80. No portion of these conduits shall be metallic.*
2. For equipment to be moved into place at a later date, install a PVC-Coated RGS coupling flush with the floor slab. Insert a threaded flush plug into the coupling. Provide a pull wire looped backed into the conduit that can be reached after removal of the plug.
 3. Only the straight portion of conduits shall exit grade or concrete. No curved portion of a factory or field-bent conduit shall be visible existing the penetration, even when covered or hidden by equipment.

D. CONDUIT STUB-UPS INTO EQUIPMENT AND ENCLOSURES

1. Where conduits are stubbed up into open bottom equipment and enclosures, extend the bottom of the conduit threads 1/2 inch above grade. Provide ground bushing and end fittings, flush with fitting and 2-inch stub, above the bottom of the enclosure. Stub conduits to a uniform height (plus or minus 1/8 of an inch) and align within plus or minus 1/4 inch.

Exception:

- *Conduits that do not meet the requirements of being 100 percent continuous, stubbing up directly under a Motor Control Center that is mounted on a housekeeping pad, shall be allowed to terminate as a PVC conduit with a bell-end.*
2. Locate stub-ups directly under the section gutter into which the conductors they contain are to be routed. Terminate conduit with insulating, grounding type bushing bonded to the ground bus of the equipment.

3. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portion of bends are not visible above the finished slab.
4. Unless otherwise noted on the Plans, spare conduits stubbing up through concrete floors and not adjacent to a wall shall be finished flush with floor with an RGS coupling. Provide an in-set metal plug (male thread) into coupling flush with floor.
5. Unless otherwise noted on the Plans, spare conduits stubbing up through concrete floors or grade, and adjacent to a wall or housekeeping pad shall extend 12 inches above slab/grade. The exterior edge of the conduit shall be a minimum of 1 inch from the wall/pad.
6. All stub-ups shall be provided with pull string.
7. Provide conduit labels on all stub-ups which are not flush mounted.

E. FIBERGLASS/RTR ELBOWS

1. Types of Joints
 - a. Adhesive Joints: When using an adhesive type joint, the manufacturer's instructions should be followed.
 - b. Adhesive for Fiberglass: The adhesive for fiberglass consists of two parts: resin and hardener. The two materials must be combined before they can be used,
2. Recommended Joining Procedures
 - a. Surfaces to be joined should be clean and free from dirt, foreign materials and moisture. Allow Cleaner to evaporate before applying adhesive.
 - b. Adhesive curing time is the time required for the adhesive in the assembled joint to harden. Cure time is dependent on ambient temperature.

4.6 PROTECTION

Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer that ensures coatings, and finishes are without damage or deterioration at the time of Substantial Completion.

- A. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
- B. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

4.7 CLEANING

On completion of installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

4.8 QUALITY CONTROL

A. TESTS

- 1. Conduits identified as meeting the requirements of 100 percent continuity shall be tested between source and destination as follows:
 - a. Testing shall be performed using a Digital Voltmeter or Biddle ohmmeter.
 - b. Testing values shall not exceed 5 ohms.
 - c. If testing values exceed 5 ohms, then corrective action shall be taken to reduce the resistance to 5 ohms or below.
 - d. These measurements shall be documented, signed, and submitted to the Engineer for approval.

***** END OF SECTION *****

SECTION 16140

WIRING DEVICES

PART 1 GENERAL

1.1 SCOPE

The work specified in this Section includes the various types of receptacles, connectors, switches, and finish plates.

1.2 RELATED WORKS SPECIFIED ELSEWHERE

<u>Section</u>	<u>Items</u>
16050	Basic Electrical Materials and Methods
16130	Raceways and Boxes

1.3 SUBMITTALS

See Section 01300.

1.4 QUALITY ASSURANCE

See Section 16050.

1.5 COORDINATION

A. WIRING DEVICES FOR OWNER FURNISHED EQUIPMENT

Match devices to plug connectors for Owner-furnished equipment.

B. CORD AND PLUG SETS

Match cord and plug sets to equipment requirements.

1.6 DEFINITIONS

Reference Section 16050, "Definitions."

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. AVAILABLE MANUFACTURERS

Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include the following:

1. Wiring Devices
 - a. Arrow Hart Div., Cooper Industries.
 - b. Bryant Electric, Inc.
 - c. Hubbell Inc.
 - d. Killark Electrical Mfg. Co.
 - e. Leviton Mfg. Co., Inc.
 - f. Legrand.
2. Multi-Outlet Assemblies
 - a. Wiremold Co.

2.2 WIRING DEVICES

Comply with NEMA Standard WD 1, "General Purpose Wiring Devices." Terminals shall be rated for 75 degrees C (min.).

A. ENCLOSURES

NEMA 1 equivalent, except as otherwise indicated.

B. COLOR

Ivory except as otherwise indicated or required by Code.

C. RECEPTACLES, STRAIGHT-BLADE AND LOCKING TYPE

Except as otherwise indicated, comply with Federal Specification W-C-596 and heavy-duty grade of UL Standard 498, "Electrical

Attachment Plugs and Receptacles.” Provide NRTL labeling of devices to verify compliance.

1. General Purpose Convenience Outlets
 - a. Duplex receptacle configuration
 - b. Nylon face
 - c. Staked screw terminals for line, neutral, and ground connections.
 - d. Provisions for split bus
 - e. NEMA 5-20R
2. Special Purpose Receptacles
 - a. Wireless control
 - b. Bottom receptacle controlled; top receptacle continually powered.
 - c. NEMA 5-20R.

D. RECEPTACLES, STRAIGHT-BLADE, SPECIAL FEATURES

Comply with the basic requirements specified above for straight-blade receptacles of the class and type indicated, and with the following additional requirements:

1. Ground-Fault Circuit Interrupter (GFCI) Receptacles – Class A (5 mA) Personal Protection

UL Standard 943, “Ground Fault Circuit Interrupters,” with integral NEMA 5-20R duplex receptacle arranged to protect only the connected receptacle and no other receptacles connected on the same circuit. Design units for installation in a 2-3/4-inch-deep outlet box without an adapter.
2. USB Charging Receptacles

UL Listed NEC Class 2 Power Supply integrated into NEMA 5-20R duplex receptacle. Power supply shall feature two USB Type A ports and shall comply with the USB Battery Charging

Specification 1.2. Charging output shall be at least 1.5 Amps at each port simultaneously. Power supply shall be FCC Part 15 compliant. Units shall be suitable for installation in a 2-3/4-inch-deep outlet box without an adapter, and shall be compatible with standard GFCI-style faceplates. Leviton T5832 or equal.

E. RECEPTACLES, INDUSTRIAL HEAVY-DUTY

Conform to NEMA Standard PK 4 “Plugs, Receptacles, and Cable Connectors of the Pin and Sleeve Type for Industrial Use.”

Refer to Specification Section 16230 for pin and sleeve generator receptacles.

F. CONVENIENCE RECEPTACLES IN WET LOCATIONS

Convenience receptacles in wet locations shall comply with NEC Article 406.9 and shall be 20 A, 125 VAC rated terminated with binding screws.

G. PENDANT CORD/CONNECTOR DEVICES

Matching, locking type, plug and plug receptacle body connector, NEMA L5-20P and L5-20R, heavy-duty grade.

1. Bodies

Nylon with screw-open cable-gripping jaws and provision for attaching external cable grip.

2. External Cable Grip

Woven wire mesh type made of high-strength galvanized-steel wire strand and matched to cable diameter and with attachment provision designed for the corresponding connector.

H. CORD AND PLUG SETS

Match voltage, current ratings, and number of conductors to requirements of the equipment being connected.

1. Cord

Rubber-insulated, stranded copper conductors, with type SOW-A jacket. Grounding conductor has green insulation. Ampacity is equipment rating plus 30 percent minimum.

2. Plug

Male configuration with nylon body and integral cable-clamping jaws. Match to cord and to receptacle type intended for connection.

- I. SNAP SWITCHES

Quiet-type ac switches, NRTL listed and labeled as complying with UL Standard 20 “General Use Snap Switches,” and with Federal Specification W-S-896.

1. Lighting Switches

120/277 Vac only, rated 20 amperes.

2. Motor Rated Switches

Horsepower rated for application indicated.

- J. WALL PLATES

Single and combination types that mate and match with corresponding wiring devices. Features include the following:

1. Color

Matches wiring device except as otherwise indicated.

2. Plate-Securing Screws

Metal with heads colored to match plate finish.

3. Material for Interior Finished Spaces

Lexan, except as otherwise indicated.

4. Material for Interior Unfinished Spaces: Galvanized steel.

5. Material for Laboratories: Stainless steel.

6. Material for Exterior or Wet Locations: Cast Aluminum.

2.3 MULTI-OUTLET ASSEMBLIES

A. Comply with Standard UL 5, “Surface Metal Raceways and Fittings.”

B. COMPONENTS OF ASSEMBLIES

Products of a single manufacturer designed to be used together to provide a complete matching assembly of raceways and receptacles.

C. RACEWAY MATERIAL

Metal, with manufacturer’s standard corrosion-resistant finish.

D. WIRE

No. 12 AWG.

PART 3 EXECUTION

3.1 INSTALLATION

A. IDENTIFICATION

Each receptacle, whether convenience, or dedicated, shall be labeled with the circuit from which its power is derived. Label as “CKT-XX” where XX = numerical circuit number.

1. Only one Panelboard servicing the site:

Label as “CKT-XX” where XX = numerical circuit number within the Panelboard.

2. More than one Panelboard servicing the site:

Label as “CKT XX-YY” where XX = Panelboard number and YY = numerical circuit number within the Panelboard.

Example:

A receptacle powered from circuit 03 of Panelboard [01 PB 02] would be labeled “CKT 02-03.”

B. RECEPTACLE BOXES

1. Reference Section 16130 for box types.

2. Mounting Height

a. Indoor, in DRY Areas

Indoor receptacle boxes in DRY areas shall be mounted 18 inches above the floor unless shown otherwise on the Plans.

b. Indoor, in WET Areas

Indoor receptacle boxes in WET areas shall be mounted 42 inches above the floor unless shown otherwise on the Plans.

c. Outdoor

Outdoor receptacle boxes shall be mounted 18 inches above grade unless shown otherwise on the Plans.

3. Reference Section 16130 for box cover types.

C. CONVENIENCE RECEPTACLES

Convenience receptacles shall be 20 A, duplex, white, GFCI, straight blade, 3-wire, grounding, unless called out otherwise on the Plans.

In addition to any GFCI requirements, all receptacles, convenience or dedicated, located in break rooms and kitchens shall be AFCI.

D. DEDICATED RECEPTACLES

Dedicated receptacles shall be 20 A, simplex, gray, non-GFCI, straight blade, 3-wire, grounding, unless called out otherwise on the Plans.

In addition to any GFCI requirements, all receptacles, convenience or dedicated, located in break rooms and kitchens shall be AFCI.

Dedicated receptacles shall include a red phenolic placard with 3/8-inch lettering over the receptacle stating:

NON-GFCI RECEPTACLE
FOR (*specific device*)
NOT INTENDED FOR GENERAL USE

E. ARRANGEMENT OF DEVICES

Except as otherwise indicated, mount flush, with long dimension vertical, and grounding terminal of receptacles on bottom. Group adjacent switches under single, multigang wall plates.

1. See “Raceways and Boxes” Section for mounting height of devices.
2. Verify locations of outlets and switches in cabinetry with cabinet supplier and Owner prior to installation.

F. INSTALLATION PRACTICES

1. Install devices and assemblies plumb, level, flush and secure. Provide spacers on device screws to flush yokes or flanges to surface of wall within 1/16 of an inch where boxes are not flush with the wall surface. Install wiring devices such as receptacles to withstand 50 pounds force applied perpendicular to the device face with a maximum deflection of 1/16 of an inch.
2. Protect devices and assemblies during painting.
3. Use corrosion resistant devices in kitchen areas and outdoors.
4. Wiring connections shall be made by compression on the screw terminals. The wire shall be neatly and symmetrically wrapped around the screw a minimum of 180 degrees.

G. LIGHT SWITCH ORIENTATION

Install switches with the “off” position down. Install three and four way switches so the load is “off” when all switch handles are down.

H. TERMINATION PRACTICES

Connect phase, neutral, and grounding wires to devices with full loops around screws installed to tighten with tightening of the screw. Trim insulation to within 1/8 of an inch of screw terminal.

I. WALL PLATES

Install after painting is complete. Install with an alignment tolerance of 1/16 of an inch to plumb. Install at flush mounted devices so that all four edges are in continuous contact with finished wall surface without the use of mats or similar devices. Do not use plaster fillings.

3.2 GROUNDING

Connect receptacle or switch ground lug to device box for devices other than isolated ground type.

3.3 FIELD QUALITY CONTROL

Test wiring devices for proper connections, polarity, and ground continuity. Perform this testing with testing equipment designed for testing polarity and connections.

Operate each operable device at least six times.

Demonstrate charging the owner's electronic devices at each USB receptacle.

Test ground-fault circuit interrupter operation with local fault simulations, using a tester designed for such testing, and according to manufacturer recommendations. Testing with integral test switches on the receptacle is not sufficient for this testing.

Replace damaged or defective components, and retest.

***** END OF SECTION *****

SECTION 16410

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes:

1. Molded case enclosed circuit breakers
2. Disconnect switches
3. Automatic Transfer Switches
4. Manual Transfer Switch

B. Other Applicable Sections applying to work of this Section include:

<u>Section</u>	<u>Item</u>
16050	Basic Electrical Materials and Methods
16440	Panelboards

1.2 SUBMITTALS

A. Provide manufacturer and material information in accordance with Section 16050 – “Basic Electrical Materials and Methods”.

1.3 QUALITY ASSURANCE

A. Complies with:

1. NEC – National Electric Code
2. NEMA ICS 10 – AC Transfer Switch Equipment
3. NEMA AB 1 – Molded Case Circuit Breakers
4. UL 50 – Enclosures for Electrical Equipment

5. UL 869A – Reference Standard for Service Equipment
 6. UL 943 – Ground Fault Circuit Interrupters
 7. UL 1008 – Transfer Switch Equipment
 8. UL 489 – Molded Case Circuit Breakers
 9. UL 486A / B – Wire Connectors
- B. Provide products specified in this Section that are listed and labeled.
1. The Terms "Listed" and "Labeled": As defined in the NEC, Article 100.
 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering switches and circuit breakers that may be incorporated into the Work include, but are not limited to, the following:
1. Hubble
 2. Eaton Corp.; Westinghouse & Cutler-Hammer Products
 3. General Electric
 4. Square D
 5. Siemens Energy & Automation, Inc.
- B. Automatic Transfer Switch and Manual Transfer Switch:
1. Cummins Power Generation Inc.
 2. ASCO
 3. Or approved equal

2.2 CIRCUIT BREAKERS

- A. Circuit breakers shall be molded case breakers with automatic trip-free, quick-make, quick-break, thermal magnetic type; with handles clearly indicating tripped position. Multi-pole breakers shall have common trip and single handle.
- B. Breaker sizes, trip ratings, and arrangement in panelboards shall be in accordance with panel schedules. Breaker sizes shall be clearly stamped on handles or on laminated plastic nameplate attached to trim.
- C. Spaces for future breakers shall have bus drilled and tapped.
- D. Multi-pole breakers shall not be used for 120-volt lighting or 120-volt receptacle circuits, except where specifically required by Codes.
- E. Provide lock off or lock on devices where required.
- F. **BREAKERS FOR DISTRIBUTION PANELS**
 - 1. Breakers shall have a minimum interrupting rating 14,000 amps, symmetrical at 480 volts. Provide high interrupting rated breakers where noted or required.
 - 2. Breakers shall be bolted to busing.
- G. **BREAKERS FOR 208Y/120 VOLT OR 120/240 VOLT RECEPTACLE PANELBOARDS**
 - 1. Breakers shall be interrupting rating 10,000 amps, symmetrical at 240 volts, bolted to busing.
 - 2. All panelboards shall have 22,000 AIC integrated rating where 22,000 AIC or 25,000 AIC main breakers or upstream feeder breakers are used.
 - 3. Provide sub-feed breakers where indicated on schedules.
 - 4. Provide approved GFI breakers for all exterior receptacle circuits and where elsewhere required by Code.

2.3 SWITCHES

A. Enclosed, Fusible Switch, 600 Amps, and Smaller: NEMA KS 1, Type HD, Class R rejection fuse clips, enclosure consistent with environment where located, handle lockable with two padlocks, and interlocked with cover in CLOSED position. Switch horsepower rated where used in motor circuits.

B. ENCLOSURE

NEMA KS 1, with enclosure types as described in 16050 – “Basic Electrical Materials and Methods”, unless indicated otherwise in the Contract Documents.

2.4 AUTOMATIC TRANSFER SWITCHES

A. RATINGS

1. Provide new 4 Pole ATS with ratings as indicated on the Contract drawing sheet E6.0 to replace existing 3 Pole types.

B. ENCLOSURE

1. NEMA Type 1 (for indoor installation).

C. FEATURES

1. UL listed for “use in Emergency Systems.”
2. Capable of transferring the connected load from "NORMAL" to "STANDBY" power and re-transferring back to "NORMAL".
3. Electrically operated by a single solenoid mechanism and mechanically held.
4. High current-breaking capacity with silver-surfaced contacts equipped with arc barriers and magnetic blow-out coils.
5. Contacts rated in accordance with UL 1008 for current carrying and switching capabilities.
6. Suitable for repetitive load transfer switching.

7. Interlocked to prevent supplying the load from more than one source at a time.
8. "NEUTRAL DELAY" to allow motors to stop on transfer or in-phase monitor relays to assure voltage waves are synchronized on retransfer.
9. Provide adjustable-close differential voltage monitoring relays on all three phases to sense voltage on the "NORMAL" and "STANDBY" sources.
10. Auxiliary Contacts
 - a. One set normally open and one set normally closed which operate in parallel with the main transfer contacts.
 - b. One with each set of voltage relays to indicate when these relays are signaling the switch that voltage is adequate or inadequate (90 percent and 70 percent, respectively).
 - c. Auxiliary contacts are isolated, dry contacts suitable for 120 volts, 10 amps inductive loads, NEMA B10 rated. Wired to terminals in the switch low voltage control area.

D. OPERATION

1. Transfers from "NORMAL" to "STANDBY" when normal voltage falls to 70 percent of rated value and standby voltage is at 90 percent of rated value.
2. Re-transfers to normal voltage when normal voltage returns to 90 percent of rating.
3. Provide two separately adjustable time delays to prevent transfer and re-transfer on voltage dips. Delay shall be overridden on retransfer if standby source is below 90 percent of rating.
4. Engine start output is closed following programmable delay time.
5. Engine stop output is energized following programmable cool down delay.

6. Provide seven-day exercise timer for periodic exercising of generator.
 - a. Timer shall be programmable as to day of week, time of day, and duration for exercising.
 - b. Switch shall be programmable as to whether generator is exercised with or without load being transferred.

2.5 MANUAL TRANSFER SWITCHES

A. RATINGS

1. Provide new 4 Pole MTS with ratings as indicated on the Contract drawing sheet E6.0.

B. ENCLOSURE

1. NEMA Type 3R minimum (for outdoor installation)

C. FEATURES

1. UL 1008 listed for Optional Standby Transfer switch (Manual Transfer Switches)
2. The transfer switch shall be manually operated and mechanically held. The switch shall be mechanically interlocked to ensure only one of the three possible positions, “STANDBY SOURCE 1”, “STANDBY SOURCE 2” or “CENTER OFF”.
3. All contacts shall be silver-surfaced contacts equipped with arc barriers.
4. Where neutral contacts must be switched, the Manual transfer Switch shall be provided with fully rated neutral transfer contact.
5. Contacts rated in accordance with UL 1008 for current carrying and switching capabilities.
6. Inspection of all contacts shall be possible from the front the switch without disassembly of operating linkages and without disconnection of power conductors.

D. OPERATION

1. The transfer switch shall be arranged for mechanical operating mechanism.
2. The manual transfer shall be actuated by physically operating the switch handle.
3. The manual operating handle shall be capable of external operation without opening the enclosure door.
4. There shall be three positions for manual operation
 - a. Connected to “STANDBY SOURCE 1” (preferred).
 - b. Connected to “STANDBY SOURCE 2” (alternate).
 - c. Connected to “Center Off” (disconnected position).
5. Switch position when connected to “STANDBY SOURCE 1” or “STANDBY SOURCE 2” shall be pad lockable.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install, connect, and identify each switch and circuit breaker in accordance with Section in 16050 – “Basic Electrical Materials and Methods”.
- B. Install switches and circuit breaker enclosures level and plumb in locations as indicated, according to manufacturer's written instructions.
- C. For equipment at walls, bolt units to wall or mount on structural–steel channels bolted to wall. For controllers not at walls, provide freestanding racks conforming in 16050 – “Basic Electrical Materials and Methods”.
- D. Install wiring between switches, circuit breakers, control, and indication devices.
- E. Connect switches and circuit breakers and components to wiring system and to ground as indicated and as instructed by manufacturer.
 1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.2 FIELD QUALITY CONTROL

A. TESTING

After installing switches and circuit breakers and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
- B. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

3.3 ADJUSTING

- A. Set field-adjustable circuit-breaker trip and transfer switch setting ranges as indicated.
1. Where circuit breakers are included in the short circuit study, set the trip as recommended in the study.
- B. Provide fuses for fused disconnect switches to coordinate with manufacturer's listed maximum fuse size for equipment supplied by the disconnect switch.

***** END OF SECTION *****

SECTION 16440

PANELBOARDS

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes lighting and power panelboards and associated auxiliary equipment rated 600 V and less.
- B. Other Applicable Sections applying to work of this Section include:

<u>Section</u>	<u>Item</u>
16050	Basic Electrical Materials and Methods
16060	Grounding and Bonding
16280	Surge Protective Device
16410	Enclosed Switches, Fuses and Circuit Breakers

1.2 SUBMITTALS

- A. Provide manufacturer and material information in accordance with Section 16050 “Basic Electrical Materials and Methods”.
- B. SHOP DRAWINGS

For panelboards. Include dimensioned plans, sections, and elevations. Show tabulations of installed devices, major features, current and voltage rating. Include the following:

1. Enclosure type and mounting.
2. Bus configuration and current ratings.
3. Short-circuit current rating of the main bus.
4. Features, characteristics, ratings, and factory settings of individual protective devices and auxiliary components.
5. Branch circuit breaker ratings

C. MAINTENANCE DATA

For panelboard components to include in the maintenance manuals.
Include manufacturer's written instructions for testing circuit breakers.

1.3 QUALITY ASSURANCE

A. Complies with:

1. NEC – National Electric Code (NFPA 70)
2. NEMA PB 1 – Panelboards
3. UL 67 – Panelboards
4. UL 50 – Enclosure and Electrical Equipment

B. Provide products specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in the NEC, Article 100.
2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Approved manufacturers for general use are:

1. Eaton Corp.; Westinghouse & Cutler-Hammer Products
2. General Electric
3. Square D
4. Siemens Energy & Automation, Inc.

2.2 PANELBOARD TYPE

A. GENERAL USE PANELBOARDS

1. Panelboards shall be rated at the proper voltage, current, and phase for intended use with bus bars of copper. Panels shall have neutral bus bar rated at 100 percent of the phase bus current, provide ground bus bar equal in size with the neutral bus bar. Provide multiple lugs where conductors in parallel or "feed through" are shown on the drawings. Provide suitable lugs on neutral busing for outgoing feeders that require neutral connection as well as separate lug for each ground conductor on the ground bus bar. Panelboards shall be dead front.

2.3 DISTRIBUTION PANELBOARDS

- A. Dead front, dead rear, equipped with automatic circuit breakers for each circuit and paneled for accessibility. Provide minimum 8" gutter space at top and bottom of panelboard. Provide individual engraved laminated plastic nameplate stating trip value and load supplied, screwed to interior trim, for circuit breaker. Include breaker frame size, type and interrupt rating on nameplate if not readily identifiable without removing trim. Breakers shall be of the size and arrangement as shown on drawings. Panels shall be fully bused, drilled and tapped; copper busing. Voltages and ratings shall be as shown on the drawings. Provide lock offs for each breaker. See section 16410 "Enclosed Switches and Circuit Breakers" for more information on circuit breakers.

2.4 BRANCH CIRCUIT PANELBOARDS

- A. Interior: Branch circuit shall be arranged using double-row construction and it shall consist of automatic circuit breakers (one for each branch circuit) properly secured and mounted in a dead front, dead rear code gauge, galvanized steel cabinet with wiring gutter of sufficient width to provide ample space for branch circuit wires and feeders; in no case less than 4" wide. Barrired wireway shall be provided for feed-through panels. Provide minimum 8" gutter space at top and bottom of panelboard. Panels shall be fully bused; copper busing. Each panel shall be furnished with 42 20 AMP 1 pole circuit breakers unless shown otherwise on drawings or panel schedules. See section 16410 "Enclosed Switches and Circuit Breakers" for more information one circuit breakers.

2.5 CABINET FOR EACH PANELBOARD

- A. Surface mounted, unless otherwise indicated; tight closing doors without play when latched. Where two cabinets are located adjacent to each other in finished areas, provide matching trim of the same height. Where a remote-controlled switch or contactor is mounted in any panelboard, mount on same frame as panelboard interior with screw-retained access door in dead front shield.
- B. Provide cabinets of sufficient dimensions to allow for future expansion and addition of circuit breakers within the panelboards as indicated on drawings.
- C. Provide a pocket for circuit directory within each cabinet. The directory shall be neatly typed to show the equipment been served by each circuit breakers which shall correspond to the final circuit arrangement. Unused breakers will be marked as "Spare" and available spaces for new breakers shall be marked "Space". The directory shall also indicate the panel designation, voltage, and phase at the top.
- D. Provide lock for each cabinet door. All Electrical distribution equipment locks to be keyed identically and to match existing.
- E. Fasten panelboard with machine screws with oval countersunk heads, finish hardware quality, with escutcheons or approved trim clamps.
- F. Finish: Provide factory standard lacquer or enamel finish, gray or blue-gray color, shall be substituted for factory prime coat.
- G. Enclosures shall be provided without knockouts. Openings for conduit entry shall be field cut using knockout punches.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install panelboards and accessory items according to NEMA PB 1.1.
 - 1. Setup, adjust and fasten in place flush trim and interiors.
 - 2. Install circuit breakers as shown on the "Circuit Schedule" for each panelboard. Record all circuit breaker installation deviations from the "Circuit Schedule" and show on the Record Drawings the actual size and pole position of all circuit breakers installed.

B. MOUNTING HEIGHTS

Top of trim 74 inches above finished floor, unless otherwise indicated.

- C.** Provide openings for conduit entry when a breaker is to be installed. Where knockouts punches are made in error, provide a circuit breaker (one pole, twenty ampere) to fill in each position opening.

3.2 MAINTAINABILITY

- A.** Panelboard interiors shall be designed such that:

1. Branch circuit breakers can be replaced without disturbing adjacent units and without removing main bus connectors.
2. So that circuits can be easily added without machining, drilling or tapping any part of the panelboard.

3.3 FIELD QUALITY CONTROL

- A.** Prepare for acceptance tests as follows:

1. Make insulation-resistance tests of each panelboard bus, component, and connecting supply, feeder, and control circuits.
2. Make continuity tests of each circuit.
3. Testing of circuit breakers shall only be required for circuit breakers 100 Ampere and larger.

B. TESTING

After installing panelboards and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units, and retest.

***** END OF SECTION *****

SECTION 16510

INTERIOR LUMINAIRES

PART 1 GENERAL

1.1 SCOPE

This work specified in this Section covers interior lighting devices, including luminaires, lamps, and power supplies, along with lighting accessories and controls; as well as luminaire mounting, installation, lamping, and testing.

1.2 RELATED WORKS SPECIFIED ELSEWHERE

<u>Section</u>	<u>Item</u>
01300	Submittals
16050	Basic Electrical Materials and Methods

1.3 DEFINITIONS

A. BALLAST

The power circuit of a gas-discharge (fluorescent, HID, etc.) lamp. Ballasts are either inductive or electronic.

B. COLOR RENDERING INDEX (CRI)

A figure-of-merit adopted by the Department of Energy that quantifies the color accuracy of lighting devices compared to incandescent light. CRI is normalized such that a score of 100 represents the output of an incandescent lamp.

C. COLOR TEMPERATURE

The color of the light produced by a particular lighting device, measured in kelvin. A higher kelvin temperature results in a “cooler” blue light, while lower kelvin temperatures are “warmer,” and more orange.

D. DIFFUSER

A modifier placed in front of a lamp to change the light intensity and distribution. Part of a LUMINAIRE.

E. DRIVER

The power circuit of an LED LAMP. May be part of a luminaire, or integrated into the lamp itself.

F. EMERGENCY LUMINAIRE

A LUMINAIRE intended to automatically supply illumination to critical areas in the event of failure of the normal supply.

G. ENGINE

See DRIVER in this section.

H. EXIT LIGHT

An illuminated sign or LUMINAIRE intended to indicate the path of egress. An exit light may or may not be an EMERGENCY LUMINAIRE.

I. GAS-DISCHARGE LAMP

General category of lamps that produce light by discharge of electricity through ionized gas. Types include Fluorescent and High-Intensity Discharge (HID). Powered by a BALLAST.

J. LAMP

The part of a LUMINAIRE that produces light.

K. LED LAMP

A lamp that uses Light Emitting Diodes (LEDs) to produce useful light. Powered by a DRIVER.

L. LUMEN MAINTENANCE FACTOR

The percent of the rated lumen output of a lamp still available after a specified period of time. A lamp capable of only half of its original output after will have a lumen maintenance factor of 0.50 or **L50**. May be used to specify the performance of a lamp after a particular number of hours, or the number of hours of operation at a particular level.

M. LUMINAIRE

A complete lighting device, exit light, or emergency lighting device. Luminaires consist of one or more LAMPS mounted in a fixture, along with DRIVERS or BALLASTS to power them, and lenses or diffusers to provide the correct lighting distribution.

N. OCCUPANCY SENSOR

A control device that switches a lighting circuit when a space is occupied.

O. PHOTOCCELL

A control device that switches a lighting circuit in response to ambient light level.

P. TOTAL HARMONIC DISTORTION (THD)

The ratio of the root mean square of the harmonic content of a voltage or current signal, expressed as a percent of the magnitude of the fundamental.

1.4 REFERENCES

All applicable ANSI and UL standards.

IES LM-79, LM-80, TM-21.

NFPA 70 [NEC] (latest edition, with Washington State Amendments).

Washington State Energy Code (latest edition).

Washington State Administrative Code [WAC] (current edition).

International Building Code (latest edition, with Washington State Amendments).

1.5 SUBMITTALS

Submit under the provisions of Section 01300.

For each required product, submit data sheets with detailed descriptions of the product to be purchased. Identify each data sheet with the corresponding entry on the Lighting Schedule or Bill of Materials. Where data sheets offer a range of options and accessories, mark or highlight each selection, along with all final part numbers.

A. Submit on each luminaire in the Lighting Schedule. Submittal shall contain the following information, as a minimum:

1. Manufacturer and part number.

2. Product dimensions and weight.
 3. Product environmental rating (NEMA rating).
 4. Electrical ratings:
 - a. Voltage, Current, and Power
 - b. Power factor
 - c. Efficacy
 5. Lighting metrics:
 - a. Lumen output
 - b. Lumen maintenance factor at 25,000 hours
 - c. Color temperature
 - d. Color Rendering Index (CRI)
 - e. Lighting distribution
 6. Regulatory approvals and certifications, including NRTL listing
 7. Battery and charging data (if applicable).
- B. Submit on all lighting controls (switches, photocells, occupancy sensors, etc.). Submittal shall contain the following information, as a minimum:
1. Manufacturer and part number.
 2. Product dimensions and weight.
 3. Environmental rating (NEMA rating).
 4. Electrical ratings (Voltage, Current, and Power).
 5. Regulatory approvals, certifications, and labels.
 6. Wiring diagrams showing both factory- and field-installed wiring for the specific application in this Project. Differentiate between factory- and field-installed wiring.
- C. Submit maintenance data for luminaires and lighting controls in the operation and maintenance manual specified in Section 01300.

1.6 QUALITY ASSURANCE

See Section 16050. Coordinate luminaires, mounting hardware, and trim with all other items to be mounted on the ceiling, and all reserved or classified areas, including work of other trades.

1.7 EXTRA MATERIALS

Reference Specification Section 16050 for spare parts.

1.8 WARRANTY

A. WARRANTY

1. The manufacturer shall warrant the materials and workmanship of all luminaires for a minimum of 2 years from the time of Substantial Completion.
2. The warranty shall be comprehensive and shall include all components included in the luminaire package.
3. If during the warranty period the manufacturer refuses to honor a claim due to the actions of the contractor, the contractor shall replace all affected items at no cost to the owner.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. AVAILABLE MANUFACTURERS

Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include the following:

1. Acuity Brands, Inc.; Holophane, Lithonia
2. GE Lighting

B. "OR EQUAL" PRODUCTS

Luminaires shall be the products specified in the Lighting Schedule in the Plans, or equal. Substitute products shall:

1. Use the same lighting technology (LED, Fluorescent, etc.) as the specified luminaire,

2. Have the same lumen output, color temperature, CRI, and IES distribution,
3. Not have an input wattage greater than 110% of the specified luminaire, and,
4. Have the same environmental ratings.

2.2 LUMINAIRES

A. POWER

1. Power supplies, including ballasts, drivers, and transformers, shall be self-contained within luminaires.

B. QUALITY

1. MANUFACTURER LABELS AND MARKINGS

The exterior of lenses and diffusers shall have no visible logos, labels, trademarks, or monograms.

2. METAL PARTS

Metal parts shall be free from burrs, scratches, and sharp corners and edges.

3. TRANSMITTING AND REFLECTING SURFACES

Luminaires shall be provided and installed with all transmitting and reflecting surfaces required to produce the same distribution as the luminaires used as the basis of design, as shown in the Lighting Schedule.

4. FINISH

Provide manufacturer's standard finish, except where otherwise indicated, applied over corrosion-resistant treatment or primer. Finish shall be free from streaks, runs, holidays, stains, blisters, and other defects.

C. MAINTENANCE ACCESS

Any parts of luminaires not subject to the manufacturer's warranty shall be accessible for maintenance and owner-replaceable.

D. UV RADIATION

LED Luminaires shall not emit UV radiation

Luminaires fitted with gas discharge lamps shall block at least 99 percent of the UV radiation emitted by the lamps.

E. WET LOCATION LUMINAIRES

Unless otherwise stated in the Plans, luminaires installed in wet locations shall be rated:

1. NEMA 3R where not subject to splashing or hose-directed water.
2. NEMA 4 where subject to splashing or hose-directed water.
3. NEMA 4X where subject to corrosion or exposed to the process.

Contractor shall provide all materials required to obtain labeled environmental ratings.

F. FUSED LUMINAIRES

Provide fused luminaires for applications:

1. Installed more than eight feet above the floor,
2. Powered by 277 V circuits, or,
3. Where required by code.

Install a listed fuse and fuse holder approved for the application by the luminaire manufacturer.

G. EMERGENCY AND BATTERY BACKED LUMINAIRES

All emergency luminaires shall be UL 924 listed. Additionally, emergency luminaires located in classified areas shall be UL 844 listed.

Emergency luminaires shall have the following features:

1. Self-contained internal battery, rated to provide a minimum of 90 minutes of emergency level illumination in the event of a power failure.

H. EXIT LIGHTS

All exit lights shall be UL 924 listed, and shall have the following features:

1. Internal illumination, always on.
2. Illuminated arrow indicating direction of egress.
3. Self-contained internal battery, rated to provide a minimum of 90 minutes of emergency level illumination in the event of a power failure.
4. 120VAC input power unless stated otherwise on the Plans.

2.3 LIGHTING TECHNOLOGIES

Each luminaire shall use the technology specified in the lighting schedule.

A. LED LUMINAIRES

LED Luminaires shall conform to UL 1598 (Luminaires) and UL 8750 (LED Equipment for Use in Lighting Products).

1. Drivers

LED Drivers shall be manufacturer approved for the specific model of luminaire to be installed. Drivers shall meet the following specifications:

- a. UL 8750 listed.
- b. Certified by NRTL acceptable to the State of Washington.
- c. Compliant with FCC Part 15, Class A.
- d. Power Factor: greater than 0.90.
- e. Supply circuit THD: less than 10%.

f. Temperature Rating: -20 to +40 degrees Celsius.

2. Lamps

LED Lamps shall be an integral part of the luminaire, and rated to last the entire design lifetime of the luminaire. LED lamps shall have the following specifications:

a. Color Temperature: 4000K, unless otherwise indicated.

b. CRI: at least 80 CRI.

c. Lamp Life: at least 60,000 hours, L80.

2.4 LIGHTING CONTROLS

The lighting control devices shall be fully coordinated with the luminaires to provide a complete lighting and lighting control system as indicated on the Contract Drawings.

A. Lighting control devices may be line voltage or low voltage devices and include but are not limited to:

1. Switches
2. Dimmers
3. Occupancy Sensors
4. Photo Sensors

B. GE Acuity's nLight lighting controls were utilized as the basis of design.

PART 3 EXECUTION

3.1 INSTALLATION

A. COORDINATION WITH OTHER WORK

1. Coordinate lighting with general electrical work, and with other trades.
2. Locate luminaires outside of classified areas and reserved electrical space, unless explicitly called for by the Plans.

3. Process equipment and piping has priority over lighting. Luminaires shall be placed to avoid conflict with the process and maintenance thereof.
4. Heating, Ventilation, and Air Conditioning (HVAC) equipment and ductwork has priority over lighting. Luminaires shall be placed to avoid conflict with HVAC.
5. Maintenance vehicle access has priority over lighting. Luminaires shall be placed to not impede maintenance vehicles.
6. Luminaires shall be mounted parallel to finished floor or grade, with no tilt angle unless explicitly called for by the Plans.
7. Adjust stem or chain lengths to suit field conditions where indicated mounting heights are not feasible.

B. LUMINAIRE SUPPORTS

1. Install luminaires with supports, brackets, and trim recommended by the luminaire manufacturer.
2. Bottom of luminaires shall be at the elevation noted in the Plans.
3. Luminaires shall be secured by manufacturer hardware and fasteners. Nails shall not be used to secure luminaires.
4. Supports shall be rated for four times the weight of the luminaire, or 45 kilograms (100 lbs.), whichever is greater. Luminaires weighing more than 23 kilograms (50 lbs.) shall be supported independently from the outlet box.
5. Luminaires shall be supported from building structure or ceiling framing. Provide additional framing to support luminaires that cannot be directly mounted to structural members. Structural integrity shall not be compromised due to installation of luminaires.
6. Hanging luminaires shall be supported at each quarter point and every eight feet, minimum, by hardware that cannot be dislodged by upward force. Pendants and rods over 120 centimeters long (48 inches) shall be braced to limit swinging.
7. Luminaires in grid-type ceilings shall be supported by additional wires at each corner, independently anchored to the structural

system above. Wires shall be the same type and size as the wires supporting the grid ceiling structure.

8. Surface-mounted luminaires shall be installed flush and tight to the finished ceiling. Surface-mounted luminaires more than 45-centimeters wide (18 inches) shall be supported at each corner, in addition to the outlet box.

C. INSTALLATION METHODS

1. Unless preempted by other work, luminaires shall be installed at the positions and spacings shown on the Lighting Plan(s). Inform the Engineer of all lighting changes in writing. Plan symbols show the required position of the center of each luminaire, but may be undimensioned.
2. Luminaires in rows or grids shall be installed true to line. Continuous runs of luminaires shall be installed straight and true, with manufacturer's joining hardware.
3. Luminaires located in a common area shall be installed at the same level.

D. ELECTRICAL CONNECTIONS

1. All luminaires shall be grounded.
2. Each luminaire shall be powered by the circuit and operated by the control device(s) shown on the Plans.
3. All luminaires shall be connected according to manufacturer's wiring diagrams.
4. All screw terminals shall be torqued to manufacturer's specifications. If no torque values are published by the manufacturer, terminals shall be torqued to values specified in UL 486A.
5. All luminaires (except emergency luminaires and exit luminaires) shall be fitted with NEC 410.130(G)-type luminaire disconnect plugs. Ideal PowerPlug or equal.
6. Emergency and battery-backed luminaires shall be supplied by both switched lighting conductors AND unswitched charging conductors, powered by the same circuit.

7. Power conductors to exit lights shall not be switched.

E. LIGHTING CONTROLS

Lighting controls shall be installed according to the Plans.

Process areas shall have manual lighting controls.

Restrooms, garages, storage rooms, and other enclosed non-process spaces shall have occupancy sensors.

F. LAMPING

Lamps shall be selected and installed according to the Lighting Schedule and manufacturer's instructions.

Test lamp sockets and holders before installing lamps.

G. ENVIRONMENTAL RATINGS

Installation of luminaires shall meet all manufacturer requirements to maintain labeled environmental ratings.

H. CLEANING

Thoroughly clean dirt and debris from all internal and external surfaces. Vacuum interior of luminaires after installation.

Prior to commissioning, wipe all transmitting and reflecting surfaces with damp cloth.

I. SAFE DISPOSAL

Disposal of lamps and luminaires containing hazardous materials (mercury, etc.) shall comply with state and local rules.

3.2 FIELD QUALITY CONTROL

A. DAMAGED LUMINAIRES

During commissioning, Contractor shall inspect each installed luminaire for damage. Damaged luminaires and components shall be replaced at no cost to the owner. Contractor shall replace any transmitting or reflecting

surface that is scratched, shattered, or otherwise damaged before completion of work at no cost to the owner.

Metal parts that demonstrate corrosion during the project warranty period shall be replaced at no cost to the owner.

Contractor shall provide replacements for any lamps that fail prior to completion of work.

B. TESTING

Contractor shall demonstrate normal operation of each luminaire. Contractor shall interrupt electrical power to demonstrate proper operation of emergency luminaires.

Malfunctioning luminaires and components shall be repaired or replaced, then tested again.

Contractor shall demonstrate each lighting control to show correct operation, and repair or replace malfunctioning controls.

*****END OF SECTION*****

SECTION 16740

COMMUNICATIONS HORIZONTAL CABLING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide all materials and labor for the installation of an inside plant telecommunication system. This section includes Inside Plant Communications cabling, termination, and equipment.
- B. The work shall include all materials, equipment and apparatus not specifically mentioned herein or noted on the plans but which are necessary to make a complete working ANSI/TIA/EIA and ISO/IEC compliant SCS.

PART 2 PRODUCTS

2.1 PATCH PANELS

- A. Copper Patch Panels: Complete with pre-manufactured cable management for supporting station cable behind the patch panel, and with incidental materials necessary for mounting. Unless otherwise indicated, copper patch panels shall be manufactured by the selected SCS Manufacturer:
 - 1. Horizontal Distribution Patch Panels (Workstation Patch Panels): Shall exceed Category 6 transmission requirements for connecting hardware, as specified in TIA/EIA 568-B.2-1 Wired for T568B.
 - a. For AMP:
 - i. Category 6, 24 Port:
 - (1) Leviton: 69586-U24
 - (2) Systimax:360-IPR-1100-E-GS3-1U-24
 - ii. Category 6, 48 Port:
 - (1) Leviton: 69586-U48
 - (2) Systimax:360-IPR-1100-E-GS3-1U-48

B. Horizontal Wire Management: Horizontal wire management shall be, regardless of rack/distribution equipment manufacturer:

1. Chatsworth Products, Inc. (CPI): CHA-30130-719

2.2 CONNECTORS

A. Copper Connectors (modular jacks): 8-position/8-conductor, insulation displacement connection (IDC), non-keyed, and shall accept modular 8-position/8-conductor plugs, complete with multicolored identification labels/icons for identification, and with a universally color-coded wiring pattern for both T568A and T568B.

1. Horizontal Distribution: Shall meet or exceed Category 6 transmission requirements for connecting hardware, as specified in ANSI/TIA/EIA 568-B.2-1.
 - a. For Leviton: 61110-RI6
 - b. For Systimax: MGS400-246

2.3 STATION

A. Faceplates: Complete with port identification labels and blank inserts/fillers for covering unused connector openings:

1. Faceplates shall be:
 - a. For Leviton: 42080-xIS
 - b. For Systimax: M1xL-246

B. Surface Device Boxes: Surface mount device boxes shall be:

1. Wiremold

2.4 CABLE

A. COPPER CABLE

1. Horizontal Category 6 cable for telecommunications systems shall be blue.

2. Category 6 Cable:
 - a. Plenum Rated:
 - i. For Systimax: 2071E BL4/23 W1000
 - ii. For Mohawk: M58281
 - iii. For General Cable: 7131800
 - iv. For Superior Essex: 77-240-2B
 - b. Riser Rated:
 - i. For Systimax: 1071E BL4/23 W1000
 - ii. For Mohawk: M58292
 - iii. For General Cable: 7133800
 - iv. For Superior Essex: 77-240-2A

2.5 LABELING AND ADMINISTRATION

A. LABELS

1. As recommended in ANSI/TIA/EIA 606. Permanent (i.e. not subject to fading or erasure), permanently affixed, and created by a hand-carried label maker or a computer/software-based label making system. Handwritten labels are not acceptable.
 - a. For Station Cable:
 - i. Brady: Bradymaker Wire Marking Labels WML-511-292 (or approved equal)

B. Hand-carried label maker:

1. Brady: ID Pro Plus (or approved equal).

PART 3 EXECUTION

3.1 PATCH PANELS

- A. Provide patch panels and horizontal wire management according to locations, elevations, and plan views as shown on the Contract Documents.
 - 1. Copper: Size and install rack-mountable patch panels as shown on the Contract Documents. Use patch panels to terminate copper horizontal cables.
 - 2. Fiber: Size and install rack-mountable patch panels as shown on the Contract Documents. Use fiber patch panels to terminate multimode and/or singlemode fiber backbone cables.
 - 3. Horizontal Wire Management: Provide horizontal wire management as shown on the Drawings.

3.2 CONNECTORS

A. COPPER CONNECTORS (MODULAR JACKS)

- 1. For Horizontal Distribution:
 - a. Provide connectors and install using **T568B** wiring pattern.
 - b. Mount connectors at 90-degrees (i.e., straight, not angled).
 - c. 10 spare connectors is typical.
 - d. Provide and 50 black connectors to Owner for spares.
 - e. Additional Connector product installation requirements shall be added to the above list as applicable to this project.
 - f. Punch down cable using only the selected SCS Manufacturer approved impact tool.

B. FIBER CONNECTORS

Provide connectors and adapters per manufacturer recommendations and install into Connector Panels

3.3 STATIONS

A. FACEPLATES

Provide faceplates for stations in the locations and gang counts shown on the Contract Documents. Faceplates shall completely conceal outlet boxes, reducer plates, etc. Faceplates shall provide a snug and sure fit for connectors – loose connectors are not acceptable.

B. Flush-mount connectors on faceplates.

C. FACEPLATE MOUNTING BRACKETS

Provide faceplate mounting brackets as required and as shown for flush mounted communications outlets.

D. SURFACE DEVICE BOXES

Provide surface mount device boxes as required and as shown for surface mounted communications outlets.

3.4 CABLE

A. GENERAL (APPLICABLE TO ALL CABLE TYPES)

Provide non-plenum (CM/CMR, OFNR) rated cable for locations where cable is to be installed in conduit. For cable not installed in conduit, provide plenum (CMP, OFNP) rated cable if cable is installed in a plenum air space environment, non-plenum rated otherwise. Cabling shall bear plenum or non-plenum markings for the environment in which it is installed.

1. For Horizontal Distribution: Provide station cable in types, sizes, and quantities as defined by the Symbol Schedule and as shown on the Contract Documents. Install cable between the station and its associated telecommunications room. Provide one cable per each connector at each station. Provide cables of the same type in the same color – multiple colors of the same cable type are not acceptable.
2. Install cable in compliance with ANSI/TIA/EIA and ISO/IEC 11801 requirements and BICSI TCIM practices.
3. Adhere to the bending radius and pull strength requirements as detailed in the ANSI/TIA/EIA standards and the manufacturer's

installation recommendations during cable handling and installation.

- a. Pull all cables simultaneously where more than one cable is being installed in the same raceway.
 - b. Use pulling compound or lubricant where necessary. Use compounds that will not damage conductor or insulation (Polywater, or approved equal).
 - c. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage media or raceway. Repair or replace conduit bushings that become damaged during cabling installation.
4. Install cable in a continuous (non-spliced) manner unless otherwise indicated.
 5. Install exposed cable parallel to and perpendicular to surfaces on exposed structural members and follow surface contours where possible.
 6. Tie or clamp cabling. Attaching cables to pipes, electrical conduit, mechanical items, existing cables, or the ceiling support system (grids, hanger wires, etc. – with the exception of ceiling support anchors) is not acceptable. Install tie-wraps in conformance with the SCS manufacturer’s installation recommendations. Do not over-tighten tie wraps or cause cross-sectional deformation of cabling.
 7. Cable at the backboards:
 - a. Lay and dress cables to allow other cables to enter raceway (conduit or otherwise) without difficulty at a later time by maintaining a working distance from these openings.
 - b. Route cable as close as possible to the ceiling, floor, sides, or corners to ensure that adequate wall or backboard space is available for current and future equipment and for cable terminations.
 - c. Lay cables via the shortest route directly to the nearest edge of the backboard from mounted equipment or blocks. Support cables so as not to create a load on the equipment upon which the cables are terminated. Tie-wrap similarly

routed and similar cables together and attach to D-rings vertically and/or horizontally, then route over a path that will offer minimum obstruction to future installations of equipment, backboards or other cables.

- d. See COPPER TERMINATION BLOCKS above for details on routing copper cabling to termination blocks.

8. Cable in the telecommunications rooms:

- a. For telecommunications rooms with ladder rack, lay cable neatly in ladder rack in even bundles and loosely secure cabling to the ladder rack at regular intervals with tie-wraps or velcro straps.

9. Cable terminating on patch panels located on racks:

- a. Route cables in telecommunications rooms to patch panels on racks by routing across ladder rack across top of rack and then down vertical ladder rack to patch panel.

B. COPPER CABLE

Terminate all pairs within a cable. Un-terminated cable pairs are not acceptable.

- 1. Provide station cable in the locations shown on the Contract Documents. Provide service loops with a minimum length of 12 inches in outlet boxes and no less than 10 feet in the ER/TR's.
 - a. Route station cable that is exposed (not in conduit) to comply with ANSI/TIA/EIA-569 requirements for avoiding potential EMI sources and as follows:
 - i. 48 inches from motors or transformers
 - ii. 12 inches from conduit and cables used for electrical power distribution
 - iii. 5 inches from fluorescent lighting

- C. Furnish hook-and-loop cable managers for managing patch cords in the telecommunications rooms. Provide in colors, sizes and quantities as indicated below. Cable managers shall be the same color as the patch cable type that they manage.

1. Furnish four (4) cable managers each 6 inches in length for each telecommunications room with fiber connectivity.
2. Furnish one roll of 50 cable managers each 6 inches in length for use in Main Equipment Room.

3.5 LABELING AND ADMINISTRATION

A. CABLES

1. Label Location: Affix at each end of the cable within 24” of telecommunications room entrance and again within 4” of termination point).
2. Copper Station Cables: Label station cables with the same label as the station connector (see STATION CONNECTORS (PORTS) below) that terminates the cable at the station location. Include a clear vinyl adhesive wrapping applied over the label in order to permanently affix the label to the cable. Using transparent tape to affix labels to cables is not acceptable.

B. PATCH PANELS

1. For Horizontal Distribution:
 - a. General: Label patch panels as shown on the Contract Documents.
 - b. Ports: Ports are typically pre-labeled by the manufacturer with sequential numbers (i.e. 1 to 48). For ports which are not pre-labeled, label port in the form “##” where “##” is the sequential port number within the panel. Each patch panel shall start at port number “01”.

C. STATION CONNECTORS (PORTS)

1. Connected to Patch Panels in the Telecommunications Room:
 - a. Label connectors in the form “FTR-P-##” where “F” is the floor of the communications outlet where the horizontal cable terminates, “TR” is the telecommunications room where the cable terminates (see TELECOMMUNICATIONS ROOMS above), P is the workstation patch panel number, and “##” is the sequential

port number on the patch panel that is used to terminate the cable. Cross reference connector labels with the Port Designation label on the Contract Documents. See Appendix at the end of this Section for horizontal cable labeling.

- i. Example: If an outlet on the third floor has a faceplate with two copper cables (sequentially numbered 5 and 6) terminated on the 3rd workstation patch panel in the second telecommunications room on the fourth floor, then the connectors would have the labels “34B-3-05” and “34B- 3-06,” respectively.

3.6 TESTING

- A. Provide test records on a form approved by the Owner and Designer. Include the test results for each cable in the system. Submit the test results for each cable tested with identification as discussed under LABELING AND ADMINISTRATION above. Include the cable identifier, outcome of test, indication of errors found, cable length, retest results, and name and signature of technician completing the tests. Provide test results to the Owner and Designer for review and acceptance within two weeks of Substantial Completion.
 1. Print test records for each cable within the system directly from the tester and submit in paper form (in a binder) and in electronic form (on diskette or CDROM) to the Owner and Designer for review. Handwritten test results will not be accepted.
- B. Test the SCS after installation for compliance to all applicable standards.
- C. Identify cables and equipment that do not pass to the Owner and Designer. Determine the source of the non-compliance and replace or correct the cable or the connection materials, and retest the cable or connection materials at no additional expense to the Owner. Provide new test results to the Owner and Designer in the same manner as above.
 1. In addition to the above, if it is determined that the cable is at fault, remove the damaged cable and replace it with a new cable. Cable “repairs” are not acceptable. The procedure for removing the cable shall be as follows:

- a. Prior to removal of damaged cable and installation of new cable:
 - i. Inform the Owner and Designer of the schedule for the removal and installation.
 - ii. Test the new cable on the reel per paragraph B, above.
 - iii. Test cables that occupy the same innerduct or conduit (if not in innerduct) as the damaged cable per paragraph B, above, regardless of whether or not they are new cables installed as part of this project or existing cables installed prior to this project.
 - iv. Provide test results to the Owner and Designer for approval by the Owner and Designer.
- b. Remove the damaged cable and provide new cable.
- c. After the removal of the damaged cable and installation of the new cable:
 - i. Test the new cable per the paragraph titled TESTING.
 - ii. Test cables that occupy the same innerduct or conduit (if not in innerduct) as the damaged cable per paragraph B, above, regardless of whether they are new cables installed as part of this project or existing cables installed prior to this project.
 - (1) If any of the cables requiring testing are in use, coordinate with the Owner to schedule an outage opportunity during which the testing can be performed.
 - iii. Provide test results to the Owner and Designer for approval by the Owner and Designer.

- d. If a cable which occupies the same innerduct or conduit (if not in innerduct) as a damaged cable is damaged by the extraction and installation process, replace the cable at no additional expense to the Owner.
 - i. Damaged cables which are replaced shall be subject to the testing procedures of the paragraph titled TESTING.

***** END OF SECTION *****

MEASUREMENT AND PAYMENT

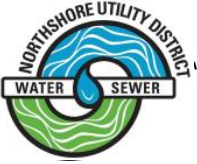
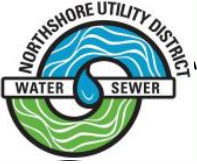


TABLE OF CONTENTS

SECTION 4

MEASUREMENT AND PAYMENT

BID ITEM INTRODUCTION.....	1
MOBILIZATION	1
DISTRICT HEADQUARTERS IMPROVEMENTS	2
DEMOLITION	2
TEMPORARY EROSION AND SEDIMENT CONTROL	2
EXCAVATION SAFETY SYSTEMS.....	2
INTERIOR STRUCTURAL SEISMIC RETROFIT	3
INTERIOR UTILITIES SEISMIC RETROFIT.....	3
EXTERIOR UTILITIES SEISMIC RETROFIT	3
SITE IMPROVEMENTS AND RESTORATION.....	3



Section 4 - Measurement and Payment

Bid Item Introduction

It is the intent of these Specifications that the performance of all work under the bid items shall result in the complete construction, in proper operating condition, of the facilities described. It is understood that any additional material or work required to place the facilities in operating condition shall be provided by the Contractor as work covered by the listed bid items and shall be considered incidental thereto.

Submittals, shop drawings, calculations, start-up, testing, training, warranties, and operation and maintenance manuals as required shall be considered incidental to the various items of work and no additional compensation will be allowed.

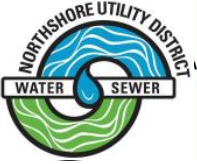
Mobilization

The lump sum price bids for Mobilization shall be full compensation for all labor, material, tools and equipment required for preparatory work and operations, including, but not limited to the following items:

1. The movement of personnel, equipment, supplies and incidentals to the project site as related to project mobilization, demobilization and cleanup.
2. The establishment of field offices and material storage areas.
3. Insurance, bonding, submittals and other work and operations that must be performed or costs incurred before beginning contract work.
4. Mobilization costs for subcontracted work.

Payment for mobilization will be made monthly based upon the following partitions:

1. 10% of the original Contract amount, but not more than 100% of the amount bid for mobilization, will be paid as part of the first monthly pay estimate.
2. When 75% of the original contract amount is earned, 100% of the amount bid for mobilization will be paid.



District Headquarters Improvements

The lump sum price bid for District Headquarters Improvements shall be full compensation for all labor, materials, tools, and equipment necessary and incidental to perform construction of all building improvements as shown on the Plans and as specified herein.

Demolition

The lump sum price bid for Demolition shall be full compensation for all labor, materials, tools, and equipment necessary and incidental to perform Schedule B demolition as shown on the Plans and as specified herein.

Temporary Erosion and Sediment Control

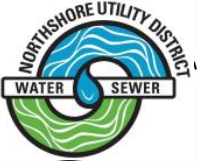
The lump sum price bid for Temporary Erosion and Sediment Control shall be full compensation for all labor, materials, tools and equipment necessary and incidental to design, install, maintain and remove the TESC facilities as shown on the Plans and as specified herein.

Excavation Safety Systems

The lump sum price bid for Excavation Safety Systems shall constitute full compensation for all labor, materials, tools and equipment necessary and incidental to providing a safe trench excavation. This item shall include, but not be limited to, the following:

1. Design, installation, proper use and removal of all sheeting, shoring, cribbing, boxes or other trench protection methods.
2. Excavation, backfill, compaction and other work required if extra excavation is used in lieu of trench box, shoring, cribbing or other trench protection. If imported backfill gravel is required for backfilling within the limits of the sewer or water line excavation, it shall also be required as backfill material for the extra excavation and shall be provided at the Contractor's expense.
3. All barricades, warning lights, signs, flaggers or other devices needed to warn and protect the public.

The Contractor shall be solely responsible for the safety of his crew and public, and the District assumes no responsibility. The District will not be responsible for determining the adequacy of any system used by the Contractor and payment for protection systems will not imply District's approval of adequacy.



Interior Structural Seismic Retrofit

The lump sum price bid for Interior Structural Seismic Retrofit shall be full compensation for all labor, materials, tools, and equipment necessary and incidental to perform construction of structural seismic retrofit of interior walls and structural elements as shown on the Plans and as specified herein.

Interior Utilities Seismic Retrofit

The lump sum price bid for Interior Utilities Seismic Retrofit shall be full compensation for all labor, materials, tools, and equipment necessary and incidental to perform construction of the seismic retrofit of interior equipment and utilities as shown on the Plans and as specified herein.

Exterior Utilities Seismic Retrofit

The lump sum price bid for Exterior Utilities Seismic Retrofit shall be full compensation for all labor, materials, tools, and equipment necessary and incidental to perform construction of the seismic retrofit of exterior buried utilities as shown on the Plans and as specified herein.

Site Improvements and Restoration

The lump sum price bid for Site Improvements and Restoration shall be full compensation for all labor, materials, tools, and equipment necessary and incidental to perform construction of site work, site improvements, and site restoration as shown on the Plans and as specified herein.

PROPOSAL

SECTION 5

Proposal

Honorable Commissioners
Northshore Utility District
King County, Washington

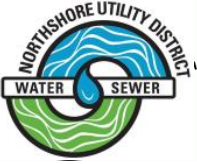
Dear Members of the Board:

The undersigned has examined the site, specifications, plans, laws and ordinances covering the improvements contemplated. In accordance with the terms, provisions and requirements of the foregoing, the following lump sums and unit prices are tendered as an offer to perform the work and furnish the equipment, materials, appurtenances and guarantees, where required, complete in place, in good working order.

As evidence of good faith, cash, bid bond, cashier's check, certified check, or postal money order made payable to the King County Treasurer is attached hereto. The undersigned understands and here agrees that, should this offer be accepted and the undersigned fail or refuse to enter into a contract and furnish the required construction performance bond and necessary liability insurance, the undersigned will forfeit to the District an amount from the "good faith token", equal to five percent (5%) of the amount bid as liquidated damages, all as provided for in the specifications.

The undersigned hereby proposes to undertake and complete the work embraced in this improvement, in accordance with the terms of the specifications and contract documents, at the following lump sum and unit prices.

Please find attached the itemized listing for said lump sum and unit prices, receipt of addenda, non-collusion declaration, the bidder responsibility checklist, the subcontractor responsibility checklist, the statement of Bidder's qualifications, and the proposed subcontractors list for Contract 2023-01; Building "A" Improvements.



ATTACHMENTS
2023-01; BUILDING "A" IMPROVEMENTS

SCHEDULE A – BUILDING “A” REMODEL

Item	Item Description	Units	Quantity	Unit Price	Amount
1	Mobilization	LS	1	\$	\$
2	District Headquarters Improvements	LS	1	\$	\$
Schedule A Subtotal					\$

SCHEDULE B – BUILDING “A” SEISMIC RETROFIT

Item	Item Description	Units	Quantity	Unit Price	Amount
1	Mobilization	LS	1	\$	\$
2	Demolition	LS	1	\$	\$
3	Temporary Erosion and Sediment Control	LS	1	\$	\$
4	Excavation Safety Systems	LS	1	\$	\$
5	Interior Structural Seismic Retrofit	LS	1	\$	\$
6	Interior Utilities Seismic Retrofit	LS	1	\$	\$
7	Exterior Utilities Seismic Retrofit	LS	1	\$	\$
8	Site Improvements and Restoration	LS	1	\$	\$
Schedule B Subtotal					\$

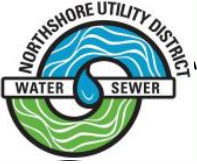
2023-01; BUILDING "A" IMPROVEMENTS

Subtotal Schedule A	\$
Subtotal Schedule B	\$
Total Schedule A and B	\$
10.1% Sales Tax	\$
Total Bid	\$

Receipt of Addenda

Receipt of Addenda No(s). _____ to the Contract Documents is hereby acknowledged:

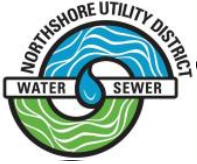
Note: Failure to acknowledge receipt of the addenda will be considered an irregularity in the proposal.



BIDDER RESPONSIBILITY CHECKLIST

The following checklist is used in documenting that a Bidder meets the mandatory Bidder Responsibility Criteria. Please print a copy of documentation from the appropriate website to be included with the submittal.

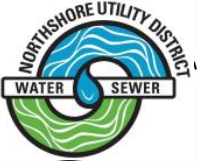
General Information	
Project Name: Contract 2023-01; Building "A" Improvements.	Project Number: C1813
Bidder's Business Name:	Bid Submittal Deadline:
Contractor Registration	
License Number:	Status: Active: Yes <input type="checkbox"/> No <input type="checkbox"/>
Effective Date (must be effective on or before Bid Submittal Deadline):	Expiration Date:
Contractor and Plumber Infraction List	
Is Bidder on Infraction List?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Current UBI Number	
UBI Number:	Account Closed: Open <input type="checkbox"/> Closed <input type="checkbox"/>
Industrial Insurance Coverage	
Account Number:	Account Current: Yes <input type="checkbox"/> No <input type="checkbox"/>
Employment Security Department Number	
Employment Security Department Number:	
Please provide a copy of your latest correspondence, containing your account number, with Employment Security Department. Please do not provide document containing personal information such as social security numbers.	
State Excise Tax Registration Number	
Tax Registration Number:	Account Closed: Open <input type="checkbox"/> Closed <input type="checkbox"/>
Not Disqualified from Bidding	
Is the Bidder listed on the "Contractors Not Allowed to Bid" list of the Department of Labor and Industries?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Contractor Public Works Training (RCW 39.04.350 & RCW 39.06.020)	
Has the Bidder satisfied the PW training requirements?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Information Supplied by:	
Print Name of Bidder Representative:	Date:
Verified by:	
Signature of District Employee:	Date:



SUBCONTRACTOR RESPONSIBILITY CHECKLIST

The following checklist is used in documenting that a subcontractor of any tier meets the subcontractor responsibility Criteria. Bidder must complete one of these forms for each of the first-tier subcontractor. Please print a copy of the documentation from the appropriate website to be included with the submittal.

General Information	
Project Name: Contract 2023-01; Building "A" Improvements.	Project Number: C1813
Subcontractor's Business Name:	Subcontract Execution Date:
Contractor Registration	
License Number:	Status: Active: Yes <input type="checkbox"/> No <input type="checkbox"/>
Effective Date (must be effective on or before Subcontract Bid Submittal Deadline):	Expiration Date:
Contractor and Plumber Infraction List	
Is Subcontractor on Infraction List? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Current UBI Number	
UBI Number:	Account Closed: Open <input type="checkbox"/> Closed <input type="checkbox"/>
Industrial Insurance Coverage	
Account Number:	Account Current: Yes <input type="checkbox"/> No <input type="checkbox"/>
Employment Security Department Number	
Employment Security Department Number:	
<ul style="list-style-type: none"> • Has Subcontractor provided account number on the Bid Form? Yes <input type="checkbox"/> No <input type="checkbox"/> • And/or have you asked the Subcontractor for documentation from Employment Security Department on account number? Yes <input type="checkbox"/> No <input type="checkbox"/> 	
State Excise Tax Registration Number	
Tax Registration Number:	Account Closed: Open <input type="checkbox"/> Closed <input type="checkbox"/>
Not Disqualified from Bidding	
Is the Subcontractor listed on the "Contractors Not Allowed to Bid" list of the Department of Labor and Industries? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Contractor Licenses	
<u>Electrical:</u> If required by Chapter 19.28 RCW, does the Subcontractor have an Electrical Contractor's License? Yes <input type="checkbox"/> No <input type="checkbox"/>	<u>Elevator:</u> If required by Chapter 70.87 RCW, does the Subcontractor have an Elevator Contractor's License? Yes <input type="checkbox"/> No <input type="checkbox"/>
Contractor Public Works Training (RCW 39.04.350 & RCW 39.06.020)	
Has the Subcontractor satisfied the PW training requirements? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Information Supplied by:	
Print Name of <input type="checkbox"/> Contractor <input type="checkbox"/> Subcontractor Representative:	Date:
Verified by:	
Signature of District Employee:	Date:



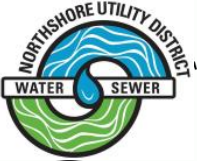
STATEMENT OF BIDDER'S QUALIFICATIONS

Contracting Firm Name:
Number of years Contractor has been in the construction business under the present firm name:
Present gross dollar amount of work under contract: \$
Present gross dollar amount of contracts not yet completed: \$
General type of work performed by firm:

List the five major pieces of equipment to be used on this project:	Owned	Leased	Rented
1.			
2.			
3.			
4.			
5.			

List the general superintendents or other supervisory employees at your firm:	# of Years at Firm
Employee 1:	
Employee 2.:	
Employee 3:	

Bank Reference:
Have you changed bonding companies within the last three years?
If so, why? (optional)



PROPOSED SUBCONTRACTORS

Consistent with RCW 39.30.060, each Bidder on a project in excess of \$1,000,000 is required to submit the completed Subcontractors list included in the proposal section with the bid. The completed list must identify each subcontractor who will perform heating, ventilation and air-conditioning (HVAC), or plumbing work as described in Chapter 18.106 RCW, electrical work as described in Chapter 19.28 RCW, or the contractor must name itself for the work. The requirement to name the Bidder's proposed HVAC, plumbing and electrical subcontractor applies only to those subcontractors who will contract directly with the Bidder (i.e. first-tier subcontractors only, even if that first-tier subcontractor intends to hire a sub-tier contractor to perform all or part of the HVAC, plumbing or electrical work

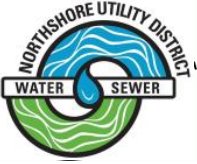
The Bidder shall not list more than one subcontractor for each category of work identified, unless subcontractors vary with bid alternates, in which case the Bidder must indicate which subcontractor will be used for which alternates.

Failure of the Bidder to submit as part of the bid the names of such subcontractors, or name itself to perform such work, or the naming of two or more subcontractors to perform the work, shall render the Bidder's bid it nonresponsive and therefore void.

In completing the form, Bidders are advised that: 1) Ventilation is typically required to meet safety requirements for enclosed spaces and tunnels or certain shafts, but it may be incidental to other parts of the work, and may be required for the temporary construction facilities; 2) No plumbing work within buildings (as described in Chapter 18.106 RCW) has been specified in the contract, however plumbing work may be required for the temporary construction facilities and elsewhere in the contract documents; 3) Electrical work may be incidental to the work such as encountered with traffic control systems, electrical service to buildings and street lights, distribution wiring, conduit and junction box installation, generators, temporary electrical service and wiring for construction equipment and dewatering systems. In each instance above, the Bidder should list the work in the table(s) above. Other areas may be identified by the Bidder in the contract documents as well.

The subcontractors list may be submitted with the Bid, or 1) HVAC, Plumbing, or Electrical may be submitted separately within one hour of the time and date for Bid submittal stated in the Call for Bids or by addendum; 2) Structural Steel Installation and Rebar Installation may be submitted within 48 hours of the time and date for Bid submittal stated in the Call for Bids or by addendum. The form may be submitted in person or by facsimile (FAX number (425) 398-4430) to:

Northshore Utility District
Attention: Brandon Humphrey, P.E.
6830 NE 185th St
Kenmore, WA 98028

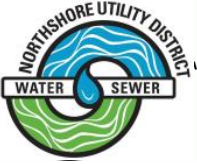


STRUCTURAL STEEL INSTALLATION	
Firm Name:	% of Project:
Contact Person:	
Address:	
City, State, Zip Code:	
Phone #:	Fax #:
E-mail Address:	

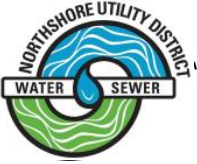
REBAR INSTALLATION	
Firm Name:	% of Project:
Contact Person:	
Address:	
City, State, Zip Code:	
Phone #:	Fax #:
E-mail Address:	

HVAC SUBCONTRACTOR	
Firm Name:	% of Project:
Contact Person:	
Address:	
City, State, Zip Code:	
Phone #:	Fax #:
E-mail Address:	

PLUMBING SUBCONTRACTOR	
Firm Name:	% of Project:
Contact Person:	
Address:	
City, State, Zip Code:	
Phone #:	Fax #:
E-mail Address:	



ELECTRICAL SUBCONTRACTOR	
Firm Name:	% of Project:
Contact Person:	
Address:	
City, State, Zip Code:	
Phone #:	Fax #:
E-mail Address:	



Subject to the time lost due to inclement weather and delay in delivery of materials, should such delay not be the result of the undersigned's actions, the undersigned agrees to complete all of the work embraced in this contract in 240 calendar days, all beginning with the date of written Notice to Proceed with the work.

The undersigned fully understands and agrees to the provisions of the Information for Bidders and herewith further agrees that the liquidated damages shall be \$1,400.00 per day for each and every working day required beyond the construction time allowed above to complete this Project.

Contractor Name:	
Contact Name:	
Mailing Address:	
Office Phone #:	
Cell Phone #:	
E-mail:	

NON-COLLUSION DECLARATION

I, by signing the proposal, hereby declare, under penalty of perjury under the laws of the United States that the following statements are true and correct:

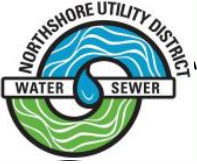
1. That the undersigned person(s), firm, association or corporation has (have) not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the project for which this proposal is submitted.
2. That by signing the signature page of this proposal, I am deemed to have signed and to have agreed to the provisions of this declaration.

Signature: _____

Print Name: _____

Title: _____

Date Signed: _____



BID BOND FORM

Herewith find deposit in the form of a certified check, cashier's check, cash, or bid bond in amount of \$ _____, which amount is not less than five percent (5%) of the total bid.

SIGN HERE _____

BID BOND for Contract: Contract 2023-01; Building "A" Improvements.

KNOW ALL MEN BY THESE PRESENTS: That we, _____, as Principal, and _____,

as Surety are held and firmly bound unto the King County Treasurer, King County, Washington, as Obligee in the penal sum of _____ for the payment of which the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by these presents.

The conditions of the obligation are such that, if the Obligee shall make any award to the Principal for _____, according to the terms of said proposal or bid and award and shall give bond for the faithful performance thereof, with Surety or Sureties approved by the Obligee; or if the Principal shall, in case of failure so to do, pay and forfeit to the Obligee the penal amount of the deposit specified in the Call for Bids, then this obligation shall be null and void; otherwise, it shall be and remain in full force and effect and the surety shall forthwith pay and forfeit to the Obligee, as penalty and liquidated damages, the amount of this bond.

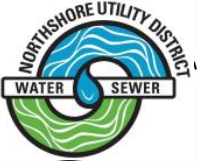
SIGNED, SEALED AND DATED this _____ day of _____, 20____.

By _____
Principal

By _____
Surety

Received return of deposit in the sum of \$ _____,

On _____, 20____.

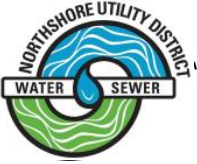


BIDDER'S CHECKLIST

This checklist is intended to assist the Bidder in completing the Proposal. The Bidder should carefully review the Proposal form and Contract Documents to ensure a responsive bid is submitted.

- Bidders must bid on all items contained in the Proposal. Fill in the bid proposal form(s) included in this section, entering the unit price and total amount for each bid item. Verify all math.
- Only use the bid proposal form(s) included in this document or those issued with an addenda.
- Acknowledge receipt of any addenda.
- Read the *Non-Collusion Declaration* and include the form with the proposal.
- Fill out the *Bidder Responsibility Checklist*.
- Fill out the *Subcontractor Responsibility Checklist*.
- Fill out the *Statement of Bidder's Qualifications*.
- Fill out the *Proposed Subcontractors* list.
- Sign and date the proposal on the final page of the proposal and include all of the contact information as indicated.
- Submit the bid security (in the form of a certified check, cashier's check, cash or bid bond, with amount is not less than 5% of the bid total) with the proposal and fill out the Bid Bond Form.
- Submit the entire Proposal section from the contract documents as your bid documents.

CONTRACT



SECTION 6

CONTRACT

THIS CONTRACT is dated this _____ day of _____, 20____, by and between Northshore Utility District, ("District"), a Washington municipal corporation, and _____ ("Contractor"), a _____.

In consideration of the mutual covenants hereinafter set forth, District and Contractor agree as follows:

ARTICLE 1. DESCRIPTION OF WORK

The Contractor shall complete the work as specified under the Bid Schedule(s) of Section 5 – Proposal & Bid Bond of the District's Contract Documents entitled Contract 2023-01; Building "A" Improvements. The work is generally described as follows:

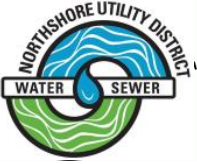
Project Description

Contract 2023-01; Building "A" Improvements

The project consists of the following work:

Schedule A - The Building "A" Remodel consists of revisions to an existing 27,500± square foot cement concrete tilt-up building originally constructed in 1980 and then extensively remodeled in 1998/1999. This remodel project includes, but is not necessarily limited to: demolition; full lobby reconstruction; security improvements; remodeling of offices, restrooms, locker rooms, and work rooms; revisions to walls, flooring, and ceilings; replacement of inventory room ceiling; reroofing of the building; HVAC improvements and modifications; and electrical system improvements and modifications.

Schedule B - The Building "A" Seismic Retrofit consists of seismic improvements to the structure and utilities of the building and site. This retrofit includes, but is not necessarily limited to: seismic response retrofitting to a tilt-up wall and interior masonry walls; seismic support upgrades to interior fire sprinkler piping and gas piping; and seismic support upgrades to exterior utility building connections for water, sewer, electrical, and gas.



ARTICLE 2. WORK COMPLETION TIME

The work shall be completed within 240 calendar days from the commencement date stated in the “Notice to Proceed” as described in Section 7 – Definitions and Abbreviations.

ARTICLE 3. LIQUIDATED DAMAGES

District and the Contractor recognize that time is of the essence of this Contract and that the District will suffer financial loss if the work is not completed within the time period specified in Article 2 herein, plus any Extension thereof allowed in accordance with Section 8 – General Conditions. They also recognize the delays, expense, and difficulties involved in proving in a legal proceeding, the actual loss suffered by the District if the work is not completed on time. Accordingly, instead of requiring any such proof, the District and the Contractor agree that as liquidated damages for delay (but not as a penalty), the Contractor shall pay the District \$1,400.00 for each day that expires after the work completion time specified in Article 2 herein.

ARTICLE 4. CONTRACT PRICE

District shall pay Contractor for completion of the work in accordance with the Contract Documents in current funds the amount set forth in the Bid Schedule(s) of Section 5 – Proposal & Bid Bond.

ARTICLE 5. CONTRACT DOCUMENTS

The Contract Documents which comprise the entire agreement between District and Contractor concerning the work consist of this Contract and the following attachments to this Contract:

- Section 1 Instructions to Bidders
- Section 2 Special Provisions
- Section 3 Engineering Specifications
- Section 4 Measurement and Payment
- Section 5 Proposal & Bid Bond
- Section 6 Contract & Performance, Payment and Guaranty Bond



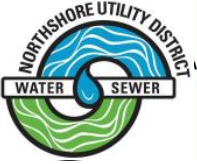
- Section 7 Definitions and Abbreviations
- Section 8 General Conditions
- Appendices
- Plans consisting of 91 sheets, as listed in the Special Provisions.
- Addenda numbers _____ inclusive.
- Change Orders, which may be delivered or issued after the date of this Contract, are not attached hereto.
- Permit stipulations.

There are no Contract Documents other than those listed in this Article.

ARTICLE 6. MISCELLANEOUS

An assignment by a party hereto of any rights under or interests in the Contract Documents will not be binding on the other party hereto without the written consent of the party sought to be bound; and specifically but without limitation monies that may become due and monies that are due may not be assigned without such consent, and unless specifically stated to the contrary in any written consent to an assignment, an assignment will not release or discharge the assignor from any duty or responsibility under the Contract Documents.

District and Contractor each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.



IN WITNESS WHEREOF, District and Contractor have caused this Contract to be executed the day and year first above written.

DISTRICT

CONTRACTOR

By Amanda Campbell,
its Acting General Manager

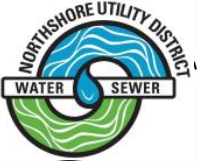
By _____
its: _____

Address for giving notices:

6830 NE 185th Street,
Kenmore, WA 98028

Address for giving notices:

License No.:



MANAGEMENT OF RETAINED PERCENTAGE

The Contractor shall declare an option for management of statutory retained percentage of this Contract by initialing and dating the applicable box below:

Option 1

The Contractor hereby elects to have the retained percentage of this Contract held in a non-interest bearing fund by Northshore Utility District until sixty (60) days (minimum) following formal Acceptance of the work. The time of release of the retained percentage shall depend upon final receipt by the District of all required releases from the State of Washington.

Option 2

The Contractor hereby elects to have Northshore Utility District place the retained percentage of the Contract in escrow from time to time as such retained percentage accrues. Contractor hereby designates the following bank or trust company as the repository for said funds:

Name of Financial Institution: _____

Address of Financial Institution: _____

Escrow Account Number: _____

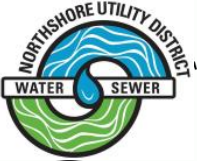
The Contractor understands that the District will issue a check or checks representing the retained percentage payable to the financial institutions and the Contractor jointly. This check shall be converted into bonds and securities chosen by the Contractor and approved by the District and the bonds and securities shall be held in escrow. Interest on the bonds and securities shall be paid to the Contractor as the interest accrues. Contractor agrees to be fully responsible for payment of all costs or fees incurred as a result of placing said retained percentage in escrow and investing it as authorized by statute. Northshore Utility District shall not be responsible for any cost, fees or loss in connection therewith.

Option 3

The Contractor hereby elects to have Northshore Utility District place the retained percentage of the Contract in an interest bearing account in a bank, mutual savings bank or savings and loan association. Contractor hereby designates the following bank or trust company as the repository for said funds:

Name of Financial Institution: _____

Address of Financial Institution: _____



Escrow Account Number: _____

Interest on moneys deposited into said fund by the District shall be paid to the Contractor. Contractor agrees to be fully responsible for payment of all costs or fees incurred as a result of placing said retained percentage in said account. Northshore Utility District shall not be responsible for any cost, fees or loss in connection therewith.

Option 4

Contractor hereby elects to post a retainage bond in the amount of 5% of the total bid, not including tax, in lieu of Northshore Utility District withholding the retained percentage from the monies earned by the Contractor. Contractor hereby designates the following surety company as bondholder (a copy of the bond must be attached to this form):

Name of Financial Institution: _____

Contact Name and Phone No.: _____

Address of Financial Institution: _____

Contractor's Signature

Date



PERFORMANCE, PAYMENT & GUARANTY BOND

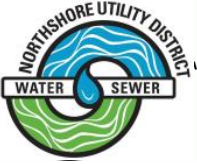
KNOW ALL MEN BY THESE PRESENTS: That we,
_____, the Contractor named in the contract
hereinafter referred to as Principal, and
_____, as
SURETY, are held and firmly bound unto the NORTHSHORE UTILITY
DISTRICT, hereinafter called and also being the DISTRICT named in said
contract,

Contract 2023-01; Building "A" Improvements. in the full sum of
_____ Dollars, (\$_____) lawful
money of the United States of America, for the payment of which sum well and
truly to be made, we bond ourselves, our heirs, executors, assigns,
administrators and successors jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that, **WHEREAS,** the
Principal entered into a certain contract with the District, dated
_____, 20____ for construction of sanitary sewers and
appurtenances including restoration, in connection with the District's construction
of **Contract 2023-01; Building "A" Improvements** in the County of King, State
of Washington.

NOW, THEREFORE, if the Principal shall well and truly and faithfully perform all
of the provisions and fulfill all of the undertakings, covenants, terms, conditions
and agreements of said contract during the period of the original contract and
any Extension thereof that may be granted by the District, with or without notice
to the Surety; and during the life of any guaranty required under the contract; and
shall also well and truly perform and fulfill all of the undertakings, covenants,
terms, conditions and agreements of any and all duly authorized modifications of
said contract that may hereafter be made; notice of which modifications to the
Surety being hereby waived; and furthermore shall pay all laborers, mechanics
and subcontractors and material men and all persons who shall supply such
person or persons and such Principal or subcontractors with provisions and
supplies for the carrying on of such work, shall indemnify and save harmless
District from all cost and damage by reason of the Principal's default or failure to
do so, and shall pay the State of Washington sales and use taxes, and amounts
due said State pursuant to Titles 50 and 51 of the Revised Code of Washington,
then this obligation to be void; otherwise to remain in full force and effect.

THIS BOND shall be continued in force for a period of two (2) years after
completion of the contract and acceptance by the District, and thereafter for such
additional period as shall be required for the performance by the Contractor
under this guaranty provision, or otherwise, of the contract.



IN WITNESS WHEREOF, the above bounded parties have executed this instrument under their separate seals this _____ day of _____, 20____, the name and corporate seal of each corporate party hereto affixed, and these presents duly signed by its undersigned representatives pursuant to authority of its governing body.

Principal

Surety

By

By

Title

Title

Attest: (If Corporation)

Address:

By

Title

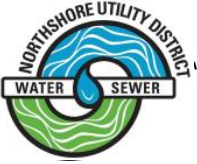
Corporate Seal:

Witness

1:

Witness

2:



Certificate as to Corporate Seal

I hereby certify that I am the (Assistant) Secretary of the Corporation named as Principal in the within Bond; that

_____, who signed the said Bond on behalf of the Principal, was _____ (title) of said Corporation; that I know its signature thereto is genuine and that said Bond was duly signed, sealed, and attested for and in behalf of said Corporation by authority of its governing body.

Secretary or Assistant Secretary

DEFINITIONS AND ABBREVIATIONS



SECTION 7

Definitions and Abbreviations

DEFINITIONS

The following terms as used in this Contract shall be defined and interpreted as follows:

Acceptance - The District's formal, written notice acknowledging completion and acceptance of the Work. Acceptance commences the time for submission of any third-party claims against performance or payment bonds under Chapter 39.08 RCW and statutory retention under Chapter 60.28 RCW.

Addendum - A written or graphic document issued by the District prior to the Proposal opening date that clarifies, corrects, or changes a document contained or referenced within the Bid Documents.

Adjusted Contract Work - The Contract Work as adjusted by any additive or deductive Change Orders executed prior to the District's termination of the Work or any portion thereof for convenience in accordance with Section 8.31 of the General Conditions.

As-Built Plans - A neatly and legibly marked set of Plans that reflect the manner in which the Work has been performed in the field. The requirements for the As-Built Plans are separately set forth in the Specifications.

Bidder - An entity that submits a Proposal for potential award of the Contract.

Bid Documents - All Contract Documents, excluding Change Orders, but including the Call for Bids.

Change Order - A document which is signed by Contractor and District and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Time, issued on or after the effective date of the Contract.

Claim - A written demand or assertion by the Contractor in accordance with Section 8.23 of the General Conditions after denial of a Request for Change Order seeking, as a matter of right, adjustment of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract.



Contract Documents - The Contract Documents shall consist of the following and, in case of conflicting provisions, the first mentioned shall have precedence:

- Change Orders
- Addenda
- Contract
- Measurement and Payment
- Special Provisions
- General Conditions
- Detail Specifications
- Engineering Specifications – Materials of Construction
- Engineering Specifications – Methods of Construction
- Reference Specifications
- Plans
- Instructions To Bidders
- Bid Proposal
- Permit and easement stipulations
- Performance, Payment, and Guaranty Bond

Contractor - The entity contracting to do the Work under these Contract Documents.

Contractor's Equipment - All equipment remaining in the Contractor's ownership and removed from the Site upon completion of the Project.

Contract - The written form executed by the District and Contractor that binds the Contractor to perform the Work in accordance with the Contract Documents.

Contract Price - The total amount payable by the District to the Contractor for performance of the Work in accordance with the Contract Documents.

Contract Time - The time allotted in the Contract for the Substantial Completion of the Work. The Contract Time begins upon Notice to Proceed and ends on the date of Substantial Completion of the Work by the Contractor.

Day - The term Day shall mean a calendar day unless otherwise specifically designated.

District - The entity that is a party to the Contract, contracting under the official name Northshore Utility District.

Engineer - The person identified in the Invitation to Bid responsible for administration of the Contract for the benefit of the District in accordance with the Contract Documents.



Equipment - The machinery, accessories, appurtenances, and manufactured articles to be furnished and/or installed under the Contract.

Inspector - A representative of the Engineer that is assigned to make inspections and record the progress of Contractor's performance of the Work. The Inspector has no authority to bind the District to any modification of the Contract Documents or liabilities of any kind.

Materials - Manufactured articles, materials of construction (fabricated or otherwise) and any other classes of material to be furnished in connection with the Contract.

Notice of Award - The official notice from the District that it intends to execute the Contract with the selected responsible, responsive Bidder.

Notice to Proceed - Written notice issued by the District that indicates that the Contractor can mobilize on the Site and begin all, or a designated part, of the Work. Notice to Proceed starts the running of the Contract Time.

Or Equal - Equal or better function, quality and performance to that specified in the Contract Documents. An item is not Or Equal if it is materially different, with respect to other constraints or requirements in the Contract Documents, in size, weight or other aspect from the item specified in the Contract Documents. Similarly, an item is not Or Equal if it is expected to have significantly higher total cost of ownership over the life of the completed Work.

Permit - Any and all permits required to comply with local, State, and Federal laws and regulations in performance of the Work.

Physical Completion - The time at which all of the Work has progressed to the point where (a) Contractor has achieved Substantial Completion, (b) the Contractor has completed all items identified on the Punch List to the District's satisfaction and (c) the Contractor has submitted and the District has accepted all required As-Built Plans.

Plans - All official drawings or reproductions of drawings made or to be made pertaining to the Work provided for in the Contract.

Project - The Work to be constructed in whole or in part through the performance of the Contract.

Project Records - All records that document the performance and/or cost of the Work as well as any materials as more fully defined in Section 8.7 of the General Conditions.

Proposal - The offer of a Bidder, on the prescribed bid form, properly executed, setting forth the price or prices for the Work to be performed.



Punch List - A list(s) of the physical construction that remains to be completed after the achievement of Substantial Completion of the Work, which must be satisfactorily completed in order to attain Physical Completion.

Reference Specifications - The technical specifications of other agencies incorporated or referred to herein.

Request for Information (RFI) - The written document by which the Contractor requests clarification, verification or information concerning a portion of the Work.

Responsible - A responsible Contractor or Subcontractor who complies with the requirements of RCW 39.04.010, 39.04.350, and 39.06.020 and any requirements of any applicable supplemental bidder responsibility criteria and who is determined to have: adequate financial resources to perform the Contract; the ability to comply with the required delivery or performance schedule; a satisfactory performance record; a satisfactory record of integrity; the necessary organization, experience, accounting and operational controls, and technical skills; the necessary construction equipment and facilities; and be otherwise qualified and eligible to be awarded the Contract under applicable laws and regulations.

Schedule - The plan prepared by the Contractor in accordance with the requirements of the Contract and reviewed by the Engineer setting forth the logical sequence of activities required for the Contractor's orderly performance and completion of the Work in accordance with the Contract. The Schedule includes updates – whether by progress schedule(s), recovery schedule(s) or otherwise – required by the Contract.

Shop Drawing - All shop details of structural steel, pipe, machinery, equipment, schedules and bending diagrams of reinforcing steel, and other detail drawings furnished by the Contractor as required and provided for in the Submittal requirements of the Contract Documents.

Site - The location(s) where the Work will be performed or constructed by the Contractor as set forth in the Plans and Specifications. The Site may at the District's option include areas identified by the District for Contractor's logistics or staging but does not include any areas separately secured by the Contractor, a Subcontractor of any tier, or supplier for use in connection with the Work (e.g. Contractor's home office, an off-site fabrication plant, etc.).

Specifications - The written requirements for contract administration, Materials, Equipment, systems, standards, and workmanship for the Work and for the performance of any related services.

Subcontractor - A business entity that has a direct contract with the Contractor to perform a portion of the Work. Unless the context clearly requires otherwise, the term Subcontractor includes all of the Subcontractor's authorized representatives.



Submittal - Written or graphic document (including electronic) or sample that is required by the Contract Documents and is prepared for the Work by the Contractor or a Subcontractor or supplier at any tier, and submitted to the District by the Contractor, including Shop Drawings, product data, samples, certificates, schedules of material or other data. Submittals are not Contract Documents.

Substantial Completion - The stage in the progress of the Work where:

1. The District has full and unrestricted use and benefit of the facilities for the purpose intended;
2. All the systems and parts of the Work are functional;
3. Utilities are connected and operate normally;
4. Only minor incidental Work or correction or repair remains to complete all applicable Contract requirements; and,
5. At the District's option, the Contractor has provided all applicable occupancy Permits and easement releases.

As provided in the Contract, the District at its sole option may also require or grant Substantial Completion to specific Schedules, milestones or subsystems or portions of the Work. The date(s) of Substantial Completion shall be determined, in writing, by the District.

Surety - Any firm or corporation executing a surety bond or bonds payable to the District, securing the performance of the Contract, either in whole or in part.

Work - The construction to be completed under the terms of this Contract as detailed more fully in the Plans and Specifications. Work specifically includes the furnishing of all labor, Materials, Equipment, and all incidentals necessary to the successful completion of the construction, whether expressly required by or reasonably inferable from the Contract Documents, whether they are temporary or permanent, and whether they are incorporated into the finished Work or not. Work also includes all other obligations imposed on the Contractor by the Contract. The Work is sometimes generally referred to as the "Project."

Usage of Certain Words and Phrases - Whenever the words, "as directed", "as required", "as permitted", or words of like effect are used, it shall be understood that the direction, requirement or permission of the District and Engineer is intended. The words, "sufficient", "necessary", "proper", and the like shall mean sufficient, necessary or proper in the judgment of the District and Engineer. The words, "approved", "acceptable", "satisfactory", or words of like import shall mean approved by or acceptable to the District and Engineer.



ABBREVIATIONS

Whenever the following abbreviations are used on the Plans, Specifications, Proposal and Contract, they shall be construed to mean the words and terms as listed below:

A	Acre
AC	Asbestos Cement
AF	Acre-Feet
Adj	Adjust
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AITC	American Institute of Timber Construction
APWA	American Public Works Association
Asp. Pav.	Asphalt Pavement
Asp.Conc.Pav.	Asphalt Concrete Pavement
ASTM	American Society of Testing and Material
ATB	Asphalt Treated Base
AVE	Avenue
AWS	American Welding Society
AWWA	American Water Works Association
Bld	Boulevard
BO	Blow Off
BTU	British Thermal Unit
CB	Catch Basin
CB Inlet	Curb Inlet
CFS	Cubic Feet per Second
CI	Cast Iron
CIP	Cast Iron Pipe
CL	Centerline
CMP	Corrugated Metal Pipe
CMU	Concrete Mason Unit
Conc	Concrete
Conc. Cb.	Concrete Curb
Conc. Pav.	Concrete Pavement
Conc.Ret.Wall	Concrete Retaining Wall
Conc. Swr	Concrete Sewer
Cond.	Conduit
Conn	Connect
Cr	Cross
CTB	Cement Treated Base
Cu	Cubic



ABBREVIATIONS

Continued

DFPA	Douglas Fir Plywood Association
DI	Ductile Iron
Dr	Drive or Driveway
E	East
Elev.	Elevation
Exist.	Existing
Exc	Excavation
FBM	Foot Board Measure
FH	Fire Hydrant
FL	Flange
FT, FT ² , FT ³	Foot, Square Feet, Cubic Feet
GIP	Galvanized Iron Pipe
GPAD	Gallons Per Acre Day
GPH	Gallons Per Hour
GPM	Gallons per Minute
G Stl P	Galvanized Steel Pipe
GV	Gate Valve
Hyd	Hydrant
Hyd Ext	Hydrant Extension
ID	Inside Diameter
In, In ² , In ³	Inch, Square Inch, Cubic Inch
L	Length
Lbs	Pounds
LF	Lineal Feet
Max	Maximum
Mon	Monument Case
Min	Minimum
MG	Million Gallons
MGD	Million Gallons per Day
MH	Manhole
MJ	Mechanical Joint
N	North
NIC	Not in Contract
No.	Number
NRS	Non Rising Stem
OD	Outside Diameter
Pav	Pavement
PC	Point of Curvature
PJM	Premolded Expansion Joint Material



ABBREVIATIONS

Continued

PL	Property Line
PI	Place
Plk	Planking
Pos	Position
PP	Power Pole
Pri	Primary
Prop	Proposed
PS	Permastran
PSF	Pounds per Square Foot
PSI	Pounds per Square Inch
PT	Point of Tangency
PVC	Polyvinyl chloride
R	Radius
RC	Reinforced Concrete
RCP	Reinforced Concrete Pipe
Rem	Remove
Repl	Replace
RS	Rising Stem
S	South
Sec	Secondary
Swr	Sewer
Sp	Special
Sq	Square
SS	Side Sewer
SSPC	Steel Structure Painting Council
Std	Standard
Stl	Steel
Temp	Temporary
Trans	Transformer
VC	Vertical Curve
W	West
WM	Water Main
Yd	Yard

GENERAL CONDITIONS



TABLE OF CONTENTS

SECTION 8

GENERAL CONDITIONS

8.1	EXECUTION, CORRELATION AND INTENT OF CONTRACT DOCUMENTS	1
8.2	PLANS AND SPECIFICATIONS - OMISSIONS AND DISCREPANCIES.....	1
8.3	EXAMINATION OF SITE OF WORK.....	2
8.4	STATUS OF ENGINEER	2
8.5	INSPECTION AND TESTS	3
8.6	PLANS, SPECIFICATIONS, SUBMITTALS, AND SHOP DRAWINGS ACCESSIBLE; RFIs.....	4
8.7	AUDIT RECORDS	5
8.8	OWNERSHIP OF DOCUMENTS; NO WARRANTIES BY THE DISTRICT ...	6
8.9	INSURANCE	6
8.10	SCHEDULE AND PRE-CONSTRUCTION CONFERENCE	10
8.11	SCHEDULE OF VALUES OF LUMP SUM WORK	11
8.12	MATERIALS AND EQUIPMENT FURNISHED BY CONTRACTOR.....	12
8.13	MATERIALS AND EQUIPMENT FURNISHED BY DISTRICT.....	13
8.14	SUBMITTALS	14
8.15	LABOR AND FACILITIES	15
8.16	ROYALTIES AND PATENTS	16
8.17	PROJECT SITE; PERMITS, LAWS, AND REGULATIONS	16
8.18	PAYMENT OF PREVAILING WAGES	17
8.19	PROTECTION OF WORK, PERSONS, AND PROPERTY	18
8.20	SAFETY.....	19
8.21	UTILITIES.....	19
8.22	DISTRICT-INITIATED CHANGES IN THE WORK.....	21
8.23	CONTRACTOR REQUESTS FOR CHANGE / CLAIMS.....	21
8.24	DIFFERING SITE CONDITIONS	24
8.25	FORCE ACCOUNT.....	24
8.26	DELAYS AND EXTENSION OF TIME.....	25
8.27	COMPLETION AND/OR CORRECTION OF WORK.....	27



8.28 DEFECTS ARISING IN TWO YEARS AND REMEDIES27

8.29 SUSPENSION OF WORK28

8.30 DISTRICT'S RIGHT TO TERMINATE CONTRACT FOR DEFAULT29

8.31 DISTRICT'S RIGHT TO TERMINATE CONTRACT FOR
CONVENIENCE31

8.32 CONTRACTOR'S OBLIGATIONS DURING TERMINATION32

8.33 USE OF COMPLETED PORTION OF WORK.....33

8.34 APPLICATION FOR PAYMENT.....33

8.35 PROGRESS PAYMENTS34

8.36 FINAL PAYMENT34

8.37 ACCEPTANCE AND RELEASE OF RETAINAGE35

8.38 DISTRICT'S RIGHT TO WITHHOLD PAYMENTS36

8.39 HOLD HARMLESS AGREEMENT37

8.40 PERFORMANCE AND PAYMENT BOND38

8.41 ASSIGNMENT AND SUBCONTRACTING38

8.42 SEPARATE CONTRACT - INTERFERENCE WITH OTHER
CONTRACTORS39

8.43 CLEANUP.....39

8.44 PROPERTY RESTORATION RELEASE40

8.45 PREVENTION OF ENVIRONMENTAL POLLUTION40

8.46 VENUE/LIMITATION40



Section 8 – General Conditions

8.1 EXECUTION, CORRELATION AND INTENT OF CONTRACT DOCUMENTS

The Contract Documents are complementary and what is called for by any one shall be as binding as if called for by all. The intent of the Contract Documents is to prescribe the complete Work. The Contractor shall furnish all labor, Materials, Equipment and incidentals necessary to complete all parts of the Work. Where the Contractor is directed to provide something as part of the Work, that term specifically includes everything necessary to furnish, install, connect, adjust, test and make ready for use or occupancy. Compensation for the cost of the complete Work and for full performance of the Contract is included in the Contract Price. Materials, Equipment, or Work described in words which so applied have a well-known technical or trade meaning shall be held to refer to such recognized standards.

It is intended that Work not covered under any heading, section, branch, class or trade of the Specifications shall be supplied if it is shown on Plans or is reasonably inferable as being necessary to produce the intended results. Minor items of Work, Materials, or Equipment omitted from the original Plans or Specifications, but clearly inferable from the information presented and which are called for by accepted good practice shall be provided and/or performed by the Contractor as part of its original cost.

Where the Contract Documents refer to Reference Specifications, such specifications shall be applicable to technical provisions only, unless otherwise designated.

The Contract represents the entire and integrated agreement between the District and the Contractor. It supersedes all prior discussions, negotiations, representations or agreements pertaining to the Work, whether written or oral.

8.2 PLANS AND SPECIFICATIONS - OMISSIONS AND DISCREPANCIES

Upon receipt of Notice of Award of the Contract, the Contractor shall carefully study and compare all Plans, Specifications and other instructions and shall, prior to ordering Materials or performing Work, report in writing to the Engineer any error, inconsistency or omission in respect to design, mode of construction or cost which the Contractor may discover. If the Contractor, in the course of this study or in the accomplishment of the Work, finds any discrepancy between the Plans and the physical condition of the locality as represented in the Plans, or any such errors or omissions in respect to design, mode of construction or cost in Plans or in the layout as given by points and instructions, it shall be its duty to provide timely notice thereof in accordance with Section 8.23 below. The Contractor shall



make all reasonable efforts to mitigate any impact resulting from such error, inconsistency, omission or variance. Any Work done after such discovery, until correction of Plans or authorization of extra Work is given, if the Engineer finds that extra Work is involved, will be done at the Contractor's risk. If extra Work is involved, the procedure shall be as provided in Section 8.23 below.

8.3 EXAMINATION OF SITE OF WORK

Before submitting its bid, the Contractor shall examine the Site of the Work and ascertain for itself all the physical conditions in relation thereto. In making a Proposal under these Contract Documents, the Contractor represents and warrants that it has satisfied itself as to construction conditions by personal examination of the Plans, Specifications and Site of the proposed Work, and by appropriate examination and investigation as to the nature of the soil and construction problems which may be encountered by reason thereof. Contractor also warrants and represents itself to be experienced and an expert in the construction contemplated. Contractor further understands that, in making the Contract award, District is relying upon the representations and warranties of Contractor herein contained.

Contractor's failure to examine the Plans, Specifications, and Site shall not relieve the Contractor from entering into a Contract nor excuse it from performing the Work in strict accordance with the terms of the Contract and Specifications. The Contractor will not be entitled to additional compensation if it subsequently finds the conditions to require other methods or equipment that it did not anticipate in making its Proposal. Any statement or representation (whether written or oral) made by an officer, agent or employee of the District (or by any third party consultant of the District) with respect to the physical or geotechnical conditions at the Site of the Work shall not be binding upon the District.

8.4 STATUS OF ENGINEER

- (a) The Engineer shall act as advisor and consultant to the District in engineering matters relating to the Contract; provided, however, nothing contained herein or elsewhere in the Contract Documents shall be construed as requiring or authorizing the Engineer to direct the method or manner of performing any Work by the Contractor under this Contract. The Engineer has authority to stop the Work whenever, in its opinion, such stoppage may be necessary to ensure the proper execution of the Contract. The Engineer may reject all Work, Materials, or Equipment which, in its opinion, do not conform to the Contract.
- (b) It is understood and agreed by and between the parties hereto that the Work included in the Contract is to be done to the complete satisfaction of the Engineer, and that the decision of the Engineer as to the true construction and meaning of the Contract, Plans, Specifications and estimates, and as to all questions arising as to proper performance of the



Work shall be final. The Engineer shall determine the unit quantities and the classification of all Work done and Materials and Equipment furnished under the provisions of this Contract and its determination thereof shall be final and conclusive and binding upon the Contractor.

- (c) The Engineer shall decide any and all questions which may arise as to the quality or acceptability of Materials and Equipment furnished and Work performed and as to the rate of progress of the Work, and all questions as to acceptable fulfillment and performance of the Contract on the part of the Contractor and as to compensation. The decision of the Engineer in such matters shall be final.
- (d) The Engineer shall have authority to make changes in the Work, not inconsistent with the purpose of the Work. Except in any emergency endangering life or property, no extra Work or change shall be made unless pursuant to a Change Order executed by the Engineer. If the District or Contractor believes that a Change Order justifies an adjustment in the Contract Price and/or Contract Time, the value of any such extra Work shall be determined as set forth in Sections 8.22 and 8.23.
- (e) The Engineer has no authority to waive the obligation of the Contractor to perform the Work in accordance with the Contract Documents. Failure or omission on the part of the Engineer to reject unsuitable, inferior or defective Work and/or labor or Materials or Equipment furnished under the Contract shall not release the Contractor or its bond from performing the Work in accordance with the Contract Documents.

8.5 INSPECTION AND TESTS

- (a) All Work and all Materials and Equipment furnished shall be subject to inspection by the Engineer and/or Inspector. The Engineer and/or Inspector shall, at all times, have access to the Work to observe the progress and quality wherever it is in preparation or progress, and the Contractor shall provide proper facilities for such access and for necessary inspection and testing. If any Work should be covered up without approval or consent of the Engineer or Inspector, it must, if required by the Engineer, be uncovered for inspection at the Contractor's expense.
- (b) The Contractor shall make reasonable tests of the Work at the Contractor's expense upon Engineer's request and shall maintain a record of such tests. Prior to the time scheduled for a performance test to be observed by the Engineer, the Contractor shall make whatever preliminary tests are necessary to assure that the Work is in accordance with the Specifications. If, for any reason, the test observed by the Engineer is unsatisfactory, the Contractor shall pay all costs incurred by the Engineer for the inspection of the unsatisfactory test.



- (c) Inspections, tests, measurements, or other acts or functions performed for or by the District are recognized as being solely to assist the Engineer in determining that the Work complies with the Contract requirements. Such activities shall in no manner whatsoever be construed to relieve the Contractor from the responsibility for performing its own inspections and tests as necessary to ensure compliance with the Contract. In addition, any inspection, test or measurement by or for the District does not constitute or imply acceptance of the Work by the District or waive any rights of the District to require the Work be completed in strict accordance with the Contract and does not impair the District's authority to reject non-conforming Work or evoke any remedy to which it may be entitled.
- (d) The Work may be subject to inspection by various governmental agencies or utility owners. The Contractor shall cooperate and make the Site available for all such persons or agencies with regard to their inspections, including providing access for inspection by way of safe and proper facilities. Such inspection shall in no way make such agencies or persons parties to this Contract and shall not constitute an interference with the Work or the rights of either the District or the Contractor. In its scheduling and planning the Contractor shall allow sufficient time for such inspections. Required certificates of inspection by any authority other than the Engineer shall be secured by the Contractor.
- (e) Except as provided herein, the District will at its cost observe performance of the Work during normal working days or hours during the Contract Time and any modification or extension of the Contract Time authorized by the District in approved Change Orders. If the Contractor is authorized by the District to work more than 8 hours per Day, or more than 5 Days per week, or on holidays, during the course of the Contract Time, then Section 2.1 of the Special Provisions governs.

8.6 PLANS, SPECIFICATIONS, SUBMITTALS, AND SHOP DRAWINGS ACCESSIBLE; RFIs

The Contractor shall keep at least one copy of the Plans, Specifications, Submittals, and Shop Drawings constantly accessible at the construction Site.

If the Contractor discovers, or in the exercise of reasonable diligence should have discovered, that the Work to be performed is not sufficiently detailed or explained in the Contract Documents, or that there is a conflict or inconsistency between any part of the Contract Documents, the Contractor shall promptly apply to the Engineer for such further written explanation(s) as may be necessary using a Request for Information (RFI) form to be provided or approved by the Engineer. The Engineer will address the RFI in writing. Before submitting a RFI, the Contractor shall diligently and thoroughly examine the Contract Documents. The Contractor shall also plan its Work in an efficient manner so as to allow for timely



responses to RFIs. If requested by the Engineer, the Contractor shall prioritize its RFIs and explain the reasons for such priority. District will reply to the RFI with reasonable promptness which on average is defined to mean twenty (20) Days. If Contractor submits an RFI on an activity and reasonably believes that a response from District within up to twenty (20) Days will cause a delay to the Work, Contractor shall denominate such particular RFI as "Priority" and indicate Contractor's preferred reasonable response date. Responses by the District to RFIs are not changes to the Contract. If Contractor believes a response to an RFI constitutes changed Work or causes an adverse impact to performance of the Work or construction schedule, the Contractor is required to submit a request for change in accordance with the requirements of the Contract.

8.7 AUDIT RECORDS

- a) The Contractor and all Subcontractors shall keep and maintain comprehensive records and documentation relating to the Work under this Contract, as well as documents related to the Contractor's Proposal and Project cost accounting records for this Contract, for an audit period of six (6) years. The Project Records shall include, but are not limited to, Contract Documents, subcontracts, purchase orders, employment records, payrolls, Project cost accounting records, prevailing wage records, Plans, Specifications, Addenda, Submittals, Shop Drawings, Change Orders and all working documents leading to Change Orders, field test records, quality control documents, daily construction logs by all field supervisors and Project management personnel, correspondence relating to the Contract, and As-Built Plans.
- b) Contractor and its Subcontractors shall segregate and separately record at the time incurred all costs resulting in any way from any event, act, omission or condition for which Contractor or its Subcontractors seek an adjustment to the Contract Price, Contract Time and/or monetary compensation of any kind. Any costs claimed to be delay or impact costs, acceleration costs, loss of productivity or inefficiency costs, increased costs of onsite or home office overhead or any similar costs shall be separately recorded at the time and shall be fairly and accurately allocated to each such event, act, omission or condition and to other causes of such costs. The Contractor shall be entitled to make a Claim or obtain extra compensation for any such event, act, omission or condition only to the extent the Project Records are kept in full compliance with all Contract requirements and the cost allocations support entitlement to such compensation.
- c) The Contractor and Subcontractors shall permit the District to audit, inspect, examine, and copy the Project Records and/or other documents related to any Claim or issue related to performance of the Work maintained by Contractor (including all Proposal documentation) or any affiliated company involved in the project (collectively, "Audit Records") at any reasonable time



and shall provide such assistance as may be reasonably required in the course of such inspection, including the right to interview personnel. The Contractor shall in no event dispose of, destroy, alter, or mutilate said Audit Records in any manner whatsoever for six (6) years after final payment and until all pending matters are closed. No additional compensation will be provided to the Contractor for compliance with the requirements of this subsection.

8.8 OWNERSHIP OF DOCUMENTS; NO WARRANTIES BY THE DISTRICT

All Plans, Specifications and copies thereof prepared or furnished by the District are its property. They are not to be used on other work.

The Reference Documents and any other information, records, or reports that may be made available by the District to the Contractor are provided solely for the convenience of the Contractor. The District makes no representations or warranties, express or implied, regarding the content of the Reference Documents or any other information, records, or reports. No information derived from inspection of Reference Documents or other information, records, or reports will in any way relieve the Contractor from its responsibility to properly perform its obligations under the Contract. The Contractor shall make its own conclusions and interpretations from the data supplied, information available from other sources, and the Contractor's own observations.

8.9 INSURANCE

The Contractor shall obtain and keep in force during the term of the Contract, Commercial General Liability insurance policies with insurance companies which have an A.M. Best's rating of A VII or better and who are approved by the Insurance Commissioner of the State of Washington pursuant to Title 48 RCW.

Prior to the execution of the Contract, the Contractor shall purchase and maintain during the term of this project a Commercial General Liability insurance policy meeting the requirements set forth herein. The Contractor shall file with the District either a certified copy of all policies with endorsements attached, or a certificate of insurance with endorsements attached as are necessary to comply with these specifications. Failure of the Contractor to fully comply with the requirements regarding insurance will be considered a material breach of Contract.

The Contractor shall not begin Work under the Contract or under any special condition until all required insurances have been obtained and until such insurances have been approved by the District. Said insurance shall provide coverage for the Contractor, its Subcontractors and the District. The coverage so provided shall protect against claims from bodily injuries, including accidental death, as well as claims for property damage which may arise from any act or



omission of the Contractor, its Subcontractors, or by anyone directly or indirectly employed by either of them.

The insurance policies shall specifically name the District, its elected or appointed officials, officers, employees, volunteers and King County (or as needed – City of Kenmore, Bothell, Kirkland, Lake Forest Park, etc.), as insured(s) with regard to damages and defense of claims arising from:

- Activities performed by or on behalf of the Contractor; and
- Products and completed operations of the Contractor; and
- Premises owned leased or used by the Contractor.

It is hereby understood and agreed that Northshore Utility District, its commissioners, officers, and employees, while acting within the scope of their duties as such, are named as additional insured. The insurance shall be maintained in full force and effect at the Contractor's expense throughout the term of the Contract and for any extended period after Acceptance as may be required hereunder.

The District shall be given at least 45 Days' written notice of cancellation, non-renewal, material reduction or modification of coverage. Such notice shall be by certified mail to the District.

The coverages provided by the Contractor's insurance policies are to be primary to any insurance maintained by the District. Any insurance that might cover this Contract which is maintained by the District shall be in excess of the Contractor's insurance and shall not contribute with the Contractor's insurances.

The Contractor's insurance policies shall protect each insured in the same manner as though a separate policy had been issued to each. The inclusion of more than one insured shall not affect the rights of any insured as respects any claim, suit or judgment made or brought by or for any other insured or by or for any employee of any other insured. However, this provision shall not increase the limits of the insurer's liability.

The General Aggregate provision of the Contractor's insurance policies shall be amended to show that the General Aggregate Limit of the policies applies separately to this Project.

The Contractor's insurance policies shall not contain deductibles or self-insured retentions in excess of \$10,000 (unless approved by the District) and Contractor shall be responsible for any such deductible or SIR if the loss arises from its operations or those of its Subcontractors or suppliers at any tier.



The Contractor's insurance policies shall contain a provision that the District has no obligation to report events which might rise to a claim until a claim has been filed with the District's Board of Commissioners.

Types and Limits of Insurance Required:

Commercial General Liability

- \$1,000,000 each occurrence Bodily Injury and Property Damage Liability.
- \$2,000,000 annual aggregate
- Employees and volunteers as Additional Insured(s)
- Premises and operations
- Broad form property damage including:
 - Underground
 - Explosion
 - Collapse Hazards (XCU)
 - Products completed operations
 - Blanket contractual
 - Subcontractors
- Personal injury with employee exclusion deleted
- Employers liability (Stop gap)

Automobile Liability

- \$1,000,000 per accident bodily injury and property damage liability, including:
 - any owned automobiles,
 - hired automobiles,
 - non-owned automobile.

Umbrella Liability

- \$2,000,000 per occurrence
- \$2,000,000 aggregate

Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" policy form in the amount of the Contract Price, as adjusted by Change Orders. This insurance shall include interests of the District, the Contractor and Subcontractors on the Project. Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage,



theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements. Maximum deductible shall be \$10,000 and Contractor shall be responsible for such deductible if the loss arises from its operations of those of any Subcontractor.

District, Contractor and Subcontractors waive all rights against each other for damages caused by fire or other causes of loss to the extent of proceeds actually paid by property insurance obtained pursuant to this Section 8.9 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the District as fiduciary. The District or Contractor, as appropriate, shall require Subcontractors, by appropriate agreements, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as 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.

As an alternative to the above indicated Commercial General Liability and Umbrella Liability insurance policies the Contractor may provide the District with an Owners and Contractors Protective (OCP) policy with a limit of coverage of \$5,000,000 on terms and conditions acceptable to the District.

The Contractor shall additionally provide the District with evidence that the District has been named as additional insured on the Contractor's Commercial General Liability Policy through Acceptance plus six (6) additional years (inclusive of completed operations coverage).

Providing of coverage on the stated amounts shall not be construed to relieve the Contractor from liability in excess of such limits.

In addition, the Contractor shall have its insurance agent/representative complete the Insurance Coverage Questionnaire contained in the Special Provisions and attach it to the Certificate of Insurance for District's approval. The Contractor shall maintain Workers Compensation insurance and/or Longshore and Harbor Workers insurance as required by State or Federal statute for all of its employees to be engaged in Work on the Project under this Contract and, in case any such Work is sublet, the Contractor shall require the Subcontractor similarly to provide Workers Compensation insurance and/or Longshore and Harbor Workers Insurance for all of the latter's employees to be engaged in such Work. The Contractor's Department of Labor & Industries account number shall be noted on the certificate of insurance.

In the event any class of employees engaged in the Work under this Contract is not covered under Workers Compensation insurance or Longshore and Harbor Workers insurance as required by State and Federal statute, the Contractor shall



maintain and cause each Subcontractor to maintain, Employers Liability insurance for limits of at least \$1,000,000 each employee for disease or accident, and shall furnish the District with satisfactory evidence of such.

The contractual coverage of the Contractor's policy shall be sufficiently broad enough to insure the provisions of the HOLD HARMLESS AND INDEMNIFICATION AGREEMENT of this Contract.

Nothing contained in these insurance requirements is to be construed as limiting the extent of the Contractor's responsibility for payment of damages resulting from its operations under this Contract.

8.10 SCHEDULE AND PRE-CONSTRUCTION CONFERENCE

(a) The Schedule shall set forth the order in which the Contractor plans to perform the Work. The Schedule and any supplemental Schedule shall show:

1. Substantial Completion of all Work within the specified Contract Time,
2. The proposed order of Work, and
3. Projected starting and completion times for major phases of the Work and for the total Project.

The Schedule shall also reflect any phasing, sequencing, or timing restrictions set forth in the Contract Documents.

The District allocates resources to a Contract based on the total time allowed in the Contract. The District will accept a Schedule indicating an early Substantial Completion date, but cannot guarantee the District's resources will be available to meet the accelerated Schedule. No additional compensation will be allowed if the Contractor is not able to meet its accelerated Schedule due to the unavailability of the District's resources or for other reasons beyond the District's control.

The Contractor shall submit supplemental Schedules when requested by the Engineer or as required by any provision of the Contract. The supplemental Schedules shall reflect any changes in the proposed order of Work, any construction delays, or other conditions that may affect the progress of the Work. The Contractor shall provide the Engineer with the supplemental Schedules within ten (10) Days of receiving written notice of the request.

The original and all supplemental Schedules shall not conflict with any time and order-of-work requirement in the Contract.



If the Engineer deems that the original or any necessary supplemental Schedule does not provide the information required in this subsection, the District may withhold progress payments until a Schedule containing the required information has been submitted by the Contractor and approved by the Engineer.

- (b) The Schedule may be in graph or tabular form and shall include the date of submission for approval of Plans as may be required, starting dates for construction of the several parts of the Work, and estimated completion dates of such parts, and completion date of the Project. Review by the Engineer of the Schedule shall not in any event excuse the Contractor of the obligation to complete the Work within the time specified in the Contract or of complying with all terms, conditions and provisions of the Contract Documents. Failure of the Contractor to follow the Schedule submitted and accepted, including revisions thereof, shall relieve the District of any and all responsibility for furnishing and making available all or any portion of the Site from time to time and will relieve the District of any responsibility for delays to Contractor in the performance of the Work.
- (c) A pre-construction conference shall be held at a time and place fixed by the Engineer which will generally be within one month from date of Notice of Award. The Contractor must be prepared for a thorough discussion and review of the following:
- Schedule
 - Materials and Equipment
 - Traffic Control
 - Job Procedures
 - Inspection Procedures
 - Plans and Specifications
 - Shop Drawings
 - Schedule of Values of Lump Sum Work
 - Safety
 - Other Matters pertaining to Performance of the Work

8.11 SCHEDULE OF VALUES OF LUMP SUM WORK

If payments are to be made on lump sum items, the Contractor shall submit a schedule of values of the various parts of the Work, including quantities, aggregating the total Contract Price. When approved by the Engineer, the schedule of values shall be used as the basis for certificates for payment unless it is found to be in error. In applying for payments for lump sum Work, the Contractor shall submit estimates of the percentage of Work completed and payment will be based upon the schedule of values for lump sum Work.



8.12 MATERIALS AND EQUIPMENT FURNISHED BY CONTRACTOR

The Contractor shall furnish all Materials and Equipment for the completion of the Work to be performed under this Contract and shall be fully responsible for all Materials and Equipment until the completed Project is delivered to and accepted by the District.

The Contractor shall, at its own expense, secure and maintain a storage place for Materials and Equipment. Contractor shall protect Materials and Equipment against damage from careless handling, exposure to weather, mixture with foreign matter, and all other causes. The District will reject and refuse to test Materials and Equipment improperly handled or stored.

- (a) All Materials and Equipment required to be incorporated into the Work shall be new and in accordance with the Plans and Specifications, except as otherwise provided in the Contract Documents. All such Materials and Equipment shall be applied, installed, connected, erected, used, cleaned, maintained and conditioned in accordance with the instructions of the applicable manufacturer, fabricator or processor, except as otherwise provided in the Contract Documents. Upon the request of the Engineer, the Contractor shall furnish satisfactory evidence as to the kind, quality and manufacturer of Materials and Equipment. The Contractor shall furnish the District with copies of the supplier's warranty and adopt the same as the warranty of the Contractor and shall also be liable thereon to the District.
- (b) The Contractor shall furnish for approval all samples as directed by the Contract Documents. The finished Work shall be in accordance with approved samples. Approval of samples by the Engineer does not relieve the Contractor of performance of the Work in accordance with the Contract Documents.
- (c) Substitutions requested by the Contractor will be subject to the District's prior written acceptance and at the District's sole discretion. For each proposed substitution, the Contractor shall submit samples, descriptive and technical data, and reports of tests to the District for approval. The Contractor shall also indicate the difference in Contract Price and/or Contract Time by reason of the proposed substitutions. All costs of any redesign or modification to other systems, parts, equipment or components of the Project or Work, which result from the substitution, shall be borne by the Contractor.
- (d) When the District approves a substitution proposed by the Contractor, the Contractor shall guarantee the substituted Materials or Equipment to be equal to, or better than, those originally specified and shall be compatible with all other systems, parts, Materials, Equipment, or components of the Project and Work. The District has the right to order an unaccepted,



substituted article removed and replaced without additional cost to the District.

- (e) When Materials or Equipment are specified by one or more patents, brand names, or catalog numbers, it shall be understood that this is for the purpose of defining the performance or other salient requirements and shall, unless otherwise expressly stated, be understood as if followed by the words Or Equal whether or not such words appear. If the Contractor proposes to furnish Or Equal Materials or Equipment, then Contractor shall demonstrate (1) conformance to the specified performance, testing, quality, life-cycle or dimensional requirements and (2) suitability of the Materials or Equipment for the use intended. Intended use of any Or Equal Materials or Equipment shall be specifically identified as part of the submittal process, and the Engineer must accept the Contractor's proposed Or Equal Materials or Equipment before it may be used. Any such acceptance shall not relieve Contractor of its obligations to achieve the specified performance, testing, quality, life-cycle or dimensional requirements and suitability of any accepted the Or Equal Materials or Equipment for the use intended under this Contract.
- (f) In the event that the Contractor proposes an alternate design or designs for some portion of the Work, the District may at its option allow the Contractor to proceed on the condition that the Contractor assume full responsibility for the alternate design.

8.13 MATERIALS AND EQUIPMENT FURNISHED BY DISTRICT

- (a) Unless otherwise specifically provided in the Contract Documents, if the Contract requires that the Contractor install Materials and Equipment provided by the District, in the absence of a reasonably apparent defect, such Materials and Equipment shall be considered compliant with the Contract Documents.
- (b) If the Contractor discovers defects in the District-furnished Materials or Equipment the Contractor shall immediately notify the District in writing.
- (c) After such discovery, the Contractor shall not proceed with Work involving such District-furnished Materials and Equipment unless otherwise authorized in writing by the District.
- (d) Contractor's failure to provide immediate written notice of any defects in District-furnished Materials or Equipment shall constitute acceptance of such Materials and Equipment as fit for incorporation into the Work.
- (e) Contractor shall be responsible for any damages or delays resulting from Contractor's failure to provide timely written notice or Contractor's improper



incorporation of such defective District-furnished Materials or Equipment into the Work.

8.14 SUBMITTALS

- (a) The Contractor shall perform no portion of the Work requiring Submittals until the Submittals have been reviewed and returned by the District with one of the following annotations: (1) "No Exception Taken" or (2) "Make Corrections Noted" or (3) "Revise and Resubmit" or (4) "Rejected" or (5) "Submit Specified Item".
- (b) Prior to furnishing the Submittals to the District, the Contractor shall: (1) review all Contractor and Subcontractor Submittals for accuracy, completeness, and compliance with the Contract; (2) coordinate all Submittals with all Contract Work by other trades and with field measurements; and (3) indicate approval on the Submittals as a representation that it has complied with its obligation to review and coordinate Submittals. Where required by law or by the Contract, an appropriate licensed professional shall stamp Submittals. Submittals lacking required stamps or evidence of Contractor review and approval will be returned without review by the District for resubmission. Submittals shall be sequentially numbered.
- (c) When submitting information, the Contractor shall identify and state reasons for any alteration, variation, addition, deviation, or omission from the Contract. The Contractor shall not perform work that alters, varies, adds, deviates, or omits Work without prior specific written acceptance by the District.
- (d) The Contractor shall provide Submittals with reasonable promptness and in such sequence as to facilitate the timely completion of the Contract. The Contractor shall prepare and keep current, for review by the District, a schedule of Submittals which is coordinated with the Contractor's Project Schedule and allows the District reasonable time for review.
- (e) The District shall review the Contractor's Submittals and respond in writing with reasonable promptness. Unless otherwise agreed, no delay to the Contractor's Work shall be attributable to the failure by the District to respond to a Submittal until thirty (30) Days after the Submittal is received by the District, and then only if failure by the District to respond is unreasonable and affects the Substantial Completion date.
- (f) If the Contractor is required to resubmit a Submittal, any revisions on resubmittals, shall be specifically identified in writing and the resubmitted Submittal shall be sequentially alpha denoted and note revisions in numerical order. The cost of the review of the initial Submittal and the first revised Submittal shall be borne by the District. The costs of all additional



revised Submittals shall be charged to the Contractor. The cost of review shall include, without limitation, administrative, design, and engineering activities directly related to review of Submittals. The District may deduct these costs from any amounts due the Contractor.

- (g) The District shall review the Contractor's Submittals only for conformance with the design of the Work and compliance with the Contract Documents. Review of the Submittals are not conducted to verify the accuracy of dimensions, quantities, or calculations, the performance of Materials, systems, or Equipment, or construction means, methods, techniques, sequences, or procedures, all of which remain the Contractor's responsibility. Failure by the District to take exception to a Submittal shall not relieve the Contractor from any duty, including its responsibility for errors or omissions in Submittals, its duty to make Submittals and its duty to perform the Work according to the requirements of the Contract. The District's review of a Submittal shall not alter or waive the requirements of the Contract unless the District has issued prior written approval of such change or alteration of the Contract requirements.
- (h) The Contractor's failure to identify any error, deviation, or omission and subsequent acceptance of the Submittal by the District shall not relieve the Contractor from the obligation to comply with the all requirements in the Contract Documents.

8.15 LABOR AND FACILITIES

- (a) The Contractor shall provide and pay for all labor, water, tools, light, power, transportation and other facilities necessary for the execution and completion of the Work, except as otherwise stipulated in the Contract Documents.
- (b) Necessary sanitation conveniences for the use of workmen on the Site, properly secluded from public observation, shall be provided and maintained by the Contractor.
- (c) The Contractor shall, at all times, enforce strict discipline and good order among its employees and shall not employ on the Work any person unfit or not skilled in the Work assigned to him. At the Engineer's written request, the Contractor shall immediately remove and replace any incompetent, careless, or negligent employee.
- (d) The Contractor shall remain onsite whenever the Work is under way. Before the Work begins, the Contractor shall name in writing an experienced superintendent who understands the Contract and is able to continuously supervise the Work. This superintendent shall have full authority to represent and act for the Contractor. Any superintendent who repeatedly fails to follow the Engineer's written or oral orders, directions, instructions, or determinations shall be subject to removal from the Project.



Upon the written request of the Engineer, the Contractor shall immediately remove such superintendent and name a replacement in writing.

- (e) During the term of this Contract, neither party shall employ nor hire any employee of the other party, nor of the Engineer, without the written consent of the other party or of the Engineer. The Contractor shall not use any Work performed or any information obtained from any employee hired in violation of this provision in making a claim against the District or Engineer and shall also be liable to the District as liquidated damages in an amount equal to double the amount of salary or wages paid to any such employee so hired in violation hereof.

8.16 ROYALTIES AND PATENTS

The Contractor shall be liable for all suits brought against the District by reason of infringement of patent rights or licenses on any Materials, Equipment, or process used on the Work or incorporated into the finished Project, except where specifically exempted by the Special Provisions. Prices named in the Proposal shall include payment of royalties, if any. Contractor shall defend and hold District harmless from any such suit, costs of defense and any judgment which may be made or entered against District thereon.

8.17 PROJECT SITE; PERMITS, LAWS, AND REGULATIONS

The District will furnish the Site and rights-of-way necessary for carrying out this Contract and completion of the Work herein contemplated and will use due diligence in acquiring said lands and rights-of-way as speedily as possible. If the District's right of access to any lands for the Site, Permits, or rights-of-way is delayed for any reason, Contractor shall exercise reasonable efforts to mitigate consequences and work around the delay. If Contractor believes it is entitled to a change in the Contract Time and/or Contract Price by reason of such delay, Contractor shall comply with the notice and Claim requirements provided in Section 8.23. Nothing in this section shall limit the District's right to terminate as provided in Section 8.31.

Contractor's Work shall be confined to the District's premises, including easements and construction Permit limits. The Contractor shall not enter upon or place Materials or Equipment on other property except by written consent of the individual property owners and the Contractor shall save District harmless from all suits and actions of every kind and description that might result from its use of property other than that of the District.

The Contractor shall be responsible for obtaining all Permits except those specified herein or in the Special Provisions.

The Contractor shall keep fully informed concerning all governmental requirements, including but not limited to all State, Federal, county and municipal laws, ordinances and regulations which in any manner affect the performance of



the Work or the Materials and Equipment used in the Work, or which in any way affect those employed to work in connection with the Project, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same including the specific legal requirements referenced in the Contract Documents (collectively, the “Governmental Requirements”). The Contractor shall at all times comply with, and shall cause all the Contractor’s agents, employees and Subcontractors to comply with all such Governmental Requirements, and shall indemnify, defend and hold harmless District and all of its commissioners, officers, agents, and employees against all claims, liabilities, losses, damages and expenses (including attorney’s fees and related costs) arising from or based on the violation of any such Governmental Requirement whether by the Contractor or contractor’s agents, employees or Subcontractors. If any discrepancy or inconsistency is discovered in the Contract Documents for the work in relation to any such Governmental Requirements, the Contractor shall immediately report the same to the Engineer in writing.

Wherever the law of the place of construction requires a sales, consumer, use or similar tax, the Contractor shall pay such tax.

8.18 PAYMENT OF PREVAILING WAGES

The wage rates to be paid all laborers, workers and mechanics who perform any part of this Contract shall meet or exceed the prevailing wage rates as required by Chapter 39.12 of the Revised Code of Washington, as amended. This requirement applies to laborers, workers and mechanics whether they are employed by the Contractor, Subcontractors, sub-Subcontractors, or any other person who performs a portion of the Work contemplated by this Contract.

The current prevailing wage rates as provided to the District by the Industrial Statistician of the Washington State Department of Labor and Industries are available at the following location: <https://lni.wa.gov/licensing-permits/public-works-projects/prevailing-wage-rates/>. In referencing such rates, the District does not imply or warrant that the Contractor will find labor available at those rates. It is the Contractor’s sole responsibility to determine the wage rates it will actually have to pay.

In case any dispute arises as to what are the prevailing rates of wages for work of a similar nature and such dispute cannot be adjusted by the parties in interest, including labor and management representatives, the matter shall be referred for arbitration to the Director of the Department of Labor and Industries of the State and the Director’s decision therein shall be final and conclusive and binding on all parties involved in the dispute, as provided for by Section 39.12.060 of the Revised Code of Washington, as amended.

In connection with this Contract, the Contractor will be required, pursuant to Section 39.12.040 of the Revised Code of Washington to file with the District a “Statement of Intent to Pay Prevailing Wages” and an “Affidavit of Wages Paid” for



itself and all Subcontractors and sub-Subcontractors. The Statements require the “approval” of, and the Affidavits the “certification” of, the industrial statistician of the State Department of Labor and Industries before the Statements or Affidavits are to be presented to the District. The Department of Labor and Industries charges a fee for such approval and certification, which fee shall be paid by the Contractor. Any change in the fee will not be grounds for revision in Contract Price.

All workers delivering fill, sand, gravel, crushed rock, transit/concrete mix, asphalt or other similar Materials and all workers removing any Materials from the Site as required by the Specifications are subject to the provisions of RCW Chapter 39.12 and are entitled to the appropriate prevailing wage rate. For purposes of this Contract, such Materials are for specified future use and per WAC 296-127-018, delivery and pick-up of the above listed Materials constitutes incorporation.

The Contractor is required to include this provision in all subcontracts and shall require that it be placed in all sub-subcontracts at any tier.

8.19 PROTECTION OF WORK, PERSONS, AND PROPERTY

The Contractor shall be solely and completely responsible for conditions of the Site, including protecting all persons and property, during performance of the Work. The Contractor shall maintain the Site and perform the Work in a manner which meets all statutory and common law requirements or other specific contractual requirements for the provision of a safe place to work and which adequately protects the safety of all persons and property on or near the Site. This obligation shall apply continuously and shall not be limited to normal working hours. The District’s inspection of the Work or presence at the Site does not and shall not be construed to include review of the adequacy of the Contractor’s safety measures in, on or near the site of the Work.

Unless otherwise required in the Contract Documents, the Contractor shall protect and be responsible for any damage or loss to the Work, or to the Materials and Equipment associated with the Work until the date of Substantial Completion. The Contractor remains responsible for any damage or loss caused directly or indirectly by the acts or omissions of the Contractor, Subcontractors, suppliers or third parties authorized or allowed on the Site by the Contractor until Acceptance. The Contractor shall repair or replace without cost to the District any damage or loss that may occur, except damages or loss caused by the acts or omissions of the District.

Contractor shall take adequate precautions to protect existing lawns, trees and shrubs, sidewalks, curbs, pavements, adjoining property, and structures, and to avoid damage thereto. The Contractor shall, at its own expense, completely repair any damage thereto caused by its operations to the satisfaction of the Engineer, except as otherwise provided elsewhere in the Contract Documents. The Contractor shall be solely and completely responsible for damages arising from the Work that affect property adjacent to the Site.



Whenever it is necessary in the course of construction to remove or disturb culverts, driveways, roadways, pipelines, or other existing improvements, without limiting the generality thereof and whether on private or public property, they shall be replaced to a condition equal to that existing before they were so removed and disturbed and all such costs for this replacement shall be borne by the Contractor and considered incidental to the construction and Work covered by the Contract Documents.

The Contractor shall erect and maintain adequate signs, fencing, barricades, lights or security measures and persons to protect the Work until the Engineer authorizes in writing the removal of signs, fencing, barricades, lights or security measures.

8.20 SAFETY

The Contractor shall take all reasonable precautions for the safety of all employees working on this Contract and all other persons who may be affected by such Work. The Contractor shall designate a responsible member of its organization at the Site whose duty shall be to manage and coordinate the Safety Programs and to prevent accidents of the Contractor and Subcontractor and suppliers.

Except as otherwise stated in the Contract, if the Contractor encounters on the Site material reasonably believed to be Hazardous Material including but not limited to asbestos, lead, or polychlorinated biphenyl (PCB), the Contractor shall immediately stop Work in the area affected and give notice of the condition to the District. Work in the affected area shall not be resumed without written direction by the District.

In order to protect the lives and health of persons performing Work under this Contract, the Contractor shall comply with the Federal Occupational Safety and Health Act of 1970 (OSHA), including all revisions, amendments and regulations issued thereunder, and the provisions of the Washington Industrial Safety Act of 1973 (WISHA), including all revisions, amendments and regulations issued thereunder by the Washington State Department of Labor and Industries. The WISHA regulations shall apply, without limitation, to all excavation, tunneling, trenching and ditching operations. In case of conflict between any such requirements, the more stringent regulation or requirement shall apply. There is no acceptable deviation from these safety requirements, regardless of practice in the construction industry. Any violation of OSHA, WISHA or other safety requirements applicable to the Work may be considered a breach of this Contract.

8.21 UTILITIES

In connection with any underground and utility Work, the Contractor shall strictly comply with Chapter 19.122 of the Revised Code of Washington. Any cost or



scheduling impact resulting from the Contractor's failure to comply with these statutory provisions shall be borne by the Contractor.

Unless specified otherwise by the Contract, Contractor shall plan and execute its Work to prevent outages in existing utilities or disruption of service. Where removal or relocation of known or disclosed utilities or temporary utility connections are necessary to accommodate the Work, such removal, relocation or temporary connections shall be performed at the Contractor's sole expense unless it is specified in the Contract Documents that it will be performed by the District or by others.

The District or utility owner may enter the Site from time to time to make changes as may be necessary for the relocation of utilities or to make necessary connections or repairs. Where the utility owner is identified as being responsible for removing or relocating utilities, the Contractor shall make timely arrangements with the utility owner to schedule such work to accommodate the Work. The Contractor shall also cooperate with and facilitate any necessary access to or on the Site by the forces engaged in such work and shall conduct its operations in such a manner as to avoid delay or hindrance to the work being performed by such other forces.

Contractor shall not commence any excavations until existing utilities have been staked or marked by the utility owner. The District will provide utility locates for District-owned utilities. The Contractor may encounter underground utilities adjacent to their Work operations. It shall be the Contractor's responsibility to protect these utilities from damage. If the Contractor discovers the presence of any unknown/unidentified utilities at the Site, the Contractor shall provide the District oral or written notice promptly (and in no event more than 24 hours after discovery). If any underground utility not identified in the Contract Documents must be relocated to accommodate the Project, the Engineer will either arrange for the relocation of such utility or provide a Change Order to the Contractor to do such work. If the Contractor asserts that the discovery entitles it to a change in Contract Price and/or Time, written notification shall be made in accordance with Section 8.24.

The Contractor may request District approval for changes or rearrangement to any utility for the Contractor's convenience in order to facilitate construction of the Work. The District shall be the sole judge of whether the proposed change or rearrangement is acceptable. The Contractor shall be responsible for any delay or cost resulting from this request.

Loss of time, if any, suffered by the Contractor due to delays in removal or relocation of any utilities by others may be considered in relation to a request by the Contractor for an adjustment to the Contract Time in accordance with Sections 8.23 and 8.26.



Utilities damaged by the Contractor shall be repaired by the Contractor to their original condition at the Contractor's expense. The Contractor shall notify the Engineer of any such damage promptly (and in no event more than 24 hours after the damage occurs) and shall begin repairs immediately and work continuously until the utility is restored to the satisfaction of the Engineer.

8.22 DISTRICT-INITIATED CHANGES IN THE WORK

- (a) The District, without invalidating the Contract, may order extra work or make changes by altering, adding to or deducting from the Work. The District reserves the right to make such alterations in the Plans or in the quantities of Work as may be considered necessary. Such alterations shall be in writing by the District and shall not be considered a waiver of any condition of the Contract nor invalidate any of the provisions thereof.
- (b) All such changes in the Work shall be authorized and directed by Change Order.
- (c) Unless the District in its sole discretion agrees otherwise in writing by way of Change Order, an alteration that only increases or decreases the quantity of bid item units to be installed shall not modify or adjust the unit prices set forth in the Proposal or contained in the Contract Price.
- (d) Subject to the limitation set forth above in (c), any modification to the Contract Price due to such changed Work shall be determined, in order of precedence, in the following methods:
 - 1. By unit or lump sum prices set by the Contract.
 - 2. If method (1) does not apply, by prices mutually agreed upon.
 - 3. If no agreement is reached under method (2), such Work will be paid for under Force Account rules established pursuant to Section 8.25 of these General Conditions. In such cases, the Contractor shall keep and present in such form as the Engineer may direct a correct account of such costs, together with supporting time cards and vouchers. The Engineer shall evaluate and determine the amount due Contractor.
- (e) This Section 8.22 applies only to District-initiated changes in the Work.

8.23 CONTRACTOR REQUESTS FOR CHANGE / CLAIMS

If the Contractor believes it is entitled to any additional compensation or time extension for any reason, the Contractor shall comply with the terms and conditions of this Section 8.23. In general, as described further below, the Contractor must adhere to a three-step process in making any request for additional compensation and/or time extension: (1) a timely written Notice of Intent



(2) a timely and properly documented Request for Change Order and, if such Request is denied (3) a timely and properly documented submission of a Claim.

Step 1: If the Contractor claims that the cost to perform the Work has been increased through any act or omission believed to be the District's responsibility (including without limitation District instructions, Plans, Site conditions or any alleged interference or impact by the District) the Contractor shall give the Engineer written Notice of Intent within five (5) Days after the receipt of any such instructions, or occurrence of any other act, omission or impact, and in any event before proceeding to execute the Work (except in emergency endangering life or property). The Notice of Intent shall describe (1) the date, circumstances, and source of the direction, instruction, interpretation, determination by the District and/or the event or impact to the Project (2) reasonable order of magnitude estimate of the change to the Contract Price (3) reasonable order of magnitude estimate of the time impact to the Contract Time; and (4) Contract provisions and substantive basis to support entitlement. Contractor's failure to provide the Notice of Intent as required by this Section 8.23 will act as a waiver of any right to bring any Claim related to the act, omission or impact in question.

Step 2: Within no more than 14 Days of submitting its Notice of Intent, The Contractor shall provide a detailed Request for Change Order to the Engineer. The Request for a Change Order shall include:

- Specific dollar amount covering all costs associated with the requested Change Order calculated in accordance with the Contract;
- Specific request for time extension (number of days);
- All documentation supporting the Request for a Change Order, including but not limited to all cost records and any schedule analysis.

Contractor's failure to provide the Request for Change Order as required by this Section 8.23 will act as a waiver of any right to bring any Claim related to the act, omission or impact in question.

The District will review each submitted Request for Change Order within thirty (30) Days after receipt and will respond in writing approving or denying the Request.

Step 3: If the Request for Change Order is denied, the Contractor within no more than thirty (30) Days of the denial shall file a written Claim. At a minimum, a fully documented Claim must contain the following information:

- A detailed statement of the Claim providing all necessary details, locations, and items of Work affected;
- The date on which the incident arose that gave rise to the Claim;



- The name of each person employed or associated with the Contractor, Subcontractors, suppliers, and/or the District with knowledge about the event or condition which gave rise to the Claim;
- Copies of documents and a written description of the substance of any oral communications that concern or relate to the Claim;
- The specific provisions of the Contract Documents on which the Claim is based;
- If an adjustment in the Contract Price is sought, the exact amount sought, calculated in accordance with the Contract and accompanied by all records supporting the Claim;
- If an adjustment in the Contract Time is sought, the specific days and dates for which it is sought; the specific reason the Contractor believes an adjustment in the Contract Time should be granted; and the Contractor's analyses of its Schedule, any specific Schedule analysis as required by the Contract Documents, and all updates to demonstrate the reason for the adjustment in Contract Time; and,
- A statement certifying, under penalty of perjury, that after the exercise of reasonable diligence and investigation the Claim is made in good faith, that the supporting cost and pricing data are true and accurate to the best of the 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 Price or Contract Time for which the Contractor believes the District is liable.

Failure to comply with the time requirements set for filing a Claim shall constitute acceptance by the Contractor, on behalf of itself and its Subcontractors and suppliers, of the District's denial of a Request for Change Order. Such acceptance shall be considered complete, full, and final settlement of all costs, damages, and Claims related to or arising from the Request for Change Order.

Any modification to the Contract made on account of any Request for Change Order or Claim shall be determined, in order of precedence, in the following ways:

1. By unit or lump sum prices set by the Contract.
2. If method (1) does not apply, by prices mutually agreed upon.
3. If no agreement is reached under method (2), payment for the Request for Change Order or Claim will be made under Force Account rules established pursuant to Section 8.25 of these General Conditions. In such cases, the Contractor shall keep and present in such form as the Engineer may direct a correct account of such costs, together with supporting time cards and vouchers.

After the Contractor has submitted a fully documented Claim that complies with this provision, the District shall respond, in writing, to the Contractor within thirty



(30) Days from the date of receipt of the fully documented Claim. If the District denies the Claim, the Contractor's sole remedy is as set forth in Section 8.46 (Venue/Limitation).

8.24 DIFFERING SITE CONDITIONS

If the Notice of Intent, Request for Change Order or Claim arises from an alleged Differing Site Condition, the requirements of this Section will apply in addition to those set forth in Section 8.23. In the event this Section imposes requirements, deadlines or rules more stringent than those set forth in Section 8.23, the requirements, deadlines or rules of this Section will govern.

The Contractor shall within 24 hours of discovery notify the Engineer in writing of: (1) pre-existing subsurface or latent physical conditions differing materially from those indicated in the Contract, or (2) pre-existing unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work of the character provided for in the Contract. This 24-hour Notice of Intent is in place of the 5 Day Notice of Intent listed in Section 8.23. Provided Contractor complies with this 24 hour Notice of Intent requirement and wishes to pursue relief, it must then comply with Step 2 and Step 3 set forth in Section 8.23. Contractor shall at all times preserve (and not dispose) the physical conditions or materials constituting the alleged Differing Site Condition and upon request make them available to the District for review and/or inspection.

Any geotechnical reports provided to Contractor shall have the following order of precedence: (1) Geotechnical Baseline Report (GBR) and/or Geotechnical Baselines described in the Specifications; (2) Geotechnical Data Report (GDR); (3) Geotechnical Design Report; (4) other soils reports, borings, test pits or additional investigative data. Baseline statements in the GBR and/or Geotechnical Baselines described in the Specifications shall take absolute precedence over any data in the GDR or elsewhere (or any inference or interpolation from such data) even if the baseline statements exceed the physical conditions identified in the data.

8.25 FORCE ACCOUNT

Except as provided herein, Force Account will be paid under the terms and conditions of Section 1-09.6 of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation. Notwithstanding the foregoing, the following provisions for Contractor Owned Equipment and Standby shall apply to all Force Account work performed under this contract:

Contractor Owned Equipment: For equipment owned by the Contractor, payment shall be made on the basis of Actual Cost. The term Actual Cost means the ownership and operating cost of the equipment as determined



by the District based on records made available by the Contractor. The District in determining Actual Cost may consider the equipment's acquisition cost, the equipment's useful life, any indirect costs associated with ownership of the equipment, depreciation and other commercially reasonable factors. It is the responsibility of the Contractor to provide cost records to the District upon request to assist with determining the Actual Cost for the equipment. If the Contractor did not keep and maintain such cost records or fails to comply with the document request made by the District, the District may at its option make a reasonable determination of the Actual Cost. If the Contractor disagrees with this determination, it must file a written Notice of Intent and pursue a Request for Change Order as set forth in Section 8.23.

Standby: Payment for equipment during any standby time or shutdown caused by the District shall be paid at: (i) 25% of Actual Cost (for owned equipment) or (ii) 100% of the applicable rental rate (for rental equipment) for a period not to exceed ten (10) Days.

8.26 DELAYS AND EXTENSION OF TIME

- (a) If the Contractor seeks an extension of the Contract Time or additional compensation due to an allegedly compensable impact to the Contract Time, its sole remedy is to comply with the Notice of Intent / Request for Change Order / Claim process identified in Section 8.23. The remainder of this Section 8.26 describes the general rules applicable to any timely-filed Notice of Intent / Request for Change Order / Claim related to Contract Time.
- (b) Non-Excusable and Non-Compensable Delays. Delays in the prosecution of the Work that could have been avoided by the exercise of due care, coordination and diligence on the part of the Contractor, its Subcontractors or its suppliers at any tier are neither excusable nor compensable under the Contract. No extension of Contract Time or increase in the Contract Price shall be allowed for any claimed delay that is caused by or results from the breach, fault, negligence, or collusion of the Contractor, or its Subcontractors, sub-Subcontractors, or suppliers.
- (c) Excusable and Non-compensable Delays. The Contract Time may be extended without compensation by the District for a period equivalent to the time that the Engineer determines that the Contractor was delayed in the Work by one or more of the following causes, beyond the control of the District and the Contractor, occurring during the performance of the Work:
 - 1. Fire or other casualty for which the Contractor is not at fault or otherwise responsible;
 - 2. Riot, war, or civil disorder;



3. Unusual and severe weather
4. General industry strikes or labor disputes beyond the reasonable control of Contractor,
5. Unreasonable delay in issuance of a permit by the agency having jurisdiction, and
6. Delay to the Work resulting from causes beyond the control of Contractor and District and that could not have been avoided by Contractor with the exercise of coordination, foresight and diligence.

Such non-compensable extensions of Contract Time will be allowed only to the extent that Substantial Completion of the Work is unreasonably delayed through no fault of the Contractor, which must in all cases be substantiated by impact to the Work on the Schedule. Any extension of the Contract Time by the District will be set forth in a Change Order, which shall specify the Days by which the Contract Time is to be increased.

(d) Excusable and Compensable Delays. The Contract Time may be extended and the Contract Price increased in the event that:

1. The Work was delayed by reason of changes made by the District or by any unreasonable act or omission of the District,
2. The Contractor was not concurrently responsible for the delay in the Work,
3. The Contractor has suffered actual losses as a result of the delay in the Work,
4. The delay in the Work could not have been mitigated despite the Contractor taking reasonable work-around actions, and
5. The delay in the Work was not within the contemplation of the Contract.

In that event, the Contract Time will be extended for a period equivalent to the time that the Engineer determines that the Contractor was delayed in the Work and the Contract Price will be increased to compensate the Contractor for its loss from such delay and associated disruption. Any extension of the Contract Time and increase in the Contract Price by the District will be set forth in a Change Order, which shall specify the Days by which the Contract Time is to be increased and the amount by which the Contract Price is to be increased.



8.27 COMPLETION AND/OR CORRECTION OF WORK

- (a) If the Contractor should neglect to prosecute the Work properly and/or fail to perform any provision of this Contract, the District, after five (5) Days' written notice to the Contractor, may, without prejudice to any other remedy it may have, make good such deficiencies and deduct the cost thereof from payments then or thereafter due the Contractor.
- (b) The Contractor shall promptly remove from the construction Site all Materials and/or Equipment rejected by the Engineer as failing to conform to the Contract, whether incorporated in the Work or not; and the Contractor shall promptly replace and re-execute its own Work in accordance with the intent of the Contract and without expense to the District and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement. If the Contractor does not remove such rejected Work and Materials and/or Equipment and commence re-execution of the Work within five (5) Days of notice from the Engineer, the District may correct the same as otherwise provided herein.
- (c) If the Contractor does not remove such rejected Work and Materials and/or Equipment within the period herein above described, the District may remove and store any such Materials and/or Equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal within ten (10) Days from the notice to Contractor of the fact of such removal, the District may, upon an additional ten (10) Days' written notice, sell such Materials and/or Equipment at public or private sale, and deduct all costs and expenses incurred, including costs of sale, accounting to the Contractor for the net proceeds remaining, and District may bid at any such sale. Contractor shall be liable to District for the amount of deficiency remaining between the costs incurred and the proceeds of sale. District may deduct the costs of such removal, storage and sale and/or remaining deficiency from any funds otherwise due the Contractor.

8.28 DEFECTS ARISING IN TWO YEARS AND REMEDIES

- (a) The Contractor shall be responsible for correcting all defects in workmanship and Materials and/or Equipment within two (2) years after Acceptance. When corrections of defects are made, Contractor shall be responsible for correcting all defects in workmanship and/or Materials and Equipment in the corrected Work for two years after proper completion of the correction. The Contractor shall start work to remedy such defects within seven (7) Days of mailing notice of discovery thereof by District and shall complete such work within a reasonable time. In emergencies, where damage may result from delay or where loss of service may result, such corrections may be made by the District, in which case the cost shall be borne by the Contractor. In the event the Contractor does not accomplish



corrections at the time specified, the Work will be otherwise accomplished and the cost of same shall be paid by the Contractor.

- (b) The Contractor shall be liable for any costs, losses, expenses, or damages, including consequential damages suffered by the District resulting from defects in the Work including, but not limited to, cost of Materials and labor extended by District in making emergency repairs and cost of engineering, inspection and supervision by District or Engineer. The Contractor shall hold the District harmless from any and all claims which may be made against the District as a result of any defective Work and the Contractor shall defend any such claims at its own expense.

8.29 SUSPENSION OF WORK

- (a) The District may order the Contractor, in writing, to suspend all or any part of the Work of this Contract for the period of time that the District determines appropriate for the convenience of the District. The Contractor shall not suspend the Work without written direction from the District specifically authorizing the suspension of Work.
- (b) Upon receipt of a written notice suspending the Work, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize costs attributable to such suspension. The District may require the Contractor to furnish temporary roads, patches, safety barricades, restorative work, or other measures to protect the Work, the Site, property adjacent to the Site, and public safety. Within a period up to 120 Days after the suspension notice is received by the Contractor, or within any extension of that period which the District requires, the District shall either:
 - 1. Cancel the written notice suspending the Work; or
 - 2. Terminate the Work for either Default or Convenience as provided in Sections 8.30 and 8.31.
- (c) If a written notice suspending the Work is canceled or the period of the Suspension or any extension thereof expires, the Contractor shall resume Work as required by the District.
- (d) If the performance of all or any part of the Work is, for an unreasonable period of time, suspended by the written direction of the District, and if the cause of the suspension is not the fault, breach or negligence of the Contractor or those for whom Contractor is responsible, the Contractor may be entitled to an adjustment in the Contract Price and/or Contract Time for increases in the time or cost of performance directly attributable to such unreasonably long suspension and provided that the Contractor sufficiently documents all costs and time impacts attributable to the suspension. No adjustments to Contract Price and/or Contract Time shall be allowed unless



the Contractor can demonstrate that the unreasonable period of suspension caused by the District impacted the Work and delayed the Contractor from completing the Work within the Contract Time. The Contractor shall comply with the requirements of Sections 8.23 and 8.26 in seeking an adjustment. Any sums paid to Contractor on account of suspension shall be determined in accordance with the order of precedence described in Section 8.23. Failure to comply with these requirements shall constitute a waiver of Contractor's rights to any adjustment in Contract Time and/or Contract Price.

- (e) No adjustment shall be made under this provision for any suspension to the extent that (1) Contractor's performance would have been suspended, delayed, or interrupted as a result of actions, omissions, fault or negligence caused, in whole or in part, by the Contractor or any of its Subcontractors and suppliers, (2) Contractor failed to diligently pursue the Work before the suspension, (3) the District suspended the Work due to Contractor's failure to comply with the Contract or the Engineer's orders, or (4) an equitable adjustment is provided for or excluded under any other provision of the Contract.
- (f) When ordered by the Engineer to suspend or resume Work, the Contractor shall do so immediately.
- (g) Before and during any suspension the Contractor shall protect the Work from damage or deterioration. Suspension shall not relieve the Contractor from anything the Contract requires unless this section states otherwise.

8.30 DISTRICT'S RIGHT TO TERMINATE CONTRACT FOR DEFAULT

- (a) The District may terminate the Contract and take possession of the premises and of all Materials and Equipment thereon and finish the Work by whatever methods it may deem expedient, upon the occurrence of any one or more of the events hereafter specified, and receipt of the certificate by the Engineer that sufficient cause exists to justify such action:
 - If the Contractor is insolvent, files a petition for bankruptcy protections, is adjudged bankrupt, makes a general assignment for the benefit of its creditors, or a receiver is appointed on account of its insolvency.
 - If the Contractor fails to supply a sufficient number of properly skilled workmen or proper Materials or Equipment for completion of the Work.
 - If the Contractor fails to prosecute the Work or any portion thereof with such diligence as will ensure Substantial Completion within the original Contract Time and any extensions of time which may have been granted to the Contractor by Change Order or otherwise.



- If the Contractor fails to prosecute the Work or any portion thereof with such diligence as will ensure Physical Completion of the Work in a timely manner.
- If the Contractor fails in a material way to repair, replace, or correct Work not in conformance with the Contract.
- If the Contractor fails to make prompt payment to its employees or Subcontractors and suppliers.
- If the Contractor disregards laws, ordinances, rules, codes, regulations, orders or similar requirements of any public entity having jurisdiction over the Contractor, the Work, or the Site.
- If Contractor fails to comply with any Contract safety requirement.
- If the Contractor otherwise materially breaches any provisions or requirements of the Contract or persistently disregards instructions of Engineer.

District shall give Contractor five (5) Days' written notice to cure the default and, if not cured to the satisfaction of District as certified by Engineer, the District may, upon three (3) Days' written notice, elect to so terminate. Any such termination shall be without prejudice to any other right or remedy which District may have against Contractor.

- (b) If Contractor fails to cure the default to the District's satisfaction within the five (5) Day cure period, or if the Contractor abandons the Work undertaken under the Contract, District may, at its option, upon ten (10) Days' written notice to the Surety and without any written notice to Contractor, transfer the employment of said Work from Contractor to Surety. Upon receipt of such notice, the Surety shall enter upon the premises and take possession of all Materials, Equipment, tools and appliances thereon for the purpose of completing the Work included under this Contract and employ, by contract or otherwise, any person or persons to finish the Work and provide the Materials and Equipment therefore, without termination of the continuing full force and effect of the Contract. In case of transfer of such employment to the Surety, the Surety shall be paid in its own name on estimates covering the Work subsequently performed under the terms of the Contract and according to the terms hereof, without any right of Contractor to make any claim for the same or any part thereof.
- (c) In the event that the Contract is terminated for default by the District, Contractor shall not be entitled to receive any further balance of the amount to be paid under this Contract until the Work shall have been fully finished. At such time, if the unpaid balance of the amount to be paid under this Contract exceeds the expense incurred by District in finishing the Work, and all damages sustained or which may be sustained by District by reason of such refusal, neglect, failure of discontinuance of employment, such excess



shall be paid by District to Contractor. If such expense and damages shall exceed the unpaid balance, Contractor and its Surety and each thereof shall be jointly and severally liable therefore to District and shall pay the difference to District. Such expense and damage shall include all reasonable legal costs incurred by District in the employment of attorneys to protect the rights and interests of District under the Contract.

8.31 DISTRICT'S RIGHT TO TERMINATE CONTRACT FOR CONVENIENCE

- (a) Upon written notice to the Contractor, the District may terminate the Work, or any part of it, without prejudice to any right or remedy of the District inclusive of all audit rights in the Contract, for the convenience of the District.
- (b) If the District terminates the Work or any portion thereof for convenience, Contractor shall be entitled to be paid, at applicable Contract rates and prices, for Adjusted Contract Work executed in conformance with the Contract and completed prior to the effective date of the termination.
- (c) Termination for Convenience shall not enlarge, expand, modify, alter or in any way subsume or convert the rights or remedies (if any) of Contractor with respect to any Claim, Request for Change Order, Notice of Intent or other request for any revision to the Contract Price or Contract Time asserted or accrued at the time of the termination (collectively, "Pending Requests"). Without limiting the foregoing, the termination for convenience shall not have the effect of converting the Pending Requests into no-fault or assumed liabilities of the District. Following any Termination for Convenience, Contractor's rights or remedies (if any) to any extra compensation, change in the Contract Price or additional Contract Time for any Pending Requests shall continue to be subject to and governed by the same Contract provisions, legal rules and processes, defenses and burdens of proof that would apply but for the termination.
- (d) Except as provided for above in Section 8.31(b) or (c), the Contractor shall not be entitled to any other costs or damages whatsoever (including without limitation profit or overhead on the terminated Work). The total sum payable upon termination shall also not exceed the Contract Price reduced by prior payments.
- (e) If it appears that due to any cause or reason the Contractor would have incurred a loss on the entire Contract had it been completed, the District shall not reimburse Contractor for any indirect costs for the Adjusted Contract Work completed and shall reduce the settlement to reflect the indicated rate of loss.
- (f) If the payments made by the District prior to the effective date of the termination exceed the reasonable direct cost of the Adjusted Contract



Work completed as of the effective date of the termination (as in, for example, a mobilization payment that exceeds direct mobilization costs or other similar front-loaded payments), the District shall at its option be entitled to a credit for the overpayment. The Contractor shall cooperate with any audit the District elects to conduct pursuant to the terms of the Contract.

- (g) The rights and remedies of the District in this provision are in addition to any other rights and remedies provided by law or under this Contract, inclusive specifically of all audit rights.

8.32 CONTRACTOR'S OBLIGATIONS DURING TERMINATION

Unless the District directs otherwise, after receipt of a written notice of Termination for Default or Termination for Convenience, Contractor shall promptly:

- (a) Stop performing Work on the date and as specified in the notice of termination;
- (b) 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 not terminated;
- (c) Cancel all orders and subcontracts, upon terms acceptable to the District, to the extent that they relate to the performance of Work terminated;
- (d) Assign as specifically requested by the District all of the rights, title, and interest of Contractor in all orders and subcontracts;
- (e) Take such action as may be necessary or as directed by the District to preserve and protect the Site and any other property related to this Project in the possession of Contractor in which the District has an interest;
- (f) Continue performance of the Work only to the extent not terminated;
- (g) If notified to do so by the District, promptly remove any part or all of its Equipment, Materials, and supplies from the Site; and,
- (h) Take any other steps required by the District with respect to the Project.

If Contractor fails to remove its Equipment, Materials, or supplies within three (3) Days of District's notice to do so, District shall have the right to remove such Equipment, Materials, and supplies at the expense of Contractor, deducting the cost thereof from any funds otherwise due Contractor.



8.33 USE OF COMPLETED PORTION OF WORK

District shall have the right to take possession of and use any completed or partially completed portions of the Work, notwithstanding that the time may not have expired for completing the entire Work. Such taking possession and use shall not be deemed to be completion of the Contract in respect to such Work nor shall the same be deemed to be Acceptance of the Work.

8.34 APPLICATION FOR PAYMENT

On or about the first business day of each month, the Contractor shall submit to the District an Application for Payment. Each application shall be on a form acceptable to the District and designated as an "Application for Payment." The Contractor shall include with each Application for Payment:

1. Current schedule of values reflecting the Work done since the last Application for Payment and the cumulative Work completed to date;
2. Project Schedule and the most current updates; and,
3. Affidavits signed by all Subcontractors performing Work as of the last Application for Payment, stating that each of them has been paid, less earned retainage, as their interests appeared in the last Application For Payment.

The Contractor is not entitled to payment for any Work unless the Application for Payment includes all required documentation. The District reserves the right to withhold payment pursuant to Section 8.38 if it is subsequently determined that all required documentation was not provided by the Contractor or any of the documentation provided by the Contractor was inaccurate or otherwise objectionable. At the District's option, no payments will be made after the date of expiration of the Contract Time, as established in the Contract, until final payment.

The Application for Payment shall correlate the amount requested with the schedule of values and with the state of completion of the Work, as measured by the current Project Schedule. In addition to Work performed by the Contractor, Applications for Payment may include the cost of Materials suitably stored on the Site in accordance with Section 8.35.

The District shall comply with RCW 39.76, as amended, and promptly review each Application for Payment and identify in writing any cause for disapproval within eight (8) working days. In addition to withholding payment for unsatisfactory performance or failure to comply with Contract requirements, if the Contractor's Application for Payment fails to recognize any back-charges, off-sets, credits, change orders, or deductions in payment made in accordance with Section 8.35, the District shall have the right to revise or disapprove Contractor's Application For



Payment because the Application For Payment is not considered a properly completed invoice.

8.35 PROGRESS PAYMENTS

Progress payments will be made no more often than monthly following Contractor's Application for Payment. Payment shall be based upon the actual quantities of Work performed as verified and agreed by the Engineer according to the Contract Documents. Payment shall be based upon invoices approved by the Engineer. Progress payments will be made within forty-five (45) Days of the District's receipt of the properly prepared invoice (Application for Payment). Monthly progress payments will be made to the Contractor during the working period but not after the Substantial Completion date. Five per cent (5%) of the amount of the estimated progress payment will be retained by the District as provided in Chapter 60.28 RCW. The statutory retained percentage shall be managed by the District as specified by the Contractor in the Proposal form of the Bid Documents.

The Contractor is required to make payment to all Subcontractors and suppliers for all Work included within the progress payment within ten (10) Days from the receipt of the progress payment. Furthermore, the Contractor shall require all subcontracts issued under this contract to all Subcontractors and suppliers at all tiers to also make all due payments within ten (10) Days of their receipt of payment. The Contractor must justify to the District in writing any intent to withhold payment of monies due to any Subcontractor or supplier.

The cost of Materials, properly stored, protected and insured at the Site of the Work, will be paid on monthly estimates only when provided for in the Special Provisions, and then only for the specific Materials listed therein for partial payment. In preparing the monthly estimates, advancement will be made therein for ninety per cent (90%) of the cost of such Materials, as evidenced by invoices to Contractor. Advances will not be made for any item of Material amounting to less than five hundred dollars (\$500.00). All Materials must conform to the requirements of the Specifications. However, advancement for Materials will not constitute acceptance of same, and any faulty Materials will be condemned although advancement may have been made for same in the estimates. Deductions at the same rates and equal in amount to the advancements, will be made on the estimates as the Materials are used. All Materials for which costs are allowed under this subparagraph must be substantiated by written documentation from the Material supplier that the Material has been paid for.

8.36 FINAL PAYMENT

The District will make final payment, excluding held retention, to the Contractor following (1) Physical Completion and (2) final resolution by settlement, mediation or litigation of all Requests for Change Orders or Claims. Final payment shall include the entire sum found to be due hereunder after deducting therefrom such



amounts as the terms of the Contract permit. Prior estimates and payments, including those relating to unit price Work, extra Work or Work omitted, shall be subject to review and correction by the final payment. Final payment will be made only for Materials actually incorporated in the Work; and, all Materials remaining for which progress payments have been made shall revert to the Contractor, unless otherwise agreed, and progress payments made for these items shall be deducted from the final payment for the Work.

By accepting final payment, the Contractor shall be deemed thereby to have released the District from all claims of Contractor and all liability to the Contractor for things done or furnished in connection with the Work and for every act and neglect of the District and others relating to or arising out of the Work, other than release and held retention. Final payment by the District shall not release the Contractor or its Surety from any obligation under the Contract or under the performance and payment bonds or under any warranty obligations.

Neither the final payment nor any part of the retained percentage shall become due until Contractor, if requested, shall deliver to District a complete release of all liens arising out of this Contract, or receipts in full in lieu thereof, and, if required in either case, an affidavit that so far as it has knowledge or information, the release and receipts include all labor and Material for which a lien could be filed; but Contractor may, if any Subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to Engineer to indemnify District against any lien. If any lien remains unsatisfied after all payments are made, Contractor shall reimburse to District all moneys that the latter may be compelled to pay in discharging such lien, including all costs and reasonable engineer's and attorney's fees.

8.37 ACCEPTANCE AND RELEASE OF RETAINAGE

Following issuance of the Notice of Physical Completion and the completion of all closeout administrative requirements, the District will formally accept the Project. Once the District determines that the Contractor has fulfilled these requirements, the Engineer will issue a formal Notice of Acceptance.

Promptly following Acceptance, the District will prepare the Notice of Completion of Public Works Contract and submit it to the relevant Washington State agencies.

Release of the retainage will be made no sooner than sixty (60) Days after issuing the Notice of Completion of a Public Works Contract provided the following conditions are met:

1. On Contracts totaling more than \$35,000, a release has been obtained from the Washington State Department of Revenue (RCW 60.28.051);
2. Receipt of a certificate of Payment of Contributions Penalties and Interest on Public Works Contract from the Washington State Employment Security Department;



3. Receipt of a certificate from Washington State Department of Labor and Industries showing the Contractor is current with payments of industrial insurance and medical aid premiums;
4. All claims, as provided by law, filed against the retainage have been resolved. In the event claims are filed and provided the conditions of 1 through 3 above are met, the Contractor will be paid such retained percentage less an amount sufficient to pay any such claims together with a sum determined by the District sufficient to pay the cost of foreclosing on claims and to cover attorney's fees.

It is the responsibility and a condition of this Contract that Contractor promptly notifies all Subcontractors and suppliers of the commencement of the period and of the final day for submitting any liens. As a further condition of this Contract the Contractor is required to place within all subcontracts a clause that states that this shall be done. The Contractor shall by letter inform the District of the compliance with this provision. Failure of the Contractor to comply with this provision may be used by the District as a basis to withhold retainage to ensure payment to uninformed Subcontractors. Failure to comply will also be made a matter of record for future determinations of Bidder responsibility.

8.38 DISTRICT'S RIGHT TO WITHHOLD PAYMENTS

In addition to moneys retained pursuant to RCW 60.28 and without waiver of any other available remedies, the District at its sole option has the right to recapture, withhold, nullify, or back-charge, in whole or in part, any payments due to Contractor or payments made to the Contractor on the following grounds:

1. The Work for which the Contractor is claiming payment was not performed in accordance with the Contract;
2. The Contractor's pay request does not contain the required documentation or is otherwise not in conformance with the requirements of the Contract;
3. There is a good faith dispute over all or a portion of the amount due, in accordance with 39.04.250 RCW;
4. Failure of the Contractor to make payments owed to Subcontractors, or for labor, Materials, or Equipment;
5. Failure of the Contractor to submit Schedule(s), schedule(s) of value or update any schedules as required by the Contract;
6. Failure to prosecute progress of the Work in a timely manner or failure to take necessary steps to regain time or deliver the Work in the prescribed Contract Time;
7. A reasonable doubt that the Contract can be completed for the balance then unpaid;



8. Cost or liability that may occur to the District as the result of the Contractor's or Subcontractor's acts, omissions, fault, or negligence;
9. Failure of the Contractor to repair damaged materials, equipment, property, or Work;
10. Imposition of any liquidated or other delay damages under the Contract;
11. Payments made by mistake; or
12. Payments made erroneously and/or in excess of the sum actually due under the Contract.

The withholding, nullification, or back-charge of any payment(s) by the District shall in no way relieve the Contractor of any of its obligations under this Contract. In the event the District withholds all or a part of a payment for deficiencies in either performance, or in a payment request, the District will notify the Contractor in accordance with RCW 39.76. The Contractor shall have the right to correct all deficiencies that are the basis for the withholding and resubmit the pay request at any time for reconsideration.

8.39 HOLD HARMLESS AGREEMENT

The Contractor shall protect, defend, indemnify and hold harmless the District, its officers, officials, separate contractors, employees, agents, and successors and assigns, (collectively "the Indemnified Parties") from any and all liability, claims, demands, suits, penalties, losses, damages, judgments, or costs of any kind whatsoever (hereinafter "claims"), arising out of or in any way, whether direct, indirect or consequential (including, but not limited to, attorneys' and consultants' fees and other expenses of litigation or arbitration) resulting from the Contractor's and/or Subcontractor's and supplier's of all tiers acts or omissions, performance or failure to perform this Contract, to the maximum extent permitted by law or as defined by RCW 4.24.115, now enacted or as hereinafter amended; provided, however, that if the provisions of RCW 4.24.115 apply to the Work and any injuries to persons or property arising out of performance of this Contract are caused by or result from the concurrent negligence of the Contractor or its Subcontractors, agents or employees, and an Indemnified Party, the indemnification applies only to the extent of the negligence of the Contractor and its Subcontractors, agents or employees. This Paragraph shall not be construed so as to require the Contractor to defend, indemnify, or hold harmless the District from such claims, damages, losses or expenses caused by or resulting from the sole negligence of the District or its agents.

The Contractor specifically assumes potential liability for actions brought by the Contractor's own employees or former employees against any Indemnified Party, and for that purpose the Contractor specifically waives all immunity and limitations on liability under the workers compensation act, RCW Title 51, or any industrial insurance act, disability benefit act or other employee benefit act of any jurisdiction



that would otherwise be applicable in the case of such claim. The Contractor recognizes that this waiver was specifically entered into and was the subject of mutual negotiation. Provided, however, the Contractor's waiver of immunity by the provisions of this paragraph extends only to claims against the Contractor by District, and does not include, or extend to, any claims by the Contractor's employee directly against the Contractor.

The District may, in its sole discretion, (1) withhold amounts sufficient to pay the amount of any claim for injury, and/or (2) pay any claim for injury of which the District may have knowledge, regardless of the formalities of notice of such claim, arising out of the performance of this Contract. Any amount withheld will be held until the Contractor secures a written release from the claimant, obtains a court decision that such claim is without merit, or satisfies any judgment on such claim. In addition, the Contractor shall reimburse and otherwise be liable for claims costs incurred by the District, including, without limitation, attorneys' fees and costs and costs for claims adjusting services, engineering, and administration.

In the event the District incurs any judgment, award, and/or costs arising therefrom, including attorneys' fees, to enforce the provisions of this article, all such fees, expenses, and costs shall be recoverable from the Contractor.

The foregoing indemnities and duties to defend shall survive the termination of this Contract and final payment hereunder, and are in addition to any other rights or remedies which District and/or any of the Indemnified Parties may have by law or under this Contract.

8.40 PERFORMANCE AND PAYMENT BOND

The Contractor shall furnish a surety bond in compliance with RCW 39.08 in the full amount of the Contract Price which shall guarantee the faithful performance of the Contract and the payment of all labor, mechanics, Subcontractors and Material suppliers. This bond shall remain in force until all obligations of the Contract are extinguished or until the expiration of all applicable statutes of repose or limitation, whichever is later. Without limiting the foregoing, this bond shall cover, for a period of two (2) years after Physical Completion, all faulty workmanship and Materials or items of Work warranted by Contractor. This bond shall be furnished by a corporate surety company rated A-VII or higher by A. M. Best, authorized to do business in the State of Washington, acceptable to the District, and subject to the approval of the District's attorney as to form.

8.41 ASSIGNMENT AND SUBCONTRACTING

- (a) Contractor shall not assign the Contract in whole or in part without the written consent of District, nor shall Contractor assign any moneys due or to become due to him hereunder without the prior written consent of District.



- (b) Contractor agrees that it is fully responsible to District for the acts or omissions of Subcontractors and persons either directly or indirectly employed by Subcontractors, as well as for the acts and omissions of persons directly employed by Contractor. District's consent to subcontracting parts of the Work shall in no way release Contractor from responsibility for performance of the Work. Contractor will be held, in all aspects, accountable for subcontracted Work as if no consent had been given. Contractor shall be required to give its personal attention to the Work that is subcontracted. Nothing contained in the Contract Documents shall create any contractual relation between any Subcontractor and District.

8.42 SEPARATE CONTRACT - INTERFERENCE WITH OTHER CONTRACTORS

- (a) District reserves the right to perform work with its own forces or to let other contracts for work under similar general conditions in connection with this Project, of which the work awarded to one or more contractors under separate contracts is a part. Contractor shall afford District and other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their respective work and shall properly connect and coordinate its Work with theirs.
- (b) If the performance of any contract for the Project is likely to be interfered with by the simultaneous execution of some other contract or contracts, Engineer shall decide which contractor shall cease work temporarily and which contractor shall continue or whether the work under the contractor can be coordinated so that the contractors may proceed simultaneously. District shall not be responsible for any damages suffered or extra costs incurred by Contractor resulting directly or indirectly from the award, performance, or attempted performance of any other contract or contracts on the Project or caused by any decision or omission of Engineer respecting the order of precedence in the performance of the contractors other than for an extension of Contract Time.

8.43 CLEANUP

- (a) During performance of the Work, Contractor shall frequently clean up all refuse, rubbish, scrap material and debris caused by its operations. The Site of the Work shall present a neat, orderly and workmanlike appearance at all times.
- (b) Upon completion of the Work, Contractor shall remove all rubbish, scrap material, tools, scaffolding and surplus Materials and Equipment used in and about the Work. Before the Contract shall be considered complete and prior to final payment, Contractor shall remove all surplus Materials and Equipment, falseworks, temporary structures, including foundations thereof, plants of any description, and debris of every nature, resulting from its



operations, shall clean out all ditches that may have been filled during the Work, replace damaged surfacing, and put the Site in a neat, orderly condition and, in respect to structures, shall clean all windows and leave buildings broom clean.

8.44 PROPERTY RESTORATION RELEASE

The Contractor shall obtain a written release from each property owner upon whose property Work has been performed or Materials stored. A sample form of such release is included in the Special Provisions section.

8.45 PREVENTION OF ENVIRONMENTAL POLLUTION

The Contractor shall comply with all Federal, State and local statutes, ordinances and regulations dealing with the prevention of environmental pollution and preservation of public human resources that affect or are affected by this Project including, but not limited to, the State Environmental Policy Act of 1971, the National Environmental Policy Act of 1969, King County Council Ordinance No. 1700, King County Council Motion 1335, and any current amendments thereto which are hereby incorporated into the Contract as if written herein in full. All costs for compliance shall be included in the unit or lump sum prices bid for the several items of Work as indicated in the Proposal.

8.46 VENUE/LIMITATION

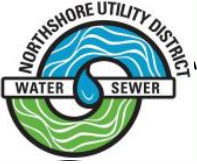
The exclusive venue for any litigation arising from or relating to this Contract or the Project is King County Superior Court, Seattle, Washington. This Contract and all provisions hereof shall be interpreted in accordance with the laws of the State of Washington.

No legal action against the District may be filed on account of a Claim or other liability arising out of or related to this Contract unless:

1. The requirements of Sections 8.23, 8.24, and 8.26 have been strictly complied with;
2. The procedures of Sections 8.23 and 8.24 have been exhausted; and,
3. The lawsuit is filed in the exclusive venue specified above and served on the District within 180 Days of the date of Substantial Completion.

The Contractor's failure to strictly comply with all requirements of this Section shall be a complete bar to any lawsuit.

APPENDICES



APPENDIX A – CITY OF KENMORE PERMITS



Permit Conditions

City of Kenmore

Permit Number: **BLD21-0955**

Description: **NUD Building A TI**

Applied: **12/21/2021**

Approved: **5/24/2022**

Site Address: **6830 NE 185TH ST**

Issued:

Finalized:

City, State Zip Code: **KENMORE, WA 98028**

Status: **READY TO ISSUE**

Applicant: **AARON PEASE**

Parent Permit:

Owner: **NORTHSHORE UTILITY DISTRICT**

Parent Project:

Contractor: **<NONE>**

DRAFT

Details:

LIST OF CONDITIONS

SEQ NO	ADDED DATE	REQUIRED DATE	SATISFY DATE	TYPE	STATUS
DEPARTMENT		CONTACT		REMARKS	
0	5/21/2022			BLD: SPECIAL INSPECTION REQUIRED	PRIOR TO ISSUANCE
DEVELOPMENT SVCS		LUKASZ LISOWSKI			
Notes:					
SPECIAL INSPECTIONS REQUIRED PER IBC IN ADDITION TO CITY INSPECTIONS; PRIOR TO PERMIT ISSUANCE, APPLICANT MUST SUBMIT SIGNED SPECIAL INSPECTION AGREEMENT FOR APPROVAL FROM THE BUILDING DEPARTMENT					
1	5/21/2022			BLD: PLU AND MEC PERMITS	FOR INFORMATION
DEVELOPMENT SVCS		TELA GARDNER			
Notes:					
Plumbing and mechanical work not included in scope of permit; separate permits required.					
2	2/7/2022			FIRE CONDITION(S)	FOR INFORMATION
DEVELOPMENT SVCS		BUTCH NOBLE			
Notes:					
Fire Department conditions apply per Derek LaFontaine, Fire Marshal; see memo dated 2/7/2022. Conditions shall be verified and inspected prior to final and/or certificate of occupancy.					
2. Required sprinkler and fire alarm modifications must be on deferred submittals and applied for at the Northshore Fire Department.					



APPENDIX B – WAGE RATES

**WASHINGTON STATE PREVAILING WAGE
RATES**

State of Washington
 Department of Labor & Industries
 Prevailing Wage Section - Telephone 360-902-5335
 PO Box 44540, Olympia, WA 98504-4540

Washington State Prevailing Wage

The PREVAILING WAGES listed here include both the hourly wage rate and the hourly rate of fringe benefits. On public works projects, worker's wage and benefit rates must add to not less than this total. A brief description of overtime calculation requirements are provided on the Benefit Code Key.

Journey Level Prevailing Wage Rates for the Effective Date: 03/28/2023

<u>County</u>	<u>Trade</u>	<u>Job Classification</u>	<u>Wage</u>	<u>Holiday</u>	<u>Overtime</u>	<u>Note</u>	<u>*Risk Class</u>
King	Asbestos Abatement Workers	Journey Level	\$56.80	<u>5D</u>	<u>1H</u>		View
King	Boilermakers	Journey Level	\$74.29	<u>5N</u>	<u>1C</u>		View
King	Brick Mason	Journey Level	\$66.32	<u>7E</u>	<u>1N</u>		View
King	Brick Mason	Pointer-Caulker-Cleaner	\$66.32	<u>7E</u>	<u>1N</u>		View
King	Building Service Employees	Janitor	\$28.23	<u>5S</u>	<u>2F</u>		View
King	Building Service Employees	Traveling Waxer/Shampooer	\$28.68	<u>5S</u>	<u>2F</u>		View
King	Building Service Employees	Window Cleaner (Non-Scaffold)	\$32.18	<u>5S</u>	<u>2F</u>		View
King	Building Service Employees	Window Cleaner (Scaffold)	\$33.18	<u>5S</u>	<u>2F</u>		View
King	Cabinet Makers (In Shop)	Journey Level	\$22.74		<u>1</u>		View
King	Carpenters	Acoustical Worker	\$71.53	<u>15J</u>	<u>4C</u>		View
King	Carpenters	Bridge, Dock And Wharf Carpenters	\$71.53	<u>15J</u>	<u>4C</u>		View
King	Carpenters	Floor Layer & Floor Finisher	\$71.53	<u>15J</u>	<u>4C</u>		View
King	Carpenters	Journey Level	\$71.53	<u>15J</u>	<u>4C</u>		View
King	Carpenters	Scaffold Erector	\$71.53	<u>15J</u>	<u>4C</u>		View
King	Cement Masons	Application of all Composition Mastic	\$70.09	<u>15J</u>	<u>4U</u>		View
King	Cement Masons	Application of all Epoxy Material	\$69.59	<u>15J</u>	<u>4U</u>		View
King	Cement Masons	Application of all Plastic Material	\$70.09	<u>15J</u>	<u>4U</u>		View
King	Cement Masons	Application of Sealing Compound	\$69.59	<u>15J</u>	<u>4U</u>		View
King	Cement Masons	Application of Underlayment	\$70.09	<u>15J</u>	<u>4U</u>		View
King	Cement Masons	Building General	\$69.59	<u>15J</u>	<u>4U</u>		View
King	Cement Masons	Composition or Kalman Floors	\$70.09	<u>15J</u>	<u>4U</u>		View
King	Cement Masons	Concrete Paving	\$69.59	<u>15J</u>	<u>4U</u>		View
King	Cement Masons	Curb & Gutter Machine	\$70.09	<u>15J</u>	<u>4U</u>		View
King	Cement Masons	Curb & Gutter, Sidewalks	\$69.59	<u>15J</u>	<u>4U</u>		View
King	Cement Masons	Curing Concrete	\$69.59	<u>15J</u>	<u>4U</u>		View
King	Cement Masons	Finish Colored Concrete	\$70.09	<u>15J</u>	<u>4U</u>		View

King	Cement Masons	Floor Grinding	\$70.09	15J	4U		View
King	Cement Masons	Floor Grinding/Polisher	\$69.59	15J	4U		View
King	Cement Masons	Green Concrete Saw, self-powered	\$70.09	15J	4U		View
King	Cement Masons	Grouting of all Plates	\$69.59	15J	4U		View
King	Cement Masons	Grouting of all Tilt-up Panels	\$69.59	15J	4U		View
King	Cement Masons	Gunite Nozzleman	\$70.09	15J	4U		View
King	Cement Masons	Hand Powered Grinder	\$70.09	15J	4U		View
King	Cement Masons	Journey Level	\$69.59	15J	4U		View
King	Cement Masons	Patching Concrete	\$69.59	15J	4U		View
King	Cement Masons	Pneumatic Power Tools	\$70.09	15J	4U		View
King	Cement Masons	Power Chipping & Brushing	\$70.09	15J	4U		View
King	Cement Masons	Sand Blasting Architectural Finish	\$70.09	15J	4U		View
King	Cement Masons	Screed & Rodding Machine	\$70.09	15J	4U		View
King	Cement Masons	Spackling or Skim Coat Concrete	\$69.59	15J	4U		View
King	Cement Masons	Troweling Machine Operator	\$70.09	15J	4U		View
King	Cement Masons	Troweling Machine Operator on Colored Slabs	\$70.09	15J	4U		View
King	Cement Masons	Tunnel Workers	\$70.09	15J	4U		View
King	Divers & Tenders	Bell/Vehicle or Submersible Operator (Not Under Pressure)	\$126.05	15J	4C		View
King	Divers & Tenders	Dive Supervisor/Master	\$89.94	15J	4C		View
King	Divers & Tenders	Diver	\$126.05	15J	4C	8V	View
King	Divers & Tenders	Diver On Standby	\$84.94	15J	4C		View
King	Divers & Tenders	Diver Tender	\$77.16	15J	4C		View
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 0-30.00 PSI	\$89.09	15J	4C		View
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 30.01 - 44.00 PSI	\$94.09	15J	4C		View
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 44.01 - 54.00 PSI	\$107.09	15J	4C		View
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 54.01 - 60.00 PSI	\$103.09	15J	4C		View
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 60.01 - 64.00 PSI	\$105.59	15J	4C		View
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 64.01 - 68.00 PSI	\$110.59	15J	4C		View
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 68.01 - 70.00 PSI	\$112.59	15J	4C		View
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 70.01 - 72.00 PSI	\$114.59	15J	4C		View

King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 72.01 - 74.00 PSI	\$116.59	15J	4C		View
King	Divers & Tenders	Manifold Operator	\$77.16	15J	4C		View
King	Divers & Tenders	Manifold Operator Mixed Gas	\$82.16	15J	4C		View
King	Divers & Tenders	Remote Operated Vehicle Operator/Technician	\$77.16	15J	4C		View
King	Divers & Tenders	Remote Operated Vehicle Tender	\$71.98	15J	4C		View
King	Dredge Workers	Assistant Engineer	\$76.56	5D	3F		View
King	Dredge Workers	Assistant Mate (Deckhand)	\$75.97	5D	3F		View
King	Dredge Workers	Boatmen	\$76.56	5D	3F		View
King	Dredge Workers	Engineer Welder	\$78.03	5D	3F		View
King	Dredge Workers	Leverman, Hydraulic	\$79.59	5D	3F		View
King	Dredge Workers	Mates	\$76.56	5D	3F		View
King	Dredge Workers	Oiler	\$75.97	5D	3F		View
King	Drywall Applicator	Journey Level	\$71.53	15J	4C		View
King	Drywall Tapers	Journey Level	\$70.61	5P	1E		View
King	Electrical Fixture Maintenance Workers	Journey Level	\$37.19	5L	1E		View
King	Electricians - Inside	Cable Splicer	\$102.90	7C	4E		View
King	Electricians - Inside	Cable Splicer (tunnel)	\$110.61	7C	4E		View
King	Electricians - Inside	Certified Welder	\$99.38	7C	4E		View
King	Electricians - Inside	Certified Welder (tunnel)	\$106.75	7C	4E		View
King	Electricians - Inside	Construction Stock Person	\$49.28	7C	4E		View
King	Electricians - Inside	Journey Level	\$95.88	7C	4E		View
King	Electricians - Inside	Journey Level (tunnel)	\$102.90	7C	4E		View
King	Electricians - Motor Shop	Journey Level	\$48.68	5A	1B		View
King	Electricians - Powerline Construction	Cable Splicer	\$93.00	5A	4D		View
King	Electricians - Powerline Construction	Certified Line Welder	\$85.42	5A	4D		View
King	Electricians - Powerline Construction	Groundperson	\$55.27	5A	4D		View
King	Electricians - Powerline Construction	Heavy Line Equipment Operator	\$85.42	5A	4D		View
King	Electricians - Powerline Construction	Journey Level Lineperson	\$85.42	5A	4D		View
King	Electricians - Powerline Construction	Line Equipment Operator	\$73.35	5A	4D		View
King	Electricians - Powerline Construction	Meter Installer	\$55.27	5A	4D	8W	View
King	Electricians - Powerline Construction	Pole Sprayer	\$85.42	5A	4D		View
King	Electricians - Powerline Construction	Powderperson	\$63.50	5A	4D		View
King	Electronic Technicians	Journey Level	\$62.13	7E	1E		View
King	Elevator Constructors	Mechanic	\$107.49	7D	4A		View
King	Elevator Constructors	Mechanic In Charge	\$116.13	7D	4A		View
King	Fabricated Precast Concrete Products	All Classifications - In-Factory Work Only	\$21.34	5B	1R		View

King	Fence Erectors	Fence Erector	\$48.14	15J	4V	8Y	View
King	Fence Erectors	Fence Laborer	\$48.14	15J	4V	8Y	View
King	Flaggers	Journey Level	\$48.14	15J	4V	8Y	View
King	Glaziers	Journey Level	\$75.91	7L	1Y		View
King	Heat & Frost Insulators And Asbestos Workers	Journey Level	\$84.84	15H	11C		View
King	Heating Equipment Mechanics	Journey Level	\$94.11	7F	1E		View
King	Hod Carriers & Mason Tenders	Journey Level	\$59.85	15J	4V	8Y	View
King	Industrial Power Vacuum Cleaner	Journey Level	\$15.74		1		View
King	Inland Boatmen	Boat Operator	\$61.41	5B	1K		View
King	Inland Boatmen	Cook	\$56.48	5B	1K		View
King	Inland Boatmen	Deckhand	\$57.48	5B	1K		View
King	Inland Boatmen	Deckhand Engineer	\$58.81	5B	1K		View
King	Inland Boatmen	Launch Operator	\$58.89	5B	1K		View
King	Inland Boatmen	Mate	\$57.31	5B	1K		View
King	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Cleaner Operator, Foamer Operator	\$31.49		1		View
King	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Grout Truck Operator	\$15.74		1		View
King	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Head Operator	\$24.91		1		View
King	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Technician	\$19.33		1		View
King	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Tv Truck Operator	\$20.45		1		View
King	Insulation Applicators	Journey Level	\$71.53	15J	4C		View
King	Ironworkers	Journeyman	\$83.79	7N	10		View
King	Laborers	Air, Gas Or Electric Vibrating Screed	\$56.80	15J	4V	8Y	View
King	Laborers	Airtrac Drill Operator	\$58.56	15J	4V	8Y	View
King	Laborers	Ballast Regular Machine	\$56.80	15J	4V	8Y	View
King	Laborers	Batch Weighman	\$48.14	15J	4V	8Y	View
King	Laborers	Brick Pavers	\$56.80	15J	4V	8Y	View
King	Laborers	Brush Cutter	\$56.80	15J	4V	8Y	View
King	Laborers	Brush Hog Feeder	\$56.80	15J	4V	8Y	View
King	Laborers	Burner	\$56.80	15J	4V	8Y	View
King	Laborers	Caisson Worker	\$58.56	15J	4V	8Y	View
King	Laborers	Carpenter Tender	\$56.80	15J	4V	8Y	View
King	Laborers	Cement Dumper-paving	\$57.84	15J	4V	8Y	View
King	Laborers	Cement Finisher Tender	\$56.80	15J	4V	8Y	View
King	Laborers	Change House Or Dry Shack	\$56.80	15J	4V	8Y	View
King	Laborers	Chipping Gun (30 Lbs. And Over)	\$57.84	15J	4V	8Y	View
King	Laborers	Chipping Gun (Under 30 Lbs.)	\$56.80	15J	4V	8Y	View
King	Laborers	Choker Setter	\$56.80	15J	4V	8Y	View

King	Laborers	Chuck Tender	\$56.80	15J	4V	8Y	View
King	Laborers	Clary Power Spreader	\$57.84	15J	4V	8Y	View
King	Laborers	Clean-up Laborer	\$56.80	15J	4V	8Y	View
King	Laborers	Concrete Dumper/Chute Operator	\$57.84	15J	4V	8Y	View
King	Laborers	Concrete Form Stripper	\$56.80	15J	4V	8Y	View
King	Laborers	Concrete Placement Crew	\$57.84	15J	4V	8Y	View
King	Laborers	Concrete Saw Operator/Core Driller	\$57.84	15J	4V	8Y	View
King	Laborers	Crusher Feeder	\$48.14	15J	4V	8Y	View
King	Laborers	Curing Laborer	\$56.80	15J	4V	8Y	View
King	Laborers	Demolition: Wrecking & Moving (Incl. Charred Material)	\$56.80	15J	4V	8Y	View
King	Laborers	Ditch Digger	\$56.80	15J	4V	8Y	View
King	Laborers	Diver	\$58.56	15J	4V	8Y	View
King	Laborers	Drill Operator (Hydraulic, Diamond)	\$57.84	15J	4V	8Y	View
King	Laborers	Dry Stack Walls	\$56.80	15J	4V	8Y	View
King	Laborers	Dump Person	\$56.80	15J	4V	8Y	View
King	Laborers	Epoxy Technician	\$56.80	15J	4V	8Y	View
King	Laborers	Erosion Control Worker	\$56.80	15J	4V	8Y	View
King	Laborers	Faller & Bucker Chain Saw	\$57.84	15J	4V	8Y	View
King	Laborers	Fine Graders	\$56.80	15J	4V	8Y	View
King	Laborers	Firewatch	\$48.14	15J	4V	8Y	View
King	Laborers	Form Setter	\$57.84	15J	4V	8Y	View
King	Laborers	Gabian Basket Builders	\$56.80	15J	4V	8Y	View
King	Laborers	General Laborer	\$56.80	15J	4V	8Y	View
King	Laborers	Grade Checker & Transit Person	\$59.85	15J	4V	8Y	View
King	Laborers	Grinders	\$56.80	15J	4V	8Y	View
King	Laborers	Grout Machine Tender	\$56.80	15J	4V	8Y	View
King	Laborers	Groutmen (Pressure) Including Post Tension Beams	\$57.84	15J	4V	8Y	View
King	Laborers	Guardrail Erector	\$56.80	15J	4V	8Y	View
King	Laborers	Hazardous Waste Worker (Level A)	\$58.56	15J	4V	8Y	View
King	Laborers	Hazardous Waste Worker (Level B)	\$57.84	15J	4V	8Y	View
King	Laborers	Hazardous Waste Worker (Level C)	\$56.80	15J	4V	8Y	View
King	Laborers	High Scaler	\$58.56	15J	4V	8Y	View
King	Laborers	Jackhammer	\$57.84	15J	4V	8Y	View
King	Laborers	Laserbeam Operator	\$57.84	15J	4V	8Y	View
King	Laborers	Maintenance Person	\$56.80	15J	4V	8Y	View
King	Laborers	Manhole Builder-Mudman	\$57.84	15J	4V	8Y	View
King	Laborers	Material Yard Person	\$56.80	15J	4V	8Y	View
King	Laborers	Mold Abatement Worker	\$56.80	15J	4V	8Y	View
King	Laborers	Motorman-Dinky Locomotive	\$59.95	15J	4V	8Y	View

King	Laborers	nozzleman (concrete pump, green cutter when using combination of high pressure air & water on concrete & rock, sandblast, gunite, shotcrete, water blaster, vacuum blaster)	\$59.85	15J	4V	8Y	View
King	Laborers	Pavement Breaker	\$57.84	15J	4V	8Y	View
King	Laborers	Pilot Car	\$48.14	15J	4V	8Y	View
King	Laborers	Pipe Layer (Lead)	\$59.85	15J	4V	8Y	View
King	Laborers	Pipe Layer/Tailor	\$57.84	15J	4V	8Y	View
King	Laborers	Pipe Pot Tender	\$57.84	15J	4V	8Y	View
King	Laborers	Pipe Reliner	\$57.84	15J	4V	8Y	View
King	Laborers	Pipe Wrapper	\$57.84	15J	4V	8Y	View
King	Laborers	Pot Tender	\$56.80	15J	4V	8Y	View
King	Laborers	Powderman	\$58.56	15J	4V	8Y	View
King	Laborers	Powderman's Helper	\$56.80	15J	4V	8Y	View
King	Laborers	Power Jacks	\$57.84	15J	4V	8Y	View
King	Laborers	Railroad Spike Puller - Power	\$57.84	15J	4V	8Y	View
King	Laborers	Raker - Asphalt	\$59.85	15J	4V	8Y	View
King	Laborers	Re-timberman	\$58.56	15J	4V	8Y	View
King	Laborers	Remote Equipment Operator	\$57.84	15J	4V	8Y	View
King	Laborers	Rigger/Signal Person	\$57.84	15J	4V	8Y	View
King	Laborers	Rip Rap Person	\$56.80	15J	4V	8Y	View
King	Laborers	Rivet Buster	\$57.84	15J	4V	8Y	View
King	Laborers	Rodder	\$57.84	15J	4V	8Y	View
King	Laborers	Scaffold Erector	\$56.80	15J	4V	8Y	View
King	Laborers	Scale Person	\$56.80	15J	4V	8Y	View
King	Laborers	Sloper (Over 20")	\$57.84	15J	4V	8Y	View
King	Laborers	Sloper Sprayer	\$56.80	15J	4V	8Y	View
King	Laborers	Spreader (Concrete)	\$57.84	15J	4V	8Y	View
King	Laborers	Stake Hopper	\$56.80	15J	4V	8Y	View
King	Laborers	Stock Piler	\$56.80	15J	4V	8Y	View
King	Laborers	Swinging Stage/Boatswain Chair	\$48.14	15J	4V	8Y	View
King	Laborers	Tamper & Similar Electric, Air & Gas Operated Tools	\$57.84	15J	4V	8Y	View
King	Laborers	Tamper (Multiple & Self-propelled)	\$57.84	15J	4V	8Y	View
King	Laborers	Timber Person - Sewer (Lagger, Shorer & Cribber)	\$57.84	15J	4V	8Y	View
King	Laborers	Toolroom Person (at Jobsite)	\$56.80	15J	4V	8Y	View
King	Laborers	Topper	\$56.80	15J	4V	8Y	View
King	Laborers	Track Laborer	\$56.80	15J	4V	8Y	View
King	Laborers	Track Liner (Power)	\$57.84	15J	4V	8Y	View
King	Laborers	Traffic Control Laborer	\$51.48	15J	4V	9C	View
King	Laborers	Traffic Control Supervisor	\$54.55	15J	4V	9C	View
King	Laborers	Truck Spotter	\$56.80	15J	4V	8Y	View
King	Laborers	Tugger Operator	\$57.84	15J	4V	8Y	View

King	Laborers	Tunnel Work-Compressed Air Worker 0-30 psi	\$158.87	15J	4V	9B	View
King	Laborers	Tunnel Work-Compressed Air Worker 30.01-44.00 psi	\$163.90	15J	4V	9B	View
King	Laborers	Tunnel Work-Compressed Air Worker 44.01-54.00 psi	\$167.58	15J	4V	9B	View
King	Laborers	Tunnel Work-Compressed Air Worker 54.01-60.00 psi	\$173.28	15J	4V	9B	View
King	Laborers	Tunnel Work-Compressed Air Worker 60.01-64.00 psi	\$175.40	15J	4V	9B	View
King	Laborers	Tunnel Work-Compressed Air Worker 64.01-68.00 psi	\$180.50	15J	4V	9B	View
King	Laborers	Tunnel Work-Compressed Air Worker 68.01-70.00 psi	\$182.40	15J	4V	9B	View
King	Laborers	Tunnel Work-Compressed Air Worker 70.01-72.00 psi	\$184.40	15J	4V	9B	View
King	Laborers	Tunnel Work-Compressed Air Worker 72.01-74.00 psi	\$186.40	15J	4V	9B	View
King	Laborers	Tunnel Work-Guage and Lock Tender	\$59.95	15J	4V	8Y	View
King	Laborers	Tunnel Work-Miner	\$59.95	15J	4V	8Y	View
King	Laborers	Vibrator	\$57.84	15J	4V	8Y	View
King	Laborers	Vinyl Seamer	\$56.80	15J	4V	8Y	View
King	Laborers	Watchman	\$43.76	15J	4V	8Y	View
King	Laborers	Welder	\$57.84	15J	4V	8Y	View
King	Laborers	Well Point Laborer	\$57.84	15J	4V	8Y	View
King	Laborers	Window Washer/Cleaner	\$43.76	15J	4V	8Y	View
King	Laborers - Underground Sewer & Water	General Laborer & Topman	\$56.80	15J	4V	8Y	View
King	Laborers - Underground Sewer & Water	Pipe Layer	\$57.84	15J	4V	8Y	View
King	Landscape Construction	Landscape Construction/Landscaping Or Planting Laborers	\$43.76	15J	4V	8Y	View
King	Landscape Construction	Landscape Operator	\$78.80	15J	11G	8X	View
King	Landscape Maintenance	Groundskeeper	\$17.87		1		View
King	Lathers	Journey Level	\$71.53	15J	4C		View
King	Marble Setters	Journey Level	\$66.32	7E	1N		View
King	Metal Fabrication (In Shop)	Fitter/Certified Welder	\$42.17	15I	11E		View
King	Metal Fabrication (In Shop)	General Laborer	\$30.07	15I	11E		View
King	Metal Fabrication (In Shop)	Mechanic	\$43.63	15I	11E		View
King	Metal Fabrication (In Shop)	Welder/Burner	\$39.28	15I	11E		View
King	Millwright	Journey Level	\$73.08	15J	4C		View
King	Modular Buildings	Cabinet Assembly	\$15.74		1		View
King	Modular Buildings	Electrician	\$15.74		1		View
King	Modular Buildings	Equipment Maintenance	\$15.74		1		View
King	Modular Buildings	Plumber	\$15.74		1		View
King	Modular Buildings	Production Worker	\$15.74		1		View
King	Modular Buildings	Tool Maintenance	\$15.74		1		View
King	Modular Buildings	Utility Person	\$15.74		1		View
King	Modular Buildings	Welder	\$15.74		1		View

King	Painters	Journey Level	\$49.46	<u>6Z</u>	<u>11J</u>		View
King	Pile Driver	Crew Tender	\$77.16	<u>15J</u>	<u>4C</u>		View
King	Pile Driver	Journey Level	\$71.98	<u>15J</u>	<u>4C</u>		View
King	Plasterers	Journey Level	\$67.49	<u>7Q</u>	<u>1R</u>		View
King	Plasterers	Nozzleman	\$71.49	<u>7Q</u>	<u>1R</u>		View
King	Playground & Park Equipment Installers	Journey Level	\$15.74		<u>1</u>		View
King	Plumbers & Pipefitters	Journey Level	\$96.69	<u>6Z</u>	<u>1G</u>		View
King	Power Equipment Operators	Asphalt Plant Operators	\$80.12	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Assistant Engineer	\$75.35	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Barrier Machine (zipper)	\$79.41	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Batch Plant Operator: concrete	\$79.41	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Boat Operator	\$80.33	<u>7A</u>	<u>11H</u>	<u>8X</u>	View
King	Power Equipment Operators	Bobcat	\$75.35	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Brokk - Remote Demolition Equipment	\$75.35	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Brooms	\$75.35	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Bump Cutter	\$79.41	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Cableways	\$80.12	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Chipper	\$79.41	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Compressor	\$75.35	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Concrete Finish Machine - Laser Screed	\$75.35	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Concrete Pump - Mounted Or Trailer High Pressure Line Pump, Pump High Pressure	\$78.80	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Concrete Pump: Truck Mount With Boom Attachment Over 42 M	\$80.12	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Concrete Pump: Truck Mount With Boom Attachment Up To 42m	\$79.41	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Conveyors	\$78.80	<u>15J</u>	<u>11G</u>	<u>8X</u>	View
King	Power Equipment Operators	Cranes Friction: 200 tons and over	\$82.76	<u>7A</u>	<u>11H</u>	<u>8X</u>	View
King	Power Equipment Operators	Cranes, A-frame: 10 tons and under	\$75.55	<u>7A</u>	<u>11H</u>	<u>8X</u>	View
King	Power Equipment Operators	Cranes: 100 tons through 199 tons, or 150' of boom (including jib with attachments)	\$81.12	<u>7A</u>	<u>11H</u>	<u>8X</u>	View
King	Power Equipment Operators	Cranes: 20 tons through 44 tons with attachments	\$79.62	<u>7A</u>	<u>11H</u>	<u>8X</u>	View
King	Power Equipment Operators	Cranes: 200 tons- 299 tons, or 250' of boom including jib with attachments	\$81.97	<u>7A</u>	<u>11H</u>	<u>8X</u>	View
King	Power Equipment Operators	Cranes: 300 tons and over or 300' of boom including jib with attachments	\$82.76	<u>7A</u>	<u>11H</u>	<u>8X</u>	View

King	Power Equipment Operators	Cranes: 45 tons through 99 tons, under 150' of boom(including jib with attachments)	\$80.33	7A	11H	8X	View
King	Power Equipment Operators	Cranes: Friction cranes through 199 tons	\$81.97	7A	11H	8X	View
King	Power Equipment Operators	Cranes: through 19 tons with attachments, a-frame over 10 tons	\$79.00	7A	11H	8X	View
King	Power Equipment Operators	Crusher	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Deck Engineer/Deck Winches (power)	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Derricks, On Building Work	\$80.12	15J	11G	8X	View
King	Power Equipment Operators	Dozers D-9 & Under	\$78.80	15J	11G	8X	View
King	Power Equipment Operators	Drill Oilers: Auger Type, Truck Or Crane Mount	\$78.80	15J	11G	8X	View
King	Power Equipment Operators	Drilling Machine	\$80.92	15J	11G	8X	View
King	Power Equipment Operators	Elevator and man-lift: permanent and shaft type	\$75.35	15J	11G	8X	View
King	Power Equipment Operators	Finishing Machine, Bidwell And Gamaco & Similar Equipment	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Forklift: 3000 lbs and over with attachments	\$78.80	15J	11G	8X	View
King	Power Equipment Operators	Forklifts: under 3000 lbs. with attachments	\$75.35	15J	11G	8X	View
King	Power Equipment Operators	Grade Engineer: Using Blue Prints, Cut Sheets, Etc	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Gradechecker/Stakeman	\$75.35	15J	11G	8X	View
King	Power Equipment Operators	Guardrail Punch	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Hard Tail End Dump Articulating Off- Road Equipment 45 Yards. & Over	\$80.12	15J	11G	8X	View
King	Power Equipment Operators	Hard Tail End Dump Articulating Off-road Equipment Under 45 Yards	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Horizontal/Directional Drill Locator	\$78.80	15J	11G	8X	View
King	Power Equipment Operators	Horizontal/Directional Drill Operator	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Hydralifts/Boom Trucks Over 10 Tons	\$79.00	7A	11H	8X	View
King	Power Equipment Operators	Hydralifts/boom trucks: 10 tons and under	\$75.55	7A	11H	8X	View
King	Power Equipment Operators	Leverman	\$81.75	15J	11G	8X	View
King	Power Equipment Operators	Loader, Overhead, 6 Yards. But Not Including 8 Yards	\$80.12	15J	11G	8X	View
King	Power Equipment Operators	Loaders, Overhead Under 6 Yards	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Loaders, Plant Feed	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Loaders: Elevating Type Belt	\$78.80	15J	11G	8X	View
King	Power Equipment Operators	Locomotives, All	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Material Transfer Device	\$79.41	15J	11G	8X	View

King	Power Equipment Operators	Mechanics: All (Leadmen - \$0.50 per hour over mechanic)	\$80.92	15J	11G	8X	View
King	Power Equipment Operators	Motor Patrol Graders	\$80.12	15J	11G	8X	View
King	Power Equipment Operators	Mucking Machine, Mole, Tunnel Drill, Boring, Road Header And/or Shield	\$80.12	15J	11G	8X	View
King	Power Equipment Operators	Oil Distributors, Blower Distribution & Mulch Seeding Operator	\$75.35	15J	11G	8X	View
King	Power Equipment Operators	Outside Hoists (Elevators and Manlifts), Air Tuggers, Strato	\$78.80	15J	11G	8X	View
King	Power Equipment Operators	Overhead, bridge type Crane: 20 tons through 44 tons	\$79.62	7A	11H	8X	View
King	Power Equipment Operators	Overhead, bridge type: 100 tons and over	\$81.12	7A	11H	8X	View
King	Power Equipment Operators	Overhead, bridge type: 45 tons through 99 tons	\$80.33	7A	11H	8X	View
King	Power Equipment Operators	Pavement Breaker	\$75.35	15J	11G	8X	View
King	Power Equipment Operators	Pile Driver (other Than Crane Mount)	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Plant Oiler - Asphalt, Crusher	\$78.80	15J	11G	8X	View
King	Power Equipment Operators	Posthole Digger, Mechanical	\$75.35	15J	11G	8X	View
King	Power Equipment Operators	Power Plant	\$75.35	15J	11G	8X	View
King	Power Equipment Operators	Pumps - Water	\$75.35	15J	11G	8X	View
King	Power Equipment Operators	Quad 9, Hd 41, D10 And Over	\$80.12	15J	11G	8X	View
King	Power Equipment Operators	Quick Tower: no cab, under 100 feet in height base to boom	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Remote Control Operator On Rubber Tired Earth Moving Equipment	\$80.12	15J	11G	8X	View
King	Power Equipment Operators	Rigger and Bellman	\$75.55	7A	11H	8X	View
King	Power Equipment Operators	Rigger/Signal Person, Bellman(Certified)	\$79.00	7A	11H	8X	View
King	Power Equipment Operators	Rollagon	\$80.12	15J	11G	8X	View
King	Power Equipment Operators	Roller, Other Than Plant Mix	\$75.35	15J	11G	8X	View
King	Power Equipment Operators	Roller, Plant Mix Or Multi-lift Materials	\$78.80	15J	11G	8X	View
King	Power Equipment Operators	Roto-mill, Roto-grinder	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Saws - Concrete	\$78.80	15J	11G	8X	View
King	Power Equipment Operators	Scraper, Self Propelled Under 45 Yards	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Scrapers - Concrete & Carry All	\$78.80	15J	11G	8X	View
King	Power Equipment Operators	Scrapers, Self-propelled: 45 Yards And Over	\$80.12	15J	11G	8X	View
King	Power Equipment Operators	Service Engineers: Equipment	\$78.80	15J	11G	8X	View
King	Power Equipment Operators	Shotcrete/Gunite Equipment	\$75.35	15J	11G	8X	View
King	Power Equipment Operators	Shovel, Excavator, Backhoe, Tractors Under 15 Metric Tons	\$78.80	15J	11G	8X	View
King	Power Equipment Operators	Shovel, Excavator, Backhoe: Over 30 Metric Tons To 50 Metric Tons	\$80.12	15J	11G	8X	View

King	Power Equipment Operators	Shovel, Excavator, Backhoes, Tractors: 15 To 30 Metric Tons	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Shovel, Excavator, Backhoes: Over 50 Metric Tons To 90 Metric Tons	\$80.92	15J	11G	8X	View
King	Power Equipment Operators	Shovel, Excavator, Backhoes: Over 90 Metric Tons	\$81.75	15J	11G	8X	View
King	Power Equipment Operators	Slipform Pavers	\$80.12	15J	11G	8X	View
King	Power Equipment Operators	Spreader, Topsider & Screedman	\$80.12	15J	11G	8X	View
King	Power Equipment Operators	Subgrader Trimmer	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Tower Bucket Elevators	\$78.80	15J	11G	8X	View
King	Power Equipment Operators	Tower Crane: over 175' through 250' in height, base to boom	\$81.97	7A	11H	8X	View
King	Power Equipment Operators	Tower crane: up to 175' in height base to boom	\$81.12	7A	11H	8X	View
King	Power Equipment Operators	Tower Cranes: over 250' in height from base to boom	\$82.76	7A	11H	8X	View
King	Power Equipment Operators	Transporters, All Track Or Truck Type	\$80.12	15J	11G	8X	View
King	Power Equipment Operators	Trenching Machines	\$78.80	15J	11G	8X	View
King	Power Equipment Operators	Truck Crane Oiler/Driver: 100 tons and over	\$79.62	7A	11H	8X	View
King	Power Equipment Operators	Truck crane oiler/driver: under 100 tons	\$79.00	7A	11H	8X	View
King	Power Equipment Operators	Truck Mount Portable Conveyor	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Vac Truck (Vactor Guzzler, Hydro Excavator)	\$79.41	15J	11G	8X	View
King	Power Equipment Operators	Welder	\$80.12	15J	11G	8X	View
King	Power Equipment Operators	Wheel Tractors, Farmall Type	\$75.35	15J	11G	8X	View
King	Power Equipment Operators	Yo Yo Pay Dozer	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Asphalt Plant Operators	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Assistant Engineer	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Barrier Machine (zipper)	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Batch Plant Operator, Concrete	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Boat Operator	\$80.33	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Bobcat	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Brokk - Remote Demolition Equipment	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Brooms	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Bump Cutter	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Cableways	\$80.12	15J	11G	8X	View

King	Power Equipment Operators-Underground Sewer & Water	Chipper	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Compressor	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Concrete Finish Machine - Laser Screed	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Concrete Pump - Mounted Or Trailer High Pressure Line Pump, Pump High Pressure	\$78.80	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Concrete Pump: Truck Mount With Boom Attachment Over 42 M	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Concrete Pump: Truck Mount With Boom Attachment Up To 42m	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Conveyors	\$78.80	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Cranes Friction: 200 tons and over	\$82.76	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Cranes, A-frame: 10 tons and under	\$75.55	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Cranes: 100 tons through 199 tons, or 150' of boom (including jib with attachments)	\$81.12	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Cranes: 20 tons through 44 tons with attachments	\$79.62	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Cranes: 20 tons through 44 tons with attachments	\$79.62	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Cranes: 200 tons- 299 tons, or 250' of boom including jib with attachments	\$81.97	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Cranes: 300 tons and over or 300' of boom including jib with attachments	\$82.76	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Cranes: 45 tons through 99 tons, under 150' of boom(including jib with attachments)	\$80.33	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Cranes: Friction cranes through 199 tons	\$81.97	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Cranes: through 19 tons with attachments, a-frame over 10 tons	\$79.00	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Crusher	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Deck Engineer/Deck Winches (power)	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Derricks, On Building Work	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Dozers D-9 & Under	\$78.80	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Drill Oilers: Auger Type, Truck Or Crane Mount	\$78.80	15J	11G	8X	View

King	Power Equipment Operators-Underground Sewer & Water	Drilling Machine	\$80.92	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Elevator and man-lift: permanent and shaft type	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Finishing Machine, Bidwell And Gamaco & Similar Equipment	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Forklift: 3000 lbs and over with attachments	\$78.80	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Forklifts: under 3000 lbs. with attachments	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Grade Engineer: Using Blue Prints, Cut Sheets, Etc	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Gradechecker/Stakeman	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Guardrail Punch	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Hard Tail End Dump Articulating Off- Road Equipment 45 Yards. & Over	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Hard Tail End Dump Articulating Off-road Equipment Under 45 Yards	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Horizontal/Directional Drill Locator	\$78.80	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Horizontal/Directional Drill Operator	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Hydralifts/boom trucks: 10 tons and under	\$75.55	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Hydralifts/boom trucks: over 10 tons	\$79.00	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Leverman	\$81.75	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Loader, Overhead, 6 Yards. But Not Including 8 Yards	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Loaders, Overhead Under 6 Yards	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Loaders, Plant Feed	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Loaders: Elevating Type Belt	\$78.80	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Locomotives, All	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Material Transfer Device	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Mechanics: All (Leadmen - \$0.50 per hour over mechanic)	\$80.92	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Motor Patrol Graders	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Mucking Machine, Mole, Tunnel Drill, Boring, Road Header And/or Shield	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Oil Distributors, Blower Distribution & Mulch Seeding Operator	\$75.35	15J	11G	8X	View

King	Power Equipment Operators-Underground Sewer & Water	Outside Hoists (Elevators and Manlifts), Air Tuggers, Strato	\$78.80	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Overhead, bridge type Crane: 20 tons through 44 tons	\$79.62	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Overhead, bridge type: 100 tons and over	\$81.12	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Overhead, bridge type: 45 tons through 99 tons	\$80.33	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Pavement Breaker	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Pile Driver (other Than Crane Mount)	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Plant Oiler - Asphalt, Crusher	\$78.80	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Posthole Digger, Mechanical	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Power Plant	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Pumps - Water	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Quad 9, Hd 41, D10 And Over	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Quick Tower: no cab, under 100 feet in height base to boom	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Remote Control Operator On Rubber Tired Earth Moving Equipment	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Rigger and Bellman	\$75.55	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Rigger/Signal Person, Bellman(Certified)	\$79.00	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Rollagon	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Roller, Other Than Plant Mix	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Roller, Plant Mix Or Multi-lift Materials	\$78.80	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Roto-mill, Roto-grinder	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Saws - Concrete	\$78.80	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Scraper, Self Propelled Under 45 Yards	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Scrapers - Concrete & Carry All	\$78.80	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Scrapers, Self-propelled: 45 Yards And Over	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Shotcrete/Gunite Equipment	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Shovel, Excavator, Backhoe, Tractors Under 15 Metric Tons	\$78.80	15J	11G	8X	View

King	Power Equipment Operators-Underground Sewer & Water	Shovel, Excavator, Backhoe: Over 30 Metric Tons To 50 Metric Tons	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Shovel, Excavator, Backhoes, Tractors: 15 To 30 Metric Tons	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Shovel, Excavator, Backhoes: Over 50 Metric Tons To 90 Metric Tons	\$80.92	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Shovel, Excavator, Backhoes: Over 90 Metric Tons	\$81.75	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Slipform Pavers	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Spreader, Topsider & Screedman	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Subgrader Trimmer	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Tower Bucket Elevators	\$78.80	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Tower Crane: over 175' through 250' in height, base to boom	\$81.97	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Tower crane: up to 175' in height base to boom	\$81.12	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Tower Cranes: over 250' in height from base to boom	\$82.76	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Transporters, All Track Or Truck Type	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Trenching Machines	\$78.80	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Truck Crane Oiler/Driver: 100 tons and over	\$79.62	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Truck Crane Oiler/Driver: 100 tons and over	\$79.62	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Truck crane oiler/driver: under 100 tons	\$79.00	7A	11H	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Truck Mount Portable Conveyor	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Vac Truck (Vactor Guzzler, Hydro Excavator)	\$79.41	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Welder	\$80.12	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Wheel Tractors, Farmall Type	\$75.35	15J	11G	8X	View
King	Power Equipment Operators-Underground Sewer & Water	Yo Yo Pay Dozer	\$79.41	15J	11G	8X	View
King	Power Line Clearance Tree Trimmers	Journey Level In Charge	\$57.22	5A	4A		View
King	Power Line Clearance Tree Trimmers	Spray Person	\$54.32	5A	4A		View
King	Power Line Clearance Tree Trimmers	Tree Equipment Operator	\$57.22	5A	4A		View
King	Power Line Clearance Tree Trimmers	Tree Trimmer	\$51.18	5A	4A		View

King	Power Line Clearance Tree Trimmers	Tree Trimmer Groundperson	\$38.99	<u>5A</u>	<u>4A</u>	View
King	Refrigeration & Air Conditioning Mechanics	Journey Level	\$92.51	<u>6Z</u>	<u>1G</u>	View
King	Residential Brick Mason	Journey Level	\$66.32	<u>7E</u>	<u>1N</u>	View
King	Residential Carpenters	Journey Level	\$36.44		<u>1</u>	View
King	Residential Cement Masons	Journey Level	\$46.64		<u>1</u>	View
King	Residential Drywall Applicators	Journey Level	\$71.53	<u>15J</u>	<u>4C</u>	View
King	Residential Drywall Tapers	Journey Level	\$36.36		<u>1</u>	View
King	Residential Electricians	Journey Level	\$48.80		<u>1</u>	View
King	Residential Glaziers	Journey Level	\$28.93		<u>1</u>	View
King	Residential Insulation Applicators	Journey Level	\$28.18		<u>1</u>	View
King	Residential Laborers	Journey Level	\$29.73		<u>1</u>	View
King	Residential Marble Setters	Journey Level	\$27.38		<u>1</u>	View
King	Residential Painters	Journey Level	\$23.47		<u>1</u>	View
King	Residential Plumbers & Pipefitters	Journey Level	\$96.69	<u>6Z</u>	<u>1G</u>	View
King	Residential Refrigeration & Air Conditioning Mechanics	Journey Level	\$92.51	<u>6Z</u>	<u>1G</u>	View
King	Residential Sheet Metal Workers	Journey Level	\$94.11	<u>7F</u>	<u>1E</u>	View
King	Residential Soft Floor Layers	Journey Level	\$55.76	<u>5A</u>	<u>3J</u>	View
King	Residential Sprinkler Fitters (Fire Protection)	Journey Level	\$58.26	<u>5C</u>	<u>2R</u>	View
King	Residential Stone Masons	Journey Level	\$66.32	<u>7E</u>	<u>1N</u>	View
King	Residential Terrazzo Workers	Journey Level	\$60.36	<u>7E</u>	<u>1N</u>	View
King	Residential Terrazzo/Tile Finishers	Journey Level	\$24.39		<u>1</u>	View
King	Residential Tile Setters	Journey Level	\$21.04		<u>1</u>	View
King	Roofers	Journey Level	\$60.95	<u>5A</u>	<u>3H</u>	View
King	Roofers	Using Irritable Bituminous Materials	\$63.95	<u>5A</u>	<u>3H</u>	View
King	Sheet Metal Workers	Journey Level (Field or Shop)	\$94.11	<u>7F</u>	<u>1E</u>	View
King	Shipbuilding & Ship Repair	New Construction Boilermaker	\$41.83	<u>7V</u>	<u>1</u>	View
King	Shipbuilding & Ship Repair	New Construction Carpenter	\$41.83	<u>7V</u>	<u>1</u>	View
King	Shipbuilding & Ship Repair	New Construction Crane Operator	\$41.83	<u>7V</u>	<u>1</u>	View
King	Shipbuilding & Ship Repair	New Construction Electrician	\$41.83	<u>7V</u>	<u>1</u>	View
King	Shipbuilding & Ship Repair	New Construction Heat & Frost Insulator	\$84.84	<u>15H</u>	<u>11C</u>	View
King	Shipbuilding & Ship Repair	New Construction Laborer	\$41.83	<u>7V</u>	<u>1</u>	View
King	Shipbuilding & Ship Repair	New Construction Machinist	\$41.83	<u>7V</u>	<u>1</u>	View
King	Shipbuilding & Ship Repair	New Construction Operating Engineer	\$41.83	<u>7V</u>	<u>1</u>	View
King	Shipbuilding & Ship Repair	New Construction Painter	\$41.83	<u>7V</u>	<u>1</u>	View
King	Shipbuilding & Ship Repair	New Construction Pipefitter	\$41.83	<u>7V</u>	<u>1</u>	View
King	Shipbuilding & Ship Repair	New Construction Rigger	\$41.83	<u>7V</u>	<u>1</u>	View
King	Shipbuilding & Ship Repair	New Construction Sheet Metal	\$41.83	<u>7V</u>	<u>1</u>	View

King	Shipbuilding & Ship Repair	New Construction Shipfitter	\$41.83	<u>7V</u>	<u>1</u>		View
King	Shipbuilding & Ship Repair	New Construction Warehouse/Teamster	\$41.83	<u>7V</u>	<u>1</u>		View
King	Shipbuilding & Ship Repair	New Construction Welder / Burner	\$41.83	<u>7V</u>	<u>1</u>		View
King	Shipbuilding & Ship Repair	Ship Repair Boilermaker	\$50.35	<u>7X</u>	<u>4J</u>		View
King	Shipbuilding & Ship Repair	Ship Repair Carpenter	\$50.95	<u>7X</u>	<u>4J</u>		View
King	Shipbuilding & Ship Repair	Ship Repair Crane Operator	\$45.06	<u>7Y</u>	<u>4K</u>		View
King	Shipbuilding & Ship Repair	Ship Repair Electrician	\$50.42	<u>7X</u>	<u>4J</u>		View
King	Shipbuilding & Ship Repair	Ship Repair Heat & Frost Insulator	\$84.84	<u>15H</u>	<u>11C</u>		View
King	Shipbuilding & Ship Repair	Ship Repair Laborer	\$50.95	<u>7X</u>	<u>4J</u>		View
King	Shipbuilding & Ship Repair	Ship Repair Machinist	\$50.95	<u>7X</u>	<u>4J</u>		View
King	Shipbuilding & Ship Repair	Ship Repair Operating Engineer	\$45.06	<u>7Y</u>	<u>4K</u>		View
King	Shipbuilding & Ship Repair	Ship Repair Painter	\$50.95	<u>7X</u>	<u>4J</u>		View
King	Shipbuilding & Ship Repair	Ship Repair Pipefitter	\$50.95	<u>7X</u>	<u>4J</u>		View
King	Shipbuilding & Ship Repair	Ship Repair Rigger	\$50.35	<u>7X</u>	<u>4J</u>		View
King	Shipbuilding & Ship Repair	Ship Repair Sheet Metal	\$50.35	<u>7X</u>	<u>4J</u>		View
King	Shipbuilding & Ship Repair	Ship Repair Shipwright	\$50.95	<u>7X</u>	<u>4J</u>		View
King	Shipbuilding & Ship Repair	Ship Repair Warehouse / Teamster	\$45.06	<u>7Y</u>	<u>4K</u>		View
King	Sign Makers & Installers (Electrical)	Journey Level	\$55.78	<u>0</u>	<u>1</u>		View
King	Sign Makers & Installers (Non-Electrical)	Journey Level	\$35.73	<u>0</u>	<u>1</u>		View
King	Soft Floor Layers	Journey Level	\$62.39	<u>15J</u>	<u>4C</u>		View
King	Solar Controls For Windows	Journey Level	\$15.74		<u>1</u>		View
King	Sprinkler Fitters (Fire Protection)	Journey Level	\$92.49	<u>5C</u>	<u>1X</u>		View
King	Stage Rigging Mechanics (Non Structural)	Journey Level	\$15.74		<u>1</u>		View
King	Stone Masons	Journey Level	\$66.32	<u>7E</u>	<u>1N</u>		View
King	Street And Parking Lot Sweeper Workers	Journey Level	\$19.09		<u>1</u>		View
King	Surveyors	Assistant Construction Site Surveyor	\$79.00	<u>7A</u>	<u>11H</u>	<u>8X</u>	View
King	Surveyors	Chainman	\$75.55	<u>7A</u>	<u>11H</u>	<u>8X</u>	View
King	Surveyors	Construction Site Surveyor	\$80.33	<u>7A</u>	<u>11H</u>	<u>8X</u>	View
King	Surveyors	Drone Operator (when used in conjunction with survey work only)	\$75.55	<u>7A</u>	<u>11H</u>	<u>8X</u>	View
King	Surveyors	Ground Penetrating Radar Operator	\$75.55	<u>7A</u>	<u>11H</u>	<u>8X</u>	View
King	Telecommunication Technicians	Journey Level	\$62.13	<u>7E</u>	<u>1E</u>		View
King	Telephone Line Construction - Outside	Cable Splicer	\$39.15	<u>5A</u>	<u>2B</u>		View
King	Telephone Line Construction - Outside	Hole Digger/Ground Person	\$26.29	<u>5A</u>	<u>2B</u>		View
King	Telephone Line Construction - Outside	Telephone Equipment Operator (Light)	\$32.72	<u>5A</u>	<u>2B</u>		View

King	Telephone Line Construction - Outside	Telephone Lineperson	\$37.00	5A	2B		View
King	Terrazzo Workers	Journey Level	\$60.36	7E	1N		View
King	Tile Setters	Journey Level	\$60.36	7E	1N		View
King	Tile, Marble & Terrazzo Finishers	Finisher	\$51.19	7E	1N		View
King	Traffic Control Stripers	Journey Level	\$51.90	7A	1K		View
King	Truck Drivers	Asphalt Mix Over 16 Yards	\$72.45	15J	11M	8L	View
King	Truck Drivers	Asphalt Mix To 16 Yards	\$71.61	15J	11M	8L	View
King	Truck Drivers	Dump Truck	\$71.61	15J	11M	8L	View
King	Truck Drivers	Dump Truck & Trailer	\$72.45	15J	11M	8L	View
King	Truck Drivers	Other Trucks	\$72.45	15J	11M	8L	View
King	Truck Drivers - Ready Mix	Transit Mix	\$72.45	15J	11M	8L	View
King	Well Drillers & Irrigation Pump Installers	Irrigation Pump Installer	\$17.71		1		View
King	Well Drillers & Irrigation Pump Installers	Oiler	\$15.74		1		View
King	Well Drillers & Irrigation Pump Installers	Well Driller	\$18.00		1		View

Benefit Code Key – Effective 3/3/2023 thru 8/30/2023

Overtime Codes

Overtime calculations are based on the hourly rate actually paid to the worker. On public works projects, the hourly rate must be not less than the prevailing rate of wage minus the hourly rate of the cost of fringe benefits actually provided for the worker.

1. ALL HOURS WORKED IN EXCESS OF EIGHT (8) HOURS PER DAY OR FORTY (40) HOURS PER WEEK SHALL BE PAID AT ONE AND ONE-HALF TIMES THE HOURLY RATE OF WAGE.
 - B. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - C. The first two (2) hours after eight (8) regular hours Monday through Friday and the first ten (10) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other overtime hours and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - D. The first two (2) hours before or after a five-eight (8) hour workweek day or a four-ten (10) hour workweek day and the first eight (8) hours worked the next day after either workweek shall be paid at one and one-half times the hourly rate of wage. All additional hours worked and all worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - E. The first two (2) hours after eight (8) regular hours Monday through Friday and the first eight (8) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other hours worked Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - F. The first two (2) hours after eight (8) regular hours Monday through Friday and the first ten (10) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other overtime hours worked, except Labor Day, shall be paid at double the hourly rate of wage. All hours worked on Labor Day shall be paid at three times the hourly rate of wage.
 - G. The first ten (10) hours worked on Saturdays and the first ten (10) hours worked on a fifth calendar weekday in a four-ten hour schedule, shall be paid at one and one-half times the hourly rate of wage. All hours worked in excess of ten (10) hours per day Monday through Saturday and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - H. All hours worked on Saturdays (except makeup days if work is lost due to inclement weather conditions or equipment breakdown) shall be paid at one and one-half times the hourly rate of wage. All hours worked Monday through Saturday over twelve (12) hours and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - I. All hours worked on Sundays and holidays shall also be paid at double the hourly rate of wage.
 - J. The first two (2) hours after eight (8) regular hours Monday through Friday and the first ten (10) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked over ten (10) hours Monday through Saturday, Sundays and holidays shall be paid at double the hourly rate of wage.
 - K. All hours worked on Saturdays and Sundays shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid at double the hourly rate of wage.
 - M. All hours worked on Saturdays (except makeup days if work is lost due to inclement weather conditions) shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - N. All hours worked on Saturdays (except makeup days) shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

Overtime Codes Continued

1. O. The first ten (10) hours worked on Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays, holidays and after twelve (12) hours, Monday through Friday and after ten (10) hours on Saturday shall be paid at double the hourly rate of wage.
- P. All hours worked on Saturdays (except makeup days if circumstances warrant) and Sundays shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid at double the hourly rate of wage.
- Q. The first two (2) hours after eight (8) regular hours Monday through Friday and up to ten (10) hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked in excess of ten (10) hours per day Monday through Saturday and all hours worked on Sundays and holidays (except Christmas day) shall be paid at double the hourly rate of wage. All hours worked on Christmas day shall be paid at two and one-half times the hourly rate of wage.
- R. All hours worked on Sundays and holidays shall be paid at two times the hourly rate of wage.
- U. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays (except Labor Day) shall be paid at two times the hourly rate of wage. All hours worked on Labor Day shall be paid at three times the hourly rate of wage.
- V. All hours worked on Sundays and holidays (except Thanksgiving Day and Christmas day) shall be paid at one and one-half times the hourly rate of wage. All hours worked on Thanksgiving Day and Christmas day shall be paid at double the hourly rate of wage.
- W. All hours worked on Saturdays and Sundays (except make-up days due to conditions beyond the control of the employer)) shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid at double the hourly rate of wage.
- X. The first four (4) hours after eight (8) regular hours Monday through Friday and the first twelve (12) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked over twelve (12) hours Monday through Saturday, Sundays and holidays shall be paid at double the hourly rate of wage. When holiday falls on Saturday or Sunday, the day before Saturday, Friday, and the day after Sunday, Monday, shall be considered the holiday and all work performed shall be paid at double the hourly rate of wage.
- Y. All hours worked outside the hours of 5:00 am and 5:00 pm (or such other hours as may be agreed upon by any employer and the employee) and all hours worked in excess of eight (8) hours per day (10 hours per day for a 4 x 10 workweek) and on Saturdays and holidays (except labor day) shall be paid at one and one-half times the hourly rate of wage. (except for employees who are absent from work without prior approval on a scheduled workday during the workweek shall be paid at the straight-time rate until they have worked 8 hours in a day (10 in a 4 x 10 workweek) or 40 hours during that workweek.) All hours worked Monday through Saturday over twelve (12) hours and all hours worked on Sundays and Labor Day shall be paid at double the hourly rate of wage.
- Z. All hours worked on Saturdays and Sundays shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid the straight time rate of pay in addition to holiday pay.

Overtime Codes Continued

2. ALL HOURS WORKED IN EXCESS OF EIGHT (8) HOURS PER DAY OR FORTY (40) HOURS PER WEEK SHALL BE PAID AT ONE AND ONE-HALF TIMES THE HOURLY RATE OF WAGE.

- B. All hours worked on holidays shall be paid at one and one-half times the hourly rate of wage.
- F. The first eight (8) hours worked on holidays shall be paid at the straight hourly rate of wage in addition to the holiday pay. All hours worked in excess of eight (8) hours on holidays shall be paid at double the hourly rate of wage.
- M. This code appears to be missing. All hours worked on Saturdays, Sundays and holidays shall be paid at double the hourly rate of wage.
- O. All hours worked on Sundays and holidays shall be paid at one and one-half times the hourly rate of wage.
- R. All hours worked on Sundays and holidays and all hours worked over sixty (60) in one week shall be paid at double the hourly rate of wage.
- U. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked over 12 hours in a day or on Sundays and holidays shall be paid at double the hourly rate of wage.

3. ALL HOURS WORKED IN EXCESS OF EIGHT (8) HOURS PER DAY OR FORTY (40) HOURS PER WEEK SHALL BE PAID AT ONE AND ONE-HALF TIMES THE HOURLY RATE OF WAGE.

- F. All hours worked on Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sunday shall be paid at two times the hourly rate of wage. All hours worked on paid holidays shall be paid at two and one-half times the hourly rate of wage including holiday pay.
- H. All work performed on Sundays between March 16th and October 14th and all Holidays shall be compensated for at two (2) times the regular rate of pay. Work performed on Sundays between October 15th and March 15th shall be compensated at one and one half (1-1/2) times the regular rate of pay.
- J. All hours worked between the hours of 10:00 pm and 5:00 am, Monday through Friday, and all hours worked on Saturdays shall be paid at a one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
- K. Work performed in excess of eight (8) hours of straight time per day, or ten (10) hours of straight time per day when four ten (10) hour shifts are established, or forty (40) hours of straight time per week, Monday through Friday, or outside the normal 5 am to 6pm shift, and all work on Saturdays shall be paid at one and one-half times the hourly rate of wage. All work performed after 6:00 pm Saturday to 5:00 am Monday and Holidays, and all hours worked in excess of twelve (12) hours in a single shift shall be paid at double the hourly rate of wage.

After an employee has worked eight (8) hours at an applicable overtime rate, all additional hours shall be at the applicable overtime rate until such time as the employee has had a break of eight (8) hours or more. When an employee returns to work without at least eight (8) hours time off since their previous shift, all such time shall be a continuation of shift and paid at the applicable overtime rate until he/she shall have the eight (8) hours rest period.

Overtime Codes Continued

4. ALL HOURS WORKED IN EXCESS OF EIGHT (8) HOURS PER DAY OR FORTY (40) HOURS PER WEEK SHALL BE PAID AT ONE AND ONE-HALF TIMES THE HOURLY RATE OF WAGE.

- A. All hours worked in excess of eight (8) hours per day or forty (40) hours per week shall be paid at double the hourly rate of wage. All hours worked on Saturdays, Sundays and holidays shall be paid at double the hourly rate of wage
- C. On Monday through Friday, the first four (4) hours of overtime after eight (8) hours of straight time work shall be paid at one and one half (1-1/2) times the straight time rate of pay, unless a four (4) day ten (10) hour workweek has been established. On a four (4) day ten (10) hour workweek scheduled Monday through Thursday, or Tuesday through Friday, the first two (2) hours of overtime after ten (10) hours of straight time work shall be paid at one and one half (1-1/2) times the straight time rate of pay. On Saturday, the first twelve (12) hours of work shall be paid at one and one half (1-1/2) times the straight time rate of pay, except that if the job is down on Monday through Friday due to weather conditions or other conditions outside the control of the employer, the first ten (10) hours on Saturday may be worked at the straight time rate of pay. All hours worked over twelve (12) hours in a day and all hours worked on Sunday and Holidays shall be paid at two (2) times the straight time rate of pay.
- D. All hours worked in excess of eight (8) hours per day or forty (40) hours per week shall be paid at double the hourly rate of wage. All hours worked on Saturday, Sundays and holidays shall be paid at double the hourly rate of pay. Rates include all members of the assigned crew.

EXCEPTION:

On all multipole structures and steel transmission lines, switching stations, regulating, capacitor stations, generating plants, industrial plants, associated installations and substations, except those substations whose primary function is to feed a distribution system, will be paid overtime under the following rates:

The first two (2) hours after eight (8) regular hours Monday through Friday of overtime on a regular workday, shall be paid at one and one-half times the hourly rate of wage. All hours in excess of ten (10) hours will be at two (2) times the hourly rate of wage. The first eight (8) hours worked on Saturday will be paid at one and one-half (1-1/2) times the hourly rate of wage. All hours worked in excess of eight (8) hours on Saturday, and all hours worked on Sundays and holidays will be at the double the hourly rate of wage.

All overtime eligible hours performed on the above described work that is energized, shall be paid at the double the hourly rate of wage.

- E. The first two (2) hours after eight (8) regular hours Monday through Friday and the first eight (8) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other hours worked Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

On a four-day, ten-hour weekly schedule, either Monday thru Thursday or Tuesday thru Friday schedule, all hours worked after ten shall be paid at double the hourly rate of wage. The Monday or Friday not utilized in the normal four-day, ten hour work week, and Saturday shall be paid at one and one half (1½) times the regular shift rate for the first eight (8) hours. All other hours worked Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
- G. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked Monday through Saturday over twelve (12) hours and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
- I. The First eight (8) hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked in excess of eight (8) per day on Saturdays shall be paid at double the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

Overtime Codes Continued

4. J. The first eight (8) hours worked on a Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked in excess of eight (8) hours on a Saturday shall be paid at double the hourly rate of wage. All hours worked over twelve (12) in a day, and all hours worked on Sundays and Holidays shall be paid at double the hourly rate of wage.
- K. All hours worked on a Saturday shall be paid at one and one-half times the hourly rate of wage, so long as Saturday is the sixth consecutive day worked. All hours worked over twelve (12) in a day Monday through Saturday, and all hours worked on Sundays and Holidays shall be paid at double the hourly rate of wage.
- L. The first twelve (12) hours worked on a Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked on a Saturday in excess of twelve (12) hours shall be paid at double the hourly rate of pay. All hours worked over twelve (12) in a day Monday through Friday, and all hours worked on Sundays shall be paid at double the hourly rate of wage. All hours worked on a holiday shall be paid at one and one-half times the hourly rate of wage, except that all hours worked on Labor Day shall be paid at double the hourly rate of pay.
- U. The first four (4) hours after eight (8) regular hours Monday through Friday and the first twelve (12) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. (Except on makeup days if work is lost due to inclement weather, then the first eight (8) hours on Saturday may be paid the regular rate.) All hours worked over twelve (12) hours Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
- S. On a four (4) day ten (10) hour workweek scheduled Monday through Thursday, or Tuesday through Friday, work performed in excess of (10) hours shall be paid at one and one half (1-1/2) times the hourly rate of pay. On Monday through Friday, work performed outside the normal work hours of 6:00 a.m. and 6:00 p.m. shall be paid at one and one-half (1-1/2) times the straight time rate, (except for special shifts or multiple shift operations).

All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All work performed on Sundays and holidays shall be paid at double the hourly rate of wage. When an employee returns to work without at least eight (8) hours time off since their previous shift, all such time shall be a continuation of shift and paid at the applicable overtime rate until such time as the employee has had a break of eight (8) hours.

Multiple Shift Operations: When the first shift of a multiple shift (a two or three shift) operation is started at the basic straight time rate or at a specific overtime rate, all shifts of that day's operation shall be completed at that rate. Special Shifts: The Special Shift Premium is the basic hourly rate of pay plus \$2.00 an hour. When due to conditions beyond the control of the employer or when an owner (not acting as the contractor), a government agency or the contract specifications require more than four (4) hours of a special shift can only be performed outside the normal 6am to 6pm shift then the special shift premium will be applied to the basic straight time for the entire shift. When an employee works on a special shift, they shall be paid the special shift premium for each hour worked unless they are in overtime or double-time status. (For example, the special shift premium does not waive the overtime requirements for work performed on Saturday or Sunday).

Overtime Codes Continued

4. V. Work performed in excess of ten (10) hours of straight time per day when four ten (10) hour shifts are established or outside the normal shift (5 am to 6pm), and all work on Saturdays, except for make-up days shall be paid at time and one-half (1 ½) the straight time rate.

In the event the job is down due to weather conditions, then Saturday may, be worked as a voluntary make-up day at the straight time rate. However, Saturday shall not be utilized as a make-up day when a holiday falls on Friday. All work performed on Sundays and holidays and work in excess of twelve (12) hours per day shall be paid at double (2x) the straight time rate of pay.

After an employee has worked eight (8) hours at an applicable overtime rate, all additional hours shall be at the applicable overtime rate until such time as the employee has had a break of eight (8) hours.

When an employee returns to work without a break of eight (8) hours since their previous shift, all such time shall be a continuation of shift and paid at the applicable overtime rate until such time as the employee has had a break of eight (8) hours.

- X. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage. Work performed outside the normal shift of 6 am to 6pm shall be paid at one and one-half the straight time rate, (except for special shifts or three shift operations). All work performed on Sundays and holidays shall be paid at double the hourly rate of wage. Shifts may be established when considered necessary by the Employer.

The Employer may establish shifts consisting of eight (8) or ten (10) hours of work (subject to WAC 296-127-022), that shall constitute a normal forty (40) hour work week. The Employer can change from a 5-eight to a 4-ten hour schedule or back to the other. All hours of work on these shifts shall be paid for at the straight time hourly rate. Work performed in excess of eight hours (or ten hours per day (subject to WAC 296-127-022) shall be paid at one and one-half the straight time rate.

When due to conditions beyond the control of the Employer, or when contract specifications require that work can only be performed outside the regular day shift, then by mutual agreement a special shift may be worked at the straight time rate, eight (8) hours work for eight (8) hours pay. The starting time shall be arranged to fit such conditions of work.

When an employee returns to work without at a break of eight (8) hours since their previous shift, all such time shall be a continuation of shift and paid at the applicable overtime rate until such time as the employee has had a break of eight (8) hours.

11. ALL HOURS WORKED IN EXCESS OF EIGHT (8) HOURS PER DAY OR FORTY (40) HOURS PER WEEK SHALL BE PAID AT ONE AND ONE-HALF TIMES THE HOURLY RATE OF WAGE.

- B After an employee has worked eight (8) hours, all additional hours worked shall be paid at the applicable overtime rate until such time as the employee has had a break of eight (8) hours or more.

- C The first two (2) hours after eight (8) regular hours Monday through Friday and the first eight (8) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other overtime hours worked, except Labor Day, and all hours on Sunday shall be paid at double the hourly rate of wage. All hours worked on Labor Day shall be paid at three times the hourly rate of wage. All non-overtime and non-holiday hours worked between 4:00 pm and 5:00 am, Monday through Friday, shall be paid at a premium rate of 15% over the hourly rate of wage.

Overtime Codes Continued

11. D. All hours worked on Saturdays and holidays shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays shall be paid at double the hourly rate of wage.
- After an employee has worked eight (8) hours, all additional hours worked shall be paid at the applicable overtime rate until such time as the employee has had a break of eight (8) hours or more.
- E. The first two (2) hours after eight (8) regular hours Monday through Friday, the first ten (10) hours on Saturday, and the first ten (10) hours worked on Holidays shall be paid at one and one-half times the hourly rate of wage. All hours worked over ten (10) hours Monday through Saturday, and Sundays shall be paid at double the hourly rate of wage.
- After an employee has worked eight (8) hours, all additional hours worked shall be paid at the applicable overtime rate until such time as the employee has had a break of eight (8) hours or more.
- F. The first two (2) hours after eight (8) regular hours Monday through Friday and the first eight (8) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other hours worked Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
- On a four-day, ten-hour weekly schedule, either Monday thru Thursday or Tuesday thru Friday schedule, all hours worked after ten shall be paid at double the hourly rate of wage. The Monday or Friday not utilized in the normal four-day, ten hour work week, and Saturday shall be paid at one-half times the hourly rate of wage for the first eight (8) hours. All other hours worked Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
- G. Work performed in excess of eight (8) hours of straight time per day, or ten (10) hours of straight time per day when four ten (10) hour shifts are established, or forty (40) hours of straight time per week, Monday through Friday, or outside the normal 5 am to 6pm shift, and all work on Saturdays shall be paid at one and one-half times the hourly rate of wage.
- All work performed after 6:00 pm Saturday to 5:00 am Monday and Holidays, and all hours worked in excess of twelve (12) hours in a single shift shall be paid at double the hourly rate of wage.
- After an employee has worked eight (8) hours at an applicable overtime rate, all additional hours shall be at the applicable overtime rate until such time as the employee has had a break of nine (9) hours or more. When an employee returns to work without at least nine (9) hours time off since their previous shift, all such time shall be a continuation of shift and paid at the applicable overtime rate until he/she shall have the nine (9) hours rest period.
- H. Work performed in excess of eight (8) hours of straight time per day, or ten (10) hours of straight time per day when four ten (10) hour shifts are established, or forty (40) hours of straight time per week, Monday through Friday, or outside the normal 5 am to 6pm shift, and all work on Saturdays shall be paid at one and one-half times the hourly rate of wage.
- All work performed after 6:00 pm Saturday to 5:00 am Monday and Holidays, and all hours worked in excess of twelve (12) hours in a single shift shall be paid at double the hourly rate of wage.
- After an employee has worked eight (8) hours at an applicable overtime rate, all additional hours shall be at the applicable overtime rate until such time as the employee has had a break of ten (10) hours or more. When an employee returns to work without at least ten (10) hours time off since their previous shift, all such time shall be a continuation of shift and paid at the applicable overtime rate until he/she shall have the ten (10) hours rest period.

Overtime Codes Continued

11. J. All hours worked on holidays shall be paid at double the hourly rate of wage.
- K. On Monday through Friday hours worked outside 4:00 am and 5:00 pm, and the first two (2) hours after eight (8) hours worked shall be paid at one and one-half times the hourly rate. All hours worked over 10 hours per day Monday through Friday, and all hours worked on Saturdays, Sundays, and Holidays worked shall be paid at double the hourly rate of wage.
- L. An employee working outside 5:00 am and 5:00 pm shall receive an additional two dollar (\$2.00) per hour for all hours worked that shift. All hours worked on holidays shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid at one and one-half times the hourly rate of wage.
- M. On Monday through Friday, the first four (4) hours of overtime after eight (8) hours of straight time work shall be paid at one and one half (1-1/2) times the straight time rate of pay, unless a four (4) day ten (10) hour workweek has been established. On a four (4) day ten (10) hour workweek scheduled Monday through Thursday, or Tuesday through Friday, the first two (2) hours of overtime after ten (10) hours of straight time work shall be paid at one and one half (1-1/2) times the straight time rate of pay.
- Work performed outside the normal work hours of 5:00 a.m. and 6:00 p.m. shall be paid at one and one-half (1-1/2) times the straight time rate, (except for special shifts or multiple shift operations). When the first shift of a multiple shift (a two or three shift) operation is started at the basic straight time rate or at a specific overtime rate, all shifts of that day's operation shall be completed at that rate. When due to conditions beyond the control of the Employer or when contract specifications require that work can only be performed outside the regular day shift of 5:00 am to 6:00 pm, then a special shift may be worked at the straight time rate, plus the shift pay premium when applicable. The starting time of work will be arranged to fit such conditions of work. Such shift shall consist of eight (8) hours work for eight (8) hours pay or ten (10) hours work for ten (10) hours pay for four ten shifts.
- On Saturday, the first twelve (12) hours of work shall be paid at one and one half (1-1/2) times the straight time rate of pay. All work performed after 6:00 pm Saturday to 5:00 am Monday, all work performed over twelve (12) hours, and all work performed on holidays shall be paid at double the straight time rate of pay.
- Shift Pay Premium: In an addition to any overtime already required, all hours worked between the hours of 6:00 pm and 5:00 am shall receive an additional two dollars (\$2.00) per hour.
- N. All work performed over twelve hours in a shift and all work performed on Sundays and Holidays shall be paid at double the straight time rate.
- Any time worked over eight (8) hours on Saturday shall be paid double the straight time rate, except employees assigned to work six 10-hour shifts per week shall be paid double the straight time rate for any time worked on Saturday over 10 hours.

Benefit Code Key – Effective 3/3/2023 thru 8/30/2023

Holiday Codes

- 5. A. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, and Christmas Day (7).
- B. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, the day before Christmas, and Christmas Day (8).
- C. Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (8).
- D. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, And Christmas Day (8).
- H. Holidays: New Year's Day, Memorial Day, Independence Day, Thanksgiving Day, the Day after Thanksgiving Day, And Christmas (6).
- I. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day (6).
- K. Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday After Thanksgiving Day, The Day Before Christmas, And Christmas Day (9).
- L. Holidays: New Year's Day, Martin Luther King Jr. Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, And Christmas Day (8).
- N. Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, The Friday After Thanksgiving Day, And Christmas Day (9).
- P. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday And Saturday After Thanksgiving Day, The Day Before Christmas, And Christmas Day (9). If A Holiday Falls On Sunday, The Following Monday Shall Be Considered As A Holiday.
- Q. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day (6).
- R. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Day After Thanksgiving Day, One-Half Day Before Christmas Day, And Christmas Day. (7 1/2).
- S. Paid Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, And Christmas Day (7).
- Z. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (8).
- 6. G. Paid Holidays: New Year's Day, Martin Luther King Jr. Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, and Christmas Eve Day (11).
- H. Paid Holidays: New Year's Day, New Year's Eve Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday After Thanksgiving Day, Christmas Day, The Day After Christmas, And A Floating Holiday (10).

Holiday Codes Continued

6. T. Paid Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, The Friday After Thanksgiving Day, The Last Working Day Before Christmas Day, And Christmas Day (9).
- Z. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, And Christmas Day (7). If a holiday falls on Saturday, the preceding Friday shall be considered as the holiday. If a holiday falls on Sunday, the following Monday shall be considered as the holiday.
7. A. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, And Christmas Day (8). Any Holiday Which Falls On A Sunday Shall Be Observed As A Holiday On The Following Monday. If any of the listed holidays falls on a Saturday, the preceding Friday shall be a regular work day.
- B. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, And Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- C. Holidays: New Year's Day, Martin Luther King Jr. Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- D. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (8). Unpaid Holidays: President's Day. Any paid holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any paid holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- E. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (7). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- F. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, the last working day before Christmas day and Christmas day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- G. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day (6). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday.
- H. Holidays: New Year's Day, Martin Luther King Jr. Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, the Last Working Day before Christmas Day and Christmas Day (9). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- I. Holidays: New Year's Day, President's Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day, The Friday After Thanksgiving Day, The Day Before Christmas Day And Christmas Day (9). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

Holiday Codes Continued

7. J. Holidays: New Year's Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day and Christmas Day (6). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- K. Holidays: New Year's Day, Memorial Day, Independence Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, And Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- L. Holidays: New Year's Day, Memorial Day, Labor Day, Independence Day, Thanksgiving Day, the Last Work Day before Christmas Day, And Christmas Day (7). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- N. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (7). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. When Christmas falls on a Saturday, the preceding Friday shall be observed as a holiday.
- P. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, And Christmas Day (7). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday.
- Q. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, the Last Working Day before Christmas Day and Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. If any of the listed holidays falls on a Saturday, the preceding Friday shall be a regular work day.
- S. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, Christmas Day, the Day after Christmas, and A Floating Holiday (9). If any of the listed holidays falls on a Sunday, the day observed by the Nation shall be considered a holiday and compensated accordingly.
- V. Holidays: New Year's Day, President's Birthday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, the day before or after Christmas, and the day before or after New Year's Day. If any of the above listed holidays falls on a Sunday, the day observed by the Nation shall be considered a holiday and compensated accordingly.
- W. Holidays: New Year's Day, Day After New Year's, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Eve Day, Christmas Day, the day after Christmas, the day before New Year's Day, and a Floating Holiday.
- X. Holidays: New Year's Day, Day before or after New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, and the day before or after Christmas day. If a holiday falls on a Saturday or on a Friday that is the normal day off, then the holiday will be taken on the last normal workday. If the holiday falls on a Monday that is the normal day off or on a Sunday, then the holiday will be taken on the next normal workday.
- Y. Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, and Christmas Day. (8) If the holiday falls on a Sunday, then the day observed by the federal government shall be considered a holiday and compensated accordingly.
- Z. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, Christmas Eve, and Christmas Day (9). Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday. Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday.

Holiday Codes Continued

15. G. New Year's Day, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, The Friday After Thanksgiving Day, the last scheduled workday before Christmas, and Christmas Day (9). If any of the listed holidays falls on a Sunday, the day observed by the Nation shall be considered a holiday and compensated accordingly.
- H. Holidays: New Year's Day, Martin Luther King Jr. Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, the Last Working Day before Christmas Day and Christmas Day (9). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- I. Holidays: New Year's Day, President's Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day, The Friday After Thanksgiving Day, The Day Before Christmas Day And Christmas Day (9). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- J. Holidays: New Year's Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day and Christmas Day (6). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- K. Holidays: New Year's Day, Memorial Day, Independence Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, And Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

Note Codes

8. D. Workers working with supplied air on hazmat projects receive an additional \$1.00 per hour.
- L. Workers on hazmat projects receive additional hourly premiums as follows -Level A: \$0.75, Level B: \$0.50, And Level C: \$0.25.
- M. Workers on hazmat projects receive additional hourly premiums as follows: Levels A & B: \$1.00, Levels C & D: \$0.50.
- N. Workers on hazmat projects receive additional hourly premiums as follows -Level A: \$1.00, Level B: \$0.75, Level C: \$0.50, And Level D: \$0.25.
- S. Effective August 31, 2012 – A Traffic Control Supervisor shall be present on the project whenever flagging or spotting or other traffic control labor is being utilized. Flaggers and Spotters shall be posted where shown on approved Traffic Control Plans or where directed by the Engineer. All flaggers and spotters shall possess a current flagging card issued by the State of Washington, Oregon, Montana, or Idaho. This classification is only effective on or after August 31, 2012.
- T. Effective August 31, 2012 – A Traffic Control Laborer performs the setup, maintenance and removal of all temporary traffic control devices and construction signs necessary to control vehicular, bicycle, and pedestrian traffic during construction operations. Flaggers and Spotters shall be posted where shown on approved Traffic Control Plans or where directed by the Engineer. All flaggers and spotters shall possess a current flagging card issued by the State of Washington, Oregon, Montana, or Idaho. This classification is only effective on or after August 31, 2012.

Note Codes Continued

8. U. Workers on hazmat projects receive additional hourly premiums as follows – Class A Suit: \$2.00, Class B Suit: \$1.50, And Class C Suit: \$1.00. Workers performing underground work receive an additional \$0.40 per hour for any and all work performed underground, including operating, servicing and repairing of equipment. The premium for underground work shall be paid for the entire shift worked. Workers who work suspended by a rope or cable receive an additional \$0.50 per hour. The premium for work suspended shall be paid for the entire shift worked. Workers who do “pioneer” work (break open a cut, build road, etc.) more than one hundred fifty (150) feet above grade elevation receive an additional \$0.50 per hour.
- V. In addition to the hourly wage and fringe benefits, the following depth and enclosure premiums shall be paid. The premiums are to be calculated for the maximum depth and distance into an enclosure that a diver reaches in a day. The premiums are to be paid one time for the day and are not used in calculating overtime pay.
- Depth premiums apply to depths of fifty feet or more. Over 50' to 100' - \$2.00 per foot for each foot over 50 feet. Over 101' to 150' - \$3.00 per foot for each foot over 101 feet. Over 151' to 220' - \$4.00 per foot for each foot over 220 feet. Over 221' - \$5.00 per foot for each foot over 221 feet.
- Enclosure premiums apply when divers enter enclosures (such as pipes or tunnels) where there is no vertical ascent and is measured by the distance travelled from the entrance. 25' to 300' - \$1.00 per foot from entrance. 300' to 600' - \$1.50 per foot beginning at 300'. Over 600' - \$2.00 per foot beginning at 600'.
- W. Meter Installers work on single phase 120/240V self-contained residential meters. The Lineman/Groundmen rates would apply to meters not fitting this description.
- X. Workers on hazmat projects receive additional hourly premiums as follows - Class A Suit: \$2.00, Class B Suit: \$1.50, Class C Suit: \$1.00, and Class D Suit: \$0.50. Special Shift Premium: Basic hourly rate plus \$2.00 per hour.
- When due to conditions beyond the control of the Employer or when an owner (not acting as the contractor), a government agency or the contract specifications requires that work can only be performed outside the normal 5 am to 6pm shift, then the special shift premium will be applied to the basic hourly rate. When an employee works on a special shift, they shall be paid a special shift premium for each hour worked unless they are in OT or Double-time status. (For example, the special shift premium does not waive the overtime requirements for work performed on Saturday or Sunday.)
- Y. Tide Work: When employees are called out between the hours of 6:00 p.m. and 6:00 a.m. to work on tide work (work located in the tide plane) all time worked shall be at one and one-half times the hourly rate of pay.
- Swinging Stage/Boatswains Chair: Employees working on a swinging state or boatswains chair or under conditions that require them to be tied off to allow their hands to be free shall receive seventy-five cents (\$0.75) per hour above the classification rate.
- Z. Workers working with supplied air on hazmat projects receive an additional \$1.00 per hour.
- Special Shift Premium: Basic hourly rate plus \$2.00 per hour. When due to conditions beyond the control of the Employer or when an owner (not acting as a contractor), a government agency or the contract specifications require that more than (4) hours of a special shift can only be performed outside the normal 6 am to 6pm shift, then the special shift premium will be applied to the basic straight time for the entire shift. When an employee works on a special shift, they will be paid a special shift premium for each hour worked unless they are in overtime or double-time status. (For example, the special shift premium does not waive the overtime requirements for work performed on Saturday or Sunday.)

Note Codes Continued

9. A. Workers working with supplied air on hazmat projects receive an additional \$1.00 per hour.
- Special Shift Premium: Basic hourly rate plus \$2.00 per hour. When due to conditions beyond the control of the Employer or when an owner (not acting as the contractor), a government agency or the contract specifications require that more than four (4) hours of a special shift can only be performed outside the normal 6 am to 6pm shift, then the special shift premium will be applied to the basic straight time for the entire shift. When an employee works on a special shift, they shall be paid a special shift premium for each hour worked unless they are in overtime or double-time status. (For example, the special shift premium does not waive the overtime requirements for work performed on Saturday or Sunday.)
- Certified Crane Operator Premium: Crane operators requiring certifications shall be paid \$0.50 per hour above their classification rate.
- Boom Pay Premium: All cranes including tower shall be paid as follows based on boom length:
- (A) – 130’ to 199’ – \$0.50 per hour over their classification rate.
(B) – 200’ to 299’ – \$0.80 per hour over their classification rate.
(C) – 300’ and over – \$1.00 per hour over their classification rate.
- B. The highest pressure registered on the gauge for an accumulated time of more than fifteen (15) minutes during the shift shall be used in determining the scale paid.
- Tide Work: When employees are called out between the hours of 6:00 p.m. and 6:00 a.m. to work on tide work (work located in the tide plane) all time worked shall be at one and one-half times the hourly rate of pay. Swinging Stage/Boatswains Chair: Employees working on a swinging stage or boatswains chair or under conditions that require them to be tied off to allow their hands to be free shall receive seventy-five cents (\$0.75) per hour above the classification rate.
- C. Tide Work: When employees are called out between the hours of 6:00 p.m. and 6:00 a.m. to work on tide work (work located in the tide plane) all time worked shall be at one and one-half times the hourly rate of pay. Swinging Stage/Boatswains Chair: Employees working on a swinging stage or boatswains chair or under conditions that require them to be tied off to allow their hands to be free shall receive seventy-five cents (\$0.75) per hour above the classification rate.
- Effective August 31, 2012 – A Traffic Control Supervisor shall be present on the project whenever flagging or spotting or other traffic control labor is being utilized. A Traffic Control Laborer performs the setup, maintenance and removal of all temporary traffic control devices and construction signs necessary to control vehicular, bicycle, and pedestrian traffic during construction operations. Flaggers and Spotters shall be posted where shown on approved Traffic Control Plans or where directed by the Engineer. All flaggers and spotters shall possess a current flagging card issued by the State of Washington, Oregon, Montana, or Idaho. These classifications are only effective on or after August 31, 2012.
- D. Industrial Painter wages are required for painting within industrial facilities such as treatment plants, pipelines, towers, dams, bridges, power generation facilities and manufacturing facilities such as chemical plants, etc., or anywhere abrasive blasting is necessary to prepare surfaces, or hazardous materials encapsulation is required.
- E. Heavy Construction includes construction, repair, alteration or additions to the production, fabrication or manufacturing portions of industrial or manufacturing plants, hydroelectric or nuclear power plants and atomic reactor construction. Workers on hazmat projects receive additional hourly premiums as follows -Level A: \$1.00, Level B: \$0.75, Level C: \$0.50, And Level D: \$0.25.
- F. Industrial Painter wages are required for painting within industrial facilities such as treatment plants, pipelines, towers, dams, power generation facilities and manufacturing facilities such as chemical plants, etc., or anywhere abrasive blasting is necessary to prepare surfaces, or hazardous materials encapsulation is required.

Note Codes Continued

9. H. One (1) person crew shall consist of a Party Chief. (Total Station or similar one (1) person survey system). Two (2) person survey party shall consist of a least a Party Chief and a Chain Person. Three (3) person survey party shall consist of at least a Party Chief, an Instrument Person, and a Chain Person.

FEDERAL WAGE RATES

"General Decision Number: WA20230011 02/03/2023

Superseded General Decision Number: WA20220011

State: Washington

Construction Type: Building

County: King County in Washington.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

<p>If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:</p>	<p>. Executive Order 14026 generally applies to the contract.</p> <p>. The contractor must pay all covered workers at least \$16.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2023.</p>
<p>If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:</p>	<p>. Executive Order 13658 generally applies to the contract.</p> <p>. The contractor must pay all covered workers at least \$12.15 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2023.</p>

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number	Publication Date
0	01/06/2023
1	01/13/2023
2	02/03/2023

ASBE0007-002 06/01/2022

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR.....	\$ 64.37	18.03

BRWA0001-011 06/01/2021

	Rates	Fringes
Bricklayers, Caulkers.....	\$ 46.14	16.97

CARP0030-008 06/01/2021

	Rates	Fringes
CARPENTER (Acoustical Installation).....	\$ 49.18	19.01
CARPENTER (Including Formwork, Drywall Hanging, Cabinet Installation; Insulator-Batt and Metal Stud Installation).....	\$ 49.18	19.01
MILLWRIGHT.....	\$ 50.68	19.01
PILEDRIVERMAN.....	\$ 49.58	19.01

(HOURLY ZONE PAY: WESTERN AND CENTRAL WASHINGTON - ALL CLASSIFICATIONS EXCEPT MILLWRIGHTS AND PILEDRIVERS

Hourly Zone Pay shall be paid on jobs located outside of the free zone computed from the city center of the following listed cities:

Seattle	Olympia	Bellingham
Auburn	Bremerton	Anacortes
Renton	Shelton	Yakima
Aberdeen-Hoquiam	Tacoma	Wenatchee
Ellensburg	Everett	Port Angeles
Centralia	Mount Vernon	Sunnyside
Chelan	Pt. Townsend	

Zone Pay:

0 -25 radius miles	Free
26-35 radius miles	\$1.00/hour
36-45 radius miles	\$1.15/hour
46-55 radius miles	\$1.35/hour
Over 55 radius miles	\$1.55/hour

(HOURLY ZONE PAY: WESTERN AND CENTRAL WASHINGTON - MILLWRIGHT AND PILEDRIVER ONLY)

Hourly Zone Pay shall be computed from Seattle Union Hall, Tacoma City center, and Everett City center

Zone Pay:

0 -25 radius miles	Free
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26-45 radius miles \$.70/hour
 Over 45 radius miles \$1.50/hour

 ELEC0046-006 08/01/2022

	Rates	Fringes
ELECTRICIAN.....	\$ 65.72	26.87

 ELEC0046-007 08/01/2022

	Rates	Fringes
ELECTRICIAN (Alarm Installation Only).....	\$ 44.09	16.01
ELECTRICIAN (Low Voltage Wiring Only).....	\$ 44.09	16.01

 ELEV0019-001 01/01/2023

	Rates	Fringes
ELEVATOR MECHANIC.....	\$ 62.25	37.335+a+b

FOOTNOTE:

- a. PAID VACATION: Employer contributes 8% of regular hourly rate as vacation pay credit for employees with more than 5 years of service, and 6% for 6 months to 5 years of service.
- b. PAID HOLIDAYS: New Years Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, Friday after Thanksgiving, and Christmas Day.

 ENGI0302-019 06/01/2022

	Rates	Fringes
Power equipment operators:		
Group 1A.....	\$ 54.20	24.47
Group 1AA.....	\$ 54.98	24.47
Group 1AAA.....	\$ 55.78	24.47
Group 1.....	\$ 53.40	24.47
Group 2.....	\$ 52.72	24.47
Group 3.....	\$ 52.12	24.47
Group 4.....	\$ 48.78	24.47

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1AAA - Cranes-over 300 tons, or 300 ft of boom (including jib with attachments)

GROUP 1AA - Cranes 200 to 300 tons, or 250 ft of boom (including jib with attachments); Excavator/Trackhoe: Over 90 metric tons

GROUP 1A - Cranes, 100 tons thru 199 tons, or 150 ft of boom (including jib with attachments); Loaders-overhead, 8 yards and over; excavator/Trackhoe: over 50 metric tons to 90 metric tons

GROUP 1 - Cranes 45 tons thru 99 tons, under 150 ft of boom

(including jib with attachments); Excavator/Trackhoe: over 30 metric tons to 50 metric tons; Loader- overhead 6 yards to, but not including 8 yards; Dozer D-10; Screedman; Scrapers: 45 yards and over; Grader/Blade

GROUP 2 - Cranes, 20 tons thru 44 tons with attachments; Drilling machine; Excavator/Trackhoe: 15 to 30 metric tons; Horizontal/directional drill operator; Loaders-overhead under 6 yards; Crane Oiler-100 Tons and Over; Compactor; Scraper: under 45 tons

GROUP 3 - Cranes-thru 19 tons with attachments; Dozers-D-9 and under; Motor patrol grader-nonfinishing; Roller-Plant Mix; Crane Oiler under 100 tons; Excavator/Trackhoe: under 15 metric tons; Forklift: 3000 lbs and over with attachments; Service Oiler; Concrete Pump; Outside Hoist (Elevators and Manlifts); Pump Grout

GROUP 4 - Roller-other than plant mix; Forklift: under 3000 lbs with attachments; Bobcat; Rigger/Bellman

IRON0086-010 07/04/2022

	Rates	Fringes
IRONWORKER (Reinforcing, Structural and Ornamental).....	\$ 49.90	31.82

LAB00242-002 06/01/2022

ZONE 1:

	Rates	Fringes
LABORER		
GROUP 2A.....	\$ 34.20	13.80
GROUP 3.....	\$ 42.86	13.80
GROUP 4.....	\$ 43.90	13.80
GROUP 5.....	\$ 44.62	13.80

ZONE DIFFERENTIAL (ADD TO ZONE 1 RATES):
 ZONE 2 - \$1.00
 ZONE 3 - \$1.30

BASE POINTS: BELLINGHAM, MT. VERNON, EVERETT, SEATTLE, KENT, TACOMA, OLYMPIA, CENTRALIA, ABERDEEN, SHELTON, PT. TOWNSEND, PT. ANGELES, AND BREMERTON

ZONE 1 - Projects within 25 radius miles of the respective city hall
 ZONE 2 - More than 25 but less than 45 radius miles from the respective city hall
 ZONE 3 - More than 45 radius miles from the respective city hall

LABORERS CLASSIFICATIONS

GROUP 2A: Flagman

GROUP 3: General Laborer; Chipping Gun (under 30 lbs.); Form Stripping; Roof Tearoff

GROUP 4: Chipping Gun (over 30 lbs.); Concrete Saw Operator;
Gunite; Pipe Layer; Vibrating Plate

GROUP 5: Mason Tender-Brick; Mason Tender-Cement/Concrete;
Grade Checker

PAIN0005-029 07/01/2022

	Rates	Fringes
DRYWALL FINISHER/TAPER.....	\$ 48.46	21.73

PAIN0005-030 07/01/2019

	Rates	Fringes
Painters: Parking Lot and Highway Striping Only.....	\$ 31.61	16.07

PAIN0005-031 07/01/2022

	Rates	Fringes
PAINTER (Including Brush, Roller, Spray and Prep Work)....	\$ 35.95	13.23

PAIN0188-005 07/01/2022

	Rates	Fringes
GLAZIER.....	\$ 54.45	21.20

PAIN1238-002 07/01/2022

	Rates	Fringes
SOFT FLOOR LAYER (Including Vinyl and Carpet).....	\$ 36.53	18.78

PLAS0528-002 06/01/2022

	Rates	Fringes
PLASTERER.....	\$ 47.89	19.14

PLAS0528-004 06/01/2022

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 50.00	19.59

* PLUM0032-009 01/01/2023

	Rates	Fringes
PIPEFITTER.....	\$ 67.21	28.88
PLUMBER (Including HVAC Pipe Installation).....	\$ 67.21	28.88
REFRIGERATION MECHANIC.....	\$ 26.87	23.64

ROOF0054-008 06/01/2022

	Rates	Fringes
ROOFER (Includes Roof Tear Off, Waterproofing, and Installation of Metal Roofs).....	\$ 42.80	16.79

SFWA0699-002 01/01/2023

	Rates	Fringes
SPRINKLER FITTER (Fire Sprinklers).....	\$ 60.94	31.05

SHEE0066-023 06/01/2022

	Rates	Fringes
Sheet Metal Worker (Including HVAC Duct Work and Installation of HVAC Systems)....	\$ 61.55	30.05

* TEAM0174-005 06/01/2019

	Rates	Fringes
Truck drivers: ZONE A: GROUP 2:.....	\$ 39.54	20.46

ZONE B (25-45 miles from center of listed cities*): Add \$.70 per hour to Zone A rates.
 ZONE C (over 45 miles from centr of listed cities*): Add \$1.00 per hour to Zone A rates.

*Zone pay will be calculated from the city center of the following listed cities:

BELLINGHAM	CENTRALIA	RAYMOND	OLYMPIA
EVERETT	SHELTON	ANACORTES	BELLEVUE
SEATTLE	PORT ANGELES	MT. VERNON	KENT
TACOMA	PORT TOWNSEND	ABERDEEN	BREMERTON

TRUCK DRIVERS CLASSIFICATIONS

GROUP 2 - Semi-Trailer Truck

HAZMAT PROJECTS

Anyone working on a HAZMAT job, where HAZMAT certification is required, shall be compensated as a premium, in addition to the classification working in as follows:

LEVEL C: +\$.25 per hour - This level uses an air purifying respirator or additional protective clothing.

LEVEL B: +\$.50 per hour - Uses same respirator protection as Level A. Supplied air line is provided in conjunction with a chemical "splash suit."

LEVEL A: +\$.75 per hour - This level utilizes a fully-encapsulated suit with a self-contained breathing apparatus or a supplied air line.

 * SUWA2009-024 05/22/2009

	Rates	Fringes
LABORER: Driller.....	\$ 17.17	5.36
LABORER: Irrigation.....	\$ 11.58 **	0.00
LABORER: Landscape.....	\$ 9.73 **	0.00
LABORER: Overhead Door Installation.....	\$ 22.31	3.44
OPERATOR: Backhoe.....	\$ 29.95	7.20
OPERATOR: Mechanic.....	\$ 24.33	4.33
ROOFER: Metal Roof.....	\$ 24.30	4.05
TILE SETTER.....	\$ 18.72	3.35
TRUCK DRIVER: Dump Truck.....	\$ 27.43	0.00

 WELDERS - Receive rate prescribed for craft performing
 operation to which welding is incidental.

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 ** Workers in this classification may be entitled to a higher
 minimum wage under Executive Order 14026 (\$16.20) or 13658
 (\$12.15). Please see the Note at the top of the wage
 determination for more information.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave
 for Federal Contractors applies to all contracts subject to the
 Davis-Bacon Act for which the contract is awarded (and any
 solicitation was issued) on or after January 1, 2017. If this
 contract is covered by the EO, the contractor must provide
 employees with 1 hour of paid sick leave for every 30 hours
 they work, up to 56 hours of paid sick leave each year.
 Employees must be permitted to use paid sick leave for their
 own illness, injury or other health-related needs, including
 preventive care; to assist a family member (or person who is
 like family to the employee) who is ill, injured, or has other
 health-related needs, including preventive care; or for reasons
 resulting from, or to assist a family member (or person who is
 like family to the employee) who is a victim of, domestic
 violence, sexual assault, or stalking. Additional information
 on contractor requirements and worker protections under the EO
 is available at
<https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within
 the scope of the classifications listed may be added after
 award only as provided in the labor standards contract clauses
 (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISIO"