City of Wenatchee

DEPARTMENT OF PARKS, RECREATION, AND CULTURAL SERVICES

CITY OF WENATCHEE

HALE PARK PHASE II PROJECT

CITY PROJECT NUMBER 16-1584D

MAY 2020

Dave Erickson
Parks, Recreation and Cultural Services Director
City of Wenatchee
1350 McKittrick St, POB 519
Wenatchee, WA 98807
Phone: (509) 888-3280

Aaron D. Anderson, PE
Pacific Engineering & Design
200 South Columbia Street, Ste 300
Wenatchee, WA 98801
Phone: (509) 662-1161

Bid Forms, Contract Forms, Special Provisions, and Project Plans
Conformed Set – June 3, 2020

CITY OF WENATCHEE
PROJECT NO. 16-1584D
HALE PARK PHASE II
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City of Wenatchee
301 Yakima Street, Suite 301
Wenatchee, WA 98801

ADVERTISEMENT FOR BIDS

Notice is hereby given that sealed bids will be received by the City of Wenatchee, until **3:00 p.m. PST on Wednesday, May 27, 2020**, for construction of the Hale Park Phase II project. Bid proposals will be received by the Parks, Recreation and Cultural Services Director at the City of Wenatchee Public Services Center at 1350 McKittrick Street, Suite B, Wenatchee, WA 98801. Due to current closure of city facilities, hardcopy bids will be received at the front door of the Public Services Center between 2:30 p.m. and 3:00 p.m. and contractors will not be allowed to enter the building. Proposals received after this time will not be considered.

Received bids will be delivered to City Hall at 301 Yakima Street, Suite 304, Wenatchee, WA 98801. All bids will be opened, read, and tabulated publicly via the City of Wenatchee's YouTube channel at 4:00 p.m.PST on Wednesday, May 27, 2020. Contractors can view the bid opening using the following link: https://www.youtube.com/channel/UCT-YjVud0twVXGMUjg16rhA/.

The major items of work include but are not limited to temporary erosion and sedimentation control, clearing and grubbing, earthwork, site grading, and import, placement and compaction of crushed surfacing materials, asphalt trail paving, landscaping improvements, irrigation adjustments, utility extensions, restroom facility, playground surfacing and equipment installation, picnic shelter installation and associated appurtenances.

All work performed on the project will be subject to prevailing state wage rates.

Complete digital project bidding documents are available at www.questcdn.com. Bidders may download the digital plan set for $15.00 by entering **Quest project #6904757** on the website's Project Search page. Please contact QuestCDN.com at (952) 233-1632 or info@questcdn.com for assistance in free membership registration, downloading, and working with this digital information.

Each bid proposal shall be accompanied by a bid proposal deposit in certified check, cashier's check, postal money order, or surety bond in an amount equal to at least 5 percent of the amount of the bid proposal. Checks shall be made payable to the City of Wenatchee. Should the successful bidder fail to enter into such contract and furnish satisfactory performance and payment bond within the time stated in the specifications, the bid proposal deposit shall be forfeited to the City of Wenatchee. The City of Wenatchee reserves the right to reject any or all bids and to waive irregularities in the bid or in the bidding.

The City, in accordance with Title VI of the Civil Rights Act of 1964, hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprise as defined at 49 CFR Part 23 will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin, or sex in consideration for an award.

Contractor shall assure to City of Wenatchee that all services provided through this contract shall be completed in full compliance with the Americans with Disabilities Act ("ADA") and Architectural and Transportation Barriers Compliance Board, Federal Register 36 CFR Parts 1190 and 1191, Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; proposed rule, published in the Federal Register on July 23, 2004.

No bidder may withdraw his proposal after the hours set for the opening thereof, or before award of contract, unless said award is delayed for a period exceeding forty-five (45) days.

PUBLISHED: Wenatchee World

PUBLISH DATE(S): May 5, 2020 and May 12, 2020

BIDDING CHECKLIST

Bidders must bid on all items contained in the Proposal. The omission or deletion of any bid item will be considered non-responsive and shall be cause for rejection of the bid.

Please make sure you have accomplished the following:

- Have you certified receipt of addenda?
- Have you bid on ALL ITEMS?
- Has the proposal been properly signed?
- Has bid bond or certified check been enclosed with your bid?
- Is the amount of the bid guaranty at least 5 percent of the total amount of the bid?
- Have you completed the Bidder's Qualifications Certificate?
- Have you read and included the non-collusion affidavit?
- Have you prepared the Subcontractor List?
- Have you read and included the Certificate of Compliance with Wage Payment Statutes?
- Have you read and included the Certificate of Compliance with Prevailing Wage Training?
- Have you read and included the Certificate of Regarding Debarment?
- Have you completed the Bonding and Claims form?

INFORMATION TO BIDDERS

INFORMATION TO BIDDERS

CITY OF WENATCHEE
HALE PARK PHASE II
PROJECT NO. 16-1584D

RECEIPT AND OPENING OF BIDS

The City of Wenatchee (herein after called the Owner) invites bids on the forms attached hereto. Bids will be received by the Owner at the location and until the time indicated in the advertisement for bids. The envelopes containing the bids must be sealed and shall be clearly marked as follows:

ATTENTION: DIRECTOR OF PARKS, RECREATION AND CULTURAL SERVICES
SEALED BID – DO NOT OPEN
CITY OF WENATCHEE HALE PARK PHASE II
CITY PROJECT NO. 16-1584D

PREPARATION OF THE PROPOSAL

Refer to Section 1-02.5 of the Standard Specifications and Special Provisions section 1-02.5 of the Standard Specifications for requirements in completing the proposal. **Make sure your bid proposal is complete.**

ADDENDA AND INTERPRETATIONS

Questions regarding the Specifications should be addressed (in writing via email) to:

Aaron Anderson
Pacific Engineering & Design
email: aaron@pacificengineering.net
(509) 662-1161

The City's representative will not be responsible for oral questions or interpretations. Each request for such interpretation should be in writing addressed to the contact at the email address above. Any and all such interpretations and supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be sent out via QuestCDN or by email to all prospective bidders (at the respective email addresses furnished for such proposal). Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.

INSURANCE REQUIREMENTS

The contractor shall name the City of Wenatchee, its employees and elected officials as additional insured in the certificate of insurance. The insurance requirements for this project can be found in the Special Provisions.

PERMITS AND LICENSES

The Contractor and each of his subcontractors will be required to obtain a City of Wenatchee Business License prior to starting work on the project.

The contractor will be required to obtain any other permits and licenses required by laws of the state and federal government necessary to perform the work under this contract. All costs related to the acquisition of permits and licenses shall be paid by the Contractor and shall be incidental to the bid items of this contract. See section 1-07.6 of the Standard Specifications and Special Provisions for more requirements.

STATE SALES TAX

Washington State sales tax will be charged on this project. See Section 1-07.2 of the Standard Specifications and Special Provision.

EQUAL EMPLOYMENT OPPORTUNITY

The City of Wenatchee will comply with all federal and state Equal Employment Opportunity regulations where relevant or applicable, to the end that no person shall on the grounds of race, color, creed, age, sex, or marital status, sensory, mental or physical handicap or national origin, be excluded from participation in; be deprived of the benefits of; or be otherwise subjected to discrimination.

DATE May 13, 2020

OWNER City of Wenatchee Department of Parks, Recreation, and Cultural Services

PROJECT Hale Park Phase II
City of Wenatchee Project No. 16-1548D

ADDENDUM NO. 1

To the Contractors, Subcontractors and Suppliers:

The following items contain additions, deletions, or modifications to the Plans and Specifications. This Addendum forms a part of the Contract Documents.

Bidders shall acknowledge receipt of this Addendum on Page BF-1 of their Bid Proposal form.

NOTICE TO ALL PLANHOLDERS
This Addendum will be posted online via Quest CDN at www.questcdn.com under project #6904757.

BID FORMS

1. **TABLE OF CONTENTS**
   - Replace the TABLE OF CONTENTS with the attached version.

2. **BID ITEM SCHEDULE**
   - Replace the BID ITEM SCHEDULE with the attached version.

SPECIAL PROVISIONS

1. **INTRODUCTION, DIVISIONS, AND AMENDMENTS**
   - Replace the SPECIAL PROVISIONS in its entirety with the attached version.

SPECIFICATIONS

1. **SECTION 22 05 33 – HEAT TRACING FOR PLUMBING PIPING,**
   - Paragraph 2.1 Heat Tracing System, sub-paragraph "B" – Materials, Sub, sub-paragraph "5" – Energy Efficient Control System, sub-paragraph "b" – Ambient Temperature Shut-off Controls
     - ADD: sub-paragraph "b" – Ambient Temperature Shut-off Controls – The heat tracing system shall include an automatic control system consisting of all controls as required to automatically disable the heat trace system when the ambient temperature reaches 40 Deg. F. or as set. The shut-off temperature shall be adjustable by the owner.

2. **SECTION 22 11 19 – DOMESTIC WATER PIPING SPECIALTIES**
   - Paragraph 2.6 Trap Seal Primer Valves & Paragraph 2.7 Trap Seal Primer Valve Systems

- REVISE: Primer valves are not to be used on the floor drains. Each floor drain shall have a floor drain trap seal installed in lieu of a trap primer valve. Floor Drain Trap Seal to be Rectorseal SureSeal or equal.

PLANS

1. **DRAWINGS C1.0, C1.1, C1.2, C1.3, C2.0, C3.0, C4.0, C5.0, C6.0, C8.0, C9.0**
   - Replace the CIVIL DRAWINGS with the attached versions.

2. **DRAWING M1.0**
   - Legends and Schedules – Electric Ceiling Heater Schedule
     - Revise heating capacity of CH-1 to 3,000 watts.
     - Revise heating capacity of CH-2 to 3,000 watts.

END OF ADDENDUM NO. 1

DATE May 22, 2020

OWNER City of Wenatchee Department of Parks, Recreation, and Cultural Services

PROJECT Hale Park Phase II
City of Wenatchee Project No. 16-1548D

ADDENDUM NO. 2

To the Contractors, Subcontractors and Suppliers:

The following items contain additions, deletions, or modifications to the Plans and Specifications. This Addendum forms a part of the Contract Documents.

Bidders shall acknowledge receipt of this Addendum on Page BF-1 of their Bid Proposal form.

NOTICE TO ALL PLANHOLDERS
This Addendum will be posted online via Quest CDN at www.questcdn.com under project #6904757.

Q&A

1. **Question-** ***Are we to assume that there is an existing 1" conduit from existing irrigation controller to the last group of existing electric valves to the south that is dedicated for installing wire from phase 2 area to existing controller for irrigation system?***

   - Answer- It is our understanding there is an existing conduit to the last group of electrical valves. Bid it as such.

2. **Question-** ***Please clarify the maintenance period for sodded or seeded lawn areas.***

   - Answer- The maintenance period for landscaping is 20 working days for plants or 4 mowings for lawn areas whichever is greater.

3. **Question-** ***The Landscape bid item (specification regarding irrigation systems was referenced in the question) says it will be paid for by force account. The bid schedule doesn't reflect that.***

   - Answer- The irrigation system is a lump sum bid item and will not be paid by force account. Delete Section 8-03.4 Measurements and 8-03.5.

4. **Question-** ***The pedestrian curb quantity is shown as 36 lf. On sheet 2.0, callout 18, references pedestrian curb around the play structures. The quantity doesn't reflect the curb required for the play areas. Is the curb around the play areas being paid for under the pedestrian curb bid item? If not, which bid item should it be under?***

   - Answer- It was believed the pedestrian curb quantity was included in the Pour-In-Place Surfacing (PIP) Specifications with the base material callout in Part 4. It was not. Bid

Item 16, Cement Concrete Pedestrian Curb Quantity must be changed from 36 L.F. to 286 L.F.

- **Clarification: The lump sum bid item 21, Playground Surfacing, includes all items identified in Part 4- Execution of the PIP Specifications as needed for the placement of the PIP surface.**

END OF ADDENDUM NO. 2

BID FORMS

BID PROPOSAL

Bidder Name SE Inc., dba Smith Excavation

Bidder Address P.O. Box 284, Cashmere, WA 98815

for the construction of City of Wenatchee Project No. 16-1584D, Hale Park Phase II and related work hereinafter referred to as the Works.

City Council
City Hall
Wenatchee, Washington

Greetings:

We, the undersigned, having investigated the site of the Works and having examined the Advertisement, Information to Bidders, and the Contract Documents for the construction of the Works, offer to construct, complete, and maintain the Works in conformity with said documents, and to enter into an agreement according to the form hereto attached, in consideration of the sum arrived at by the proper extension of units of work shown in the following Schedule of Quantities, or such sum as may be ascertained in accordance with said documents.

We acknowledge receipt, understanding, and full consideration of Addenda Numbers.

1, 2 issued prior to the date for receipt of bids.

List all Addenda by Number

Signature Verifying Receipt of Addenda

BASE BID					
Item #	**Description**	**Unit**	**Quantity**	**Unit Price**	**Total Price**
1	MOBILIZATION	L.S.	1	$ 15,000	$ 15,000.00
2	CLEARING AND GRUBBING - SITE	ACRE	1	$ 3,400	$ 3,400.00
3	TREE REMOVAL	EACH	1	$ 400	$ 400.00
4	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	L.S.	1	$ 2,700	$ 2,700.00
5	ROCK EXCAVATION INCL. HAUL	C.Y.	190	$ 75	$ 14,250.00
6	COMMON EXCAVATION INCL HAUL	C.Y.	100	$ 15	$ 1,500.00
7	SERVICE CONNECTION 2 IN. DIAM.	L.S.	1	$ 5,850	$ 5,850.00
8	ILLUMINATION SYSTEM (EXCL. SKATE PARK)	L.S.	1	$ 32,300	$ 32,300.00
9	COMMON BORROW INCL. HAUL	C.Y.	425	$ 24	$ 10,200.00
10	CRUSHED SURFACING BASE COURSE	C.Y.	25	$ 41	$ 1,025.00
11	CRUSHED SURFACING TOP COURSE	C.Y.	175	$ 32	$ 5,600.00
12	TOPSOIL TYPE C	C.Y.	650	$ 25	$ 16,250.00
13	COMMERCIAL HMA	TON	105	$ 178	$ 18,690.00
14	CONCRETE STAIRS INCL. HANDRAIL AND APPURTENANCES	L.S.	1	$ 26,500	$ 26,500.00
15	CONCRETE FOUNDATION AND APRONS FOR STRUCTURES	L.S.	1	$ 22,200	$ 22,200.00
16	CEMENT CONC. PEDESTRIAN CURB	L.F.	286 ~~30~~	$ 57	$ 16,302.00
17	IRRIGATION SYSTEMS	L.S.	1	$ 54,500	$ 54,500.00
18	PAINTED TRAFFIC ARROW	EACH	3	$ 115	$ 345.00
19	LANDSCAPING	L.S.	1	$ 22,000	$ 22,000.00

20	INSTALLATION OF OWNER PROVIDED PLAYGROUND EQUIPMENT	L.S.	1	$ 11,000	$ 11,000.00
21	PLAYGROUND SURFACING	L.S.	1	$ 47,750	$ 47,750.00
22	INSTALLATION OF OWNER PROVIDED PICNIC SHELTER	L.S.	1	$ 8,300	$ 8,300.00
23	RESTROOM	L.S.	1	$ 166,500	$ 166,500.00
24	PROJECT TEMPORARY TRAFFIC CONTROL	L.S.	1	$ 2,800	$ 2,800.00
25	EROSION CONTROL AND WATER POLLUTION PREVENTION	L.S.	1	$ 1,900	$ 1,900.00
26	SPCC PLAN	L.S.	1	$ 500	$ 500.00
27	FORCE ACCOUNT	EST.	1	$(1)	$(1)
28	MINOR CHANGE	CALC	1	$(1)	$(1)
29	RECORD DRAWING (MIN. BID $500)	L.S.	1	$500	$500.00
				TOTAL BID WITHOUT SALES TAX	$ 508,264.00
				SALES TAX (8.5%)	$ 43,202.44
				TOTAL BID WITH SALES TAX	$ 551,466.44

20ADDITIVE BID 1					
Item #	**Description**	**Unit**	**Quantity**	**Unit Price**	**Total Price**
30	ADDITIVE 1: SKATE PARK ILLUMINATION SYSTEM	L.S.	1.0	$ 17,200	$ 17,200.00
				TOTAL BID WITHOUT SALES TAX	$ 17,200.00
				SALES TAX (8.5%)	$ 1,462.00
				TOTAL BID WITH SALES TAX	$ 18,662.00

ADDITIVE BID 2					
Item #	**Description**	**Unit**	**Quantity**	**Unit Price**	**Total Price**
31	ADDITIVE 2: SOD INSTALLATION	S.Y.	3,825	$9	$ 34,425.00
				TOTAL BID WITHOUT SALES TAX	$ 34,425.00
				SALES TAX (8.5%)	$ 2,926.13
				TOTAL BID WITH SALES TAX	$ 37,351.13

ADDITIVE BID 3					
Item #	**Description**	**Unit**	**Quantity**	**Unit Price**	**Total Price**
32	ADDITIVE 3: SEEDED LAWN INSTALLATION	S.Y.	3,825	$2.50	$ 9,562.50
				TOTAL BID WITHOUT SALES TAX	$ 9,562.50
				SALES TAX (8.5%)	$ 812.81
				TOTAL BID WITH SALES TAX	$ 10,375.31

The City reserves the right to award any of the above listed additive bids in no particular order, ranking, and/combination of selection in addition to the base bid. Should the base bid and any awarded additive bids be accepted, we agree to provide the City of Wenatchee Department of Parks, Recreation, and Cultural Services, within ten (10) Calendar Days from the date of award and return two (2) signed contracts and to provide the Contract Bond and Certificate of Insurance.

We agree to begin work within ten (10) Calendar Days from the date of the Notice to Proceed, and to proceed so as to have substantial completion within fifty (50) working days. Charged working days will begin the day following the issuance of the Notice to Proceed. Completion of all contract work means the final acceptance by the Owner's governing body.

Attached hereto is certified check, cashier's check, or bid bond in the amount of ($) 5 %, payable to the order of the City Treasurer of the City of Wenatchee, this amount being five (5%) percent of the total bid, based upon the approximate quantities at the above prices.

DATED this 27th day of May, 2020, at Cashmere, Washington.

ADDRESS OF BIDDER
(Principal Place of Business)

SE Inc., dba Smith Excavation
Firm Name
P.O. Box 284
Cashmere, WA

By _____
Signature

TELEPHONE 509-782-0446

FAX NO. 800-811-0924

Gregg Smith, President
Printed Name/Title

(If the bidder is a corporation, this proposal must be executed by its duly authorized officials.)

Contractor's State Registration No. SMITHE*952B1

City of Wenatchee Business License No. 40059

State Industrial Insurance No. 030,166-01

Employment Security Department No. 284950 00 8

Current Unified Business Identifier No. 602 455 594

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, SE Inc., dba Smith Excavation as Principal, and Contractors Bonding and Insurance Company as Surety, are hereby held and firmly bound unto the City of Wenatchee as OWNER in the penal sum of Five percent of total bid proposal dollars for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this 26th day of May, 2020.

The conditions of the above obligation is such that whereas the Principal has submitted to the City of Wenatchee a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing, for the

Hale Park Phase II
Project No. 16-1584D

NOW THEREFORE,

If said BID shall be rejected, or

If said BID shall be accepted and the principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and for the payment of all persons performing work or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extensions of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

SE Inc., dba Smith Excavation /
Principal Gregg Smith

Contractors Bonding and Insurance Company
Surety

BY: Attorney in Fact /
Sheri Norris

CONTRACTORS BONDING AND INSURANCE COMPANY CORPORATE SEAL 1970 WASHINGTON

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Washington.

POWER OF ATTORNEY

RLI Insurance Company
Contractors Bonding and Insurance Company

9025 N. Lindbergh Dr. Peoria, IL 61615
Phone: 800-645-2402

Know All Men by These Presents:

That this Power of Attorney is not valid or in effect unless attached to the bond which it authorizes executed, but may be detached by the approving officer if desired.

That **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, each an Illinois corporation, (separately and together, the "Company") do hereby make, constitute and appoint:

Lori L. Reed, Craig Field, Diana Paulus, Brent E. Schmitten, Sheri L. Norris, Tamra L. Mitchell, Sheila Walch, jointly or severally

in the City of Wenatchee, State of Washington its true and lawful Agent(s) and Attorney(s) in Fact, with full power and authority hereby conferred, to sign, execute, acknowledge and deliver for and on its behalf as Surety, in general, any and all bonds and undertakings in an amount not to exceed **Twenty Five Million** Dollars (**$25,000,000.00**) for any single obligation.

The acknowledgment and execution of such bond by the said Attorney in Fact shall be as binding upon the Company as if such bond had been executed and acknowledged by the regularly elected officers of the Company.

RLI Insurance Company and/or **Contractors Bonding and Insurance Company**, as applicable, have each further certified that the following is a true and exact copy of a Resolution adopted by the Board of Directors of each such corporation, and is now in force, to-wit:

> "All bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, any Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys in Fact or Agents who shall have authority to issue bonds, policies or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile."

IN WITNESS WHEREOF, the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, as applicable, have caused these presents to be executed by its respective Vice President with its corporate seal affixed this 15th day of June, 2018.

CONTRACTORS BONDING AND INSURANCE COMPANY CORPORATE SEAL ILLINOIS

RLI INSURANCE COMPANY CORPORATE SEAL ILLINOIS

RLI Insurance Company
Contractors Bonding and Insurance Company

By: B. W. D.
Barton W. Davis — Vice President

State of Illinois
County of Peoria } SS

On this 15th day of June, 2018, before me, a Notary Public, personally appeared Barton W. Davis, who being by me duly sworn, acknowledged that he signed the above Power of Attorney as the aforesaid officer of the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company** and acknowledged said instrument to be the voluntary act and deed of said corporation.

By: Gretchen L. Johnigk
Gretchen L. Johnigk — Notary Public

GRETCHEN L JOHNIGK
NOTARY PUBLIC STATE OF ILLINOIS
"OFFICIAL SEAL"
My Commission Expires
May 26, 2020

CERTIFICATE

I, the undersigned officer of **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, do hereby certify that the attached Power of Attorney is in full force and effect and is irrevocable; and furthermore, that the Resolution of the Company as set forth in the Power of Attorney, is now in force. In testimony whereof, I have hereunto set my hand and the seal of the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company** this 26th day of May, 2020.

RLI Insurance Company
Contractors Bonding and Insurance Company

By: Jean M. Stephenson
Jean M. Stephenson — Corporate Secretary

4675472020212

A0058817

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 05/26/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Diana Paulus
Mitchell Reed & Schmitten Insurance, Inc. 124 E. Penny Road, Suite 101 Wenatchee WA 98801	PHONE (A/C, No, Ext): (509) 665-0500 FAX (A/C, No): (509) 664-4004 E-MAIL ADDRESS: diana@mrandsins.com
INSURED SE Inc dba Smith Excavation PO Box 284 Cashmere WA 98815-0284	INSURER(S) AFFORDING COVERAGE / NAIC # INSURER A: American Fire and Casualty Company 24066 INSURER B: West American Insurance Co 44393 INSURER C: Ohio Casualty Insurance Co 24074 INSURER D: Westchester Surplus Lines Insurance Co. 10172 INSURER E: INSURER F:

COVERAGES CERTIFICATE NUMBER: '20 bid bonding info only REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	[X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [X] PRO-JECT [ ] LOC [ ] OTHER:			BKS55074903	02/11/2020	02/11/2021	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG Experience Mod Factor 1	$ 1,000,000 $ 1,000,000 $ 15,000 $ 1,000,000 $ 2,000,000 $ 2,000,000 $
B	AUTOMOBILE LIABILITY [X] ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS [ ] HIRED AUTOS ONLY [ ] NON-OWNED AUTOS ONLY			BAW55074903	02/11/2020	02/11/2021	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) Medical payments	$ 1,000,000 $ $ $ $ 5,000
C	[X] UMBRELLA LIAB [ ] OCCUR [ ] EXCESS LIAB [ ] CLAIMS-MADE [ ] DED [X] RETENTION $ 10,000			USO55074903	02/11/2020	02/11/2021	EACH OCCURRENCE AGGREGATE	$ 5,000,000 $ 5,000,000 $
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N [ ] If yes, describe under DESCRIPTION OF OPERATIONS below	N/A		BKS55074903	02/11/2020	02/11/2021	[ ] PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	WA State Stop Gap $ 1,000,000 $ 1,000,000 $ 1,000,000
D	Pollution $5,000 deductible per conditon			G71126997002	05/03/2019	05/03/2020	$2,000,000 $2,000,000	Aggregate Per Claim

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

INFORMATION ONLY **********
MITCHELL, REED & SCHMITTEN INS
TO ADD ANY CERTIFICATE HOLDERS

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Sheri Norris

BIDDER'S QUALIFICATION CERTIFICATE

The undersigned hereby certifies and submits the following qualifications:

1. Name and Address

   SE Inc., dba Smith Excavation

   P.O. Box 284

   Cashmere, WA 98815

2. State of Washington Registration Number and expiration SMITHE*952B1 / Exp. 01/21/2021

3. Number of years in contracting business under present firm name 16

4. Particular types of construction work performed by your company:

   Site excavation & utility construction

5. List several recent construction projects performed:

Amount	Type	Owner	Name	Phone
See Attached				

6. Gross amount of contracts now in hand:

   $1,000,000

7. Bank reference(s):

   Cashmere Valley Bank, Alex Cruz, 509-782-4542

By (Authorized Signature):

Title President

NON-COLLUSION AFFIDAVIT

STATE OF WASHNGTON)
) ss
COUNTY OF CHELAN)

Gregg Smith, being first duly sworn, on his oath says that the bid above submitted is a genuine and not a sham or collusive bid, or made in the interest or on behalf of any person not therein named; and he further says that the said bidder is not directly or indirectly induced or solicited any bidder on the above work or supplies to put in a sham bid, or any another person or corporation to refrain from bidding; and that said bidder has not in any manner sought by collusion to secure to self an advantage over other bidder or bidders.

SE Inc., dba Smith Excavation / _____
(Contractor)

Subscribed and sworn to before me this 27th day of May, 2020.

_____
Notary Public in and for the State of
Washington, residing at Cashmere

LAURA C PIPKIN
Commission Expires
NOTARY
PUBLIC
11-11-2021
STATE OF WASHINGTON

SUBCONTRACTOR LIST

Prepared in compliance with RCW 39.30.060 as amended

The City of Wenatchee Requires the bidder to submit the names of all subcontractors whose subcontract amount exceeds 10 percent of the contract price for all contracts exceeding $100,000. Bidders shall complete Section A below, as appropriate, with the bid proposal or within 1 hour of the bid time.

Bidders may attach additional sheets as necessary to identify additional subcontractors. If Information is delivered within 1 hour of the bid time, it may be delivered in person, by fax, courier or email to the owner's representative.

SECTION A. OWNER REQUIRED SUBCONTRACTOR LIST

The following subcontractor(s) subcontract amount(s) exceed 10 percent of the contract price and the contract exceeds $100,000 (list subcontractor and bid item).

Bidder certifies that there are no subcontractors at this time who meet the above requirements.

Name _____

Title. _____

Signature _____

OR There are subcontractors that meet the above requirements.

Subcontractor Name Anderson Landscaping

Bid Item No. 17, 19, 31, 32

Address. 1250 N. Wenatchee Avenue, #H130, Wenatchee, WA 98801

Phone No. 509-665-4916 State Contractor's Lic. No. ANDERL*935N4

Subcontractor Name Ridgeline Custom Builders LLC

Bid Item No. 15, 23

Address. P.O. Box 3572, Wenatchee, WA 98807

Phone No. 509-860-1042 State Contractor's Lic. No. RIDGECB957RE

Subcontractor Name _____

Bid Item No. _____

Address. _____

Phone No. _____ State Contractor's Lic. No. _____

This form must be submitted with the Bid Proposal or as a Supplement to the Bid no later than 24 hours after the time for delivery of the Bid Proposal, as provided for in Section 1-02.9 of the Contract Provisions.

Certification of Compliance with Wage Payment Statutes

The bidder hereby certifies that, within the three-year period immediately preceding the bid solicitation date July 10, 2018 the bidder is not a "willful" violator, as defined in RCW 49.48.082, of any provision of chapters 49.46, 49.48, or 49.52 RCW, as determined by a final and binding citation and notice of assessment issued by the Department of Labor and Industries or through a civil judgment entered by a court of limited or general jurisdiction.

I certify under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct.

SE Inc., dba Smith Excavation
Bidder's Business Name

Signature of Authorized Official*

Gregg Smith
Printed Name

President
Title

05/27/2020	Cashmere	Washington
Date	City	State

Check One:

Sole Proprietorship ☐ Partnership ☐ Joint Venture ☐ Corporation ☑

State of Incorporation, or if not a corporation, State where business entity was formed:

Washington

If a co-partnership, give firm name under which business is transacted:

_____

** If a corporation, proposal must be executed in the corporate name by the president or vice-president (or any other corporate officer accompanied by evidence of authority to sign). If a co-partnership, proposal must be executed by a partner*

CERTIFICATION OF COMPLIANCE WITH PREVAILING WAGE TRAINING

The bidder hereby certifies that they meet responsible bidder criteria set forth in RCW 39.04.350 and RCW 39.06.020, specifically in regards to ESSHB 1673 which requires all businesses to have prevailing wage training before bidding and/or performing work on public works projects, starting on July 1, 2019. Online Contractor training is available at https://www.lni.wa.gov/TradesLicensing/PrevWage/Contractors/Training.asp.

Alternatively, Contractors with an active Unified Business Identifier (UBI) for three or more years **AND** have performed work on three or more public works projects are exempt from this training requirement. Please provide business information below and either completed training date OR three completed public works projects as reference.

I certify under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct.

SE Inc., dba Smith Excavation
BIDDER'S BUSINESS NAME

SIGNATURE OF AUTHORIZED OFFICIAL*

Gregg Smith
PRINTED NAME

602 455 594
UNIFIED BUSINESS INDENTIFIER (UBI)

07/01/2019
EFFECTIVE DATE

**Check one option below and provide details*

Option A ☐ Completion of Labor & Industries Prevailing Wage Training

L&I Prevailing Wage Training Completion Date

Option B ☑ Exemption from Labor & Industries Prevailing Wage Training Requirement

Project Name	Contracting Agency	Completion Date
1. Roaring Creek Instream Flow Improvements	Trout Unlimited	09/24/2018
2. 2018 Steel Main Replacement	East Wenatchee Water District	08/21/2018
3. Vale Elementary Classroom Addition	Cashmere School District	06/21/2018

CERTIFICATION REGARDING DEBARMENT

Certification Regarding
Debarment, Suspension, and Other Responsibility Matters
Primary Covered Transactions

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 13 CFR Part 145. The regulations were published as Part VII of the May 26, 1988 *Federal Register* (pages 19160-19211). Copies of the regulations are available from local offices of the U.S. Small Business Administration.

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)

(1) The prospective primary participant certifies to the best of its knowledge and belief that it and its principals:

(a) Are not presently debarred, suspended, proposed for disbarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three-year period preceding this application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application had one or more public transactions (Federal, State, or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective primary participant shall attach an explanation to this proposal.

Business Name SE Inc., dba Smith Excavation

Date 05/27/2020

By Gregg Smith, President
Name and Title of Authorized Representative

Signature of Authorized Representative

SBA Form 1623 (10-88) Federal Recycling Program Printed on Recycled Paper

This form was electronically produced by Elite Federal Forms, Inc.

INSTRUCTIONS FOR CERTIFICATION

1. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.
2. The inability of a person to provide the certification required below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such person from participation in this transaction.
3. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.
4. The prospective primary participant shall provide immediate written notice to the department or agency to which this proposal is submitted if at any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
5. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations (13 CFR Part 145).
6. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.
7. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
8. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the ineligibility of its principals. Each participant may, but is not required to, check the Non-Procurement List.
9. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
10. Except for transactions authorized under paragraph 6 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

BONDING AND CLAIMS

Developers Surety & Indem Co.
BONDING COMPANY NAME (Exactly as Registered)

9025 Lindbergh Dr
ADDRESS

Peoria	IL	61615
CITY	STATE	ZIP

856983C	$ 12,000	Until Cancelled
REGISTRATION BOND NO.	AMOUNT	EXPIRATION DATE

Are there claims pending against your bond? ☐ Yes ☑ No

If yes, what are each claimant's name, reasons for the claim, amount claimed, date, and place of filing?

Have there been tax liens or judgments against you filed by the Internal Review Service, Department of Revenue, Employment Security Department or Department of Labor & Industries within the last three (3) years resulting from non-payment of employee taxes? ☐ Yes ☑ No

If yes, what date and in which County did each filing occur?

Are there any lawsuits or unsatisfied judgments pending against you? ☐ Yes ☑ No

If yes, what date and in which County is each lawsuit pending or judgment entered?

SE, INC.
P.O. Box 284
Cashmere, WA 98815
509-782-0446

Contract Amount	Project Name	Owner	Phone Number
$ 1,402,737.69	Alpine Acres Water System Improvements	Alpine Acres Cmmunity Association	(509) 548-5765
$ 539,066.65	2017 Roadway & Water Improvements	City of Mansfield	(509) 683-1114
$ 473,412.30	Beaver Valley Road Wall Replacement	Chelan County Public Works	(509) 667-6415
$ 437,712.56	Okanogan Ave & Red Apple Road Pedestrian Improvements	City of Wenatchee	(509) 888-3200

CONTRACT FORMS

CONTRACT

THIS AGREEMENT, made and entered into this ___ day of _____, 2020, between the CITY OF WENATCHEE, a Municipal Corporation of the State of Washington, and **SE Inc., Smith Excavation** hereinafter called the Contractor; WITNESSETH:

That in consideration of the payments, covenants, and agreements hereinafter mentioned and attached and made a part of this agreement to be made and performed by the parties hereto, the parties hereto covenant and agree as follows:

1. The contractor shall do all work and furnish all tools, materials, and equipment for City of Wenatchee Project No. **16-1584D – Hale Park Phase II (Base Bid, Additive Bid 1, and Additive Bid 2)**, in the amount of **$607,479.57** (inclusive of applicable sales tax) in accordance with and as described in the attached plans and specifications and in full compliance with the terms, conditions, and stipulations herein set forth and attached, now referred to and by such reference incorporated herein and made a part hereof as fully for all purposes as if set forth at length, and shall perform any alterations in, or additions to, the work covered by this contract and every part thereof and any force account work which may be ordered as provided in this contract and every part thereof.

   The Contractor shall provide and be at the expense of all materials, labor, carriage, tools, implements and conveniences, and things of every description that may be requisite for the transfer of materials and for constructing and completing the work provided for in this contract and every part thereof, except such as mentioned in the specifications to be furnished by the City of Wenatchee.

2. The City of Wenatchee hereby promises and agrees with the Contractor to employ, and does employ the Contractor to provide the materials and to do and cause to be done the above described work and to complete and finish the same according to the attached plans and specifications and the terms and conditions herein contained, and hereby contracts to pay for the same according to the attached specifications and the schedule of unit or itemized prices hereto attached, at the time and in the manner and upon the conditions provided for in this contract and every part thereof. The City further agrees to employ the Contractor to perform any alterations or additions to the work covered by this contract and every part thereof and any force account work that may be ordered and to pay for the same under the terms of this contract and the attached plans and specifications.

3. The Contractor for himself, and for his heirs, executors, administrators, successors, and assigns, does hereby agree to the full performance of all the covenants herein contained upon the part of the Contractor.

4. It is further provided that no liability shall attach to the City by reason of entering into this contract, except as expressly provided for herein.

5. Contractor agrees that he shall actively solicit the employment of minority group members. Contractor further agrees that he shall actively solicit bids for the subcontracting of goods or services from qualified minority businesses. Contractor shall furnish evidence of his compliance with these requirements of minority employment and solicitation. Contractor further agrees to consider the grant of subcontracts to said minority bidders on the basis of substantially equal proposals in the light most favorable to said minority businesses. The contractor shall be required to submit evidence of compliance with this section as part of the bid.

IN WITNESS WHEREOF the said parties and each of them have caused these presents to be duly executed by its proper officers and in the proper person or persons, the day and year first above written.

ATTEST

_____
City Clerk

CITY OF WENATCHEE
A Municipal Corporation

_____
Frank Kuntz, Mayor

_____
Contractor

By_____

_____
Printed Name/Title

PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: THAT whereas the City of Wenatchee, Wenatchee, Washington a municipal corporation has awarded to:

_____

(Contractor)

hereinafter designated as the “Principal” a contract for work items, which contract consists of the Proposal/Agreement, together with the Contract Documents, Specifications, Addenda and Plans, all as hereto attached and made a part hereof, and more particularly described as:

Hale Park Phase II

and whereas said principal is required under the terms of said contract to furnish a bond for the faithful performance of said contract:

NOW, THEREFORE, we the Principal and _____, a corporation, organized and existing under and by virtue of the laws of the State of Washington, and duly authorized to do business in the State of Washington as surety, are firmly bound unto the City of Wenatchee in the sum of _____ dollars ($_____) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if the above bonded principal, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in said contract, and shall faithfully perform all the provisions of such contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said contract that may hereafter be made, at the time and in the manner therein specified; and shall pay all laborers, mechanics, subcontractors and materialmen, and all persons who shall supply such person or persons, or subcontractors, with provisions and supplies for the carrying on of such work on his or their parts; and shall indemnify and save harmless the Owner's Engineer, its officers and agents, from any loss or damage occasioned to any person or property by reason of any carelessness or negligence on the part of said principal, or any subcontractor, in the performance of said contract or any modifications thereof; and shall further indemnify and save harmless the City of Wenatchee, its officers and agents, from any damage or expense by reason of failure of performance as required by said contract, or any modifications thereof, then this obligation shall become null and void, otherwise it shall be and remain in full force and effect.

And the said surety, for value received, hereby further stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any change, extension of time, alternations or additions to the terms of the contract or the work or to the specifications. This Bond is provided pursuant to and shall be construed in accordance with Ch. 39.08 RCW.

IN WITNESS THEREOF, the said Principal and the said surety caused this bond and three (3) counterparts thereof to be signed and sealed by their duly authorized officers, this _____ day of _____, 2020.

_____
Principal

By _____

Title _____

ATTEST (If Corporation)

_____

_____

CORPORATE SEAL

By _____

Title _____

WITNESSES (If Individual or Partnership)

_____

_____

APPROVED AS TO FORM

Surety _____

By _____
(Attorney)
for _____

By _____

Address of local office and agent of Surety Company is:

_____

_____

_____

City of Wenatchee
Department of Parks,
Recreation, and Cultural Services

Final Contract Voucher Certificate

Contractor			
Street Address			
City	State	Zip	Date
City Project Number 16-1584D	Federal-Aid Project Number N/A		Highway Number
Job Description (Title) Hale Park Phase II			
Date Work Physically Completed	Final Amount $		

Contractor's Certification

I, The undersigned, having first been duly sworn, certify that I am authorized to sign for the claimant; that in connection with the work performed and to the best of my knowledge no loan, gratuity or gift in any form whatsoever has been extended to any employee of the City of Wenatchee nor have I rented or purchased any equipment or materials from any employee of the City of Wenatchee; I further certify that the attached final estimate is a true and correct statement showing all the monies due me from the City of Wenatchee for work performed and materials furnished under this contract; that I have carefully examined said final estimate and understand the same and that I hereby release the City of Wenatchee from any and all claims of whatsoever nature which I may have, arising out of the performance of said contract, which are not set forth in said estimate.

_____
Contractor Authorized Signature Required

_____
Type Signature Name

Subscribed and sworn to before me this _____day of _____20_____

X_____ Notary Public in and for the State of Washington,

residing at _____

City of Wenatchee

City of Wenatchee hereby accepts the completed contract pursuant to Section 1-05.12 of the contract provisions.

X_____ _____
Mayor/or Designee Date of Acceptance

STATE PREVAILING WAGES

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: 05/27/2020

County	Trade	Job Classification	Wage	Holiday	Overtime	Note	*Risk Class
Chelan	Asbestos Abatement Workers	Journey Level	$41.09	7A	4V	8Y	View
Chelan	Boilermakers	Journey Level	$69.29	5N	1C		View
Chelan	Brick Mason	Journey Level	$50.44	5A	1M		View
Chelan	Building Service Employees	Janitor	$13.50		1		View
Chelan	Building Service Employees	Shampooer	$13.50		1		View
Chelan	Building Service Employees	Waxer	$13.50		1		View
Chelan	Building Service Employees	Window Cleaner	$13.50		1		View
Chelan	Cabinet Makers (In Shop)	Journey Level	$22.09		1		View
Chelan	Carpenters	Acoustical Worker	$47.37	7E	4X	8N	View
Chelan	Carpenters	Bridge, Dock And Wharf Carpenters	$62.44	7A	4C		View
Chelan	Carpenters	Floor Layer & Floor Finisher	$47.37	7E	4X	8N	View
Chelan	Carpenters	Form Builder	$47.37	7E	4X	8N	View
Chelan	Carpenters	General Carpenter	$47.37	7E	4X	8N	View
Chelan	Carpenters	Heavy Construction Carpenter	$52.35	7E	4X	9E	View
Chelan	Carpenters	Scaffold/Shoring Erecting & Dismantling	$52.35	7E	4X	8N	View
Chelan	Cement Masons	Journey Level	$45.14	7B	1N		View
Chelan	Divers & Tenders	Bell/Vehicle or Submersible Operator (Not Under Pressure)	$116.20	7A	4C		View
Chelan	Divers & Tenders	Dive Supervisor/Master	$79.23	7A	4C		View
Chelan	Divers & Tenders	Diver	$116.20	7A	4C	8V	View
Chelan	Divers & Tenders	Diver On Standby	$74.23	7A	4C		View
Chelan	Divers & Tenders	Diver Tender	$67.31	7A	4C		View
Chelan	Divers & Tenders	Manifold Operator	$67.31	7A	4C		View
Chelan	Divers & Tenders	Manifold Operator Mixed Gas	$72.31	7A	4C		View
Chelan	Divers & Tenders	Remote Operated Vehicle Operator/Technician	$67.31	7A	4C		View
Chelan	Divers & Tenders	Remote Operated Vehicle Tender	$62.69	7A	4C		View
Chelan	Dredge Workers	Assistant Engineer	$56.44	5D	3F		View
Chelan	Dredge Workers	Assistant Mate (Deckhand)	$56.00	5D	3F		View
Chelan	Dredge Workers	Boatmen	$56.44	5D	3F		View
Chelan	Dredge Workers	Engineer Welder	$57.51	5D	3F		View
Chelan	Dredge Workers	Leverman, Hydraulic	$58.67	5D	3F		View
Chelan	Dredge Workers	Mates	$56.44	5D	3F		View
Chelan	Dredge Workers	Oiler	$56.00	5D	3F		View
Chelan	Drywall Applicator	Journey Level	$47.37	7E	4X	8N	View
Chelan	Drywall Tapers	Journey Level	$42.54	7E	1P		View
Chelan	Electrical Fixture Maintenance Workers	Journey Level	$13.50		1		View
Chelan	Electricians - Inside	Cable Splicer	$72.98	7H	1E		View
Chelan	Electricians - Inside	Construction Stock Person	$36.47	7H	1D		View
Chelan	Electricians - Inside	Journey Level	$68.42	7H	1E		View
Chelan	Electricians - Motor Shop	Craftsman	$15.37		1		View
Chelan	Electricians - Motor Shop	Journey Level	$14.69		1		View
Chelan	Electricians - Powerline Construction	Cable Splicer	$82.39	5A	4D		View
Chelan	Electricians - Powerline Construction	Certified Line Welder	$75.64	5A	4D		View
Chelan	Electricians - Powerline Construction	Groundperson	$49.17	5A	4D		View
Chelan	Electricians - Powerline Construction	Heavy Line Equipment Operator	$75.64	5A	4D		View
Chelan	Electricians - Powerline Construction	Journey Level Lineperson	$75.64	5A	4D		View
Chelan	Electricians - Powerline Construction	Line Equipment Operator	$64.54	5A	4D		View
Chelan	Electricians - Powerline Construction	Meter Installer	$49.17	5A	4D	8W	View
Chelan	Electricians - Powerline Construction	Pole Sprayer	$75.64	5A	4D		View
Chelan	Electricians - Powerline Construction	Powderperson	$56.49	5A	4D		View
Chelan	Electronic Technicians	Electronic Technicians Journey Level	$45.23	5B	1B		View
Chelan	Elevator Constructors	Mechanic	$97.31	7D	4A		View
Chelan	Elevator Constructors	Mechanic In Charge	$105.06	7D	4A		View
Chelan	Fabricated Precast Concrete Products	Journey Level	$13.50		1		View
Chelan	Fabricated Precast Concrete Products	Journey Level - In-Factory Work Only	$13.50		1		View
Chelan	Fence Erectors	Fence Erector	$38.59	7A	4V	8Y	View
Chelan	Fence Erectors	Fence Laborer	$38.59	7A	4V	8Y	View
Chelan	Flaggers	Journey Level	$38.59	7A	4V	8Y	View
Chelan	Glaziers	Journey Level	$31.59	7L	4L		View
Chelan	Heat & Frost Insulators And Asbestos Workers	Journeyman	$76.61	5J	4H		View
Chelan	Heating Equipment Mechanics	Journey Level	$56.61	6Z	1B		View
Chelan	Hod Carriers & Mason Tenders	Journey Level	$42.30	7A	4V	8Y	View
Chelan	Industrial Power Vacuum Cleaner	Journey Level	$13.50		1		View
Chelan	Inland Boatmen	Journey Level	$13.50		1		View
Chelan	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Cleaner Operator, Foamer Operator	$13.50		1		View
Chelan	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Grout Truck Operator	$13.50		1		View
Chelan	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Head Operator	$13.50		1		View
Chelan	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Technician	$13.50		1		View
Chelan	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Tv Truck Operator	$13.50		1		View
Chelan	Insulation Applicators	Journey Level	$47.37	7E	4X	8N	View
Chelan	Ironworkers	Journeyman	$63.06	7N	1O		View
Chelan	Laborers	Erosion Control Worker	$41.09	7A	4V	8Y	View
Chelan	Laborers	Air, Gas Or Electric Vibrating Screed	$41.09	7A	4V	8Y	View
Chelan	Laborers	Airtrac Drill Operator	$42.30	7A	4V	8Y	View
Chelan	Laborers	Ballast Regular Machine	$41.09	7A	4V	8Y	View
Chelan	Laborers	Batch Weighman	$38.59	7A	4V	8Y	View
Chelan	Laborers	Brick Pavers	$41.09	7A	4V	8Y	View

Chelan	Laborers	Brush Cutter	$41.09	7A	4V	8Y	View
Chelan	Laborers	Brush Hog Feeder	$41.09	7A	4V	8Y	View
Chelan	Laborers	Burner	$41.09	7A	4V	8Y	View
Chelan	Laborers	Caisson Worker	$42.30	7A	4V	8Y	View
Chelan	Laborers	Carpenter Tender	$41.09	7A	4V	8Y	View
Chelan	Laborers	Cement Dumper-paving	$41.79	7A	4V	8Y	View
Chelan	Laborers	Cement Finisher Tender	$41.09	7A	4V	8Y	View
Chelan	Laborers	Change House Or Dry Shack	$41.09	7A	4V	8Y	View
Chelan	Laborers	Chipping Gun (30 Lbs. And Over)	$41.79	7A	4V	8Y	View
Chelan	Laborers	Chipping Gun (Under 30 Lbs.)	$41.09	7A	4V	8Y	View
Chelan	Laborers	Choker Setter	$41.09	7A	4V	8Y	View
Chelan	Laborers	Chuck Tender	$41.09	7A	4V	8Y	View
Chelan	Laborers	Clary Power Spreader	$41.79	7A	4V	8Y	View
Chelan	Laborers	Clean-up Laborer	$41.09	7A	4V	8Y	View
Chelan	Laborers	Concrete Dumper/Chute Operator	$41.79	7A	4V	8Y	View
Chelan	Laborers	Concrete Form Stripper	$41.09	7A	4V	8Y	View
Chelan	Laborers	Concrete Placement Crew	$41.79	7A	4V	8Y	View
Chelan	Laborers	Concrete Saw Operator/Core Driller	$41.79	7A	4V	8Y	View
Chelan	Laborers	Crusher Feeder	$38.59	7A	4V	8Y	View
Chelan	Laborers	Curing Laborer	$41.09	7A	4V	8Y	View
Chelan	Laborers	Demolition: Wrecking & Moving (Incl. Charred Material)	$41.09	7A	4V	8Y	View
Chelan	Laborers	Ditch Digger	$41.09	7A	4V	8Y	View
Chelan	Laborers	Diver	$42.30	7A	4V	8Y	View
Chelan	Laborers	Drill Operator (Hydraulic, Diamond)	$41.79	7A	4V	8Y	View
Chelan	Laborers	Dry Stack Walls	$41.09	7A	4V	8Y	View
Chelan	Laborers	Dump Person	$41.09	7A	4V	8Y	View
Chelan	Laborers	Epoxy Technician	$41.09	7A	4V	8Y	View
Chelan	Laborers	Faller & Bucker Chain Saw	$41.79	7A	4V	8Y	View
Chelan	Laborers	Fine Graders	$41.09	7A	4V	8Y	View
Chelan	Laborers	Firewatch	$38.59	7A	4V	8Y	View
Chelan	Laborers	Form Setter	$41.09	7A	4V	8Y	View
Chelan	Laborers	Gabian Basket Building	$41.09	7A	4V	8Y	View
Chelan	Laborers	Gaurdrail Erector	$41.09	7A	4V	8Y	View
Chelan	Laborers	General Laborer	$41.09	7A	4V	8Y	View
Chelan	Laborers	Grade Checker & Transit Person	$42.30	7A	4V	8Y	View
Chelan	Laborers	Grinders	$41.09	7A	4V	8Y	View
Chelan	Laborers	Grout Machine Tender	$41.09	7A	4V	8Y	View
Chelan	Laborers	Groutmen (Pressure) Including Post Tension Beams	$41.79	7A	4V	8Y	View
Chelan	Laborers	Hazardous Waste Worker (Level A)	$42.30	7A	4V	8Y	View
Chelan	Laborers	Hazardous Waste Worker (Level B)	$41.79	7A	4V	8Y	View
Chelan	Laborers	Hazardous Waste Worker (Level C)	$41.09	7A	4V	8Y	View
Chelan	Laborers	High Scaler	$42.30	7A	4V	8Y	View
Chelan	Laborers	Jackhammer	$41.79	7A	4V	8Y	View
Chelan	Laborers	Laserbeam Operator	$41.79	7A	4V	8Y	View
Chelan	Laborers	Maintenance Person	$41.09	7A	4V	8Y	View
Chelan	Laborers	Manhole Builder-Mudman	$41.79	7A	4V	8Y	View
Chelan	Laborers	Material Yard Person	$41.09	7A	4V	8Y	View
Chelan	Laborers	Motorman-Dinky Locomotive	$41.79	7A	4V	8Y	View
Chelan	Laborers	Nozzleman (Concrete Pump, Green Cutter When Using Combination Of High Pressure Air & Water On Concrete & Rock, Sandblast, Gunite, Shotcrete, Water Blaster, Vacuum Blaster)	$41.79	7A	4V	8Y	View
Chelan	Laborers	Pavement Breaker	$41.79	7A	4V	8Y	View
Chelan	Laborers	Pilot Car	$38.59	7A	4V	8Y	View
Chelan	Laborers	Pipe Later Lead	$42.30	7A	4V	8Y	View
Chelan	Laborers	Pipe Layer/Tailor	$41.79	7A	4V	8Y	View
Chelan	Laborers	Pipe Pot Tender	$41.79	7A	4V	8Y	View
Chelan	Laborers	Pipe Reliner	$41.79	7A	4V	8Y	View
Chelan	Laborers	Pipe Wrapper	$41.79	7A	4V	8Y	View
Chelan	Laborers	Pot Tender	$41.09	7A	4V	8Y	View
Chelan	Laborers	Powderman	$42.30	7A	4V	8Y	View
Chelan	Laborers	Powderman's Helper	$41.09	7A	4V	8Y	View
Chelan	Laborers	Power Jacks	$41.79	7A	4V	8Y	View
Chelan	Laborers	Railroad Spike Puller - Power	$41.79	7A	4V	8Y	View
Chelan	Laborers	Raker - Asphalt	$42.30	7A	4V	8Y	View
Chelan	Laborers	Re-timberman	$42.30	7A	4V	8Y	View
Chelan	Laborers	Remote Equipment Operator	$41.79	7A	4V	8Y	View
Chelan	Laborers	Rigger/Signal Person	$41.79	7A	4V	8Y	View
Chelan	Laborers	Rip Rap Person	$41.09	7A	4V	8Y	View
Chelan	Laborers	Rivet Buster	$41.79	7A	4V	8Y	View
Chelan	Laborers	Rodder	$41.79	7A	4V	8Y	View
Chelan	Laborers	Scaffold Erector	$41.09	7A	4V	8Y	View
Chelan	Laborers	Scale Person	$41.09	7A	4V	8Y	View
Chelan	Laborers	Sloper (Over 20")	$41.79	7A	4V	8Y	View
Chelan	Laborers	Sloper Sprayer	$41.09	7A	4V	8Y	View
Chelan	Laborers	Spreader (Concrete)	$41.79	7A	4V	8Y	View
Chelan	Laborers	Stake Hopper	$41.09	7A	4V	8Y	View
Chelan	Laborers	Stock Piler	$41.09	7A	4V	8Y	View
Chelan	Laborers	Tamper & Similar Electric, Air & Gas Operated Tools	$41.79	7A	4V	8Y	View
Chelan	Laborers	Tamper (Multiple & Self-propelled)	$41.79	7A	4V	8Y	View
Chelan	Laborers	Timber Person - Sewer (Lagger, Shorer & Cribber)	$41.79	7A	4V	8Y	View
Chelan	Laborers	Toolroom Person (at Jobsite)	$41.09	7A	4V	8Y	View
Chelan	Laborers	Topper	$41.09	7A	4V	8Y	View
Chelan	Laborers	Track Laborer	$41.09	7A	4V	8Y	View
Chelan	Laborers	Track Liner (Power)	$41.79	7A	4V	8Y	View
Chelan	Laborers	Traffic Control Laborer	$40.90	7A	4V	9C	View
Chelan	Laborers	Traffic Control Supervisor	$40.90	7A	4V	9C	View
Chelan	Laborers	Truck Spotter	$41.09	7A	4V	8Y	View
Chelan	Laborers	Tugger Operator	$41.79	7A	4V	8Y	View
Chelan	Laborers	Tunnel Work-Guage and Lock Tender	$42.40	7A	4V	8Y	View
Chelan	Laborers	Tunnel Work-Guage and Lock Tender	$42.40	7A	4V	8Y	View
Chelan	Laborers	Vibrator	$41.79	7A	4V	8Y	View
Chelan	Laborers	Vinyl Seamer	$41.09	7A	4V	8Y	View
Chelan	Laborers	Watchmen	$35.20	7A	4V	8Y	View

Chelan	Laborers	Welder	$41.79	7A	4V	8Y	View
Chelan	Laborers	Well Point Laborer	$41.79	7A	4V	8Y	View
Chelan	Laborers	Window Washer/Cleaner	$35.20	7A	4V	8Y	View
Chelan	Laborers - Underground Sewer & Water	General Laborer & Topman	$41.09	7A	4V	8Y	View
Chelan	Laborers - Underground Sewer & Water	Pipe Layer	$41.79	7A	4V	8Y	View
Chelan	Landscape Construction	Landscape Construction/landscaping Or Planting Laborers	$35.20	7A	4V	8Y	View
Chelan	Landscape Construction	Landscape Operator	$66.05	7A	3K	8X	View
Chelan	Landscape Maintenance	Groundskeeper	$13.50		1		View
Chelan	Lathers	Journey Level	$47.37	7E	4X	8N	View
Chelan	Marble Setters	Journey Level	$50.44	5A	1M		View
Chelan	Metal Fabrication (In Shop)	Fitter	$15.04		1		View
Chelan	Metal Fabrication (In Shop)	Laborer	$13.50		1		View
Chelan	Metal Fabrication (In Shop)	Machine Operator	$13.50		1		View
Chelan	Metal Fabrication (In Shop)	Painter	$13.50		1		View
Chelan	Metal Fabrication (In Shop)	Welder	$13.50		1		View
Chelan	Millwright	Journey Level	$66.83	7E	4X	8N	View
Chelan	Modular Buildings	Journey Level	$14.11		1		View
Chelan	Painters	Commercial Painter	$36.87	6Z	1W		View
Chelan	Painters	Industrial Painter	$45.37	6Z	1W	9D	View
Chelan	Pile Driver	Journey Level	$62.69	7A	4C		View
Chelan	Plasterers	Journey Level	$42.88	7K	1N		View
Chelan	Playground & Park Equipment Installers	Journey Level	$13.50		1		View
Chelan	Plumbers & Pipefitters	Journey Level	$59.87	5A	1G		View
Chelan	Power Equipment Operators	Asphalt Plant Operators	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Assistant Engineer	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Barrier Machine (zipper)	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Batch Plant Operator: concrete	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Bobcat	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Brokk - Remote Demolition Equipment	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Brooms	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Bump Cutter	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Cableways	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Chipper	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Compressor	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Concrete Finish Machine - Laser Screed	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Concrete Pump - Mounted Or Trailer High Pressure Line Pump, Pump High Pressure	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Concrete Pump: Truck Mount With Boom Attachment Over 42 M	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Concrete Pump: Truck Mount With Boom Attachment Up To 42m	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Conveyors	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Cranes friction: 200 tons and over	$69.20	7A	3K	8X	View
Chelan	Power Equipment Operators	Cranes: 100 tons through 199 tons, or 150' of boom (including jib with attachments)	$67.84	7A	3K	8X	View
Chelan	Power Equipment Operators	Cranes: 20 Tons Through 44 Tons With Attachments	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Cranes: 200 tons- 299 tons, or 250' of boom including jib with attachments	$68.53	7A	3K	8X	View
Chelan	Power Equipment Operators	Cranes: 300 tons and over or 300' of boom including jib with attachments	$69.20	7A	3K	8X	View
Chelan	Power Equipment Operators	Cranes: 45 Tons Through 99 Tons, Under 150' Of Boom (including Jib With Attachments)	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Cranes: A-frame - 10 Tons And Under	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Cranes: Friction cranes through 199 tons	$68.53	7A	3K	8X	View
Chelan	Power Equipment Operators	Cranes: through 19 tons with attachments, A-frame over 10 tons	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Crusher	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Deck Engineer/Deck Winches (power)	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Derricks, On Building Work	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Dozers D-9 & Under	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Drill Oilers: Auger Type, Truck Or Crane Mount	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Drilling Machine	$67.84	7A	3K	8X	View
Chelan	Power Equipment Operators	Elevator And Man-lift: Permanent And Shaft Type	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Finishing Machine, Bidwell And Gamaco & Similar Equipment	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Forklift: 3000 Lbs And Over With Attachments	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Forklifts: Under 3000 Lbs. With Attachments	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Grade Engineer: Using Blue Prints, Cut Sheets, Etc	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Gradechecker/Stakeman	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Guardrail Punch	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Hard Tail End Dump Articulating Off- Road Equipment 45 Yards. & Over	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Hard Tail End Dump Articulating Off-road Equipment Under 45 Yards	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Horizontal/Directional Drill Locator	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Horizontal/Directional Drill Operator	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Hydralifts/Boom Trucks Over 10 Tons	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Hydralifts/Boom Trucks, 10 Tons And Under	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Loader, Overhead 8 Yards. & Over	$67.84	7A	3K	8X	View
Chelan	Power Equipment Operators	Loader, Overhead, 6 Yards. But Not Including 8 Yards	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Loaders, Overhead Under 6 Yards	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Loaders, Plant Feed	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Loaders: Elevating Type Belt	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Locomotives, All	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Material Transfer Device	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Mechanics, All (leadmen - $0.50 Per Hour Over Mechanic)	$67.84	7A	3K	8X	View
Chelan	Power Equipment Operators	Motor Patrol Graders	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Mucking Machine, Mole, Tunnel Drill, Boring, Road Header And/or Shield	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Oil Distributors, Blower Distribution & Mulch Seeding Operator	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Outside Hoists (Elevators And Manlifts), Air Tuggers, Strato	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Overhead, Bridge Type Crane: 20 Tons Through 44 Tons	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Overhead, Bridge Type: 100 Tons And Over	$67.84	7A	3K	8X	View
Chelan	Power Equipment Operators	Overhead, Bridge Type: 45 Tons Through 99 Tons	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Pavement Breaker	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Pile Driver (other Than Crane Mount)	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Plant Oiler - Asphalt, Crusher	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Posthole Digger, Mechanical	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Power Plant	$63.17	7A	3K	8X	View

Chelan	Power Equipment Operators	Pumps - Water	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Quad 9, Hd 41, D10 And Over	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Quick Tower - No Cab, Under 100 Feet In Height Based To Boom	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Remote Control Operator On Rubber Tired Earth Moving Equipment	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Rigger and Bellman	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Rigger/Signal Person, Bellman (Certified)	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Rollagon	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Roller, Other Than Plant Mix	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Roller, Plant Mix Or Multi-lift Materials	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Roto-mill, Roto-grinder	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Saws - Concrete	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Scraper, Self Propelled Under 45 Yards	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Scrapers - Concrete & Carry All	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Scrapers, Self-propelled: 45 Yards And Over	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Service Engineers - Equipment	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Shotcrete/Gunite Equipment	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Shovel, Excavator, Backhoe, Tractors Under 15 Metric Tons	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Shovel, Excavator, Backhoe: Over 30 Metric Tons To 50 Metric Tons	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Shovel, Excavator, Backhoes, Tractors: 15 To 30 Metric Tons	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Shovel, Excavator, Backhoes: Over 50 Metric Tons To 90 Metric Tons	$67.84	7A	3K	8X	View
Chelan	Power Equipment Operators	Shovel, Excavator, Backhoes: Over 90 Metric Tons	$68.53	7A	3K	8X	View
Chelan	Power Equipment Operators	Slipform Pavers	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Spreader, Topsider & Screedman	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Subgrader Trimmer	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Tower Bucket Elevators	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Tower Crane Up To 175' In Height Base To Boom	$67.84	7A	3K	8X	View
Chelan	Power Equipment Operators	Tower Crane: over 175' through 250' in height, base to boom	$68.53	7A	3K	8X	View
Chelan	Power Equipment Operators	Tower Cranes: over 250' in height from base to boom	$69.20	7A	3K	8X	View
Chelan	Power Equipment Operators	Transporters, All Track Or Truck Type	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Trenching Machines	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Truck Crane Oiler/driver - 100 Tons And Over	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Truck Crane Oiler/Driver Under 100 Tons	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators	Truck Mount Portable Conveyor	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators	Welder	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators	Wheel Tractors, Farmall Type	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators	Yo Yo Pay Dozer	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Asphalt Plant Operators	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Assistant Engineer	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Barrier Machine (zipper)	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Batch Plant Operator, Concrete	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Bobcat	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Brokk - Remote Demolition Equipment	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Brooms	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Bump Cutter	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Cableways	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Chipper	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Compressor	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Concrete Finish Machine - Laser Screed	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Concrete Pump - Mounted Or Trailer High Pressure Line Pump, Pump High Pressure	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Concrete Pump: Truck Mount With Boom Attachment Over 42 M	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Concrete Pump: Truck Mount With Boom Attachment Up To 42m	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Conveyors	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Cranes friction: 200 tons and over	$69.20	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Cranes: 100 tons through 199 tons, or 150' of boom (including jib with attachments)	$67.84	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Cranes: 20 Tons Through 44 Tons With Attachments	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Cranes: 200 tons- 299 tons, or 250' of boom including jib with attachments	$68.53	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Cranes: 300 tons and over or 300' of boom including jib with attachments	$69.20	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Cranes: 45 Tons Through 99 Tons, Under 150' Of Boom (including Jib With Attachments)	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Cranes: A-frame - 10 Tons And Under	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Cranes: Friction cranes through 199 tons	$68.53	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Cranes: through 19 tons with attachments, A-frame over 10 tons	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Crusher	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Deck Engineer/Deck Winches (power)	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Derricks, On Building Work	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Dozers D-9 & Under	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Drill Oilers: Auger Type, Truck Or Crane Mount	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Drilling Machine	$67.84	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Elevator And Man-lift: Permanent And Shaft Type	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Finishing Machine, Bidwell And Gamaco & Similar Equipment	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Forklift: 3000 Lbs And Over With Attachments	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Forklifts: Under 3000 Lbs. With Attachments	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Grade Engineer: Using Blue Prints, Cut Sheets, Etc	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Gradechecker/Stakeman	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Guardrail Punch	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Hard Tail End Dump Articulating Off- Road Equipment 45 Yards. & Over	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Hard Tail End Dump Articulating Off-road Equipment Under 45 Yards	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Horizontal/Directional Drill Locator	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Horizontal/Directional Drill Operator	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Hydralifts/Boom Trucks Over 10 Tons	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Hydralifts/Boom Trucks, 10 Tons And Under	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Loader, Overhead 8 Yards. & Over	$67.84	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Loader, Overhead, 6 Yards. But Not Including 8 Yards	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Loaders, Overhead Under 6 Yards	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Loaders, Plant Feed	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Loaders: Elevating Type Belt	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Locomotives, All	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Material Transfer Device	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Mechanics, All (leadmen - $0.50 Per Hour Over Mechanic)	$67.84	7A	3K	8X	View

Chelan	Power Equipment Operators- Underground Sewer & Water	Motor Patrol Graders	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Mucking Machine, Mole, Tunnel Drill, Boring, Road Header And/or Shield	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Oil Distributors, Blower Distribution & Mulch Seeding Operator	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Outside Hoists (Elevators And Manlifts), Air Tuggers, Strato	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Overhead, Bridge Type Crane: 20 Tons Through 44 Tons	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Overhead, Bridge Type: 100 Tons And Over	$67.84	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Overhead, Bridge Type: 45 Tons Through 99 Tons	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Pavement Breaker	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Pile Driver (other Than Crane Mount)	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Plant Oiler - Asphalt, Crusher	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Posthole Digger, Mechanical	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Power Plant	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Pumps - Water	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Quad 9, Hd 41, D10 And Over	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Quick Tower - No Cab, Under 100 Feet In Height Based To Boom	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Remote Control Operator On Rubber Tired Earth Moving Equipment	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Rigger and Bellman	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Rigger/Signal Person, Bellman (Certified)	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Rollagon	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Roller, Other Than Plant Mix	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Roller, Plant Mix Or Multi-lift Materials	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Roto-mill, Roto-grinder	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Saws - Concrete	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Scraper, Self Propelled Under 45 Yards	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Scrapers - Concrete & Carry All	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Scrapers, Self-propelled: 45 Yards And Over	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Service Engineers - Equipment	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Shotcrete/Gunite Equipment	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Shovel, Excavator, Backhoe, Tractors Under 15 Metric Tons	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Shovel, Excavator, Backhoe: Over 30 Metric Tons To 50 Metric Tons	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Shovel, Excavator, Backhoes, Tractors: 15 To 30 Metric Tons	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Shovel, Excavator, Backhoes: Over 50 Metric Tons To 90 Metric Tons	$67.84	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Shovel, Excavator, Backhoes: Over 90 Metric Tons	$68.53	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Slipform Pavers	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Spreader, Topsider & Screedman	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Subgrader Trimmer	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Tower Bucket Elevators	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Tower Crane Up To 175' In Height Base To Boom	$67.84	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Tower Crane: over 175' through 250' in height, base to boom	$68.53	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Tower Cranes: over 250' in height from base to boom	$69.20	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Transporters, All Track Or Truck Type	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Trenching Machines	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Truck Crane Oiler/driver - 100 Tons And Over	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Truck Crane Oiler/Driver Under 100 Tons	$66.05	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Truck Mount Portable Conveyor	$66.57	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Welder	$67.16	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Wheel Tractors, Farmall Type	$63.17	7A	3K	8X	View
Chelan	Power Equipment Operators- Underground Sewer & Water	Yo Yo Pay Dozer	$66.57	7A	3K	8X	View
Chelan	Power Line Clearance Tree Trimmers	Journey Level In Charge	$53.10	5A	4A		View
Chelan	Power Line Clearance Tree Trimmers	Spray Person	$50.40	5A	4A		View
Chelan	Power Line Clearance Tree Trimmers	Tree Equipment Operator	$53.10	5A	4A		View
Chelan	Power Line Clearance Tree Trimmers	Tree Trimmer	$47.48	5A	4A		View
Chelan	Power Line Clearance Tree Trimmers	Tree Trimmer Groundperson	$36.10	5A	4A		View
Chelan	Refrigeration & Air Conditioning Mechanics	Journey Level	$59.87	5A	1G		View
Chelan	Residential Brick Mason	Journey Level	$19.38		1		View
Chelan	Residential Carpenters	Journey Level	$16.39		1		View
Chelan	Residential Cement Masons	Journey Level	$15.50		1		View
Chelan	Residential Drywall Applicators	Journey Level	$25.84		1		View
Chelan	Residential Drywall Tapers	Journey Level	$17.06		1		View
Chelan	Residential Electricians	Journey Level	$22.02		1		View
Chelan	Residential Glaziers	Journey Level	$16.50		1		View
Chelan	Residential Insulation Applicators	Journey Level	$14.86		1		View
Chelan	Residential Laborers	Journey Level	$19.06		1		View
Chelan	Residential Marble Setters	Journey Level	$15.91		1		View
Chelan	Residential Painters	Journey Level	$25.01		1		View
Chelan	Residential Plumbers & Pipefitters	Journey Level	$20.67		1		View
Chelan	Residential Refrigeration & Air Conditioning Mechanics	Journey Level	$17.25		1		View
Chelan	Residential Sheet Metal Workers	Journey Level (Field or Shop)	$56.61	5I	1B		View
Chelan	Residential Soft Floor Layers	Journey Level	$13.64		1		View
Chelan	Residential Sprinkler Fitters (Fire Protection)	Journey Level	$17.71		1		View
Chelan	Residential Stone Masons	Journey Level	$19.38		1		View
Chelan	Residential Terrazzo Workers	Journey Level	$14.86		1		View
Chelan	Residential Terrazzo/Tile Finishers	Journey Level	$13.50		1		View
Chelan	Residential Tile Setters	Journey Level	$14.86		1		View
Chelan	Roofers	Journey Level	$41.09	5I	1R		View
Chelan	Roofers	Using Irritable Bituminous Materials	$43.09	5I	1R		View
Chelan	Sheet Metal Workers	Journey Level (Field or Shop)	$56.61	6Z	1B		View
Chelan	Sign Makers & Installers (Electrical)	Journey Level	$75.25	7F	1E		View
Chelan	Sign Makers & Installers (Non-Electrical)	Journey Level	$17.48		1		View
Chelan	Soft Floor Layers	Journey Level	$51.07	5A	3J		View
Chelan	Solar Controls For Windows	Journey Level	$13.50		1		View
Chelan	Sprinkler Fitters (Fire Protection)	Journey Level	$58.99	7J	1R		View
Chelan	Stage Rigging Mechanics (Non Structural)	Journey Level	$13.50		1		View
Chelan	Stone Masons	Journey Level	$50.44	5A	1M		View
Chelan	Street And Parking Lot Sweeper Workers	Journey Level	$20.00		1		View
Chelan	Surveyors	Assistant Construction Site Surveyor	$66.05	7A	3K	8X	View
Chelan	Surveyors	Chainman	$63.17	7A	3K	8X	View
Chelan	Surveyors	Construction Site Surveyor	$67.16	7A	3K	8X	View
Chelan	Telecommunication Technicians	Telecom Technician Journey Level	$45.23	5B	1B		View
Chelan	Telephone Line Construction - Outside	Cable Splicer	$41.81	5A	2B		View
Chelan	Telephone Line Construction - Outside	Hole Digger/Ground Person	$23.53	5A	2B		View
Chelan	Telephone Line Construction - Outside	Installer (Repairer)	$40.09	5A	2B		View

Chelan	Telephone Line Construction - Outside	Special Aparatus Installer I	$41.81	5A	2B		View
Chelan	Telephone Line Construction - Outside	Special Apparatus Installer II	$40.99	5A	2B		View
Chelan	Telephone Line Construction - Outside	Telephone Equipment Operator (Heavy)	$41.81	5A	2B		View
Chelan	Telephone Line Construction - Outside	Telephone Equipment Operator (Light)	$38.92	5A	2B		View
Chelan	Telephone Line Construction - Outside	Telephone Lineperson	$38.92	5A	2B		View
Chelan	Telephone Line Construction - Outside	Television Groundperson	$22.32	5A	2B		View
Chelan	Telephone Line Construction - Outside	Television Lineperson/Installer	$29.60	5A	2B		View
Chelan	Telephone Line Construction - Outside	Television System Technician	$35.20	5A	2B		View
Chelan	Telephone Line Construction - Outside	Television Technician	$31.67	5A	2B		View
Chelan	Telephone Line Construction - Outside	Tree Trimmer	$38.92	5A	2B		View
Chelan	Terrazzo Workers	Journey Level	$43.61	5A	1M		View
Chelan	Tile Setters	Journey Level	$43.61	5A	1M		View
Chelan	Tile, Marble & Terrazzo Finishers	Journey Level	$35.73	5A	1M		View
Chelan	Traffic Control Stripers	Journey Level	$47.68	7A	1K		View
Chelan	Truck Drivers	Asphalt Mix Over 20 Yards	$46.42	5D	1V	8M	View
Chelan	Truck Drivers	Asphalt Mix To 20 Yards	$46.05	5D	1V	8M	View
Chelan	Truck Drivers	Dump Truck	$46.05	5D	1V	8M	View
Chelan	Truck Drivers	Dump Truck & Trailer	$46.42	5D	1V	8M	View
Chelan	Truck Drivers	Other Trucks	$45.94	5D	1V	8M	View
Chelan	Truck Drivers - Ready Mix	Transit Mixers 20 yards and under	$46.42	5D	1V	8M	View
Chelan	Truck Drivers - Ready Mix	Transit Mixers over 20 yards	$46.75	5D	1V	8M	View
Chelan	Well Drillers & Irrigation Pump Installers	Irrigation Pump Installer	$13.50		1		View
Chelan	Well Drillers & Irrigation Pump Installers	Oiler	$13.50		1		View
Chelan	Well Drillers & Irrigation Pump Installers	Well Driller	$18.00		1		View

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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.

S. 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 hours worked on holidays and 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.

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.

   C. All hours worked on Sundays shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid at two 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.

   G. 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 hours worked on Sunday shall be paid at two 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.

   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.

   W. 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 first eight (8) hours worked on the fifth day shall be paid at one and one-half times the hourly rate of wage. All other hours worked on the fifth, sixth, and seventh days and on 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.

   A. 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 shift, and all work on Saturdays shall be paid at time and one-half the straight time rate. Hours worked over twelve hours (12) in a single shift and all work performed after 6:00 pm Saturday to 6:00 am Monday and holidays shall be paid at double the straight time rate of pay. Any shift starting between the hours of 6:00 pm and midnight shall receive an additional one dollar ($1.00) per hour for all hours worked that shift. The employer shall have the sole discretion to assign overtime work to employees. Primary consideration for overtime work shall be given to employees regularly assigned to the work to be performed on overtime situations. 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.

   C. 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 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 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.

Overtime Codes Continued

3. E. All hours worked Sundays and holidays shall be paid at double the hourly rate of wage. Each week, once 40 hours of straight time work is achieved, then any hours worked over 10 hours per day Monday through Saturday shall be paid at double the hourly wage rate.

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.

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.

B. All hours worked over twelve (12) hours per day and all hours worked on 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.

Overtime Codes Continued

4. 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.

F. All hours worked between the hours of 6:00 pm and 6:00 am, Monday through Saturday, shall be paid at a premium rate of 20% over the hourly rate of wage. All hours worked on 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.

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.

H. 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.

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.

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.

Overtime Codes Continued

4. 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.

M. All hours worked on Sunday and Holidays shall be paid at double the hourly rate. Any employee reporting to work less than nine (9) hours from their previous quitting time shall be paid for such time at time and one-half times the hourly rate.

N. 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, and all work performed between the hours of midnight (12:00 AM) and eight AM (8:00 AM) every day shall be paid at double the hourly rate of wage.

O. All hours worked between midnight Friday to midnight Sunday shall be paid at one and one-half the hourly rate of wage. After an employee has worked in excess of eight (8) continuous hours in any one or more calendar days, all additional hours shall be at the applicable overtime rate until such time as the employee has had a break of six (6) hours or more. All hours worked on Holidays shall be paid at double the hourly rate of wage.

P. All hours worked on Holidays shall be paid at one and one-half times the hourly rate of wage.

Q. The first four (4) 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 hours worked over twelve (12) hours Monday through Saturday shall be paid at double the hourly rate. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

R. All hours worked on Saturdays 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 on Sundays and holidays shall be paid at double the hourly rate of wage.

S. 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.

T. The first two (2) hours of overtime for hours worked Monday-Friday 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 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. For work on Saturday which is scheduled prior to the end of shift on Friday, the first six (6) hours work shall be paid at one and one-half times the hourly rate of wage, and all hours over (6) shall be paid double the hourly rate of wage. For work on Saturday which was assigned following the close of shift on Friday, all work shall be paid at double the hourly rate of wage.

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.

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.

W. 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.

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.

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.

Overtime Codes Continued

4. Y. 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 shift, and all work on Saturdays shall be paid at time and one-half the straight time rate. All work performed after 6:00 pm Saturday to 6:00 am Monday and holidays shall be paid at double the straight time rate of pay.

   Any shift starting between the hours of 6:00 pm and midnight shall receive an additional one dollar ($1.00) per hour for all hours worked that shift.

   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.

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).

   J. Holidays: New Year's Day, Memorial Day, Independence Day, Thanksgiving Day, Friday after Thanksgiving Day, Christmas Eve Day, And Christmas Day (7).

   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).

Holiday Codes Continued

5. 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).

   T. Paid Holidays: New Year's Day, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, The Friday After Thanksgiving Day, Christmas Day, And The Day Before Or After Christmas (9).

   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. A. Paid Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (8).

   E. Paid 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 a Half-Day On Christmas Eve Day. (9 1/2).

   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).

   I. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday After Thanksgiving Day, And Christmas Day (7).

   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.

Holiday Codes Continued

7. 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.

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.

M. Paid Holidays: New Year's Day, The Day after or before New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, And the Day after or before Christmas Day (10). 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.

Holiday Codes Continued

7. 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.

R. Paid Holidays: New Year's Day, the day after or before New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, and the day after or before Christmas Day (10). If any of the listed holidays fall on Saturday, the preceding Friday shall be observed as the holiday. If any of the listed holidays falls on a Sunday, the day observed by the Nation shall be considered a holiday and compensated accordingly.

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.

T. Paid Holidays: New Year's Day, the Day after or before New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, and The Day after or before Christmas Day. (10). If any of the listed holidays falls on a Sunday, the day observed by the Nation shall be considered a holiday and compensated accordingly. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

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, President's Day, Independence Day, Memorial 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.

15. A. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, the 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.

B. Holidays: New Year's Day, Martin Luther King Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day. (9)

C. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, the day before Christmas Day and Christmas Day. (8)

Holiday Codes Continued

15. D. Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, Christmas Day, and the day after Christmas.

E. Holidays: the day before New Years's Day, New Year's Day, Martin Luther King, Jr. Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, Friday after Thanksgiving Day, the day before Christmas, and Christmas Day. (12)

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.

P. 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.

Q. 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.

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.

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.

Note Codes Continued

8. 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.

Department of Labor and Industries
Prevailing Wage
(360) 902-5335
www.lni.wa.gov/TradesLicensing/PrevWage

STATEMENT OF INTENT TO PAY PREVAILING WAGES

Public Works Contract
$40.00 Filing Fee Required

- This form **must** be typed or printed in ink.
- **Fill in all blanks or the form will be returned for correction (see instructions).**
- Please allow a **minimum** of 10 working days for processing.
- Once approved, your form will be posted online at https://fortress.wa.gov/lni/pwiapub/SearchFor.asp

Intent ID # (Assigned by L&I)_____

Your Company Information		
Your Company Name		
Your Address		
City	State	Zip+4
Your Contractor Registration Number	Your UBI Number	
Your Industrial Insurance Account Number		
Your Email Address (required for notification of approval)	Your Phone Number	

Awarding Agency Information		
Project Name	Contract Number	
Awarding Agency		
Awarding Agency Address		
City	State	Zip+4
Awarding Agency Contact Name	Phone Number	
County Where Work Will Be Performed	City Where Work Will Be Performed	

Additional Details	
Your Expected Job Start Date (mm/dd/yyyy)	
Job Site Address/Directions	

Contract Details		
Bid Due Date (**Prime Contractor's**)	Award Date (**Prime Contractor's**)	
Total Dollar Amount of **Your** Contract (including sales tax) or indicate time and materials, if applicable.	$	☐ T&M

ARRA Funds	**Weatherization or Energy Efficient Funds**
☐ ☐ Does this project utilize American Recovery and Reinvestment Act (ARRA) funds? Yes No	☐ ☐ Does this project utilize any weatherization or energy efficiency upgrade funds (ARRA or otherwise)? Yes No

Prime Contractor's Company Information		**Hiring Contractor's Company Information**	
Prime Contractor's Company Name	Prime Contractor's Intent Number	Hiring Contractor's Company Name	
Prime Contractor's Registration Number	Prime Contractor's UBI Number	Hiring Company's Contractor Registration Number	Hiring Contractors UBI Number

Employment Information

Do you intend to use **ANY** subcontractors?	☐ Yes	☐ No	Will employees perform work on this project?	☐ Yes	☐ No
Will **ALL** work be subcontracted?	☐ Yes	☐ No	Do you intend to use apprentice employees?	☐ Yes	☐ No

Number of Owner/Operators who own at least 30% of the company who will perform work on this project: ☐ None (0) ☐ One (1) ☐ Two (2) ☐ Three (3)

Crafts/Trades/Occupations – (Do not list apprentices. They are listed on the Affidavit of Wages Paid only.) If an employee works in more than one trade, ensure that all hours worked in each trade are reported below. For additional crafts/trades/occupations please use Addendum A.	**Number of Workers**	**Rate of Hourly Pay**	**Rate of Hourly Usual ("Fringe") Benefits**

Signature Block

I hereby certify that I have read and understand the instructions to complete this form and that the information, including any addenda, are correct and that all workers I employ on this Public Works Project will be paid no less than the Prevailing Wage Rate(s) as determined by the Industrial Statistician of the Department of Labor and Industries.

Print Name: **Print Title:** **Signature:** **Date:**

For L&I Use Only

Approved by signature of the Department of Labor and Industries Industrial Statistician

NOTICE: If the prime contract is at a cost of over one million dollars ($1,000,000.00), RCW 39.04.370 requires you to complete the EHB 2805 (RCW 39.04.370) Addendum and attach it to your Affidavit of Wages of Paid when your work on the project concludes. This is only a notice. The EHB 2805 Addendum is not submitted with this Intent.

Department of Labor and Industries
Prevailing Wage Program
(360) 902-5335
www.Lni.wa.gov/TradesLicensing/PrevWage/default.asp

Affidavit of Wages Paid
Public Works Contract
$40.00 Filing Fee Required*
*Exemption may apply. See instruction 9.

This form **must** be typed or printed in ink.
Fill in ALL blanks or the form will be returned for correction (see instructions).
Please allow a **minimum** of 10 business days for processing.
Once approved, your form will be posted online at:
https://fortress.wa.gov/lni/wagelookup/searchforms.aspx

Affidavit ID # (Assigned by L&I):
 # SAMPLE

Your Company Information		
Your Company Name ABC Company		
Your Company Address 1234 Main Street		
City Olympia	State WA	Zip+4 98501-1234
Your Contractor Registration Number ABCCI*0123AA	Your UBI Number 123456789	
Your Industrial Insurance Account Number 111,111-11		
Your Email Address (required for notification of approval) prevailingwage@lni.wa.gov	Your Phone Number (555) 555-5555	

Awarding Agency Information		
Project Name Road Repair	Contract Number 123-456	
Awarding Agency WA St Department of Transportation		
Awarding Agency Address PO Box 123		
City Olympia	State WA	Zip+4 9850
Awarding Agency Contact Name John Doe	Phone Number (555) 555-5555	
County Where Work Was Performed Thurston	City Where Work Was Performed Olympia	

Additional Details		
Your Job Start Date (mm/dd/yyyy) 2/1/2011	**Your** Date Work Completed (mm/dd/yyyy) 3/1/2011	
Job Site Address/Directions Plum and State Street	Your Approved Intent ID # 123456	
EHB 2805 (RCW 39.04.370) – Is the Prime Contractor's contract at a cost of over one million dollars ($1,000,000)?	☒ No ☐ Yes	If "Yes" to the **EHB 2805** question and the Award Date is **9/1/2010** or later you must complete and submit the **EHB 2805 (RCW 39.04.370) Addendum**.

Contract Details	
Bid Due Date (**Prime Contractor's**) 1/1/2011	Award Date (**Prime Contractor's**) 1/5/2011
Indicate Total Dollar Amount of **Your** Contract (including sales tax).	$ $10,000.00

ARRA Funds	Weatherization or Energy Efficient Funds
Does this project utilize American Recovery and Reinvestment Act (ARRA) funds? ☐ Yes ☒ No	Does this project utilize any weatherization or energy efficiency upgrade funds (ARRA or otherwise)? ☐ Yes ☒

Prime Contractor's Company Information		Hiring Contractor's Company Information	
Prime Contractor's Company Name XYZ Company		Hiring Contractor's Company Name CBA Company	
Prime Contractor's Registration Number XYZCI*0123AA	Prime Contractor's UBI Number 987654321	Hiring Contractor's Registration Number CBACI*0123AA	Hiring Contractor's UBI Number 456789123

Employment Information					
Did you use **ANY** subcontractors?	☐ Yes (**Addendum B Required**)	☒ No	Did employees perform work on this project?	☒ Yes	☐ No
Was **ALL** work subcontracted?	☐ Yes (**Addendum B Required**)	☒ No	Did you use apprentice employees?	☐ Yes	☒ No

Number of Owner/Operators who own at least 30% of the company who performed work on this project: ☐ None (0) ☒ One (1) ☐ Two (2) ☐ Three (3)
You must list the First and Last Name(s) of any Owner/Operator performing work below

List your Crafts/Trades/Occupations Below - For Journey Level Workers you must provide all of the information below. Owner/Operators - must provide their First and Last name no other information required. ****Apprentices are not recorded below. You must use Addendum D to list Apprentices.**	**Number of Workers**	**Total # of Hours Worked**	**Rate of Hourly Pay**	**Rate of Hourly Usual ("Fringe") Benefits**
General Labor	**2**	**153**	**41.23**	**8.54**
Carpenter	**5**	**210**	**52.26**	**10.13**

Signature Block

I hereby certify that I have read and understand the instructions to complete this form and that the information on the form and any addenda is correct and that all workers I employed on this Public Works Project were paid no less than the Prevailing Wage Rate(s) as determined by the Industrial Statistician of the Department of Labor and Industries.

Print Name:	Print Title:	Signature:	Date:

For L&I Use Only

Department of Labor and Industries
APPROVED BY: _____
Industrial Statistician

SPECIAL PROVISIONS

INTRO.AP1

INTRODUCTION

The following Amendments and Special Provisions shall be used in conjunction with the 2018 Standard Specifications for Road, Bridge, and Municipal Construction.

AMENDMENTS TO THE STANDARD SPECIFICATIONS

The following Amendments to the Standard Specifications are made a part of this contract and supersede any conflicting provisions of the Standard Specifications. For informational purposes, the date following each Amendment title indicates the implementation date of the Amendment or the latest date of revision.

Each Amendment contains all current revisions to the applicable section of the Standard Specifications and may include references which do not apply to this particular project.

1-01.AP1

Section 1-01, Definitions and Terms
August 6, 2018

1-01.3 Definitions

The following new term and definition is inserted before the definition for "Shoulder":

Sensitive Area – Natural features, which may be previously altered by human activity, that are present on or adjacent to the project location and protected, managed, or regulated by local, tribal, state, or federal agencies.

The following new term and definition is inserted after the definition for "Working Drawings":

WSDOT Form – Forms developed and maintained by WSDOT that are required or available for use on a project. These forms can be downloaded from the forms catalogue at:

http://wsdot.wa.gov/forms/pdfForms.html

1-02.AP1

Section 1-02, Bid Procedures and Conditions
June 3, 2019

1-02.4(1) General

This section is supplemented with the following:

Prospective Bidders are advised that the Contracting Agency may include a partially completed Washington State Department of Ecology (Ecology) Transfer of Coverage (Ecology Form ECY 020-87a) for the Construction Stormwater General Permit (CSWGP) as part of the Bid Documents. When the Contracting Agency requires the transfer of coverage of the CSWGP to the Contractor, an informational copy of the Transfer of Coverage and the associated CSWGP will be included in the appendices. As a condition of Section 1-03.3, the Contractor is required to complete sections I, III, and VIII of the Transfer of Coverage and return the form to the Contracting Agency.

The Contracting Agency is responsible for compliance with the CSWGP until the end of day that the Contract is executed. Beginning on the day after the Contract is executed, the Contractor shall assume complete legal responsibility for compliance with the CSWGP and full implementation of all conditions of the CSWGP as they apply to the Contract Work.

1-02.5 Proposal Forms

The first sentence of the first paragraph is revised to read:

At the request of a Bidder, the Contracting Agency will provide a physical Proposal Form for any project on which the Bidder is eligible to Bid.

1-02.6 Preparation of Proposal

Item number 1 of the second paragraph is revised to read:

1. A unit price for each item (omitting digits more than two places to the right of the decimal point),

In the third sentence of the fourth paragraph, “WSDOT Form 422-031” is revised to read “WSDOT Form 422-031U”.

The following new paragraph is inserted before the last paragraph:

The Bidder shall submit with their Bid a completed Contractor Certification Wage Law Compliance form (WSDOT Form 272-009). Failure to return this certification as part of the Bid Proposal package will make this Bid Nonresponsive and ineligible for Award. A Contractor Certification of Wage Law Compliance form is included in the Proposal Forms.

1-02.13 Irregular Proposals

Item 1(h) is revised to read:

h. The Bidder fails to submit Underutilized Disadvantaged Business Enterprise Good Faith Effort documentation, if applicable, as required in Section 1-02.6, or if the documentation that is submitted fails to demonstrate that a Good Faith Effort to meet the Condition of Award was made;

Item 1(i) is revised to read the following three items:

i. The Bidder fails to submit a UDBE Bid Item Breakdown form, if applicable, as required in Section 1-02.6, or if the documentation that is submitted fails to meet the requirements of the Special Provisions;

j. The Bidder fails to submit UDBE Trucking Credit Forms, if applicable, as required in Section 1-02.6, or if the documentation that is submitted fails to meet the requirements of the Special Provisions; or

k. The Bid Proposal does not constitute a definite and unqualified offer to meet the material terms of the Bid invitation.

1-03.AP1

Section 1-03, Award and Execution of Contract
January 2, 2018

1-03.3 Execution of Contract

The first paragraph is revised to read:

Within 20 calendar days after the Award date, the successful Bidder shall return the signed Contracting Agency-prepared Contract, an insurance certification as required by Section 1-07.18, a satisfactory bond as required by law and Section 1-03.4, the Transfer of Coverage form for the Construction Stormwater General Permit with sections I, III, and VIII completed when provided, and shall be registered as a contractor in the state of Washington.

1-03.5 Failure to Execute Contract

The first sentence is revised to read:

Failure to return the insurance certification and bond with the signed Contract as required in Section 1-03.3, or failure to provide Disadvantaged, Minority or Women's Business Enterprise information if required in the Contract, or failure or refusal to sign the Contract, or failure to register as a contractor in the state of Washington, or failure to return the completed Transfer of Coverage for the Construction Stormwater General Permit to the Contracting Agency when provided shall result in forfeiture of the proposal bond or deposit of this Bidder.

1-05.AP1

Section 1-05, Control of Work
August 6, 2018

1-05.5 Vacant

This section, including title, is revised to read:

1-05.5 Tolerances

Geometrical tolerances shall be measured from the points, lines, and surfaces defined in Contract documents.

A plus (+) tolerance increases the amount or dimension to which it applies, or raises a deviation from level. A minus (-) tolerance decreases the amount or dimension to which it applies, or lowers a deviation from level. Where only one signed tolerance is specified (+ or -), there is no specified tolerance in the opposing direction.

Tolerances shall not be cumulative. The most restrictive tolerance shall control.

Tolerances shall not extend the Work beyond the Right of Way or other legal boundaries identified in the Contract documents. If application of tolerances causes the extension of the Work beyond the Right of Way or legal boundaries, the tolerance shall be reduced for that specific instance.

Tolerances shall not violate other Contract requirements. If application of tolerances causes the Work to violate other Contract requirements, the tolerance shall be reduced for that

specific instance. If application of tolerances causes conflicts with other components or aspects of the Work, the tolerance shall be reduced for that specific instance.

1-05.9 Equipment

The following new paragraph is inserted before the first paragraph:

Prior to mobilizing equipment on site, the Contractor shall thoroughly remove all loose dirt and vegetative debris from drive mechanisms, wheels, tires, tracks, buckets and undercarriage. The Engineer will reject equipment from the site until it returns clean.

This section is supplemented with the following:

Upon completion of the Work, the Contractor shall completely remove all loose dirt and vegetative debris from equipment before removing it from the job site.

1-06.AP1

Section 1-06, Control of Material
January 7, 2019

1-06.1(3) Aggregate Source Approval (ASA) Database

This section is supplemented with the following:

Regardless of status of the source, whether listed or not listed in the ASA database the source owner may be asked to provide testing results for toxicity in accordance with Section 9-03.21(1).

1-06.2(2)D Quality Level Analysis

This section is supplemented with the following new subsection:

1-06.2(2)D5 Quality Level Calculation – HMA Compaction

The procedures for determining the quality level and pay factor for HMA compaction are as follows:

1. Determine the arithmetic mean, X_m, for compaction of the lot:

$$X_m = \frac{\sum x}{n}$$

Where:
x = individual compaction test values for each sublot in the lot.
∑x = summation of individual compaction test values
n = total number test values

2. Compute the sample standard deviation, “S”, for each constituent:

$$S = \left[\frac{n\sum x^2 - \left(\sum x\right)^2}{n(n-1)} \right]^{\frac{1}{2}}$$

Where:
$\sum x^2$ = summation of the squares of individual compaction test values
$(\sum x)^2$ = summation of the individual compaction test values squared

3. Compute the lower quality index (Q_L):

$$Q_L = \frac{X_m - LSL}{S}$$

Where:
LSL = 92.0

4. Determine P_L (the percent within the lower Specification limit which corresponds to a given Q_L) from Table 1. For negative values of Q_L, P_L is equal to 100 minus the table P_L. If the value of Q_L does not correspond exactly to a figure in the table, use the next higher value.

5. Determine the quality level (the total percent within Specification limits):

   Quality Level = P_L

6. Using the quality level from step 5, determine the composite pay factor (CPF) from Table 2.

7. If the CPF determined from step 6 is 1.00 or greater: use that CPF for the compaction lot; however, the maximum HMA compaction CPF using an LSL = 92.0 shall be 1.05.

8. If the CPF from step 6 is not 1.00 or greater: repeat steps 3 through 6 using an LSL = 91.5. The value thus determined shall be the HMA compaction CPF for that lot; however, the maximum HMA compaction CPF using an LSL = 91.5 shall be 1.00.

1-06.2(2)D1 Quality Level Analysis

The following new sentence is inserted after the first sentence:

The quality level calculations for HMA compaction are completed using the formulas in Section 1-06.2(2)D5.

1-06.2(2)D4 Quality Level Calculation

The first paragraph (excluding the numbered list) is revised to read:

The procedures for determining the quality level and pay factors for a material, other than HMA compaction, are as follows:

1-06.6 Recycled Materials

The first three sentences of the second paragraph are revised to read:

The Contractor shall submit a Recycled Material Utilization Plan on WSDOT Form 350-075A within 30 calendar days after the Contract is executed. The plan shall provide the

Contractor's anticipated usage of recycled concrete aggregates for meeting the requirements of these Specifications. The quantity of recycled concrete aggregate will be provided in tons and as a percentage of the Plan quantity for eligible material listed in Section 9-03.21(1)E Table on Maximum Allowable percent (By Weight) of Recycled Material.

The last paragraph is revised to read:

Within 30 calendar days after Physical Completion, the Contractor shall report the quantity of recycled concrete aggregates that were utilized in the construction of the project for each eligible item listed in Section 9-03.21(1)E. The Contractor's report shall be provided on WSDOT Form 350-075A, Recycled Materials Reporting.

1-06.6(1)A General

Item 1(a) in the second paragraph is revised to read:

a. The estimated costs for the Work for each material with 25 percent recycled concrete aggregate. The cost estimate shall include for each material a documented price quote from the supplier with the lowest total cost for the Work.

1-07.AP1

Section 1-07, Legal Relations and Responsibilities to the Public
April 1, 2019

1-07.5 Environmental Regulations

This section is supplemented with the following new subsections:

1-07.5(5) U.S. Army Corps of Engineers

When temporary fills are permitted, the Contractor shall remove fills in their entirety and the affected areas returned to pre-construction elevations.

If a U.S. Army Corps of Engineers permit is noted in Section 1-07.6 of the Special Provisions, the Contractor shall retain a copy of the permit or the verification letter (in the case of a Nationwide Permit) on the worksite for the life of the Contract. The Contractor shall provide copies of the permit or verification letter to all subcontractors involved with the authorized work prior to their commencement of any work in waters of the U.S.

1-07.5(6) U.S. Fish/Wildlife Services and National Marine Fisheries Service

The Contracting Agency will provide fish exclusion and handling services if the Work dictates. However, if the Contractor discovers any fish stranded by the project and a Contracting Agency biologist is not available, they shall immediately release the fish into a flowing stream or open water.

1-07.5(1) General

The first sentence is deleted and replaced with the following:

No Work shall occur within areas under the jurisdiction of resource agencies unless authorized in the Contract.

The third paragraph is deleted.

1-07.5(2) State Department of Fish and Wildlife

This section is revised to read:

In doing the Work, the Contractor shall:

1. Not degrade water in a way that would harm fish, wildlife, or their habitat.

2. Not place materials below or remove them from the ordinary high water line except as may be specified in the Contract.

3. Not allow equipment to enter waters of the State except as specified in the Contract.

4. Revegetate in accordance with the Plans, unless the Special Provisions permit otherwise.

5. Prevent any fish-threatening silt buildup on the bed or bottom of any body of water.

6. Ensure continuous stream flow downstream of the Work area.

7. Dispose of any project debris by removal, burning, or placement above high-water flows.

8. Immediately notify the Engineer and stop all work causing impacts, if at any time, as a result of project activities, fish are observed in distress or a fish kill occurs.

If the Work in (1) through (3) above differs little from what the Contract requires, the Contracting Agency will measure and pay for it at unit Contract prices. But if Contract items do not cover those areas, the Contracting Agency will pay pursuant to Section 1-09.4. Work in (4) through (8) above shall be incidental to Contract pay items.

1-07.5(3) State Department of Ecology

This section is revised to read:

In doing the Work, the Contractor shall:

1. Comply with Washington State Water Quality Standards.

2. Perform Work in such a manner that all materials and substances not specifically identified in the Contract documents to be placed in the water do not enter waters of the State, including wetlands. These include, but are not limited to, petroleum products, hydraulic fluid, fresh concrete, concrete wastewater, process wastewater, slurry materials and waste from shaft drilling, sediments, sediment-laden water, chemicals, paint, solvents, or other toxic or deleterious materials.

3. Use equipment that is free of external petroleum-based products.

4. Remove accumulations of soil and debris from drive mechanisms (wheels, tracks, tires) and undercarriage of equipment prior to using equipment below the ordinary high water line.

5. Clean loose dirt and debris from all materials placed below the ordinary high water line. No materials shall be placed below the ordinary high water line without the Engineer's concurrence.

6. When a violation of the Construction Stormwater General Permit (CSWGP) occurs, immediately notify the Engineer and fill out WSDOT Form 422-011, Contractor ECAP Report, and submit the form to the Engineer within 48 hours of the violation.

7. Once Physical Completion has been given, prepare a Notice of Termination (Ecology Form ECY 020-87) and submit the Notice of Termination electronically to the Engineer in a PDF format a minimum of 7 calendar days prior to submitting the Notice of Termination to Ecology.

8. Transfer the CSWGP coverage to the Contracting Agency when Physical Completion has been given and the Engineer has determined that the project site is not stabilized from erosion.

9. Submit copies of all correspondence with Ecology electronically to the Engineer in a PDF format within four calendar days.

1-07.5(4) Air Quality

This section is revised to read:

The Contractor shall comply with all regional clean air authority and/or State Department of Ecology rules and regulations.

The air quality permit process may include additional State Environment Policy Act (SEPA) requirements. Contractors shall contact the appropriate regional air pollution control authority well in advance of beginning Work.

When the Work includes demolition or renovation of any existing facility or structure that contains Asbestos Containing Material (ACM) and/or Presumed Asbestos-Containing Material (PACM), the Contractor shall comply with the National Emission Standards for Hazardous Air Pollutants (NESHAP).

Any requirements included in Federal and State regulations regarding air quality that applies to the "owner or operator" shall be the responsibility of the Contractor.

1-07.7(1) General

The first sentence of the third paragraph is revised to read:

When the Contractor moves equipment or materials on or over Structures, culverts or pipes, the Contractor may operate equipment with only the load-limit restrictions in Section 1-07.7(2).

The first sentence of the last paragraph is revised to read:

Unit prices shall cover all costs for operating over Structures, culverts and pipes.

1-07.9(1) General

The last sentence of the sixth paragraph is revised to read:

Generally, the Contractor initiates the request by preparing standard form 1444 Request for Authorization of Additional Classification and Rate, available at https://www.dol.gov/whd/recovery/dbsurvey/conformance.htm, and submitting it to the Engineer for further action.

1-07.9(2) Posting Notices

The second sentence of the first paragraph (up until the colon) is revised to read:

The Contractor shall ensure the most current edition of the following are posted:

The revision dates are deleted from all items in the numbered list.

The following new items are inserted after item number 1:

2. **Mandatory Supplement to EEOC P/E-1** published by US Department of Labor. Post for projects with federal-aid funding.

3. **Pay Transparency Nondiscrimination Provision** published by US Department of Labor. Post for projects with federal-aid funding.

Item number 2 through 12 are renumbered to 4 through 14, respectively.

1-07.11(2) Contractual Requirements

In this section, “creed” is revised to read “religion”.

Item numbers 1 through 9 are revised to read 2 through 10, respectively.

After the preceding Amendment is applied, the following new item number 1 is inserted:

1. The Contractor shall maintain a Work site that is free of harassment, humiliation, fear, hostility and intimidation at all times. Behaviors that violate this requirement include but are not limited to:

    a. Persistent conduct that is offensive and unwelcome.

    b. Conduct that is considered to be hazing.

    c. Jokes about race, gender, or sexuality that are offensive.

    d. Unwelcome, unwanted, rude or offensive conduct or advances of a sexual nature which interferes with a person’s ability to perform their job or creates an intimidating, hostile, or offensive work environment.

e. Language or conduct that is offensive, threatening, intimidating or hostile based on race, gender, or sexual orientation.

f. Repeating rumors about individuals in the Work Site that are considered to be harassing or harmful to the individual's reputation.

1-07.11(5) Sanctions

This section is supplemented with the following:

Immediately upon the Engineer's request, the Contractor shall remove from the Work site any employee engaging in behaviors that promote harassment, humiliation, fear or intimidation including but not limited to those described in these specifications.

1-07.11(6) Incorporation of Provisions

The first sentence is revised to read:

The Contractor shall include the provisions of Section 1-07.11(2) Contractual Requirements (1) through (5) and the Section 1-07.11(5) Sanctions in every subcontract including procurement of materials and leases of equipment.

1-07.15(1) Spill Prevention, Control, and Countermeasures Plan

The last sentence of the first paragraph is revised to read:

An SPCC Plan template and guidance information is available at http://www.wsdot.wa.gov/environment/technical/disciplines/hazardous-materials/spill-prevent-report.

1-07.16(2)A Wetland and Sensitive Area Protection

The first sentence of the first paragraph is revised to read:

Existing wetland and other sensitive areas, where shown in the Plans or designated by the Engineer, shall be saved and protected through the life of the Contract.

1-07.18 Public Liability and Property Damage Insurance

Item number 1 is supplemented with the following new sentence:

This policy shall be kept in force from the execution date of the Contract until the Physical Completion Date.

1-08.AP1

Section 1-08, Prosecution and ProgressJanuary 7, 2019

1-08.1 Subcontracting

The first sentence of the seventh paragraph is revised to read:

All Work that is not performed by the Contractor will be considered as subcontracting except: (1) purchase of sand, gravel, crushed stone, crushed slag, batched concrete aggregates, ready-mix concrete, off-site fabricated structural steel, other off-site fabricated items, and any other materials supplied by established and recognized commercial plants; or (2) delivery of these materials to the Work site in vehicles owned or operated by such

plants or by recognized independent or commercial hauling companies hired by those commercial plants.

The following new paragraph is inserted after the seventh paragraph:

The Contractor shall not use businesses (material suppliers, vendors, subcontractors, etc.) with federal purchasing exclusions. Businesses with exclusions are identified using the System for Award Management web page at www.SAM.gov.

1-08.5 Time for Completion

Item number 2 of the sixth paragraph is supplemented with the following:

f. A copy of the Notice of Termination sent to the Washington State Department of Ecology (Ecology); the elapse of 30 calendar days from the date of receipt of the Notice of Termination by Ecology; and no rejection of the Notice of Termination by Ecology. This requirement will not apply if the Construction Stormwater General Permit is transferred back to the Contracting Agency in accordance with Section 8-01.3(16).

1-08.7 Maintenance During Suspension

The fifth paragraph is revised to read:

The Contractor shall protect and maintain all other Work in areas not used by traffic. All costs associated with protecting and maintaining such Work shall be the responsibility of the Contractor.

1-09.AP1

Section 1-09, Measurement and Payment
August 6, 2018

1-09.2(1) General Requirements for Weighing Equipment

The last paragraph is supplemented with the following:

When requested by the Engineer, the Contractor's representative shall collect the tickets throughout the day and provide them to the Engineer's designated receiver, not later than the end of shift, for reconciliation. Tickets for loads not verified as delivered will receive no pay.

1-09.2(2) Specific Requirements for Batching Scales

The last sentence of the first paragraph is revised to read:

Batching scales used for concrete or hot mix asphalt shall not be used for batching other materials.

1-09.10 Payment for Surplus Processed Materials

The following sentence is inserted after the first sentence of the second paragraph:

For Hot Mix Asphalt, the Plan quantity and quantity used will be adjusted for the quantity of Asphalt and quantity of RAP or other materials incorporated into the mix.

2-01.AP2

Section 2-01, Clearing, Grubbing, and Roadside Cleanup
April 1, 2019

2-01.2(3) Disposal Method No. 3 – Chipping

Item number 2 of the first paragraph is revised to read:

2. Chips shall be disposed outside of sensitive areas, and in areas that aren't in conflict with permanent Work.

2-02.AP2

Section 2-02, Removal of Structures and Obstructions
April 2, 2018

2-02.3(3) Removal of Pavement, Sidewalks, Curbs, and Gutters

In item number 3 of the first paragraph, the second sentence is revised to read:

For concrete pavement removal, a second vertical full depth relief saw cut offset 12 to 18 inches from and parallel to the initial saw cut is also required, unless the Engineer allows otherwise.

2-03.AP2

Section 2-03, Roadway Excavation and Embankment
April 1, 2019

2-03.3(14)F Displacement of Unsuitable Foundation Materials

This section, including title, is revised to read:

2-03.3(14)F Vacant

2-09.AP2

Section 2-09, Structure Excavation
April 1, 2019

2-09.2 Materials

In the first paragraph, the references to "Portland Cement" and "Aggregates for Portland Cement Concrete" are revised to read:

Cement	9-01
Fine Aggregate for Concrete	9-03.1(2)

2-09.3(3)B Excavation Using Open Pits – Extra Excavation

The last two paragraphs are deleted and replaced with the following:

The excavation height (Ht) shall be calculated within a vertical plane as the difference between the lowest elevation in the excavation and the highest elevation of the ground surface immediately adjacent to the excavation. Pavement thickness and other surface treatments existing at the time of the excavation shall be included in the height calculation.

Submittals and Design Requirements

Excavations 4-feet and less in height do not require design and submittals. The Contractor shall provide a safe work environment and shall execute the work in a manner that does not damage adjacent pavements, utilities, or structures. If the Engineer determines the Contractor's work may potentially affect adjacent traffic, pavements, utilities, or structures, the Engineer may request a Type 1 Working Drawing from the Contractor. The Contractor shall explain in the Type 1 Working Drawing how the Engineer's concerns will be addressed, why infrastructure will not be damaged by the work, and how worker safety will be preserved.

For excavations that have soil types and slope geometries defined in WAC 296-155 part N and are between 4-feet and 20-feet in height, the Contractor shall submit Type 2 Working Drawings. Required submittal elements include, at a minimum, the following:

1. A plan view showing the limits of the excavation and its relationship to traffic, structures, utilities and other pertinent project elements. If the stability of the excavation requires no-load zones or equipment setback distances, those shall be shown on the plan view.

2. A typical or controlling cross section showing the proposed excavation, original ground line, and locations of traffic, existing structures, utilities, site constraints, surcharge loads, or other conditions that could affect the stability of the slope. If the stability of the excavation requires no-load zones or equipment setback distances, those shall be shown in cross section.

3. A summary clearly describing subsurface conditions, soil type for WAC 296-155 part N, and groundwater conditions, sequencing considerations, and governing assumptions.

Where WAC 296-155 part N requires an engineer's design, the Contractor shall submit Type 2E Working Drawings. Required submittal elements include, at a minimum, the three items above and the following additional items:

4. Supporting calculations for the design of the excavation, the soil and material properties selected for design, and the justification for the selection for those properties, in accordance with the WSDOT *Geotechnical Design Manual* M 46-03.

5. Safety factors, or load and resistance factors used, and justification for their selection, in accordance with the WSDOT *Geotechnical Design Manual* M 46-03, and referenced AASHTO design manuals.

6. A monitoring plan to evaluate the excavation performance throughout its design life.

7. Any supplemental subsurface explorations made by the Contractor to meet the requirements for geotechnical design of excavation slopes, in accordance with the WSDOT *Geotechnical Design Manual* M 46-03.

2-09.3(3)D Shoring and Cofferdams

The first sentence of the sixth paragraph is revised to read:

Structural shoring and cofferdams shall be designed for conditions stated in this Section using methods shown in Division I Section 5 of the AASHTO *Standard Specifications for Highway Bridges* Seventeenth Edition – 2002 for allowable stress design, or the AASHTO *LRFD Bridge Design Specifications* for load and resistance factor design.

3-01.AP3

Section 3-01, Production from Quarry and Pit Sites
April 2, 2018

3-01.1 Description

The first paragraph is revised to read:

This Work shall consist of manufacturing and producing crushed and screened aggregates including pit run aggregates of the kind, quality, and grading specified for use in the construction of concrete, hot mix asphalt, crushed surfacing, maintenance rock, ballast, gravel base, gravel backfill, gravel borrow, riprap, and bituminous surface treatments of all descriptions.

4-04.AP4

Section 4-04, Ballast and Crushed Surfacing
April 2, 2018

4-04.3(5) Shaping and Compaction

This section is supplemented with the following new paragraph:

When using 100% Recycled Concrete Aggregate, the Contractor may submit a written request to use a test point evaluation for compaction acceptance testing in lieu of compacting to 95% of the standard density as determined by the requirements of Section 2-03.3(14)D. The test point evaluation shall be performed in accordance with SOP 738.

5-01.AP5

Section 5-01, Cement Concrete Pavement Rehabilitation
January 7, 2019

5-01.2 Materials

The reference for Concrete Patching Material is revised to read:

Concrete Patching Material, Grout, and Mortar 9-20.1

5-01.3(1)A1 Concrete Patching Materials

In this section, each reference to “9-20” is revised to read “9-20.1”.

5-01.3(4) Replace Cement Concrete Panel

This section’s content is deleted and replaced with the following new subsections:

5-01.3(4)A General

Curing, cold weather work, concrete pavement construction in adjacent lines, and protection of pavement shall meet the requirements of Section 5-05.3(13) through Section 5-05.3(15). The Contractor, at no cost to the Contracting Agency, shall repair any damage to existing pavement caused by the Contractor’s operations.

5-01.3(4)B Sawing and Dimensional Requirements

Concrete slabs to be replaced as shown in the Plans or staked by the Engineer shall be at least 6.0 feet long and full width of an existing pavement panel. The portion of the panel to remain in place shall have a minimum dimension of 6 feet in length and full panel width; otherwise the entire panel shall be removed and replaced. There shall be no new joints closer than 3.0 feet to an existing transverse joint or crack. A vertical full depth saw cut is required along all longitudinal joints and at transverse locations and, unless the Engineer allows otherwise, an additional vertical full depth relief saw cut located 12 to 18 inches from and parallel to the initial longitudinal and transverse saw cut locations is also required. Removal of existing cement concrete pavement shall not cause damage to adjacent slabs that are to remain in place. In areas that will be ground, slab replacements shall be performed prior to pavement grinding.

Side forms shall meet the requirements of Section 5-05.3(7)B whenever a sawed full depth vertical face cannot be maintained.

5-01.3(4)C Dowel Bars and Tie Bars

For the half of a dowel bar or tie bar placed in fresh concrete, comply with the requirements of Section 5-05.

For the half of a dowel bar or tie bar placed in hardened concrete, comply with the Standard Plans and the following.

After drilling, secure dowel bars and tie bars into the existing pavement with either an epoxy bonding agent Type I or IV as specified in Section 9-26.1, or a grout Type 2 for non-shrink applications as specified in Section 9-20.3.

Dowel bars shall be placed at the mid depth of the concrete slab, centered over the transverse joint, and parallel to the centerline and to the roadway surface, within the tolerances in the table below. Dowel bars may be adjusted to avoid contact with existing dowel bars in the transverse joint at bridge approach slabs or existing panels provided the adjusted dowel bars meet the tolerances below.

Tie bars shall be placed at the mid depth of the concrete slab, centered over the joint, perpendicular to centerline, and parallel to the roadway surface, within the tolerances in the table below. The horizontal position of tie bars may be adjusted to avoid contact with existing tie bars in the longitudinal joint where panel replacement takes place, provided the adjusted tie bars meet the tolerances below.

Placement Tolerances		
	Dowel Bars	**Tie Bars**
Vertical: Center of Bar to Center of Slab Depth	± 1.00 inch max	± 1.00 inch max
Dowel Bar Centered Over the Transverse Joint	± 1.00 inch max	N/A
Tie Bar Centered Over the Longitudinal Joint	N/A	± 1.00 inch max
Parallel to Centerline Over the Length of the Dowel Bar	± 0.50 inch max	N/A
Perpendicular to Longitudinal Joint Over the Length of the Tie Bar	N/A	± 1.00 inch max

Parallel to Roadway Surface Over the Length of the Bar	± 0.50 inch max	± 1.00 inch max

Dowel bars and tie bars shall be placed according to the Standard Plan when multiple panels are placed. Panels shall be cast separately from the bridge approach slab.

Dowel bars to be drilled into existing concrete or at a new transverse contraction joint shall have a parting compound, such as curing compound, grease, or other Engineer accepted equal, applied to them prior to placement.

Clean the drilled holes in accordance with the epoxy or grout manufacturer's instructions. Holes shall be clean and dry at the time of placing the epoxy, or grout and tie bars. Completely fill the void between the tie bar and the outer limits of the drilled hole with epoxy or grout. Use retention rings to prevent leakage of the epoxy or grout and support the tie bar to prevent movement until the epoxy or grout has cured the minimum time recommended by the manufacturer.

5-01.3(4)D Foundation Preparation

The Contractor shall smooth the surfacing below the removed panel and compact it to the satisfaction of the Engineer. Crushed surfacing base course, or hot mix asphalt may be needed to bring the surfacing to grade prior to placing the new concrete.

If the material under the removed panel is uncompactable and the Engineer requires it, the Contractor shall excavate the Subgrade 2 feet, place a soil stabilization construction geotextile meeting the requirements of Section 9-33, and backfill with crushed surfacing base course. This Work may include:

1. Furnishing and hauling crushed surfacing base course to the project site.
2. Excavating uncompactable material.
3. Furnishing and placing a soil stabilization construction geotextile.
4. Backfilling and compacting crushed surfacing base course.
5. Removing, hauling and restocking any unused crushed surfacing base course.

5-01.3(4)E Concrete Finishing

Grade control shall be the responsibility of the Contractor.

All panels shall be struck off level with the adjacent panels and floated to a smooth surface.

Final finish texturing shall meet the requirements of Section 5-05.3(11).

In areas where the Plans do not require grinding, the surface smoothness will be measured with a 10-foot straightedge by the Engineer in accordance with Section 5-05.3(12). If the replacement panel is located in an area that will be ground as part of concrete pavement grinding in accordance with Section 5-01.3(9), the surface smoothness shall be measured, by the Contractor, in conjunction with the smoothness measurement done in accordance with Section 5-01.3(10).

5-01.3(4)F Joints

All transverse and longitudinal joints shall be sawed and sealed in accordance with Section 5-05.3(8). The Contractor may use a hand pushed single blade saw for sawing joints.

5-01.3(4)G Cracked Panels

Replacement panels that crack shall be repaired as specified in Section 5-05.3(22) at no cost to the Contracting Agency. When repairing replacement panels that have cracked, epoxy-coated dowel bars meeting the requirements of Section 9-07.5(1) may be substituted for the corrosion resistant dowel bars specified.

5-01.3(4)H Opening to Traffic

Opening to traffic shall meet the requirements of Section 5-05.3(17).

5-01.3(5) Partial Depth Spall Repair

The second sentence of the third paragraph is revised to read:

All sandblasting residue shall be removed.

5-01.3(7) Sealing Existing Concrete Random Cracks

The second sentence of the second paragraph is revised to read:

Immediately prior to sealing, the cracks shall be clean.

5-01.3(8) Sealing Existing Longitudinal and Transverse Joint

The first sentence of the fifth paragraph is revised to read:

Immediately prior to sealing, the cracks shall be clean.

5-01.3(10) Pavement Smoothness

This section is revised to read:

Pavement surface smoothness for cement concrete pavement grinding on this project will include International Roughness Index (IRI) testing. Ride quality will be evaluated using the Mean Roughness Index (MRI) calculated by averaging the IRI data for the left and right wheel path within the section.

Smoothness Testing Equipment and Operator Certification

Use an inertial profiler and operator that meet the requirements of Section 5-05.3(3)E.

Surface Smoothness

Operate the inertial profiler in accordance with AASHTO R 57. Collect two longitudinal traces, one in each wheel path. Collect the control profile at locations designated in Table 2 prior to any pavement rehabilitation Work on the areas to be tested. Collect an acceptance profile at locations designated in Table 2 after completion of all cement concrete pavement grinding on the project. Profiles shall be collected in a continuous pass including areas excluded from pay adjustments. Provide notice to the Engineer a minimum of seven calendar days prior to testing.

Table 2
Locations Requiring MRI Testing

Travel lanes where cement concrete grinding is shown in the plans	Control profile
Additional locations designated by the Engineer	Control profile
Travel lanes with completed cement concrete pavement grinding	Acceptance profile
Bridges, approach panels and 0.02 miles before and after bridges and approach panels and other excluded areas within lanes requiring testing	Control and acceptance profile
Ramps, Shoulders and Tapers	Do not test

Within 30 calendar days after the Contractor's testing, the Engineer may perform verification testing. If the verification testing shows a difference in MRI greater than the 10 percent, the following resolution process will be followed:

1. The profiles, equipment and procedures will be evaluated to determine the cause of the difference.

2. If the cause of the discrepancy cannot be resolved the pavement shall be retested with both profilers at a mutually agreed time. The two profilers will test the section within 30 minutes of each other. If the retest shows a difference in MRI equal or greater than the percentages shown in Table 2 of AASHTO R 54 the Engineer's test results will be used for pavement smoothness acceptance.

The Contractor shall evaluate profiles for acceptance or corrective action using the current version of ProVAL and provide the results including the profile data in unfiltered electronic Engineering Research Division (ERD) file format to the Engineer within 3 calendar days of completing each days profile testing. If the profile data files are created using an export option in the manufacturer's software where filter settings can be specified, use the filter settings that were used to create data files for certification.

Analyze the entire profile. Exclude areas listed in Table 3.

Table 3
Areas Excluded from MRI Acceptance Requirements

Location	Exclude
Beginning and end of grinding	Pavement within 0.02 mile
Bridges and approach slabs	The bridge and approach slab and 0.02 mile from the ends of the bridge or approach slab
Defects in the existing roadway identified by the Contractor that adversely affect the MRI such as dips, depressions and wheel path longitudinal joints.[1]	0.01-mile section containing the defect and the 0.01-mile section following the section with the defect.
[1]The presence of defects is subject to verification by the Engineer	

Report the MRI results in inches per mile for each 0.01-mile section and each 0.10-mile section. Do not truncate 0.10-mile sections for areas excluded from MRI acceptance requirements. MRI requirements will not apply to 0.10-mile sections with more than three 0.01 mile-sections excluded. MRI requirements for the individual 0.01-mile sections shall still apply. The Engineer will verify the analysis.

The MRI for each 0.10 mile of ground lane will comply with the following:

Control Profile MRI per 0.10 Mile	Maximum MRI of Acceptance Profile per 0.10 Mile
≤130 inches/mile	78 inches/mile
>130 inches/mile	0.6 x Control Profile MRI

The MRI for each 0.01 mile of the completed cement concrete grinding shall not exceed 160 inches/mile.

All Work is subject to parallel and transverse 10-foot straightedge requirements, corrective work and disincentive adjustments.

Surface smoothness of travel lanes including areas subject to MRI testing shall not vary more than ⅛ inch from the lower edge of a 10-foot straightedge placed on the surface parallel to the centerline.

The smoothness perpendicular to the centerline will be measured with a 10-foot straightedge within the lanes. There shall be not vertical elevation difference of more than a ¼ inch between lanes.

Pavement that does not meet these requirements will be subject to corrective Work. All corrective Work shall be completed at no additional expense, including traffic control, to the Contracting Agency. Pavement shall be repaired by one or more of the following methods:

1. Diamond grinding.

2. By other method accepted by the Engineer.

Repair areas shall be re-profiled to ensure they no longer require corrective Work. With concurrence of the Engineer, a 10-foot straight edge may be used in place of the inertial profiler.

If correction of the roadway as listed above either will not or does not produce satisfactory results as to smoothness or serviceability the Engineer may accept the completed pavement and a credit will be calculated in accordance with Section 5-01.5. Under these circumstances, the decision whether to accept the completed pavement or to require corrective work as described above shall be vested entirely in the Engineer.

5-01.5 Payment

This section is supplemented with the following:

"Grinding Smoothness Compliance Adjustment", by calculation.

Grinding Smoothness Compliance Adjustments will be based on the requirements in Section 5-01.3(10) and the following calculations:

> A smoothness compliance adjustment will be calculated in the sum of minus $100 for each and every section of single traffic lane 0.01 mile in length and $1,000 for each and every section of single traffic lane 0.10 mile in length that does not meet the requirements in Section 5-01.3(10) after corrective Work.

5-02.AP5

Section 5-02, Bituminous Surface Treatment
April 1, 2019

5-02.3(5) Application of Aggregates

The first sentence of the eleventh paragraph is revised to read:

> The Contractor shall use a pickup broom in all curbed areas, on all bridges, within city limits, within sensitive areas, and where shown in the Plans both before the application of emulsified asphalt and during the final brooming operation.

5-04.AP5

Section 5-04, Hot Mix Asphalt
April 1, 2019

5-04.1 Description

The last sentence of the first paragraph is revised to read:

> The manufacture of HMA may include additives or processes that reduce the optimum mixing temperature (Warm Mix Asphalt) or serve as a compaction aid in accordance with these Specifications.

5-04.2 Materials

The reference to “Warm Mix Asphalt Additive” is revised to read “HMA Additive”.

5-04.2(1) How to Get an HMA Mix Design on the QPL

The last bullet in the first paragraph is revised to read:

- Do not include HMA additives that reduce the optimum mixing temperature or serve as a compaction aid when developing a mix design or submitting a mix design for QPL evaluation. The use of HMA additives is not part of the process for obtaining approval for listing a mix design on the QPL. Refer to Section 5-04.2(2)B.

In the table, “WSDOT Standard Practice QC-8” is revised to read “WSDOT Standard Practice QC-8 located in the WSDOT Materials Manual M 46-01”.

5-04.2(1)C Mix Design Resubmittal for QPL Approval

Item number 3 of the first paragraph is revised to read:

3. Changes in modifiers used in the asphalt binder.

5-04.2(2)B Using Warm Mix Asphalt Processes

This section, including title, is revised to read:

5-04.2(2)B Using HMA Additives

The Contractor may, at the Contractor's discretion, elect to use additives that reduce the optimum mixing temperature or serve as a compaction aid for producing HMA. Additives include organic additives, chemical additives and foaming processes. The use of Additives is subject to the following:

- Do not use additives that reduce the mixing temperature in accordance with Section 5-04.3(6) in the production of High RAP/Any RAS mixtures.

- Before using additives, obtain the Engineer's approval using WSDOT Form 350-076 to describe the proposed additive and process.

5-04.3(3)A Mixing Plant

Item number 5 of the first paragraph is revised to read:

5. Provide HMA sampling equipment that complies with FOP for AASHTO T 168:

    - Use a mechanical sampling device accepted by the Engineer, or

    - Platforms or devices to enable sampling from the truck transport without entering the truck transport for sampling HMA.

5-04.3(4) Preparation of Existing Paved Surfaces

The first sentence of the fourth paragraph is revised to read:

Unless otherwise allowed by the Engineer, use cationic emulsified asphalt CSS-1, CSS-1h, or Performance Graded (PG) asphalt for tack coat.

5-04.3(6) Mixing

The first paragraph is revised to read:

The asphalt supplier shall introduce recycling agent and anti-stripping additive, in the amount designated on the QPL for the mix design, into the asphalt binder prior to shipment to the asphalt mixing plant.

The seventh paragraph is revised to read:

Upon discharge from the mixer, ensure that the temperature of the HMA does not exceed the optimum mixing temperature shown on the accepted Mix Design Report by more than 25°F, or as allowed by the Engineer. When an additive is included in the manufacture of HMA, do not heat the additive (at any stage of production including in binder storage tanks) to a temperature higher than the maximum recommended by the manufacturer of the additive.

5-04.3(7) Spreading and Finishing

The last row of the table is revised to read:

⅜ inch	0.25 feet	0.30 feet

5-04.3(8) Aggregate Acceptance Prior to Incorporation in HMA

The following new paragraph is inserted after the first paragraph:

The Contracting Agency's combined aggregate bulk specific gravity (Gsb) blend as shown on the HMA Mix Design will be used for VMA calculations until the Contractor submits a written request for a Gsb test. The new Gsb will be used in the VMA calculations for HMA from the date the Engineer receives the written request for a Gsb retest. The Contractor may request aggregate specific gravity (Gsb) testing be performed by the Contracting Agency twice per project. The Gsb blend of the combined stockpiles will be used to calculate voids in mineral aggregate (VMA) of any HMA produced after the new Gsb is determined.

5-04.3(9)A1 Test Section – When Required, When to Stop

The following new row is inserted after the second row in Table 9:

VMA	Minimum PF_i of 0.95 based on the criteria in Section 5-04.3(9)B4[2]	None[4]

5-04.3(9)A2 Test Section – Evaluating the HMA Mixture in a Test Section

In Table 9a, the test property "Gradation, Asphalt Binder, and V_a" is revised to read "Gradation, Asphalt Binder, VMA, and V_a"

In Table 9a, the first column of the third row is revised to read:

Aggregates: Sand Equivalent Uncompacted Void Content Fracture

5-04.3(9)B3 Mixture Statistical Evaluation – Acceptance Testing

In Table 11, "V_a" is revised to read "VMA and V_a"

5-04.3(9)B5 Mixture Statistical Evaluation – Composite Pay Factors (CPF)

The following new row is inserted above the last row in Table 12:

Voids in Mineral Aggregate (VMA)	2

5-04.3(9)B7 Mixture Statistical Evaluation – Retests

The second to last sentence is revised to read:

The sample will be tested for a complete gradation analysis, asphalt binder content, VMA and V_a, and the results of the retest will be used for the acceptance of the HMA mixture in place of the original mixture sublot sample test results.

5-04.3(10)A HMA Compaction – General Compaction Requirements

The last paragraph is revised to read:

On bridge decks and on roadway approaches within five feet of a bridge/back of pavement seat, rollers shall not be operated in a vibratory mode, defined as a mode in which the drum vibrates vertically. However, unless otherwise noted on the plans, rollers may be operated in an oscillatory mode, defined as a mode in which the drum vibrates in the horizontal direction only.

5-04.3(10)C1 HMA Compaction Statistical Evaluation – Lots and Sublots

The bulleted item in the fourth paragraph is revised to read:

- For a compaction lot in progress with a compaction CPF less than 0.75 using an LSL = 91.5, a new compaction lot will begin at the Contractor's request after the Engineer is satisfied that material conforming to the Specifications can be produced. See also Section 5-04.3(11)F.

5-04.3(10)C2 HMA Compaction Statistical Evaluation – Acceptance Testing

In the table, "WSDOT FOP for AASHTO T 355" is revised to read "FOP for AASHTO T 355".

5-04.3(10)C3 HMA Statistical Compaction – Price Adjustments

In the first paragraph, "WSDOT FOP for AASHTO T 355" is revised to read "FOP for AASHTO T 355".

The first sentence in the second paragraph is revised to read:

For each HMA compaction lot (that is accepted by Statistical Evaluation) which does not meet the criteria in the preceding paragraph, the compaction lot shall be evaluated in accordance with Section 1-06.2(2)D5 to determine the appropriate Composite Pay Factor (CPF).

The last two paragraphs are revised to read:

Determine the Compaction Price Adjustment (CPA) from the table below, selecting the equation for CPA that corresponds to the value of CPF determined above.

Calculating HMA Compaction Price Adjustment (CPA)	
Value of CPF	**Equation for Calculating CPA**
When CPF > 1.00	CPA = [1.00 x (CPF – 1.00)] x Q x UP
When CPF = 1.00	CPA = $0
When CPF < 1.0	CPA = [0.60 x (CPF – 1.00)] x Q x UP

Where
CPA = Compaction Price Adjustment for the compaction lot ($)
CPF = Composite Pay Factor for the compaction lot (maximum is 1.05)
Q = Quantity in the compaction lot (tons)
UP = Unit price of the HMA in the compaction lot ($/ton)

5-04.3(10)C4 HMA Statistical Compaction – Requests for Retesting

The first sentence is revised to read:

For a compaction sublot that has been tested with a nuclear density gauge that did not meet the minimum of 91.5 percent of the theoretical maximum density in a compaction lot with a CPF below 1.00 and thus subject to a price reduction or rejection, the Contractor may request that a core, taken at the same location as the nuclear density test, be used for determination of the relative density of the compaction sublot.

5-04.3(13) Surface Smoothness

The second to last paragraph is revised to read:

When concrete pavement is to be placed on HMA, the surface tolerance of the HMA shall be such that no surface elevation lies above the Plan grade minus the specified Plan depth of concrete pavement. Prior to placing the concrete pavement, bring any such irregularities to the required tolerance by grinding or other means allowed by the Engineer.

5-04.5 Payment

The paragraph following the Bid item "Crack Sealing-LF", per linear foot is revised to read:

The unit Contract price per linear foot for "Crack Sealing-LF" shall be full payment for all costs incurred to perform the Work described in Section 5-04.3(4)A.

5-05.AP5

Section 5-05, Cement Concrete Pavement
April 1, 2019

5-05.1 Description

In the first paragraph, "portland cement concrete" is revised to read "cement concrete".

5-05.2 Materials

In the first paragraph, the reference to "Portland Cement" is revised to read:

Cement 9-01

In the first paragraph, the section reference for Concrete Patching Material is revised to read "9-20.1".

The second paragraph is revised to read:

Cementitious materials are considered to be the following: portland cement, blended hydraulic cement, fly ash, ground granulated blast furnace slag and microsilica fume.

5-05.3(1) Concrete Mix Design for Paving

The table title in item number 4 is revised to read **Concrete Batch Weights**.

In item 4a, "Portland Cement" is revised to read "Cement".

5-05.3(3)E Smoothness Testing Equipment

This section is revised to read:

Inertial profilers shall meet all requirements of AASHTO M 328 and be certified in accordance with AASHTO R 56 within the preceding 12 months.

The inertial profiler operator shall be certified as required by AASHTO R 56 within three years preceding profile measurement.

Equipment or operator certification by other states or a profiler certification facility will be accepted provided the certification meets the requirements of AASHTO R 56. Documentation verifying certification by another state shall be submitted to the Engineer a minimum of 14 calendar days prior to profile measurement. Equipment certification documentation shall include the information required by part 8.5 and 8.6 of AASHTO R 56. Operator documentation shall include a statement from the certifying state that indicates the operator is certified to operate the inertial profiler to be used on the project. The decision whether another state's certification meets the requirements of AASHTO R 56 shall be vested entirely in the Engineer.

5-05.3(4) Measuring and Batching Materials

Item number 2 is revised to read:

2. **Batching Materials** – On all projects requiring more than 2,500 cubic yards of concrete for paving, the batching plant shall be equipped to proportion aggregates and cement by weight by means of automatic and interlocked proportioning devices of accepted type.

5-05.3(4)A Acceptance of Portland Cement Concrete Pavement

This section's title is revised to read:

Acceptance of Portland Cement or Blended Hydraulic Cement Concrete Pavement

The first sentence is revised to read:

Acceptance of portland cement or blended hydraulic cement concrete pavement shall be as provided under statistical or nonstatistical acceptance.

5-05.3(7) Placing, Spreading, and Compacting Concrete

This section's content is deleted.

5-05.3(10) Tie Bars and Corrosion Resistant Dowel Bars

The first sentence of the last paragraph is revised to read:

The tie bar holes shall be clean before grouting.

5-05.3(12) Surface Smoothness

This section is revised to read:

Pavement surface smoothness for this project will include International Roughness Index (IRI) testing. The Contractor shall perform IRI testing on each through lane, climbing lane, and passing lane, greater than 0.25 mile in length and these lanes will be subject to incentive/disincentive adjustments. Ride quality will be evaluated using the Mean

Roughness Index (MRI) calculated by averaging the IRI data for the left and right wheel path within the section.

Ramps, shoulders and tapers will not be included in MRI testing for pavement smoothness and will not be subject to incentive adjustments. All Work is subject to parallel and transverse 10-foot straightedge requirements, corrective work and disincentive adjustments.

Operate the inertial profiler in accordance with AASHTO R 57. Collect two longitudinal traces, one in each wheel path. Collect profile data after completion of all concrete paving on the project in a continuous pass including areas excluded from pay adjustments. Provide notice to the Engineer a minimum of seven calendar days prior to testing.

Within 30 calendar days after the Contractor's testing, the Engineer may perform verification testing. If the verification testing shows a difference in MRI greater than the percentages shown in Table 2 of AASHTO R 54 the following resolution process will be followed:

1. The profiles, equipment and procedures will be evaluated to determine the cause of the difference.

2. If the cause of the discrepancy cannot be resolved the pavement shall be retested with both profilers at a mutually agreed time. The two profilers will test the section within 30 minutes of each other. If the retest shows a difference in MRI equal or greater than the percentages shown in Table 2 of AASHTO R 54 the Engineer's test results will be used to establish pay adjustments.

Surface smoothness of travel lanes not subject to MRI testing will be measured with a 10-foot straightedge no later than 5:00 p.m. of the day following the placing of the concrete. The completed surface of the wearing course shall not vary more than ⅛ inch from the lower edge of a 10-foot straightedge placed on the surface parallel to the centerline.

Smoothness perpendicular to the centerline will be measured with a 10-foot straightedge across all lanes with the same cross slope, including shoulders when composed of cement concrete pavement. The overlapping 10-foot straightedge measurement shall be discontinued at a point 6 inches from the most extreme outside edge of the finished cement concrete pavement. The completed surface of the wearing course shall not vary more than ¼ inch from the lower edge of a 10-foot straightedge placed on the surface perpendicular to the centerline. Any deviations in excess of the above tolerances shall be corrected.

The Contractor shall evaluate profiles for acceptance, incentive payments, disincentive payments, or corrective action using the current version of ProVAL and provide the results including the profile data in unfiltered electronic Engineering Research Division (ERD) file format to the Engineer within 2 calendar days of completing testing each section of pavement. If the profile data files are created using an export option in the manufacturer's software where filter settings can be specified, use the filter settings that were used to create data files for certification. Analyze the entire profile. Exclude any areas specifically identified in the Contract. Exclude from the analysis the first 100 feet after the start of the paving operations and last 100 feet prior to the end of the paving operation, the first 100 feet on either side of bridge Structures and bridge approach slab. Report the MRI results in inches per mile for each 52.8 foot section and horizontal distance measurements in project

stationing to the nearest foot. Include pay adjustments in the results. The Engineer will verify the analysis.

Corrective work for pavement smoothness may be taken by the Contractor prior to MRI testing. After completion of the MRI testing the Contractor shall measure the smoothness of each 52.8-foot section with an MRI greater than 125 inches per mile with a 10-foot straightedge within 14 calendar days or as allowed by the Engineer. The Contractor shall identify all locations that require corrective work and provide the straight edge measurements at each location that exceeds the allowable limit to the Engineer. If all measurements in a 52.8-foot section comply with smoothness requirements, the Contractor shall provide the maximum measurement to the Engineer and a statement that corrective work is not required. Unless allowed by the Engineer, corrective work shall be taken by the Contractor for pavement identified by the Contractor or Engineer that does not meet the following requirements:

1. The completed surface shall be of uniform texture, smooth, uniform as to crown and grade, and free from defects of all kinds.

2. The completed surface shall not vary more than ⅛ inch from the lower edge of a 10-foot straightedge placed on the surface parallel to the centerline.

3. The completed surface shall vary not more than ¼ inch in 10 feet from the rate of transverse slope shown in the Plans.

All corrective work shall be completed at no additional expense, including traffic control, to the Contracting Agency. Corrective work shall not begin until the concrete has reached its design strength unless allowed by the Engineer. Pavement shall be repaired by one or more of the following methods:

1. Diamond grinding; repairs shall not reduce pavement thickness by more than ¼ inch less than the thickness shown in the Plans. When required by the Engineer, the Contractor shall verify the thickness of the concrete pavement by coring. Thickness reduction due to corrective work will not be included in thickness measurements for calculating the Thickness Deficiency in Section 5-05.5(1)A.

2. Removal and replacement of the cement concrete pavement.

3. By other method allowed by the Engineer.

For repairs following MRI testing the repaired area shall be checked by the Contractor with a 10-foot straightedge to ensure it no longer requires corrective work. With concurrence of the Engineer an inertial profiler may be used in place of the 10-foot straight edge.

If correction of the roadway as listed above either will not or does not produce satisfactory results as to smoothness or serviceability the Engineer may accept the completed pavement and a credit will be calculated in accordance with Section 5-05.5. The credit will be in addition to the price adjustment for MRI. Under these circumstances, the decision whether to accept the completed pavement or to require corrective work as described above shall be vested entirely in the Engineer.

5-05.3(22) Repair of Defective Pavement Slabs

The last sentence of the fourth paragraph is revised to read:

All sandblasting residue shall be removed.

5-05.4 Measurement

Item number 3 of the second paragraph is revised to read:

3. The depth shall be determined in accordance with Section 5-05.5(1). The depth utilized to calculate the volume shall not exceed the Plan depth plus 0.04 feet.

The third paragraph is revised to read:

The volume of cement concrete pavement in each thickness lot shall equal the measured length × width × thickness measurement.

The last paragraph is revised to read:

The calculation for cement concrete compliance adjustment is the volume of concrete represented by the CPF and the Thickness deficiency adjustment.

5-05.5 Payment

The paragraph following the Bid item “Cement Conc. Pavement”, per cubic yard is supplemented with the following:

All costs associated with performing the magnetic pulse induction thickness testing shall be included in the unit Contract price per cubic yard for “Cement Conc. Pavement”.

The Bid item “Ride Smoothness Compliance Adjustment”, by calculation, and the paragraph following this bid item are revised to read:

“Ride Smoothness Compliance Adjustment”, by calculation.

Smoothness Compliance Adjustments will be based on the requirements in Section 5-05.3(12) and the following calculations:

1. Final MRI acceptance and incentive/disincentive payments for pavement smoothness will be calculated as the average of the ten 52.8-foot sections in each 528 feet in accordance with the price adjustment schedule.

    a. For sections of a lane that are a minimum of 52.8 feet and less than 528 feet, the price adjustment will be calculated using the average of the 52.8 foot MRI values and the price adjustment prorated for the length of the section.

    b. MRI values per 52.8-feet that were measured prior to corrective work will be included in the 528 foot price adjustment for sections with corrective work.

2. In addition to the price adjustment for MRI a smoothness compliance adjustment will be calculated in the sum of minus $1000.00 for each and every section of

single traffic lane 52.8 feet in length in that does not meet the 10-foot straight edge requirements in Section 5-05.3(12) after corrective Work.

Price Adjustment Schedule

MRI for each 528 ft. section	Pay Adjustment Schedule
in. / mi.	**$ / 0.10 mi.**
< 30	2400
30	2400
31	2320
32	2240
33	2160
34	2080
35	2000
36	1920
37	1840
38	1760
39	1680
40	1600
41	1520
42	1440
43	1360
44	1280
45	1200
46	1120
47	1040
48	960
49	880
50	800
51	720
52	640
53	560
54	480
55	400
56	320
57	240
58	160
59	80
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0

71	0
72	0
73	0
74	0
75	0
76	-80
77	-160
78	-240
79	-320
80	-400
81	-480
82	-560
83	-640
84	-720
85	-800
86	-880
87	-960
88	-1040
89	-1120
90	-1200
91	-1280
92	-1360
93	-1440
94	-1520
95	-1600
96	-1680
97	-1760
98	-1840
99	-1920
100	-2000
101	-2080
102	-2160
103	-2240
104	-2320
105	-2400
106	-2480
107	-2560
108	-2640
109	-2720
110	-2800
111	-2880
112	-2960
113	-3040
114	-3120
115	-3200
116	-3280
117	-3360
118	-3440
119	-3520

120	-3600
121	-3680
122	-3760
123	-3840
124	-3920
≥125	-4000

The bid item "Portland Cement Concrete Compliance Adjustment", by calculation, and the paragraph following this bid item are revised to read:

"Cement Concrete Compliance Adjustment", by calculation.

Payment for "Cement Concrete Compliance Adjustment" will be calculated by multiplying the unit Contract price for the cement concrete pavement, times the volume for adjustment, times the percent of adjustment determined from the calculated CPF and the Deficiency Adjustment listed in Section 5-05.5(1)A.

5-05.5(1) Pavement Thickness

This section is revised to read:

Cement concrete pavement shall be constructed in accordance with the thickness requirements in the Plans and Specifications. Tolerances allowed for Subgrade construction and other provisions, which may affect thickness, shall not be construed to modify such thickness requirements.

Thickness measurements in each lane paved shall comply with the following:

Thickness Testing of Cement Concrete Pavement	
Thickness Lot Size	15 panels maximum
Thickness test location determined by	Engineer will select testing locations in accordance with WSDOT TM 716 method B.
Sample method	AASHTO T 359
Sample preparation performed by	Contractor provides, places, and secures disks in the presence of the Engineer[1]
Measurement method	AASHTO T 359
Thickness measurement performed by	Contractor, in the presence of the Engineer[2]
[1]Reflectors shall be located at within 0.5 feet of the center of the panel. The Contractor shall supply a sufficient number of 300 mm-diameter round reflectors meeting the requirements of AASHTO T 359 to accomplish the required testing. [2]The Contractor shall provide all equipment and materials needed to perform the testing.	

Thickness measurements shall be rounded to the nearest 0.01 foot.

Each thickness test location where the pavement thickness is deficient by more than 0.04 foot, shall be subject to price reduction or corrective action as shown in Table 2.

Table 2 **Thickness Deficiency**	
0.04' < Thickness Deficiency ≤ 0.06'	10
0.06' < Thickness deficiency ≤ 0.08'	25

Thickness deficiency > 0.08'	Remove and replace the panels or the panels may be accepted with no payment at the discretion of the Engineer.

The price reduction shall be computed by multiplying the percent price reduction in Table 2 by the unit Contract price by the volume of pavement represented by the thickness test lot.

Additional cores may be taken by the Contractor to determine the limits of an area that has a thickness deficiency greater than 0.04 feet. Cores shall be taken at the approximate center of the panel. Only the panels within the limits of the deficiency area as determined by the cores will be subject to a price reduction or corrective action. The cores shall be taken in the presence of the Engineer and delivered to the Engineer for measurement. All costs for the additional cores including filling the core holes with patching material meeting the requirements of Section 9-20 will be the responsibility of the Contractor.

5-05.5(1)A Thickness Deficiency of 0.05 Foot or Less

This section, including title, is revised to read:

5-05.5(1)A Vacant

5-05.5(1)B Thickness Deficiency of More Than 0.05 Foot

This section, including title, is revised to read:

5-05.5(1)B Vacant

6-01.AP6

Section 6-01, General Requirements for Structures
January 7, 2019

This section is supplemented with the following new subsections:

6-01.16 Repair of Defective Work

6-01.16(1) General

When using repair procedures that are described elsewhere in the Contract Documents, the Working Drawing submittal requirements of this Section shall not apply to those repairs unless noted otherwise.

Repair procedures for defective Work shall be submitted as Type 2 Working Drawings. Type 2E Working Drawings shall be submitted when required by the Engineer. As an alternative to submitting Type 2 or 2E Working Drawings, defective Work within the limits of applicability of a pre-approved repair procedure may be repaired using that procedure. Repairs using a pre-approved repair procedure shall be submitted as a Type 1 Working Drawing.

Pre-approved repair procedures shall consist of the following:

- The procedures listed in Section 6-01.16(2)
- For precast concrete, repair procedures in the annual plant approval process documents that have been approved for use by the Contracting Agency.

All Working Drawings for repair procedures shall include:

- A description of the defective Work including location, extent and pictures
- Materials to be used in the repair. Repairs using manufactured products shall include written manufacturer recommendations for intended uses of the product, surface preparation, mixing, aggregate extension (if applicable), ambient and surface temperature limits, placement methods, finishing and curing.
- Construction procedures
- Plan details of the area to be repaired
- Calculations for Type 2E Working Drawings

Material manufacturer's instructions and recommendations shall supersede any conflicting requirements in pre-approved repair procedures.

The Engineer shall be notified prior to performing any repair procedure and shall be given an opportunity to inspect the repair work being performed.

6-01.16(2) Pre-Approved Repair Procedures

6-01.16(2)A Concrete Spalls and Poor Consolidation (Rock Pockets, Honeycombs, Voids, etc.)

This repair shall be limited to the following areas:

- Areas that are not on top Roadway surfaces (with or without an overlay) including but not limited to concrete bridge decks, bridge approach slabs or cement concrete pavement
- Areas that are not underwater
- Areas that are not on precast barrier, except for the bottom 4 inches (but not to exceed 1 inch above blockouts)
- Areas that do not affect structural adequacy as determined by the Engineer.

The repair procedure is as follows:

1. Remove all loose and unsound concrete. Impact breakers shall not exceed 15 pounds in weight when removing concrete adjacent to reinforcement or other embedments and shall not exceed 30 pounds in weight otherwise. Operate impact breakers at angles less than 45 degrees as measured from the surface of the concrete to the tool and moving away from the edge of the defective Work. Concrete shall be completely removed from exposed surfaces of existing steel reinforcing bars. If half or more of the circumference of any steel reinforcing bar is exposed, if the reinforcing bar is loose or if the bond to existing concrete

is poor then concrete shall be removed at least ¾ inch behind the reinforcing bar. Do not damage any existing reinforcement. Stop work and allow the Engineer to inspect the repair area after removing all loose and unsound concrete. Submit a modified repair procedure when required by the Engineer.

2. Square the edges of the repair area by cutting an edge perpendicular to the concrete surface around the repair area. The geometry of the repair perimeter shall minimize the edge length and shall be rectangular with perpendicular edges, avoiding reentrant corners. The depth of the cut shall be a minimum of ¾ inch, but shall be reduced if necessary to avoid damaging any reinforcement. For repairs on vertical surfaces, the top edge shall slope up toward the front at a 1-vertical-to-3-horizontal slope.

3. Remove concrete within the repair area to a depth at least matching the cut depth at the edges. Large variations in the depth of removal within short distances shall be avoided. Roughen the concrete surface. The concrete surface should be roughened to at least Concrete Surface Profile (CSP) 5 in accordance with ICRI Guideline No. 310.2R, unless a different CSP is recommended by the patching material manufacturer.

4. Inspect the concrete repair surface for delaminations, debonding, microcracking and voids using hammer tapping or a chain drag. Remove any additional loose or unsound concrete in accordance with steps 1 through 3.

5. Select a patching material in accordance with Section 9-20.2 that is appropriate for the repair location and thickness. The concrete patching material shall be pumpable or self-consolidating as required for the type of placement that suits the repair. The patching material shall have a minimum compressive strength at least equal to the specified compressive strength of the concrete.

6. Prepare the concrete surface and reinforcing steel in accordance with the patching material manufacturer's recommendations. At a minimum, clean the concrete surfaces (including perimeter edges) and reinforcing steel using oil-free abrasive blasting or high-pressure (minimum 5,000 psi) water blasting. All dirt, dust, loose particles, rust, laitance, oil, film, microcracked/bruised concrete or foreign material of any sort shall be removed. Damage to the epoxy coating on steel reinforcing bars shall be repaired in accordance with Section 6-02.3(24)H.

7. Construct forms if necessary, such as for patching vertical or overhead surfaces or where patching extends to the edge or corner of a placement.

8. When recommended by the patching material manufacturer, saturate the concrete in the repair area and remove any free water at the concrete surface to obtain a saturated surface dry (SSD) substrate. When recommended by the patching material manufacturer, apply a primer, scrub coat or bonding agent to the existing surfaces. Epoxy bonding

agents, if used, shall be Type II or Type V in accordance with Section 9-26.1.

9. Place and consolidate the patching material in accordance with the manufacturer's recommendations. Work the material firmly into all surfaces of the repair area with sufficient pressure to achieve proper bond to the concrete.

10. The patching material shall be textured, cured and finished in accordance with the patching material manufacturer's recommendations and/or the requirements for the repaired component. Protect the newly placed patch from vibration in accordance with Section 6-02.3(6)D.

11. When the completed repair does not match the existing concrete color and will be visible to the public, a sand and cement mixture that is color matched to the existing concrete shall be rubbed, brushed, or applied to the surface of the patching material and the concrete.

6-01.10 Utilities Supported by or Attached to Bridges

In the third paragraph, "Federal Standard 595" is revised to read "SAE AMS Standard 595".

6-01.12 Final Cleanup

The second sentence of the first paragraph is revised to read:

Structure decks shall be clean.

The second paragraph is deleted.

6-02.AP6

Section 6-02, Concrete Structures
April 1, 2019

6-02.1 Description

The first sentence is revised to read:

This Work consists of the construction of all Structures (and their parts) made of portland cement or blended hydraulic cement concrete with or without reinforcement, including bridge approach slabs.

6-02.2 Materials

In the first paragraph, the references to "Portland Cement" and "Aggregates for Portland Cement Concrete" are revised to read:

Cement	9-01
Aggregates for Concrete	9-03.1

The reference to metakaolin is deleted.

6-02.3(2) Proportioning Materials

The second paragraph is revised to read:

Unless otherwise specified, the Contractor shall use Type I or II portland cement or blended hydraulic cement in all concrete as defined in Section 9-01.2(1).

The last sentence of the fifth paragraph is revised to read:

With the Engineer's written concurrence, microsilica fume may be used in all classifications of Class 4000, Class 3000, and commercial concrete and is limited to a maximum of 10 percent of the cementitious material.

6-02.3(2)A Contractor Mix Design

The last sentence of the last paragraph is revised to read:

For all other concrete, air content shall be a minimum of 4.5 percent and a maximum of 7.5 percent for all concrete placed above the finished ground line unless noted otherwise.

6-02.3(2)A1 Contractor Mix Design for Concrete Class 4000D

Item number 5 of the first paragraph is deleted.

Item number 6 of the first paragraph (after the preceding Amendment is applied) is renumbered to 5.

6-02.3(2)B Commercial Concrete

The second paragraph is revised to read:

Where concrete Class 3000 is specified for items such as, culvert headwalls, plugging culverts, concrete pipe collars, pipe anchors, monument cases, Type PPB, PS, I, FB and RM signal standards, pedestals, cabinet bases, guardrail anchors, fence post footings, sidewalks, concrete curbs, curbs and gutters, and gutters, the Contractor may use commercial concrete. If commercial concrete is used for sidewalks, concrete curbs, curbs and gutters, and gutters, it shall have a minimum cementitious material content of 564 pounds per cubic yard of concrete, shall be air entrained, and the tolerances of Section 6-02.3(5)C shall apply.

6-02.3(4) Ready-Mix Concrete

The first sentence of the first paragraph is revised to read:

All concrete, except lean concrete, shall be batched in a prequalified manual, semi-automatic, or automatic plant as described in Section 6-02.3(4)A.

6-02.3(4)D Temperature and Time For Placement

The following is inserted after the first sentence of the first paragraph:

The upper temperature limit for placement for Class 4000D concrete may be increased to a maximum of 80°F if allowed by the Engineer.

6-02.3(5)C Conformance to Mix Design

Item number 1 of the second paragraph is revised to read:

1. Cement weight plus 5 percent or minus 1 percent of that specified in the mix design.

6-02.3(6)A1 Hot Weather Protection

The first paragraph is revised to read:

The Contractor shall provide concrete within the specified temperature limits. Cooling of the coarse aggregate piles by sprinkling with water is permitted provided the moisture content is monitored, the mixing water is adjusted for the free water in the aggregate and the coarse aggregate is removed from at least 1 foot above the bottom of the pile. Sprinkling of fine aggregate piles with water is not allowed. Refrigerating mixing water or replacing all or part of the mixing water with crushed ice is permitted, provided the ice is completely melted by placing time.

The second sentence of the second paragraph is revised to read:

These surfaces include forms, reinforcing steel, steel beam flanges, and any others that touch the concrete.

6-02.3(7) Vacant

This section, including title, is revised to read:

6-02.3(7) Tolerances

Unless noted otherwise, concrete construction tolerances shall be in accordance with this section. Tolerances in this section do not apply to cement concrete pavement.

Horizontal deviation of roadway crown points, cross-slope break points, and curb, barrier or railing edges from alignment or work line: ±1.0 inch

Deviation from plane: ±0.5 inch in 10 feet

Deviation from plane for roadway surfaces: ±0.25 inch in 10 feet

Deviation from plumb or specified batter: ±0.5 inch in 10 feet, but not to exceed a total of ±1.5 inches

Vertical deviation from profile grade for roadway surfaces: ±1 inch

Vertical deviation of top surfaces (except roadway surfaces): ±0.75 inch

Thickness of bridge decks and other structural slabs not at grade: ±0.25 inch

Length, width and thickness of elements such as columns, beams, crossbeams, diaphragms, corbels, piers, abutments and walls, including dimensions to construction joints in initial placements: +0.5 inch, -0.25 inch

Length, width and thickness of spread footing foundations: +2 inches, -0.5 inch

Horizontal location of the as-placed edge of spread footing foundations: The greater of ±2% of the horizontal dimension of the foundation perpendicular to the edge and ±0.5 inch. However, the tolerance shall not exceed ±2 inches.

Location of opening, insert or embedded item at concrete surface: ±0.5 inch

Cross-sectional dimensions of opening: ±0.5 inch

Bridge deck, bridge approach slab, and bridge traffic barrier expansion joint gaps with a specified temperature range, measured at a stable temperature: ±0.25 inch

Horizontal deviation of centerline of bearing pad, oak block or other bearing assembly: ±0.125 inch

Horizontal deviation of centerline of supported element from centerline of bearing pad, oak block or other bearing assembly ±0.25 inch

Vertical deviation of top of bearing pad, oak block or other bearing assembly: ±0.125 inch

6-02.3(10)C Finishing Equipment

The first paragraph is revised to read:

The finishing machine shall be self-propelled and be capable of forward and reverse movement under positive control. The finishing machine shall be equipped with augers and a rotating cylindrical single or double drum screed. The finishing machine shall have the necessary adjustments to produce the required cross section, line, and grade. The finishing machine shall be capable of raising the screeds, augers, and any other parts of the finishing mechanical operation to clear the screeded surface, and returning to the specified grade under positive control. Unless otherwise allowed by the Engineer, a finishing machine manufacturer technical representative shall be on site to assist the first use of the machine on the Contract.

The first sentence of the second paragraph is revised to read:

For bridge deck widening of 20 feet or less, and for bridge approach slabs, or where jobsite conditions do not allow the use of the conventional configuration finishing machines, or modified conventional machines as described above; the Contractor may submit a Type 2 Working Drawing proposing the use of a hand-operated motorized power screed such as a "Texas" or "Bunyan" screed.

6-02.3(10)D4 Monitoring Bridge Deck Concrete Temperature After Placement

This section, including title, is revised to read:

6-02.3(10)D4 Vacant

6-02.3(10)D5 Bridge Deck Concrete Finishing and Texturing

In the third subparagraph of the first paragraph, the last sentence is revised to read:

The Contractor shall texture the bridge deck surface to within 3-inches minimum and 24-inches maximum of the edge of concrete at expansion joints, within 1-foot minimum and 2-feet maximum of the curb line, and within 3-inches minimum and 9-inches maximum of the perimeter of bridge drain assemblies.

6-02.3(10)F Bridge Approach Slab Orientation and Anchors

The second to last paragraph is revised to read:

The compression seal shall be a 2½ inch wide gland and shall conform to Section 9-04.1(4).

The last paragraph is deleted.

6-02.3(13)A Strip Seal Expansion Joint System

In item number 3 of the third paragraph, "Federal Standard 595" is revised to read "SAE AMS Standard 595".

6-02.3(13)B Compression Seal Expansion Joint System

The first paragraph is revised to read:

Compression seal glands shall conform to Section 9-04.1(4) and be sized as shown in the Plans.

6-02.3(14)C Pigmented Sealer for Concrete Surfaces

This section is supplemented with the following new paragraph:

Pigmented Sealer Materials shall be a product listed in the current WSDOT Qualified Products List (QPL). If the pigmented sealer material is not listed in the current WSDOT QPL, a sample shall be submitted to the State Materials Laboratory in Tumwater for evaluation and acceptance in accordance with Section 9-08.3.

6-02.3(20) Grout for Anchor Bolts and Bridge Bearings

The second, third and fourth paragraphs are revised to read:

Grout shall be a workable mix with a viscosity that is suitable for the intended application. Grout shall not be placed outside of the manufacturer recommended range of thickness. The Contractor shall receive concurrence from the Engineer before using the grout.

Field grout cubes and cylinders shall be fabricated and tested in accordance with Section 9-20.3 when requested by the Engineer, but not less than once per bridge pier or once per day.

Before placing grout, the substrate on which it is to be placed shall be prepared as recommended by the manufacturer to ensure proper bonding. The grout shall be cured as recommended by the manufacturer. The grout may be loaded when a minimum of 4,000 psi compressive strength is attained.

The fifth paragraph is deleted.

6-02.3(23) Opening to Traffic

This section is supplemented with the following new paragraph:

After curing bridge approach slabs in accordance with Section 6-02.3(11), the bridge approach slabs may be opened to traffic when a minimum compressive strength of 2,500 psi is achieved.

6-02.3(24)C Placing and Fastening

This section is revised to read:

The Contractor shall position reinforcing steel as the Plans require and shall ensure that the steel is set within specified tolerances. Adjustments to reinforcing details outside of specified tolerances to avoid interferences and for other purposes are acceptable when approved by the Engineer.

When spacing between bars is 1 foot or more, they shall be tied at all intersections. When spacing is less than 1 foot, every other intersection shall be tied. If the Plans require bundled bars, they shall be tied together with wires at least every 6 feet. All epoxy-coated bars in the top mat of the bridge deck shall be tied at all intersections, however they may be tied at alternate intersections when spacing is less than 1 foot in each direction and they are supported by continuous supports meeting all other requirements of supports for epoxy-coated bars. Other epoxy-coated bars shall also be tied at all intersections, but shall be tied at alternate intersections when spacing is less than 1 foot in each direction. Wire used for tying epoxy-coated reinforcing steel shall be plastic coated. **Tack welding is not permitted on reinforcing steel**.

Abrupt bends in the steel are permitted only when one steel member bends around another. Vertical stirrups shall pass around main reinforcement or be firmly attached to it.

For slip-formed concrete, the reinforcing steel bars shall be tied at all intersections and cross braced to keep the cage from moving during concrete placement. Cross bracing shall be with additional reinforcing steel. Cross bracing shall be placed both longitudinally and transversely.

After reinforcing steel bars are placed in a traffic or pedestrian barrier and prior to slip-form concrete placement, the Contractor shall check clearances and reinforcing steel bar placement. This check shall be accomplished by using a template or by operating the slip-form machine over the entire length of the traffic or pedestrian barrier. All clearance and reinforcing steel bar placement deficiencies shall be corrected by the Contractor before slip-form concrete placement.

Precast concrete supports (or other accepted devices) shall be used to maintain the concrete coverage required by the Plans. The precast concrete supports shall:

1. Have a bearing surface measuring not greater than 2 inches in either dimension, and

2. Have a compressive strength equal to or greater than that of the concrete in which they are embedded.

In slabs, each precast concrete support shall have either: (1) a grooved top that will hold the reinforcing bar in place, or (2) an embedded wire that protrudes and is tied to the reinforcing steel. If this wire is used around epoxy-coated bars, it shall be coated with plastic.

Precast concrete supports may be accepted based on a Manufacturer’s Certificate of Compliance.

In lieu of precast concrete supports, the Contractor may use metal or all-plastic supports to hold uncoated bars. Any surface of a metal support that will not be covered by at least ½ inch of concrete shall be one of the following:

1. Hot-dip galvanized after fabrication in keeping with AASHTO M232 Class D;

2. Coated with plastic firmly bonded to the metal. This plastic shall be at least 3⁄32 inch thick where it touches the form and shall not react chemically with the concrete when tested in the State Materials Laboratory. The plastic shall not shatter or crack at or above -5°F and shall not deform enough to expose the metal at or below 200°F; or

3. Stainless steel that meet the requirements of ASTM A493, Type 302. Stainless steel chair supports are not required to be galvanized or plastic coated.

In lieu of precast concrete supports, epoxy-coated reinforcing bars may be supported by one of the following:

1. Metal supports coated entirely with a dielectric material such as epoxy or plastic,

2. Other epoxy-coated reinforcing bars, or

3. All-plastic supports.

Damaged coatings on metal bar supports shall be repaired prior to placing concrete.

All-plastic supports shall be lightweight, non-porous, and chemically inert in concrete. All-plastic supports shall have rounded seatings, shall not deform under load during normal temperatures, and shall not shatter or crack under impact loading in cold weather. All-plastic supports shall be placed at spacings greater than 1 foot along the bar and shall have at least 25 percent of their gross place area perforated to compensate for the difference in the coefficient of thermal expansion between plastic and concrete. The shape and configuration of all-plastic supports shall permit complete concrete consolidation in and around the support.

A “mat” is two adjacent and perpendicular layers of reinforcing steel. In bridge decks, top and bottom mats shall be supported adequately enough to hold both in their proper positions. If bar supports directly support, or are directly supported on No. 4 bars, they shall be spaced at not more than 3-foot intervals (or not more than 4-foot intervals for bars No. 5 and larger). Wire ties to girder stirrups shall not be considered as supports. To provide a rigid mat, the Contractor shall add other supports and tie wires to the top mat as needed.

Unless noted otherwise, the minimum concrete cover for main reinforcing bars shall be:

3 inches to a concrete surface deposited against earth without intervening forms.

2½ inches to the top surface of a concrete bridge deck or bridge approach slab.

2 inches to a concrete surface when not specified otherwise in this section or in the Contract documents.

1½ inches to a concrete barrier or curb surface.

Except for top cover in bridge decks and bridge approach slabs, minimum concrete cover to ties and stirrups may be reduced by ½ inch but shall not be less than 1 inch. Minimum concrete cover shall also be provided to the outermost part of mechanical splices and headed steel reinforcing bars.

Reinforcing steel bar location, concrete cover and clearance shall not vary more than the following tolerances from what is specified in the Contract documents:

Reinforcing bar location for members 12 inches or less in thickness: ±0.25 inch

Reinforcing bar location for members greater than 12 inches in thickness: ±0.375 inch

Reinforcing bar location for bars placed at equal spacing within a plane: the greater of either ±1 inch or ±1 bar diameter within the plane. The total number of bars shall not be fewer than that specified.

The clearance between reinforcement shall not be less than the greater of the bar diameter or 1 inch for unbundled bars. For bundled bars, the clearance between bundles shall not be less than the greater of 1 inch or a bar diameter derived from the equivalent total area of all bars in the bundle.

Longitudinal location of bends and ends of bars: ±1 inch

Embedded length of bars and length of bar lap splices:

No. 3 through No. 11: -1 inch

No. 14 through No. 18: -2 inches

Concrete cover measured perpendicular to concrete surface (except for the top surface of bridge decks, bridge approach slabs and other roadway surfaces): ±0.25 inch

Concrete cover measured perpendicular to concrete surface for the top surface of bridge decks, bridge approach slabs and other roadway surfaces: +0.25 inch, -0 inch

Before placing any concrete, the Contractor shall:

1. Clean all mortar from reinforcement, and

2. Obtain the Engineer's permission to place concrete after the Engineer has inspected the placement of the reinforcing steel. (Any concrete placed without the Engineer's permission shall be rejected and removed.)

6-02.3(25)H Finishing

The last paragraph is revised to read:

The Contractor may repair defects in prestressed concrete girders in accordance with Section 6-01.16.

6-02.3(25)I Fabrication Tolerances

Item number 12 of the first paragraph is revised to read:

12. Stirrup Projection from Top of Girder:

    Wide flange thin deck and slab girders: ± ½ inch

    All other girders: ± ¾ inch

6-02.3(27) Concrete for Precast Units

The last sentence of the first paragraph is revised to read:

Type III portland cement or blended hydraulic cement is permitted to be used in precast concrete units.

6-02.3(28)B Casting

In the second paragraph, the reference to Section 6-02.3(25)B is revised to read Section 6-02.3(25)C.

6-02.3(28)D Contractors Control Strength

In the first paragraph, “WSDOT FOP for AASHTO T 23” is revised to read “FOP for AASHTO T 23”.

6-02.3(28)E Finishing

This section is supplemented with the following:

The Contractor may repair defects in precast panels in accordance with Section 6-01.16.

6-03.AP6

Section 6-03, Steel Structures
January 7, 2019

6-03.2 Materials

In the first paragraph, the material reference for Paints is revised to read:

Paints and Related Materials 9-08

6-03.3(25)A3 Ultrasonic Inspection

The first paragraph (up until the colon) is revised to read:

Complete penetration groove welds on plates 5/16 inch and thicker in the following welded assemblies or Structures shall be 100 percent ultrasonically inspected:

6-03.3(33) Bolted Connections

The first paragraph is supplemented with the following:

After final tightening of the fastener components, the threads of the bolts shall at a minimum be flush with the end of the nut.

The following is inserted after the third sentence of the fourth paragraph:

When galvanized bolts are specified, tension-control galvanized bolts are not permitted.

6-05.AP6

Section 6-05, Piling
January 2, 2018

6-05.3(9)A Pile Driving Equipment Approval

The fourth sentence of the second paragraph is revised to read:

For prestressed concrete piles, the allowable driving stress in kips per square inch shall be $0.095 \cdot \sqrt{f'_c}$ plus prestress in tension, and $0.85f'_c$ minus prestress in compression, where f'_c is the concrete compressive strength in kips per square inch.

6-07.AP6

Section 6-07, Painting
January 7, 2019

6-07.1 Description

The first sentence is revised to read:

This work consists of containment, surface preparation, shielding adjacent areas from work, testing and disposing of debris, furnishing and applying paint, and cleaning up after painting is completed.

6-07.2 Materials

The material reference for Paint is revised to read:

Paint and Related Materials	9-08

6-07.3(1)A Work Force Qualifications for Shop Application of Paint

This section is supplemented with the following new sentence:

The work force may be accepted based on the approved facility.

6-07.3(1)B Work Force Qualifications for Field Application of Paint

The first two paragraphs are revised to read:

The Contractor preparing the surface and applying the paint shall be certified under SSPC-QP 1 or NACE International Institute Contractor Accreditation Program (NIICAP) AS 1.

The Contractor removing and otherwise disturbing existing paint containing lead and other hazardous materials shall be certified under SSPC-QP 2, Category A or NIICAP AS 2.

The third paragraph (up until the colon) is revised to read:

In lieu of the above SSPC or NIICAP certifications, the Contractor performing the specified work shall complete both of the following actions:

Item number 2 of the third paragraph is revised to read:

2. The Contractor's quality control inspector(s) for the project shall be NACE-certified CIP Level 3 or SSPC Protective Coating Inspector (PCI) Level 3.

6-07.3(2) Submittals

The first paragraph is supplemented with the following:

Each component of the plan shall identify the specification section it represents.

6-07.3(2)B Contractor's Quality Control Program Submittal Component

The numbered list in the first paragraph is revised to read:

1. Description of the inspection procedures, tools, techniques and the acceptance criteria for all phases of work.

2. Procedure for implementation of corrective action for non-conformance work.

3. The paint system manufacturer's recommended methods of preventing defects.

4. The Contractor's frequency of quality control inspection for each phase of work.

5. Example of each completed form(s) of the daily quality control report used to document the inspection work and tests performed by the Contractor's quality control personnel.

6-07.3(2)C Paint System Manufacturer and Paint System Information Submittal Component

Item number 1 is revised to read:

1. Product data sheets and Safety Data Sheets (SDS) on the paint materials, paint preparation, and paint application, as specified by the paint manufacturer, including:

    a. All application instructions, including the mixing and thinning directions.

    b. Recommended spray nozzles and pressures.

    c. Minimum and maximum drying time between coats.

    d. Restrictions on temperature and humidity.

    e. Repair procedures for shop and field applied coatings.

    f. Maximum dry film thickness for each coat.

    g. Minimum wet film thickness for each coat to achieve the specified minimum dry film thickness.

6-07.3(2)D Hazardous Waste Containment, Collection, Testing, and Disposal Submittal Component

The first paragraph (up until the colon) is revised to read:

> The hazardous waste containment, collection, testing, and disposal shall meet all Federal and State requirements, and the submittal component of the painting plan shall include the following:

6-07.3(2)E Cleaning and Surface Preparation Submittal Component

Item 1(b) of the first paragraph is revised to read::

> b. Type, manufacturer, and brand of abrasive blast material and all associated additives, including Safety Data Sheets (SDS).

6-07.3(3)B Quality Control and Quality Assurance for Field Application of Paint

The last sentence of the first paragraph (excluding the numbered list) is revised to read:

> The Contractor's quality control operations shall include a minimum monitoring and documenting the following for each working day:

Item number 1 in the fourth paragraph is revised to read:

> 1. Environmental conditions for painting in accordance with ASTM E 337.

Item number 4 in the fourth paragraph is revised to read:

> 4. Pictorial of surface preparation guides in accordance with SSPC-VIS 1, 3, 4, and 5.

Item number 5 in the fourth paragraph is revised to read:

> 5. Surface profile by Keanne-Tator comparator in accordance with ASTM D 4417 and SSPC PA17.

6-07.3(4) Paint System Manufacturer's Technical Representative

This section is revised to read:

> The paint system manufacturer's representative shall be present at the jobsite for the pre-painting conference and for the first day of paint application, and shall be available to the Contractor and Contracting Agency for consultation for the full project duration.

6-07.3(5) Pre-Painting Conference

The second paragraph is revised to read:

> If the Contractor's key personnel change between any work operations, an additional conference shall be held if requested by the Engineer.

6-07.3(6)A Paint Containers

In item number 2 of the first paragraph, "Federal Standard 595" is revised to read "SAE AMS Standard 595".

6-07.3(6)B Paint Storage

Item number 2 of the second paragraph is revised to read:

2. The Contractor shall monitor and document daily the paint material storage facility with a high-low recording thermometer device.

6-07.3(7) Paint Sampling and Testing

The first two paragraphs are revised to read:

The Contractor shall provide the Engineer 1 quart of each paint representing each lot. Samples shall be accompanied with a Safety Data Sheet.

If the quantity of paint required for each component of the paint system for the entire project is 20 gallons or less, then the paint system components will be accepted as specified in Section 9-08.1(7).

6-07.3(8)A Paint Film Thickness Measurement Gages

The first paragraph is revised to read:

Paint dry film thickness measurements shall be performed with either a Type 1 pull-off gage or a Type 2 electronic gage as specified in SSPC Paint Application Specification No. 2, Procedure for Determining Conformance to Dry Coating Thickness Requirements.

6-07.3(9) Painting New Steel Structures

The last sentence of the second paragraph is revised to read:

Welded shear connectors are not required to painted.

The last paragraph is revised to read:

Temporary attachments or supports for scaffolding, containment or forms shall not damage the paint system.

6-07.3(9)A Paint System

The first paragraph is revised to read:

The paint system applied to new steel surfaces shall consist of the following:

Option 1 (component based paint system):

Primer Coat – Inorganic Zinc Rich	9-08.1(2)C
Intermediate Coat – Moisture Cured Polyurethane	9-08.1(2)G
Intermediate Stripe Coat – Moisture Cured Polyurethane	9-08.1(2)G
Top Coat – Moisture Cured Polyurethane	9-08.1(2)H

Option 2 (performance based paint system):

Primer Coat – Inorganic Zinc Rich	9-08.1(2)M
Intermediate Coat – Epoxy	9-08.1(2)M
Intermediate Stripe Coat – Epoxy	9-08.1(2)M

Top Coat – Polyurethane	9-08.1(2)M

The following new paragraph is inserted after the first paragraph:

Paints and related materials shall be products listed in the current WSDOT Qualified Products List (QPL). Component based paint systems shall be listed on the QPL in the applicable sections of Section 9-08. Performance based systems shall be listed on the current Northeast Protective Coatings Committee (NEPCOAT) Qualified Products List "A" as listed on the WSDOT QPL in Section 9-08.1(2)M. If the paint and related materials for the component based system is not listed in the current WSDOT QPL, a sample shall be submitted to the State Materials Laboratory in Tumwater for evaluation and acceptance in accordance with Section 9-08.

6-07.3(9)C Mixing and Thinning Paint

This section is revised to read:

The Contractor shall thoroughly mix paint in accordance with the manufacturer's written recommendations and by mechanical means to ensure a uniform and lump free composition. Paint shall not be mixed by means of air stream bubbling or boxing. Paint shall be mixed in the original containers and mixing shall continue until all pigment or metallic powder is in suspension. Care shall be taken to ensure that the solid material that has settled to the bottom of the container is thoroughly dispersed. After mixing, the Contractor shall inspect the paint for uniformity and to ensure that no unmixed pigment or lumps are present.

Catalysts, curing agents, hardeners, initiators, or dry metallic powders that are packaged separately may be added to the base paint in accordance with the paint manufacturer's written recommendations and only after the paint is thoroughly mixed to achieve a uniform mixture with all particles wetted. The Contractor shall then add the proper volume of curing agent to the correct volume of base and mix thoroughly. The mixture shall be used within the pot life specified by the manufacturer. Unused portions shall be discarded at the end of each work day. Accelerants are not permitted except as allowed by the Engineer.

The Contractor shall not add additional thinner at the application site except as allowed by the Engineer. The amount and type of thinner, if allowed, shall conform to the manufacturer's specifications. If recommended by the manufacturer and allowed by the Engineer, a measuring cup shall be used for the addition of thinner to any paint with graduations in ounces. No un-measured addition of thinner to paint will be allowed. Any paint found to be thinned by unacceptable methods will be rejected.

When recommended by the manufacturer, the Contractor shall constantly agitate paint during application by use of paint pots equipped with mechanical agitators.

The Contractor shall strain all paint after mixing to remove undesirable matter, but without removing the pigment or metallic powder.

Paint shall be stored and mixed in a secure, contained location to eliminate the potential for spills into State waters and onto the ground and highway surfaces.

6-07.3(9)D Coating Thickness

This section is revised to read:

Dry film thickness shall be measured in accordance with SSPC Paint Application Specification No. 2, *Procedure for Determining Conformance to Dry Coating Thickness Requirements*.

The minimum dry film thickness of the primer coat shall not be less than 2.5 mils.

The minimum dry film thickness of each coat (combination of intermediate and intermediate stripe, and top) shall be not less than 3.0 mils.

The dry film thickness of each coat shall not be thicker than the paint manufacturer's recommended maximum thickness.

The minimum wet film thickness of each coat shall be specified by the paint manufacturer to achieve the minimum dry film thickness.

Film thickness, wet and dry, will be measured by gages conforming to Section 6-07.3(8)A.

Wet measurements will be taken immediately after the paint is applied in accordance with ASTM D4414. Dry measurements will be taken after the coating is dry and hard in accordance with SSPC Paint Application Specification No. 2.

Each painter shall be equipped with wet film thickness gages and shall be responsible for performing frequent checks of the paint film thickness throughout application.

Coating thickness measurements may be made by the Engineer after the application of each coat and before the application of the succeeding coat. In addition, the Engineer may inspect for uniform and complete coverage and appearance. One hundred percent of all thickness measurements shall meet or exceed the minimum wet film thickness. In areas where wet film thickness measurements are impractical, dry film thickness measurements may be made. If a question arises about an individual coat's thickness or coverage, it may be verified by the use of a Tooke gage in accordance with ASTM D4138.

If the specified number of coats does not produce a combined dry film thickness of at least the sum of the thicknesses required per coat, if an individual coat does not meet the minimum thickness, or if visual inspection shows incomplete coverage, the coating system will be rejected and the Contractor shall discontinue painting and surface preparation operations and shall submit a Type 2 Working Drawing of the repair proposal. The repair proposal shall include documentation demonstrating the cause of the less-than-minimum thickness, along with physical test results, as necessary, and modifications to Work methods to prevent similar results. The Contractor shall not resume painting or surface preparation operations until receiving the Engineer's acceptance of the completed repair.

6-07.3(9)E Surface Temperature Requirements Prior to Application of Paint

This section, including title, is revised to read:

6-07.3(9)E Environmental Condition Requirements Prior to Application of Paint

Paint shall be applied only during periods when:

1. Air and steel temperatures are in accordance with the paint manufacturer's recommendations but in no case less than 35°F nor greater than 115°F.

2. Steel surface temperature is a minimum of 5°F above the dew point.

3. Steel surface is not wet.

4. Relative humidity is within the manufacturer's recommended range.

5. The anticipated ambient temperature will remain above 35°F or the manufacturer's minimum temperature, whichever is greater, during the paint drying and curing period.

Application will not be allowed if conditions are not favorable for proper application and performance of the paint.

Paint shall not be applied when weather conditions are unfavorable to proper curing. If a paint system manufacturer's recommendations allow for application of a paint under environmental conditions other than those specified, the Contractor shall submit a Type 2 Working Drawing consisting of a letter from the paint manufacturer specifying the environmental conditions under which the paint can be applied. Application of paint under environmental conditions other than those specified in this section will not be allowed without the Engineer's concurrence.

6-07.3(9)F Shop Surface Cleaning and Preparation

The last sentence is revised to read:

The entire steel surface to be painted, including surfaces specified in Section 6-07.3(9)G to receive a mist coat of primer, shall be cleaned to a near white condition in accordance with SSPC-SP 10, *Near-white Metal Blast Cleaning*, and shall be in this condition immediately prior to paint application.

6-07.3(9)G Application of Shop Primer Coat

The first paragraph is supplemented with the following:

Repairs of the shop primer coat shall be prepared in accordance with the painting plan. Shop primer coat repair paint shall be selected from the approved component based or performance based paint system in accordance with Section 6-07.3(10)H.

6-07.3(9)H Containment for Field Coating

This section is revised to read:

The Contractor shall use a containment system in accordance with Section 6-07.3(10)A for surface preparation and prime coating of all uncoated areas remaining, including bolts, nuts, washers, and splice plates.

During painting operations of the intermediate, stripe and top coats the Contractor shall furnish, install, and maintain drip tarps below the areas to be painted to contain all spilled paint, buckets, brushes, and other deleterious material, and prevent such materials from reaching the environment below or adjacent to the structure being painted. Drip tarps shall be absorbent material and hung to minimize puddling. The Contractor shall evaluate the

project-specific conditions to determine the specific type and extent of containment needed to control the paint emissions and shall submit a containment plan in accordance with Section 6-07.3(2).

6-07.3(9)I Application of Field Coatings

This section is revised to read:

An on-site supervisor shall be present for each work shift at the bridge site.

Upon completion of erection Work, all uncoated or damaged areas remaining, including bolts, nuts, washers, and splice plates, shall be prepared in accordance with Section 6-07.3(9)F, followed by a field primer coat of a zinc-rich primer and final coats of paint selected from the approved component or performance based paint system in accordance with Section 6-07.3(10)H. . The intermediate, intermediate stripe, and top coats shall be applied in accordance with the manufacturer's written recommendations.

Upon completion of erection Work, welds for steel column jackets may be prepared in accordance with SSPC-SP 15, Commercial Grade Power Tool Cleaning.

The minimum drying time between coats shall be as shown in the product data sheets, but not less than 12 hours. The Contractor shall determine whether the paint has cured sufficiently for proper application of succeeding coats.

The maximum time between intermediate and top coats shall be in accordance with the manufacturer's written recommendations. If the maximum time between coats is exceeded, all newly coated surfaces shall be prepared to SSPC-SP 7, *Brush-off Blast Cleaning*, and shall be repainted with the same paint that was cleaned, at no additional cost to the Contracting Agency.

Each coat shall be applied in a uniform layer, completely covering the preceding coat. The Contractor shall correct runs, sags, skips, or other deficiencies before application of succeeding coats. Such corrective work may require re-cleaning, application of additional paint, or other means as determined by the Engineer, at no additional cost to the Contracting Agency.

Dry film thickness measurements will be made in accordance with Section 6-07.3(9)D.

All paint damage that occurs shall be repaired in accordance with the manufacturer's written recommendations. On bare areas or areas of insufficient primer thickness, the repair shall include field-applied zinc-rich primer and the final coats of paint selected from the approved component or performance based paint system in accordance with Section 6-07.3(10)H. On areas where the primer is at least equal to the minimum required dry film thickness, the repair shall include the application of the final two coats of the paint system. All paint repair operations shall be performed by the Contractor at no additional cost or time to the Contracting Agency.

6-07.3(10)A Containment

The first sentence of the third paragraph is revised to read:

Emissions shall be assessed by Visible Emission Observations (Method A) in SSPC Technology Update No. 7, *Conducting Ambient Air, Soil, and Water Sampling of Surface*

Preparation and Paint Disturbance Activities, Section 6.2 and shall be limited to the Level A Acceptance Criteria Option Level 0 Emissions standard.

6-07.3(10)D Surface Preparation Prior to Overcoat Painting

The first paragraph is revised to read:

The Contractor shall remove any visible oil, grease, and road tar in accordance with SSPC-SP 1, *Solvent Cleaning*.

The second paragraph is revised to read:

Following any preparation by SSPC-SP1, all steel surfaces to be painted shall be prepared in accordance with SSPC-SP 7, *Brush-off Blast Cleaning*. Surfaces inaccessible to brush-off blast shall be prepared in accordance with SSPC-SP 3, *Power Tool Cleaning*, as allowed by the Engineer.

The first sentence of the third paragraph is revised to read:

Following brush-off blast cleaning, the Contractor shall perform spot abrasive blast cleaning in accordance with SSPC-SP 6, *Commercial Blast Cleaning*.

The second to last sentence of the third paragraph is revised to read:

For small areas, as allowed by the Engineer, the Contractor may substitute cleaning in accordance with SSPC-SP 15, *Commercial Grade Power Tool Cleaning*.

6-07.3(10)G Treatment of Pack and Rust Gaps

The second paragraph is revised to read:

Pack rust forming a gap between steel surfaces of 1/16 to ¼ inch shall be cleaned to a depth of at least one half of the gap width. The gaps shall be cleaned and prepared in accordance with SSPC-SP6. The cleaned gap shall be treated with rust penetrating sealer, prime coated, and then caulked to form a watertight seal along the top edge and the two sides of the steel pieces involved, using the rust penetrating sealer and caulk as accepted by the Engineer. The bottom edge or lowest edge of the steel pieces involved shall not be caulked.

The third paragraph is supplemented with the following:

Caulk shall be a single-component urethane sealant conforming to Section 9-08.7.

The fifth paragraph is revised to read:

At locations where gaps between steel surfaces exceed ¼ inch, the Contractor shall clean and prepare the gap in accordance SSPC-SP6, apply the rust penetrating sealer, apply the prime coat, and then fill the gap with foam backer rod material as accepted by the Engineer. The foam backer rod material shall be of sufficient diameter to fill the crevice or gap. The Contractor shall apply caulk over the foam backer rod material to form a watertight seal.

This section is supplemented with the following new paragraph:

Caulk and backer rod, if needed, shall be placed prior to applying the top coat. The Contractor, with the concurrence of the Engineer, may apply the rust penetrating sealer after application of the prime coat provided the primer is removed in the areas to be sealed. The areas to be sealed shall be re-cleaned and re-prepared in accordance with SSPC-SP6.

6-07.3(10)H Paint System

The first paragraph is revised to read:

The paint system applied to existing steel surfaces shall consist of the following five-coat system:

Option 1 (component based system):

Primer Coat – Zinc-filled Moisture Cured Polyurethane	9-08.1(2)F
Primer Stripe Coat - Moisture Cured Polyurethane	9-08.1(2)F
Intermediate Coat - Moisture Cured Polyurethane	9-08.1(2)G
Intermediate Stripe Coat - Moisture Cured Polyurethane	9-08.1(2)G
Top Coat - Moisture Cured Polyurethane	9-08.1(2)H

Option 2 (performance based system):

Primer Coat – Zinc-rich Epoxy	9-08.1(2)N
Primer Stripe Coat – Epoxy	9-08.1(2)N
Intermediate Coat – Epoxy	9-08.1(2)N
Intermediate Stripe Coat – Epoxy	9-08.1(2)N
Top Coat – Polyurethane	9-08.1(2)N

The following new paragraph is inserted after the first paragraph:

Paints and related materials shall be a product listed in the current WSDOT Qualified Products List (QPL). Component based paint systems shall be listed on the QPL in the applicable sections of Section 9-08. Performance based systems shall be listed on the current Northeast Protective Coatings Committee (NEPCOAT) Qualified Products List "B" as listed on the WSDOT QPL in Section 9-08.1(2)N. If the paint and related material for the component based system is not listed in the current WSDOT QPL, a sample shall be submitted to the State Materials Laboratory in Tumwater for evaluation and acceptance in accordance with Section 9-08.

6-07.3(10)J Mixing and Thinning Paint

This section is revised to read:

Mixing and thinning paint shall be in accordance with Section 6-07.3(9)C.

6-07.3(10)K Coating Thickness

This section is revised to read:

Coating thickness shall be in accordance with Section 6-07.3(9)D except the minimum dry film thickness of each coat (combination of primer and primer stripe, combination of intermediate and intermediate stripe, and top) shall not be less than 3.0 mils.

6-07.3(10)L Environmental Condition Requirements Prior to Application of Paint

This section is revised to read:

Environmental conditions shall be in accordance with Section 6-07.3(9)E.

6-07.3(10)M Steel Surface Condition Requirements Prior to Application of Paint

The third paragraph is revised to read:

Edges of existing paint shall be feathered in accordance with SSPC-PA 1, *Shop, Field, and Maintenance Coating of Metals*, Note 15.20.

6-07.3(10)N Field Coating Application Methods

The third sentence is revised to read:

The Contractor may apply stripe coat paint using spray or brush but shall follow spray application using a brush to ensure complete coverage around structural geometric irregularities and to push the paint into gaps between existing steel surfaces and around rivets and bolts.

6-07.3(10)O Applying Field Coatings

The second to last paragraph is revised to read:

Each application of primer, primer stripe, intermediate, intermediate stripe, and top coat shall be considered as separately applied coats. The Contractor shall not use a preceding or subsequent coat to remedy a deficiency in another coat. The Contractor shall apply the top coat to at least the minimum specified top coat thickness, to provide a uniform appearance and consistent finish coverage.

6-07.3(10)P Field Coating Repair

The second sentence is revised to read:

Repair areas shall be cleaned of all damaged paint and the system reapplied using all coats typical to the paint system and shall meet the minimum coating thickness.

6-07.3(11)A Painting of Galvanized Surfaces

This section is revised to read:

All galvanized surfaces receiving paint shall be prepared for painting in accordance with the ASTM D 6386. The method of preparation shall be brush-off in accordance with SSPC-SP16 *Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals* or as otherwise allowed by the Engineer. The Contractor shall not begin painting until receiving the Engineer's acceptance of the prepared galvanized surface. For galvanized bolts used for replacement of deteriorated existing rivets, the Contractor, with the concurrence of the Engineer and after successful demonstration testing, may prepare galvanized surfaces in accordance with SSPC-SP1 followed by SSPC-SP2, *Hand Tool Cleaning* or SSPC-SP3, *Power Tool Cleaning*. The

demonstration testing shall include adhesion testing of the first coat of paint over galvanized bolts, nuts, and washers or a representative galvanized surface. Adhesion testing shall be performed in accordance with ASTM D 4541 for 600 psi minimum adhesion. A minimum of 3 successful tests shall be performed on the galvanized surface prepared and painted using the same methods and materials to be used on the galvanized bolts, nuts and washers in the field.

6-07.3(11)A2 Paint Coat Materials

This section is revised to read:

The Contractor shall paint the dry surface as follows:

1. The first coat over a galvanized surface shall be an epoxy polyamide conforming to Section 9-08.1(2)E . In the case of galvanized bolts used for replacement of deteriorated existing rivets and for small surface areas less than or equal to one square foot, an intermediate moisture cured polyurethane conforming to Section 9-08.1(2)G may be used as a first coat. In both cases the first coat shall be compatible with galvanizing and as recommended by the top coat manufacturer.

2. The second coat shall be a top coat moisture cured aliphatic polyurethane conforming to Section 9-08.1(2)H or a top coat polyurethane conforming to Section 6-07.3(10)H Option 2 NEPCOAT performance based paint specification compatible with the first coat as recommended by the manufacturer.

Each coat shall be dry before the next coat is applied. All coats applied in the shop shall be dried hard before shipment.

6-07.3(11)B Powder Coating of Galvanized Surfaces

This section is revised to read:

Powder coating of galvanized surfaces shall consist of the following coats:

1. The first coat shall be an epoxy powder primer coat conforming to Section 9-08.2.

2. The second coat shall be a polyester finish coat conforming to Section 9-08.2.

6-07.3(11)B3 Galvanized Surface Cleaning and Preparation

The first three paragraphs are revised to read:

Galvanized surfaces receiving the powder coating shall be cleaned and prepared for coating in accordance with ASTM D 7803, and the project-specific powder coating plan.

Assemblies conforming to the ASTM D 7803 definition for newly galvanized steel shall receive surface smoothing and surface cleaning in accordance with ASTM D 7803, Section 5, and surface preparation in accordance with ASTM D 7803, Section 5.1.3.

Assemblies conforming to the ASTM D 7803 definition for partially weathered galvanized steel shall be checked and prepared in accordance with ASTM D 7803, Section 6, before then receiving surface smoothing and surface cleaning in accordance with ASTM D 7803, Section 5, and surface preparation in accordance with ASTM D 7803, Section 5.1.3.

The fourth paragraph (up until the colon) is revised to read:

Assemblies conforming to the ASTM D 7803 definition for weathered galvanized steel shall be prepared in accordance with ASTM D 7803, Section 7 before then receiving surface smoothing and surface cleaning in accordance with ASTM D 7803, Section 5, and surface preparation in accordance with ASTM D 7803, Section 5.3 except as follows:

6-07.3(11)B5 Testing

Item number 4 in the first paragraph is revised to read:

4. Adhesion testing in accordance with ASTM D 4541 for 600 psi minimum adhesion for the complete two-component system.

The second sentence of the fourth paragraph is revised to read:

Rejected assemblies shall be repaired or recoated by the Contractor, at no additional expense to the Contracting Agency, in accordance with the powder coating manufacturer's recommendation as detailed in the project-specific powder coating plan, until the assemblies satisfy the acceptance testing requirements.

6-07.3(12) Painting Ferry Terminal Structures

This section is revised to read:

Painting of ferry terminal Structures shall be in accordance with Section 6-07.3 as supplemented below.

This section is supplemented with the following new subsections:

6-07.3(12)A Painting New Steel Ferry Terminal Structures

Painting of new steel Structures shall be in accordance with Section 6-07.3(9) except that all coatings (primer, intermediate, intermediate stripe, and top) shall be applied in the shop with the following exceptions:

1. Steel surfaces to be field welded.

2. Steel surfaces to be greased.

3. The length of piles designated in the Plans not requiring painting.

The minimum drying time between coats shall be as shown in the product data sheets, but not less than 12 hours. The Contractor shall determine whether the paint has cured sufficiently for proper application of succeeding coats.

6-07.3(12)A1 Paint Systems

Paint systems for Structural Steel, which includes vehicle transfer spans and towers, pedestrian overhead loading structures and towers, upland structural steel and other elements as designated in the Special Provisions shall be as specified in Section 6-07.3(9)A.

Paint systems for Piling, Landing Aids and Life Ladders shall be as specified in the Special Provisions.

6-07.3(12)A2 Paint Color

Paint colors shall be as specified in the Special Provisions.

6-07.3(12)A3 Coating Thickness

Coating thicknesses shall be as specified in the Special Provisions.

6-07.3(12)A4 Application of Field Coatings

An on-site supervisor shall be present for each work shift at the project site.

Upon completion of erection Work, all uncoated or damaged areas remaining, including bolts, nuts, washers, splice plates, and field welds shall be prepared in accordance with SSPC-SP 1, Solvent Cleaning, followed by SSPC-SP 11, *Power Tool Cleaning to Bare Metal*. Surface preparation shall be measured according to SSPC-VIS 3. SSPC-SP 11 shall be performed for a minimum distance of 1 inch from the uncoated or damaged area. In addition, intact shop-applied coating surrounding the area shall be abraded or sanded for a distance of 6 inches out from the properly prepared clean/bare metal areas to provide adequate roughness for application of field coatings. All sanding dust and contamination shall be removed prior to application of field coatings.

Field applied paint for Structural Steel shall conform to Section 6-07.3(10)H, as applicable. Field applied paint for Piling, Landing Aids and Life Ladders shall be as specified in the Special Provisions.

For areas above the tidal zone, the minimum drying time between coats shall be as shown in the product data sheets, but not less than 12 hours. For areas within the tidal zone, the minimum drying time between coats shall be as recommended by the paint system manufacturer. The Contractor shall determine whether the paint has cured sufficiently for proper application of succeeding coats.

The maximum time between intermediate and top coats shall be in accordance with the manufacturer's written recommendations. If the maximum time between coats is exceeded, all newly coated surfaces shall be prepared to SSPC-SP 3, *Power Tool Cleaning*, and shall be repainted with the same paint that was cleaned, at no additional cost to the Contracting Agency.

Each coat shall be applied in a uniform layer, completely covering the preceding coat. The Contractor shall correct runs, sags, skips, or other deficiencies before application of succeeding coats. Such corrective work may require re-cleaning, application of additional paint, or other means as determined by the Engineer, at no additional cost to the Contracting Agency.

Surface preparation for underwater locations shall consist of removing all dirt, oil, grease, loose paint, loose rust, and marine growth from the area that is to be repaired. The sound paint surrounding the damaged area shall be roughened to meet the requirements of the manufacturer. Paint for underwater applications shall be as specified in the Special Provisions and shall be applied in accordance with the manufacturer's recommendations.

6-07.3(12)B Painting Existing Steel Ferry Terminal Structures

Painting of existing steel structures shall be in accordance with Section 6-07.3(10) as supplemented by the following.

6-07.3(12)B1 Containment

Containment for full removal shall be in accordance with Section 6-07.3(10)A. Containment for overcoat systems shall be in accordance with all applicable Permits as required in the Special Provisions.

Prior to cleaning the Contractor shall enclose all exposed electrical and mechanical equipment to seal out dust, water, and paint. Non-metallic surfaces shall not be abrasive blasted or painted. Unless otherwise specified, the following metallic surfaces shall not be painted and shall be protected from abrasive blasting and painting:

1. Galvanized and stainless steel surfaces not previously painted,
2. Non-skid surfaces,
3. Unpainted intentionally greased surfaces,
4. Equipment labels, identification plates, tags, etc.,
5. Fire and emergency containers or boxes,
6. Mechanical hardware such as hoist sheaves, hydraulic cylinders, gear boxes, wire rope, etc.

The Contractor shall submit a Type 2 Working Drawing consisting of materials and equipment used to shield components specified to not be cleaned and painted. The Contractor shall shut off the power prior to working around electrical equipment. The Contractor shall follow the lock-out/tag-out safety provisions of the WAC 296-803 and all other applicable safety standards.

6-07.3(12)B2 Surface Preparation

For applications above high water and within the tidal zone, surface preparation for overcoat painting shall be in accordance with SSPC-SP 1, *Solvent Cleaning*, followed by SSPC-SP 3, *Power Tool Cleaning*. Use of wire brushes is not allowed. After SP 3 cleaning has been completed all surfaces exhibiting coating failure down to the steel substrate, and those exhibiting visible corrosion, shall be prepared down to clean bare steel in accordance with SSPC-SP 15, Commercial Grade *Power Tool Cleaning*. Surface preparation shall be measured according to SSPC-VIS 3. SSPC-SP 15 shall be performed for a minimum distance of 1 inch from the area exhibiting failure or visible corrosion. In addition, intact shop-applied coating surrounding the repair area shall be abraded or sanded for a distance of 6 inches out from the properly prepared clean/bare metal areas to provide adequate roughness for application of repair coatings. All sanding dust and contamination shall be removed prior to application of repair coatings. Surface preparation for full paint removal shall be in accordance with Section 6-07.3(10)E except SSPC-SP 11 will be permitted as detailed in the Contractor's painting plan and as allowed by the Engineer.

Surface preparation for underwater locations shall consist of removing all dirt, oil, grease, loose paint, loose rust, and marine growth from the area that is to be repaired. The sound paint surrounding the damaged area shall be roughened as required by the coating manufacturer.

Removed marine growth may be released to state waters provided the marine growth is not mixed with contaminants (paint, oil, rust, etc.) and it shall not accumulate on the sea bed. All marine growth containing contaminants shall be collected for proper disposal.

Surface preparation for the underside of bridge decks (consisting of either a steel grid system of main bars or tees and a light gauge metal form, in-filled with concrete or a corrugated light gauge metal form, infilled with concrete) shall be in accordance with SSPC-SP 2, *Hand Tool Cleaning* or SSPC-SP 3, *Power Tool Cleaning* with the intent of not causing further damage to the light gauge metal form. Following removal of any pack rust and corroded sections from the underside of the bridge deck, cleaning and flushing to remove salts and prior to applying the primer coat, the Contractor shall seal the entire underside of the deck system with rust-penetrating sealer. Damage to galvanized metal forms and/or grids shall be repaired in accordance with ASTM A 780, with the preferred method of repair using paints containing zinc dust.

6-07.3(12)B3 Paint Systems

Paints systems for Structural Steel, which includes vehicle transfer spans and towers, pedestrian overhead loading structures and towers, upland structural steel and other elements as designated in the Special Provisions shall be as specified in Section 6-07.3(10)H.

Paint systems for Piling, Landing Aids, Life Ladders, underside of vehicle transfer span bridge decks, non-skid surface treated areas, and anti-graffiti coatings shall be as specified in the Special Provisions.

6-07.3(12)B4 Paint Color

Paint colors shall be as specified in the Special Provisions.

6-07.3(12)B5 Coating Thickness

Coating thicknesses shall be as specified in the Special Provisions.

6-07.3(12)B6 Application of Field Coatings

Application of field coatings shall be in accordance with Section 6-07.3(10)O and Section 6-07.3(12)A2 except for the following:

1. All coatings applied in the field shall be applied using a brush or roller. Spray application methods may be used if allowed by the Engineer.

2. Applied coatings shall not be immersed until the coating has been cured as required by the coating manufacturer.

3. Non-skid surface treatment products shall be applied in accordance with the manufacturer’s recommendations.

4. Anti-graffiti coatings shall be applied in one coat following application of the top coat, where specified in the Plans.

6-07.3(14)B Reference Standards

The second standard reference (to SSPC CS 23.00), and its accompanying title, is revised to read:

SSPC CS 23.00	Specification for the Application of Thermal Spray Coatings (Metallizing) of Aluminum, Zinc, and Their Alloys and Composites for the Corrosion Protection of Steel

6-08.AP6

Section 6-08, Bituminous Surfacing on Structure Decks
January 7, 2019

6-08.3(7)A Concrete Deck Preparation

The first sentence of the first paragraph is revised to read:

The Contractor, with the Engineer, shall inspect the exposed concrete deck to establish the extent of bridge deck repair in accordance with Section 6-09.3(6).

6-08.3(8)A Structure Deck Preparation

The second sentence of the last paragraph is revised to read:

Prior to applying the primer or sheet membrane, all dust and loose material shall be removed from the Structure Deck.

6-09.AP6

Section 6-09, Modified Concrete Overlays
January 7, 2019

6-09.3 Construction Requirements

This section is supplemented with the following new subsection:

6-09.3(15) Sealing and Texturing Concrete Overlay

After the requirements for checking for bond have been met, all joints and visible cracks shall be filled and sealed with a high molecular weight methacrylate resin (HMWM). Cracks 1⁄16 inch and greater in width shall receive two applications of HMWM. Immediately following the application of HMWM, the wetted surface shall be coated with sand for abrasive finish.

After all cracks have been filled and sealed and the HMWM resin has cured, the concrete overlay surface shall receive a longitudinally sawn texture in accordance with Section 6-02.3(10)D5.

Traffic shall not be permitted on the finished concrete until it has reached a minimum compressive strength of 3,000 psi as verified by rebound number determined in accordance with ASTM C805 and the longitudinally sawn texture is completed.

6-09.3(1)B Rotary Milling Machines

This section is revised to read:

Rotary milling machines used to remove an upper layer of existing concrete overlay, when present, shall have a maximum operating weight of 50,000 pounds and conform to Section 6-08.3(5)B.

6-09.3(1)C Hydro-Demolition Machines

The first sentence of this section is revised to read:

Hydro-demolition machines shall consist of filtering and pumping units operating in conjunction with a remote-controlled robotic device, using high-velocity water jets to remove sound concrete to the nominal scarification depth shown in the Plans with a single pass of the machine, and with the simultaneous removal of deteriorated concrete.

6-09.3(1)D Shot Blasting Machines

This section, including title, is revised to read:

6-09.3(1)D Vacant

6-09.3(1)E Air Compressor

This section is revised to read:

Air compressors shall be equipped with oil traps to eliminate oil from being blown onto the bridge deck.

6-09.3(1)J Finishing Machine

This section is revised to read:

The finishing machine shall meet the requirements of Section 6-02.3(10) and the following requirements:

The finishing machine shall be equipped with augers, followed by an oscillating, vibrating screed, vibrating roller tamper, or a vibrating pan, followed by a rotating cylindrical double drum screed. The vibrating screed, roller tamper or pan shall be of sufficient length and width to properly consolidate the mixture. The vibrating frequency of the vibrating screed, roller tamper or pan shall be variable with positive control.

6-09.3(2) Submittals

Item number 1 and 2 are revised to read:

1. A Type 1 Working Drawing consisting of catalog cuts and operating parameters of the hydro-demolition machine selected by the Contractor for use in this project to scarify concrete surfaces.

2. A Type 1 Working Drawing consisting of catalog cuts, operating parameters, axle loads, and axle spacing of the rotary milling machine (if used to remove an upper layer of existing concrete overlay when present).

The first sentence of item number 3 is revised to read:

A Type 2 Working Drawing of the Runoff Water Disposal Plan.

6-09.3(5)A General

The first sentence of the fourth paragraph is revised to read:

All areas of the deck that are inaccessible to the selected scarifying machine shall be scarified to remove the concrete surface matrix to a maximum nominal scarification depth shown in the Plans by a method acceptable to the Engineer.

This section is supplemented with the following:

Concrete process water generated by scarifying concrete surface and removing existing concrete overlay operations shall be contained, collected, and disposed of in accordance with Section 5-01.3(11) and Section 6-09.3(5)C, and the Section 6-09.3(2) Runoff Water Disposal Plan.

6-09.3(5)B Testing of Hydro-Demolition and Shot Blasting Machines

This section's title is revised to read:

Testing of Hydro-Demolition Machines

The second paragraph is revised to read:

In the "sound" area of concrete, the equipment shall be programmed to remove concrete to the nominal scarification depth shown in the Plans with a single pass of the machine.

6-09.3(5)D Shot Blasting

This section, including title, is revised to read:

6-09.3(5)D Vacant

6-09.3(5)E Rotomilling

This section, including title, is revised to read:

6-09.3(5)E Removing Existing Concrete Overlay Layer by Rotomilling

When the Contractor elects to remove the upper layer of existing concrete overlay, when present, by rotomilling prior to final scarifying, the entire concrete surface of the bridge deck shall be milled to remove the surface matrix to the depth specified in the Plans with a tolerance as specified in Section 6-08.3(5)B. The operating parameters of the rotary milling machine shall be monitored in order to prevent the unnecessary removal of concrete below the specified removal depth.

6-09.3(6) Further Deck Preparation

The first paragraph is revised to read::

Once the lane or strip being overlaid has been cleaned of debris from scarifying, the Contractor, with the Engineer, shall perform a visual inspection of the scarified surface. The Contractor shall mark those areas of the existing bridge deck that are authorized by the Engineer for further deck preparation by the Contractor.

Item number 4 of the second paragraph is deleted.

The first sentence of the third paragraph is deleted.

6-09.3(6)A Equipment for Further Deck Preparation

This section is revised to read:

> Further deck preparation shall be performed using either power driven hand tools conforming to Section 6-09.3(1)A, or hydro-demolition machines conforming to Section 6-09.3(1)C.

6-09.3(6)B Deck Repair Preparation

The second paragraph is deleted.

The last sentence of the second paragraph (after the preceding Amendment is applied) is revised to read:

> In no case shall the depth of a sawn vertical cut exceed ¾ inch or to the top of the top steel reinforcing bars, whichever is less.

The first sentence of the third to last paragraph is revised to read:

> Where existing steel reinforcing bars inside deck repair areas show deterioration greater than 20-percent section loss, the Contractor shall furnish and place steel reinforcing bars alongside the deteriorated bars in accordance with the details shown in the Standard Plans.

The last paragraph is deleted.

6-09.3(7) Surface Preparation for Concrete Overlay

The first seven paragraphs are deleted and replaced with the following:

> Following the completion of any required further deck preparation the entire lane or strip being overlaid shall be cleaned to be free from oil and grease, rust and other foreign material that may still be present. These materials shall be removed by detergent-cleaning or other method accepted by the Engineer followed by sandblasting.
>
> After detergent cleaning and sandblasting is completed, the entire lane or strip being overlaid shall be cleaned in final preparation for placing concrete.
>
> Hand tool chipping, sandblasting and cleaning in areas adjacent to a lane or strip being cleaned in final preparation for placing concrete shall be discontinued when final preparation is begun. Scarifying and hand tool chipping shall remain suspended until the concrete has been placed and the requirement for curing time has been satisfied. Sandblasting and cleaning shall remain suspended for the first 24 hours of curing time after the completion of concrete placing.
>
> Scarification, and removal of the upper layer of concrete overlay when present, may proceed during the final cleaning and overlay placement phases of the Work on adjacent portions of the Structure so long as the scarification and concrete overlay removal

operations are confined to areas which are a minimum of 100 feet away from the defined limits of the final cleaning or overlay placement in progress. If the scarification and concrete overlay removal impedes or interferes in any way with the final cleaning or overlay placement as determined by the Engineer, the scarification and concrete overlay removal Work shall be terminated immediately and the scarification and concrete overlay removal equipment removed sufficiently away from the area being prepared or overlaid to eliminate the conflict. If the grade is such that water and contaminants from the scarification and concrete overlay removal operation will flow into the area being prepared or overlaid, the scarification and concrete overlay removal operation shall be terminated and shall remain suspended for the first 24 hours of curing time after the completion of concrete placement.

6-09.3(11) Placing Concrete Overlay

The first sentence of item number 3 in the fourth paragraph is revised to read:

Concrete shall not be placed when the temperature of the concrete surface is less than 45°F or greater than 75°F, and wind velocity at the construction site is in excess of 10 mph.

6-09.3(12) Finishing Concrete Overlay

The third paragraph is deleted.

The last paragraph is deleted.

6-09.3(13) Curing Concrete Overlay

The first sentence of the first paragraph is revised to read:

As the finishing operation progresses, the concrete shall be immediately covered with a single layer of clean, new or used, wet burlap.

The last sentence of the second paragraph is deleted.

The following two new paragraphs are inserted after the second paragraph:

As an alternative to the application of burlap and fog spraying described above, the Contractor may propose a curing system using proprietary curing blankets specifically manufactured for bridge deck curing. The Contractor shall submit a Type 2 Working Drawing consisting of details of the proprietary curing blanket system, including product literature and details of how the system is to be installed and maintained.

The wet curing regimen as described shall remain in place for a minimum of 42-hours.

The last paragraph is deleted.

6-09.3(14) Checking for Bond

The first sentence of the first paragraph is revised to read:

After the requirements for curing have been met, the entire overlaid surface shall be sounded by the Contractor, in a manner accepted by and in the presence of the Engineer, to ensure total bond of the concrete to the bridge deck.

The last sentence of the first paragraph is deleted.

The second paragraph is deleted.

6-10.AP6

Section 6-10, Concrete Barrier
August 6, 2018

6-10.2 Materials

In the first paragraph, the reference to "Portland Cement" is revised to read:

Cement 9-01

6-10.3(6) Placing Concrete Barrier

The first two sentences of the first paragraph are revised to read:

Precast concrete barriers Type 2, Type 4, Type F, precast single slope barrier, and transitions shall rest on a paved foundation shaped to a uniform grade and section. The foundation surface for precast concrete barriers Type 2, Type 4, Type F, precast single slope barrier, and transitions shall meet this test for uniformity: When a 10-foot straightedge is placed on the surface parallel to the centerline for the barrier, the surface shall not vary more than ¼ inch from the lower edge of the straightedge.

6-11.AP6

Section 6-11, Reinforced Concrete Walls
April 2, 2018

6-11.2 Materials

In the first paragraph, the reference to "Aggregates for Portland Cement Concrete" is revised to read:

Aggregates for Concrete 9-03.1

6-12.AP6

Section 6-12, Noise Barrier Walls
August 6, 2018

6-12.2 Materials

In the first paragraph, the reference to "Aggregates for Portland Cement Concrete" is revised to read:

Aggregates for Concrete 9-03.1

The first paragraph is supplemented with the following new material reference:

Noise Barrier Wall Access Door 9-06.17

6-12.3(9) Access Doors and Concrete Landing Pads

The second paragraph is deleted and replaced with the following:

All frame and door surfaces, except stainless steel surfaces, shall be painted in accordance with Section 6-07.3(9). Primer shall be applied to all non-stainless steel surfaces. All primer coated exposed metal surfaces shall be field painted with the remaining Section 6-07.3(9)A paint system coats. The top coat, when dry, shall match the color specified in the Plans or Special Provisions.

This section is supplemented with the following:

Access door deadbolt locks shall be capable of accepting a Best CX series core. The Contractor shall furnish and install a spring-loaded construction core lock with each lock. The Engineer will furnish the permanent Best CX series core for the Contractor to install at the conclusion of the project.

6-13.AP6

Section 6-13, Structural Earth Walls
August 6, 2018

6-13.2 Materials

In the first paragraph, the reference to "Aggregates for Portland Cement Concrete" is revised to read:

Aggregates for Concrete	9-03.1

6-13.3(4) Precast Concrete Facing Panel and Concrete Block Fabrication

Item number 1 of the sixth paragraph is revised to read:

1. Vertical dimensions shall be ± 1/16 inch of the Plan dimension, and the rear height shall not exceed the front height.

Item number 3 of the sixth paragraph is revised to read:

3. All other dimensions shall be ± ¼ inch of the Plan dimension.

6-14.AP6

Section 6-14, Geosynthetic Retaining Walls
April 2, 2018

6-14.2 Materials

In the first paragraph, the references to "Portland Cement" and "Aggregates for Portland Cement Concrete" are revised to read:

Cement	9-01
Aggregates for Concrete	9-03.1

6-15.AP6

Section 6-15, Soil Nail Walls
January 7, 2019

6-15.3(7) Shotcrete Facing

The last paragraph is supplemented with the following:

After final tightening of the nut, the threads of the soil nail shall at a minimum be flush with the end of the nut.

6-16.AP6

Section 6-16, Soldier Pile and Soldier Pile Tieback Walls
April 2, 2018

6-16.2 Materials

In the first paragraph, the reference to "Aggregates for Portland Cement Concrete" is revised to read:

Aggregates for Concrete	9-03.1

6-18.AP6

Section 6-18, Shotcrete Facing
April 1, 2019

6-18.2 Materials

The reference to metakaolin is deleted.

6-18.3(3) Testing

In the last sentence of the first paragraph, "AASHTO T 24" is revised to read "ASTM C1604".

6-18.3(3)B Production Testing

In the last sentence, "AASHTO T 24" is revised to read "ASTM C1604".

6-18.3(4) Qualifications of Contractor's Personnel

In the last sentence of the second paragraph, "AASHTO T 24" is revised to read "ASTM C1604".

6-19.AP6

Section 6-19, Shafts
January 7, 2019

6-19.2 Materials

In the first paragraph, the references to "Portland Cement" and "Aggregates for Portland Cement Concrete" are revised to read:

Cement	9-01
Aggregates for Concrete	9-03.1

6-19.3(1)A Shaft Construction Tolerances

The last paragraph is supplemented with the following:

The elevation of the top of the reinforcing cage for drilled shafts shall be within +6 inches and -3 inches from the elevation shown in the Plans.

6-19.3(2)D Nondestructive QA Testing Organization and Personnel

Item number 4 in the first paragraph is revised to read:

4. Personnel preparing test reports shall be a Professional Engineer, licensed under Title 18 RCW, State of Washington, and shall seal the report in accordance with WAC 196-23-020.

6-19.3(3)C Conduct of Shaft Casing Installation and Removal and Shaft Excavation Operations

The first paragraph is supplemented with the following:

In no case shall shaft excavation and casing placement extend below the bottom of shaft excavation as shown in the Plans.

6-19.3(6)E Thermal Wire and Thermal Access Point (TAPS)

The third sentence of the third paragraph is revised to read:

The thermal wire shall extend from the bottom of the reinforcement cage to the top of the shaft, with a minimum of 5-feet of slack wire provided above the top of shaft.

The following new sentence is inserted after the third sentence of the third paragraph:

All thermal wires in a shaft shall be equal lengths.

6-19.3(9)D Nondestructive QA Testing Results Submittal

The last sentence of the first paragraph is revised to read:

Results shall be a Type 2E Working Drawing presented in a written report.

7-02.AP7

Section 7-02, Culverts
April 2, 2018

7-02.2 Materials

In the first paragraph, the references to “Portland Cement” and “Aggregates for Portland Cement Concrete” are revised to read:

Cement	9-01
Aggregates for Concrete	9-03.1

7-02.3(6)A4 Excavation and Bedding Preparation

The first sentence of the third paragraph is revised to read:

The bedding course shall be a 6-inch minimum thickness layer of culvert bedding material, defined as granular material either conforming to Section 9-03.12(3) or to AASHTO Grading No. 57 as specified in Section 9-03.1(4)C.

7-05.AP7

Section 7-05, Manholes, Inlets, Catch Basins, and Drywells
August 6, 2018

7-05.3 Construction Requirements

The fourth sentence of the third paragraph is deleted.

7-08.AP7

Section 7-08, General Pipe Installation Requirements
April 2, 2018

7-08.3(3) Backfilling

The fifth sentence of the fourth paragraph is revised to read:

> All compaction shall be in accordance with the Compaction Control Test of Section 2-03.3(14)D except in the case that 100% Recycled Concrete Aggregate is used.

The following new sentences are inserted after the fifth sentence of the fourth paragraph:

> When 100% Recycled Concrete Aggregate is used, the Contractor may submit a written request to use a test point evaluation for compaction acceptance. Test Point evaluation shall be performed in accordance with SOP 738.

8-01.AP8

Section 8-01, Erosion Control and Water Pollution Control
April 1, 2019

8-01.1 Description

This section is revised to read:

> This Work consists of furnishing, installing, maintaining, removing and disposing of best management practices (BMPs), as defined in the Washington Administrative Code (WAC) 173-201A, to manage erosion and water quality in accordance with these Specifications and as shown in the Plans or as designated by the Engineer.
>
> The Contracting Agency may have a National Pollution Discharge Elimination System Construction Stormwater General Permit (CSWGP) as identified in the Contract Special Provisions. The Contracting Agency may or may not transfer coverage of the CSWGP to the Contractor when a CSWGP has been obtained. The Contracting Agency may not have a CSWGP for the project but may have another water quality related permit as identified in the Contract Special Provisions or the Contracting Agency may not have water quality related permits but the project is subject to applicable laws for the Work. Section 8-01 covers all of these conditions.

This section is supplemented with the following new subsection:

> **8-01.1(1) Definitions**
>
> **1. pH Affected Stormwater**
>
> a. Stormwater contacting green concrete (concrete that has set/stiffen but is still curing), recycled concrete, or engineered soils (as defined in the Construction Stormwater General Permit (CSWGP)) as a natural process
>
> b. pH monitoring shall be performed in accordance with the CSWGP, or Water Quality Standards (WQS in accordance with WAC 173-201A (surface) or 173-200C (ground)) when the CSWGP does not apply

c. May be neutralized and discharged to surface waters or infiltrated

2. pH Affected Non-Stormwater

a. Conditionally authorized in accordance with CSWGP Special Condition S.1.C., uncontaminated water contacting green concrete, recycled concrete, or engineered soils (as defined in the CSWGP)

b. Shall not be categorized as cementitious wastewater/concrete wastewater, as defined below

c. Shall be managed and treated in accordance with the CSWGP, or WQS when the CSWGP does not apply

d. pH adjustment and dechlorination may be necessary, as specified in the CSWGP or in accordance with WQS when the CSWGP does not apply

e. May be neutralized, treated, and discharged to surface waters in accordance with the CSWGP, with the exception of water-only shaft drilling slurry. Water-only shaft drilling slurry may be treated, neutralized, and infiltrated but not discharged to surface waters (Refer to Special Conditions S1.C. Authorized Discharges and S1.d Prohibited Discharges of the CSWGP)

3. Cementitious Wastewater/Concrete Wastewater

a. Any water that comes into contact with fine cementitious particles or slurry; any water used in the production, placement and/or clean-up of cementitious products; any water used to cut, grind, wash, or otherwise modify cementitious products

b. When any water, including stormwater, commingles with cementitious wastewater/concrete wastewater, the resulting water is considered cementitious wastewater/concrete wastewater and shall be managed to prevent discharge to waters of the State, including ground water

c. CSWGP Examples include: water used for or resulting from concrete truck/mixer/pumper/tool/chute rinsing or washing, concrete saw cutting and surfacing (sawing, coring, grinding, roughening, hydro-demolition, bridge and road surfacing)

d. Cannot be neutralized and discharged or infiltrated

8-01.2 Materials

The first paragraph is revised to read:

Materials shall meet the requirements of the following sections:

Corrugated Polyethylene Drain Pipe	9-05.1(6)
Quarry Spalls and Permeable Ballast	9-13
Erosion Control and Roadside Planting	9-14
Construction Geotextile	9-33

The second paragraph is deleted.

8-01.3(1) General

This section is revised to read:

Adaptive management shall be employed throughout the duration of the project for the implementation of erosion and water pollution control permit requirements for the current condition of the project site. The adaptive management includes the selection and utilization of BMPs, scheduling of activities, prohibiting unacceptable practices, implementing maintenance procedures, and other managerial practices that when used singularly or in combination, prevent or reduce the release of pollutants to waters of the State. The adaptive management shall use the means and methods identified in this section and means and methods identified in the Washington State Department of Transportation's Temporary Erosion and Sediment Control Manual or the Washington State Department of Ecology's Stormwater Management Manuals for construction stormwater.

The Contractor shall install a high visibility fence along the lines shown in the Plans or as instructed by the Engineer.

Throughout the life of the project, the Contractor shall preserve and protect the delineated preservation area, acting immediately to repair or restore any high visibility fencing damaged or removed.

All discharges to surface waters shall comply with surface water quality standards as defined in Washington Administrative Code (WAC) Chapter 173-201A. All discharges to groundwater shall comply with groundwater quality standards WAC Chapter 173-200. The Contractor shall comply with the CSWGP when the project is covered by the CSWGP.

Work, at a minimum, shall include the implementation of:

1. Sediment control measures prior to ground disturbing activities to ensure all discharges from construction areas receive treatment prior to discharging from the site.

2. Flow control measures to prevent erosive flows from developing.

3. Water management strategies and pollution prevention measures to prevent contamination of waters that will be discharged to surface waters or the ground.

4. Erosion control measures to stabilize erodible earth not being worked.

5. Maintenance of BMPs to ensure continued compliant performance.

6. Immediate corrective action if evidence suggests construction activity is not in compliance. Evidence includes sampling data, olfactory or visual evidence such as the presence of suspended sediment, turbidity, discoloration, or oil sheen in discharges.

To the degree possible, the Contractor shall coordinate this Work with permanent drainage and roadside restoration Work the Contract requires.

Clearing, grubbing, excavation, borrow, or fill within the Right of Way shall never expose more erodible earth than as listed below:

Western Washington (West of the Cascade Mountain Crest)	
May 1 through September 30	17 Acres
October 1 through April 30	5 Acres

Eastern Washington (East of the Cascade Mountain Crest)	
April 1 through October 31	17 Acres
November 1 through March 31	5 Acres

The Engineer may increase or decrease the limits based on project conditions.

Erodible earth is defined as any surface where soils, grindings, or other materials may be capable of being displaced and transported by rain, wind, or surface water runoff.

Erodible earth not being worked, whether at final grade or not, shall be covered within the specified time period (see the table below), using BMPs for erosion control.

Western Washington (West of the Cascade Mountain Crest)	
October 1 through April 30	2 days maximum
May 1 to September 30	7 days maximum

Eastern Washington (East of the Cascade Mountain Crest)	
October 1 through June 30	5 days maximum
November 1 through March 31	10 days maximum

When applicable, the Contractor shall be responsible for all Work required for compliance with the CSWGP including annual permit fees.

If the Engineer, under Section 1-08.6, orders the Work suspended, the Contractor shall continue to comply with this division during the suspension.

8-01.3(1)A Submittals

This section's content is deleted.

This section is supplemented with the following new subsection:

8-01.3(1)A1 Temporary Erosion and Sediment Control Plan

Temporary Erosion and Sediment Control (TESC) Plans consist of a narrative section and plan sheets that meets the Washington State Department of Ecology's Stormwater Pollution Prevention Plan (SWPPP) requirement in the CSWGP. For projects that do not require a CSWGP but have the potential to discharge to surface waters of the state, an abbreviated TESC plan shall be used, which may consist of a narrative and/or plan sheets and shall demonstrate compliance with applicable codes, ordinances and regulations, including the water quality standards for surface waters; Chapter 173-201A of the

Washington Administrative Code (WAC) and water quality standards for groundwaters in accordance with Chapter 173-200 WAC.

The Contractor shall either adopt the TESC Plan in the Contract or develop a new TESC Plan. If the Contractor adopts the TESC Plan in scenarios in which the CSWGP is transferred to the Contractor, the Contractor shall modify the TESC Plan to match the Contractor's schedule, method of construction, and to include all areas that will be used to directly support construction activity such as equipment staging yards, material storage areas, or borrow areas. TESC Plans shall include all high visibility fence shown in the Plans. All TESC Plans shall meet the requirements of the current edition of the WSDOT Temporary Erosion and Sediment Control Manual M 3109 and be adaptively managed throughout construction based on site inspections and required sampling to maintain compliance with the CSWGP, or WQS when no CSWGP applies. The Contractor shall develop a schedule for implementation of the TESC work and incorporate it into the Contractor's progress schedule.

The Contractor shall submit their TESC Plan (either the adopted plan or new plan) as Type 2 Working Drawings. At the request of the Engineer, updated TESC Plans shall be submitted as Type 1 Working Drawings.

8-01.3(1)B Erosion and Sediment Control (ESC) Lead

This section is revised to read:

The Contractor shall identify the ESC Lead at the preconstruction discussions and in the TESC Plan. The ESC Lead shall have, for the life of the Contract, a current Certificate of Training in Construction Site Erosion and Sediment Control from a course approved by the Washington State Department of Ecology. The ESC Lead must be onsite or on call at all times throughout construction. The ESC Lead shall be listed on the Emergency Contact List required under Section 1-05.13(1).

The ESC Lead shall implement the TESC Plan. Implementation shall include, but is not limited to:

1. Installing, adaptively managing, and maintaining temporary erosion and sediment control BMPs to assure continued performance of their intended function. Damaged or inadequate BMPs shall be corrected immediately.

2. Updating the TESC Plan to reflect current field conditions.

3. Discharge sampling and submitting Discharge Monitoring Reports (DMRs) to the Washington State Department of Ecology in accordance with the CSWGP.

4. Develop and maintain the Site Log Book as defined in the CSWGP. When the Site Log Book or portion thereof is electronically developed, the electronic documentation must be accessible onsite. As a part of the Site Log Book, the Contractor shall develop and maintain a tracking table to show that identified TESC compliance issues are fully resolved within 10 calendar days. The table shall include the date an issue was identified, a description of how it was resolved, and the date the issue was fully resolved.

The ESC Lead shall also inspect all areas disturbed by construction activities, all on-site erosion and sediment control BMPs, and all stormwater discharge points at least once every calendar week and within 24-hours of runoff events in which stormwater discharges from the site. Inspections of temporarily stabilized, inactive sites may be reduced to once every calendar month. The Washington State Department of Ecology's Erosion and Sediment Control Site Inspection Form, located at https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit, shall be completed for each inspection and a copy shall be submitted to the Engineer no later than the end of the next working day following the inspection.

8-01.3(1)C Water Management

This section is supplemented with the following new subsections:

8-01.3(1)C5 Water Management for In-Water Work Below Ordinary High Water Mark (OHWM)

Work over surface waters of the state (defined in WAC 173-201A-010) or below the OHWM (defined in RCW 90.58.030) shall comply with water quality standards for surface waters of the State of Washington.

8-01.3(1)C6 Environmentally Acceptable Hydraulic Fluid

All equipment containing hydraulic fluid that extends from a bridge deck over surface waters of the state or below the OHWM, shall be equipped with a biodegradable hydraulic fluid. The fluid shall achieve either a Pw1 Environmental Persistence Classification stated in ASTM D6046 (≥60% biodegradation in 28 days) or equivalent standard. Alternatively, hydraulic fluid that meets International Organization for Standardization (ISO 15380), the European Union Ecolabel, or equivalent certification will also be accepted.

The Contractor shall submit a Type 1 Working Drawing consisting of a manufacturer catalog cut of the hydraulic fluid used.

The designation of biodegradable hydraulic fluid does not mean fluid spills are acceptable. The Contractor shall respond to spills to land or water in accordance with the Contract, the associated SPCC Plan, and all applicable local, state, and federal regulations.

8-01.3(1)C7 Turbidity Curtain

All Work for the turbidity curtain shall be in accordance with the manufacturer's recommendations for the site conditions. Removal procedures shall be developed and used to minimize silt release and disturbance of silt. The Contractor shall submit a Type 2 Working Drawing, detailing product information, installation and removal procedures, equipment and workforce needs, maintenance plans, and emergency repair/replacement plans.

Turbidity curtain materials, installation, and maintenance shall be sufficient to comply with water quality standards.

The Contractor shall notify the Engineer 10 days in advance of removing the turbidity curtain. All components of the turbidity curtain shall be removed from the project.

8-01.3(1)C1 Disposal of Dewatering Water

This section is revised to read:

When uncontaminated groundwater is encountered in an excavation on a project it may be infiltrated within vegetated areas of the right of way not designated as Sensitive Areas or incorporated into an existing stormwater conveyance system at a rate that will not cause erosion or flooding in any receiving surface water.

Alternatively, the Contractor may pursue independent disposal and treatment alternatives that do not use the stormwater conveyance system provided it is in compliance with the applicable WACs and permits.

8-01.3(1)C2 Process Wastewater

This section is revised to read:

Wastewater generated on-site as a byproduct of a construction process shall not be discharged to surface waters of the State. Some sources of process wastewater may be infiltrated in accordance with the CSWGP. Some sources of process wastewater may be disposed via independent disposal and treatment alternatives in compliance with the applicable WACs and permits.

8-01.3(1)C3 Shaft Drilling Slurry Wastewater

This section is revised to read:

Wastewater generated on-site during shaft drilling activity shall be managed and disposed of in accordance with the requirements below. No shaft drilling slurry wastewater shall be discharged to surface waters of the State. Neither the sediment nor liquid portions of the shaft drilling slurry wastewater shall be contaminated, as detectable by visible or olfactory indication (e.g., chemical sheen or smell).

1. Water-only shaft drilling slurry or water slurry with accepted flocculants may be infiltrated on-site. Flocculants used shall meet the requirements of Section 9-14.5(1) or shall be chitosan products listed as General Use Level Designation (GULD) on the Washington State Department of Ecology's stormwater treatment technologies webpage for construction treatment. Infiltration is permitted if the following requirements are met:

    a. Wastewater shall have a pH of 6.5 – 8.5 prior to discharge.

    b. The amount of flocculant added to the slurry shall be kept to the minimum needed to adequately settle out solids. The flocculant shall be thoroughly mixed into the slurry.

    c. The slurry removed from the shaft shall be contained in a leak proof cell or tank for a minimum of 3 hours.

    d. The infiltration rate shall be reduced if needed to prevent wastewater from leaving the infiltration location. The infiltration site shall be monitored regularly during infiltration activity. All wastewater discharged to the ground shall fully infiltrate and discharges shall stop before the end of each work day.

    e. Drilling spoils and settled sediments remaining in the containment cell or tank shall be disposed of in accordance with Section 6-19.3(4)F.

f. Infiltration locations shall be in upland areas at least 150 feet away from surface waters, wells, on-site sewage systems, aquifer sensitive recharge areas, sole source aquifers, well head protection areas, and shall be marked on the plan sheets before the infiltration activity begins.

g. Prior to infiltration, the Contractor shall submit a Shaft Drilling Slurry Wastewater Management and Infiltration Plan as a Type 2 Working Drawing. This Plan shall be kept on-site, adapted if needed to meet the construction requirements, and updated to reflect what is being done in the field. The Working Drawing shall include, at a minimum, the following information:

i. Plan sheet showing the proposed infiltration location and all surface waters, wells, on-site sewage systems, aquifer-sensitive recharge areas, sole source aquifers, and well-head protection areas within 150 feet.

ii. The proposed elevation of soil surface receiving the wastewater for infiltration and the anticipated phreatic surface (i.e., saturated soil).

iii. The source of the water used to produce the slurry.

iv. The estimated total volume of wastewater to be infiltrated.

v. The accepted flocculant to be used (if any).

vi. The controls or methods used to prevent surface wastewater runoff from leaving the infiltration location.

vii. The strategy for removing slurry wastewater from the shaft and containing the slurry wastewater once it has been removed from the shaft.

viii. The strategy for monitoring infiltration activity and adapting methods to ensure compliance.

ix. A contingency plan that can be implemented immediately if it becomes evident that the controls in place or methods being used are not adequate.

x. The strategy for cleaning up the infiltration location after the infiltration activity is done. Cleanup shall include stabilizing any loose sediment on the surface within the infiltration area generated as a byproduct of suspended solids in the infiltrated wastewater or soil disturbance associated with BMP placement and removal.

2. Shaft drilling mineral slurry, synthetic slurry, or slurry with polymer additives not allowed for infiltration shall be contained and disposed of by the Contractor at an accepted disposal facility in accordance with Section 2-03.3(7)C. Spoils that have come into contact with mineral slurry shall be disposed of in accordance with Section 6-19.3(4)F.

8-01.3(1)C4 Management of Off-Site Water

This section is revised to read:

Prior to clearing and grubbing, the Contractor shall intercept all sources of off-site surface water and overland flow that will run-on to the project. Off-site surface water run-on shall be diverted through or around the project in a way that does not introduce construction related pollution. It shall be diverted to its preconstruction discharge location in a manner that does not increase preconstruction flow rate and velocity and protects contiguous properties and waterways from erosion. The Contractor shall submit a Type 2 Working Drawing consisting of the method for performing this Work.

8-01.3(1)E Detention/Retention Pond Construction

This section is revised to read:

Permanent or temporary ponds shall be constructed before beginning other grading and excavation Work in the area that drains into that pond. Detention/retention ponds may be constructed concurrently with grading and excavation when allowed by the Engineer. Temporary conveyances shall be installed concurrently with grading in accordance with the TESC Plan so that newly graded areas drain to the pond as they are exposed.

8-01.3(2) Seeding, Fertilizing, and Mulching

This section's title is revised to read:

8-01.3(2) Temporary Seeding and Mulching

8-01.3(2)A Preparation for Application

This section is revised to read:

A cleated roller, crawler tractor, or similar equipment, which forms longitudinal depressions at least 2 inches deep shall be used for compaction and preparation of the surface to be seeded. The entire area shall be uniformly covered with longitudinal depressions formed perpendicular to the natural flow of water on the slope. The soil shall be conditioned with sufficient water so the longitudinal depressions remain in the soil surface until completion of the seeding.

8-01.3(2)A1 Seeding

This section is deleted in its entirety.

8-01.3(2)A2 Temporary Seeding

This section is deleted in its entirety.

8-01.3(2)B Seeding and Fertilizing

This section, including title, is revised to read:

8-01.3(2)B Temporary Seeding

Temporary grass seed shall be a commercially prepared mix, made up of low growing grass species that will grow without irrigation at the project location, and accepted by the Engineer. The application rate shall be two pounds per 1000 square feet.

The Contractor shall notify the Engineer not less than 24 hours in advance of any seeding operation and shall not begin the Work until areas prepared or designated for seeding have been accepted. Following the Engineer's acceptance, seeding of the accepted slopes shall begin immediately.

Temporary seeding may be sown at any time allowed by the Engineer. Temporary seeding shall be sown by one of the following methods:

1. A hydro seeder that utilizes water as the carrying agent, and maintains continuous agitation through paddle blades. It shall have an operating capacity sufficient to agitate, suspend, and mix into a homogeneous slurry the specified amount of seed and water or other material. Distribution and discharge lines shall be large enough to prevent stoppage and shall be equipped with a set of hydraulic discharge spray nozzles that will provide a uniform distribution of the slurry.

2. Blower equipment with an adjustable disseminating device capable of maintaining a constant, measured rate of material discharge that will ensure an even distribution of seed at the rates specified.

3. Power-drawn drills or seeders.

4. Areas in which the above methods are impractical may be seeded by hand methods.

When seeding by hand, the seed shall be incorporated into the top ¼ inch of soil by hand raking or other method that is allowed by the Engineer.

Seed applied using a hydroseeder shall have a tracer added to visibly aid uniform application. This tracer shall not be harmful to plant, aquatic, or animal life. If Short-Term Mulch is used as a tracer, the application rate shall not exceed 250 pounds per acre.

Seed and fertilizer may be applied in one application provided that the fertilizer is placed in the hydroseeder tank no more than 1 hour prior to application.

8-01.3(2)D Mulching

This section, including title, is revised to read:

8-01.3(2)D Temporary Mulching

Temporary mulch shall be straw, wood strand, or HECP mulch and shall be used for the purpose of erosion control by protecting bare soil surface from particle displacement. Mulch shall not be applied below the anticipated water level of ditch slopes, pond bottoms, and stream banks. HECP mulch shall not be used within the Ordinary High Water Mark. Non-HECP mulches applied below the anticipated water level shall be removed or anchored down so that it cannot move or float, at no additional expense to the Contracting Agency.

Straw or wood strand mulch shall be applied at a rate to achieve at least 95 percent visual blockage of the soil surface.

Short Term Mulch shall be hydraulically applied at the rate of 2500 pounds per acre and may be applied in one lift.

Moderate Term Mulch and Long Term Mulch shall be hydraulically applied at the rate of 3500 pounds per acre with no more than 2000 pounds applied in any single lift.

Mulch sprayed on signs or sign Structures shall be removed the same day.

Areas not accessible by mulching equipment shall be mulched by accepted hand methods.

8-01.3(2)F Dates for Application of Final Seed, Fertilizer, and Mulch

This section is deleted in its entirety.

8-01.3(2)G Protection and Care of Seeded Areas

This section is deleted in its entirety.

8-01.3(2)H Inspection

This section is deleted in its entirety.

8-01.3(2)I Mowing

This section is deleted in its entirety.

8-01.3(3) Placing Biodegradable Erosion Control Blanket

This section's title is revised to read:

8-01.3(3) Placing Erosion Control Blanket

The first sentence of the first paragraph is revised to read:

Erosion Control Blankets are used as an erosion prevention device and to enhance the establishment of vegetation.

The second paragraph is revised to read:

When used to enhance the establishment of seeded areas, seeding and fertilizing shall be done prior to blanket installation.

8-01.3(4) Placing Compost Blanket

This section is revised to read:

Compost blankets are used for erosion control. Compost blanket shall be only be placed on ground surfaces that are steeper than 3-foot horizontal and 1-foot vertical though steeper slopes shall be broken by wattles or compost socks placed according to the Standard Plans. Compost shall be placed to a depth of 3 inches over bare soil. An organic tackifier shall be placed over the entire composted area when dry or windy conditions are present or expected. The tackifier shall be applied immediately after the application of compost to prevent compost from leaving the composted area.

Medium compost shall be used for the compost blanket. Compost may serve the purpose of soil amendment as specified in Section 8-02.3(6).

8-01.3(5) Plastic Covering

The first paragraph is revised to read:

Erosion Control – Plastic coverings used to temporarily cover stockpiled materials, slopes or bare soils shall be installed and maintained in a way that prevents water from intruding under the plastic and prevents the plastic cover from being damaged by wind. Plastic coverings shall be placed with at least a 12-inch overlap of all seams and be a minimum of 6 mils thick. Use soil stabilization and energy dissipation BMPs to minimize the erosive energy flows coming off sloped areas of plastic (e.g., toe of slope). When feasible, prevent the clean runoff from plastic from hitting bare soil. Direct flows from plastic to stabilized outlet areas.

8-01.3(7) Stabilized Construction Entrance

The first paragraph is revised to read:

Temporary stabilized construction entrance shall be constructed in accordance with the *Standard Plans*, prior to construction vehicles entering the roadway from locations that generate sediment track out on the roadway. Material used for stabilized construction entrance shall be free of extraneous materials that may cause or contribute to track out.

8-01.3(8) Street Cleaning

This section is revised to read:

Self-propelled pickup street sweepers shall be used to remove and collect dirt and other debris from the Roadway. The street sweeper shall effectively collect these materials and prevent them from being washed or blown off the Roadway or into waters of the State. Street sweepers shall not generate fugitive dust and shall be designed and operated in compliance with applicable air quality standards. Material collected by the street sweeper shall be disposed of in accordance with Section 2-03.3(7)C.

When allowed by the Engineer, power broom sweepers may be used in non-sensitive areas. The broom sweeper shall sweep dirt and other debris from the roadway into the work area. The swept material shall be prevented from entering or washing into waters of the State.

Street washing with water will require the concurrence of the Engineer.

8-01.3(12) Compost Socks

The first two sentences of the first paragraph are revised to read:

Compost socks are used to disperse flow and sediment. Compost socks shall be installed as soon as construction will allow but before flow conditions create erosive flows or discharges from the site. Compost socks shall be installed prior to any mulching or compost placement.

8-01.3(13) Temporary Curb

The last two sentences of the second paragraph are revised to read:

Temporary curbs shall be a minimum of 4 inches in height. Temporary curb shall be installed so that ponding does not occur in the adjacent roadway.

8-01.3(14) Temporary Pipe Slope Drain

The third and fourth paragraphs are revised to read:

The pipe fittings shall be water tight and the pipe secured to the slope with metal posts, wood stakes, or sand bags.

The water shall be discharged to a stabilized conveyance, sediment trap, stormwater pond, rock splash pad, or vegetated strip, in a manner to prevent erosion and maintain water quality compliance.

The last paragraph is deleted.

8-01.3(15) Maintenance

This section is revised to read:

Erosion and sediment control BMPs shall be maintained or adaptively managed as required by the CSWGP until the Engineer determines they are no longer needed. When deficiencies in functional performance are identified, the deficiencies shall be rectified immediately.

The BMPs shall be inspected on the schedule outlined in Section 8-01.3(1)B for damage and sediment deposits. Damage to or undercutting of BMPs shall be repaired immediately.

In areas where the Contractor's activities have compromised the erosion control functions of the existing grasses, the Contractor shall overseed at no additional cost to the Contracting Agency.

The quarry spalls of construction entrances shall be refreshed, replaced, or screened to maintain voids between the spalls for collecting mud and dirt.

Unless otherwise specified, when the depth of accumulated sediment and debris reaches approximately ⅓ the height of the BMP the deposits shall be removed. Debris or contaminated sediment shall be disposed of in accordance with Section 2-03.3(7)C. Clean sediments may be stabilized on-site using BMPs as allowed by the Engineer.

8-01.3(16) Removal

This section is revised to read:

The Contractor shall remove all temporary BMPs, all associated hardware and associated accumulated sediment deposition from the project limits prior to Physical Completion unless otherwise allowed by the Engineer. When the temporary BMP materials are made of natural plant fibers unaltered by synthetic materials the Engineer may allow leaving the BMP in place.

The Contractor shall remove BMPs and associated hardware in a way that minimizes soil disturbance. The Contractor shall permanently stabilize all bare and disturbed soil after removal of BMPs. If the installation and use of the erosion control BMPs have compacted or otherwise rendered the soil inhospitable to plant growth, such as construction entrances, the Contractor shall take measures to rehabilitate the soil to facilitate plant growth. This

may include, but is not limited to, ripping the soil, incorporating soil amendments, or seeding with the specified seed.

At the request of the Contractor and at the sole discretion of the Engineer the CSWGP may be transferred back to the Contracting Agency. Approval of the Transfer of Coverage request will require the following:

1. All other Work required for Contract Completion has been completed.

2. All Work required for compliance with the CSWGP has been completed to the maximum extent possible. This includes removal of BMPs that are no longer needed and the site has undergone all Stabilization identified for meeting the requirements of Final Stabilization in the CSWGP.

3. An Equitable Adjustment change order for the cost of Work that has not been completed by the Contractor.

4. Submittal of the Washington State Department of Ecology Transfer of Coverage form (Ecology form ECY 020-87a) to the Engineer.

If the Engineer approves the transfer of coverage back to the Contracting Agency, the requirement in Section 1-07.5(3) for the Contractor's submittal of the Notice of Termination form to the Washington State Department of Ecology will not apply.

8-01.4 Measurement

This section's content is deleted and replaced with the following new subsections:

8-01.4(1) Lump Sum Bid for Project (No Unit Items)

When the Bid Proposal contains the item "Erosion Control and Water Pollution Prevention" there will be no measurement of unit or force account items for Work defined in Section 8-01 except as described in Sections 8-01.4(3) and 8-01.4(4). Also, except as described in Section 8-01.4(3), all of Sections 8-01.4(2) and 8-01.5(2) are deleted.

8-01.4(2) Item Bids

When the Proposal does not contain the items "Erosion Control and Water Pollution Prevention", Section 8-01.4(1) and 8-01.5(1) are deleted and the Bid Proposal will contain some or all of the following items measured as noted.

ESC lead will be measured per day for each day that an inspection is made and a report is filed.

Erosion control blanket and plastic covering will be measured by the square yard along the ground slope line of surface area covered and accepted.

Turbidity curtains will be measured by the linear foot along the ground line of the installed curtain.

Check dams will be measured per linear foot one time only along the ground line of the completed check dam. No additional measurement will be made for check dams that are required to be rehabilitated or replaced due to wear.

Stabilized construction entrances will be measured by the square yard by ground slope measurement for each entrance constructed.

Tire wash facilities will be measured per each for each tire wash installed.

Street cleaning will be measured by the hour for the actual time spent cleaning pavement, refilling with water, dumping and transport to and from cleaning locations within the project limits, as authorized by the Engineer. Time to mobilize the equipment to or from the project limits on which street cleaning is required will not be measured.

Inlet protections will be measured per each for each initial installation at a drainage structure.

Silt fence, gravel filter, compost berms, and wood chip berms will be measured by the linear foot along the ground line of the completed barrier.

Wattles and compost socks will be measured by the linear foot.

Temporary curbs will be measured by the linear foot along the ground line of the completed installation.

Temporary pipe slope drains will be measured by the linear foot along the flow line of the pipe.

Coir logs will be measured by the linear foot along the ground line of the completed installation.

Outlet protections will be measured per each initial installation at an outlet location.

Temporary seeding, temporary mulching, and tackifiers will be measured by the acre by ground slope measurement.

Compost blanket will be measured by the square yard by ground slope surface area covered and accepted.

8-01.4(3) Reinstating Unit Items with Lump Sum Erosion Control and Water Pollution Prevention

The Contract Provisions may establish the project as lump sum, in accordance with Section 8-01.4(1) and also include one or more of the items included above in Section 8-01.4(2). When that occurs, the corresponding measurement provision in Section 8-01.4(2) is not deleted and the Work under that item will be measured as specified.

8-01.4(4) Items not included with Lump Sum Erosion Control and Water Pollution Prevention

Compost blanket will be measured by the square yard by ground slope surface area covered and accepted.

Temporary mulch will be measured by the acre by ground slope surface area covered and accepted.

High visibility fence will be measured by the linear foot along the ground line of the completed fence.

8-01.5 Payment

This section's content is deleted and replaced with the following new subsections:

8-01.5(1) Lump Sum Bid for Project (No Unit Items)

Payment will be made for the following Bid item when it is included in the Proposal:

"Erosion Control and Water Pollution Prevention", lump sum.

The lump sum Contract price for "Erosion Control and Water Pollution Prevention" shall be full pay to perform the Work as described in Section 8-01 except for costs compensated by Bid Proposal items inserted through Contract Provisions as described in Section 8-01.4(2). Progress payments for the lump sum item "Erosion Control and Water Pollution Prevention" will be made as follows:

1. The Contracting Agency will pay 15 percent of the bid amount for the initial set up for the item. Initial set up includes the following:

   a. Acceptance of the TESC Plan provided by the Contracting Agency or submittal of a new TESC Plan,

   b. Submittal of a schedule for the installation of the BMPs, and

   c. Identifying water quality sampling locations.

2. 70 percent of the bid amount will be paid in accordance with Section 1-09.9.

3. Once the project is physically complete and copies of the all reports submitted to the Washington State Department of Ecology have been submitted to the Engineer, and, if applicable, transference of the CSWGP back to the Contracting Agency is complete, the remaining 15 percent of the bid amount shall be paid in accordance with Section 1-09.9.

8-01.5(2) Item Bids

"ESC Lead", per day.

"Turbidity Curtain", per linear foot.

"Erosion Control Blanket", per square yard.

"Plastic Covering", per square yard.

"Check Dam", per linear foot.

"Inlet Protection", per each.

"Gravel Filter Berm", per linear foot.

"Stabilized Construction Entrance", per square yard.

"Street Cleaning", per hour.

"Silt Fence", per linear foot.

"Wood Chip Berm", per linear foot.

"Compost Berm", per linear foot.

"Wattle", per linear foot.

"Compost Sock", per linear foot.

"Coir Log", per linear foot.

"Temporary Curb", per linear foot.

"Temporary Pipe Slope Drain", per linear foot.

"Temporary Seeding", per acre.

"Temporary Mulching", per acre.

"Compost Blanket", per square yard.

"Outlet Protection", per each.

"Tackifier", per acre.

"Erosion/Water Pollution Control", by force account as provided in Section 1-09.6.

Maintenance and removal of erosion and water pollution control devices including removal and disposal of sediment, stabilization and rehabilitation of soil disturbed by these activities, and any additional Work deemed necessary by the Engineer to control erosion and water pollution will be paid by force account in accordance with Section 1-09.6.

To provide a common Proposal for all Bidders, the Contracting Agency has entered an amount in the Proposal to become a part of the Contractor's total Bid.

8-01.5(3) Reinstating Unit Items with Lump Sum Erosion Control and Water Pollution Prevention

The Contract may establish the project as lump sum, in accordance with Section 8-01.4(1) and also reinstate the measurement of one or more of the items described in Section 8-01.4(2), except for Erosion/Water Pollution Control, by force account. When that occurs, the corresponding payment provision in Section 8-01.5(2) is not deleted and the Work under that item will be paid as specified.

8-01.5(4) Items not included with Lump Sum Erosion Control and Water Pollution Prevention

Payment will be made for the following Bid item when it is included in the Proposal:

"High Visibility Fence", per linear foot.

8-02.AP8

Section 8-02, Roadside Restoration
April 1, 2019

This section, including all subsections, is revised to read:

8-02.1 Description

This Work consists of preserving, maintaining, establishing and augmenting vegetation on the roadsides and within mitigation or sundry site areas. It includes vegetation preservation, weed and pest control, furnishing and placing topsoil, compost, and soil amendments, and furnishing and planting seed, sod and plants of all forms and container types. It includes performing plant establishment activities and soil bioengineering. Work shall be performed in accordance with these Specifications and as shown in the Plans or as designated by the Engineer.

Trees, whips, shrubs, ground covers, cuttings, live stakes, live poles, live branches, rhizomes, tubers, rootstock, and seedlings will hereinafter be referred to collectively as "plants" or "plant material". Grass, wildflowers, and other plant materials installed in seed form will hereinafter be referred to collectively as "seed".

8-02.2 Materials

Materials shall meet the requirements of the following sections:

Erosion Control and Roadside Planting	9-14
Water	9-25.2

Botanical identification and nomenclature of plant materials shall be based on descriptions by Hitchcock and Cronquist in "Flora of the Pacific Northwest". Botanical identification and nomenclature of plant material not found in "Flora" shall be based on Bailey in "Hortus Third" or superseding editions and amendments or as referenced in the Plans.

8-02.3 Construction Requirements

8-02.3(1) Responsibility During Construction

The Contractor shall prepare, install, and ensure adequate and proper care of all roadside seeded, planted, and lawn areas on the project until all plant establishment periods required by the Contract are complete or until Physical Completion of the project, whichever is last.

Adequate and proper care shall include, but is not limited to, keeping all plant material in a healthy, growing condition by watering, pruning, and other actions deemed necessary for plant health. This Work shall include keeping the project area free from insect infestation, weeds or unwanted vegetation, litter, and other debris along with retaining the finished grades and mulch in a neat uniform condition.

Existing desirable vegetation shall be saved and protected unless removal is required by the Contract or allowed by the Engineer.

The Contractor shall have sole responsibility for the maintenance and appearance of the roadside restoration.

8-02.3(2) Work Plans

Three Work Plan submittals exist under this Section:

1. Roadside Work Plan: This plan is required when Work will disturb the roadside beyond 20 feet from the pavement or where trees or native vegetation will be removed, the Contractor shall submit a Type 2 Working Drawing.

2. Weed and Pest Control Plan: This plan is required when the proposal contains the item "Weed and Pest Control," and prior to application of any chemicals or weed control activities, the Contractor shall submit a Type 2 Working Drawing.

3. Plant Establishment Plan: This plan is required when the proposal contains the item "PSIPE__", and prior to completion of Initial Planting, the Contractor shall submit a Type 2 Working Drawing.

8-02.3(2)A Roadside Work Plan

The Roadside Work Plan shall define the expected impacts to the roadside and restoration resulting from Work necessary to meet all Contract requirements. The Contractor shall define how the roadside restoration Work included in the Contract will be phased and coordinated with project Work such as earthwork, staging, access, erosion and water pollution control, irrigation, etc. The Roadside Work Plan shall include the following:

1. <u>Limiting impacts to roadsides:</u>

    a. Limits of Work including locations of staging or parking.

    b. Means and methods for vegetation protection (in accordance with Section 1-07.16(2)).

    c. Locations outside of clearing limits where vegetation shall be removed to provide access routes or other needs to accomplish the Work.

    d. Plans for removal, preservation and stockpile of topsoil or other native materials, if outside of clearing and grubbing limits and within the project limits.

2. <u>Roadside Restoration:</u>

    a. Plan for propagation and procurement of plants, ground preparation for planting, and installation of plants.

    b. Means and methods to limit soil compaction where seeding and planting are to occur, such as steel plates, hog fuel access roads, wood mats for sensitive areas (including removal) and decompaction for unavoidable impacts.

c. Plan and timing to incorporate or remove erosion control items.

3. Lawn Installation:

a. Schedule for lawn installation work.

b. Establishment and maintenance of lawns.

8-02.3(2)B Weed and Pest Control Plan

The Weed and Pest Control Plan shall describe all weed and pest control needs for the project.

The plan shall be prepared and signed by a licensed Commercial Pest Control Operator or Consultant. The plan for control of weeds and pests on the Contract in accordance with Section 8-02.3(3) shall include the following:

1. Names of plan preparer and pesticide operators, including contact information. The Contractor shall furnish the Engineer evidence that all operators are licensed with appropriate endorsements, and that the pesticide used is registered for use by the Washington State Department of Agriculture.

2. Means and methods of weed control, including mechanical and/or chemical.

3. Schedule for weed control including re-entry times for pesticide application by pesticide type.

4. Proposed pesticide use in accordance with Section 8-02.3(3)A: name, application rate, and Safety Data Sheets of all proposed pesticides. Include a copy of the current product label for each pesticide to be used.

5. Plan to ensure worker safety until pesticide re-entry periods are met.

8-02.3(2)C Plant Establishment Plan

The Plant Establishment Plan shall describe activities necessary to ensure continued health and vigor of planted and seeded areas in accordance with the requirements of Sections 8-02.3(12) and 8-02.3(13). Should the plan become unworkable at any time during the first-year plant establishment, the Contractor shall submit a revised plan prior to proceeding with further Work. The Plant Establishment Plan shall include:

1. Proposed scheduling of joint inspection meetings, activities, materials, equipment to be utilized for the first-year plant establishment.

2. Proposed adaptive management activities to ensure successful establishment of seeded, sodded, and planted areas.

3. A contact person.

4. Management of the irrigation system, when applicable.

8-02.3(3) Weed and Pest Control

The Contractor shall control weed and pest species within the project limits using integrated pest management principles consisting of mechanical, biological, and chemical controls that are outlined in the Weed and Pest Control Plan or as designated by the Engineer. Controlling weeds consists of killing and removing weeds by chemical, mechanical, and hand methods.

8-02.3(3)A Chemical Pesticides

Chemical pesticides include, but are not restricted to, any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest, including but not limited to, insecticides, herbicides, fungicides, adjuvants, and additives, including plant regulators, defoliants and desiccants. The Contractor shall apply chemical pesticides in accordance with the label recommendations, the Washington State Department of Ecology, local sensitive area ordinances, and Washington State Department of Agriculture laws and regulations. Only those pesticides listed in the table Herbicides Approved for Use on WSDOT Rights of Way and accepted as part of the Weed and Pest Control Plan or by written authorization from the Engineer may be used (www.wsdot.wa.gov/maintenance/roadside/herbicide_use.htm).

The applicator shall be licensed by the State of Washington as a Commercial Applicator or Commercial Operator, with additional endorsements as required by the Special Provisions or the proposed weed control plan. All chemical pesticides shall be delivered to the job site in the original containers, or if pre-mixed off-site, a certification of the components and formulation from the supplier is required. The licensed applicator or operator shall complete WSDOT Form 540-509, Commercial Pesticide Application Record, each day the pesticide is applied and furnish a copy to the Engineer by the following business day.

The Contractor shall ensure confinement of the chemicals within the designated areas. The use of spray chemical pesticides shall require the use of anti-drift and activating agents and a spray pattern indicator unless otherwise allowed by the Engineer.

The Contractor shall assume all responsibility for rendering any area unsatisfactory for planting by reason of chemical application. Damage to adjacent areas, either on or off the Highway Right of Way, shall be repaired to the satisfaction of the Engineer or the property owner at no additional cost to the Contracting Agency.

8-02.3(3)B Planting and Lawn Area Weed Control

Planting and lawn area weed control consists of controlling weeds and pests in planted and lawn areas shown in the Plans. This Work is included in the bid items for planting and lawn installation.

All planting and lawn areas shall be prepared so that they are weed and debris free at the time of planting and until completion of the project. The planting areas shall include the entire ground surface, regardless of cover, areas around plants, and those areas shown in the Plans.

Within planting or lawn areas, all species that are not shown in the Plans are unwanted and shall be controlled unless specifically allowed by the Engineer to remain.

Grass growing within the mulch ring of a plant, including grass applied in accordance with Sections 8-01.3(2)A1, 8-02.3(9) or 8-02.3(10), shall be considered a weed and shall be controlled on the project in accordance with the weed and pest control plan.

All applications of post-emergent herbicides shall be made while green and growing tissue is present. Residual herbicides shall not be used where rhizomatous species or perennial species are indicated.

Should unwanted vegetation reach the flowering and seed stage in violation of these Specifications, the Contractor shall physically remove and bag the seed heads prior to seed dispersion. All physically removed vegetation and seed heads shall be disposed of off-site at no cost to the Contracting Agency.

8-02.3(3)C Project Area Weed and Pest Control

The Contractor shall control weeds not otherwise covered in accordance with Section 8-02.3(3)B, in all areas within the project limits, including erosion control seeding areas and vegetation preservation areas, as designated by the Engineer.

When the Bid Item “Project Area Weed and Pest Control” is included in the Contract, the Contractor shall also control all weeds specified as noxious by the Washington State Department of Agriculture, the local Weed District, or the County Noxious Weed Control Board outside of planting areas within the project limits.

8-02.3(4) Topsoil

Topsoil shall not be worked or placed when the ground or topsoil is frozen, or excessively wet.

The Contractor shall protect topsoil stockpiled for project use to prevent erosion and weed growth. Weed growth on topsoil stockpile sites shall be immediately eliminated in accordance with the accepted Weed and Pest Control Plan and Section 8-02.3(3)C.

The subsoil where topsoil is to be placed shall be tilled to a depth of 1 foot or as specified in the Special Provisions or the Plans. Topsoil of the type specified shall be evenly spread over the specified areas to the depth shown in the Plans or as otherwise ordered by the Engineer. Topsoil depths greater than 6 inches shall be placed in lifts no more than 6 inches in depth. The first lift of topsoil shall be incorporated with sub-soil to a depth of 8 inches and subsequent lifts placed and lightly tamped between lifts. After the topsoil has been spread, all large clods, hard lumps, and rocks 2 inches in diameter and larger, and litter shall be raked up, removed, and disposed.

8-02.3(4)A Topsoil Type A

Topsoil Type A shall be as specified in the Special Provisions. The Contractor shall submit a certification by the supplier that the contents of the Topsoil meet the requirements in the Special Provisions.

8-02.3(4)B Topsoil Type B

Topsoil Type B shall be naturally occurring topsoil taken from within the project limits and shall meet the requirements of Section 9-14.1(2). Topsoil Type B shall be taken from areas shown in the Plans to the designated depth and stockpiled at locations that will not interfere with the construction of the project, and outside of sensitive areas, as allowed by the Engineer. A minimum of two weeks prior to excavation of Topsoil Type B, the Contractor shall pre-treat the vegetation on the designated Topsoil Type B areas according to the Weed and Pest Control Plan. Areas beyond the slope stakes shall be disturbed as little as possible in the above operations and under no circumstances shall Topsoil Type B be stockpiled within 10 feet of any existing tree or vegetation area designated to be saved and protected. The Contractor shall protect topsoil stockpile from weed infestation.

The Contractor shall set aside sufficient material to satisfy the needs of the project.

Upon completion of topsoil placement, the Contractor shall dispose of remaining stockpiled Topsoil Type B not required for use on the project at no additional expense to the Contracting Agency in accordance with Section 2-03.3(7)C.

Should a shortage of Topsoil Type B occur, and the Contractor has wasted or otherwise disposed of topsoil material, the Contractor shall furnish Topsoil Type A or C at no additional expense to the Contracting Agency.

8-02.3(4)C Topsoil Type C

Topsoil Type C shall be naturally occurring topsoil obtained from a source provided by the Contractor outside of the Contracting Agency-owned Right of Way. Topsoil Type C shall meet the requirements of Sections 8-02.3(4)B and 9-14.1(3). The Contractor shall not begin removal of Topsoil Type C from the proposed source until the material has been allowed for use by the Engineer.

8-02.3(5) Roadside Seeding, Lawn and Planting Area Preparation

This Work includes preparing worked areas for the installation of all types of permanent erosion control planting. Work shall be conducted so the flow lines in drainage channels are maintained. Material displaced by the Contractor's operations that interferes with drainage shall be removed from the channel and disposed of as allowed by the Engineer.

8-02.3(5)A Seeding Area Preparation

The Contractor shall prepare roadside seeding areas as follows:

1. Remove all excess material, debris, stumps, and rocks greater than 3 inches in diameter from areas to be seeded. Dispose of removed materials offsite.

2. Prepare roadside seeding area to a weed free and bare condition.

3. Bring area to uniform grade and install topsoil, soil amendments, or compost as specified. Any slopes 3(H) to 1(V) or steeper shall not be tilled unless otherwise specified.

4. Compact to provide a reasonably firm but friable seedbed; tractor walk to uniformly cover the surface with longitudinal depressions at least 2 inches deep formed perpendicular to the natural flow of water on the slope. Condition the soil with sufficient water so the longitudinal depressions remain in the soil surface until completion of the seeding.

5. Seed and mulch within 2 days of preparation.

8-02.3(5)B Lawn Area Preparation

The Contractor shall prepare lawn areas as follows:

1. Prepare lawn area to a weed free and bare condition in accordance with Section 8-02.3(3)B.

2. Remove excess material, stumps, wood or rocks over 3 inches in diameter and remove from site.

3. Bring area to uniform grade and install topsoil or soil amendments in accordance with Section 8-02.3(4) and 8-02.3(6).

4. Till to an 8-inch depth, rake to a smooth even grade without low areas that trap water, and compact with a 50-pound roller. The finished grade of the soil shall be 1 inch below the top of all curbs, junction and valve boxes, walks, driveways, and other Structures.

5. Seed or sod the area within two days of preparation.

8-02.3(5)C Planting Area Preparation

The Contractor shall prepare planting areas as follows:

1. Prepare planting area to a weed free and bare condition in accordance with Section 8-02.3(3)B.

2. Decompact soil to a depth of 18 inches where construction activities have taken place or where native soils are compacted.

3. Return soil to uniform grade even with surrounding areas, leaving no holes or mounds over 3 inches in depth or height.

4. Remove excess material, stumps, wood or rocks over 3 inches in diameter and remove from site.

5. Apply compost or other amendments as indicated in the plans and in accordance with Section 8-02.3(6).

6. Cultivate amendments to a depth of 12 inches to provide a reasonably firm but friable planting area. Do not till any slopes 3(H) to 1(V) or steeper.

7. Return soil to a uniform finished grade, 1 inch, or the specified depth of mulch plus 1 inch, below walks, curbs, junction and valve boxes, catch basins, and driveways, unless otherwise specified.

8. Begin planting and mulching the area within two days of final preparation.

8-02.3(6) Soil Amendments

The Contractor shall place soil amendments of the type, quality, and quantities specified where shown in the Plans or as specified in the Special Provisions. Areas receiving soil amendments shall be bare soil or vegetation free prior to application. All soil amendments shall be installed as shown in the Plans within 30 calendar days after delivery to the project site.

8-02.3(6)A Compost

Compost used for soil amendments shall be Fine Compost unless otherwise designated in the Plans. When compost blanket is used for temporary erosion control, the compost blanket may be incorporated into the soil immediately prior to planting when used as compost soil amendment. The area shall be prepared in accordance with Section 8-02.3(5) prior to placing compost.

8-02.3(6)B Fertilizers

The Contractor shall apply fertilizer in the form, mixture, and rate specified in the Special Provisions or as directed by the Engineer. Application procedures shall be in accordance with the manufacturer's recommendations unless otherwise specified in the Special Provisions.

The Contractor shall submit a guaranteed fertilizer analysis label for the selected product a minimum of one week prior to application for acceptance. Following the Engineer's acceptance, fertilizing of the accepted ground or vegetated surfaces shall begin immediately.

In seeding and lawn areas to be fertilized, the fertilizer shall be applied concurrently with the seed. When fertilizer is hydraulically applied, the fertilizer shall be suitable for application with seeding as specified in Section 8-02.3(9)C. If hydroseeding, the fertilizer shall be placed in the hydroseeder tank no more than 1 hour prior to application.

Fertilizers for planting areas shall be applied concurrently with compost and applied prior to incorporation, unless tablet form fertilizer is specified. Where tablet form fertilizer is specified, fertilizer shall be applied concurrently with plant installation.

Fertilizer sprayed on signs or sign structures shall be removed the same day.

Areas not accessible by fertilizing equipment shall be fertilized by allowed hand methods.

Second Application: A second application of fertilizer shall be applied as specified in the Special Provisions at the locations designated in the Plans. The fertilizer shall be applied during the months of March, April, or May of the following year

after the initial seeding, planting, or lawn installation. The fertilizer shall be dry granular pellets or pearls and applied in accordance with the manufacturer's recommendations or as specified in the Special Provisions.

8-02.3(7) Layout of Planting, Lawn and Seeding Areas

The Contractor shall lay out and prepare planting and lawn areas and receive the Engineer's acceptance of layout and preparation prior to any installation activities. The Contractor shall stake the location of all trees larger than 1-inch caliper and the perimeter of all planting areas for acceptance by the Engineer prior to any installation activities.

The Contractor shall locate all trees to be planted in mowable grass areas a minimum of 10 feet from the edge of planting areas, other trees, fence lines, and bottom of ditches unless otherwise specified.

Tree locations shown in the Plans shall be considered approximate unless shown with stationing and offset distance. In irrigated areas, trees shall be located so their trunk is a minimum of ⅓ of the spray radius away from the nearest sprinkler head.

Unless otherwise shown, planting areas located adjacent to Roadways shall begin 6 feet from the edge of shoulder on roadway fills and begin 5 feet up on the back slope from the bottom on roadway cut sections. Plants within planting areas shall be located such that mature branching pattern will not block sight distance, signs, or other traffic-related devices. No trees shall be placed where the mature canopy will grow to within 10 feet of existing power lines. Where roadside ditches are present, planting areas shall begin 5 feet from the centerline of the ditch unless shown otherwise in the Plans.

8-02.3(8) Planting

8-02.3(8)A Dates and Conditions for Planting

No plant material shall be planted until it has been inspected and accepted for planting by the Engineer. Rejected material shall be removed from the project site immediately. All plants for the project or a sufficient quantity to plant 1-acre of the site, whichever is less, shall be received on site prior to the Engineer beginning inspection of the plants.

Under no circumstances will planting be permitted during unsuitable soil or weather conditions as determined by the Engineer. Unsuitable conditions may include frozen soil, freezing weather, saturated soil, standing water, high winds, heavy rains, and high water levels. The ground shall be moist at the time of planting. All planting shall be accomplished during the following periods:

1. Non-Irrigated Plant Material
   Western Washington (West of the Cascade Mountain Crest) – October 1 to March 1.
   Eastern Washington (East of the Cascade Mountain Crest) – October 1 to November 15.

2. Irrigated Plant Material

In irrigated areas, plant material shall not be installed until the irrigation system is fully operational and accepted by the Engineer. Trees and shrubs

may be planted in irrigated areas during the non-irrigated planting window before the irrigation system is functional with the written concurrence of the Engineer only if the irrigation system is guaranteed to be operational prior to the end of the non-irrigated planting window.

8-02.3(8)B Plant Installation

The Contractor shall handle plant material in the following manner:

1. Root systems shall be kept covered and damp at all times. Plant material shall be kept in containers until the time of planting.

2. Roots shall not be bunched, curled, twisted, or unreasonably bent when placed in the planting hole. Bare root plant material shall be dormant at the time of harvesting and planting. The root systems of all bare root plant material shall be dipped in a slurry immediately prior to planting.

3. Plant material supplied in wrapped balls shall not be removed from the wrapping until the time of planting at the planting location. The root system of balled plant material shall be moist at the time of planting. Root balls shall be loosened prior to planting. All burlap, baskets, string, wire and other such materials shall be removed from the hole when planting balled plants.

4. Plant cutting material shall be dormant at the time of cutting and planting. All cuttings shall be installed immediately if buds begin to swell.

5. Plants shall be placed with the crown at the finished grade. In their final position, plants shall have their top true root (not adventitious root) no more than 1 inch below the soil surface, no matter where that root was located in the original root ball or container. The backfill material, including container and root ball soil, shall be thoroughly watered on the same day that planting occurs regardless of season.

When installing plants, the Contractor shall dig planting holes three times the diameter of the container or root ball size. Any glazed surface of the planting hole shall be roughened prior to planting.

8-02.3(8)C Pruning, Staking, Guying, and Wrapping

Plants shall be pruned at the time of planting, only to remove minor broken or damaged twigs, branches or roots. Pruning shall be performed with a sharp tool and shall be done in such a manner as to retain or to encourage natural growth characteristics of the plants. All other pruning shall be performed only after the plants have been in the ground at least 1 year and when plants are dormant.

Trees shall only be staked when so noted in the Plans. Each tree shall be staked or guyed before completion of the backfilling in accordance with the details shown in the Plans.

Trees shall be wrapped when so noted in the Plans.

8-02.3(9) Seeding, Fertilizing, and Mulching

For all seed, the Contractor shall furnish the following documentation to the Engineer:

1. The state or provincial seed dealer license and endorsements.

2. Copies of Washington State Department of Agriculture (WSDA) test results on each lot of seed. Test results shall be within six months prior to the date of application.

8-02.3(9)A Dates for Application of Seed

Unless otherwise allowed by the Engineer, the Contractor shall apply seed for permanent erosion control during the following periods:

Western Washington[1] (West of the Cascade Mountain Crest)	Eastern Washington (East of the Cascade Mountain Crest)
March 1 through May 15 September 1 through October 1	October 1 through November 15
[1]Seeding may be allowed outside these dates when allowed by the Engineer.	

All roadway excavation and embankment ground surfaces that are completed to final grades shall be prepared and seeded during the first available seeding window. When environmental conditions are not conducive to satisfactory results, the Engineer may suspend the seeding Work until such time that the desired results are likely to be obtained. If seeding is suspended, temporary erosion control methods according to Section 8-01 shall be used to protect the bare soil until seeding conditions improve.

8-02.3(9)B Seeding and Fertilizing

The Contractor shall prepare the seeding area in accordance with Section 8-02.3(5)A and apply seed at the rate and mix specified in the Special Provisions. The Contractor shall notify the Engineer within 5 days in advance of any seeding operation and shall not begin the Work until areas prepared or designated for seeding have been accepted. Following the Engineer's acceptance, seeding of the accepted ground surfaces shall begin immediately.

Seeding shall not be done during windy weather or when the ground is frozen, or excessively wet.

When seeding by hand, the seed shall be incorporated into the top ¼ inch of soil by hand raking or other method that is allowed by the Engineer.

Seed applied as a separate operation using a hydroseeder shall have a tracer added to visibly aid uniform application. The tracer shall be HECP Short-Term Mulch applied at a rate of 200 to 250 pounds per acre and the tracer shall carry the measured specified seeding rate.

8-02.3(9)C Seeding with Fertilizers and Mulches

When the Proposal includes any variation of seeding, fertilizing, and without mulching, the seed and fertilizer shall be applied in one application followed by

mulching. West of the Cascade Mountains, seed, fertilizer, and mulch may be completely applied in one application. East of the Cascades, seeding, fertilizing, and mulching shall not be applied as a single application unless allowed by the Engineer in writing prior to application. The fertilizing and mulching shall meet the requirements of Sections 8-02.3(6) and 8-02.3(11).

8-02.3(9)D Inspection

Seeded areas will be inspected upon completion of seeding, fertilizing, and mulching. The Work in any area will not be measured for payment until a uniform distribution of the materials is accomplished at the specified rate. Areas that have not received a uniform application of seed, fertilizer, and mulch at the specified rate, as determined by the Engineer, shall be re-seeded, re-fertilized, or re-mulched prior to payment for seeding within a designated area.

8-02.3(9)E Protection and Care of Seeded Areas

The Contractor shall install and establish a stable and weed free stand of grass as specified within all designated permanent seeding areas. A stable stand of grass shall meet the following requirements:

1. A dense and uniform canopy cover, 70% for Western Washington and 50% for Eastern Washington, of specified species covers all seeded areas after 3 months of active growth following germination during the growing season. Canopy cover is defined as the cover of living and vigorous grass blades, leaves, and shoots of specified species. Volunteer species, weeds, woody plants, or other undesirable vegetation shall not factor into the canopy cover. Growth and establishment may require supplemental irrigation to meet cover requirements.

2. Stand health is evident by vigorously growing planted species having a uniform rich-green appearance and with no dead patches or major gaps of growth. A stand of grass that displays rusting, wilting, stunted growth, disease, yellowing or browning of leaves, or bare patches does not meet the stand health requirement.

3. The Contractor shall establish a stable stand of grass free of all weeds, non-specified grasses, and other undesirable vegetation. Weed control shall be in accordance with the Weed and Pest Control Plan and occur on a monthly basis during the establishment period and through the life of the Contract.

4. Remove all trash, rocks, construction debris, and other obstructions that may be detrimental to the continued establishment of future seeding.

In addition to the requirements of Section 1-07.13(1), restoration of eroded areas including clean up, removal, and proper disposal of eroded material, filling and raking of eroded areas with Topsoil Type A or fine compost, and re-application of the specified seed, fertilizer, and mulch shall occur at no additional cost to the Contracting Agency.

8-02.3(10) Lawn Installation

8-02.3(10)A Dates and Conditions for Lawn Installation

In irrigated areas, lawn installation shall not begin until the irrigation system is fully operational.

Unless otherwise allowed by the Engineer, seeded lawn installation shall be performed during the following time periods at the location shown:

Western Washington (West of the Cascade Mountain Crest)	Eastern Washington (East of the Cascade Mountain Crest)
March 1 through May 15 September 1 through October 1	October 1 through November 15
When irrigation system is operational March 1 through October 1	When irrigation system is operational March 1 through November 1

8-02.3(10)B Lawn Seeding and Sodding

The Contractor shall prepare the lawn area in accordance with Section 8-02.3(5) and apply seed at the mix and rate of application as specified in the Special Provisions.

The Contractor shall have the option of sodding in lieu of seeding for lawn installation at no additional expense to the Contracting Agency. Seeding in lieu of sodding will not be allowed.

Seed placed by hand shall be raked into the soil. Following raking, the seeded soil shall be rolled with a smooth 50-pound roller. Sod strips shall be placed within 48 hours of being cut. Placement shall be without voids and have the end joints staggered. Following placement, the sod shall be rolled with a smooth roller to establish contact with the soil.

Barriers shall be erected, with warning signs where necessary, to preclude pedestrian traffic access to the newly placed lawn during the establishment period.

8-02.3(10)C Lawn Establishment

Lawn establishment shall consist of caring for all new lawn areas within the limits of the project.

The lawn establishment period shall begin immediately after the lawn seeding or sodding has been accepted by the Engineer and shall extend to the end of four mowings or 20 working days whichever is longer. The mowings shall be done in accordance with Section 8-02.3(10)D.

During the lawn establishment period, the Contractor shall ensure the continuing healthy growth of the turf. This care shall include keeping the project in a presentable condition including, but not limited to, removal of litter, mowing, trimming, removal of grass clippings, edging, fertilization, insecticide and fungicide applications, weed control, watering, repairing the irrigation system, and repair and reseeding all damaged areas.

Temporary barriers shall be removed only when directed by the Engineer.

All Work performed under lawn establishment shall comply with established turf management practices.

Acceptance of lawn planting as specified will be based on a uniform stand of grass and a uniform grade at the time of final inspection. The Contractor shall recultivate, re-grade, reseed, and refertilize areas that are bare or have a poor stand of grass or not having a uniform grade through any cause before final inspection at no additional cost to the Contracting Agency.

8-02.3(10)D Lawn Mowing

Lawn mowing shall begin immediately after the lawn establishment period has been accepted by the Engineer and shall extend to the end of the Contract or the first-year plant establishment, whichever is last.

The Contractor shall accomplish the following minimum requirements:

1. Mow, trim, and edge as often as conditions dictate, at a minimum, once per week between April and September. Maximum height of lawn shall not exceed 3 inches. The cutting height shall be 2 inches. Cuttings, trimmings, and edgings shall be disposed of off the project site. When the Engineer allows the use of a mulching mower, trimmings may be left in place.

2. Water as often as conditions dictate depending on weather and soil conditions.

3. Provide fertilizer, weed control, water, and other measures as necessary to establish and maintain a healthy stand of grass.

8-02.3(11) Mulch

Mulches associated with seeding and planting shall be of the type specified in the Special Provisions or as indicated in the Plans. The Contractor shall evenly apply mulch at the rates indicated in the Plans. Mulches shall not be placed below the anticipated water level of ditch slopes, pond bank slopes, and stream banks, or in areas of standing or flowing water.

8-02.3(11)A Mulch for Seeding Areas

The Contractor shall furnish and evenly apply Hydraulically Applied Erosion Control Product (HECP) Long Term Mulch at the rates indicated and in accordance with the Manufacturer's specifications unless otherwise specified.

HECP Long Term Mulch shall be hydraulically applied at the rate of 3500 pounds per acre with no more than 2000 pounds applied in any single lift. HECP mulch shall not be used within the Ordinary High Water Mark.

Mulch sprayed on signs or sign Structures shall be removed the same day.

Areas not accessible by mulching equipment shall be mulched by accepted hand methods.

HECP Long Term Mulch may be applied with seed and fertilizer west of the summit of the Cascade Range. East of the summit of the Cascade Range, seed and fertilizer shall be applied in a single application followed by the application of mulch.

8-02.3(11)B Bark or Woodchip Mulch

The Contractor shall apply bark or wood chip mulch of the type and depth specified where shown in the Plans or as specified in the Special Provisions.

The Contractor shall complete final grading and placement/incorporation of soil amendments within the planting area prior to placement of mulch. Areas receiving bark mulch shall be bare soil or vegetation free before application, except where trees and other plants are specifically identified in the Plans or designated by the Engineer to be saved and protected.

Bark or wood chip mulch shall be placed to a uniform non-compacted depth of 3 inches over all planting areas unless otherwise specified. Mulch shall be feathered to the base of the plant and 1 inch below the top of junction and valve boxes, curbs, and pavement edges.

Any contamination of the mulch due to the Contractor's operations shall be corrected to its former condition at no additional cost to the Contracting Agency. Mulch placed to a thickness greater than specified shall be at no additional cost to the Contracting Agency.

The Contractor shall keep plant material crowns, runners, and branches free of mulch at all times.

8-02.3(11)C Bark or Woodchip Mulch Rings

The Contractor shall apply mulch rings around plants installed within existing vegetation areas or within seeded areas as shown in the Plans. Bark or wood chip mulch rings shall be applied to the surface of vegetation free amended soil in the isolated plant locations where shown in the Plans or as specified in the Special Provisions. Bark or wood chip mulch shall be placed to a uniform non-compacted depth of 3 inches to a radius of 2 feet around all plants within interplanted plant locations.

8-02.3(12) Completion of Initial Planting

Upon completion of the initial planting within a designated area, the Engineer will make an inspection of all planting areas. The Engineer will notify the Contractor, in writing, of any replacements or corrective action necessary to meet the plant installation requirements. The Contractor shall replace all plants and associated materials rejected or missing and correct unsatisfactory conditions.

Completion of the initial planting within a designated area includes the following conditions:

1. 100 percent of each of the plant material categories are installed as shown in the Plans.

2. Planting Area is cleaned up.

3. Repairs are completed, including but not limited to, full operation of the irrigation system.

4. Mulch coverage is complete.

5. All weeds are controlled.

8-02.3(13) Plant Establishment

Plant establishment consists of caring for all plants and planting areas within the project limits. The provisions of Sections 1-07.13(2) and 1-07.13(3) do not apply to this Section.

When the Proposal includes the bid item PSIPE____ (Plant Selection Including Plant Establishment), that bid item includes one year of plant establishment Work. The first year of plant establishment shall begin immediately upon written notification from the Engineer of the completion of initial planting for the project. The first-year plant establishment period shall be a minimum of one calendar year. The one calendar year shall be extended an amount equal to any periods where the Contractor does not comply with the plant establishment requirements and plan.

During the first-year plant establishment period, the Contractor shall perform all Work necessary to ensure the resumption and continued growth of the transplanted material. This Work shall include, but is not limited to, applying water, removing foreign, dead, or rejected plant material, maintaining all planting areas in a weed-free condition, and replacing all unsatisfactory plant material planted under the Contract. If plants are stolen or damaged by the acts of others, the Contracting Agency will pay invoice cost only for the replacement plants with no mark-up and the Contractor will be responsible for the labor to install the replacement plants. Other weed control within the project limits but outside of planting, lawn, or seeding areas shall be as specified in Section 8-02.3(3)C.

During the first year of plant establishment, the Contractor shall meet monthly or at an agreed upon schedule with the Engineer for the purpose of joint inspection of the planting material. The Contractor shall correct all unsatisfactory conditions identified by the Engineer within a 10-day period immediately following the inspection. If plant replacement is required, the Contractor shall, within the 10-day period, submit a plan and schedule for the plant procurement and replacement to occur during the planting period as designated in Section 8-02.3(8). At the end of the plant establishment period, plants that do not show normal growth shall be replaced and all staking and guying that remain on the project shall be removed unless otherwise allowed by the Engineer.

All automatic irrigation systems shall be operated fully automatic during the plant establishment period and until final acceptance of the Contract. Payment for water used to water in plants, or hand watering of plant material or lawn areas unless otherwise specified, is the responsibility of the Contractor during the first-year plant establishment period.

Subsequent year plant establishment periods shall begin immediately at the completion of the preceding year's plant establishment period. Each subsequent plant establishment period shall be one full calendar year in duration.

During the plant establishment period(s) after the first year plant establishment, the Work necessary for the continued healthy and vigorous growth of all plants material shall be performed as directed by the Engineer.

Payment for water used to water plants during the subsequent year(s) of plant establishment will be paid under the plant establishment item.

8-02.3(14) Plant Replacement

The Contractor shall be responsible for growing or arrange to provide sufficient plants for replacement of all plant material rejected through first-year plant establishment. All replacement plant material shall be inspected and accepted by the Engineer prior to installation. All rejected plant material shall be replaced with acceptable plants meeting the specifications and installed according to the requirements of this Section at dates allowed by the Engineer.

All replacement plants shall be of the same species as the plants they replace and meet the requirements of Section 9-14.8 unless otherwise allowed by the Engineer. Plants may vary in size reflecting one season of growth should the Contractor elect to hold plant material under nursery conditions for an additional year to serve as replacement plants. Replacement plant material larger than specified in the Plans shall meet the applicable section requirements of the ASNS for container class, ball size, spread, and branching characteristics.

8-02.3(15) Bioengineering

Bioengineering consists of using plant materials for the purpose of streambank or earthen slope construction and surface stabilization. This Work may include installing woody plant cuttings in various forms as well as part of streambank or earthen slope construction.

8-02.3(15)A Fascines

Live fascines shall be constructed of live and dead cuttings bundled together with a diameter of 8 to 18 inches. Live cuttings shall be the species shown in the Plans. Dead branches may be cuttings from any woody, non-invasive plant native to the project area. Dead branches may be placed within the live fascine and on the side exposed to the air. Live branches shall be placed in contact with the soil along their entire length. Each live fascine must contain a minimum of eight live branches. Dead branches shall constitute no more than 40 percent of the total fascine content.

The total length of each live fascine shall be a minimum of 5 feet. Branches shall be bundled into log-like forms and bound with biodegradable twine spaced at 1-foot intervals along the entire length of the live fascine. Live fascines shall be installed horizontally in a trench whose depth shall be ½ the diameter of the live fascine. Secure the live fascine with live stakes 3 feet in length and ¾ inch in diameter placed at 18-inch intervals. A minimum of three live stakes shall be used per fascine. The live stakes shall be driven through the live fascine vertically into

the slope. The ends of live fascines shall be woven together so that no gap remains between the two sections of the live fascine.

Prior to being covered with soil, the fascine shall be thoroughly watered. Once the fascine is covered with 6 inches of soil, the soil covering the fascine shall be thoroughly watered.

When used to remedy erosion areas, live fascines shall extend a minimum of two feet beyond the visible area of erosion and soil disturbance. The locations for live fascines and live stake rows shall be identified in the field for review and acceptance by the Engineer. The Engineer may require adjustment of fascine locations prior to installation in order to best accomplish the intended functions.

Plant replacement during plant establishment for "PSIPE Live Fascine" will be required for any section void of live shoots for a length of 3 feet or more. Replacement shall consist of installing live stakes, spaced 1 foot apart above the fascine within the area void of live shoots. Live stakes shall be of the same species as the live fascine and shall have a minimum length of 3 feet and a minimum diameter of ¾ inch. The requirements of Section 8-02.3(8) apply to PSIPE Live Fascine.

8-02.3(15)B Brush Mattress

Live brush mattress shall be constructed of live branch cuttings, live poles, jute rope and topsoil. The live cuttings and live poles shall be from the plant species designated in the Plans. Live branch cuttings shall be placed with the cut ends oriented down slope as shown in the Plans. Cuttings shall overlap from side to side and from top to bottom as each layer is constructed. The live branches in each succeeding upper layer shall overlap the adjacent lower layer by a minimum of 6 inches. A maximum of 20 percent of the branches may be dead branches, but the live branches shall be distributed evenly to provide even rooting and growth over the entire area of the brush mattress.

The Contractor shall anchor the live brush mattress to the slope using stakes and jute rope as shown in the Plans. Initially, the stakes shall be installed to protrude above the live brush mattress. The Contractor shall attach the jute rope to the stakes and tighten the rope by tamping the stakes further into the bank, pulling the live brush mattress tight against the soil surface. The Contractor shall cover the live brush mattress with sufficient stockpiled topsoil to ensure good soil contact with the live plant material.

Plant replacement during plant establishment for "PSIPE Live Brush Mattress" will be required for any section void of live shoots for an area of 25 square feet or more. Replacement shall consist of installing live stakes, spaced 3 feet apart in a triangular pattern within the area void of live shoots. Live stakes shall be of the same species as the live brush mattress and shall have a minimum length of 3 feet and a minimum diameter of ¾ inch. The requirements of Section 8-02.3(8) apply to PSIPE Brush Mattress.

8-02.3(15)C Brush Layer

Brush layers shall be constructed of live branch cuttings, randomly mixed, from the plant species listed under the brush layer heading in the Plans. The number

of branches required will vary depending on the average branch diameter and layer thickness.

Brush layers shall be placed in a trench dug at a 45 degree incline into the slope or stream bank. Two-thirds to three-fourths of the length of the live branches shall be buried. Soil shall be firmly tamped in place. Succeeding layers shall be spaced as detailed in the Plans. Brush layer placed in stream banks shall be angled downstream.

Brush layers may include plant establishment when designated as PSIPE Brush Layer. Plant replacement for PSIPE Brush Layer will be required for each section void of live shoots for a continuous distance of 3 feet or more. The requirements of Section 8-02.3(8) apply to PSIPE Brush Layer.

8-02.3(16) Roadside Maintenance Under Construction

When the Contract includes the item, Roadside Maintenance Under Construction, this Work includes roadside mowing and ditch maintenance, and noxious weed control outside of planting areas according to Section 8-02.3(3)C.

8-02.3(16)A Roadside Mowing

The Contractor shall mow designated roadside grass areas to the limits designated by the Engineer. Roadside mowing is limited to slopes not steeper than 3(H) to 1(V).

The Contractor shall mow according to the following requirements:

1. Trim around traffic equipment, structures, planting areas, or other features extending above ground preceding or simultaneously with each mowing.

2. Maintain grass between 4 and 12 inches in height.

3. Operate mowing equipment with suitable guards to prevent throwing rocks or debris onto the traveled way or off of the Contracting Agency property. Power driven equipment shall not cause ruts, deformation, and compaction of the vegetated soil.

4. Removing clippings is required on the traveled way, shoulders, walkways, or Structures.

5. Restore soil rutting to a smooth and even grade at the direction of the Engineer.

8-02.3(16)B Ditch Maintenance

The Contractor shall maintain drainage for the duration of the Contract according to the following requirements:

1. Maintain flow lines in drainage channels and roadside ditches.

2. Cutting or trimming vegetation within drainage channels to maintain positive flow.

3. Remove dirt and debris from inside of culverts or any drainage area where runoff has allowed accumulations and re-seed for erosion control.

4. Restore channels to previous operational condition.

8-02.4 Measurement

Topsoil, bark or woodchip mulch and soil amendments will be measured by the acre or the square yard along the grade and slope of the area covered immediately after placement. Weed control pre-treatment of topsoil areas, excavation, and stockpiling are included in the bid item "Topsoil Type ___.

Bark or woodchip mulch rings will be measured per each.

Compost will be measured by the acre or the square yard along the grade and slope of the area covered immediately after application.

Seeding, fertilizing, and mulching will be measured by the acre or the square yard by ground slope measurement or through the use of design data.

Seeding and fertilizing by hand will be measured by the square yard. No adjustment in area size will be made for the vegetation free zone around each plant.

Seeded lawn, sod installation, and lawn mowing will be measured along the ground slope and computed in square yards of actual lawn completed, established, and accepted.

Plant selection will be measured per each.

PSIPE __ (Plant Selection Including Plant Establishment) will be measured per each.

Live Pole will be measured per each.

Live Stake Row will be measured by the linear foot along the ground slope line.

The pay quantities for plant materials will be determined by count of the number of satisfactory plants in each category accepted by the Engineer.

Fascine and PSIPE live fascine will be measured by the linear foot along the ground slope line.

Brush mattress and PSIPE live brush mattress will be measured by the surface square yard along the ground slope line.

Brush layer and PSIPE brush layer will be measured by the linear foot along the ground slope line.

Water will be measured in accordance with Section 2-07.4. Measurement will be made of only that water hauled in tank trucks or similar equipment.

8-02.5 Payment

Payment will be made for each of the following listed Bid items that are included in the Proposal:

"Project Area Weed and Pest Control" will be paid in accordance with Section 1-09.6. For the purpose of providing a common Proposal for all Bidders, the Contracting Agency entered an amount for "Project Area Weed and Pest Control" in the Proposal to become a part of the total Bid by the Contractor. Payment under this item will be made only when the Work is not already covered by other items.

"Topsoil Type ____", per acre.
The unit Contract price per acre for "Topsoil Type ____" shall be full payment for all costs for the specified Work.

"Fine Compost ", per acre or per square yard.
"Medium Compost", per acre or per square yard.
"Coarse Compost", per acre or per square yard.
The unit Contract price per acre for "Fine Compost", "Medium Compost" or "Coarse Compost" shall be full pay for furnishing and spreading the compost onto the existing soil.

"Soil Amendment", per acre.
The unit Contract price per acre for "Soil Amendment" shall be full pay for furnishing and incorporating the soil amendment into the existing soil.

"Plant Selection ___", per each.
The unit Contract price for "Plant Selection ___", per each shall be full pay for all Work to perform the work as specified within the planting area prior to planting for weed control, planting area preparation and installation of plants with initial watering.

As the plants that do not include plant establishment are obtained, propagated, and grown, partial payments will be made as follows:

Payment of 15 percent of the unit Contract price per each when the plant materials have been contracted, propagated, and are growing under nursery conditions. The Contractor shall provide the Engineer with certification that the plant material has been procured or contracted for delivery to the project for planting within the time limits of the project. The certification shall state the location, quantity, and size of all material.

Payment will be increased to 100 percent of the unit Contract price per each for contracted plant material at the completion of the initial planting.

All partial payments shall be limited to the actual number of healthy vigorous plants that meet the stage requirements, limited to plan quantity. Previous partial payments made for materials rejected or missing will be deducted from future payments due the Contractor.

"PSIPE ___", per each.
The unit Contract price for "PSIPE ___", per each, shall be full pay for all Work necessary to perform as specified within the planting area for weed control and

planting area preparation, planting, cleanup, and water necessary to complete planting operations as specified to the end of first year plant establishment.

As the plants that include plant establishment are obtained, propagated, and grown, partial payments will be made as follows after inspection by the Engineer:

Payment of 5 percent of the unit Contract price, per each, when the plant materials have been contracted, propagated, and are growing under nursery conditions. The Contractor shall provide the Engineer with certification that the plant material has been procured or contracted for delivery to the project for planting within the time limits of the project. The certification shall state the location, quantity, and size of all material.

Payment will be increased to 15 percent of the unit Contract price, per each, upon completion of the initial weed control and planting area preparation Work.

Payment will be increased to 60 percent of the unit Contract price per each for the contracted plant material in a designated unit area when planted.

Payment will be increased to 70 percent of the unit Contract price per each for contracted plant material at the completion of the initial planting.

Payment will be increased to the appropriate percentage upon reaching the following plant establishment milestones:

June 30th	80 percent
September 30th	90 percent
Completion of first-year plant establishment or after all replacement plants have been installed, whichever is later.	100 percent

Plant establishment milestones are achieved when planting areas meet conditions described in Section 8-02.3(13).

“Seeding, Fertilizing and Mulching”, per acre.

“Seeding and Fertilizing”, per acre or per square yard.

“Seeding and Fertilizing by Hand”, per square yard.

“Second Application of Fertilizer”, per acre.

“Seeding and Mulching”, per acre.

“Seeded Lawn Installation”, per square yard.
“Sod Installation”, per square yard.
“Lawn Mowing”, per square yard.
The unit Contract price per square yard for “Seeded Lawn Installation” or “Sod Installation” shall be full pay for all costs necessary to prepare the area, plant or sod

the lawn, erect barriers, control weeds, and establish lawn areas and for furnishing all labor, tools, equipment, and materials necessary to complete the Work as specified and shall be paid in the following sequence for healthy, vigorous lawn:

Completion of Lawn Planting	60 percent of individual areas
Mid Lawn Establishment (after two mowings)	85 percent of individual areas
Completion of Lawn Establishment (after four mowings)	100 percent of individual areas

"Plant Establishment Year ____" will be paid in accordance with Section 1-09.6.
For the purpose of providing a common Proposal for all Bidders, the Contracting Agency entered an amount for "Plant Establishment - ___ Year" in the Proposal to become a part of the total Bid by the Contractor.

"Live Pole", per each.

"Live Stake Row", per linear foot.

"Bark or Wood Chip Mulch", per acre.

"Bark or Wood Chip Mulch Rings", per each.
The unit Contract price per acre for "Bark or Wood Chip Mulch" shall be full pay for furnishing and spreading the mulch onto the existing soil.

"Fascine" and "PSIPE Live Fascine", per linear foot.
"Brush Mattress" and "PSIPE Live Brush Mattress", per square yard.
"Brush Layer" and "PSIPE Brush Layer", per linear foot.
When PSIPE is included with Fascine, Brush Mattress, or Brush Layer, the payment schedule for PSIPE ____ will apply.

"Roadside Maintenance under Construction" will be paid in accordance with Section 1-09.6.
For the purpose of providing a common Proposal for all Bidders, the Contracting Agency has entered an amount for "Roadside Maintenance Under Construction" in the Proposal to become a part of the total Bid by the Contractor.

"Water", per M Gal.

8-04.AP8

Section 8-04, Curbs, Gutters, and Spillways
April 2, 2018

8-04.2 Materials

In the first paragraph, the reference to "Portland Cement" is revised to read:

Cement	9-01

8-04.3(1) Cement Concrete Curbs, Gutters, and Spillways

The first paragraph is supplemented with the following:

Roundabout truck apron cement concrete curb and gutter shall be constructed with air entrained concrete Class 4000 conforming to the requirements of Section 6-02.

8-06.AP8

Section 8-06, Cement Concrete Driveway Entrances
April 2, 2018

8-06.2 Materials

In the first paragraph, the reference to "Portland Cement" is revised to read:

Cement 9-01

8-06.3 Construction Requirements

The first paragraph is revised to read:

Cement concrete driveway approaches shall be constructed with air entrained concrete Class 4000 conforming to the requirements of Section 6-02 or Portland Cement or Blended Hydraulic Cement Concrete Pavement conforming to the requirements of Section 5-05.

8-07.AP8

Section 8-07, Precast Traffic Curb
April 2, 2018

8-07.3(1) Installing Curbs

The first sentence of the first paragraph is revised to read:

The curb shall be firmly bedded for its entire length and breadth on a mortar bed conforming to Section 9-20.4(3) composed of one part Portland cement or blended hydraulic cement and two parts sand.

The fourth paragraph is revised to read:

All joints between adjacent pieces of curb except joints for expansion and/or drainage as designated by the Engineer shall be filled with mortar composed of one part Portland cement or blended hydraulic cement and two parts sand.

8-09.AP8

Section 8-09, Raised Pavement Markers
April 1, 2019

8-09.5 Payment

The last paragraph is revised to read:

The unit Contract price per hundred for "Raised Pavement Marker Type 1", "Raised Pavement Marker Type 2", "Raised Pavement Marker Type 3_____ In.", and "Recessed Pavement Marker" shall be full pay for furnishing and installing the markers in accordance with these Specifications.

8-11.AP8

Section 8-11, Guardrail
April 1, 2019

8-11.3(1)A Erection of Posts

The first sentence of the first paragraph is revised to read:

> Posts shall be set to the true line and grade of the Highway after the grade is in place and compaction is completed.

8-11.3(1)C Terminal and Anchor Installation

The first paragraph is revised to read:

> All excavation and backfilling required for installation of anchors shall be performed in accordance with Section 2-09, except that the costs thereof shall be included in the unit Contract price for the anchor installed.

The first sentence of the second to last paragraph is revised to read:

> Assembly and installation of Beam Guardrail Non-flared Terminals for Type 31 guardrail shall be supervised at all times by a manufacturer's representative, or an installer who has been trained and certified by the manufacturer.

The last paragraph is revised to read:

> Beam Guardrail Non-flared Terminals for Type 31 guardrail shall meet the crash test and evaluation criteria in the Manual for Assessing Safety Hardware (MASH).

8-11.4 Measurement

The third paragraph is revised to read:

> Measurement of beam guardrail _____ terminal will be per each for the completed terminal.

The fourth paragraph is revised to read:

> Measurement of beam guardrail Type 31 buried terminal Type 2 will be per linear foot for the completed terminal.

The sixth paragraph is revised to read:

> Measurement of beam guardrail anchor Type 10 will be per each for the completed anchor, including the attachment of the anchor to the guardrail.

8-11.5 Payment

The Bid item "Beam Guardrail Anchor Type ___", per each is revised to read "Beam Guardrail Anchor Type 10", per each.

The Bid item "Beam Guardrail Buried Terminal Type 1", per each is deleted from this section.

The Bid item "Beam Guardrail Buried Terminal Type 2", per linear foot and the following paragraph are revised to read:

"Beam Guardrail Type 31 Buried Terminal Type 2", per linear foot.

The unit Contract price per linear foot for "Beam Guardrail Type 31 Buried Terminal Type 2" shall be full payment for all costs to obtain and provide materials and perform the Work as described in Section 8-11.3(1)C.

8-14.AP8

Section 8-14, Cement Concrete Sidewalks
April 2, 2018

8-14.2 Materials

In the first paragraph, the reference to "Portland Cement" is revised to read:

Cement	9-01

In the second paragraph, each reference to "Federal Standard 595" is revised to read "SAE AMS Standard 595".

8-16.AP8

Section 8-16, Concrete Slope Protection
April 2, 2018

8-16.2 Materials

In the first paragraph, the last two material references are revised to read:

Poured Portland Cement or Blended Hydraulic Cement Concrete Slope Protection	9-13.5(2)
Pneumatically Placed Portland Cement or Blended Hydraulic Cement Concrete Slope Protection	9-13.5(3)

8-17.AP8

Section 8-17, Impact Attenuator Systems
January 7, 2019

8-17.3 Construction Requirements

This section is supplemented with the following:

Permanent impact attenuators shall meet the crash test and evaluation criteria of the Manual for Assessing Safety Hardware (MASH), except as otherwise noted in the Plans or Special Provisions.

8-20.AP8

Section 8-20, Illumination, Traffic Signal Systems, Intelligent Transportation Systems, and Electrical
August 6, 2018

8-20.1(1) Regulations and Code

The last paragraph is revised to read:

> Persons performing electrical Work shall be certified in accordance with and supervised as required by RCW 19.28.161. Proof of certification shall be worn at all times in accordance with WAC 296-46B-942. Persons failing to meet these certification requirements may not perform any electrical work, and shall stop any active electrical work, until their certification is provided and worn in accordance with this Section.

8-20.2(2) Equipment List and Drawings

This section is renumbered:

> **8-20.2(1) Equipment List and Drawings**

8-20.3(4) Foundations

The second sentence of the first paragraph is revised to read:

> Concrete for Type II, III, IV, V, and CCTV signal standards and light standard foundations shall be Class 4000P and does not require air entrainment.

8-20.3(5)A General

The last two sentences of the last paragraph is deleted.

This section is supplemented with the following:

> All conduits shall include a pull tape with the equipment grounding conductor. The pull tape shall be attached to the conduit near the end bell or grounded end bushing, or to duct plugs or caps if present, at both ends of the conduit.

8-20.3(8) Wiring

The seventeenth paragraph is supplemented with the following:

> Pulling tape shall meet the requirements of Section 9-29.1(10). Pull string may not be used.

8-20.3(14)C Induction Loop Vehicle Detectors

Item number 2 is deleted.

Item numbers 3 through 12 are renumbered to 2 through 11, respectively.

8-21.AP8

Section 8-21, Permanent Signing
January 7 2019

8-21.3(5) Sign Relocation

The second sentence of the first paragraph is revised to read:

Where the existing sign Structure is mounted on concrete pedestals, the Contractor shall remove the pedestal to a minimum of 2 feet below finished grade and backfill the remaining hole with material similar to that surrounding the hole.

8-21.3(9)F Foundations

Item number 3 of the twelfth paragraph is supplemented with the following new sentence:

Class 4000P concrete for roadside sign structures does not require air entrainment.

8-22.AP8

Section 8-22, Pavement Marking
January 7, 2019

8-22.3(2) Preparation of Roadway Surfaces

The second paragraph is revised to read:

Remove all other contaminants from pavement surfaces that may adversely affect the installation of new pavement marking.

8-22.3(3)F Application Thickness

The second to last sentence of the last paragraph is revised to read:

After grinding, clean the groove.

9-00.AP9

Section 9-00, Definitions and Tests
January 7, 2019

9-00.4 Sieves for Testing Purposes

This section is revised to read:

Test sieves shall be made of either: (1) woven wire cloth conforming to ASTM E11, or (2) square-hole, perforated plates conforming to ASTM E323.

9-00.7 Galvanized Hardware, AASHTO M 232

The first sentence is revised to read:

An acceptable alternate to hot-dip galvanizing in accordance with AASHTO M 232 will be zinc coatings mechanically deposited in accordance with ASTM B695, providing the minimum thickness of zinc coating is not less than that specified in AASHTO M 232, and the process will not produce hydrogen embrittlement in the base metal.

9-02.AP9

Section 9-02, Bituminous Materials
January 7, 2019

9-02.1 Asphalt Material, General

The second paragraph is revised to read:

The Asphalt Supplier of Performance Graded (PG) asphalt binder and emulsified asphalt shall have a Quality Control Plan (QCP) in accordance with WSDOT QC 2 "Standard Practice for Asphalt Suppliers That Certify Performance Graded and Emulsified Asphalts". The Asphalt Supplier's QCP shall be submitted and receive the acceptance of the WSDOT State Materials Laboratory. Once accepted, any change to the QCP will require a new QCP to be submitted for acceptance. The Asphalt Supplier of PG asphalt binder and emulsified asphalt shall certify through the Bill of Lading that the PG asphalt binder or emulsified asphalt meets the Specification requirements of the Contract.

9-02.1(4) Performance Graded Asphalt Binder (PGAB)

This section's title is revised to read:

Performance Graded (PG) Asphalt Binder

The first paragraph is revised to read:

PG asphalt binder meeting the requirements of AASHTO M 332 Table 1 of the grades specified in the Contract shall be used in the production of HMA. For HMA with greater than 20 percent RAP by total weight of HMA, or any amount of RAS, the new asphalt binder, recycling agent and recovered asphalt (RAP and/or RAS) when blended in the proportions of the mix design shall meet the PG asphalt binder requirements of AASHTO M 332 Table 1 for the grade of asphalt binder specified by the Contract.

The second paragraph, including the table, is revised to read:

In addition to AASHTO M 332 Table 1 specification requirements, PG asphalt binders shall meet the following requirements:

		Additional Requirements by Performance Grade (PG) Asphalt Binders					
Property	**Test Method**	**PG58S-22**	**PG58H-22**	**PG58V-22**	**PG64S-28**	**PG64H-28**	**PG64V-28**
RTFO Residue: Average Percent Recovery @ 3.2 kPa	AASHTO T 350[1]			30% Min.	20% Min.	25% Min.	30% Min.
[1]Specimen conditioned in accordance with AASHTO T 240 – RTFO.							

The third paragraph is revised to read:

The RTFO J_{nrdiff} and the PAV direct tension specifications of AASHTO M 332 are not required.

9-02.1(6) Cationic Emulsified Asphalt

This section is revised to read:

Cationic Emulsified Asphalt meeting the requirements of AASHTO M 208 Table 1 of the grades specified in the Contract shall be used.

9-02.5 Warm Mix Asphalt (WMA) Additive

This section, including title, is revised to read:

9-02.5 HMA Additive

Additives for HMA shall be accepted by the Engineer.

9-03.AP9

Section 9-03, Aggregates
January 7, 2019

9-03.1 Aggregates for Portland Cement Concrete

This section's title is revised to read:

Aggregates for Concrete

9-03.1(1) General Requirements

The first two sentences of the first paragraph are revised to read:

Concrete aggregates shall be manufactured from ledge rock, talus, or sand and gravel in accordance with the provisions of Section 3-01. Reclaimed aggregate may be used if it complies with the specifications for concrete.

The second paragraph (up until the colon) is revised to read:

Aggregates for concrete shall meet the following test requirements:

The second sentence of the second to last paragraph is revised to read:

The Contractor shall submit test results according to ASTM C1567 through the Engineer to the State Materials Laboratory that demonstrate that the proposed fly ash when used with the proposed aggregates and cement will control the potential expansion to 0.20 percent or less before the fly ash and aggregate sources may be used in concrete.

9-03.1(2) Fine Aggregate for Portland Cement Concrete

This section's title is revised to read:

Fine Aggregate for Concrete

9-03.1(4) Coarse Aggregate for Portland Cement Concrete

This section's title is revised to read:

Coarse Aggregate for Concrete

9-03.1(4)C Grading

The first paragraph (up until the colon) is revised to read:

Coarse aggregate for concrete when separated by means of laboratory sieves shall conform to one or more of the following gradings as called for elsewhere in these Specifications, Special Provisions, or in the Plans:

9-03.1(5) Combined Aggregate Gradation for Portland Cement Concrete

This section's title is revised to read:

Combined Aggregate Gradation for Concrete

9-03.1(5)B Grading

In the last paragraph, "WSDOT FOP for WAQTC/AASHTO T 27/T 11" is revised to read "FOP for WAQTC/AASHTO T 27/T 11".

9-03.2 Aggregate for Job-Mixed Portland Cement Mortar

This section's title is revised to read:

Aggregate for Job-Mixed Portland Cement or Blended Hydraulic Cement Mortar

The first sentence of the first paragraph is revised to read:

Fine aggregate for portland cement or blended hydraulic cement mortar shall consist of sand or other inert materials, or combinations thereof, accepted by the Engineer, having hard, strong, durable particles free from adherent coating.

9-03.4(1) General Requirements

The first paragraph (up until the colon) is revised to read:

Aggregate for bituminous surface treatment shall be manufactured from ledge rock, talus, or gravel, in accordance with Section 3-01. Aggregates for Bituminous Surface Treatment shall meet the following test requirements:

9-03.8(1) General Requirements

The first paragraph (up until the colon) is revised to read:

Aggregates for Hot Mix Asphalt shall meet the following test requirements:

9-03.8(2) HMA Test Requirements

The two tables in the second paragraph are replaced with the following three tables:

Mix Criteria	HMA Class							
	⅜ inch		½ inch		¾ inch		1 inch	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Voids in Mineral Aggregate (VMA), %	15.0		14.0		13.0		12.0	
Voids Filled With Asphalt (VFA), %								
ESAL's (millions)	VFA							
< 0.3	70	80	70	80	70	80	67	80
0.3 to < 3	65	78	65	78	65	78	65	78
≥ 3	73	76	65	75	65	75	65	75
Dust/Asphalt Ratio	0.6	1.6	0.6	1.6	0.6	1.6	0.6	1.6

Test Method	ESAL's (millions)	Number of Passes
Hamburg Wheel-Track Testing, FOP for AASHTO T 324 Minimum Number of Passes with no Stripping Inflection Point and Maximum Rut Depth of 10mm	< 0.3	10,000
	0.3 to < 3	12,500
	≥ 3	15,000
Indirect Tensile (IDT) Strength (psi) of Bituminous Materials FOP for ASTM D6931		175 Maximum

	ESAL's (millions)	N initial	N design	N maximum
% Gmm	< 0.3	≤ 91.5	96.0	≤ 98.0
	0.3 to < 3	≤ 90.5	96.0	≤ 98.0
	≥ 3	≤ 89.0	96.0	≤ 98.0
Gyratory Compaction (number of gyrations)	< 0.3	6	50	75
	0.3 to < 3	7	75	115
	> 3	8	100	160

9-03.8(7) HMA Tolerances and Adjustments

In the table in item number 1, the fifth row is revised to read:

Asphalt binder	-0.4% to 0.5%		±0.7%

In the table in item number 1, the following new row is inserted before the last row:

Voids in Mineral Aggregate, VMA	-1.0%		

9-03.9(1) Ballast

The second paragraph (up until the colon) is revised to read:

Aggregates for ballast shall meet the following test requirements:

9-03.14(4) Gravel Borrow for Structural Earth Wall

The second sentence of the first paragraph is revised to read:

The material shall be substantially free of shale or other soft, poor durability particles, and shall not contain recycled materials, such as glass, shredded tires, concrete rubble, or asphaltic concrete rubble.

9-03.21(1)B Recycled Concrete Aggregate Approval and Acceptance

The first sentence of the second paragraph is revised to read:

Recycled concrete aggregate may be used as coarse aggregate or blended with coarse aggregate for Commercial Concrete, Class 3000 concrete, or Cement Concrete Pavement.

Item number 4 of the second paragraph is revised to read:

4. For Cement Concrete Pavement mix designs using recycled concrete aggregates, the Contractor shall submit evidence that ASR mitigating measures control expansion in accordance with Section 9-03.1(1).

This section is supplemented with the following new subsection:

9-03.21(1)B1 Recycled Concrete Aggregate Approval and Acceptance

Recycled concrete aggregate may be approved through a three tiered system that consists of the following:

Tier 1	
Approval Requirements	Approval of the Reclamation Facility is not required.
Acceptance Requirements	Certification of toxicity characteristics in accordance with Section 9-03.21(1). Field acceptance testing in accordance with Section 3-04.
Approved to provide the following Aggregate Materials:	
9-03.10 Aggregate for Gravel Base 9-03.12(1)B Gravel Backfill for Foundations Class B 9-03.12(2) Gravel Backfill for Walls 9-03.12(3) Gravel Backfill for Pipe Zone Bedding 9-03.14(1) Gravel Borrow 9-03.14(2) Select Borrow 9-03.14(2) Select Borrow (greater than 3 feet below subgrade and side slope) 9-03.14(3) Common Borrow 9-03.14(3) Common Borrow (greater than 3 feet below subgrade and side slope) 9-03.17 Foundation Material Class A and Class B 9-03.18 Foundation Material Class C 9-03.19 Bank Run Gravel for Trench Backfill	

Tier 2	
Approval Requirements	The Reclamation Facility shall have a Quality Control Plan (QCP) in accordance with WSDOT QC 9 "Standard Practice for Approval of Reclamation Facilities of WSDOT Recycled Concrete and Returned Concrete". The Reclamation Facility's QCP shall be submitted and approved by the WSDOT State Materials Laboratory. Once accepted, any changes to the QCP will require a new QCP to be submitted for acceptance. Evaluation of aggregate source properties (LA Wear and Degradation) for the recycled concrete aggregate is not required.
Acceptance Requirements	Certification of toxicity characteristics in accordance with Section 9-03.21(1), required if requested. Field acceptance testing in accordance with Section 3-04 is required. Provide certification in accordance with WSDOT QC 9 for every lot. A lot shall be no larger than 10,000 tons.
Approved to provide the following Aggregate Materials:	
Tier 1 aggregate materials 9-03.1 Coarse Aggregate for Commercial Concrete or Concrete class 3000 9-03.9(1) Ballast 9-03.9(2) Permeable Ballast	

9-03.9(3) Crushed Surfacing 9-03.12(1)A Gravel Backfill for Foundations Class A

Tier 3	
Approval Requirements	The Reclamation Facility shall have a Quality Control Plan (QCP) in accordance with WSDOT QC 10 "Standard Practice for Approval of Reclamation Facilities of Recycled Concrete Aggregates from Stockpiles of Unknown Sources". The Reclamation Facility's QCP shall be submitted and approved by the WSDOT State Materials Laboratory. Once accepted, any changes to the QCP will require a new QCP to be submitted for acceptance. Evaluation of aggregate source properties (LA Wear and Degradation) for the recycled concrete aggregate is required.
Acceptance Requirements	Certification of toxicity characteristics in accordance with Section 9-03.21(1) is required. Field acceptance testing in accordance with Section 3-04 is required. Provide certification in accordance with WSDOT QC 10 for every lot. A lot shall be no larger than 10,000 tons
Approved to provide the following Aggregate Materials:	
Tier 1 aggregate materials 9-03.1 Coarse Aggregate for Commercial Concrete or Concrete class 3000 9-03.9(1) Ballast 9-03.9(2) Permeable Ballast 9-03.9(3) Crushed Surfacing 9-03.12(1)A Gravel Backfill for Foundations Class A	

For Reclamation Facilities that do not participate in Tier 2 and Tier 3, approval of recycled concrete aggregate will be in accordance with Section 9-03.21(1), and acceptance will be in accordance with Section 3-04.

9-03.21(1)E Table on Maximum Allowable percent (By Weight) of Recycled Material

"Portland Cement" is deleted from the first two rows in the table.

The following new row is inserted after the second row:

Coarse Aggregate for Concrete Pavement	9-03.1(4)	0	100	0	0

The first column of the fourth row (after the preceding Amendment is applied) is revised to read:

Coarse Aggregate for Commercial Concrete and Class 3000 Concrete

9-04.AP9

Section 9-04, Joint and Crack Sealing Materials
January 7, 2019

This section's title is revised to read:

Joint Sealing Materials

9-04.1(2) Premolded Joint Filler for Expansion Joints

In this section, each reference to "AASHTO T 42" is revised to read "ASTM D 545".

9-04.2(1)A1 Hot Poured Sealant for Cement Concrete Pavement

This section is supplemented with the following:

Hot poured sealant for cement concrete pavement is acceptable for installations in joints where cement concrete pavement abuts a bituminous pavement.

9-04.2(1)A2 Hot Poured Sealant for Bituminous Pavement

This section is supplemented with the following:

Hot poured sealant for bituminous pavement is acceptable for installations in joints where cement concrete pavement abuts a bituminous pavement.

9-04.2(1)B Sand Slurry for Bituminous Pavement

Item number 2 of the first paragraph is revised to read:

2. Two percent portland cement or blended hydraulic cement, and

9-04.3 Joint Mortar

The first paragraph is revised to read:

Mortar for hand mortared joints shall conform to Section 9-20.4(3) and consist of one part portland cement or blended hydraulic cement, three parts fine sand, and sufficient water to allow proper workability.

9-04.5 Flexible Plastic Gaskets

In the table, the Test Method value for **Specific Gravity at 77°F** is revised to read "ASTM D71".

In the table, the Test Method value for **Flash Point COC, F** is revised to read "ASTM D93 REV A".

In the table, the Test Method value for **Volatile Matter** is revised to read "ASTM D6".

9-05.AP9

Section 9-05, Drainage Structures and Culverts
January 7, 2019

9-05.3(1)A End Design and Joints

The second sentence of the first paragraph is revised to read:

The joints and gasket material shall meet the requirements of ASTM C990.

9-05.3(1)C Age at Shipment

The last sentence of the first paragraph is revised to read:

Unless it is tested and accepted at an earlier age, it shall not be considered ready for shipment sooner than 28 days after manufacture when made with Type II portland cement or blended hydraulic cement, nor sooner than 7 days when made with Type III portland cement.

9-05.7(3) Concrete Storm Sewer Pipe Joints

The second sentence is revised to read:

The joints and gasket material shall meet the requirements of ASTM C990.

9-05.7(4)A Hydrostatic Pressure on Pipes in Straight Alignment

The first sentence is revised to read:

Hydrostatic pressure tests on pipes in straight alignment shall be made in accordance with the procedure outlined in Section 10 of ASTM C990, except that they shall be performed on an assembly consisting of not less than three nor more than five pipe sections selected from stock by the Engineer and assembled in accordance with standard installation instructions issued by the manufacturer.

9-05.24(1) Polypropylene Culvert Pipe and Storm Sewer Pipe

This section is revised to read:

Polypropylene culvert and storm sewer pipe shall conform to the following requirements:

1. For dual wall pipe sizes up to 60 inches: ASTM F2881 or AASHTO M 330, Type S or Type D.

2. For double or triple wall pipe sizes up to 60 inches: ASTM F2764.

3. Fittings shall be factory welded, injection molded, or PVC.

9-05.24(2) Polypropylene Sanitary Sewer Pipe

This section is revised to read:

Polypropylene sanitary sewer pipe shall conform to the following requirements:

1. For pipe sizes up to 60 inches: ASTM F2764.

2. Fittings shall be factory welded, injection molded, or PVC.

9-06.AP9

Section 9-06, Structural Steel and Related Materials
January 7, 2019

9-06.5 Bolts

This section's title is revised to read:

Bolts and Rods

9-06.5(4) Anchor Bolts

This section, including title, is revised to read:

9-06.5(4) Anchor Bolts and Anchor Rods

Anchor bolts and anchor rods shall meet the requirements of ASTM F1554 and, unless otherwise specified, shall be Grade 105 and shall conform to Supplemental Requirements S2, S3, and S4.

Nuts for ASTM F1554 Grade 105 black anchor bolts and anchor rods shall conform to ASTM A563, Grade D or DH. Nuts for ASTM F1554 Grade 105 galvanized anchor bolts and anchor rods shall conform to either ASTM A563, Grade DH, or AASHTO M292, Grade 2H, and shall conform to the overtapping, lubrication, and rotational testing requirements in Section 9-06.5(3). Nuts for ASTM F1554 Grade 36 or 55 black or galvanized anchor bolts and anchor rods shall conform to ASTM A563, Grade A or DH. Washers shall conform to ASTM F436.

The bolts and rods shall be tested by the manufacturer in accordance with the requirements of the pertinent Specification and as specified in these Specifications. Anchor bolts, anchor rods, nuts, and washers shall be inspected prior to shipping to the project site. The Contractor shall submit to the Engineer for acceptance a Manufacturer's Certificate of Compliance for the anchor bolts, anchor rods, nuts, and washers, as defined in Section 1-06.3. If the Engineer deems it appropriate, the Contractor shall provide a sample of the anchor bolt, anchor rod, nut, and washer for testing.

All bolts, rods, nuts, and washers shall be marked and identified as required in the pertinent Specification.

9-06.15 Welded Shear Connectors

The third paragraph is revised to read:

Mechanical properties shall be determined in accordance with AASHTO T 244.

9-06.17 Vacant

This section, including title, is revised to read:

9-06.17 Noise Barrier Wall Access Door

Access door frames shall be formed of 14-gauge steel to the size and dimensions shown in the Plans. The access door frame head and jamb members shall be mitered, securely welded, and ground smooth. Each head shall have two anchors and each jamb shall have three anchors. The hinges shall be reinforced with ¼-inch by 12-inch plate, width equal to the full inside width of the frame.

Access doors shall be full flush 1-¾-inch thick seamless doors with a polystyrene core. Door faces shall be constructed with smooth seamless 14-gauge roller-levered, cold-rolled steel sheet conforming to ASTM A 792 Type SS, Grade 33 minimum, Coating Designation AZ55 minimum. The vertical edges shall be neat interlocked hemmed edge seam. The top and bottom of the door shall be enclosed with 14-gauge channels. Mortise and reinforcement for locks and hinges shall be 10-gauge steel. Welded top cap shall be ground and filled for exterior applications. The bottom channel shall have weep holes.

Each access door shall have three hinges. Access door hinges shall be ASTM A 276 Type 316 stainless steel, 4-½-inches square, with stainless steel ball bearing and non-removable pins.

Each access door shall have two pull plates. The pull plates shall be ASTM A 240 Type 316 stainless steel, with a grip handle of one-inch diameter and 8 to 10-inches in length.

The door assembly shall be fabricated and assembled as a complete unit including all hardware specified prior to shipment.

9-06.18 Metal Bridge Railing

The second sentence of the first paragraph is revised to read:

Steel used for metal railings, when galvanized after fabrication in accordance with AASHTO M111, shall have a controlled silicon content of either 0.00 to 0.06 percent or 0.15 to 0.25 percent.

9-07.AP9

Section 9-07, Reinforcing Steel
January 7, 2019

9-07.5(1) Epoxy-Coated Dowel Bars (for Cement Concrete Rehabilitation)

This section (including title) is revised to read:

9-07.5(1) Dowel Bars for Cement Concrete Pavement Rehabilitation

Dowel bars for Cement Concrete Pavement Rehabilitation shall be 1½ inch outside diameter plain round steel bars or tubular bars 18 inches in length and meet the requirements of one of the following dowel bar types:

1. Epoxy-coated dowel bars shall be round plain steel bars of the dimensions shown in the Standard Plans. They shall conform to AASHTO M31, Grade 60 or ASTM A615, Grade 60 and shall be coated in accordance with ASTM A1078 Type 2 coating, except that the bars may be cut to length after being coated. Cut ends shall be coated in accordance with ASTM A1078 with a patching material that is compatible with the coating, inert in concrete and recommended by the coating manufacturer. The thickness of the epoxy coating shall be 10 mils plus or minus 2 mils. The Contractor shall furnish a written certification that properly identifies the coating material, the number of each batch of coating material used, quantity represented, date of manufacture, name and address of manufacturer, and a statement that the supplied coating material meets the requirements of ASTM A1078 Type 2 coating. Patching material, compatible with the coating material and

inert in concrete and recommended by the manufacturer shall be supplied with each shipment for field repairs by the Contractor.

2. ASTM A513 steel tubes made from Grade 60 Carbon Steel Tube with a 1.625 inch outside diameter and a 0.120 inch wall thickness. Both the inside and outside of the tube shall be zinc coated with G40 galvanizing in accordance with ASTM A653. Following zinc coating the tubes shall be coated in accordance with Section 9-07.5(1) item 1. The ends of the tube shall be capped to prevent intrusion of concrete or other materials.

9-07.5(2) Corrosion Resistant Dowel Bars (for Cement Concrete Pavement and Cement Concrete Pavement Rehabilitation)

The first paragraph (up until the colon) is revised to read:

Corrosion resistant dowel bars shall be 1½ inch outside diameter plain round steel bars or tubular bars 18 inches in length and meet the requirements of one of the following:

Item number 4 and 5 of the first paragraph are revised to read:

4. Corrosion-resistant, low-carbon, chromium plain steel bars for concrete reinforcement meeting all the requirements of ASTM A 1035 Alloy Type CS Grade 100 or Alloy Type CS Grade 120.

5. Zinc Clad dowel bars shall be 1½ inch solid bars or 1.625 inch outside diameter by 0.120 inch wall tubular bars meeting the chemical and physical properties of AASHTO M 31, Grade 60, or AASHTO M 255, Grade 60. The bars shall have a minimum of 0.035 inches A710 Zinc alloy clad to the plain steel inner bar or tube. A710 Zinc shall be composed of: zinc: 99.5 percent, by weight, minimum; copper: 0.1-0.25 percent, by weight; and iron: 0.0020 percent, by weight, maximum. Each end of tubular bars shall be plugged using a snug-fitting insert to prohibit any intrusion of concrete or other materials.

The numbered list in the first paragraph is supplemented with the following:

6. Multicoated fusion bonded epoxy bars shall consist of an ASTM A615 bar with alternating layers of ASTM A934 coating and an abrasion resistant overcoat (ARO). The ASTM A934 coating shall form the base and there shall be two layers of each coating material. The minimum thickness of the combined layers of the ASTM A934 coating and ARO coating shall be 20 mils. The ARO shall meet the following requirements:

Test	Method	Specification
Gouge Resistance	NACE TM0215, 30 kg wt., LS-1 bit @ 25°C	< 0.22 mm
Gouge Resistance	NACE TM0215, 50 kg wt., LS-1 bit @ 25°C	< 0.44 mm

7. ASTM A513 steel tubes made from Grade 60 Carbon Steel Tube with a 1.625 inch outside diameter and a 0.120 inch wall thickness. Both the inside and outside of the tube shall be zinc coated with G90 galvanizing in accordance with ASTM A653. Following zinc coating the tubes shall be coated in accordance with Section 9-07.5(1)

item 1. The ends of the tube shall be capped to prevent intrusion of concrete or other materials.

The last paragraph is revised to read:

Stainless Steel Clad and Stainless Steel Tube Dowel bar ends shall be sealed with a patching material (primer and finish coat) used for patching epoxy-coated reinforcing steel as required in Section 9-07.3, item 6.

9-07.7 Wire Mesh

This section is supplemented with the following:

Welded wire manufacturers shall participate in the NTPEP Audit Program for Reinforcing Steel (rebar) Manufacturers and shall be listed on the NTPEP audit program website displaying that they are NTPEP compliant.

9-08.AP9

Section 9-08, Paints and Related Materials
January 7, 2019

9-08.1(1) Description

The first sentence is revised to read:

Paint used for highway and bridge structure applications shall be made from materials meeting the requirements of the applicable Federal and State Paint Specifications, Department of Defense (DOD), American Society of Testing of Materials (ASTM), and The Society for Protective Coatings (SSPC) specifications in effect at time of manufacture.

9-08.1(2) Paint Types

This section is supplemented with the following new subsections:

9-08.1(2)M NEPCOAT Qualified Products List A

Qualified products used shall be part of a NEPCOAT system supplied by the same manufacturer.

9-08.1(2)N NEPCOAT Qualified Products List B

Qualified products used shall be part of a NEPCOAT system supplied by the same manufacturer.

9-08.1(2)D Organic Zinc-Rich Primer

This section, including title, is revised to read:

Vacant

9-08.1(2)E Epoxy Polyamide

This section is revised to read:

Epoxy polyamide shall be a two-component system conforming to MIL-DTL-24441 or SSPC Coating Standard No. 42.

9-08.1(2)H Top Coat, Single-Component, Moisture-Cured Polyurethane

This section is revised to read:

Vehicle Type: Moisture-cured aliphatic polyurethane.

Color and Gloss: Meet the SAE AMS Standard 595 Color as specified in the table below.

The Top Coat shall meet the following requirements:

The resin shall be an aliphatic urethane.

Minimum-volume solids 50 percent.

The top coat shall be semi-gloss.

Color	Semi-Gloss
Washington Gray	26357
Mt. Baker Gray	26134
Mt. St. Helens Gray	26306
Cascade Green	24158

9-08.1(2)I Rust-Penetrating Sealer

This section is revised to read:

Rust-penetrating sealer shall be a two-component, chemically-cured, 100 percent solids epoxy.

9-08.1(2)J Black Enamel

This section is revised to read:

The enamel shall conform to Federal Specification MIL PRF 24635E Type II Class 2.

9-08.1(2)K Orange Equipment Enamel

The first paragraph is revised to read:

The enamel shall be an alkyd gloss enamel conforming to Federal Specification MIL-PRF-24635E Type II Class 1. The color, when dry, shall match that of SAE AMS Standard 595, color number 12246.

9-08.1(2)L Exterior Acrylic Latex Paint-White

The first paragraph is revised to read:

This paint shall conform to Federal Specification MIL-PRF-24635E Type II Class 1, 2 or 3.

9-08.1(7) Acceptance

This section is revised to read:

For projects with moisture-cured polyurethane quantities less than 20 gallons, acceptance will be by the Manufacturer's Certificate of Compliance.

For projects with moisture-cured polyurethane quantities greater than 20 gallons, the product shall be listed in the current WSDOT Qualified Products List (QPL). If the lot number is listed on the QPL, it may be accepted without additional testing. If the lot number is not listed on the QPL, a 1 quart sample shall be submitted to the State Materials Laboratory for testing and acceptance.

For all other paint types, acceptance will be based on visual inspection.

9-08.1(8) Standard Colors

In the first paragraph, the reference to "Federal Standard 595" is revised to read "SAE AMS Standard 595".

The second paragraph is revised to read:

Unless otherwise specified, all top or finish coats shall be semi-gloss, with the paint falling within the range of 35 to 70 on the 60-degree gloss meter.

9-08.2 Powder Coating Materials for Coating Galvanized Surfaces

The last paragraph is revised to read:

Repair materials shall be as recommended by the powder coating manufacturer and as specified in the Contractor's powder coating plan as accepted by the Engineer.

9-08.3 Pigmented Sealer Materials for Coating of Concrete Surfaces

This section, including title, is revised to read:

9-08.3 Concrete Surface Treatments

9-08.3(1) Pigmented Sealer Materials

The pigmented sealer shall be a semi-opaque, colored toner containing only methyl methacrylate-ethyl acrylate copolymer resins, toning pigments suspended in solution at all times by a chemical suspension agent, and solvent. Toning pigments shall be laminar silicates, titanium dioxide, and inorganic oxides only. There shall be no settling or color variation. Tinting shall occur at the factory at the time of manufacture and placement in containers, prior to initial shipment. Use of vegetable or marine oils, paraffin materials, stearates, or organic pigments in any part of coating formulation will not be permitted. The color of pigmented sealer shall be as specified by the Contracting Agency. The Contractor shall submit a 1-quart wet sample, a drawdown color sample, and spectrophotometer or colorimeter readings taken in accordance with ASTM D2244, for each batch and corresponding standard color card. The calculated Delta E shall not exceed 1.5 from the Commission Internationale de l'Eclairage (CIELAB) when measured at 10 degrees Standard Observer and Illuminant D 65.

The 1-quart wet sample shall be submitted in the manufacturer's labeled container with product number, batch number, and size of batch. The companion drawdown color sample shall be labeled with the product number, batch number, and size of batch. The Contractor shall submit the specified samples and readings to the Engineer at least 14 calendar days prior to the scheduled application of the sealer. The Contractor shall not begin applying pigmented sealer until receiving the Engineer's written approval of the pigmented sealer color samples.

9-08.3(2) Exposed Aggregate Concrete Coatings and Sealers

9-08.3(2)A Retardant Coating

Retardant coating shall exhibit the following properties:

1. Retards the set of the surface mortar of the concrete without preventing the concrete to reach the specified 28 day compressive strength.

2. Leaves the aggregate with its original color and luster, and firmly embedded in the concrete matrix.

3. Allows the removal of the surface mortar in accordance with the methods specified in Section 6-02.3(14)E without the use of acidic washing compounds.

4. Allows for uniform removal of the surface mortar.

If the Contractor proposes use of a retardant coating that is not listed in the current WSDOT QPL, the Contractor shall submit a Type 2 Working Drawing consisting of a one quart product sample from a current lot along with supporting product information, Safety Data Sheet, and a Manufacturer's Certificate of Compliance stating that the product conforms to the above performance requirements.

9-08.3(2)B Clear Sealer

The sealer for concrete surfaces with exposed aggregate finish shall be a clear, non-gloss, penetrating sealer of either a silane, siloxane, or silicone based formulation.

9-08.3(3) Permeon Treatment

Permeon treatment shall be a product of known consistent performance in producing the SAE AMS Standard 595 Color No. 30219 target color hue established by WSDOT, either selected from the WSDOT Qualified Products List (QPL), or an equivalent product accepted by the Engineer. For acceptance of products not listed in the current WSDOT QPL, the Contractor shall submit Type 3 Working Drawings consisting of a one quart product sample from a current lot, supporting product information and a Safety Data Sheet.

9-13.AP9

Section 9-13, Riprap, Quarry Spalls, Slope Protection, and Rock for Erosion and Scour Protection and Rock Walls
April 2, 2018

9-13.1(1) General

The last paragraph is revised to read:

Riprap and quarry spalls shall be free from segregation, seams, cracks, and other defects tending to destroy its resistance to weather and shall meet the following test requirements:

9-13.5 Concrete Slope Protection

This section is revised to read:

Concrete slope protection shall consist of reinforced portland cement or blended hydraulic cement concrete poured or pneumatically placed upon the slope with a rustication joint pattern or semi-open concrete masonry units placed upon the slope closely adjoining each other.

9-13.5(2) Poured Portland Cement Concrete Slope Protection

This section's title is revised to read:

Poured Portland Cement or Blended Hydraulic Cement Concrete Slope Protection

9-13.5(3) Pneumatically Placed Portland Cement Concrete Slope Protection

This section's title is revised to read:

Pneumatically Placed Portland Cement or Blended Hydraulic Cement Concrete Slope Protection

The first paragraph is revised to read:

Cement – This material shall be portland cement or blended hydraulic cement as specified in Section 9-01.

9-13.7(1) Rock for Rock Walls and Chinking Material

The first paragraph (up until the colon) is revised to read:

Rock for rock walls and chinking material shall be hard, sound and durable material, free from seams, cracks, and other defects tending to destroy its resistance to weather, and shall meet the following test requirements:

9-14.AP9

Section 9-14, Erosion Control and Roadside Planting
August 6, 2018

9-14.4(2) Hydraulically Applied Erosion Control Products (HECPs)

In Table 1, the last four rows are deleted.

9-14.4(2)A Long-Term Mulch

The first paragraph is supplemented with the following:

Products containing cellulose fiber produced from paper or paper components will not be accepted.

Table 2 is supplemented with the following new rows:

Water Holding Capacity	ASTM D 7367	800 percent minimum
Organic Matter Content	AASHTO T 267	90 percent minimum
Seed Germination Enhancement	ASTM D 7322	Long Term 420 percent minimum

9-14.4(2)B Moderate-Term Mulch

This section is revised to read:

Within 48 hours of application, the Moderate-Term Mulch shall bond with the soil surface to create a continuous, absorbent, flexible, erosion-resistant blanket. Moderate-Term Mulch shall effectively perform the intended erosion control function in accordance with Section 8-01.3(1) for a minimum of 3 months, or until temporary vegetation has been established, whichever comes first.

Moderate-Term Mulch shall not be used in conjunction with permanent seeding.

9-14.4(2)C Short-Term Mulch

This section is revised to read:

Short-Term Mulch shall effectively perform the intended erosion control function in accordance with Section 8-01.3(1) for a minimum of 2 months, or until temporary vegetation has been established, whichever comes first. Short-Term Mulch shall not be used in conjunction with permanent seeding.

9-16.AP9

Section 9-16, Fence and Guardrail
August 6, 2018

9-16.3(1) Rail Element

The last sentence of the first paragraph is revised to read:

All rail elements shall be formed from 12-gage steel except for thrie beam reducer sections, reduced length thrie beam rail elements, thrie beams used for bridge rail retrofits, and Design F end sections, which shall be formed from 10-gage steel.

9-16.3(5) Anchors

The last paragraph is revised to read:

Cement grout shall conform to Section 9-20.3(4) and consist of one part portland cement or blended hydraulic cement and two parts sand.

9-18.AP9

Section 9-18, Precast Traffic Curb
April 2, 2018

9-18.1(1) Aggregates and Proportioning

Item number 1 of the first paragraph is revised to read:

1. Portland cement or blended hydraulic cement shall conform to the requirements of Section 9-01 except that it may be Type I portland cement conforming to AASHTO M 85.

9-20.AP9

Section 9-20, Concrete Patching Material, Grout, and Mortar
April 1, 2019

9-20.1 Patching Material

This section, including title, is revised to read:

9-20.1 Patching Material for Cement Concrete Pavement

Concrete patching material shall be prepackaged mortar extended with aggregate. The amount of aggregate for extension shall conform to the manufacturer's recommendation.

Patching mortar and patching mortar extended with aggregate shall contain cementitious material and conform to Sections 9-20.1(1) and 9-20.1(2). The Manufacturer shall use the services of a laboratory that has an equipment calibration verification system and a technician training and evaluation process in accordance with AASHTO R 18 to perform all tests specified in Section 9-20.1.

9-20.1(1) Patching Mortar

Patching mortar shall conform to the following requirements:

Compressive Strength	ASTM Test Method	Specification
at 3 hours	C 39	Minimum 3,000 psi
at 24 hours	C 39	Minimum 5,000 psi
Length Change		
at 28 days	C 157	0.15 percent maximum
Total Chloride Ion Content	C 1218	1 lb/yd^3 maximum
Bond Strength		
at 24 hours	C 882 (As modified by C 928, Section 9.5)	Minimum 1,000 psi
Scaling Resistance (at 25 cycles of freezing and thawing)	C 672 (As modified by C 928, Section 9.4)	1 lb/ft^2 maximum

9-20.1(2) Patching Mortar Extended with Aggregate

Patching mortar extended with aggregate shall meet the following requirements:

Compressive Strength	ASTM Test Method	Specification
at 3 hours	C 39	Minimum 3,000 psi
at 24 hours	C 39	Minimum 5,000 psi
Length Change		
at 28 days	C 157	0.15 percent maximum
Bond Strength		
at 24 hours	C 882 (As modified by ASTM C928, Section 9.5)	Minimum 1,000 psi
Scaling Resistance (at 25 cycles of freezing and thawing)	C 672	2 Maximum Visual Rating
Freeze thaw	C 666	Maximum expansion 0.10% Minimum durability 90.0%

9-20.1(3) Aggregate

Aggregate used to extend the patching mortar shall conform to Section 9-03.1(4) and be AASHTO Grading No. 8. A Manufacturer's Certificate of Compliance shall be submitted showing the aggregate source and the gradation. Mitigation for Alkali Silica Reaction (ASR) will not be required for the extender aggregate used for concrete patching material.

9-20.1(4) Water

Water shall meet the requirements of Section 9-25.1. The quantity of water shall be within the limits recommended by the repair material manufacturer.

9-20.2 Specifications

This section, including title, is revised to read:

9-20.2 Patching Material for Concrete Structure Repair

Concrete patching material shall be a prepackaged mixture of portland or blended hydraulic cement, aggregate, and admixtures. Fly ash, ground granulated blast furnace slag and microsilica fume may be used. The concrete patching material may be shrinkage compensated. The concrete patching material shall also meet the following requirements:

- Compressive strength of 6000 psi or higher at 28 days in accordance with AASHTO T 22 (ASTM C 39), unless noted otherwise
- Bond strength of 250 psi or higher at 28 days or less in accordance with ASTM C 1583 or ICRI 210.3R
- Shrinkage shall be 0.05 percent (500 microstrain) or lower at 28 days in accordance with AASHTO T 160 (ASTM C 157) as modified by ICRI 320.3R
- Permeability shall be 2,000 coulombs or lower at 28 days in accordance with AASHTO T 277 (ASTM C 1202)
- Freeze-thaw resistance shall have a durability factor of 90 percent or higher after a minimum of 300 cycles in accordance with AASHTO T 161 Procedure A (ASTM C 666)
- Soluble chloride ion limits in Section 6-02.3(2) shall be satisfied

9-20.2(1) Patching Mortar

This section, including title, is deleted in its entirety.

9-20.2(2) Patching Mortar Extended with Aggregate

This section, including title, is deleted in its entirety.

9-20.3(3) Grout Type 3 for Unconfined Bearing Pad Applications

This section's title is revised to read:

Grout Type 3 for Unconfined Applications

This section is revised to read:

Grout Type 3 shall be a prepackaged material that does not include expansive admixtures meeting the following requirements:

- Compressive strength shall be 4000 psi or higher at 28 days in accordance with AASHTO T 22 (ASTM C 39) for grout extended with coarse aggregate or AASHTO T 106 (ASTM C109) otherwise.
- Bond strength shall meet one of the following:
  - 250 psi or higher at 28 days or less in accordance with ASTM C1583.
  - 2000 psi or higher at 28 days or less in accordance with ASTM C882. The following modification to ASTM C882 is acceptable: use Type 3 Grout in lieu of epoxy resin base bonding system and freshly mixed portland-cement mortar in the procedure for testing Type II and V systems.
- Drying shrinkage shall be 0.08 percent (800 microstrain) or lower at 28 days in accordance with AASHTO T 160 (ASTM C157). The following modification to AASHTO T 160 is acceptable: use a standard specimen size of 3 x 3 x 11-¼ inches.

9-20.5 Bridge Deck Repair Material

Item number 3 of the first paragraph is revised to read:

3. Permeability of less than 2,000 coulombs at 28-days or more in accordance with AASHTO T 277.

9-21.AP9

Section 9-21, Raised Pavement Markers (RPM)
January 2, 2018

9-21.2 Raised Pavement Markers Type 2

This section's content is deleted.

9-21.2(1) Physical Properties

This section, including title, is revised to read:

9-21.2(1) Standard Raised Pavement Markers Type 2

The marker housing shall contain reflective faces as shown in the Plans to reflect incident light from either a single or opposite directions and meet the requirements of ASTM D 4280 including Flexural strength requirements.

9-21.2(2) Optical Requirements

This section, including title, is revised to read:

9-21.2(2) Abrasion Resistant Raised Markers Type 2

Abrasion Resistant Raised Markers Type 2 shall comply with Section 9-21.2(1) and meet the requirements of ASTM D 4280 with the following additional requirement: The coefficient of luminous intensity of the markers shall be measured after subjecting the entire lens

surface to the test described in ASTM D 4280 Section 9.5 using a sand drop apparatus. After the exposure described above, retroreflected values shall not be less than 0.5 times a nominal unblemished sample.

9-21.2(3) Strength Requirements

This section is deleted in its entirety.

9-23.AP9

Section 9-23, Concrete Curing Materials and Admixtures
April 1, 2019

9-23.12 Natural Pozzolan

This section is revised to read:

Natural Pozzolans shall be ground Pumice and shall conform to the requirements of AASHTO M295 Class N, including supplementary optional chemical requirements as set forth in Table 2.

9-23.13 Blended Supplementary Cementitious Material

The second sentence is revised to read:

Blended SCMs shall be limited to binary or ternary blends of fly ash, ground granulated blast furnace slag and microsilica fume.

The second to last sentence is deleted.

9-26.AP9

Section 9-26, Epoxy Resins
January 7, 2019

9-26.1(1) General

The following new sentence is inserted after the first sentence of the first paragraph:

For pre-packaged cartridge kits, the epoxy bonding agent shall meet the requirements of ASTM C881 when mixed according to manufacturer instructions, utilizing the manufacturer's mixing nozzle.

9-26.1(2) Packaging and Marking

The first sentence of the first paragraph is revised to read:

The components of the epoxy system furnished under these Specifications shall be supplied in separate containers or pre-packaged cartridge kits that are non-reactive with the materials contained.

The second paragraph is revised to read:

Separate containers shall be marked by permanent marking that identify the formulator, "Component A" (contains the Epoxy Resin) and "Component B" (Contains the Curing Agent), type, grade, class, lot or batch number, mixing instructions and the quantity contained in pounds or gallons as defined by these Specifications.

The following new paragraph is inserted after the second paragraph:

Pre-packaged cartridge kits shall be marked by permanent marking that identify the formulator, type, grade, class, lot or batch number, mixing instructions and the quantity contained in ounces or milliliters as defined by these Specifications.

9-28.AP9

Section 9-28, Signing Materials and Fabrication
April 1, 2019

9-28.2 Manufacturer's Identification and Date

The second sentence is revised to read:

In addition, the width and height dimension, in inches, the Contract number, and the number of the sign as it appears in the Plans shall be placed using 3-inch series C black letters on the back of destination, distance, and large special signs.

9-28.10 Vacant

This section, including title, is revised to read:

9-28.10 Digital Printing

Transparent and opaque durable inks used in digital printed sign messages shall be as recommended by the manufacturer. When properly applied, digital printed colors shall have a warranty life of the base retroreflective sign sheeting. Digital applied colors shall present a smooth surface, free from foreign material, and all messages and borders shall be clear and sharp. Digital printed signs shall conform to 70% of the retroreflective minimum values established for its type and color. Digitally printed signs shall meet the daytime color and luminance, and nighttime color requirements of ASTM D 4956. No variations in color or overlapping of colors will be permitted. Digital printed permanent traffic signs shall have an integrated engineered match component clear protective overlay recommended by the sheeting manufacturer applied to the entire face of the sign. On Temporary construction/maintenance signs printed with black ink only, the protective overlay film is optional, as long as the finished sign has a warranty of a minimum of three years from sign sheeting manufacturer.

All digital printed traffic control signs shall be an integrated engineered match component system. The integrated engineered match component system shall consist of retroreflective sheeting, durable ink(s), and clear overlay film all from the same manufacturer applied to aluminum substrate conforming to Section 9-28.8.

The sign fabricator shall use an approved integrated engineered match component system as listed on the Qualified Products List (QPL). Each approved digital printer shall only use the compatible retroreflective sign sheeting manufacturer's engineered match component system products.

Each retroreflective sign sheeting manufacturer/integrated engineered match component system listed on the QPL shall certify a department approved sign fabricator is approved to operate their compatible digital printer. The sign fabricator shall re-certify annually with the retroreflective sign manufacturer to ensure their digital printer is still meeting manufacturer's

specifications for traffic control signs. Documentation of each re-certification shall be submitted to the QPL Engineer annually.

9-28.11 Hardware

The last paragraph is revised to read:

All steel parts shall be galvanized in accordance with AASHTO M111. Steel bolts and related connecting hardware shall be galvanized in accordance with ASTM F 2329.

9-28.14(2) Steel Structures and Posts

The first sentence of the third paragraph is revised to read:

Anchor rods for sign bridge and cantilever sign structure foundations shall conform to Section 9-06.5(4), including Supplemental Requirement S4 tested at -20°F.

In the second sentence of the fourth paragraph, “AASHTO M232” is revised to read “ASTM F 2329”.

The first sentence of the fifth paragraph is revised to read:

Except as otherwise noted, steel used for sign structures and posts shall have a controlled silicon content of either 0.00 to 0.06 percent or 0.15 to 0.25 percent.

The last sentence of the last paragraph is revised to read:

If such modifications are contemplated, the Contractor shall submit a Type 2 Working Drawing of the proposed modifications.

9-29.AP9

Section 9-29, Illumination, Signal, Electrical
April 1, 2019

9-29.1 Conduit, Innerduct, and Outerduct

This section is supplemented with the following new subsections:

9-29.1(10) Pull Tape

Pull tape shall be pre-lubricated polyester pulling tape. The pull tape shall have a minimum width of ½-inch and a minimum tensile strength of 500 pounds. Pull tape may have measurement marks.

9-29.1(11) Foam Conduit Sealant

Foam conduit sealant shall be self-expanding waterproof foam designed to prevent both water and pest intrusion. The foam shall be designed for use in and around electrical equipment, including both insulated and bare conductors.

9-29.2(1) Junction Boxes

The first paragraph is revised to read:

For the purposes of this Specification concrete is defined as portland cement or blended hydraulic cement concrete and non-concrete is all others.

9-29.2(1)A2 Non-Concrete Junction Boxes

The first paragraph is revised to read:

Material for the non-concrete junction boxes shall be of a quality that will provide for a similar life expectancy as portland cement or blended hydraulic cement concrete in a direct burial application.

9-29.2(2)A Standard Duty Cable Vaults and Pull Boxes

In the table in the last paragraph, the fourth, fifth and sixth rows are revised to read:

Slip Resistant Lid	ASTM A36 steel
Frame	ASTM A36 steel
Slip Resistant Frame	ASTM A36 steel

9-29.3(2)A1 Single Conductor Current Carrying

This second sentence is revised to read:

Insulation shall be XLP (cross-linked polyethylene) or EPR (Ethylene Propylene Rubber), Type USE (Underground Service Entrance) or USE-2, and rated for 600-volts or higher.

9-29.6 Light and Signal Standards

In the first sentence of the third paragraph, “AASHTO M232” is revised to read “ASTM F 2329”.

Item number 2 of the last paragraph is revised to read:

2. The steel light and signal standard fabricator’s shop drawing submittal, including supporting design calculations, submitted as a Type 2E Working Drawing in accordance with Section 8-20.2(1) and the Special Provisions.

9-29.6(1) Steel Light and Signal Standards

In the second paragraph, “AASHTO M232” is revised to read “ASTM F 2329”.

The first sentence of the last paragraph is revised to read:

Steel used for light and signal standards shall have a controlled silicon content of either 0.00 to 0.06 percent or 0.15 to 0.25 percent.

9-29.6(5) Foundation Hardware

In the last paragraph, “AASHTO M232” is revised to read “ASTM F 2329”.

9-29.10(1) Conventional Roadway Luminaires

This section is revised to read:

All conventional roadway luminaires shall meet 3G vibration requirements as described in ANSI C136.31.

All luminaires shall have housings fabricated from aluminum. The housing shall be painted flat gray, SAE AMS Standard 595 color chip No. 26280, unless otherwise specified in the

Contract. Painted housings shall withstand a 1,000 hour salt spray test as specified in ASTM B117.

Each housing shall include a four bolt slip-fitter mount capable of accepting a nominal 2" tenon and adjustable within +/- 5 degrees of the axis of the tenon. The clamping bracket(s) and the cap screws shall not bottom out on the housing bosses when adjusted within the +/- 5 degree range. No part of the slipfitter mounting brackets on the luminaires shall develop a permanent set in excess of 0.2 inch when the cap screws used for mounting are tightened to a torque of 32 foot-pounds. Each luminaire shall include leveling reference points for both transverse and longitudinal adjustment.

All luminaires shall include shorting caps when shipped. The caps shall be removed and provided to the Contracting Agency when an alternate control device is required to be installed in the photocell socket. House side shields shall be included when required by the Contract. Order codes shall be modified to the minimum extent necessary to include the option for house side shields.

This section is supplemented with the following new subsections:

9-29.10(1)A High Pressure Sodium (HPS) Conventional Roadway Luminaires

HPS conventional roadway luminaires shall meet the following requirements:

1. General shape shall be "cobrahead" style, with flat glass lens and full cutoff optics.

2. Light pattern distribution shall be IES Type III.

3. The reflector of all luminaires shall be of a snap-in design or secured with screws. The reflector shall be polished aluminum or prismatic borosilicate glass.

4. Flat lenses shall be formed from heat resistant, high-impact, molded borosilicate or tempered glass.

5. The lens shall be mounted in a doorframe assembly, which shall be hinged to the luminaire and secured in the closed position to the luminaire by means of an automatic latch. The lens and doorframe assembly, when closed, shall exert pressure against a gasket seat. The lens shall not allow any light output above 90 degrees nadir. Gaskets shall be composed of material capable of withstanding the temperatures involved and shall be securely held in place.

6. The ballast shall be mounted on a separate exterior door, which shall be hinged to the luminaire and secured in the closed position to the luminaire housing by means of an automatic type of latch (a combination hex/slot stainless steel screw fastener may supplement the automatic-type latch).

7. Each luminaire shall be capable of accepting a 150, 200, 250, 310, or 400 watt lamp complete and associated ballast. Lamps shall mount horizontally.

9-29.10(1)B Light Emitting Diode (LED) Conventional Roadway Luminaires

LED Conventional Roadway Luminaires are divided into classes based on their equivalent High Pressure Sodium (HPS) luminaires. Current classes are 200W, 250W, 310W, and 400W. LED luminaires are required to be pre-approved in order to verify their photometric

output. To be considered for pre-approval, LED luminaires must meet the requirements of this section.

LED luminaires shall include a removable access door, with tool-less entry, for access to electronic components and the terminal block. The access door shall be removable, but include positive retention such that it can hang freely without disconnecting from the luminaire housing. LED drivers may be mounted either to the interior of the luminaire housing or to the removable door itself.

LED drivers shall be removable for user replacement. All internal modular components shall be connected by means of mechanical plug and socket type quick disconnects. Wire nuts may not be used for any purpose. All external electrical connections to the luminaire shall be made through the terminal block.

LED luminaires shall include a 7-pin NEMA photocell receptacle. The LED driver(s) shall be dimmable from ten volts to zero volts. LED output shall have a Correlated Color Temperature (CCT) of 4000K nominal (4000-4300K) and a Color Rendering Index (CRI) of 70 or greater. LED output shall be a minimum of 85% at 75,000 hours at 25 degrees Celsius.

LED luminaires shall be available for 120V, 240V, and 480V supply voltages. Voltages refer to the supply voltages to the luminaires present in the field. LED power usage shall not exceed the following maximum values for the applicable wattage class:

Class	Max. Wattage
200W	110W
250W	165W
310W	210W
400W	275W

Only one brand of LED conventional roadway luminaire may be used on a Contract. They do not necessarily have to be the same brand as any high-mast, underdeck, or wall-mount luminaires when those types of luminaires are specified in the Contract. LED luminaires shall include a standard 10 year manufacturer warranty.

The list of pre-approved LED Conventional Roadway Luminaires is available at http://www.wsdot.wa.gov/Design/Traffic/ledluminaires.htm.

9-29.10(2) Decorative Luminaires

This section, including title, is revised to read:

9-29.10(2) Vacant

9-29.12 Electrical Splice Materials

This section is supplemented with the following new subsections:

9-29.12(3) Splice Enclosures

9-29.12(3)A Heat Shrink Splice Enclosure

Heat shrink splice enclosures shall be medium or heavy wall cross-linked polyolefin, meeting the requirements of AMS-DTL-23053/15, with thermoplastic adhesive sealant. Heat shrink splices used for “wye” connections require rubber electrical mastic tape.

9-29.12(3)B Molded Splice Enclosure

Molded splice enclosures shall use epoxy resin in a clear rigid plastic mold. The material used shall be compatible with the insulation material of the insulated conductor or cable. The component materials of the resin insulation shall be packaged ready for convenient mixing without removing from the package.

9-29.12(4) Re-Enterable Splice Enclosure

Re-enterable splice enclosures shall use either dielectric grease or a flexible resin contained in a two-piece plastic mold. The mold shall either snap together or use stainless steel hose clamps.

9-29.12(5) Vinyl Electrical Tape for Splices

Vinyl electrical tape in splicing applications shall meet the requirements of MIL-I-24391C.

9-29.12(1) Illumination Circuit Splices

This section is revised to read:

Underground illumination circuit splices shall be solderless crimped connections capable of securely joining the wires, both mechanically and electrically, as defined in Section 8-20.3(8). Aerial illumination splices shall be solderless crimp connectors or split bolt vice-type connectors.

9-29.12(1)A Heat Shrink Splice Enclosure

This section is deleted in its entirety.

9-29.12(1)B Molded Splice Enclosure

This section is deleted in its entirety.

9-29.12(2) Traffic Signal Splice Material

This section is revised to read:

Induction loop splices and magnetometer splices shall use an uninsulated barrel-type crimped connector capable of being soldered.

9-29.13(10)D Cabinets for Type 170E and 2070 Controllers

The first sentence of item number 4 is revised to read:

A disposable paper filter element with dimensions of 12” × 16” × 1” shall be provided in lieu of a metal filter.

Item number 6 is revised to read:

6. LED light strips shall be provided for cabinet lighting, powered from the Equipment breaker on the Power Distribution Assembly. Each LED light strip shall be

approximately 12 inches long, have a minimum output of 320 lumens, and have a color temperature of 4100K (cool white) or higher. There shall be three light strips for each rack within the cabinet. Lighting shall be ceiling mounted – rack mounted lighting is not permitted. Light strips shall be installed in the locations shown in the Standard Plans. Lighting shall not interfere with the proper operation of any other ceiling mounted equipment. All lighting fixtures above a rack shall energize automatically when either door to that respective rack is opened. Each door switch shall be labeled “Light”.

Item number 7 is revised to read:

7. Rack mounted equipment shall be as shown in the Standard Plans. The cabinet shall use PDA #2LX and Output File #1LX. Where an Auxiliary Output File is required, Output File #2LX shall also be included.

This section is supplemented with the following new item:

9. The PCB connectors for Field Terminal Blocks FT1 through FT6 on Output Files #1LX and #2LX shall be capable of accepting minimum 14 AWG field wiring, have a pitch of 5.08 mm, and use screw flange type locking to secure the plug and socket connection. The sockets on the Field Terminal Panel shall be secured to the panel such that unplugging a connector will not result in the socket moving or separating from the panel.

9-29.13(11) Traffic Data Accumulator and Ramp Meters

Item number 2 is revised to read:

2. Rack mounted equipment shall be as shown in the Standard Plans.

Item number 3 is revised to read:

3. PDA #3LX shall be furnished with three Model 200 Load Switches installed. PDA #3LX shall be modified to include a second Model 430 transfer relay, mounted on the rear of the PDA and wired as shown in the Standard Plans.

9-29.13(12) ITS Cabinet

This section’s title is revised to read:

Type 331L ITS Cabinet

The first paragraph (excluding the numbered list) is revised to read:

Basic ITS cabinets shall be Model 331L Cabinets, unless otherwise specified in the Contract. Type 331L Cabinets shall be constructed in accordance with the TEES, with the following modifications:

Item number 6 of the first paragraph is revised to read:

6. LED light strips shall be provided for cabinet lighting, powered from the Equipment breaker on the Power Distribution Assembly. Each LED light strip shall be approximately 12 inches long, have a minimum output of 320 lumens, and have a color temperature of 4100K (cool white) or higher. There shall be three light strips for each

rack within the cabinet. Lighting shall be ceiling mounted – rack mounted lighting is not permitted. Light strips shall be installed in the locations shown in the Standard Plans. Lighting shall not interfere with the proper operation of any other ceiling mounted equipment. All lighting fixtures above a rack shall energize automatically when either door to that respective rack is opened. Each door switch shall be labeled “Light”.

9-29.16(2)E Painting Signal Heads

In the first sentence, “Federal Standard 595” is revised to read “SAE AMS Standard 595”.

9-29.17 Signal Head Mounting Brackets and Fittings

In the first paragraph, item number 2 under **Stainless Steel** is revised to read:

2. Bands or cables for Type N mount.

9-29.20 Pedestrian Signals

In item 2C of the second paragraph, “Federal Standard 595” is revised to read “SAE AMS Standard 595”.

9-29.24 Service Cabinets

The third sentence of item number 6 is revised to read:

The dead front cover shall have cutouts for the entire breaker array, with blank covers where no circuit breakers are installed.

Item number 8 is revised to read:

8. Lighting contactors shall meet the requirements of Section 9-29.24(2).

The last sentence of item number 10 is revised to read:

Dead front panels shall prevent access to any exposed, live components, and shall cover all equipment except for circuit breakers (including blank covers), the photocell test/bypass switch, and the GFCI receptacle.

9-29.24(2) Electrical Circuit Breakers and Contactors

This section is revised to read:

All circuit breakers shall be bolt-on type, with the RMS-symmetrical interrupting capacity described in this Section. Circuit breakers for 120/240/277 volt circuits shall be rated at 240 or 277 volts, as applicable, with an interrupting capacity of not less than 10,000 amperes. Circuit breakers for 480 volt circuits shall be rated at 480 volts, and shall have an interrupting capacity of not less than 14,000 amperes.

Lighting contactors shall be rated for tungsten or ballasted (such as sodium vapor, mercury vapor, metal halide, and fluorescent) lamp loads. Contactors for 120/240/277 volt circuits shall be rated at 240 volts maximum line to line voltage, or 277 volts maximum line to neutral voltage, as applicable. Contactors for 480 volt circuits shall be rated at 480 volt maximum line to line voltage.

9-33.AP9

Section 9-33, Construction Geosynthetic
August 6, 2018

9-33.4(1) Geosynthetic Material Approval

The second sentence of the first paragraph is revised to read:

> If the geosynthetics material is not listed in the current WSDOT QPL, a Manufacturer's Certificate of Compliance including Certified Test Reports of each proposed geosynthetic shall be submitted to the State Materials Laboratory in Tumwater for evaluation.

The last paragraph is revised to read:

> Geosynthetics used as reinforcement in permanent geosynthetic retaining walls, reinforced slopes, reinforced embankments, and other geosynthetic reinforcement applications require proof of compliance with the National Transportation Product Evaluation Program (NTPEP) in accordance with AASHTO Standard Practice R 69, Standard Practice for Determination of Long-Term Strength for Geosynthetic Reinforcement.

9-34.AP9

Section 9-34, Pavement Marking Material
January 7, 2019

9-34.2(2) Color

The first sentence is revised to read:

> Paint draw-downs shall be prepared according to ASTM D823.

Each reference to "Federal Standard 595" is revised to read "SAE AMS Standard 595".

9-34.2(3) Prohibited Materials

This section is revised to read:

> Traffic paint shall not contain mercury, lead, chromium, diarylide pigments, toluene, chlorinated solvents, hydrolysable chlorine derivatives, ethylene-based glycol ethers and their acetates, nor any other EPA hazardous waste material over the regulatory levels in accordance with CFR 40 Part 261.24.

9-34.2(5) Low VOC Waterborne Paint

The heading "Standard Waterborne Paint" is supplemented with "Type 1 and 2".

The heading "High-Build Waterborne Paint" is supplemented with "Type 4".

The heading "Cold Weather Waterborne Paint" is supplemented with "Type 5".

In the row beginning with "° @90°F", each minimum value is revised to read "60".

In the row beginning with "Fineness of Grind, (Hegman Scale)", each minimum value is revised to read "3".

The last four rows are replaced with the following:

Vehicle Composition	ASTM D 2621	100% acrylic emulsion	100% cross-linking acrylic[4]	100% acrylic emulsion
Freeze-Thaw Stability, KU	ASTM D 2243 and D 562	@ 5 cycles show no coagulation or change in viscosity greater than ± 10 KU	@ 5 cycles show no coagulation or change in viscosity greater than ± 10 KU	@ 3 cycles show no coagulation or change in viscosity greater than ± 10 KU
Heat Stability	ASTM D 562[2]	± 10 KU from the initial viscosity	± 10 KU from the initial viscosity	± 10 KU from the initial Viscosity
Low Temperature Film Formation	ASTM D 2805[3]	No Cracks*		No Cracks
Cold Flexibility[5]	ASTM D522	Pass at 0.5 in mandrel*		
Test Deck Durability[6]	ASTM D913	≥70% paint retention in wheel track*		
Mud Cracking	(See note 7)	No Cracks	No Cracks	

After the preceding Amendments are applied, the following new column is inserted after the "Standard Waterborne Paint Type 1 and 2" column:

Semi-Durable Waterborne Paint Type 3			
White		**Yellow**	
Min.	**Max.**	**Min.**	**Max.**
Within ± 0.3 of qualification sample			
80	95	80	95
60		60	
77		77	
	65		65
43		43	
	1.25		1.25
3		3	
0.98		0.96	
88		50	
100°		100°	
9.5		9.5	
	10		10
100% acrylic emulsion			
@ 5 cycles show no coagulation or change in viscosity greater than ± 10 KU			
± 10 KU from the initial viscosity			
No Cracks			
Pass at 0.25 in mandrel			
≥70% paint retention in wheel track			
No Cracks			

The footnotes are supplemented with the following:

[4]Cross-linking acrylic shall meet the requirements of federal specification TT-P-1952F Section 3.1.1.

[5]Cold Flexibility: The paint shall be applied to an aluminum panel at a wet film thickness of 15 mils and allowed to dry under ambient conditions (50±10% RH and 72±5 ˚F) for 24 hours. A cylindrical mandrel apparatus (in accordance with ASTM D522 method B) shall be put in a 40°F refrigerator when the paint is drawn down. After 24 hours, the aluminum panel with dry paint shall be put in the 40°F refrigerator with the mandrel apparatus for 2 hours. After 2 hours, the panel and test apparatus shall be removed and immediately tested to according to ASTM D522 to evaluate cold flexibility. Paint must show no evidence of cracking, chipping or flaking when bent 180 degrees over a mandrel bar of specified diameter.

[6]NTPEP test deck, or a test deck conforming to ASTM D713, shall be conducted for a minimum of six months with the following additional requirements: it shall be applied at 15 wet mils to a test deck that is located at 40N latitude or higher with at least 10,000 ADT and which was applied during the months of September through November.

[7]Paint is applied to an approximately 4”x12” aluminum panel using a drawdown bar with a 50 mil gap. The coated panel is allowed to dry under ambient conditions (50±10% RH and 72±5 ˚F) for 24 hours. Visual evaluation of the dry film shall reveal no cracks.

9-34.3 Plastic

In the first sentence of the last paragraph, “Federal Standard 595” is revised to read “SAE AMS Standard 595”.

9-34.3(2) Type B – Pre-Formed Fused Thermoplastic

In the last two paragraphs, each reference to “Federal Standard 595” is revised to read “SAE AMS Standard 595”.

9-34.3(4) Type D – Liquid Cold Applied Methyl Methacrylate

The Test Method value for **Adhesion to PCC or HMA, psi** is revised to read “ASTM D4541[1]”.

9-34.4 Glass Beads for Pavement Marking Materials

In the Test Method column of the table titled Metal Concentration Limits, “EPA 3052 SW-846 6010C” is revised to read “EPA 3052 SW-846 6010D”.

9-34.5(1) Temporary Pavement Marking Tape – Short Duration

This section, including title, is revised to read:

9-34.5(1) Temporary Pavement Marking Tape – Short Duration (Removable)

Temporary pavement marking tape for short duration (usage is for up to two months) shall conform to ASTM D4592 Type I except that black tape, black mask tape and the black portion of the contrast removable tape, shall be non-reflective.

9-34.5(2) Temporary Pavement Marking Tape – Long Duration

This section’s title is revised to read:

Temporary Pavement Marking Tape – Long Duration (Non-Removable)

The first sentence is revised to read:

Temporary pavement marking tape for long duration (usage is for greater than two months and less than one year) shall conform to ASTM D4592 Type II.

ASTM E2176 is deleted from the second sentence.

9-34.7(1) Requirements

The first paragraph is revised to read:

Field performance evaluation is required for low VOC solvent-based paint per Section 9-34.2(4), Type A – liquid hot applied thermoplastic per Section 9-34.3(1), Type B – preformed fused thermoplastic per Section 9-34.3(2), Type C – cold applied preformed tape per Section 9-34.3(3), and Type D – liquid applied methyl methacrylate per Section 9-34.3(4).

The last paragraph is deleted.

9-34.7(1)C Auto No-Track Time

The first paragraph is revised to read:

Auto No-Track Time will only be required for low VOC solvent-based paint in accordance with Section 9-34.2(4).

The second and third sentences of the second paragraph are deleted.

INTRODUCTION TO THE SPECIAL PROVISIONS

(August 14, 2013 APWA GSP)

The work on this project shall be accomplished in accordance with the *Standard Specifications for Road, Bridge and Municipal Construction*, 2018 edition, as issued by the Washington State Department of Transportation (WSDOT) and the American Public Works Association (APWA), Washington State Chapter (hereafter "Standard Specifications"). The Standard Specifications, as modified or supplemented by the Amendments to the Standard Specifications and these Special Provisions, all of which are made a part of the Contract Documents, shall govern all of the Work.

These Special Provisions are made up of both General Special Provisions (GSPs) from various sources, which may have project-specific fill-ins; and project-specific Special Provisions. Each Provision either supplements, modifies, or replaces the comparable Standard Specification, or is a new Provision. The deletion, amendment, alteration, or addition to any subsection or portion of the Standard Specifications is meant to pertain only to that particular portion of the section, and in no way should it be interpreted that the balance of the section does not apply.

The project-specific Special Provisions are not labeled as such. The GSPs are labeled under the headers of each GSP, with the effective date of the GSP and its source. For example:

(March 8, 2013 APWA GSP)
(April 1, 2013 WSDOT GSP)

Also incorporated into the Contract Documents by reference are:

- *Manual on Uniform Traffic Control Devices for Streets and Highways*, currently adopted edition, with Washington State modifications, if any
- *Standard Plans for Road, Bridge and Municipal Construction*, WSDOT/APWA, current edition
- City of Wenatchee Standard Plans

Contractor shall obtain copies of these publications, at Contractor's own expense.

Division 1
General Requirements

Description of Work
(March 13,1995)

The Contract provides for the improvement of riverfront parcel of land, construction of park amenities and site improvements, including but not limited to temporary erosion and sedimentation control, clearing and grubbing, earthwork, site grading, and import, placement and compaction of crushed surfacing materials, asphalt trail paving, landscaping improvements, irrigation adjustments, utility extensions and associated appurtenances and other work, all in accordance with the attached Contract Plans, the Contract Provisions and the Standard Specifications.

1-01 Definitions and Terms

1-01.3 Definitions
(January 4, 2016 APWA GSP, revised)

Delete the heading **Completion Dates** and the three paragraphs that follow it, and replace them with the following:

Dates

Bid Opening Date
The date on which the Contracting Agency publicly opens and reads the Bids.

Award Date
The date of the formal decision of the Contracting Agency to accept the lowest responsible and responsive Bidder for the Work.

Contract Execution Date
The date the Contracting Agency officially binds the Agency to the Contract.

Notice to Proceed Date
The date stated in the Notice to Proceed on which the Contract time begins.

Substantial Completion Date
The day the Engineer determines the Contracting Agency has full and unrestricted use and benefit of the facilities, both from the operational and safety standpoint, any remaining traffic disruptions will be rare and brief, and only minor incidental work, replacement of temporary substitute facilities, plant establishment periods, or correction or repair remains for the Physical Completion of the total Contract.

Physical Completion Date
The day all of the Work is physically completed on the project. All documentation required by the Contract and required by law does not necessarily need to be furnished by the Contractor by this date.

Completion Date
The day all the Work specified in the Contract is completed and all the obligations of the Contractor under the contract are fulfilled by the Contractor. All documentation required by the Contract and required by law must be furnished by the Contractor before establishment of this date.

Final Acceptance Date
The date on which the Contracting Agency accepts the Work as complete.

Supplement this Section with the following:

All references in the Standard Specifications, Amendments, or WSDOT General Special Provisions, to the terms "Department of Transportation", "Washington State Transportation Commission", "Commission", "Secretary of Transportation", "Secretary", "Headquarters", and "State Treasurer" shall be revised to read "Contracting Agency".

All references to the terms "State" or "state" shall be revised to read "Contracting Agency" unless the reference is to an administrative agency of the State of Washington, a State statute or regulation, or the context reasonably indicates otherwise.

All references to "State Materials Laboratory" shall be revised to read "Contracting Agency designated location".

All references to "final contract voucher certification" shall be interpreted to mean the Contracting Agency form(s) by which final payment is authorized, and final completion and acceptance granted.

Additive
A supplemental unit of work or group of bid items, identified separately in the Bid Proposal, which may, at the discretion of the Contracting Agency, be awarded in addition to the base bid.

Alternate
One or more units of work or groups of bid items, identified separately in the Bid Proposal, from which the Contracting Agency may make a choice between different methods or material of construction for performing the same work.

Business Day
A business day is any day from Monday through Friday except holidays as listed in Section 1-08.5.

Contract Bond
The definition in the Standard Specifications for "Contract Bond" applies to whatever bond form(s) are required by the Contract Documents, which may be a combination of a Payment Bond and a Performance Bond.

Contract Documents
See definition for "Contract".

Contract Time
The period of time established by the terms and conditions of the Contract within which the Work must be physically completed.

Deductive
A unit of work or group of bid items, identified separately in the Bid Proposal, which may, at the discretion of the Contracting Agency, be awarded in addition to the base bid to diminish the overall project.

Notice of Award
The written notice from the Contracting Agency to the successful Bidder signifying the Contracting Agency's acceptance of the Bid Proposal.

Notice to Proceed
The written notice from the Contracting Agency or Engineer to the Contractor authorizing and directing the Contractor to proceed with the Work and establishing the date on which the Contract time begins.

Traffic
Both vehicular and non-vehicular traffic, such as pedestrians, bicyclists, wheelchairs, and equestrian traffic.

Supplement Section 1-01.3 with the following:

(******)
Engineer
Pacific Engineering and Design, PLLC

Contracting Agency
City of Wenatchee

1-02 BID PROCEDURES AND CONDITIONS

1-02.1 Prequalification of Bidders

Delete this section and replace it with the following:

1-02.1 Qualifications of Bidder
(January 24, 2011 APWA GSP)

Before award of a public works contract, a bidder must meet at least the minimum qualifications of RCW 39.04.350(1) to be considered a responsible bidder and qualified to be awarded a public works project.

1-02.2 Plans and Specifications
(******)

Delete this section and replace it with the following:

Information as to where Bid Documents can be obtained can be found in the Call for Bids (Advertisement for Bids) for the work.

After award of the contract, plans and specifications will be issued to the Contractor electronically.

1-02 Bid Procedures and Conditions

1-02.4 Examination of Plans, Specifications, and Site Work

1-02.4(1) General

(August 15, 2016 APWA GSP Option B)

The first sentence of the last paragraph is revised to read:

> Any prospective Bidder desiring an explanation or interpretation of the Bid Documents, shall request the explanation or interpretation in writing by close of business $$ three (3) $$ business days preceding the bid opening to allow a written reply to reach all prospective Bidders before the submission of their Bids.

1-02.5 Proposal Forms

(July 31, 2017 APWA GSP)

Delete this section and replace it with the following:

> The Proposal Form will identify the project and its location and describe the work. It will also list estimated quantities, units of measurement, the items of work, and the materials to be furnished at the unit bid prices. The bidder shall complete spaces on the proposal form that call for, but are not limited to, unit prices; extensions; summations; the total bid amount; signatures; date; and, where applicable, retail sales taxes and acknowledgment of addenda; the bidder's name, address, telephone number, and signature; the bidder's UDBE/DBE/M/WBE commitment, if applicable; a State of Washington Contractor's Registration Number; and a Business License Number, if applicable. Bids shall be completed by typing or shall be printed in ink by hand, preferably in black ink. The required certifications are included as part of the Proposal Form.
>
> The Contracting Agency reserves the right to arrange the proposal forms with alternates, additives, and deductives if such be to the advantage of the Contracting Agency. The bidder shall bid on all alternates, additives, and deductives set forth in the Proposal Form unless otherwise specified.

1-02.6 Preparation of Proposal

(July 11, 2018 APWA GSP)

Supplement the second paragraph with the following:

4. If a minimum bid amount has been established for any item, the unit or lump sum price must equal or exceed the minimum amount stated.
5. Any correction to a bid made by interlineation, alteration, or erasure, shall be initialed by the signer of the bid.

Delete the last two paragraphs, and replace them with the following:

> If no Subcontractor is listed, the Bidder acknowledges that it does not intend to use any Subcontractor to perform those items of work.
>
> The Bidder shall submit with their Bid a completed Contractor Certification Wage Law Compliance form, provided by the Contracting Agency. Failure to return this certification as

part of the Bid Proposal package will make this Bid Nonresponsive and ineligible for Award. A Contractor Certification of Wage Law Compliance form is included in the Proposal Forms.

The Bidder shall make no stipulation on the Bid Form, nor qualify the bid in any manner.

A bid by a corporation shall be executed in the corporate name, by the president or a vice president (or other corporate officer accompanied by evidence of authority to sign).

A bid by a partnership shall be executed in the partnership name, and signed by a partner. A copy of the partnership agreement shall be submitted with the Bid Form if any UDBE requirements are to be satisfied through such an agreement.

A bid by a joint venture shall be executed in the joint venture name and signed by a member of the joint venture. A copy of the joint venture agreement shall be submitted with the Bid Form if any UDBE requirements are to be satisfied through such an agreement.

Section 1-02.6 is supplemented with the following:

Deductive and Additive Bids

The bidding proposal on this project permits the bidder to submit a bid on a deductive item for the site stabilization and an additive item for construction of illumination for the skate park.

Bid Proposal

The bid proposal is composed of the following parts: Base Bid, Additive A1 and Deductive D1.

The base bid shall include constructing all items included in the Proposal except those items contained in the Additive(s) or Deductive(s).

Bidding Procedures

Bidders are to submit a base bid, the cost of each additive item, and the cost of each deductive item in case it is necessary to reduce the project cost.

The successful Bidder will be the Bidder submitting the lowest responsible Bid for the Base Bid without any Additives or Deductives.

The Contracting Agency may, at its discretion, award a Contract for the Base Bid with the Deductives and without any Additives to reduce the size of the project if it is necessary to fit the budget.

The Contracting Agency may, at its discretion, award a Contract for the Base Bid with the Additives and without any Deductives if the budget is sufficient. The successful Bidder will be as determined as outlined above.

The Contracting Agency may, at its discretion, award a Contract for the Base Bid without the Additives and Deductives if the budget is sufficient for the Base Bid but not the Additives. The successful Bidder will be as determined as outlined above.

1-02.7 Bid Deposit

(******)

Revise this section to read:

A deposit of at least 5 percent of the total Bid shall accompany each bond. This deposit may be in certified check, cashier's check or a proposal bond (surety bond). Any proposal bond shall be on a form acceptable to the Contracting Agency and shall be signed by the Bidder and Surety. A proposal bond shall not be conditioned in any way to modify the minimum 5 percent required. The Surety shall: (1) be registered with the Washington State Insurance Commissioner, and (2) appear on the current Authorized Insurance List in the State of Washington published by the Office of the Insurance Commissioner. The failure to furnish a Bid deposit of a minimum of 5 percent with the bid shall make the bid nonresponsive and shall cause the Bid to be rejected by the Contracting Agency.

(March 8, 2013 APWA GSP)

Supplement this section with the following:

Bid bonds shall contain the following:

1. Contracting Agency-assigned number for the project;
2. Name of the project;
3. The Contracting Agency named as obligee;
4. The amount of the bid bond stated either as a dollar figure or as a percentage which represents five percent of the maximum bid amount that could be awarded;
5. Signature of the bidder's officer empowered to sign official statements. The signature of the person authorized to submit the bid should agree with the signature on the bond, and the title of the person must accompany the said signature;
6. The signature of the surety's officer empowered to sign the bond and the power of attorney.

If so stated in the Contract Provisions, bidder must use the bond form included in the Contract Provisions.

If so stated in the Contract Provisions, cash will not be accepted for a bid deposit.

1-02.9 Delivery of Proposal

(******)

Delete this section and replace it with the following:

Each Proposal shall be submitted in a sealed envelope, with the Project Name and Project Number as stated in the Call for Bids clearly marked on the outside of the envelope, or as otherwise required in the Bid Documents, to ensure proper handling and delivery.

All information required to be submitted with the Bid Proposal must be submitted with the Bid Proposal itself, at the time stated in the Call for Bids.

Proposals that are received as required will be publicly opened and read as specified in Section 1-02.12.The Contracting Agency will not open or consider any Bid Proposal that is received after the time specified in the Call for Bids for receipt of Bid Proposals, or received in a

location other than that specified in the Call for Bids. The Contracting Agency will not open or consider any "Supplemental Information" (UDBE confirmations, or GFE documentation) that is received after the time specified above, or received in a location other than that specified in the Call for Bids.

If an emergency or unanticipated event interrupts normal work processes of the Contracting Agency so that Proposals cannot be received at the office designated for receipt of bids as specified in Section 1-02.12 the time specified for receipt of the Proposal will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which the normal work processes of the Contracting Agency resume.

1-02.10 Withdrawing, Revising, or Supplementing Proposal
(July 23, 2015 APWA GSP)

Delete this section, and replace it with the following:

After submitting a physical Bid Proposal to the Contracting Agency, the Bidder may withdraw, revise, or supplement it if:

1. The Bidder submits a written request signed by an authorized person and physically delivers it to the place designated for receipt of Bid Proposals, and
2. The Contracting Agency receives the request before the time set for receipt of Bid Proposals, and
3. The revised or supplemented Bid Proposal (if any) is received by the Contracting Agency before the time set for receipt of Bid Proposals.

If the Bidder's request to withdraw, revise, or supplement its Bid Proposal is received before the time set for receipt of Bid Proposals, the Contracting Agency will return the unopened Proposal package to the Bidder. The Bidder must then submit the revised or supplemented package in its entirety. If the Bidder does not submit a revised or supplemented package, then its bid shall be considered withdrawn.

Late revised or supplemented Bid Proposals or late withdrawal requests will be date recorded by the Contracting Agency and returned unopened. Mailed, emailed, or faxed requests to withdraw, revise, or supplement a Bid Proposal are not acceptable.

1-02.12 Public Opening of Proposals

Section 1-02.12 is supplemented with the following:
(******)

Date of Opening Bids
The bid opening date for this project is ***Wednesday, May 27, 2020***. Bid proposals will be received by the Parks, Recreation and Cultural Services Director at the City of Wenatchee Public Services Center at 1350 McKittrick Street, Suite B, Wenatchee, WA 98801. Due to current closure of city facilities, hardcopy bids will be received at the front door of the Public Services Center between 2:30 p.m. and 3:00 p.m. and contractors will not be allowed to enter the building. Proposals received after this time will not be considered.

Received bids will be delivered to City Hall at 301 Yakima Street, Suite 304, Wenatchee, WA 98801. All bids will be opened, read, and tabulated publicly via the City of Wenatchee's YouTube channel at 4:00 p.m.PST on Wednesday, May 27, 2020. Contractors can view the bid opening using the following link: https://www.youtube.com/channel/UCT-YjVud0twVXGMUjg16rhA/.

1-02.13 Irregular Proposals

(June 20, 2017 APWA GSP)

Delete this section and replace it with the following:

1. A Proposal will be considered irregular and will be rejected if:
   a. The Bidder is not prequalified when so required;
   b. The authorized Proposal form furnished by the Contracting Agency is not used or is altered;
   c. The completed Proposal form contains any unauthorized additions, deletions, alternate Bids, or conditions;
   d. The Bidder adds provisions reserving the right to reject or accept the award, or enter into the Contract;
   e. A price per unit cannot be determined from the Bid Proposal;
   f. The Proposal form is not properly executed;
   g. The Bidder fails to submit or properly complete a Subcontractor list, if applicable, as required in Section 1-02.6;
   h. The Bidder fails to submit or properly complete an Underutilized Disadvantaged Business Enterprise Certification, if applicable, as required in Section 1-02.6;
   i. The Bidder fails to submit written confirmation from each UDBE firm listed on the Bidder's completed UDBE Utilization Certification that they are in agreement with the bidder's UDBE participation commitment, if applicable, as required in Section 1-02.6, or if the written confirmation that is submitted fails to meet the requirements of the Special Provisions;
   j The Bidder fails to submit UDBE Good Faith Effort documentation, if applicable, as required in Section 1-02.6, or if the documentation that is submitted fails to demonstrate that a Good Faith Effort to meet the Condition of Award was made;
   k. The Bid Proposal does not constitute a definite and unqualified offer to meet the material terms of the Bid invitation; or
   l. More than one Proposal is submitted for the same project from a Bidder under the same or different names.

2. A Proposal may be considered irregular and may be rejected if:
   a. The Proposal does not include a unit price for every Bid item;
   b. Any of the unit prices are excessively unbalanced (either above or below the amount of a reasonable Bid) to the potential detriment of the Contracting Agency;
   c. Receipt of Addenda is not acknowledged;
   d. A member of a joint venture or partnership and the joint venture or partnership submit Proposals for the same project (in such an instance, both Bids may be rejected); or
   e. If Proposal form entries are not made in ink.

1-02.14 Disqualification of Bidders

(May 17, 2018 APWA GSP, Option A)

Delete this section and replace it with the following:

A Bidder will be deemed not responsible if the Bidder does not meet the mandatory bidder responsibility criteria in RCW 39.04.350(1), as amended.

The Contracting Agency will verify that the Bidder meets the mandatory bidder responsibility criteria in RCW 39.04.350(1). To assess bidder responsibility, the Contracting Agency reserves the right to request documentation as needed from the Bidder and third parties concerning the Bidder's compliance with the mandatory bidder responsibility criteria.

If the Contracting Agency determines the Bidder does not meet the mandatory bidder responsibility criteria in RCW 39.04.350(1) and is therefore not a responsible Bidder, the Contracting Agency shall notify the Bidder in writing, with the reasons for its determination. If the Bidder disagrees with this determination, it may appeal the determination within two (2) business days of the Contracting Agency's determination by presenting its appeal and any additional information to the Contracting Agency. The Contracting Agency will consider the appeal and any additional information before issuing its final determination. If the final determination affirms that the Bidder is not responsible, the Contracting Agency will not execute a contract with any other Bidder until at least two business days after the Bidder determined to be not responsible has received the Contracting Agency's final determination.

1-02.15 Pre Award Information

(August 14, 2013 APWA GSP)

Revise this section to read:

Before awarding any contract, the Contracting Agency may require one or more of these items or actions of the apparent lowest responsible bidder:

1. A complete statement of the origin, composition, and manufacture of any or all materials to be used,
2. Samples of these materials for quality and fitness tests,
3. A progress schedule (in a form the Contracting Agency requires) showing the order of and time required for the various phases of the work,
4. A breakdown of costs assigned to any bid item,
5. Attendance at a conference with the Engineer or representatives of the Engineer,
6. Obtain, and furnish a copy of, a business license to do business in the city or county where the work is located.
7. Any other information or action taken that is deemed necessary to ensure that the bidder is the lowest responsible bidder.

1-03.1 Consideration of Bids

(January 23, 2006 APWA GSP)

Revise the first paragraph to read:

After opening and reading proposals, the Contracting Agency will check them for correctness of extensions of the prices per unit and the total price. If a discrepancy exists between the price per unit and the extended amount of any bid item, the price per unit will control. If a

minimum bid amount has been established for any item and the bidder's unit or lump sum price is less than the minimum specified amount, the Contracting Agency will unilaterally revise the unit or lump sum price, to the minimum specified amount and recalculate the extension. The total of extensions, corrected where necessary, including sales taxes where applicable and such additives and/or alternates as selected by the Contracting Agency, will be used by the Contracting Agency for award purposes and to fix the Awarded Contract Price amount and the amount of the contract bond.

1-03.3 Execution of Contract

(October 1, 2005 APWA GSP)

Revise this section to read:

~~Copies of~~ The Contract Provisions, including the unsigned Form of Contract, will be available **electronically** for signature by the successful bidder on the first business day following award. The number of copies to be executed by the Contractor will be determined by the Contracting Agency.

Within $$ ten (10) $$ calendar days after the award date, the successful bidder shall return the signed Contracting Agency-prepared contract, an insurance certification as required by Section 1-07.18, and a satisfactory bond as required by law and Section 1-03.4. Before execution of the contract by the Contracting Agency, the successful bidder shall provide any pre-award information the Contracting Agency may require under Section 1-02.15.

Until the Contracting Agency executes a contract, no proposal shall bind the Contracting Agency nor shall any work begin within the project limits or within Contracting Agency-furnished sites. The Contractor shall bear all risks for any work begun outside such areas and for any materials ordered before the contract is executed by the Contracting Agency.

If the bidder experiences circumstances beyond their control that prevents return of the contract documents within the $$ ten (10) $$ calendar days after the award date as stated above, the Contracting Agency may grant up to a maximum of $$ fourteen (14) $$ additional calendar days for return of the documents, provided the Contracting Agency deems the circumstances warrant it.

1-03.4 Contract Bond

(July 23, 2015 APWA GSP)

Delete the first paragraph and replace it with the following:

The successful bidder shall provide executed payment and performance bond(s) for the full contract amount. The bond may be a combined payment and performance bond; or be separate payment and performance bonds. In the case of separate payment and performance bonds, each shall be for the full contract amount. The bond(s) shall:

1. Be on Contracting Agency-furnished form(s);
2. Be signed by an approved surety (or sureties) that:
   a. Is registered with the Washington State Insurance Commissioner, and
   b. Appears on the current Authorized Insurance List in the State of Washington published by the Office of the Insurance Commissioner,
3. Guarantee that the Contractor will perform and comply with all obligations, duties, and conditions under the Contract, including but not limited to the duty and obligation to

indemnify, defend, and protect the Contracting Agency against all losses and claims related directly or indirectly from any failure:

a. Of the Contractor (or any of the employees, subcontractors, or lower tier subcontractors of the Contractor) to faithfully perform and comply with all contract obligations, conditions, and duties, or
b. Of the Contractor (or the subcontractors or lower tier subcontractors of the Contractor) to pay all laborers, mechanics, subcontractors, lower tier subcontractors, material person, or any other person who provides supplies or provisions for carrying out the work;

4. Be conditioned upon the payment of taxes, increases, and penalties incurred on the project under titles 50, 51, and 82 RCW; and
5. Be accompanied by a power of attorney for the Surety's officer empowered to sign the bond; and
6. Be signed by an officer of the Contractor empowered to sign official statements (sole proprietor or partner). If the Contractor is a corporation, the bond(s) must be signed by the president or vice president, unless accompanied by written proof of the authority of the individual signing the bond(s) to bind the corporation (i.e., corporate resolution, power of attorney, or a letter to such effect signed by the president or vice president).

1-03.7 Judicial Review

(November 30, 2018 APWA GSP)

Revise this section to read:

Any decision made by the Contracting Agency regarding the Award and execution of the Contract or Bid rejection shall be conclusive subject to the scope of judicial review permitted under Washington Law. Such review, if any, shall be timely filed in the Superior Court of the county where the Contracting Agency headquarters is located, provided that where an action is asserted against a county, RCW 36.01.050 shall control venue and jurisdiction.

Scope of the Work

1-04 Scope of Work

1-04.2 Coordination of Contract Documents, Plans, Special Provisions, Specifications, and Addenda

(March 13, 2012 APWA GSP)

Revise the second paragraph to read:

Any inconsistency in the parts of the contract shall be resolved by following this order of precedence (e.g., 1 presiding over 2, 2 over 3, 3 over 4, and so forth):

1. Addenda,
2. Proposal Form,
3. Special Provisions,
4. Contract Plans,
5. Amendments to the Standard Specifications,
6. Standard Specifications,
7. Contracting Agency's Standard Plans or Details (if any), and
8. WSDOT Standard Plans for Road, Bridge, and Municipal Construction.

1-05 Control of Work

1-05.4 Conformity with and Deviations from Plans and Stakes

Section 1-05.4 is supplemented with the following:

(August 7, 2017, revised)

Contractor Surveying - Roadway

Copies of the Contracting Agency provided primary survey control data are available for the bidder's inspection ~~at the office of the Contracting Agency~~ are available upon request.

The Contractor shall be responsible for setting, maintaining, and resetting all alignment stakes, slope stakes, and grades necessary for the construction of the roadbed, drainage, surfacing, paving, channelization and pavement marking, illumination and signals, guardrails and barriers, and signing. Except for the survey control data to be furnished by the Contracting Agency, calculations, surveying, and measuring required for setting and maintaining the necessary lines and grades shall be the Contractor's responsibility.

The Contractor shall inform the Engineer when monuments are discovered that were not identified in the Plans and construction activity may disturb or damage the monuments. All monuments noted on the plans “DO NOT DISTURB” shall be protected throughout the length of the project or be replaced at the Contractors expense.

~~Detailed survey records shall be maintained, including a description of the work performed on each shift, the methods utilized, and the control points used. The record shall be adequate to allow the survey to be reproduced. A copy of each day's record shall be provided to the Engineer within three working days after the end of the shift.~~

The meaning of words and terms used in this provision shall be as listed in "Definitions of Surveying and Associated Terms" current edition, published by the American Congress on Surveying and Mapping and the American Society of Civil Engineers.

The survey work shall include but not be limited to the following:

1. Verify the primary horizontal and vertical control furnished by the Contracting Agency, and expand into secondary control by adding stakes and hubs as well as additional survey control needed for the project. ~~Provide descriptions of secondary control to the Contracting Agency. The description shall include coordinates and elevations of all secondary control points~~.

2. Establish, the centerlines of all alignments, by placing hubs, stakes, or marks on centerline or on offsets to centerline at all curve points (PCs, PTs, and PIs) and at points on the alignments spaced no further than 50 feet.

3. ~~Establish clearing limits, placing stakes at all angle points and at intermediate points not more than 50 feet apart. The clearing and grubbing limits shall be 5 feet beyond the toe of a fill and 10 feet beyond the top of a cut unless otherwise shown in the Plans~~.

4. ~~Establish grading limits, placing slope stakes at centerline increments not more than 50 feet apart. Establish offset reference to all slope stakes. If Global Positioning~~

~~Satellite (GPS) Machine Controls are used to provide grade control, then slope stakes may be omitted at the discretion of the Contractor~~

5. ~~Establish the horizontal and vertical location of all drainage features, placing offset stakes to all drainage structures and to pipes at a horizontal interval not greater than 25 feet~~.

6. Establish roadbed and surfacing elevations by placing stakes at the top of subgrade and at the top of each course of surfacing. Subgrade and surfacing stakes shall be set at horizontal intervals not greater than 50 feet in tangent sections, 25 feet in curve sections with a radius less than 300 feet, and at 10-foot intervals in intersection radii with a radius less than 10 feet. Transversely, stakes shall be placed at all locations where the roadway slope changes and at additional points such that the transverse spacing of stakes is not more than 12 feet. If GPS Machine Controls are used to provide grade control, then roadbed and surfacing stakes may be omitted at the discretion of the Contractor.

7. Establish intermediate elevation benchmarks as needed to check work throughout the project.

8. ~~Provide references for paving pins at 25-foot intervals or provide simultaneous surveying to establish location and elevation of paving pins as they are being placed~~.

9. For all other types of construction included in this provision, (including but not limited to channelization and pavement marking, illumination and signals, guardrails and barriers, and signing) provide staking and layout as necessary to adequately locate, construct, and check the specific construction activity.

10. Contractor shall determine if changes are needed to the profiles or roadway sections shown in the Contract Plans in order to achieve proper smoothness and drainage where matching into existing features, such as a smooth transition from new pavement to existing pavement. The Contractor shall submit these changes to the Engineer for review and approval 10 days prior to the beginning of work.

The Contractor shall provide the Contracting Agency copies of any calculations and staking data when requested by the Engineer.

To facilitate the establishment of these lines and elevations, the Contracting Agency will provide the Contractor with primary survey control information consisting of descriptions of two primary control points used for the horizontal and vertical control, ~~and descriptions of two additional primary control points for every additional three miles of project length. Primary control points will be described by reference to the project alignment and the coordinate system and elevation datum utilized by the project. In addition, the Contracting Agency will supply horizontal coordinates for the beginning and ending points and for each Point of Intersection (PI) on each alignment included in the project.~~

The Contractor shall ensure a surveying accuracy within the following tolerances:

	Vertical	Horizontal
Slope stakes	±0.10 feet	±0.10 feet
Subgrade grade stakes set 0.04 feet below grade	±0.01 feet	±0.5 feet (parallel to alignment) ±0.1 feet (normal to alignment)
Stationing on roadway	N/A	±0.1 feet
Alignment on roadway	N/A	±0.04 feet
Surfacing grade stakes	±0.01 feet	±0.5 feet (parallel to alignment) ±0.1 feet (normal to alignment)
Roadway paving pins for surfacing or paving	±0.01 feet	±0.2 feet (parallel to alignment) ±0.1 feet (normal to alignment)

The Contracting Agency may spot-check the Contractor's surveying. These spot-checks will not change the requirements for normal checking by the Contractor.

~~When staking roadway alignment and stationing, the Contractor shall perform independent checks from different secondary control to ensure that the points staked are within the specified survey accuracy tolerances~~.

~~The Contractor shall calculate coordinates for the alignment. The Contracting Agency will verify these coordinates prior to issuing approval to the Contractor for commencing with the work. The Contracting Agency will require up to seven calendar days from the date the data is received~~.

Contract work to be performed using contractor-provided stakes shall not begin until the stakes are approved by the Contracting Agency. Such approval shall not relieve the Contractor of responsibility for the accuracy of the stakes.

Stakes shall be marked in accordance with Standard Plan A10.10. When stakes are needed that are not described in the Plans, then those stakes shall be marked, at no additional cost to the Contracting Agency as ordered by the Engineer.

~~Payment~~

~~Payment will be made for the following bid item when included in the proposal:~~

~~"Roadway Surveying", lump sum.~~

~~The lump sum contract price for "Roadway Surveying" shall be full pay for all labor, equipment, materials, and supervision utilized to perform the Work specified, including any resurveying, checking, correction of errors, replacement of missing or damaged stakes, and coordination efforts~~.

(April 2, 2018)

Contractor Surveying – ADA Features

ADA Feature Staking Requirements

The Contractor shall be responsible for setting, maintaining, and resetting all alignment stakes, and grades necessary for the construction of the ADA features. Calculations, surveying, and measuring required for setting and maintaining the necessary lines and grades shall be the Contractor's responsibility. The Contractor shall build the ADA features within the specifications in the Standard Plans and contract documents.

ADA Feature As-Built Measurements

The Contractor shall be responsible for providing electronic As-Built records of all ADA feature improvements completed in the Contract.

The survey work shall include but not be limited to completing the measurements, recording the required measurements ~~and completing other data fill-ins found on the ADA Measurement Forms, and transmitting the electronic Forms to the Engineer. The ADA Measurement Forms are found at the following website location:~~

~~http://www.wsdot.wa.gov/Design/ADAGuidance.htm~~

In the instance where an ADA Feature does not meet accessibility requirements, all work to replace non-conforming work and then to measure, record the as-built measurements, and transmit the electronic Forms to the Engineer shall be completed at no additional cost to the Contracting Agency, as ordered by the Engineer.

~~Payment~~

~~Payment will be made for the following bid item that is included in the Proposal:~~

~~"ADA Features Surveying", lump sum.~~

~~The unit Contract price per lump sum for "ADA Features Surveying" shall be full pay for all the Work as specified~~.

1-05.7 Removal of Defective and Unauthorized Work

(October 1, 2005 APWA GSP)

Supplement this section with the following:

If the Contractor fails to remedy defective or unauthorized work within the time specified in a written notice from the Engineer, or fails to perform any part of the work required by the Contract Documents, the Engineer may correct and remedy such work as may be identified in the written notice, with Contracting Agency forces or by such other means as the Contracting Agency may deem necessary.

If the Contractor fails to comply with a written order to remedy what the Engineer determines to be an emergency situation, the Engineer may have the defective and unauthorized work corrected immediately, have the rejected work removed and replaced, or have work the Contractor refuses to perform completed by using Contracting Agency or other forces. An emergency situation is any situation when, in the opinion of the Engineer, a delay in its

remedy could be potentially unsafe, or might cause serious risk of loss or damage to the public.

Direct or indirect costs incurred by the Contracting Agency attributable to correcting and remedying defective or unauthorized work, or work the Contractor failed or refused to perform, shall be paid by the Contractor. Payment will be deducted by the Engineer from monies due, or to become due, the Contractor. Such direct and indirect costs shall include in particular, but without limitation, compensation for additional professional services required, and costs for repair and replacement of work of others destroyed or damaged by correction, removal, or replacement of the Contractor's unauthorized work.

No adjustment in contract time or compensation will be allowed because of the delay in the performance of the work attributable to the exercise of the Contracting Agency's rights provided by this Section.

The rights exercised under the provisions of this section shall not diminish the Contracting Agency's right to pursue any other avenue for additional remedy or damages with respect to the Contractor's failure to perform the work as required.

1-05.9 Equipment

Section 1-05.9 is supplemented with the following:

(******)

The use of vibratory equipment of any kind is expressly prohibited within the Wenatchee Reclamation District right-of-way.

(April 7, 2008), revised

General

This specification contains requirements for the use of machine control grading.

Instead of providing grade control through construction stakes, the Contractor may control grade with equipment that is controlled by a machine control system.

The Contractor may use any type of equipment and machine control system that produces results meeting the requirements of the Contract.

Electronic data is provided for the Contractor's convenience, and is not a part of the Contract. No guarantee or warranty is made by the Contracting Agency that electronic data provided to the Contractor: is compatible with any of the systems that are used by the Contractor; is complete; is representative of actual conditions at the project site, or; accurately reflects the quantities and character of the actual Work required. The furnishing of electronic design data or documentation shall not relieve the Contractor from any risks or of any duty to make examinations and investigations as required by Section 1-02.4 or any other responsibility under the Contract or as required by law. Except as provided above, no corrections, additions, or updates of any kind will be made to electronic data provided to the Contractor.

The Engineer may perform spot checks of the Contractor's machine control grading results, calculations, records, field procedures, and quality control measures. If the Engineer determines that the Work being performed is not achieving results that will meet the Contract

requirements, the Contractor shall make corrections to the Work at no additional cost to the Contracting Agency.

Contracting Agency Responsibilities

1. ~~The Engineer will set the initial horizontal and vertical control points for the project as shown in the Contract documents~~. See 1-05.4 Contractor Surveying – Roadway for information and responsibilities regarding project control.

2. The Engineer will provide additional datum and scale factor information upon request.

3. After execution of the Contract, the Engineer will make available upon written request the following electronic data used to design the project:

   *** Site Plan, AutoCAD 2018 Drawing, surface information in .xml format ***

   Data may be obtained by furnishing a written request via email to the Engineer at the following address(es):

   *** aaron@pacificengineering.net ***

Contractor's Responsibilities

1. The Contractor shall provide any information or data that is requested by the Contracting Agency for the purpose of performing the verification of quantities, and quality.

2. The Contractor shall be responsible for any edits or conversions of the Contracting Agencies electronic data whether done by the Contractor or a vendor that is hired by the Contractor to perform such edits or conversions.

3. The Contractor shall be responsible for the accuracy and usability of any data or model that is developed from the Contracting Agencies data.

4. The Contractor shall be responsible for checking and recalibrating Machine Control Equipment as required to achieve results that meet the requirements of the Contract.

5. The Contractor shall be responsible for establishing any additional control points needed to achieve results that meet the requirements of the Contract.

6. The Contractor shall provide the Contracting Agency electronic as-built construction data for the final Roadway surface model in a MicroStation format.

7. One week prior to the start of grading operations the Contractor shall meet with the Engineers staff to review the grading plans, quality processes, and tolerance requirements.

Payment

All costs associated with the use of machine control grading equipment are incidental to related items of Work, and no additional payment will be provided.

1-05.11 Final Inspection

Delete this section and replace it with the following:

1-05.11 Final Inspections and Operational Testing

(October 1, 2005 APWA GSP)

1-05.11(1) Substantial Completion Date

When the Contractor considers the work to be substantially complete, the Contractor shall so notify the Engineer and request the Engineer establish the Substantial Completion Date. The Contractor's request shall list the specific items of work that remain to be completed in order to reach physical completion. The Engineer will schedule an inspection of the work with the Contractor to determine the status of completion. The Engineer may also establish the Substantial Completion Date unilaterally.

If, after this inspection, the Engineer concurs with the Contractor that the work is substantially complete and ready for its intended use, the Engineer, by written notice to the Contractor, will set the Substantial Completion Date. If, after this inspection the Engineer does not consider the work substantially complete and ready for its intended use, the Engineer will, by written notice, so notify the Contractor giving the reasons therefor.

Upon receipt of written notice concurring in or denying substantial completion, whichever is applicable, the Contractor shall pursue vigorously, diligently and without unauthorized interruption, the work necessary to reach Substantial and Physical Completion. The Contractor shall provide the Engineer with a revised schedule indicating when the Contractor expects to reach substantial and physical completion of the work.

The above process shall be repeated until the Engineer establishes the Substantial Completion Date and the Contractor considers the work physically complete and ready for final inspection.

1-05.11(2) Final Inspection and Physical Completion Date

When the Contractor considers the work physically complete and ready for final inspection, the Contractor by written notice, shall request the Engineer to schedule a final inspection. The Engineer will set a date for final inspection. The Engineer and the Contractor will then make a final inspection and the Engineer will notify the Contractor in writing of all particulars in which the final inspection reveals the work incomplete or unacceptable. The Contractor shall immediately take such corrective measures as are necessary to remedy the listed deficiencies. Corrective work shall be pursued vigorously, diligently, and without interruption until physical completion of the listed deficiencies. This process will continue until the Engineer is satisfied the listed deficiencies have been corrected.

If action to correct the listed deficiencies is not initiated within 7 days after receipt of the written notice listing the deficiencies, the Engineer may, upon written notice to the Contractor, take whatever steps are necessary to correct those deficiencies pursuant to Section 1-05.7.
The Contractor will not be allowed an extension of contract time because of a delay in the performance of the work attributable to the exercise of the Engineer's right hereunder.

Upon correction of all deficiencies, the Engineer will notify the Contractor and the Contracting Agency, in writing, of the date upon which the work was considered physically complete. That date shall constitute the Physical Completion Date of the contract, but shall not imply acceptance of the work or that all the obligations of the Contractor under the contract have been fulfilled.

1-05.11(3) Operational Testing

It is the intent of the Contracting Agency to have at the Physical Completion Date a complete and operable system. Therefore when the work involves the installation of machinery or other mechanical equipment; street lighting, electrical distribution or signal systems; irrigation systems; buildings; or other similar work it may be desirable for the Engineer to have the Contractor operate and test the work for a period of time after final inspection but prior to the physical completion date. Whenever items of work are listed in the Contract Provisions for operational testing they shall be fully tested under operating conditions for the time period specified to ensure their acceptability prior to the Physical Completion Date. During and following the test period, the Contractor shall correct any items of workmanship, materials, or equipment which prove faulty, or that are not in first class operating condition. Equipment, electrical controls, meters, or other devices and equipment to be tested during this period shall be tested under the observation of the Engineer, so that the Engineer may determine their suitability for the purpose for which they were installed. The Physical Completion Date cannot be established until testing and corrections have been completed to the satisfaction of the Engineer.

The costs for power, gas, labor, material, supplies, and everything else needed to successfully complete operational testing, shall be included in the unit contract prices related to the system being tested, unless specifically set forth otherwise in the proposal.

Operational and test periods, when required by the Engineer, shall not affect a manufacturer's guaranties or warranties furnished under the terms of the contract.

Add the following new section:

1-05.12(1) One-Year Guarantee Period
(March 8, 2013 APWA GSP)

The Contractor shall return to the project and repair or replace all defects in workmanship and material discovered within one year after Final Acceptance of the Work. The Contractor shall start work to remedy any such defects within seven (7) calendar days of receiving Contracting Agency's written notice of a defect, and shall complete such work within the time stated in the Contracting Agency's notice. In case of an emergency, where damage may result from delay or where loss of services may result, such corrections may be made by the Contracting Agency's own forces or another contractor, in which case the cost of corrections shall be paid by the Contractor. In the event the Contractor does not accomplish corrections within the time specified,

the work will be otherwise accomplished and the cost of same shall be paid by the Contractor.

When corrections of defects are made, the Contractor shall then be responsible for correcting all defects in workmanship and materials in the corrected work for one year after acceptance of the corrections by Contracting Agency.

This guarantee is supplemental to and does not limit or affect the requirements that the Contractor's work comply with the requirements of the Contract or any other legal rights or remedies of the Contracting Agency.

1-05.13 Superintendents, Labor and Equipment of Contractor

(August 14, 2013 APWA GSP)

Delete the sixth and seventh paragraphs of this section.

1-05.14 Cooperation with Other Contractors

Section 1-05.14 is supplemented with the following:

(March 13, 1995 GSP)

Other Contracts Or Other Work

It is anticipated that the following work adjacent to or within the limits of this project will be performed by others during the course of this project and will require coordination of the work:

***Subsurface Stormwater Management BMP
Contractor TBD
City of Wenatchee Project #1901
City Contact: Jeremy Hoover, PE, 509.888.3212***

1-05.15 Method of Serving Notices

(March 25, 2009 APWA GSP)

Revise the second paragraph to read:

All correspondence from the Contractor shall be directed to the Project Engineer. <u>All correspondence from the Contractor constituting any notification, notice of protest, notice of dispute, or other correspondence constituting notification required to be furnished under the Contract, must be in paper format, hand delivered or sent via mail delivery service to the Project Engineer's office. Electronic copies such as e-mails or electronically delivered copies of correspondence will not constitute such notice and will not comply with the requirements of the Contract.</u>

Add the following new section:

1-05.16 Water and Power

(October 1, 2005 APWA GSP)

The Contractor shall make necessary arrangements, and shall bear the costs for power and water necessary for the performance of the work, unless the contract includes power and water as a pay item.

(******)

A hydrant meter may be obtained from the City of Wenatchee at the Contractor's sole expense.

Add the following new section:

1-05.18 Record Drawings
(March 8, 2013 APWA GSP)

The Contractor shall maintain one set of full size plans for Record Drawings, updated with clear and accurate red-lined field revisions on a daily basis, and within 2 business days after receipt of information that a change in Work has occurred. The Contractor shall not conceal any work until the required information is recorded.

This Record Drawing set shall be used for this purpose alone, shall be kept separate from other Plan sheets, and shall be clearly marked as Record Drawings. These Record Drawings shall be kept on site at the Contractor's field office, and shall be available for review by the Contracting Agency at all times. The Contractor shall bring the Record Drawings to each progress meeting for review.

The preparation and upkeep of the Record Drawings is to be the assigned responsibility of a single, experienced, and qualified individual. The quality of the Record Drawings, in terms of accuracy, clarity, and completeness, is to be adequate to allow the Contracting Agency to modify the computer-aided drafting (CAD) Contract Drawings to produce a complete set of Record Drawings for the Contracting Agency without further investigative effort by the Contracting Agency.

The Record Drawing markups shall document all changes in the Work, both concealed and visible. Items that must be shown on the markups include but are not limited to:

- Actual dimensions, arrangement, and materials used when different than shown in the Plans.
- Changes made by Change Order or Field Order.
- Changes made by the Contractor.
- Accurate locations of storm sewer, sanitary sewer, water mains and other water appurtenances, structures, conduits, light standards, vaults, width of roadways, sidewalks, landscaping areas, building footprints, channelization and pavement markings, etc. Include pipe invert elevations, top of castings (manholes, inlets, etc.).

If the Contract calls for the Contracting Agency to do all surveying and staking, the Contracting Agency will provide the elevations at the tolerances the Contracting Agency requires for the Record Drawings.

When the Contract calls for the Contractor to do the surveying/staking, the applicable tolerance limits include, but are not limited to the following:

	Vertical	Horizontal
As-built sanitary & storm invert and grate elevations	± 0.01 foot	± 0.01 foot
As-built monumentation	± 0.001 foot	± 0.001 foot
As-built waterlines, inverts, valves, hydrants	± 0.10 foot	± 0.10 foot
As-built ponds/swales/water features	± 0.10 foot	± 0.10 foot

As-built buildings (fin. Floor elev.)	± 0.01 foot	± 0.10 foot
As-built gas lines, power, TV, Tel, Com	± 0.10 foot	± 0.10 foot
As-built signs, signals, etc.	N/A	± 0.10 foot

Making Entries on the Record Drawings:

- Use erasable colored pencil (not ink) for all markings on the Record Drawings, conforming to the following color code:
- Additions - Red
- Deletions - Green
- Comments - Blue
- Dimensions - Graphite
- Provide the applicable reference for all entries, such as the change order number, the request for information (RFI) number, or the approved shop drawing number.
- Date all entries.
- Clearly identify all items in the entry with notes similar to those in the Contract Drawings (such as pipe symbols, centerline elevations, materials, pipe joint abbreviations, etc.).

The Contractor shall certify on the Record Drawings that said drawings are an accurate depiction of built conditions, and in conformance with the requirements detailed above. The Contractor shall submit final Record Drawings to the Contracting Agency. Contracting Agency acceptance of the Record Drawings is one of the requirements for achieving Physical Completion.

Payment will be made for the following bid item:

Record Drawings (Minimum Bid $500)	Lump Sum

Payment for this item will be made on a prorated monthly basis for work completed in accordance with this section up to 75% of the lump sum bid. The final 25% of the lump sum item will be paid upon submittal and approval of the completed Record Drawings set prepared in conformance with these Special Provisions.

A minimum bid amount has been entered in the Bid Proposal for this item. The Contractor must bid at least that amount.

1-07 Legal Relations and Responsibilities to the Public

1-07.1 Laws to be Observed

(October 1, 2005 APWA GSP)

Supplement this section with the following:

In cases of conflict between different safety regulations, the more stringent regulation shall apply.

The Washington State Department of Labor and Industries shall be the sole and paramount administrative agency responsible for the administration of the provisions of the Washington Industrial Safety and Health Act of 1973 (WISHA).

The Contractor shall maintain at the project site office, or other well-known place at the project site, all articles necessary for providing first aid to the injured. The Contractor shall establish, publish, and make known to all employees, procedures for ensuring immediate removal to a hospital, or doctor's care, persons, including employees, who may have been injured on the project site. Employees should not be permitted to work on the project site before the Contractor has established and made known procedures for removal of injured persons to a hospital or a doctor's care.

The Contractor shall have sole responsibility for the safety, efficiency, and adequacy of the Contractor's plant, appliances, and methods, and for any damage or injury resulting from their failure, or improper maintenance, use, or operation. The Contractor shall be solely and completely responsible for the conditions of the project site, including safety for all persons and property in the performance of the work. This requirement shall apply continuously, and not be limited to normal working hours. The required or implied duty of the Engineer to conduct construction review of the Contractor's performance does not, and shall not, be intended to include review and adequacy of the Contractor's safety measures in, on, or near the project site.

Phase 1 COVID-19 job site safety practices will be required as long as the "Stay Home, Stay Healthy" Gubernatorial Proclamation 20-25 is in effect or if adopted as rules by a federal, state or local regulatory agency. See Appendices for Phase 1 Construction Restart COVID-19 Job Site Requirements per Governor Jay Inslee's Construction Working Group Recommendations.

1-07.2 State Taxes

Delete this section, including its sub-sections, in its entirety and replace it with the following:

1-07.2 State Sales Tax
(June 27, 2011 APWA GSP)

The Washington State Department of Revenue has issued special rules on the State sales tax. Sections 1-07.2(1) through 1-07.2(3) are meant to clarify those rules. The Contractor should contact the Washington State Department of Revenue for answers to questions in this area. The Contracting Agency will not adjust its payment if the Contractor bases a bid on a misunderstood tax liability.

The Contractor shall include all Contractor-paid taxes in the unit bid prices or other contract amounts. In some cases, however, state retail sales tax will not be included. Section 1-07.2(2) describes this exception.

The Contracting Agency will pay the retained percentage (or release the Contract Bond if a FHWA-funded Project) only if the Contractor has obtained from the Washington State Department of Revenue a certificate showing that all contract-related taxes have been paid (RCW 60.28.051). The Contracting Agency may deduct from its payments to the Contractor any amount the Contractor may owe the Washington State Department of Revenue,

whether the amount owed relates to this contract or not. Any amount so deducted will be paid into the proper State fund.

1-07.2(1) State Sales Tax — Rule 171

WAC 458-20-171, and its related rules, apply to building, repairing, or improving streets, roads, etc., which are owned by a municipal corporation, or political subdivision of the state, or by the United States, and which are used primarily for foot or vehicular traffic. This includes storm or combined sewer systems within and included as a part of the street or road drainage system and power lines when such are part of the roadway lighting system. For work performed in such cases, the Contractor shall include Washington State Retail Sales Taxes in the various unit bid item prices, or other contract amounts, including those that the Contractor pays on the purchase of the materials, equipment, or supplies used or consumed in doing the work.

1-07.2(2) State Sales Tax — Rule 170

WAC 458-20-170, and its related rules, apply to the constructing and repairing of new or existing buildings, or other structures, upon real property. This includes, but is not limited to, the construction of streets, roads, highways, etc., owned by the state of Washington; water mains and their appurtenances; sanitary sewers and sewage disposal systems unless such sewers and disposal systems are within, and a part of, a street or road drainage system; telephone, telegraph, electrical power distribution lines, or other conduits or lines in or above streets or roads, unless such power lines become a part of a street or road lighting system; and installing or attaching of any article of tangible personal property in or to real property, whether or not such personal property becomes a part of the realty by virtue of installation.

For work performed in such cases, the Contractor shall collect from the Contracting Agency, retail sales tax on the full contract price. The Contracting Agency will automatically add this sales tax to each payment to the Contractor. For this reason, the Contractor shall not include the retail sales tax in the unit bid item prices, or in any other contract amount subject to Rule 170, with the following exception.

Exception: The Contracting Agency will not add in sales tax for a payment the Contractor or a subcontractor makes on the purchase or rental of tools, machinery, equipment, or consumable supplies not integrated into the project. Such sales taxes shall be included in the unit bid item prices or in any other contract amount.

1-07.2(3) Services

The Contractor shall not collect retail sales tax from the Contracting Agency on any contract wholly for professional or other services (as defined in Washington State Department of Revenue Rules 138 and 244).

1-07.23 Public Convenience and Safety

Supplement this section as follows:

(*****)
This project is directly adjacent to the regionally popular Apple Capital Loop Trail and is heavily used by bikers and pedestrians.

The Contractor shall install and maintain a six foot tall temporary chain link fence. The fence shall be in place commencing with the Notice to Proceed until the Notice of Physical Completion, unless otherwise approved by the Engineer. The fence shall be located along the west side of the trail, and between the existing black pedestrian bridge (south) and the existing parking lot (north). Supports for each post shall be a minimum of three feet from the trail edge, as measured edge to edge. The supports for each post shall be plainly visible to the public via a single standard bright orange traffic cone, located on the trail side of each support. The Engineer will reject any cone that is, in his opinion, unsatisfactory. The Contractor shall immediately replace all rejected cones.

All labor, costs and materials to comply with this section shall be born by the Contractor.

1-07.6 Permits and Licenses

Section 1-07.6 is supplemented with the following:

(January 2, 2018), revised

The Contracting Agency has obtained, or is in the process of obtaining, the below-listed permit(s) for this project. ~~A copy of the permit(s) is attached as an appendix for informational purposes.~~ Copies of ~~these~~ the building permits, including a copy of the Transfer of Coverage form, when applicable, are required to be onsite at all times.

Contact with the permitting agencies, concerning the below-listed permit(s), shall be made through the Engineer with the exception of when the Construction Stormwater General Permit coverage is transferred to the Contractor, direct communication with the Department of Ecology is allowed. The Contractor shall be responsible for obtaining Ecology's approval for any Work requiring additional approvals (e.g. Request for Chemical Treatment Form). The Contractor shall obtain additional permits as necessary. All costs to obtain and comply with additional permits shall be included in the applicable Bid items for the Work involved.

(******)

NAME OF DOCUMENT	PERMITTING AGENCY	PERMIT REFERENCE NO.
Building Permit (Picnic Shelter)	City of Wenatchee	BPC 20-030
Building Permit (Restroom)	City of Wenatchee	*Permit Pending
Shoreline Permit, Variance, or Exemption	City of Wenatchee	SP-14-02

1-07.7 Load Limits

Section 1-07.7 is supplemented with the following:

(March 13, 1995)

If the sources of materials provided by the Contractor necessitates hauling over roads other than State Highways, the Contractor shall, at the Contractor's expense, make all arrangements for the use of the haul routes.

1-07.9(5) Required Documents

Section 1-07.9(5) is revised to read:

(January 6, 2020)

General

All "Statements of Intent to Pay Prevailing Wages", "Affidavits of Wages Paid" and Certified Payrolls, including a signed Statement of Compliance for Federal-aid projects, shall be submitted to the Engineer using the State L&I online Prevailing Wage Intent & Affidavit (PWIA) system.

Intents and Affidavits

On forms provided by the Industrial Statistician of State L&I, the Contractor shall submit to the Engineer the following for themselves and for each firm covered under RCW 39.12 that will or has provided Work and materials for the Contract:

1. The approved "Statement of Intent to Pay Prevailing Wages" State L&I's form number F700-029-000. The Contracting Agency will make no payment under this Contract until this statement has been approved by State L&I and reviewed by the Engineer.

2. The approved "Affidavit of Prevailing Wages Paid", State L&I's form number F700-007-000. The Contracting Agency will not grant Completion until all approved Affidavit of Wages paid for the Contractor and all Subcontractors have been received by the Engineer. The Contracting Agency will not release to the Contractor any funds retained under RCW 60.28.011 until "Affidavit of Prevailing Wages Paid" forms have been approved by State L&I and all of the approved forms have been submitted to the Engineer for every firm that worked on the Contract.

The Contractor is responsible for requesting these forms from State L&I and for paying any fees required by State L&I.

Certified Payrolls

Certified payrolls are required to be submitted by the Contractor for themselves, all Subcontractors and all lower tier subcontractors. The payrolls shall be submitted weekly on all Federal-aid projects and no less than monthly on State funded projects.

Penalties for Noncompliance

The Contractor is advised, if these payrolls are not supplied within the prescribed deadlines, any or all payments may be withheld until compliance is achieved. In addition, failure to provide these payrolls may result in other sanctions as provided by State laws (RCW 39.12.050) and/or Federal regulations (29 CFR 5.12).

1-07.17 Utilities and Similar Facilities

Section 1-07.17 is supplemented with the following:

(April 2, 2007)

Locations and dimensions shown in the Plans for existing facilities are in accordance with available information obtained without uncovering, measuring, or other verification.

The following addresses and telephone numbers of utility companies known or suspected of having facilities within the project limits are supplied for the Contractor's convenience:

***Wenatchee Reclamation District
514 Easy Street
Wenatchee, WA 98801

Office: 509.663.8300

PUD No. 1 of Chelan County
327 N. Wenatchee Ave.
Wenatchee, WA 98801
Attn: Tammy Fisher (power) 509.661.4617
Attn: Ron Slabaugh (water) 509.661.4131
Attn: Ed Murray (fiber/internet) 509.661.4064

Frontier Communications
320 East Penny Road
Wenatchee, WA 9880
Attn: Sean Whitesitt 509.661.1142

Cascade Natural Gas
614 North Mission Street
Wenatchee, WA 98801
Attn: Heather Jones 509.765.7896

Charter Communications
145 Easy Street
Wenatchee, WA 98801 888.438.2427

CALL BEFORE YOU DIG***
Utility Notification Center
1-800-424-5555

Section 1-07.17 is supplemented with the following:

(******)

The project site is located outside public right of way and therefore the one-call utility notification center may not provide locates within the project limits. Contractor is responsible for any additional utility location performed on private property within the project limits which may require a private locate be performed. All locates (public, private, or otherwise) shall be considered incidental to the contract.

1-07.18 Public Liability and Property Damage Insurance

Delete this section in its entirety, and replace it with the following:

1-07.18 Insurance
(January 4, 2016 APWA GSP)

1-07.18(1) General Requirements

A. The Contractor shall procure and maintain the insurance described in all subsections of section 1-07.18 of these Special Provisions, from insurers with a current A. M. Best rating of not less than A-: VII and licensed to do business in the State of Washington. The Contracting Agency reserves the right to approve or reject the insurance provided, based on the insurer's financial condition.

B. The Contractor shall keep this insurance in force without interruption from the commencement of the Contractor's Work through the term of the Contract and for thirty (30) days after the Physical Completion date, unless otherwise indicated below.

C. If any insurance policy is written on a claims made form, its retroactive date, and that of all subsequent renewals, shall be no later than the effective date of this Contract. The policy shall state that coverage is claims made, and state the retroactive date. Claims-made form coverage shall be maintained by the Contractor for a minimum of 36 months following the Completion Date or earlier termination of this Contract, and the Contractor shall annually provide the Contracting Agency with proof of renewal. If renewal of the claims made form of coverage becomes unavailable, or economically prohibitive, the Contractor shall purchase an extended reporting period ("tail") or execute another form of guarantee acceptable to the Contracting Agency to assure financial responsibility for liability for services performed.

D. The Contractor's Automobile Liability, Commercial General Liability and Excess or Umbrella Liability insurance policies shall be primary and non-contributory insurance as respects the Contracting Agency's insurance, self-insurance, or self-insured pool coverage. Any insurance, self-insurance, or self-insured pool coverage maintained by the Contracting Agency shall be excess of the Contractor's insurance and shall not contribute with it.

E. The Contractor shall provide the Contracting Agency and all additional insureds with written notice of any policy cancellation, within two business days of their receipt of such notice.

F. The Contractor shall not begin work under the Contract until the required insurance has been obtained and approved by the Contracting Agency

G. Failure on the part of the Contractor to maintain the insurance as required shall constitute a material breach of contract, upon which the Contracting Agency may, after giving five business days' notice to the Contractor to correct the breach, immediately terminate the Contract or, at its discretion, procure or renew such insurance and pay any and all premiums in connection therewith, with any sums so expended to be repaid to the Contracting Agency on demand, or at the sole discretion of the Contracting Agency, offset against funds due the Contractor from the Contracting Agency.

H. All costs for insurance shall be incidental to and included in the unit or lump sum prices of the Contract and no additional payment will be made.

1-07.18(2) Additional Insured

All insurance policies, with the exception of Workers Compensation, and of Professional Liability and Builder's Risk (if required by this Contract) shall name the following listed entities as additional insured(s) using the forms or endorsements required herein:

- the Contracting Agency and its officers, elected officials, employees, agents, and volunteers

The above-listed entities shall be additional insured(s) for the full available limits of liability maintained by the Contractor, irrespective of whether such limits maintained by the Contractor are greater than those required by this Contract, and irrespective of whether the Certificate of Insurance provided by the Contractor pursuant to 1-07.18(4) describes limits lower than those maintained by the Contractor.

For Commercial General Liability insurance coverage, the required additional insured endorsements shall be at least as broad as ISO forms CG 20 10 10 01 for ongoing operations and CG 20 37 10 01 for completed operations.

1-07.18(3) Subcontractors

The Contractor shall cause each Subcontractor of every tier to provide insurance coverage that complies with all applicable requirements of the Contractor-provided insurance as set forth herein, except the Contractor shall have sole responsibility for determining the limits of coverage required to be obtained by Subcontractors.

The Contractor shall ensure that all Subcontractors of every tier add all entities listed in 1-07.18(2) as additional insureds, and provide proof of such on the policies as required by that section as detailed in 1-07.18(2) using an endorsement as least as broad as ISO CG 20 10 10 01 for ongoing operations and CG 20 37 10 01 for completed operations.

Upon request by the Contracting Agency, the Contractor shall forward to the Contracting Agency evidence of insurance and copies of the additional insured endorsements of each Subcontractor of every tier as required in 1-07.18(4) Verification of Coverage.

1-07.18(4) Verification of Coverage

The Contractor shall deliver to the Contracting Agency a Certificate(s) of Insurance and endorsements for each policy of insurance meeting the requirements set forth herein when the Contractor delivers the signed Contract for the work. Failure of Contracting Agency to demand such verification of coverage with these insurance requirements or failure of Contracting Agency to identify a deficiency from the insurance documentation provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

Verification of coverage shall include:

1. An ACORD certificate or a form determined by the Contracting Agency to be equivalent.
2. Copies of all endorsements naming Contracting Agency and all other entities listed in 1-07.18(2) as additional insured(s), showing the policy number. The Contractor may submit a copy of any blanket additional insured clause from its policies instead of a separate endorsement.
3. Any other amendatory endorsements to show the coverage required herein.
4. A notation of coverage enhancements on the Certificate of Insurance shall not satisfy these requirements – actual endorsements must be submitted.

Upon request by the Contracting Agency, the Contractor shall forward to the Contracting Agency a full and certified copy of the insurance policy(s). If Builders Risk insurance is required on this Project, a full and certified copy of that policy is required when the Contractor delivers the signed Contract for the work.

1-07.18(5) Coverages and Limits

The insurance shall provide the minimum coverages and limits set forth below. Contractor's maintenance of insurance, its scope of coverage, and limits as required herein shall not be construed to limit the liability of the Contractor to the coverage provided by such insurance, or otherwise limit the Contracting Agency's recourse to any remedy available at law or in equity.

All deductibles and self-insured retentions must be disclosed and are subject to approval by the Contracting Agency. The cost of any claim payments falling within the deductible or self-insured retention shall be the responsibility of the Contractor. In the event an additional insured incurs a

liability subject to any policy's deductibles or self-insured retention, said deductibles or self-insured retention shall be the responsibility of the Contractor.

1-07.18(5)A Commercial General Liability

Commercial General Liability insurance shall be written on coverage forms at least as broad as ISO occurrence form CG 00 01, including but not limited to liability arising from premises, operations, stop gap liability, independent contractors, products-completed operations, personal and advertising injury, and liability assumed under an insured contract. There shall be no exclusion for liability arising from explosion, collapse or underground property damage.

The Commercial General Liability insurance shall be endorsed to provide a per project general aggregate limit, using ISO form CG 25 03 05 09 or an equivalent endorsement.

Contractor shall maintain Commercial General Liability Insurance arising out of the Contractor's completed operations for at least three years following Substantial Completion of the Work.

Such policy must provide the following minimum limits:

$1,000,000	Each Occurrence
$2,000,000	General Aggregate
$2,000,000	Products & Completed Operations Aggregate
$1,000,000	Personal & Advertising Injury each offence
$1,000,000	Stop Gap / Employers' Liability each accident

1-07.18(5)B Automobile Liability

Automobile Liability shall cover owned, non-owned, hired, and leased vehicles; and shall be written on a coverage form at least as broad as ISO form CA 00 01. If the work involves the transport of pollutants, the automobile liability policy shall include MCS 90 and CA 99 48 endorsements.

Such policy must provide the following minimum limit:

$1,000,000	Combined single limit each accident

1-07.18(5)C Workers' Compensation

The Contractor shall comply with Workers' Compensation coverage as required by the Industrial Insurance laws of the State of Washington.

1-07.23(1) Construction Under Traffic

Section 1-07.23(1) is supplemented with the following:

(January 2, 2012)

Work Zone Clear Zone

The Work Zone Clear Zone (WZCZ) applies during working and nonworking hours. The WZCZ applies only to temporary roadside objects introduced by the Contractor's operations and does not apply to preexisting conditions or permanent Work. Those work operations that are actively in progress shall be in accordance with adopted and approved Traffic Control Plans, and other contract requirements.

During nonworking hours equipment or materials shall not be within the WZCZ unless they are protected by permanent guardrail or temporary concrete barrier. The use of temporary concrete barrier shall be permitted only if the Engineer approves the installation and location.

During actual hours of work, unless protected as described above, only materials absolutely necessary to construction shall be within the WZCZ and only construction vehicles absolutely necessary to construction shall be allowed within the WZCZ or allowed to stop or park on the shoulder of the roadway.

The Contractor's nonessential vehicles and employees private vehicles shall not be permitted to park within the WZCZ at any time unless protected as described above.

Deviation from the above requirements shall not occur unless the Contractor has requested the deviation in writing and the Engineer has provided written approval.

Minimum WZCZ distances are measured from the edge of traveled way and will be determined as follows:

Regulatory Posted Speed	Distance From Traveled Way (Feet)
35 mph or less	10*
40 mph	15
45 to 55 mph	20
60 mph or greater	30

* or 2-feet beyond the outside edge of sidewalk

Minimum Work Zone Clear Zone Distance

1-07.24 Rights of Way

(July 23, 2015 APWA GSP, revised)

Delete this section and replace it with the following:

Street Right of Way lines, limits of easements, project limits, and limits of construction ~~permits~~ are indicated in the Plans. The Contractor's construction activities shall be confined within these limits, unless arrangements for use of private property are made.

Generally, the Contracting Agency will have obtained, prior to bid opening, all rights of way and easements, both permanent and temporary, necessary for carrying out the work. Exceptions to this are noted in the Bid Documents or will be brought to the Contractor's attention by a duly issued Addendum.

Whenever any of the work is accomplished on or through property other than public Right of Way, the Contractor shall meet and fulfill all covenants and stipulations of any easement agreement obtained by the Contracting Agency from the owner of the private property. Copies of the easement agreements may be included in the Contract Provisions or made available to the Contractor as soon as practical after they have been obtained by the Engineer.

Whenever easements or rights of entry have not been acquired prior to advertising, these areas are so noted in the Plans. The Contractor shall not proceed with any portion of the work in areas where right of way, easements or rights of entry have not been acquired until the Engineer certifies to the Contractor that the right of way or easement is available or that

the right of entry has been received. If the Contractor is delayed due to acts of omission on the part of the Contracting Agency in obtaining easements, rights of entry or right of way, the Contractor will be entitled to an extension of time. The Contractor agrees that such delay shall not be a breach of contract.

Each property owner shall be given 48 hours notice prior to entry by the Contractor. This includes entry onto easements and private property where private improvements must be adjusted.

The Contractor shall be responsible for providing, without expense or liability to the Contracting Agency, any additional land and access thereto that the Contractor may desire for temporary construction facilities, storage of materials, or other Contractor needs. However, before using any private property, whether adjoining the work or not, the Contractor shall file with the Engineer a written permission of the private property owner, and, upon vacating the premises, a written release from the property owner of each property disturbed or otherwise interfered with by reasons of construction pursued under this contract. The statement shall be signed by the private property owner, or proper authority acting for the owner of the private property affected, stating that permission has been granted to use the property and all necessary permits have been obtained or, in the case of a release, that the restoration of the property has been satisfactorily accomplished. The statement shall include the parcel number, address, and date of signature. Written releases must be filed with the Engineer before the Completion Date will be established.

1-08 Prosecution and Progress

Add the following new section:

1-08.0 Preliminary Matters

(May 25, 2006 APWA GSP)

Add the following new section:

1-08.0(1) Preconstruction Conference

(October 10, 2008 APWA GSP)

Prior to the Contractor beginning the work, a preconstruction conference will be held between the Contractor, the Engineer and such other interested parties as may be invited. The purpose of the preconstruction conference will be:

1. To review the initial progress schedule;
2. To establish a working understanding among the various parties associated or affected by the work;
3. To establish and review procedures for progress payment, notifications, approvals, submittals, etc.;
4. To establish normal working hours for the work;
5. To review safety standards and traffic control; and
6. To discuss such other related items as may be pertinent to the work.

The Contractor shall prepare and submit at the preconstruction conference the following:

1. A breakdown of all lump sum items;

2. A preliminary schedule of working drawing submittals; and
3. A list of material sources for approval if applicable.
4. A comprehensive COVID-19 exposure control, mitigation, and recovery plan

If COVID-19 related mandates issued by federal, state and local authorities are still in effect prior to the Contractor beginning work, the City of Wenatchee will continue to implement Social Distancing protocols for this Project. Protocols may include limited to no in-person meetings, meetings held via teleconference or virtual meetings, and email correspondence.

Add the following new section:

1-08.0(2) Hours of Work
(December 8, 2014 APWA GSP)

Except in the case of emergency or unless otherwise approved by the Engineer, the normal working hours for the Contract shall be any consecutive 8-hour period between 7:00 a.m. and 6:00 p.m. Monday through Friday, exclusive of a lunch break. If the Contractor desires different than the normal working hours stated above, the request must be submitted in writing prior to the preconstruction conference, subject to the provisions below. The working hours for the Contract shall be established at or prior to the preconstruction conference.

All working hours and days are also subject to local permit and ordinance conditions (such as noise ordinances).

If the Contractor wishes to deviate from the established working hours, the Contractor shall submit a written request to the Engineer for consideration. This request shall state what hours are being requested, and why. Requests shall be submitted for review no later than two (2) working days prior to the day(s) the Contractor is requesting to change the hours.

If the Contracting Agency approves such a deviation, such approval may be subject to certain other conditions, which will be detailed in writing. For example:

1. On non-Federal aid projects, requiring the Contractor to reimburse the Contracting Agency for the costs in excess of straight-time costs for Contracting Agency representatives who worked during such times. (The Engineer may require designated representatives to be present during the work. Representatives who may be deemed necessary by the Engineer include, but are not limited to: survey crews; personnel from the Contracting Agency's material testing lab; inspectors; and other Contracting Agency employees or third party consultants when, in the opinion of the Engineer, such work necessitates their presence.)
2. Considering the work performed on Saturdays, Sundays, and holidays as working days with regard to the contract time.
3. Considering multiple work shifts as multiple working days with respect to contract time even though the multiple shifts occur in a single 24-hour period.
4. If a 4-10 work schedule is requested and approved the non-working day for the week will be charged as a working day.
5. If Davis Bacon wage rates apply to this Contract, all requirements must be met and recorded properly on certified payroll

1-08.1 Subcontracting

(May 30, 2019 APWA GSP, Option B)

Delete the ninth paragraph, beginning with "On all projects, the Contractor shall certify…".

1-08.3(2)A Type A Progress Schedule

(March 13, 2012 APWA GSP)

Revise this section to read:

The Contractor shall submit two (2) copies of a Type A Progress Schedule no later than at the preconstruction conference, or some other mutually agreed upon submittal time. The schedule may be a critical path method (CPM) schedule, bar chart, or other standard schedule format. Regardless of which format used, the schedule shall identify the critical path. The Engineer will evaluate the Type A Progress Schedule and approve or return the schedule for corrections within 15 calendar days of receiving the submittal.

1-08.4 Prosecution of Work

Delete this section and replace it with the following:

1-08.4 Notice to Proceed and Prosecution of Work

(July 23, 2015 APWA GSP), revised

Notice to Proceed will be given after the contract has been executed, approval from the Washington State Recreation and Conservation Office (RCO) has been received, and the contract bond and evidence of insurance have been approved and filed by the Contracting Agency. The Contractor shall not commence with the work until the Notice to Proceed has been given by the Engineer. The Contractor shall commence construction activities on the project site within $$ fourteen (14) $$ calendar days of the Notice to Proceed Date, unless otherwise approved in writing. The Contractor shall diligently pursue the work to the physical completion date within the time specified in the contract. Voluntary shutdown or slowing of operations by the Contractor shall not relieve the Contractor of the responsibility to complete the work within the time(s) specified in the contract.

When shown in the Plans, the first order of work shall be the installation of high visibility fencing to delineate all areas for protection or restoration, as described in the Contract. Installation of high visibility fencing adjacent to the roadway shall occur after the placement of all necessary signs and traffic control devices in accordance with 1-10.1(2). Upon construction of the fencing, the Contractor shall request the Engineer to inspect the fence. No other work shall be performed on the site until the Contracting Agency has accepted the installation of high visibility fencing, as described in the Contract.

1-08.5 Time for Completion

(November 30, 2018 APWA GSP, Option B, revised)

Revise the third and fourth paragraphs to read:

Contract time shall begin on the first working day following the day after the Notice to Proceed date. If the Contractor starts work on the project at an earlier date, then contract time shall begin on the first working day when onsite work begins.

Each working day shall be charged to the contract as it occurs, until the contract work is physically complete. If substantial completion has been granted and all the authorized working days have been used, charging of working days will cease. Each week the Engineer will provide the Contractor a statement that shows the number of working days: (1) charged to the contract the week before; (2) specified for the physical completion of the contract; and (3) remaining for the physical completion of the contract. The statement will also show the nonworking days and any partial or whole day the Engineer declares as unworkable. Within 10 calendar days after the date of each statement, the Contractor shall file a written protest of any alleged discrepancies in it. To be considered by the Engineer, the protest shall be in sufficient detail to enable the Engineer to ascertain the basis and amount of time disputed. By not filing such detailed protest in that period, the Contractor shall be deemed as having accepted the statement as correct. If the Contractor is approved to work 10 hours a day and 4 days a week (a 4-10 schedule) and the fifth day of the week in which a 4-10 shift is worked would ordinarily be charged as a working day, then the fifth day of that week will be charged as a working day whether or not the Contractor works on that day.

Revise the sixth paragraph to read:

The Engineer will give the Contractor written notice of the completion date of the contract after all the Contractor's obligations under the contract have been performed by the Contractor. The following events must occur before the Completion Date can be established:

1. The physical work on the project must be complete; and
2. The Contractor must furnish all documentation required by the contract and required by law, to allow the Contracting Agency to process final acceptance of the contract. The following documents must be received by the Project Engineer prior to establishing a completion date:
   a. Certified Payrolls (per Section 1-07.9(5)).
   b. Material Acceptance Certification Documents
   c. Monthly Reports of Amounts Credited as DBE Participation, as required by the Contract Provisions.
   d. Final Contract Voucher Certification
   e. Copies of the approved "Affidavit of Prevailing Wages Paid" for the Contractor and all Subcontractors
   f. ~~A copy of the Notice of Termination sent to the Washington State Department of Ecology (Ecology); the elapse of 30 calendar days from the date of receipt of the Notice of Termination by Ecology; and no rejection of the Notice of Termination by Ecology. This requirement will not apply if the Construction Stormwater General Permit is transferred back to the Contracting Agency in accordance with Section 8-01.3(16).~~
   g. Property owner releases per Section 1-07.24

Section 1-08.5 is supplemented with the following:

(December 4, 2006), revised

This project shall be physically completed within *** $$ fifty (50) $$ *** working days.

1-08.6 Suspension of Work

Section 1-08.6 is supplemented with the following:

(******)

Contract time may be suspended to comply with coronavirus-related mandates issued by federal, state, or local authorities restricting construction of this type. Charging of contract time will resume upon the expiration or extinguishment of restrictions imposed by such mandates.

1-08.9 Liquidated Damages

(August 14, 2013 APWA GSP)

Revise the fourth paragraph to read:

When the Contract Work has progressed to Substantial Completion as defined in the Contract, the Engineer may determine that the work is Substantially Complete. The Engineer will notify the Contractor in writing of the Substantial Completion Date. For overruns in Contract time occurring after the date so established, the formula for liquidated damages shown above will not apply. For overruns in Contract time occurring after the Substantial Completion Date, liquidated damages shall be assessed on the basis of direct engineering and related costs assignable to the project until the actual Physical Completion Date of all the Contract Work. The Contractor shall complete the remaining Work as promptly as possible. Upon request by the Project Engineer, the Contractor shall furnish a written schedule for completing the physical Work on the Contract.

1-09.2(1) General Requirements for Weighing Equipment

(July 23, 2015 APWA GSP, Option 2)

Revise item 4 of the fifth paragraph to read:

4. Test results and scale weight records for each day's hauling operations are provided to the Engineer daily. Reporting shall utilize WSDOT form 422-027, Scaleman's Daily Report, unless the printed ticket contains the same information that is on the Scaleman's Daily Report Form. The scale operator must provide AM and/or PM tare weights for each truck on the printed ticket.

1-09.2(5) Measurement

(May 2, 2017 APWA GSP)

Revise the first paragraph to read:

Scale Verification Checks – At the Engineer's discretion, the Engineer may perform verification checks on the accuracy of each batch, hopper, or platform scale used in weighing contract items of Work.

1-09.9 Payments

(March 13, 2012 APWA GSP)

Delete the first four paragraphs and replace them with the following:

The basis of payment will be the actual quantities of Work performed according to the Contract and as specified for payment.

The Contractor shall submit a breakdown of the cost of lump sum bid items at the Preconstruction Conference, to enable the Project Engineer to determine the Work performed on a monthly basis. A breakdown is not required for lump sum items that include a basis for incremental payments as part of the respective Specification. Absent a lump sum breakdown, the Project Engineer will make a determination based on information available. The Project Engineer's determination of the cost of work shall be final.

Progress payments for completed work and material on hand will be based upon progress estimates prepared by the Engineer. A progress estimate cutoff date will be established at the preconstruction conference.

The initial progress estimate will be made not later than 30 days after the Contractor commences the work, and successive progress estimates will be made every month thereafter until the Completion Date. Progress estimates made during progress of the work are tentative, and made only for the purpose of determining progress payments. The progress estimates are subject to change at any time prior to the calculation of the final payment.

The value of the progress estimate will be the sum of the following:

1. Unit Price Items in the Bid Form — the approximate quantity of acceptable units of work completed multiplied by the unit price.
2. Lump Sum Items in the Bid Form — based on the approved Contractor's lump sum breakdown for that item, or absent such a breakdown, based on the Engineer's determination.
3. Materials on Hand — 100 percent of invoiced cost of material delivered to Job site or other storage area approved by the Engineer.
4. Change Orders — entitlement for approved extra cost or completed extra work as determined by the Engineer.

Progress payments will be made in accordance with the progress estimate less:

1. Retainage per Section 1-09.9(1), on non FHWA-funded projects;
2. The amount of progress payments previously made; and
3. Funds withheld by the Contracting Agency for disbursement in accordance with the Contract Documents.

Progress payments for work performed shall not be evidence of acceptable performance or an admission by the Contracting Agency that any work has been satisfactorily completed. The determination of payments under the contract will be final in accordance with Section 1-05.1.

Supplement this section with the following:

Lump sum item breakdowns are not required when the bid price for the lump sum item is less than $20,000.

1-09.11 Disputes and Claims

1-09.11(3) Time Limitation and Jurisdiction
(November 30, 2018 APWA GSP)

Revise this section to read*:*

For the convenience of the parties to the Contract it is mutually agreed by the parties that any claims or causes of action which the Contractor has against the Contracting Agency arising from the Contract shall be brought within 180 calendar days from the date of final acceptance (Section 1-05.12) of the Contract by the Contracting Agency; and it is further agreed that any such claims or causes of action shall be brought only in the Superior Court of the county where the Contracting Agency headquarters is located, provided that where an action is asserted against a county, RCW 36.01.050 shall control venue and jurisdiction. The parties understand and agree that the Contractor's failure to bring suit within the time period provided, shall be a complete bar to any such claims or causes of action. It is further mutually agreed by the parties that when any claims or causes of action which the Contractor asserts against the Contracting Agency arising from the Contract are filed with the Contracting Agency or initiated in court, the Contractor shall permit the Contracting Agency to have timely access to any records deemed necessary by the Contracting Agency to assist in evaluating the claims or action.

1-09.13 Claims Resolution

1-09.13(3) Claims $250,000 or Less
(October 1, 2005 APWA GSP)

Delete this section and replace it with the following:

The Contractor and the Contracting Agency mutually agree that those claims that total $250,000 or less, submitted in accordance with Section 1-09.11 and not resolved by nonbinding ADR processes, shall be resolved through litigation unless the parties mutually agree in writing to resolve the claim through binding arbitration.

1-09.13(3)A Administration of Arbitration
(November 30, 2018 APWA GSP)

Revise the third paragraph to read:

The Contracting Agency and the Contractor mutually agree to be bound by the decision of the arbitrator, and judgment upon the award rendered by the arbitrator may be entered in the Superior Court of the county in which the Contracting Agency's headquarters is located, provided that where claims subject to arbitration are asserted against a county, RCW 36.01.050 shall control venue and jurisdiction of the Superior Court. The decision of the arbitrator and the specific basis for the decision shall be in writing. The arbitrator shall use the Contract as a basis for decisions.

1-10.2 Traffic Control Management

1-10.2(1) General
Section 1-10.2(1) is supplemented with the following:

(January 3, 2017)

Only training with WSDOT TCS card and WSDOT training curriculum is recognized in the State of Washington. The Traffic Control Supervisor shall be certified by one of the following:

The Northwest Laborers-Employers Training Trust
27055 Ohio Ave.
Kingston, WA 98346
(360) 297-3035

Evergreen Safety Council
12545 135th Ave. NE
Kirkland, WA 98034-8709
1-800-521-0778

The American Traffic Safety Services Association
15 Riverside Parkway, Suite 100
Fredericksburg, Virginia 22406-1022
Training Dept. Toll Free (877) 642-4637
Phone: (540) 368-1701

Division 2
Earthwork

2-01 Clearing, Grubbing, and Roadside Cleanup

(******)

Delete the following section in its entirety.

2-01.2(1) Disposal Method No. 1 – Open Burning

2-02 Removal of Structures and Obstructions

Supplement this section as follows:

(******)

2-02.3 Construction Requirements

This following list of items to be removed and disposed of is for the sole convenience of the Contractor and shall not be presumed to be complete.

Removal of Traffic Arrow	± 3 at Parking Lot
HMA Removal at Trail	±36 sf
Concrete Barrier	4

(******)

Sawcutting shall be incidental to this bid item

(******)

The project location is primarily fill potentially consisting of a wide variety of materials including solid wastes. The Contractor shall remove and dispose of any solid waste and other debris unsuitable for the project as determined by the Engineer.

7-09.SA2

Add the following new section:

Rock Excavation Including Haul

(******)

Description

This work shall consist of removal of rock found at the existing grade, excavation of rock found below existing grade, and haul of all material to an offsite location owned by the Contractor or other legal location.

Construction Requirements

Rock excavation shall conform to 7-09.3(7)B and other applicable standard specifications and shall cover the removal of rock and boulders which exceed 1 cubic yard.

Measurement

Measurement of Rock Excavation Including Haul shall be per 7-09.4.

Payment

Payment for “Rock Excavation Including Haul” shall be per 7-09.5.

Add the following new section:

Common Excavation Including Haul

(******)

Description

This work described in this section, regardless of the type or nature of the materials encountered, includes the removal of material found at the existing grade, excavation of material found below the existing grade, and haul of all material to an offsite location owned by the Contractor or other legal location.

Construction Requirements

Common excavation shall conform to 2-03 and other applicable standard specifications and shall cover material less than 1 cubic yard.

Measurement

Measurement of Common Excavation Including Haul shall be per CY.

7-09.5 Payment

Payment for “Common Excavation Including Haul”, CY.

2-03 Roadway Excavation and Embankment

Supplement this section as follows:

~~(******)~~

2-03.1 Description

Any rock found within the improvements, which does not conform to the Plans and Specifications, shall be removed from the project limits and disposed of.

2-06 Subgrade Preparation

2-06.1 Description

Supplement this section as follows:

(******)
This work includes preparing graded subgrade at all structures, trails, and vehicular areas.

Delete this entire section and replace with the following:

(******)
2-06.5 Measurement and Payment

All costs for “Subgrade” shall be included in and incidental to other bid items.

2-11 Trimming and Cleanup

Supplement this section as follows:

(******)
2-11.5 Payment
All costs for “Trimming and Cleanup” shall be included in and incidental to other bid items.

Division 5
Surface Treatments and Pavements

5-04 Hot Mix Asphalt

(July 18, 2018 APWA GSP)

Delete Section 5-04 and amendments, Hot Mix Asphalt and replace it with the following:

5-04.1 Description

This Work shall consist of providing and placing one or more layers of plant-mixed hot mix asphalt (HMA) on a prepared foundation or base in accordance with these Specifications and the lines, grades, thicknesses, and typical cross-sections shown in the Plans. The manufacture of HMA may include warm mix asphalt (WMA) processes in accordance with these Specifications. WMA processes include organic additives, chemical additives, and foaming.

HMA shall be composed of asphalt binder and mineral materials as may be required, mixed in the proportions specified to provide a homogeneous, stable, and workable mixture.

5-04.2 Materials

Materials shall meet the requirements of the following sections:

Asphalt Binder	9-02.1(4)	
Cationic Emulsified Asphalt	9-02.1(6)	
Anti-Stripping Additive	9-02.4	
HMA Additive	9-02.5	
Aggregates	9-03.8	
Recycled Asphalt Pavement	9-03.8(3)B	
Mineral Filler	9-03.8(5)	
Recycled Material	9-03.21	
Portland Cement	9-01	
Sand	9-03.1(2)	(As noted in 5-04.3(5)C for crack sealing)
Joint Sealant	9-04.2	
Foam Backer Rod	9-04.2(3)A	

The Contract documents may establish that the various mineral materials required for the manufacture of HMA will be furnished in whole or in part by the Contracting Agency. If the documents do not establish the furnishing of any of these mineral materials by the Contracting Agency, the Contractor shall be required to furnish such materials in the amounts required for the designated mix. Mineral materials include coarse and fine aggregates, and mineral filler.

The Contractor may choose to utilize recycled asphalt pavement (RAP) in the production of HMA. The RAP may be from pavements removed under the Contract, if any, or pavement material from an existing stockpile.

The Contractor may use up to 20 percent RAP by total weight of HMA with no additional sampling or testing of the RAP. The RAP shall be sampled and tested at a frequency of one sample for every 1,000 tons produced and not less than ten samples per project. The asphalt content and gradation test data shall be reported to the Contracting Agency when

submitting the mix design for approval on the QPL. The Contractor shall include the RAP as part of the mix design as defined in these Specifications.

The grade of asphalt binder shall be as required by the Contract. Blending of asphalt binder from different sources is not permitted.

The Contractor may only use warm mix asphalt (WMA) processes in the production of HMA with 20 percent or less RAP by total weight of HMA. The Contractor shall submit to the Engineer for approval the process that is proposed and how it will be used in the manufacture of HMA.

Production of aggregates shall comply with the requirements of Section 3-01. Preparation of stockpile site, the stockpiling of aggregates, and the removal of aggregates from stockpiles shall comply with the requirements of Section 3-02.

5-04.2(1) How to Get an HMA Mix Design on the QPL

If the contractor wishes to submit a mix design for inclusion in the Qualified Products List (QPL), please follow the WSDOT process outlined in Standard Specification 5-04.2(1).

5-04.2(1)A Vacant

5-04.2(2) Mix Design – Obtaining Project Approval

No paving shall begin prior to the approval of the mix design by the Engineer.

Nonstatistical evaluation will be used for all HMA not designated as Commercial HMA in the contract documents.

Commercial evaluation will be used for Commercial HMA and for other classes of HMA in the following applications: sidewalks, road approaches, ditches, slopes, paths, trails, gores, prelevel, and pavement repair. Other nonstructural applications of HMA accepted by commercial evaluation shall be as approved by the Project Engineer. Sampling and testing of HMA accepted by commercial evaluation will be at the option of the Project Engineer. The Proposal quantity of HMA that is accepted by commercial evaluation will be excluded from the quantities used in the determination of nonstatistical evaluation.

Nonstatistical Mix Design. Fifteen days prior to the first day of paving the contractor shall provide one of the following mix design verification certifications for Contracting Agency review;

- The WSDOT Mix Design Evaluation Report from the current WSDOT QPL, or one of the mix design verification certifications listed below.
- The proposed HMA mix design on WSDOT Form 350-042 with the seal and certification (stamp & sig-nature) of a valid licensed Washington State Professional Engineer.
- The Mix Design Report for the proposed HMA mix design developed by a qualified City or County laboratory that is within one year of the approval date.**

The mix design shall be performed by a lab accredited by a national authority such as Laboratory Accreditation Bureau, L-A-B for Construction Materials Testing, The Construction Materials Engineering Council (CMEC's) ISO 17025 or AASHTO Accreditation Program

(AAP) and shall supply evidence of participation in the AASHTO: resource proficiency sample program.

Mix designs for HMA accepted by Nonstatistical evaluation shall;

- Have the aggregate structure and asphalt binder content determined in accordance with WSDOT Standard Operating Procedure 732 and meet the requirements of Sections 9-03.8(2), except that Hamburg testing for ruts and stripping are at the discretion of the Engineer, and 9-03.8(6).
- Have anti-strip requirements, if any, for the proposed mix design determined in accordance with AASHTO T 283 or T 324, or based on historic anti-strip and aggregate source compatibility from previous WSDOT lab testing.

At the discretion of the Engineer, agencies may accept verified mix designs older than 12 months from the original verification date with a certification from the Contractor that the materials and sources are the same as those shown on the original mix design.

Commercial Evaluation Approval of a mix design for “Commercial Evaluation” will be based on a review of the Contractor’s submittal of WSDOT Form 350-042 (For commercial mixes, AASHTO T 324 evaluation is not required) or a Mix Design from the current WSDOT QPL or from one of the processes allowed by this section. Testing of the HMA by the Contracting Agency for mix design approval is not required.

For the Bid Item Commercial HMA, the Contractor shall select a class of HMA and design level of Equivalent Single Axle Loads (ESAL’s) appropriate for the required use.

5-04.2(2)B Using Warm Mix Asphalt Processes

The Contractor may elect to use additives that reduce the optimum mixing temperature or serve as a compaction aid for producing HMA. Additives include organic additives, chemical additives and foaming processes. The use of Additives is subject to the following:

- Do not use additives that reduce the mixing temperature more than allowed in Section 5-04.3(6) in the production of mixtures.
- Before using additives, obtain the Engineer’s approval using WSDOT Form 350-076 to describe the proposed additive and process.

5-04.3 Construction Requirements

5-04.3(1) Weather Limitations

Do not place HMA for wearing course on any Traveled Way beginning October 1st through March 31st of the following year without written concurrence from the Engineer.

Do not place HMA on any wet surface, or when the average surface temperatures are less than those specified below, or when weather conditions otherwise prevent the proper handling or finishing of the HMA.

Minimum Surface Temperature for Paving

Compacted Thickness (Feet)	Wearing Course	Other Courses

Less than 0.10	55◦F	45◦F
0.10 to .20	45◦F	35◦F
More than 0.20	35◦F	35◦F

5-04.3(2) Paving Under Traffic

When the Roadway being paved is open to traffic, the requirements of this Section shall apply.

The Contractor shall keep intersections open to traffic at all times except when paving the intersection or paving across the intersection. During such time, and provided that there has been an advance warning to the public, the intersection may be closed for the minimum time required to place and compact the mixture. In hot weather, the Engineer may require the application of water to the pavement to accelerate the finish rolling of the pavement and to shorten the time required before reopening to traffic.

Before closing an intersection, advance warning signs shall be placed and signs shall also be placed marking the detour or alternate route.

During paving operations, temporary pavement markings shall be maintained throughout the project. Temporary pavement markings shall be installed on the Roadway prior to opening to traffic. Temporary pavement markings shall be in accordance with Section 8-23.

All costs in connection with performing the Work in accordance with these requirements, except the cost of temporary pavement markings, shall be included in the unit Contract prices for the various Bid items involved in the Contract.

5-04.3(3) Equipment

5-04.3(3)A Mixing Plant

Plants used for the preparation of HMA shall conform to the following requirements:

1. **Equipment for Preparation of Asphalt Binder** – Tanks for the storage of asphalt binder shall be equipped to heat and hold the material at the required temperatures. The heating shall be accomplished by steam coils, electricity, or other approved means so that no flame shall be in contact with the storage tank. The circulating system for the asphalt binder shall be designed to ensure proper and continuous circulation during the operating period. A valve for the purpose of sampling the asphalt binder shall be placed in either the storage tank or in the supply line to the mixer.
2. **Thermometric Equipment** – An armored thermometer, capable of detecting temperature ranges expected in the HMA mix, shall be fixed in the asphalt binder feed line at a location near the charging valve at the mixer unit. The thermometer location shall be convenient and safe for access by Inspectors. The plant shall also be equipped with an approved dial-scale thermometer, a mercury actuated thermometer, an electric pyrometer, or another approved thermometric instrument placed at the discharge chute of the drier to automatically register or indicate the

temperature of the heated aggregates. This device shall be in full view of the plant operator.

3. **Heating of Asphalt Binder** – The temperature of the asphalt binder shall not exceed the maximum recommended by the asphalt binder manufacturer nor shall it be below the minimum temperature required to maintain the asphalt binder in a homogeneous state. The asphalt binder shall be heated in a manner that will avoid local variations in heating. The heating method shall provide a continuous supply of asphalt binder to the mixer at a uniform average temperature with no individual variations exceeding 25°F. Also, when a WMA additive is included in the asphalt binder, the temperature of the asphalt binder shall not exceed the maximum recommended by the manufacturer of the WMA additive.
4. **Sampling and Testing of Mineral Materials** – The HMA plant shall be equipped with a mechanical sampler for the sampling of the mineral materials. The mechanical sampler shall meet the requirements of Section 1-05.6 for the crushing and screening operation. The Contractor shall provide for the setup and operation of the field testing facilities of the Contracting Agency as provided for in Section 3-01.2(2).
5. **Sampling HMA** – The HMA plant shall provide for sampling HMA by one of the following methods:
    a. A mechanical sampling device attached to the HMA plant.
    b. Platforms or devices to enable sampling from the hauling vehicle without entering the hauling vehicle.

5-04.3(3)B Hauling Equipment

Trucks used for hauling HMA shall have tight, clean, smooth metal beds and shall have a cover of canvas or other suitable material of sufficient size to protect the mixture from adverse weather. Whenever the weather conditions during the work shift include, or are forecast to include, precipitation or an air temperature less than 45°F or when time from loading to unloading exceeds 30 minutes, the cover shall be securely attached to protect the HMA.

The contractor shall provide an environmentally benign means to prevent the HMA mixture from adhering to the hauling equipment. Excess release agent shall be drained prior to filling hauling equipment with HMA. Petroleum derivatives or other coating material that contaminate or alter the characteristics of the HMA shall not be used. For live bed trucks, the conveyer shall be in operation during the process of applying the release agent.

5-04.3(3)C Pavers

HMA pavers shall be self-contained, power-propelled units, provided with an internally heated vibratory screed and shall be capable of spreading and finishing courses of HMA plant mix material in lane widths required by the paving section shown in the Plans.

The HMA paver shall be in good condition and shall have the most current equipment available from the manufacturer for the prevention of segregation of the HMA mixture installed, in good condition, and in working order. The equipment certification shall list the make, model, and year of the paver and any equipment that has been retrofitted.

The screed shall be operated in accordance with the manufacturer's recommendations and shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, segregating, or gouging the mixture. A copy of the manufacturer's recommendations shall be provided upon request by the Contracting Agency. Extensions will be allowed provided they produce the same results, including ride, density, and surface

texture as obtained by the primary screed. Extensions without augers and an internally heated vibratory screed shall not be used in the Traveled Way.

When specified in the Contract, reference lines for vertical control will be required. Lines shall be placed on both outer edges of the Traveled Way of each Roadway. Horizontal control utilizing the reference line will be permitted. The grade and slope for intermediate lanes shall be controlled automatically from reference lines or by means of a mat referencing device and a slope control device. When the finish of the grade prepared for paving is superior to the established tolerances and when, in the opinion of the Engineer, further improvement to the line, grade, cross-section, and smoothness can best be achieved without the use of the reference line, a mat referencing device may be substituted for the reference line. Substitution of the device will be subject to the continued approval of the Engineer. A joint matcher may be used subject to the approval of the Engineer. The reference line may be removed after the completion of the first course of HMA when approved by the Engineer. Whenever the Engineer determines that any of these methods are failing to provide the necessary vertical control, the reference lines will be reinstalled by the Contractor.

The Contractor shall furnish and install all pins, brackets, tensioning devices, wire, and accessories necessary for satisfactory operation of the automatic control equipment.

If the paving machine in use is not providing the required finish, the Engineer may suspend Work as allowed by Section 1-08.6. Any cleaning or solvent type liquids spilled on the pavement shall be thoroughly removed before paving proceeds.

5-04.3(3)D Material Transfer Device or Material Transfer Vehicle

A Material Transfer Device/Vehicle (MTD/V) shall only be used with the Engineer's approval, unless other-wise required by the contract.

Where an MTD/V is required by the contract, the Engineer may approve paving without an MTD/V, at the request of the Contractor. The Engineer will determine if an equitable adjustment in cost or time is due.

When used, the MTD/V shall mix the HMA after delivery by the hauling equipment and prior to laydown by the paving machine. Mixing of the HMA shall be sufficient to obtain a uniform temperature throughout the mixture. If a windrow elevator is used, the length of the windrow may be limited in urban areas or through intersections, at the discretion of the Engineer.

To be approved for use, an MTV:

1. Shall be self-propelled vehicle, separate from the hauling vehicle or paver.
2. Shall not be connected to the hauling vehicle or paver.
3. May accept HMA directly from the haul vehicle or pick up HMA from a windrow.
4. Shall mix the HMA after delivery by the hauling equipment and prior to placement into the paving machine.
5. Shall mix the HMA sufficiently to obtain a uniform temperature throughout the mixture.

To be approved for use, an MTD:

1. Shall be positively connected to the paver.

2. May accept HMA directly from the haul vehicle or pick up HMA from a windrow.
3. Shall mix the HMA after delivery by the hauling equipment and prior to placement into the paving machine.
4. Shall mix the HMA sufficiently to obtain a uniform temperature throughout the mixture.

5-04.3(3)E Rollers

Rollers shall be of the steel wheel, vibratory, oscillatory, or pneumatic tire type, in good condition and capable of reversing without backlash. Operation of the roller shall be in accordance with the manufacturer's recommendations. When ordered by the Engineer for any roller planned for use on the project, the Contractor shall provide a copy of the manufacturer's recommendation for the use of that roller for compaction of HMA. The number and weight of rollers shall be sufficient to compact the mixture in compliance with the requirements of Section 5-04.3(10). The use of equipment that results in crushing of the aggregate will not be permitted. Rollers producing pickup, washboard, uneven compaction of the surface, displacement of the mixture or other undesirable results shall not be used.

5-04.3(4) Preparation of Existing Paved Surfaces

When the surface of the existing pavement or old base is irregular, the Contractor shall bring it to a uniform grade and cross-section as shown on the Plans or approved by the Engineer.

Preleveling of uneven or broken surfaces over which HMA is to be placed may be accomplished by using an asphalt paver, a motor patrol grader, or by hand raking, as approved by the Engineer.

Compaction of preleveling HMA shall be to the satisfaction of the Engineer and may require the use of small steel wheel rollers, plate compactors, or pneumatic rollers to avoid bridging across preleveled areas by the compaction equipment. Equipment used for the compaction of preleveling HMA shall be approved by the Engineer.

Before construction of HMA on an existing paved surface, the entire surface of the pavement shall be clean. All fatty asphalt patches, grease drippings, and other objectionable matter shall be entirely removed from the existing pavement. All pavements or bituminous surfaces shall be thoroughly cleaned of dust, soil, pavement grindings, and other foreign matter. All holes and small depressions shall be filled with an appropriate class of HMA. The surface of the patched area shall be leveled and compacted thoroughly. Prior to the application of tack coat, or paving, the condition of the surface shall be approved by the Engineer.

A tack coat of asphalt shall be applied to all paved surfaces on which any course of HMA is to be placed or abutted; except that tack coat may be omitted from clean, newly paved surfaces at the discretion of the Engineer. Tack coat shall be uniformly applied to cover the existing pavement with a thin film of residual asphalt free of streaks and bare spots at a rate between 0.02 and 0.10 gallons per square yard of retained asphalt. The rate of application shall be approved by the Engineer. A heavy application of tack coat shall be applied to all joints. For Roadways open to traffic, the application of tack coat shall be limited to surfaces that will be paved during the same working shift. The spreading equipment shall be equipped with a thermometer to indicate the temperature of the tack coat material.

Equipment shall not operate on tacked surfaces until the tack has broken and cured. If the Contractor's operation damages the tack coat it shall be repaired prior to placement of the HMA.

The tack coat shall be CSS-1, or CSS-1h emulsified asphalt. The CSS-1 and CSS-1h emulsified asphalt may be diluted once with water at a rate not to exceed one part water to one part emulsified asphalt. The tack coat shall have sufficient temperature such that it may be applied uniformly at the specified rate of application and shall not exceed the maximum temperature recommended by the emulsified asphalt manufacturer.

5-04.3(4)A Crack Sealing

5-04.3(4)A1 General

When the Proposal includes a pay item for crack sealing, seal all cracks ¼ inch in width and greater.

Cleaning: Ensure that cracks are thoroughly clean, dry and free of all loose and foreign material when filling with crack sealant material. Use a hot compressed air lance to dry and warm the pavement surfaces within the crack immediately prior to filling a crack with the sealant material. Do not overheat pavement. Do not use direct flame dryers. Routing cracks is not required.

Sand Slurry: For cracks that are to be filled with sand slurry, thoroughly mix the components and pour the mixture into the cracks until full. Add additional CSS-1 cationic emulsified asphalt to the sand slurry as needed for workability to ensure the mixture will completely fill the cracks. Strike off the sand slurry flush with the existing pavement surface and allow the mixture to cure. Top off cracks that were not completely filled with additional sand slurry. Do not place the HMA overlay until the slurry has fully cured.

The sand slurry shall consist of approximately 20 percent CSS-1 emulsified asphalt, approximately 2 percent portland cement, water (if required), and the remainder clean Class 1 or 2 fine aggregate per section 9-03.1(2). The components shall be thoroughly mixed and then poured into the cracks and joints until full. The following day, any cracks or joints that are not completely filled shall be topped off with additional sand slurry. After the sand slurry is placed, the filler shall be struck off flush with the existing pavement surface and allowed to cure. The HMA overlay shall not be placed until the slurry has fully cured. The requirements of Section 1-06 will not apply to the portland cement and sand used in the sand slurry.

In areas where HMA will be placed, use sand slurry to fill the cracks.

In areas where HMA will not be placed, fill the cracks as follows:

1. Cracks ¼ inch to 1 inch in width - fill with hot poured sealant.
2. Cracks greater than 1 inch in width – fill with sand slurry.

Hot Poured Sealant: For cracks that are to be filled with hot poured sealant, apply the material in accordance with these requirements and the manufacturer's recommendations. Furnish a Type 1 Working Drawing of the manufacturer's product information and recommendations to the Engineer prior to the start of work, including the manufacturer's recommended heating time and temperatures, allowable storage time and temperatures after initial heating, allowable reheating criteria, and application temperature range. Confine

hot poured sealant material within the crack. Clean any overflow of sealant from the pavement surface. If, in the opinion of the Engineer, the Contractor's method of sealing the cracks with hot poured sealant results in an excessive amount of material on the pavement surface, stop and correct the operation to eliminate the excess material.

5-04.3(4)A2 Crack Sealing Areas Prior to Paving

In areas where HMA will be placed, use sand slurry to fill the cracks.

5-04.3(4)A3 Crack Sealing Areas Not to be Paved

In areas where HMA will not be placed, fill the cracks as follows:

A. Cracks ¼ inch to 1 inch in width - fill with hot poured sealant.
B. Cracks greater than 1 inch in width – fill with sand slurry.

5-04.3(4)B Vacant

5-04.3(4)C Pavement Repair

The Contractor shall excavate pavement repair areas and shall backfill these with HMA in accordance with the details shown in the Plans and as marked in the field. The Contractor shall conduct the excavation operations in a manner that will protect the pavement that is to remain. Pavement not designated to be removed that is damaged as a result of the Contractor's operations shall be repaired by the Contractor to the satisfaction of the Engineer at no cost to the Contracting Agency. The Contractor shall excavate only within one lane at a time unless approved otherwise by the Engineer. The Contractor shall not excavate more area than can be completely finished during the same shift, unless approved by the Engineer.

Unless otherwise shown in the Plans or determined by the Engineer, excavate to a depth of 1.0 feet. The Engineer will make the final determination of the excavation depth required. The minimum width of any pavement repair area shall be 40 inches unless shown otherwise in the Plans. Before any excavation, the existing pavement shall be sawcut or shall be removed by a pavement grinder. Excavated materials will become the property of the Contractor and shall be disposed of in a Contractor-provided site off the Right of Way or used in accordance with Sections 2-02.3(3) or 9-03.21.

Asphalt for tack coat shall be required as specified in Section 5-04.3(4). A heavy application of tack coat shall be applied to all surfaces of existing pavement in the pavement repair area.

Placement of the HMA backfill shall be accomplished in lifts not to exceed 0.35-foot compacted depth. Lifts that exceed 0.35-foot of compacted depth may be accomplished with the approval of the Engineer. Each lift shall be thoroughly compacted by a mechanical tamper or a roller.

5-04.3(5) Producing/Stockpiling Aggregates and RAP

Aggregates and RAP shall be stockpiled according to the requirements of Section 3-02. Sufficient storage space shall be provided for each size of aggregate and RAP. Materials shall be removed from stockpile(s) in a manner to ensure minimal segregation when being moved to the HMA plant for processing into the final mixture. Different aggregate sizes shall be kept separated until they have been delivered to the HMA plant.

5-04.3(5)A Vacant

5-04.3(6) Mixing

After the required amount of mineral materials, asphalt binder, recycling agent and anti-stripping additives have been introduced into the mixer the HMA shall be mixed until complete and uniform coating of the particles and thorough distribution of the asphalt binder throughout the mineral materials is ensured.

When discharged, the temperature of the HMA shall not exceed the optimum mixing temperature by more than 25°F as shown on the reference mix design report or as approved by the Engineer. Also, when a WMA additive is included in the manufacture of HMA, the discharge temperature of the HMA shall not exceed the maximum recommended by the manufacturer of the WMA additive. A maximum water content of 2 percent in the mix, at discharge, will be allowed providing the water causes no problems with handling, stripping, or flushing. If the water in the HMA causes any of these problems, the moisture content shall be reduced as directed by the Engineer.

Storing or holding of the HMA in approved storage facilities will be permitted with approval of the Engineer, but in no event shall the HMA be held for more than 24 hours. HMA held for more than 24 hours after mixing shall be rejected. Rejected HMA shall be disposed of by the Contractor at no expense to the Contracting Agency. The storage facility shall have an accessible device located at the top of the cone or about the third point. The device shall indicate the amount of material in storage. No HMA shall be accepted from the storage facility when the HMA in storage is below the top of the cone of the storage facility, except as the storage facility is being emptied at the end of the working shift.

Recycled asphalt pavement (RAP) utilized in the production of HMA shall be sized prior to entering the mixer so that a uniform and thoroughly mixed HMA is produced. If there is evidence of the recycled asphalt pavement not breaking down during the heating and mixing of the HMA, the Contractor shall immediately suspend the use of the RAP until changes have been approved by the Engineer. After the required amount of mineral materials, RAP, new asphalt binder and asphalt rejuvenator have been introduced into the mixer the HMA shall be mixed until complete and uniform coating of the particles and thorough distribution of the asphalt binder throughout the mineral materials, and RAP is ensured.

5-04.3(7) Spreading and Finishing

The mixture shall be laid upon an approved surface, spread, and struck off to the grade and elevation established. HMA pavers complying with Section 5-04.3(3) shall be used to distribute the mixture. Unless otherwise directed by the Engineer, the nominal compacted depth of any layer of any course shall not exceed the following:

HMA Class 1”		0.35 feet
HMA Class ¾” and HMA Class ½”		
	wearing course	0.30 feet
	other courses	0.35 feet
HMA Class ⅜”		0.15 feet

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the paving may be done with other equipment or by hand.

When more than one JMF is being utilized to produce HMA, the material produced for each JMF shall be placed by separate spreading and compacting equipment. The intermingling of HMA produced from more than one JMF is prohibited. Each strip of HMA placed during a work shift shall conform to a single JMF established for the class of HMA specified unless there is a need to make an adjustment in the JMF.

5-04.3(8) Aggregate Acceptance Prior to Incorporation in HMA

For HMA accepted by nonstatistical evaluation the aggregate properties of sand equivalent, uncompacted void content and fracture will be evaluated in accordance with Section 3-04. Sampling and testing of aggregates for HMA accepted by commercial evaluation will be at the option of the Engineer.

5-04.3(9) HMA Mixture Acceptance

Acceptance of HMA shall be as provided under nonstatistical, or commercial evaluation.

Nonstatistical evaluation will be used for the acceptance of HMA unless Commercial Evaluation is specified.

Commercial evaluation will be used for Commercial HMA and for other classes of HMA in the following applications: sidewalks, road approaches, ditches, slopes, paths, trails, gores, prelevel, temporary pavement, and pavement repair. Other nonstructural applications of HMA accepted by commercial evaluation shall be as approved by the Engineer. Sampling and testing of HMA accepted by commercial evaluation will be at the option of the Engineer.

The mix design will be the initial JMF for the class of HMA. The Contractor may request a change in the JMF. Any adjustments to the JMF will require the approval of the Engineer and may be made in accordance with this section.

HMA Tolerances and Adjustments

1. **Job Mix Formula Tolerances** – The constituents of the mixture at the time of acceptance shall be within tolerance. The tolerance limits will be established as follows:

   For Asphalt Binder and Air Voids (Va), the acceptance limits are determined by adding the tolerances below to the approved JMF values. These values will also be the Upper Specification Limit (USL) and Lower Specification Limit (LSL) required in Section 1-06.2(2)D2

Property	Non-Statistical Evaluation	Commercial Evaluation
Asphalt Binder	+/- 0.5%	+/- 0.7%
Air Voids, Va	2.5% min. and 5.5% max	N/A

   For Aggregates in the mixture:

   a. First, determine preliminary upper and lower acceptance limits by applying the following tolerances to the approved JMF.

Aggregate Percent Passing	Non-Statistical Evaluation	Commercial Evaluation
1", ¾", ½", and 3/8" sieves	+/- 6%	+/- 8%
No. 4 sieve	+/-6%	+/- 8%
No. 8 Sieve	+/- 6%	+/-8%
No. 200 sieve	+/- 2.0%	+/- 3.0%

   b. Second, adjust the preliminary upper and lower acceptance limits determined from step (a) the minimum amount necessary so that none of the aggregate properties are outside the control points in Section 9-03.8(6). The resulting values will be the

upper and lower acceptance limits for aggregates, as well as the USL and LSL required in Section 1-06.2(2)D2.

2. Job Mix Formula Adjustments – An adjustment to the aggregate gradation or asphalt binder content of the JMF requires approval of the Engineer. Adjustments to the JMF will only be considered if the change produces material of equal or better quality and may require the development of a new mix design if the adjustment exceeds the amounts listed below.
   a. **Aggregates** –2 percent for the aggregate passing the 1½″, 1″, ¾″, ½″, ⅜″, and the No. 4 sieves, 1 percent for aggregate passing the No. 8 sieve, and 0.5 percent for the aggregate passing the No. 200 sieve. The adjusted JMF shall be within the range of the control points in Section 9-03.8(6).
   b. **Asphalt Binder Con**tent – The Engineer may order or approve changes to asphalt binder content. The maximum adjustment from the approved mix design for the asphalt binder content shall be 0.3 percent

5-04.3(9)A Vacant

5-04.3(9)B Vacant

5-04.3(9)C Mixture Acceptance – Nonstatistical Evaluation

HMA mixture which is accepted by Nonstatistical Evaluation will be evaluated by the Contracting Agency by dividing the HMA tonnage into lots.

5-04.3(9)C1 Mixture Nonstatistical Evaluation – Lots and Sublots

A lot is represented by randomly selected samples of the same mix design that will be tested for acceptance. A lot is defined as the total quantity of material or work produced for each Job Mix Formula placed. Only one lot per JMF is expected. A sublot shall be equal to one day's production or 800 tons, whichever is less except that the final sublot will be a minimum of 400 tons and may be increased to 1200 tons.

All of the test results obtained from the acceptance samples from a given lot shall be evaluated collectively. If the Contractor requests a change to the JMF that is approved, the material produced after the change will be evaluated on the basis of the new JMF for the remaining sublots in the current lot and for acceptance of subsequent lots. For a lot in progress with a CPF less than 0.75, a new lot will begin at the Contractor's request after the Engineer is satisfied that material conforming to the Specifications can be produced.

Sampling and testing for evaluation shall be performed on the frequency of one sample per sublot.

5-04.3(9)C2 Mixture Nonstatistical Evaluation Sampling

Samples for acceptance testing shall be obtained by the Contractor when ordered by the Engineer. The Contractor shall sample the HMA mixture in the presence of the Engineer and in accordance with AASH-TO T 168. A minimum of three samples should be taken for each class of HMA placed on a project. If used in a structural application, at least one of the three samples shall to be tested.

Sampling and testing HMA in a Structural application where quantities are less than 400 tons is at the discretion of the Engineer.

For HMA used in a structural application and with a total project quantity less than 800 tons but more than 400 tons, a minimum of one acceptance test shall be performed. In all cases, a minimum of 3 samples will be obtained at the point of acceptance, a minimum of one of the three samples will be tested for conformance to the JMF:

- If the test results are found to be within specification requirements, additional testing will be at the Engineer's discretion.
- If test results are found not to be within specification requirements, additional testing of the remaining samples to determine a Composite Pay Factor (CPF) shall be performed.

5-04.3(9)C3 Mixture Nonstatistical Evaluation – Acceptance Testing

Testing of HMA for compliance of V_a will at the option of the Contracting Agency. If tested, compliance of V_a will use WSDOT SOP 731.

Testing for compliance of asphalt binder content will be by WSDOT FOP for AASHTO T 308.

Testing for compliance of gradation will be by FOP for WAQTC T 27/T 11.

5-04.3(9)C4 Mixture Nonstatistical Evaluation – Pay Factors

For each lot of material falling outside the tolerance limits in 5-04.3(9), the Contracting Agency will determine a Composite Pay Factor (CPF) using the following price adjustment factors:

Table of Price Adjustment Factors	
Constituent	**Factor "f"**
All aggregate passing: 1½″, 1″, ¾″, ½″, ⅜″ and No.4 sieves	2
All aggregate passing No. 8 sieve	15
All aggregate passing No. 200 sieve	20
Asphalt binder	40
Air Voids (Va) (where applicable)	20

Each lot of HMA produced under Nonstatistical Evaluation and having all constituents falling within the tolerance limits of the job mix formula shall be accepted at the unit Contract price with no further evaluation. When one or more constituents fall outside the nonstatistical tolerance limits in the Job Mix Formula shown in Table of Price Adjustment Factors, the lot shall be evaluated in accordance with Section 1-06.2 to determine the appropriate CPF. The nonstatistical tolerance limits will be used in the calculation of the CPF and the maximum CPF shall be 1.00. When less than three sublots exist, backup samples of the existing sublots or samples from the Roadway shall be tested to provide a minimum of three sets of results for evaluation.

5-04.3(9)C5 Vacant

5-04.3(9)C6 Mixture Nonstatistical Evaluation – Price Adjustments

For each lot of HMA mix produced under Nonstatistical Evaluation when the calculated CPF is less than 1.00, a Nonconforming Mix Factor (NCMF) will be determined. The NCMF equals the algebraic difference of CPF minus 1.00 multiplied by 60 percent. The total job mix compliance price adjustment will be calculated as the product of the NCMF, the quantity of HMA in the lot in tons, and the unit Contract price per ton of mix.

If a constituent is not measured in accordance with these Specifications, its individual pay factor will be considered 1.00 in calculating the Composite Pay Factor (CPF).

5-04.3(9)C7 Mixture Nonstatistical Evaluation - Retests

The Contractor may request a sublot be retested. To request a retest, the Contractor shall submit a written request within 7 calendar days after the specific test results have been received. A split of the original acceptance sample will be retested. The split of the sample will not be tested with the same tester that ran the original acceptance test. The sample will be tested for a complete gradation analysis, asphalt binder content, and, at the option of the agency, V_a. The results of the retest will be used for the acceptance of the HMA in place of the original sublot sample test results. The cost of testing will be deducted from any monies due or that may come due the Contractor under the Contract at the rate of $500 per sample.

5-04.3 (9)D Mixture Acceptance – Commercial Evaluation

If sampled and tested, HMA produced under Commercial Evaluation and having all constituents falling within the tolerance limits of the job mix formula shall be accepted at the unit Contract price with no further evaluation. When one or more constituents fall outside the commercial tolerance limits in the Job Mix Formula shown in 5-04.3(9), the lot shall be evaluated in accordance with Section 1-06.2 to determine the appropriate CPF. The commercial tolerance limits will be used in the calculation of the CPF and the maximum CPF shall be 1.00. When less than three sublots exist, backup samples of the existing sublots or samples from the street shall be tested to provide a minimum of three sets of results for evaluation.

For each lot of HMA mix produced and tested under Commercial Evaluation when the calculated CPF is less than 1.00, a Nonconforming Mix Factor (NCMF) will be determined. The NCMF equals the algebraic difference of CPF minus 1.00 multiplied by 60 percent. The Job Mix Compliance Price Adjustment will be calculated as the product of the NCMF, the quantity of HMA in the lot in tons, and the unit Contract price per ton of mix.

If a constituent is not measured in accordance with these Specifications, its individual pay factor will be considered 1.00 in calculating the Composite Pay Factor (CPF).

5-04.3(10) HMA Compaction Acceptance

HMA mixture accepted by nonstatistical evaluation that is used in traffic lanes, including lanes for intersections, ramps, truck climbing, weaving, and speed change, and having a specified compacted course thickness greater than 0.10-foot, shall be compacted to a specified level of relative density. The specified level of relative density shall be a Composite Pay Factor (CPF) of not less than 0.75 when evaluated in accordance with Section 1-06.2, using a LSL of 92.0 (minimum of 92 percent of the maximum density). The maximum density shall be determined by WSDOT FOP for AASHTO T 729. The specified level of density attained will be determined by the evaluation of the density of the pavement. The density of the pavement shall be determined in accordance with WSDOT FOP for WAQTC TM 8,

except that gauge correlation will be at the discretion of the Engineer, when using the nuclear density gauge and WSDOT SOP 736 when using cores to determine density.

Tests for the determination of the pavement density will be taken in accordance with the required procedures for measurement by a nuclear density gauge or roadway cores after completion of the finish rolling.

If the Contracting Agency uses a nuclear density gauge to determine density the test procedures FOP for WAQTC TM 8 and WSDOT SOP T 729 will be used on the day the mix is placed and prior to opening to traffic.

Roadway cores for density may be obtained by either the Contracting Agency or the Contractor in accordance with WSDOT SOP 734. The core diameter shall be 4-inches minimum, unless otherwise approved by the Engineer. Roadway cores will be tested by the Contracting Agency in accordance with WSDOT FOP for AASHTO T 166.

If the Contract includes the Bid item “Roadway Core” the cores shall be obtained by the Contractor in the presence of the Engineer on the same day the mix is placed and at locations designated by the Engineer. If the Contract does not include the Bid item “Roadway Core” the Contracting Agency will obtain the cores.

For a lot in progress with a CPF less than 0.75, a new lot will begin at the Contractor’s request after the Engineer is satisfied that material conforming to the Specifications can be produced.

HMA mixture accepted by commercial evaluation and HMA constructed under conditions other than those listed above shall be compacted on the basis of a test point evaluation of the compaction train. The test point evaluation shall be performed in accordance with instructions from the Engineer. The number of passes with an approved compaction train, required to attain the maximum test point density, shall be used on all subsequent paving.

HMA for preleveling shall be thoroughly compacted. HMA that is used for preleveling wheel rutting shall be compacted with a pneumatic tire roller unless otherwise approved by the Engineer.

Test Results

For a sublot that has been tested with a nuclear density gauge that did not meet the minimum of 92 percent of the reference maximum density in a compaction lot with a CPF below 1.00 and thus subject to a price reduction or rejection, the Contractor may request that a core be used for determination of the relative density of the sublot. The relative density of the core will replace the relative density determined by the nuclear density gauge for the sublot and will be used for calculation of the CPF and acceptance of HMA compaction lot.

When cores are taken by the Contracting Agency at the request of the Contractor, they shall be requested by noon of the next workday after the test results for the sublot have been provided or made available to the Contractor. Core locations shall be outside of wheel paths and as determined by the Engineer. Traffic control shall be provided by the Contractor as requested by the Engineer. Failure by the Contractor to provide the requested traffic control will result in forfeiture of the request for cores. When the CPF for the lot based on the results of the HMA cores is less than 1.00, the cost for the coring will be deducted from any monies

due or that may become due the Contractor under the Contract at the rate of $200 per core and the Contractor shall pay for the cost of the traffic control.

5-04.3(10)A HMA Compaction – General Compaction Requirements

Compaction shall take place when the mixture is in the proper condition so that no undue displacement, cracking, or shoving occurs. Areas inaccessible to large compaction equipment shall be compacted by other mechanical means. Any HMA that becomes loose, broken, contaminated, shows an excess or deficiency of asphalt, or is in any way defective, shall be removed and replaced with new hot mix that shall be immediately compacted to conform to the surrounding area.

The type of rollers to be used and their relative position in the compaction sequence shall generally be the Contractor's option, provided the specified densities are attained. Unless the Engineer has approved otherwise, rollers shall only be operated in the static mode when the internal temperature of the mix is less than 175°F. Regardless of mix temperature, a roller shall not be operated in a mode that results in checking or cracking of the mat. Rollers shall only be operated in static mode on bridge decks.

5-04.3(10)B HMA Compaction – Cyclic Density

Low cyclic density areas are defined as spots or streaks in the pavement that are less than 90 percent of the theoretical maximum density. At the Engineer's discretion, the Engineer may evaluate the HMA pavement for low cyclic density, and when doing so will follow WSDOT SOP 733. A $500 Cyclic Density Price Adjustment will be assessed for any 500-foot section with two or more density readings below 90 percent of the theoretical maximum density.

5-04.3(10)C Vacant

5-04.3(10)D HMA Nonstatistical Compaction

5-04.3(10)D1 HMA Nonstatistical Compaction – Lots and Sublots

HMA compaction which is accepted by nonstatistical evaluation will be based on acceptance testing performed by the Contracting Agency dividing the project into compaction lots.

A lot is represented by randomly selected samples of the same mix design that will be tested for acceptance. A lot is defined as the total quantity of material or work produced for each Job Mix Formula placed. Only one lot per JMF is expected. A sublot shall be equal to one day's production or 400 tons, whichever is less except that the final sublot will be a minimum of 200 tons and may be increased to 800 tons. Testing for compaction will be at the rate of 5 tests per sublot per WSDOT T 738.

The sublot locations within each density lot will be determined by the Engineer. For a lot in progress with a CPF less than 0.75, a new lot will begin at the Contractor's request after the Engineer is satisfied that material conforming to the Specifications can be produced.

HMA mixture accepted by commercial evaluation and HMA constructed under conditions other than those listed above shall be compacted on the basis of a test point evaluation of the compaction train. The test point evaluation shall be performed in accordance with instructions from the Engineer. The number of passes with an approved compaction train, required to attain the maximum test point density, shall be used on all subsequent paving.

HMA for preleveling shall be thoroughly compacted. HMA that is used to prelevel wheel ruts shall be compacted with a pneumatic tire roller unless otherwise approved by the Engineer.

5-04.3(10)D2 HMA Compaction Nonstatistical Evaluation – Acceptance Testing

The location of the HMA compaction acceptance tests will be randomly selected by the Engineer from within each sublot, with one test per sublot.

5-04.3(10)D3 HMA Nonstatistical Compaction – Price Adjustments

For each compaction lot with one or two sublots, having all sublots attain a relative density that is 92 percent of the reference maximum density the HMA shall be accepted at the unit Contract price with no further evaluation. When a sublot does not attain a relative density that is 92 percent of the reference maximum density, the lot shall be evaluated in accordance with Section 1-06.2 to determine the appropriate CPF. The maximum CPF shall be 1.00, however, lots with a calculated CPF in excess of 1.00 will be used to offset lots with CPF values below 1.00 but greater than 0.90. Lots with CPF lower than 0.90 will be evaluated for compliance per 5-04.3(11). Additional testing by either a nuclear moisture-density gauge or cores will be completed as required to provide a minimum of three tests for evaluation.

For compaction below the required 92% a Non-Conforming Compaction Factor (NCCF) will be determined. The NCCF equals the algebraic difference of CPF minus 1.00 multiplied by 40 percent. The Compaction Price Adjustment will be calculated as the product of CPF, the quantity of HMA in the compaction control lot in tons, and the unit Contract price per ton of mix.

5-04.3(11) Reject Work

5-04.3(11)A Reject Work General

Work that is defective or does not conform to Contract requirements shall be rejected. The Contractor may propose, in writing, alternatives to removal and replacement of rejected material. Acceptability of such alternative proposals will be determined at the sole discretion of the Engineer. HMA that has been rejected is subject to the requirements in Section 1-06.2(2) and this specification, and the Contractor shall submit a corrective action proposal to the Engineer for approval.

5-04.3(11)B Rejection by Contractor

The Contractor may, prior to sampling, elect to remove any defective material and replace it with new material. Any such new material will be sampled, tested, and evaluated for acceptance.

5-04.3(11)C Rejection Without Testing (Mixture or Compaction)

The Engineer may, without sampling, reject any batch, load, or section of Roadway that appears defective. Material rejected before placement shall not be incorporated into the pavement. Any rejected section of Roadway shall be removed.

No payment will be made for the rejected materials or the removal of the materials unless the Contractor requests that the rejected material be tested. If the Contractor elects to have the rejected material tested, a minimum of three representative samples will be obtained and tested. Acceptance of rejected material will be based on conformance with the nonstatistical acceptance Specification. If the CPF for the rejected material is less than 0.75, no payment will be made for the rejected material; in addition, the cost of sampling and

testing shall be borne by the Contractor. If the CPF is greater than or equal to 0.75, the cost of sampling and testing will be borne by the Contracting Agency. If the material is rejected before placement and the CPF is greater than or equal to 0.75, compensation for the rejected material will be at a CPF of 0.75. If rejection occurs after placement and the CPF is greater than or equal to 0.75, compensation for the rejected material will be at the calculated CPF with an addition of 25 percent of the unit Contract price added for the cost of removal and disposal.

5-04.3(11)D Rejection - A Partial Sublot

In addition to the random acceptance sampling and testing, the Engineer may also isolate from a normal sublot any material that is suspected of being defective in relative density, gradation or asphalt binder content. Such isolated material will not include an original sample location. A minimum of three random samples of the suspect material will be obtained and tested. The material will then be statistically evaluated as an independent lot in accordance with Section 1-06.2(2).

5-04.3(11)E Rejection - An Entire Sublot

An entire sublot that is suspected of being defective may be rejected. When a sublot is rejected a minimum of two additional random samples from this sublot will be obtained. These additional samples and the original sublot will be evaluated as an independent lot in accordance with Section 1-06.2(2).

5-04.3(11)F Rejection - A Lot in Progress

The Contractor shall shut down operations and shall not resume HMA placement until such time as the Engineer is satisfied that material conforming to the Specifications can be produced:

1. When the Composite Pay Factor (CPF) of a lot in progress drops below 1.00 and the Contractor is taking no corrective action, or
2. When the Pay Factor (PF) for any constituent of a lot in progress drops below 0.95 and the Contractor is taking no corrective action, or
3. When either the PFi for any constituent or the CPF of a lot in progress is less than 0.75.

5-04.3(11)G Rejection - An Entire Lot (Mixture or Compaction)

An entire lot with a CPF of less than 0.75 will be rejected.

5-04.3(12) Joints

5-04.3(12)A HMA Joints

5-04.3(12)A1 Transverse Joints

The Contractor shall conduct operations such that the placing of the top or wearing course is a continuous operation or as close to continuous as possible. Unscheduled transverse joints will be allowed and the roller may pass over the unprotected end of the freshly laid mixture only when the placement of the course must be discontinued for such a length of time that the mixture will cool below compaction temperature. When the Work is resumed, the previously compacted mixture shall be cut back to produce a slightly beveled edge for the full thickness of the course.

A temporary wedge of HMA constructed on a 20H:1V shall be constructed where a transverse joint as a result of paving or planing is open to traffic. The HMA in the temporary wedge shall be separated from the permanent HMA by strips of heavy wrapping paper or other methods approved by the Engineer. The wrapping paper shall be removed and the joint trimmed to a slightly beveled edge for the full thickness of the course prior to resumption of paving.

The material that is cut away shall be wasted and new mix shall be laid against the cut. Rollers or tamping irons shall be used to seal the joint.

5-04.3(12)A2 Longitudinal Joints

The longitudinal joint in any one course shall be offset from the course immediately below by not more than 6 inches nor less than 2 inches. All longitudinal joints constructed in the wearing course shall be located at a lane line or an edge line of the Traveled Way. A notched wedge joint shall be constructed along all longitudinal joints in the wearing surface of new HMA unless otherwise approved by the Engineer. The notched wedge joint shall have a vertical edge of not less than the maximum aggregate size or more than ½ of the compacted lift thickness and then taper down on a slope not steeper than 4H:1V. The sloped portion of the HMA notched wedge joint shall be uniformly compacted.

5-04.3(12)B Bridge Paving Joint Seals

5-04.3(12)B1 HMA Sawcut and Seal

Prior to placing HMA on the bridge deck, establish sawcut alignment points at both ends of the bridge paving joint seals to be placed at the bridge ends, and at interior joints within the bridge deck when and where shown in the Plans. Establish the sawcut alignment points in a manner that they remain functional for use in aligning the sawcut after placing the overlay.

Submit a Type 1 Working Drawing consisting of the sealant manufacturer's application procedure.

Construct the bridge paving joint seal as specified ion the Plans and in accordance with the detail shown in the Standard Plans. Construct the sawcut in accordance with the detail shown in the Standard Plan. Construct the sawcut in accordance with Section 5-05.3(8)B and the manufacturer's application procedure.

5-04.3(12)B2 Paved Panel Joint Seal

Construct the paved panel joint seal in accordance with the requirements specified in section 5-04.3(12)B1 and the following requirement:

1. Clean and seal the existing joint between concrete panels in accordance with Section 5-01.3(8) and the details shown in the Standard Plans.

5-04.3(13) Surface Smoothness

The completed surface of all courses shall be of uniform texture, smooth, uniform as to crown and grade, and free from defects of all kinds. The completed surface of the wearing course shall not vary more than ⅛ inch from the lower edge of a 10-foot straightedge placed on the surface parallel to the centerline. The transverse slope of the completed surface of the wearing course shall vary not more than ¼ inch in 10 feet from the rate of transverse slope shown in the Plans.

When deviations in excess of the above tolerances are found that result from a high place in the HMA, the pavement surface shall be corrected by one of the following methods:

1. Removal of material from high places by grinding with an approved grinding machine, or
2. Removal and replacement of the wearing course of HMA, or
3. By other method approved by the Engineer.

Correction of defects shall be carried out until there are no deviations anywhere greater than the allowable tolerances.

Deviations in excess of the above tolerances that result from a low place in the HMA and deviations resulting from a high place where corrective action, in the opinion of the Engineer, will not produce satisfactory results will be accepted with a price adjustment. The Engineer shall deduct from monies due or that may become due to the Contractor the sum of $500.00 for each and every section of single traffic lane 100 feet in length in which any excessive deviations described above are found.

When utility appurtenances such as manhole covers and valve boxes are located in the traveled way, the utility appurtenances shall be adjusted to the finished grade prior to paving. This requirement may be waived when requested by the Contractor, at the discretion of the Engineer or when the adjustment details provided in the project plan or specifications call for utility appurtenance adjustments after the completion of paving.

Utility appurtenance adjustment discussions will be included in the Pre-Paving planning (5-04.3(14)B3). Submit a written request to waive this requirement to the Engineer prior to the start of paving.

5-04.3(14) Planing (Milling) Bituminous Pavement

The planning plan must be approved by the Engineer and a pre planning meeting must be held prior to the start of any planing. See Section 5-04.3(14)B2 for information on planning submittals.

Locations of existing surfacing to be planed are as shown in the Drawings.

Where planing an existing pavement is specified in the Contract, the Contractor must remove existing surfacing material and to reshape the surface to remove irregularities. The finished product must be a prepared surface acceptable for receiving an HMA overlay.

Use the cold milling method for planing unless otherwise specified in the Contract. Do not use the planer on the final wearing course of new HMA.

Conduct planing operations in a manner that does not tear, break, burn, or otherwise damage the surface which is to remain. The finished planed surface must be slightly grooved or roughened and must be free from gouges, deep grooves, ridges, or other imperfections. The Contractor must repair any damage to the surface by the Contractor’s planing equipment, using an Engineer approved method.

Repair or replace any metal castings and other surface improvements damaged by planing, as determined by the Engineer.

A tapered wedge cut must be planed longitudinally along curb lines sufficient to provide a minimum of 4 inches of curb reveal after placement and compaction of the final wearing course. The dimensions of the wedge must be as shown on the Drawings or as specified by the Engineer.

A tapered wedge cut must also be made at transitions to adjoining pavement surfaces (meet lines) where butt joints are shown on the Drawings. Cut butt joints in a straight line with vertical faces 2 inches or more in height, producing a smooth transition to the existing adjoining pavement.

After planing is complete, planed surfaces must be swept, cleaned, and if required by the Contract, patched and preleveled.

The Engineer may direct additional depth planing. Before performing this additional depth planing, the Contractor must conduct a hidden metal in pavement detection survey as specified in Section 5-04.3(14)A.

5-04.3(14)A Pre-Planing Metal Detection Check

Before starting planing of pavements, and before any additional depth planing required by the Engineer, the Contractor must conduct a physical survey of existing pavement to be planed with equipment that can identify hidden metal objects.

Should such metal be identified, promptly notify the Engineer.

See Section 1-07.16(1) regarding the protection of survey monumentation that may be hidden in pavement.

The Contractor is solely responsible for any damage to equipment resulting from the Contractor's failure to conduct a pre-planing metal detection survey, or from the Contractor's failure to notify the Engineer of any hidden metal that is detected.

5-04.3(14)B Paving and Planing Under Traffic

5-04.3(14)B1 General

In addition the requirements of Section 1-07.23 and the traffic controls required in Section 1-10, and unless the Contract specifies otherwise or the Engineer approves, the Contractor must comply with the following:

1. Intersections:
   a. Keep intersections open to traffic at all times, except when paving or planing operations through an intersection requires closure. Such closure must be kept to the minimum time required to place and compact the HMA mixture, or plane as appropriate. For paving, schedule such closure to individual lanes or portions thereof that allows the traffic volumes and schedule of traffic volumes required in the approved traffic control plan. Schedule work so that adjacent intersections are not impacted at the same time and comply with the traffic control restrictions required by the Traffic Engineer. Each individual intersection closure or partial closure, must be addressed in the traffic control plan, which must be submitted to and accepted by the Engineer, see Section 1-10.2(2).
   b. When planing or paving and related construction must occur in an intersection, consider scheduling and sequencing such work into quarters of the intersection, or

half or more of an intersection with side street detours. Be prepared to sequence the work to individual lanes or portions thereof.

c. Should closure of the intersection in its entirety be necessary, and no trolley service is impacted, keep such closure to the minimum time required to place and compact the HMA mixture, plane, remove asphalt, tack coat, and as needed.

d. Any work in an intersection requires advance warning in both signage and a number of Working Days advance notice as determined by the Engineer, to alert traffic and emergency services of the intersection closure or partial closure.

e. Allow new compacted HMA asphalt to cool to ambient temperature before any traffic is allowed on it. Traffic is not allowed on newly placed asphalt until approval has been obtained from the Engineer.

2. Temporary centerline marking, post-paving temporary marking, temporary stop bars, and maintaining temporary pavement marking must comply with Section 8-23.
3. Permanent pavement marking must comply with Section 8-22.

5-04.3(14)B2 Submittals – Planing Plan and HMA Paving Plan

The Contractor must submit a separate planing plan and a separate paving plan to the Engineer at least 5 Working Days in advance of each operation's activity start date. These plans must show how the moving operation and traffic control are coordinated, as they will be discussed at the pre-planing briefing and pre-paving briefing. When requested by the Engineer, the Contractor must provide each operation's traffic control plan on 24 x 36 inch or larger size Shop Drawings with a scale showing both the area of operation and sufficient detail of traffic beyond the area of operation where detour traffic may be required. The scale on the Shop Drawings is 1 inch = 20 feet, which may be changed if the Engineer agrees sufficient detail is shown.

The planing operation and the paving operation include, but are not limited to, metal detection, removal of asphalt and temporary asphalt of any kind, tack coat and drying, staging of supply trucks, paving trains, rolling, scheduling, and as may be discussed at the briefing.

When intersections will be partially or totally blocked, provide adequately sized and noticeable signage alerting traffic of closures to come, a minimum 2 Working Days in advance. The traffic control plan must show where police officers will be stationed when signalization is or may be, countermanded, and show areas where flaggers are proposed.

At a minimum, the planing and the paving plan must include:

1. A copy of the accepted traffic control plan, see Section 1-10.2(2), detailing each day's traffic control as it relates to the specific requirements of that day's planing and paving. Briefly describe the sequencing of traffic control consistent with the proposed planing and paving sequence, and scheduling of placement of temporary pavement markings and channelizing devices after each day's planing, and paving.
2. A copy of each intersection's traffic control plan.
3. Haul routes from Supplier facilities, and locations of temporary parking and staging areas, including return routes. Describe the complete round trip as it relates to the sequencing of paving operations.
4. Names and locations of HMA Supplier facilities to be used.
5. List of all equipment to be used for paving.
6. List of personnel and associated job classification assigned to each piece of paving equipment.

7. Description (geometric or narrative) of the scheduled sequence of planing and of paving, and intended area of planing and of paving for each day's work, must include the directions of proposed planing and of proposed paving, sequence of adjacent lane paving, sequence of skipped lane paving, intersection planing and paving scheduling and sequencing, and proposed notifications and coordinations to be timely made. The plan must show HMA joints relative to the final pavement marking lane lines.
8. Names, job titles, and contact information for field, office, and plant supervisory personnel.
9. A copy of the approved Mix Designs.
10. Tonnage of HMA to be placed each day.
11. Approximate times and days for starting and ending daily operations.

5-04.3(14)B3 Pre-Paving and Pre-Planing Briefing

At least 2 Working Days before the first paving operation and the first planing operation, or as scheduled by the Engineer for future paving and planing operations to ensure the Contractor has adequately prepared for notifying and coordinating as required in the Contract, the Contractor must be prepared to discuss that day's operations as they relate to other entities and to public safety and convenience, including driveway and business access, garbage truck operations, Metro transit operations and working around energized overhead wires, school and nursing home and hospital and other accesses, other contractors who may be operating in the area, pedestrian and bicycle traffic, and emergency services. The Contractor, and Subcontractors that may be part of that day's operations, must meet with the Engineer and discuss the proposed operation as it relates to the submitted planing plan and paving plan, approved traffic control plan, and public convenience and safety. Such discussion includes, but is not limited to:

1. General for both Paving Plan and for Planing Plan:
   a. The actual times of starting and ending daily operations.
   b. In intersections, how to break up the intersection, and address traffic control and signalization for that operation, including use of peace officers.
   c. The sequencing and scheduling of paving operations and of planing operations, as applicable, as it relates to traffic control, to public convenience and safety, and to other con-tractors who may operate in the Project Site.
   d. Notifications required of Contractor activities, and coordinating with other entities and the public as necessary.
   e. Description of the sequencing of installation and types of temporary pavement markings as it relates to planning and to paving.
   f. Description of the sequencing of installation of, and the removal of, temporary pavement patch material around exposed castings and as may be needed
   g. Description of procedures and equipment to identify hidden metal in the pavement, such as survey monumentation, monitoring wells, street car rail, and castings, before planning, see Section 5-04.3(14)B2.
   h. Description of how flaggers will be coordinated with the planing, paving, and related operations.
   i. Description of sequencing of traffic controls for the process of rigid pavement base repairs.
   j. Other items the Engineer deems necessary to address.
2. Paving – additional topics:
   a. When to start applying tack and coordinating with paving.

b. Types of equipment and numbers of each type equipment to be used. If more pieces of equipment than personnel are proposed, describe the sequencing of the personnel operating the types of equipment. Discuss the continuance of operator personnel for each type equipment as it relates to meeting Specification requirements.
c. Number of JMFs to be placed, and if more than one JMF how the Contractor will ensure different JMFs are distinguished, how pavers and MTVs are distinguished if more than one JMF is being placed at the time, and how pavers and MTVs are cleaned so that one JMF does not adversely influence the other JMF.
d. Description of contingency plans for that day's operations such as equipment breakdown, rain out, and Supplier shutdown of operations.
e. Number of sublots to be placed, sequencing of density testing, and other sampling and testing.

5-04.3(15) Sealing Pavement Surfaces

Apply a fog seal where shown in the plans. Construct the fog seal in accordance with Section 5-02.3. Unless otherwise approved by the Engineer, apply the fog seal prior to opening to traffic.

5-04.3(16) HMA Road Approaches

HMA approaches shall be constructed at the locations shown in the Plans or where staked by the Engineer. The Work shall be performed in accordance with Section 5-04.

5-04.4 Measurement

HMA Cl. ___ PG ___, HMA for ___ Cl. ___ PG ___, and Commercial HMA will be measured by the ton in accordance with Section 1-09.2, with no deduction being made for the weight of asphalt binder, mineral filler, or any other component of the mixture. If the Contractor elects to remove and replace mix as allowed by Section 5-04.3(11), the material removed will not be measured.

Roadway cores will be measured per each for the number of cores taken.

Preparation of untreated roadway will be measured by the mile once along the centerline of the main line Roadway. No additional measurement will be made for ramps, Auxiliary Lanes, service roads, Frontage Roads, or Shoulders. Measurement will be to the nearest 0.01 mile.

Soil residual herbicide will be measured by the mile for the stated width to the nearest 0.01 mile or by the square yard, whichever is designated in the Proposal.

Pavement repair excavation will be measured by the square yard of surface marked prior to excavation.

Asphalt for prime coat will be measured by the ton in accordance with Section 1-09.2.

Prime coat aggregate will be measured by the cubic yard, truck measure, or by the ton, whichever is designated in the Proposal.

Asphalt for fog seal will be measured by the ton, as provided in Section 5-02.4.

Longitudinal joint seals between the HMA and cement concrete pavement will be measured by the linear foot along the line and slope of the completed joint seal.

Planing bituminous pavement will be measured by the square yard.

Temporary pavement marking will be measured by the linear foot as provided in Section 8-23.4.

Water will be measured by the M gallon as provided in Section 2-07.4.

5-04.5 Payment

Payment will be made for each of the following Bid items that are included in the Proposal:

"HMA Cl. ___ PG ___", per ton.

"HMA for Approach Cl. ___ PG ___", per ton.

"HMA for Preleveling Cl. ___ PG ___", per ton.

"HMA for Pavement Repair Cl. ___ PG ___", per ton.

"Commercial HMA", per ton.

The unit Contract price per ton for "HMA Cl. ___ PG ___", "HMA for Approach Cl. ___ PG ___", "HMA for Preleveling Cl. ___ PG ___", "HMA for Pavement Repair Cl. ___ PG ___", and "Commercial HMA" shall be full compensation for all costs, including anti-stripping additive, incurred to carry out the requirements of Section 5-04 except for those costs included in other items which are included in this Subsection and which are included in the Proposal.

"Preparation of Untreated Roadway", per mile.

The unit Contract price per mile for "Preparation of Untreated Roadway" shall be full pay for all Work described under 5-04.3(4) , with the exception, however, that all costs involved in patching the Roadway prior to placement of HMA shall be included in the unit Contract price per ton for "HMA Cl. ___ PG ___" which was used for patching. If the Proposal does not include a Bid item for "Preparation of Untreated Roadway", the Roadway shall be prepared as specified, but the Work shall be included in the Contract prices of the other items of Work.

"Preparation of Existing Paved Surfaces", per mile.

The unit Contract Price for "Preparation of Existing Paved Surfaces" shall be full pay for all Work described under Section 5-04.3(4) with the exception, however, that all costs involved in patching the Roadway prior to placement of HMA shall be included in the unit Contract price per ton for "HMA Cl. ___ PG ___" which was used for patching. If the Proposal does not include a Bid item for "Preparation of Untreated Roadway", the Roadway shall be prepared as specified, but the Work shall be included in the Contract prices of the other items of Work.

"Crack Sealing", by force account.

"Crack Sealing" will be paid for by force account as specified in Section 1-09.6. For the purpose of providing a common Proposal for all Bidders, the Contracting Agency has entered an amount in the Proposal to become a part of the total Bid by the Contractor.

"Pavement Repair Excavation Incl. Haul", per square yard.

The unit Contract price per square yard for "Pavement Repair Excavation Incl. Haul" shall be full payment for all costs incurred to perform the Work described in Section 5-04.3(4) with the exception, however, that all costs involved in the placement of HMA shall be included in the unit Contract price per ton for "HMA for Pavement Repair Cl. ___ PG ___", per ton.

"Asphalt for Prime Coat", per ton.

The unit Contract price per ton for "Asphalt for Prime Coat" shall be full payment for all costs incurred to obtain, provide and install the material in accordance with Section 5-04.3(4).

"Prime Coat Agg.", per cubic yard, or per ton.

The unit Contract price per cubic yard or per ton for "Prime Coat Agg." shall be full pay for furnishing, loading, and hauling aggregate to the place of deposit and spreading the aggregate in the quantities required by the Engineer.

"Asphalt for Fog Seal", per ton.

Payment for "Asphalt for Fog Seal" is described in Section 5-02.5.

"Longitudinal Joint Seal", per linear foot.

The unit Contract price per linear foot for "Longitudinal Joint Seal" shall be full payment for all costs incurred to perform the Work described in Section 5-04.3(12).

"Planing Bituminous Pavement", per square yard.

The unit Contract price per square yard for "Planing Bituminous Pavement" shall be full payment for all costs incurred to perform the Work described in Section 5-04.3(14).

"Temporary Pavement Marking", per linear foot.

Payment for "Temporary Pavement Marking" is described in Section 8-23.5.

"Water", per M gallon.

Payment for "Water" is described in Section 2-07.5.

"Job Mix Compliance Price Adjustment", by calculation.

"Job Mix Compliance Price Adjustment" will be calculated and paid for as described in Section 5-04.3(9)C6.

"Compaction Price Adjustment", by calculation.

"Compaction Price Adjustment" will be calculated and paid for as described in Section 5-04..3(10)D3.

"Roadway Core", per each.

The Contractor's costs for all other Work associated with the coring (e.g., traffic control) shall be incidental and included within the unit Bid price per each and no additional payments will be made.

"Cyclic Density Price Adjustment", by calculation.

"Cyclic Density Price Adjustment" will be calculated and paid for as described in Section 5-04.3(10)B.

Division 7
Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits

7-15 Service Connections

Supplement this section as follows:

(******)

7-15.1 Description

The work includes installing isolation ball valves, valve box's, and meters.

7-15.4 Measurement

Measurement for service connections shall be lump sum.

7-15.5 Payment

Payment for "Service Connection 2 In. Diam.", lump sum.

7-18 Side Sewers

Supplement this section as follows:

(******)

7-19.1 Description

This work shall consist of all work and materials required for connection of the existing side sewer to the restroom.

7-19.4 Measurement

There is no measurement for side sewers.

7-19.5 Payment

Payment for "Side Sewers" shall be included in and incidental to other items of work.

7-19 Sewer Cleanouts

Supplement this section as follows:

(******)

7-19.4 Measurement

There is no measurement for sewer cleanout.

7-19.5 Payment

Payment for "Sewer Cleanout" shall be included in and incidental to other items of work.

Division 8
Miscellaneous Construction

8-01 Erosion Control and Water Pollution Control

Add this new section:

(******)

8-01.3(1)D Dust Control

Dust control prevents wind transport of dust from disturbed soil surfaces onto roadways, drainage ways, and surface waters. Wind erosion is a significant cause of soil movement from construction sites in Eastern Washington. Although wind erosion can contribute to water quality impacts, dust control is regulated in some areas of Eastern Washington primarily through local air quality authorities. Where such an entity exists, the Contractor shall contact the local air quality authority for appropriate and required BMPs for dust control.

Design and Installation:

- Contact your local Air Pollution Control Authority for guidance and training on other dust control measures. Compliance with the local Air Pollution Control Authority constitutes compliance with this BMP.
- See also “Techniques for Dust Prevention and Suppression,” Ecology Publication Number 96-433, revised April 2002.

Construction Techniques:

- Vegetate or mulch areas that will not receive vehicle traffic. In areas where planting, mulching, or paving is impractical, apply gravel or landscaping rock.
- Limit dust generation by clearing only those areas where immediate activity will take place, leaving the remaining area(s) in the original condition, if stable. Maintain the original ground cover as long as practical.
- Construct natural or artificial windbreaks or windscreens. These may be designed as enclosures for small dust sources.
- Sprinkle the site with water until surface is wet. Repeat as needed. To prevent carryout of mud onto street, refer to Stabilized Construction Entrance (BMP C105).
- Irrigation water can be used for dust control. Irrigation systems should be installed as a first step on sites where dust control is a concern.
- Spray exposed soil areas with a dust palliative, following the manufacturer’s instructions and cautions regarding handling and application. Used oil is prohibited from use as a dust suppressant. Local governments may approve other dust palliatives such as calcium chloride or PAM.
- PAM (BMP C126) added to water at a rate of 0.5 lbs. per 1,000 gallons of water per acre and applied from a water truck is more effective than water alone. This is due to the increased infiltration of water into the soil and reduced evaporation. In addition, small soil particles are bonded together and are not as easily transported by wind. Adding PAM may actually reduce the quantity of water needed for dust control, especially in eastern Washington. Since the wholesale cost of PAM is about $ 4.00 per pound, this is an extremely cost-effective dust control method.

Unpaved Roads and Lots:

- Lower speed limits. High vehicle speed increases the amount of dust stirred up from unpaved roads and lots.

- Upgrade the road surface strength by improving particle size, shape, and mineral types that make up the surface and base materials.
- Add surface gravel to reduce the source of dust emission. Limit the amount of fine particles (those smaller than .075 mm) to 10 to 20 percent.
- Use geotextile fabrics to increase the strength of new roads or roads undergoing reconstruction.
- Encourage the use of alternate, paved routes, if available.
- Restrict use by tracked vehicles and heavy trucks to prevent damage to road surface and base.
- Apply chemical dust suppressants using the admix method, blending the product with the top few inches of surface material. Suppressants may also be applied as surface treatments.
- Pave unpaved permanent roads and other trafficked areas.
- Use vacuum street sweepers.
- Remove mud and other dirt promptly so it does not dry and then turn into dust.
- Limit dust-causing work on windy days.

Maintenance Standards

- Respray area as necessary to keep dust to a minimum.
- Water applied to construction sites for dust control must not leave the site as surface runoff.

Supplement this section as follows:

(******)

8-01.3(2)B Seeding and Fertilizing

Seeding Notes: All seeding areas shall be prepared in accordance with Section 8-01.3 of the Standard Specifications. Seeding areas need not be cultivated, but shall be raked or chained to ensure a friable surface free of soil clumps larger than 2 inches in diameter. The seeded area shall be equal to the actual area cleared and grubbed. The following “Columbia Hydro Mix” shall be used, or an approved equal.

Common Name	%
Pangea Perennial Rye	60
Rockstar KBG.	40

Supplement this section as follows:

(******)

8-01.5 Payment

All costs associated with the removal of any erosion control, water pollution control, construction BMP, or any other item related to this section, as determined by the Engineer, shall be incidental to the work and included in other bid items.

All costs associated with “Street Cleaning” shall be incidental to the work and included in other bid items.

All costs associated with “Dust Control” shall be incidental to the work and included in other bid items.

8-02 Roadside Restoration

Supplement this section as follows:

(******)

Landscaping

8-02.1 Description

This work shall consist of all work and material required to plant trees, sod installation and seeded lawn installation.

8-02.3 Construction Requirements

8-02.3(1) Responsibility During Construction

Plant materials shall not be installed until weather permits and installation has been authorized by the Engineer. If water restrictions are in force, planting may be delayed.

Throughout planting operations, the Contractor shall keep the premises clean, free of excess soils, plants, and other materials, including refuse and debris, resulting from the Contractor's work. At the end of each work day, and as each planting area is completed, it shall be neatly dressed, and all surrounding walks and paved areas shall be cleaned to the satisfaction of the Engineer. At the conclusion of work, the Contractor shall remove surplus soils, materials, and debris from the construction site and shall leave project in a clean condition acceptable to the Engineer.

8-02.3(2)C Planting Area Weed Control

Herbicide for invasive weed management shall be AquamasterTM or equal product approved for use in aquatic environments. No preemergent herbicides shall be used on this project.

All herbicide use on the site shall be applied by a licensed commercial applicator: person or persons certified and licensed by the State of Washington as a Commercial Applicator, and familiar with the regulation and use of herbicides in and near aquatic resources.

8-02.3(4) Topsoil

Topsoil shall be spread to a depth of 6 inches in all areas in which trees, shrubs, groundcover and turf are shown on the Plans, or indicated herein.

8-02.3(5) Planting Area Preparation

Soil preparation shall consist of cultivating and amending the topsoil to the required depths, after completion of grading, paving, utility, work, and prior to planting and seeding.

Cultivation shall consist of tilling, plowing, ripping, or otherwise thoroughly breaking up the existing soil so as to produce a uniformly loosened soil to the required depths over the areas to be cultivated. Equipment passes shall be spaced closely enough to loosen all the soil.
Soil preparation shall include removing and disposing of all grass, herbaceous ground covers, weeds, and woody plants. Remove clods, rocks, and debris 2 inches or larger in any dimension. Rake the prepared soil surface to a smooth even grade without low areas.

8-02.3(5)A Protection of Planting Area Preparation

After completion of soil preparation, prevent soil compaction by preventing access of vehicles or wheeled or tracked equipment to soil preparation areas. Minimize foot traffic to that required for Work. If soil preparation areas are compacted by Work after soil preparation is complete,

re-cultivate compacted areas to conform to 8-02.3(5), the Plans, and other related sections herein.

8-02.3(6) Soil Amendments

Amendment shall consist of incorporating compost as specified, into the cultivated soil to a depth of 6".Where multiple lifts of compost are required, each lift shall be incorporated before placing and incorporating the next lift. Soil amendment shall not be performed when cultivated soil or the amendment materials are frozen, excessively wet, or in the opinion of the Engineer, would preclude the ability to establish a well-blended, friable soil.

8-02.3(7) Layout of Planting

The Engineer shall reserve the option of selecting and inspecting plant material at the nursery. The Contractor shall provide the Engineer with at least one week notice prior to preparing plants for shipping.

The Contractor shall locate all plant materials by placing them in their actual locations or marking each location with wood stakes or colored wire flags marked with the plant symbol. No planting holes shall be dug or backfilled without express approval of the Engineer. The Engineer shall reserve the right to adjust the locations of landscape elements during the installation period as appropriate to the job. After plant installation, remove stakes or flags used to mark plant location.

Plants shall be located as indicated or as approved in the field by the Engineer. If obstructions are encountered that are not shown on the Plans, the Contractor shall not proceed with planting operations until alternate plant locations have been selected.

8-02.3(8) Planting

Circular planting pits shall be excavated with vertical sides. The depth of pit shall accommodate the root system. Loosen planting pit's subsurface to a depth of four to six inches (4" - 6") and scarify sides prior to planting. Plant specimens upright and hold rigidly in position until incorporated soil has been backfilled and tamped firmly around the ball or roots. Root crowns shall be flush with finished grade. No filling shall be permitted around trunks or stems. Frozen or muddy mixtures shall not be used for backfilling. Plant material that settles, or otherwise moves from an upright and level position during the construction and guarantee period shall be repositioned or replanted as required.

Balled and burlapped plants shall be placed in the planting pits with the burlap intact; the binding at the top of the ball shall be removed and the top one-third (1/3) of the burlap or cloth wrapping materials shall be removed from the root ball. Remove all plastic, twine and ropes. The wrapping shall not be pulled from under the root ball and the plant shall be rejected if the root ball is cracked or broken during the planting process.

Backfill planting pit with incorporated soil. Compact carefully to fill all voids. Avoid injury to roots. When pit is three-quarters (3/4) backfilled, completely fill with water and allow water to soak away. Fill pit with additional soil, until flush with root crown and matches finish grade. A ring of soil 3 inches high shall be formed around the edge of each planting pit for all trees and shrubs to retain water.

8-02.3(11) Bark or Wood Chip Mulch

A 4" layer of medium, softwood, weed-free bark chips shall be placed around the base of all new small tree and shrub plantings.

8-02.3(13) Plant Establishment

During Plant Establishment, the Contractor shall maintain a healthy growing condition for all plant materials by watering, pruning, weeding, and other necessary maintenance operations. Planting beds and tree mulch rings shall be kept free of all weeds, grass and other undesirable vegetation. Plants shall be inspected by the Contractor at least once per month and maintenance performed promptly. Dead and dying plants, and plants that are disfigured from mechanical damage or pests damage, shall be promptly replaced during specified planting seasons.

Guarantee: All plant material shall be guaranteed for a period of one year, after substantial completion, at which time a final inspection of the work will be completed jointly with the Contractor and the Engineer. Defective materials shall be replaced in like kind and size. The Engineer will certify final acceptance in writing.

8-02.3(16) Lawn Installation

8-02.3(16)A Lawn Installation

Prior to beginning work, thoroughly wash out hydroseeder tanks off-site to remove seeds and other materials from prior applications.

8-02.4 Measurement

Measurement for landscaping shall be lump sum.

8-02.5 Payment

Payment for “Landscaping”, lump sum.

The unit contract price per lump sum for “Landscaping” shall include full pay for all labor, materials, tools, and equipment needed to furnish and install trees including but not limited to loading, hauling, placement, pruning, weeding, cleanup, pest control, watering for 1 year, maintenance, protection and replacement of plants through the end of the plant establishment period.

8-03 Irrigation Systems

Supplement this section as follows:

(******)

8-03.1 Description

This work consists of preparing plans, potholing, rerouting, and repairing components of the existing sprinkler system, and other improvements as directed by the Engineer.

8-03.2 Materials

Materials shall meet or exceed the quality / specifications of found existing materials. All new materials shall be approved via 1-06 prior to its incorporation into the work.

8-03.3 Construction Requirements

The Contractor shall prepare and submit a schematic system design, for review and approval by the Engineer, prior to its incorporation into the work.

The Contractor shall stake lateral reroutes and sprinkler head locations revisions in the field for Engineer review and approval prior to its incorporation into the work.

Laterals shall not be located under structures. The Contractor shall reroute existing laterals as needed.

Division 9
Materials

9-14 Erosion Control and Roadside Planting

9-14.1(3) Topsoil Type C

Supplement this section with the following:

(*****)

Topsoil shall be sampled and analyzed for lead, arsenic, and for organochlorine pesticides. Topsoil shall not contain contaminants at concentrations above the Model Toxics Control Act cleanup levels.

9-14.2 Seed

Supplement this section with the following:

(*****)

Grass Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts "Rules for Testing Seeds" for purity and germination tolerances.

9-14.2(1) Mixture

Seed of turfgrass species as listed below for solar exposure, with not less than 85 percent germination, not less than 95 percent pure seed, and not more than 0.5 percent weed seed:

60 percent Pangea Perennial Ryegrass (Lolium perenne L);
40 percent Rockstar Kentucky Bluegrass (Poa pratensis).

SPECIFICATIONS

STRUCTURAL

SECTION 055200 - METAL RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Reference structural drawings for additional information.

1.2 SUMMARY

A. Section Includes:

1. Aluminum tube handrails

1.3 REFERENCE STANDARDS

A. Aluminum Association:

1. AA ADM 1 - Aluminum Design Manual.

B. ASTM International:
1. ASTM B211 - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire.
2. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
3. ASTM B241 - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.

1.4 SUBMITTALS

A. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

1.5 QUALITY ASSURANCE

A. Perform Work for structural aluminum according to AA ADM 1.

B. Perform Work of this Section according to ASTM E985.

C. Finish joints according to NOMMA Guideline 1.

1.6 QUALIFICATIONS

A. Fabricator: Company specializing in fabricating products specified in this Section with minimum three years' experience.

B. Erector: Company specializing in performing Work of this Section with minimum three years' experience.

1.7 EXISTING CONDITIONS

A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 FABRICATION

A. Fit and shop-assemble components in largest practical sizes for delivery to Site.

B. Supply components required for anchorage of fabrications.

C. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations not encouraging water intrusion or retention.

D. Grind exposed joints flush and smooth with adjacent finish surface. Ease exposed edges to small uniform radius.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive Work.

3.2 INSTALLATION

A. Install components plumb and level, accurately fitted, free from distortion or defects.

B. Anchor railings to structure per construction drawings.

3.3 TOLERANCES

A. Maximum Variation from Plumb: 1/8 inch.

B. Maximum Offset from Alignment: 1/8 inch.

C. Maximum Out-of-Position: 1/8 inch.

END OF SECTION 055200

ELECTRICAL

CERTIFICATION PAGE

I hereby certify that these contract documents were prepared by me or under my direct supervision and that I am a duly licensed engineer under the laws of the State of Washington.

4/29/2020

TABLE OF CONTENTS

DIVISION 26 – ELECTRICAL

SECTION 26 05 00 – ELECTRICAL GENERAL REQUIREMENTS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope

1. This section specifies general requirements for electrical work. Detailed requirements for specific electrical items are specified in other sections, but are subject to the general requirements of this section. The electrical drawings and schedules included in this project manual are functional in nature and do not specify exact locations of equipment or equipment terminations.

2. The Contractor shall examine all mechanical and civil drawings and Specifications to determine actual locations, sizes, materials, and ratings of all equipment provided by others.

3. Items of Work shown on drawings and not specified, or mentioned in the specifications and not shown on the drawings, shall be considered required as if they had been both specified and show on the Drawings. In the event of conflicting specified or drafted requirements the more stringent requirement shall govern. Any work or material omitted from the description of the work but which is clearly implied shall be furnished by the Contractor as though specifically stated. The Drawings and Specifications contemplate a finished piece of Work of such character and quality a described in and reasonably inferred from them, and fitting with the Work of other Contractors and the Owner. The Contractor agrees that the failure to show details or repeat on any drawings the figures or notes given on another shall not be cause for additional charges or claims.

4. When record drawings are provided with the contract drawing set, they constitute the best available information pertaining to the relevant systems at the time of design. Their accuracy is specifically not guaranteed and they are provided only for the Contractor's convenience. It is the Contractor responsibilities to field verify these record drawings prior to use. Actual field conditions are specifically and entirely the responsibility of the Contractor. Deviation of the record drawings provided from actual field conditions shall not constitute a basis for any increase in time allowed for completion or compensation for the Contractor.

5. The Contractor shall notify the Engineer in writing of perceived discrepancies, errors, or omissions in the Contract Documents prior to bid. The Engineer shall provide clarification to resolve these issues prior to bid. The Contractor shall resolve his questions regarding the perceived inconsistency, errors, or omissions in the Contract Documents prior to bid. Failure of the contractor to resolve his questions prior to bid shall result in the residual issues of the aforementioned kind providing no basis of claim for an increase in compensation for the Work or the time allowed for the completion of the contract and the Engineer's interpretation shall govern.

B. Definitions

1. Provide: Furnish and install.

2. Contractor: The party who furnishes and installs all tools, materials, and equipment to complete the work shown and implied in the drawings and these Specifications. This includes the Prime Contractor, the Electrical Contractor, Control System Integrator, and all other Contractors and Subcontractors.

3. Control System Integrator / System Integrator/ Integrator: The party that furnishes all control components and designs, the detailed control wiring diagrams, and layout and assembly of the custom control panels.

4. Control System: All equipment, instruments, and wiring for control and monitoring of all operating equipment. This shall also include custom control panels, packaged control panels, and control equipment furnished with other systems and mechanical equipment. All sensing, transmitting, indicating, control and recording of all functions as specified and shown shall also be included in the control system.

5. Elementary or Schematic or Control Diagram: Shows, by means of graphic symbols, the electrical connections and functions of a specific circuit arrangement. The schematic diagram shows all circuit functions without regard to the actual physical size, shape, or location of the component devices or parts.

6. Single-Line Diagram/ One-Line Diagram: Shows, by means of lines and graphical symbols, the course of the electrical distribution system and the components, devices, or parts used therein.

7. Wiring Diagram or Connection Schematic: Includes all of the devices in a system and shows their physical relationship to each other, including terminals and interconnecting wiring in assembly. This diagram shall be (a) in a form showing interconnecting wiring only by terminal designation (wireless diagram), or (b) a panel layout diagram showing the physical location of devices plus the elementary diagram.

8. Interconnection Diagram: Shows all external connections between terminals of equipment and outside points, such as motors and auxiliary devices. References shall be shown to all connection diagrams that interface to the interconnection diagrams. Interconnection diagrams shall be of the continuous line type. Bundled wires shall be shown as a single line with the direction of entry / exit of the individual wires clearly shown. Each wire identification as actually installed shall be shown. The wire identification for each end of the same wire shall be identical. All devices and equipment shall be identified. Terminal blocks shall be shown as actually installed and identified in the equipment complete with individual terminal identification. All jumpers, shielding and grounding termination details not shown on the equipment connection diagrams shall be shown on the interconnection diagrams. Wires or jumpers shown on the equipment connection diagrams shall not be shown again on the interconnection diagram. Signal and DC circuit polarities and wire pairs shall be shown. Spare wires and cables shall be shown.

9. Arrangement, Layout, or Outline Drawings: Shows the physical space and mounting requirements of a piece of equipment. Diagrams may also indicate ventilation requirements and space provided for connections or the location to which connections are to be made.

1.02 GENERAL DESCRIPTION OF WORK

A. The Contractor shall provide all labor, material, tools, equipment and services required to complete the furnishing, installation, wiring, connection, calibration, adjustment, testing and operation of all electrical equipment, devices and components as indicated and implied by the plans and these Specifications. General descriptions include:

1. Complete the procurement, installation, wiring, connection, calibration, adjustment, testing and operation of all electrical devices, components, accessories and equipment that is not shown or specified but which is nonetheless required to make the systems shown and specified function properly.

2. Complete the wiring to, connection to, adjustment and calibration of, and testing of furnished electrical components.

3. Install all equipment so it shall be readily accessible for maintenance. Installations shall have electrical clearances in accordance with NEC and shall be installed in locations that will provide adequate cooling.

4. Check electrical equipment prior to installation so that defective equipment is not installed.

5. Provide field services of qualified technicians to supervise and check out the installation of the equipment, to supervise and check out interconnecting wiring, to conduct start-up of operation of the equipment, and to correct any problems that occur during start-up.

6. Provide circuit breakers, conduit, wire and installation for all items that require electrical power.

1.03 PROJECT DESCRIPTION

A. General

In general, the project shall consist of all electrical construction required to make a complete and fully operational system. The following is a general description of the work anticipated to be provided by the Electrical Contractor:

1. Provide new power distribution including distribution panel, feeders, equipment rack, branch circuits, raceway, handholes, and other equipment.

2. Provide site and security lighting including pole mount LED area lights, and pole receptacle for security cameras. The City shall furnish and install the cameras.

3. Provide all electrical materials and installation for new Restroom Facility as shown on the drawings.

4. Additional electrical work where shown on the drawings and specifications.

1.04 TEMPORARY OPERATION AND CONSTRUCTION POWER

A. The Contractor shall provide a separately metered temporary power service for construction power. The temporary service shall provide:

1. Power for operation of all equipment during testing.

2. Power for operation of all equipment until certificate of occupancy is obtained.

B. All coordination with the utility and associated construction costs for temporary construction power shall be paid for by the Contractor. The Contractor shall pay the for the energy costs as billed by the utility on the construction power meter.

C. The Contractor may use existing power feeder if coordinated and agreed to by the District.

1.05 TEMPERATURE RATINGS OF EQUIPMENT TERMINATIONS

A. All materials shall conform to the National Electrical Code Article 110-14C. Wiring and circuit breakers on this project are designed for 75 deg C operation above 100 amperes; 60 deg C for 100 amperes and below. All products furnished on this project shall have electrical terminations rated for 60 deg C for ampacities of 100 amperes and below, and rated for 75 deg C for ampacities above 100 amperes.

B. These requirements cover all electrical equipment provided under this Contract.

1.06 STANDARDS AND CODES

The Contractor shall provide all permits, licenses, approvals and other arrangements for work on this project and all fees shall be paid for by the Contractor. The Contractor shall include these fees in the bid price.

A. References

This section contains references to the following documents. They are part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

1. National Electrical Code (NEC)
2. Underwriters' Laboratories, Inc. (UL)
3. National Electrical Manufacturers Association (NEMA)
4. Canadian Standards Association (CSA)
5. Electrical Testing Laboratories (ETL)
6. Factory Mutual (FM)

B. Identification of Listed Products

1. All materials and equipment specified herein shall be within the scope of Nationally Recognized Testing Laboratory (NRTL) examination services, be approved by the NRTL for the purpose for which they are used, and shall bear the appropriate listing label.
2. Equipment listed/labeled by an NRTL shall be as dictated by the latest printing of the *Electrical Testing Laboratories Accreditation Report* available from the State of Washington Department of Labor and Industries, Electrical Inspection Division. Any NRTL listing/labeling shall be as accepted by the local authority having jurisdiction.
3. When a product is not available with a testing laboratory listing for the purpose for which it is to serve, the product may be required by the inspection authority to undergo a special inspection at the manufacturer’s place of assembly. All costs

and expenses incurred for such inspections shall be included in the original contract price.

1.07 SITE FAMILIARIZATION

The Contractor shall become familiar with all features of the site which may affect the execution of the work prior to submitting a bid. The Contractor shall take all field measurements necessary for the work and shall assume full responsibility for their accuracy. The Contractor shall take full responsibility for locating and avoiding all substructures and utilities. Any damage to existing equipment or utilities shall be repaired or replaced by the Contractor at the Contractors expense.

1.08 AREA CLASSIFICATIONS

The following classification of areas shall be used as a reference in determining application of material covered by this Section unless specifically shown otherwise on the drawings. Areas that fall under two or more of the following classifications shall conform to the minimum requirements of all of the area classifications listed for that area.

A. Outdoor and Damp Areas: Vaults, all outdoor areas

Raceways shall be galvanized rigid steel (GRS). Conduit entrances shall be threaded and fittings shall have gasketed covers. Threaded fastening hardware and rods shall be stainless steel. Raceway supports such as channel, clamps, and brackets shall be stainless steel or aluminum. Panels and boxes shall be NEMA 4X - aluminum, stainless steel or FRP (or as shown on the drawings). Enclosures shall be mounted 1 inch from walls to provide an air space unless specifically shown otherwise. Device boxes shall be cast, copper free aluminum.

B. Below Grade Areas:

Conduits shall be Schedule 40 PVC, or as indicated on the drawings. Transitions and sweeps from below grade to above grade shall be GRS or PVC coated GRS.

C. General Purpose Areas: All other areas not described above

Raceways shall be GRS. Raceways concealed in walls or ceilings for general purpose lighting and receptacle circuits may be EMT. Exposed boxes shall be NEMA 12. Concealed boxes may be NEMA 1. Boxes poured in concrete shall be cast copper free aluminum.

1.09 ELECTRICAL SUBMITTALS

A. Electrical submittals shall be submitted in accordance with Exhibit S Section 013000 Administrative Requirements.

PART 2 - PRODUCTS

2.01 EQUIPMENT AND MATERIALS

A. General

Equipment and materials shall be new and free from defects. All material and equipment of the same or a similar type shall be of the same manufacturer throughout the work. Standard production materials shall be used wherever possible.

B. Equipment Finish

Unless otherwise specified, electrical equipment and materials shall be painted by the manufacturer.

C. Galvanizing

Where specified, galvanizing shall be in hot dipped.

2.02 NAMEPLATES

A. Nameplates shall be provided on all electrical devices. This includes, but is not limited to: motor control equipment, MCC cubicles, control stations, junction boxes, panels, motors, instruments, switches, indicating lights, meters, and all electrical equipment enclosures.

B. Nameplates shall also be provided on all electrical panel interior equipment. This includes but is not limited to: relays, circuit breakers, power supplies, terminals, contactors, and other devices.

C. Nameplates shall be made of 1/16" thick machine engraved laminated phenolic having engraved black filled letters not less than 3/16" high on white background or as shown on the drawings or other sections of the Specifications. Nameplates on the interior of panels shall be white polyester with printed thermal transfer lettering and permanent pressure sensitive acrylic; Tyton 822 or equal. All nameplates shall include the equipment name and number (and function, if applicable).

D. Warning nameplates shall be provided on all panels and equipment which contain multiple power sources or which may have energized circuits with the main disconnecting means in the off position. Lettering shall be white on red background.

E. All nameplates shall be secured to equipment with stainless steel screws/fasteners. Epoxy glue may be used where fasteners are not practical as determined by the Engineer.

PART 3 - EXECUTION

3.01 GENERAL

A. Storage and Installation Environment

1. The Contractor shall store all electrical equipment in a dry environment free from dust, moisture, sprays or vapors which may be detrimental to their new condition. After installation of equipment, the Contractor shall take care to protect all equipment from all dust, moisture, paint and other spray, harmful vapors.

2. Equipment shall not be installed in indoor areas until the area is covered, dry and finished to the point that other work will not create dust, vapors, or moisture. Equipment with integral heaters and fans shall not be installed until power is available at the location, and the heater and fan shall be energized within 6 hours of the equipment being installed.

B. Housekeeping

1. The premises shall be kept free of accumulated materials, rubbish and debris at all times. Surplus material, tools and equipment must not be stored at the job site. Upon completion of the project, all equipment and fixtures shall be cleaned and in proper condition for their intended use.

2. Lamps and fluorescent tubes shall be cleaned and defective units replaced at the time of final acceptance.

3.02 TESTS

A. The Contractor shall conduct testing for installed feeder cables in accordance with Sections 260519. Grounding shall be tested in accordance with Section 260526.

B. Functional testing shall be performed. Prior to functional testing, all protective devices shall be adjusted and made operative. Prior to energization of equipment, the Contractor shall perform a functional checkout of the control circuit. Checkout shall consist of energizing each control circuit and operating each control, alarm or malfunction device and each interlock in turn to verify that the specified action occurs. The Contractor shall submit a description of the proposed functional test procedures prior to the performance of the functional checkout.

3.03 FINAL ACCEPTANCE

A. Prior to final acceptance, the Engineer will perform one or more site observation trips to develop a “punch list” of items deemed incomplete. The Electrical Contractor shall be present while these inspections are taking place and shall be available for opening cabinets and operating and adjusting the system as is necessary for the Engineer to verify all equipment is installed and operates to the requirements of the contract documents.

B. The Contractor shall complete all items of work, including wire markers, nameplates, final tests and final test reports prior to requesting final acceptance inspections. All equipment shall be checked for proper operation and all signals verified for correct calibration and wiring. Fixtures shall have been cleaned, and burned out or defective lamps shall have been replaced.

3.04 TRAINING

A. The Contractor shall provide training in accordance with the specific requirements in other sections of these Specifications. In addition to training required in other Sections of the Specifications, the Contractor shall conduct specifically organized training sessions in the overall operation and maintenance of the electrical system for personnel employed by the Owner. The training sessions shall be conducted to educate and train the personnel in operation and maintenance of all components of the electrical system outside the training requirements in the other sections of these Specifications. Training shall include, but not be limited to, the following:

1. Preventative maintenance procedures
2. Trouble-shooting
3. Calibration
4. Testing
5. Replacement of components
6. Equipment operation

B. At least two training sessions, each at least four (4) hours in duration, or as deemed necessary by the Owner, shall be conducted at the facility after start-up of the system. The Contractor shall prepare and assemble specific instruction materials for each

training session and shall supply such materials to the Owner at least one (1) week prior to the time of the training.

END OF SECTION 26 05 00

DIVISION 26 – ELECTRICAL

SECTION 26 05 19 – WIRE AND CABLE

PART 1 – GENERAL

1.01 DESCRIPTION

This section specifies conductors and cables rated to 600 volts used for power, lighting, receptacle, signal, and control circuits.

1.02 STANDARDS AND CODES

A. All materials and equipment specified herein shall be within the scope of Nationally Recognized Testing Laboratory (NRTL) examination services, be approved by the NRTL for the purpose for which they are used, and shall bear the appropriate listing label.

B. Equipment listed/labeled by an NRTL shall be as dictated by the latest printing of the Electrical Testing Laboratories Accreditation Report available from the State of Washington Department of Labor and Industries, Electrical Inspection Division. Any NRTL listing/labeling shall be as accepted by the local authority having jurisdiction.

C. When a product is not available with a testing laboratory listing for the purpose for which it is to serve, the product may be required by the inspection authority to undergo a special inspection at the manufacturer's place of assembly. All costs and expenses incurred for such inspections shall be included in the original Bid Price.

1.03 SUBMITTALS

Submit all catalog data in accordance with the Section 013000, Appendix 013000-1, Required Submittals. Show material information and confirm compliance with these Specifications.

PART 2 - PRODUCTS

2.01 GENERAL

With the exception of lighting, communication, paging, security and receptacle circuits, the type, size and number of conductors shall be as specified on the Contract Drawings. Lighting and receptacle circuit conductors are unscheduled and shall be sized by the Contractor in accordance with the NEC to limit voltage drop to 3 percent. Number and types of communication, paging, and security cables shall be as required for the particular equipment provided.

2.02 LIGHTING AND RECEPTACLE BRANCH CIRCUIT CONDUCTORS

A. Lighting conductors shall be stranded except for 12 AWG which shall be solid. Minimum conductor size shall be 12 AWG.

B. Conductors shall be provided with the following characteristics:

1. Voltage: 600 volts
2. Conductor: Bare soft annealed copper, Class B stranded per ASTM-8; solid per ASTM B-3
3. Insulation: THWN/THHN, 90 degree C dry, 75 degree C wet polyvinylchloride (PVC)
4. Jacket: Nylon
5. Flame resistance: UL 83
6. Manufacturer: Okonite; Southwire; Or Equal

2.03 POWER AND CONTROL CONDUCTORS

A. Power Conductors:

Single conductor cable shall be stranded and shall be used in conduits for power circuits.

Conductor shall be provided with the following characteristics:

1. Voltage 600 volts
2. Conductor: Uncoated, soft annealed copper, Class B stranded per ASTM B-3 or B-8
3. Insulation: XHHW-2, 90 degrees C continuous rating, wet or dry
4. Manufacturer: Okonite, Southwire; Anaconda; Or Equal

B. Control Conductors:

Single conductor cable shall be stranded and shall be used in conduits for control circuits.

Conductor shall be provided with the following characteristics:

1. Voltage 600 volts
2. Conductor: Uncoated, soft annealed copper, Class B stranded per ASTMB-3 or B-8
3. Insulation: THHN/THWN, 90 ° C dry, 75 ° C wet, cross-linked polyethylene (XLP), (CSPE) per ICEA S-66-524
4. Jacket: Polyvinylchloride (PVC)
5. Manufacturer: Okonite, Southwire; Anaconda; Or Equal

2.04 SIGNAL CABLES

A. General

Signal cable shall be provided for instrument signal transmission, alarm, communication and any circuit operating at less than 100 volts. Cables shall be color coded black and white for pairs or black, white and red for triads. Circuit shielding shall be provided in addition to cable shielding. Circuits shall be provided in compliance with the instrument manufacturer's recommendations.

B. Single Circuit

Cable shall consist of one pair or triad, 18 AWG conductors with 15 mils of 90 degree C polyvinylchloride (PVC) insulation, 4 mils nylon conduit or jacket, twisted on a 2-inch lay, and covered with a 100 percent 1.35 mil aluminum-Mylar tape shield with 18 AWG 7-strand tinned copper drain wire and a 45 mil PVC jacket overall. Cable shall be UL listed, Type TC, rated 600 volts. Cable shall be Okonite, Okoseal N TYPE P-OS, Or Equal.

C. Multiple Circuit

Cable shall consist of four or more pairs or triads which are made up of 18 AWG conductors with 15 mils of 90 degree C PVC insulation, 4 mils nylon jacket, twisted on a staggered lay 1-1/2 to 2-1/2 inches, and covered with a 100 percent 1.35 mil aluminum-Mylar tape shield with 22 AWG 7-strand tinned copper drain wire. Overall cable shield shall be 2.35 mil aluminum-Mylar tape with a 20 AWG 7-strand tinned copper drain wire. Cable shall be UL listed, Type TC, 600 volts. Cable shall be Okonite, Okoseal-N Type SP-OS, Or Equal.

2.05 PORTABLE CORD

Portable cord shall be UL listed, Type SO for 10 AWG and smaller. Cords with conductors larger than 10 AWG shall be UL listed, Type G. Cords shall contain an equipment grounding conductor. Cable characteristics shall be as follows:

A. Conductors: Flexible rope stranded per ASTM B189 and B33. Conductors shall be coated except ground conductors may be uncoated.

B. Insulation: Insulation shall be ethylene propylene(EPR) as per ICEA S-68-516 and rated for continuous operation at 90 degrees C.

C. Jacket: Heavy-duty neoprene as per ICEA S-68-516

D. Manufacturer: Okonite Or Equal

2.06 CONNECTORS

A. Pre-insulated connectors for splices and taps in conductors 10 AWG and smaller shall be Ideal Industries "Wing Nut" or 3M Company "SCOTCHLOCK", Or Equal. For 8 AWG and larger conductors shall be T&B compression connectors, Or Equal. Compress using manufacturer’s recommended die and tools.

B. Waterproof silicone filled “wing nut” type connectors or spade/lug type terminations and terminals and coated with liquid insulation shall be used for all connections of wire to cord to removable equipment provided with integral cords (such as floats, transmitters, limit switches, etc.) in junction boxes in underground handholes or outdoor junction boxes. Insulators shall be Thomas and Betts multi splice insulator MSLT112-4, Or Equal.

2.07 SPLICE INSULATION

A. Splice insulation shall be equal or greater than the insulation level of the conductor used.

B. All permanent splices that are underground or in damp or corrosive environments shall be insulated with cast epoxy type insulation which covers the jacket of all cords and the insulation on all wire. Epoxy splice shall be Scotch #3570 Or Equal.

2.08 WIRING SCHEDULE

Refer to cable schedule on Contract Drawings for description of conductors required.

2.09 MOTOR TERMINAL SPLICE INSULATION

Motor terminal splice insulation in the motor connection box shall be provided which will withstand constant vibration and abrasion without degrading the insulation of the splice. A product shall be used that is specifically designed for the purpose of motor terminations in accordance with the following:

A. Motor splices in general purpose areas: bolted splice with a TY-RAP boot type insulator, Thomas and Betts Splice insulator Series MSC, Or Equal. Splices using wire larger than 8 AWG may be heat shrinkable motor connection stub splices, Raychem, MCK-V series, Or Equal.

B. Motors in outdoor, damp, or corrosive environments: waterproof motor stub insulator, Thomas and Betts multi splice insulator MSLT112-4, Or Equal. Splices using wire larger than 8 AWG may be heat shrinkable motor connection stub splices, Raychem, MCK-V series, Or Equal.

2.010 WIRE MARKERS

Field installed wire markers shall be T&B SMS pre-printed clip-on markers, Or Equal.

PART 3 - EXECUTION

3.01 GENERAL

A. Each power and control conductor shall be identified at each terminal to which it is connected.

B. Pulling wire and cable into conduit or trays shall be completed without damaging or putting undue stress on the cable insulation. Soapstone, talc or UL listed pulling compounds are acceptable lubricants for pulling wire and cable. Grease is not acceptable. Raceway construction shall be complete, cleaned, and protected from the weather before cable is placed in the raceway.

3.02 600 VOLT CONDUCTOR AND CABLE

A. Conductors in panels and electrical equipment, 6 AWG and smaller, shall be bundled and laced at intervals not greater than 6 inches, spread into trees and connected to their respective terminals. Lacing shall be made up with plastic cable ties. Lacing is not necessary in plastic panel wiring duct. Conductors crossing hinges shall be bundled into groups not exceeding 12 and shall be so arranged that they will be protected from chafing when the hinged member is moved.

B. Slack shall be provided in junction and pull boxes, and handholes. Slack shall be sufficient to allow cables or conductors to be routed along the walls of the box. Amount of slack shall be equal to largest dimension of the box. Where plastic panel wiring duct is provided for wire runs, lacing is not required.

C. Solid wire shall not be lugged, nor shall electrical spring connectors be used on any except for solid wires in lighting and receptacle circuits. Lugs and connectors shall be installed with a compression tool.

D. All splices and terminations are subject to inspection by the Engineer prior to and after insulating. Terminations at 460 volt motors shall be made by bolt-connecting the lugged connectors. Connections shall be insulated and sealed with factory-engineered kits.

Bolt connection area shall be kept free of mastics and fillers to facilitate rapid stripping and re-entry. Motor connection kits shall accommodate a range of cable sizes for both in-line and stub-type configurations. Connection kits shall be independent of cable manufacturer's tolerances.

E. In-line splices, where Approved, shall be made with tubular compression connectors and insulated as specified for motor terminations, except that conductors 10 AWG and smaller may be spliced using self-insulating connectors. Splices and tees in underground handholes or pull boxes shall be insulated using Scotch-cast epoxy resin splicing kits. Terminations at devices with 120 volt pigtail leads shall be made using self-insulating tubular compression connectors.

F. Terminations at solenoid valves, 120 volt motors, and other devices furnished with pigtail leads shall be made using self insulating tubular compression connectors.

G. In the case where multiple field located instrumentation and control devices require parallel or series wiring configuration, it shall be done at one location in one junction box or marshalling enclosure with terminals. Interconnection of instrumentation and control devices shall not be done within conduit bodies (i.e. LBs, condulets, etc.).

3.03 SIGNAL CABLING

A. Circuit runs shall be of individually shielded twisted pairs or triads. In no case shall a circuit be made up using conductors from different pairs or triads. Triads shall be used wherever 3-wire circuits are required. Terminal blocks shall be provided at instrument cable junctions unless otherwise specified. Signal circuits shall be run without splices between instruments, terminal boxes, or panels.

B. Shields shall not be used as a signal path, except for coaxial cable circuits operating at radio frequencies.

C. Unless otherwise specified, shields shall be bonded to the signal ground bus at the control panel and isolated from ground and other shields at other locations. Terminals shall be provided for running signal leads and shield drain wires through junction boxes.

D. Spare circuits shall be terminated on terminal blocks at both ends of the cable run and be electrically continuous through terminal boxes. Shield drain wires for spare circuits shall not be grounded at either end of the cable run. Terminal boxes shall be provided at instrument cable splices. If cable is buried or in raceway below grade at splice, an instrument stand shall be provided as specified with terminal box mounted approximately 3 feet above grade.

E. Cable for paging, telephone, and security systems shall be installed and terminated in compliance with the manufacturer's recommendations.

3.04 PORTABLE CORD

Portable cord feeding permanent equipment, such as pendant cords, pumps, cranes, hoists and portable items shall have a wire mesh cord grip of flexible stainless steel wire to take the tension from the cable termination. Connection of portable cords to permanent wiring shall be accomplished with the use of terminals. In-line taps and splices shall be used only where specified.

3.05 COLOR CODING

A. Wiring shall conform to the following color code, unless otherwise specified.

B. Insulation on phase conductor sizes 8 AWG and smaller shall be colored, 6 AWG and larger may have black insulation with plastic tape of the appropriate color from the table below.

C. Insulation on the grounded conductor (neutral) sizes 6 AWG and smaller shall be colored;4 AWG and larger may have black insulation with plastic tape of white or gray in accordance with the table below:

Description	240/120V	208Y/120V	480Y/277V	Control
Phase A (Left, Top, Front)	Black	Black	Brown	--
Phase B (Center, Center, Center)	Red	Red	Orange	--
Phase C (Right, bottom, Back)	N/A	Blue	Yellow	--
Neutral	White	White	Gray	White
Ground	Green	Green	Green	Green
120 VAC Control	--	--	--	Red
120 VAC Control	Neutral	Neutral	--	White
DC Control (+)	--	--	--	Purple
DC Control (-)	--	--	--	Gray
External Source	--	--	--	Yellow

D. All control wiring in control panels or other enclosures that is powered from an external source and is not disconnected by the control panel disconnect shall be terminated at a disconnecting terminal block (with energization indicator light) upon entering the enclosure. The color of the wire shall then be changed to yellow to identify it as being powered from an external source. Provide identification nameplate on exterior of enclosure to indicate sources of external power.

E. All wiring in industrial machines and equipment shall be in accordance with NFPA 79. Notify Owner of any deficiencies noted during installation.

3.06 TERMINAL MARKING

All terminals in instrument and relay compartments, motor control centers, in control panels, instrument panels, field panels and control stations, as well as connections to mechanical equipment shall have reference number and letter referencing connected equipment.

3.07 WIRE BENDING RADIUS

The radius of bends in all non-shielded wire (conductors and cables) shall not be less than eight (8) times the outside diameter of the wire. Shielded or lead covered wire shall not be bent to a radius less than twelve (12) times the diameter of the wire. Any wire installed with bends less than the allowed diameter and which the Engineer deems has caused that insulation to be damaged, shall be removed and new wire shall be installed.

3.08 GENERAL TESTS

A. The Contractor shall perform voltage, current and resistance tests as required to complete the Electrical System Test Report form provided at the end of this section. Test reports shall be submitted to the Engineer prior to final acceptance by the Owner. The Contractor shall inform the Engineer of scheduled testing a minimum of 5 days prior

to the testing. Testing shall not take place unless the Engineer or Owner Representative is present to witness the testing.

B. The Contractor shall undertake all such corrective measures if the test results indicate corrective measures are required. No additional compensation will be paid for corrective measures.

C. Test Scope

1. The Contractor shall provide all material, equipment, labor and technical supervision to perform tests and inspections as specified herein.

2. It is the intent of these tests to assure that all electrical equipment as supplied and installed by the Contractor is operational within the industry and manufacturer's tolerances and is installed in accordance with the design documents.

3. The tests and inspection shall determine the suitability for energization.

D. Conductor Tests

1. Following the completion of installation, the following conductors shall be tested:

a. All 480 volt power feeders.
b. Service and feeder conductors.
c. All new grounding; measure ground resistance at each ground rod.

E. Visual and Mechanical Inspections

1. Inspect exposed section for physical damage.

2. Verify cable is supplied and connected in accordance with Specifications and one line diagram, and that phases are labeled correctly.

F. Electrical Tests

1. Perform insulation resistance test on each cable in reference to ground and adjacent conductors in the same raceway.

2. Perform continuity test to ensure proper cable connection.

G. Test Values

1. Insulation resistance tests shall be performed at 1000 volts DC for one-half minute.
2. Minimum megger readings at 20 degrees C shall be one megohm.
3. The maximum acceptable reading for an individual ground rod shall be 25 ohms as required by the NEC and measured by the three rod method. The composite ground electrode shall have a maximum acceptable reading of 15 ohms.

3.09 ELECTRICAL SYSTEM TEST REPORT - 600V CABLE

A. Electrical System Description Data

SERVICE DESCRIPTION:	
nominal voltage, phase to phase	
phase to neutral - single or three phase	
number of conductors	

SERVICE CONDUCTORS:	
phase size and insulation type	
neutral size and insulation type	
ground size and insulation type	

SERVICE DISCONNECT DESCRIPTION:	
circuit breaker or disconnect switch	
size (amps)	
fuse (amps)	

MEASURED CONDITIONS	DATA			
Operating Load Voltage	Volts	Vab	Vbc	Vca
		Van	Vbn	Vcn
Operating Load Feeder Current	Amps	Ia	Ib	Ic
Conductor Insulation	Megohms	a-b	b-c	c-a
Resistance (record the indicated measurement for each of the following circuits:)	Megohms	a-g	b-g	c-g

END OF SECTION 26 05 19

DIVISION 26 – ELECTRICAL

SECTION 26 05 26 – GROUNDING

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. This specification describes the requirements for the grounding of electrical systems and equipment.

B. Installation shall be in accordance with the National Electrical Code (NEC).

PART 2 - PRODUCT

2.01 **MATERIALS**

A. Ground wire: Soft drawn bare stranded copper wire, sized as noted on the drawings.

B. Terminals and connectors: Burndy Hyground compression system.

C. Exothermic type weld: Erico Cadweld process, or Furseweld/T&B corp. Exothermic welding system.

D. Rod Electrodes: Copper clad (minimum 0.010 jacket) ground rods minimum ¾" diameter x 8' long.

E. Grounding Electrode conductors and bonding conductors: Copper conductors, bare or insulated, as shown on drawings.

PART 3 - EXECUTION

3.01 PREPARATION

A. All contacting surfaces of ground connections shall be cleaned to bright metal before connection is made.

3.02 INSTALLATION

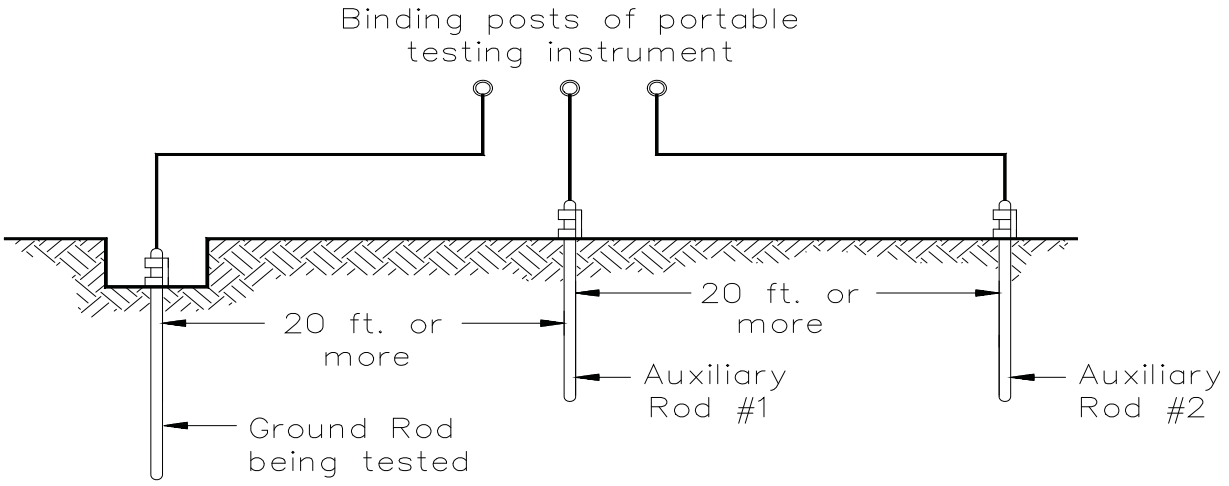
A. Grounding conductors: Install in PVC conduit where subject to damage. All grounding conductors smaller than #6 AWG must be protected.

B. Connections and splices: Provide as required and as shown on drawings.

1. Connections, taps, and splices shall be made by compression connectors, Burndy Hyground compression system.

C. Provide equipment grounding conductor in all PVC conduits.

ELECTRICAL GROUND ROD TEST REPORT



GROUND ROD RESISTANCE TESTING

PROCEDURE:
To measure ground resistance, two additional temporary grounds, consisting of short rods 2 or 3 ft long, shall be driven in the ground at least 20 ft. away from the rod being tested. A direct-reading ground resistance tester shall then be connected to the three ground rods by means of insulated leads. The battery operated ground resistance tester reads the resistance of the ground rod being tested directly in ohms. The ground rod location / designation and its measured ohm value shall be recorded in chart below.

GROUND ROD LOCATION / DESIGNATION	OHM VALUE
1.	*
2.	*
3.	*
COMPOSITE GROUND	*

* Ohm value of a single ground rod shall not exceed 15 Ohms. If additional ground rod(s) are added, the "composite" ground electrode shall have a maximum acceptable reading of 15 Ohms which shall be recorded in chart above.

END OF SECTION 26 05 26

DIVISION 26 – ELECTRICAL

SECTION 26 05 33 – RACEWAYS, FITTINGS, AND SUPPORTS

PART 1 – GENERAL

1.01 DESCRIPTION

A. This section specifies raceways for electrical conductors including fittings and supports. Raceways shall be provided for power, control, instrumentation, grounding, lighting, receptacles, and signaling systems. Raceways consist of conduits, tubing, and tray systems. For the purpose of this specification, conduit and tubing is described collectively as conduit.

1.02 STANDARDS AND CODES

A. All materials and equipment specified herein shall be within the scope of Nationally Recognized Testing Laboratory (NRTL) examination services, be approved by the NRTL for the purpose for which they are used, and shall bear the appropriate listing label.

B. Equipment listed/labeled by an NRTL shall be as dictated by the latest printing of the *Electrical Testing Laboratories Accreditation Report* available from the State of Washington Department of Labor and Industries, Electrical Inspection Division. Any NRTL listing/labeling shall be as accepted by the local authority having jurisdiction.

C. When a product is not available with a testing laboratory listing for the purpose for which it is to serve, the product may be required by the inspection authority to undergo a special inspection at the manufacturer's place of assembly. All costs and expenses incurred for such inspections shall be included in the original contract price.

1.03 SUBMITTALS

A. The Contractor shall submit catalog data showing material information and conformance with Specifications in accordance with the "Submittals" requirements of section 260500.

PART 2 - PRODUCTS

2.01 GENERAL

A. Material

1. All materials shall be new, free from defects, of current manufacture, of quality specified or shown. Each type of material shall be of the same manufacturer throughout the work.

B. Unscheduled Raceway

1. With the exception of lighting, communication, paging, security and receptacle circuits, the type and size of raceway shall be as specified on the drawings or schedules. Lighting and receptacle raceway are unscheduled and shall be sized

by the contractor in accordance with the NEC. Minimum size shall be 3/4 inch for exposed and 1 inch for embedded raceway.

2. The number and size of communication, paging, and security raceways shall be as required for the particular equipment provided subject to the minimum sizes specified above. The type of raceway shall be in accordance with paragraph 260500-3.01.

C. Scheduled Raceway

1. The size and type of raceway shall be as specified on the drawings or schedules. In case of conflicts between the drawings and paragraph 3.01, the drawings shall prevail.

2.02 RACEWAY

A. Application:

1. All conduits shall be Galvanized Rigid Steel (GRS), unless otherwise noted or specifically allowed in Section 26 05 00, Area Classification.

2. All connections to vibrating equipment or motors shall be liquidtight flexible metallic conduit.

3. All underground power, control and telephone conduits shall be Schedule 40 PVC, meeting standard TC-2.

B. Rigid Steel Conduit

Rigid conduit shall be steel, hot dipped galvanized. Final conduit terminations shall be by means of threaded hubs or double locknuts and insulating grounding type bushings.

C. Liquid Tight Flexible Metallic Conduit

Flexible conduit shall be interlocking single strip, hot dipped galvanized and shall have a polyvinyl chloride jacket extruded over the outside to form a flexible watertight raceway.

D. Nonmetallic Conduit

Nonmetallic conduit shall be electrical grade Schedule 40 PVC, meeting NEMA standard TC-2. All conduit, pipe, sweeps and fittings shall be gray in color. All pipe shall be in either 10 or 20 foot sections with on extended bell end. Conduit shall be in standard diameters. Conduit, fittings and solvent cement shall all be manufactured by the same manufacturer. All couplings shall be the extended type.

E. PVC Coated Rigid Steel Conduit

PVC coated conduit shall have a polyvinylchloride (PVC) coating and shall be bonded to the galvanized outer surface of rigid steel conduit. The bond between the PVC coating and the conduit surface shall be greater than the tensile strength of the plastic. The thickness of the PVC coating shall be a minimum of .035" (35 mil) (40 mil nominal).

F. Aluminum Conduit

Aluminum conduit shall be rigid ANSI C80.5, threaded.

G. Electrical Metallic Tubing (EMT)

EMT shall be UL 797 and ANSI C80.3, steel tubing, hot-dip galvanized. EMT fittings shall be ANSI/NEMA FB 1, steel, raintight, insulated throat, compression type.

2.03 FITTINGS AND BOXES

A. Material

Materials for fittings and boxes shall be chosen to satisfy the requirements of Paragraph 16010. 1.08 - Area Classification. All screws, nuts, bolts, and other hardware used with fittings and boxes shall be stainless steel unless installed in general purpose areas.

B. Unions

All unions of the type designated as UNF and UNY and shall be suitable for use in moist atmospheres. Unions shall be of cast ferrous alloy, electroplated with zinc.

C. Locknuts

All locknuts used in general purpose areas shall be extra heavy steel electroplated with zinc for sizes ¾ inch to 2 inches. Locknuts larger than 2 inches shall be of malleable iron, electroplated with zinc. Locknuts used in damp and outdoor areas shall be stainless steel. Locknuts in corrosive areas shall be FRP.

D. Bushings

All bushings shall be steel or malleable iron threaded type electroplated with zinc or hot-dip galvanized. Bushings shall have a molded-phenolic or nylon insulating collar.

1. Grounding Bushings: Grounding-type bushings shall have a projecting portion drilled for the size grounding cable used and shall be provided with a clamp or set screw for securing the cable. In addition, a set screw shall be provided to securely lock the bushing to the conduit. Grounding bushings shall be GEDNEY Type IBC-LS, Type BL, or T&B No. 3870 through 3880, or equal.

2. Bushed Openings: Bushings for protection of cables passing through metal boxes or troughs shall all be phenolic type and shall be OZ Type ABB, or equal.

3. Hubs for connection of conduit to boxes shall be of zinc. Hubs for use in damp or corrosive areas shall be non metallic or aluminum to match the raceway. The hubs shall provide a liquidtight connection to the box and an insulating bushing for the wiring. Hubs shall be Thomas and Betts bullet type, or equal.

E. Liquidtight Flexible Metallic Conduit Connectors:

Connectors for liquidtight flexible metallic conduit shall be electroplated zinc malleable iron. An O-ring gasket and an approved grounding insert shall be part of the unit. Where applicable, 45 degree and 90 degree fittings may be used. Liquid-tight connectors shall be by O.Z. GEDNEY, or equal.

F. Expansion Fittings

1. Expansion fittings in exposed runs shall be weatherproof type and shall be provided with an external bonding jumper. The expansion fittings shall allow for 4 inch longitudinal movement and shall be designed so that when completely assembled the end of each conduit entering the fitting is bushed. Fittings shall be O.Z. GEDNEY Type EX, or equal.

2. Deflection fittings in embedded runs shall be of the watertight type and shall be provided with an internal bonding jumper. The expansion material shall be neoprene and shall allow for ¾ inch movement in any direction. Fittings shall be O.Z. GEDNEY Type DX, or equal.

G. Junction Boxes

1. Junction boxes, device boxes, fixture support boxes, oblong, round and rectangular conduit fittings (condulets) shall be of the same material as required by the area classification for the raceway. Junction boxes for use in general purpose areas shall be zinc electroplated cast ferrous alloy. Integrally cast threaded hubs or bosses shall be provided for all conduit entrances and shall provide for full 5 thread contact on tightening. Drilling and threading shall be done before finishing.

2. Cover plates shall be of similar cast ferrous alloy material and finish. Full body neoprene gaskets shall be provided with all covers and shall fastened with stainless steel screws.

3. NEMA 12 boxes shall be of heavy gauge sheet steel, or cast metal. All NEMA 12 boxes shall be provided with a 5 mil thick light gray thermo-epoxy finish, and designed so that moisture will drain away from the gasketed cover joint. Covers for sheet steel boxes shall have turned edges, ground smooth to form a tight seal against the gasket when the cover is closed.

2.04 CONDUIT & CABLE SUPPORTS

A. Conduit Supports

Hot-dip galvanized framing channel shall be used to support groups of conduit. Individual conduit supports shall be one-hole galvanized malleable iron pipe straps used with galvanized clamp backs and nesting backs where required. Conduit supports for PVC or epoxy coated rigid steel and PVC conduit systems shall be one hole PVC or epoxy coated clamps or PVC conduit wall hangers.

B. Ceiling Hangers

Ceiling hangers shall be adjustable galvanized carbon steel rod hangers as specified. Straps or hangers of plumber's perforated tape are not acceptable. Unless otherwise specified, hanger rods shall be 1/2-inch all-thread rod and shall meet ASTM A193. Hanger rods in corrosive areas and those exposed to weather or moisture shall be stainless steel.

C. Racks

Racks shall be constructed from framing channel. Galvanized channels and hanger rods shall be steel, hot dip galvanized, 1.5 oz. / sq. ft. after fabrication. Field cuts shall be re-galvanized by the Galv-A-Weld process or by GAL-VAN-IZE as manufactured by LAWSON Products Inc., or equal. Channels attached directly to building surfaces shall be 14 gauge minimum thickness, 1-5/8 inch deep. Channel section shall be sufficient to limit deflection to 1/360 of span.

Framing channels on all exterior areas and in corrosive areas shall be aluminum stainless steel, or fiberglass. All hardware shall be stainless steel. Channel section shall be sufficient to limit deflection to 1/360 of span. Framing channel shall be as manufactured by Unistrut or equal.

2.05 CONDUIT SCHEDULE

Refer to conduit schedule on drawings for raceway sizing and routing description.

2.06 CONDUIT TAGS

Conduit tags shall be corrosion resistant and remain legible after exposure to abrasion or aggressive fluids. Tags shall be crosslinked polyolifin construction. Manufacturer shall be Impact Industries, or equal.

2.07 HANDHOLES

Handholes shall be precast concrete with checker plate, galvanized, traffic covers designed for H-20 loading. Dimensions shall be as specified on the drawings, or as required to meet minimum sizes as required by the NEC. Handholes shall be construction of 3000 psi reinforced concrete.

2.08 UNDERGROUND MARKING TAPE (DETECTABLE TYPE)

Underground marking tape shall be for location and early warning protection of buried power and communication lines. Tape shall be detectable by a pipe / cable locator or metal detector from above the undisturbed ground. Tape shall be nominally 2 inches wide with a type B721 aluminum foil core laminated between two layers of 5 mil thickness polyester plastic. The plastic color shall be red for electrical lines and orange for telephone lines. A warning shall be imprinted continuously along the length, with message reading similar to: "CAUTION - STOP DIGGING - BURIED ELECTRIC (TELEPHONE) LINE BELOW." Tape shall be Brady "Detectable Identoline"; Services and Materials "Buried Underground Tape, Detectable", or equal.

PART 3 - EXECUTION

3.01 3.01 CONDUIT

A. General

1. The Contractor shall limit the number of directional changes of the conduit to a total not more than 270 degrees in any run between pull boxes. Conduit runs shall be limited to 400 feet, less 100 feet or fraction thereof, for every 90 degrees of change in direction. No more than four bends will be allowed in any single run. Bends and offsets shall be avoided where possible but, where necessary, shall be made without flattening or kinking, or shall be factory preformed bends. Turns shall be made with case metal fittings or conduit bends. Welding, brazing or otherwise heating of conduit is not acceptable.

2. Where required for pulling cable and as necessary to meet the requirements of the previous Paragraph, the Contractor shall provide cast junction or pull boxes. Pull boxes used for multiple conduit runs shall not combine circuits fed from different MCCs, switchboards, or switchgear.

3. Conduit entering NEMA 1 type sheet steel boxes or cabinets shall be secured by locknuts on both the interior and exterior of the box or cabinet and shall have an insulating grounding or bonding bushing constructed over the conduit end. Conduit entering all other boxes shall be terminated with a threaded hub. Cast boxes and nonmetallic enclosures shall have threaded hubs. Joints shall be made with standard couplings or threaded unions. Metal parts of nonmetallic

boxes and plastic coated boxes shall be bonded to the conduit system. Running threads shall not be used in lieu of conduit nipples, nor shall excessive thread be used on any conduit. The ends of conduit shall be cut square, reamed and threaded with straight threads.

4. Unless otherwise specified, conduit entering field equipment enclosures shall enter the bottom or side of the box. Where conduit comes from above, it shall be run down beside the enclosure and a tee condulet and drip leg shall be installed.

5. When new conduit is added to areas which are already painted, the conduit and its supports shall be painted to match the existing facilities. Where new conduit is used to replace existing conduit, the existing conduit and supports shall be removed, resulting blemishes shall be patched and repainted to match original conditions. Similarly, if existing conduits are to be reused and rerouted, resulting blemished shall be corrected in the same manner.

B. Conduit Support

1. Exposed conduit shall be run on supports spaced not more than 10 feet apart and shall be constructed with runs parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceiling. No conduit shall be routed within 6 inches of any object operating above 30 degrees C.

2. Where three or more conduits are located in a parallel run, they shall be spaced from the wall using framing channel. Support systems shall be galvanized steel unless otherwise specified.

3. Conduit rack and tray supports shall be secured to concrete walls and ceilings by means of cast-in-place anchors. Individual conduit supports shall use cast-in-place anchors, die-cast, rust-proof alloy or expansion shields. Wooden plugs, plastic inserts or gunpowder-driven inserts are not acceptable as a base to secure conduit supports.

C. Trench Preparation

1. All trenching will be at a depth sufficient to allow installation of primary conduit with a minimum of 36” cover.

2. All trenching for secondary service runs to to meters will be at a depth sufficient to allow installation of all secondary conduits with a minimum of 30” of cover.

3. Construct the trench so that the bottom provides a firm, stable, and uniform support for the full length of the conduit. Clear the bottom of any rocks or debris that might damage the conduit.

4. Increase the trench depth, if necessary, to minimize grade changes and eliminate bends in the conduit system.

5. When crossing existing utilities, slope the trench to avoid the obstacle. Keep the slope gradual so as to minimize conduit bending.

6. Install a minimum of 3” sand bedding material to provide a flat surface that will not damage the conduit system.

D. Conduit Assembly and Placement

1. All conduit cuts shall be made using a fine tooth saw. All burrs and rough edges shall be removed.

2. Apply a liberal and uniform coat of PVC cement to the conduit and bell end. Assemble the pieces while the surfaces while the surfaces are wet and fluid. Slip the conduit straight into the bell end, while slightly twisting until it bottoms. Hold the joint for 15 seconds so the conduit will not push out.

3. Let conduit joints cure completely before placing the conduit in permanent position.

4. All conduits (primary, secondary, control and communications) shall be placed at a common depth in a common trench.

5. Place conduit banks directly on sand-bedded bottoms.

6. Use conduit base spacers for bottom row of conduit. Place spacers at 5 foot intervals.

7. Stagger bell ends between layers to facilitate bank assembly.

8. See additional details provided on the electrical drawings.

E. Conduit Separation

1. Signal conduits shall be separated from AC power or control conduits. The separation shall be a minimum of 12 inches.

F. Conduit Seals for Hazardous or Corrosive Areas

1. Each conduit passing from a hazardous or corrosive area into a non-hazardous or non-corrosive area shall be provided with a sealing fitting which may be located on either side of the boundary. The seal shall be located at the boundary in accordance with the NEC.

2. Seal fittings for conduit systems in hazardous atmosphere locations shall be hot-dip galvanized case ferrous alloy. Sealing compound shall be hard type, Chico A, or equal, UL listed for explosion-proof sealing fittings. Sealing compound shall be non-hardening type for corrosive areas. Provide reducing bushings and larger seals as required to meet NEC 25% fill.

3.02 HANDHOLES

A. Handholes shall be set plumb to limit the depth of standing water to a maximum of 2 inches. Handhole covers, unless otherwise specified, shall be set at grade.

3.03 RACEWAY NUMBERING

A. Each conduit shall be provided with a number tag at each end and in each handhole and/or pullbox.

END OF SECTION 26 05 33

MECHANICAL

SECTION 22 05 00 - COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. General Requirements
2. Piping materials and installation instructions common to most piping systems.
3. Access Doors
4. Joining Materials
5. Dielectric fittings.
6. Mechanical Sleeve Seals.
7. Sleeves.
8. Escutcheons.
9. Flushing and Cleaning of Piping Systems
10. Pressure Testing of Piping Systems
11. Piping Systems Common Requirements
12. Piping Joint Construction
13. Piping Connections
14. Equipment Installation Common Requirements.

1.3 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

F. "Engineer" shall mean "the Mechanical Engineer."

G. The following are industry abbreviations for plastic materials:

1. ABS: Acrylonitrile-butadiene-styrene plastic.

2. CPVC: Chlorinated polyvinyl chloride plastic.

3. PE: Polyethylene plastic.

4. PVC: Polyvinyl chloride plastic.

H. The following are industry abbreviations for rubber materials:

1. EPDM: Ethylene-propylene-diene terpolymer rubber.

2. NBR: Acrylonitrile-butadiene rubber.

1.4 PRODUCT SELECTION PROCEDURES

A. Where the specifications list one or more manufacturers, provide product by one of the named manufacturers on the list that complies with specification requirements.

B. Other manufacturers of products which may meet the specification requirements, but are not listed in the specifications will be considered, subject to prior approval. Submit one copy of a prior approval request to the Engineer, listing all pertinent product information indicating compliance with the specifications requirements. Prior approval requests must be received by the Engineer at least 7 days prior to the project bid date. A list of products given prior approval will be listed by Addendum to the project.

1.5 SUBMITTALS

A. In addition to the requirements of Section 00 72 00 4.03, comply with the following:

1. Provide submittal data for each product required by the specifications. All material and equipment required by the specifications shall be approved by the Engineer and Architect before being released for shipment.

2. Preparation:

a. Clearly mark each copy of the submittals to identify pertinent products or models. Indicate material or equipment by reference to specification section number, schedule designation on the Contract Documents, or by reference to Sheet or detail on the Contract Documents.

b. Show performance characteristics and capacities

c. Show dimensions and clearances required.

d. Show wiring, piping and control diagrams

3. Manufacturer's standard schematic drawings and diagrams:

a. Modify drawings and diagrams to delete information which is not applicable to the work.

b. Supplement standard information to provide information specifically applicable to the work.

4. Submission:

a. Provide number of product submittals as required by Section 013300.

B. Contractor responsibilities:

1. Review shop drawings, product data and samples prior to submission.

2. Determine and verify:

a. Field measurements

b. Field construction criteria

c. Catalog numbers and similar data

d. Conformance with specifications

3. Coordinate each submittal with requirements of the work and of the Contract Documents.

4. Notify the Architect in writing, at the time of submission, of any deviations in the submittals from requirements of the Contract Documents.

5. Begin no fabrication or work which requires submittals until return of submittals with Architect acceptance.

C. Submittals shall contain:

1. The date of submission and the dates of any previous submissions.

2. The project title and number

3. The contract identification

4. The names of:

   a. Contractor

   b. Supplier

   c. Manufacturer

D. Provide on submittals, contractor's stamp, initialed or signed, certifying review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of the Contract Documents.

E. Materials or equipment without prior approval will not be acceptable.

F. Resubmission requirements:

   1. Submittals which require resubmission shall be returned to the contractor with corrections noted thereon.

   2. Make any corrections or changes in the submittals and resubmit.

1.6 SUBSTITUTIONS

A. Comply with the requirements of Section 01 25 00.

B. When Architect accepts substitution, it is with the understanding that the person who is requesting the substitution be made, guarantees that the substituted article or material is equal to or better than the one specified. Also, the person requesting the substitution, shall pay for any tests made to determine quality of an item/substitution. Also, cost of any redesigning and excessive submittal review caused by substitution shall be borne by person requesting the substitution.

C. Substitutions that require alteration or changes in other trade and any additional costs occurred therein, shall be the responsibility of the person making the request for the substitution.

1.7 SUPERVISION

A. Contractor shall have in charge of the work at all times, a thoroughly competent superintendent with considerable experience in this work. Any superintendent judged not competent by the Architect shall be removed at once upon the request of the Architect and be replaced by an approved superintendent.

1.8 SCHEDULE OF VALUES

A. In addition to the requirements of Section 01 29 73, submit a Schedule of Values for the work of Division 22 per the following categories (material and labor cost shall be listed separately for each item):

1. Mobilization, detailing and engineering
2. Permits and Charges
3. Outside Utilities
4. Waste and Vent Below Grade
5. Waste and Vent Above Grade
6. Domestic Water Piping System
    a. Water Heaters
    b. Piping (cold, and hot piping)
7. Special Piping Systems (piping and equipment)
8. Plumbing Fixtures & Finish Plumbing
9. Piping Insulation
10. Operation and Maintenance Manuals
11. Record documents
12. Project closeout

1.9 CODES, FEES AND RELATED COSTS

A. All materials and workmanship shall comply with all applicable codes, specifications, local ordinances, industry standards and utility company regulations.

B. If building codes, state laws, local ordinances, industry standards and/or utility company regulations conflict with the contract documents, the most stringent shall govern. Contractor shall promptly notify the Architect in writing of any such difference.

C. Noncompliance: Should the Contractor perform any work that does not comply with the local ordinances, industry standards and utility company regulations, he shall bear all costs arising in correcting the deficiencies.

D. Requirements of Regulatory Agencies:

1. This Contractor shall be responsible for obtaining and payment for all permits, licenses, and inspection certificates required in accordance with provisions of

contract documents, and shall pay all fees for the utility connections as required for this part of the work.

2. In addition to requirements shown or specified, comply with latest current local and/or state ordinances and codes; and applicable standards, specifications or codes published by:

   a. Building Codes:

      1) IBC - International Building Code

      2) IFC - International Fire Code

      3) UPC - Uniform Plumbing Code

      4) IMC - International Mechanical Code

      5) NEC - National Electric Code

   b. Industry Standards, Codes and Specifications:

      1) AIEE - American Institute of Electrical Engineers

      2) AMCA - Air Moving & Conditioning Association

      3) ASA - American Standards Association

      4) ASHRAE - American Society of Heating, Refrigeration and Air Conditioning Engineers

      5) ASME - American Society of Mechanical Engineers

      6) ASTM - American Society of Testing Materials

      7) IBR - Institute of Boiler & Rating Manufacturers

      8) SMACNA - Sheet Metal and Air Conditioning Contractors National Association, Inc.

      9) AWWA - American Water Works Association

      10) ANSI - American National Standards Institute

      11) ARI - Air Conditioning and Refrigeration Institute

      12) FIA - Factory Insurance Association

      13) FM - Factory Mutual

      14) NEMA - National Electrical Manufacturers Association

15) OSHA - Occupational Safety and Health Act

16) ADC - Air Diffusion Council

17) WISHA - Washington Industrial Safety & Health Act

18) APWA - Standard Specification for Municipal Public Works

19) NFPA - National Fire Protection Association

20) WSRB - Washington Survey & Rating Bureau

21) AIEE - American Institute of Electrical Engineers

22) WDOE - Washington Department of Ecology

23) WSEC - Washington State Energy Code

24) WSVC - Washington State Ventilation Code

1.10 PROJECT RECORD DOCUMENTS

A. In addition to the requirements of Section 00 72 00 4.02, project record documents shall include the following:

1. Log the depth of all outside utility lines. Include both new and existing lines encountered during construction.

2. Log the leaving inverts of all waste and storm lines in the building.

3. All change orders to the contract shall be noted on the project record documents and shall include all revisions accomplished by these change orders.

4. No cost change orders shall be noted on the project record documents.

5. Where buried piping has been rerouted from as shown on the contract documents, dimension piping from grid lines, columns, or a fixed part of the building.

1.11 SUPPORTS

A. Provide all pipe stands, mounting brackets and metal bases required for plumbing material and equipment.

B. Provide all necessary supplementary steel for support or attachment of plumbing material and equipment in shafts and between building structural members. Steel shall be painted with one coat of rust-inhibiting primer.

1.12 LISTED EQUIPMENT

A. The Washington State Electrical Code requires that all materials, devices, appliances, and equipment, shall be of a type that conforms to applicable standards or be indicated as

acceptable by the established standards of the Underwriters Laboratories, Inc. or other electrical product testing laboratories which are accredited by the department.

B. This statement is being interpreted by the State Electrical Inspector as follows: It is understood that many specialty items such as cast iron boiler, certain items of air handling equipment and other building components are not available with a UL label covering the entire piece of equipment. The State will impose no requirement that an item of equipment be UL labeled unless it is available as UL labeled item from at least two manufacturers. Electrical components of unlabeled equipment, such as motors, shall be labeled if they are available from at least two manufacturers.

C. If any building component is available with UL or other Washington State approved label from at least two manufacturers, an identical or similar unlabeled component shall not be acceptable for installation in the State of Washington. Should any such component be installed in the State of Washington, it shall either be inspected and labeled by a UL representative or other authority approved by the State or it shall be replaced with a UL labeled component, before the building will be accepted by the State Electrical Inspector.

D. The engineer has attempted to select UL listed components on this project. However, it must be understood that catalog data on which he bases his selection are not necessarily always current. Components are continually added to the UL approved listings. Conversely, a manufacturer may make a change in a product line, voiding the previous UL approval shown in the catalog. These changes commonly take place after the project has been released for bidding.

E. Consequently, it shall be the sole responsibility of the Contractor (through his suppliers and equipment manufacturers) to purchase and install only equipment bearing the UL or other approved label whenever that equipment so labeled is available. The Contractor, should he install any equipment without the proper UL label, shall bear the entire cost of correction to the satisfaction of the Washington State Electrical Inspector.

1.13 TEST LOG DATA

A. The Contractor shall keep a three-ring notebook in the construction job office for the sole purpose of filing test data. The test data shall include the testing and flushing of all piping on the project. All log data test entries shall be signed by the Contractor's Superintendent and the Architect's representative or the code authority having jurisdiction.

1.14 CLEANUP

A. Upon the completion of the work hereinafter specified and at times during the progress of the work or when requested by the Architect, the Contractor shall remove all surplus materials, debris, and rubbish resulting from his operations, and shall leave the entire building and involved portions of the site, insofar as the work of the contract is concerned, in a neat, clean and acceptable condition as approved by the Architect.

B. The Contractor shall be expected to police his day-to-day operation and maintain a clean and safe working area.

1.15 SOD REMOVAL AND REPLACEMENT

A. Unless indicated otherwise, sod removed or damaged by the Contractor during the work required under Division 22, or as a result thereof, shall be replaced by the General Contractor with like material as specified in Section 01 73 29.

1.16 BARRICADES AND BRIDGES

A. Barricades shall be provided for all work under Division 22, as required. Barricades shall be erected to meet all state and local requirements and standards.

B. Temporary bridges and supports shall be provided for all work under Division 22, as required, to accommodate vehicle and pedestrian traffic over open trenches or obstructions. All temporary supports and bridges shall be constructed of sufficient strength to safely accommodate the normal vehicle or pedestrian traffic.

1.17 OPERATING AND MAINTENANCE INSTRUCTIONS

A. At the completion of the project, at such time as designated by the Architect, an operational and maintenance instruction period for the Owner shall take place. Contractor shall have present during this entire period his superintendent, foremen of various portions of the project, and manufacturer's service representatives (factory trained) for all equipment requiring periodic maintenance. All operational and maintenance instructions shall be presented under direct supervision of the Architect.

B. Contractor shall provide sign in sheet and shall be responsible for all parties present to sign in. After instruction is complete and accepted by the Owner, Contractor shall provide letter to the Architect indicating that the instructions have been completed and accepted, and Owner shall sign same.

1.18 OPERATION AND MAINTENANCE MANUALS

A. In addition to the requirements of Section 01 78 23 provide the following for Division 22 Operation and Maintenance Manuals:

1. Arrange material per order of Specifications.

2. Include a copy of all approved material and equipment submittals (equipment submittals to indicate specific model furnished, capacity, voltage, etc.).

3. Provide operating and maintenance instructions for all equipment to include the following:

a. Complete word description of all equipment including systems and areas served, methods of control and sequence of controls.

b. Description of routine maintenance for equipment.

c. Suggested frequency of maintenance.

d. Lubrication chart for all equipment, listing lubricant to be used and time interval for lubrication.

e. Parts list

f. Warranties for equipment

g. Complete valve schedule for all piping systems to indicate valve tag number, valve location by room number, system served, and valve purpose.

h. Copy of Test Log

i. Guarantee for work.

1.19 PROJECT CLOSEOUT

A. In addition to the requirements of Section 01 77 00, Contractor shall review the following specific checklist items prior to requesting inspection for Substantial or Final completion. The signed and dated checklist items shall be submitted with the request for Substantial or Final completion:

Item	Verified By	Date
All shipping tie-downs removed	_____	_____
All equipment with motors have specified motor with correct horsepower voltage and individual control heaters are adequate.	_____	_____
All equipment with electrical connections have wiring completed with proper voltage /phase	_____	_____
All equipment operational	_____	_____

Valves installed where indicated on the drawings and left in proper position (open or closed as required)	_____	_____
All piping systems flushed, cleaned, chlorinated, tested and free from leaks	_____	_____
All piping systems piping insulation complete	_____	_____
All valves tagged	_____	_____
All piping systems labeled and with flow arrows	_____	_____
All plumbing fixtures installed, properly connected and operational.	_____	_____
All plumbing fixtures cleaned	_____	_____

1.20 QUALITY ASSURANCE

A. The Contractor shall guarantee all work included in this section for a period of one year after date of Certificate of Substantial Completion. During that period, all defects due to faulty materials or workmanship and damage to other work, resulting therefrom or the correction of same, shall be remedied at the Contractor's expense.

B. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

C. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."

2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

1.21 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling and during the progress of the work to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

1.22 COORDINATION

A. Coordinate the location of all piping to determine that it clears all openings and structural members, that it may be properly concealed and that it clears cabinets, lights and all equipment having fixed locations. No extra payments will be allowed where piping and/or ductwork must be offset to avoid other work, or where minor changes are necessary to facilitate installation.

B. Drawings do not attempt to show complete details of building construction which affect the mechanical installation. Contractor shall refer to the Architectural, Structural, Electrical drawings for additional building details which affect installation of his work.

C. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for plumbing installations.

D. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.

E. Access panels shall be provided for all plumbing items requiring access that are concealed behind finished surfaces. All access panels required for the work of Division 22, size 24"x24" and under, shall be provided under the work of Division 22. Coordinate the location of all access panels with Architect.

PART 2 - PRODUCTS

2.1 ACCESS DOORS

A. Provide access doors suited for installation in masonry, tile, wood or other wall and ceiling surfaces. Provide fire rated access doors for installation in fire rated wall or ceiling assemblies.

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

1. Elmdor/Stoneman; Div. of Acorn Engineering Co.

2. MIFAB, Inc.

3. Milcor Inc.

C. Lightweight Flush Access Doors and Frames with Exposed Trim: Fabricated from lightweight metal.

1. Locations: Wall and ceiling surfaces.

2. Door: Minimum 0.018-inch- (0.45-mm-) thick steel sheet.

3. Frame: Minimum 0.045-inch- (1.1-mm-) thick extruded aluminum with 1-1/4-inch- (32-mm-) wide rolled flange.

4. Hinges: Fully concealed, continuous piano type.

5. Latch: Screwdriver-operated cam latch.

D. Fire-Rated, Insulated, Flush Access Doors and Frames with Exposed Trim: Fabricated from steel sheet.

1. Locations: Wall and ceiling surfaces.

2. Fire-Resistance Rating: Not less than 1-1/2 hours in walls and 3 hours in ceilings.

3. Temperature Rise Rating: 250 deg F (139 deg C) at the end of 30 minutes.

4. Door: Flush panel with a core of 2" thick mineral-fiber insulation enclosed in sheet metal with a minimum thickness of 0.036 inch (0.9 mm).

5. Frame: Minimum 0.060-inch- (1.5-mm-) thick sheet metal with 1-inch- (25-mm-) wide, surface-mounted trim.

6. Hinges: Fully concealed, continuous piano type.

7. Automatic Closer: Spring type

8. Latch: Self-latching device operated by knurled knob with interior release.

2.2 JOINING MATERIALS

A. Refer to individual Division 22 piping Sections for special joining materials not listed below.

B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.

1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated.

a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.

b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.

2. AWWA C110, rubber, flat face, 1/8 inch (3.2 mm) thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.

C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

D. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

E. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

F. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAg1, silver alloy for refrigerant piping, unless otherwise indicated.

G. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

H. Solvent Cements for Joining Plastic Piping:

1. ABS Piping: ASTM D 2235.

2. CPVC Piping: ASTM F 493.

3. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

4. PVC to ABS Piping Transition: ASTM D 3138.

2.3 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.

B. Insulating Material: Suitable for system fluid, pressure, and temperature.

C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig (1725-kPa) minimum working pressure at 180 deg F (82 deg C).

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

a. Capitol Manufacturing Co.

b. Central Plastics Company.

c. Eclipse, Inc.

d. Epco Sales, Inc.

e. Hart Industries, International, Inc.

f. Watts Industries, Inc.; Water Products Div.

g. Zurn Industries, Inc.; Wilkins Div.

D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150- or 300-psig (1035- or 2070-kPa) minimum working pressure as required to suit system pressures.

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

a. Capitol Manufacturing Co.

b. Central Plastics Company.

c. Epco Sales, Inc.

d. Watts Industries, Inc.; Water Products Div.

E. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).

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

a. Perfection Corp.

b. Precision Plumbing Products, Inc.

c. Sioux Chief Manufacturing Co., Inc.

d. Victaulic Co. of America.

2.4 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

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

a. Advance Products & Systems, Inc.

b. Calpico, Inc.

c. Metraflex Co.

d. Pipeline Seal and Insulator, Inc.

e. Link-Seal

2. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.

3. Pressure Plates: Carbon steel. Include two for each sealing element.

4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.5 SLEEVES

A. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

B. PVC Pipe: ASTM D 1785, Schedule 40.

2.6 ESCUTCHEONS

A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.

C. One-Piece, Cast-Brass Type: With set screw.

1. Finish: Polished chrome-plated.

D. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.

1. Finish: Polished chrome-plated.

E. One-Piece, Stamped-Steel Type: With set screw or spring clips and chrome-plated finish.

F. Split-Plate, Stamped-Steel Type: With concealed hinge, set screw or spring clips, and chrome-plated finish.

G. One-Piece, Floor-Plate Type: Cast-iron floor plate.

H. Split-Casting, Floor-Plate Type: Cast brass with concealed hinge and set screw.

PART 3 - EXECUTION

3.1 FLUSHING AND CLEANING OF PIPING SYSTEMS

A. Piping systems shall be flushed and cleaned as indicated under Division 22 Sections specifying piping systems.

B. Domestic water piping systems shall be chlorinated as indicated under Division 22 Sections specifying domestic water piping.

3.2 PRESSURE TESTING OF PIPING SYSTEMS

A. Each system of piping shall be tested as indicated under Division 22 Sections specifying piping systems, after portions of mechanical work are completed. Tests shall be made in presence of Owner's representatives. Adequate advance written notice of tests shall be given to Architect and other agencies having jurisdiction.

B. Furnish all tools, materials, fuel, air, water, gases, pumps, gauges, blowers, instruments, test equipment and personnel required for tests. Make all provisions for removal of test equipment and draining of pipes after tests. Submit documentation of all test results.

C. Subject all systems and connections to tests prior to painting, insulation, or concealment.

D. Tests may be made on isolated portions of systems to facilitate general progress of installation. Any revisions made in the systems will require retesting of the affected portions of the systems.

E. System components with working pressure below test pressure shall be removed from the system during the testing period. Contractor shall be responsible for any damage during testing.

F. Should a system fail to meet the test, it shall be repaired and retested until proper results are obtained.

G. Contractor shall pretest systems prior to requesting witnessed test.

H. All tests shall be entered into the test log.

I. Certification: Submit certificates of approval from agencies having jurisdiction. Work not considered complete until all certificates have been submitted.

3.3 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Install piping according to the following requirements and Division 22 Sections specifying piping systems.

B. Install valves, thermometers, pressure gauges, cleanout fittings, indicating equipment or any other specialties requiring reading, adjusting, inspection, repairing, removal or replacement such that they are conveniently and accessibly located with reference to the finished building. Thermometers and pressure gauges shall be installed to be easily read from floor or catwalk.

C. Do not permit electrical conduit and lights to be supported or hung from the mechanical utilities, or piping.

D. Do not permit tee bar or fixed plaster ceilings to be supported or hung from the mechanical utilities or piping.

E. Piping for mechanical systems shall not be installed in any switchgear room, transformer vault, telephone room, or electric closet, rooms except as indicated.

F. Piping shall not be installed to run over any electrical panel. Contractor shall be required to move at his expense any pipe or duct run over an electrical panel regardless of where it is shown on the drawings.

G. In all rooms where piping runs over motor control centers, electrical bus duct or other electrical equipment, provide aluminum or galvanized pan or gutter under pipes (reinforced to prevent sagging). Edges of pans shall turn up 2" on all sides with corners welded or soldered watertight. Pan width 1" wider than pipe hanger. Pans shall be supported by pipe hangers and drain clear of electrical work. Provide **:"** copper drain pipe for each pan terminating above nearest floor drain. Shop drawings shall be submitted showing proposed shielding at each location.

H. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

I. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

J. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

K. Install piping to permit valve servicing.

L. Install piping at indicated slopes.

M. Install piping free of sags and bends.

N. Install fittings for changes in direction and branch connections.

O. Install piping to allow application of insulation.

P. Select system components with pressure rating equal to or greater than system operating pressure.

Q. Install escutcheons suitable for the application for penetrations of walls, ceilings, and floors, to completely cover opening.

R. Install sleeves for pipes passing through new above grade concrete and masonry walls, and new concrete floor and roof slabs. Sleeves are not required for core-drilled holes.

1. Cut sleeves to length for mounting flush with both surfaces.

    a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches (50 mm) above finished floor level.

2. Install sleeves in new walls and slabs as new walls and slabs are constructed.

3. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation.

4. Except for underground wall penetrations, and fire rated penetrations, seal annular space between sleeve and pipe or pipe insulation, using joint sealants appropriate for size, depth, and location of joint. Refer to Division 07 Section "Joint Sealants" for materials and installation.

S. Underground, Exterior-Wall Pipe Penetrations: At below grade exterior walls, separating below grade from finished spaces, seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for sufficient annular clear space between pipe and sleeve for installing mechanical sleeve seals.

1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

T. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 07 Section "Penetration Firestopping" for materials.

U. Verify final equipment locations for roughing-in.

V. Install access panels for all piping accessories requiring access for operation, service or maintenance.

W. Install dielectric fittings at connections of dissimilar piping materials.

3.4 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 22 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.

F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.

2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.

H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

I. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.

2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.

3. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.

4. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.

5. PVC Nonpressure Piping: Join according to ASTM D 2855.

6. PVC to ABS Nonpressure Transition Fittings: Join according to ASTM D 3138 Appendix.

J. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.

K. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.

L. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.

1. Plain-End Pipe and Fittings: Use butt fusion.

2. Plain-End Pipe and Socket Fittings: Use socket fusion.

3.5 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:

1. Install unions, in piping NPS 2 (DN 50) and smaller, adjacent to each valve and at final connection to each piece of equipment.

2. Install flanges, in piping NPS 2-1/2 (DN 65) and larger, adjacent to flanged valves and at final connection to each piece of equipment.

3.6 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

B. Provide aisles, or space around equipment suitable for complete service and inspection of equipment. Maintain minimum 6'6" headroom in all access aisles. Provide minimum clearances at electrical equipment per NEC.

C. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

D. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

E. Install equipment to allow right of way for piping installed at required slope.

F. Label Pressure Vessels in accordance with the State Boiler and Unfired Pressure Vessels Inspection Law. Frame and mount a certificate showing approval under this law adjacent to each respective piece of equipment. Pay all costs and fees for certificates, inspections, filing and labeling.

G. Provide equipment with OSHA approved drive and shaft guards for all exposed, rotating drive shafts and drive connections between motors and driven equipment including, pumps, compressors, etc. Guards shall include heavy duty steel frames securely fastened for easy removal to the equipment frame. Guards, in general, shall be solid sheet metal with tachometer cutout at shafts where applicable. Guards may be provided by the equipment manufacturer or fabricated by this Contractor to the manufacturer's clearances, configurations, etc.

H. Provide a service engineer for equipment start-up as indicated under division 22 Sections specifying equipment. Service engineer shall be a factory-trained and certified engineer in the employ of the factory, or the employee of the sales representative. Where Contractor is the sales representative, he/she must employ a factory trained and certified person to do this service work and shall have a letter from the manufacturer stating that he/she is qualified for start-up of equipment furnished

END OF SECTION 22 05 00

SECTION 22 05 19 - METERS AND GAGES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Thermometers.

2. Gages.

3. Test plugs.

1.3 DEFINITIONS

A. CR: Chlorosulfonated polyethylene synthetic rubber.

B. EPDM: Ethylene-propylene-diene terpolymer rubber.

PART 2 - PRODUCTS

2.1 METAL-CASE, LIQUID-IN-GLASS THERMOMETERS

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

1. Palmer - Wahl Instruments Inc.

2. Trerice, H. O. Co.

3. Weiss Instruments, Inc.

4. Weksler Instruments Operating Unit; Dresser Industries; Instrument Div.

5. Miljoco

6. Tel Tru

B. Case: Die-cast aluminum, 9 inches long.

C. Tube: Red or blue reading, spirit filled, mercury free, with magnifying lens.

D. Tube Background: White background with black figures and markings.

E. Window: Glass or clear acrylic.

F. Connector: Adjustable type, 180 degrees in vertical plane, 360 degrees in horizontal plane, with locking device.

G. Stem: Copper-plated steel, aluminum, or brass for thermowell installation and of length to suit installation.

H. Accuracy: Plus or minus 1 percent of range or plus or minus 1 scale division to maximum of 1.5 percent of range.

2.2 THERMOWELLS

A. Manufacturers: Same as manufacturer of thermometer being used.

B. Description: Pressure-tight, socket-type metal fitting made for insertion into piping and of type, diameter, and length required to hold thermometer.

2.3 PRESSURE GAGES

A. Provide pressure gauges with valves and snubbers.

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

1. Ashcroft Commercial Instrument Operations; Dresser Industries; Instrument Div.

2. Ernst Gage Co.

3. Eugene Ernst Products Co.

4. KOBOLD Instruments, Inc.

5. Miljoco Corp.

6. Palmer - Wahl Instruments Inc.

7. Trerice, H. O. Co.

8. Weiss Instruments, Inc.

9. Weksler Instruments Operating Unit; Dresser Industries; Instrument Div.

10. Winters Instruments.

11. Tel Tru

C. Direct-Mounting, Dial-Type Pressure Gages: Indicating-dial type complying with ASME B40.100.

1. Case: Dry type, drawn steel or cast aluminum, 4-1/2-inch diameter.
2. Pressure-Element Assembly: Bourdon tube, unless otherwise indicated.
3. Pressure Connection: Brass, NPS 1/4, bottom-outlet type unless back-outlet type is indicated.
4. Movement: Mechanical, with link to pressure element and connection to pointer.
5. Dial: Satin-faced, nonreflective aluminum with permanently etched scale markings.
6. Pointer: Red or other dark-color metal.
7. Window: Glass.
8. Ring: Stainless steel.
9. Accuracy: Grade A, plus or minus 1 percent of middle half scale.
10. Vacuum-Pressure Range: 30-in. Hg of vacuum to 15 psig of pressure.
11. Range for Fluids under Pressure: Two times operating pressure.

D. Pressure-Gage Fittings:

1. Valves: NPS 1/4 brass or stainless-steel needle type.
2. Snubbers: ASME B40.5, NPS 1/4 brass bushing with corrosion-resistant, porous-metal disc of material suitable for system fluid and working pressure.

2.4 TEST PLUGS

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

1. Flow Design, Inc.
2. MG Piping Products Co.
3. National Meter, Inc.
4. Peterson Equipment Co., Inc.
5. Sisco Manufacturing Co.
6. Trerice, H. O. Co.
7. Watts Industries, Inc.; Water Products Div.

B. Description: Corrosion-resistant brass or stainless-steel body with core inserts and gasketed and threaded cap, with extended stem for units to be installed in insulated piping.

C. Minimum Pressure and Temperature Rating: 500 psig at 200 deg F.

D. Core Inserts: One or two self-sealing rubber valves.

1. Insert material for water service at 20 to 200 deg F shall be CR.

2. Insert material for water service at minus 30 to plus 275 deg F shall be EPDM.

E. Test Kit: Furnish one test kit(s) containing one pressure gage and adaptor, two thermometers, and carrying case. Pressure gage, adapter probes, and thermometer sensing elements shall be of diameter to fit test plugs and of length to project into piping.

1. Pressure Gage: Small bourdon-tube insertion type with 2- to 3-inch- diameter dial and probe. Dial range shall be 0 to 200 psig.

2. Low-Range Thermometer: Small bimetallic insertion type with 1- to 2-inch-diameter dial and tapered-end sensing element. Dial ranges shall be 25 to 125 deg F.

3. High-Range Thermometer: Small bimetallic insertion type with 1- to 2-inch-diameter dial and tapered-end sensing element. Dial ranges shall be 0 to 220 deg F.

4. Carrying case shall have formed instrument padding.

PART 3 - EXECUTION

3.1 THERMOMETER APPLICATIONS

A. Install liquid-in-glass thermometers in the inlet and outlet of each domestic, hot-water heater.

B. Provide the following temperature ranges for thermometers:

1. Domestic Hot Water: 30 to 180 deg F, with 2-degree scale divisions.

2. Domestic Cold Water: 0 to 100 deg F, with 2-degree scale divisions.

3.2 GAGE APPLICATIONS

A. Install dry-case-type pressure gages for inlet and discharge of each pressure-reducing valve.

B. Install dry-case-type pressure gages at suction and discharge of each pump.

3.3 INSTALLATIONS

A. Install direct-mounting thermometers and adjust vertical and tilted positions.

B. Install remote-mounting dial thermometers on panel, with tubing connecting panel and thermometer bulb supported to prevent kinks. Use minimum tubing length.

C. Install thermowells with socket extending to center of pipe and in vertical position in piping tees where thermometers are indicated.

D. Install direct-mounting pressure gages in piping tees with pressure gage located on pipe at most readable position.

E. Install remote-mounting pressure gages on panel.

F. Install needle-valve and snubber fitting in piping for each pressure gage.

G. Install test plugs in tees in piping.

H. Install permanent indicators on walls or brackets in accessible and readable positions.

I. Install connection fittings for attachment to portable indicators in accessible locations.

J. Install thermometers and gages adjacent to machines and equipment to allow service and maintenance for thermometers, gages, machines, and equipment.

K. Adjust faces of thermometers and gages to proper angle for best visibility.

END OF SECTION 22 05 19

SECTION 22 05 23 - GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes the following for copper or steel piping systems:

1. Bronze ball valves.

2. Bronze lift check valves.

3. Bronze swing check valves.

4. Valve Schedules

1.3 DEFINITIONS

A. CWP: Cold working pressure.

B. EPDM: Ethylene propylene copolymer rubber.

C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.

D. NRS: Nonrising stem.

E. OS&Y: Outside screw and yoke.

F. RS: Rising stem.

G. SWP: Steam working pressure.

1.4 PRODUCT HANDLING

A. Protection: Use all means necessary to protect the materials of this Division before, during and after installation and to protect the installed work and materials.

B. Replacement: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

A. Refer to valve schedule articles for applications of valves.

B. Obtain all valves from single source, from single manufacturer, wherever possible.

C. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

D. Selection of valve trim materials shall be as recommenced by manufacturer for pressure, temperature and application.

E. Valve Sizes: Same as upstream piping unless otherwise indicated.

F. Valve Actuator Types:

1. Handwheel: For valves other than quarter-turn types.

2. Handlever: For quarter-turn valves NPS 6 and smaller.

G. Valves in Insulated Piping: With 2-inch stem extensions and the following features:

1. Gate Valves: With rising stem.

2. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.

3. Butterfly Valves: With extended neck.

H. Valve-End Connections:

1. Flanged: With flanges according to ASME B16.1 for iron valves.

2. Grooved: With grooves according to AWWA C606.

3. Solder Joint: With sockets according to ASME B16.18.

4. Threaded: With threads according to ASME B1.20.1.

2.2 MANUFACTURERS

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

1. Conbraco Industries, Inc.; Apollo Valves.

2. Crane Co.; Crane Valve Group; Crane Valves.

3. Crane Co.; Crane Valve Group; Stockham Valves

4. Crane Co.; Crane Valve Group; Jenkins Valves

5. Hammond Valve.

6. Milwaukee Valve Company.

7. NIBCO INC.
8. Red-White Valve Corporation.
9. Victaulic
10. Anvil International, Inc.

2.3 BRONZE BALL VALVES

A. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim:

1. Description:
   a. Standard: MSS SP-110.
   b. SWP Rating: 150 psig.
   c. CWP Rating: 600 psig.
   d. Body Design: Two piece.
   e. Body Material: Bronze.
   f. Ends: Threaded or solder.
   g. Seats: PTFE or TFE.
   h. Stem: Bronze.
   i. Ball: Chrome-plated brass.
   j. Port: Full.

B. Three-Piece, Full-Port, Bronze Ball Valves with Bronze Trim:

1. Description:
   a. Standard: MSS SP-110.
   b. SWP Rating: 150 psig.
   c. CWP Rating: 600 psig.
   d. Body Design: Three piece.
   e. Body Material: Bronze.
   f. Ends: Threaded or solder.
   g. Seats: PTFE or TFE.

h. Stem: Bronze.

i. Ball: Chrome-plated brass.

j. Port: Full.

2.4 BRONZE LIFT CHECK VALVES

A. Class 125, Lift Check Valves with Nonmetallic Disc:

1. Description:

a. Standard: MSS SP-80, Type 2.

b. CWP Rating: 200 psig.

c. Body Design: Vertical flow.

d. Body Material: ASTM B 61 or ASTM B 62, bronze.

e. Spring: 316 stainless steel

f. Ends: Threaded or solder.

g. Disc: NBR, PTFE, or TFE.

2.5 BRONZE SWING CHECK VALVES

A. Class 125, Bronze Swing Check Valves with Bronze Disc:

1. Description:

a. Standard: MSS SP-80, Type 3.

b. CWP Rating: 200 psig.

c. Body Design: Horizontal flow.

d. Body Material: ASTM B 62, bronze.

e. Ends: Threaded or solder.

f. Disc: Bronze.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.

B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.

C. Examine threads on valve and mating pipe for form and cleanliness.

D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.

E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

A. Install valves according to manufacturer's written instructions.

B. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

C. Locate valves for easy access and provide separate support where necessary.

D. Install valves in horizontal piping with stem at or above center of pipe.

E. Install valves in position to allow full stem movement.

F. Install check valves for proper direction of flow and as follows:

1. Swing Check Valves: In horizontal position with hinge pin level.

2. Lift Check Valves: With stem upright and plumb.

3.3 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.4 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valve applications are not indicated, use the following:

1. Shutoff Service: Ball, butterfly, or gate valves.

2. Butterfly Valve Dead-End Service: Single-flange (lug) type.

3. Throttling Service: Globe valves.

B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.

C. Select valves with the following end connections unless noted otherwise:

1. For Copper Tubing, NPS 2 and Smaller: Threaded or solder-joint end.
2. For Copper Tubing, NPS 2-1/2 and larger: Flanged ends.
3. For Steel Piping, NPS 2 and Smaller: Threaded ends.
4. For Steel Piping, NPS 2-1/2 and larger: Flanged ends.
5. For Grooved-End Copper Tubing and Steel Piping: Valve ends may be grooved.

3.5 DOMESTIC, HOT- AND COLD-WATER VALVE SCHEDULE

A. Pipe NPS 2 and Smaller:

1. Ball Valves: Two piece, full port, bronze with stainless-steel trim.
2. Bronze Swing Check Valves: Class 125, bronze disc.
3. Bronze Lift Check Valves: Class 125, non-metallic disc

END OF SECTION 22 05 23

SECTION 22 05 29 - HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following hangers and supports for plumbing system piping and equipment:

1. Steel pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.
4. Thermal-hanger shield inserts.
5. Fastener systems.
6. Roof Pipe stands.
7. Pipe positioning systems.
8. Equipment supports.

1.3 DEFINITIONS

A. MSS: Manufacturers Standardization Society for The Valve and Fittings Industry Inc.

B. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.4 PERFORMANCE REQUIREMENTS

A. Provide supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.

B. Provide equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

PART 2 - PRODUCTS

2.1 STEEL PIPE HANGERS AND SUPPORTS

A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.

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

1. ERICO/Michigan Hanger Co.

2. Anvil

3. Pipe Shields, Inc..

4. PHD Manufacturing, Inc.

C. Galvanized, Metallic Coatings: Pre-galvanized or hot dipped.

D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

E. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion for support of bearing surface of piping.

2.2 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural-steel shapes with MSS SP-58 hanger rods, nuts, saddles, and U-bolts.

2.3 METAL FRAMING SYSTEMS

A. Description: MFMA-3, shop- or field-fabricated pipe-support assembly made of steel channels and other components.

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

1. ERICO/Michigan Hanger Co.; ERISTRUT Div.

2. Power-Strut Div.; Tyco International, Ltd.

3. Thomas & Betts Corporation.

4. Unistrut Corp.; Tyco International, Ltd.

C. Metallic Coatings: Manufacturer's standard finish for indoor use, hot dip galvanized for outdoor use.

D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

2.4 THERMAL-HANGER SHIELD INSERTS

A. Description: 100-psig- (690-kPa-) minimum, compressive-strength insulation insert encased in sheet metal shield.

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

1. ERICO/Michigan Hanger Co.

2. Pipe Shields, Inc.

3. Anvil.

4. PHD Manufacturing, Inc..

C. Insulation-Insert Material: Water-repellent treated, ASTM C 533, Type I calcium silicate or ASTM C 552, Type II cellular glass with vapor barrier. 360 degree insert, 180 or 360 degree shield.

D. Insert Length: Extend 2 inches (50 mm) beyond sheet metal shield.

2.5 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

1. Manufacturers: Subject to requirements provide products by one of the following:

a. Hilti, Inc.

b. ITW Ramset/Red Head.

c. Masterset Fastening Systems, Inc.

d. MKT Fastening, LLC.

e. Powers Fasteners.

B. Mechanical-Expansion Anchors: Insert-wedge-type [**zinc-coated**] [**stainless**] steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

1. Manufacturers: Subject to requirements provide products by one of the following:

a. B-Line Systems, Inc.; a division of Cooper Industries.

b. Empire Industries, Inc.

c. Hilti, Inc.

d. ITW Ramset/Red Head.

e. MKT Fastening, LLC.

f. Powers Fasteners.

2.6 PIPE POSITIONING SYSTEMS

A. Description: IAPMO PS 42, system of metal brackets, clips, and straps for positioning piping in pipe spaces for plumbing fixtures for commercial applications.

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

1. C & S Mfg. Corp.

2. HOLDRITE Corp.; Hubbard Enterprises.

3. Samco Stamping, Inc.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.

C. Use hangers and supports with galvanized, metallic coatings for piping and equipment that will not have field-applied finish.

D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use padded hangers for piping that is subject to scratching.

F. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of non-insulated or insulated stationary pipes, NPS 1/2 to NPS 30 (DN 15 to DN 750).

2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of 120 to 450 deg F (49 to 232 deg C) pipes, NPS 4 to NPS 16 (DN 100 to DN 400), requiring up to 4 inches (100 mm) of insulation.

3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes, NPS 3/4 to NPS 24 (DN 20 to DN 600), requiring clamp flexibility and up to 4 inches (100 mm) of insulation.

4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes, NPS 1/2 to NPS 24 (DN 15 to DN 600), if little or no insulation is required.

5. Pipe Hangers (MSS Type 5): For suspension of pipes, NPS 1/2 to NPS 4 (DN 15 to DN 100), to allow off-center closure for hanger installation before pipe erection.

6. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of non-insulated stationary pipes, NPS 3/4 to NPS 8 (DN 20 to DN 200).

7. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of non-insulated stationary pipes, NPS 1/2 to NPS 8 (DN 15 to DN 200).

8. Adjustable Band Hangers (MSS Type 9): For suspension of non-insulated stationary pipes, NPS 1/2 to NPS 8 (DN 15 to DN 200).

9. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of non-insulated stationary pipes, NPS 1/2 to NPS 2 (DN 15 to DN 50).

10. Split Pipe-Ring with or without Turnbuckle-Adjustment Hangers (MSS Type 11): For suspension of non-insulated stationary pipes, NPS 3/8 to NPS 8 (DN 10 to DN 200).

11. Extension Hinged or 2-Bolt Split Pipe Clamps (MSS Type 12): For suspension of non-insulated stationary pipes, NPS 3/8 to NPS 3 (DN 10 to DN 80).

12. U-Bolts (MSS Type 24): For support of heavy pipes, NPS 1/2 to NPS 30 (DN 15 to DN 750).

13. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.

14. Pipe Saddle Supports (MSS Type 36): For support of pipes, NPS 4 to NPS 36 (DN 100 to DN 900), with steel pipe base stanchion support and cast-iron floor flange.

15. Pipe Stanchion Saddles (MSS Type 37): For support of pipes, NPS 4 to NPS 36 (DN 100 to DN 900), with steel pipe base stanchion support and cast-iron floor flange and with U-bolt to retain pipe.

16. Adjustable, Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes, NPS 2-1/2 to NPS 36 (DN 65 to DN 900), if vertical adjustment is required, with steel pipe base stanchion support and cast-iron floor flange.

17. Single Pipe Rolls (MSS Type 41): For suspension of pipes, NPS 1 to NPS 30 (DN 25 to DN 750), from 2 rods if longitudinal movement caused by expansion and contraction might occur.

18. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes, NPS 2-1/2 to NPS 20 (DN 65 to DN 500), from single rod if horizontal movement caused by expansion and contraction might occur.

19. Complete Pipe Rolls (MSS Type 44): For support of pipes, NPS 2 to NPS 42 (DN 50 to DN 1050), if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.

20. Pipe Roll and Plate Units (MSS Type 45): For support of pipes, NPS 2 to NPS 24 (DN 50 to DN 600), if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.

21. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes, NPS 2 to NPS 30 (DN 50 to DN 750), if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.

22. PEX Tubing horizontal and vertical pipe hanger and support materials to be provided and installed as recommended by PEX Tubing manufacturer.

G. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20 (DN 20 to DN 500).

2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20 (DN 20 to DN 500), if longer ends are required for riser clamps.

H. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches (150 mm) for heavy loads.

2. Steel Clevises (MSS Type 14): For 120 to 450 deg F (49 to 232 deg C) piping installations.

3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.

4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.

5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F (49 to 232 deg C) piping installations.

I. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.

2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction to attach to top flange of structural shape.

3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.

4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.

5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.

6. C-Clamps (MSS Type 23): For structural shapes.

7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.

8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.

9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.

10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.

11. Malleable Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.

12. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:

    a. Light (MSS Type 31): 750 lb (340 kg).

    b. Medium (MSS Type 32): 1500 lb (680 kg).

    c. Heavy (MSS Type 33): 3000 lb (1360 kg).

13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.

14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.

15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.

J. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.

2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.

3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

K. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections.

L. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

M. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

3.2 HANGER AND SUPPORT INSTALLATION

A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.

B. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated trapeze pipe hangers.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.

2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.

C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled metal framing systems.

D. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

E. Fastener System Installation:

1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches (100 mm) thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.

2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

F. Roof Pipe Stand Installation:

1. Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.

G. Pipe Positioning System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture. Refer to Division 22 Section "Plumbing Fixtures" for plumbing fixtures.

H. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

I. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

J. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

K. Install lateral bracing with pipe hangers and supports to prevent swaying.

L. Install building attachments within concrete slabs or attach to structural steel. Provide supplementary steel for support and attachment of hangers in shafts and between building structural members. Do not weld to building structural members without written approval of the Structural Engineer. Install additional attachments at concentrated loads, including valves, flanges, and strainers, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

M. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment. Provide welded support at elbows on pump suction and discharge piping and extend elbow support to floor.

N. Coordinate location of hangers with respect to light fixtures and other building components. Piping shall be supported by independent hangers and shall no be supported from ductwork, duct supports or other piping. Hanger rods shall not penetrate ductwork.

O. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9 (for building services piping) are not exceeded.

3.3 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands or metal framing systems to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make smooth bearing surface.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.4 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches (40 mm).

END OF SECTION 22 05 29

SECTION 220533 - HEAT TRACING FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 SUMMARY

a. This Section includes a UL Listed CSA Certified, or FM Approved complete pipe freeze protection system that consists of a self-regulating trace heater, connection kits, accessories, and electronic controller for insulated pipes exposed to the risk of freezing.

b. Related Requirements

1. Section 22 07 19 Plumbing Piping Insulation

2. Section 22 10 00 Plumbing Piping

3. Section 26 05 19 Low-Voltage Electrical Power Conductors and Cables

4. Section 26 05 26 Grounding and Bonding for Electrical Systems

1.2 REFERENCES

a. Reference Standards

1. UL515 – Electrical Resistance Heat Tracing for Commercial Applications

2. IEEE 515.1-2012 Standard for the Testing, Design, Installation & Maintenance of Electric Resistance Trace Heating for Commercial Applications.

3. CSA Standard C22.2 No. 130-03 Requirements for Electrical Resistance Heating Cables & Heating Device Sets.

4. NFPA 70 – National Electrical Code

5. CSSA Standard C22.1 – Canadian Electrical Code.

1.3 SYSTEM DESCRIPTION

a. System includes a complete pipe freeze protection system for insulated pipes exposed to the risk of freezing. System consists of a self-regulating heating cable, connection kits, accessories, and energy efficiency control, monitoring and Building Management System (BMS) communication capabilities. The heating cable shall have a Polyolefin jacket for above ground piping.

1. Pipe freeze protection of above ground water piping.

1.4 SUBMITTALS

a. Product Data:

1. Heating cable data sheet.
2. UL Listed, CSA Certified, or FM Approved certifications for freeze protection.
    a. Pipe freeze protection of above ground water piping.
3. Design Guide
    a. Pipe Freeze Protection Design Guide
4. System Operation and Operation Manual
5. System Installation Details
6. Connection kits and accessories data sheet
7. Controller Data Sheet
8. Controller Wiring Diagram

b. Shop Drawings:

1. Provide engineered isometric heat tracing circuit layout drawings indicating power connections, tees, end seals, cable length and circuit cable length.

1.5 QUALITY ASSURANCE

a. Source Limitations: All system components shall be sourced from a single manufacturer. Under no circumstances shall any components be installed other than those supplied by the cable manufacturer to ensure system integrity and to meet warranty requirements.

b. Qualifications:

1. Manufacturers
    a. Manufacturer to show minimum of forty (40) years of experience in manufacturing electric self-regulating heating cables and components.
    b. Manufacturer will be ISO-9001 registered.
    c. Manufacturer to provide products consistent with UL 515, CSA 22.2 No. 130-03 and IEEE 515.1 requirements.
    d. The self-regulating heating cable shall be qualified and tested to demonstrate a useful lifetime in excess of 20 years.
2. Installers
    a. System installer shall have complete understanding of product and product literature from manufacturer or authorized representative prior to installation. Electrical connections shall be performed by a licensed electrician.

c. Certifications:

1. The system (heating cable, connection kits, and controller) shall be UL Listed, CSA Certified, or FM Approved for:

a. Freeze protection of above ground water piping

1.6 DELIVERY, STORAGE AND HANDLING

a. Delivery and Acceptance Requirements

1. Deliver, store and handle products to prevent their deterioration or damage due to moisture, temperature changes, contaminates or other causes.

2. Deliver products to the site in original, unopened containers or packages with intact and legible manufacturer's labels identifying the following:

a. Product and Manufacturer

b. Length/Quantity

c. Lot Number

d. Installation and Operation Manual

b. Storage and Handling Requirements

1. Store the heating cable in a clean, dry location with a temperature range of 0 Deg.F. to 140 Deg. F.

2. Protect the heating cable from water ingress.

1.7 WARRANTY

a. Manufacturer Warranty

1. Manufacturer's warranty that warrants all goods listed below for two (2) years from the date of purchase against faulty workmanship and use of defective materials when such goods are properly installed, operated, and maintained according to product documentation.

a. Heating cables, connection kits & accessories

b. Thermostats, controllers, panels contactors, sensors and accessories.

b. Special Warranty

1. Contractor shall provide the owner an extended product warranty for the heat tracing products listed below. The contractor must complete and forward to the owner the installation, inspection and complete the online warranty registration form with thirty (30) days from the date of installation.

a. Heating Cable & Components shall be Ten (10) ears from Date of Purchase

2. Heating cables, connection kits and accessories not automatically offered with a Ten (10) Year manufacturer's warranty, as a standard matter of course, will not be allowed. Warranty information must be published on the manufacturer's website.

PART 2 - PRODUCTS

2.1 HEAT TRACING SYSTEM

A. Manufacturers

1. Basis of Design Manufacturer: Subject to the compliance with requirements, provide RAYCHEM heat tracing products of NVent Thermal Management, LLC, Redwood City, 94063, 800-545-6258;

   E-Mail: thermal.info@nvent.com Website: www.nventthermal.com

2. Submit comparable products for approval by Plumbing Engineer.

   a. Submit request for substitutions in accordance with Instructions to Bidders and Division 01 General Requirements

B. Materials

1. Heating cables shall be RAYCHEM XL-Trace, self-regulating heating cables specifically designed for the intended application, test and approved to UL 515, CSA 22.2 No 130-03 and IEEE 515.1 requirements.

   a. The construction of the self-regulating heating cable shall consist of a continuous core of conductive polymer that is radiation crosslinked, extruded between two (2) 16 AWG nickel-plated copper bus wires that varies its power output in response to pipe temperature changes.

   b. The heating cable shall have a modified polyolefin inner jacket for dielectric integrity and long life expectancy.

   c. The heating cable shall have a thicker gauge (5/24) tinned copper braid with minimum 70% coverage for ground path and mechanical ruggedness.

   d. The heating cable shall have a self-regulating factor of at least 90% for 5XL and 8XL, and at least 66 percent for 12XL. The self-regulating factor is defined as the percent reduction of the heating cable power output going from a 40 Deg.F. pipe temperature to 150 Deg.F. pipe temperature.

   e. The heating cable shall have an outer jacket that is approved and clearly marked for use in above ground water piping applications. The heating cable shall have a "Modified Polyolefin" outer jacket printed with the cable number, agency listings, batch number and meter marks (for ease of installation within maximum circuit length.

f. The heating cable shall be designed for 120v, 8watts/ft for use in above grade, water piping applications.

g. The heating cable shall be included in a UL Listed, CSA Certified, or FM Approved system.

h. Constant wattage cables are not acceptable

2. Heating Cable Connection Kits.

a. Heating cable connection kits shall be RAYCHEM and shall be the appropriate model for the type of service to be provided.

b. Contractor shall provide power connections, splices/tees, and end seal kits to properly connect and terminate the heating cable circuit along the specified length of the piping.

c. All splices, tees and crosses shall be installed underneath the pipe insulation with service loops installed to allow for future service of the piping.

d. Connection kits shall be rated NEMA 4X to prevent water ingress and corrosion. All components shall be UV stabilized and shall not require the installing contractor to cut into the heating-cable core to expose the buss wires.

e. Connection kits shall be UL Listed, CSA Certified and FM Approved.

f. All connection kits must be located above grade for buried applications.

3. Attachment of Heating Cable

a. Attachment method of heating cable to the piping shall be RAYCHEM model:

1. GT-66 – General purpose, high temperature, glass filament tape for installation @ 40 Deg. F. and above. Contractor to affix the heating cable to the pipe every 12" by wrapping the GT-66 tape around the pipe and over the heating cable.

b. Metal cable ties are not permitted.

4. Identification of Heating Cable System

a. Contractor shall provide and install RAYCHEM model ETL "Electric Heat Traced" labels on the exterior of pipe insulation every ten (10) feet on "opposite sides of the pipe for the entire length of the heat traced piping.

b. In addition, all splices, tees, crosses and power connections shall be labeled on the exterior of the pipe insulation indicating the presence of a connection kit.

5. Energy Efficient Control System

a. Single Circuit Local Digital Controller

1. All self-regulating heating cable shall be controlled via an energy saving, programmable, single circuit controller to provide adjustable maintained temperatures in the range of -40 Deg. F. to 140 Deg. F.

2. Contractor shall provide one (1), single circuit, local digital controller for each heat tracing circuit.

3. Controller shall include a self-test function to verify heat tracing integrity at least once every 24 hours.

4. The single circuit local digital controller shall be equivalent to RAYCHEM C910-485.

5. Line Sensing Control – Contractor shall provide one (1) RAYCHEM model RTD-10CS, 100 Ohm, platinum 3-wire RTD for pipe temperature sensing for each single circuit local digital controller.

6. Approval – The complete heat trace system (heating cable, connection kits and controller) shall be listed by a Nationally Recognized Testing (NRTL),and marked for the use on freeze protection of above grade piping systems.

6. Thermal Pipe Insulation

   a. Pipes must be thermally insulated in accordance with the XL-Trace Design Guide requirements.

   b. Thermal insulation must be a type that is flame retardant with a waterproof covering.

7. Approval – The complete heat trace system (heating cable, connection kits and controller) shall be listed by a Nationally Recognized Testing Laboratory (NRTL) and marked for the intended use of freeze protection of above ground water piping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions

1. Prior to installation of heating cable system, verify that all piping which will be heat traced has passed all hydrostatic/pressure test and is signed off by the plumbing inspector.

B. Preinstalling Testing

1. Prior to installing heating cable on the piping, an insulation resistance test shall be performed by the installing contractor to ensure integrity of heating cable as described in the installation and maintenance manual.

3.2 PREPARATION

A. Protection of In-Place Conditions

1. All heating cable ends shall be protected from moisture ingress until cable is terminated.

2. Acceptable methods are installing RayClic-E end seals.

3.3 INSTALLATION

A. Comply with the manufacturer's recommendations contained in their heating cable system installation and operation manual.

B. All heat tracing components including power connections, splices, tees, crosses or end seal must be installed above grade and protected from abuse or damage. By NEC and CEC, electrical connections are not permitted to be installed below grade.

C. Temperature sensor shall be installed inside of ¾" plastic conduit and pushed all the way to the closed end. Contractor to wire temperature sensor to the controller and be responsible for extended temperature sensor wiring as required by the site conditions.

D. Install electric heating cable according to the drawings and manufacturer's instructions. The installer shall be responsible for providing a complete functional system, installed in accordance with applicable national and local requirements.

E. Interface with Other Work.

1. Connection of all electrical wiring shall be according to the Electrical Specification – "Low-Voltage Electrical Power Conductors and Cables".

2. Grounding of controller shall be according to the Electrical Specification – "Grounding and Bonding for Electrical Systems".

3. Pipe Insulation shall be according to Section 22 07 00 – "Plumbing Pipe Insulation" and is required for a properly operating heat trace system.

3.4 FIELD QUALITY CONTROL

A. Initial start-up and field testing (commissioning) of the system shall be performed by factory technician or factory representative.

B. Field Tests and Inspections

1. The system shall be commissioned in accordance to the XL-Trace Installation and Operation manual.

2. The following test shall be performed after the heat cable has been installed but before the insulation and after insulating the piping. The results of both sets of tests

shall be recorded as detailed in the RAYCHEM Pipe Freeze Protection Installation and Maintenance Manual and included in submittals to the owner.

a. Continuity Test

b. Insulation Resistance – 2500 VDC

c. Capacitance Check – Circuit Length Verification

d. Power Check

e. Ground Fault Test

3. The technician shall verify the insulation schedule is in compliance with the XL-Trace installation and operation manual.

4. The technician shall verify that the controller control parameters are set to the application requirements.

C. Non-Conforming Work

1. Any heat tracing circuit which fails any of the above tests must be corrected prior to commissioning or startup of the system.

D. Retain the services of nVent RAYCHEM Management to provide factory design build and inspection services to prepare submittals for complete design layouts, wiring diagrams, installation details for all heat trace equipment including heating cable, connection kits, controllers and sensors. nVent shall supply 11"x 17" isometric drawings for every circuit for a complete heat tracing system.

E. Provide inspection report, by factory technician or factory representative as part of a complete manufacturer approved installation that is compliant to Code.

F. Start-up – Start-up of system shall be performed by factory technician or factory representative per the owner's requirements.

3.5 SYSTEM STARTUP

A. Provide a factory-certified technician or manufacturer's representative for startup and commissioning of the heat tracing system and controller.

B. Coordinate all controller settings prior to programming the controller with the owner and the plumbing engineer.

C. Provide commissioning report in submittals package to owner.

END OF SECTION 22 05 33

SECTION 22 05 53 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Equipment labels.
2. Warning signs and labels.
3. Pipe labels.
4. Valve tags.
5. Warning tags.

1.3 COORDINATION

A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

B. Coordinate installation of identifying devices with locations of access panels and doors.

C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Plastic Labels for Equipment:

1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch (3.2 mm) thick, and having predrilled holes for attachment hardware.
2. Letter Color: White.
3. Background Color: Black.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F (71 deg C).
5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch (64 by 19 mm).

6. Minimum Letter Size: 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

7. Fasteners: Stainless-steel rivets or self-tapping screws.

8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Label Content: Include equipment's Drawing designation or unique equipment number.

2.2 WARNING SIGNS AND LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch (3.2 mm) thick, and having predrilled holes for attachment hardware.

B. Letter Color: White.

C. Background Color: Red.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F (71 deg C).

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch (64 by 19 mm).

F. Minimum Letter Size: 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Fasteners: Stainless-steel rivets or self-tapping screws.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.3 PIPE LABELS

A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

B. Pre-tensioned Pipe Labels: Pre-coiled, semi-rigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.

C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.

1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.

2. Lettering Size: At least 1-1/2 inches (38 mm) high.

2.4 VALVE TAGS

A. Valve Tags: Stamped or engraved with 1/4-inch (6.4-mm) letters for piping system abbreviation and 1/2-inch (13-mm) numbers.

1. Tag Material: Brass, 0.032-inch (0.8-mm) minimum thickness, and having predrilled or stamped holes for attachment hardware.

2. Fasteners: Brass wire-link or beaded chain; or S-hook.

B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch (A4) bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.

1. Valve-tag schedule shall be included in operation and maintenance data.

2.5 WARNING TAGS

A. Warning Tags: Preprinted or partially preprinted, accident-prevention tags, of plasticized card stock with matte finish suitable for writing.

1. Size: 3 by 5-1/4 inches (75 by 133 mm) minimum.

2. Fasteners: Brass grommet and wire.

3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."

4. Color: Yellow background with black lettering.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

B. Locate equipment labels where accessible and visible.

3.3 PIPE LABEL INSTALLATION

A. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:

1. Near each valve and control device.

2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.

3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.

4. At access doors, manholes, and similar access points that permit view of concealed piping.

5. Near major equipment items and other points of origination and termination.

6. Spaced at maximum intervals of 50 feet (15 m) along each run. Reduce intervals to 25 feet (7.6 m) in areas of congested piping and equipment.

B. Pipe Label Color Schedule:

1. Domestic Water Piping:

a. Background Color: Yellow.

b. Letter Color: Black.

2. Sanitary Waste and Storm Drainage Piping:

a. Background Color: Yellow.

b. Letter Color: Black.

3.4 VALVE-TAG INSTALLATION

A. Install tags on valves and control devices in piping systems, except for the following: check valves; valves within factory-fabricated equipment units; faucets; convenience and lawn-watering hose connections; and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:

1. Valve-Tag Size and Shape:

    a. All Valve Tags: 1-1/2 inches (38 mm), round.

2. Valve-Tag Color:

    a. All Valve Tags: Natural.

3. Letter Color:

    a. All Valve Tags: Black.

3.5 WARNING-TAG INSTALLATION

A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 22 05 53

SECTION 22 07 00 - PLUMBING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Insulation Materials:

a. Mineral fiber, Preformed Pipe Insulation

b. Flexible Elastomeric Pipe Insulation.

c. Mineral Fiber Blanket Insulation.

2. PVC fitting Covers

3. Field Applied Jackets

4. Insulation Installation Requirements

5. Piping Insulation Schedule

6. Field Applied Jacket Schedule

7. Minimum Pipe Insulation Thickness Table

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing and inspecting agency.

1. Flame-spread index of 25 or less, and smoke-developed index of 50 or less.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.5 COORDINATION

A. Coordinate size and location of supports, hangers, and insulation shields specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."

B. Coordinate clearance requirements with piping Installer for piping insulation application and equipment Installer for equipment insulation application. Establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

C. Coordinate installation and testing of heat tracing, where required.

1.6 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. General:

1. Comply with requirements in Part 3 schedule articles for where insulating materials shall be applied.

2. Products shall not contain asbestos, lead, mercury, or mercury compounds.

3. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

4. Thermal conductivity of all insulation materials (k-value) at mean temperature shall be as noted in Part 3 Minimum Pipe Insulation Thickness Table.

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

a. CertainTeed Corp.; Duct Wrap.

b. Johns Manville; Microlite.

c. Knauf Insulation; Duct Wrap.

d. Owens Corning; All-Service Duct Wrap.

e. Aeroflex USA Inc.

f. Armacell LLC; AP Armaflex.

g. RBX Corporation

h. Einsulation, Inc.

B. Mineral-Fiber, Preformed Pipe Insulation:

1. Type I, 850 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied vapor barrier all purpose jacket, self sealing lap (ASJ-SSL).

C. Flexible Elastomeric Pipe Insulation:

1. Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.

D. Mineral-Fiber Blanket Insulation:

1. Mineral or glass fibers bonded with a thermosetting resin, with FSK facing. Comply with ASTM C 553, Type II and ASTM C 1290, Type I.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.

1. Verify that systems and equipment to be insulated have been tested and are free of defects.

2. Verify that surfaces to be insulated are clean and dry.

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

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

3.3 GENERAL INSULATION INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment and piping including fittings, flanges, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment and pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. On cold piping with vapor barrier, hangers shall not penetrate insulation. Provide insulation inserts with vapor barrier at hanger locations, such that hanger encircles insulation. At supports and anchors other than hangers, seal penetrations in insulation with vapor barrier mastic.

K. On piping with field applied jackets, hangers, supports and anchors shall not penetrate jacketing or insulation.

L. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement. Replace damaged insulation or insulation facings with new sections of insulation.

O. Insulation shall be continuous through walls, floors, or sleeves with thickness same as adjacent piping.

P. Do not install insulation to the following:

1. Vibration-control devices.

2. Testing agency labels and stamps.

3. Nameplates and data plates.

4. Manholes.

5. Handholes.

6. Cleanouts.

3.4 MINERAL-FIBER PREFORMED PIPE INSULATION INSTALLATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Draw jacket tight and smooth.

2. Cover circumferential joints with manufacturer's 3-inch- wide self adhesive strips, of same material as insulation jacket.

3. For longitudinal joints, clean and dry surface to receive self-sealing lap and secure self sealing lap.

4. Where vapor barriers are indicated, apply vapor-barrier mastic at ends adjacent to pipe flanges and fittings, or other open ends and protrusions.

B. Insulation Installation on Pipe Fittings, Elbows, Flanges and Valves:

1. Install PVC fitting cover insulation inserts to thickness of adjacent piping and install PVC fitting covers.

2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands. Install PVC fitting covers.

3. Seal fitting covers with manufacturers recommended adhesive.

3.5 FLEXIBLE ELASTOMERIC PIPE INSULATION INSTALLATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Fittings and Elbows:

1. Install mitered sections of pipe insulation.

2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed valve covers manufactured of same material as pipe insulation when available.

2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.

3. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.6 INDOOR PIPING INSULATION SCHEDULE

A. Domestic Cold Water Above Grade:

1. Insulation shall be Mineral-Fiber, Preformed Pipe Insulation, Type I: minimum 1/2 inch thick, for all pipe sizes.

B. Domestic Hot Water Above Grade:

1. Insulation shall be Mineral-Fiber, Preformed Pipe Insulation, Type I, for automatic-circulating hot water systems, 1" thickness for all pipe sizes. Insulation shall have a conductivity (k), not exceeding k=0.27.

END OF SECTION 22 07 00

SECTION 22 11 16 - DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Above ground domestic water pipes, tubes, fittings, and specialties inside the building.

2. Encasement for piping.

3. Piping Schedule

1.3 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

B. Comply with NSF 14 for plastic, potable domestic water piping and components.

C. Comply with NSF 61 for potable domestic water piping and components.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 COPPER TUBE AND FITTINGS

A. Hard Copper Tube: ASTM B 88, Type K, ASTM B 88, Type L, ASTM B 88, Type M, water tube, drawn temper.

1. Cast-Copper Solder-Joint Fittings: ASME B16.18, pressure fittings.

2. Wrought-Copper Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.

3. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.

4. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.

5. Copper Pressure-Seal-Joint Fittings:

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

        1) Elkhart Products Corporation; Industrial Division.

        2) NIBCO INC.

        3) Viega; Plumbing and Heating Systems.

    b. NPS 2 and Smaller: Wrought-copper fitting with EPDM-rubber O-ring seal in each end.

6. Copper-Tube Extruded-Tee Connections:

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

        1) T-DRILL Industries Inc.

    b. Description: Tee formed in copper tube according to ASTM F 2014.

7. Grooved-Joint Copper-Tube Appurtenances:

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

        1) Anvil International.

        2) Shurjoint Piping Products.

        3) Victaulic Company.

    b. Copper Grooved-End Fittings: ASTM B 75 copper tube or ASTM B 584 bronze castings.

    c. Grooved-End-Tube Couplings: Copper-tube dimensions and design similar to AWWA C606. Include ferrous housing sections, EPDM-rubber gaskets suitable for hot and cold water, and bolts and nuts.

B. Soft Copper Tube: [**ASTM B 88, Type K**] [**and**] [**ASTM B 88, Type L**] water tube, annealed temper.

1. Copper Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.

2. Copper Pressure-Seal-Joint Fittings:

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

1) Elkhart Products Corporation; Industrial Division.
2) NIBCO INC.
3) Viega; Plumbing and Heating Systems.

b. NPS 2 and Smaller: Wrought-copper fitting with EPDM-rubber O-ring seal in each end.

c. NPS 3 and NPS 4: Cast-bronze or wrought-copper fitting with EPDM-rubber O-ring seal in each end.

2.3 PVC PIPE AND FITTINGS

A. Pipe in this article is available in NPS 1/8 to NPS 24 (DN 6 to DN 600).

B. PVC Pipe: ASTM D 1785, Schedule 40 and Schedule 80.

1. PVC Socket Fittings: ASTM D 2466 for Schedule 40 and ASTM D 2467 for Schedule 80.

2. PVC Schedule 80 Threaded Fittings: ASTM D 2464.

2.4 PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free, unless otherwise indicated; full-face or ring type unless otherwise indicated.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

C. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

D. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

2.5 ENCASEMENT FOR PIPING

A. Standard: ASTM A 674 or AWWA C105.

B. Form: Sheet or Tube.

C. Material: LLDPE film of 0.008-inch minimum thickness.

2.6 TRANSITION FITTINGS

A. General Requirements:

1. Same size as pipes to be joined.

2. Pressure rating at least equal to pipes to be joined.

3. End connections compatible with pipes to be joined.

B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.

C. Sleeve-Type Transition Coupling: AWWA C219.

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

a. Cascade Waterworks Manufacturing.

b. Dresser, Inc.; Dresser Piping Specialties.

c. Ford Meter Box Company, Inc. (The).

d. JCM Industries.

e. Romac Industries, Inc.

f. Smith-Blair, Inc; a Sensus company.

g. Viking Johnson; c/o Mueller Co.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Provide all excavation, backfill and bedding as required for the work. Comply with requirements in Division 31 Section "Earth Moving" for excavating, trenching, and backfilling.

3.2 PIPING INSTALLATION

A. Install domestic water piping graded back to central points for drainage at low points. Provide drain valve with hose connection at low points.

B. Install seismic restraints on piping, when required. Comply with requirements in Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment" for seismic-restraint devices.

C. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than system pressure rating used in applications below unless otherwise indicated.

3.3 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads.

2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

D. Brazed Joints: Join copper tube and fittings according to CDA's "Copper Tube Handbook," "Brazed Joints" Chapter.

E. Soldered Joints: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."

F. Pressure-Sealed Joints: Join copper tube and pressure-seal fittings with tools recommended by fitting manufacturer.

G. Extruded-Tee Connections: Form tee in copper tube according to ASTM F 2014. Use tool designed for copper tube; drill pilot hole, form collar for outlet, dimple tube to form seating stop, and braze branch tube into collar.

H. Copper-Tubing Grooved Joints: Roll groove end of tube. Assemble coupling with housing, gasket, lubricant, and bolts. Join copper tube and grooved-end fittings according to AWWA C606 for roll-grooved joints.

I. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.

3.4 VALVE INSTALLATION

A. General-Duty Valves: Comply with requirements in Division 22 Section "General-Duty Valves for Plumbing Piping" for valve installations.

B. Install shutoff valves in all branch piping that serves batteries of three or more plumbing fixtures, and on each water supply to plumbing fixtures that do not have supply stops, and on supplies to all equipment requiring water connections. Shutoff valves may or may not be shown on the drawings.

C. Install ½" or ¾" drain valves for equipment at base of each water riser, at low points in horizontal piping, and where required to drain water piping. Drain valves are specified in Division 22 Section "Domestic Water Piping Specialties."

1. Hose-End Drain Valves: At low points in water mains, risers, and branches.

D. Install balancing valve in each hot-water circulation return branch and discharge side of each pump and circulator. Set balancing valves partly open to restrict but not stop flow. Comply with requirements in Division 22 Section "Domestic Water Piping Specialties" for balancing valves.

3.5 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment" for pipe hanger and support products and installation.

1. Vertical Piping: MSS Type 8 or 42, clamps.

2. Individual, Straight, Horizontal Piping Runs: MSS Type 1, adjustable, steel clevis hangers

3. Multiple, Straight, Horizontal Piping Runs: MSS SP-69 trapeze pipe hangers.

B. Support vertical piping and tubing at base and at each floor.

C. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.

D. Install coated hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.

2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.

3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.

4. NPS 2-1/2: 108 inches with 1/2-inch rod.

5. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.

6. NPS 6: 10 feet with 5/8-inch rod.

7. NPS 8: 10 feet with 3/4-inch rod.

E. Install supports for vertical copper tubing every 10 feet.

3.6 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment and machines to allow service and maintenance.

C. Connect domestic water piping to exterior water-service piping. Provide interior shutoff valve. Use transition fitting to join dissimilar piping materials.

3.7 IDENTIFICATION

A. Identify system components. Comply with requirements in Division 22 Section "Identification for Plumbing Piping and Equipment" for identification materials and installation.

3.8 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Piping Inspections:

1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.

2. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:

a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.

b. Final Inspection: Arrange final inspection for authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

3. Re-inspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for re-inspection.

4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

C. Piping Tests:

1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.

2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.

3. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.

4. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.

5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.

6. Prepare reports for tests and for corrective action required.

D. Domestic water piping will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.9 ADJUSTING

A. Perform the following adjustments before operation:

1. Close drain valves, hydrants, and hose bibbs.

2. Open shutoff valves to fully open position.

3. Open throttling valves to proper setting.

4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.

a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide flow of hot water in each branch.

b. Adjust calibrated balancing valves to flows indicated.

5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.

6. Remove and clean strainer screens. Close drain valves and replace drain plugs.

7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.

8. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.10 CLEANING AND DISINFECTION

A. Clean and disinfect potable and non-potable domestic water piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.

2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:

a. Flush piping system with clean, potable water until dirty water does not appear at outlets.

b. Fill and isolate system according to either of the following:

1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.

2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.

c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.

d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.

B. Prepare and submit reports of purging and disinfecting activities.

C. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.11 PIPING SCHEDULE

A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.

C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.

D. Under-building-slab, domestic water, building service piping, NPS 3 and smaller, shall be one of the following:

1. Soft copper tube, ASTM B 88, Type K; wrought-copper solder-joint fittings; and brazed joints.

2. Hard copper tube, ASTM B 88, Type K; wrought-copper solder-joint fittings; and brazed joints.

3. PVC, Schedule 40 pipe; PVC, Schedule 40 socket fittings; and solvent-cemented joints.

E. Aboveground domestic water piping, NPS 2 and smaller, shall be one of the following:

1. Hard copper tube, ASTM B 88, Type L wrought- copper solder-joint fittings; and soldered joints.

2. Hard copper tube, ASTM B 88, Type L copper pressure-seal-joint fittings; and pressure-sealed joints.

3. Hard copper tube, 2" size, ASTM B 88, Type L grooved-joint copper-tube appurtenances; and grooved joints.

END OF SECTION 22 11 16

SECTION 22 11 19 - DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following domestic water piping specialties:

1. Vacuum breakers.
2. Backflow preventers.
3. Strainers.
4. Drain valves.
5. Water hammer arresters.
6. Trap-seal primer valves.
7. Trap-seal primer systems.

1.3 QUALITY ASSURANCE

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

B. NSF Compliance:

1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components.
2. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9."

C. Backflow prevention devices shall be approved by the Cross Connection Control Committee of the AWWA for their respective size and application.

PART 2 - PRODUCTS

2.1 VACUUM BREAKERS

A. Pipe-Applied, Atmospheric-Type Vacuum Breakers:

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

    a. Ames Co.

    b. Cash Acme.

    c. FEBCO; SPX Valves & Controls.

    d. Rain Bird Corporation.

    e. Toro Company (The); Irrigation Div.

    f. Watts Industries, Inc.; Water Products Div.

    g. Zurn Plumbing Products Group; Wilkins Div.

2. Standard: ASSE 1001.

3. Size: NPS 1/4 to NPS 3 (DN 8 to DN 80), as required to match connected piping.

4. Body: Bronze.

5. Inlet and Outlet Connections: Threaded.

6. Finish: Chrome plated.

B. Hose-Connection Vacuum Breakers:

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

    a. Cash Acme.

    b. MIFAB, Inc.

    c. Watts Industries, Inc.; Water Products Div.

    d. Woodford Manufacturing Company.

    e. Zurn Plumbing Products Group; Light Commercial Operation.

    f. Zurn Plumbing Products Group; Wilkins Div.

2. Standard: ASSE 1011.

3. Body: Bronze, non-removable, with manual drain.

4. Outlet Connection: Garden-hose threaded complying with ASME B1.20.7.

5. Finish: Chrome or nickel plated.

C. Pressure Vacuum Breakers:

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

a. Ames Co.

b. FEBCO; SPX Valves & Controls.

c. Toro Company (The); Irrigation Div.

d. Watts Industries, Inc.; Water Products Div.

e. Zurn Plumbing Products Group; Wilkins Div.

2. Standard: ASSE 1020.

3. Operation: Continuous-pressure applications.

4. Pressure Loss: 5 psig (35 kPa) maximum, through middle 1/3 of flow range.

5. Size: NPS ½ to NPS 2

6. Accessories:

a. Valves: Ball type, on inlet and outlet.

D. Spill-Resistant Vacuum Breakers:

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

a. Watts Industries, Inc.; Water Products Div.

2. Standard: ASSE 1056.

3. Operation: Continuous-pressure applications.

4. Size: NPS 3/8 (DN 10) to NPS 1 (DN 25).

5. Accessories:

a. Valves: Ball type, on inlet and outlet.

2.2 BACKFLOW PREVENTERS

A. Intermediate Atmospheric-Vent Backflow Preventers:

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

    a. Cash Acme.

    b. FEBCO; SPX Valves & Controls.

    c. Watts Industries, Inc.; Water Products Div.

    d. Zurn Plumbing Products Group; Wilkins Div.

2. Standard: ASSE 1012.

3. Operation: Continuous-pressure applications.

4. Size: NPS 1/2 (DN 15) NPS 3/4 (DN 20).

5. Body: Bronze.

6. End Connections: Union, solder joint.

7. Finish: Rough bronze.

B. Reduced-Pressure-Principle Backflow Preventers:

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

    a. Ames Co.

    b. FEBCO; SPX Valves & Controls.

    c. Watts Industries, Inc.; Water Products Div.

    d. Zurn Plumbing Products Group; Wilkins Div.

2. Standard: ASSE 1013.

3. Operation: Continuous-pressure applications.

4. Pressure Loss: 12 psig (83 kPa) maximum, through middle 1/3 of flow range.

5. Size: NPS ¾ to NPS 10

6. Body: Bronze for NPS 2 (DN 50) and smaller; cast iron with interior lining complying with AWWA C550 or that is FDA approved for NPS 2-1/2 (DN 65) and larger.

7. End Connections: Threaded for NPS 2 (DN 50) and smaller; flanged for NPS 2-1/2 (DN 65) and larger.

8. Configuration: Designed for horizontal, straight through flow.

9. Accessories:

   a. Valves: Ball type with threaded ends on inlet and outlet of NPS 2 (DN 50) and smaller; outside screw and yoke gate-type with flanged ends on inlet and outlet of NPS 2-1/2 (DN 65) and larger.

   b. Air-Gap Fitting: ASME A112.1.2, matching backflow-preventer connection.

C. Beverage-Dispensing-Equipment Dual check Valve with Intermediate Vent Backflow Preventers:

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

   a. Watts Industries, Inc.; Water Products Div.

   b. Zurn Plumbing Products Group; Wilkins Div.

2. Standard: ASSE 1022.

3. Operation: Continuous-pressure applications.

4. Size: NPS 1/4 or NPS 3/8 (DN 8 or DN 10).

5. Body: Stainless steel.

6. End Connections: Threaded.

D. Beverage-Dispensing Equipment, Dual-Check-Valve Backflow Preventers:

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

   a. Cash Acme.

   b. Watts Industries, Inc.; Water Products Div.

2. Standard: ASSE 1032.

3. Operation: Continuous-pressure applications.

4. Size: NPS 1/4 or NPS 3/8 (DN 8 or DN 10).

5. Body: Stainless steel.

6. End Connections: Threaded.

E. Backflow-Preventer Test Kits:

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

    a. FEBCO; SPX Valves & Controls.

    b. Watts Industries, Inc.; Water Products Div.

    c. Zurn Plumbing Products Group; Wilkins Div.

2. Description: Factory calibrated, with gages, fittings, hoses, and carrying case with test-procedure instructions.

2.3 STRAINERS FOR DOMESTIC WATER PIPING

A. Y-Pattern Strainers:

1. Pressure Rating: 125 psig (860 kPa) minimum, unless otherwise indicated.

2. Body: Bronze for NPS 3 and smaller; cast iron for NPS 4 and larger.

3. End Connections: Threaded for NPS 3 and smaller;flanged for NPS 4 and larger.

4. Screen: Stainless steel with round perforations, unless otherwise indicated.

5. Perforation Size:

    a. Strainers NPS 3 and Smaller: 20 Mesh.

    b. Strainers NPS 4 and larger: 0.125 inch (3.18 mm).

6. Drain: Ball blowdown valve with hose end connection.

2.4 DRAIN VALVES

A. Ball-Valve-Type, Hose-End Drain Valves:

1. Standard: MSS SP-110 for standard-port, two-piece ball valves.

2. Pressure Rating: 400-psig (2760-kPa) minimum CWP.

3. Size: NPS 3/4 (DN 20).

4. Body: Copper alloy.

5. Ball: Chrome-plated brass.

6. Seats and Seals: Replaceable.

7. Handle: Vinyl-covered steel.

8. Inlet: Threaded or solder joint.

9. Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

B. Gate-Valve-Type, Hose-End Drain Valves:

1. Standard: MSS SP-80 for gate valves.

2. Pressure Rating: Class 125.

3. Size: NPS 3/4 (DN 20).

4. Body: ASTM B 62 bronze.

5. Inlet: NPS 3/4 (DN 20) threaded or solder joint.

6. Outlet: Garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

2.5 WATER HAMMER ARRESTERS

A. Water Hammer Arresters:

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

a. AMTROL, Inc.

b. Josam Company.

c. MIFAB, Inc.

d. PPP Inc.

e. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.

f. Watts Drainage Products Inc.

g. Zurn Plumbing Products Group; Specification Drainage Operation.

2. Standard: ASSE 1010 or PDI-WH 201.

3. Type: Metal bellows.

4. Size: ASSE 1010, Sizes AA and A through F or PDI-WH 201, Sizes A through F.

2.6 TRAP-SEAL PRIMER VALVES

A. Supply-Type, Trap-Seal Primer Valves:

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

   a. MIFAB, Inc.

   b. PPP Inc.

   c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.

   d. Watts Industries, Inc.; Water Products Div.

2. Standard: ASSE 1018.

3. Pressure Rating: 125 psig (860 kPa) minimum.

4. Body: Bronze.

5. Inlet and Outlet Connections: NPS 1/2 (DN 15) threaded, union, or solder joint.

6. Gravity Drain Outlet Connection: NPS 1/2 (DN 15) threaded or solder joint.

7. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.

B. Flush Valve Type, Vacuum Breaker Trap Primer:

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

   a. Sloan

   b. Zurn

2. One piece, chrome plated vacuum breaker flush connection assembly, with water diverter.

3. 3/8" chrome plated elbow and tube connection from vacuum breaker to wall.

4. Chrome plated wall flange and fittings to connect to ½" NPT pipe.

2.7 TRAP-SEAL PRIMER SYSTEMS

A. Trap-Seal Primer Systems:

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

a. PPP Inc.

2. Standard: ASSE 1044,

3. Piping Connection: NPS 3/4, ASTM B 88, Type L (DN 20, ASTM B 88M, Type B); copper, water tubing.

4. Cabinet: Recessed or Surface-mounting as indicated, steel box with stainless-steel cover.

5. Electric Controls: 24-hour timer, solenoid valve, and manual switch for 120-V ac power.

6. Vacuum Breaker: ASSE 1001.

7. Number Outlets: 4 thru 30

8. Size Outlets: NPS 1/2 (DN 15).

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

A. Refer to Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.

3.2 BACKFLOW PREVENTER INSTALLATION

A. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with authorities having jurisdiction.

1. Install backflow preventers a maximum of 5 feet above the floor, with adequate front and rear clearance for testing purposes, unless otherwise required by the authority having jurisdiction.

2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe to floor drain. Locate air-gap device attached to or under backflow preventer.

3. Test each backflow preventer according to authorities having jurisdiction and the device's reference standard.

3.3 STRAINER INSTALLATION

A. Install Y-pattern strainers in locations as indicated and as follows:

1. On upstream side of each water pressure-reducing valve.

2. On upstream side of each reduced pressure or double check valve assembly backflow preventer.

B. Install blowdown valve with hose end connection on each Y-strainer.

3.4 WATER HAMMER ARRESTER INSTALLATION

A. Install water hammer arresters in locations as indicated and at all quick closing and solenoid valves in water piping according to PDI-WH 201.

3.5 TRAP PRIMER INSTALLATION

A. Install supply-type, trap-seal primer valves or flush valve type vacuum breaker trap primers for all floor drains, with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.

B. Install trap primer valves in accessible locations. Where necessary to conceal in wall, install trap primer valves behind key operated, locking access panel.

C. Connect trap primer valves to nearest commonly utilized cold water line.

D. Provide shutoff valve for each trap primer valve.

END OF SECTION 22 11 19

SECTION 22 13 16 - SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following for soil, waste, and vent piping inside the building:

1. Pipe, tube, and fittings.

2. Special pipe fittings.

3. Piping Application Schedule.

1.3 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic.

B. EPDM: Ethylene-propylene-diene terpolymer rubber.

C. LLDPE: Linear, low-density polyethylene plastic.

D. NBR: Acrylonitrile-butadiene rubber.

E. PE: Polyethylene plastic.

F. PVC: Polyvinyl chloride plastic.

G. TPE: Thermoplastic elastomer.

1.4 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.

2.2 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 74, Service class.

B. Gaskets: ASTM C 564, rubber.

C. Calking Materials: ASTM B 29, pure lead and oakum or hemp fiber.

2.3 HUBLESS CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 888 or CISPI 301.

B. Shielded Couplings: ASTM C 1277 assembly of metal shield or housing, corrosion-resistant fasteners, and rubber sleeve with integral, center pipe stop.

1. Standard, Shielded, Stainless-Steel Couplings: CISPI 310, with stainless-steel corrugated shield; stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve.

a. Manufacturers: Subject to requirements provide products by one of the following:

1) ANACO.

2) Fernco, Inc.

3) Ideal Div.; Stant Corp.

4) Mission Rubber Co.

5) Tyler Pipe; Soil Pipe Div.

2. Heavy-Duty, Shielded, Stainless-Steel Couplings: With stainless-steel shield, stainless-steel bands and tightening devices, and ASTM C 564, rubber sleeve.

a. Manufacturers: Subject to requirements provide products by one of the following:

1) ANACO.

2) Clamp-All Corp.

3) Ideal Div.; Stant Corp.

4) Mission Rubber Co.

5) Tyler Pipe; Soil Pipe Div.

3. Heavy-Duty, Shielded, Cast-Iron Couplings: ASTM A 48/A 48M, two-piece, cast-iron housing; stainless-steel bolts and nuts; and ASTM C 564, rubber sleeve.

a. Manufacturers: Subject to requirements provide products by one of the following:

1) MG Piping Products Co.

2.4 STEEL PIPE AND FITTINGS

A. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade A or B, Standard Weight or Schedule 40, galvanized. Include ends matching joining method.

B. Drainage Fittings: ASME B16.12, galvanized, threaded, cast-iron drainage pattern.

C. Pressure Fittings:

D. Fittings and couplings in paragraph and subparagraphs below are available in NPS 3/4 to NPS 24 (DN 20 to DN 600).

E. Grooved-Joint Systems:

1. Manufacturers: Subject to requirements provide products by one of the following:

a. Anvil International.

b. Star Pipe Products; Star Fittings Div.

c. Victaulic Company.

d. Ward Manufacturing, Inc.

2. Grooved-End, Steel-Piping Fittings: ASTM A 47/A 47M, galvanized, malleable-iron casting; ASTM A 106, galvanized-steel pipe; or ASTM A 536, galvanized, ductile-iron casting; with dimensions matching steel pipe.

3. Grooved-End, Steel-Piping Couplings: AWWA C606, for steel-pipe dimensions. Include ferrous housing sections, gasket suitable for water, and bolts and nuts.

2.5 COPPER TUBE AND FITTINGS

A. Copper DWV Tube: ASTM B 306, drainage tube, drawn temper.

1. Copper Drainage Fittings: ASME B16.23, cast copper or ASME B16.29, wrought copper, solder-joint fittings.

B. Hard Copper Tube: ASTM B 88, Types L and M, water tube, drawn temper.

1. Copper Pressure Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.

2. Copper Flanges: ASME B16.24, Class 150, cast copper with solder-joint end.

3. Copper Unions: MSS SP-123, copper-alloy, hexagonal-stock body with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.

2.6 ABS PIPE AND FITTINGS

A. Solid-Wall ABS Pipe: ASTM D 2661, Schedule 40.

B. ABS Socket Fittings: ASTM D 2661, made to ASTM D 3311, drain, waste, and vent patterns.

C. Solvent Cement and Adhesive Primer:

1. Use ABS solvent cement that has a VOC content of 325 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Use adhesive primer that has a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.7 SPECIAL PIPE FITTINGS

A. Flexible, Nonpressure Pipe Couplings: Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition pattern. Include shear ring, ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

1. Manufacturers: Subject to requirements provide products by one of the following:

a. Dallas Specialty & Mfg. Co.

b. Fernco, Inc.

c. Logan Clay Products Company (The).

d. Mission Rubber Co.

e. NDS, Inc.

f. Plastic Oddities, Inc.

2. Sleeve Materials:

a. For Cast-Iron Soil Pipes: ASTM C 564, rubber.

b. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.

c. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

B. Shielded Non-pressure Pipe Couplings: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.

1. Manufacturers: Subject to requirements provide products by one of the following:

a. Cascade Waterworks Mfg. Co.

b. Mission Rubber Co.

C. Rigid, Unshielded, Non-pressure Pipe Couplings: ASTM C 1461, sleeve-type reducing- or transition-type mechanical coupling molded from ASTM C 1440, TPE material with corrosion-resistant-metal tension band and tightening mechanism on each end.

1. Manufacturers: Subject to requirements provide products by one of the following:

a. ANACO.

D. Pressure Pipe Couplings: AWWA C219 metal, sleeve-type same size as, with pressure rating at least equal to, and ends compatible with, pipes to be joined.

1. Manufacturers: Subject to requirements provide products by one of the following:

a. Cascade Waterworks Mfg. Co.

b. Dresser, Inc.; DMD Div.

c. EBAA Iron Sales, Inc.

d. Ford Meter Box Company, Inc. (The); Pipe Products Div.

e. JCM Industries, Inc.

f. Romac Industries, Inc.

g. Smith-Blair, Inc.

h. Viking Johnson.

2. Center-Sleeve Material: Manufacturer's standard.

3. Gasket Material: Natural or synthetic rubber.

4. Metal Component Finish: Corrosion-resistant coating or material.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Provide all excavation, backfill and bedding as required for the work. Refer to Division 31 Section "Earth Moving" for excavating, trenching, and backfilling.

3.2 PIPING APPLICATION SCHEDULE

A. Flanges and unions may be used on aboveground pressure piping, unless otherwise indicated.

B. Aboveground, soil and waste piping NPS 4 and smaller shall be any of the following:

1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.

2. Hubless cast-iron soil pipe and fittings standard, shielded, stainless-steel couplings; and hubless-coupling joints.

3. Steel pipe, drainage fittings, and threaded joints.

4. Copper DWV tube, copper drainage fittings, and soldered joints.

C. Aboveground, soil and waste piping NPS 5 and larger shall be any of the following:

1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.

2. Hubless cast-iron soil pipe and fittings; standard, shielded, stainless-steel couplings; and hubless-coupling joints.

3. Steel pipe, drainage fittings, and threaded joints.

D. Aboveground, vent piping NPS 4 and smaller shall be any of the following:

1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.

2. Hubless cast-iron soil pipe and fittings; standard, shielded, stainless-steel couplings; and hubless-coupling joints.

3. Steel pipe, drainage fittings, and threaded joints.

4. Copper DWV tube, copper drainage fittings, and soldered joints.

E. Aboveground, vent piping NPS 5 and larger shall be any of the following:

1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.

2. Hubless cast-iron soil pipe and fittings; standard, shielded, stainless-steel couplings; and hubless-coupling joints.

3. Steel pipe, drainage fittings, and threaded joints.

F. Underground, soil, waste, and vent piping NPS 4 and smaller shall be any of the following:

1. [Extra-Heavy] [Service] class, cast-iron soil piping; gaskets; and gasketed joints.

2. Hubless cast-iron soil pipe and fittings; [standard, shielded, stainless-steel] [heavy-duty shielded, stainless-steel] [heavy-duty shielded, cast-iron] [and] [rigid, unshielded] couplings; and hubless-coupling joints.

3. Solid wall ABS pipe, ABS socket fittings, and solvent-cemented joints.

G. Underground, soil and waste piping NPS 5 and larger shall be any of the following:

1. Extra-Heavy class, cast-iron soil piping; [gaskets; and gasketed] joints.

2. Hubless cast-iron soil pipe and fittings;[heavy-duty shielded, stainless-steel and heavy-duty shielded, cast-iron couplings; and hubless-coupling joints.

3. Solid wall ABS pipe, ABS socket fittings, and solvent-cemented joints.

H. Aboveground sanitary-sewage force mains NPS 1-1/2 and NPS 2 shall be any of the following:

1. Hard copper tube, Type L copper pressure fittings; and soldered joints.

2. Steel pipe, pressure fittings, and threaded joints.

I. Aboveground sanitary-sewage force mains NPS 2-1/2 to NPS 6 shall be any of the following:

1. Hard copper tube, Type L; copper pressure fittings; and soldered joints.

2. Steel pipe, pressure fittings, and threaded joints.

3. Grooved-end steel pipe, grooved-joint system fittings and couplings, and grooved joints.

J. Underground sanitary-sewage force mains NPS 4 and smaller shall be any of the following:

1. Hard copper tube, Type L; wrought-copper pressure fittings; and brazed joints.

2. Steel pipe, pressure fittings, and threaded joints.

K. Underground sanitary-sewage force mains NPS 5 and larger shall be any of the following:

1. Steel pipe, pressure fittings, and threaded joints.

3.3 PIPING INSTALLATION

A. Basic piping installation requirements are specified in Division 22 Section "Common Work Results for Plumbing."

B. Install seismic restraints on piping, where required. Seismic-restraint devices are specified in Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment."

C. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.

D. Install cleanout fitting with closure plug inside the building in sanitary force-main piping.

E. Install underground, steel, force-main piping.

F. Install underground, copper, force-main tubing according to CDA's "Copper Tube Handbook."

G. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

H. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

I. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.

J. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:

1. Horizontal Sanitary Drainage Piping:: 2 percent (1/4”/ft) downward in direction of flow for piping NPS 3 and smaller; 2 percent (1/4”/ft)downward in direction of flow for piping NPS 4 and larger, unless specifically indicated otherwise. If specifically indicated otherwise, slope no less than 1 percent (1/8”/ft) downward in direction of flow.

2. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.

K. Install ABS soil and waste drainage and vent piping according to ASTM D 2661.

L. Install underground ABS soil and waste drainage piping according to ASTM D 2321.

M. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

3.4 JOINT CONSTRUCTION

A. Basic piping joint construction requirements are specified in Division 22 Section "Common Work Results for Plumbing."

B. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.

C. Join hub-and-spigot, cast-iron soil piping with calked joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead and oakum calked joints.

D. Join hubless cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-coupling joints.

E. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.

F. Grooved Joints: Assemble joint with keyed coupling, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.

3.5 VALVE INSTALLATION

A. Backwater Valves: Install backwater valves in piping subject to sewage backflow.

1. Horizontal Piping: Horizontal backwater valves. Use normally closed type, unless otherwise indicated.

2. Floor Drains: Drain outlet backwater valves, unless drain has integral backwater valve.

3. Install backwater valves in accessible locations.

4. Backwater valve are specified in Division 22 Section "Sanitary Waste Piping Specialties."

3.6 HANGER AND SUPPORT INSTALLATION

A. Seismic-restraint devices are specified in Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment."

B. Pipe hangers and supports are specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment." Install the following:

1. Vertical Piping: MSS Type 8 or Type 42, clamps.

2. Install individual, straight, horizontal piping runs according to the following:

a. MSS Type 1, adjustable, steel clevis hangers.

3. Multiple, Straight, Horizontal Piping Runs: MSS P-69 trapeze hangers.

C. Install supports according to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."

D. Support vertical piping and tubing at base and at each floor.

E. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch minimum rods.

F. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
2. NPS 3: 60 inches with 1/2-inch rod.
3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
4. NPS 6: 60 inches with 3/4-inch rod.
5. NPS 8 to NPS 12: 60 inches with 7/8-inch rod.

G. Install supports for vertical cast-iron soil piping every 15 feet.

H. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/4: 84 inches with 3/8-inch rod.
2. NPS 1-1/2: 108 inches with 3/8-inch rod.
3. NPS 2: 10 feet with 3/8-inch rod.
4. NPS 2-1/2: 11 feet with 1/2-inch rod.
5. NPS 3: 12 feet with 1/2-inch rod.
6. NPS 4 and NPS 5: 12 feet with 5/8-inch rod.
7. NPS 6: 12 feet with 3/4-inch rod.
8. NPS 8 to NPS 12: 12 feet with 7/8-inch rod.

I. Install supports for vertical steel piping every 15 feet.

J. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/4: 72 inches with 3/8-inch rod.
2. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
3. NPS 2-1/2: 108 inches with 1/2-inch rod.
4. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.
5. NPS 6: 10 feet with 5/8-inch rod.
6. NPS 8: 10 feet with 3/4-inch rod.

K. Install supports for vertical copper tubing every 10 feet.

L. Install hangers for ABS piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/2 and NPS 2: 48 inches with 3/8-inch rod.

2. NPS 3: 48 inches with 1/2-inch rod.

3. NPS 4 and 5: 48 inches with 5/8-inch rod.

4. NPS 6: 48 inches with 3/4-inch rod.

5. NPS 8 to NPS 12: 48 inches with 7/8-inch rod.

M. Install supports for vertical ABS piping every 48 inches.

N. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.7 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.

C. Connect drainage and vent piping to all equipment and fixtures requiring drainage and vent piping.

3.8 TESTING AND INSPECTION

A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.

1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.

2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

B. Re-inspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for re-inspection.

C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, as a minimum, as indicated in the Uniform Plumbing Code.

1. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.

2. Prepare reports for tests and required corrective action.

E. Test force-main piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:

1. Leave uncovered and unconcealed new, altered, extended, or replaced force-main piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.

2. Cap and subject piping to static-water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.

3. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.

4. Prepare reports for tests and required corrective action.

3.9 CLEANING

A. Clean interior of piping. Remove dirt and debris as work progresses.

B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.10 PROTECTION

A. Exposed ABS Piping: Protect plumbing vents exposed to sunlight with two coats of water-based latex paint.

END OF SECTION 22 13 16

SECTION 22 13 19 - SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following sanitary drainage piping specialties:

1. Cleanouts.
2. Floor drains.
3. Roof Flashing Assemblies
4. Miscellaneous sanitary drainage piping specialties.
5. Flashing materials.

1.3 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic.

B. FRP: Fiberglass-reinforced plastic.

C. HDPE: High-density polyethylene plastic.

D. PE: Polyethylene plastic.

E. PP: Polypropylene plastic.

F. PVC: Polyvinyl chloride plastic.

1.4 COORDINATION

A. Coordinate size and location of building penetrations.

PART 2 - PRODUCTS

2.1 CLEANOUTS

A. Cleanouts for Copper DWV and Steel Piping:

1. For exposed above grade piping, provide manufacturer's standard cleanout of material suitable for piping system being utilized.

2. For concealed above grade piping, provide manufacturer's standard cleanout or cleanout tee of material suitable for piping system being utilized. Closure plugs shall be drilled and tapped to accept round, flat, stainless steel cover plate, with screw.

B. Cleanouts for ABS Below Grade Piping:

1. Cleanouts utilized shall be cast iron floor cleanouts with adapters to connect to piping system being utilized.

C. Exposed Cast Iron Cleanouts:

1. Basis-of-Design Product: Subject to compliance with requirements, provide J. R. Smith Series 4420C (spigot ferrule) or 4512S (cleanout tee) or a comparable product by one of the following:

   a. Josam Company; Josam Div.

   b. MIFAB, Inc.

   c. Tyler Pipe; Wade Div.

   d. Watts Drainage Products Inc.

   e. Zurn Plumbing Products Group

2. Standard: ASME A112.36.2M.

3. Size: Same as connected drainage piping

4. Body Material: Hub-and-spigot, cast-iron soil pipe or Hubless, cast-iron soil pipe spigot ferrule of cleanout tee as required to match connected piping.

5. Closure: Countersunk, cast bronze, taper thread plug.

6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.

D. Cast Iron Floor Cleanouts:

1. Basis-of-Design Product: Subject to compliance with requirements, provide J. R. Smith Series 4020/4031/4025 or a comparable product by one of the following:

   a. Josam Company; Josam Div.

   b. MIFAB

   c. Tyler Pipe; Wade Div.

   d. Watts Drainage Products Inc.

   e. Zurn Plumbing Products Group

2. Standard: ASME A112.36.2M for threaded, adjustable housing cleanout.

3. Size: Same as connected branch.

4. Type: Threaded, adjustable housing.

5. Body or Ferrule: Cast iron.

6. Outlet Connection: Inside calk, No hub or Speedi- set.

7. Closure: Slotted Cast-iron plug, gasket seal or taper thread.

8. Adjustable Housing Material: Cast iron with threads.

9. Frame and Cover Material and Finish: Nickel-bronze, copper alloy in finished areas, cast iron in unfinished areas.

10. Frame and Cover Shape: Round unless otherwise indicated.

11. Top Loading Classification: Medium Duty.

12. Riser: ASTM A 74, Service class, cast-iron drainage pipe fitting and riser to cleanout.

E. Cast-Iron Wall Cleanouts:

1. Basis-of-Design Product: Subject to compliance with requirements, provide J.R. Smith Series 4422C (spigot ferrule) or Series 4532S (Cleanout tee) or a comparable product by one of the following:

   a. Josam Company; Josam Div.

   b. MIFAB, Inc.

   c. Tyler Pipe; Wade Div.

   d. Watts Drainage Products Inc.

   e. Zurn Plumbing Products Group

2. Standard: ASME A112.36.2M. Include wall access.

3. Size: Same as connected drainage piping.

4. Body: Hub-and-spigot, or no hub cast-iron soil pipe spigot ferrule or cleanout tee as required to match connected piping.

5. Closure: Countersunk, cast bronze plug, drilled and threaded.

6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.

7. Wall Access: Round, flat, stainless-steel cover plate with screw.

2.2 FLOOR DRAINS

A. Cast-Iron Floor Drains:

1. Basis-of-Design Product: Subject to compliance with requirements, provide J.R. Smith floor drains with features and accessories as scheduled on the Drawings or a comparable product by one of the following:

a. Josam Company; Josam Div.

b. MIFAB, Inc.

c. Tyler Pipe; Wade Div.

d. Watts Drainage Products Inc.

e. Zurn Plumbing Products Group

2. Standard: ASME A112.6.3.

2.3 AIR-ADMITTANCE VALVES

A. Fixture Air-Admittance Valves:

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

a. Oatey.

b. ProSet Systems Inc.

c. Studor, Inc.

2. Standard: ASSE 1051, Type A for single fixture or Type B for branch piping.

3. Housing: Plastic.

4. Operation: Mechanical sealing diaphragm.

5. Size: Same as connected fixture or branch vent piping.

B. Stack Air-Admittance Valves:

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

a. ProSet Systems Inc

b. Oatey.

c. Studor, Inc.

2. Standard: ASSE 1050 for vent stacks.

3. Housing: Plastic.

4. Operation: Mechanical sealing diaphragm.

5. Size: Same as connected stack vent or vent stack.

2.4 ROOF FLASHING ASSEMBLIES

A. Roof Flashing Assemblies:

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

a. Acorn Engineering Company; Elmdor/Stoneman Div.

b. Thaler Metal Industries Ltd.

B. Description: Manufactured assembly made of 4.0-lb/sq. ft., 0.0625-inch- thick, lead flashing collar and skirt extending at least 10 inches from pipe, with galvanized-steel boot reinforcement and counterflashing fitting.

2.5 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

A. Open Hub Drains:

1. Description: Shop or field fabricate from ASTM A 74, Service class, hub-and-spigot, or no-hub cast-iron, soil-pipe fittings. Include P-trap, riser section; and where required, increaser fitting.

2. Size: Same as connected waste piping with increaser fitting of size indicated.

3. Provide factory fabricated cast iron, auxiliary inlet fitting with NPS 1/2 trap primer inlet.

B. Auxilliary Inlet Fittings:

1. Description: Factory fabricated, cast iron, auxiliary inlet fitting with threaded inlet and threaded or spigot outlet, and integral NPS ½ side trap-seal primer valve connection.

2. Size: Same as drain outlet.

C. Air-Gap Fittings:

1. Standard: ASME A112.1.2, for fitting designed to ensure fixed, positive air gap between installed inlet and outlet piping.

2. Body: Bronze or cast iron.

3. Inlet: Opening in top of body.

4. Outlet: Larger than inlet.

5. Size: Same as connected waste piping and with inlet large enough for associated indirect waste piping.

2.6 FLASHING MATERIALS

A. Lead Sheet: ASTM B 749, Type L51121, copper bearing, with the following minimum weights and thicknesses, unless otherwise indicated:

1. General Use: 4.0-lb/sq. ft., 0.0625-inch thickness.

2. Vent Pipe Flashing: 3.0-lb/sq. ft., 0.0469-inch thickness.

B. Copper Sheet: ASTM B 152/B 152M, of the following minimum weights and thicknesses, unless otherwise indicated:

1. General Applications: 12 oz./sq. ft..

2. Vent Pipe Flashing: 8 oz./sq. ft..

C. Solder: ASTM B 32, lead-free alloy.

PART 3 - EXECUTION

3.1 CLEANOUT INSTALLATION

A. Install cleanouts in aboveground piping and building drain piping where indicated and according to the following, unless otherwise indicated:

1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.

2. Locate at each change in direction of piping greater than 45 degrees.

3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.

4. Locate at base of each vertical soil and waste stack.

B. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.

C. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

3.2 FLOOR DRAIN INSTALLATION

1. Install in locations as indicated on drawings.

2. Provide grates as scheduled and adjust as required for level installation with finished floor.

3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.

4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.

5. Provide trap primer connection for all floor drains unless otherwise indicated

3.3 AIR ADMITTANCE VALVE INSTALLATION

A. Install fixture air-admittance valves on fixture drain piping only where indicated on drawings.

B. Install stack air-admittance valves at top of stack vent and vent stack piping only where indicated on drawings.

C. Install air-admittance-valves in wall boxes recessed in wall, where indicated.

3.4 AIR GAP FITTING INSTALLATION

A. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.

3.5 FLASHING INSTALLATION

A. Vent Flashing: Install flashing on all pipes penetrating roof assembly. Flash with copper or lead sheets which extend a minimum of 10" in all directions from the pipe and extend up pipe at least 6" above the roof membrane. Make watertight with counterflashing pipe fitting.

B. Floor Drain Flashing: Install flashings for all floor drains not located on slab on grade. Flash with lead or copper sheet flashing clamped to drain flashing ring, and extending a minimum of 10" beyond flashing ring in all directions. Apply mastic to sheet flashing.

3.6 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 22 13 19

SECTION 22 33 00 - ELECTRIC DOMESTIC WATER HEATERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following electric water heaters:

1. Point of Use, storage electric water heaters.

2. Domestic Hot Water Compression tanks.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain same type of electric water heaters through one source from a single manufacturer, wherever possible.

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

C. ASHRAE/IESNA 90.1-2004 Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004.

D. ASME Compliance: Where indicated, fabricate and label commercial water heater storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

E. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9," for all components that will be in contact with potable water.

1.4 WARRANTY

A. Warranty Period(s): From date of Substantial Completion:

1. Commercial Electric Water Heaters: Six (6) year Limited Warranty on entire unit and 2 Year Limited Warranty on parts.

PART 2 - PRODUCTS

2.1 POINT OF USE ELECTRIC WATER HEATERS

A. Commercial, Storage Electric Water Heaters: Comply with UL 1453 and UL/NSF005.

1. Manufacturers: Subject to compliance with requirements, provide product by manufacturer as scheduled on the drawings or a comparable product by one of the following:

    a. Eemax
    b. Bosch
    c. Bradford White Corporation.
    d. Lochinvar Corporation.
    e. Rheem Water Heater Div.; Rheem Manufacturing Company.
    f. Ruud Water Heater Div.; Rheem Manufacturing Company.
    g. Smith, A. O. Water Products Company.
    h. State Industries, Inc.

2. Certifications:

    a. The electric mini-tank water heaters shall be UL listed for the US and UPC certified.

3. Construction:

    a. Water heater shall be electrically powered with compact mini-tank design for point-of-use operation and an efficiency rating of 98%. Tank shall be glass-lined and insulated for thermal retention. Unit shall be protected by a tough plastic housing. Tank shall be rated for maximum working pressure not less than 150 psig. Water heater shall be equipped with a pressure relief valve and a magnesium anode rod for protection against tank corrosion. Water connections for inlet and outlet shall be ½" NPT male.

4. Controls:

    a. The controls shall be a wired thermostat with temperature selector and a high temperature safety cut-out. A red light shall indicate when the unit is powering the heating element.

2.2 DOMESTIC HOT WATER COMPRESSION TANKS

A. Description: Steel, ASME, pressure-rated tank constructed with welded joints and factory-installed butyl-rubber diaphragm. Include air pre-charge to minimum system-operating pressure at tank.

1. Manufacturers: Subject to compliance with requirements, provide product by manufacturer as scheduled or noted on the drawings or a comparable product by one of the following:

    a. AMTROL Inc.

    b. Armstrong Pumps, Inc.

    c. Honeywell Sparco.

d. Smith, A. O.; Aqua-Air Div.

e. State Industries, Inc.

f. Taco, Inc.

g. Watts Regulator Co.

h. Wessels Co.

2. Construction:

a. ASME for 150 psig working pressure.

b. Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1, pipe thread.

c. Interior Finish: Comply with NSF 61 barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.

d. Air-Charging Valve: Factory installed.

e. Steel legs or integral ring mount base for vertical installation, where noted or scheduled.

PART 3 - EXECUTION

3.1 WATER HEATER INSTALLATION

A. Wall mount, Point of Use, electric water heaters directly behind the sink they serve.

B. Install water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.

C. Install combination temperature and pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain or other termination point as indicated..

D. Seismically strap or secure the water heater to meet local seismic requirements.

E. Fill water heaters with water.

F. Install heat traps on both the cold water inlet and hot water discharge.

G. Charge domestic hot water compression tanks with air.

3.2 FIELD QUALITY CONTROL

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

1. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.

2. Operational Test: After electrical circuitry has been energized, confirm proper operation.

3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

4. Set water heater thermostats for supply hot water temperature as required.

B. Remove and replace water heaters that do not pass tests and inspections and retest as specified above.

END OF SECTION 22 33 00

SECTION 22 40 00 - PLUMBING FIXTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following plumbing fixtures and trim:

1. Plumbing fixtures and trim as scheduled on the drawings

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain plumbing fixtures, faucets, and other components of a specific type, through one source from a single manufacturer, wherever possible..

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

C. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; for plumbing fixtures for people with disabilities.

D. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.

E. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible. Provide fixtures complete with fittings, supports, fastening devices, faucets, valves, traps and appurtenances required.

F. Provide vitreous ware of non-absorbent china of even color and unmarked.

G. Provide porcelain lined ware constructed of smooth, sound iron castings, properly finished and provided with first quality high temperature enamel.

H. Provide fittings, trim and escutcheons of heavy brass castings, properly finished and chrome plated.

I. Warranty all fixtures not to craze, color or scale.

PART 2 - PRODUCTS

2.1 STAINLESS STEEL, HIGH ABUSE FIXTURES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product by manufacturer as scheduled on the drawings, or a comparable product by one of the following:

1. Metcraft
2. Elkay
3. Just
4. Dayton

B. Minimum 18-gauge stainless steel, unless noted otherwise.

2.2 MANUAL FAUCETS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product by manufacturer as scheduled on the drawings, or a comparable product by one of the following:

1. Chicago Faucet
2. American Standard
3. Kohler
4. Elkay
5. Just
6. Moen
7. Powers
8. Symmons
9. Delta
10. T&S Brass

2.3 MANUAL AND INFRARED FLUSH VALVES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product by manufacturer as scheduled on the drawings, or a comparable product by one of the following:

1. Zurn

2. Sloan

2.4 WASTES AND SUPPLIES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product by manufacturer as scheduled on the drawings, or a comparable product by one of the following:

1. American Standard
2. Kohler
3. Elkay
4. Just
5. McGuire
6. Speedway
7. Dearborn Brass

2.5 NON-REFRIGERATED DRINKING FOUNTAIN

A. Basis-of-Design Product: Subject to compliance with requirements, provide product by manufacturer as scheduled on the drawings, or a comparable product by one of the following:

1. Elkay
2. Halsey Taylor
3. Haws Corporation
4. Oasis

2.6 FIXTURE CARRIERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product by manufacturer as scheduled on the drawings, or a comparable product by one of the following:

1. J.R. Smith
2. Zurn
3. Josam
4. Wade
5. Mifab

6. Watts Drainage

B. Determine from drawings, required hand and type.

2.7 TOILET SEATS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product by manufacturer as scheduled on the drawings, or a comparable product by one of the following:

1. Olsonite
2. Church
3. Kohler
4. Beneke
5. Bemis

2.8 UNDER SINK PIPING COVERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product by manufacturer as scheduled on the drawings, or a comparable product by one of the following:

1. ProFlo
2. Truebro
3. Plumberex

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before plumbing fixture installation.

B. Examine cabinets, counters, floors, and walls for suitable conditions where fixtures will be installed.

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

3.2 INSTALLATION

A. Assemble plumbing fixtures, trim, fittings, and other components according to manufacturers' written instructions. Set fixtures and connect to soil, waste, vent and water supplies in neat, finished, uniform manner.

B. Install carrier supports, affixed to building substrate, for wall-mounting fixtures. Select carriers as recommended by fixture manufacturer.

C. Install counter-mounting fixtures in and attached to casework. Cut counter tops in casework for installation of counter mounted fixtures. Retain qualified and experienced personnel for cutting counter tops in casework.

D. Install fixtures level and plumb according to roughing-in drawings. Install fixtures at height and location as indicated on the Architectural drawings, or as directed by the Architect.

E. Install flushometer valves for ADA accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.

F. Install tanks for ADA accessible, tank-type water closets with lever handle mounted on wide side of compartment.

G. Install under-sink piping covers for exposed waste piping and hot water risers and stops at ADA accessible sinks and lavatories.

H. Install escutcheons at piping wall penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding fittings.

I. Seal joints between fixtures and walls, floors, and countertops using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color.

3.3 FIELD QUALITY CONTROL

A. Verify that installed plumbing fixtures are categories and types specified for locations where installed.

B. Check that plumbing fixtures are complete with trim, faucets, fittings, and other specified components.

C. Inspect installed plumbing fixtures for damage. Replace damaged fixtures and components.

D. Test installed fixtures after water systems are pressurized for proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.

E. Install fresh batteries in sensor-operated mechanisms.

3.4 ADJUSTING

A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.

B. Adjust water pressure at fixtures to produce proper flow and stream.

C. Replace washers and seals of leaking and dripping faucets and stops.

3.5 CLEANING

A. Clean fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials. Do the following:

1. Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.

2. Remove sediment and debris from drains.

B. After completing installation of exposed, factory-finished fixtures, faucets, and fittings, inspect exposed finishes and repair damaged finishes.

3.6 PROTECTION

A. Provide protective covering for installed fixtures and fittings.

B. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION 22 40 00

SECTION 23 05 00 - COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. General Requirements

2. Equipment Installation Common Requirements.

3. Supports and Anchorages.

1.3 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

F. "Engineer" shall mean "the Mechanical Engineer."

1.4 PRODUCT SELECTION PROCEDURES

A. Where the specifications list one or more manufacturers, provide product by one of the named manufacturers on the list that complies with specification requirements.

B. Other manufacturers of products which may meet the specification requirements, but are not listed in the specifications will be considered, subject to prior approval. Submit one copy of a prior approval request to the Engineer, listing all pertinent product information indicating compliance with the specifications requirements. Prior approval requests must be received by the Engineer at least 7 days prior to the project bid date. A

list of products given prior approval will be listed by Addendum to the project. Manufacturers that have not received prior approval will not be considered.

1.5 SUBMITTALS

A. In addition to the requirements of the General Conditions, comply with the following:

1. Provide submittal data for each product required by the specifications. All material and equipment required by the specifications shall be approved by the Engineer and Architect before being released for shipment.

2. Preparation:

a. Clearly mark each copy of the submittals to identify pertinent products or models. Indicate material or equipment by reference to specification section number, schedule designation on the Contract Documents, or by reference to Sheet or detail on the Contract Documents.

b. Show performance characteristics and capacities

c. Show dimensions and clearances required.

d. Show wiring, piping and control diagrams

3. Manufacturer's standard schematic drawings and diagrams:

a. Modify drawings and diagrams to delete information which is not applicable to the work.

b. Supplement standard information to provide information specifically applicable to the work.

4. Submission:

a. Provide number of product submittals as required by General Condtions 4.03.

B. Contractor responsibilities:

1. Review shop drawings, product data and samples prior to submission.

2. Determine and verify:

a. Field measurements

b. Field construction criteria

c. Catalog numbers and similar data

d. Conformance with specifications

3. Coordinate each submittal with requirements of the work and of the Contract Documents.

4. Notify the Architect in writing, at the time of submission, of any deviations in the submittals from requirements of the Contract Documents.

5. Begin no fabrication or work which requires submittals until return of submittals with Architect acceptance.

C. Submittals shall contain:

1. The date of submission and the dates of any previous submissions.

2. The project title and number

3. The contract identification

4. The names of:

a. Contractor

b. Supplier

c. Manufacturer

D. Provide on submittals, contractor's stamp, initialed or signed, certifying review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of the Contract Documents.

E. Materials or equipment without prior approval will not be acceptable.

F. Resubmission requirements:

1. Submittals which require resubmission shall be returned to the contractor with corrections noted thereon.

2. Make any corrections or changes in the submittals and resubmit.

1.6 SUBSTITUTIONS

A. Comply with the requirements of the Section 01 25 00.

B. When Architect accepts substitution, it is with the understanding that the person who is requesting the substitution be made, guarantees that the substituted article or material is equal to or better than the one specified. Also, the person requesting the substitution, shall pay for any tests made to determine quality of an item/substitution. Also, cost of any redesigning and excessive submittal review caused by substitution shall be borne by person requesting the substitution.

C. Substitutions that require alteration or changes in other trade and any additional costs occurred therein, shall be the responsibility of the person making the request for the substitution.

1.7 SUPERVISION

A. Contractor shall have in charge of the work at all times, a thoroughly competent superintendent with considerable experience in this work. Any superintendent judged not competent by the Architect shall be removed at once upon the request of the Architect and be replaced by an approved superintendent.

1.8 SCHEDULE OF VALUES

A. In addition to the requirements of the General Conditions, submit a Schedule of Values for the work of Division 23 per the following categories (material and labor cost shall be listed separately for each item):

1. Mobilization, detailing and engineering
2. Permits and Charges
3. Ductwork:
    a. Field Fabricated Ductwork and Plenums
    b. Spiral Ductwork
    c. Ductwork Accessories
4. HVAC Equipment:
    a. Electric Ceiling Heaters
    b. Powered Ventilators (Exhaust Fans)
5. Finish HVAC – Grilles and Diffusers
6. Temperature Controls
7. Testing and Balancing
8. Operation and Maintenance Manuals
9. Record documents
10. Project closeout

1.9 CODES, FEES AND RELATED COSTS

A. All materials and workmanship shall comply with all applicable codes, specifications, local ordinances, industry standards and utility company regulations.

B. If building codes, state laws, local ordinances, industry standards and/or utility company regulations conflict with the contract documents, the most stringent shall govern. Contractor shall promptly notify the Architect in writing of any such difference.

C. Noncompliance: Should the Contractor perform any work that does not comply with the local ordinances, industry standards and utility company regulations, he shall bear all costs arising in correcting the deficiencies.

D. Requirements of Regulatory Agencies:

1. This Contractor shall be responsible for obtaining and payment for all permits, licenses, and inspection certificates required in accordance with provisions of contract documents, and shall pay all fees for the utility connections as required for this part of the work.

2. In addition to requirements shown or specified, comply with latest current local and/or state ordinances and codes; and applicable standards, specifications or codes published by:

a. Building Codes:

1) IBC - International Building Code

2) IFC - International Fire Code

3) UPC - Uniform Plumbing Code

4) IMC - International Mechanical Code

5) NEC - National Electric Code

b. Industry Standards, Codes and Specifications:

1) AIEE - American Institute of Electrical Engineers

2) AMCA - Air Moving & Conditioning Association

3) ASA - American Standards Association

4) ASHRAE - American Society of Heating, Refrigeration and Air Conditioning Engineers

5) ASME - American Society of Mechanical Engineers

6) ASTM - American Society of Testing Materials

7) IBR - Institute of Boiler & Rating Manufacturers

8) SMACNA - Sheet Metal and Air Conditioning Contractors National Association, Inc.

9) AWWA - American Water Works Association

10) ANSI - American National Standards Institute

11) ARI - Air Conditioning and Refrigeration Institute

12) FIA - Factory Insurance Association

13) FM - Factory Mutual

14) NEMA - National Electrical Manufacturers Association

15) OSHA - Occupational Safety and Health Act

16) ADC - Air Diffusion Council

17) WISHA - Washington Industrial Safety & Health Act

18) APWA - Standard Specification for Municipal Public Works

19) NFPA - National Fire Protection Association

20) WSRB - Washington Survey & Rating Bureau

21) AIEE - American Institute of Electrical Engineers

22) WDOE - Washington Department of Ecology

23) WSEC - Washington State Energy Code

1.10 PROJECT RECORD DOCUMENTS

A. In addition to the requirements of General Conditions, project record documents shall include the following:

1. All change orders to the contract shall be noted on the project record documents and shall include all revisions accomplished by these change orders.

2. No cost change orders shall be noted on the project record documents.

1.11 SUPPORTS

A. Provide all pipe stands, mounting brackets and metal bases required for HVAC material and equipment.

B. Provide all necessary supplementary steel for support or attachment of HVAC material and equipment, in shafts and between building structural members. Steel shall be painted with one coat of rust-inhibiting primer.

1.12 LISTED EQUIPMENT

A. The Washington State Electrical Code requires that all materials, devices, appliances, and equipment, shall be of a type that conforms to applicable standards or be indicated as acceptable by the established standards of the Underwriters Laboratories, Inc. or other electrical product testing laboratories which are accredited by the department.

B. This statement is being interpreted by the State Electrical Inspector as follows: It is understood that many specialty items such as cast iron boiler, certain items of air handling equipment and other building components are not available with a UL label covering the entire piece of equipment. The State will impose no requirement that an item of equipment be UL labeled unless it is available as UL labeled item from at least two manufacturers. Electrical components of unlabeled equipment, such as motors, shall be labeled if they are available from at least two manufacturers.

C. If any building component is available with UL or other Washington State approved label from at least two manufacturers, an identical or similar unlabeled component shall not be acceptable for installation in the State of Washington. Should any such component be installed in the State of Washington, it shall either be inspected and labeled by a UL representative or other authority approved by the State or it shall be replaced with a UL labeled component, before the building will be accepted by the State Electrical Inspector.

D. The engineer has attempted to select UL listed components on this project. However, it must be understood that catalog data on which he bases his selection are not necessarily always current. Components are continually added to the UL approved listings. Conversely, a manufacturer may make a change in a product line, voiding the previous UL approval shown in the catalog. These changes commonly take place after the project has been released for bidding.

E. Consequently, it shall be the sole responsibility of the Contractor (through his suppliers and equipment manufacturers) to purchase and install only equipment bearing the UL or other approved label whenever that equipment so labeled is available. The Contractor, should he install any equipment without the proper UL label, shall bear the entire cost of correction to the satisfaction of the Washington State Electrical Inspector.

1.13 TEST LOG DATA

A. The Contractor shall keep a three-ring notebook in the construction job office for the sole purpose of filing test data. The test data shall include the completed Mechanical Equipment Start-Up Sheets, duct testing and other testing requirements on the project. All log data test entries shall be signed by the Contractor's Superintendent and the Architect's representative or the code authority having jurisdiction.

1.14 CLEANUP

A. Upon the completion of the work hereinafter specified and at times during the progress of the work or when requested by the Architect, the Contractor shall remove all surplus materials, debris, and rubbish resulting from his operations, and shall leave the entire building and involved portions of the site, insofar as the work of the contract is concerned, in a neat, clean and acceptable condition as approved by the Architect.

B. The Contractor shall be expected to police his day-to-day operation and maintain a clean and safe working area.

1.15 BARRICADES AND BRIDGES

A. Barricades shall be provided for all work under Division 23, as required. Barricades shall be erected to meet all state and local requirements and standards.

B. Temporary bridges and supports shall be provided for all work under Division 23, as required, to accommodate vehicle and pedestrian traffic over open trenches or obstructions. All temporary supports and bridges shall be constructed of sufficient strength to safely accommodate the normal vehicle or pedestrian traffic.

1.16 OPERATING AND MAINTENANCE INSTRUCTIONS

A. At the completion of the project, at such time as designated by the Architect, an operational and maintenance instruction period for the Owner shall take place. Contractor shall have present, during this entire period, his superintendent, foremen of various portions of the project, and manufacturer's service representatives (factory trained) for all equipment requiring periodic maintenance. All operational and maintenance instructions shall be presented under direct supervision of the Architect.

B. Contractor shall provide sign in sheet and shall be responsible for all parties present to sign in. After instruction is complete and accepted by the Owner, Contractor shall provide letter to the Architect indicating that the instructions have been completed and accepted, and Owner shall sign same.

1.17 OPERATION AND MAINTENANCE MANUALS

A. In addition to the requirements of Section 01 78 23 provide the following for Division 23 Operation and Maintenance Manuals:

1. Arrange material per order of Specifications.

2. Include a copy of all approved material and equipment submittals (equipment submittals to indicate specific model furnished, capacity, voltage, etc.).

3. Provide operating and maintenance instructions for all equipment to include the following:

a. Complete word description of all equipment including systems and areas served, methods of control and sequence of controls.

b. Description of routine maintenance for equipment.

c. Suggested frequency of maintenance.

d. Lubrication chart for all equipment, listing lubricant to be used and time interval for lubrication.

e. Parts list

f. Warranties for equipment

4. Provide complete valve schedule for all HVAC piping systems to indicate valve tag number, valve location by room number, system served, and valve purpose.

5. Include final Test and Balance Report

6. Include approved Temperature Control Submittals and Control Diagrams

7. Include copy of Test Log

8. Include Guarantee for work.

1.18 PROJECT CLOSEOUT

A. Contractor shall review the following specific checklist items prior to requesting inspection for Substantial or Final completion. The signed and dated checklist items shall be submitted with the request for Substantial or Final completion:

Item	Verified By	Date
All shipping tie-downs removed	_____	_____
All equipment with motors have specified motor with correct horsepower voltage and individual control heaters are adequate.	_____	_____
All equipment with electrical connections have wiring completed with proper voltage /phase	_____	_____

Fan wheels and pump impellers rotate in proper direction	_____	_____
Fans and pumps rotate at specified RPM	_____	_____
All equipment operational	_____	_____
All grilles, registers and diffusers connected to system and properly installed.	_____	_____
All ductwork installed and sealed	_____	_____
Control System fully operational	_____	_____

1.19 QUALITY ASSURANCE

A. The Contractor shall guarantee all work included in this section for a period of one year after date of Certificate of Substantial Completion. During that period, all defects due to faulty materials or workmanship and damage to other work, resulting there from or the correction of same, shall be remedied at the Contractor's expense.

B. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

C. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."

2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

1.20 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling and during the progress of the work to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

B. Protect ductwork from the elements during transportation, construction and storage. Acoustically lined ductwork shall not be stored outside at any time. When internally lined ductwork is on the job site, all openings shall be completely sealed to prevent entrance of construction dust.

C. Openings in all types of ductwork (grilles, registers, diffusers, duct openings, etc.) shall be completely sealed at the end of each working day and during the progress of the construction as feasible to prevent entrance of construction dust and debris. Ductwork may be unsealed after all of the construction spaces served by the ductwork have been completely cleaned, painted and approved by the Owner and Architect.

1.21 TEMPORARY HEATING, VENTILATION AND AIR CONDITIONING

A. Air moving equipment is not to be operated for any purpose, including but not limited to temporary heating/cooling of the construction space, testing and balancing, commissioning, etc., until all of the construction spaces served by the air moving equipment have been completed, cleaned, painted and approved by the Owner or the Architect.

1.22 COORDINATION

A. Coordinate the location of all ductwork to determine that it clears all openings and structural members, that it may be properly concealed and that it clears cabinets, lights and all equipment having fixed locations. No extra payments will be allowed where piping and/or ductwork must be offset to avoid other work, or where minor changes are necessary to facilitate installation.

B. Drawings do not attempt to show complete details of building construction which affect the mechanical installation. Contractor shall refer to the Architectural, Structural, Electrical drawings for additional building details which affect installation of his work.

C. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for piping and ductwork installations.

D. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.

PART 2 - PRODUCTS

2.1 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

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

   a. Advance Products & Systems, Inc.

   b. Calpico, Inc.

   c. Metraflex Co.

   d. Pipeline Seal and Insulator, Inc.

   e. Link-Seal

2. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.

3. Pressure Plates: Carbon steel. Include two for each sealing element.

4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

B. Provide aisles, or space around equipment suitable for complete service and inspection of equipment. Maintain minimum 6'-8" headroom in all access aisles. Provide minimum clearances at electrical equipment per NEC.

C. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

D. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

E. Install equipment to allow right of way for piping installed at required slope.

F. Label Pressure Vessels in accordance with the State Boiler and Unfired Pressure Vessels Inspection Law. Frame and mount a certificate showing approval under this law adjacent to each respective piece of equipment. Pay all costs and fees for certificates, inspections, filing and labeling.

G. Provide equipment with OSHA approved drive and shaft guards for all exposed, rotating drive shafts and drive connections between motors and driven equipment including, pumps, compressors, etc. Guards shall include heavy duty steel frames securely fastened for easy removal to the equipment frame. Guards, in general, shall be solid sheet metal

with tachometer cutout at shafts where applicable. Guards may be provided by the equipment manufacturer or fabricated by this Contractor to the manufacturer's clearances, configurations, etc.

H. Provide a service engineer for equipment start-up as indicated under division 23 Sections specifying equipment. Service engineer shall be a factory-trained and certified engineer in the employ of the factory, or the employee of the sales representative. Where Contractor is the sales representative, he/she must employ a factory trained and certified person to do this service work and shall have a letter from the manufacturer stating that he/she is qualified for start-up of equipment furnished

3.2 ERECTION OF METAL SUPPORTS AND ANCHORAGES

A. Refer to Division 05 Section "Metal Fabrications" for structural steel.

B. Provide shop drawings showing sizing, design and location of supplementary steel and sizing calculations stamped by a structural engineer registered in the state in which the project resides.

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

D. Field Welding: Comply with AWS D1.1. Do not weld to building structural components without written approval of the Structural Engineer.

3.3 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

A. Furnish and cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor HVAC materials and equipment.

B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

END OF SECTION 23 05 00

SECTION 23 05 13 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements for magnetic starters, disconnects and for single-phase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on ac power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

PART 2 - PRODUCTS

2.1 GENERAL MOTOR REQUIREMENTS

A. Provide all motors as required by Division 23 specifications.

B. Comply with requirements in this Section except when stricter requirements are specified in HVAC equipment schedules or Sections.

C. Comply with NEMA MG 1 unless otherwise indicated.

D. Nameplates in accordance with NEMA MG 1.

2.2 MOTOR CHARACTERISTICS

A. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.

B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

C. Motors shall be rated for the supply voltage. Motors rated 460/230V or 460/230/208V shall not be acceptable for 208/200V systems.

2.3 SINGLE-PHASE MOTORS

A. Motors larger than 1.0 hp shall be one of the following, to suit starting torque and requirements of specific motor application:

1. Permanent-split capacitor.

2. Split phase.

3. Capacitor start, inductor run.

4. Capacitor start, capacitor run.

B. EC-Rated Motors: All mechanical equipment using single-phase motors 1/12th HP to less than 1.0 HP shall utilize an EC-Rated motor.

C. Multispeed Motors: Variable-torque, permanent-split-capacitor type.

D. Bearings: Pre-lubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.

E. Motors 1/20 HP and Smaller: Shaded-pole type.

F. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

2.4 MAGNETIC STARTERS AND DISCONNECTS

A. Magnetic starters and disconnects as required for Division 23 motors shall be provided under the work of Division 23 and installed by Division 26.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 23 05 13

SECTION 23 05 29 - HANGERS AND SUPPORTS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following hangers and supports for plumbing system piping and equipment:

1. Fastener systems.

2. Equipment supports.

1.3 DEFINITIONS

A. MSS: Manufacturers Standardization Society for The Valve and Fittings Industry Inc.

B. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.4 PERFORMANCE REQUIREMENTS

A. Provide supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.

B. Provide equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

PART 2 - PRODUCTS

2.1 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

1. Manufacturers: Subject to requirements provide products by one of the following:

a. Hilti, Inc.

b. ITW Ramset/Red Head.

c. Masterset Fastening Systems, Inc.

d. MKT Fastening, LLC.

e. Powers Fasteners.

B. Mechanical-Expansion Anchors: Insert-wedge-type [**zinc-coated**] [**stainless**] steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

1. Manufacturers: Subject to requirements provide products by one of the following:

a. B-Line Systems, Inc.; a division of Cooper Industries.

b. Empire Industries, Inc.

c. Hilti, Inc.

d. ITW Ramset/Red Head.

e. MKT Fastening, LLC.

f. Powers Fasteners.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.

C. Use hangers and supports with galvanized, metallic coatings for piping and equipment that will not have field-applied finish.

D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use padded hangers for piping that is subject to scratching.

F. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of non-insulated or insulated stationary pipes, NPS 1/2 to NPS 30 (DN 15 to DN 750).

2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of 120 to 450 deg F (49 to 232 deg C) pipes, NPS 4 to NPS 16 (DN 100 to DN 400), requiring up to 4 inches (100 mm) of insulation.

3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes, NPS 3/4 to NPS 24 (DN 20 to DN 600), requiring clamp flexibility and up to 4 inches (100 mm) of insulation.

4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes, NPS 1/2 to NPS 24 (DN 15 to DN 600), if little or no insulation is required.

5. Pipe Hangers (MSS Type 5): For suspension of pipes, NPS 1/2 to NPS 4 (DN 15 to DN 100), to allow off-center closure for hanger installation before pipe erection.

6. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of non-insulated stationary pipes, NPS 3/4 to NPS 8 (DN 20 to DN 200).

7. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of non-insulated stationary pipes, NPS 1/2 to NPS 8 (DN 15 to DN 200).

8. Adjustable Band Hangers (MSS Type 9): For suspension of non-insulated stationary pipes, NPS 1/2 to NPS 8 (DN 15 to DN 200).

9. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of non-insulated stationary pipes, NPS 1/2 to NPS 2 (DN 15 to DN 50).

10. Split Pipe-Ring with or without Turnbuckle-Adjustment Hangers (MSS Type 11): For suspension of non-insulated stationary pipes, NPS 3/8 to NPS 8 (DN 10 to DN 200).

11. Extension Hinged or 2-Bolt Split Pipe Clamps (MSS Type 12): For suspension of non-insulated stationary pipes, NPS 3/8 to NPS 3 (DN 10 to DN 80).

12. U-Bolts (MSS Type 24): For support of heavy pipes, NPS 1/2 to NPS 30 (DN 15 to DN 750).

13. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.

14. Pipe Saddle Supports (MSS Type 36): For support of pipes, NPS 4 to NPS 36 (DN 100 to DN 900), with steel pipe base stanchion support and cast-iron floor flange.

15. Pipe Stanchion Saddles (MSS Type 37): For support of pipes, NPS 4 to NPS 36 (DN 100 to DN 900), with steel pipe base stanchion support and cast-iron floor flange and with U-bolt to retain pipe.

16. Adjustable, Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes, NPS 2-1/2 to NPS 36 (DN 65 to DN 900), if vertical adjustment is required, with steel pipe base stanchion support and cast-iron floor flange.

17. Single Pipe Rolls (MSS Type 41): For suspension of pipes, NPS 1 to NPS 30 (DN 25 to DN 750), from 2 rods if longitudinal movement caused by expansion and contraction might occur.

18. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes, NPS 2-1/2 to NPS 20 (DN 65 to DN 500), from single rod if horizontal movement caused by expansion and contraction might occur.

19. Complete Pipe Rolls (MSS Type 44): For support of pipes, NPS 2 to NPS 42 (DN 50 to DN 1050), if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.

20. Pipe Roll and Plate Units (MSS Type 45): For support of pipes, NPS 2 to NPS 24 (DN 50 to DN 600), if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.

21. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes, NPS 2 to NPS 30 (DN 50 to DN 750), if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.

G. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20 (DN 20 to DN 500).

2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20 (DN 20 to DN 500), if longer ends are required for riser clamps.

H. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches (150 mm) for heavy loads.

2. Steel Clevises (MSS Type 14): For 120 to 450 deg F (49 to 232 deg C) piping installations.

3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.

4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.

5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F (49 to 232 deg C) piping installations.

I. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.

2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction to attach to top flange of structural shape.

3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.

4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.

5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.

6. C-Clamps (MSS Type 23): For structural shapes.

7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.

8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.

9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.

10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.

11. Malleable Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.

12. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:

    a. Light (MSS Type 31): 750 lb (340 kg).

    b. Medium (MSS Type 32): 1500 lb (680 kg).

    c. Heavy (MSS Type 33): 3000 lb (1360 kg).

13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.

14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.

15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.

J. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.

2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.

3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

K. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections.

L. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

M. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

3.2 HANGER AND SUPPORT SPACING

A. Install coated hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 3/4 (DN 20) and Smaller: 60 inches (1500 mm) with 3/8-inch (10-mm) rod.

2. NPS 1 and NPS 1-1/4 (DN 25 and DN 32): 72 inches (1800 mm) with 3/8-inch (10-mm) rod.

3. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 96 inches (2400 mm) with 3/8-inch (10-mm) rod.

4. NPS 2-1/2 (DN 65): 108 inches (2700 mm) with 1/2-inch (13-mm) rod.

5. NPS 3 to NPS 5 (DN 80 to DN 125): 10 feet (3 m) with 1/2-inch (13-mm) rod.

6. NPS 6 (DN 150): 10 feet (3 m) with 5/8-inch (16-mm) rod.

7. NPS 8 (DN 200): 10 feet (3 m) with 3/4-inch (19-mm) rod.

8. Install supports for vertical copper tubing every 10 feet (3 m).

B. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/4 (DN 32) and Smaller: 84 inches (2100 mm) with 3/8-inch (10-mm) rod.

2. NPS 1-1/2 (DN 40): 108 inches (2700 mm) with 3/8-inch (10-mm) rod.

3. NPS 2 (DN 50): 10 feet (3 m) with 3/8-inch (10-mm) rod.

4. NPS 2-1/2 (DN 65): 11 feet (3.4 m) with 1/2-inch (13-mm) rod.

5. NPS 3 and NPS 3-1/2 (DN 80 and DN 90): 12 feet (3.7 m) with 1/2-inch (13-mm) rod.

6. NPS 4 and NPS 5 (DN 100 and DN 125): 12 feet (3.7 m) with 5/8-inch (16-mm) rod.

7. NPS 6 (DN 150): 12 feet (3.7 m) with 3/4-inch (19-mm) rod.

8. NPS 8 to NPS 12 (DN 200 to DN 300): 12 feet (3.7 m) with 7/8-inch (22-mm) rod.

9. Install supports for vertical steel piping every 15 feet (4.5 m).

C. Install vinyl-coated hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 2 (DN 50) and Smaller: 48 inches (1200 mm) with 3/8-inch (10-mm) rod.

2. NPS 2-1/2 to NPS 3-1/2 (DN 65 to DN 90): 48 inches (1200 mm) with 1/2-inch (13-mm) rod.

3. NPS 4 and NPS 5 (DN 100 and DN 125): 48 inches (1200 mm) with 5/8-inch (16-mm) rod.

4. NPS 6 (DN 150): 48 inches (1200 mm) with 3/4-inch (19-mm) rod.

5. NPS 8 (DN 200): 48 inches (1200 mm) with 7/8-inch (22-mm) rod.

6. Install supports for vertical PVC piping every 48 inches (1200 mm).

D. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer's written instructions.

3.3 HANGER AND SUPPORT INSTALLATION

A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.

B. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated trapeze pipe hangers.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.

2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.

C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled metal framing systems.

D. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

E. Fastener System Installation:

1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches (100 mm) thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.

2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

F. Roof Pipe Stand Installation:

1. Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.

G. Pipe Positioning System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture. Refer to Division 22 Section "Plumbing Fixtures" for plumbing fixtures.

H. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

I. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

J. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

K. Install lateral bracing with pipe hangers and supports to prevent swaying.

L. Install building attachments within concrete slabs or attach to structural steel. Provide supplementary steel for support and attachment of hangers in shafts and between building structural members. Do not weld to building structural members without written approval of the Structural Engineer. Install additional attachments at concentrated loads, including valves, flanges, and strainers, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

M. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment. Provide welded support at elbows on pump suction and discharge piping and extend elbow support to floor.

N. Coordinate location of hangers with respect to light fixtures and other building components. Piping shall be supported by independent hangers and shall no be supported from ductwork, duct supports or other piping. Hanger rods shall not penetrate ductwork.

O. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9 (for building services piping) are not exceeded.

3.4 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands or metal framing systems to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make smooth bearing surface.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.5 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches (40 mm).

END OF SECTION 22 05 29

SECTION 23 05 53 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Equipment labels.
2. Warning signs and labels.
3. Warning tags.

1.3 COORDINATION

A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

B. Coordinate installation of identifying devices with locations of access panels and doors.

C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Plastic Labels for Equipment:

1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
2. Letter Color: White.
3. Background Color: Black.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch (13 mm) for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

7. Fasteners: Stainless-steel rivets or self-tapping screws.

8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Label Content: Include equipment's Drawing designation or unique equipment number.

2.2 WARNING SIGNS AND LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

B. Letter Color: White.

C. Background Color: Red.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Fasteners: Stainless-steel rivets or self-tapping screws.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.3 WARNING TAGS

A. Warning Tags: Preprinted or partially preprinted, accident-prevention tags, of plasticized card stock with matte finish suitable for writing.

1. Size: 3 by 5-1/4 inches minimum.

2. Fasteners: Brass grommet and wire.

3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."

4. Color: Yellow background with black lettering.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

B. Locate equipment labels where accessible and visible.

3.3 WARNING-TAG INSTALLATION

A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 23 05 53

SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Balancing Air Systems:

1.3 DEFINITIONS

A. AABC: Associated Air Balance Council.

B. NEBB: National Environmental Balancing Bureau.

C. TAB: Testing, adjusting, and balancing.

D. TABB: Testing, Adjusting, and Balancing Bureau.

E. TAB Specialist: An entity engaged to perform TAB Work.

1.4 SUBMITTALS

A. Certified TAB reports.

B. Sample report forms.

C. Instrument calibration reports, to include the following:

1. Instrument type and make.

2. Serial number.

3. Application.

4. Dates of use.

5. Dates of calibration.

1.5 QUALITY ASSURANCE

A. TAB Contractor Qualifications: Engage a TAB entity certified by AABC OR NEBB.

1. TAB Field Supervisor: Employee of the TAB contractor and certified by AABC OR NEBB.

2. TAB Technician: Employee of the TAB contractor and who is certified by AASBC OR NEBB.

B. TAB Report Forms: Use standard TAB contractor's forms approved by Architect.

C. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.6 DESCRIPTION OF THE WORK

A. The Hale Park Phase 2 Project require only air balancing. There are no hydronic balancing or domestic water system balancing requirements on this (these) projects.

B. Base Bid

1. Balance the system exhaust air to the quantities of the exhaust fans and the individual air outlets/inlets as indicated on the drawings on the following systems; Restroom Exhaust Fans (EF-1 – Qty=1)

2. Functionally test the specified Sequences of Operation of the following systems to very correct operation; Electric Ceiling Heaters (CH-1, CH-2 & CH-3) and Restroom Exhaust Fan (EF-1 – Qty=1).

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 TAB SPECIALISTS

A. Subject to compliance with requirements, engage one of the following:

1. TESTCOMM LLC, Maiani Construction Services.

3.2 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.

B. Examine systems for installed balancing devices.. Verify that locations of these balancing devices are accessible.

C. Examine the approved submittals for HVAC systems and equipment.

D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine equipment performance data including fan and pump curves.

1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.

2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.

F. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.

G. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.

H. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

I. Examine operating safety interlocks and controls on HVAC equipment.

J. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.3 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures.

B. Complete system-readiness checks. Verify the following:

1. Permanent electrical-power wiring is complete.

2. Automatic temperature-control systems are operational.

3. Equipment and duct access doors are securely closed.

4. Balance dampers are open.

5. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.

6. Windows and doors can be closed so indicated conditions for system operations can be met.

3.4 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance" and in this Section.

1. Comply with requirements in ASHRAE 62.1-2004, Section 7.2.2, "Air Balancing."

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.

1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.

2. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Division 23 Section "HVAC Insulation."

C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

3.5 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.

C. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.

D. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

E. Verify that motor starters are equipped with properly sized thermal protection.

F. Check dampers for proper position to achieve desired airflow path.

G. Check for airflow blockages.

H. Check condensate drains for proper connections and functioning.

I. Check for proper sealing of air-handling-unit components.

J. Verify that air duct system is sealed as specified in Division 23 Section "Metal Ducts."

3.6 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.

1. Measure total airflow.

a. Where sufficient space in ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow.

2. Measure fan static pressures as follows to determine actual static pressure:

a. Measure outlet static pressure as far downstream from the fan as practical and upstream from restrictions in ducts such as elbows and transitions.

b. Measure static pressure directly at the fan outlet or through the flexible connection.

c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from the flexible connection, and downstream from duct restrictions.

d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.

3. Measure static pressure across each component that makes up an air-handling unit, rooftop unit, and other air-handling and -treating equipment.

a. Report the cleanliness status of filters and the time static pressures are measured.

4. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.

B. Adjust volume dampers for main duct, sub-main ducts, and major branch ducts to indicated airflows within specified tolerances.

1. Measure airflow of sub-main and branch ducts.

a. Where sufficient space in sub-main and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.

2. Measure static pressure at a point downstream from the balancing damper, and adjust volume dampers until the proper static pressure is achieved.

3. Re-measure each sub-main and branch duct after all have been adjusted. Continue to adjust sub-main and branch ducts to indicated airflows within specified tolerances.

C. Measure air outlets and inlets without making adjustments.

1. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.

D. Adjust air outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using branch volume dampers rather than extractors and the dampers at air terminals.

1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.

2. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.7 TOLERANCES

A. Set HVAC system's air flow rates and water flow rates within the following tolerances:

1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 10 percent .

2. Air Outlets and Inlets: Plus or minus 10 percent .

3.8 FINAL REPORT

A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.

1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.

2. Include a list of instruments used for procedures, along with proof of calibration.

B. General Report Data: In addition to form titles and entries, include the following data:

1. Title page.

2. Name and address of the TAB contractor.

3. Project name.

4. Project location.

5. Architect's name and address.

6. Engineer's name and address.

7. Contractor's name and address.

8. Report date.

9. Signature of TAB supervisor who certifies the report.

10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.

11. Summary of contents including the following:

    a. Indicated versus final performance.

    b. Notable characteristics of systems.

    c. Description of system operation sequence if it varies from the Contract Documents.

12. Nomenclature sheets for each item of equipment.

13. Notes to explain why certain final data in the body of reports vary from indicated values.

14. Test conditions for fan performance forms including the following:

    a. Settings for outdoor-, return-, and exhaust-air dampers.

    b. Conditions of filters.

    c. Cooling coil, wet- and dry-bulb conditions.

    d. Fan drive settings including settings and percentage of maximum pitch diameter.

    e. Other system operating conditions that affect performance.

C. Air-Handling-Unit Test Reports: For air-handling units with coils, include the following:

1. Unit Data:

    a. Unit identification.

    b. Location.

    c. Make and type.

    d. Model number and unit size.

    e. Manufacturer's serial number.

f. Unit arrangement and class.

g. Discharge arrangement.

h. Sheave make, size in inches (mm), and bore.

i. Center-to-center dimensions of sheave, and amount of adjustments in inches (mm).

j. Number, make, and size of belts.

k. Number, type, and size of filters.

2. Motor Data:

a. Motor make, and frame type and size.

b. Horsepower and rpm.

c. Volts, phase, and hertz.

d. Full-load amperage and service factor.

e. Sheave make, size in inches (mm), and bore.

f. Center-to-center dimensions of sheave, and amount of adjustments in inches (mm).

3. Test Data (Indicated and Actual Values):

a. Total air flow rate in cfm .

b. Total system static pressure in inches wg.

c. Fan rpm.

d. Discharge static pressure in inches wg .

e. Outdoor airflow in cfm .

f. Return airflow in cfm .

g. Outdoor-air damper position.

h. Return-air damper position.

D. Fan Test Reports: For supply, return, and exhaust fans, include the following:

1. Fan Data:

a. System identification.

b. Location.

c. Make and type.

d. Model number and size.

e. Manufacturer's serial number.

f. Arrangement and class.

g. Sheave make, size in inches (mm), and bore.

h. Center-to-center dimensions of sheave, and amount of adjustments in inches (mm).

2. Motor Data:

a. Motor make, and frame type and size.

b. Horsepower and rpm.

c. Volts, phase, and hertz.

d. Full-load amperage and service factor.

e. Sheave make, size in inches (mm), and bore.

f. Center-to-center dimensions of sheave, and amount of adjustments in inches (mm).

g. Number, make, and size of belts.

3. Test Data (Indicated and Actual Values):

a. Total airflow rate in cfm (L/s).

b. Total system static pressure in inches wg (Pa).

c. Fan rpm.

d. Discharge static pressure in inches wg (Pa).

e. Suction static pressure in inches wg (Pa).

E. Instrument Calibration Reports:

1. Report Data:

a. Instrument type and make.

b. Serial number.

c. Application.

d. Dates of use.

e. Dates of calibration.

END OF SECTION 23 05 93

SECTION 23 09 00 - INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. The intent of this section is for the contractor to include all labor and material as required to provide a fully functioning Temperature Control System to provide the specified control sequences on the following equipment:

1. Electric Ceiling Heaters

2. Restroom Exhaust Fans

3. All other new equipment that is provided under this project.

1.3 WORK INCLUDED:

A. Furnish, stand-alone thermostats, rotary timers, and fan coil control boards as required to provide the following sequences.

B. Prepare individual hardware layouts, interconnection drawings, and software configuration from project design data.

C. Implement the detailed design for all analog and binary objects, system databases, graphic displays, logs, and management reports based on control descriptions, logic drawings, configuration data, and bid documents.

D. Design, provide, and install all equipment cabinets, panels, data communication network cables needed, and all associated hardware.

E. Provide complete manufacturer's specifications for all items that are supplied. Include vendor name of every item supplied.

F. Provide supervisory specialists and technicians at the job site to assist in all phases of system installation, startup, and commissioning.

G. Provide a comprehensive operator and technician training program as described herein.

H. Provide only new sensors, damper electronic actuators, dampers. No existing controllers, valve/damper actuators, valves, dampers or room sensors are to be reused.

1.4 SCOPE OF WORK:

A. BASE BID

1. Restroom Exhaust Fans

2. Electric Wall Heaters

1.5 SEQUENCE OF OPERATION – RESTROOM EXHAUST FANS**:**

A. The restroom exhaust fan is normally off and the exhaust fan backdraft damper is closed.

B. When either restroom occupancy sensor detects motion, the restroom the exhaust fan shall start opening the gravity, backdraft damper. The exhaust fan shall continue to operate for 15 minutes (or as set) after the last detection of occupancy. When 15 minutes has passed with no detection of occupancy, the exhaust fan shall stop and the restroom exhaust fan damper shall close.

1.6 SEQUENCE OF OPERATION – ELECTRIC WALL HEATERS**:**

A. Upon a call for heat from the remote-mounted thermostat, the propeller fan shall start and the electric heating coil shall be energized. The propeller fan shall continue to operate until the space temperature reaches the thermostat setpoint. Once the space temperature reaches the thermostat setpoint, the electric heating coil shall be de-energized and the propeller fan shall stop.

1.7 APPROVED MANUFACTURERS:

A. Carrier

B. Honeywell

1.8 QUALITY ASSURANCE:

A. Responsibility: The supplier of the EMCS shall be responsible for inspection and Quality Assurance (QA) for all materials and workmanship furnished.

B. Component Testing: Maximum reliability shall be achieved through extensive use of high-quality, pre-tested components. Each and every controller, sensor, and all other DDC components shall be individually tested by the manufacturer prior to shipment.

C. Tools, Testing and Calibration Equipment: The Building Automation System supplier shall provide all tools, testing, and calibration equipment necessary to ensure reliability and accuracy of the system.

1.9 REFERENCE STANDARDS:

A. The latest edition of the following standards and codes in effect and amended as of supplier's proposal date, and any applicable subsections thereof , shall govern design and selection of equipment and material supplied:

1. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).

2. ANSI/ASHRAE Standard 135-2001, BACnet.

3. International Code Council series of building codes including local amendments.

4. UL 916 Underwriters Laboratories Standard for Energy Management Equipment. Canada and the US.

5. National Electrical Code (NEC).

6. FCC Part 15, Subpart J, Class A

7. EMC Directive 89/336/EEC (European CE Mark)

8. City, county, state, and federal regulations and codes in effect as of contract date.

B. Except as otherwise indicated the system supplier shall secure and pay for all permits, inspections, and certifications required for his work and arrange for necessary approvals by the governing authorities.

1.10 SUBMITTALS:

A. Drawings

1. The system supplier shall submit engineered drawings, control sequence, and bill of materials for approval.

2. Drawings shall be submitted in the following standard sizes: 11" x 17" (ANSI B).

3. Provide the Division 1 specified number of complete sets (copies) of submittal drawings plus an additional copy to be retained by the mechanical engineer.

4. Drawings shall be available on CD-ROM.

B. System Documentation: Include the following in submittal package:

1. System configuration diagrams in simplified block format.

2. All input/output object listings and an alarm point summary listing.

3. Electrical drawings that show all system internal and external connection points, terminal block layouts, and terminal identification.

4. Complete bill of materials, valve schedule and damper schedule.

5. Manufacturer's instructions and drawings for installation, maintenance, and operation of all purchased items.

6. Provide complete description and documentation of any proprietary services and/or objects used in the system.

7. A list of all functions available and a sample of function block programming that shall be part of delivered system.

C. Scheduling:

1. The vendor shall provide a detailed project design and installation schedule with time markings and details for hardware items and software development phases. Schedule shall show all the target dates for transmission of project information and documents and shall indicate timing and dates for system installation, debugging, and commissioning.

1.11 WARRANTY:

A. Warranty for the entire control system shall commence upon owner acceptance of beneficial use. Warranty shall cover all items considered associated with factory defects.

B. Provide a two-year warranty on all controllers, host control panel and actuators.

C. Provide a one-year warranty on all other components.

D. Provide a one-year warranty on all workmanship and labor.

1.12 RELATED WORK IN OTHER SECTIONS:

A. Refer to Division 01 for related contractual requirements.

B. Refer to Division 26 for General Electrical Provisions.

PART 2 - PRODUCTS

2.1 ELECTRONIC THERMOSTATS AND MISCELLANEOUS DEVICES:

A. Micro-Processor based, LED/LCD Readout, Programmable Thermostat.

1. All thermostats shall be micro-processor based and be from the same manufacturer and model number.

2. The thermostats shall be selected to match the number of stages of heating and cooling offered by each heating and cooling unit.

3. Each thermostat shall be a 7-Day (minimum) programmable thermostat capable of being set for seven (7) different day types per week. Thermostats of the 5+1+1 and 5+2 variety are not acceptable.

4. All thermostats shall have the capability to be configured to set back or temporarily operate the HVAC system to maintain zone temperatures down to 45 Deg. F. (Heating) or up to 85 Deg. F. (Cooling) during periods of non-occupancy.

5. All thermostats shall have program back–up capabilities that will retain program and time settings for a minimum of ten (10) hours upon a loss of building power.

6. All thermostats, when used to control both heating and cooling shall be configured to provide a temperature range or deadband of at least 5 Deg. F.

7. Each thermostat shall include a manual override button that when activated shall place the HVAC system into occupied mode for a maximum of two (2) hours.

8. Each thermostat shall include an "Optimum Start" feature.

9. Thermostats shall be capable of interfacing with a remote, stainless steel temperature sensor.

2.2 ENCLOSURES:

A. All controllers, power supplies and relays shall be mounted in enclosures.

B. Enclosures may be NEMA 1 when located in a clean, dry, indoor environment. Indoor enclosures shall be NEMA 12 when installed in other than a clean environment.

C. Enclosures shall have hinged, locking doors.

D. Provide laminated plastic nameplates for all enclosures in any mechanical room or electrical room. Include location and unit served on nameplate. Laminated plastic shall be 1/8" thick sized appropriately to make label easy to read.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence.

B. Notify the owners' representative in writing of conditions detrimental to the proper and timely completion of the work.

C. Do not begin work until all unsatisfactory conditions are resolved.

3.2 INSTALLATION (GENERAL):

A. Install in accordance with manufacturer's instructions.

B. Provide all miscellaneous devices, hardware, software, interconnections installation and programming required to ensure a complete operating system in accordance with the sequences of operation and point schedules.

3.3 LOCATION AND INSTALLATION OF COMPONENTS:

A. Locate and install components for easy accessibility; in general, mount 48 inches above floor with minimum 3'-0" clear access space in front of units. Obtain approval on locations from owner's representative prior to installation.

B. All instruments, switches, transmitters, etc., shall be suitably wired and mounted to protect them from vibration, moisture and high or low temperatures.

C. Identify all equipment and panels. Provide permanently mounted tags for all panels.

D. Provide stainless steel or brass thermowells suitable for respective application and for installation under other sections—sized to suit pipe diameter without restricting flow.

3.4 INTERLOCKING AND CONTROL WIRING:

A. Provide all interlock and control wiring. All wiring shall be installed neatly and professionally, in accordance with Specification Division 26 and all national, state and local electrical codes.

B. Provide wiring as required by functions as specified and as recommended by equipment manufacturers, to serve specified control functions. Provide shielded low capacitance wire for all communications trunks.

C. Control wiring shall not be installed in power circuit raceways. Magnetic starters and disconnect switches shall not be used as junction boxes. Provide auxiliary junction boxes as required. Coordinate location and arrangement of all control equipment with the owner's representative prior to rough-in.

D. Provide auxiliary pilot duty relays on motor starters as required for control function.

E. Provide power for all control components from nearest electrical panel or as indicated on the electrical drawings—coordinate with electrical contractor.

F. All line voltage wiring and all control wiring in the mechanical, electrical, telephone, boiler rooms, hidden in inaccessible locations (inside walls and above hard ceilings) to be installed in raceways. All other wiring to be installed neatly and inconspicuously per local code requirements. If local code allows, control wiring above accessible ceiling spaces may be run with plenum rated cable (without conduit).

G. Control wiring in the mechanical penthouse is not required to be installed in conduit. However, the wiring in the penthouse is to be neatly bundled together and shall not interfere with the future cable tray or piping uni-strut shown on the mechanical sections.

H. All control wiring is to be securely fastened and is not permitted to be loosely laid on top of the ceiling or on the floor of the attic space.

3.5 OPERATION AND MANTENANCE MANUALS:

A. Upon completion of the installation and prior to training, provide manuals containing the following information:

1. Installation and Service Instructions on all products and components

2. Calibration Instruction and troubleshooting Procedures for all equipment and components

3. Location of all controllers, sensors, transformers and other components

4. Control Drawings as specified above with all modifications, changes and wiring details that depict actual installation

5. Sequence of Operation

6. Preventative Maintenance Proposal

B. Provide laminated control diagrams in each control panel for each air handling system and other major controlled equipment.

3.6 TRAINING:

A. Provide Temperature Control training for up to six (6) Owner personnel, as determined by Owner's management. Upon completion of each phase of training, a work order shall be signed by both the Controls Contractor and the Owner's personnel. The total amount of Temperature Control training shall be no less than:

1. Provide up to two (2) hours evenly spread through one (1) training sessions.

B. All training shall be scheduled in writing with the Owner and shall occur only during normal working hours/days.

C. Provide telephone support and answer questions throughout the warranty period.

3.7 DEMONSTRATION:

A. Provide systems demonstration under provisions of Section 23 05 00.

B. Demonstrate complete operating system to owner's representative.

C. Provide certificate stating that control system has been tested and adjusted for proper operation.

D. The Demonstration shall occur prior to any owner training.

END OF SECTION 23 09 00

SECTION 23 31 13 - METAL DUCTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Sheet Metal materials.
2. Single-wall rectangular ducts and fittings.
3. Single-wall round ducts and fittings.
4. Sealants and gaskets.
5. Hangers and supports.
6. Ductwork Static Pressure Classifications.
7. Duct Sealing.
8. Duct Schedule

1.3 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum," for aluminum supports.
3. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

PART 2 - PRODUCTS

2.1 SHEET METAL MATERIALS

A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for material thicknesses and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G90.

2. Finishes for Surfaces Exposed to View: Mill phosphatized.

2.2 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

A. Material: Galvanized Steel.

B. General Fabrication Requirements: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.

C. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-4, "Transverse (Girth) Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Proprietary transverse joint systems, such as manufactured By Ductmate Industries may be utilized. Install in strict accordance with manufacturer's published construction standards and installation requirements.

D. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-5, "Longitudinal Seams - Rectangular Ducts," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

E. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Provide types as indicated on the drawings. Where not specifically indicated, select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 2, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

F. Turning Vanes: Provide double construction turning vanes for all square elbows, constructed and installed in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.3 SINGLE-WALL ROUND DUCTS AND FITTINGS

A. All exposed round, metal duct shall be spiral duct.

B. In lieu of the specified single wall, internally lined spiral duct, double wall, insulated, acoustical ductwork such as United McGill's Acousti-k27 is an acceptable alternative.

C. Material: Galvanized Steel.

D. General Fabrication Requirements: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and

Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.

E. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Transverse Joints - Round Duct," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Transverse Joints in Ducts Larger Than **60 Inches** in Diameter: Flanged.

2. Proprietary transverse joint systems, such as manufactured By Ductmate Industries may be utilized. Install in strict accordance with manufacturer's published construction standards and installation requirements.

F. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Seams - Round Duct and Fittings," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Fabricate round ducts larger than 90 inches in diameter with butt-welded longitudinal seams.

G. Tees and Laterals: Provide types as indicated on the drawings. Where not specifically indicated, select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "90 Degree Tees and Laterals," and Figure 3-5, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

H. Elbows: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-3, "Round Duct Elbows," and Figure 3-6, "Flat Oval Ducts," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.4 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.

B. Two-Part Tape Sealing System:

1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.

2. Tape Width: 3 inches.

3. Sealant: Modified styrene acrylic.

4. Water resistant.

5. Mold and mildew resistant.

6. Maximum Static-Pressure Class: 10-inch w.g.), positive and negative.

7. Service: Indoor and outdoor.

8. Service Temperature: Minus 40 to plus 200 deg F.

9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.

C. Water-Based Joint and Seam Sealant:

1. Application Method: Brush on.

2. Solids Content: Minimum 65 percent.

3. Shore A Hardness: Minimum 20.

4. Water resistant.

5. Mold and mildew resistant.

6. VOC: Maximum 75 g/L (less water).

7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.

8. Service: Indoor or outdoor.

9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.

2. Type: S.

3. Grade: NS.

4. Class: 25.

5. Use: O.

E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

2.5 HANGERS AND SUPPORTS

A. Unless otherwise indicated or detailed, comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Section IV " Hangers and Supports"

B. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1, "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct."

C. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.

D. Steel Cables for Stainless-Steel Ducts: Stainless steel complying with ASTM A 492.

E. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

F. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

G. Trapeze and Riser Supports:

1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.

2. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.

3. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

PART 3 - EXECUTION

3.1 DUCTWORK STATIC PRESSURE CLASSIFICATIONS

A. 1" Water Gage Systems:

1. All exhaust ductwork.

3.2 DUCT SEALING

A. All transverse and longitudinal seams and joints in the exhaust duct shall be sealed to Static Pressure Classification 3" w.g. duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

3.3 DUCT SCHEDULE

A. General: Ductwork configurations as indicated on the drawings (rectangular, round, flat oval) are designed to accommodate clearances within the building for duct routing.

Substitution of ductwork of different configuration than shown on the drawings shall not be made without approval of the Engineer.

B. Single Wall Rectangular Ductwork:

1. Provide in locations as indicated on the drawings.

C. Single Wall Round Ductwork:

1. Provide in locations as indicated on the drawings.

3.4 DUCT INSTALLATION

A. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

B. Offsets in Ductwork: All offsets necessary in ductwork are not shown on the drawings. Provide all offsets required without additional cost. Offset angles to be as small as possible.

C. Field Changes to Ductwork: Changes such as those required to suit the size of factory fabricated equipment actually furnished shall be designed to minimize losses in pressure and performance due to sudden expansion or contraction. Transitions shall be used in field changes as well as modifications to connecting ducts.

D. Duct Sizes:

1. Duct dimensions indicated on the drawings for internally lined single wall ductwork refer to inside clear dimensions inside the lining.

2. Duct dimensions indicated on the drawings for double wall ductwork refer to inside clear dimensions of the inner liner.

3. Flat-Oval Ducts: Indicated dimensions are the duct width (major dimension) and diameter of the round sides connecting the flat portions of the duct (minor dimension).

E. Install round and flat-oval ducts in maximum practical lengths.

F. Install ducts with fewest possible joints.

G. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

H. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

I. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.

J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.

K. Exposed Ductwork:

1. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.

2. Use clear duct sealants. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.

3. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.

4. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.

5. Repair or replace damaged sections and finished work that does not comply with these requirements.

L. Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized-steel primer.

END OF SECTION 23 31 13

SECTION 23 33 00 - AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Backdraft dampers.
2. Relief dampers.
3. Control Dampers.
4. Manual volume dampers.
5. Grilles, Registers and Diffusers.
6. Remote damper operators.
7. Flexible Connectors.
8. Flexible Ducts.

PART 2 - PRODUCTS

2.1 BACKDRAFT DAMPERS

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

1. Air Balance Inc.; a division of Mestek, Inc.
2. American Warming and Ventilating; a division of Mestek, Inc.
3. Cesco Products; a division of Mestek, Inc.
4. Duro Dyne Inc.
5. Greenheck Fan Corporation.
6. Nailor Industries Inc.
7. Pottorff; a division of PCI Industries, Inc.
8. Ruskin Company

9. SEMCO Incorporated.

10. Vent Products Company, Inc.

B. Leakage Requirements for Backdraft Dampers:

1. Maximum dimension 24" or less: 40 CFM/SFT at 1" w.g.

2. Maximum dimension greater than 24": 20 CFM/SFT at 1" w.g.

C. Round Backdraft Dampers:

1. Frame: 20 gage galvanized steel

2. Blades: Two blade design with separate axles, .016 thick aluminum.

3. Blade Seal: Vinyl foam.

4. Axles: 3/16" dia. Plated steel.

5. Spring closure: Blades retained in closed position by tensioned springs. Springs field adjustable for damper orientation and opening pressure.

6. Mounting: Horizontal or vertical

D. Rectangular Backdraft Dampers:

1. Description: Gravity balanced.

2. Frame: 6063T5 extruded aluminum, 0.09 wall thickness, mitered corners.

3. Blades: 0.025 formed aluminum, parallel blades.

4. Blade Seal: Extruded vinyl.

5. Bearings: Synthetic.

6. Linkage: Concealed in frame.

7. Operational Pressure:

a. Blades start to open: 0.03" w.g.

b. Blades fully open: 0.10" w.g.

8. Mounting: Horizontal (upward airflow only) or vertical.

9. Maximum Air Velocity: 1500 FPM

2.2 MANUAL VOLUME DAMPERS

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

1. Air Balance Inc.; a division of Mestek, Inc.
2. American Warming and Ventilating; a division of Mestek, Inc.
3. McGill AirFlow LLC.
4. METALAIRE, Inc.
5. Nailor Industries Inc.
6. Pottorff; a division of PCI Industries, Inc.
7. Ruskin Company.
8. Vent Products Company, Inc.
9. Durodyne.

B. Standard, Steel, Rectangular Manual Volume Dampers:

1. Dampers up to 12”x12” size:
   a. Standard leakage rating.
   b. Suitable for horizontal or vertical applications.
   c. Frame: 22 gage galvanized steel
   d. Blades: Single blade, 22 gage galvanized steel with center V-groove for reinforcement.
   e. Blade Axle: 3/8” square steel shaft, full length of damper blade.
   f. Bearings: Molded synthetic
   g. Hand Quadrant: Locking hand quadrant with 2” stand off bracket.
2. Dampers larger than 12”x12”, up to 48”x48” in size:
   a. Standard leakage rating.
   b. Suitable for horizontal or vertical applications.
   c. Frame: 16 gage galvanized steel formed into structural hat channel with tabbed corners for reinforcement.

d. Blades: Multiple opposed blades, maximum 8" width, 16 gage galvanized steel with 3 longitudinal grooves for reinforcement.

e. Blade Axles: ½" hex, positively locked into damper blades.

f. Bearings: Molded synthetic

g. Control Shaft: 3" x 3/8" square plated steel.

h. Linkage Assembly: Out of airstream.

i. Hand Quadrant: Locking hand quadrant with 2" stand off bracket.

j. For dampers larger than 48" in any dimension, provide multiple opposed blade damper modules, with locking quadrant for each module.

C. Standard, Steel, Round, Manual Volume Dampers

1. Dampers up to 16" diameter:

a. Standard leakage rating.

b. Suitable for horizontal or vertical applications.

c. Frame: 20 gage galvanized steel

d. Blade: Single blade, 20 gage galvanized steel.

e. Blade Axle: 3/8" square steel shaft, full length of damper blade.

f. Bearings: Molded synthetic, or oilite

g. Hand Quadrant: Locking hand quadrant with 2" stand off bracket.

2. Dampers from 17" to 28" diameter:

a. Standard leakage rating.

b. Suitable for horizontal or vertical applications.

c. Outer Frame: 14 gage galvanized steel channel.

d. Inner Frame: 16 gage galvanized steel angle.

e. Blades: Two opposed blades, 16 gage galvanized steel.

f. Blade Axles: ½" diameter plated steel.

g. Bearings: Nylon sleeve with stainless steel thrust washers.

h. Linkage: In airstream.

i. Actuator Shaft: Extendable shaft, 6" beyond frame.

j. Hand Quadrant: Locking hand quadrant with 2" stand off bracket.

3. Dampers from 29" diameter to 50" diameter:

a. Standard leakage rating.

b. Suitable for horizontal or vertical applications.

c. Outer Frame: 14 gage galvanized steel channel.

d. Inner Frame: 16 gage galvanized steel angle.

e. Blades: Multiple opposed blades, 16 gage galvanized steel.

f. Blade Axle: ½" diameter plated steel.

g. Bearings: Nylon sleeve with stainless steel thrust washers.

h. Linkage: In airstream.

i. Actuator Shaft: Extendable shaft, 6" beyond frame.

j. Hand Quadrant: Locking hand quadrant with 2" stand off bracket.

2.3 GRILLES, REGISTERS AND DIFFUSERS

A. Manufacturers: Subject to compliance with requirements, provide products as scheduled on the drawings, or a comparable product by one of the following:

1. Titus

2. Kreuger

3. Price

4. Anemostat

5. Tuttle and Bailey

B. Comparable products to those scheduled shall meet scheduled certified catalog ratings as to noise criteria, pressure drops and throw.

2.4 FLEXIBLE CONNECTORS

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

1. Ductmate Industries, Inc.

2. Duro Dyne Inc.

3. Ventfabrics, Inc.

B. Description: Metal edged, coated heavy glass fabric.

C. Coatings and Adhesives: Comply with UL 181, Class 1.

D. Metal Edged Connectors: Strip of fabric permanently attached to 2 strips of minimum 24 gage galvanized sheet metal.

E. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.

1. Minimum Weight: 26 oz./sq. yd.

2. Tensile Strength: 480 lbf/inchin the warp and 360 lbf/inchin the filling.

3. Service Temperature: Minus 20 to plus 200 deg F

F. Outdoor System, Flexible Connector Fabric: Glass fabric double coated with weatherproof, synthetic rubber resistant to UV rays, ozone and weather.

1. Minimum Weight: 24 oz./sq. yd..

2. Tensile Strength: 530 lbf/inchin the warp and 440 lbf/inchin the filling.

3. Service Temperature: Minus 10 to plus 275 deg F

PART 3 - EXECUTION

3.1 BACKDRAFT DAMPER INSTALLATION

A. Install backdraft dampers in the discharge ductwork of all exhaust fans or exhaust ducts, and in locations as indicated.

3.2 MANUAL VOLUME DAMPER INSTALLATION

A. Install manual volume dampers in locations as indicated and at points on supply, return, and exhaust systems where branches extend from larger ducts.

B. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.

C. Install manual volume dampers as far from the outlet as possible.

D. After installation, operate dampers to verify full range of movement, and set dampers to the full open position.

3.3 GRILLES, REGISTERS AND DIFFUSERS INSTLLATION

A. Install in locations as indicated on the mechanical drawings, and in accordance with the reflected ceiling plan where indicated. Where locations indicated on the drawings are not feasible, or there is a discrepancy between locations shown on the mechanical drawings and the Architectural drawings, notify the Engineer before proceeding with installation.

B. Make duct connections to grilles, registers and diffusers as detailed on the drawings.

C. Paint interior of metal ducts that are visible through registers, grilles or diffusers and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized steel primer.

3.4 FLEXIBLE CONNECTOR INSTALLATION

A. Provide flexible connectors between fans and ducts, between fans and casings, between fans and plenums, between ducts of dissimilar metals and in locations as indicated.

END OF SECTION 23 33 00

SECTION 23 34 23 - HVAC POWER VENTILATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Exterior-Mount, Direct Drive, Centrifugal, Exhaust Fan.

1.3 PERFORMANCE REQUIREMENTS

A. Project Altitude: Base fan-performance ratings on actual project site elevations.

1.4 SUBMITTALS

A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated and include the following:

1. Certified fan performance curves with system operating conditions indicated.

2. Certified fan sound-power ratings.

3. Motor ratings and electrical characteristics, plus motor and electrical accessories.

4. Material thickness and finishes, including color charts.

5. Dampers, including housings, linkages, and operators.

6. Roof curbs.

7. Fan speed controllers.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1. Wiring Diagrams: Power, signal, and control wiring.

2. Design Calculations: Calculate requirements for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.

3. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, and base weights.

C. Field quality-control test reports.

D. Operation and Maintenance Data: For power ventilators to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

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

B. AMCA Compliance: Products shall comply with performance requirements and shall be licensed to use the AMCA-Certified Ratings Seal.

C. NEMA Compliance: Motors and electrical accessories shall comply with NEMA standards.

D. UL Standard: Power ventilators shall comply with UL 705.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver fans as factory-assembled unit, to the extent allowable by shipping limitations, with protective crating and covering.

B. Disassemble and reassemble units, as required for moving to final location, according to manufacturer's written instructions.

C. Lift and support units with manufacturer's designated lifting or supporting points.

1.7 COORDINATION

A. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

PART 2 - PRODUCTS

2.1 EXTERIOR-MOUNTED, DIRECT-DRIVE, CENTRIFUGAL EXHAUST FAN

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

1. Acme Engineering & Mfg. Corp.

2. Breidert Air Products.

3. Carnes Company HVAC.

4. Greenheck.

5. Loren Cook Company.

6. Penn Ventilation.

B. Description: Centrifugal type, wall-mount, exhauster suitable for residential or light commercial applications. Motors are to be capable of operating in air stream temperatures of up to 140 Deg. F. All uits are 100% speed controllable through a decrease in voltage using either a solid state or transformer type speed control. RVF exhausters can be supplied with optional equipment including integral disconnect switch, duct mounting clamps, backdraft dampers.

C. Certifications: Fan shall be listed by Underwriters Laboratories (UL705). Fan shall bear the HVI certified ratings seal for sound and performance.

D. Construction: The fan housing shall be constructed of a heavy gauge, galvanized sheet metal with a white backed enamel finish. The wall mount backplate shall be provided with a gasket seal to prevent leakage and to isolate vibration. The discharge cover shall be easily removable for mounting and/or service of the fan. Pre-wired internal terminal box shall be provided for electrical connection.

E. Fan Wheels: Fan wheel shall be of the backward inclined centrifugal type with a well-designed inlet venturi for maximum performance. Motorized impeller shall be both statically and dynamically balanced as one integral unit to provide for vibration free performance.

F. Motor: Motor shall be an external rotor type with permanent split capacitor. The motor shall be a permanently sealed self-lubricating ball bearing type. Motor shall be equipped with automatic reset thermal overload protection. Motor shall be rated for continuous use.

G. Accessories: See Exhaust Fan Schedule on drawings for exhaust fan accessories.

H. Capacities and Characteristics: See Exhaust Fan Schedule on drawings for exhaust fan capacities and characteristics.

2.2 MOTORS

A. Comply with requirements in Division 23 Section "Common Motor Requirements for HVAC Equipment."

2.3 SOURCE QUALITY CONTROL

A. Sound-Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Factory test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Label fans with the AMCA-Certified Ratings Seal.

B. Fan Performance Ratings: Establish flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests and ratings according to AMCA 210, "Laboratory Methods of Testing Fans for Rating."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install power ventilators level and plumb.

B. Secure roof-mounting fans to roof curbs with cadmium-plated hardware. Refer to Division 07 Section "Roof Accessories" for installation of roof curbs.

C. Install units with clearances for service and maintenance.

D. Label units according to requirements specified in Division 23 Section "Identification for HVAC Piping and Equipment."

3.2 CONNECTIONS

A. Duct installation and connection requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Division 23 Section "Air Duct Accessories."

B. Install ducts adjacent to power ventilators to allow service and maintenance.

3.3 FIELD QUALITY CONTROL

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

1. Verify that shipping, blocking, and bracing are removed.

2. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.

3. Verify that cleaning and adjusting are complete.

4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.

5. Adjust belt tension.

6. Adjust damper linkages for proper damper operation.

7. Verify lubrication for bearings and other moving parts.

8. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in fully open position.

9. Disable automatic temperature-control operators, energize motor and adjust fan to indicated rpm, and measure and record motor voltage and amperage.

10. Shut unit down and reconnect automatic temperature-control operators.

11. Remove and replace malfunctioning units and retest as specified above.

B. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

A. Adjust damper linkages for proper damper operation.

B. Refer to Division 23 Section "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing procedures.

END OF SECTION 23 34 23

SECTION 238239 - WALL & CEILING HEATERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Ceiling heaters with propeller fans and electric-resistance heating coils.

1.2 SUBMITTALS

A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories for each product indicated.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1. Plans, elevations, sections, and details.

2. Location and size of each field connection.

3. Equipment schedules to include rated capacities, furnished specialties, and accessories.

C. Field quality-control test reports.

D. Operation and maintenance data.

1.3 QUALITY ASSURANCE

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

B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

C. ASHRAE/IESNA 90.1-2004 Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6 - "Heating, Ventilating, and Air-Conditioning."

PART 2 - PRODUCTS

2.1 WALL AND CEILING HEATERS

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

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

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

1. King Pic-A-Watt
2. Berko Electric Heating; a division of Marley Engineered Products.
3. Chromalox, Inc.; a division of Emerson Electric Company.
4. Indeeco.
5. Markel Products; a division of TPI Corporation.
6. Marley Electric Heating; a division of Marley Engineered Products.
7. Q-Mark Electric Heating; a division of Marley Engineered Products.
8. Trane.

D. Description: An assembly including chassis, electric heating coil, fan, motor, and controls. Comply with UL 2021.

E. Cabinet:

1. Front Panel: 20 gauge, electro-galvanized steel.
2. Finish: Powder-coated paint in gloss white applied to factory-assembled and -tested wall and ceiling heaters before shipping.
3. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.

F. Recessed-Mounting Cabinet Enclosure: 20 gauge electro-galvanized steel. Factory installed ground wire. Zero clearance to insulation.

G. Electric-Resistance Heating Coil: 3 steel sheathed heating tubes in a furnace-brazed, plate-finned, block design containing coiled Ni-Chrome wire embedded in a Magnesium Oxide insulator. Assembly provides up to seven (7) possible wattage configurations available for field installation selection. The use of external resistors, diodes, or other weak links to obtain multiple wattages will not be accepted.

H. Fan: High efficiency, dynamically balanced, 5-bladed aluminum propeller directly connected to motor.

1. Motor: Permanently lubricated. Comply with requirements in Division 23 Section "Common Motor Requirements for HVAC Equipment."

I. Controls: Remote Mounted Thermostat. See Specification Section 230900 – Instrumentation and Control for thermostat requirements.

J. Heat/Fan/Off Tamperproof Disconnect Switch: The DPST off switch provides a "positive off" that disconnects all ungrounded conductors. 3-Position switch provides heating and summer fan-only operation.

K. Thermal Overload: Heaters shall be equipped with thermal overload Smart Limit Protection, which disconnects elements and motor in the event normal operating temperatures are exceeded. If thermal overload shall remain open until manually reset by turning the heater off for fifteen (15) minutes.

L. Fan Delay Switch: Fan continues to operate after the thermostat shuts off to remove residual heat left in the element.

M. Electrical Connection: Factory wire motors and controls for a single field connection with disconnect switch.

N. Capacities and Characteristics:

1. See Equipment on Drawings for Capacities and Characteristics.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install unit heaters to comply with NFPA 90A.

B. Comply with safety requirements in UL 1995.

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

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

3.2 FIELD QUALITY CONTROL

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

1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

2. Operate electric heating elements through each stage to verify proper operation and electrical connections.

3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

B. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 238239

ARCHITECTURAL

SECTION 03 20 00 – CONCRETE REINFORCING

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

B. Reference structural drawings for additional information.

1.2 STANDARDS

A. Comply with requirements set forth in ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures", except where more exacting requirements are specified in the Contract Documents.

B. Bars shall be bent cold and details of reinforcement shall conform to ACI 318. Welding of reinforcing steel shall be by certified welders in conformance with details on Drawings and with the American Welding Society's Recommendations for Welding Reinforcing Steel (A.W.S. D1.4, latest edition).

C. Abbreviations Used in This Section

1. ACI:American Concrete Institute, P.O. Box 19150, Redford Station, Detroit, Michigan, 48219

2. ASTM:American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania, 19102.

3. CRSI:Concrete Reinforcing Steel Institute, 38 S. Dearborn Street, Chicago, Illinois, 60603.

1.3 SUBMITTALS

A. Submit drawings to Architect showing bending and placing of all reinforcing. Drawings shall include diagrammatic elevations of all walls at a scale sufficiently large to show clearly the position and erection marks of marginal bars and their dowels and splices. Review shall extend only to general arrangement and correspondence with the Drawings and Specifications and shall not relieve the Contractor from complying with the requirements of the Contract Documents as to dimensions, laps, lengths, fit and all other details. Do no fabrication before receipt of reviewed drawings from the Architect. See Section 03 30 00 and 04 22 00 for additional reinforcement and design requirements.

1.4 STORAGE

A. Pile reinforcement at the site to prevent excessive rusting or fouling with grease and/or coating that will interfere with bond. Store so as to maintain identifications after bundles are broken.

1.5 COORDINATION

A. Coordinate work with other trades so as not to interfere with their work. Bring interferences between trades to Architect's attention and resolve before any concrete is poured.

1.6 SPECIAL INSPECTION and TESTING

A. Refer to Division 1 for cost information and general requirements.

PART 2 – PRODUCT

2.1 MATERIALS

A. Reinforcing Bars: Shall be deformed bars conforming to ASTM, A615, (S1), Grade 60, unless otherwise noted. Grade 60 for masonry work. Each bundle shall be accompanied by identification of heat number and grade.

B. Welded Wire Fabric: Shall conform to requirements of ASTM, A185, furnished in flat sheets. Gauges and dimensions shall be as noted on the Drawings. Provide in all interior slabs where bars are not indicated, and exterior slabs on grade unless noted otherwise.

C. Dowel Bars: shall be plain steel bars conforming to ASTM A 615, ASTM A 616, or ASTM A 617 and shall be free from burring or other deformation restricting slippage in the concrete. High strength dowel bars shall conform to ASTM A 714, Class 2, Type S, Grade I, II, or III, bare finish. Before delivery to the construction site each dowel bar shall be painted on all surfaces with one coat of paint meeting Federal Specification TT-P.

D. Accessories: Conform to CRSI, "Manual of Standard Practice for Reinforced Concrete Construction". Include all devices necessary for proper placing, spacing, supporting and fastening steel reinforcement in place. Metal or plastic accessories, except where noted otherwise. Colored concrete block chairs and spacers only at architectural exposed concrete. Use concrete blocks or metal chairs to support reinforcement in slabs.

E. Non-Shrink Grout: Masters Builders 'Masterflow 928', or approved.

F. Reinforcing Bars to be Furnished to Other Trades: All standard type reinforcing bars required for reinforcing masonry work shall be furnished properly cut and shaped as indicated on the Drawings.

PART 3 – EXECUTION

3.1 INSTALLATION

A. All reinforcing steel shall be detailed in conformance with ACI "Manual of Standard Practice For Detailing Reinforced Concrete", except as otherwise shown.

B. Placing: Reinforcement shall be accurately placed in accordance with Structural Drawings and reviewed shop drawings and securely tied at intersections with 16-gauge black annealed wire. It shall be maintained in proper position by chairs, bar supports, or other approved devices. Bars in footings shall be supported on precast concrete blocks. Support securely so that bars may be walked upon without displacement and fasten to prevent movement before and during placing of concrete.

1. Bars shall be free from loose, flaky rust, mud, mill scale, oil or other coating that will reduce bond.

C. Laps and Splices: Bars shall lap 40 diameters, or 24" minimum, unless otherwise indicated on Drawings. Splices in adjoining horizontal bars shall be staggered at least 6 feet. Where this is not feasible, submit suggestions for the Architect's consideration. Horizontal bars shall be hooked around corners not less than 30 diameters, or a minimum of 24", unless otherwise shown on Drawings.

1. Lap wire fabric a minimum of one full mesh on sides and ends, but not less than 8".

2. Wherever conduit, piping, inserts, sleeves and other embedded items interfere with the placing of reinforcing steel as shown or called for, the Contractor shall consult the Architect and secure from him in writing the method of procedure before pouring any concrete. Bending or field cutting of bars around openings or sleeves will not be permitted.

D. Bends shall generally be made prior to placement. No bars partially embedded in hardened concrete shall be field bent unless specifically so detailed or approved.

E. Concrete cover of bars shall conform to IBC requirements as a minimum and as may otherwise be detailed or noted on the drawings.

F. Welding: Shall be done by welders certified by a third party quality control agency, such as Washington Association of Building Officials (WABO). Conform to requirements of the American Welding Society Standard Code of Arc and Gas Welding in Building Construction.

G. Non-shrink grout shall be mixed and placed in strict accordance with manufacturers' printed instructions.

H. Inspection: Contractor's job superintendent shall personally inspect placement of all reinforcing steel to ensure proper installation, in accordance with Design Drawings and reviewed shop drawings. He shall sign a daily log and note in his Progress Report his approval prior to pouring of concrete.

END OF SECTION 03 20 00

SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

B. Reference structural drawings for additional information.

1.2 SCOPE

A. The Extent of concrete work, excluding incidental patching, is shown on the Drawings.

1.3 STANDARDS

A. Codes and Standards: Comply with the provisions of the following codes, specifications and standards, except as otherwise shown or specified:

1. ACI 315"Manual of Standard Practice for Detailing Reinforced Concrete Structures"
2. ACI 318"Building Code Requirements for Reinforced Concrete"
3. ACI 347"Recommended Practice for Concrete Formwork"
4. ACI 304"Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete"
5. ACI 605"Recommended Practice for Hot Weather Concrete"
6. ACI 306"Recommended Practice for Cold Weather Concrete"

1.4 SUBMITTALS

A. Submit mix design for approval, substantiated by test results for the various strengths and types of concrete required. Obtain Architect's acceptance of mix before delivery of material to job

1.5 QUALITY ASSURANCE

A. Workmanship: The workmanship must be equal to the best practice in modern construction. Contractor shall exercise the greatest possible care to make a uniform dense concrete of required strength, true to elevations and lines shown on the Drawings.

1. All concrete work which does not conform to the specified requirements, including strength, tolerances, finishes, or due to excessive imperfections shall be corrected or removed and recast as directed by the Architect at the Contractor's expense without time extension therefore. The Contractor shall also be responsible for the cost of corrections to any other work affected by, or resulting from, corrections to the concrete work.

B. Concrete Sampling and Testing: Materials and installed work may require testing and retesting by the Owner's inspection laboratory as directed by the Architect. Refer to Division 1 for cost information and general requirements.

C. Samples of all materials required for analysis and tests in the amounts required, shall be furnished to the testing laboratory free of charge. Not less than 50 lbs. of the fine aggregate and not less than 100 lbs. of each grading of coarse aggregate proposed for use shall be delivered to the laboratory. These samples shall be selected to represent fairly the average quality and grading of the respective aggregates. Deliver aggregate samples not less than 30 days before first scheduled date for pouring of concrete. Portland Cement samples will be taken for testing by the laboratory from the bins of the concrete producer selected by the Contractor. If cement for mixes is obtained from certified pretested bins, the laboratory will omit this sampling and testing.

D. Specimens will be taken by testing laboratory/special inspector. Contractor shall provide labor, and material as required, to assist testing laboratory in preparing specimens for testing, and job storage facilities for making and storage of specimens. Assist in packing specimens for shipping.

1. Delivery of specimens will be done by testing laboratory/special inspector.

2. The Testing Laboratory may:

   a. Make an analysis of aggregate in accordance with ASTM C33-80.
   b. Test cement in accordance with ASTM C150 unless cement will be furnished from certified pretested bins.
   c. Design mixes to obtain the minimum strength specified.
   d. Make a complete inspection of the producer's plant prior to start of operation to verify that the plant is equipped with an approved metering device for determining the moisture content of the fine aggregate and the adequacy of all other quality controls.
   e. Make and cure concrete test specimens for each strength of concrete in accordance with ASTM C31-69. Make not less than one set of three identical compression test specimens from concrete obtained from each one hundred (100) cubic yards or fraction thereof placed each day.
   f. Make slump tests in accordance with ASTM C143-69 to control slump. Make one test for each batch of each strength of concrete and at least one test per hour during a continuous concrete pour.
   g. Make air entrainment tests for each batch of each strength of concrete.
   h. Keep an identification record of cylinders taken and concrete poured. Mark all cylinders from each set with the same number on one end and enter this number in a record book for this purpose with the date, time and location in the Building.
   i. Make compression tests in accordance with ASTM C39-66. Where Type I cement is used, test one cylinder at 7 days and one cylinder at 28 days. Where Type III cement is used, test one cylinder at 3 days and one cylinder at 7 days. The third cylinder shall used as a check cylinder when required. If report is satisfactory, dispose of third sample; if report is unsatisfactory, test third sample at age selected by Architect.

j. Assume full responsibility for transportation of test specimens from job site to laboratory. Submit test reports to the Architect.

E. Evaluation of tests shall proceed promptly so as not to impede progress of the Work. Strengths of concrete shall be considered satisfactory if the average of any three consecutive strength tests of the laboratory cured specimens representing each specified strength of concrete is 15% greater than the specified strength, and if not more than 10% of the strength tests have values not more than 10% less than the specified strength.

1. If strength tests fail to meet the minimum requirements, the concrete represented by such tests shall be considered questionable and shall be subject to further testing. Refer to Section 01410.

2. The Architect may require test cores of hardened structure to be taken by the testing laboratory in accordance with ASTM C42-77 and C39-80. If test indicates core specimen below required strength, remove the concrete in question and replace it without cost to the Owner.

1.6 COORDINATION

A. Schedule the work and notify other trades in ample time so that provisions for their work can be made without delaying progress of the Project. Any patching or cutting made necessary by failure or delay in complying with this requirement shall be at the Contractor's expense.

PART 2 – PRODUCT

2.1 MATERIALS

A. Form Materials: Unless specified or detailed otherwise, construct all formwork with new plywood or clean steel forms, to provide continuous straight, smooth, exposed surfaces. Vertical surfaces not over 12" high may be formed with new dimension lumber or stock steel forms. Provide form material with sufficient thickness to withstand pressure of newly placed concrete without bow or deflection.

B. Form Ties: Adjustable length removable or snap-off metal ties (with plastic cone heads) designed to prevent spalling of concrete during removal (and to receive pre-cast concrete plugs as specified). Any portion of ties remaining in wall after removal shall be at least 1-1/2" below formed concrete surface.

C. Reinforcing Materials: See Section 03 20 00

D. Concrete Materials:

1. Cement shall conform to "Specifications for Portland Cement", ASTM C150, Type I or II.

2. Aggregate shall conform to ASTM C33, except as modified herein. Aggregates shall be uncoated, clean and thoroughly washed before using and shall not contain disintegrated granite, shale or decomposed laminated pieces.

3. Fine aggregate shall conform to ASTM C33 and be concrete sand, as available from established, approved local sources.

4. Maximum size of aggregate shall be 1-1/2" for standard weight concrete, but not larger than 1/5 of the depth of slabs or 3/4 of the minimum clear distance between reinforcing bars and forms.

5. Water shall be clean and free from oil, acid, alkali, vegetable matter, organic matter and other deleterious substances.

6. Water Reducing Agent(s) (Plasticizers): Master Builders' 'Pozzolith'.

7. Air-entraining admixture shall be per ASTM C260.

E. Related Materials:

1. Joint Filler Strips: 'Ceramar' by W.R. Meadows, or approved, 3/8" thickness x 3" deep, or as otherwise detailed or noted.

2. Liquid Joint Sealer: 'Master Seal SL2' paving joint sealant, or approved.

3. Membrane forming curing compound, if and where allowed, shall conform to ASTMC309, Type 1. Day-Chem Rez Cure, J-11-W, conforming to ASTM C309, Type 1, Class A. or Dayton Superior, Safe Cure and Seal, conforming to ASTM C309, Type I. Day-Chem J-11 curing compound may be used at all below grade surfaces such as footings and foundation walls

2.2 CONCRETE FORMWORK

A. Forms: Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by the concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.

1. Formwork shall be designed to be readily removable without impact, shock or damage to concrete surfaces and adjacent materials and surfaces.

2. Forms shall be in compliance with ACI 347 construct to sizes, shapes, lines and dimensions shown and to obtain accurate alignment, location, grades, level and plumb work in the finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features as shown or required in the Work. Solidly butt joints of forms and provide back-up at joints to prevent leakage of water and/or cement paste. Use vinyl foam tape at joints of formwork for all architecturally exposed concrete. Voids, honeycombing, sand pockets, fins, etc., may be cause for rejection.

3. Fabricate forms for easy removal without hammering or prying against the concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces.

4. Provide temporary openings where formwork is inaccessible for cleanout, for inspection before concrete placement by Architect/Project Engineer or Special Inspector, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of water or cement paste. Locate temporary openings on forms at inconspicuous locations as approved.

B. Cleaning and Tightening: Before inspection of forms and reinforcing steel thoroughly clean forms and adjacent surfaces to receive concrete. Remove wood chips, sawdust or other debris just before concrete is placed. Retighten forms after placement of concrete, and as required, to eliminate any concrete or water leakage.

C. Form for exterior slabs, walks, and steps to finish elevations indicated on Drawings and as otherwise required to provide positive drainage away from building(s) and off concrete surfaces.

1. Where not otherwise indicated, typical drainage slope shall be 1/4" per foot.

2.3 PROPORTIONING and DESIGN of MIXES

A. Provide concrete as specified or noted on the Structural Drawings.

B. Submit mix design for approval, substantiated by test results for the various strengths and types of concrete required. Obtain Architect's approval of mix before delivery of material to job.

C. Air-entrained concrete shall be in strict accordance with agent manufacturer's printed instructions and shall be limited to the following:

D. For concrete slabs (pavement)/walks exposed to weather, use 7% of entrained air, by volume, as determined by procedure prescribed in ASTM C231.

E. For other concrete exposed to weather, use 7% of entrained air, by volume, per ASTM C231.

F. For concrete at all other locations, use of air-entraining agents not permitted, except where approved by the Architect.

PART 3 – EXECUTION

3.1 CONCRETE MIXING

A. Mixing Concrete: Consistency of mix shall be obtained with the minimum amount of water required to produce a concrete that will flow sluggishly into the forms, work properly into the corners, angles, and reinforcement without excessive puddling, spading or vibrations and without permitting the materials to segregate or free water to collect on the surface.

B. Maximum slump of all concrete measured in accordance with ASTM C143 and in accordance with the Structural Drawings.

C. Ready-mixed concrete shall be used in accordance with the Specifications and ASTM C-94-74a. Discharge and place concrete not later than one hour after the addition of water. Mix concrete for a minimum of 10 minutes, at least 3 minutes of which must be immediately prior to discharge at the site. No additional water to be added at the site.

3.2 CONVEYING and PLACING CONCRETE

A. Do not place concrete until the forms and reinforcement have been completed and all preparations for the pour have been made, and have been inspected and approved by the Architect or his authorized representative.

B. Notify Architect (and Special Inspector) not less than 48 hours before placing concrete.

C. Clean formwork thoroughly, removing all loose dirt, scrap lumber and other debris from forms and footing trenches before pouring.

D. In no case shall concrete be placed on standing water, muddy, soft or spongy areas. Subgrade conditions shall conform in all respects to requirements of Section on 'Earthwork' hereinbefore.

E. Pours of concrete once started, shall be carried on as a continuous operation until the section of approved size and shape is completed.

F. Depositing of concrete shall be continuous, or in layers, or bands, of such thickness that no concrete will be deposited on, or against, concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section.

G. Vibration shall follow immediately upon deposit so as to minimize entrapped air between concrete and form and to blend two layers.

H. Slabs: Before placing slabs, removable screed shall have been installed at edges of walls and at as many intermediate locations as necessary to ensure correct elevations and true planes. Surfaces shall be defined by fair lines and be free from irregularities.

1. Place concrete on damp (not wet) firm earth, or drainage fill where so indicated on Drawings. Rod to uniform surface true to plane within 1/4" in 10' in any direction.

2. Form slabs with control joints conforming to details on Drawings. Install joint filler strips, as detailed, wherever slabs abut vertical surfaces, and at all construction and control joints in exterior slabs and exposed interior slabs on grade. Control joints in exterior slabs are not to be more than 12'-0" o.c. in any dimension, and at exposed interior slabs not more than 16'-0" in any dimension, in any case, unless specifically dimensioned otherwise on Plans or on Structural Drawings. Refer to details on Drawings for finish tooling pattern of joints in exposed exterior slabs.

3. All (interior) slabs control joints shall be sawcut within **8 hours** of the pour with a "green concrete" saw blade. Cutting times may be extended 4 hours when ambient temperatures are below 60s.

4. Where Drawings call for sealing compound finish at exposed control joints, joint filler material shall be installed with depth as required to bring top to 3/4" below surface of slab. Fill remainder of joint with standard sealing compound, "Sonelastic" Paving Joint Sealant or approved.

5. Prepare slabs for finishing by tamping concrete with special tools to force the coarse aggregate away from the surface and then screed to the required level.

I. Cold Weather: When the mean daily temperature of the atmosphere is less than 50 degrees F., the contractor shall institute cold weather concreting precautions and practices in accordance with ACI standard recommended practice for winter concreting ACI 604 (306). Admixtures shall be used in all concrete to reduce the mixing water requirements and to control the rate of hardening in keeping with specifications requirements and prevailing job site temperatures. Exterior walks shall not be poured in freezing weather and shall be maintained at a surrounding air temperature of 40 degrees for a period of 28 days. No additional time will be given for delays to concrete placement due to ambient air temperatures or snow cover.

J. Hot Weather: Arrangements for installation of windbreaks, shading, fog spraying, sprinkling, ponding or wet covering of a light color shall be made in advance of placement, and such protective measures shall be taken as quickly as concrete hardening and finishing operations will allow.

K. Changes in Temperature: Curing temperature of all concrete shall be as uniform as possible. Changes shall not exceed 5 degrees F. in any one hour or 50 degrees F. in any 24-hour period.

3.3 PROTECTION and CURING

A. Leave forms in place not less than the period specified herein 7 days following the pour for curing, unless adequate provision is made to keep the surfaces of the concrete wet, or to prevent evaporation by application of a suitable, approved, membrane.

1. Concrete shall be protected from damage during removal of formwork and from injury resulting from the storage or movement of materials during construction.

B. Apply Fluid applied curing compounds at a rate of 200 square feet per gallon and apply a second coat at a rate of 400 square feet per gallon. Curing compounds at slabs on grade shall be trowel applied. Exposed edges of footings and foundation walls may be spray applied.

1. When forms are removed prior to end of prescribed curing time, continue curing for the prescribed time as specified above.

3.4 SLAB FINISHES

A. Smooth trowel finish shall be provided at all interior slab surfaces, unless specifically noted or scheduled otherwise. Trowel by hand or machine to hard, dense surfaces, free from trowel marks. Do not absorb wet spots with neat cement or mixture of sand and cement. Wait until surfaces are dry enough for proper troweling. Chemical dryers not permitted. Trowel to uniform surface, true to plane, as indicated: **FF 25/FL 20,** per the F-Number system. Testing of surfaces shall occur 72 hours after slab installation and shall be performed by the Contractor.

B. At exterior slabs and walks, not otherwise noted, lightly brush wet troweled surface with soft hair broom, all strokes perpendicular to walks or flow lines, or in direction as indicated on Drawings, to create moderately abrasive, uniform, non-skid surface. Where called for on Drawings, "smooth trowel" finish at exterior slabs and walks shall be "sweat" finish (not hard troweled) as approved.

1. Mark off slabs as indicated or directed; round edges to 1/2" radius with 1-1/2" wide smooth edging tool. Unless otherwise indicated or detailed, edge all sections of brushed slabs with 1-1/2" wide smooth edging along all edges and both sides of all joints.

3.5 FINISHES OF FORMED SURFACES

A. Standard Rough Form Finish: For formed concrete surfaces not exposed to view in the finish work or covered by other construction, unless otherwise shown or specified. Concrete surface may retain the texture imparted by the form facing material used, with significantly defective areas repaired and patched as specified. Form tie holes to be filled flush with formed concrete surface with cement grout.

B. Standard Smooth Finish: For formed concrete surfaces exposed to view, or that are to be covered with a coating material applied directly to the concrete or a covering material bonded to the concrete such as waterproofing, dampproofing, painting or other similar system, provide as-cast concrete surface as obtained with the form facing material, with defective areas repaired and patched as specified, and fins and other projections on the surface completely removed and smoothed. Form tie holes to be filled and finished flush with formed concrete surface with cement grout.

C. For Exposed Concrete: The formed surface shall be similar to standard smooth finish surface. Repair and patch tie holes, honeycombs and defective areas to a smooth finish. Remove fins and other projections completely and smoothed. Thoroughly wet surface and provide a sacked finish by coating the entire exposed concrete surface with sacking mortar as soon as the concrete surface approaches dryness. Thoroughly and vigorously rub mortar over the area with clean burlap pads to fill all voids. While mortar is still plastic but partially set (so it cannot be pulled from voids), sack-rub surface with dry mix of sacking mortar (leave out water). There should be no discernible thickness of mortar on concrete surface, except in voids; all surfaces should be uniformly textured. Immediately begin a continuous moist cure for 72 hours.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets and similar unformed surfaces occurring adjacent to formed surfaces, strikeoff smooth and finish with a

texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise shown.

E. Miscellaneous Finish Patching: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete the work.

3.6 CONCRETE SURFACE REPAIRS

A. Repair and patch defective areas with cement mortar immediately after removal of forms, but only as acceptable to the Architect/Engineer. Surface defects, as such, include color and texture irregularities, cracks, spawls, air bubbles, honeycomb, rock pockets and holes left by tie rods and bolts; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning.

1. Cut out honeycomb, rock pockets, voids over 1/2" diameter and holes left by tie rods and bolts, down to solid concrete, but in no case, to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Before placing cement mortar, thoroughly clean, dampen with water and brush-coat the area as acceptable to Architect.

2. For surfaces exposed to view, blend white Portland cement and standard Portland cement so that when dry, patching mortar will match color of surrounding surfaces. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

B. Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect/Engineer.

C. Test unformed surfaces, such as monolithic slabs, for smoothness and to verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope. Replace such slabs, etc., which cannot be repaired satisfactorily and approved by Architect.

D. Repair finished unformed surfaces that contain defects which adversely affect durability of concrete. Surface defects include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets and other objectionable conditions.

E. Correct high areas in unformed surfaces by grinding, if approved by Architect, after concrete has cured at least 14 days.

F. Correct low areas in unformed surfaces during, or immediately after completion of surface finishing operations by cutting out low areas to the nearest joint or edge on all sides and replacing with fresh concrete. Finish repaired areas to match adjacent concrete.

G. All concrete slabs shall be tested with a straight edge in the presence of the Architect/Engineer prior to construction of walls, etc which would preclude removal and replacement of new concrete slabs. All high areas and low areas shall be repaired prior to acceptance and beginning of adjacent work.

END OF SECTION 03 30 00

SECTION 04 05 00 – MASONRY MORTAR and GROUT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

B. Reference structural drawings for additional information.

1.2 SUMMARY

A. Provide masonry mortar and grout in conjunction with work of Section 04 22 00.

1.3 SUBMITTALS

A. If ready-mixed mortar is used, furnish certificates from mixing plant stating that mortar delivered to project conforms to these specifications.

B. Samples: Refer to Section 04 22 00.

1.4 QUALITY ASSURANCE

A. Tests and Special Inspection: Refer to Section 04 22 00 and structural drawings.

PART 2 – PRODUCT

2.1 MATERIALS

A. Sand shall be natural grey sand conforming to ASTM C-144 and IBC requirements.

B. Portland Cement: Conform to ASTM C-150, Type 1.

C. Hydrated Lime: Conform to ASTM C-207, Type "S".

D. Mortar colors shall be inorganic mineral oxides, manufactured by Richard Coulston, J. Lee Smith, Ricketson, 3-M Company, or approved.

E. Waterproofing admixture shall be Horn "Hydratite", Master Builders "Omicron", Euclid Chemical "Integral Waterpeller", or approved.

F. Accelerator shall be plasticizing agent, "Anti-Hydro", "Trimix", or approved.

G. Retardant shall be plasticizing agent, Sika "Plastiment", Sonneborn "Sonotard", or approved.

H. Other materials shall conform to requirements of International Building Code, current edition, and be specifically approved by the Architect.

2.2 SETTING MORTARS

A. Factory Blended Mortar Mix: Portland cement, lime and sand mortar, Type S.

1. Bonsal American Amerimix 400 or equivalent.

B. Reinforced masonry walls and exterior veneer; IBC Type "S".

C. Mortar Mixing: Shall conform to requirements of International Building Code and ASTM Specification C270, latest edition.

D. Mortar Color: Add color selected by Architect, in proportions recommended by manufacturer, to mortar as determined by sample panels.

E. Waterproofing admixture shall be added, in proportions recommended by manufacturer, to mortar where exposed to weather or in contact with earth. Waterproof cement, of type specified, may be used and waterproofer omitted, at Contractor's option.

F. Accelerator or retardant shall be added to mixes only when required by weather conditions and as approved by the Architect.

2.3 GROUTED REINFORCED UNIT MASONRY WALL GROUT

A. 1 part by volume Portland cement, 0 to 1/10 part hydrated lime, 2-1/4 to 3 parts sand, 1 to 2 parts gravel, maximum 3/8" aggregate mixed to achieve f'c = 2,000 psi at 28 days.

1. Shall conform to requirements of International Building Code and ASTM C476 latest edition.

B. Slumps: Shall be as required to produce consistency for pouring without segregation, to a minimum of 8" at the time of grouting.

C. Mix of Grout: Shall be plastic, suitable for pumping without separation of constituents, and mixed thoroughly.

PART 3 – EXECUTION

(Not Used)

END OF SECTION 04 05 00

SECTION 04 22 00 – CONCRETE UNIT MASONRY

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

B. Reference structural drawings for additional information.

1.2 SUMMARY

A. Provide a concrete unit masonry system at exterior and interior walls, including all lintels framing, corner units, sills, and end units as required for a complete and finished system.

1.3 STANDARDS

A. All materials procedures and workmanship shall conform strictly to all applicable provisions of:

1. ASTM C90

2. Recommendations of National Concrete Masonry Association.

1.4 SUBMITTALS

A. Submit:

1. Manufacturer's published literature.

2. Documentation all concrete units have been thoroughly cured at the plant before shipment.

3. Documentation all concrete units conform to requirements of this Specification.

B. Sample Panels: Obtain sample units and construct 2' x 4' sample panel, at location directed. Show bond, jointing, tooling, and mortar color if required as directed. Continue to build panels (up to 3 panels for each type of concrete block masonry), until acceptable panel is produced and obtain Architect's written approval on dated and identified panel which is to remain on the job until all work of this Section is complete. The approved sample shall be the basis for accepting work of this Section.

1. Sample panel may be integrated into the final work if properly erected and accepted by the Architect.

C. Furnish a certificate to the Architect stating that all concrete blocks have been thoroughly cured at the plant before shipment and that they conform to all requirements of this Specification. Block manufacturer shall sign each certificate and indicate name of Contractor, Project location, quantity, date and date of delivery.

1.5 QUALITY ASSURANCE

A. Inspection and Testing.

1. Special inspection will (may) be done by a testing laboratory/special inspector, selected by the Owner. Refer to General and Supplementary Conditions and Division 01 for cost information and general requirements.

2. Special Inspection of reinforcement placement prior to grouting is required for all Grouted Reinforced Masonry Construction in accordance with requirements of IBC, latest edition.

3. Testing: Mortar and grout test specimens shall be taken by Testing Laboratory/Special Inspector during period of Masonry Construction in accordance with IBC Chapter 17.

4. Furnish and deliver to the special inspector, without charge, identified samples of blocks, mortar and grout required for testing.

5. Each such mortar (and grout) test specimen shall exhibit a minimum ultimate compressive strength as specified.

6. Remove and reconstruct as directed, any work for which tests taken do not pass these standards, at no additional cost to the Owner.

1.6 CODES, PERMITS and FEES

A. Requirements of the International Building Code, latest edition, if more rigid than those herein, shall govern.

1.7 HANDLING, DELIVERY and STORAGE

A. Deliver and store materials in dry and protected areas off the ground to prevent contamination by mud, dust, or other items likely to cause staining or other defects. Cover materials as necessary to protect from elements. Replace damaged materials at no cost to the Owner.

1.8 JOB CONDITIONS

A. Coordinate with all other trades whose work relates to concrete masonry installation for placing of all required blocking, subframing, backing, furring, electrical, mechanical blockouts, sleeves, etc.

B. Do no masonry work in freezing weather unless approved means are provided for heating materials and masonry is protected from frost until mortar has reached design strength. Anti-freeze ingredients are NOT PERMITTED to be added to mortar or grout.

C. Protect masonry construction from direct exposure to wind and sun when erected in an ambient air temperature of 99 degrees F. in the shade with the relative humidity less than 50%.

D. Do no work in rainy weather unless materials and work are protected by cover.

E. Cover tops of walls with non-staining, waterproof covering before stopping work for the day. Clean top surfaces of loose mortar when stopping work.

PART 2 – PRODUCT

2.1 GENERAL

A. Concrete Masonry Units: Grade N Type 1 units conforming to ASTM C90. Provide as called for on the drawings in the following sizes and face types:

1. CMU-1: Standard smooth face, nominal 8"x8"x16". Furnish companion corner units, bond beam units, ledger units, etc., for each type, as called for on the Drawings and as may be required for proper completion of the work of this Section.

B. Mortar: See Section 04 05 00.

C. Grout: See Section 04 05 00.

D. Reinforcing Steel: Conforming to requirements of Section 03 20 00.

E. Steel Lintels, Inserts, Plates, etc.: Provide as required and as indicated on the Drawings. All steel components shall conform strictly to the requirements of the structural notes on the Drawings.

F. Admixtures: May be used only with the written approval of the Architect/Engineer.

G. Painting: See Section 09 91 00.

H. Other Materials: All other materials not specifically described, but required for a complete and proper installation of concrete unit masonry, shall be as selected by the Contractor subject to conformance to the above specified standards and the prior approval of the Architect.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Inspection:

1. Prior to all work of this Section, carefully inspect the installed work of all other trades, and verify that all such work is complete to the point where this installation may properly commence.

2. Verify that concrete masonry may be completed in accordance with all pertinent codes and regulations, the reference standards and the Construction Documents.

3. Verify all measurements shown on Drawings by taking field measurements; proper fit and attachments of all concrete masonry is required. The Contractor shall make any reasonable change due to discrepancies between Drawings and actual on-site conditions at no additional cost to the Owner.

B. Preparation:

1. Protect sills, ledges, offsets and other projections from dropping of grout materials and mortar.

2. Establish lines, levels, and coursing. Protect from disturbance.

3. Clean CMU prior to installation. Do not use wire brushes or implements which will mark or damage exposed surfaces.

4. Remove paint, coatings, curing compounds, dirt, grease, oils, soaps, wax and substances from masonry surfaces where stone units will be adhered directly to masonry substrate.

C. General Workmanship:

1. Lay all masonry plumb, level and true to line, unless otherwise indicated on Drawings. Keep bond plumb and uniform. Rack courses back to higher level without toothing. Lay out face coursing to minimize cutting or jumping of bond. Cut out, refill and retool any defective joints. Clean exposed surface free from stain and daubs. Rinse with clear water. Remove all efflorescence. Embed all bolts, ties, etc., into solid grout for full length and depth.

2. Build in panel boxes, anchors, grounds, flashings, expansion joints and all other necessary incidental work. Install embedded structural items detailed on Drawings. Build chases and recesses into walls at time walls are constructed, so that structural stability and weather resistance of wall is maintained.

3. Wetting of masonry units not permitted, unless as approved in writing by the Architect.

D. Concrete Block Masonry Workmanship:

1. Lay with nominal 3/8" bed and head joints in running bond, strike mortar joints flush, then tool to concave rodded joint before mortar sets hard. Tool head joints first.

2. Where coursing requires less than full length units, cut with saw and shape ends to match factory ends. Bond each course at corners and intersections.

3. Do not use chipped or cracked masonry units. If any such are discovered in a finished wall, promptly remove and replace with new units to the approval of the Architect at no additional cost to the Owner.

4. Reinforce as noted on Drawings and provide one #5 at corners, sides and heads of openings. Grout all units containing reinforcing with specified concrete grout. Grouting shall be done in maximum 4'-0" high lifts, as approved by inspection agency.

5. Horizontal bond beams at 4'-0" o.c. vertically, unless shown otherwise on Drawings. Provide two (2) #4 continuous bars in bond beams, unless detailed otherwise.

3.2 CLEANING

A. Thoroughly clean exposed surfaces, whether or not they are to be pointed, stained or sealed, using mild muriatic acid solution or approved cleaner, and rinsing thoroughly with clean water. Leave surfaces clean, free from mortar and other stains.

B. Brush (interior) surfaces with stiff brush to remove all visible efflorescence, after exterior dampproofing, and building has been heated a minimum of one week. Make final cleaning of all efflorescence, as necessary, at completion of job.

C. All residue debris, dust, etc. to be washed from building surface shall be swept or flushed from surrounding sidewalk and service area, removed from planting areas, etc., leaving premises clean and neat.

END OF SECTION 04 22 00

SECTION 06 10 00 – ROUGH CARPENTRY

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

B. Reference structural drawings for additional information.

1.2 QUALITY ASSURANCE

A. Grading Rules: Conform with all applicable requirements of the Western Wood Product's Association's "Western Lumber Grading Rules", latest edition, and as specifically required hereinafter.

1. Each piece of lumber or plywood used for structural framing shall be graded and marked with grade and trademark of WWPA, except that a certificate of grade from grading organization may be accepted in lieu of grade and trademarks when approved by Architect. Trademark of manufacturer shall also appear on each piece.

B. Moisture Content: Maximum moisture content shall be 15 percent for 2-inch nominal thickness or less, 19 percent for more than 2-inch nominal thickness.

C. Plywood Grades: Conform to American Plywood Association (APA) standard grades and specifications.

D. Glued Laminated Members shall be manufactured/fabricated (in a AITC member fabrication plant) in accordance with ANCI/AITC A190.1-1983 and conform to all requirements and recommendations of WWPA and the American Institute of Timber Construction.

1. Each member shall bear the AITC inspection stamp and combination/stress grade, or submit manufacturer's certification that glu-lam members meet these standards and specified combination/stress grade prior to incorporation of members into the Work.

E. Engineered Lumber shall bear a stamp or stamps noting the name and plant number of the manufacturer, the grade, the NER or ICC-ES report number, and the quality control agency. All members shall be manufactured with an approved adhesive.

F. Additional Reference Standards: Conform with all requirements of U.S. Department of Commerce Commercial Standards and American Wood Preservers Association Standards, as they apply.

1.3 SUBMITTALS

A. Submit pre-engineered wood truss design which indicates compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 DELIVERY, STORAGE and HANDLING

A. Deliver and store lumber on sills and cover for protection.

1.5 COORDINATION

A. Coordinate work with other trades (electrical, mechanical, plumbing, etc.) and do all cutting and patching required to accommodate their work, unless otherwise specified. Protect adjacent work as required.

B. Reference structural drawings for additional information.

1.6 MEASUREMENTS

A. Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required. Before commencing work, check all lines and levels indicated and such other work as has been completed. Should there be any discrepancies, immediately report in writing to Architect. In event of failure to do so, be responsible for correction of any errors.

PART 2 – PRODUCT

2.1 MATERIALS

A. Also reference Structural Drawings for information regarding Structural Framing Members. The most stringent shall govern materials used on this project.

B. Framing lumber shall be kiln dried or MC 19 Douglas Fir-Larch graded in accordance with W.C.L.B. Grading Rules for West Coast Lumber No. 17 and grade marked by WWPA.

1. All framing lumber shall be stress grade. All sides shall be surfaced. Grades shall be as follows:

a. Plates, Trimmers, Stringers, Misc.: Douglas Fir/Larch No. 2, S-Dry.

b. Blocking (Non-Structural): Douglas Fir/Larch No. 3 and better, S-Dry.

c. Prefabricated Wood Trusses: Shall be factory manufactured trusses of dimension and configuration required, 2 x 4 and 2 x 6 members (as detailed), Manufacturer engineered in accordance with the structural drawings, and loads as indicated on Drawings. Truss manufacturer shall provide all accessory items such as blocking, bridging, etc. required for a complete, engineered, roof framing system.

d. Plywood Roof Sheathing: Shall be APA, Group 1, C-D Ext, Exposure 1. Thickness as noted on Drawings.

e. Plywood Wall Sheathing: Shall be APA, Group 1, C-D Ext, Exposure 1. Thickness as noted on Drawings.

f. Vented Soffits: Vented Smooth Hardiesofft Panels by James Hardie or approved. Primed for paint, 0.25" thickness, 1.98 lbs. per square foot.

g. Felt Underlay (Building Paper): 30 lb. asphalt impregnated paper felt; product of Nationally Recognized Manufacturer. Minimum grade of roofing felt shall be ASTM D-226-89 Type II.

h. Connection Hardware: Provide all connecting hardware shown or noted on Drawings, specified herein or required to complete work. Use pre-manufactured anchors, hangers, and connectors; Silver, Simpson "Strong Tie", "Trip-L-Grip", or approved. Conform to requirements of IBC.

i. Nails: Unless otherwise noted, common wire nails, galvanized if exposed to exterior, meeting Federal Specification FF-N-101, of the types and sizes required by IBC.-II-B1.

j. Screws: Standard domestic manufacture, bright steel, except galvanized for exterior use and of brass, bronze, aluminum or stainless steel when used to attach items made of those materials.

   1) Types, head configurations and sizes as noted on Drawings.

k. Bolts: Standard mild steel, square or hex head lag bolts with companion nuts and steel plate washers, or carriage bolts with companion nuts and cut washers where so indicated. Bolts, nuts and washers, wholly or partially exposed on exterior shall be galvanized.

l. Powder Actuated Fasteners: Federal Specification GGG-D-777a, install as per manufacturer's printed directions. Charge shall be powerful enough to prevent spalling of concrete.

m. Miscellaneous Clips, Steel Assemblies: Conforming to ASTM A36.

PART 3 – EXECUTION

3.1 WORKMANSHIP

A. All rough carpentry shall produce joints true, tight, and well nailed with all members assembled in accordance with the Drawings and with all pertinent codes and regulations.

1. Carefully select all members; select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing or making proper connections. Cut out and discard all defects which will render a piece unable to serve its intended function; lumber may be rejected by the Architect, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.

2. Do not shim sills, joists, short studs, trimmers, headers, lintels, or other framing components without receiving prior approval from the Architect.

3.2 INSTALLATION

A. Nailing: Use only common wire nails or spikes of the type and dimension, and spacing, required by IBC Table 2304.9.1, except where otherwise specifically noted in the Drawings. For conditions not covered in the IBC, provide penetration into the piece receiving the point of not less than 1/2 the length of the nail or spike; provided, however, that 16d nails may be used to connect two pieces of two inch (nominal) thickness. Do all nailing without splitting wood, preboring as required; replace all split members.

B. Plywood (Diaphragm) Nailing: Nail spacing shall conform to IBC Table 2304.9.1 and additionally to notations and schedules on Drawings.

C. Bolts: Drill bolt holes 1/32" larger than bolt diameter. Use square plate or large washers under heads and nut where they bear against wood. Retighten bolts immediately prior to final inspection.

D. Lag Screws and Screws: Subdrill, use square plate or large washers under lag screw heads when they bear on wood.

E. Typical Framing: Standard 16" o.c. Western (Platform) Framing, except as otherwise shown or noted on Drawings. Double all bearing top plates, headers and trimmers. Provide double studs at ends of all headers. Conform to IBC minimum requirements for headers, structural blocking, bridging, etc., and any more stringent requirements shown on the Drawings.

1. Provide solid bearing to foundation below all beam and header bearing points.

2. In addition to all framing operations normal to the fabrication and erection indicated on the Drawings, install all backing required for the work of other trades.

3. Set all horizontal or sloped members with crown up. Do not notch, bore, or cut members for pipes, ducts, conduits, or other reasons except as shown on the Drawings or as specifically approved in advance by the Architect/Engineer.

4. Make all bearings full, unless otherwise indicated on the Drawings. Finish all bearing surfaces on which structural members are to rest so as to give sure and even support; where framing members slope, cut or notch the ends as required to give uniform bearing surface.

5. Erection, anchorage and bridging of roof truss framing system to be per truss manufacturer's standards and engineering design.

F. Nailers and nailing strips shall be provided as necessary for the attachment of finish materials. Nailers used in conjunction with roof deck installation shall be installed flush with the roof deck system. Stacked nailers shall be assembled with spikes or nails spaced not more than 18 inches on center and staggered. Beginning and ending nails shall not

be more than 6 inches from nailer end. Ends of stacked nailers shall be offset approximately 12 inches in long runs and alternated at corners. Anchors shall extend through the entire thickness of the nailer. Strips shall be run in lengths as long as practicable, butt jointed, cut into wood framing members when necessary, and rigidly secured in place.

G. Sheathing: Install sheathing panels with long dimension running across (normal to) direction of supporting members. Provide support of all panel edges by means of "ply clips", blocking, T & G joints, or other approved means per APA recommendations. Nailing as specified hereinbefore.

H. Accessory Items: Install accessory items such as vents, metal fabrications, etc. in strict accordance with best trade practice, per manufacturer's instructions when applicable, and as detailed or noted on the Drawings.

I. Do not splice structural members between supports unless otherwise indicated.

J. Framing with engineered wood products: Install engineered wood products to comply with manufacturer's written instructions.

3.3 TERMITE CONTROL and DECAY PREVENTION

A. Remove all wood, including form lumber, scrap lumber, shavings and sawdust in contact with ground. Leave no wood buried in any fill or backfill.

B. All wood (e.g., sillplates and ledgers) in direct contact with concrete or masonry shall be pressure treated with approved preservative in oil in accordance with AWPA U1, Commodity Specifications A or F) for above ground use.

C. Ends of posts, joists, blocking, etc., in direct contact with concrete or masonry shall be treated after cutting by soaking ends, for minimum length of 12", in 5% solution of pentachlorophenol for not less than 15 minutes.

3.4 CLEAN UP

1. Keep the premises in a neat, safe, and orderly condition at all times during execution of this portion of the work, in accordance with requirements of General Conditions and Division 1.

2. At the end of each working day, or more often if necessary, thoroughly sweep all surfaces where refuse from this portion of the work has settled. Remove the refuse to the area of the job site set aside for its storage. Upon completion of this portion of the work, thoroughly broom clean all surfaces.

END OF SECTION 06 10 00

SECTION 07 11 00 – DAMPPROOFING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SCOPE OF APPLICATION

A. Apply to all below grade exterior earth faces of concrete footings, foundations, walls, etc., unless specifically indicated not to receive dampproofing.

1.3 COORDINATION

A. Coordinate work under this Section closely with work of all adjacent trades. Whenever the watertightness of the dampproofing is dependent on other trades, assume full responsibility for watertightness of the finished installation.

1.4 GUARANTEE

A. Per GENERAL CONDITIONS, furnish a written guarantee, countersigned by the General Contractor, that all liquid dampproofing is unconditionally guaranteed to be watertight for a period of 2 years.

1.5 DELIVERY, HANDLING and STORAGE

A. Deliver materials to job site in manufacturer's original, unopened packaging and adequately protect against damage while temporarily stored at site.

B. Use all means necessary to protect the installed work of this Section.

C. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 – PRODUCT

2.1 MATERIALS

A. Materials designated for a specific application shall be the products of one manufacturer.

B. Liquid Dampproofing: "Master Builders MasterSeal 614" by BASF, or approved, below grade exterior dampproofing for trowel application and “MasterSeal 610" spray applied primer coat.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Surface Condition: Examine all subsurfaces and verify that they are in proper condition to receive work of this Section. Do not proceed until improper conditions are corrected. Surface must be clean and free of foreign matter. All cracks, voids, honeycombs, etc., shall be filled and repaired with mortar to provide a sound structural surface and to allow dampproofing to properly bridge joints.

B. Application: Do work only in dry weather and apply in strict accordance with manufacturer's written specifications and instructions.

1. Not less than 2 coat (plus prime) application. Allow first coat to dry to "tacky" state (24 hours) before applying second.

2. Prior to applying full strength (trowel) coat, prime surface by spraying thoroughly with a liquid of specified dampproofing primer cut a maximum of 20% (50%) with clean water (gasoline or solvent).

3. Use dampproofing as it comes from container. Apply by troweling on a continuous unbroken film, free from pin holes or other surface breaks. Minimum coverage per coat: 8 gals/100 sf.

END OF SECTION 07 11 00

SECTION 07 20 00 – INSULATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION

A. Provide and install all thermal insulation indicated on Drawings or required herein, except insulation for mechanical work specified in DIVISIONS 22 and 23.

1.3 LABELS

A. Manufacturer's labels required on each piece or package of insulation. Do not remove labels or open packages until Architect inspects and approves. Clearly identify contents, brand name, applicable standard, and R-value.

1.4 DELIVERY, HANDLING and STORAGE

A. Delivery materials to Project site in manufacturer's original packaging. Store materials off the ground. Protect against weather, condensation, and damage.

PART 2 – PRODUCT

2.1 MATERIALS

A. Type 1 Insulation:

1. R-49 Flexible Blanket Insulation (Attic): Manville, Certainteed, or Owens-Corning Fiberglass, un-faced, with flame spread rating not over 25.

2.2 SCOPE OF APPLICATION

A. Blanket Insulation: Install in ceilings below unheated attics.

PART 3 – EXECUTION

3.1 INSTALLATION

A. In accordance with manufacturer's directions for the specific application with recommended adhesives or fastening devices. Fit insulation together snugly. Maintain integrity of insulation over entire area or warm space side.

B. Install flexible blanket insulation with ends and edges tight, supported by friction until such time vapor barrier can be installed.

C. Install insulation to attain maximum R-value possible for finished assembly.

3.2 CLEAN UP

A. Remove and dispose of excess materials, litter and debris, leaving work areas and site in a clean condition.

END OF SECTION 07 20 00

SECTION 07 26 00 – PLASTIC VAPOR BARRIERS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 GENERAL

A. The structure is to be constructed with a continuous air barrier at the perimeter of the thermal envelope.

1. The air barrier shall be uninterrupted and/or sealed at all intersections of roof wall and at all penetrations.

1.3 QUALITY ASSURANCE

A. Acceptable manufacturers - Arco/Polymers (Durethene); Gering Plastics Company (Ger. Pak); Mobil Oil Company.

1.4 DELIVERY HANDLING and STORAGE

A. Deliver and store materials in manufacturer's unopened packages. Protect polyethylene sheeting from punctures, cuts, or other damage which would affect its use as a vapor barrier. After installation of vapor barrier, protect from punctures or cuts.

PART 2 – PRODUCT

2.1 MATERIALS

A. Polyethylene Sheeting: Conform to sheeting ES LP-378C, Type 1; Clear (unless otherwise noted).

1. 6 mil thickness under interior slabs on grade.

2. 4 mil thickness under roof insulation.

B. Tape: Splicing tape as approved by sheeting manufacturer.

C. Ice Shield: Cold-applied, self adhering membrane composed of a high density, cross laminated polyethylene film coated on one side with a layer of rubberized asphalt adhesive. An embossed, slip resistant surface is to be provided on the polyethylene. Supply wound with a disposable silicone-coated release sheet.

1. Color: Gray-Black
2. Thickness: 40 mil, ASTM D3767 procedure A (Section 9.1)
3. Tensile strength, membrane: 250 psi, ASTM D412
4. Elongation, membrane: 250%, ASTM D412

5. Low Temperature flexibility: Unaffected @ - 20 degrees Fahrenheit, ASTM D1970
6. Adhesion to plywood: 3.0 lbs/in. width, ASTM D903.
7. Permeance (max): 0.05 perms, ASTM E96.
8. Material weight installed (max): 0.3 lb/sq ft, ASTM D461.

D. Fasteners, adhesives, primers, and other products required by the manufacturer for a complete and warrantable system.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Lay in widest practical widths. Where splices are made, overlap 12 inches minimum.

B. Protect from puncture and other damage. Replace or repair all damaged material before proceeding with subsequent work (e.g., slabs, etc.).

C. Ice Shield:

1. Install ice shield according to manufacturer's requirements.

2. Ice shield shall be installed throughout the entire roof and shall be installed over curbs and edges, except where called out as perimeter only in which case ice shield shall be installed a minimum of 4' up the roof beyond the line of the insulated wall below, see drawings for additional information.

END OF SECTION 07 26 00

SECTION 07 60 00 – PREFORMED METAL ROOFING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Provide all preformed metal roofing including underlayment felts, attachments, spacers, blocking, closure strips, coping, cap flashing, flashing collars, caulking, clips, cants, etc., as required by the manufacturer, as shown on the Drawings, and as specified herein. The Preformed Metal Roofing installation shall be a complete and watertight assembly in all respects.

1.3 SUBMITTALS

A. Submit the following in accordance with the General Conditions and DIVISION 1.

B. List of materials to be used, identifying manufacturers and any suggested detail revisions. Incorporate any required detail revisions, as approved by the Architect, in the Project at no additional cost to the Owner.

C. Prior to Application for 100% Completion Payments: (2) copies of processed, signed and countersigned guarantee(s) as specified above and certifications that materials conform to these Specifications.

1.4 GUARANTEES

A. The Contractor shall unconditionally guarantee in writing the watertightness of all roofing related work for a period of two years from date of acceptance of the Work by the Architect and Owner.

B. In addition, provide the manufacturer's standard twenty (20) year guarantee against cracking, peeling and fading (not to exceed 5 N.B.S. units) for metal roofing finish.

1.5 QUALITY ASSURANCE

A. Standards and Workmanship: All work shall be done by a preformed metal roofing contractor approved by the manufacturer and the Architect. All work shall be installed in strict accordance with roofing materials manufacturers' directions and recommendations, highest standards of trade practice and all applicable codes and regulations.

B. Coordination: Coordinate work of this Section closely with framing, skylite installation, plumbing vents, exhaust ducts and any other adjacent trades so as to ensure a complete and watertight assembly in all respects.

C. Pre-Application Requirements: Review preformed metal roofing detail drawings and specifications with metal roofing manufacturer to verify that materials are properly used.

1.6 DELIVERY, HANDLING and STORAGE

A. Deliver materials to job site in manufacturer's original protective wrapping. Fully protect against wetness, exposure to sun's rays and other damage while temporarily stored. All materials designated for a specific application shall be the products of one manufacturer.

1.7 JOB CONDITIONS

A. Construction Traffic: Protect roofing materials and take precautions to prevent damage of new, preformed metal roof surfaces during and after construction. Repair any damaged materials immediately art no additional cost to Owner.

PART 2 – PRODUCT

2.1 GENERAL

A. Except as otherwise indicated or approved, all components of the preformed metal roof shall be the products of the same manufacturer and shall meet the minimum standards of applicable ASTM Standards and/or Federal Specifications.

2.2 MATERIALS

A. Metal Roofing: AEP, "Design Span hp, 24 gage, Standing Seam Metal Roof. Roof panels shall consist of integral self-locking standing seams 1-3/4" high spaced 16" on center (striated pan). Products to be manufactured and formed in accordance with the Buy American Act. Equal products by other manufacturer's must be prior approved in accordance with Divisions 1.

1. Roofing system shall have an Underwriter's Laboratory Class 90 wind uplift performance rating when tested by UL580.

2. Fastener clip shall be UL90 rated 18-gauge G-90 Galvanized steel, 40 ksi yield strength, 3-1/2" long triple fastener type.

3. Exterior Finish: DuraTech 5000 (Polyvinylidine Fluoride), color to be selected by Owner from manufacturer's standard selection of not less than 22 colors.

4. Provide full length panels.

5. All metal flashing and trim, required for a watertight installation and as required by the drawings shall be provided from the same manufacturer as the panels and in the same color.

B. Synthetic Sheet Flashings: Gates "Contourflash", "Nervastral", or approved elastomeric flashing sheet material of specific type and thickness recommended by manufacturer for particular application.

C. Underlayment Felt: See Section 06 10 00.

D. Ice Shield: See Section 07 26 00.

E. Pre-Fabricated Pipe Flashing Collars: "Oatey", Buildex "Dektite", or approved, monolithic EPDM elastomeric collar units.

F. Miscellaneous: Furnish any required caulking, nails, clips, cants, etc., required for a proper completion of installation whether shown or called for, or as required by the manufacturer for his application as directed.

PART 3 – EXECUTION

3.1 FABRICATION

A. Fabrication: Shop fabricate all custom shapes and components as required by Drawings and actual job conditions. Fabricate all components for expansion type concealed clip attachment.

3.2 INSTALLATION

A. Prior to commencing preformed metal roofing operations, roof sheathing deck shall be smooth and sound with nailers, curbs and cants, skylites, fascia blocking, etc., in place and complete. All items required by other sections for building into roofing shall be on hand and ready to install.

B. Remove all extraneous materials from roof deck; sweep clean and free of all objects which may puncture underlayment. The only materials allowed on the roof deck to be roofing materials in process of application and roofers' appliances and tools. Deck shall be dry, with no visible moisture or frost present.

C. Entire roof area must be covered with a minimum of one layer of underlayment felt (applied with waffle pattern up,) lapped horizontally and with ice shield starting at the eave. Lap all edges a minimum of 6". Underlayment/ice shield shall be installed directly ahead of roofing metal installation to alleviate wind damage and loose fitting portions of underlayment felt/ice shield.

D. Roofing Application: Apply preformed metal roofing assembly in strict accordance with manufacturers' printed directions and recommendations, and as detailed on the Drawings. Maximum spacing of main attachment clips shall be 24" o.c.

E. All attachments shall be concealed type allowing for movement of expansion and contractions of all components over 24" in any dimension without buckling or loosening. All joints shall be interlocked with no surface or exposed fastenings.

F. Furnish and install all required miscellaneous flashing collars around mechanical penetrations, trims, flashing, clips, channels, and other accessory items required for proper completion of work under this Section.

3.3 CLEANING

A. Remove all excess materials and debris from site. Touch up damaged painted areas with manufacturer approved touch-up paint.

END OF SECTION 07 60 00

SECTION 07 92 00 – CAULKING AND SEALANTS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Provide all caulking and sealing work as shown on the Drawings or required for a reasonably air tight and totally moisture tight building. Certain types and applications of caulking, related to specific trade applications may be specified elsewhere, and take precedence over this Section for the work of the Section wherein they appear.

1.3 GUARANTEE

A. Provide a written guarantee warranting caulking to be free of all defects in materials and workmanship for a period of 5 years from date of acceptance of building. Leakage, hardening, staining, separation, crumbling, running, melting will be considered defects; replace all defective caulking at no cost to the Owner.

1.4 SUBMITTALS

A. Submit manufacturers' published literature, including instructions for application, for specified products and accessories as applicable, including manufacturers' specifications, physical characteristics and performance data.

1.5 QUALITY ASSURANCE

A. Installation of caulking shall be performed only by workmen thoroughly skilled and specially trained in the techniques of caulking, and who are completely familiar with the published recommendations of the manufacturer of the caulking material being used.

1.6 DELIVERY, HANDLING AND STORAGE

A. Deliver caulking and sealant materials to site in manufacturers' original sealed containers.

B. Store all caulking materials and equipment under conditions recommended by its manufacturer. Do not use materials stored for a period of time exceeding the maximum recommended shelf-life of the material.

C. Use all means necessary to protect caulking materials before, during and after installation and to protect the installed work and materials of all other trades. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect.

PART 2 – PRODUCT

2.1 CAULKING AND SEALANT

A. All caulking and sealant materials, unless otherwise specifically approved by the Architect, shall be a single component, high performance, primerless, non-sagging type. Color approved by the Architect where exposed to view.

1. Sealant - General Use, Interior and Exterior: Silicone based building sealant, GE 'Silpruf', Master Seal "DegaSeal 100", Dow Corning 795, Tremco 'Spectrum 2', Rhodorsil 5C, or as approved by Architect. Color to be selected from manufacturer's standards.

2. Sealant-Toilet Rooms: GE 'Sanitary 1700', Dow Corning 786 or approved equal, mildew resistant silicone based sealant.

3. Back-Up Material: Foamed polyethylene or polystyrene rod stock, sizes as required by joint conditions, "Ethaform SB", PRC "Minicel", or approved.

4. Butyl Tape: Extruded polyisobutylene tape CL-50 as manufactured by Chemical Sealing Corp. "Cushion-Lock".

5. Horizontal Joint Sealant: See Section 03 30 00.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Examine subsurfaces and verify that they are in proper condition before commencing work of this Section. Do not proceed until improper conditions are corrected.

B. Preparation:
1. Clean and prepare surfaces to which sealant is to be applied, per manufacturers' recommendations.
2. All surfaces shall be dry and free from loose materials.
3. Prime surfaces if recommended by manufacturer.

C. Required Application (General Use): Where identified as "Sealant", "caulk", or "calk" on Drawings, provide complete sealing system, including back-up as follows:

1. Where more than 1/2" deep, install back-up rod compressed a minimum of 30% to within 1/4" of surface.

2. Where 1/2" deep or less, apply tape to bottom of joint to prevent adhesion of sealant.

D. Other locations of application include, but are not limited to the following:

1. Apply bead of approved sealant around connection of accessories at wall, such as grab bars, towel bars, paper dispensers, soap dishes, etc., provided on or within walls to protect structural elements from moisture.

2. Apply a bead of approved sealant at connection of plumbing fixtures to wall surface, such as wall hung lavatories, urinals, water closets, etc.

3. Apply a full bead of approved sealant between all interior walls and woodwork, baseboards, doorways, and relite frames. Color as selected.

4. Apply a full bead of approved silicone sealant along with required backer rod at all penetrations of the exterior wall for miscellaneous items such as utility piping, set any exterior electrical boxes, bolts, signage connections, etc. in approved sealant for watertight application. Color shall match color of exterior wall finishes.

E. Application:
   1. Apply materials in strict accordance with manufacturer's printed directions; observe manufacturer's requirements regarding temperature control, useability of materials and protection of adjacent surfaces.
   2. Make sealing surface slightly concave, free of wrinkles and skips, uniformly smooth and with perfect adhesion along both sides of joint.
   3. Protect adjacent surfaces from excess material; leave joints in a clean, neat condition.
   4. Defective joints shall be removed, cleaned and replaced at no additional cost to the Owner.

F. Protection:
   1. Protect all finished joints for at least 24 hours.
   2. Protect from dust, moisture, and other harmful substances during installation.
   3. Do not allow silicone sealants to touch glass surfaces; all glass touched by silicone shall be replaced with clean glass.

G. Cleaning:
   1. Clean adjacent surfaces free of sealant and caulking compound or soiling; clean as work progresses.
   2. Use solvent or cleaning agent as recommended by manufacturer of sealant or caulking compound.
   3. Do not scratch or otherwise damage visible surfaces.

END OF SECTION 07 92 00

SECTION 08 11 00 – STEEL DOORS and FRAMES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 STANDARDS

A. In addition to complying with all pertinent codes and regulations conform to latest edition of "Recommended Specifications, Standard Steel Doors and Frames, SDI 100", published by Steel Door Institute, Keith Building, Cleveland, Ohio 44115, as Architect judges them applicable and as modified herein.

B. Manufacture all labeled doors in strict accordance with the specifications and procedures of Underwriters' Laboratories, Inc., Warnock Hersey, or Factory Mutual.

C. In certifications and shop drawings, comply with nomenclature established in American National Standards Institute publication A123.1, "Nomenclature for Steel Doors and Steel Door Frames".

D. In the event of conflict between pertinent codes and regulations and the requirements of the referenced standards or these Specifications, the provisions of the more stringent shall govern.

1.3 SUBMITTALS

A. Within 30 days of Contract date, and in accordance with requirements of General and Supplementary Conditions and Division 01, submit:

B. Shop drawings of all metal doors and frames showing dimensions, cut-outs, reinforcements, joints and welds to the Architect for review.

C. Manufacturers' technical data including certification of conformance with this specification.

1.4 QUALITY ASSURANCE

A. For installation of metal doors and frames, and installation of finish hardware, specified elsewhere, on metal doors and frames, use only personnel who are thoroughly trained and experienced in the skills required and who are completely familiar with the manufacturers' recommended methods of installation as well as the requirements of this work.

1.5 DELIVERY, HANDLING and STORAGE

A. Deliver, store and handle all metal doors and frames in a manner to prevent damage and deterioration.

B. Provide packaging such as cardboard or other containers, separators, banding, spreaders, and paper wrappings as required to completely protect all metal doors and frames during transportation and storage.

C. Store doors upright, in a protected dry area, at least 1" off the ground and with at least 1/4" air space between individual pieces; protect all prefinished and hardware surfaces as required.

D. Use all means necessary to protect the installed work and materials of all other trades.

E. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 – PRODUCT

2.1 GENERAL

A. All metal doors and frames specified herein shall be provided by one manufacturer.

B. Doors at fire rated openings shall be UL or NBFU certified and labeled, for minimum protection as shown on door schedule. If minimum required protection cannot be provided with openings as may be indicated, provide next higher protection (labeling) which does have required testing, approved and certified label.

2.2 MANUFACTURERS

A. Design is based on products as manufactured by Steelcraft. Equivalent products by Curries, Ceco, or S.W. Fleming (with approved primer coat), acceptable without prior approval. Other manufacturers' products must be prior approved.

2.3 METAL DOORS

A. Doors shall be made of cold-rolled steel, gauge per construction type. Doors shall be reinforced, stiffened, sound deadened and insulated with the scheduled type core completely filling the inside of the doors and laminated to both inside faces of the panels.

B. Doors shall have continuous vertical mechanical interlocking joints at lock and hinge edges with visible edge seams filled with epoxy.

C. Doors shall have beveled (1/8" in 2") lock edges.

D. Hinge reinforcing shall be 8-gauge for 1-3/4" doors.

E. Lock reinforcing shall be 16-gauge and closer reinforcing 12-gauge.

F. Adequate reinforcing shall be provided for other hardware as described in Section 08700, Hardware. All doors shall be bonderized and finished as standard with one coat of baked-on rust inhibiting prime paint capable of passing a 500-hour salt spray and 1000-hour humidity test, in accordance with Federal Standard 141 of ASTM Specification B117, as certified by an independent laboratory.

G. Furnish all exterior doors, with snap-in vinyl top cap.

H. DOOR CONSTRUCTION TYPES

1. Type 1: Steelcraft H16 flush door of cold rolled steel, standard H Series rigid honeycomb core, and H Series visible edge construction.

2.4 HOLLOW METAL FRAMES

A. Frames shall be preformed of 14- gauge, cold-rolled steel, 2" faces, in depths as indicated on Drawings and as required to properly fit (the various) wall configurations. Provide wire masonry anchors.

B. Frames shall be set up and arc welded at reinforced mitered corners (welded unit).

C. Frames for interior doors shall be supplied with factory installed rubber bumpers; 3 per strike jamb at single doors, and 2 per head for pair of doors.

D. Frames for 1-3/4" doors shall have 8-gauge steel hinge reinforcings and be prepared for 4-1/2" x 4-1/2" standard weight template hinges unless specified hardware requires otherwise.

E. Strike reinforcing shall be 16-gauge and prepared for ANSI - 115.1 Universal Strike.

F. Strike jambs shall have a 16-gauge reinforcing and be prepared for strikes as required for specified hardware.

G. Metal plaster guards shall be provided for all mortised cutouts.

H. Reinforcings for surface closers shall be 12-gauge steel. Adequate reinforcings shall be provided for other hardware as described in Section 08 70 00, Hardware.

I. Grout: Unless otherwise noted on Drawings, installed frames shall be fully grouted with:

1. IBC Type "O" mortar, or "fine" grout per ASTM C270 at all exterior openings and all openings in concrete or masonry walls.

J. Finishes: Pre-clean and shop prime each door and frame for finish painting, as specified under Section 09 90 00 of these Specifications. Touch up shop prime before starting any finish painting.

K. All doors and frames shall be bonderized and finished, as standard, with one coat of baked-on, rust inhibiting prime paint, capable of passing a 500-hour salt spray and 1000-hour humidity test, in accordance with Federal Standard 141 or ASTM Specification B117, as certified by an independent laboratory.

PART 3 – EXECUTION

3.1 INSPECTION

A. Prior to installation of metal doors and frames, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

B. Verify that metal doors and frames may be installed in strict accordance with all pertinent codes and regulations, the original design, approved shop drawings, and manufacturers' recommendations.

C. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 INSTALLATION

A. Install all metal doors and frames in strict accordance with all pertinent codes and regulations, the approved shop drawings, and the manufacturers' recommendations, anchoring all components firmly in position for long life under hard use.

B. **All hollow metal frames, including relites, shall be fully grouted.** Caulk around metal frames to adjacent wall as required and approved.

C. Finish Hardware: Install all finish hardware in strict accordance with the manufacturers' recommendations, eliminating all hinge-bound conditions and making all items smoothly operating and firmly anchored into position.

END OF SECTION 08 11 00

SECTION 08 70 00 – FINISH HARDWARE

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. The extent of finish hardware is shown on the Drawings and in the schedules. Finish hardware is hereby defined to include all items known commercially as builder's hardware as required for swing doors, (sliding doors, etc.) except certain special types of hardware specified in the same section as the door and/or door frame.

B. Hardware, which is part of the following articles, as well as separate items of hardware listed below, are not included in this Section of the Specifications.

1. Cabinet hardware, fastenings, brackets and other hardware specified to be, (or customarily), furnished with special doors, gates, specialty items, etc.

1.3 SUBMITTALS

A. Conform to General and Supplementary Conditions and Division 01, and further requirements as follows:

1. Hardware supplier shall submit required number of copies of a complete hardware schedule, in a vertical format, for the Architect's approval. Hardware for **each door** shall be separately listed in numerical order. List hardware symbols opposite each item. Schedules prepared in a horizontal coded form will not be accepted.

2. Submittal(s) shall include manufacturers' catalog 'cuts' covering all significant data on all items other than the exact (manufacturers' number) items specified herein. If approved, requested copies will be returned.

3. Corrections or changes in the first submittal must be incorporated promptly and the required number of copies of the revised schedule returned to the Architect.

4. Hardware schedules are intended for coordination of the work. Review and acceptance by the Architect or Owner does not relieve the Contractor of his responsibility to fulfill the requirements as shown and specified. Provide additional copies to the General Contractor to meet his requirements.

5. Include a copy of Schedule showing **exact** final installation in the Operating Instructions and Maintenance Manual for general work.

1.4 QUALITY ASSURANCE

A. Acceptable Manufacturers and their product numbers are specified herein. Others must be named in Addenda.

1. Subcontract for the furnishing of hardware, as specified herein, shall be by well recognized builders' hardware supplier who has been furnishing hardware in the same area as the Project for a period of not less than 2 years and who has in his employment an experienced hardware consultant who is available at all reasonable times during the course of the Work for Project hardware consultation to the Owner, Architect and Contractor.

1.5 GUARANTEE REQUIREMENTS

A. In addition to requirements of the GENERAL CONDITIONS, also guarantee that repair service and replacement parts for all items specified herein, shall be available from local sources. See certain items following for additional specific guarantee requirements.

PART 2 – PRODUCT

2.1 MANUFACTURERS

A. The numbers shown in the Hardware Groups are taken from the catalogs of the following manufacturers and are for the purpose of establishing quality, design, function and finish. Except as listed, no substitutions will be allowed, except in strict accordance with procedures specified. The Architect may require that requests for approval of items other than shown be accompanied by physical samples of items proposed for substitution.

Item	Numbers Used	Approved Substitutions
Butts	Hager	Stanley, McKinney, Lawrence
Locks/Latchsets	Yale	Best, Corbin, Schlage
Closers	LCN	Norton, Stanley
Push, Pull Plates	Hager	Rockwood, Glynn-Johnson
Kickplates	Hager	Rockwood, Builder's Brass
Silencers	Hager	Ives, Trimco
Wall, Floor Stops	Hager	Rockwood, Glynn-Johnson
Thresholds	Pemko	Zero, Sager, National
Door Seals	Pemko	Zero, Sager, National
Cylinders	Best	None
Misc. Brackets	Builder's Brass	None

2.2 FINISHES

A. Unless specifically indicated otherwise, architectural hardware items shall be furnished in the following finishes:

B. Butts, locks, latchsets, door stops and miscellaneous items: dull chrome (US 26D)

C. Push and Pull Plates: Dull stainless steel (US32D).

D. Door Closers: Aluminum lacquer.

E. Kickplates: Dull stainless steel (US32D).

2.3 KEYING FOR BUILDING LOCKS

A. Final keying and cores to be provided and installed by Owner.

B. Any locks installed during the normal period of construction shall be temporary locks, or if permanent, without permanent cylinder cores or keys. All secure doors must be operative for access and exit during construction with construction locks or cores.

2.4 BUTTS

A. All butts shall have concealed bearings.

B. Provide non-removable pins (NRP) for all exterior doors and for reverse bevel, interior, lockable doors.

C. Width of butts shall be as required to clear projecting trim or structural conditions to obtain maximum degree of opening.

D. Provide: 1-1/2 pair butts for doors from 61" to 90" in height

E. .Provide: One extra butt for every 30" exceeding 90" in height.

2.5 LATCH AND LOCKSETS

A. Lever Lockset Design: Shall be Yale Augusta AU

B. Provide all Locks and Deadbolts with wrought box strikes.

C. In addition to guarantee requirements specified above, locks shall carry a 1 year guarantee of satisfactory performance.

2.6 DOOR CLOSERS

A. Arms shall permit maximum degree of opening permitted by wall conditions. All closers shall function in conformance with current Federal (HEW) Handicapped Access Requirements; including hold open time and maximum allowable horizontal force required to operate.

B. Furnish all closers on exterior doors with heavy duty (EDA) arms.

C. Furnish closers with key valves for speed, latching and back checking adjustments.

D. Provide drop plates for doors with insufficient top rails to cover sight of closers from opposite side of door, and when used in conjunction with regular arm closer and overhead concealed stop application.

E. In addition to guarantee requirements specified above, provide Owner with a 5 year performance guarantee, for closers.

2.7 DOOR STOPS AND SILENCERS

A. Types are listed in hardware schedule.

B. Provide floor stops of proper type and height to suit door clearance.

C. Provide toggle bolts or machine screws and tamp-ins as required. Plastic or fiber anchors will not be permitted.

D. Provide door silencers at all openings not scheduled to receive perimeter weatherstripping or gasketing. Rubber insert type proper for application, as approved.

2.8 HARDWARE GROUPS

GROUP NO.	ITEMS REQUIRED	MANUFACTRER NO.	REMARKS
HW-1	Hinges	ECBB1101NRP 4 ½ x 4 ½	US32D
	Lockset	BAU4707LN (7 Pin)	626
	Kickplate	190S (12 x 2" less door width)	US32D
	Weatherseal	S88D	
	Threshold	158A or 171A (as applicable)	
	Sweep	315CN	
	Stop	256W	US26D
	Closer	4110 (4111) Series	Aluminum
		Cylinder 4111(6)-3071	
		Cover 4110-72	
		Arm 4110-3077EDA	
HW-2	Hinges	ECBB1101NRP 4 ½ x 4 ½	US32D
	Deadbolt	8T3-2 ¾" 7-7 Pin STK CS	626
	Pull	33G (4 x 16)	US32D
	Push Plate	30S (4 X 16)	US32D
	Kickplate	190S (12 x 2" less door width)	US32D
	Weatherseal	S88D	
	Threshold	158A or 171A (as applicable)	
	Sweep	315CN	
	Stop	256W	US26D
	Closer	4110 (4111) Series	Aluminum
		Cylinder 4111(6)-3071	
		Cover 4110-72	
		Arm 4110-3077EDA	

PART 3 – EXECUTION

3.1 PRODUCT HANDLING

A. Provide secure lockup for hardware delivered to the Project, but not yet installed. Control the handling and installation of hardware items which are not immediately replaceable so that the completion of the work will not be delayed by hardware losses, both before and after installation.

3.2 COORDINATION

A. Coordinate Hardware with other Work: Tag each item or package separately, with identification related to the final hardware schedule; include basic installation instructions in the package. Furnish hardware items of proper design for use on doors and frames of the thicknesses, profile, swing, security, and similar requirements indicated, as necessary for proper information in the Contract Documents. Deliver individually packaged hardware items at the times and to the locations (shop or field) for installation, as directed by the Contractor.

B. Templates: Furnish hardware templates to each fabricator of doors, frames, and other work to be factory-prepared for the installation of hardware. Upon request, check the shop drawings of such other work, to confirm that adequate provisions will be made for the proper installation of hardware.

1. Have templates available not more than 10 days after receipt of approved hardware schedule.

3.3 HARDWARE MOUNTING HEIGHTS

A. In the absence of a hardware installation requirement in another Section of this Specification, the following recommendations shall be used as a guide:

1. Top Hinge: 5" header rabbet to top of hinge.

2. Bottom Hinge: 10" finish floor to bottom hinge

3. Center Hinge: Equal distance between top and bottom hinges

4. Latch/Locksets: 40" finish floor to center lever (or as required by exit device requirements)

5. All other hardware shall be installed as recommended by the manufacturers.

3.4 INSTALLATION

A. Install each hardware item in compliance with the manufacturers' instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application.

After completion of the finishes, reinstall each item. Do not install surface-mounted items until finishes have been completed.

3.5 ADJUSTMENT AND CLEANING

3.6 Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Lubricate moving parts with type lubrication recommended by manufacturer (graphite type if no other recommended). Replace units which cannot be adjusted and lubricated to operate freely and smoothly as intended for the application made.

3.7 All doors, when installed and ready for use, shall function in conformance with current Federal (HEW) Requirements for Handicapped Access; including hold open time and maximum allowable horizontal force required to open. Adjust all hardware as required.

3.8 Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make a final check and adjustment of all hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

3.9 Instruct Owner's personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware, or scheduled Owner's instruction session, per DIVISION 1, as directed.

END OF SECTION 08 70 00

SECTION 08 80 00 – GLASS and GLAZING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Provide Type 1 Glass at all exterior glazed openings. Coordinate with Section 08 11 00 Steel Doors and Frames (hollow metal window frames).

1.3 STANDARDS

A. Comply with all applicable standards of the Flat Glass Jobbers Association's Glazing Manual. Tempered or safety glass, as approved, where required by codes, ordinances or federal regulations and standards.

B. Each piece of glazing shall bear manufacturer's label certifying type and grade. Do not remove labels until approved by Architect.

1.4 SUBMITTALS

A. Within 30 days of Contract date, submit:

1. 6" square samples of each specified glass type. Have each sample bear manufacturers' label, material identification and use destination. All samples shall be banded to prevent sharp edges.

1.5 GUARANTEE

A. Guarantee all glass and glazing for a period of 2 years. All insulating glass shall be guaranteed for 10 years against seal failure.

1.6 JOB CONDITIONS

A. Measurements

1. Verify all glass dimensions by taking field measurements before any glass is shipped to job site.

B. Coordination

1. Coordinate work with components to be glazed to prevent delay in work.

C. Inspection

1. Examine all subsurfaces to receive work of this Section and verify that they are in proper condition to commence work of this Section.

D. Delivery, Handling and Storage

1. Deliver and store materials in protected areas. Protect glass, whether installed or not, against damage; replace broken or defective glass at no cost to Owner.

PART 2 – PRODUCT

2.1 MANUFACTURER

A. Vitro Architectural Glass (formerly Pittsburg Plate Glass Co.), Libby Owens Ford Glass Co., American Saint Gobain Corporation, Environmental Glass Products, Rohm & Haas, or as approved by Architect.

2.2 MATERIALS

A. Glazing Types:

1. Type 1: Factory (shop) fabricated 1" insulating unit, obscure, formed from 2 sheets of first quality tempered laminated safety glass. ¼" .030 cool white (obscure) tempered laminated over 5/16" .060 sb60 #5 tempered laminated (1" overall).

B. Setting Blocks: Hard rubber or clear grain softwood.

C. Sealants: See Section 07 92 00

D. Glazing Gaskets: Appropriately sized and shaped for the application and as manufactured by Conservation Technology or equal manufacturer, extruded EPDM; free of porosity, surface defects, dimensional irregularities and conforming to physical properties of ASTM C502.

E. Glazing Tape: DAP #1202, or as approved.

2.3 FABRICATION

A. Insulating glass units shall be fabricated in a fully equipped commercial fabrication shop and only by skilled workmen thoroughly familiar with all materials and well experienced in the processes involved.

B. All glass shall be **machine washed** prior to assembly of insulating units.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Do no glazing in damp or rainy weather.

B. Have surfaces receiving glass clean, dry and free of foreign matter. Prepare, clean and prime (as required), surfaces to which sealant is to be applied, per sealant manufacturers' recommendations.

C. Install glass glazing types at locations shown on Drawings and according to glass manufacturers' recommended maximum size limitations and placement of any setting blocks. Make all adjacent glass in same glazed areas consistent in type and thickness, unless otherwise noted, directed, or required by code.

D. Keep labels indicating manufacturer, quality and thickness on glass until installation has been approved by Architect. Absence of label constitutes cause for rejection.

3.2 PROTECTION and CLEANING

A. On completion of work and just prior to job completion date, clean and wash all glass thoroughly. Use no abrasives, implements or methods likely to result in scratched surfaces. Replace any scratched, defective or broken glass caused by improper.

END OF SECTION 08 80 00

SECTION 09 21 16 – GYPSUM WALLBOARD

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 STANDARDS

A. Comply with all applicable requirements of "American Standard Specifications for the Application and Finishing of Gypsum Wallboard", by the American Standards Association, except where more stringent requirements are called for herein, in local codes, or by manufacturer of materials.

1.3 SAMPLES

A. Prepare and submit successive groups of two identical samples of surface texture(s) as required and directed and obtain Architect's approval before proceeding with texturing. Samples shall be a minimum of 2-feet square pieces of same type(s) wallboard used in the work, prime sealed and painted as specified. Approved sample(s) shall be retained as criteria for approval of finished work.

1.4 QUALITY ASSURANCE

A. Employ only qualified journeymen mechanics in this work; apprentices may be employed on the work under the direction of qualified journeymen in accordance with trade regulations.

B. Conform particularly to code requirements to achieve fire ratings of walls, ceilings, etc., which require joint taping or surfacing of gypsum assemblies, even when finishing is not required for decorative purposes.

C. Provide temporary coverings and coordinate work, as required so that adjacent surfaces are protected from materials and operations specified in this Section.

1.5 COORDINATION

A. Work herein requires coordination with trades whose work connects with, is concealed by, or is affected by, gypsum wall and ceiling finishing. Schedule this work to not cover incomplete or uninspected work. Redo work which must be removed due to premature concealment of work of other trades.

B. Advise all trades of requirements and conditions that their work must meet in order to obtain the best quality of gypsum wallboard finishing.

1.6 JOB CONDITIONS

A. Ventilation: Do not proceed with joint taping and finishing until the interior is enclosed adequately to control ventilation and circulation in conjunction with temporary heat, to

achieve stabilization of framing and proper drying, setting and curing finishing compounds.

B. Lighting: Do not proceed with the work in any room unless lighting level of 15 candlepower per square foot is available.

PART 2 – PRODUCT

2.1 MATERIALS

A. "Exterior Gypsum Ceiling Board" water-resistant and sag-resistant panels at all interior horizontal applications (ceilings of restrooms and mechanical room).

1. Conform to ASTM C1396.

2. 4' x 8' or 12' sheets, thicknesses as noted on Drawings.

B. Screws: USG, or equal, Type S, of length proper for conditions.

C. Nails: Cement coated, of lengths as required.

D. Gypsum Wallboard Accessories: 26-gauge, USG.

1. "J" Mold – tape in metal edge protection.

2. Others - As required.

E. Joint Compound and Tape: Typically, USG's "Dura-Bond" and "Perf-a-Tape or equal. Fiberglass mesh tape and adhesive at WR board locations.

F. Gypsum Wallboard Primer: ASM approved PVA product(s).

PART 3 – EXECUTION

3.1 INSPECTION

A. Inspect surfaces and conditions before starting work and verify they are in proper condition to commence work of this Section. Do not proceed until improper conditions are corrected.

3.2 INSTALLATION

A. Gypsum Board Installation: Conform strictly to applicable requirements of the Standard Specifications. Screw apply board to metal framing; if option is used, nail board at wood framing. Maximum attachment spacing 12" o.c. Install metal corner reinforcement at all external corners. Install J molding, or trim where called for, at all exposed drywall edges or edges at dissimilar materials

1. Where ceilings abut differing wall materials such as masonry, concrete, wood, etc., install approved metal edge trim with applied vinyl insert or minimum 1/2" self-

adhesive weatherstripping. Conceal flange of metal trim reinforcement with at least 2 coats compound.

B. Gypsum Wallboard Taping and Finishing: Apply embedding or all-purpose compound to dimples at fastener heads, marred spots and joints in gypsum wallboard surfaces that are to receive further painting, coatings, or wallcovering finishes, or that are required to be taped for fire ratings, code requirements or sound control. Center tape over joint and embed in uniform layer of joint compound of sufficient width and depth to provide firm and complete bond. Apply skim coat while embedding tape.

1. Finish joints with a sufficient number of coats of compound, sanded or sponged as required, to achieve a monolithic surface without ridges, protrusions, dents or other visible imperfections in the surface, ready to receive specified surface finish.

C. Attachment and Finishing to Trims: Provide trims as specified, detailed and noted on the Drawings and install to best suit the conditions of the work. Trims requiring finishing with joint compound shall be filled and subsequently finished to meet the finish requirements of the gypsum wallboard joints. Trims that are adhesively attached with tape compounds are specifically included in this Section.

1. Conceal flanges of metal reinforcement with at least 2 coats compound. When completed, compound shall extend approximately 8" to 10" on each side of metal nosing.

2. Provide all exposed fastener heads with sufficient coats of joint compound and sand as necessary to completely conceal trim.

D. Taping not required on gypsum wallboard surfaces that are above ceilings, behind acoustic tile, in concealed spaces, behind rigid surface paneling or on base layers of multi-layer systems, except as required for fire resistance ratings; on draft stops in attic spaces; under ceramic tile on water resistant board or tile backer types of gypsum wallboard; and where tongue and groove edged backer board is installed to achieve fire resistance ratings for the assembly as installed.

E. Moisture in Dry-Type Compounds: Allow coats of taping and finishing compounds which achieve their bond, strength, and hardness through drying (as opposed to chemical setting), to dry to a maximum of 15% moisture content before subsequent coats or finishes are applied.

3.3 CLEAN UP and PATCHING

A. Prior to application of surface finishes, clean and repair all surface damage or imperfections caused by the work in this Section. Clean up adjacent surfaces which may be damaged by joint com-pound splatters, etc. Leave the surfaces ready to receive final surface finishes, as specified hereinafter.

END OF SECTION 09 21 16

SECTION 09 91 00 – PAINTING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION

A. Provide all painting and finishing work as specified herein and as noted on the Drawings. ALL surfaces, including existing items, surfaces and galvanized metals, shall be painted or finished as part of this work, unless specifically noted as not to receive a finish.

B. Certain items may be specified to be shop primed (or finished) in other Sections. Any required priming not so specified elsewhere in this specification shall be provided as a part of the work of this Section.

C. Surfaces Not to be Painted or Finished:
1. Drywall or plaster permanently concealed from view.
2. Wood (or plastic) structural/framing elements permanently concealed from view.
3. Concrete slabs.
4. Factory finished paneling, equipment and other devices with an approved factory applied finish, unless specifically noted otherwise in the Specification Finish Schedule or on the Drawings.
5. Finish hardware, except where primed for a paint finish.
6. Plumbing fixtures; toilet room accessories, except as noted otherwise.
7. Lighting fixtures and electrical devices except as noted otherwise.
8. Concealed rough hardware.
9. Glass, plastic.
10. Areas noted as "unfinished" or "existing to remain" on Finish Schedules, or "existing finish to remain" on Drawings.

D. All surfaces and items not excluded above shall receive the various paint finishes, as scheduled.

1.3 FURNISHED, BUT NOT INSTALLED

A. For the Owner's maintenance purposes for touch up, furnish one properly labeled and sealed quart can of each type of finish coat of each color taken from the batch mix furnished for the work. Deliver to the Owner's representative before final payment and obtain a signed receipt therefore.

1.4 STANDARD SPECIFICATIONS

1.5 Except as otherwise specified, all work of this Section shall conform strictly to the standards for material and workmanship, set forth in the "Architectural Painting Specification Manual" published by the Master Painters Institute as distributed by the Washington State Council of PDCA, 325 Washington Ave., S. #434 – Kent, WA 98032, Phone: 206-317-8580.

A. The term "MPI" refers to Master Painters Institute, and “APSM” refers to Architectural Painting Specification Manual. Refer to various sections for general definitions and to the APSM glossary for technical terms and industry colloquialisms.

1.6 INSPECTIONS AND TESTS

A. Comply with all requirements of APSM, Chapter 6 - Quality Assurance Programs.

B. The APSM Inspection and Warranty Program is not a required part of the Work.

C. Prior to starting any portion of this work, the Contractor shall also examine respective surfaces and verify that they are in proper condition to commence work of this Section. Do not proceed until improper conditions have been corrected.

1.7 APPROVED MANUFACTURERS

A. ONLY the approved paint products of the paint manufacturers listed in APSM, Chapter 5, under "Product List" may be used unless a specific manufacturer is listed in Finishing Schedule. When substitutes are proposed, use only those substitutes that are approved by MPI and the Architect in writing per conditions outlined in the Specifications.

B. The Architect will furnish the Contractor a Paint and Finishing Color Schedule of colors selected either from manufacturers' stock colors as submitted by Contractor or specially requested color mixes. For bidding purposes and unless otherwise specified, refer to the Finish Schedules and paint or finish the following to match adjacent surfaces:

1. Access doors, registers, primer coated butts, primer coated door closers, exposed piping in finished spaces, electric conduit and panels exposed in finished spaces, exposed uncovered ductwork.

C. Allow in Contract for: one uniform color specific to each scheduled paint system, except that the ceiling and soffit color may be different than the wall color.

1.8 SUBMITTALS

A. Unless otherwise specified hereinafter and before any painting or finishing work is started, submit samples of all finishes, selections, etc., to the Architect.

B. Samples: Prepare with type of paint or finish and application specified on prepared substrate, including species and texturing if specified, to which paint is to be finally applied, minimum samples each not less than 12" x 12" with banded, finished edges, if required. Approval(s) of prepared stain and finish samples shall be based on actual **color** of the sample(s), **not** stain number or formulation. Refer to "Color Uniformity" hereafter. Furnish additional samples as required until colors, finishes and textures are approved. Retain approved samples to be used as the quality standards for final finishes.

1.9 ENVIRONMENTAL CONDITIONS

A. Conform to all requirements of APSM unless otherwise specified hereinafter. Disregard of working in accordance with provisions set forth in these following paragraphs may cause warranty to be voided.

B. Weather Conditions: Do no exterior work on unprotected surfaces if it is raining or moisture from any other source is present, or expected before applied paints can dry or attain proper cure without damage thereto. Allow surfaces wetted by rain or other moisture source to dry and to attain temperatures and conditions specified hereinafter before proceeding with work, or continuation of previously started work.

C. Temperatures: Do no painting work when temperatures on the surface or of the air in the vicinity of the painting work are below plus 50 degrees F. or below those temperatures recommended by the manufacturer for the material type used. The minimum temperatures for latex finishes to be not less than plus 45 degrees F. for interior work and plus 50 degrees F. for exterior work, unless specifically approved in writing by the Architect and Paint Inspection Agency. See APSM.

D. Lighting: Minimum of 15 candle power per square foot on surfaces to be painted or finished.

E. Ventilation: Provide continuous ventilation as required for various materials used in the spaces scheduled, but not less than recommended by the paint and finish manufacturer for drying.

1. Follow moisture test per APSM.
   a. 12% for concrete and masonry
   b. 15% for wood
   c. 12% for plaster and gypsum board

1.10 PROTECTION

A. Adequately protect other surfaces from paint and damages caused by this work. Also adequately protect painted areas from damage by others such as painted door and relite frames, painted doors, etc.

B. Make good any damage caused by failure to provide suitable protection.

C. Removal of Flammable Rubbish: Place all materials which may constitute a fire hazard in closed metal containers and daily remove from site.

D. Removal of Hardware and Miscellaneous Items: Coordinate the work so that electrical outlets and switch plates, mechanical diffusers, escutcheons, registers, surface hardware, fittings and fastenings, are removed prior to starting work of this Section and reinstalled upon completion of the work.

PART 2 – PRODUCT

2.1 GENERAL

A. Provide paint, varnish, stain, enamel, lacquer, fillers, and related products for prime, intermediate and finish coats, of types, brand and manufacture listed in APSM, Chapter 5, latest edition, factory labeled for positive identification, in accordance with Finishing Schedule hereafter.

3.1 Materials not specifically noted in APSM such as linseed oil, shellac, thinners or other materials shall be quality not less than required by published Federal or State Specification Standards, and as manufactured by approved firms.

3.2 FINISHING SCHEDULE

A. **Exterior Surfaces:**

1. Concrete Block Surfaces: Exterior 4.2C, "Premium Grade"; block filler, 2-coats W.B. Light Industrial Coating, gloss level 5.

2. Ferrous Metal (Not Galvanized): Exterior 5.1D, "Premium Grade"; alkyd metal primer and 2-coats alkyd, gloss level 5.

3. Non-Ferrous Metal (Including Galvanized Steel): Exterior 5.3B Alkyd, "Premium Grade"; 3 coats, 1-coat cementitious primer, 2-coats approved exterior alkyd enamel, gloss level 5.

4. Galvanized Sheet Metal: Exterior 5.3H, "Premium Grade"; pretreatment primer, W.B. primer, 2-coats exterior latex, gloss level 5.

5. Wood Trim: Exterior 6.3K, "Premium Grade"; oil/alkyd primer, 2-coats latex, gloss level 5.

6. Exterior Cementitious Soffits: Exterior 3.3A, "Premium Grade"; 3-coats latex, gloss level 5.

7. **All exterior mechanical grilles and louvers shall be painted whether galvanized or not, unless finished in anodized aluminum or pre-selected fluorocarbon finish.**

8. Miscellaneous Surfaces: Any other surfaces not noted "not to receive finish" and/or not specifically scheduled above, shall be finished with an approved APSM system for that particular substrate. Choice of exact approved APSM system of finish shall be at Contractor's option.

B. **Interior Surfaces:**

1. Concrete Block Surfaces: Interior 4.2G, "Premium Grade"; latex block filler, 2-coats epoxy, gloss level 5.

2. Gypsum Wallboard (Ceilings): Interior 9.2A "Premium Grade"; 1-coat latex primer sealer and 2-coats interior latex, gloss level 4.

3. Wood Trim: Interior 6.3U; "Premium Grade"; alkyd primer/sealer and 2-coats interior latex, gloss level 5.

4. Exposed Ferrous Metal (Latex): Interior 5.1Q "Premium Grade"; rust inhibitive alkyd primer and 2-coats interior latex enamel, semi-gloss, gloss level 5. (Primer may be omitted where items, such as door frames, are finished with a factory applied primer.)

5. Exposed Non-Ferrous Metal (Including Galvanized): Interior 5.3A "Premium Grade"; pre-treatment primer, cementitious primer, 2-coats interior latex enamel, gloss level 5.

6. Miscellaneous Surfaces: Any other surfaces not noted "not to receive finish" and/or not specifically scheduled above, shall be finished with an approved APSM system for that particular substrate. Choice of exact approved APSM system of finish shall be at Contractor's option.

PART 3 – EXECUTION

3.3 PREAPPLICATION PREPARATION

A. Conditions of Surfaces: Do not proceed until any discovered defects have been corrected and surfaces approved by Inspection Agency and specifying authority. Conform to APSM, Surface Preparations, as to surface conditions and preparations for each various surface to be painted or finished.

B. Starting work under this Section implies acceptance of the surface and substrate.

3.4 APPLICATION

A. Comply with requirements of APSM total program specifically, and as follows:

1. Paint and stain applied to concrete or CMU, may be applied by brush, roller or airless spray equipment provided all requirements for adhesion, coverage, film thickness, color, and texture are consistently achieved.

2. Stain shall be applied to wood by brush and/or hand wiping with a rag only.

3. Special coatings, sealers, etc., shall be applied only by method(s) specifically recommended by manufacturer.

4. Each succeeding pigmented coat shall be distinguishably lighter than the previous coat. Tint all prime and undercoats to a color similar to, but darker than, finish coat.

3.5 COMPLETION AND CLEAN-UP

A. On completion of the work, carefully clean all glass, hardware, frames, etc, and remove all misplaced paint and finish spots, spills, splatters, etc., and leave the work neat and clean to the satisfaction of the Architect. Request final inspection from the Inspection Agency and/or MPI, if any.

END OF SECTION 09 91 00

SECTION 09 97 00 – SPECIAL COATINGS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Provide floor sealer at all interior concrete slabs not scheduled to receive other finish material.

1.3 SUBMITTALS

A. Per requirements of Division 01, submit:

1. Complete list of all materials and equipment proposed to be furnished and installed under this portion of the work, giving manufacturers' name, catalog cuts and catalog number for each item where applicable. Accompanying the materials list, furnish copies of the manufacturers' current recommended method of installation for the special coating and sealer materials.

2. Certification from the Contractor/Applicator that:

a. Materials conform to the requirements of the Specifications.

b. Surfaces to receive special coating and sealer materials are clean and at a moisture content considered to be a "dry state" which will not cause efflorescence on the coating by moisture evaporating.

c. Materials were applied in strict accordance with the manufacturers' current recommendations.

1.4 GUARANTEE

A. Manufacturers' standard written guarantee(s) of performance for the coating/applications.

1.5 QUALITY ASSURANCE

A. All materials applied by an experienced applicator must be approved by Architect and manufacturer of material or his distributor.

1.6 DELIVERY, HANDLING and STORAGE

A. Deliver materials in original sealed containers, clearly marked with manufacturers' name, brand name, and type of material.

B. Clearly mark percentage of silicon or acrylic resin on label of each container.

C. Use all means necessary to protect the liquid water repellent materials from freezing or intrusion or foreign matter, before, during and after application and to protect the installed work and materials of all other trades.

D. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

E. Store materials in areas where temperatures are not less than 50 degrees F. or over 85 degrees F., unless otherwise authorized by manufacturer.

1.7 JOB CONDITIONS

A. Do not proceed with application of materials when ambient temperature is less than 50 degrees F., or when low temperature of 40 degrees F. or less is predicted within a period of 24 hours after application.

B. Do not apply water repellent in rainy conditions or within 3 days after surfaces become wet from rainfall or other moisture.

C. Protect plants and vegetation which might be affected by fumes or alkalinity of the materials.

D. Protect bituminous or asphaltic coatings from overspray. Clean overspray from glass and metal using xylene or mineral spirits; follow with ammonia base window cleaner to remove haze left by solvent.

PART 2 – PRODUCT

2.1 GENERAL

A. All special coating and sealer materials shall be the product of one manufacturer and shall be either the one upon which the design is based, similar products of approved acceptable manufacturers or as approved in advance by the Architect.

2.2 MATERIALS

A. Sealer – Concrete Floors: BASF MasterProtect H 400, 40% concentration, transparent penetrating water repellent liquid, or prior approved manufacturer.

PART 3 – EXECUTION

3.1 INSPECTION

A. Examine all subsurfaces to receive work and verify that they are in proper condition to commence work of this Section. Do not proceed until improper conditions have been corrected.

B. Provide adequate ventilation. Allow no open flame in or near work area.

C. Verify that all special coating and sealer materials can be installed in accordance with all pertinent codes and regulations, the original design, and the referenced standards

3.2 PREPARATION

A. Verify that substrate has cured a minimum of 8 days prior to application of waterproofing, is free of soil, tars, oils, mortar smear, efflorescence and other contamination. Make certain that surface temperature is not less than 40 degrees F., that there is no surface moisture present, and that precipitation is not expected within 4 hours.

B. Repair and fill all cracks and voids in mortar joints and elsewhere by pressing caulking firmly into crack. Color of caulking shall be selected to closely match color of mortar. Use urethane or polysulfide caulking. Obtain approval of conditions of surface by Architect and manufacturer or his distributor before start of application.

C. Remove dirt if necessary by scrubbing and allowing to dry thoroughly.

3.3 INSTALLATION

A. Use only equipment approved by material manufacturer and perform all work in accordance with manufacturers' printed instructions and recommendations.

B. Roller apply sealer, Spray application not permitted for finished surfaces.

C. Unless otherwise directed, clean and seal floors just prior to Substantial Completion.

END OF SECTION 09 97 00

SECTION 10 00 00 – MISCELLANEOUS SPECIALTIES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUBMITTALS

A. Within 30 days of Contract date, and in accordance with provisions of Division 1, submit:

1. Complete Manufacturers' Information on all items intended for installation under work of this Section.

2. Guarantees, Operating and Maintenance Instructions and parts replacement ordering information as part of O & M Manuals.

3. Shop Drawings: Submit brochures and/or shop drawings of all items showing sizes of members, methods of construction and mounting techniques.

4. Samples: Where specifically stated herein under the particular item of work, submit a minimum of 2 samples.

1.3 GUARANTEE

A. Per GENERAL CONDITIONS. See various items for longer manufacturers' guarantees which shall govern.

1.4 DELIVERY, HANDLING and STORAGE

A. Deliver and store all items in dry, protected areas. Keep free of corrosion or other damage. Replace any damaged items or parts at no cost to Owner.

1.5 COORDINATION

A. Coordinate with all trades whose work relates in any way to items specified herein. Ensure that all blocking, backing, access, etc., is provided as work progresses.

1.6 MEASUREMENTS

A. Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

PART 2 – PRODUCT

2.1 MATERIALS

A. Access Panels: Milcor, or prior approved equal, steel door and frame, hinged, prime coated and painted per Section 09 91 00.

1. Type AP-1: Milcor M-architectural Grade Flush Door, Style M Series Model 3202028, 16 gauge door in 16 gauge frame, for installation in GWB/frame ceiling. 20" x 30" opening for attic access.

B. Door Grilles (Louvers): Shall be as manufactured by Anemostat, or approved, from cold rolled sheet steel, grey primer and painted per Section 09 91 00. Sized as noted on door schedule and as follows:

1. Restroom Doors: Model AFDL inverted Y non-vision louver.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install all items per details on Drawings, manufacturers' printed installation instructions and any additional requirements specified. All wall mounted items shall be securely fastened to solid backing or blocking.

B. Provide all anchorage devices required to install the item and its appurtenances, complete. Furnish anchorage requirements in ample time when required to be built in by other trades.

END OF SECTION 10 00 00

SECTION 10 14 00 – IDENTIFYING DEVICES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

1. All signage mounted in or on building(s).

1.3 SUBMITTALS

A. Within 45 days of Contract date, submit complete shop drawings to the Architect which show all sizes, graphic layout, finishes, details of manufacture and manufacturers' recommended installation techniques.

B. Accompanying the shop drawings, submit specified number of copies of a complete list of all materials proposed to be furnished and installed under this portion of the work, giving manufacturers' name, catalog number, and catalog cut for each item where applicable.

C. Submit 2 samples of each item, unless otherwise specified hereinafter.

D. All submittals to be made in strict accordance with requirements specified in DIVISION 1.

1.4 CODES, PERMITS and FEES

A. Signage shall comply fully with all applicable codes and regulations in effect at time of installation including Washington State Handicapped Accessibility Code and Federal ADA requirements. Where provisions of pertinent codes, regulations and standards conflict with these Specifications or Drawings, the more stringent provisions shall govern JOB CONDITIONS

1.5 DELIVERY, STORAGE and HANDLING

A. Deliver and store materials in dry, protected areas. Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.

B. Replace any damaged parts at no additional cost to the Owner.

1.6 COORDINATION

A. Coordinate with all other trades whose work relates to this work for placing of all required blocking, backing, etc., to ensure proper locations.

PART 2 – PRODUCT

2.1 MANUFACTURERS

A. Kroy Sign Systems, Vomar, Best Manufacturing Company, or prior approved.

2.2 MATERIALS

A. ADA Signs – Injection Molded: Signs shall be UV resistant, high impact polystyrene panels that are 8" square and 1/8" thick. Raised white pictograms, text and Grade II Braille insure that ADA and ISA (International Symbol of Accessibility) requirements are achieved. Solid color panel = ADA Blue, Frame = Dark Grey.

B. Other Materials: All other materials not specifically described, but required for a complete and proper installation of the work of this Section, shall be new, first quality of their respective kinds, and subject to prior approval of the Architect.

2.3 SIGN SCHEDULE

A. Location Door #	Mounting Location	Sign Content
1. Door #102A	Exterior Wall	Restroom/ISA
2. Door #103A	Exterior Wall	Restroom/ISA

PART 3 – EXECUTION

3.1 INSPECTION

A. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

B. Verify that all identifying devices may be installed in accordance with all pertinent codes and regulations, the original design, and the referenced manufacturer standards

3.2 INSTALLATION

A. Locations/Mounting Heights shall be as indicated on the drawings, or, if not so indicated, as directed and approved. In any case all signs required to conform to above cited handicapped access regulations shall be mounted at heights of between 48" and 60" above floor or grade, and at locations easily reachable (horizontally) from a finished floor or slab surface

B. Anchorage: Furnish and install all anchorage as required to secure all devices to the construction, as detailed on Drawings or as necessary to install complete. Provide anchorage in ample time when required to be built in by other trades

C. Install in strict conformance with the manufacturers' recommendations and as approved by the Architect.

3.3 CLEANING

A. Prior to Substantial Completion, clean all identifying devices of fingerprints or other marks in accordance with the manufacturers' directions

END OF SECTION 10 14 00

SECTION 10 28 00 – TOILET and BATH ACCESSORIES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUBMITTALS

A. Within 30 days of Contract execution, and in accordance with requirements of Division 1, submit:

1. Complete manufacturers' information on all items intended for installation under work of this Section, including shop installation drawings and details, prior to ordering.

2. Operating and Maintenance instructions and parts replacement ordering information as a part of O & M Manuals

1.3 DELIVERY, HANDLING and STORAGE

A. Deliver and store all items specified herein in dry, protected areas. Keep free of corrosion or other damage. Replace any damaged items at no cost to Owner.

1.4 COORDINATION

A. Coordinate with all other trades whose work relates to items specified herein for placing of all required backing and furring to ensure proper locations.

B. Items required to be recessed, semi-recessed, etc., shall have templates provided to Contractor to ensure a proper rough opening is provided.

C. For OFCI and OFOI items, obtain templates and instructions from Owner in ample time to provide blocking, backing, openings, etc.

1.5 MEASUREMENTS

A. Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

PART 2 – PRODUCT

2.1 MATERIALS

A. Toilet Paper Dispensers (TPD): Romtec stainless steel ¼" thick x 11" long, surfaced mounted, two roll dispenser. Padlock supplied by Owner.

B. Hand Dryer: Bradley #2902-2800, surfaced mounted, ADA compliant, cover - 3/16" thick one-piece cast iron; white porcelain enamel coating.

C. Soap Dispensers (SD): Bradley #6A01-11, surfaced mounted foam tank type vertical dispenser, heavy gauge stainless steel with exposed surfaces in architectural satin finish.

D. Sanitary Napkin Disposal (SND): Bradley #4781-11, surfaced mounted, 22 gauge stainless steel with exposed surfaces in architectural satin finish.

E. GB-1: 42" x 54" L shaped grab bar with stand-off mounting on long side.

   a. Tubing: 1 ½" o.d. 18 gauge stainless steel tubing.

   b. Flanges: 3 1/8" diameter 13 gauge flanges, concealed mounting.

   c. Escutcheons: 22 gauge stainless steel.

   d. Finish: Peened safety grip.

F. GB-2: 18" grab bar, matching construction of GB-1.

G. Drinking Fountain Grab Bar: Brey Krause Mfg. Part #D-7867-SS, 1½" x .049W stainless steel tube with D-78 snap flange and cover. Satin #4 finish.

PART 3 – EXECUTION

3.1 INSTALLATION

3.2 Install items per respective manufacturers' published instructions and reviewed shop drawings.

3.3 Securely attach to proper blocking/backing or framing, using concealed fastening wherever possible. All exposed attachment hardware shall be vandal resistant type of stainless steel, or other approved rust-resistant finish.

3.4 Adhesive installations not permitted.

END OF SECTION 10 28 00