420 COLLEGE ST SE
LACEY, WASHINGTON 98503

RAC PARKING LOT EXPANSION

LACEY CONTRACT NUMBER PW 2022-19

SPECIFICATIONS AND BID DOCUMENTS
DEPARTMENT OF PUBLIC WORKS

LACEY PROJECT NUMBER PW 2022-19

CITY OF LACEY
WASHINGTON

CITY OFFICIALS

MAYOR	**ANDY RYDER**
DEPUTY MAYOR	**MALCOLM MILLER**
COUNCIL MEMBERS	**LENNY GREENSTEIN**
	MICHAEL STEADMAN
	CAROLYN COX
	ED KUNKEL
	ROBIN VAZQUEZ
CITY MANAGER	**RICK WALK**
CITY ATTORNEY	**DAVID S. SCHNEIDER**
DIRECTOR OF PUBLIC WORKS	**SCOTT EGGER, P.E.**
CITY ENGINEER	**AUBREY COLLIER, P.E., S.E.**

SCOTT EGGER, P.E.
DIRECTOR OF PUBLIC WORKS

LACEY CONTRACT NUMBER PW 2022-19
CITY OF LACEY

I hereby certify that the Project Specifications were prepared by me or under my direct supervision and I am a duly registered Engineer under the laws of the state of Washington.

John Mark Lewis Swidecki
City of Lacey
Sections A, B, C, D, E, and F

John Mark L. Swidecki
9/12/2023

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ADVERTISEMENT FOR BIDS

RAC PARKING LOT EXPANSION

NOTICE IS HEREBY GIVEN that sealed bids will be received by the City of Lacey at City Hall, Lacey, Washington until 2:30 p.m., October, 5th, 2023, at which time bids will be publicly opened via a live video stream. Links to the YouTube live video stream can be found at https://cityoflacey.org/rfp-rfq-rfi/ under the specific project section and on the specific project page on the Builders Exchange website located at http://bxwa.com/bxwa_toc/pub/2080/toc.html for the following work:

This contract provides for the expansion of the RAC parking lot at the corner of Steilacoom Rd and Marvin Rd to include: grading, paving, striping, stormwater, illumination, landscaping, electrical vehicle charging station installation, and other work.

Each bid must be accompanied by a certified check for five percent of the amount of the proposal made payable to the City Treasurer, or an approved bid bond for five percent of the amount of the proposal executed on the approved form attached to these specifications. If bid bond is used, the five percent may be shown in dollars and cents or the form may be filled in by inserting therein, in lieu thereof, "five percent of the amount of the accompanying proposal". Check of unsuccessful bidders will be returned immediately upon award of contract.

The City Council reserves the right to reject any and all bids and to waive all informalities.

Plans, Specifications, and Addenda for this project are available through the "City of Lacey" on-line plan room. Free of charge access is provided by going to http://bxwa.com and clicking on: "Posted Projects", "Public Works", "City of Lacey", and "Projects Bidding". Bidders are asked to "Register" in order to receive automatic email notification of future addenda and to be placed on the "Bidders List". Any questions regarding this contract can be directed to:

Brett Boogerd
(360) 486-8732
bbooger@ci.lacey.wa.us

The range for this project is $3,250,000 to $ 4,000,000.

Elissa Fontaine, City Clerk
City of Lacey, Washington

A
INSTRUCTIONS

INSTRUCTIONS TO BIDDERS

Bidders shall examine contract and bid documents and the site and shall satisfy themselves as to conditions that exist.

Each Bidder shall submit to the City Clerk, Lacey, Washington a sealed bid endorsed upon the outside wrapper with RAC Parking Lot Expansion at the time and place designated in the advertisement.

Bids may be delivered in person to Lacey City Hall, 420 College Street SE, or by mail to City of Lacey 420 College St SE Lacey, WA 98503.

Bids will be publicly opened via a live video stream. Links to the YouTube live video stream can be found at hhttps://cityoflacey.org/rfp-rfq-rfi/ or under the specific project section and on the specific project page on the Builders Exchange website.

The City of Lacey is committed to offering reasonable accommodations to persons with disabilities. We invite any person with special needs to contact the City Clerk at (360) 491-3212 at least seventy-two (72) hours before the meeting to discuss any special accommodations that may be necessary. Citizens with hearing impairment may call the TDD line at (800) 833-6388.

Each Bidder shall complete the proposal with prices in figures with the extension properly computed. The proposal must be properly signed by a duly authorized agent. Proposal must acknowledge addenda, if any, received.

If alternates are included in the proposal the Bidder shall complete the alternates. The City will award the contract to the lowest responsible Bidder as determined by the Special Provisions. The City reserves the right to delete alternates after award.

A Bidder will be deemed not responsible if the Bidder does not meet the mandatory bidder responsibility criteria in RCW 39.04.350(1).

The City does not pre-qualify Bidders. However, if the apparent low Bidder has not already been determined qualified, the City shall afford seven (7) days after notification for the low Bidder to provide evidence for evaluation, as to capability to perform the work. The evaluation will include consideration of experience, personnel, equipment, financial resources as well as performance record. The information must be sufficient to enable the Bidder to obtain the required qualification rating prior to the award of the contract.

No bidder may withdraw his bid after the hour set for the opening of bids or before award of the contract unless said award is delayed for a period of forty-five (45) days.

CONTRACT PARTS

The contract to be executed as a result of this bid consists of multiple parts, all of which pertain as if fully attached hereto and Bidder shall consider all parts as a complete document. In the event of discrepancies between the various parts, precedent shall be in the following order:

1. Contract Form,
2. Addenda (if any),
3. Proposal Form,
4. Special Provisions,
5. Technical Specifications, if included,
6. Contract Plans,
7. WSDOT Standard Specifications for Road, Bridge, and Municipal Construction,
8. City of Lacey Development Guidelines and Public Works Standards, and
9. WSDOT Standard Plans for Road, Bridge and Municipal Construction

- The Bidder is directed to complete and return the forms in Section B as a bid proposal.

BIDDER'S CHECKLIST

The bidder's attention is especially called to the following forms which must be executed in full as required, and submitted with the bid proposal:

1. Proposal: The unit prices bid must be shown in the space provided.
2. Proposal Signature Sheet: To be filled in and signed by the bidder. All addenda must be acknowledged.
3. Bid Deposit: Any bid shall be accompanied by a deposit of cash, certified check, cashier's check, or surety bond, in an amount equal to at least five percent (5%) of the total amount bid. Checks shall be payable to the City Clerk, City of Lacey, Washington.

   If a surety bond is used, it shall be submitted on a form furnished by the Commission and signed by the bidder and his surety company. The sureties' "attorney-in-fact" must be registered with the Washington State Insurance Commissioner. The power of attorney must also be submitted with the bond. See Specification section 1-02.7 for more information.
4. Non-Collusion and Debarment Affidavit
5. Subcontractors List

The following form must be submitted within 24 hours following the bid submittal deadlines.

6. Certification of Compliance with Wage Payment Statutes

The following must be completed before the contract can be awarded:

7. L&I training on the requirements related to public works and prevailing wages per RCW 39.04.350
8. Certification of Employment Security Department (ESD) good standing

The following forms are to be executed after the contract is awarded:

9. Contract: This agreement to be executed by the successful bidder
10. Performance and Payment Bond
11. Insurance Certificate

Bidder's Checklist

1.	Proposal	
2.	Proposal Signature Sheet	
	Addenda Acknowledged	
3.	Bid Deposit	
	Power of Attorney included if applicable	
4.	Non-Collusion and Debarment Affidavit	
5.	Subcontractor List	
6.	Certification of Compliance with Wage Payment Statutes	
7.	L&I Public Works Prevailing Wage Training	
8.	ESD Certification	

B
BID DOCUMENTS

CITY OF LACEY

RAC Parking Lot Expansion

EV Chargers

Lacey Contract Number: PW 2022-19

Federal Aid Project Number:

WSDOT Contract Number:

TIB Contract Number:

Contract Proposal

DATE: _____

The undersigned, as bidder, has examined the bid documents as prepared by the Public Works Department, City of Lacey.

The undersigned, as bidder, proposes to furnish all material and perform all labor in accordance with the bid documents at the following prices.

Bidder must fill in unit prices in figures for each item and total.

Bidder shall sign this proposal form and submit all required paperwork with the bid.

A Roadway - Frontage Improvements

No.	Quantity	Unit	Item ID	Item Description	Unit Price	Extended Price
A1	1	MC	104-010	Minor Change	$31,000.00	$31,000.00
A2	1	LS	109-010	Mobilization	LUMP SUM	
A3	1	LS	110-010	Project Temporary Traffic Control	LUMP SUM	
A4	55	HR	110-040	Flaggers		
A5	40	HR	110-070	Portable Changeable Message Sign		
A6	1	LS	201-010	Clearing and Grubbing	LUMP SUM	
A7	430	CY	203-010	Roadway Excavation Incl. Haul		
A8	55	TN	404-010	Crushed Surfacing Base Course		
A9	55	TN	404-020	Crushed Surfacing Top Course		
A10	225	TN	504-011	HMA Cl. 1/2" PG 58H-22		
A11	1	LS	504-610	Preparation of Existing Surfaces	LUMP SUM	
A12	160	LF	704-513	12 Inch Diameter D.I. Storm Sewer Pipe		
A13	2	EA	705-210	Catch Basin Type 1		
A14	1	LS	801-680	Erosion/Water Pollution Control	LUMP SUM	
A15	1	LS	802-980	Landscaping	LUMP SUM	
A16	660	LF	804-010	Cement Conc. Traffic Curb and Gutter		
A17	475	SY	814-510	Cement Conc. Sidewalk		
A18	3	EA	814-540	Cement Conc. Sidewalk Ramp		
A19	1	LS	820-505	Illumination System	LUMP SUM	
A20	1200	LF	822-020	Plastic Line		
A21	1	EA	822-190	Plastic Traffic Arrow		

A22	180	LF	822-670	Plastic Crosswalk Line		
A23	5	EA	822-770	Plastic Bicycle Legend		

Schedule A Subtotal:

Tax Rate (%) : 0.00 Tax: $0.00

Schedule A Total:

B General - Parking lot expansion

No.	Quantity	Unit	Item ID	Item Description	Unit Price	Extended Price
B1	1	MC	104-010	Minor Change		
B2	1	LS	109-010	Mobilization	LUMP SUM	
B3	1	LS	201-010	Clearing and Grubbing	LUMP SUM	
B4	1	LS	202-510	Removal of Structures and Obstructions	LUMP SUM	
B5	50	CY	203-010	Roadway Excavation Incl. Haul		
B6	1	LS	205-510	Trench Safety System	LUMP SUM	
B7	3360	TN	404-020	Crushed Surfacing Top Course		
B8	2820	TN	504-011	HMA Cl. 1/2" PG 58H-22		
B9	1	LS	504-610	Preparation of Existing Surfaces	LUMP SUM	
B10	1130	LF	704-513	12 Inch Diameter D.I. Storm Sewer Pipe		
B11	8	EA	705-210	Catch Basin Type 1		
B12	1	LS	801-680	Erosion/Water Pollution Control	LUMP SUM	
B13	1	LS	802-980	Landscaping	LUMP SUM	
B14	2840	LF	804-010	Cement Conc. Traffic Curb and Gutter		
B15	1250	SY	814-510	Cement Conc. Sidewalk		
B16	5	EA	814-540	Cement Conc. Sidewalk Ramp		
B17	4.9	TN	815-020	Light Loose Riprap		
B18	1	LS	820-505	Illumination System	LUMP SUM	
B19	8500	LF	822-010	Paint Line		
B20	8	EA	822-015	Painted Access Parking Space Symbol with Background		
B21	1	EA	850-530	Bollard Type I		
B22	8	EA	850-535	Bollard Type 2		
B23	1	LS	850-792	Project Closeout	$500.00	$500.00
B24	8	EA	853-510	Wheel Stop		

Schedule B Subtotal:

Tax Rate (%) : 9.50 Tax:

Schedule B Total:

C General - EV chargers

No.	Quantity	Unit	Item ID	Item Description	Unit Price	Extended Price
C1	1	MC	104-010	Minor Change		

C2	1	LS	104-020	Additive #1	LUMP SUM	
C3	1	LS	104-025	Additive #2	LUMP SUM	
C4	1	LS	109-010	Mobilization	LUMP SUM	
C5	1	LS	899-916	Type 3 Electric Vehicle Charger	LUMP SUM	

Schedule C Subtotal:

Tax Rate (%) : 9.50 Tax:

Schedule C Total:

Contract Total:
(All Schedules)

The undersigned also agrees as follows:

- Within 10 calendar days after the contract is awarded to sign and return the contract and provide insurance documents.
- That this proposal cannot be withdrawn within 45 days after receipt of bids.
- That it is the understanding that the City of Lacey may accept or reject any or all bids.
- The undersigned hereby agrees to pay for labor not less than the prevailing rates of wages per the bid documents.
- Enclosed with this proposal is a bid deposit in the sum of 5% of the bid total amount which it is agreed shall be collected and retained by the City of Lacey as liquidated damages in the event this proposal is accepted by the City of Lacey with 45 calendar days after the receipt of bids and the undersigned fails to execute the contract and the required bond with the City of Lacey, under the conditions thereof, within 10 calendar days after the undersigned is notified that said proposal has been accepted, otherwise said bid deposit shall be returned to the undersigned upon demand.
- A Performance/Payment Bond will be furnished to the City with the contract.
- Retention will be held on this contract per RCW 60.28.011.

Addenda Receipt Acknowledged

_____,_____,_____

_____ _____

Signature of Bidder Date

(If an Individual, Partnership, or Non-Incorporated organization)

_____ _____

Firm Name Please Print Phone

Address of Bidder: _____

_____

Name and Address of Firm Members:

_____

_____

_____

_____

Signature of Bidder (if a Corporation)

Title: _____

Firm Name: _____ Phone: _____

Business Address: _____

Incorporated under the Laws of the State of _____

Officers Address

President: _____ _____

Secretary: _____ _____

Treasurer: _____ _____

BID DEPOSIT SELECTION

A bid deposit in an amount of five percent (5%) of the total bid amount is attached hereto:

CASH	☐	In the amount of _____
CASHIER'S CHECK	☐	In the amount of _____
CERTIFIED CHECK	☐	In the amount of _____
BID BOND	☐	In the amount of 5% of the total bid amount

CONTRACTOR'S BID DEPOSIT SURETY BOND
to City of Lacey, Washington

We,_____ , as Principal, existing under and by virtue of the laws of the State of Washington and authorized to do business in the State of Washington, and _____, as Surety, organized and existing under the laws of the State of _____ , are held and firmly bound unto the City of Lacey, a Washington municipality, as Obligee, in the penal sum of 5% of the total amount bid, not to exceed $_____ , for the payment of which we jointly and severally bind ourselves, and our legal representatives and successors.

WHEREAS, the Principal has submitted a bid for RAC Parking Lot Expansion.

NOW THEREFORE, the condition of the obligation is such that if the Obligee shall accept the bid of Principal and make timely award to the Principal according to the terms of the bid documents; and the Principal shall, within ten days after notice of the award, exclusive of the day of notice, enter into the contract with the Obligee and furnish the contractor's bonds (performance and payment bonds) with Surety satisfactory to the Obligee in an amount equal to 100% of the amount of the bid proposed including additives, alternatives and Washington State sales tax, then this obligation shall be null and void; otherwise if the Principal fails to enter into the contract and fails to furnish the contractor's bonds within ten days of notice of award, exclusive of the day of notice, the amount of the bid deposit shall be forfeited to the Obligee, payable by the Surety; but in no event will the Surety's liability exceed the face amount of this bid bond.

This bond may be executed in two original counterparts, and shall be signed by the parties' duly authorized officers. This bond will only be accepted if it is accompanied by a fully executed and original power of attorney for the officer executing on behalf of the surety.

PRINCIPAL (CONTRACTOR)		SURETY	
_____		_____	
Principal Signature	Date	Surety Signature	Date
_____		_____	
Printed Name		Printed Name	
_____		_____	
Title		Title	

Name, address, and telephone of local office/agent of Surety Company is:

_____

_____

NON-COLLUSION AND DEBARMENT AFFIDAVIT

State of)

)ss

County of)

I, the undersigned, being duly sworn, deposes and says that the person, firm, association, copartnership or corporation herein named, has not either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in the preparation and submission of a proposal of the City of Lacey for consideration in the award of a contract on the improvement described as follows.

I further certify that, except as noted below, the firm, association or corporation or any person in a controlling capacity associated therewith or any position involving the administration of State or federal funds; is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal or State agency; has not been suspended, debarred, voluntarily excluded or determined ineligible by any federal or State agency within the past three years; does not have a proposed debarment pending; and has not been indicted, convicted, or had a civil judgment rendered against said person, firm, association or corporation by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three years.

I further acknowledge that by signing my signature, I am deemed to have signed and have agreed to the provisions of this affidavit.

_____

Name of Project

_____

Name of Firm

_____

Signature of Authorized Member

Sworn to before me this

_____ day of _____ ,20 _____

_____

Notary Public

(CORPORATE SEAL)

CERTIFICATION OF COMPLIANCE WITH WAGE PAYMENT STATUTES

The bidder hereby certifies that, within the three-year period immediately preceding the bid solicitation date, 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.

_____
Bidder's Business Name

_____
Signature of Authorized Official*

_____
Printed Name

_____
Title

_____ _____ _____
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:

_____

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.*

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.

SUBCONTRACTOR LIST

Prepared in compliance with RCW 39.30.060 as amended

To Be Submitted with the Bid Proposal

Project Name: _____

Failure to list subcontractors with whom the bidder, if awarded the contract, will directly subcontract for performance of the work of structural steel installation and rebar installation, heating, ventilation and air conditioning, plumbing, as described in Chapter 18.106RCW, and electrical, as described in Chapter 19.28 RCW or naming more than one subcontractor to perform the same work will result in your bid being non-responsive and therefore void.

Subcontractor(s) with whom the bidder will directly subcontract that are proposed to perform the work of structural steel installation and rebar installation, heating, ventilation and air conditioning, plumbing, as described in Chapter 18.106 RCW, and electrical as described in Chapter 19.28 RCW **must** be listed below. The work to be performed is to be listed below the subcontractor(s) name.

To the extent the Project includes one or more categories of work referenced in RCW 39.30.060, and no subcontractor is listed below to perform such work, the bidder certifies that the work will either (i) be performed by the bidder itself, or (ii) be performed by a lower tier subcontractor who will not contract directly with the bidder.

Subcontractor Name: N/A
Work to be Performed: Structural steel installation

Subcontractor Name: N/A
Work to be Performed: Rebar installation

Subcontractor Name: N/A
Work to be Performed: Plumbing

Subcontractor Name:
Work to be Performed: Electrical

Subcontractor Name: N/A
Work to be Performed: Heating ventilation and air conditioning

* Bidder's are notified that is the opinion of the enforcement agency that PVC or metal conduit, junction boxes, etc, are considered electrical equipment and therefore considered part of electrical work, even if the installation is for future use and no wiring or electrical current is connected during the project.

CERTIFICATION OF EMPLOYMENT SECURITY DEPARTMENT (ESD) GOOD STANDING AND NUMBER

The bidder hereby provides an ESD number and certifies that per RCW 39.04.350 and Title 50 RCW, in which the City will verify prior to entering into contract with the Contractor, that the Bidder has a valid ESD number and is deemed to be in good standing with Washington State's Employment Security Department.

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

_____
Bidder's Business Name

_____
Employment Security Department (ESD) Number

_____
WA State Unified Business Identifier (UBI #)

_____
Signature of Authorized Official*

_____
Printed Name

_____
Title

_____	_____	_____
Date	City	State

C
CONTRACT DOCUMENTS

Project Number PW _____

CONSTRUCTION CONTRACT

THIS AGREEMENT, made andeffective as of the date of the last signature below, between the City of Lacey, hereinafter called Owner, under and by virtue of the charter, laws and ordinances of the said Owner and the laws of the State of Washington, and _____ hereinafter called Contractor,

WITNESSETH:

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

1. The Contractor shall do all work and furnish all tools, materials and equipment 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 here set forth at length, and shall perform any alterations in or in addition 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 bear the expense of all materials, labor, equipment, 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 are mentioned in the Specifications to be furnished by the Owner.

2. The Owner 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 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.

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

4. It is further provided that no liability shall attach to Owner or Agent thereof by reason of entering into this Contract, except as expressly provided herein.

5. Payments will be made under the Contract according to the schedule of rates and prices and the specification attached and made a part thereof. Partial payments under the Contract will be made at the request of the Contractor not more than once each month upon approval of the Owner, as hereinafter specified, provided they are in accordance with the provisions of RCW 60.28.010. There will be reserved and retained from monies

earned by the Contractor, as determined by such monthly estimates, a sum equal to 5 percent of the Contract price.

Payment of the retained percentage shall be withheld for a period of forty-five (45) days following the final acceptance of the work and materials by the Owner, and shall be paid the Contractor at the expiration of said forty-five (45) days in event no claims, as provided by law, have been filed against such funds; and provided further, that releases have been obtained from all departments and agencies having jurisdiction over the activities of the Contractor. In the event such claims are filed, Contractor shall be paid such retained percentages less an amount sufficient to pay any such claims together with a sum sufficient to pay the cost of such action, and to cover attorney fees as determined by the Owner.

6. Requests for review of substitute items of material or equipment will not be accepted by the Owner or Agent from anyone other than the Contractor. If the Contractor wishes to furnish a substitute item, the Contractor shall make written application to the Owner's Agent for acceptance thereof, certifying that the proposed substitute will perform adequately the functions called for by the general design, be similar and of equal substance to that specified and be suited to the same use and capable of performing the same function as that specified. All variations of the proposed substitute from that specified shall be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, which shall be considered by the Owner in evaluating the proposed substitute. The Owner may require the Contractor to furnish at the Contractor's expense, additional data about the proposed substitute. The Owner will be the sole judge of acceptability, and no substitute will be ordered without the Owner's prior written acceptance. The Owner may require the Contractor to furnish at the Contractor's expense, a special performance guarantee or other surety with respect to any other substitute.

   The Owner or Agent will record the time and expenses in evaluating substitutions proposed by the Contractor. Whether or not the Owner accepts a proposed substitute, the Contractor shall reimburse the Owner for the costs of evaluating any proposed substitute.

7. The Owner reserves the right, after the final payment has been made, to claim and recover by process of law such sums as may be sufficient to make good any defects in the equipment or to recover any over-payment resulting from dishonest acts of the Contractor.

8. The contract time will commence to run, and the Contractor shall start to perform his obligation under the contract documents, on the day indicated in the Notice to Proceed given by Owner to Contractor; but in no event shall contract time commence to run later than the 30th calendar day after the date when both Owner and Contractor execute the Contract. A Notice to Proceed may be given at any time within thirty (30) calendar days after the date when both Owner and Contractor execute the Contract.

9. The Contractor shall guarantee the materials and workmanship for a period of one (1) year from and after the date of final acceptance by the Owner.

   If, within said guarantee period, repairs are required which, in the opinion of the Owner, are rendered necessary as a result of work or materials which are inferior, defective or not

in accordance with the terms of the Contract, the Contractor shall, promptly upon receipt of notice from the Owner, and without expense to the Owner, (a) correct all defects and place in satisfactory condition in every particular all of such guaranteed work and materials; (b) make good all damage which in the opinion of the Owner is caused by such defects; and (c) make good any other work or material or the equipment and contents of a building, structure or site disturbed in fulfilling any such guarantee.

If the Contractor, after notice, fails within ten (10) days to proceed to comply to the terms of this guarantee, the Owner may have the defects corrected, and the Contractor and his Surety shall be liable for all expense incurred, provided, however, that in case of an emergency where, in the opinion of the Owner, delay would cause serious loss or damage, repairs may be made without notice being given to the Contractor and the Contractor shall pay the cost thereof.

IN WITNESS WHEREOF, the said Contractor has executed this instrument and the City Manager, pursuant to resolution duly adopted, has caused this instrument to be executed in the name of the City of Lacey the day and year first above-written.

_____

_____

_____

Contractor Date

_____

Contractor's Registration Number (UBI No.)

_____

City of Lacey Business License Number

_____

City Manager Date

ATTEST:
By:

_____

City Clerk

APPROVED AS TO FORM:
By :

_____

City Attorney

CONTRACTOR'S PERFORMANCE/PAYMENT BOND
to City of Lacey, Washington

The City of Lacey, Washington, in Thurston County, has awarded to _____ (Contractor), as Principal, a contract for the construction of the project designated as **RAC Parking Lot Expansion**, Project No. **PW 2023-19** in Lacey, Washington, and said Principal is required under the terms of the Contract to furnish a performance/payment bond in accordance with chapter 39.08 Revised Code of Washington (RCW).

The Principal, and _____(Surety), a corporation, organized under the laws of _____ and licensed to do business in the State of Washington as surety and named in the current list of "Surety Companies Acceptable in Federal Bonds" as published in the Federal Register by the Audit Staff Bureau of Accounts, U.S. Treasury Dept., are jointly and severally held and firmly bound to the City of Lacey, as Obligee, in the sum of $_____ total Contract amount (including Washington State sales tax), subject to the provisions herein.

The obligations of this bond shall become null and void, if and when the Principal, its heirs, executors, administrators, successors, or assigns shall well and faithfully perform all of the Principal's obligations under the Contract and fulfill all the terms and conditions of all duly authorized modifications, additions, and changes to said Contract that may hereafter be made, at the time and in the manner therein specified; shall pay all persons in accordance with chapters 39.08, 39.12, and 60.28 RCW, including all workers, laborers, mechanics, subcontractors, and material suppliers, and all persons who shall supply such contractor or subcontractor with provisions and supplies for the carrying on of such work; shall warranty the work as provided in the Contract and shall indemnify and hold harmless the Obligee from any defects in the workmanship and materials incorporated into the work for the period identified in the Contract; and if such obligations have not been fulfilled, this bond shall remain in full force and effect.

The Surety for value received agrees that no change, extension of time, alteration or addition to the terms of the Contract, the specifications accompanying the Contract, or to the work to be performed under the Contract shall in any way affect its obligation on this bond, and waives notice of any change, extension of time, alteration or addition to the terms of the Contract or the work performed. The Surety agrees that modifications and changes to the terms and conditions of the Contract that increase the total amount to be paid the Principal shall automatically increase the obligation of the Surety on this bond and notice to Surety is not required for such increased obligation.

This bond may be executed in two original counterparts and shall be signed by the parties' duly authorized officers. This bond will only be accepted if it is accompanied by a fully executed and original power of attorney for the officer executing on behalf of the surety.

PRINCIPAL (CONTRACTOR)		SURETY	
_____		_____	
Principal Signature	Date	Surety Signature	Date
_____		_____	
Printed Name		Printed Name	
_____		_____	
Title		Title	

Name, address, and telephone of local office/agent of Surety Company is:

_____

_____

DECLARATION OF OPTION FOR MANAGEMENT OF STATUTORY RETAINED PERCENTAGE

A. I hereby elect to have the retained percentage of this contract held in a fund by the City of Lacey until forty-five (45) days following final acceptance of the work.

_____
Contractor (please print)

_____ _____
Date Signature

B. I hereby elect to have the City of Lacey invest the retained percentage of this contract from time to time as such retained percentage accrues and in accordance with RCW Ch. 60.28.

I hereby designate _____ as the repository for the escrow of said funds.

I hereby further agree to be fully responsible for payment of all costs or fees incurred as a result of placing said percentage in escrow and investing it as authorized by statue.

The City of Lacey shall not be liable in any way for any costs or fees in connection therewith.

_____
Contractor (please print)

_____ _____
Date Signature

C. I hereby elect to hold a retainage bond.

_____
Contractor (please print)

_____ _____
Date Signature

D
SPECIAL PROVISIONS

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SPECIAL PROVISIONS

INTRODUCTION TO THE SPECIAL PROVISIONS

(January 19, 2022 APWA GSP)

The work on this project shall be accomplished in accordance with the *Standard Specifications for Road, Bridge and Municipal Construction*, 2023 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 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, but are generally denoted with (******). The GSPs are labeled under the headers of each GSP, with the effective date of the GSP and its source, except WSDOT uses a date only (2nd on list). For example:

(March 8, 2013 APWA GSP)
(April 1, 2013)
(May 1, 2013 Lacey 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 Lacey Development Guidelines and Public Works Standards, current edition

Contractor shall obtain copies of these publications, at Contractor's own expense.

DESCRIPTION OF WORK

This contract provides for the expansion of the RAC parking lot at the corner of Steilacoom Road and Marvin Road to include, but not limited to: Grading, paving, striping, stormwater, illumination, landscaping, CCTV infrastructure installation, electrical vehicle charging station installation, and other construction work.

1-01 DEFINITIONS AND TERMS

1-01.3 Definitions

(January 19, 2022 APWA GSP)

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 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 of two 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.

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.

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
(June 27, 2011 APWA GSP)

Delete this section and replace it with the following:

Information as to where Bid Documents can be obtained or reviewed will 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 at no cost as detailed below:

To Prime Contractor	No. of Sets	Basis of Distribution
Reduced plans (11" x 17")	3	Furnished automatically upon award
Contract Provisions	3	Furnished automatically upon award
Large plans (22" x 34")	3	Furnished only upon request

Additional plans and Contract Provisions may be obtained by the Contractor from the source stated in the Call for Bids, at the Contractor's own expense.

1-02.4 Examination of Plans, Specifications and Site of Work

1-02.4(1) General
(December 30, 2022 APWA GSP Option B)

The first sentence of the ninth paragraph, beginning with "Prospective Bidder desiring…", is revised to read:

Prospective Bidder desiring an explanation or interpretation of the Bid Documents, shall request the explanation or interpretation in writing by close of business 5 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 and additives, if such be to the advantage of the Contracting Agency. The bidder shall bid on all alternates and additives set forth in the Proposal Form unless otherwise specified.

1-02.6 Preparation of Proposal

(******)

The bid proposal for this contract requires the Bidder to bid additives as part of the bid. As such the Bidder is required to submit a Base Bid and a bid for each of the Additives.

Bid Proposal
The Bid Proposal includes the following:

1. Base Bid
a. The Base Bid shall include constructing all items included in the Proposal except those items contained in the Additives.

2. Additives
a. Additive #1 - Electric Vehicle charger No. 5
b. Additive #2 - Electric Vehicle charger No. 6

See the Technical Specifications for additional information and descriptions of bid items.

Bidding Procedures
To be considered responsive the Bidder shall submit a price on each and every Bid item include in the Base Bid and all Additives.

The successful Bidder will be the Bidder submitting the lowest responsible Bid for the highest order Preference that is within the amount of available funds for the project. The following are listed in order from highest to lowest Preference:

1. Preference 1: Lowest total for Base Bid
2. Preference 2: Lowest total for Base Bid plus Additive #1
3. Preference 3: Lowest total for Base Bid plus Additive #1 & Additive #2

The Contracting Agency may, at their discretion, award a Contract for the Base Bid, without any additional Additives, in the event that all Bids exceed the available funds. In any case, the award will be subject to the requirements of Section 1-03. The sum of the schedule(s) selected by the Contracting Agency will fix the awarded contract price and the amount of the contract bond.

1-02.6.1 Recycled Materials Proposal

(January 4, 2016 APWA GSP)

The Bidder shall submit with the Bid, its proposal for incorporating recycled materials into the project, using the form provided in the Contract Provisions.

1-02.7 Bid Deposit

(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

(March 3, 2022 Lacey GSP)

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.

If supplemental information is due after the Bid Proposal is due, the document(s) shall be submitted as follows:

1. In a sealed envelope labeled the same as for the Proposal, with "Supplemental Information" added, or
2. By e-mail to the following e-mail address: ProjectAdmin@ci.lacey.wa.us

All other 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" that is received after the time specified, 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 in its entirety, 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

(November 20, 2020 Lacey GSP)

Delete and replace this section with the following:

Proposals will be opened and publicly read by live video stream per the "Instructions to Bidders" in Section A of these Specifications at the time as indicated in the call for Bids

1-02.13 Irregular Proposals

(December 30, 2022 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 (WSDOT Form 271-015), if applicable, as required in Section 1-02.6;
h. The Bidder fails to submit or properly complete a Disadvantaged Business Enterprise Certification (WSDOT Form 272-056), if applicable, as required in Section 1-02.6;
i. The Bidder fails to submit Written Confirmation (WSDOT Form 422-031) from each DBE firm listed on the Bidder's completed DBE Utilization Certification that they are in agreement with the bidder's DBE 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 Provision;
j The Bidder fails to submit DBE 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 Bidder fails to submit a DBE Bid Item Breakdown (WSDOT Form 272-054), 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;

l. The Bidder fails to submit DBE Trucking Credit Forms (WSDOT Form 272-058), 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;
m. The Bid Proposal does not constitute a definite and unqualified offer to meet the material terms of the Bid invitation; or
n. 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.

1-02.15 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 AWARD AND EXECUTION OF CONTRACT

1-03.1 Consideration of Bids
(December 30, 2022 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

(January 19, 2022 APWA GSP)

Revise this section to read:

Within 3 calendar days of Award date (not including Saturdays, Sundays and Holidays), the successful Bidder shall provide the information necessary to execute the Contract to the Contracting Agency. The Bidder shall send the contact information, including the full name, email address, and phone number, for the authorized signer and bonding agent to the Contracting Agency.

Copies of the Contract Provisions, including the unsigned Form of Contract, will be available 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 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, a satisfactory bond as required by law and Section 1-03.4, and the Transfer of Coverage form for the Construction Stormwater General Permit with sections I, III, and VIII completed when provided. 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 calendar days after the award date stated above, the Contracting Agency may grant up to a maximum of 10 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

(December 30, 2022 APWA GSP)

Revise this section to read:

All decisions 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.

1-04 SCOPE OF THE WORK

1-04.2 Coordination of Contract Documents, Plans, Special Provisions, Specifications, and Addenda

(November 20, 2020 Lacey 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 presiding over 3, 3 over 4, and so forth):

1. Contract Form,
2. Addenda (if any),
3. Proposal Form,
4. Special Provisions,
5. Technical Specifications, if included,
6. Contract Plans,
7. WSDOT Standard Specifications for Road, Bridge, and Municipal Construction,
8. City of Lacey Development Guidelines and Public Works Standards, and
9. WSDOT Standard Plans for Road, Bridge and Municipal Construction

1-04.4(1) Minor Changes
(May 30, 2019 APWA GSP)

Delete the first paragraph and replace it with the following:

Payments or credits for changes amounting to $15,000 or less may be made under the Bid item "Minor Change". At the discretion of the Contracting Agency, this procedure for Minor Changes may be used in lieu of the more formal procedure as outlined in Section 1-04.4, Changes. All "Minor Change" work will be within the scope of the Contract Work and will not change Contract Time.

1-04.6 Variation in Estimated Quantities
(May 25, 2006 APWA GSP)

Supplement this Section with the following:

The quantities for "Utility Potholing", "Controlled Density Fill", "Imported Pipe Bedding" and "Bank Run Gravel for Trench Backfill" have been entered into the Proposal only to provide a common proposal for bidders. Actual quantities will be determined in the field as the work progresses, and will be paid at the original bid price, regardless of final quantity. These bid items shall not be subject to the provisions of 1-04.6 of the Standard Specifications.

1-04.6 Variations in Estimated Quantities
(December 30, 2022 APWA GSP Option B)

Revise the first paragraph to read:

Payment to the Contractor will be made only for the actual quantities of Work performed and accepted in conformance with the Contract. When the accepted quantity of Work performed under a unit item varies from the original Proposal quantity, payment will be at the unit Contract price for all Work unless the total accepted quantity of the Contract item, adjusted to exclude added or deleted amounts included in change orders accepted by both parties, increases or decreases by more than 25 percent from the original Proposal quantity, and if the total extended bid price for that item at time of award is equal to or greater than 10 percent of the total contract price at time of award. In that case, payment for contract work may be adjusted as described herein.

1-05 CONTROL OF WORK

1-05.4 Conformity With and Deviations from Plans and Stakes
Supplement this section with the following:

Roadway and Utility Surveys
(July 23, 2015 APWA GSP, Option 1)

The Engineer shall furnish to the Contractor one time only all principal lines, grades, and measurements the Engineer deems necessary for completion of the work. These shall generally consist of one initial set of:

1. Slope stakes for establishing grading;
2. Curb grade stakes;
3. Centerline finish grade stakes for pavement sections wider than 25 feet; and

4. Offset points to establish line and grade for underground utilities such as water, sewers, and storm drains.

On alley construction projects with minor grade changes, the Engineer shall provide only offset hubs on one side of the alley to establish the alignment and grade.

1-05.4(2) Survey Control and Electronic Files

(August 10, 2010 Lacey GSP)

Add the following new section:

The Contractor shall re-establish the survey control used in design by using existing survey monuments and other control points as provided by the City.

When requested by the Contractor, the City will provide an electronic version of the construction plans (drawings), for use by the Contractor at the Contractor's own risk. In all cases, the approved paper construction plans are the official contract documents. If the Contractor wishes to use the electronic version of the construction plans for the purposes of providing surveying of the proposed improvements, it shall be the Contractor's responsibility to verify that any coordinates used from the electronic file match the station and offset location given in the contract construction plans. Construction plans are diagrammatic in nature. The coordinate locations of the various graphic elements within the electronic files may not necessarily be precisely shown with respect to their coordinate position. In all cases, the location callouts in the contract construction plans shall govern.

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.

1-05.11 Final Inspections and Operational Testing
(October 1, 2005 APWA GSP)

Delete this section and replace it with the following:

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 therefore.

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.

1-05.12(1) One-Year Guarantee Period
(March 8, 2013 APWA GSP)

Add the following new section:

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 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.

1-05.14 Cooperation with Other Contractors
(August 3, 2015 Lacey GSP)

Supplement this section with the following:

The Contractor shall coordinate residential refuse and recycling pick-up with Pacific Disposal (360) 923-0111. Construction activities shall be planned so that there is no interruption of services.

1-05.15 Method of Serving Notices
(December 30, 2022 APWA GSP)

Revise the second paragraph to read:

All correspondence from the Contractor shall be directed to the Project Engineer. 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.

1-05.16 Water and Power
(October 1, 2005 APWA GSP)

Add the following new section:

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.

1-05.18 Record Drawings
(January 3, 2011 Lacey GSP Option A)

Add the following new section:

The Contractor shall furnish As-Built/Record Drawings of all changes to the original plans in accordance with the following conditions:

One set of 22”x 34” plans showing the changes to the project as installed.
Drawings shall be to scale with all notations neat in appearance.
Turn the record drawings over to the Engineer for review and approval prior to final payment.

1-06 CONTROL OF MATERIAL

1-06.1 Approval of Materials Prior to Use
(April 3, 2017 WSDOT GSP 1-06.1.OPT1.GR1)

The second sentence of first paragraph is revised to read:

For each proposed material that is required to be submitted for approval using either the QPL or RAM process the Contractor will be allowed to submit for approval two material sources or manufacturers per material type at no cost. Additional material sources or manufacturers may be submitted for approval and will be processed at a cost of $125.00 per material source or manufacturer submitted by QPL submittal and $400.00 per material submitted by RAM. All costs for processing additional material sources or manufacturers will be deducted from monies due or that may come due to the Contractor. Subject to a request by the Contractor and a determination by the Engineer the costs for processing may be waived.

1-06.1 Approval of Materials Prior to Use

(January 4, 2016 Lacey GSP)

The second sentence of first paragraph is revised to read:

The Contractor shall use the Qualified Product List (QPL), the Aggregate Source Approval (ASA) Database, or the City of Lacey Request for Approval of Material (COL RAM) form.

1-06.1(2) Request for Approval of Material (RAM)

The first paragraph is revised to read:

The COL RAM shall be used with all submittals. The COL RAM shall be prepared by the Contractor in accordance with the instructions and submitted to the engineer for approval before the material is incorporated into the Work..

Supplement this section with the following:

The Contractor shall submit sufficient information that describes the materials proposed as defined and described in these specifications and plans within 20 working days following the Notice to Proceed.

The City of Lacey has identified the following items as long lead items.

1. EV Charging Stations
2. Light Poles
3. CCTV Cameras

Long lead items shall be submitted within 10 working days of Notice to Proceed. The list above may not include all long lead items. The contractor is responsible for identifying all items and shall notify the Engineer of any additional items.

The Contractor shall submit one electronic of catalog cuts, shop drawings, and a material testing sample, as required for all items to be used in this contract for approval. The Contractor shall circle or highlight products and materials that are specific to this project, and cross out items that are not for this project.

All items not in exact compliance with the specifications must be noted as a change. The Contractor shall include an explanation, product specifications, sample articles, and any other items that will aid the Engineer in approving an item not in exact accordance with the specifications.

All submittals shall be submitted in Adobe Acrobat format and submittals that exceed 10 pages shall include a table of contents. Submittals that are not submitted in the format outlined may be rejected outright and the Contractor is required to resubmit in the correct format. The form and the submittal shall be sent in the same e-mail. Submittals that exceed 10 MB shall either be provided on a CD, a flash drive or via an internet link.

The Engineer will review submittals within 10 working days. The Contractor may request additional working days if approval or disapproval is not received in 10 working days. The Contractor may not request additional working days for failure to submit sufficient information to approve an item, or for rejection of an item not in accordance with the specifications.

Resubmittals shall be submitted within 5 working days from City's transmittal, to the contractor, of the Engineer reviewed submittal. If the submittal is "Rejected", the contractor shall resubmit the entire

submittal. If the submittal is marked “Revise and Resubmit”, the contractor shall submit items that are identified in the Engineer’s comments.

Any material purchased or labor performed prior to such approval shall be at the Contractor's risk. The Contractor must receive all material approvals before the materials will be allowed on the project.

1-06.6 Recycled Materials
(January 4, 2016 APWA GSP)

Delete this section, including its subsections, and replace it with the following:

The Contractor shall make their best effort to utilize recycled materials in the construction of the project. Approval of such material use shall be as detailed elsewhere in the Standard Specifications.

Prior to Physical Completion the Contractor shall report the quantity of recycled materials that were utilized in the construction of the project for each of the items listed in Section 9-03.21. The report shall include hot mix asphalt, recycled concrete aggregate, recycled glass, steel furnace slag and other recycled materials (e.g. utilization of on-site material and aggregates from concrete returned to the supplier). The Contractor’s report shall be provided on DOT form 350-075 Recycled Materials Reporting.

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.

1-07.1 Laws to be Observed

(April 3, 2006 WSDOT GSP)

Supplement this section with the following:

Confined spaces are known to exist at the following locations:

Electrical Vaults

The Contractor shall be fully responsible for the safety and health of all on-site workers and compliant with Washington Administrative Code (WAC 296-809).

The Contractor shall prepare and implement a confined space program for each of the confined spaces identified above. The Contractors Confined Space program shall be sent to the contracting agency at least 30 days prior to the Contractor beginning work in or adjacent to the confined space. No work shall be performed in or adjacent to the confined space until the plan is submitted to the Engineer as required. The Contractor shall communicate with the Engineer to ensure a coordinated effort for providing and maintaining a safe worksite for both the Contracting Agency's and Contractor's workers when working in or near a confined space.

All costs to prepare and implement the confined space program shall be included in the bid prices for the various items associated with the confined space work.

1-07.2 State Sales Tax

(June 27, 2011 APWA GSP)

Delete this section, including its sub-sections, in its entirety and replace it with the following:

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).

1-07.6 Permits and Licenses

(January 2, 2018 WSDOT 1-07.6.OPT1.FR1)

Section 1-07.6 is supplemented with the following:

The Contracting Agency has obtained 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 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.
NPDES Construction Stormwater General Permit	Department of Ecology	WAR312735
Grading Permit	City of Lacey	

1-07.6 Permits and Licenses

(February 14, 2023 Lacey GSP)

Section 1-07.6 is supplemented with the following:

The Contractor shall be responsible for obtaining the permits listed below. The Contractor shall obtain any additional permits as necessary. All costs to obtain and comply with permits shall be included in the applicable Bid items for the Work involved.

NAME OF DOCUMENT	PERMITTING AGENCY
Electrical	City of Lacey

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

(February 14, 2023 Lacey GSP)

The Contractor shall prepare a project-specific spill prevention, control, and countermeasures plan (SPCC Plan), and shall implement the plan for the duration of the project. No on-site construction activities may commence until the Contracting Agency accepts a SPCC Plan for the project. An SPCC Plan template and guidance information is available at https://wsdot.wa.gov/engineering-standards/environmental-guidance/stormwater-water-quality.

The SPCC Plan shall address all fuels, petroleum products, hazardous materials, and other materials defined in Chapter 447 of the WSDOT Environmental Manual M 31-11. Occupational safety and health requirements that may pertain to SPCC Plan implementation are contained in, but not limited to, WAC 296-824 and WAC 296-843. The SPCC Plan shall address conditions that may be required by Section 3406 of the current International Fire Code, or as approved by the local Fire Marshal.

Implementation Requirements

The Contractor shall update the SPCC Plan throughout project construction so that the written plan reflects actual site conditions and practices. The Contractor shall update the SPCC Plan at least annually and maintain a copy of the updated SPCC Plan on the project site. The Contractor shall fully implement the SPCC Plan, as accepted and updated, at all times.

SPCC Plan Element Requirements

The SPCC Plan shall set forth the following information in the following order:

1. Responsible Personnel – Identify the names, titles, and contact information for the personnel responsible for implementing and updating the plan and for responding to spills.
2. Spill Reporting – List the names and telephone numbers of the Federal, State, and local agencies the Contractor shall notify in the event of a spill as referenced in the abovementioned template.
3. Spill Prevention – Describe the following items:
   a. The contents and locations of spill response kits that the Contractor shall supply and maintain that are appropriately stocked, located in close proximity to hazardous materials and equipment, and immediately accessible.
   b. Security measures for potential spill sources to prevent accidental spills and vandalism.
   c. Site inspection procedures and frequency.
4. Spill Response – Outline the response procedures the Contractor shall follow for each scenario listed below, indicating that if hazardous materials are encountered or spilled during construction, the Contractor shall do everything possible to control and contain the material until appropriate measures can be taken. Include a description of the actions the Contractor shall take and the specific on-site spill response equipment that shall be used to assess the spill, secure the area, contain and eliminate

the spill source, clean up spilled material, decontaminate equipment, and dispose of spilled and contaminated material:
a. A spill of each type of hazardous material present.
b. Stormwater that has come into contact with hazardous materials.
c. A release or spill of any unknown preexisting contamination and contaminant sources (such as buried pipes or tanks) encountered during project Work.

Payment

If no bid item for "SPCC Plan" is included in the proposal, any work described in this section shall be incidental to the project.

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

(December 30, 2022 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 Public Convenience and Safety

1-07.23(1) Construction Under Traffic
(May 2, 2017 APWA GSP)

Revise the third sentence of the second paragraph to read:

Accessibility to existing or temporary pedestrian push buttons shall not be impaired; if approved by the Contracting Agency activating pedestrian recall timing or other accommodation may be allowed during construction.

1-07.23(1) Construction Under Traffic
(******)

Section 1-07.23(1) is supplemented with the following

Lane closures are subject to the following restrictions:

See section 1-08.4(1) for additional provisions.

If the Engineer determines the permitted closure hours adversely affect traffic, the Engineer may adjust the hours accordingly. The Engineer will notify the Contractor in writing of any change in the closure hours.

Lane closures are not allowed on any of the following:

1. A holiday,

2. A holiday weekend; holidays that occur on Friday, Saturday, Sunday or Monday are considered a holiday weekend. A holiday weekend includes Saturday, Sunday, and the holiday.

3. After noon on the day prior to a holiday or holiday weekend, and

4. Before 7:00 AM on the day after the holiday or holiday weekend.

1-07.24 Rights of Way
(July 23, 2015 APWA GSP)

Delete this section and replace it with the following:

Street Right of Way lines, limits of easements, 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:

To review the initial progress schedule;
To establish a working understanding among the various parties associated or affected by the work;
To establish and review procedures for progress payment, notifications, approvals, submittals, etc.;
To establish normal working hours for the work;
To review safety standards and traffic control; and
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:

A breakdown of all lump sum items;
A preliminary schedule of working drawing submittals; and
A list of material sources for approval if applicable.

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 5 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

1-08.0(2)A Lacey Hours of Work

(October 16, 2014 Lacey GSP Option A)

Add the following new section:

Lacey Municipal Code (LMC) Chapter 14.38.010, prohibits outside construction activities between the hours of 9:00 p.m. and 7:00 a.m. in or adjacent to residential zones of the City. A waiver to this ordinance will not be allowed, except in case of emergency, or where operations are necessary during such hours in order to promote the safety of the traveling public as shown in theses specifications or as determined by the Engineer.

1-08.1(7)A Subcontracting
(December 30, 2022 APWA GSP)

Delete the ninth paragraph, beginning with "On all projects, the Contractor shall certify…"..

1-08.3(2)A Type A Progress Schedule
(December 30, 2022 APWA GSP)

Revise this section to read:

The Contractor shall submit five (5) 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
(July 23, 2015 APWA GSP)

Delete this section in its entirety, and replace it with the following:

1-08.4 Notice to Proceed and Prosecution of Work

Notice to Proceed will be given after the contract has been executed 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 ten 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.

1-08.4(1) Order Of Work
(******)

Add the following new section:

Prior to starting construction and issuance of notice to proceed by the City, the Contractor shall furnish the Contracting Agency with a schedule, sequence, and method of proceeding with the work. This schedule shall address all items herein and must be approved by the Contracting Agency prior to commencing any construction operations.

The Contracting Agency has made commitments with a combination of several jurisdictions, public users, property owners, and private utilities that the Contractor shall incorporate into the schedule for this project. The following specific requirements shall be included into the project schedule:

- Upon commencements of ground disturbing activities, the contractor shall complete paving within 113 calendar days.
- With exception of long lead items, all physical work shall be completed by May 17th, 2024.
- With the exception of long lead items, it is essential the Public have full and unrestricted use of the project facilities at the earliest possible time. As an incentive to the Contractor, the contracting Agency will pay the Contractor $1,800.00 for each calendar day remaining prior to the established by May 17th, 2024 completion date, but not to exceed an amount equal to $25,000.00.
- All work requiring lane closures on Steilacoom Road or Marvin Road right of way will be night work, between the hours of 7 PM to 5 AM.
- Upon completion of excavating, planning or the pulverization of defined portions of Steilacoom Road, the contractor shall complete paving operations and temporary striping within 48 hours.

Refer to Section 1-08.9 Liquidated Damages for additional provisions.

Once the conditions of this section have been met, the contracting agency will issue a substantial completion on all work except long lead items and suspend the contract as described in 1-08.6. Warranty on completed work will commence upon acceptance of preliminary punch list prior to Final Completion and Acceptances.

1-08.5 Time for Completion

(******)

This project shall be physically completed within 170 working days.

1-08.5 Time for Completion

(December 30, 2022 APWA GSP Option A)

Revise the third and fourth paragraphs to read:

Contract time shall begin on the first working day following the Notice to Proceed Date.

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. The statement will be identified as a Written Determination by the Engineer. If the Contractor does not agree with the Written Determination of working days, the Contractor shall pursue the protest procedures in accordance with Section 1-04.5. By failing to follow the procedures of Section 1-04.5, 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

1-08.6 Suspension of Work

(February 15, 2023 Lacey GSP)

The Contractor shall show procurement of the materials anticipated to be critical materials as activities in the Progress Schedule. If approved Progress Schedule indicates that the materials procurement are critical activities, and if the Contractor has provided documentation that purchase orders are placed for the critical materials within the prescribed 21 calendar days, then contract time will be suspended upon physical completion of all critical work except that work dependent upon the critical materials. Items anticipated to be critical materials include but are not limited to:

1. EV Charging Stations
2. Light Poles
3. CCTV Cameras
4. Electrical Cabinets

Charging of contract time will resume upon delivery of the critical materials to the Contractor or 365 calendar days, whichever occurs first.

1-08.9 Liquidated Damages

(**** Lacey)**

Replace Section 1-08.9 with the following:

Refer to Section 1-08.4(1) Order of Work and 1-08.5 Time for Completion for additional provisions.

Delayed completion of work outlined in Section 1-08.4(1) Order of Work will result in inconvenience to residents and facility users of the site.

Accordingly, the Contractor agrees:

1. To pay (according to the following formula) liquidated damages for each working day beyond the number of working days established for Physical Completion, and

2. To authorize the Engineer to deduct these liquidated damages from any money due or coming due to the Contractor.

Liquidated Damages Formula

LD=0.15C/T

Where:

LD = liquidated damages per working day (rounded to the nearest dollar)
C = original Contract amount
T = original time for Physical Completion

When the Contract Work has progressed to Substantial Completion as defined in the Contract, the Engineer may determine the Contract 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 MEASUREMENT AND PAYMENT

1-09.2(1) General Requirements for Weighing Equipment

(December 30, 2022 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 an AM and PM tare weight for each truck on the printed ticket.

1-09.2(5) Measurement

(December 30, 2022 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.

1-09.7 Mobilization

(December 30, 2022 APWA GSP)

Delete this Section and replace it with the following:

Mobilization consists of preconstruction expenses and the costs of preparatory Work and operations performed by the Contractor which occur before 10 percent of the total original amount of an individual Bid Schedule is earned from other Contract items on that Bid Schedule. Items which are not to be included in the item of Mobilization include but are not limited to:

1. Any portion of the Work covered by the specific Contract item or incidental Work which is to be included in a Contract item or items.
2. Profit, interest on borrowed money, overhead, or management costs.
3. Any costs of mobilizing equipment for force account Work.

Based on the lump sum Contract price for "Mobilization", partial payments will be made as follows:

1. When 5 percent of the total original Bid Schedule amount is earned from other Contract items on that original Bid Schedule, excluding amounts paid for materials on hand, 50 percent of the Bid Item for mobilization on that original Bid Schedule, 5 percent of the total of that original Bid Schedule, or 5 percent of the total original Contract amount, whichever is the least, will be paid.
2. When 10 percent of the total original Bid Schedule amount is earned from other Contract items on that original Bid Schedule, excluding amounts paid for materials on hand, 100 percent of the Bid Item for mobilization on that original Bid Schedule, 10 percent of the total of that original Bid Schedule, or 10 percent of the total original Contract amount, whichever is the least, will be paid.
3. When the Substantial Completion Date has been established for the project, payment of any remaining amount Bid for mobilization will be paid.

Nothing herein shall be construed to limit or preclude partial payments otherwise provided by the Contract.

1-09.9 Payments

(December 30, 2022 APWA GSP)

Section 1-09.9 is revised to read:

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.

Failure to perform obligations under the Contract by the Contractor may be decreed by the Contracting Agency to be adequate reason for withholding any payments until compliance is achieved.

Upon completion of all Work and after final inspection (Section 1-05.11), the amount due the Contractor under the Contract will be paid based upon the final estimate made by the Engineer and presentation of a Final Contract Voucher Certification to be signed by the Contractor. The Contractor's signature on such voucher shall be deemed a release of all claims of the Contractor unless a Certified Claim is filed in accordance with the requirements of Section 1-09.11 and is expressly excepted from the Contractor's certification on the Final Contract Voucher Certification. The date the Contracting Agency signs the Final Contract Voucher Certification constitutes the final acceptance date (Section 1-05.12).

If the Contractor fails, refuses, or is unable to sign and return the Final Contract Voucher Certification or any other documentation required for completion and final acceptance of the Contract, the Contracting Agency reserves the right to establish a Completion Date (for the purpose of meeting the requirements of RCW 60.28) and unilaterally accept the Contract. Unilateral final acceptance will occur only after the Contractor has been provided the opportunity, by written request from the Engineer, to voluntarily submit such documents. If voluntary compliance is not achieved, formal notification of the impending establishment of a Completion Date and unilateral final acceptance will be provided by email with delivery confirmation from the Contracting Agency to the Contractor, which will provide 30 calendar days for the Contractor to submit the necessary documents. The 30 calendar day period will begin on the date the email with delivery confirmation is received by the Contractor. The date the Contracting Agency unilaterally signs the Final Contract Voucher Certification shall constitute the Completion Date and the final acceptance date (Section 1-05.12). The reservation by the Contracting Agency to unilaterally accept the Contract will apply to Contracts that are Physically Completed in accordance with Section 1-08.5, or for Contracts that are terminated in accordance with Section 1-08.10. Unilateral final acceptance of the Contract by the Contracting Agency does not in any way relieve the Contractor of their responsibility to comply with all Federal, State, tribal, or local laws, ordinances, and regulations that affect the Work under the Contract.

Payment to the Contractor of partial estimates, final estimates, and retained percentages shall be subject to controlling laws.

1-09.9 Payments

(November 20, 2020 Lacey GSP)

Section 1-09.9 is supplemented with the following:

Progress payments and the Final Contract Voucher Certification (FCVC) will be transmitted electronically to the Contractor for signature. The Contractor shall apply all signatures electronically using the software provided by the Contracting Agency. Within 21 days of execution of the Contract, the Contractor shall submit the names, email addresses, and text-message capable phone numbers for the authorized signers and shall bear the name, phone number and email of the officer providing this authorization. Delegation of authority to sign progress payments and the FCVC shall be by the officer authorized to sign the Contract.

1-09.11(3) Time Limitation and Jurisdiction

(December 30, 2022 APWA GSP)

Revise this section to read:

For the convenience of the parties to the Contract it is mutually agreed by the parties that all 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 all 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 all such claims or causes of action. It is further mutually agreed by the parties that when 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 all records deemed necessary by the Contracting Agency to assist in evaluating the claims or action.

1-09.13(1) General

(January 19, 2022 APWA GSP)

Revise this section to read:

Prior to seeking claims resolution through arbitration or litigation, the Contractor shall proceed in accordance with Sections 1-04.5 and 1-09.11. The provisions of Sections 1-04.5 and 1-09.11 must be complied with in full as a condition precedent to the Contractor's right to seek claim resolution through binding arbitration or litigation.

Any claims or causes of action which the Contractor has against the Contracting Agency arising from the Contract shall be resolved, as prescribed herein, through binding arbitration or litigation.

The Contractor and the Contracting Agency mutually agree that those claims or causes of action which total $1,000,000 or less, which are not resolved by mediation, shall be resolved through litigation unless the parties mutually agree in writing to resolve the claim through binding arbitration.

The Contractor and the Contracting Agency mutually agree that those claims or causes of action in excess of $1,000,000, which are not resolved by mediation, shall be resolved through litigation unless the parties mutually agree in writing to resolve the claim through binding arbitration.

1-09.13(3)A Arbitration General
(January 19, 2022 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.

1-09.13(4) Venue for Litigation
(December 30, 2022 APWA GSP)

Revise this section to read:

Litigation shall be brought in the Superior Court of the county in which the Contracting Agency's headquarters is located, provided that where claims are asserted against a county, RCW 36.01.050 shall control venue and jurisdiction of the Superior Court. It is mutually agreed by the parties that when litigation occurs, the Contractor shall permit the Contracting Agency to have timely access to all records deemed necessary by the Contracting Agency to assist in evaluating the claims or action.

1-10 TEMPORARY TRAFFIC CONTROL

1-10.1 General
(January 3, 2017 Lacey GSP)

Supplement this section with the following:

Delays to traffic shall be held to a minimum. There shall be no restrictions or interruptions to traffic on Saturdays, Sundays or Holidays. In addition, there shall be no restrictions or interruptions to traffic after 12:00 noon on the day prior to a holiday or holiday weekend.

There shall be no delay to medical, fire, police, or other emergency vehicles with flashing lights or sirens. The Contractor shall alert all flaggers and personnel of this requirement.

The Contractor shall be responsible for removing the permanent traffic signs, as deemed necessary by the Engineer, and shall install and maintain any temporary signs necessary for the safety of the public.

The Contractor shall maintain pedestrian access at all times, without having pedestrians enter the travel lane.

All lane restrictions shall be held to a minimum time and length. Lane closures shall comply with the traffic control plans and these specifications. If the Contractor wishes to deviate from the plans, the Contractor shall submit a traffic control plan to the Engineer, at no additional cost, that complies with the MUTCD, and the Traffic Control Plans, for approval by the Engineer within (5) five working days before the proposed lane closure. If the Engineer determines that lane restrictions are causing congestion, the Contractor will be required to open any lanes, as determined by the Engineer, until the congestion is eliminated.

During non-working hours, Saturdays, Sundays, and Holidays, the Contractor shall keep all lanes open to traffic throughout the limits of the project with the lane and sidewalk area completely clear of all material, tools, personnel, and equipment as directed by the Engineer.

1-10.4(3) Reinstating Unit Items With Lump Sum Traffic Control

(August 2, 2004 WSDOT GSP)

Section 1-10.4(3) is supplemented with the following:

The bid proposal contains the item "Project Temporary Traffic Control," lump sum and the additional temporary traffic control items listed below. The provisions of Section 1-10.4(1), Section 1-10.4(3), and Section 1-10.5(3) shall apply.

"Flaggers", per hour.
"Portable Changeable Message Sign", per hour.

1-10.5(2) Item Bids With Lump Sum For Incidentals

(November 23, 2015 Lacey GSP)

Section 1-10.5(2) is supplemented with the following:

The City shall pay flagging hours only for paving operations. The paving traffic control plan shall be approved by the Engineer. Flagging hours as part of utility main construction shall be considered incidental and be accounted for in the lump sum price of "Project Temporary Traffic Control."

2-01 CLEARING, GRUBBING, AND ROADSIDE CLEANUP

2-01.1 Description

(******)

Supplement this section with the following:

The City of Lacey is a Tree City USA, and has deemed it necessary to protect all trees to the best of their ability. Only the trees that are evaluated by a certified Arborist as being diseased or detrimental to the project shall be removed as shown in the plans. The Contractor shall conduct a site review noting all trees within the construction zone prior to submitting a bid. Ease of construction, spoils, or stockpiling needs shall not justify tree removal.

A high visibility fence shall be installed around all trees and vegetation as required by the Engineer prior to beginning work. The Contractor shall be responsible for installing, maintaining and removing the high visibility fence as required.

Disposal of all organic waste shall be by Disposal Method No. 2. Disposal Method No. 1 and No. 3 will not be permitted in this contract. The City of Lacey encourages recycling of organic material at a certified organic recycling center.

The Contractor shall take all precautions necessary to protect the public, property, trees, and natural vegetation from harm. Any damage to utilities or other structures on public right-of-way or private property shall be restored by the Contractor or authorized agent at the Contractor's expense.

See additional guidance, not to supersede the above special provision, included in Section E Technical Specifications Section 311000.

2-01.5 Payment

(October 16, 2009 Lacey GSP)

Modify this section with the following:

The unit contract price per acre or lump sum for "Clearing and Grubbing" shall be full pay for all work described in this section including "Roadside Cleanup". If no bid item for "Clearing and Grubbing" or "High Visibility Fence" is included in the proposal, any work described in this section shall be incidental to the project.

2-02 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

2-02.1 Description

(******)

Supplement this section with the following:

The following items plus all materials resulting from incidental work including clearing; grubbing and roadside cleanup shall be removed from the job site, disposed of in a waste site or when noted on the plans, delivered to the City.

This work consists of but shall not be limited to the following items:

Pavement
Lane Markings (Buttons, Paint, Plastic, RPM)
Sidewalk
Traffic signal standards and equipment
Concrete
Foundations
Curb and Gutter
Fencing
Catch Basins
Manholes
Storm Sewer Pipe
Culverts
Storm Sewer Outfalls
Refuse
Water Pipe
Fire Hydrants
Water Valves and Fittings
Valve Boxes
Meter Boxes
Silt Fence
Street Lights
Roadside Cleanup
Septic System Drain Field
Rocks and Stumps
Air release valves

The Contractor shall notify property owners/residents prior to all grading, clearing, and fence removal on newly acquired right-of-way a minimum of 3 days before any work.

The Contractor shall provide the temporary fencing immediately upon removal of the existing fence and will maintain the temporary fence until the permanent fence is installed.

2-02.2 Video

(March 3, 2022 Lacey GSP)

Add the following new section:

The Contractor shall provide pre-construction video of the existing conditions for the construction area including all easements, streets, alleys, and driveways within the project area. Further, video shall include existing drainage, driveways, sidewalks, and other frontage improvements. The Contractor shall also

provide pre-construction video of the existing conditions of each face of an existing structure (houses, garages, sheds, fences, etc.), within 30 feet of the construction area.

The Contractor shall provide a copy of the video, in electronic format, to the City prior to any construction.

All costs for providing and furnishing the pre-construction video shall be considered incidental to the Project and no other payment will be allowed.

2-02.3 Construction Requirements

(*** Lacey GSP)**

Supplement this section with the following:

Unless otherwise noted, catch basins and manholes shall be removed entirely.

Where shown on the plans, catch basins, manholes, and inlets may be removed to a point 5 feet below the subgrade and the cavity filled with gravel borrow compacted to 95% of maximum density. Where existing pipe is to be abandoned, the Contractor shall seal the pipe with commercial concrete.

The removal of an existing hydrant assembly shall consist of turning off the gate valve, removing the existing hydrant assembly, valve box and anything else that is within 2' of the finished grade. Cap or plug the existing valve after the existing hydrant assembly has been removed. The Contractor shall return the existing fire hydrant assembly to the City. If the existing hydrant is damaged due to the Contractor's negligence, the Contractor shall replace the hydrant with a new hydrant.

Street lights, barricades, pedestrian signal heads, vehicular signal heads, pedestrian push button assemblies, and street signs shall be salvaged and delivered to the City of Lacey Shop located at 1200 College St. S.E.

The Contractor shall use due care and caution during removal and transportation of the salvaged material so that no damage occurs to the salvaged material. Any damage caused by the Contractor shall be deducted from the amount due.

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

(October 16, 2016 Lacey GSP)

Supplement this section with the following:

In removing pavement, sidewalks, and curbs, the Contractor shall:

1. Mark all cut lines in the field and have the Engineer approve them prior to commencing cutting operations. The Engineer reserves the right to adjust removal to the nearest construction joint.

2. Make a vertical saw cut between any existing pavement, sidewalk, or curb that is to remain and the portion to be removed.

3. All sawcuts shall be continuous and made with saws designed specifically for this purpose; no skip cutting, wheel cutting, or jack hammering will be allowed unless given prior approval by the Engineer.

4. Replace at no expense to the Contracting Agency any pavement designated to remain that is damaged during the removal of other pavement. All damaged sidewalks and curbs shall be replaced to the nearest existing joint.

5. Haul all broken–up pieces of pavement, sidewalks, and curbs to an off-project disposal site.

All transitions to existing asphalt or cement concrete driveways, parking lots, curb and gutter and walkways shall be vertically sawcut full-depth with straight, uniform edges. Existing asphalt pavement roadway edge may be cut with a wheel, provided the wheel cut is full depth and no damage occurs to the pavement which is to remain. Neither impact tools nor pavement breakers may be used for trench crossing of existing pavement. Trench crossing of existing pavement shall be vertically sawcut.

When sawcutting the existing roadway is needed to widen the road to perform excavation, the Contractor shall take extra precaution to make a neat, uniform cut, and shall sawcut pavement to full depth, regardless of number of passes necessary. Compaction of asphalt near the sawcut is critical and a vertical, neat line sawcut is required. If in the opinion of the Engineer, the cut is not satisfactory due to Contractor's workmanship or equipment, or if the sawcut becomes damaged and irregular, the Contractor shall fix the problem to the satisfaction of the Engineer, at Contractor's own expense.

Existing asphalt pavement shall be expected to have a 12 inch thickness. Both Martin Way and Pacific Avenue have an additional 12 inch cement concrete pavement below the asphalt. No additional compensation for saw cutting shall be considered unless the depth of the total pavement is greater than 24 inches. If a remnant of a concrete panel remains, the panel shall be removed as directed by the Engineer utilizing Unsuitable Foundation Excavation Incl. Haul.

The Contractor may grind the existing pavement in lieu of excavation and haul. Spoils from grinding can be stockpiled and used and paid for per sections 4-04.3(12), 4-04.4 and 4-04.5. If the Contractor elects to grind and stockpile the existing pavement, all costs and expenses necessary to furnish all labor, equipment, tools and materials shall be incidental to other bid items and no additional compensation will be allowed.

2-02.5 Payment

(March 18, 2015 Lacey GSP)

Delete this section and replace with the following:

"Removal of Structures and Obstructions", lump sum.

The lump sum contract price for these bid items shall be full compensation for all labor, equipment and materials necessary to complete the requirements of this section.

2-03 ROADWAY EXCAVATION AND EMBANKMENT

2-03.1 Description

(******)

The following is added at the beginning of this section:

The Work described in this Section includes pond excavation, debris pile removal, excavating below the groundwater table, embankment for the ponds, and hauling and disposing of all excavated material. Work includes but is not limited to all operations and material handling necessary to prepare, stockpile, and otherwise process the excavated material for hauling and disposal offsite.

Incidental to the Work will be all necessary and required clearing, grubbing, and water management. Water management will include, but is not limited to, construction of any cofferdams, pumping, and treatment. Clearing and grubbing will include the removal and disposal of any and all existing vegetation within the clearing limits necessary for the project as well as salvaging and stockpiling any logs for reuse as described in Section 2-01.

All Work described here shall be in accordance with the lines, grades, cross-sections and elevations shown on the Plans or established by the Engineer, and shall include any additional excavation necessary to accommodate placement of soil amendment to the elevations described in 8-02.3(6) Soil Amendments.

See additional guidance, not to supersede the above special provision, included in Section E Technical Specifications Section 312316.

2-03.3(7)C Contractor-Provided Disposal Site

(October 16, 2009 Lacey GSP)

Supplement this section with the following:

The Contracting Agency has not provided a waste site for disposal of excess materials and debris.

2-03.3(14)C Compacting Earth Embankments

(October 29, 2010 Lacey GSP)

Supplement this section with the following:

The Contractor shall be required to compact all embankments in accordance with Method C as described in Section 2-03.3(14) C of the Standard Specifications.

2-03.3(14)D Compaction and Moisture Control Tests

(March 3, 2022 Lacey GSP Option A)

Supplement this section with the following:

The Contractor shall be responsible for scheduling and coordinating with the City's testing laboratory. No adjustment to the contract price or time for delays will be made if the contractor fails to schedule the needed testing.

The Contractor shall schedule a minimum of one density test for backfill for each 500 CY placed. In addition, the Contractor shall schedule a minimum of one density test for every 1,000 LF (per layer) of surfacing material placed.

For materials placed in a non-structural application outside the roadway prism such as slope flattening or shoulder dressing, acceptance for compaction may be based on visual inspection to the satisfaction of the engineer.

2-03.3(14)E Unsuitable Foundation Excavation
(October 29, 2010 Lacey GSP)

Supplement this section with the following:

The Contractor shall excavate to stable material and backfill in lifts with Crushed Surfacing Base Course or Gravel Borrow as identified by the Engineer.

If the Engineer identifies additional excavation to a depth greater than what is shown in the Plans, it shall be paid for by the bid item "Unsuitable Foundation Excavation Incl. Haul". If the Contractor excavates to a depth beyond that shown in the Plans without the Engineer's approval, all costs shall be at the Contractor's expense.

2-03.3(14)N Pavement Digout Including Haul
(March 3, 2022 Lacey GSP)

Add the following new section:

The areas designated for pavement digout are areas that require excavation more than that which could be removed through pavement planing. Depths shall vary dependent on construction activity and backfill requirements. Backfill of areas shall be either Topsoil Type A in planted areas or C.S.B.C in paved areas.

The Contractor shall excavate only within one lane at a time. The areas shall be excavated, backfilled and compacted to the satisfaction of the Engineer within the same day's working shift.

Any excavation over the depth indicated on the Plans shall be compensated by the bid item "Extra Excavation incl. Haul."

2-03.3(20) Pond Excavation
(February 14, 2023 Lacey GSP)

Add the following new section:

This work consists of constructing stormwater ponds by clearing and grubbing, excavating including haul, reusing suitable native material, storing and moving existing material onsite and embankment construction to form the general shapes and slopes as shown on the Plans, or as directed by the Engineer. If it is determined that additional material is need to construct the pond(s) per the Plans and these Specifications, then the additional material shall be paid under the separate bid item, "Gravel Borrow Incl. Haul."

2-03.4 Measurement
(October 29, 2010 Lacey GSP)

Supplement this section with the following:

The quantity of the following items to be paid for on this project shall be quantities shown on the bid proposal:

"Roadway Excavation Incl. Haul", per cubic yard.

The quantities in the bid proposal are based on a computer-generated earthwork calculated on the existing ground survey. The quantities do not incorporate expansion, clearing and grubbing, or construction methodology. These values are listed for the convenience of the Contractor in determining the volume of

work involved as calculated by the Engineer and are not guaranteed to be accurate. The prospective bidders shall verify these quantities prior to submitting the bid. A digital copy of the survey is available to prospective bidders from the Contracting Agency at the Contractor's request. No adjustments will be made in these quantities although the actual quantities may deviate from those listed.

2-03.5 Payment

(**** Lacey GSP)**

Supplement this section with the following:

The unit contract price per cubic yard for "Roadway Excavation Incl. Haul", per cubic yard shall be full compensation for all costs to excavate designated areas and dispose of excavated material. The cost of backfilling shall be included in the unit contract price per ton for crushed surfacing materials.

If no bid item for "Pond Excavation Incl. Haul", per cubic yard, is included in the proposal, any work described in this section shall be incidental to the project.

2-05 TRENCH SAFETY SYSTEM

(October 16, 2009 Lacey GSP)

Add the following new section:

2-05.1 Description

This work consists of furnishing, utilizing, moving, and maintaining a trench safety system.

2-05.3 Construction Requirements

The Contractor shall comply with all applicable state laws, OSHA, WISHA requirements, and Department of Labor and Industries regulations governing trench excavation and pipe laying.

If extra excavation is used in lieu of, or in addition to shoring, cribbing, trench shields, or trench boxes, and select backfill material is required in the trench zone, then select backfill shall be used in the extra excavation zone.

2-05.4 Measurement

Trench safety system shall be paid for per lump sum regardless of the type, size and quantity used.

2-05.5 Payment

The lump sum contract price for "Trench Safety System" shall be full compensation for all labor, tools, equipment, and materials necessary to comply with the requirements stated above.

2-07 WATERING

2-07.3 Construction Requirements

(October 16, 2009 Lacey GSP)

Supplement this section with the following:

If the Contractor anticipates the use of City water, the Contractor shall apply for a water meter through the City of Lacey. Any damage rendered to the meter shall be repaired or replaced by the Contracting Agency and those costs deducted from monies due to the Contractor. All water used shall be metered and used sparingly for the entire length of the project. The Contractor will not be charged for water used on the project. The meter shall be returned promptly at the end of the project.

The Contractor is responsible for complying with backflow prevention requirements, which may include but are not limited to providing a certified air gap or reduced pressure backflow assembly (RPBA).

The Contractor shall use the water to keep the project site clean and to control dust during and after construction hours as determined by the Engineer.

2-07.4 Measurement

(October 16, 2009 Lacey GSP)

Delete and replace this section with the following:

The Contractor shall apply for a construction meter through the Contracting Agency. All water used shall be measured with the Contracting Agency supplied meter.

2-07.5 Payment

(February 14, 2023 Lacey GSP)

Delete and replace this section with the following:

The Contractor will not be charged for water used on this project. A construction meter will also be provided for a deposit and can be obtained at the City of Lacey Maintenance Service Center. Any costs to repair meters damaged by the Contractor shall be recovered from monies due the Contractor.

All costs to use or apply water as directed by the Engineer, including but not limited to supplying tank trucks, reduced pressure backflow assemblies (RPBA), and certification of approved backflow prevention methods, shall be considered incidental to the project and no other payment will be allowed.

2-08 DUST CONTROL

(October 16, 2009 Lacey GSP)

Add the following new sections:

2-08.1 Description

This work consists of furnishing and applying Magnesium Chloride solution for dust control as the Engineer requires.

2-08.2 Materials

Magnesium Chloride compound shall be combined with water per the manufacturer's specifications for dust control applications.

2-08.3 Construction Requirements

The Contractor shall apply magnesium chloride solution by means of tank trucks equipped with spray bars. Spray controls shall ensure that the solution flows evenly and in the amounts required by the manufacturer's recommendation and directed by the Engineer.

2-08.4 Measurement

"Dust Control" per MGAL, shall be measured by tanks or tank trucks of known capacity or by meters approved by the Engineer. The Contractor shall supply and install any meters at no expense to the Contracting Agency.

2-08.5 Payment

"Dust Control", per MGAL.

The unit contract price per MGAL for "Dust Control" shall be full pay for all labor, materials, tools, and equipment necessary to furnish, haul, and apply the magnesium chloride solution.

2-10 DITCH EXCAVATION

2-10.5 Payment

(October 16, 2009 Lacey GSP)

Delete and replace this section with the following:

Payment for ditch excavation shall be paid by including those quantities described in this section in the bid item "Roadway Excavation Incl. Haul".

For hauling, the Contracting Agency will pay the unit contract price for hauling excavated material (Section 2-04). If the pay item for excavation includes haul, the unit contract price per cubic yard shall cover all costs for hauling the material any distance required.

2-13 PRIVATE UTILITY COORDINATION AND CONSTRUCTION

(January 3, 2016 Lacey GSP)

Add the following new sections:

2-13.1 Description

(January 3, 2016 Lacey GSP)

This work includes excavating, providing access, shoring for private utility contractors if necessary, bedding, and backfilling joint utility trenches, service trenches, vaults and other private utility appurtenances as shown on the Plans per the Puget Sound Energy service requirements. The respective utility contractors shall be responsible for installing their individual vaults, conduits, and conductors in

the joint utility trench. Service trench shall be installed from the joint trench to the existing individual service meters.

Electrical conversion includes converting existing overhead Puget Sound Energy electrical service to an underground service. The Contractor shall supply and install the conduit and conductor for the Electrical service, communication contractors shall install their respective conduit.

The Contractor shall adjust existing PSE Gas Valve Boxes to finished grade.

2-13.1(1) Utility Coordination

(January 3, 2016 Lacey GSP)

The Contracting Agency has made commitments with several jurisdictions, public users, property owners, and private utilities that the Contractor shall incorporate into the schedule for this project. The following specific requirements shall be included into the project schedule:

Within the first 40 working days of the project, the Contractor shall prepare the site to resolve any conflicts and relocate any utilities necessary to allow construction of the vault excavation and joint trench.

After the site is prepared for the Contractor shall provide a 150 working day utility window throughout the duration of this project for all the private utilities to be relocated. If a state disaster is declared in the utility's service area, the working days and the utility window will be extended. This work will be completed in four phases that include:

1. New system infrastructure (Vaults and Joint Trench)
2. Conversion to Energize the New System
3. Private Residential and Commercial Conversions
4. Demolish and Remove existing system.

This work is dependent on the following specific tasks to be performed by the Contractor:

The Contractor shall complete an average of 3 vaults per day, and all vaults shall be installed prior to excavation of the joint trench as coordinated with the Engineer.

The Contractor shall maintain 200 lineal feet of trench excavation.

All Electrical Service Conversion conduit and/or conductor shall be completed and extended from the point of connection to the private utility as required.

The existing utilities to be abandoned will be removed after the new system is energized and all electrical service conversions are complete.

The Contractor shall provide sufficient time for the private utilities to construct the new system, energize the new system, convert over to new system, and demolish the old and temporary system(s). The Engineer will track the utility window based on the ability of the private utility contractors to proceed with any specific task based on the conditions above.
The Contractor is permitted to complete other work within the project limits provided the construction activities do not interfere with private utility contractors.

Throughout the duration of the utility window, other contractors and/or utilities will be working within the project limits. The Contractor shall schedule all work not to impede other contractors and/or utilities, and work jointly on several specific tasks.

The Contractor shall provide written notice to the Engineer at least ten working days prior to excavation of any phase of the utility conversion. Changes to schedules shall be communicated with the Engineer as soon as they arise.

It is anticipated that the following work will be performed by others during the course of this project:

PSE has existing overhead distribution lines on power poles and existing underground distribution lines within the project limits. PSE's scope of work will include relocation of electrical distribution to the new joint utility trench.

PSE will install the Underground Distribution System in the joint utility trench. Conversion from overhead to underground will commence upon completion of joint utility trench installation. PSE will transfer all facilities from the poles to their respective conduits in the new joint utility trench. PSE is also responsible to transfer residential and commercial overhead services to the underground system and to cut over existing underground service lines to the new joint utility trench. PSE will remove the existing overhead electric distribution system from the poles and notify Comcast, CenturyLink, the Contractor, and the Engineer when they have completed work on their poles. PSE will remove the poles once Comcast and CenturyLink facilities are removed from the poles.

PSE has existing gas mains within the project limits. PSE's scope of work will include replacement of conflicting gas mains into the new joint utility trench, and transferring individual gas services to the new gas main.

Comcast has existing underground utilities and overhead lines on PSE's poles to be removed. Comcast is responsible for relocating and adjusting their pedestals, as well as transferring infrastructure to the new joint utility trench. Once PSE completes their power conversion to underground, Comcast will transfer all facilities from the poles to their respective conduits in the new joint utility trench. Comcast will notify PSE, the Contractor, and the Engineer when their lines are removed from the poles.

CenturyLink has existing underground utilities and overhead lines on PSE and CenturyLink poles within the project limits. CenturyLink is responsible for transferring this infrastructure. Once PSE completes their power conversion to underground, CenturyLink will transfer all facilities from the poles to their respective conduits. CenturyLink will notify PSE, the Contractor, and the Engineer when their lines are removed from the poles. CenturyLink will remove poles that are owned by CenturyLink. CenturyLink is also responsible for adjusting and/or relocating their pedestals and vaults to the finished grade elevation of the widened roadway and/or sidewalk.

2-13.2 Materials

(January 3, 2016 Lacey GSP)

Materials shall meet the requirements of the following Sections:

Fluidized Thermal Backfill	Section PSE MID No. 9995644
Bedding Material	Section 9-03.16
Bank Run Gravel for Trench Backfill	Section 9-03.19
Conduit	Section 9-29.1

All materials and workmanship shall comply with National Electrical Code, State of Washington Electrical Code, Lacey Municipal Code, and Puget Sound Energy requirements.

2-13.3 Construction Requirements

(January 3, 2016 Lacey GSP)

The Contractor shall sequence the utility conversion in accordance with 1-08.4(1) Order of Work. It is anticipated that the utility conversion will take place in several phases. For each phase, including work on vault excavation, joint trench, and service trench, the Contractor shall continue this work uninterrupted until all associated work is complete. Any interruption of progress will require additional mobilizations by the private utility companies. Any additional mobilizations shall be considered for the convenience of the Contractor and will be at the Contractor's expense.

The Contractor shall provide secure staging and storage area(s) for duct and vault materials provided by the private utilities.

Construction requirements shall conform to Section 7-08 and PSE requirements. The depth of the typical trench shall be as shown in the plans. Deeper excavation will be required where cuts are planned, or around other existing utilities where necessary. The Contractor shall grade the site as needed and maintain the minimum depth of cover at all times. The Contractor shall maintain all vertical and horizontal sweeps to the standards of each utility.

If any trench or other excavation is 4 feet or more in depth that does not meet the open pit requirements, the Contractor shall provide shoring, cribbing, trench shields, or trench boxes for all work to be performed in the joint trench or vault area.

Vault excavation and backfill shall be completed prior to excavation of the joint trench. The excavation shall be sufficient size to accommodate the vaults. The Contractor shall provide a firm level access adjacent to the vault location from the roadway for the utility contractor to unload and install the vaults. Vaults located in the planter strip will require additional depth to avoid conflicts with proposed conduit and irrigation systems.

Joint trench excavation shall not be more than 200 feet ahead of the pipe laying operation and all trenches shall be closed up at the end of the day unless otherwise approved by the Engineer. The Utility contractors have committed to 200 feet of conduit installation per day provided an open trench is available. The Contractor shall deflect joint trench vertical alignment a minimum of 100 feet prior to and away from a utility crossing conflict. Otherwise, the Contractor shall maintain the minimum cover depth as shown on the Plans and the required bedding depth above and below the joint trench conduits. If fills are planned for the road reconstruction area, the Contractor shall grade the site as needed to maintain the minimum depth of cover at all times.

The Contractor shall exercise sound construction practices in excavating the trench and maintaining it so that no damage will occur to any foundation, structure, pole line, pipe line, or other facility. If, as a result of the excavation, there is disturbance of the ground that may endanger other property, the Contractor shall immediately take remedial action at no expense to the City. No act, representation or instruction of the Engineer shall in any way relieve the Contractor from liability for damages or costs that result from trench excavation.

Service Trench shall be installed from the joint trench to individual service meters. The Contractor shall provide trenching and backfill for service trenches to the structure directly below existing PSE meters. The route of each trench will be identified in conjunction with PSE and Engineer on an individual basis to minimize impact to private property. The service conductors and conduit shall be installed to the PSE designated point of service, typically a hand hole or transformer at the property line. Conduits and conductors in the service trench shall be included in the bid item for "Electrical Service Conversion". Other private utilities may install conduit and conductors in the service trench. This work shall be coordinated prior to service trench excavation.

PSE conduits shall be encased in Fluidized Thermal Backfill (FTB) or imported pipe bedding material as shown on the Plans. Bedding shall be placed as shown in the plans and as directed by the Engineer. Native material shall not be used as bedding material for the joint trench. Where FTB is required, the Contractor shall separate PSE conduits and telecommunications conduits with formwork or gypsum wallboard for FTB placement. PSE conduit runs shall be secured so that they do not float when FTB is placed in the trench.

2-13.3(5)Electrical Service Conversion

(January 3, 2016 Lacey GSP)

The following property(s) with existing overhead electrical service shall be converted to underground services:

109 Carpenter Road NE, #A	109 Carpenter Road NE, #C
6318 Martin Way E	6326 Martin Way E, #1
6326 Martin Way E, #2	6326 Martin Way E, #3
6326 Martin Way E, #4	6502 Martin Way E
6321 Martin Way E	6325 Martin Way E, #1

The Engineer reserves the right to include additional addresses if necessary.

The Contractor shall convert each property from the existing overhead electrical service to a new underground service. Material replacement and installation shall include, but is not limited to all conduits, conductor, meter service, electrical panels, circuit breakers, and other items necessary to complete the conversion to current electrical code. The Contractor shall coordinate with the Engineer, PSE, and the property owner prior to the conversion to minimize impacts or outages to the property owner. Electrical outages shall not exceed more than one hour per building.

The service conductors and conduit shall be installed to the designated point of service, typically a hand hole or transformer at the property line, and continue up to the new meter base. Conduit shall be routed from the service trench to the electrical meter vertically along the face of the building.

Restoration shall restore the building to its original condition or better prior to construction. Work shall include all necessary repairs to the building or structure such as repairing roof material, soffits, walls, and siding, due to the required installation or removal of appurtenances. All restoration work on the private property shall be included in the cost to complete the electrical service conversion.

The Contractor shall acquire and pay for all permits required for the electrical conversion. The Contractor shall prepare the PSE applications for service. The City of Lacey will submit the applications to PSE and pay for the PSE service connection fees.

2-13.3(6) Gas Valve Box Adjustment

(October 29, 2010 Lacey GSP)

All existing gas valve boxes shall be adjusted to line and grade staked in the field or otherwise designated by the Engineer. The Contractor shall be responsible for coordination with Puget Sound Energy (PSE) for replacement of the existing gas valve boxes and lids if they are determined to be non-adjustable. PSE will provide new valve boxes and lids if the existing is determined to be unusable by the Engineer.

2-13.4 Measurement

(January 3, 2011 Lacey GSP)

Joint Trench shall be measured per linear foot of trench excavated and backfilled, regardless of the depth of the trench. Measurement shall be along the centerline of the joint trench. All spurs or sweeps necessary shall be incidental to the joint trench.

Service Trench shall be measured per linear foot of trench excavation, regardless of the depth of the trench. Measurement shall be along the centerline of the service trench from the edge of the joint trench to the service connection.

Vault Excavation shall be measured per cubic yard of the actual dimensions of the vault to be installed.

Fluidized Thermal Backfill shall be measured per cubic yard of material.

Electrical Service Conversion shall be measured per each.

Adjust Gas Valve Box shall be measured per each.

2-13.5 Payment

(October 29, 2010 Lacey GSP)

The unit contract price, per cubic yard for "Vault Excavation" shall be full compensation for the excavation and backfill of the vault including required gravel base requirements and coordination with the private utility companies.

"Joint Utility Trench", per linear foot.
"Service Trench", per linear foot.

The unit contract price, per linear foot, for the above bid items shall be full compensation for equipment, materials and labor for excavation, bedding, backfill (excluding fluidized thermal backfill), haul and disposal of excess excavated material, and coordination with the private utility companies.

The unit contract price, per cubic yard, of "Fluidized Thermal Backfill" shall be full compensation for equipment, materials, and labor to backfill conduits as shown on the plans.

The unit contract price, per each, for "Electrical Service Conversion" shall be full compensation for equipment, materials and labor necessary to convert each property from overhead electrical service to underground electrical service including conduit, conductors, and all restoration work to the property and structure, regardless of the type or condition of the existing building.

The unit contract price per each for "Adjust Gas Valve Box" shall be full pay for all labor, materials, tools, and equipment, necessary to remove, replace and adjust gas valve box to line and grade staked in the field. This work is dependent on Puget Sound Energy's acceptance of the bid. The Engineer reserves the right to delete this work. No extra compensation will be permitted if the Engineer elects to delete this work.

4-04 BALLAST AND CRUSHED SURFACING

4-04.3(12) Asphalt Grindings

(April 2, 2018 Lacey GSP)

Add the following new section:

The Contractor may grind the existing pavement in lieu of excavation and haul. Spoils from the grinding can be stockpiled and used in any locations that require Crushed Surfacing Base Course, as approved by the Engineer. Grindings must be well ground and free of debris. Any large pieces 4" or greater of asphalt will be removed and disposed of at the Contractor's expense.

All grindings shall be proof rolled the entire length and width of the roadway with a truck weighing a minimum of 40,000 lb. Offset each trip of the roller by at most 2 tires width. Operate rollers at a speed between 2 and 6 miles per hour, as directed. Proof rolling shall be done in the presence of the Engineer.

The Engineer will visually inspect the asphalt grindings. If the Contractor elects to grind and stockpile the existing pavement, all costs and expenses necessary to furnish all labor, equipment, tools and materials shall be incidental to other bid items and no additional compensation will be allowed.

4-04.4 Measurement

(January 3, 2017 Lacey GSP)

Supplement this section with the following:

Asphalt Grindings will be measured by the cubic yard. Measurement by cubic yard will be made in the hauling vehicle and multiplied 2 tons/cy to convert asphalt grindings into tons. The asphalt grindings used on the project will be paid as Crushed Surfacing Base Course.

5-04 HOT MIX ASPHALT

5-04.1 Description

(******)

Delete this entire section and replace it with the following:

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.

See additional guidance, not to supersede the above special provision, included in Section E Technical Specifications Section 321216 & 312200.

5-04.2 Materials

(July 18, 2018 APWA GSP)

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(2) Mix Design – Obtaining Project Approval

(July 18, 2018 APWA GSP)

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 Accredita-tion 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) Mix Design – Obtaining Project Approval

(January 3, 2011 WSDOT GSP)

Section 5-04.2(2) is supplemented with the following

ESAL's
The number of ESAL's for the design and acceptance of the HMA shall be $$1$$ million.

5-04.2(2)A Changes to the Job Mix Formula

Delete this section

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

(July 18, 2018 APWA GSP)

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.

5-04.2(3) Fiber Reinforced HMA

(April 2, 2018 Lacey GSP)

Add the following new section:

Aramid fibers will be added to the HMA mix at a minimum dosage 2.1 ounces of aramid fibers per (1) ton of asphalt.

Reinforcing fibers shall be one of the following products:

1. Forti-Fi Fiber Reinforcement by Alliance Geosynthetics:

Aramid-polyolefin fiber mix at a dosage of (1) pound of product per (1) ton of asphalt.

2. ACE Fiber Reinforcement:

Pure aramid fiber with wax treatment at a dosage of 4.2 ounces of product per (1) ton of asphalt.

3. Non-aramid fiber blends will not be considered acceptable alternatives. If an alternate aramid-based fiber blend is proposed, the proposed alternate must meet the same performance testing requirements as one of the products listed above and be approved by the Engineer. Indirect Tensile Strength and Aramid dispersion State Ratio tests are required. All testing must be performed by an AASHTO accredited laboratory or nationally recognized university testing lab.

No modifications to the HMA job mix formula are required. Submit product data sheet and manufacturer's instructions and general recommendations to the Engineer for approval.

Store aramid product in a dry environment and do not allow it to be in contact with moisture.

Aramid fibers shall meet the following properties:

Property	Measure
Material	Aramid
Form	Monofilament
Length	0.75 inches (+/- 10%)
Specific Gravity	1.44
Minimum Tensile Strength	400,000 psi

Polyolefin fibers shall meet the following properties:

Property	Measure
Material	Polyolefin
Form	Serrated
Length	0.75 inches (+/- 10%)
Specific Gravity	.91

Fiber reinforcing shall be mixed with the asphalt per the fiber manufacturer's instructions. The fiber manufacturer's representative shall be on site during mixing and production. This requirement can be waived if fiber manufacturer and asphalt producer can supply evidence of manufacturer's brand of fiber being successfully produced a minimum of three times at the asphalt plant to be used for the project.

Visually observe the reinforced HMA from the at the plant. Collect a small sample from the discharge chute during the first 50 tons of production. If there are one or more undistributed fiber clips or bundles, adjust mixing operations per manufacturer's recommendations to eliminate fiber bundles. If undistributed fiber clips or bundles cannot be eliminated, cease production until a remedy is identified.

Visually observe the reinforced HMA in first three trucks and every tenth truck thereafter at the point of discharge. Observation shall include using a shovel or other device. Look for proper distribution of aramid fibers and make mixing adjustments if needed. Remove any observed fiber balls from placed mixture and adjust operations per the manufacturer's recommendation to eliminate future fiber ball development.

Fiber Supply System

Introduce the aramid product as follows:

Batch Plant:
When a batch type plant is used, add the aramid product dosage to the aggregate in the weigh hopper. Increase the batch dry and wet mixing times to ensure the fibers are uniformly distributed prior to the injection of asphalt cement into the mixer.

Drum Plant:
1. Inject fibers through the RAP collar by placing fibers on the RAP belt or by feeding them with an automated dosing/blower tube system. Rate the feeding of fibers with the rate the plant is producing asphalt mix, and add to the mixing drum in a continuous way. If there is any evidence of fiber balls at the discharge chute, increase the mixing time and/or temperature or change the angle of the fiber feeder line to increase dry mixing time.

2. For manual feeding (allowed on Forti-Fi Fiber Reinforcement product only), place fibers on the RAP belt at intervals based on the plant production rate. Fibers should be contained in individual dosage packaging, such as a plastic bag which will quickly melt/dissolve in the drum, to protect the fibers from rain or wind while on the RAP belt and allow quick, accurate feeding by one person.

3. When using a blower tube/automated dosing system, add fibers continuously and in a steady uniform manner. Provide automated proportioning and control delivery within ±10% of the mass of the fibers required. Perform an equipment calibration to the satisfaction of the fiber manufacturer's representative to show that the fiber is being accurately metered and uniformly distributed into the mix.

Include the following with the blower tube/automated dosing system:

- Low level indicators
- No-flow indicators

- A printout of feed rate status in pounds/minute
- A section of transparent pipe in the fiber supply line for observing consistency of flow or feed.
- Manufacturer's representative's approval of fiber addition system

Mix the aramid fiber with the heated aggregate and RAP longer, if needed, to allow thorough distribution of aramid fibers at the end of the mixing process and to promote asphalt coating of individual strands of aramid fiber.

5-04.3 Construction Requirements

5-04.3(2) Paving Under Traffic
(April 2, 2018 Lacey GSP)

Delete this section and replace it with the following:

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. Before closing an intersection, advance warning signs shall be placed and signs shall also be placed marking the detour or alternate route.

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.

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.

The Contractor shall remove all pavement markings including paint, tape, thermoplastic and RPM's.

All costs in connection with performing the Work associated with these requirements 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
(July 18, 2018 APWA GSP)

Delete this section and replace it with the following:

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
(July 18, 2018 APWA GSP)

Delete this section and replace it with the following:

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
(July 18, 2018 APWA GSP)

Delete this section and replace it with the following:

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

(April 2, 2018 Lacey GSP, Option 2)

Delete this section and replace it with the following:

Use a material transfer device (MTD) or material transfer vehicle (MTV) to deliver the HMA from the hauling equipment to the paving machine for any lift in (or partially in) the top .30 feet of the pavement unless directed otherwise by the Engineer.

Use of an MTD/V is not required in the following locations:

- Irregularly shaped and minor areas
- Within the roundabout

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.

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
(July 18, 2018 APWA GSP)

Delete this section and replace it with the following:

Rollers shall be of the steel wheel, vibratory, oscilatory, 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 Surfaces
(December 19, 2019 Lacey)

Delete this section and replace it with the following:

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. 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

All vegetation including root structures and moss shall be removed in their entirety within the paved areas including adjoining curbs, gutters, and sidewalks. Further, all vegetation overgrowth shall be trimmed and removed 6 inches from back of proposed HMA edge limits as directed by the Engineer.

Driveway preparation shall include saw cutting, cutting, filling, and grading the transitional area required to provide a HMA approach between the edge of pavement and driveway regardless of the existing surface treatment or width. The Engineer shall mark in the field where the asphalt or concrete shall be sawcut. Typical driveway aprons for paved/concrete driveways are 18" unless shown longer on the plans. Typical driveway aprons for gravel driveways are 48" unless shown longer in the plans. All material that must be removed from the driveway shall be hauled and disposed off the project site. All imported material required to grade and compact driveway bases shall be paid for by the unit bid item "Crushed Surfacing Top Course." All driveways shall require preparation. Temporary access shall be provided for all driveways prior to paving. There shall be no additional compensation for those driveways requiring more preparation than others.

Shoulder preparation shall include cutting, filling, and grading the shoulder to ensure a uniform, longitudinal pavement edge. Maximum distance shall be 12 inches from proposed edge of pavement surface to a maximum depth of 6 inches from edge of roadway finish grade. Backfill requirements beyond these limits shall be repaired at the Contractor's expense. All grading within drainage ditches or swales to establish or maintain existing flowlines shall also be included in shoulder preparation.

All excess asphalt joint filler shall be completely removed and all premolded and rubberized joint filler shall be removed to a minimum 1/2 inch below the surface of the existing pavement.

5-04.3(4)C Pavement Repair
(July 18, 2018 APWA GSP)

Delete this section and replace it with the following:

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, RAP, & RAS

Delete this section and replace it with the following:

5-04.3(5) Producing/Stockpiling Aggregates and RAP

(October 30, 2018 Lacey GSP)

If Recycled asphalt pavement (RAP) is allowed per section 5-04.2, 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 Stockpiling RAP or RAS for High RAP/Any RAS Mixes

Delete this section

5-04.3(6) Mixing

(October 30, 2018 Lacey GSP)

Delete this section and replace it with the following:

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.

If Recycled asphalt pavement (RAP) is allowed per section 5-04.2, 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

(April 2, 2018 Lacey GSP)

Delete this section and replace it with the following:

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	0.208 feet
	other courses	0.25 feet
HMA Class ⅜”		0.17 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.

The Contractor shall complete the first lift over the entire length of the project, before the final lift will be allowed to be installed.

If traffic signal loops are required, these loops shall be installed prior to the final lift.

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

(July 18, 2018 APWA GSP)

Delete this section and replace it with the following:

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
(July 18, 2018 APWA GSP)

Delete this section and replace it with the following:

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 Content – 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)C Mixture Acceptance – Nonstatistical Evaluation
(July 18, 2018 APWA GSP)

Add the following new section:

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
(July 18, 2018 APWA GSP)

Add the following new section:

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
(July 18, 2018 APWA GSP)

Add the following new section:

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 AASHTO 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
(July 18, 2018 APWA GSP)

Add the following new section:

Testing of HMA for compliance of Va will at the option of the Contracting Agency. If tested, compliance of Va 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
(July 18, 2018 APWA GSP)

Add the following new section:

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)C6 Mixture Nonstatistical Evaluation – Price Adjustments
(July 18, 2018 APWA GSP)

Add the following new section:

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
(July 18, 2018 APWA GSP)

Add the following new section:

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, Va. 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
(July 18, 2018 APWA GSP)

Delete this section and replace it with the following:

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
(July 18, 2018 APWA GSP)

Delete this section and replace it with the following:

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)D HMA Compaction-Visual Evaluation

Delete this section and replace it with the following:

5-04.3(10)D HMA Nonstatistical Compaction

5-04.3(10)D1 HMA Nonstatistical Compaction – Lots and Sublots

(July 18, 2018 APWA GSP)

Add the following new section:

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

(July 18, 2018 APWA GSP)

Add the following new section:

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
(July 18, 2018 APWA GSP)

Add the following new section:

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)C Rejection Without Testing (Mixture or Compaction)
(July 18, 2018 APWA GSP)

Delete this section and replace it with the following:

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(12)A1 Transverse Joints
(April 2, 2018 Lacey GSP)

Delete this section and replace it with the following:

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. All joints must be flush and provide a smooth transition across the meet line.

A temporary wedge of HMA constructed on a 24H:1V shall be constructed where a transverse joint as a result of paving or planing is open to traffic. The wedge shall be maintained until the paving is resumed. 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
(April 2, 2018 Lacey GSP)

Supplement this section with the following:

Cold joints shall be allowed only at locations approved by the Engineer.

Upon Completion of paving operations, all joints shall be sealed with PG 58H-22 asphalt binder.

5-04.3(12)A2 Longitudinal Joints
(April 2, 2018 Lacey GSP)

Replace the first paragraph with the following:

This project will require Echelon paving, using side-by-side pavers in operation at the same time and slightly offset on multiple lanes to improve the longitudinal joint between pavers. Rollers behind the echelon pavers shall pass directly over the longitudinal joint while both sides are hot. Hot lap joints shall be constructed in the wearing course and shall be located at the lane lines between travel lanes. Cold joints will only be allowed at locations approved by the Engineer.

All other joints shall be an extended joint (Notched wedge) with a taper placed on the first paved lane to reduce joint air voids. An attachment shall be placed on the paver screed to form the mat edge into a tapered section. Notches on either end of the taper shall eliminate thin taper extremities. The notches shall be at least as deep as the nominal maximum aggregate size of the mix. The taper shall be spread out over 1 foot and the hot lane shall overlap the cold lane notch by about 0.5 to 1 inch. The notched wedge joint shall provide a ramp for traffic transition between the cold lane and the yet unpaved portions of the hot lane.

Upon Completion of paving operations, all joints shall be sealed with PG 58H-22 asphalt binder.

5-04.3(14) Planing Bituminous Pavement
(February 14, 2023 Lacey GSP)

Supplement this section with the following:

The planing plan must be approved by the Engineer and a pre planing meeting must be held prior to the start of any planing. See Section 5-04.3(14)B2 for information on planning submittals. Pavement planing shall be completed to the cross-slopes as shown on the Plans. The Contractor shall provide a smooth transition at the changes in cross-slopes as directed by the Engineer.

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.

Repair or replace any metal castings and other surface improvements damaged by planing, as determined 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.

The Contractor can stockpile the grindings for use on the project as identified in section 2-02.3(3).

5-04.3(17) Roadway Pulverization

(October 30, 2018 Lacey GSP)

Add the following new section:

Pavement pulverizing shall be performed with equipment of a type that has operated successfully on work comparable with that to be done under the contract and shall be approved by the Engineer prior to use.

Where indicated on the Plans, the existing pavement shall be pulverized in place from edge of pavement to edge of pavement between the limits staked by the Engineer. Asphalt concrete pavement shall be pulverized to a depth of three times the asphalt thickness. Care shall be taken not to disturb the adjacent concrete curb and gutter.

The Contractor shall process the pulverized material with water to remove material larger then 4" and grade to match existing crown, as shown in the plans or as directed by the Engineer. Upon completion of the grading operation, the Contractor shall compact the material to 95% density in accordance with Section 2-03.3(14)D. Excess pulverized material, loose material and any large pieces 4" or greater of asphalt will be removed and disposed of at the Contractor's expense. Crushed Surfacing Top Course shall be placed and graded if needed, as directed by the Engineer, paid for under the bid item for Crushed Surfacing Top Course.

If the Contractor chooses to pulverize roadway where not indicated on the Plans, no compensation shall be made under the bid item "Roadway Pulverization". The demolition and removal of this pavement material shall be compensated under the lump sum bid item "Removal of Structures and Obstructions" and no other compensation shall be allowed.

The Contractor can stockpile the grindings for use on the project as identified in section 2-02.3(3).

5-04.3(18) Pre Planing Or Pulverizing Metal Detection Check
(October 30, 2018 Lacey GSP)

Add the following new section:

Before starting planing or pulverizing of pavements, and before any additional depth planing or pulverizing 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 monuments 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(19) Submittals - Paving Plan
(October 30, 2018 Lacey GSP)

Add the following new section:

The Contractor must submit a paving plan to the Engineer at least 5 Working Days in advance of the start date. These plans must show how the moving operation and traffic control are coordinated, as they will be discussed at the pre-paving briefing. When requested by the Engineer, the Contractor must provide the traffic control plan 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 traffic control plan must show where flaggers are proposed.

At a minimum, the 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 work. Briefly describe the sequencing of traffic control consistent with the proposed work sequence, and scheduling of placement of temporary pavement markings and channelizing devices after each day's work.

2. Names and locations of HMA Supplier facilities to be used, and locations of temporary parking and staging areas.

3. List of all equipment to be used for paving.

4. Description (geometric or narrative) of the scheduled sequence of work, and intended area for each day's work, must include the directions of proposed paving, sequence of adjacent lane paving, sequence of skipped lane paving, intersection scheduling and sequencing.

5. Approximate times and days for starting and ending daily operations.

5-04.3(20) Pre-Paving Briefing
(October 30, 2018 Lacey GSP)

Add the following new section:

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 paving plan, approved traffic control plan, and public convenience and safety. Such discussion includes, but is not limited to:

1. The actual times of starting and ending daily operations.

2. 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.

3. Notifications required of Contractor activities, and coordinating with other entities and the public as necessary.

4. Description of the sequencing of installation and types of temporary pavement markings as it relates to planning and to paving.

5. Description of the sequencing of installation of, and the removal of, temporary pavement patch material around exposed castings and as may be needed

6. Description of procedures and equipment to identify hidden metal in the pavement, such as survey monuments, monitoring wells, street car rail, and castings, before planning, see Section 5-04.3(14)B2.

7. Description of how flaggers will be coordinated with the planing, paving, and related operations.

8. When to start applying tack and coordinating with paving.

9. Description of contingency plans for that day's operations such as equipment breakdown, rain out, and Supplier shutdown of operations.

10. Number of sublots to be placed, sequencing of density testing, and other sampling and testing.

5-04.3(21) Paving Operations Supervisor
(April 2, 2018 Lacey GSP)

Add the following new section:

The Contractor shall identify a Paving Operations Supervisor (POS) at the Preconstruction Conference. The POS shall be employed by the Paving Contractor, shall have direct and immediate control of the paving operations on the Project at all times, and shall perform no other duties on the project. No part of the paving operations shall commence or continue without the physical presence of the POS on-site. The

POS shall act as the main point of contact in the field to the Engineer and shall execute all requests by the Engineer promptly and immediately.

Specific duties include, but are not limited to the following:

Ensures all paving operations meet the requirements of Section 5-04.
Ensures all iron is marked and properly lowered prior to pavement planing operations.
Ensures paving schedule is communicated to the Engineer 72 hours in advance of paving operations commencing. The Engineer shall be responsible for delivering paving notices to affected business owners and residents. Any changes to the paving schedule must also be communicated to the Engineer 72 hours in advance of the change.
Ensures existing surfaces to be paved are prepared in accordance with Sec. 5-04.3(4) a minimum of two (2) hours prior to paving. Specific attention shall be given to surface cleanliness, match lines to adjoining pavement are vertical and smooth, and matching to existing driveways and rolled gutters are prepared. In the event that preparation of existing surfaces are behind schedule, paving operations may be halted and rescheduled at the Engineer's request if, in his judgment, the delay of paving shall result in a less than satisfactory end product or inconvenience to the public. All costs resulting from paving rescheduling shall be borne by the Contractor.
Ensures all tack coating is completed in accordance with Sec. 5-04.3(4).

5-04.3(22) Temporary Patching

(April 2, 2018 Lacey GSP)

Add the following new section:

All excavations within or across streets, driveways, or failure of existing pavement that will be exposed to traffic shall be temporarily patched by the end of the working day or as directed by the Engineer. The patch shall be constructed of a minimum of 0.17 feet of either Commercial HMA or as directed by the Engineer. The Contractor shall maintain all temporary patches until such time as the permanent pavement is in place.

5-04.3(24) Roadway Shoulder Final Grading

(April 2, 2018 Lacey GSP)

Add the following new section:

The Contractor shall backfill and grade a 5 foot wide or a 5:1 transition (whichever is less) flush from the new edge of pavement down to the existing shoulder grade with Crushed Rock or Topsoil Type A to match existing shoulder material and condition. The Crushed Rock shall match gradation, shape, and color to of the existing rock shoulder. Upon placing and grading either material, the Contractor shall roll and compact the transition as directed by the Engineer. The Contractor shall then hydroseed all shoulder transitions backfilled with topsoil.

5-04.3(25) HMA Wedge Curb

(April 2, 2018 Lacey GSP)

Add the following new section:

The Contractor shall construct a HMA wedge curb where shown on the plans and shall be integral to the mainline paving operation respective to being placed and compacted. HMA used for wedge curb shall be compensated with the HMA bid item per ton and no other compensation shall be allowed.

5-04.3(26) Utility Access

(November 20, 2020 Lacey GSP)

Add the following new section:

When lowering and raising valves the valve riser pipes must remain free of debris. Cap the valve riser pipe to prevent debris from entering the riser and to provide access to the operating nut.

The contractor is responsible for tracking exact locations of all valves and manholes to be lowered or raised. Before asphalt is placed over a valve, metal must be placed directly above the valve location for the purpose of locating the valve with a metal detector. Once asphalt has been placed over a valve or manhole, the location of that valve or manhole must be marked on the asphalt within 3 working days. The location marks must be maintained until the valves are raised. Channelization near valves or manholes must be complete before they are raised. All valves and manholes must be raised within 20 working days after each time they are paved over. The cost of raising new valves and manholes is incidental to the cost for that bid item. The cost for raising existing valves and manholes will only be paid once for each location, no additional compensation will be allowed if the contractor has to raise the same valve/manhole twice. See sections 7-05 and 7-12 for additional information on raising valves and manholes.

5-04.4 Measurement

(February 14, 2023 Lacey GSP)

Supplement this section with the following:

"HMA Cl._PG_" 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.

No unit of measure shall apply to the lump sum price for Preparation of Existing Surfaces.

The quantities in the bid proposal for Planing Bituminous Pavement are based on a computer-generated earthwork calculation from the existing ground survey. The quantities do not incorporate expansion, clearing and grubbing, or construction methodology. These values are listed for the convenience of the Contractor in determining the volume of work involved as calculated by the Engineer and are for estimating purposes only. The prospective bidders shall verify these quantities prior to submitting the bid. A digital copy of the survey is available to prospective bidders from the Contracting Agency at the Contractor's request. No adjustments will be made in these quantities although the actual quantities may deviate from those listed.

5-04.5 Payment

(November 20, 2020 Lacey GSP)

Supplement this section with the following:

The unit Contract price per ton for all HMA bid items shall also include Paving Operations Supervisor (POS) and the removal of excess tack coat of asphalt from existing surfaces, including, but not limited to existing pavement markings. Pavement markings shall be restored to a pre-construction condition or better. No additional compensation shall be given to the Contractor for installing new pavement markings if existing pavement markings cannot be restored to a pre-construction condition or better as directed by the Engineer.

"Preparation of Existing Surfaces," lump sum.
The lump sum contract price for "Preparation of Existing Surfaces" shall be full pay for all labor, materials, and equipment to comply with the plans and specifications, including but not limited to cleaning and removal of all vegetation from proposed paved surfaces or that vegetation that will interfere with paving operations prior to paving.

7-04 STORM SEWERS

7-04.1 Description

(**** Lacey GSP)**

Supplement this section with the following:

This work shall consist of constructing debris barriers, trash racks, special fittings, joint materials, dewatering, bypass pumping, and testing.

See additional guidance, not to supersede the above special provision, included in Section E Technical Specifications Section 334211.

7-04.2 Materials

(October 29, 2010 Lacey GSP)

Delete the first paragraph of this section and replace with the following:

Pipe used in this project shall meet the requirements of the following sections:

Solid Wall PVC Storm Sewer Pipe	9-05.12(1)
Ductile Iron Sewer Pipe	9-05.13
Corrugated Polyethylene Storm Sewer Pipe	9-05.20
Safety Bars	9-05.18

7-04.3 Construction Requirements

(October 29, 2010 Lacey GSP)

Supplement this section with the following:

The Contractor shall furnish, construct, and install the debris barriers as shown in the Plans or as designated by the Engineer.

7-04.5 Payment

(October 30, 2018 Lacey GSP)

Delete this section and replace with the following:

"___ Inch Diameter D.I. Storm Sewer Pipe", per linear foot.

The unit contract price per linear foot for "___ Inch Diameter D.I. Storm Sewer Pipe", shall be full compensation for all labor, material, and equipment to furnish, place, assemble, and install ductile iron (D.I.) storm sewer line, complete in place, including all wyes, tees, caps, plugs, trash racks, debris barriers, special fittings, joint materials, commercial concrete, adjustment of inverts to manholes, dewatering, bypass pumping, and testing. Further, all excavation, hauling, disposal, compaction, temporary patching and other required earthwork shall be included.

Trash racks required on the end of existing pipes shall be incidental to the overall storm system and new storm sewer pipe identified herein.

7-05 MANHOLES, INLETS, CATCH BASINS, AND DRYWELLS

7-05.1 Description

(******)

This Work consists of constructing manholes, inlets, drywells, and catch basins and connecting to existing drainage structures of the types and sizes designated in accordance with the Plans, these Specifications, and the Standard Plans, in conformity with the lines and grades staked.

See additional guidance, not to supersede the above special provision, included in Section E Technical Specifications Section 330561.

7-05.3(5) Catch Basin Assembly

(January 3, 2017 Lacey GSP)

Section 7-05.3(5) is added with the following:

Contractor shall furnish and install East Jordan Iron Works Catch Basin Assembly, or approved equal, on all catch basins and storm sewer manholes unless otherwise indicated on the construction plans. Assemblies must be ductile iron and manufactured in the USA. Where a cover, grate or curb inlet is indicated in the plans, the Contractor shall furnish and install the indicated item.

7-05.3(6) Saddle Manhole w/ Cast-in-Place Base

(March 18, 2015 Lacey GSP)

Section 7-05.3(6) is added with the following:

Connections to existing sanitary sewer mains where no manhole is present shall be accomplished by installing a saddle manhole with a cast-in-place base in accordance with the Contract Plans.

The Contractor shall verify invert elevations prior to construction.

7-05.3(7) Low Point Drain
(March 18, 2015 Lacey GSP)

Section 7-05.3(7) is added with the following:

Low point drains shall be installed at low points in pressure sewer mains as shown in the Plans and in accordance with the Contract Plans.

In the event the low point drain is installed outside paved area a concrete pad shall be installed in accordance with the Contract Plans.

7-08 GENERAL PIPE INSTALLATION REQUIREMENTS

7-08.1 Description
(December 31, 2014 Lacey GSP)

This section is revised to read:

This work includes installing culverts, storm sewers, sanitary sewers, and water mains. The contractor shall also follow Section 7-02, 7-04, 7-09 or 7-17 as it applies to the specific kind of Work.

7-08.2 Materials
(October 16, 2009 Lacey GSP)

Supplement this section with the following:

Bank Run Gravel for Trench Backfill shall be in accordance with Section 9-03.19.
Controlled Density Fill shall be in accordance with Section 2-09.3(1)E.
Imported Pipe Bedding shall be in accordance with Section 9-03.16.

7-08.3 Construction Requirements

7-08.3(1) Excavation and Preparation of Trench
(October 30, 2018 Lacey GSP)

Supplement this section with the following:

The contractor shall locate and preserve all existing utilities per RCW 19.122. Utility locations shown on the plans depict the physical features that were visible at the time of the survey. The City of Lacey is not responsible for the location of underground utilities that are marked or not marked in the field by other utility providers. Utility service laterals are not typically shown on plans or locatable and the contractor shall anticipate such services. The City will locate the meters and the mains. For service laterals, pursuant to RCW 19.122.030, the City will indicate a presence of an un-locatable service lateral and if requested can meet with the contractor or provide copies of available records. The Contractor shall have a crimping tool available during excavation to crimp any broken water services. Before commencing work, the contractor shall coordinate with One-Call services to determine the location of all utilities.

The Contractor shall pothole all apparent conflicts between existing utilities and proposed construction as approved by the Engineer. The Contractor shall notify Engineer of location and approximate time to complete prior to potholing. The Contractor shall notify the Engineer of any conflicts with the existing utilities and proposed work at least 3 days prior to proceeding with work. Potholing of the utilities shall be completed a minimum distance of 300 feet in front of pipe laying operations. No adjustment to the

contract price or time will be made if the contractor fails to follow this specification. Potholing for Utility Crossings and Connections shall be performed by the Contractor using vacuum excavation truck or other device approved by the Engineer. If the Contractor potholes prior to approval no compensation shall be made for the potholing.

The Contractor shall deflect pressurized pipe at the joints no greater than the maximum allowable deflection as determined by the pipe or fitting manufacturer to avoid conflicts with crossing utilities. Vertical bends and vertical thrust blocking shall be avoided by deflecting pipe either upwards or downwards prior to the utility crossing.

7-08.3(1)A Trenches

(December 31, 2014 Lacey GSP)

Section 7-08.3(1)A is supplemented with the following to the fourth paragraph:

All material excavated from trenches shall not be piled on the roadway.

7-08.3(1)C Bedding the Pipe

(February 25, 2015 Lacey GSP)

Section 7-08.3(1)C is supplemented with the following

If native material meets the requirements of 7-08.2 the Contractor shall use all suitable native material prior to using imported pipe bedding or bank run gravel. All material shall be approved by the Engineer prior to placement. If the Contractor places imported material prior to approval, no compensation shall be made for the imported material.

7-08.3(3) Backfilling

(October 30, 2018 Lacey GSP)

Supplement this section with the following:

For backfilling trenches for longitudinal runs of pipe, the Contractor shall use all suitable native material prior to using bank run gravel and/or controlled density fill. All native backfill material shall be approved by the Engineer prior to placement. If the Contractor places imported material prior to approval, no compensation shall be made for the imported material. All backfill material shall be compacted and tested according to Section 2-03.3(14)D.

For transverse runs of pipe including the service lines within the roadway prism, the Contractor shall use controlled density fill unless approved otherwise by the Engineer. All native material shall be excavated, hauled and disposed of offsite. All exceptions shall be approved by the Engineer.

At the end of each workday, the Contractor shall install a lift of temporary asphalt cold mix on top of the trench backfill, flush with the existing pavement. No trench excavation shall be exposed to traffic without a temporary asphalt cold mix sealing the existing pavement surface. If approved by the Engineer, the Contractor may choose to use HMA for Pavement Repair Cl. ½" PG 64-22 for permanent pavement repair if a bid item for this work has been included in the Proposal. All costs associated with providing and removal of temporary asphalt cold mix shall be incidental to the bid item for the pipe being installed and no other compensation will be allowed.

7-08.3(3)A Controlled Density Fill

(December 31, 2014 Lacey GSP)

Section 7-08.3(3)A is added with the following:

The Contractor shall use controlled density fill (CDF) as shown in the Plans or directed by the Engineer.

Controlled Density Fill shall meet the following requirements:
1750# Sand,
1750# Pea Gravel,
230# Water,
141# Portland Cement,
6 ounces Water Reducing Agent per 100 lbs. cement.

The Controlled Density Fill will require 24 hours of cure time, or as directed by the Engineer. Prior to backfill, all appurtenances shall be covered with 11 mill plastic as directed by the Engineer.

7-08.3(3)B Steel Plating for Pipe Trench

(February 25, 2015 Lacey GSP)

Section 7-08.3(3)B is added with the following:

The Contractor shall install steel plating over the trench per the plans to allow for CDF to fully cure and allow vehicle traffic to pass during non-working hours. The steel plating shall remain complete over the trench until the pavement repair is complete. This process shall be coordinated so that there will be minimum inconvenience to the public. All costs for all labor, materials, and equipment to furnish, place, assemble, install, maintain and remove the steel plates and associated materials shall be included in the unit contract price per foot of pipe installed and no additional compensation shall be allowed.

7-08.3(5) Pipe Abandonment

(February 14, 2023 Lacey GSP)

Add the following new section:

The Contractor shall abandon pipes where shown on the Plans or directed by the Engineer. For abandonment, removal, handling and disposal of asbestos cement piping, refer to Section 7-09.3(19)D of these Special Provisions. All abandonments shall be done after all new utility mains and service connections are installed unless authorized by the Engineer. Abandonments shall include all excavation, pipe cutting and removal, fittings, concrete plugging, and backfilling. Some abandonments require specific fittings as indicated on the Plans. All fittings required to complete the abandonment shall be included in the cost for the abandonment. Potholing per 7-08.3(1) to verify required fittings shall be done as directed by the Engineer. The valve shall not be abandoned in place, the valve shall be removed and a blind flange installed. Pipe abandonments shall be completed in cooperation with the engineer in order to minimize disruption of utility service to the residents. If water services will be interrupted follow the requirements of 7-09.3(19)B.

All pipes to be abandoned shall have the first 2 linear feet of abandoned pipe filled/plugged with a watertight concrete grout. The inspector shall inspect the abandonment prior to backfilling.

In the case of an abandonment associated with a connection to an existing main, no payment shall be made for the bid item “Pipe Abandonment”. The Contractor shall include all costs with these associated abandonments under the “Connect to Existing Water Main”, “Connect to Existing Reclaimed Water Main”, “Connect to Existing Gravity Sewer Main”, or “Connect to Existing Sanitary Sewer Main” pay

item. In addition, payment for “Pipe Abandonment” will only be paid for the locations and quantities called out on the plans or as directed by the Engineer.

7-08.3(6) Water Main/Sanitary Sewer Service Crossings

(February 25, 2015 Lacey GSP)

Add the following new section:

Notify the Engineer if the waterline is less than 18 inches above sanitary sewer. The minimum cover as shown on the plans may be reduced as approved by the Engineer to maintain minimum vertical separation.

The Contractor shall install the longest standard length of water pipe so that the joints will fall an equal distance from any sewer crossing. In some cases where minimum separation cannot be maintained, it may be necessary to encase the water main as directed by the Engineer. No concrete shall be installed unless specifically directed by the Engineer.

Costs to cut and place water pipe as specified shall be incidental to the water pipe line and no other pay will be allowed.

7-08.3(7) Connections to Existing Mains

(October 30, 2018 Lacey GSP)

Add the following new section:

The Contractor shall be responsible for determining the scope of work for connection to existing mains.

It shall be the Contractor's responsibility to field verify the location and depth of the existing main and the fittings required in accordance with 7-08.3(1) to make the connections to the existing mains including any pipe abandonment associated with the connections to existing mains. Connect to existing mains shall be completed in cooperation with the engineer in order to minimize disruption of service to the residents. All taps shall be a minimum of 36” away from the bell joint unless otherwise approved by the engineer.

Temporary blow-off assembly required for temporary or permanent release of air, chlorination or flushing purposes shall be provided by the Contractor as a part of the connection to existing main.

In the case of a live tap connection no payment shall be made for the bid item, "Connect to Existing Water Main". The Contractor shall include all costs associated with live taps under "_____ Inch Tapping Valve With Tapping Sleeve" pay items.

Payment for "Connect to Existing _____" will only be paid for the locations and quantities called out on the plans or as directed by the Engineer. For purposes of payment, there will be no distinction made for the difficulty of connecting to the existing main or the quantity of connecting pipes or other materials needed.

7-08.3(8) Detectable Marking Tape

(January 4, 2016 Lacey GSP)

Add the following new section:

All pipeline installed under this contract will be identified by a continuous color coded tracer marker. For pressure lines it shall be buried 12 inches to 18 inches below finished grade, and for sewer lines it shall be buried 24 inches to 30 inches below finished grade. The marker shall be imprinted every 30 to 40 inches

in permanent black ink indicating the type of line buried below and shall also have the word “Caution” prominently shown.

The tracer marker shall be plastic non-biodegradable and have a metallic core or backing which can be detected by a standard metal detector.

In addition to the detectable marking tape a U.S.E coated 12 gauge tracer wire shall be taped to all mains and service lines. The wire shall be brought up and tied to all valves and meter boxes. The tracer wire shall be looped up into all valve boxes per the plans. A low voltage grease-type splice kits, or better shall be used on all tracer wire connection points. After the wire nut is used to connect the wire together an overhand knot shall be tied just outside the connection to prevent it from coming apart. All service and mainline tracer wires shall be properly connected. A tracer wire magnesium anode shall be installed at all dead ends of the tracer / locate system. On long stretches of pipe anodes may be required at a minimum spacing of 1000’. The anode type shall be Copperhead Anode Part# ANO-14, 1.5# x 1.315”Dx18.5”L or approved equal. When connecting a new main or a new service to an existing main, the new tracer wire shall be connected to the existing tracer wire if available.

Special high strength locate wire may be required for directional drilling where the wire is allowed to be pulled in with the pipe or conduit. High strength wire shall be Neptco Trace-Safe 1800 lb. strength or approved equal and shall be connected with the wire manufacturer’s connections.

Continuity or locate testing of the wire will be done by the City. The contractor shall give 72 hours notice for continuity testing by the City. The testing shall be conducted prior to paving or final restoration of landscape areas. The locating device will be connected to the tracer wire at any or all Gate Valves and Services and tracer wire shall transmit an acceptable signal strength as determined by the City for a minimum of 300 feet. Contractor will locate and repair any failed connections.
The wire shall be furnished and installed by the Contractor.

Color coding of tape and wire shall be as follows:

a) Water – Blue
b) Sewer – Green
c) Reclaimed – Purple
d) Electrical conduits – Red
e) Communication Conduits - Orange

Installation of the pipeline tracer marker and 12 gauge coated copper wire is considered incidental to the construction of the pipe and conduits and no other compensation will be allowed.

7-08.3(9) Concrete Thrust Blocking

(February 25, 2015 Lacey GSP)

Add the following new section:

Install thrust blocking at bends, tees, dead ends, and crosses and as shown in the plans and as directed by the Engineer. Thrust Blocking shall be commercial concrete poured against undisturbed earth. An 11 mil plastic barrier shall be placed between all thrust blocks and fittings. The calculations for thrust blocking are as follows:

Thrust at fittings in pounds at 225 pounds per square inch of water pressure.

Pipe Diameter	90° Bend	45° Bend	22-1/2° Bend	11-1/4° Bend	Dead End or Tee
4”	3,600	2,000	1,000	500	2,600
6”	8,000	4,400	2,300	1,200	5,700
8”	14,300	7,700	4,000	2,000	10,100
10”	22,300	12,100	6,200	3,100	15,800
12”	32,000	17,400	8,900	4,500	22,700
14”	43,600	23,600	12,100	6,100	30,800
16”	57,000	30,800	15,700	7,900	40,300
18”	72,000	39,000	19,900	10,000	51,000

SAFE SOIL BEARING LOADS:

Soil	Pounds per Square Foot
Muck, Peat	0,000
Soft clay	1,000
Sand	2,000
Sand and gravel	3,000
Sand and gravel cemented with clay	4,000

Ecology blocks may be used for thrust blocking if approved by the Engineer.

Installation of thrust blocking is considered incidental to the construction of the pipe and no other compensation will be allowed.

7-08.4 Measurement

(October 30, 2018 Lacey GSP)

Supplement this section with the following:

"Imported Pipe Bedding" will be measured per ton.
"Bank Run Gravel for Trench Backfill" will be measured per ton.
"Utility Potholing", will be measured per hour.
"Pipe Abandonment" will be measured per each, for each section called out on the Plans.
"Controlled Density Fill" will be measured by the cubic yard for the quantity of material placed.
"Connect to Existing Water Main" will be measured per each location called out in the plans.
"Connect to Existing Sanitary Sewer Force Main" will be measured per each location called out in the plans.
"_____ Inch Pipe Encasement" shall be measured by the linear foot of pipe casing actually installed.

7-08.5 Payment

(October 30, 2018 Lacey GSP)

Supplement this section with the following:

"Bank Run Gravel for Trench Backfill" per ton and "Imported Pipe Bedding" per ton.
The unit contract price per ton for "Bank Run Gravel for Trench Backfill" and "Imported Pipe Bedding" shall be full compensation for all labor, material and equipment to furnish, place and compact the backfill. Native material used for backfill shall be considered incidental to the pipe installation and no additional compensation shall be allowed.

Payment shall be based on actual amount of imported bedding or bank run gravel for trench backfill used. The Engineer reserves the right to adjust the bid proposal quantity as required.

There will be no additional compensation made for the removal and wasting of trench excavation that is unsuitable for backfill.

If no bid item for "Bank Run Gravel for Trench Backfill" or "Imported Pipe Bedding" is included, any work described in these sections shall be included in the unit contract price per foot of pipe installed and no additional compensation shall be allowed.

"Utility Potholing", per hour shall be full compensation for all labor, material and equipment necessary to excavate, backfill, and restore the utility location(s) required by the Engineer and determine its vertical and horizontal location. Utility potholing will only be paid for work approved by the Engineer in advance.

If no bid item for "Utility Potholing" is included, any work described in this section shall be incidental to the project.

"Pipe Abandonment", per each.
The unit contract price per each for "Pipe Abandonment" shall be full pay for providing all labor, tools, equipment and materials necessary to abandon the specified piping including the plug material.

If no bid item for "Pipe Abandonment" is included, any work described in this section shall be incidental to the project.

"Controlled Density Fill", per cubic yard.

If no bid item for “Controlled Density Fill” is included, any work described in this section shall be incidental to the project.

“Connect to Existing Water Main”, per each.
The unit contract price for "Connect to Existing Water Main" shall be full pay for providing all labor, tools, equipment, and materials necessary to connect to the existing main. For purposes of payment, there will be no distinction made for the difficulty of connecting to the existing main or the quantity of connecting pipes or other materials needed. If no such item exists all costs shall be incidental to the project and no additional compensation shall be allowed.

“Connect to Existing Sanitary Sewer Force Main”, per each.
The unit contract price for “Connect to Existing Force Main” shall be full pay for providing all labor, tools, equipment, and materials necessary to connect to the existing force main. For purposes of payment, there will be no distinction made for the difficulty of connecting to the existing main or the quantity of connecting pipes or other materials needed. If no such item exists all costs shall be incidental to the project and no additional compensation shall be allowed.

The unit contract price per linear foot of “_____ Inch Pipe Encasement” shall be full compensation for all labor, material, tools and equipment to furnish, place, assemble, and install pipe casement, complete in place, including but not limited to pipe, all fittings including casing spacers, end seals and other fittings not shown on the Plans, joint materials, special requirements, commercial concrete or controlled density fill, and dewatering.

8-01 EROSION CONTROL AND WATER POLLUTION CONTROL

8-01.3 Construction Requirements

8-01.3(1) General

(******)

Section 8-01.3(1) is supplemented with the following:

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. Inspecting and reporting on all areas disturbed by construction activities, all on-site erosion and sediment control BMPs, and all storm water discharge points every calendar week and within 24 hours of runoff events in which storm water discharges from the site or as directed by the Engineer.

4. Submit to the Engineer no later than the end of the next working day following the inspection a TESC Inspection Report that includes:

a. When, where, and how BMPs were installed, maintained, modified, and removed.

b. Observations of BMP effectiveness and proper placement.

c. Recommendations for improving future BMP performance with upgraded or replacement BMPs when inspections reveal TESC BMP deficiencies.

d. Identify for each discharge point location whether there is compliance with state water quality standards in WAC 173-201A for turbidity and pH.

Inspection of temporarily stabilized, or inactive sites may be reduced to once every calendar month if allowed by the Engineer.

See additional guidance, not to supersede the above special provision, included in Section E Technical Specifications Section 015713.

8-01.3(9)A2 Silt Fence
(October 16, 2014 Lacey GSP)

Supplement this section with the following:

If the Engineer determines that site conditions dictate additional silt fence throughout the duration of the project, the Contractor shall immediately install additional silt fence as directed by the Engineer.

8-01.3(9)D Inlet Protection
(November 20, 2020 Lacey GSP)

Delete the first paragraph and replace with the following:

All catch basins and inlets within 500 ft of the project limits, downstream or affected by construction activities shall have inlet protection and as required by the Engineer. Inlet protection devices shall be installed prior to beginning clearing, grubbing, or earthwork activities.

8-01.4 Measurement
(April 30, 2015 Lacey GSP)

Supplement this section with the following:

All items required for erosion control shall be included in the lump sum bid item "Erosion/Water Pollution Control" unless a specific bid item is included in the proposal.

8-01.5 Payment
(November 20, 2020 Lacey GSP)

Modify this section with the following:

Delete "Erosion/Water Pollution Control", by force account and add the following bid item:

"Erosion/Water Pollution Control", lump sum.

The lump sum contract price for "Erosion/Water Pollution Control" shall be full compensation for all labor, material, and equipment necessary to implement, install, maintain and remove all erosion and water pollution control items 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 and all Work required for compliance with the Construction Stormwater General Permit (CSWGP) including annual permit fees. The requirements for the ESC Lead shall also be included in this lump sum bid item if no bid item is included in the proposal. The Contractor shall bear full responsibility for erosion/water pollution control in all sources of material, disposal sites, and haul roads.

8-03 IRRIGATION SYSTEMS

8-03.1 Construction Requirements

(******)

This Work consists of installing irrigation systems in accordance with these Specifications and the details shown in the Plans or as approved by the Engineer.

See additional guidance, not to supersede the above special provision, included in Section E Technical Specifications Section 328000.

8-03.3 Construction Requirements

(March 3, 2022 Lacey GSP)

Delete the first paragraph of this section and replace with the following:

The Contractor shall design and construct the irrigation system, including water service taps, for all areas required to be irrigated as shown on the Plans. Contractor shall have the proposed irrigation design independently reviewed by a competent irrigation design specialist as approved by the Engineer (i.e. Landscape Architect, Certified Landscape Irrigation Auditor, etc.). All deficiencies identified by the independent reviewer shall be corrected prior to submitting the design to the Engineer for final approval. The independent review shall be documented by the Contractor, indicating the name of the reviewer and date the review occurred, and submitted to the Engineer as part of the final review. All costs for the independent design review will be the responsibility of the Contractor and no additional compensation shall be allowed. The design shall be submitted a minimum of 30 days before starting irrigation installation work with Engineer approval.

The design shall be submitted to the Engineer as either an electronically produced (CADD) drawing(s) or on mylar plan(s). Contractor may request the Engineer provide an electronic drawing file (AutoCAD) or plastic mylar site plan(s), as base files for the contractor-provided irrigation design.

During construction, the Contractor shall prepare and maintain a Record Drawing as-constructed (prints) of the irrigation system(s) on-site at all times. The Contractor shall update the prints weekly and make them available to the Engineer, upon request for review and inspection. Updates shall include all work completed to date including changes in design. Upon completion of the irrigation system, the prints shall be given to the Engineer for review. The Contractor will be required to complete all Record Drawing changes and corrections, then finalize the prints, and deliver to the Engineer upon completion.

The Contractor shall include the following requirements for the irrigation system design:

1. Use point-of-connection and sleeves as shown on the Plans.

2. Provide 100% water coverage to all Irrigated areas.
3. Irrigate seeded areas, shrub areas, and street trees (with grates) using separate remote control valve zones.
4. Field verify the points-of-connection for the roadsides and the locations of water and electrical service lines prior to starting irrigation construction.
5. Verify available water service line hydro-static water pressure and available flow (system operation: 10 p.m.-6 a.m.) prior to starting irrigation construction, and report findings/concerns to the Engineer immediately upon discovery.
6. Include remote control valve wire, automatic controllers, and electrical service connections in the irrigation design.
7. Provide head-to-head coverage and design using matched precipitation rate heads.
8. Provide a low-flow, drip irrigation system that will deposit water uniformly throughout the planted beds.
9. All tree wells shall be isolated into separate zones
10. Show all mainline and lateral pipe sizes, remote control and isolation valves, sprinkler heads, drip zones, and other equipment.
11. At each valve location show Valve I.D. number.
12. Drainage out of the lowest heads on sprinkler zones shall not occur when the system shuts off.
13. Individual irrigation zones shall have matching manufacturer make and model sprinkler heads or dripline emitters with matched precipitation rates and performance characteristics.
14. Never exceed manufacturer's recommendation for maximum velocities and flow rates.
15. Locate irrigation equipment for convenient operation and maintenance. All underground equipment, excluding pipe, shall be installed in irrigation valve boxes and vaults.
16. Install thrust blocking on mainlines three inches in diameter or greater.
17. Take care to minimize the potential for vandalism, especially with the temporary on-grade irrigation components, during and after construction to the maximum extent possible.

8-03.3(1) Layout of Irrigation System

(October 29, 2010 Lacey GSP)

Delete the first sentence of this section and replace with the following:

The Contractor shall stake the irrigation system according to the design and receive approval of staked locations from the Engineer prior to construction.

8-03.3(3) Piping

(January 3, 2017 Lacey GSP)

Supplement this section with the following:

All pipes shall have a 12" minimum separation from sidewalks, curbs, walls, and fences. Parallel pipes shall have 3" minimum separation. Pipe depths shall be as follows:

1. PVC pipe on pressure side of irrigation control valve, control wires and quick-coupling valves (pressure mainlines): 18" minimum cover.
2. Pipe on non-pressure side of irrigation control valve (lateral lines): 12" minimum cover.
3. Sleeving: 24" minimum cover.
4. Drip tubing shall be a minimum of 6" below finished grade.

Seal all threaded joints with Teflon tape. No PVC pipe shall be threaded or connected to a threaded fitting without an adapter. Keep pipe free from dirt or debris at all times. Cover ends of pipe when not in progress of installation. Cleaning of cutting burrs is mandatory.

Connect pipe using two-step solvent weld process. Do not move or handle pipe for a minimum of 15 minutes while solvent welds are curing. No water shall be permitted in pipe until a period of at least 10 hours has elapsed for solvent weld setting and curing. The joints shall be allowed to cure at least 24 hours before pressure is applied to the system.

Avoid all proposed and existing tree locations when installing remote control valves and irrigation pipe lines. If necessary, obtain Engineer's approval to adjust equipment locations to avoid damaging the root systems of protected trees, or utilities. Valve boxes shall be placed no closer than 24" from back of curb and 12" from sidewalks placed parallel to adjacent concrete flatwork. Grouped or manifolded remote control valves shall be spaced evenly to present a neat appearance.

Enclose all valves in individual valve boxes. Use valve box extensions as required. Valve boxes shall have a one cubic foot minimum drain rock sump. Valve bonnet packings and bolts shall be checked and tightened. Provide sufficient room to service all equipment.

Install the subterranean tubing with the water outlets facing upward whenever possible. Offset outlets to form a triangular pattern throughout the tubing layout. In irregular areas, some water outlets may end up too close to fixed improvements and may have to be capped-off.

8-03.3(3)A Sleeves

(October 29, 2010 Lacey GSP)

Supplement this section with the following:

Irrigation lines shall be sleeved under all asphalt and concrete.

Irrigation sleeve sizes and locations shall be incorporated in the Contractor-designed irrigation system plans. The Contractor shall try to incorporate irrigation sleeving within or adjacent to electrical sleeve trenches. Sleeves shall be extended a minimum of 12 inches beyond the edge of curbs, walks, walls and/or other paved surfaces. Cap and identify sleeve ends. Plug ends of sleeves to prevent soil from entering ends.

The Contractor shall ensure that all sleeves are installed prior to paving or other hardscape is complete. If it is determined that any sleeves are not installed prior to paving, the Contractor shall bore or push the sleeves as required at no additional cost.

8-03.3(5) Installation

(March 3, 2022 Lacey GSP)

Delete the first, second, third and fifth paragraphs of this section. Supplement this section with the following:

Shrub heads, unless otherwise specified, shall be placed on swing joints approximately at finished grade.

Final position of the valve boxes, capped sleeves, and quick coupler valves shall be between ½" and 1" above finished grade or mulch.

Quick Couplers
All quick couplers shall be installed on triple swing joints and at the lowest elevation point of the mainline. Minimum riser size shall match the quick coupler inlet. Set top of all quick couplers 2" below finished grade in specified enclosures.

Dripline Irrigation

Each zone to have a shut off valve, disk filter, electric control valve and pressure regulator assembly. Drip systems shall be end feed PVC header type.

Sprinklers
All ½" inlet spray heads shall be installed on flexible swing pipe. All ¾" and 1" rotor heads shall be installed on triple swing joints. Minimum riser size shall match the sprinkler inlet. Set tops of all heads flush with final finish grade. Set all heads perpendicular to finish grade and 2" back from curbs and walks unless otherwise noted.

Disc Filter
Install the disc filter, horizontally level, below grade and before or after the remote control valve as indicated in the installation details. The position of the disc filter in the valve box shall be off-center to allow for periodic removal of the disc element for servicing. Include a minimum of 1 cubic foot of ¾" minus gravel in the bottom of the valve box.

8-03.3(6) Electrical Wire Installation

(October 29, 2010 Lacey GSP)

Supplement this section with the following:

Install one common ground wire, one control valve wire and three spare wires in each direction from the automatic controller to the furthest automatic control valve grouping (looped to each valve) on each run. The wires shall be run and looped around each control valve grouping and continue to the furthest automatic control valve grouping. If an automatic control valve grouping branches off a main run, it too will be required to have a separate common ground wire, one control valve wire and three spare wires to the valve grouping. A wire label shall be placed on each wire at the control valve and at the controller. Splices will be permitted only at junction boxes, valve boxes, or at control equipment. A minimum 2 feet of excess conductor is to be left at all splices, terminals, and control valves.

The splices shall be made with Spears DS 400. Neatly coil two (2) feet of cable slack at each RCV solenoid connection within access boxes.

Wiring may be installed in the same trench as the water pipe. Sharp bends or kinks in the wiring shall not be permitted. Wires shall be unreeled in place alongside or in the trench, and shall be carefully placed along the bottom of the trench. Under no condition shall the cable be unreeled and pulled into the trench from one end.

Not less than one foot of cable slack shall be left on each side of all splices. The slack cable shall be placed in the trench in a series of "S" curves.

Do not tape wire to pipe. Keep space between wire and pipe. Tie a loose 20" wire loop at all changes of direction greater than 30 degrees. Untie all loops after all connections have been made.

Sleeve all control wire that does not run with irrigation piping. Include one bare copper locator wire (#14) parallel to each irrigation pipeline that does not otherwise have control wires in trench. When backfilling around valve box, ensure that spare wires are exposed in valve box.

8-03.3(8) Adjusting System

(October 29, 2010 Lacey GSP)

Supplement this section with the following:

The Contractor shall remove all valve box covers and operate each zone of the system as directed by the Engineer. The Contractor shall demonstrate that the irrigation system is complete, fully operational, and free of defects.

8-03.3(10) As Built Plans

(October 29, 2010 Lacey GSP)

Supplement this section with the following:

The Contractor shall furnish Record Drawings of the complete irrigation system in accordance with the following conditions:

1. One (1) set of 22"x 34" mylar plans showing the irrigation system as designed and installed.
2. All actual locations of valves, master valves, flow sensor, gate valves, risers, piping and sleeving shall be shown. Dimension from easily identified permanent features such as buildings, curbs, fences, walks or property lines.
3. Drawings shall be to scale with all notations neat in appearance.
4. Turn the record drawings over to the Engineer for review and approval prior to final payment.

8-03.3(11) System Operation

(October 29, 2010 Lacey GSP)

Supplement this section with the following:

The Contractor shall physically demonstrate to the Engineer, complete system operation including required coverage. Any deficiencies or modifications identified shall be corrected by the Contractor prior to acceptance of the irrigation system.

The Contractor shall coordinate activation of controller with the Engineer to assure electronic communication with the City of Lacey's Central Control System. Test the zone activation from the Central Control System as directed by the Engineer; numerous tests should be expected. The Contractor shall provide two keys for each control cabinet.

8-03.3(13) Irrigation Water Service

(October 29, 2010 Lacey GSP)

Delete this section and replace with the following:

The Contracting Agency will supply and install water meter(s) for the irrigation system at no cost to the Contractor. If not shown in the Plans, the Contractor shall design the irrigation system to utilize any point on the existing water system.

The water service (not including the meter) shall be furnished and installed as part of the irrigation system.

The water meter(s) will be installed by the Contracting Agency. It shall be the Contractor's responsibility to contact the Engineer to schedule the water meter installation performed by the Contracting Agency.

The Contractor shall provide a minimum of 30 calendar day s prior notice to the Engineer for the desired date for installation to ensure no service installation delays.

8-03.3(14) Irrigation Electrical Service

(October 29, 2010 Lacey GSP)

Delete this section and replace with the following:

The Contractor shall utilize the illumination electrical services for electrical service connection for the irrigation system. The bid item for irrigation system shall include the circuit breaker, conduit, and wiring from the service disconnect to the irrigation controller.

8-03.3(15) Irrigation System Modification and Adjustment

(October 16, 2016 Lacey GSP)

Add the following new section:

Existing irrigation systems shall be modified prior to removal of structures and obstructions or excavation. The Contractor shall take the appropriate steps to ensure that the existing irrigation system(s), specific to each work area, is located and pipe laterals relocated outside the new project limits.

All materials used shall be of similar quality of the existing irrigation system being modified. The Contractor shall install required pipe, heads, and fittings to ensure complete coverage of lawn and landscaped area. The system shall be repaired, flushed and restored to a condition superior to the original condition.

If the existing system does not need to be modified or relocated for the project and the Contractor elects to protect the system without damage, the Contractor will be paid for that system.

8-03.4 Measurement

(October 29, 2010 Lacey GSP)

Supplement this section with the following:

"Irrigation System" shall have no unit of measure as it will be lump sum.

"Irrigation System Modification and Adjustment" shall be measured per each for each individual irrigation system that is modified and restored. No compensation shall be made for an irrigation system outside the project limits damaged by the Contractor.

No unit of measure shall apply to the lump sum price for "Irrigation System – Wetland Mitigation Site".

8-03.5 Payment

(October 29, 2010 Lacey GSP)

Delete the third and fourth paragraphs and replace with the following:

The lump sum contract price for "Irrigation System" shall include all labor, materials, and equipment to design and install the irrigation system including excavation, backfill, water service connections, piping, valving, sleeving, controls, electrical service requirements and connections, activation with the Central Control System, hand-held remote radio, testing, record drawings, and other items for a complete operational irrigation system. The Contracting Agency will pay for the water connection fees and install the new water meter in the Contractor installed and furnished water service.

The unit contract price per each for "Irrigation System Modification and Adjustment" shall include all labor, materials, and equipment required to ensure 100% coverage of an existing irrigation system including excavation, backfill, piping, valving, sleeving, heads, fittings and other items.

The unit contract price per lump sum price for "Irrigation System – Wetland Mitigation Site" shall be full pay for all labor, materials, and equipment to design and install the irrigation system including excavation, backfill, water and electrical service connections, piping, valves, sleeving, controls, electrical requirements, activation, testing, and other items for a complete operational irrigation system.

8-04 CURBS, GUTTERS, AND SPILLWAYS

8-04.1 Description

(******)

This Work consists of the construction of cement concrete curbs, curbs and gutters, gutters, spillways, hot mix asphalt curbs, gutters, spillways, and metal spillways, of the kind and design specified, at the locations shown in the Plans or where designated by the Engineer in accordance with these Specifications and in conformity to the lines and grades as staked.

See additional guidance, not to supersede the above special provision, included in Section E Technical Specifications Section 321313 and 321623.

8-04.3 Construction Requirements

(October 16, 2009 Lacey GSP)

Supplement this section with the following:

This work shall be constructed as shown in the plans.

8-05 LAWN AND LANDSCAPE RESTORATION

(******)

Add the following new section:

8-05.1 Description

The Contractor shall take every precaution to preserve and protect existing lawn and landscape areas. Only those landscaped areas necessary for construction shall be disturbed. All lawn areas and landscaping damaged or removed shall be repaired as directed by the Engineer. Lawn areas damaged or removed shall be restored with sod as directed by the Engineer.

See additional guidance, not to supersede the above special provision, included in Section E Technical Specifications Section 329000.

8-05.3 Construction Requirements

The Contractor shall repair any vegetation, fencing, culverts, ditch sections, or any other objects or structures that are not covered by a specific bid item. Restoration shall return anything damaged by construction to their original condition or to a condition superior to the original condition. The Contractor shall be responsible to evaluate the site prior to bidding this project to determine the areas to be affected by the particular construction method or machinery proposed to be used.

8-05.4 Measurement
No unit of measure shall apply to the lump sum price for Landscaping.

8-05.5 Payment
"Landscaping", lump sum.

If no bid item for "Lawn and Landscape Restoration" is included, any work described in this section shall be incidental to the project.

8-14 CEMENT CONCRETE SIDEWALKS

8-14.1 Description
(******)

Supplement this section with the following:

Where applicable in this section "concrete sidewalks" shall read "concrete sidewalks and driveways" unless a bid item is provided. Depth shall be as shown in the Plans. The minimum driveway depth shall be 6 inches. The Contractor shall match color, texture, and material of existing sidewalks and driveways.

All ADA requirements will be strictly enforced including ramps and slopes as shown in the plans. Sidewalk and Bus Pads shall not exceed 2% cross slope.

If a sign is to be installed in concrete, the Contractor shall place a breakaway sleeve in the concrete as shown on the Plans and as directed by the Engineer. The sleeve shall be cleared of all debris. The sign shall be installed by others.

See additional guidance, not to supersede the above special provision, included in Section E Technical Specifications Section 321623.

8-14.1(1) Textured Concrete
(March 31, 2015 Lacey GSP)

Add the following new section:

For approval of the Contractor's mix design, the attainment of the required compressive strength at 28days will be a minimum of 4000 psi as determined from the results of testing two 6 inch by 12 inch cylinders tested in accordance with WSDOT Test Methods 801 and 811. Once a mix design has been approved, it shall not be varied during the project.

Colors shall be blended to achieve a final non-uniform color. The Contractor shall provide a 3x3 foot test panel with the proposed colors and textures for each of the applications for approval. The Engineer will evaluate these panels with existing concrete completed throughout the City to ensure a consistent color and texture. Once a pattern and color have been approved, they shall not be varied during the project.

Reinforcement shall be securely fastened and supported.

Concrete shall be pigmented throughout the mix with the base color. Powdered release agent shall then be applied to give desired highlights. Release agents shall be heavy-duty quality suitable for high automobile traffic areas. Concrete shall then be stamped with inconsistencies in the pattern. After a curing period of 4 days, the concrete shall be pressure washed to remove remaining release agent.

Upon initial curing, the Contractor shall use a high pressure water blaster to clean the surface and allow it to dry.

A weatherproofing concrete sealer and a clear acrylic sealer with moss control shall then be applied to the finished surface of the textured concrete in accordance to the manufacturer's specifications.

8-14.2(1) Concrete Paving Pattern A –Crosswalk
(February 15, 2002 Lacey GSP)

Section 8-14.2(1) is added with the following:

The Contractor shall bridge the crosswalk concrete with steel plates to allow sufficient time to cure.

Concrete mix shall be Class 4000. The concrete shall have a thickness as shown in the plans. Running courses of pattern shall be perpendicular to the Concrete Bands.

Paving Pattern Type: Used Brick Basketweave

Colors: Base Color – Brick Red
Release Agent Color – Brick Red

Crosswalk Concrete Band
Concrete mix shall be Class 4000. No admixtures containing calcium chloride are permitted.

Concrete Bands shall have a medium broom surface with a quarter inch radius edging.
Concrete Bands shall not be colored.

Concrete Bands shall be reinforced as shown in the plans. Refer to Section 9-07 of the Standard Specifications.

8-14.2(2) Concrete Paving Pattern B – Truck Apron
(March 31, 2015 Lacey GSP)

Section 8-14.2(2) is added with the following:

Concrete mix shall be Class 4000. The concrete shall have a thickness as shown in the plans. Running courses of pattern shall be parallel to the service pull off.

Paving Pattern Type: Running Bond Cobble

Colors: Base Color – Classic Gray

Release Agent Color – Deep Charcoal

8-14.2(4) Concrete Paving Pattern C – Islands/Medians
(March 31, 2015 Lacey GSP)

Add the following new section:

Concrete mix shall be Class 4000. The concrete shall have a thickness as shown in the Plans. The exact width may vary in the medians. Depending upon the manufacturer submitted, the intent is to have one pattern width inside the median that does not exceed 2 feet and the long edge of brick shall be parallel to the traveled way.

Paving Pattern Type: Running Bond Brick

Colors: Base Color – Brick Red

Release Agent Color: Deep Charcoal

8-14.3(5)D New Ramp Detectable Warning
(February 14, 2023 Lacey GSP)

Add the following new section:

Detectable warning panels shall meet state and federal guidelines for ADA truncated dome detectable warning on curb ramps. The panels shall be constructed of reinforced high strength (minimum 9000 psi) concrete or a glass and carbon reinforced composite, which shall be colorfast and UV Stable. The panels shall be a slip resistant per ASTM D 2047 modified greater than 0.80 wet or dry and water resistant detectable warning panels and thermoplastic retrofits shall be "Standard Interstate Yellow" in color and be integrally pigmented into the product by the manufacturer.

8-14.3(5)E Ramp Detectable Warning Retrofit
(February 14, 2023 Lacey GSP)

Add the following new section:

Detectable warning patterns for use with ramp and landing retrofits shall be preformed thermoplastic manufactured sheets. They shall be heat applied and not require a mechanical fastener to adhere to the existing surface. Detectable warning panels and thermoplastic retrofits shall be "Standard Interstate Yellow" in color and be integrally pigmented into the product by the manufacturer. Retrofits shall also include required grinding of concrete curb and sidewalk to provide a flush transition from the roadway to the ramp to bring existing ramps up to current ADA requirements.

8-14.4 Measurement
(April 2, 2018 Lacey GSP)

Supplement this section with the following:

Cement concrete sidewalks shall be measured by the square yard of finished surface outside of the ramp pay limits and will not include the surface area of the curb ramps (i.e. the sidewalk quantities indicated on the Plans are for informational purposes only and include the ramp area). Cement Concrete sidewalks shall include cement concrete bike ramps, and bus pads.

Measurement of the Cement Concrete Curb Ramps will include the 12:1 ramp regardless of length, landing, and detectible warning pattern and will be measured per each for the ramp. Sidewalk will not be measured or paid for within the ramp area. Median refuge areas shall be measured as (2) each Cement Concrete Curb Ramps.

8-14.5 Payment
(April 2, 2018 Lacey GSP)

Supplement this section with the following:

The unit contract price for "Cement Conc. Sidewalk" per square yard shall be full pay for furnishing all materials, equipment, and labor to construct the sidewalk, and bus pads complete in-place, to include

forms, and concrete. Further, the Contractor shall make all excavations including haul and disposal, regardless of depth required, for constructing the sidewalk to the lines and grades shown, and shall include all costs associated with maintaining pedestrian access through the construction area with crushed surfacing top course or other material as approved by the Engineer.

The unit contract price for "Cement Conc. Curb Ramp", per each shall be full pay for furnishing all materials, equipment, and labor to construct the ramp or median refuge area as shown in the Plans regardless of type complete in-place, to include forms, concrete, and detectable warning pattern tiles. Further, the Contractor shall make all excavations including haul and disposal, regardless of depth required for constructing the ramp or median refuge area to the lines and grades shown, and shall include all costs associated with maintaining pedestrian access through the construction area with crushed surfacing top course or other material as approved by the Engineer.

The unit contract price for "Ramp Detectable Warning Retrofit", per each shall be full pay for furnishing all materials, equipment, and labor to retrofit an existing concrete ramp or asphalt landing, complete in-place, to include surface preparation, concrete grinding, with a detectible warning thermoplastic application and other work.

The unit contract price for "Concrete Paving Pattern _____", per square yard for cement concrete paving surfaces regardless of the pattern type required and shall be full pay for furnishing all materials, tools, equipment, labor, forms, clean-up, pattern stamps, base colors, color hardener, curing solutions, weatherproofing sealers, surface retarder, and all items required to complete the concrete work as specified. Payment for test samples and removal of test samples shall be incidental. Concrete samples, whether approved or not, shall not be removed from the project site unless otherwise approved by the Engineer.

8-15 RIPRAP

8-15.1 Description

(******)

This Work consists of furnishing and placing riprap protection of the type specified at the locations and in conformity with the lines and dimensions shown in the Plans or established by the Engineer.

Riprap will be classified as heavy loose riprap, light loose riprap, and hand placed riprap.

See additional guidance, not to supersede the above special provision, included in Section E Technical Specifications Section 313700.

8-20 ILLUMINATION, TRAFFIC SIGNAL SYSTEMS, INTELLIGENT TRANSPORTATION SYSTEMS, AND ELECTRICAL

8-20.1 Description

(******)

Modify this section with the following:

Electric Vehicle Charging Stations

See additional guidance, not to supersede the above special provision, included in Section E Technical Specifications Section 265619.

8-20.1(3) Permitting and Inspection

(November 2, 2021 Lacey GSP)

Modify this section with the following:

The Contractor shall obtain an Electrical Permit prior to performing any work on this project. Regular electrical inspections shall be scheduled by the Contractor.

All costs to obtain the Electrical Permit and comply with the requirements, shall be incidental to the project and no other compensation will be allowed.

8-20.3(5)B Conduit Type

(November 20, 2020 Lacey GSP)

Modify this section with the following:

Conduit shall be schedule 40 polyvinyl chloride (PVC) of the size shown in the on the plans. Each spare conduit shall contain a 1/8 inch diameter nylon pull cord which shall be tied off at both ends.

8-20.3(5)E Method of Conduit Installation

(November 20, 2020 Lacey GSP)

Supplement this section with the following:

Unless noted otherwise in the plans or directed by the Engineer, conduit shall be open trenched.

Where shown in the plans or as directed by the Engineer, the Contractor shall push or bore the conduits under existing pavement, curb, and/or sidewalk by using approved methods of pushing or boring. The Contractor shall be responsible for any damages including but not limited to existing underground utilities during the pavement, curb, and/or sidewalk crossing.

The Contractor shall "window" existing utilities at expected crossing conflicts to ensure clearance while pushing the conduit. The Contractor shall be responsible for any damages including but not limited to existing underground utilities during construction activities.
The Contractor may elect to push or bore conduit runs where not specifically called out in the plans. If the Contractor elects to push or bore a conduit run not specifically called out, no additional compensation will be allowed.

All costs for pushing or boring operations shall be the responsibility of the Contractor and incidental to and included in the unit or lump sum prices of the Contract and no additional payment will be made.

8-20.3(5)E2 Conduit Plowing
(November 2, 2021 Lacey GSP)

Delete this section and replace with the following:

Conduit plowing will not be permitted.

8-20.3(6) Junction Boxes, Cable Vaults And Pull Boxes
(October 16, 2016 Lacey GSP)

Supplement this section with the following:

All new junction boxes, cables vaults, and pull boxes shall have locking lids per WSDOT Standard Plans.

Existing junction boxes within this project shall be adjusted as necessary.

No Logo is required on pull boxes. The cover marking shall identify "Lacey ITS"

All existing junction boxes within the project limits shall receive two one-inch tack welds between the lid and the frame. One weld will be located adjacent to the lifting hole and the other directly opposite the lid.

8-20.3(10) Services, Transformer, Intelligent Transportation System Cabinet
(November 26, 2021 Lacey GSP)

Supplement this section with the following:

The 120/240 service shall be a 200 amp Millbank West aluminum pedestal cabinet with anodized aluminum finish, or approved equal. The service cabinet shall comply with all current PSE requirements The service interiors will accept plug-in breakers (Bryant, G.E., Westinghouse, ITE, Crouse-Hinds), and copper bussed interior which has provisions for a minimum of twelve full one inch poles. The unit shall include the following additional equipment; a service disconnect which accepts a meter with a 5th jaw in the nine o'clock position, two mercury relays, one test switch, one photocell socket, and all other associated requirements.

The 277/480 3-phase service shall be a 200 amp rated Millbank West L Style Metered Commercial Pedestal (36"Wx20"Dx60"H) with anodized aluminum finish, or approved equal. The service cabinet shall comply with all current PSE requirements Part Number 1283TL42WAAL with a self-contained safety socket with 7 Jaw type 1 configuration, T-fuse disconnect, 8 circuit load center, 42AIC short circuit rating and all other associated requirements. A disconnect shall be install 10 feet ahead of the Service. The Contractor shall be required to install the service on a pad mount base as shown in the plans per Lacey Standards.

The Contractor shall be responsible to provide for and make the necessary arrangements for connection to the PSE transformer. The Contractor shall provide the conduit and conductor of the size required per PSE standards from the service cabinet to the transformer.

8-20.3(13)B Luminaire Relocation
(November 20, 2020 Lacey GSP)

Add the following new section:

The Contractor shall relocate all luminaires as shown on the plans to new foundations. Intercept the existing conduit and conductor and extend to a new j-box adjacent to the new foundation. The Contractor shall remove and dispose of the existing foundation, conduit and other related items.

8-20.3(18) EV Site Preparation
(November 26, 2021 Lacey GSP)

Add the following new section:

This work shall include preparing each site for powering the electric vehicle chargers. This shall include coordination with Puget Sound Energy (PSE) to connect to the transformers per PSE standards to include the new disconnect and service meter as shown in the plans. This work shall include the foundation, disconnect, service/meter and all necessary components to provide power for the charging stations as shown in the plans and directed by the Engineer.

8-20.3(19) Electric Vehicle Charges
(April 28, 2022 Lacey GSP)

Add the following new section:

The Contactor in conjunction with the manufacturer shall install a complete and operational charging station from the service per the manufacturer's requirements. All stations shall meet FHWA Buy America. Chargers shall be the following:

Level 2 Commercial Charging Station shall include all work shown in the plans including foundation for a future Chargepoint CT4021-GW1 6 foot Dual Port Bollard Mount Chargers to be installed by others.

Level 3 Commercial Charging Station shall be Chargepoint Express 250 CPE250C-625-CCS1-CHD with 5 year Enterprise Cloud Plan, 5 year prepaid Assure Plan with station activation and validation. Each Level 3 charger shall have conduit stubbed to the adjacent parking stall terminating into a junction box for a future charging station to be installed later.

Type __Electric Vehicle Charger will be measured per each, from the new or existing service, including the breakers necessary for each charger to be operational.

8-20.4 Measurement
(November 26, 2021 Lacey GSP)

Add the following new section:

No unit of measurement shall apply to the lump sum price for "Type 3 Electric Vehicle Charger".

8-20.5 Payment
(November 26, 2021 Lacey GSP)

Section 8-20.5 is supplemented by the following:

All costs to obtain the Electrical Permit and comply with the requirements shall be incidental to the project and no other compensation will be allowed.
Payment will be made on the systems as follows:

"Type 3 Electric Vehicle Charger", lump sum.
"Additive #1", lump sum.
"Additive #2", lump sum.

The unit contract price per lump sum for "Type 3 Electric Vehicle Charger", "Additive #1", and "Additive #2" includes all full pay for furnishing all labor, materials, tools, and equipment necessary for the construction of the complete electrical system, modifying existing systems, or both, as shown in the plans and herein specified including excavation, backfilling, concrete foundations, conduit, conductor, breakers, junction boxes, restoring facilities destroyed or damaged during construction, and for making all required tests per PSE and the manufacturers requirements. All additional materials and labor, not shown in the plans or called for herein and which are required to complete the fully operational electrical system, shall be included in contract price.

8-21 PERMANENT SIGNING

8-21 Permanent Signing
(January 4, 2016 Lacey GSP)

Delete this section and replace with the following:

All permanent sign posts and signs shall be installed by others, with the exception of signs installed on the traffic signal system. The Contractor shall request signs a minimum of 8 weeks prior to needing the signs for traffic control.

If a sign post is to be installed in concrete, the Contractor shall install a breakaway sleeve in the concrete as shown on the plans and as directed by the Engineer. The sleeves shall be supplied by the Contracting Agency and shall be level with the existing area and cleared of debris. All signing shall be erected on a 2-3/8 inch OD round galvanized steel sign post. Installation of sleeves shall be incidental to the concrete in which it is installed.

Signs installed on the Traffic Signal System shall be incidental to the signal system.

8-22 PAVEMENT MARKING

8-22.2 Material
(**** Lacey GSP)**

Modify this section with the following:

Material for all plastic lines shall be Type A – Liquid hot applied thermoplastic at 120 mil thickness.

Material used for all plastic stop lines, plastic yield line, plastic entry line, plastic crosswalk lines, circulating lane line, plastic traffic arrows, plastic traffic letters, plastic legends, plastic symbols, and all plastic lines within the circulating lanes of the roundabout shall be Type B – Pre-formed fused thermoplastic at 120 mil thickness.

See additional guidance, not to supersede the above special provision, included in Section E Technical Specifications Section 321723.

8-22.3 Construction Requirements

(February 14, 2023 Lacey GSP)

Supplement this section with the following:

Stop Line shall be a solid white line 24 inches wide or as shown in the plans.

Yield Line symbol (Sharks Teeth) shall be a triangle 24 inches wide and 36 inches tall or as shown in the plans.

Entry Lane Line shall be used to supplement the Yield Line Symbol for roundabouts on each approach. Entry Lane Line shall be a 24 inch wide dashed line with a 3 foot solid line and a 4 foot gap. The Entry Lane Line will be considered a Crosswalk Line.

Circulating Lane Line is the wide lane line within the crosswalks of the circulating portion of the roundabout. Where the plans identify a dashed circulating lane line this shall be an 8 inch wide dashed line with a 3 foot solid line and a 4 foot gap. The Circulating Lane Line will be considered a Wide Lane Line.

The roundabout symbol identified with the traffic arrow shall be considered part of the Traffic Arrow.

Crosswalk Line is a series of solid white lines, 24 inches, and a minimum of 6 feet long or as shown in the plans. All Crosswalk lines shall be parallel to the direction of travel conforming to details in the plans and Standard Plans.

Bicycle Legend is the bike lane grouping of the 2 by 4 foot BSF bicycle symbol and the 6 foot bicycle lane arrow.

Buffered Bike Lane consists of two solid white lines, 4 inches wide, separated by an 8 inch gap.

Parking Delineation Symbols shall be a 4 inch cross or tee.
Pavement must be dry prior to placing preformed thermoplastic pavement marking material. Preformed thermoplastic cannot be applied to a wet or damp surface or during precipitation. Once precipitation has stopped, the preformed thermoplastic can be applied to bituminous asphalt if the road surface has been dried thoroughly with all moisture removed.

Before preformed thermoplastic is placed, test the pavement to determine if moisture is present using a propane fueled heat gun. The moisture test must be observed by the Engineer before work begins. If moisture is present use a propane fueled heat gun to remove the moisture by passing heat over the area continuously. If the area is able to be dried and no moisture remains proceed with the application. If the area is unable to be dried, do not apply the material at that time. Any material installed that does not comply with this specification will be considered defective and no payment will be made.

8-22.4 Measurement
(February 14, 2023 Lacey GSP)

Modify this section with the following:

The measurement for the following items shall be as follows:

"Plastic Line" per linear foot.
"Plastic Crosswalk Line", per linear foot.
"Plastic Traffic Arrow Symbol" per each.
"Plastic Bicycle Warning Symbol", per each.
"Plastic Bicycle Lane Symbol", per each, shall be the combination of the bicycle symbol and arrow. If only one of the two symbols is used, it will be measured as a Plastic Bicycle Lane Legend.

"Plastic Parking Delineation Symbol", per each.

8-22.5 Payment
(January 4, 2016 Lacey GSP)

Supplement this section with the following items:

"Plastic Yield Line Symbol" per each
"Plastic Crosswalk Line", per linear foot.
"Plastic Bicycle Warning Symbol", per each.
"Plastic Bicycle Lane Legend", per each.
"Plastic Parking Delineation Symbol", per each.

8-50 MISCELLANEOUS

Add the following new sections:

8-50.1 BOLLARDS
(April 4, 2011 WSDOT GSP)

Description

This work shall consist of furnishing and installing steel bollards in accordance with the Plans, Standard Plans, and these Specifications, at the locations shown in the Plans or as staked by the Engineer.

Materials

Posts and Hardware
Type 1 and Type 2 bollard posts shall be ASTM A 53, NPS 3 (3" Nom.) schedule 80 steel pipe. Post sleeves shall be ASTM A 53, NPS 4 (4"Nom.) schedule 40 steel pipe.

Type 3 bollard posts shall be steel structural tubing per ASTM A 500 Gr B.

Steel plate shall be per ASTM A 36.

All steel parts shall be hot-dip galvanized after fabrication in accordance with AASHTO M 111.

Reflective Tape

Reflective tape shall be one of the following or an approved equal:

Scotchlite High Intensity Grade Series 2870
Reflexite AP-1000
Scotchlite Diamond Grade LDP Series 3970
T-6500 High Intensity (Type IV)

Concrete
Footings shall be constructed using concrete Class 3000 or Commercial Concrete.

Construction Requirements

Bollards shall be constructed in accordance with the Standard Plans. Bollard footing surfaces shall slope away from the bollard to meet pavement grade. The footing shall follow the dimensions and details of the square footing and the surface shall have a smooth trowel finish.

Bollards shall not vary more than 1/2 inch in 30 inches from a vertical plane.

Bollard posts and the exposed parts of the base assembly shall be painted in accordance with Section 6-07.3(11) for galvanized surfaces. The top coat shall match Federal Standard 595, Color No. 33538 Traffic Signal Yellow.

Measurement

Measurement for bollards will be by the unit for each type of bollard furnished and installed.

Payment

Payment will be made in accordance with Section 1-04.1, for the following bid items:

The unit contract price per each for "Bollard Type ___" shall be full pay for all labor, materials, and equipment required to install a bollard including foundation excavation, concrete footing, finishing, steel pipe and plate, paint, and other items required to install a bollard complete in-place.

8-50.2 PROJECT CLOSEOUT

(April 2, 2018 Lacey GSP)

Description

This work shall consist of completing all miscellaneous items of work in accordance with the Plans and these Specifications that are required to achieve Completion and Final Acceptance, as identified by the Engineer and the Contracting Agency. This work may include but is not limited to punch list items, record drawings, O&M Manuals, training, material acceptance documents, copies of the approved "Affidavit of Prevailing Wages Paid" for the Contractor and all Subcontractors, and any other work required in these Plans and Specifications that has not been completed.

Measurement

No unit of measurement shall apply to the lump sum price for "Project Closeout".

Payment

"Project Closeout", lump sum.

The unit contract price per lump sum for "Project Closeout" includes all compensation for all costs of completing the miscellaneous items of work identified by the Contracting Agency prior to final acceptance of the Project. A fixed lump sum price has been included in the Proposal for this work. Any additional costs anticipated or incurred by the Contractor for the work shall be included in the various lump sum and unit price bid items as found in the Proposal. Neither partial payment, nor additional compensation shall be allowed

8-50.4 CCTV ELECTRICAL

(******)

Description

This work is described in Section E Technical Specifications Section 282300.

Measurement

No unit of measurement shall apply to the lump sum price for "Illumination System".

Payment

"Illumination System", lump sum.

The unit contract price per lump sum for "Illumination System" includes all full compensation for all labor, materials, and equipment to furnish, place, assemble, and install all electrical components for the project as shown on the Plans and described in Divisions 26, 27 & 28 of the Project Technical Specifications and these Special Provisions

8-53 WHEEL STOP

(October 29, 2010 Lacey GSP)

Add the following new section:

8-53.1 Description

(October 29, 2010 Lacey GSP)

This work shall consist of furnishing and installing precast concrete wheel stops in accordance with the Plans as directed by the Engineer.

8-53.2 Materials

(October 29, 2010 Lacey GSP)

Precast Wheel Stop shall meet the requirements of Precast Traffic Curb in Section 9-18.1. Dimensions shall be as shown on the Plans.

8-53.3 Construction Requirements
(October 29, 2010 Lacey GSP)

Precast concrete wheel stops shall be placed true to line and grade as shown on the Plans. The pavement shall be dry and cleaned of loose and deleterious material prior to wheel stop placement. Wheel stops shall be anchored to the existing pavement by galvanized steel dowels embedded in holes drilled or cast into wheel stops as shown on the Plans. Firmly bond each dowel to wheel stop and to pavement. Securely install dowels into pavement and bond to wheel stop. Recess head of dowel beneath top of wheel stop.

8-53.4 Measurement
(October 29, 2010 Lacey GSP)

"Wheel Stop" shall be measured per each.

8-53.5 Payment
(October 29, 2010 Lacey GSP)

The unit contract price per each for "Wheel Stop" shall include all labor, materials, and equipment required to furnish and install the precast concrete wheel stops as shown on the Plans.

9-03 AGGREGATES

Add the following new Section:

9-03.16 Imported Pipe Bedding
(April 30, 2015 Lacey)

Bedding material for pressure mains and services shall be clean sand/gravel mixture free from organic matter and conforming to the following gradation:

Sieve Size	Percent Passing
3/4" square	100
3/8" square	70-100
U.S. No. 4	55-100
U.S. No. 10	35-95
U.S. No. 20	20-80
U.S. No. 40	10-55
U.S. No. 100	0-10
U.S. No. 200	0-3

Bedding material for gravity mains and stubs/or laterals shall be clean sand/gravel mixture free from organic matter and conforming to the following gradation:

Sieve Size	Percent Passing
3/8" square	85-100
U.S. No. 4	10-30
U.S. No. 8	0-10
U.S. No. 16	0-5

All percentages are by weight

9-03.21 Recycled Materials

(April 30, 2015 Lacey)

Section 9-03.21 is supplemented with the following:

Recycled materials will not be used unless approved by the Engineer.

9-14 EROSION CONTROL AND ROADSIDE PLANTING

9-14.2(1) Topsoil Type A

(March 3, 2022 Lacey GSP)

Supplement this section with the following:

Topsoil Type A shall be composed of a three way winter mix consisting of 2 parts soil, 2 parts compost, 3 parts sand.

Soil shall be classified as gravelly sand, well-graded sand, poorly graded sand, or silty sand.

Compost shall be a weed free well decomposed, humus-like material derived from the decomposition of grass clippings, leaves, branches, wood, and other organic materials. Compost shall be produced at a permitted solid waste composting facility. Composts containing shavings, cedar sawdust, or straw will not be permitted.

Sand shall consist of 100 percent passing the 3/8 inch sieve, minimum 95 percent passing the #4 sieve, and maximum of 5 percent passing the #100 sieve.

Topsoil shall meet the following requirements:

Screen Size (approximate particle size)	5/8” maximum
Maturity measure (C:N ratio)	30:1
Total Nitrogen	0.5% minimum
PH range	5.5-8.0
Foreign matter by dry weight	1% maximum

The Contractor shall provide a sample of the topsoil and a laboratory analysis with recommendations from the laboratory for desired additives for the Engineers approval. The Contractor shall incorporate any additives recommended by the laboratory.

9-14.3 Seed

(November 20, 2020 Lacey)

Supplement this section with the following:

There shall be several types of mixes used on this project. The list of approved seed varieties are specifically identified list below. They shall be applied at the given rates. Source identified seed shall be fourth generation or earlier. Non-Source Identified seed shall meet or exceed Washington State Department of Agriculture Certified Seed Standards. Seeds shall be certified “Weed Free”, indicating there are no noxious or nuisance weeds in the seed.

Lawn Mix - shall be applied at 200 pounds per acre and the maximum weed seed shall be no more than 0.5%. Grass seed of the following composition, proportion, and quality shall be applied as follows:

Kind and Variety of Seed	Percent By Weight	Minimum Pure Seed	Minimum Germination
Equal Mix 3-Perennial Ryegrasses	60%	98%	90%
One Chewing Fine Fescue	20%	98%	90%
One Creeping Red Fescue	20%	98%	90%

Approved Seed Type:

Perennial Ryegrasses

Fiesta 4	Manhattan 5	Grand Slam GLD	Karma
SR 4650	Karma	Banfield	Sideways
Thrive	Wicked	Pavilion	Dasher 3
Tetradark			

Creeping Red Fescue

Salsa	Cindy	Jasper	Salem

Chewing Fescue

Tiffany	Shadow II	Treazure E	Longfellow
Weekend	Tamara	Enjoy	Victory

9-14.4 Fertilizer

(October 16, 2009 Lacey)

Supplement this section with the following:

Fertilizer for seeded areas shall be 1 pound nitrogen from ammonium sulfate, 0.5 pound water insoluble organic nitrogen, 2 pounds of phosphorous, and 2 pounds of potassium per 1,000 square feet, or a 10-20-20 turf fertilizer mix at 435 pounds per acre with 60 pounds of water insoluble organic nitrogen per acre.

Fertilizer for Trees and Shrubs shall be granular, tablet, or spikes applied at a rate recommended by the manufacturer for the size of the plant or as directed by the Engineer. Fertilizer shall be a 20-10-5 plant mix with 7% water soluble organic nitrogen and 13% water insoluble organic nitrogen or as approved by the Engineer.

Mycorrhizal fungi amendment shall be applied to all trees at a rate recommended by the manufacturer for the size of the tree.

The wetland mitigation site seeding shall not receive any fertilizer.

9-14.5(3) Bark or Wood Chip Mulch

(November 20, 2020 Lacey GSP)

Supplement this section with the following:

Bark mulch shall be a pathogen-free medium-grind Hemlock or Douglas Fir bark mulch. The Contractor shall submit a sample to the Engineer for approval prior to use.

9-14.7(4) Sod

(October 16, 2009 Lacey)

Supplement this section with the following:

Sod shall be high quality commercial turf produced on a commercial turf farm. The turf farm shall be registered with the American Sod Producers Association. Turf shall closely match texture and color of existing turf to be repaired.

9-15 IRRIGATION SYSTEM

9-15.1(2) Polyvinyl Chloride Pipe and Fittings

(October 29, 2010 Lacey)

Supplement this section with the following:

Pressure Mains - All Sizes: Polyvinyl chloride (PVC) 1120, 1220, Schedule 40, solvent weld and shall conform to ASTM D1784.
Laterals - All Sizes: Polyvinyl chloride (PVC) 1120, 1220, SDR 21.0, Class 200, solvent weld and shall conform to ASTM D1784.
Sleeving: Polyvinyl chloride (PVC), Class 40, solvent weld and shall conform to ASTM D1784.
Threaded Pipe, Adapters and Nipples: PVC 1120 or 1220, Schedule 80, conforming to ASTM D1785.

Pipe shall be marked with manufacturer's name, class of pipe, NSF seal and date and shift of manufacturing run. Pipe shall bear no evidence of interior or exterior extrusion marks.

Pipe walls shall be uniform, smooth and glossy. Pipe may be pre-belled or with individual solvent-weld couplings.

Fittings shall be PVC Schedule 40, full size. Fittings shall be of brand(s) recommended by manufacturer of pipe.

9-15.2 Drip Tubing

(October 29, 2010 Lacey)

Supplement this section with the following:

Dripline shall be Netafim Techline CV or Engineer approved equal. Dripline fittings shall also be manufactured by NETAFIM.

Distribution Line (non-pressure) with Inline Pressure Compensating Emitters – The dripline shall consist of nominal sized ½" linear low density polyethylene tubing, housing turbulent flow integral drip emitters. The tubing shall have an outside diameter (O.D.) of approximately 0.66" and an inside diameter (I.D.) of approximately 0.56". The turbulent flow path emitters shall be molded from virgin polyethylene resin with no moving parts. The turbulent flow path emitters shall have nominal discharge rates of 0.06 gallons per hour (GPH). The distribution tubing to be available with multiple (18" preferred) on center spacing options between emitters.

9-15.3 Automatic Controllers

(October 29, 2010 Lacey)

Modify this section with the following:

Automatic Irrigation Controller shall be Toro Sentinel Series or Engineer approved equal with ET-based run time capabilities, pedestal mounted, with surge protection, data retrieval card, and antenna, and ground rod per NEC. Frequency shall be preset at 462.9125. Provide one (1) hand-held remote radio unit.

Automatic Irrigation Controller enclosure shall be a stainless steel cabinet.

9-15.3(1) Battery-Powered Controller

(October 29, 2010 Lacey)

Modify this section with the following:

Battery powered controllers shall be used on the wetland mitigation site. The controller shall be a pedestal mount TORO DDCWP, 4, 6 or 8 station controller with locking enclosure. The controller shall have a field transmitter and a control module sized for the number of zones or stations it shall serve. System shall include all solenoid adapters and Toro DC 220 Valve with latching solenoid, as required to operate the system in full.

9-15.4 Irrigation Heads

(March 3, 2022 Lacey GSP)

Modify this section with the following:

In non-drip irrigated areas, pop-up sprinkler heads shall be Rain Bird model No. 1800-SAM-PRS series 12" pop-up "Pressure Regulating Spray" with "Seal-A-Matic" check valves, or Engineer approved equal. In turf areas where gear-driven sprinkler heads are impractical such as planter strips, pop-up sprinkler heads shall be Rain Bird model No 1800-SAM-PRS series 6" pop-up "Pressure Regulating Spray" with "Seal-A-Matic" check valves, or Engineer approved equal. Use 4" pop-up heads for street trees within tree grates, unless otherwise noted on the plans. All nozzles shall be plastic. All spray heads shall be installed on a triple swing joint at base of head casing.

Gear driven sprinkler heads for large turf areas shall be Hunter I-40 gear driven rotors, 4" minimum pop-up, as manufactured by Hunter Industries, or Engineer approved equal. Gear driven sprinkler heads for medium turf areas shall be Hunter I-20 Series Rotors, 4" minimum pop-up, or Engineer approved equal. All heads shall have check valves to prevent low head drainage. All rotor heads shall be installed on a triple swing joint.

9-15.7(2) Automatic Control Valves

(March 3, 2022 Lacey GSP)

Modify this section with the following:

Remote control valves, including the master valve, shall be Weathermatic Black Bullet Max series valve or approved equal. The remote control valve shall be a normally closed, 24 VAC 50/60 cycle solenoid actuated globe/angle pattern design. The valve pressure rating shall not be less than 150 psi. All control valves shall have pressure regulating modules where system pressure has been verified to exceed 80 psi. All valves shall be double unioned with a schedule 80 ball valve on the inlet side of the valve.

Only one control valve shall be installed per valve box.

The valve body and bonnet shall be constructed of high-impact, weather-resistant PVC with stainless steel screws.

The valve shall have manual open/close control (internal bleed) for manual opening and closing of valve without electrically energizing the solenoid. The valve's internal bleed shall prevent flooding of the valve box.

The valve shall have a flow control stem for accurate manual regulation and/or shut off of outlet flow. The valve must open or close in less than 1 minute at 150 psi, and less than 30 seconds at 20 psi.

9-15.7(3) Drip Irrigation Control Valves

(October 29, 2010 Lacey)

Drip zone valve assemblies shall be Weathermatic zone valve with a disc filter or Engineer approved equal. Control zone kits to include shut off valve, and electric control valve.

9-15.8 Quick Coupling Equipment

(October 29, 2010 Lacey)

Modify this section with the following:

Quick coupling shall be a 1" Rain Bird model No. 44LRC, or Engineer approved equal. The Contractor shall supply one (1) Rain Bird 2049 locking cover key, and one (1) Rain Bird SH-1 Series Hose Swivel to the Engineer.

9-15.17 Electrical Wire and Splices

(October 29, 2010 Lacey)

Modify this section with the following:

Valve wire shall be direct burial wire, Copper, insulated single strand, minimum size AWG No. 14, 600 V., UL approved as Type UF. Color code as follows:
White: Common ground wire.
Red: Control valve wire.
Yellow: Spare wire.
Splice: Spears DRI-Splice Wire Connector DS400 or approved equal.

9-15.20 Flow Sensor

(October 29, 2010 Lacey)

Add the following new section:

Flow sensor shall be Badger Meter Data Industrial model No. IR220P flow sensor mounted in a schedule 80 PVC Tee with socket ends and installed with flow sensor wire. Wire shall be direct burial type, 2-wire, shielded, 18 gauge or larger, single run with no splices.

9-15.21 Valve Boxes

(October 29, 2010 Lacey)

Add the following new section:

Valve Boxes shall be plastic boxes, as manufactured by Applied Engineering Products, or Engineer approved equal, as follows:

Ball Valve	Model 910 L (10" round)
Quick Coupler Valve	Model 910 L (10" round, no 6" pit boxes)
Flow Sensor	Model 1320 12" High (jumbo)
Remote Control Valve	Model 1320 12" High (jumbo)

Valve box models 1320 shall be green with bolt down lids where applicable. Size valve box to allow 3" of clearance between bottom of cover and top of equipment. Furnish and install extensions as required to achieve full depth.

9-15.22 Triple Swing Joint

(March 3, 2022 Lacey GSP)

Add the following new section:

Triple swing joint shall be 0.75 inches x 12" min. for rotors and 0.50 inches x 6" min. for spray heads..

9-15.25 Disc Filter

(October 29, 2010 Lacey)

Add the following new section:

Disc filter shall be NETAFIM disc filter.

9-15.26 Backflow Preventer

(October 29, 2010 Lacey)

Add the following new section:

Backflow preventer shall be AWWA approved Double Union Double Check Valve Assembly designed to prevent the backflow of pollutants that are objectionable but not toxic, from entering into the potable water supply.

9-21 RAISED PAVEMENT MARKING

9-21.1 Raised Pavement Markers Type 1

(March 3, 2022 Lacey GSP)

Modify this section with the following:

Markers Type 1 shall be thermoplastic markers. Only the models and manufacturers identified in the Qualified Products List (QPL) will be accepted.

9-21.2 Raised Pavement Markers Type 2

(March 3, 2022 Lacey GSP)

Supplement this section with the following:

Markers Type 2 shall have an abrasion resistant coating. Only the models and manufacturers identified in the Qualified Products List (QPL) will be accepted.

9-29 ILLUMINATION, SIGNALS, ELECTRICAL

9-29.2(1)A Standard Duty Junction Boxes

(October 16, 2016 Lacey GSP)

Modify this section with the following:

The standard duty concrete junction box steel frame with locking lid, lid support, and lid shall be hot dip galvanized in accordance with ASTM M111.

9-29.6 Light and Signal Standards

(July 5, 2018 Lacey GSP)

Supplement this section with the following:

Roadway Light Poles
The roadway poles shall be a round aluminum satin finish type 2 tapered elliptic single or double luminaire mast arm..

Decorative Dual Function Light Poles
All roadway poles shall be decorative dual functional poles with a round aluminum black finish type 2 tapered elliptic single or double luminaire mast arm.

These poles shall have a decorative Lumec mid-pole aluminum bracket CRFS-F-0DEG-BXTX with orientation as shown in the plans. These poles shall also have Olympic Foundry decorative base FG3546-BK with oversized access door or Hapco Stafford structural bottleneck style base cover with a flush reinforced hand hole cover and a decorative cast aluminum transition ring with a two piece cast aluminum base cover alloy 356.

Both these light poles shall meet the following dimensions:

Single Mast Arm

Nominal Mounting Height (ft)	Wall Thickness (in)	Arm Length (ft)	Bottom Shaft (in)	Top Shaft (in)	Bolt Circle
40	0.219	6	8	4.5	11-12
30	0.188	6	8	4.5	11-12

Dual Mast Arm

Nominal Mounting Height (ft)	Wall Thickness (in)	Arm Length (ft)	Bottom Shaft (in)	Top Shaft (in)	Bolt Circle
40	0.250	6	10	6.0	14-15
30	0.250	6	8	4.5	11-12

Flashing Beacon Light Poles
The flashing beacon light poles shall support the flashing beacon pedestrian crossing apparatus. These poles shall be a round aluminum black type 2 tapered elliptic single luminaire mast arm with a two piece black cast aluminum 356 base cover alloy similar to the Stafford cover. At a minimum this cover shall have two protruding rings at the top and represent the same relative shape.

These poles shall the following dimensions:

Flashing Beacon Single Mast Arm

Nominal Mounting Height (ft)	Wall Thickness (in)	Arm Length (ft)	Bottom Shaft (in)	Top Shaft (in)	Bolt Circle
40	0.250	6	8	4.5	11-12

9-29.10(6) LED Head Luminaires

(November 20, 2020 Lacey GSP)

Add the following new section:

All luminaires shall be of the type specified. Any luminaires proposed to be considered equal shall meet or exceed the photometric curves, meet the design parameters of the project and shall meet the following requirements: The light emitting diode (LED) fixtures shall be made in the USA. Fixture shall have tool-less access for driver change out. All fixtures shall utilize flexible wattage selection. The fixture shall have Type III asymmetrical distribution, full cut off with 4,000K color band and guarantee to exceed 100,000 hours of operational life. Fixtures shall have built-in bubble level. The fixture shall pass the LM80 test with a resistance to elements of (-40 C/-40 F to 50 C/12 F). Head color shall match the type of pole specified.

400W LED Equivalent shall be LED Phillips Lumec RoadFocus model number:
RFL-180W80LED4K-G2-R3M-UNIV-RCD-(Color varies to match pole).

200W LED Equivalent shall be LED Phillips Lumec RoadFocus model number:
RFM-72W32LED4K-G2-R3M-UNIV-RCD-(Color varies to match pole).

Pedestrian scale lights shall be LED Phillips Lumec model number: [L80-023]-35WLED4K-T-PC-CS-LE3-240-FAWS-BLTX.

9-29.19 Pedestrian Push Buttons

(November 20, 2020 Lacey GSP)

Supplement this section with the following:

The pedestrian push buttons used on this project shall be model XAV2-LED push button stations manufactured by Polara Engineering Inc. 4115 W. Artesia Avenue Fullerton, CA 92833. The stations are connected to the control unit utilizing Belden 27601A, 18 AWG stranded conductor cable.

Each accessible pedestrian signal (APS) shall be a complete APS pushbutton system at each pedestrian pushbutton location. Equipment shall be Polara Engineering EZ Communicator Navigator 2-wire system (EN2).

The pushbutton shall include an integral 5" x 7 ¾" hi-intensity retroreflective MUTCD R10-3b informational sign. Braille shall not be included. Housing color shall be all black.

A special voice message shall be preinstalled. Voice shall be male. The pushbutton must be able to provide a locating tone, 5 walk sound choices, 3 clearance sound choices and direction of travel as standard feature. System shall be able to play emergency preemption message.

Speech message shall be provided in the following format for traffic signals and Pedestrian Hybrid Signals:

"Wait"
"Wait to cross _(A)_ at _(B)_ traveling _(direction of travel)_."
"Walk sign is on to cross ___A)___."

Street names will be identified in the submittals by the Contracting Agency.

9-29.25 Amplifier, Transformer, and Terminal Cabinets

(November 20, 2020 Lacey GSP)

Delete Item #1 and replace with the following:

All cabinets shall be rain tight and constructed of 0.125 inch minimum 5052 alloy aluminum H32 ASTM designator minimum and shall be of sufficient size to hold 36 terminals. Terminal cabinets shall be rigidly mounted on channel standoffs with nipple from terminal cabinet into pole as directed by the Engineer

APPENDICES

APPENDIX A
COL RAM FORMS

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PROJECT:	**SUBMITTAL NO.**
LACEY CONTRACT NO. PW___-20____	Date sent to City:

Request for Approval of Material, Product or Shop Drawing

Contractor:	Subcontractor:

No. of Pages	Item: Material, Product or Shop Drawing	Specification Reference

☐ This item is as specified **OR** ☐ This item is a substitution/or equal
Material/Product Substitution Request shall be submitted

☐ Supplier/Subcontractor certifies material/product conforms to contract.

Review Priority: ☐ 1 ☐ 2 ☐ 3 Requested Due Date:

Notes to Engineer:

City of Lacey Engineer:	Date Approved by City:
☐ Rejected	New Submittal Required.
☐ Revise and Resubmit	See Engineer's comments.
☐ Conditionally Approved	See items included in Engineer's comments.
☐ Conditionally Approved	No exceptions noted.

Review of the materials, products or plans do not relieve the contractor from compliance with requirements of the contract documents and does not necessarily constitute acceptance for materials, products or plans to be incorporated in the work. This review is for general conformance of the project's conceptual design and general compliance with the project's plans and specifications.

Date City Transmitted to Contractor:	Date Contractor Transmitted to Subcontractor/Supplier:

Date Received by City of Lacey:	Reviewed by: (Name/Company)

Engineer's Comments:

1.

PROJECT: A	SUBMITTAL NO. C
LACEY CONTRACT NO. PW___-20____ B	

Request for Approval of Material, Product or Shop Drawing

Contractor: D	Subcontractor: E

No. of Pages	Item: Material, Product or Shop Drawing	Specification Reference
F	G	H

Section 1

☐ This item is as specified I1 **OR** ☐ This item is a substitution/or equal Material/Product Substitution Request shall be submitted I2

☐ Supplier/Subcontractor certifies material/product conforms to contract.

Review Priority: ☐ 1 K ☐ 2 ☐ 3 Requested Due Date: L

Notes to Engineer:

M

City of Lacey Engineer: R	Date City Transmitted to Contractor: S
☐ Rejected	New Submittal Required.
☐ Revise and Resubmit	See Engineer's comments.
☐ Conditionally Approved	See items included in Engineer's comments.
☐ Conditionally Approved	No exceptions noted.

Q

Review of the materials, products or plans do not relieve the contractor from compliance with requirements of the contract documents and does not necessarily constitute acceptance for materials, products or plans to be incorporated in the work. This review is for general conformance of the project's conceptual design and general compliance with the project's plans and specifications.

Date Received by Contractor: T	Date Returned to Subcontractor/Supplier: U

Section 3

Date Received by City of Lacey: N	Reviewed by: (Name/Company) O

Engineer's Comments:

1. P

Section 2

Section 1

The **Project Manager** shall fill in items **A** and **B**. The "Request for Approval of Material, Products or Shop Drawing" form shall be included in the specifications.

A Project Manager enters in the project title that matches the plans and specifications.

B Project Manager enters in PW project number that matches the plans and specifications.

The **Contractor** shall fill out the "Request for Approval of Material, Product or Shop Drawing" form for all materials or products that will be installed and Shop Drawing that will be used in the project. The form and the submittal shall be sent in the same e-mail. Submittals that exceed 10 MB shall either be provided on a CD, a flash drive or an internet link.

The products and materials that are specific to the project shall be circled or highlighted. If a submittal includes products or materials that are not project specific then these items shall be crossed out. Project Submittals that exceed 10 pages shall be submitted in Adobe Acrobat format and include a table of contents. Submittals that are not submitted in this format may be rejected outright and the contractor will be required to resubmit in the correct format.

The contractor shall enter in items **C**, **D**, **E**, **F**, **G**, **H**, **I**, **J**, **K**, **L**, and **M**.

C Contractor enters in the submittal number. The first "Request for Approval of Material, Product or Shop Drawing" submittal number shall be 1.0, the second shall be 2.0, the third shall be 3.0, etc.

When a "Request for Approval of Material, Product or Shop Drawing" requires resubmitting, the next submittal shall be the first part of the submittal number and then 0.1. Example: If submittal 9.0 requires resubmitting, then the resubmittal shall be 9.1. If a second resubmittal is required, then the next resubmittal shall be 9.2.

D Contractor shall fill in their name.

E Contractor shall fill in the subcontractor that is requesting approval. If only the General Contractor is requesting approval, then NA (not applicable) shall be entered.

F The number of pages for each specific material, product or shop drawing shall be entered.

G The specific material, product or shop drawing shall be entered. Material or product will be the trade name of the product or the name it is most easily recognized by. Materials or products that are similar (i.e. pipe fittings) can be bundled into one submittal.

H The specification that pertains to the specific material, product or shop drawing shall be entered. This information is critical in comparing the material, product or shop drawing to the specifications. You may also list Plan Sheet number or Special Provision page in this area.

I The Contractor shall check if the items submitted are either specified (I1) or that the submitted item is a substitution or equal (I2). If the product is a substitute or equal, then a Material/Product Substitution Request shall be submitted.

J The Contractor shall check that supplier and/or subcontractor certifies the bid item.

K The Contractor shall check if the submittal for approval is a high (1), average (2) or low (3) priority. The City of Lacey will review priority submittals as quickly as possible. Note: The majority of the submittals shall be checked as priority 2 or 3. Priority 1 submittals shall be critical or long lead items.

L A due date can be entered by the contractor. The City of Lacey will endeavor to review and return the request for approval by the requested due date.

M Any additional notes that the Contractor finds would assist the City of Lacey in reviewing the submittal can be entered in here.

Section 2

The **City of Lacey Engineer** shall fill in items **N**, **O** and **P**.

N Enter the date that the City of Lacey received the "Request for Approval of Material, Product or Shop Drawing" from the Contractor.

O Enter the name and company of the person that reviewed the submittal.

P Any comments regarding changes needed, resubmittals requirements, conditional approval, etc. shall be entered.

Section 3

The **City of Lacey Engineer** shall fill in items **Q**, **R**, and **S**.

Q Either "Rejected: New Submittal Required.", "Review and Resubmit: See Engineer's comments.", "Conditionally Approved: See items included in Engineer's comments:", or "Conditionally Approved: No exceptions noted" shall be checked".

R Enter the name of the Engineer sending the submittal back to the Contractor. The Engineering sending the form back may not necessarily be the Engineer completing the review.

S Enter the date that the City of Lacey transmits the "Request for Approval of Material, Product or Shop Drawing" to the Contractor.

The **Contractor** shall enter in items **T** and **U** for their own records. If there is a discrepancy between the **S** "Date City Transmitted to Contractor" and **T,** the Contractor shall notify the City of Lacey within 3 working days.

T Contractor enters the date that they received the completed "Request for Approval of Material or Shop Drawing".

U Contractor enters the date that that they return the completed "Request for Approval of Material or Shop Drawing" to the Subcontractor/Supplier.

APPENDIX B
TRAFFIC CONTROL PLANS

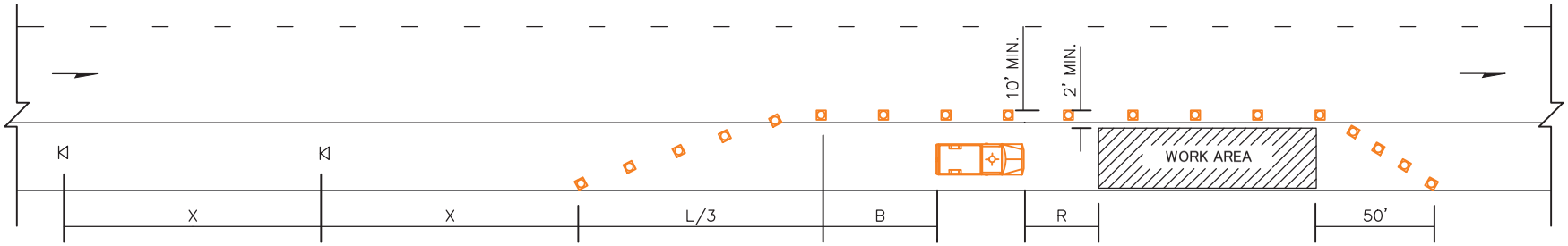
SIGN SPACING = X (1)	DESIGN SPEED (MPH)	FEET
URBAN ARTERIALS	35 / 40 MPH	350'
URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' (2)
RESIDENTIAL STREETS	25 MPH OR LESS	100' (2)

(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERSECTIONS AND DRIVEWAYS.

(2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

MINIMUM SHOULDER TAPER LENGTH = L/3 (FEET)					
SHOULDER WIDTH (feet)	DESIGN SPEED MPH				
	25	30	35	40	45
8'	40	40	60	90	120
10'	40	60	90	90	150
USE A 3 DEVICES TAPER FOR SHOULDERS LESS THEN 8'					

CHANNELIZATION DEVICE SPACING (FEET)		
DESIGN SPEED MPH	TAPER	TANGENT
35/40	30	60
25/30	20	40



W20–1

W21–5

BUFFER DATA					
LONGITUDINAL BUFFER SPACE = B					
DESIGN SPEED (MPH)	25	30	35	40	45
LENGTH (FEET)	155	200	250	305	360
BUFFER VEHICLE ROLL AHEAD DISTANCE = R					
PROTECTIVE VEHICLE MAY BE A WORK VEHICLE STRATEGICALLY LOCATED TO SHIELD THE WORK AREA.	NO SPECIFIED DISTANCE REQUIRED				

LEGEND

- **TEMPORARY SIGN LOCATION**
- **CHANNELIZING DEVICES**
- **PROTECTIVE VEHICLE**

NOTES:

1. DEVICE SPACING FOR THE DOWNSTREAM TAPER SHALL BE 20' (FT).
2. ALL SIGNS ARE BLACK ON ORANGE.
3. REFER TO THE MUTCD FOR SIGN DIMENSIONS.

SHOULDER CLOSURE – LOW SPEED (40 MPH OR LESS)

TC–5

BUFFER DATA					
LONGITUDINAL BUFFER SPACE = B					
DESIGN SPEED (MPH)	25	30	35	40	45
LENGTH (FEET)	155	200	250	305	360
BUFFER VEHICLE ROLL AHEAD DISTANCE = R					
PROTECTIVE VEHICLE MAY BE A WORK VEHICLE STRATEGICALLY LOCATED TO SHIELD THE WORK AREA.	NO SPECIFIED DISTANCE REQUIRED				

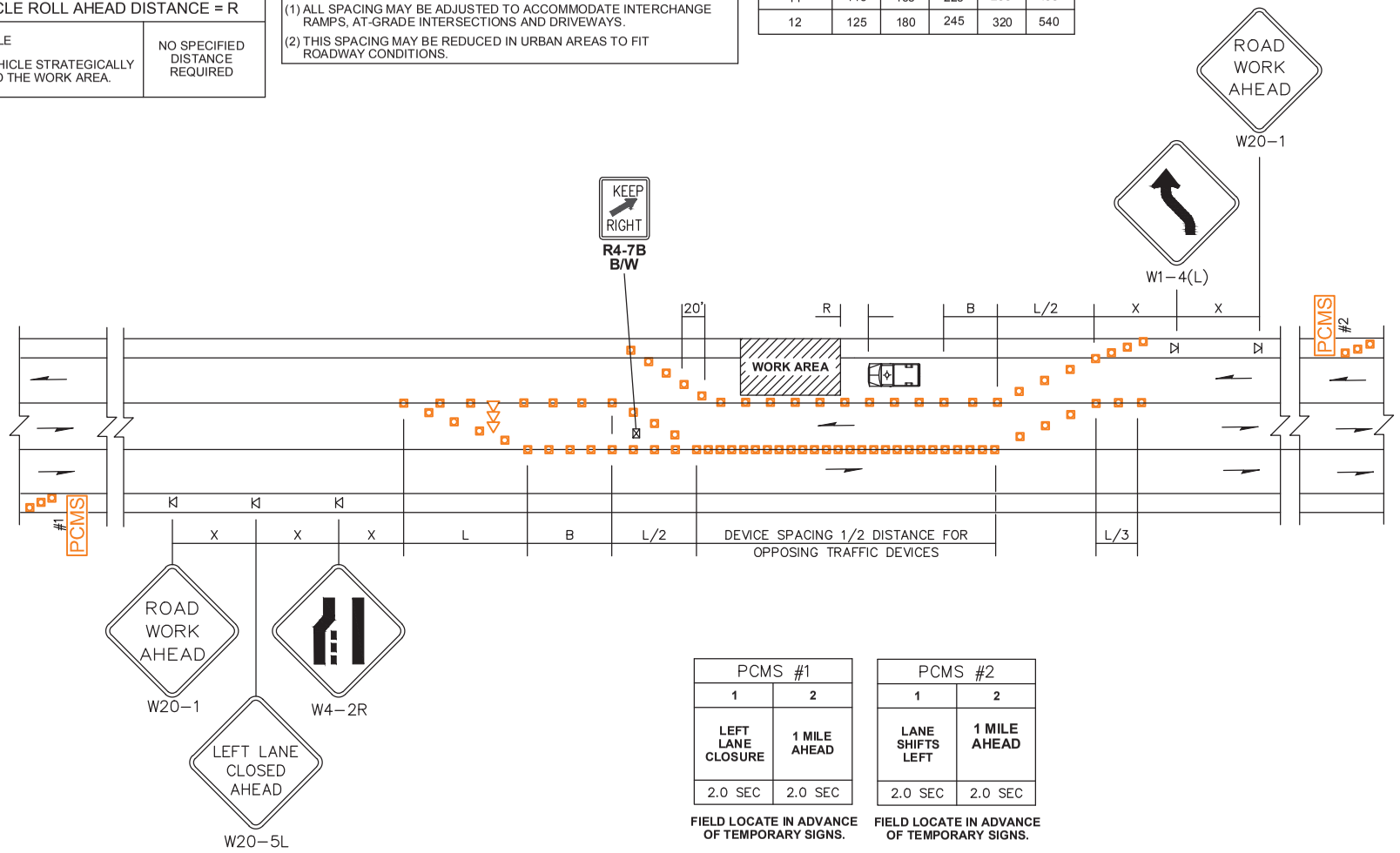
SIGN SPACING = X (1)	DESIGN SPEED (MPH)	FEET
URBAN ARTERIALS	45 MPH	500'
URBAN ARTERIALS & COLLECTORS	35 / 40 MPH	350'
COLLECTORS, RESIDENTAL & BUSINESS DISTRICTS	25 / 30 MPH	200' (2)
RESIDENTIAL STREETS	25 MPH OR LESS	100' (2)

(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS AND DRIVEWAYS.

(2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

MINIMUM TAPER LENGTH = L (FEET)						
LANE WIDTH (FEET)	DESIGN SPEED (MPH)					
	25	30	35	40	45	
10	105	150	205	270	450	
11	115	165	225	295	495	
12	125	180	245	320	540	

CHANNELIZATION DEVICE SPACING (FEET)		
DESIGN SPEED (MPH)	TAPER	TANGENT
35/45	30	60
25/30	20	40



PCMS #1	
1	2
LEFT LANE CLOSURE	1 MILE AHEAD
2.0 SEC	2.0 SEC

FIELD LOCATE IN ADVANCE OF TEMPORARY SIGNS.

PCMS #2	
1	2
LANE SHIFTS LEFT	1 MILE AHEAD
2.0 SEC	2.0 SEC

FIELD LOCATE IN ADVANCE OF TEMPORARY SIGNS.

LEGEND

- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- SEQUENTIAL ARROW SIGN
- PROTECTIVE VEHICLE
- PCMS — PORTABLE CHANGEABLE MESSAGE SIGN
- TEMPORARY SIGN LOCATION (5' MOUNTING HEIGHT)

NOTES

1. SEE SPECIAL PROVISIONS FOR WORK HOUR RESTRICTIONS.
2. FOR SPEED LIMIT OF 30 MPH OR LESS, USE SIGN W1-3 IN LIEU OF SIGN W1-4.
3. RECOMMENDED EXTENDING DEVICE TAPER (L/3) ACROSS SHOULDER.
4. ALL SIGNS ARE BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED.
5. REFER TO THE MUTCD FOR SIGN DIMENSIONS.

LANE SHIFT
THREE LANE ROADWAY
TC-12

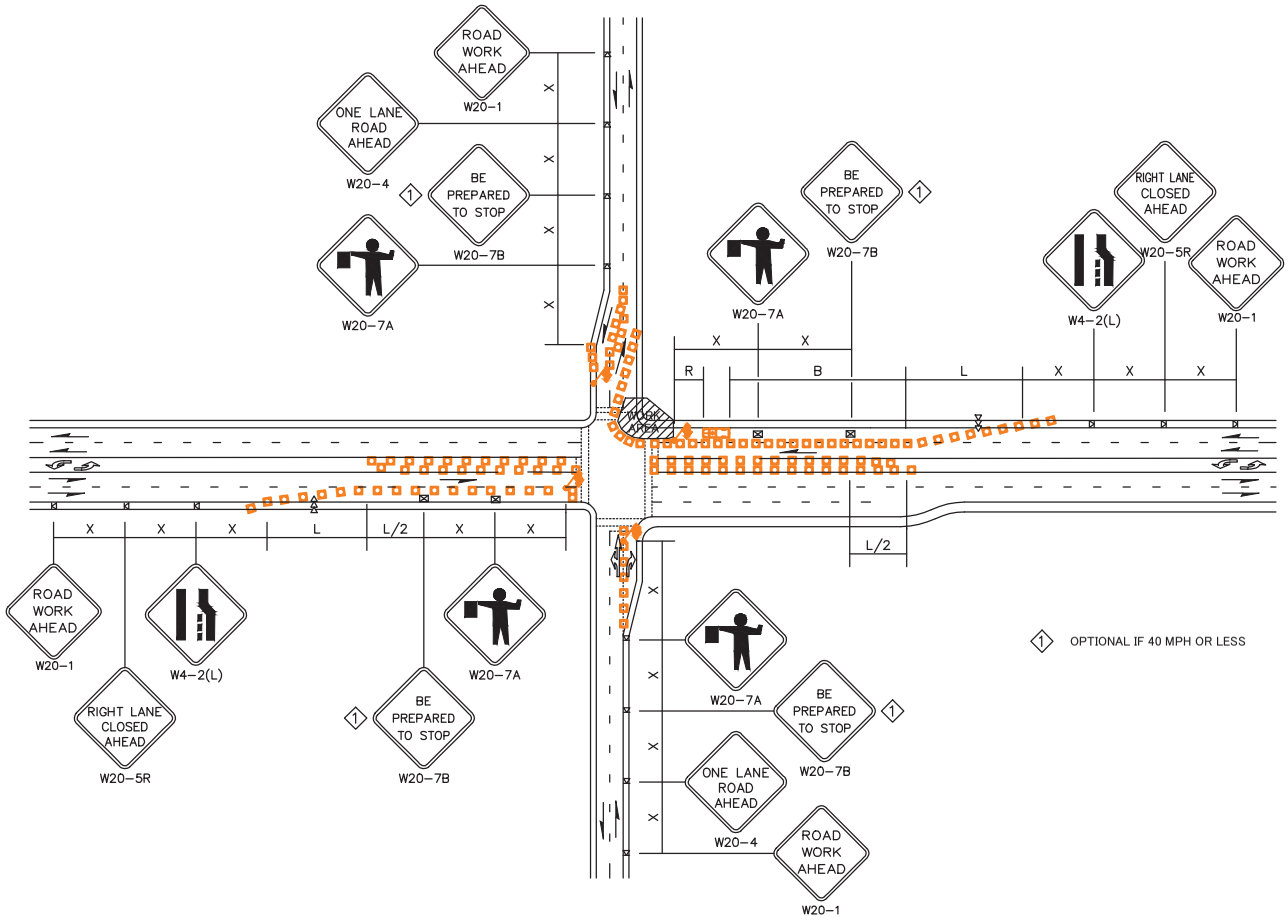
BUFFER DATA					
LONGITUDINAL BUFFER SPACE = B					
DESIGN SPEED (MPH)	25	30	35	40	45
LENGTH (feet)	155	200	250	305	360
BUFFER VEHICLE ROLL AHEAD DISTANCE = R					
PROTECTIVE VEHICLE MAY BE A WORK VEHICLE STRATEGICALLY LOCATED TO SHIELD THE WORK AREA.	NO SPECIFIED DISTANCE REQUIRED				

SIGN SPACING = X (1)	DESIGN SPEED (MPH)	FEET
URBAN ARTERIALS	45 MPH	500'
URBAN ARTERIALS & COLLECTORS	35 / 40 MPH	350'
COLLECTORS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' (2)
RESIDENTIAL STREETS	25 MPH OR LESS	100' (2)

(1) ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS AND DRIVEWAYS.
(2) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

MINIMUM TAPER LENGTH = L (FEET)						
LANE WIDTH (FEET)	DESIGN SPEED (MPH)					
	25	30	35	40	45	
10	105	150	205	270	450	
11	115	165	225	295	495	
12	125	180	245	320	540	

CHANNELIZATION DEVICE SPACING (FEET)		
DESIGN SPEED (MPH)	TAPER	TANGENT
35/45	30	60
25/30	20	40



LEGEND

- FLAGGING STATION
- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- SEQUENTIAL ARROW SIGN
- PROTECTIVE VEHICLE - RECOMMENDED
- TEMPORARY SIGN LOCATION (5' MOUNTING HEIGHT)

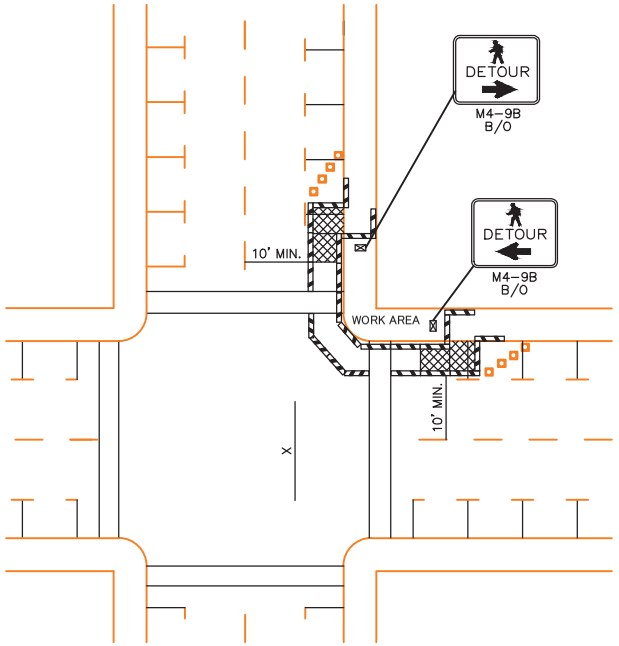
NOTES

1. RECOMMEND EXTENDING DEVICE TAPER (L/3) ACROSS SHOULDER.
2. IF A SIGNAL IS PRESENT, IT SHALL BE SET TO "RED FLASH MODE" OR TURNED OFF DURING FLAGGING OPERATIONS AND A UNIFORMED POLICE OFFICER IS REQUIRED.
3. MAINTAIN A MINIMUM OF ONE ACCESS POINT FOR EACH BUSINESS WITHIN WORK AREA LIMITS.
4. ALL SIGNS ARE BLACK ON ORANGE.
5. REFER TO THE MUTCD FOR SIGN DIMENSIONS.

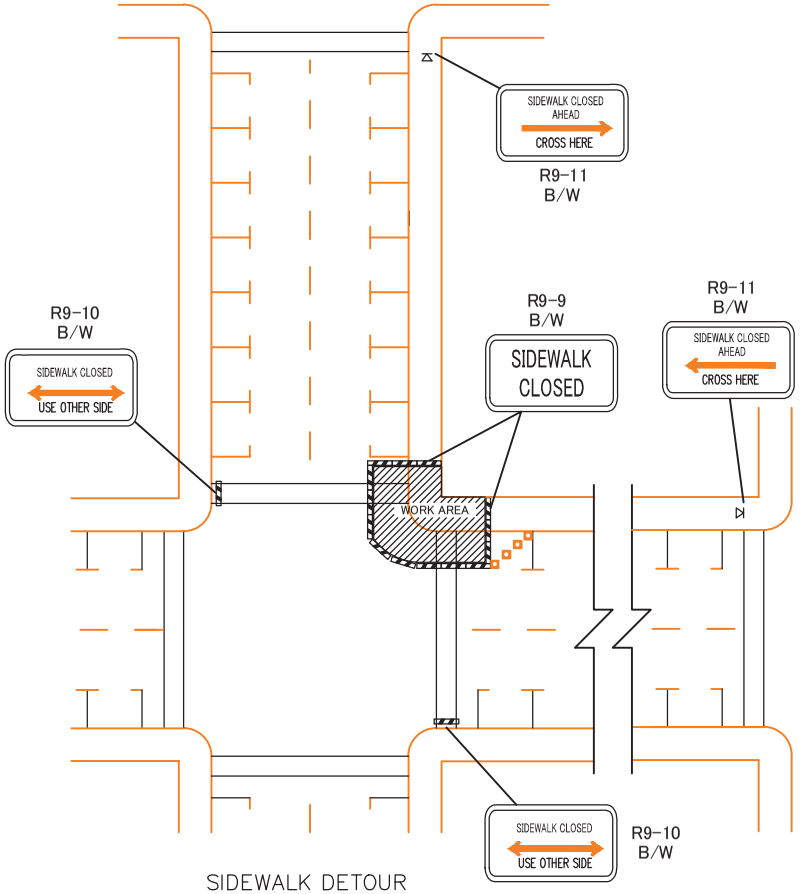
INTERSECTION LANE CLOSURE
FIVE LANE ROADWAY
TC-15

NO PARKING R8-3 R/W

INSTALL ON TYPE 2 BARRICADES THROUGHOUT THE WORK AREA
24 HOURS PRIOR TO IMPLEMENTING TRAFFIC CONTROL.
PRIOR NOTIFICATION OF LOCAL LAW ENFORCEMENT REQUIRED.



SIDEWALK DIVERSION



SIDEWALK DETOUR

LEGEND

- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- PEDESTRIAN CHANNELIZING DEVICES
- TEMPORARY PEDESTRIAN RAMP FOR SIDEWALKS

NOTES

1. CONTROLS SHOWN ARE FOR PEDESTRIAN TRAFFIC ONLY.
2. A 60" PATH WIDTH SHOULD BE MAINTAINED (48" IS THE MINIMUM).
3. CONTACT AND COORDINATE IMPACTED TRANSIT AGENCIES PRIOR TO IMPLEMENTING ANY CLOSURES.
4. SEE SHEET TC-52 FOR TEMPORARY PEDESTRIAN RAMP DETAILS.
5. ADA PEDESTRIAN FACILITIES MUST BE MAINTAINED. SEE STANDARD SPECIFICATION 1-10.2(1)B.
6. TEMPORARY PEDESTRIAN PUSH BUTTONS SHALL BE PLACED ON THE DIVERTED PATH WHEN EXISTING BUTTONS ARE NOT ACCESSIBLE TO PEDESTRIANS.
7. REFER TO THE MUTCD FOR SIGN DIMENSIONS.

INTERSECTION PEDESTRIAN TRAFFIC CONTROL

TC-16

MINIMUM LANE CLOSURE TAPER LENGTH = L (FEET)					
LANE WIDTH (FEET)	DESIGN SPEED (MPH)				
	25	30	35	40	45
10	105	150	205	270	450
11	115	165	225	295	495
12	125	180	245	320	540

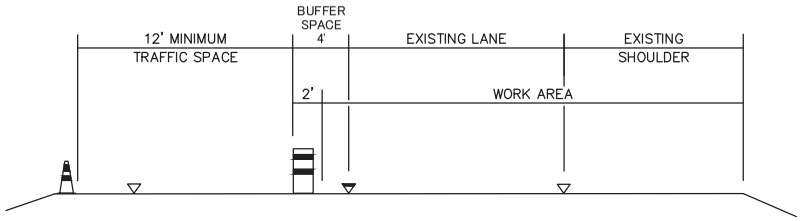
SIGN SPACING = X (1)	DESIGN SPEED (MPH)	FEET
URBAN ARTERIALS	45 / 55 MPH	500'
URBAN ARTERIALS AND COLLECTORS	35 / 40 MPH	350'
COLLECTORS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' (1)
RESIDENTIAL STREETS	25 MPH OR LESS	100' (1)

(1) THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

MINIMUM SHOULDER TAPER LENGTH = L/3 (FEET)					
SHOULDER WIDTH (FEET)					
	25	30	35	40	45
8'	40	40	60	90	120
10'	40	60	90	90	150
USE A MINIMUM 3 DEVICES TAPER FOR SHOULDER LESS THEN 8'.					

BUFFER DATA					
LONGITUDINAL BUFFER SPACE = B					
DESIGN SPEED (MPH)	25	30	35	40	45
LENGTH (feet)	155	200	250	305	360
BUFFER VEHICLE ROLL AHEAD DISTANCE = R					
PROTECTIVE VEHICLE	NO SPECIFIED DISTANCE REQUIRED				

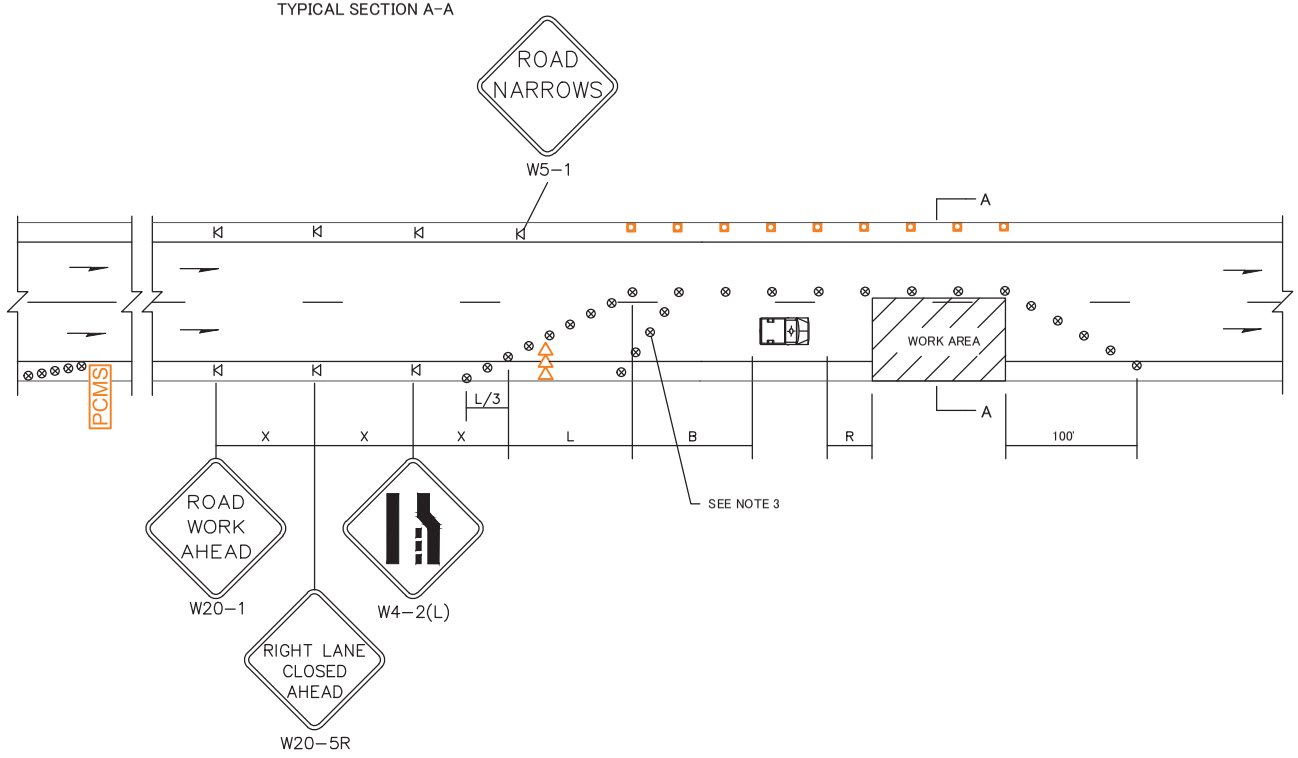
CHANNELIZATION DEVICE SPACING (FEET)		
DESIGN SPEED (MPH)	TAPER	TANGENT
35/45	30	60
25/30	20	40



TYPICAL SECTION A-A

PCMS	
1	2
RIGHT LANE CLOSURE	1 MILE AHEAD
2.0 SEC	2.0 SEC

FIELD LOCATE 1 MILE IN ADVANCE OF LANE CLOSURE SIGNING.



LEGEND

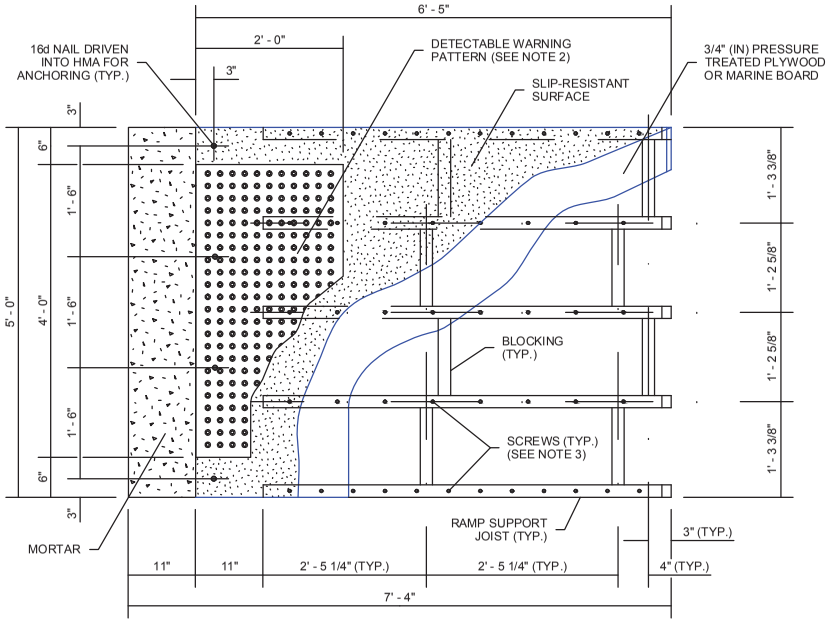
- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- TRAFFIC SAFETY DRUM
- SEQUENTIAL ARROW SIGN
- PROTECTIVE VEHICLE
- PCMS — PORTABLE CHANGEABLE MESSAGE SIGN

NOTES

1. SEE SPECIAL PROVISIONS FOR WORK HOUR RESTRICTIONS.
2. RECOMMEND EXTENDING DEVICE TAPER (L/3) ACROSS SHOULDER.
3. USE TRANSVERSE DEVICES IN CLOSED LANE EVERY 1000' □ (RECOMMENDED).
4. ALL SIGNS ARE BLACK ON ORANGE.
5. RECOMMEND ADVANCE NOTICE FOR ANY OVER WIDTH LOADS PRIOR TO LANE CLOSURE FOR ALTERNATE ROUTES IF APPLICABLE.
6. REFER TO THE MUTCD FOR SIGN DIMENSIONS.

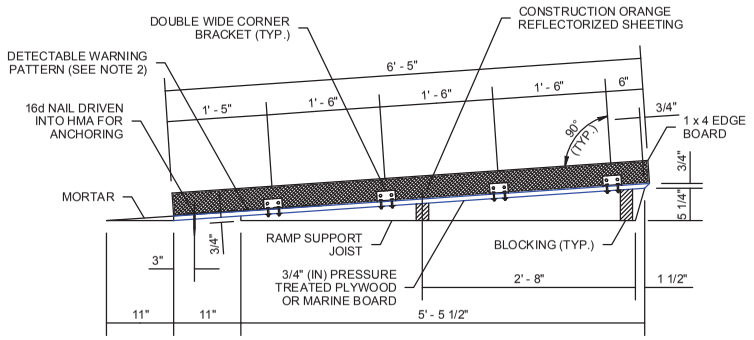
SINGLE-LANE CLOSURE WITH SHIFT

TC-17



TOP VIEW

RAMP DETAIL

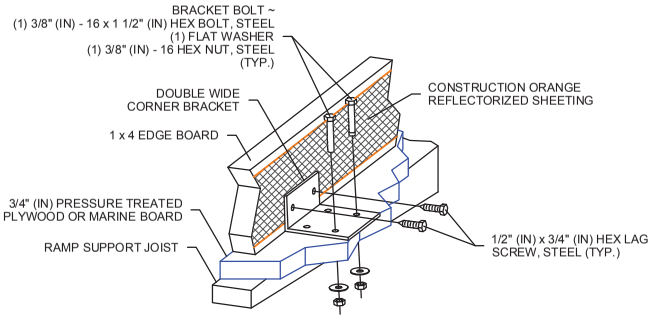


SIDE VIEW

RAMP AND EDGE BOARD

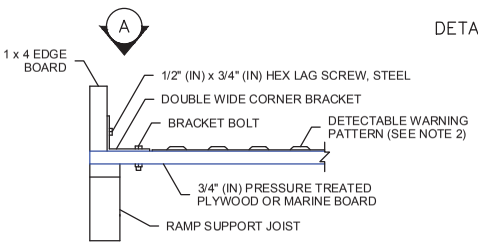
NOTES

1. THIS DESIGN ASSUMES OPTIMAL CONDITIONS AND A STANDARD CURB HEIGHT OF 6" (IN). INSTALLED RAMPS SHALL BE NO STEEPER THAN 12H : 1V, AND SHALL HAVE A CROSS-SLOPE OF 2% OR LESS. USE SHIMS OR GROUT AS REQUIRED TO ADJUST FOR EXISTING CONDITIONS AND TO PREVENT ROCKING. SHIMS SHALL BE NO HIGHER THAN 1" (IN), AND SHALL BE SECURED TO THE RAMP. FOR CURBS SHORTER THAN 6" (IN), INSTALL A RAMP ON THE SIDEWALK, NO STEEPER THAN 12H : 1V, MADE OF GROUT OR AS APPROVED BY THE ENGINEER. ADJUSTMENTS TO THE RAMP DIMENSIONS SHOWN MAY BE REQUIRED TO MATCH EXISTING CONDITIONS.
2. THE DETECTABLE WARNING PATTERN SHALL BE INSTALLED ONLY WHEN THE INTENT IS TO GUIDE PEDESTRIANS DIRECTLY ACROSS THE ROADWAY (CROSSWALK). SEE **STANDARD PLAN F-40.10** FOR DETAILS.
3. SCREWS SHALL BE USED TO SECURE THE RAMP SURFACE. SPACING SHALL BE IN ACCORDANCE WITH THE CURRENT BUILDING CODE.
4. USE A SLIP-RESISTANT TREATMENT FOR THE SURFACE OF RAMP.
5. ALL FASTENERS SHALL BE GALVANIZED.
6. DO NOT INSTALL A HAND RAILING IF USING THE EDGE BOARD OPTION.



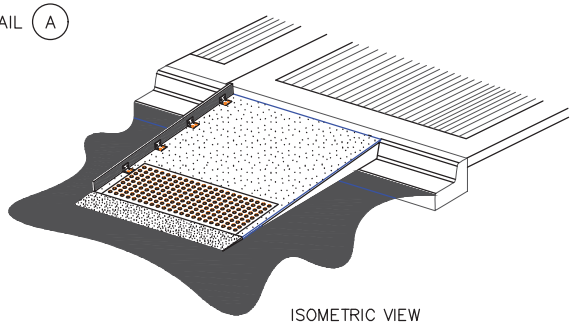
PERSPECTIVE VIEW

DETAIL (A)



END VIEW

EDGE BOARD ATTACHMENT DETAIL

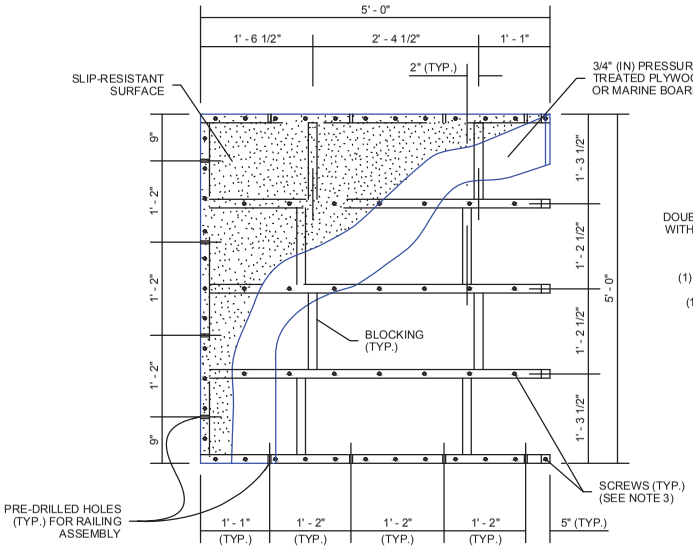


ISOMETRIC VIEW

TEMPORARY PEDESTRIAN RAMP WITH EDGE BOARD

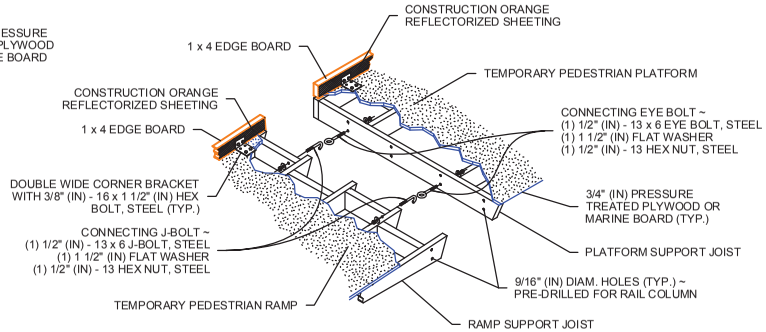
TEMPORARY PEDESTRIAN RAMP WITH EDGE BOARD

TC-52



TOP VIEW

PLATFORM DETAIL

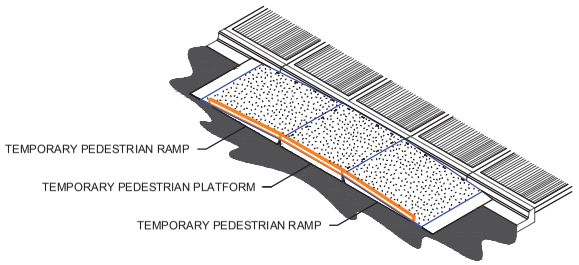


ISOMETRIC VIEW

DETAIL (A)

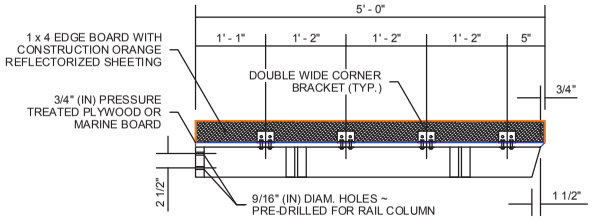
NOTES

1. ALL HOLES SHOWN SHALL BE DRILLED TO FACILITATE RE-USE AND FLEXIBLE EXPANSION.
2. SEE **SHEET REFERENCE NO. TC-52**, FOR TEMPORARY PEDESTRIAN RAMP DETAILS.
3. THIS DESIGN ASSUMES OPTIMAL CONDITIONS AND A STANDARD CURB HEIGHT OF 6" (IN). INSTALLED RAMPS SHALL BE NO STEEPER THAN 12H : 1V, AND SHALL HAVE A CROSS-SLOPE OF 2% OR LESS. USE SHIMS OR GROUT AS REQUIRED TO ADJUST FOR EXISTING CONDITIONS AND TO PREVENT ROCKING. SHIMS SHALL BE NO HIGHER THAN 1" (IN), AND SHALL BE SECURED TO THE RAMP AND/OR PLATFORM. FOR CURBS SHORTER THAN 6" (IN), INSTALL A RAMP ON THE SIDEWALK, NO STEEPER THAN 12H : 1V, MADE OF GROUT OR AS APPROVED BY THE ENGINEER. ADJUSTMENTS TO THE PLATFORM DIMENSIONS SHOWN MAY BE REQUIRED TO MATCH EXISTING CONDITIONS.
4. SCREWS SHALL BE USED TO SECURE THE RAMP SURFACE. SPACING SHALL BE IN ACCORDANCE WITH THE CURRENT BUILDING CODE.
5. USE A SLIP-RESISTANT TREATMENT FOR SURFACE OF RAMP.
6. ALL FASTENERS SHALL BE GALVANIZED.

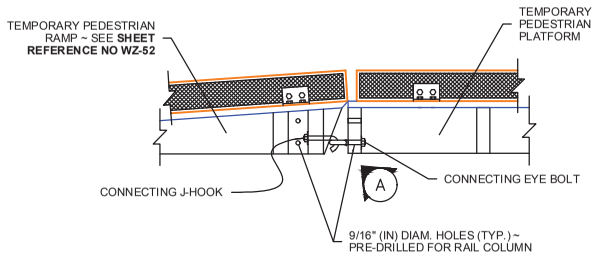


ISOMETRIC VIEW

DUAL RAMP

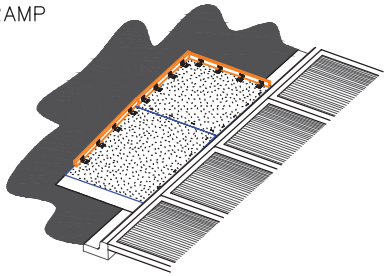


ELEVATION



SIDE VIEW

CONNECTION DETAIL



ISOMETRIC VIEW

SINGLE RAMP

TEMPORARY PEDESTRIAN PLATFORM WITH EDGE BOARD

TC-53

APPENDIX C

SWPPP

Construction Stormwater Pollution Prevention Plan (CSWPPP)

City of Lacey
420 College Street SE
Lacey, WA 98503

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KEY TERMS

BMPs	best management practices
CESCL	Certified Erosion and Sediment Control Lead
CSWGP	Construction Stormwater General Permit
DOE	Washington State Department of Ecology
LID	low-impact development
SDM	City of Lacey Storm Design Manual
SPCC	Spill Prevention, Control, and Countermeasures
SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
TMDL	total maximum daily load

1. CONSTRUCTION STORMWATER POLLUTION PREVENTION ELEMENTS

1.1 Objective of the Stormwater Pollution Prevention Plan

The purpose of a Construction Stormwater Pollution Prevention Plan (SWPPP) is to describe the potential for pollution problems on a construction project. The SWPPP also explains and illustrates the measures to be taken on the construction site to control these problems. This SWPPP is prepared according to the guidance of the City of Lacey 2022 Stormwater Design Manual (SDM) which is based on the 2019 Stormwater Management Manual for Western Washington – Washington State Department of Ecology (DOE) that has been revised for local application. The SDM describes thirteen necessary elements of construction stormwater pollution prevention. These thirteen elements include: preserving vegetation/mark clearing limits, establish construction access, control flow rates, install sediment controls, stabilize soils, protect slopes, protect drain inlets, stabilize channels and outlets, control pollutants, control de-watering, maintain Best Management Practices (BMPs), manage the project, and protect low-impact development BMPs. These elements have been addressed as follows.

1.2 Summary of Elements

The BMPs listed in this report, or their equivalent, are required. For linear projects such as roadway construction, modifying or adapting a BMP may be necessary to address unique stormwater protection challenges. Any revisions by the contractor to the BMPs listed in the SWPPP shall be approved by the Engineer. Therefore, if the contractor does not require a BMP or needs to modify a BMP, the contractor shall document the reasons and update the SWPPP to match what is being implemented in the field. A copy of the BMPs can be found in Appendix A.

1.3 Element #1: Preserve Vegetation/Mark Clearing Limits

Prior to any land disturbing activities, the construction limits shall be marked prior to any clearing to restrict clearing to the approved limits. Sensitive areas, wetland buffers, and preserved trees/vegetation shall be marked with fencing or staking flags. A high visibility fence shall be installed to delineate the location and control access of each site to be demolished prior to any work in accordance with BMP C103. The Contractor shall use best judgement selecting of the type of fencing (high orange fencing, chain-link with placards, or high visible silt fence) to be utilized based off public access to site location. A silt fence shall be installed separately or in conjunction with the high visibility fence to contain loose sediment associated with project demolition or grading within the project limits in accordance with BMP C233.

The native top soil, natural vegetation, and existing trees shall be retained in an undisturbed state to the maximum extent practicable. If it is not practicable to retain the native top soil in place, it should be stockpiled on-site, covered to prevent erosion, and replaced immediately upon completion of the ground disturbing activities. The Contractor shall determine if construction is not possible due to presence of vegetation/tree, and shall clear, grub, and dispose of accordingly.

Installation Schedule: March/April 2024 or as Contractor sees fit per construction phasing

Inspection and Maintenance Plan:

- If the fencing or clearing limits are observed to be damaged or visibility is reduced, it shall be repaired and/or replaced immediately and visibility restored.

1.4 Element #2: Establish Construction Access

Existing asphalt roads and parking lots within in the construction perimeter will be utilized as construction access to the maximum extent feasible. Locations where the existing roads are to be removed or intersections with an existing road not within the construction perimeter a stabilized construction entrance shall be constructed to minimize the tracking of sediment onto any public road. Construction vehicle access and exit shall be limited to one route, if feasible. This stabilized construction entrance shall be constructed in accordance with the requirements of BMP C105.

If sediment is tracked off-site, public roads shall be cleaned thoroughly at the end of each day, or more frequently during wet weather. Sediment shall be removed from roads by shoveling or pickup sweeping and shall be transported to a controlled sediment disposal area. Street washing will be allowed only after sediment is removed.

Should tracking of sediments off-site continue to occur, wheel washes or construction road and parking area stabilization may be needed (BMPs 106 and 107).

Installation Schedule: March/April 2024 or as Contractor sees fit per construction phasing

Inspection and Maintenance Plan:

- If sediment or quarry spalls are observed being tracked onto pavement, then alternative measures to keep the street free of sediment shall be used. This may include replacement/cleaning of existing quarry spalls, street sweeping, an increase in the dimensions of the entrance, or the installation of a wheel wash.
- If a wheel wash is installed, the wheel wash should start out the day with fresh water, and the wash water should be changed a minimum once per day. The Contractor shall determine the frequency of changing the wash water.

1.5 Element #3: Control Flow Rates

Permanent and temporary stormwater facilities shall be constructed as one of the first steps of site grading, and will be observed to function properly before constructing site improvements. Stormwater runoff shall be observed during storm events to ensure flow rates are not increased to cause erosion to off-site locations. Temporary interceptor swales are proposed to convey runoff into a temporary sediment pond before discharging and infiltrating on-site or to existing roadside ditches and storm system catch basins. If substantial flow rates are observed, check dams shall be installed to promote ponding and reduce flow rates within the swales. Temporary swales shall be constructed according to BMP C200, and shall be stabilized with temporary vegetation or other channel protection during construction. Temporary sediment ponds shall be constructed according to BMP C241.

Installation Schedule: March/April 2024 or as Contractor sees fit per construction phasing

Inspection and Maintenance Plan:

- Immediately remove sediment from within the flow path of the temporary swale following a rainfall event.
- If a temporary sediment pond is utilized, the sediment collected shall be removed from the pond when it reaches 1-foot in depth.
- Any damage to the temporary sediment pond embankments or slopes shall be repaired.

1.6 Element #4: Install Sediment Controls

To minimize the discharge of pollutants offsite, erosion and sediment controls will be installed along site perimeter as needed. Stormwater runoff from disturbed areas shall be routed through an appropriate sediment removal BMP per the Contractor's best judgement prior to runoff discharging off-site or into drain inlets. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but must ensure downstream waterways are protected from erosion due to increases in the volume, velocity, and peak flow rate of stormwater from the project site. Silt fence barriers shall be constructed in accordance with BMP C233.

In addition to silt fencing, the following BMPs are may be implemented where appropriate:

- BMP C230 – Straw Bale Barrier
- BMP C231 – Brusher Barrier
- BMP C232 – Gravel Filter Berm
- BMP C234 – Vegetated Strip
- BMP C235 – Straw Wattles
- BMP C240 – Sediment Trap
- BMP C241 – Temporary Sediment Pond
- BMP C 251 – Construction Stormwater Filtration

Installation Schedule: March/April 2024 or as Contractor sees fit per construction phasing

Inspection and Maintenance Plan:

- Repair any damage immediately.
- Intercept and convey all evident concentrated flows uphill of the silt fence to a sediment pond.
- Remove sediment deposits when the deposit reaches approximately one-third of the height of the silt fence, or install a second silt fence.
- Replace filter fabric that has deteriorated due to ultraviolet breakdown.

1.7 Element #5: Stabilize Soils

All exposed and unworked soils shall be stabilized by application of effective BMPs, which protect the soil from the erosive forces of raindrop impact, flowing water, and from wind erosion. Construction schedule phasing shall be planned to reduce the amount of soil exposed during construction activity.

From October 1 through April 30, no soils shall remain exposed and un-worked for more than 2 days. From May 1 to September 30, no soils shall remain exposed and un-worked for more than 7 days. This condition applies to all soils on-site, whether at final grade or not. Soils to be stabilized at the end of shifts prior to holidays or weekends based on weather forecasts per Contractor's best judgement.

In areas where the soils will remain un-worked for more than 30 days or have reached final grade, seeding and mulching shall be used in accordance with BMPs C120 and C121. If the soil stockpile slope is 2H:1V or greater with at least 10 feet of vertical relief, nets, or blankets shall be used according to BMP C122. Plastic covering shall be used on disturbed areas that require cover less than 30 days per BMP C123. Sod shall be used in accordance with BMP C124 for disturbed areas that require immediate vegetative cover. Dust control shall be used as needed to prevent wind transport of dust from disturbed soil surfaces and in accordance with BMP C140. Contractor to utilize available non-potable water from on-site sources or provide water tanker in order to spray down disturbed soils to minimize dust produced from construction activities.

In addition, the following BMPs may be used to stabilize soils where appropriate:

- BMP C125 – Topsoiling
- BMP C130 – Surface Roughening
- BMP C131 – Gradient Terraces

Installation Schedule: March/April 2024 or as Contractor sees fit per construction phasing

Inspection and Maintenance Plan:

- Reseed any seeded areas that fail to establish at least 80 percent cover. If reseeding is ineffective, use an alternative method such as sodding, mulching, or nets/blankets to stabilize soils.
- Reseed and protect by mulch any areas that experience erosion after achieving adequate cover.
- Supply seeded areas with adequate moisture, but do not water to the extent that runoff is generated.
- If the grass is unhealthy, the cause shall be determined and appropriate action taken to reestablish a healthy groundcover. If it is impossible to establish a healthy groundcover due to frequent saturation, instability, or some other cause, the sod shall be removed, the area seeded with an appropriate mix, and protected with a net or blanket.
- Damaged or torn plastic sheets shall be replaced and open seams shall be repaired.
- Respray areas as needed to keep dust to a minimum.

1.8 Element #6: Protect Slopes

Slopes will be stabilized as indicated in Element #5 above. Cut and fill slopes shall be constructed in a manner that will minimize erosion. In addition, the following BMPs may be implemented where appropriate:

- BMP C200 – Interceptor Dike and Swale
- BMP C205 – Subsurface Drains
- BMP C206 – Level Spreader
- BMP C207 – Check Dams

Installation Schedule: March/April 2024 or as Contractor sees fit per construction phasing

Inspection and Maintenance Plan:

- BMPs to be inspected after every runoff event to ensure that they are functioning correctly.

1.9 Element #7: Protect Drain Inlets

All storm drain inlets made operable during construction, as well as all existing structures within the project limits, shall be marked and protected so that stormwater runoff shall not enter the conveyance system without first being filtered or treated to remove sediment. Install catch basin sock filters or approved equal as shown on the TESC Plans and in accordance with BMP C220 or WSDOT standard I-40.20-00.

Contractor to prevent sediment and street wash water to enter storm drains without prior and adequate treatment.

Installation Schedule: March/April 2024 or as Contractor sees fit per construction phasing

Inspection and Maintenance Plan:

- Inlets to be inspected weekly at a minimum and daily during storm events.
- Inlet protection devices shall be cleaned and removed and replaced when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).
- Do not wash sediment into storm drains while cleaning.

1.10 Element #8: Stabilize Channels and Outlets

The temporary drainage swales shall provide stabilization, including armoring material, adequate to prevent erosion of outlets, slopes, and downstream reaches. The Contractor to contact Design Engineer for appropriate dimensions of conveyance channels if utilized.

Installation Schedule: March/April 2024 or as Contractor sees fit per construction phasing

Inspection and Maintenance Plan:

- Inspect and repair as needed.
- Install channel lining if erosion is observed.
- Install check dams if concentrated flow rates are observed during and after a runoff event.

1.11 Element #9: Control Pollutants

All pollutants, including waste materials and demolition debris, that occur on-site during construction shall be handled and disposed of in a manner that does not cause contamination of stormwater. Maintenance and repair of heavy equipment and vehicles involving oil changes, hydraulic system drain down, solvent and de-greasing cleaning operations, fuel tank drain down and removal, and other activities which may result in discharge or spillage of pollutants to the ground or into stormwater runoff must be conducted using spill prevention measures, such as drip pans. Emergency repairs may be performed on-site using temporary plastic placed beneath, and if raining, over the vehicle. Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' recommendations shall be followed for application rates and procedures.

Two source control BMPs will apply to this project:

- A Spill Prevention Control and Countermeasures Plan (prepared by Contractor)
- Street Sweeping (as needed during construction by Contractor)

Installation Schedule: March/April 2024 or as Contractor sees fit per construction phasing

Inspection and Maintenance Plan:

- Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.
- Source control BMPs shall be utilized to prevent the likelihood of pollutants being introduced on-site.

1.12 Element #10: Control Dewatering

It is not anticipated that dewatering will be required for this project.

1.13 Element #11: Maintain BMPs

All temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to ensure continued performance of their intended function. All maintenance and repair shall be in accordance with BMPs.

Sediment control BMPs shall be inspected weekly or after a runoff-producing storm event during the dry season and daily during the wet season.

All temporary erosion and sediment control BMPs shall be removed within 30 days after final site stabilization is achieved, or after the temporary BMPs are no longer needed. Trapped sediment shall be 23 removed or stabilized on-site. Disturbed soil areas resulting from removal of BMPs or vegetation shall be permanently stabilized.

1.14 Element #12: Manage the Project

1.14.1 Phasing of Construction

The project shall be phased where feasible in order to prevent, to the maximum extent practicable, the transport of sediment from the site during construction. Revegetation of exposed areas and maintenance of that vegetation shall be an integral part of the clearing activities for each phase. Installation of temporary sediment control devices shall be implemented in accordance with the respective phase of construction activities.

1.14.2 Seasonal Work Limitations

From October 1 through April 30, clearing, grading, and other soil disturbing activities shall only be permitted if silt-laden runoff will be prevented from leaving the construction site.

The following activities are exempt from the seasonal clearing and grading limitations:

- Routine maintenance and necessary repair of erosion and sediment control BMPs;
- Routine maintenance of public facilities or existing utility structures that do not expose the soil or result in the removal of the vegetative cover to the soil; and
- Activities where there is 100 percent infiltration of surface water runoff within the site in approved and installed erosion and sediment control facilities.

1.14.3 Inspection and Monitoring

All BMPs shall be inspected, maintained, and repaired as needed to ensure continued performance of their intended function.

Sampling and analysis of the stormwater discharges from the construction site may be necessary to ensure compliance with standards.

Whenever inspection and/or monitoring reveals that the BMPs identified in the construction SWPPP are inadequate, due to the actual discharge of or potential to discharge a significant amount of any pollutant, the construction SWPPP shall be modified, as appropriate, in a timely manner.

Site inspections shall be conducted by the identified CESCL. The CESCL must be on-site or on-call at all times during the duration of construction activities. The CESCL must examine stormwater visually for the presence of suspended sediment, turbidity, discoloration, and oil sheen, and it is upon the CESCL's evaluation of the effectiveness of BMPs to determine if it is necessary to install, maintain, or repair BMPs to improve quality of stormwater discharges.

The CESCL must inspect all areas disturbed by construction activities, all BMPs, and all stormwater discharge points at least once every calendar week and within 24 hours of any discharge from the site. The CESCL may reduce this inspection frequency for temporary stabilized or inactive sites to once every calendar month through the duration of construction activities.

1.14.4 Maintenance of the SWPPP

A copy of this Construction SWPPP must be on-site or within reasonable access to the site.

If there is a change in the design, operation or maintenance at the construction site that could have a significant effect on the discharge of pollutants to the waters of the State, this Construction SWPPP must be modified to meet those changes.

Additionally, the SWPPP must be modified if, during inspections, it is determined that the Construction SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. Additional or modified BMPs will be included to correct problems identified. Revisions to the Construction SWPPP must be made within 7-days following the inspection.

BMPs that apply to the maintenance of the SWPPP include:

- BMP C150: Materials on Hand
- BMP C160: Certified Erosion and Sediment Control Lead
- BMP C162: Scheduling

1.15 Element #13: Protect Low Impact Development (LID) BMPs

The primary purpose of On-Site Stormwater Management is to reduce the disruption of the natural site hydrology through infiltration. BMPs used to meet CR5: On-Site Stormwater Management, also called LID BMPs, are permanent BMPs.

Protection of all LID BMPs will be necessary throughout the duration of the project, and as required per the Contract Agreement.

Protection of the LID BMPs includes, but is not limited to:

- Protection from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the LID BMPs. Restore the BMPs to their functioning condition if they accumulate sediment during construction. Restoring the BMP must include removal of sediment and any sediment-laden Bioretention/Rain Garden soils, and replacing the removed soils with soils meeting the design specification.
- Maintain the infiltration capabilities of LID BMPs by protecting against compaction by construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction due to construction equipment.
- Keep all heavy equipment off existing soils under LID BMPs that have been excavated to final grade to retain the infiltration rate of the soils.

Additional information is available in the *Low impact Development Technical Guidance Manual for Puget Sound* (Hinman and Wulkan 2012) for more details on protecting LID integrated management practices. This information regarding this manual is for additional information purposes only.

BMPs that may be implemented for protection where appropriate:

- BMP C102: Buffer Zone
- BMP C103: High-Visibility Fence
- BMP C207: Check Dams
- CMP C233: Silt Fence

E
TECHNICAL SPECIFICATIONS

SECTION 01 5713
TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Prevention of erosion due to construction activities.

B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.

C. Restoration of areas eroded due to insufficient preventive measures.

D. Performance bond.

E. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.02 RELATED REQUIREMENTS

A. Section 31 1000 - Site Clearing: Limits on clearing; disposition of vegetative clearing debris.

B. Section 31 2200 - Grading: Temporary and permanent grade changes for erosion control.

C. Section 31 3700 - Riprap: Temporary and permanent stabilization using riprap.

D. Section D Special Provision 8-01

1.03 REFERENCE STANDARDS

A. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus 2021.

B. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity 2022.

C. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles 2015 (Reapproved 2023).

D. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles 2015a.

E. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile 2021a.

F. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples 2017 (Reapproved 2021).

G. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit Current Edition.

1.04 PERFORMANCE REQUIREMENTS

A. Comply with requirements of EPA (NPDES) for erosion and sedimentation control, as specified by the NPDES, for Phases I and II, and in compliance with requirements of Construction General Permit (CGP), whether the project is required by law to comply or not.

B. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.

C. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.

D. Provide to Owner a Performance Bond covering erosion and sedimentation preventive measures only, in an amount equal to 100 percent of the cost of erosion and sedimentation control work.

E. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.

F. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.

1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.

G. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
1. Control movement of sediment and soil from temporary stockpiles of soil.
2. Prevent development of ruts due to equipment and vehicular traffic.
3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

H. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
1. Prevent windblown soil from leaving the project site.
2. Prevent tracking of mud onto public roads outside site.
3. Prevent mud and sediment from flowing onto sidewalks and pavements.
4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

I. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.

J. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.

K. Open Water: Prevent standing water that could become stagnant.

L. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.05 SUBMITTALS

A. Erosion and Sedimentation Control Plan:
1. Include:
   a. Site plan identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.
   b. Site plan showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.
   c. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
   d. Schedule of temporary preventive measures, in relation to ground disturbing activities.
   e. Other information required by law.
   f. Format required by law is acceptable, provided any additional information specified is also included.
2. Obtain the approval of the Plan by authorities having jurisdiction.
3. Obtain the approval of the Plan by Owner.

B. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate

actual minimum average roll values; identify fabric by roll identification numbers.

C. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

PART 2 PRODUCTS

2.01 MATERIALS

A. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.

B. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
   1. Average Opening Size: 30 U.S. Std. Sieve (0.600 mm), maximum, when tested in accordance with ASTM D4751.
   2. Permittivity: 0.05 sec^-1, minimum, when tested in accordance with ASTM D4491/D4491M.
   3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.
   4. Tensile Strength: 100 pounds-force (450 N), minimum, in cross-machine direction; 124 pounds-force (550 N), minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.
   5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632/D4632M.
   6. Tear Strength: 55 pounds-force (245 N), minimum, when tested in accordance with ASTM D4533/D4533M.
   7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.

C. Silt Fence Posts: One of the following, minimum 5 feet (1500 mm) long:

D. Gravel: See Section D Special of the City of Lacey standards

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.02 PREPARATION

A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.03 SCOPE OF PREVENTIVE MEASURES

A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

B. Construction Entrances: Traffic-bearing aggregate surface.
   1. Width: As required; 20 feet (7 m), minimum.
   2. Length: 50 feet (16 m), minimum.
   3. Provide at each construction entrance from public right-of-way.
   4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.

C. Linear Sediment Barriers: Made of silt fences.
   1. Provide linear sediment barriers:
      a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
   2. Space sediment barriers with the following maximum slope length upslope from barrier:
      a. Slope of Less Than 2 Percent: 100 feet (30 m)..
      b. Slope Between 2 and 5 Percent: 75 feet (23 m).
      c. Slope Between 5 and 10 Percent: 50 feet (15 m).
      d. Slope Between 10 and 20 Percent: 25 feet (7.5 m).
      e. Slope Over 20 Percent: 15 feet (4.5 m).

D. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.

E. Soil Stockpiles: Protect using one of the following measures:
   1. Cover with polyethylene film, secured by placing soil on outer edges.

F. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.

G. Temporary Seeding: Use where temporary vegetated cover is required.

3.04 INSTALLATION

A. Traffic-Bearing Aggregate Surface:
   1. Excavate minimum of 6 inches (150 mm).
   2. Place geotextile fabric full width and length, with minimum 12 inch (300 mm) overlap at joints.
   3. Place and compact at least 6 inches (150 mm) of 1 1/2 to 3 1/2 inch (40 to 90 mm) diameter stone.

B. Silt Fences:
   1. Store and handle fabric in accordance with ASTM D4873/D4873M.
   2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch (405 mm) high barriers with minimum 36 inch (905 mm) long posts spaced at 6 feet (1830 mm) maximum, with fabric embedded at least 4 inches (100 mm) in ground.
   3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch (710 mm) high barriers, minimum 48 inch (1220 mm) long posts spaced at 6 feet (1830 mm) maximum, with fabric embedded at least 6 inches (150 mm) in ground.
   4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet (6 m), use nominal 32 inch (810 mm) high barriers with woven wire reinforcement and steel posts spaced at 4 feet (1220 mm) maximum, with fabric embedded at least 6 inches (150 mm) in ground.
   5. Install with top of fabric at nominal height and embedment as specified.
   6. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches (460 mm), with extra post.
   7. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches (300 mm) high with post spacing not more than 4 feet (1220 mm).

C. Temporary Seeding:
   1. When hydraulic seeder is used, seedbed preparation is not required.
   2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
   3. If temporary mulching was used on planting area but not removed, apply nitrogen fertilizer at 1 pound per 1000 sq ft (0.5 kg per 100 sq m).
   4. On soils of very low fertility, apply 10-10-10 fertilizer at rate of 12 to 16 pounds per 1000 sq ft (6 to 8 kg per 100 sq m).
   5. Incorporate fertilizer into soil before seeding.
   6. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch (12 to 25 mm) deep.
   7. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
   8. Repeat irrigation as required until grass is established.

3.05 MAINTENANCE

A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches (13 mm) or more rainfall at the project site, and daily during prolonged rainfall.

B. Repair deficiencies immediately.

C. Silt Fences:

1. Promptly replace fabric that deteriorates unless need for fence has passed.
2. Remove silt deposits that exceed one-third of the height of the fence.
3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

D. Clean out temporary sediment control structures weekly and relocate soil on site.

E. Place sediment in appropriate locations on site; do not remove from site.

3.06 CLEAN UP

A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Engineer.

B. Clean out temporary sediment control structures that are to remain as permanent measures.

C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION

SECTION 31 1000
SITE CLEARING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Clearing and protection of vegetation.

B. Removal of existing debris.

1.02 RELATED REQUIREMENTS

A. Section 01 5713 - Temporary Erosion and Sediment Control.

B. Section D Special Provision 2-01

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SITE CLEARING

A. Comply with other requirements specified in Special Provision 2-01

B. Minimize production of dust due to clearing operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

3.02 EXISTING UTILITIES AND BUILT ELEMENTS

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Protect existing structures and other elements that are not to be removed.

3.03 VEGETATION

A. Do not remove or damage vegetation beyond the limits indicated on drawings.

B. Install substantial, highly visible fences at least 3 feet high (at least 1 m high) to prevent inadvertent damage to vegetation to remain:
   1. At vegetation removal limits.

C. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum disturbance of the subsoil.

D. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated.
   1. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.
   2. Trees: Sell if marketable; if not, treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches (450 mm).
   3. Sod: Re-use on site if possible; otherwise sell if marketable, and if not, treat as specified for other vegetation removed.

E. Restoration: If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to Owner.

3.04 DEBRIS

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 31 2200
GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Rough grading the site for site structures.

B. Finish grading.

1.02 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench mark and intended elevations for the Work are as indicated.

B. Verify the absence of standing or ponding water.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Provide temporary means and methods to remove all standing or ponding water from areas prior to grading.

3.03 ROUGH GRADING

A. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded.

B. Do not remove wet subsoil , unless it is subsequently processed to obtain optimum moisture content.

C. When excavating through roots, perform work by hand and cut roots with sharp axe.

D. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

E. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack surface water control.

3.04 FINISH GRADING

A. Before Finish Grading:
   1. Verify building and trench backfilling have been inspected.
   2. Verify subgrade has been contoured and compacted.

B. Remove debris, roots, branches, stones, in excess of 1/2 inch (13 mm) in size. Remove soil contaminated with petroleum products.

C. In areas where vehicles or equipment have compacted soil, scarify surface to depth of 3 inches (75 mm).

D. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.

E. Maintain stability of topsoil during inclement weather. Replace topsoil in areas where surface water has eroded thickness below specifications.

3.05 FIELD QUALITY CONTROL

A. See Section D Special Provision 5-04

END OF SECTION

SECTION 31 2316
EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavating for paving, site structures, and Stormwater BMPs.

B. Temporary excavation support and protection systems.

1.02 RELATED REQUIREMENTS

A. Section 01 5713 - Temporary Erosion and Sediment Control: Slope protection and erosion control.

B. Section 31 2200 - Grading: Grading.

C. Section D Speical Provision 2-03

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction Current Edition.

1.04 QUALITY ASSURANCE

A. Temporary Support and Excavation Protection Plan:

1. Bracing and shoring design to meet requirements of OSHA's Excavation Standard, 29 CFR 1926, Subpart P.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench mark and intended elevations for the work are as indicated.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. Locate, identify, and protect utilities that remain and protect from damage.

C. Grade top perimeter of excavation to prevent surface water from draining into excavation. Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by Engineer.

3.03 EXCAVATING

A. Excavate to accommodate new structures and construction operations.

B. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

C. Do not interfere with 45 degree bearing splay of foundations.

D. Provide temporary means and methods, as required, to remove all water from excavations until directed by Engineer. Remove and replace soils deemed suitable by classification and which are excessively moist due to lack of dewatering or surface water control.

END OF SECTION

SECTION 32 1216
ASPHALT PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aggregate base course.

B. Single course bituminous concrete paving.

C. Double course bituminous concrete paving.

1.02 RELATED REQUIREMENTS

A. Section 31 2200 - Grading: Preparation of site for paving and base.

B. Section D Speical Provision 5-04

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section D Speical Provision 1-08 and 1-09 for requirements applicable to this section. Measurement and payment will be as follows:

B. Asphalt Pavement Mix (Base Course): By the ton (metric ton). Includes preparing base, tack coating surfaces, placing, compacting and rolling, testing. Includes mix design, supplying to site, testing.

C. Asphalt Pavement Mix (Binder Course): By the ton (metric ton). Includes preparing base, tack coating surfaces, placing, compacting and rolling, testing. Includes mix design, supplying to site, testing.

D. Asphalt Pavement Mix (Wearing Course): By the ton (metric ton). Includes preparing base, tack coating surfaces, placing, compacting and rolling, testing. Includes mix design, supplying to site, testing.

E. Seal Coat: By the square yard (meter). Includes preparing surfaces and applying.

1.04 REFERENCE STANDARDS

A. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil–Aggregate Subbase, Base, and Surface Courses 2017 (Reapproved 2021).

B. AI MS-2 - Asphalt Mix Design Methods 2015.

C. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 2019.

D. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) 2017, with Editorial Revision (2020).

E. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils 2017, with Editorial Revision (2018).

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with State of Washington Highways standard.

B. Mixing Plant: Complying with State of Washington Highways standard.

C. Obtain materials from same source throughout.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Comply with WSDOT code for paving work on public property.

2.02 MATERIALS

A. Aggregate for Base Course: In accordance with State of Washington Highways standards.

B. Aggregate for Binder Course: In accordance with State of Washington Highways standards.

C. Aggregate for Wearing Course: In accordance with State of Washington Highways standards.

2.03 ASPHALT PAVING MIXES AND MIX DESIGN

A. Asphalt Base Course: 3.0 to 6 percent of asphalt cement by weight in mixture in accordance with AI MS-2.

B. Asphalt Binder Course: 4.5 to 6 percent of asphalt cement by weight in mixture in accordance with AI MS-2.

C. Asphalt Wearing Course: 5 to 7 percent of asphalt cement by weight in mixture in accordance with AI MS-2.

PART 3 EXECUTION

3.01 AGGREGATE BASE COURSE

A. Place and compact aggregate base course.

3.02 PLACING ASPHALT PAVEMENT - SINGLE COURSE

A. Install Work in accordance with State of Washington Highways standards.

B. Place asphalt within 24 hours of applying primer or tack coat.

C. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

D. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.03 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

A. Place asphalt binder course within 24 hours of applying primer or tack coat.

B. Place asphalt wearing course within two hours of placing and compacting binder course.

C. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

D. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

END OF SECTION

SECTION 32 1313
CONCRETE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete sidewalks, stair steps, integral curbs, gutters, median barriers, parking areas, and roads.

1.02 RELATED REQUIREMENTS

A. Section 31 2200 - Grading: Preparation of site for paving and base and preparation of subsoil at pavement perimeter for planting.

B. Section 32 1216 - Asphalt Paving: Asphalt wearing course.

C. Section 32 1726 - Tactile Warning Surfacing: Plastic tactile and detectable warning tiles for pedestrian walking surfaces.

D. Section 33 0561 - Concrete Manholes: Manholes, including frames; gutter drainage grilles, covers, and frames for placement by this section.

E. Section D Special Provision 8-04

F. Section D Special Provision 1-08

1.03 PRICE AND PAYMENT PROCEDURES

A. Provide concrete paving by the unit price method.

B. See Section D - Speical Provisions for additional measurement and payment requirements.

1.04 REFERENCE STANDARDS

A. ASTM C150/C150M - Standard Specification for Portland Cement 2022.

PART 2 PRODUCTS

2.01 PAVING ASSEMBLIES

A. Comply with applicable requirements of WSDOT.

B. Concrete Sidewalks and Median Barrier: 3,000 psi (20.7 MPa) 28 day concrete, 4 inches (100 mm) thick, buff color Portland cement, exposed aggregate finish.

C. Parking Area Pavement: 4,000 psi (27.6 MPa) 28 day concrete, 5 inches (125 mm) thick, 6 by 6 - W2.9 by W2.9 mesh reinforcement, wood float finish.

2.02 FORM MATERIALS

A. Wood form material, profiled to suit conditions.

2.03 CONCRETE MATERIALS

A. Concrete Materials: Provide in accordance with State of Washington Highways standards.

2.04 ACCESSORIES

2.05 CONCRETE MIX DESIGN

2.06 MIXING

END OF SECTION

SECTION 32 1623
SIDEWALKS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete sidewalks.

B. Concrete wheelchair ramps.

1.02 RELATED REQUIREMENTS

A. Section 32 1313 - Concrete Paving.

B. Section 32 1723 - Pavement Markings.

C. Section D Sepcial Provision 8-04

1.03 REFERENCE STANDARDS

A. ACI 211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide 2022.

B. ACI 305R - Guide to Hot Weather Concreting 2020.

C. ACI 306R - Guide to Cold Weather Concreting 2016.

D. ADA Standards - 2010 ADA Standards for Accessible Design 2010.

E. ASTM C33/C33M - Standard Specification for Concrete Aggregates 2018.

F. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2023.

G. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types) 2018.

1.04 FIELD CONDITIONS

A. Follow recommendations of ACI 305R and ACI 306R when concreting during hot and cold weather, respectively.

PART 2 PRODUCTS

2.01 CONCRETE SIDEWALKS AND WHEELCHAIR RAMPS

A. Concrete Forms: Wood.

B. Concrete Materials: Comply with ASTM C94/C94M.

C. Aggregate: Pit Run, washed, 3/8 inch (1 cm) stone; free of shale, clay, friable material and debris.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify gradients and elevations of the subgrade are correct as shown on drawings. Where poor subgrade material is encountered, remove and replace with suitable material.

B. Verify compacted subgrade is acceptable, ready to support imposed loads and paving, and ready to receive work.

3.02 CONCRETE SIDEWALK AND WHEELCHAIR RAMP INSTALLATION

A. Forming:
   1. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
   2. Sidewalk Forms: Place and secure forms to location, dimension, profile, and gradient shown on drawings. Height equal to the full depth of the finished sidewalk.
   3. Wheelchair Ramps: Place and secure forms to location, dimension, profile, and gradient shown on drawings. Comply with ADA Standards.

B. Placement:
   1. Place concrete in a single lift.
   2. Consolidate concrete by tamping and spading.

C. Joints:

1. Spacing: Provide scored joints every 10 feet (3 m).
2. Filler height equal to the full depth of the finished concrete.

D. Finishing:
1. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge, 1/4 inch radius (6 mm radius).
2. Wheelchair Ramps: Broomed perpendicular to slope.

END OF SECTION

SECTION 32 1723
PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Painted pavement markings.

B. Raised pavement markings.

1.02 RELATED REQUIREMENTS

A. Section 32 1216 - Asphalt Paving.

B. Section 32 1313 - Concrete Paving.

C. Section 32 1623 - Sidewalks.

D. Section D Speical Provision 8-22

1.03 REFERENCE STANDARDS

A. AASHTO M 237 - Standard Specification for Epoxy Resin Adhesives for Bonding Traffic Markers to Hardened Portland Cement and Asphalt Concrete 2005 (Reapproved 2019).

B. AASHTO M 249 - Standard Specification for White and Yellow Reflective Thermoplastic Striping Material (Solid Form) 2012 (Reapproved 2020).

C. AASHTO MP 24 - Standard Specification for Waterborne White and Yellow Traffic Paints 2015 (Reapproved 2020).

D. ASTM D4505 - Standard Specification for Preformed Retroreflective Pavement Marking Tape for Extended Service Life 2012 (Reapproved 2017).

E. FHWA MUTCD - Manual on Uniform Traffic Control Devices 2010, with Errata.

1.04 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 PAINTED PAVEMENT MARKINGS

A. Comply with State of Washington Highway Department standards.

B. Painted Pavement Markings: As indicated on drawings.

2.02 RAISED PAVEMENT MARKINGS

A. Comply with State of Washington Highway Department standards.

PART 3 EXECUTION

3.01 INSTALLATION

A. General:
   1. Position pavement markings as indicated on drawings.
   2. Field location adjustments require approval of Engineer.

B. Painted Pavement Markings:
   1. Apply in accordance with manufacturer's instructions.
   2. Apply in accordance with State of Washington Highway Department standards.

C. Raised Pavement Markings:
   1. Install in accordance with manufacturer's instructions in manner necessary to maintain manufacturer's warranty.
   2. Install in accordance with State of Washington Highway Department standards.

END OF SECTION

SECTION 32 1726
TACTILE WARNING SURFACING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Plastic tactile and detectable warning tiles for pedestrian walking surfaces.

1.02 RELATED REQUIREMENTS

A. Section 32 1313 - Concrete Paving: Concrete sidewalks.

B. Section 32 1723 - Pavement Markings: Crosswalk and curb markings.

1.03 REFERENCE STANDARDS

A. 49 CFR 37 - Transportation Services for Individuals with Disabilities (ADA) current edition.

B. ADA Standards - 2010 ADA Standards for Accessible Design 2010.

C. ASTM A48/A48M - Standard Specification for Gray Iron Castings 2022.

D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2023.

E. ATBCB PROWAG - Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way 2011.

F. SAE AMS-STD-595 - Colors Used in Government Procurement 2017a.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver to project site in manufacturer's protective wrapping and in manufacturer's unopened packaging.

B. Store covered and elevated above grade and in manufacturer's unopened packaging until ready for installation. Maintain at ambient temperature between 40 and 90 degrees F (4 and 32 degrees C).

PART 2 PRODUCTS

2.01 TACTILE AND DETECTABLE WARNING DEVICES

A. Plastic Tactile and Detectable Warning Tiles: ADA Standards compliant, glass fiber and carbon fiber reinforced, exterior grade, matte finish polyester sheet with truncated dome pattern, solid color throughout, internal reinforcing of sheet and of truncated domes, integral radius cut lines on back face of tile; with factory-applied removable protective sheeting.
   1. Pattern: In-line pattern of truncated domes complying with ADA Standards.

B. Cast Iron Detectable Warning Plates:
   1. Material: Cast gray iron; ASTM A48/A48M, Class 30 A (minimum).
   2. Shape: Rectangular and Radius.
   3. Square Dimensions: 24 inches square (610 mm square).
   4. Radius Dimensions: 24 inches (610 mm) wide, 9 feet, 5 inch (2.87 m) radius.
   5. Pattern: Truncated cones in compliance with ADA Standards.
   6. Joint: Manufacturer standard, bolted connection.
   7. Finish: Manufacturer's factory-applied powder coat.
   8. Color: SAE AMS-STD-595, Table IV, Federal Yellow No. 33538.

2.02 ACCESSORIES

A. Fasteners: ASTM A666, Type 304 stainless steel
   1. Type: Countersunk, color matched composite sleeve anchors
   2. Size: 1/4 inch (6.35 mm) diameter and 1-1/2 inches (38 mm) long.

PART 3 EXECUTION

3.01 INSTALLATION, GENERAL

A. Install in accordance with manufacturer's written instructions.
   1. Do not install damaged, warped, bowed, dented, abraded, or otherwise defective units.

2. Do not install when ambient or substrate temperature has been below 40 degrees F (4 degrees C) during the preceding 8 daylight hours.

B. Field Adjustment:
   1. Locate relative to curb line in compliance with ATBCB PROWAG, Sections 304 and 305.
   2. Orient so dome pattern is aligned with the direction of ramp.

C. Install units fully seated to substrate, square to straight edges and flat to required slope.

3.02 INSTALLATION, SURFACE APPLIED PLASTIC TILES

A. Cure concrete surfaces for a minimum of 4 days before installing units.

B. Mechanically roughen surface as required to remove contaminants and prepare surface for adhesive and sealant application.

C. Drill fastener holes straight, true and to depth recommended by manufacturer.

D. Apply adhesive to back of unit as recommended by manufacturer.

E. Mechanically fasten to substrate. Avoid striking or damaging the unit itself during installation.

F. Apply sealant to edges in cove profile.

3.03 INSTALLATION - CAST IN PLACE, CAST IRON PLATES

A. Install by method described in manufacturer's written instructions.

B. Place units into wet concrete.

C. Press assembly into concrete to achieve final elevation.

D. Finish concrete adjacent to plate. Remove wet concrete spilled onto plate surface.

3.04 PROTECTION

A. Protect installed units from traffic, subsequent construction operations or other imposed loads until concrete is fully cured.

B. Touch-up, repair or replace damaged products prior to Date of Substantial Completion.

END OF SECTION

SECTION 33 0561
CONCRETE MANHOLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Precast concrete manholes.

B. Grade adjustments.

C. Frames and covers.

1.02 REFERENCE STANDARDS

A. AASHTO HB - Standard Specifications for Highway Bridges 2005, with Errata.

B. ASTM A48/A48M - Standard Specification for Gray Iron Castings 2022.

C. ASTM C55 - Standard Specification for Concrete Building Brick 2022.

D. ASTM C478/C478M - Standard Specification for Circular Precast Reinforced Concrete Manhole Sections 2020.

E. ASTM C990 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants 2009 (Reapproved 2019).

F. ASTM C1634 - Standard Specification for Concrete Facing Brick and Other Concrete Masonry Facing Units 2023.

PART 2 PRODUCTS

2.01 CONCRETE MANHOLES

A. Weight Rating: H 10 according to AASHTO HB.

B. Precast Concrete Manholes: Comply with ASTM C478/C478M, reinforced.
   1. Wall Thickness: 6 inches (152 mm).
   2. Base Thickness: 12 inches (305 mm).
   3. Reinforcement: Formed steel wire, galvanized finish, wire diameter as indicated on drawings.
   4. Joint Sealant: Comply with ASTM C990.

C. Grade Adjustments:
   1. Concrete Bricks: ASTM C1634 or ASTM C55 Grade N, cored, normal weight.

D. Frame and Cover: Cast iron construction, ASTM A48/A48M Class 30B, machined flat bearing surface; hinged; sealing gasket.

PART 3 EXECUTION

3.01 INSTALLATION

A. Establish elevations and pipe inverts for inlets and outlets as indicated in drawings.

B. Precast Concrete Manholes:
   1. Place base section plumb and level.
   2. Install joint sealant uniformly around section lip.

C. Grade Adjustments:
   1. Lay brick or masonry units uniformly on mortar bed with full head joints, running bond. Top with mortar, plumb and level.
   2. Place adjacent materials tight, and smooth following design grades.

D. Frames and Covers:
   1. Place frame plumb and level.
   2. Mount frame on mortar bed at indicated elevation.
   3. Place grate in frame securely.

END OF SECTION

SECTION 33 4211
STORMWATER GRAVITY PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Stormwater drainage piping.

B. Stormwater pipe accessories.

1.02 RELATED REQUIREMENTS

A. Section 31 2316 - Excavation: Excavating of trenches.

B. Section 31 2316.13 - Trenching: Excavating, bedding, and backfilling.

C. Section 33 0561 - Concrete Manholes.

D. Section 33 4230 - Stormwater Drains.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 01 2200 - Unit Prices, for additional unit price requirements.

1.04 REFERENCE STANDARDS

A. AASHTO M 252 - Standard Specification for Corrugated Polyethylene Drainage Pipe 2023.

B. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications 2020.

C. ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials 2021.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the installation of stormwater gravity piping with size, location and installation of stormwater drains according to Section 33 4230.

1.06 SUBMITTALS

A. See Section D - Speical Provisions for Administrative requirements and submittal procedures.

PART 2 PRODUCTS

2.01 STORMWATER PIPE MATERIALS

A. Provide products that comply with WSDOT Standards.

B. Plastic Pipe: ASTM D3350, SDR 11; High Density Polyethylene (HDPE) solid wall pipe; inside nominal diameter of, with cell classification of 335434C or better, thermal butt fusion joints in accordance with manufacturer's recommendations.

2.02 PIPE ACCESSORIES

A. Trace Wire: Magnetic detectable conductor, clear plastic covering, imprinted with "Stormwater Service" in large letters.

B. Flared End Section:

PART 3 EXECUTION

3.01 TRENCHING

A. See Section 31 2316.13 - Trenching for additional requirements.

B. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.02 INSTALLATION

A. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal watertight.
   1. Plastic Pipe: Also comply with ASTM D2321.

B. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch (3 mm) in 10 feet (3 m).

C. Connect to building storm drainage system, foundation drainage system, and utility/municipal system.

D. Install continuous trace wire 6 inches (150 mm) above top of pipe; coordinate with Section 31 2316.13.

3.03 PROTECTION

A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

END OF SECTION

BCE Engineers, Inc
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RAC PARKING LOT EXPANSION
BCE PROJECT NO. 222-147.00
SEPTEMBER 14, 2023

Notice:

The following list of specifications and drawings represents those documents that were prepared under the provisions of the Revised Code of Washington RCW 18.43, by BCE Engineers, Inc. of Tacoma, Washington. The sealing of this specification and drawings list is provided in accordance with Washington Administrative Code WAC196-23-020.

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SECTION 26 0000
ELECTRICAL GENERAL CONDITIONS

PART 1 - GENERAL

1.01 GENERAL

A. Conform to the General Conditions, Supplementary Conditions, and related work in other Divisions for all work in Divisions 26, 27, and 28. See Section D – Special Provisions 1-08.4 Order of Work.

1.02 WORK INCLUDED

A. It is the intention of this division of the specifications and the accompanying drawings to describe and provide for the furnishing, installing, testing and placing in satisfactory and successful operation all equipment, materials, devices, and necessary appurtenances to provide a complete electrical system, together with such other miscellaneous installations and equipment hereinafter specified and/or shown in the plans. The work shall include all materials, appliances and apparatus not specifically mentioned herein or noted on the plans, but which are necessary to make a complete working installation of all electrical systems shown on the plans or described herein. Equipment and devices furnished and installed under other divisions of this specification (or by the Owner) shall be connected under this division. The drawings and specifications are complementary and what is called for in either is binding as if called for in both.

B. By submitting a bid, the Contractor is acknowledging that he has made a thorough examination of the Contract Documents, existing site and building conditions, and has determined that these documents do sufficiently describe the scope of construction work required under this Contract.

1.03 SCOPE OF BASIC BID

A. Included in Divisions 26, 27, and 28 is all work and related items necessary to provide all electrical installations except as specifically excluded. In general, this includes all labor, equipment, tools, etc., to complete the electrical work.

1.04 RELATED WORK

A. Temporary Power and Lighting - See Section D – Special Provisions

B. Cutting and Patching - See Section D – Special Provisions

C. Trenching, backfill and asphalt work – See Section D – Special Provisions

1.05 STANDARDS AND REGULATIONS

A. The work shall comply with the latest edition of the applicable Standards and Codes of the following:

ASTM	American Society for Testing and Materials
NBFU	National Board of Fire Underwriters
NEC	National Electrical Code
---	State Electrical Code
NESC	National Electrical Safety Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
U.L.	Underwriters Laboratories Inc.
IPCEA	Insulated Power Cable Engineers Associated
CBM	Certified Ballasts Manufacturers
---	Federal, State and Local Building Codes
ETL	Electrical Testing Laboratories

B. If any conflict occurs between Government adopted Code Rules and this specification, the codes are to govern. Nothing in these drawings and specifications shall be construed to permit work not conforming with governing codes. Also, this shall not be construed as relieving the Contractor from complying with any requirements of the plans and specifications which may be in excess of, but not in conflict with, requirements of the Governing Codes.

1.06 PERMITS & FEES

A. The Contractor shall obtain and pay for all licenses, permits, and inspections required by laws, ordinances, and rules governing work specified herein. The Contractor shall arrange for inspection of work by the inspectors and shall give the inspectors all necessary assistance in their work of inspection.

B. The Contractor shall consult with and follow the requirements of the local fire, power, telephone, and television utilities serving the area and shall coordinate the work with them.

1.07 DEFINITIONS

A. When "provide" is used, it shall be interpreted as "furnishing and installing complete in operating condition".

B. When "drawings" is used, it shall be interpreted as "all Contract Drawings for all disciplines".

C. When "Contractor" is used, it shall be interpreted as the Electrical Contractor.

1.08 INTENT OF DRAWINGS

A. The electrical drawings are intended to serve as working drawings for general layout. The equipment layout is diagrammatic and, unless specifically dimensioned or detailed, does not indicate all fittings, hardware, or appurtenances required for a complete operating installation.

B. Anything shown on the drawings but not covered in the specifications, or anything covered in the specifications but not shown on the drawings, shall be as if covered in both. In case of conflict between the drawings and specifications, the Engineer will select the method to be used. The Contractor shall be responsible for verifying all measurements before proceeding with the work.

C. Wiring diagrams are not intended to indicate the exact course of raceways or exact location of outlets. Raceway and outlet locations are approximately correct and are subject to revision as may be necessary or desirable at the time of installation. Precise location in every case shall be subject to the Engineer's approval.

1.09 PROTECTION

A. The Contractor shall store and guard all equipment before installation and shall protect same, and replace any equipment that has been damaged prior to final acceptance. See Section D – Special Provisions for detailed requirements.

1.10 HOUSEKEEPING

A. All electrical materials shall be kept stored in an orderly fashion protected from heat, cold, and the weather.

B. All marred surfaces shall be refinished and painted after installation.

C. All debris shall be removed from premises during work, as directed, and at completion of job.

1.11 TEMPORARY USE

A. Temporary or interim use of any and all portions of the electrical system shall be under the supervision of the Electrical Contractor.

B. Temporary power and lighting for use during construction shall be provided per the requirements of Section D – Special Provisions specifications.

1.12 AS-BUILT DRAWINGS

A. The Contractor shall maintain, in addition to any reference drawings, an as-built set of prints, on which all deviations from the original design shall be drafted in a neat, legible manner with red colored pencil. This red-lined set shall identify all drawing revisions including addenda items, change orders, and Contractor revisions. The Contractor is responsible to revise panel schedules and load calculations as required.

B. Drawings shall show locations of all concealed raceway runs larger than 1", giving the number of conductors and size of raceway. Underground ducts shall be shown with cross section elevations. All pipe, raceway, manholes or lines of other trades shall be included.

C. The Contractor shall update all references to specific products to indicate products actually installed on project.

D. Upon completion of the Division 26 work, the Contractor shall deliver the red-lined drawings and one set of neatly drafted as-built drawings on electronic media in AutoCAD R-2013 format to the Engineer for transmittal through the Engineer to the Owner.

E. See Section 27 0000 for additional requirements of low voltage systems.

1.13 WARRANTY

A. Provide a written warranty that the Division 26, 27, and 28 work is free from mechanical and electrical defects. Contractor shall replace and repair, to the satisfaction of the Engineer, any parts of the installation which may fail within a period of 12 months after the date of substantial completion, provided that such failure is due to defects in material or workmanship, or failure to follow the specifications and drawings.

1.14 INSTRUCTIONS AND MANUALS

A. Operation and maintenance data shall be submitted in accordance with Section D – Special Provisions.

B. Manuals shall contain shop drawings, wiring diagrams, operating and maintenance instructions, replacement parts lists, and equipment nameplate data for all equipment and systems installed under the project. Signal equipment submittals shall contain step-by-step circuit description information designed to acquaint maintenance personnel with equipment operation in each mode of operation. Manuals shall contain original brochures supplied by manufacturers. Copies of originals will not be accepted.

C. Each type of device provided shall be identified in the O & M Manual using the same identification as shown on the drawings and specifications. The information included must be the exact equipment installed, not the complete "line" of the manufacturer. I Installed equipment shall be neatly and clearly identified on sheets where both installed equipment and other equipment are shown. Parts lists shall give full ordering information assigned by the original parts manufacturer. Relabeled and/or renumbered parts information as reassigned by equipment supplier are not acceptable. The following information shall be provided for each device:
   1. Manufacturer’s name, address, and phone number.
   2. Local supplier's name, address, and phone number.
   3. Complete parts lists including quantities and manufacturer's part numbers.
   4. Installation instructions.
   5. Recommended maintenance items including maintenance procedure and recommended interval of maintenance listed in hours of operation, calendar unit or other similar time unit.

D. The O & M Manual shall be assembled as detailed in Section D – Special Provisions. As a minimum, the following sections shall be broken out:
   1. Light Fixtures, Poles, and Pole Bases
   2. Panelboards, Switchgear, and Transformers
   3. CCTV
   4. Telecommunication System

5. Surge Protection Device (SPD)
6. Electrical System Protective Device Study
7. Ground Fault Testing Results

E. Wiring Diagrams for each system shall be complete for the specific system installed under the Contract. "Typical" line diagrams will not be acceptable unless properly marked to indicate the exact field installation.

1.15 WORK NOT INCLUDED

A. Indicated motors, controls, and equipment as described in other divisions shall be furnished by other trades, but shall be moved, set, and wired to electrical controls and power supply by the Electrical Contractor.

B. Work to be included under this Contract shall be defined on drawings and in these specifications. Any details beyond these limits are meant only to give installation clarity to that portion which is a part of this Contract.

1.16 INSTRUCTION PERIODS

A. Upon completion of the work and after all tests and final inspection of the work by the authority(ies) having jurisdiction, the Contractor shall demonstrate and instruct the Owner's designated operation and maintenance personnel in the operation and maintenance of the various electrical systems. The Contractor shall arrange scheduled instruction periods with the Owner. The Contractor's representatives shall be superintendents or foremen knowledgeable in each system and suppliers' representatives when so specified.

B. Scheduled Instruction periods shall be:
1. CCTV System 1/2 day
2. Data Network 1/2 day

C. Costs for time involved by Contractor shall be included in the bid.

1.17 COMPLETION OF WORK

A. Upon completion of the Division 26, 27, and 28 work, the Contractor shall comply with requirements of Section D – Special Provisions for project closeout.

B. Arrange for and obtain all required inspections and certificates pertaining to the Division 26, 27, and 28 work and deliver the certificates to the Engineer in triplicate.

C. Prior to or at the time of final inspection, the Contractor shall, as outlined in detail in the specifications, complete the delivery of all the following items:

1.	Completion Letter	
2.	Certificate of Final Inspection. Electrical Inspector	COMPLETION OF WORK - 26 0000 – 1.17
3.	Warranty to Owner (with copy for Engineer)	SUPPLEMENTARY GENERAL CONDITIONS – 26 0000 – 1.13
4.	Marked Set of As-Built Electrical Drawings	GENERAL AS-BUILT DRAWINGS 26 0000 – 1.12
5.	Marked Set, Electronic Media Set on Solid-State Drive - in AutoCAD R-2013 Format	GENERAL AS-BUILT DRAWINGS 26 0000 – 1.12
6.	Certificate of Completion and Document Requirements for Protective Device Study	ELECTRICAL SYSTEM PROTECTIVE DEVICE STUDY – 26 0573
7.	Motor Current Readings	GENERAL, TESTS – 26 0519 – 3.03(D)
8.	Phase Current Readings	GENERAL, TESTS – 26 0519 – 3.03(E)

9.	OHMIC Test Readings	GENERAL, TESTS – 26 0519 – 3.03(B)
10.	Ground Fault Settings	
11.	Panelboard and Special Equipment Shop Drawings and Final Approved List of Materials Installed	MATERIALS, GENERAL – 26 0000 – 2.03
12.	Certificate of Feeders Torque Results	WIRES AND CABLES – 26 0519
13.	* Receipt from person to whom delivered spare items.	LIGHTING FIXTURES – 26 5000
14.	Wiring diagrams, Maintenance Manuals, Operation Instructions, and Brochures (5 sets minimum)	GENERAL, INSTRUCTIONS & MANUALS – 26 0000 – 1.14

* Secure delivery instructions from Architect for delivery to Owner.

1.18 SHOP DRAWING SUBMITTALS

A. This Contractor shall submit to the Architect as described in Section D – Special Provisions. When shop drawings are submitted electronically, they shall be submitted as described in Paragraph B below.

B. The Contractor shall submit to the Architect electronic shop drawings in PDF format. Electronic Shop Drawings that are submitted without following the format as outlined below will be returned for corrections without any further review.
   1. A separate PDF file shall be submitted for each Division including All submittal items for that Division as outlined below:
      a. Division 26 – Electrical
      b. Division 27 – Telecommunications
      c. Division 28 – Electronic Safety and Security
   2. The contractor shall provide either a digital or hardware method of transporting the electronic submittal to the Architect. Files larger than 10 Megabytes shall not be sent via email and shall be transferred via a file transfer protocol, PC compatible CD or PC compatible thumb drive. Divisions shall not be broken up into separate files for transfer via email.
   3. Each Specification PDF shall be submitted with the following format and salient attributes:
      a. Cover page including:
         1) Project Title as indicated on the plans
         2) Project Location including address, city, state, country
         3) Prime Contractor name, phone number, and email address
         4) Sub-Contractor name, phone number, and email address
         5) Specification Division number and title
      b. Index Page outlining each specification section included in the submittal. This list shall be linked to a corresponding Specification Section Divider for each section. This link shall enable the reviewer to jump to a specification section by clicking the item in the list.
      c. Specification Section Divider: Shop Drawings shall be divided by specification section and each section shall begin with a divider page outlining the Specification number, title, and a list of submittal items for the section. In the upper right-hand corner of the divider page, a link shall be provided returning the reviewer to the Index Page.
      d. Each Submittal Item listed on the Specification Section Divider shall be linked to the specific item being submitted. Each Submittal Item shall be highlighted yellow with a note reference to the specific paragraph giving the submittal requirements.

e. Each page of the submittal shall be numbered in the bottom right corner of the page. Page numbering shall be Roman numerals for all pages before the First Specification Section. Each Specification Section page shall be numbered with the Specification Section number, a dash, and the page number in the Specification Section.
f. Specification items shall be specifically highlighted as they apply to the project rather than highlighting an entire product family. Items that do not apply to this project shall be crossed out with a red "X".
g. The PDF file shall not be protected to prevent printing, selecting of text within the document, or extracting of pages from the document.

C. Shop drawings shall be submitted complete, at one time, and with each item indexed with dividers and separated per specification section and shall include, at a minimum, the items of equipment listed below:
1. All panelboards, showing breaker arrangement with circuit numbers, relays, and panel skirts.
2. Motor starters and controls designating where items are intended to be used and equipment being controlled.
3. Transformers (Dry Type)
4. Surge Protection Device
5. Disconnect Switches
6. Fuses and spare fuse cabinet
7. Electrical System Protective Device Study
8. Lighting Fixtures (Complete)
9. Back Boxes
10. Coverplates
11. Raceways and Connectors
12. Copper Wire
13. Aluminum Wire
14. *CCTV
15. *Telecommunication System
16. **All Specialty Systems not listed above**
17. Any other items requested by Engineer.
*See Section 27 0000 for further requirements.

D. Within ten (10) working days after the date of the letter rejecting any items of equipment, lighting fixtures, or materials as not in accordance with the specifications, the Contractor shall submit a new list of items to furnish and install in place of those items rejected. If the Contractor fails to submit this new list within the above specified time, or if any items on this second list are rejected as not being in accordance with these specifications, the Engineer may select the items which the Contractor shall furnish and install without change in Contract price or time of completion.

E. The acceptance of a manufacturer's name or product by the Engineer does not relieve the Contractor of the responsibility for providing materials and equipment which comply in all details with the requirements of the Contract Documents. The Contractor shall be solely responsible for submitting materials at such a time to allow a minimum of two weeks for Engineer's review.

F. Electrical Drawings for the project have been developed by the Engineer using AutoCAD Revision 2013 software or newer. These drawing files will be made available to the Contractor for development of shop drawings and/or As-Builts with a signed waiver of responsibility.

1.19 SCHEDULE OF VALUES

A. Provide Schedule of Values per Section D – Special Provisions and related project requirements.

B. Divisions 26, 27, and 28 Breakdown: Provide schedule of values for the following categories (as a minimum):

1. Electrical Mobilization
2. Electrical Submittals
3. Electrical General Project Management, General Design, General Coordination
4. Branch Circuit Materials Rough-in
5. Branch Circuit Materials Rough in – Labor
6. Branch Circuit Trim – Materials
7. Branch Circuit Trim – Labor
8. Service Materials
9. Service Materials – Labor
10. Feeder Materials
11. Feeder Materials - Labor
12. Panelgear, Disconnects, Starters
13. Panelgear, Disconnects, Starters – Labor
14. Light Fixtures
15. Light Fixtures – Labor
16. *Closed Circuit Television System (CCTV)
17. *Data System
18. Electrical System Protective Device Study
19. Commissioning
20. Electrical Punchlist, Closeout, and Owner Training

*Provide engineering/shop drawings, material, and labor for each system.

C. The dollar value for “Electrical Punchlist, Closeout, and Owner Training” shall in no case be less than 2% of the total dollar value of the Division 26, 27, and 28 work (or as indicated in Section D – Special Provisions, whichever is higher).

D. The Contractor is advised that in addition to payments held out for retainage and project final completion (i.e., “Electrical Punchlist, Closeout, and Owner Training”), as specified above and in Section D – Special Provisions, the Owner reserves the right to withhold 10% of the funds for any of the above categories until the systems (of that category) have been proven to operate as specified and have been completely tested and adjusted.

PART 2 - PRODUCTS

2.01 COMPETITIVE PRODUCTS

A. Any reference in the specifications to any article, device, product, material, fixture, form, or type of construction by name, make, or catalog number shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. The Contractor, in such cases, may use any article, device, product, material, fixture, form, or type of construction which in the judgment of the Engineer, expressed in writing, is equal to that specified. However, any manufacturer not listed as an accepted bidder for a specific item must be submitted for acceptance in writing in accordance with Section D – Special Provisions.

2.02 MANUFACTURER/EQUIPMENT PRIOR APPROVALS

A. Any manufacturer/equipment not listed as an approved substitute for a specified item must be submitted for acceptance in accordance with Section D – Special Provisions, in writing, with detailed information to include:
1. Manufacturer's Catalog Data
2. Complete Physical and Technical Data
3. Wiring Diagrams
4. Detailed reference (written or highlighted) noting compliance with the appropriate Specification Section and all applicable Specification item numbers within that Section
5. Complete type written index cross referencing all proposed substitutes and specified items
6. Detailed reference to specified items (written or highlighted) noting equal quality and performance of proposed substitute equipment
7. Other descriptive data, as required by the Engineer

B. If substitute material is determined to be acceptable by the Engineer, it will be included in a subsequent Addenda prior to bidding. The acceptance of a manufacturer's name or product by the Engineer does not relieve the Contractor of the responsibility for providing materials and equipment which comply in all details with the requirements of the Contract Documents.

C. Only materials which are specified or published in addenda as acceptable shall be used.

2.03 MATERIALS

A. All materials must be of the quality herein specified. All materials shall be new, of the best quality, and free from defects. They shall be designed to ensure satisfactory operation and operational life in the environmental conditions which will prevail where they are being installed.

B. Each type of material shall be of the same make and quality. The materials furnished shall be standard products of the manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design.

C. All materials shall be U.L. or E.T.L. listed for the purpose for which they are used.

D. Equipment in compliance with U.L. standards but not bearing their label is not acceptable. If the manufacturer cannot arrange for labeling of an assembled unit at the factory the unit shall be field evaluated per the Washington State Administrative Code (WAC) and the electrical inspector's requirements.

2.04 COMPLETE SYSTEM

A. All the systems mentioned shall be complete and operational in every detail except where specifically noted otherwise. Mention of certain materials in these specifications shall not be construed as releasing the Contractor from furnishing such additional materials and performing all labor required to provide a complete and operable system.

2.05 NAMEPLATES

A. Provide nameplates constructed of plastic (black on white) laminated material engraved through black surface material to white sublayer (attach with screws on NEMA 1 enclosures).
   1. Service Entrance Label: Refer to Section 26 2413.
   2. Panelboard Labels: Refer to Section 26 2416.
   3. Special Equipment/Outlet Labels: Refer to Appropriate Sections.
   4. Under 600 Volt Feeder Tags: Refer to Section 26 0519.

PART 3 - EXECUTION

3.01 GENERAL

A. Coordinate installation of Divisions 26 wiring and equipment with other trades. Where insufficient room for proper installation appears, obtain clarification from Engineer before any installation begins.

B. Cutting and Patching:
   1. All construction materials damaged or cut into during the installation of this work must be repaired or replaced with materials of like kind and quality as original materials by skilled labor experienced in that particular building trade.

3.02 COORDINATION

A. The Contractor is responsible for accomplishing work contained within Divisions 26, 27, and 28. The work shall coordinate with that of the other Contractors and/or other trades doing work in the building. The contractor shall examine all drawings, including the several divisions of mechanical, structural, civil and architectural, for construction details and necessary coordination. Specific locations of construction features and equipment shall be obtained from the Contract Documents, field measurements, and/or from the trade providing the material or equipment. No extra costs will be allowed for failure to obtain this information.

B. All conflicts shall be reported to the Engineer in writing before installation for decision and correction.

1. All device measurements referenced on drawings or specifications are to be centered of device unless noted otherwise.

C. The Contractor will not be paid for work requiring reinstallation due to lack of coordination or interference with other Contractors or trades. This includes, but is not limited to, removing, replacing, relocating, cutting, patching, and finishing.

D. The Contractor shall review the installation manual for each device to be installed. If a conflict appears to occur between the manufacturer's recommended installation practices and the plans or specifications, notify the Engineer immediately. Final determination shall be by the Engineer. The Contractor will not be paid for reinstallation due to failure to comply with manufacturer instructions or design documents.

E. Device and fixture locations may be changed within 15 feet without extra charge if so desired by the Engineer, before installation.

3.03 REQUESTS FOR INFORMATION (RFI)

A. It is our intent to provide a timely response for RFIs regarding Division 26, 27, and 28 Work. To further expedite this process, where a suggestion can be determined or derived at by the initiator of the RFI, it is required this suggestion be supplied with the submitted RFI. If no suggestion is given where one is possible, the RFI will be returned as incomplete.

3.04 CLEANING AND PAINTING

A. All equipment, whether exposed to the weather or stored indoors shall be covered to protect it from water, dust and dirt.

B. After installing, all metal finishes shall be cleaned and polished, cleaned of all dirt, rust, cement, plaster, grease, and paint.

C. All equipment with a primer coat of paint shall be given two (2) or more coats of a finish enamel and scratched surfaces be refinished to look like new. Markings, identification, and nameplates shall be replaced.

3.05 EQUIPMENT IDENTIFICATION

A. Provide identifying engraved Bakelite nameplate on all equipment, including pull boxes, to clearly indicate its use, area served, circuit identification, voltage, and any other useful data.

B. Each auxiliary system, including communications, shall be clearly labeled to indicate its function.

3.06 DEVIATION

A. Deviation from the shop drawings in construction or installation of equipment shall not be made unless Shop Drawings showing proposed deviations are submitted to and approved by the Engineer. If any equipment is furnished under this or other divisions with current, voltage, or phase ratings that differ from those shown on the drawings, the Contractor shall notify the Engineer in writing immediately and shall not connect said equipment until instructed as to required changes by the Architect. No extension of time will be granted as a result of such changes.

3.07 EXCAVATIONS

A. All excavations are to be conducted so that no walls or footings shall be disturbed in any way.

B. Remove all surplus earth not needed for backfilling and dispose of same as directed.

3.08 PAINTING

A. Painting in general will be covered under another division of this specification, except items furnished under Divisions 26 that are scratched or marred in shipment or installation and shall be refinished by the Division 26 Contractor.

3.09 WORKMANSHIP AND OBSERVATION

A. Workmanship shall be of the best quality and none but competent workers shall be employed under the supervision of a competent foreman. All completed work shall represent a neat, professional appearance.

B. All work and materials shall be subject to observation at any and all times by representatives of the Engineer.

3.10 MISCELLANEOUS

A. Provide complete seismic anchorage and bracing for the lateral and vertical support of conduit and electrical equipment, as required by the International Building Code.

B. Conduits that cross seismic separations shall be installed with flexible connection suitable to accommodate conditions. Secure raceways on each side of a separation and provide a minimum of 36” length of flexible conduit to span separation.

3.11 CABLE AND WIRING ROUTED UNDERGROUND OR UNDERSLAB

A. All cables and conductors, both line voltage and low voltage, routed underground or underslab shall be U.L. listed for installation in wet locations per NEC and WAC codes.

END OF SECTION

SECTION 26 0010
EXCAVATION AND BACKFILL FOR ELECTRICAL UNDERGROUND UTILITIES

PART 1 - GENERAL

1.01 GENERAL INCLUDES

A. Excavation and Associated Grading

B. Trenching and Trench Protection

C. Backfilling and Compaction

D. Verification of Existing Utilities

E. Protection of Utilities

1.02 RELATED SECTIONS

A. Section 26 0000 – Electrical General Conditions

B. Section 26 0533 - Raceways

C. Section 26 5000 - Lighting

D. Section 27 0000 – Low Voltage System General Requirements

E. Section 27 2000 – Data and Voice Infrastructure

1.03 QUALITY ASSURANCE

A. Inspection of Job Conditions: Prior to starting work and during work, the installer shall examine the work by others, site and job conditions under which excavation, trenching, and backfilling for underground utilities work will be performed, and notify the General Contractor in writing of unsatisfactory conditions or work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

B. Codes and Standards: Comply with requirements of the following codes and standards (Latest Edition) except as modified herein:
   1. International Conference of Building Officials, "International Building Code".
   2. Local requirements for all utility work.
   3. OSHA and WISHA regulations.
   4. APWA Standard Specifications.
   5. National Electrical Code – NFPA 70.

1.04 RESPONSIBILITY

A. The Contractor is solely responsible for compliance with the requirements of the drawings, specifications, local codes and standards, proper construction coordination with work of other trades, and protection and worker's safety. Contractor shall advise Engineer of any discrepancy in, or disagreement with the specifications and/or drawings prior to starting work and not proceed until issue is resolved. Commencement of work shall indicate Contractor's acknowledgement of his expertise in this type of work. Any delay resulting from failure to comply with this procedure will not be basis for an extension of the completion date.

1.05 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced.

B. American Society of Testing and Materials (ASTM) Publications:
   1. D 422-63 Particle Size Analysis of Soils.
   2. D 423-66 Liquid Limit of Soils.
   3. D 424-59 Plastic Limit and Plasticity Index of Soils.
   4. D 1557-78 Moisture Density Relations of Soils using a 10 lb. (4.54kg) Rammer and 18 inches (457 mm) Drop.
   5. D 2167-66 Density of Soil In-Place by the Rubber Balloon Method.
   6. D 2217-66 Wet preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Contents.
   7. D 2487-69 Classification of Soils for Engineering Purposes.

8. D 2922-81 Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
9. E 548-79 Generic Criteria for Use in the Evaluation of Testing and Inspection Agencies.

PART 2 - MATERIALS

2.01 SATISFACTORY MATERIALS

A. Materials classified as ASTM D2487, Unified Soil Classification System as SW, SP, GW, and GP are satisfactory for backfill use. Materials classified as SP-SM, GP-GM, GM, GC and ML are also satisfactory for backfill use provided that they contain moisture contents suitable for the intended use and are reasonably free of organic matter. Native material, not considered unsatisfactory as specified below, may comply. Except that no material shall have any object with a dimension exceeding 2 inches and no object shall be sharply angular.

2.02 UNSATISFACTORY MATERIALS

A. Materials classified in ASTM D2487, Unified Soil Classification System as PT, OH, and OL are unsatisfactory. Unsatisfactory materials also include man-made fills, refuse and all materials containing excessive organic matter or having moisture contents which are not suitable for the intended use, or having objects with dimensions exceeding 2 inches (boulders, etc.).

2.03 UNSTABLE MATERIAL

A. Unstable material shall consist of material too wet to properly support the utility conduit or appurtenance structure, and material identified as unsuitable in the National Electrical Code 300-5(F).

2.04 GRAVELLY SAND BORROW MATERIAL

A. Gravelly sand borrow material to provide backfill, or replace unsuitable soil, shall meet the requirements of SW, SP, GW, and GP materials, except that the maximum percentage passing the No. 200 sieve shall not exceed 5% based on the soil fraction passing the U.S. No. 4 sieve, and not contain discrete particles greater than 2 inches in diameter.

2.05 DEGREE OF COMPACTION

A. Degree of compaction shall be expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D1557; Method D. Minimum compaction requirements shall be as specified in PART 3.

2.06 DRAINAGE GRAVEL

A. Shall be 3/4-inch washed gravel with no more than 2% passing 1/2-inch sieve opening.

2.07 SPECIAL BEDDING AND INITIAL BACKFILL MATERIAL

A. Minus 3/8-inch washed pea gravel.

PART 3 - EXECUTION

3.01 EXCAVATION

A. If workers enter any trench or other excavation four or more feet in depth that does not meet the open pit requirements of WSDOT Section 2.09.3(3)B, it shall be shored and cribbed. The Contractor alone shall be responsible for worker safety. All trench safety systems shall meet the requirements of the Washington Industrial Safety and Health Act, Chapter 49.17 RCW.

B. Excavation of every description and of whatever substances encountered shall be performed to allow the installation of all utilities at the lines and grades as required. During excavation, material satisfactory for backfilling shall be stockpiled in an orderly manner at a distance from the banks of the trench sufficient to avoid overloading and to prevent slides or cave-ins. Adequate drainage shall be provided for the stockpiles and surrounding areas by means of ditches, dikes, or other approved methods. The stockpiles shall also be protected from contamination with unsatisfactory excavated material or other material that may destroy the quality and fitness of the suitable stockpiled material.

C. If the Contractor fails to protect the stockpiles and any material becomes unsatisfactory as a result, such material shall be removed and replaced with satisfactory on-site or imported material from approved sources at no additional cost to the Owner.

D. Excavated material not required or not satisfactory for backfill shall be removed from the site and shall be disposed of off site, at the Contractor's expense, at the Contractor's waste area. Any excess satisfactory excavated materials shall not be mixed with unsatisfactory materials. Unsatisfactory materials shall not cover available suitable materials, or be disposed of in such a manner as to interfere with subsequent borrow operations.

E. Grading shall be done as may be necessary to prevent surface water from flowing into the excavation, and any water accumulating therein shall be removed so that the stability of the bottom and sides of the excavation is maintained. Unauthorized over-excavation shall be backfilled in accordance with paragraph 3.05 BACKFILLIING at no additional cost to the Owner.

F. The Contractor shall provide dewatering as required for installation of underground work.

3.02 TRENCH EXCAVATION

A. The trench excavation shall meet the requirements of the National Electrical Code and local utility standards.

B. Bottom Preparation: The bottoms of trenches shall be accurately graded to provide uniform bearing and support for the bottom quadrant of each section of the conduit and for bedding. Stones of 2 inches or greater in any dimension, or as recommended by the conduit manufacturer, whichever is smaller, shall be removed to avoid point bearing.

C. Removal of Unsuitable Material: Where unsuitable material is encountered in the bottom of the trench, such material shall be removed to the depth directed and replaced to the proper grade with select granular material as provided in paragraph 3.05 BACKFILLING. When removal of unsuitable material is required due to the fault or neglect of the Contractor in his performance of the work, the resulting material shall be excavated and replaced by the Contractor without additional cost to the Owner.

D. Bedding: The bedding surface for the conduit shall provide a firm foundation of uniform density throughout the entire length of the conduit. The conduit shall be bedded carefully in a soil foundation accurately shaped and rounded to conform to the lowest one-fourth of the outside portion of circular conduit or to the lower curved portion of conduit arch for the entire length of pipe or arch. When necessary, the bedding shall be taped. Provide bedding using pea gravel where noted on the drawings.

3.03 EXCAVATION FOR APPURTENANCES

A. Excavation for manholes, handholes or similar structures below grade shall be sufficient to leave at least 12 inches clear between the outer structure surfaces and the face of the excavation or support members. When concrete or masonry is to be placed in an excavated area, special care shall be taken not to disturb the bottom of the excavation. Excavation to the final grade level shall not be made until just before the concrete or masonry is to be placed.

3.04 JACKING, BORING, AND TUNNELING

A. Unless otherwise indicated, excavation shall be by open cut, except that sections of a trench may be jacked, bored, or tunneled if the raceway, cable or duct can be safely and properly installed and backfill can be properly tamped in such sections.

3.05 BACKFILLING

A. Backfill material shall be compacted to 6" layers and as specified in Paragraph 3.06 - Compaction.
   1. Trench Backfill: Trenches shall be backfilled to finish grade.
   2. Replacement of Unstable Material: Unstable material removed from the bottom of the trench of excavation shall be replaced with select granular material or gravel borrow placed in layers not exceeding 6 inches loose thickness.

3. Bedding and Initial Backfill: Bedding shall consist of satisfactory materials. Initial backfill shall be in 6-inch lift.

3.06 COMPACTION

A. Each layer of fill, or the excavated subgrade, shall be compacted to at least 95%, per ASTM D1557, of laboratory maximum density. Compaction shall be accomplished by approved tamping rollers, pneumatic-tired rollers, three-wheel power rollers, or other approved compaction equipment.

3.07 PROTECTION

A. Newly graded excavated or bedded areas shall be protected from traffic and from erosion, and any settlement or washing away that may occur from any cause, prior to acceptance, shall be repaired and grades reestablished to the required elevations and slopes.

END OF SECTION

SECTION 26 0519
WIRES AND CABLES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide all wire, cable, and terminations complete.

1.02 RELATED DOCUMENTS

A. Section 26 0000 – Electrical General Conditions

PART 2 - PRODUCTS

2.01 WIRE AND CABLE (COPPER, 600-VOLT)

A. Underground: All conductors to be type USE. Increase raceway size when necessary to accommodate conductors per code. Exception: Underground conductors completely contained in code recognized Raceway and boxes may be Type THW, THWN or XHHW.

2.02 WIRE AND CABLE (ALUMINUM, 600-VOLT)

A. May be used for service feeders only at the Contractor's option (except for ground cable) subject to the following requirements:
   1. Increased size for same current capacity (increased raceway size may be necessary).
   2. Insulation requirements are the same as for copper conductor wires and cables.
   3. Aluminum conductors shall be made of an AA-8000 series electrical grade aluminum alloy conductor material.

2.03 SPLICES

A. Below Grade: Splices below grade shall be in handholes and shall be made watertight with epoxy resin type splicing kits similar to Scotchcast.

2.04 TERMINATIONS

A. Compression set, bolted or screw terminal.

B. Conductors #12 and smaller shall utilize eye or forked tongue type compression set terminator when termination is to a bolted or screw set type terminal block or terminal cabinet.

2.05 PLASTIC CABLE TIES

A. Nylon or Equivalent, locking type.

2.06 CABLE TAGS

A. Cable tags shall be installed on all three phase feeder cables. Tags shall be embossed with feeder power source and circuit number, i.e., panel A-26. Use tag part No. FT201 for cables up to 1-1/2 inch, use FT-205 for over 1-1/2 inch.

PART 3 - EXECUTION

3.01 GENERAL

A. Install all wiring in raceway unless shown or specifically authorized otherwise.

3.02 WIRE SIZE

A. No. 12 AWG minimum for power and lighting circuits.

B. Provide solid wire for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger (600) volts.

3.03 TESTS

A. In addition to the factory testing of all equipment and cable, the Contractor shall test all wiring connections for continuity and ground before any fixtures or other loads are connected. Tests shall be made with a 500V minimum DC "Megger" type tester. If tests indicate faulty insulation (less than 2 megohms), such defects shall be corrected and tested again. Contractor shall provide all apparatus to make tests and shall bear all expenses of required testing. Routine operation tests shall be made on all pieces of equipment to demonstrate that working parts are in operating condition. Results of all tests shall be recorded and submitted to the Architect. The Contractor shall immediately replace all parts, which fail to pass the test.

B. Measure the OHMIC value of the Electric Service Entrance metallic "System Ground" with reference to "Earth Ground" using the "Multiple Ground Rod Fall-In-Potential" method and suitable instruments. Maximum resistance to ground shall be less than 10 ohms. If this resistance cannot be obtained with the ground system shown, notify the Architect immediately for further instructions. Provide OHMIC test results to Engineer.

C. All circuits both in and out of the building shall test out free of grounds, short circuits and other defects.

D. Check and record catalog number and ampere size of controller overload heaters installed, nameplate full-load amperes, and actual operating amperes of each motor. **IMPORTANT**: Submit recorded data in triplicate to the Engineer. Check proper load balance on the electrical system, direction of rotation, lubrication, and overload protection of all motors before placing in operation.

E. Provide a log of ampere reading for all panels from phase to neutral for 4 wire panels and from phase to phase for 3 wire panels. These readings shall be taken with all loads activated.

F. The final test of all equipment shall be made on dates designated by the Architect/Engineer and all readings shall be made in his presence.

G. Feeders shall be checked to ensure all phases are energized before connecting to their respective motors. Each motor shall rotate in the proper direction for its respective load. Prior to rotation test, all bearings shall be inspected for proper lubrication.

H. Minimum megger test for equipment shall be as follows:

Equipment Maximum Voltage Rating	Minimum Test Resistance
1,000-Volts or less	2 Megohms

I. Provide certification of torque values for feeder and service entrance conductors per equipment manufacturer's recommendation.

3.04 CONDUCTOR SIZES, REFERENCED ON PLANS

A. Copper, type THW or RHW unless noted.

3.05 ALUMINUM CONDUCTORS

A. Aluminum conductors serving switchboards and service entrance rated panelboard shall be terminated using compression type oxide inhibiting compound filled aluminum lugs only.

B. Compression fittings shall be sized for the conductor used and shall be set with a tool, which assures a preset deformation before release.

C. Aluminum lugs, where in contact with copper studs, bolts or bus, shall be plated.

D. Bolted aluminum lugs shall be installed with a Belleville washer under nut unless specifically permitted otherwise.

3.06 PULLING

A. Use no mechanical means for pulling No. 8 AWG conductors and smaller. Powdered soap stone or approved spray cream shall be the only lubricant used.

3.07 STRIPPING INSULATION

A. Do not ring the cable, always pare or pencil.

3.08 TAPING

A. If used shall be half lapped synthetic tape.

3.09 CONDUCTORS IN PANELS AND SWITCHBOARDS

A. Conductors in panels, switchboards, and terminal cabinets shall be neatly grouped and formed in a manner to "Fan" into terminals with regular spacing.

3.10 CABLE SUPPORTS

A. Provide conductor support devices as required by code in vertical cable runs.

3.11 RACEWAY SIZES REFERENCED ON DRAWINGS

A. Raceways are sized for copper, type THW, unless otherwise noted. Size all raceways per code unless specifically noted to be larger on the drawings.

END OF SECTION

SECTION 26 0526
GROUNDING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. A grounding system shall be provided for neutral ground and equipment ground as required by code.

B. Provide all grounding of other systems as indicated in Divisions 26, 27, and 28.

PART 2 - PRODUCTS

2.01 GROUNDING CONDUCTORS

A. Copper, code size, with physical protection where subject to damage. Bare or green insulated.

2.02 GROUND RODS

A. 3/4" x 8'-0" copper clad steel.

2.03 ISOLATED GROUND BARS

A. Provide in all panels containing isolated ground circuits.

PART 3 - EXECUTION

3.01 GENERAL

A. Provide all grounding for electrical systems and equipment as required by codes and as specified herein.

3.02 SIZE OF GROUND WIRE

A. As required by code. Where ground wire is exposed to physical damage or is used outside of the building, protect with conduit.

3.03 GROUND RODS

A. Provide as shown and/or required. Connect the ground conductor to each rod.

3.04 CONCRETE-ENCASED ELECTRODE

A. Provide in accordance with NEC 2020, Article 250.52 (A)(3) and Article 250.68 (C)(3).

3.05 GROUND CONNECTION OF WATER PIPING

A. Metal internal piping shall be grounded, as part of this Contract. This includes jumpers for dielectric fittings.

3.06 CONNECTION TO THE GROUND BUS

A. Provide connections in accordance with the codes; including but not limited to conduit system, switchboard frame, service neutral and electrically operated equipment and devices. No device or equipment shall be connected for electrical service which has a neutral conductor connected to a grounding conductor or to the frame within the device or equipment.

3.07 METHOD OF CONNECTION

A. Make all underground ground connections and ground cable splices by thermal welding. Aboveground ground connections and ground cable splices may be by permanent compression connector. Grounding lugs, where provided as standard Manufacturer's items on equipment furnished, may be used.

3.08 FLEXIBLE RACEWAY

A. Shall not be used for grounding. Install separate ground conductor in all flexible raceway.

3.09 PVC RACEWAY

A. Install separate ground conductor in all PVC raceway as required per code.

3.10 DROP CORDS

A. Shall have a grounding wire and be connected with a grounding type plug and receptacle.

3.11 TESTING REQUIREMENTS

A. Measure the OHMIC value of the Electric Service Entrance metallic "System Ground" with reference to "Earth Ground" using the "Multiple Ground Rod Fall-In-Potential" method and suitable instruments. Maximum resistance to ground shall be less than 25 ohms. If this resistance cannot be obtained with the ground system shown, notify the Architect immediately for further instructions. Provide OHMIC test results to Engineer.

END OF SECTION

SECTION 26 0532
OUTLET AND PULL BOXES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide outlet and pull boxes to enclose devices, permit the pulling of conductors and for wire splices and branches.

1.02 RELATED DOCUMENTS

A. Section 26 0000 – Electrical General Conditions

PART 2 - PRODUCTS

2.01 EXTERIOR WIRING

A. Above Grade:
   1. Pull boxes shall be fabricated of heavy gauge steel and hot dipped galvanized. All boxes shall have gasketed covers.
   2. Exterior outlet boxes shall be weather resistant and rain tight, with appropriate covers, gaskets, and screws.

B. Below Grade:
   1. Unless otherwise noted and/or as required by Code, and where exposed to earth, provide the following:
      a. Handhole and vaults shall be constructed of precast concrete with base, and shall include lid with galvanized, diamond plate, slip-resistant door with locking hatch. Door shall be spring-assisted with full 180-degree swing, where available, and shall be H-20 heavy duty rated where installed in traffic areas.
      b. For handholes, where identified on the drawings, provide a minimum interior dimension of 1’-5” w x 2’-4” l x 12” d, equivalent to H^2 Pre-cast Type 2 junction box.
      c. For vaults, where identified on the drawings, and serving power and/or systems rated 600-Volts and below, provide a minimum interior dimension of 2’w x 2’l x 2’d, equivalent to Oldcastle Precast Vault 3030 LA.
      d. For vaults, where identified on the drawings, and serving power rated over 600-Volts, provide a minimum interior dimension of 3’-4 w” x 3’-4l” x 3’-1” deep, equivalent to Oldcastle Precast 444LA.

PART 3 - EXECUTION

3.01 CONNECTION TO EQUIPMENT

A. For equipment furnished under this or other Divisions of the Specifications, or by others. Provide outlet boxes of sizes and at locations necessary to serve such equipment. An outlet box is required if the equipment has pigtail wires for external connection, does not have space to accommodate circuit wiring used. Study equipment details to assure proper coordination.

3.02 BLANK COVERS

A. Provide blank covers or plates over all boxes not covered by equipment.

3.03 JUNCTION OR PULL BOXES

A. Pull and junction boxes shall be installed as shown, and to facilitate pulling of wire and to limit the number of bends within code requirements. Boxes shall be permanently accessible and shall be placed only at locations approved by the Architect.

B. The Drawings do not necessarily show every pull or Junction Box required. The Contractor is permitted to provide boxes deemed necessary by him for his work when installed in accordance with these Specifications.

3.04 BOXES IN EARTH

A. Provide for all wire splices and as required to pull conductors. Boxes (handholes) shall be set in place on a 3" sand bed. Coverplates shall be flush to, and match the slope of, the final surface grade.

3.05 NAMEPLATES

A. For all line voltage junction boxes, provide engraved nameplate indicating circuit numbering of all wiring in junction box.

END OF SECTION

SECTION 26 0533
RACEWAY

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide Raceway System complete.

1.02 RELATED DOCUMENTS

A. Section 26 0000 – Electrical General Conditions

PART 2 - PRODUCTS

2.01 GALVANIZED RIGID STEEL CONDUIT (GRS)

A. General: Hot dipped galvanized.

B. Fittings: Galvanized malleable iron or noncorrosive alloy compatible with galvanized conduit. Erickson couplings, watertight split couplings (O.Z. type or equivalent) permitted. Running thread or set screw type fittings not approved.

2.02 INTERMEDIATE METAL CONDUIT (IMC)

A. General: Hot Dipped galvanized.

B. Fittings: Galvanized malleable iron or noncorrosive alloy compatible with galvanized conduit. Erickson couplings, watertight split couplings (O.Z. type or equivalent) permitted. Running thread or set screw type fittings not approved.

2.03 RIGID NON-METALLIC CONDUIT (PVC)

A. Schedule 40 rigid polyvinyl chloride type unless otherwise noted.

PART 3 - EXECUTION

3.01 GENERAL

A. Install Raceway concealed in construction unless noted otherwise on the Drawings or specifically approved in writing by the Architect/Engineer.

B. Cut Raceway ends square, ream and extend maximum distance into all couplings and connectors.

C. Provide and install manufactured end caps on all Raceway ends during construction to prevent the entrance of water or dirt. Tape, as a cover, not permitted.

D. Swab out all Raceways before pulling wires.

E. All elbows for GRS and PVC Raceway shall be factory radius bends. For all other Raceway, use factory radius bends of 1-1/4" and larger diameter.

3.02 GALVANIZED RIGID STEEL CONDUIT

A. All Connections shall be watertight. Install for all Raceways in concrete or where subject to damage.

3.03 INTERMEDIATE METAL CONDUIT

A. Intermediate metal conduit is permitted as a substitute for galvanized rigid steel conduit except where GRS is required by code.

3.04 RACEWAYS UNDERGROUND

A. Galvanized rigid steel conduit - painted with two coats of bitumastic paint - or galvanized rigid steel conduit with 15 mil. polyvinyl chloride (PVC) jacket (repair abrasions with PVC base paint or PVC).

B. PVC Raceways may be used for underground runs when permitted by code. Field bends, when necessary, shall be formed only with factory recommended heater. Penetrations through floor and walls shall be galvanized rigid steel (GRS) conduit. PVC, if used, shall be increased in size from that shown to include code required ground wire.

C. All underground bends in excess of 10 degrees and all elbows shall be GRS.

D. Arrange and slope Raceways entering building to drain away from building.

3.05 INSERTS, SHIELDS AND SLEEVES

A. Furnish and set in place, in advance of pouring slabs and walls, all inserts and sleeves needed to execute Division 26 equipment installation.

B. Where supports in slabs are required after wall has been poured, use a drilled-in threaded insert, installed as recommended by Manufacturer.

C. Sleeves shall be provided for all wall penetrations.

3.06 RACEWAYS THAT STUB UP THROUGH FLOOR

A. Install at such depth that the exposed Raceway is vertical and no curved section of the elbow is visible.

B. PVC Raceway shall not be stubbed through floors.

3.07 FLEXIBLE CONDUIT

A. Flexible conduit shall be used **only** for connection to motors and equipment subject to vibration with 90 degrees loop minimum to allow for. Flex conduit shall not be installed over 6' long or used to connect from fixture to fixture. Use liquid tight for pumps, equipment which is regularly washed down, and equipment in damp locations. Provide ground wire.

3.08 PULL CORDS

A. Nylon type shall be included in all installed empty Raceway.

END OF SECTION

SECTION 26 0573
ELECTRICAL SYSTEM STUDIES

PART 1 - GENERAL

1.01 GENERAL

A. Conform to the General Conditions, Supplementary Conditions, and related work in other Divisions for all work in Division 26. See Section D – Special Provisions for sequence of work.

1.02 RELATED SECTIONS

A. Section 26 0000 – Electrical General Conditions

B. Section 26 2413 – Switchboards

C. Section 26 2416 – Panelboards

1.03 SECTION INCLUDES

A. This section includes the requirements for the contractor to perform electrical system studies based on the selected electrical equipment.

B. The required studies include but are not limited to a Coordination Study and an Arc Flash Assessment Study.

C. Each of the studies performed shall be based on the actual equipment to be installed. Any revisions of the selected equipment shall result in an updated study with the revised equipment submitted for review and approval prior to ordering equipment.

D. If the contractor installs different equipment than was included in the approved electrical system studies, the owner reserves the right to require the contractor to replace the non-approved electrical equipment at no additional cost to the owner.

E. The contractor shall provide all studies in agreement with all applicable codes and standards. If a specific code is applicable to the electrical system being modeled, the code shall be referenced and the portion of the electrical system impacted shall be noted.

1.04 SUBMITTAL REQUIREMENTS OF THIS SECTION

A. During the Shop Drawing process and prior to ordering electrical equipment, the contractor shall submit an **Electrical System Overcurrent Protective Device Coordination Study**. The Coordination study shall be submitted with the product data for all devices included in the coordination study and shall be formatted as indicated in Paragraph 2.01.

B. After the electrical system has been installed and is ready for energization, the Contractor shall provide an **Arc Flash Assessment Study**. The Arc Flash Assessment shall be submitted for approval prior to substantial completion. Once the Arc Flash Assessment Study is approved, the Contractor shall print and install the approved Arc Flash notification labels on all equipment containing overcurrent protective devices. Labels installed outdoors shall be suitable for outdoor installation. The Arc Flash Assessment Study shall be assembled as outlined in Paragraph 2.02.

1.05 QUALIFICATIONS

A. All Studies shall be prepared by a qualified professional electrical engineer.

1.06 DEFINITIONS

A. For the purposes of this section, overcurrent device coordination shall be defined in two levels as follows:
   1. Coordinated = Full coordination outside of the instantaneous region of the overcurrent devices.
   2. Selectively Coordinated = Full coordination including the instantaneous region of the overcurrent devices.

1.07 OPERATION AND MAINTENANCE REQUIREMENTS OF THIS SECTION

A. The contractor shall provide to the owner the following information to be included in the Operation and Maintenance Manual:
   1. Final Arc Flash Assessment Study submitted in accordance with the requirements outlined in Specification 26 0000 Electrical General Conditions.
   2. The electronic copy shall also include a sub-folder with the software model used to perform the calculations. The model shall include all files necessary to access and review the model electronically. The Contractor shall include a Text File in the directory labeled “MODEL_INFORMATION.TXT” which includes the following:
      a. Project Name
      b. Electrical Contractor Name
      c. Software used to model the system including version
      d. Date the model was last updated
      e. Contact information for the individual/organization who prepared the model.

PART 2 - PRODUCTS

2.01 PROTECTIVE DEVICE COORDINATION STUDY

A. The contractor shall submit an **Electrical System Overcurrent Protective Device Coordination Study** during the Shop Drawing submittal phase of the project prior to ordering equipment with overcurrent protective devices. The Coordination study shall be submitted with the product data for all devices included in the coordination study.

B. All overcurrent protection devices shall be provided as a coordinated system by the manufacturer. Any cases where the selected manufacturer is unable to coordinate two overcurrent devices in series due to the sizes indicated in the design, the engineer shall be notified and a recommended coordination solution provided by the manufacturer prior to or during the submittal phase. For overcurrent protection devices 400A and larger where the manufacturer is unable to provide a coordinated system, the overcurrent protection devices shall include Long-Time/Short-Time/Instantaneous (LSI) time delay and ampacity settings minimum.

C. Unless noted otherwise, when a main service overcurrent device with adjustable Ground Fault trip has been specified, the next level feeder overcurrent devices shall also include adjustable Ground Fault trip. The Coordination Study shall also provide recommended settings for all adjustable Ground Fault trip devices.

D. The Protective Device Coordination Study shall present the following information in an organized report:
   1. Coordination Study Title Page shall include:
      a. Project Name
      b. Electrical Contractor name
      c. Date Study was performed
      d. Study Type (ie Overcurrent Device Coordination Study)
      e. Name/Company/Contact information for organization performing the study
      f. Analysis software used to perform the study including version
   2. Coordination Study Executive Summary shall include a brief project description, an overall description of the electrical system, and a listing of any items that may need resolution. If specific Code requirements exist for any portion of the electrical system, they shall be noted in addition to how the requirement was implemented.
   3. Coordination Study Analysis shall include a detailed outline of the overcurrent device coordination analysis. Time Current Curves shall be provided for each unique coordination path in the electrical system from the Main service protective device to the largest branch circuit breaker. Each Time Current Curve shall be uniquely labeled. The report shall include a list of the overcurrent devices included in each Time Current Curve and a description of any potential un-coordinated devices with the potential impact on the electrical system due to the lack of coordination.

4. Conclusion shall include a summary of overall protective device coordination for the electrical system being modeled. The Conclusion shall also include a table listing all devices with adjustable settings and the recommended settings based on the coordination study. Any uncoordinated electrical devices that include recommended revisions shall be listed with the proposed system revision.
5. As an Appendix, the Coordination Study shall include a one-line diagram of the modeled system with each bus and overcurrent device identified. The naming of the devices in the one-line diagram shall exactly match the device names in the report and time-current curves.

2.02 ARC FLASH ASSESSMENT STUDY

A. After the electrical system has been installed and is ready for energization, the Contractor shall provide an Arc Flash Assessment Study. The Arc Flash Assessment Study shall be submitted for approval prior to substantial completion. Once the Arc Flash Assessment Study is approved, the Contractor shall print and install the approved Arc Flash notification labels on all equipment containing overcurrent protective devices.

B. The Arc Flash Assessment Study shall include the following at a minimum:
   1. Study Title Page shall include the following information
      a. Project Name
      b. Date Study was performed
      c. Name/Company/Contact information for organization performing the study
      d. Analysis software used to perform the study including version
   2. An Index shall be provided listing each Section included in the Arc Flash Assessment Report.
   3. Study Executive Summary shall a brief overview of each section of the Study including any recommended revisions to the electrical system based on the results of the Study. The overview shall include at a minimum, any pieces of equipment with a calculated fault current that exceeds the equipment rating, a listing of any overcurrent devices with revised settings, a brief listing of un-coordinated equipment that necessitate revisions, and a listing of each piece of equipment with a Dangerous level of Arc Flash energy.

C. Each of the following sections and appendices shall include a dedicated Cover Page outlining the contents of the Section.

D. Section #1 Fault Analysis shall include an updated Fault Current Analysis of the entire electrical system. The Fault Analysis shall include as a minimum the following information:
   1. The available fault current at the Utility for the fault analysis shall be based on the actual Utility fault current and not an assumption. For electrical distribution systems that are primary metered, the study shall include the primary electrical system back to the point of service including but not limited to actual cable lengths/sizes/types and any overcurrent protective devices. The study shall include correspondence from the utility showing the available fault current at the utility service point in the appendices.
   2. Updated cable size/type/length shall be included in the report based on the installed conditions.
   3. Updated transformer information based on the installed transformer nameplates
   4. Current limiting fuses shall be indicated where applicable based on the actual equipment installed.
   5. Large motors (>50hp) shall be included in the analysis. Smaller motors shall be grouped together at each panel/switchboard.
   6. A Table shall be provided with a comparison of calculated fault current to equipment fault rating for each piece of equipment containing overcurrent protective devices. The calculated fault current shall be adjusted as necessary based on the calculated X/R ratio.
   7. Any equipment that is found to have a rating less than the calculated/adjusted fault current shall be specifically indicated along with recommended corrective action.
   8. The Fault Analysis shall include the system model one-line diagram with the following information indicated:
      a. Utility connection point with available fault current and X/R ratio.

b. Cables with conductor size, length, parallel count, raceway type.
c. Transformers with impedance, kva, X/R ratio.
d. Large motors (>50hp). Smaller motors shall be grouped together at each panel/switchboard.
e. Electrical equipment with overcurrent protective devices showing calculated fault current.

E. Section #2 Protective Device Coordination Study shall include an updated Coordination Study for the entire distribution system as outlined in Paragraph 2.01. The updated coordination study shall optimize settings to provide coordination while reducing the Arc Flash energy present.

F. Section #3 Arc Flash Assessment shall include a description of the method used to calculate the Arc Flash energy present and the assumptions of the study. The following additional items shall be included in the study as a minimum:
1. Table summarizing the Arc flash energy present at each piece of equipment and the conditions under which the incident energy occurred. The table shall also include the arcing time, fault current, upstream overcurrent device, and any notes for different conditions present.
2. A template Arc Flash label with each piece of information included on the label explained.
3. Sample Arc Flash Labels for each piece of equipment in the model showing the code required information.

G. Appendix A shall include that correspondence from the electric utility providing the available fault current used in the analysis.

H. Appendix B shall include cut sheets for all electrical equipment included in the Arc Flash Assessment study.

PART 3 - EXECUTION

3.01 TESTING/VERIFICATION

A. The contractor shall provide testing of each piece of electrical equipment with adjustable overcurrent protective devices to verify proper operation in accordance with the manufacturer's recommendations. The test reports shall indicate the following at a minimum:
1. Equipment name.
2. Date of the test.
3. Name and organization of the individual performing the testing
4. Test results. Any equipment failing the testing shall be replaced at no additional cost to the owner.
5. As-Left settings. These settings shall be as indicated in the Arc Flash Assessment Study. Any settings that vary from the Study shall be either updated in the Study including a revised submittal package or shall be corrected in the field and an updated test report provided.

3.02 FIELD APPLIED ARC FLASH LABELS

A. After the Arc Flash Assessment Study is approved and the electrical equipment has been successfully tested, the Contractor shall provide Arc Flash and Shock Hazard warning labels on all electrical devices containing overcurrent protection stating the following information at a minimum:
1. PPE level of protection
2. Incident energy (cal/cm^2) at 24" from the equipment unless specified otherwise by the Owner/Engineer
3. Flash hazard boundary
4. Glove class
5. Limited approach distance
6. Restricted approach distance
7. Prohibited approach distance

B. Labels shall be permanently affixed to the equipment or wiring method and shall not be hand written.

C. The label shall be of sufficient durability to withstand the installed environment. Labels installed outdoors shall be suitable for outdoor installation with no degradation due to sun light or precipitation.

D. The label shall meet ANSI Z535 guidelines and requirements.

END OF SECTION

SECTION 26 2413
SWITCHBOARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Section 26 0000 – Electrical General Conditions

1.02 WORK INCLUDED

A. Provide all service entrance and main distribution switchgear with equipment as shown and described, with continuous full load ampacities as indicated.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Square-D

B. General Electric

C. Cutler-Hammer

D. Siemens

2.02 ENCLOSURES

A. Shall be freestanding, steel with steel angle or channel framework of adequate strength and rigidity necessary to resist all conditions of use to which it may be subjected and to support all equipment, devices and appurtenances contained therein. Front plates shall be installed in sections so that all parts of the board are front accessible without disturbing other parts. A removable lifting angle shall be provided at the top and bottom of each shipping section(s).

B. Minimum 12-gauge steel, except front panels and doors may be minimum 14 gauge.

C. Shall be front access only unless noted otherwise.

D. Provide on 3-inch housekeeping concrete pad with minimum 3-inch lip on front and sides.

E. Finish shall be factory applied; standard gray color for all exterior and interior painted surfaces. Other colors may be considered.

F. Outdoor installation shall be NEMA 3R.

2.03 SWITCHBOARD DIMENSIONS

A. Overall height of switchboards shall not exceed 90 inches (not including base channels). Length and depth shall not exceed dimensions as scaled or noted in contract documents. Manufacturers whose equipment dimensions exceed those indicated shall notify the Engineer in writing 10 days prior to bid date. These Manufacturers may not bid as "Not Conforming to Contract Documents". Contractor shall base bid only on equipment which fully complies with contract documents. Cost of building modifications or switchboard relocations, if permitted, or other additional work required to fit larger size switchboard(s) than shown on drawings shall be borne totally by the Contractor.

2.04 SWITCHBOARD BUSBARS

A. Aluminum or copper at manufacturer's option, factory fabricated; carried to terminals for connection to service cables or busway. Brace switchboard components for symmetrical fault current shown plus a symmetrical offset (50,000-amp bracing minimum). Aluminum bus shall be tin plated over its full length.

B. Busbar Joints:

1. Busbar to busbar shall be bolted, lapped and silver or tin plated, having low contact resistance and low temperature rise. For aluminum bus bolt using Grade 5 bolts with Belleville washers.
2. Overcurrent devices shall be bolted to busbars using Grade 5 bolts and Belleville washers. Exception: Square-D I-line and 30-200A fused switches

C. Conductor connectors shall be bolted to busbars using Grade 5 bolts and Belleville washers. Where aluminum conductors are utilized for feeders, the connectors shall conform with Section 26 0519.

D. System of Bussing: Three phase, 4 wire, full size neutral unless otherwise noted.

E. Ground Bus: Full length ground bus bonded to frame conforming to U.L. 891 for minimum size except larger as required by the code for grounding neutral conductor.

2.05 SWITCHBOARD COMPONENTS

A. Switchboards shall include (but not limited to) the following components:
   1. Shall be full-fault current rated, series rating of devices is not allowed.
   2. Switches and fuses or breakers as shown. If fuses are used, provide all necessary fuses and spares per Section 26 2813.
   3. Space for future switches or breakers as shown including complete bussing and required hardware for mounting devices. Space for metering and instrumentation components, and current limiters (when required).
   4. Miscellaneous appurtenances as required for a complete installation.
   5. Cleats for securing all conductors.

B. When Serving as Service Entrance Equipment:
   1. Shall conform to UL 869 and have a Service Entrance Type UL label
   2. Shall be full-fault current rated, series rating of devices is not allowed. See drawings.
   3. Where utility company metering equipment is shown, provide current transformer space, meter base(s), metering conductors and miscellaneous appurtenances as required by serving utility.
   4. Shall contain surge arrestors on all phases for voltage surge protection on secondary (under 600V) electrical wiring systems. Similar to Square-D, J9200.

2.06 NAMEPLATES

A. Nameplates shall be installed on all switchboards. Each individual switch shall be identified with a nameplate adjacent to the switch, describing the load connected.

B. Provide a service entrance label nameplate on the main switchboard which includes the following:
   1. Architect
   2. Electrical Consultant
   3. Electrical Contractor
   4. Date of Installation
   5. Service Voltage & Bus Amperage Rating
   6. Symmetrical Short Circuit Current Rating
   7. Year of Manufacture

C. Lettering size shall be suitable for the size of plate and information contained. Nameplates shall be engraved plastic (3/8-inch-high minimum letters). Attach with stainless steel screws.

2.07 SINGLE PHASING SENSORS

A. Provide single phasing sensors to trip the main switches in the event of a single-phase failure.

2.08 CLEATS

A. Provide for securing all feeder cables within the switchboard.

PART 3 - EXECUTION

3.01 MOUNTING

A. Shall be bolted to floor using 1/2" x 8" (minimum) black mild steel foundation anchor J-bolts and anchored similarly to building structure to prevent overturning in the event of earthquake. Provide 3" thick structural concrete "housekeeping pad". J-Bolts in the floor shall be set in the structural floor and extend through the housekeeping pad with sufficient threads to attach the switchboard.

3.02 WIRING

A. Shall conform to applicable Sections of these specifications.

B. Shall be secured to switchboard enclosure with cleats. Maximum spacing shall not exceed 24 inches.

3.03 SPACE

A. Verify space available with equipment sizes and code required working clearances prior to submittals of shop drawings

3.04 GROUNDING

A. Provide pursuant to Section 26 0526.

3.05 UTILITY REQUIREMENTS

A. When service switchboard includes utility company metering equipment, provide all devices and wiring to meet serving utility requirements.

3.06 TESTS

A. Torquing requirements and installation of all terminations 1,000 amps and above shall be certified by an independent testing agency.

END OF SECTION

SECTION 26 2416
PANELBOARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Section 26 0000 – Electrical General Conditions

1.02 WORK INCLUDED

A. Provide all panelboard equipment, complete; dead front type.

PART 2 - PRODUCTS

2.01 PANELBOARD TYPE

A. Panelboards shall be rated at proper voltage and current for intended use with busbars of copper or aluminum. Panels shall be 3-phase, 4-wire, 100% neutral, unless noted otherwise. Where aluminum is utilized, all lugs shall be of an approved compression type. Provide multiple lugs where conductors in parallel or "feed through" are shown on the Drawings.

B. Conductor Connectors shall be bolted to busbars using Grade 5 bolts and Belleville washers. Feeder conductor connectors shall be rated for 75 Degree C. wire when 75 Degree C. wire is indicated. Where aluminum conductors are utilized for feeders or branch circuits the connectors shall conform with Section 26 0519.

C. Panelboards shall have a separate ground bus bonded to the panelboard frame.

D. Where 120-Volt, 15- or 20-Amp breakers are intended for switching loads they shall be of type rated for switching duty labeled "SWD."

2.02 ACCEPTABLE MANUFACTURERS

A. General Electric

B. Square-D

C. Siemens

D. Cutler-Hammer

2.03 CIRCUIT BREAKERS

A. The following interrupting capacity, 10,000 AIC Symmetrical shall be considered minimum. Other ratings shall be as specified on panel schedules shown on the Drawings. Series rating of breakers is not allowed.

B. Mount breakers in all panelboards so that breaker handles operate in a horizontal plane. Bolt in type only. Provide common trip on all multiple pole breakers.

C. Where noted, provide spare breakers, complete for future connection of wiring circuits. Where "Space" is indicated for breakers, provide all bussing and breaker mounting hardware in the panelboard, provide steel knockouts in dead front metal closure of unused part of panel. If any steel knockouts are removed, provide breakers in such spaces or approved cover plates. Open spaces are not permitted.

2.04 CABINET FOR EACH PANELBOARD

A. Flush or surface, as indicated; tight closing doors without play, when latched. Where two cabinets are located adjacent to each other in finished areas, provide matching trim of the same height. Where a remote-controlled switch or contactor is mounted in any panelboard, mount on same frame as panelboard interior with screw retained access door in dead front shield; common door over circuit breakers and remote-controlled device. Where flush mounted, provide (2) 3/4" conduits to accessible ceiling space for future expansion.

B. All conduits for future expansion shall stub into a junction box, where located above grade, and shall be sealed in the panel.

C. Provide cabinets of sufficient dimensions to allow for future expansion and addition of circuit breakers within the panelboards as indicated on panel schedules.

D. Provide cabinet front with full-height hinged door. One door over the interior and an additional hinged dead front cover over interior and wireway (door-in-door). Full-height front cover hinged to box with concealed trim clamps. Provide flush door locks.

E. Provide lock for each cabinet door. All Electrical Distribution Equipment Locks shall be keyed identically. Key system shall match existing. Supply Owner with minimum six keys.

F. Fasten panelboard front with machine screws with oval counter-sunk heads, finish hardware quality, with escutcheons or approved trim clamps. Clamps accessible only when dead front door is open are acceptable. Surface mounted panelboards with fronts greater than 48 inches vertical dimension shall be hinged at right side in addition to hinged door over dead front.

G. Finish: Provide factory prime coat for cabinets to be located in finished areas. Where cabinets are located in unfinished areas, standard lacquer or enamel finish, gray or blue-gray color, shall be substituted for factory prime coat.

2.05 SYSTEM OF NUMBERING AND BUS ARRANGEMENT

A. Shall be as shown on the Panel Schedules on the Drawings.

2.06 PANELBOARD NAMEPLATE

A. Provide engraved and filled (or color layer - engraved through outer layer) plastic nameplate with ½-inch high characters (for panel name); attached with screws to each NEMA 1 panelboard front. White on black, include voltage, phases, wires and minimum A.I.C. Rating in 3/8-inch characters.

B. Nameplate color shall be:
   1. Normal System: White letters on black

C. Where applicable, provide a service entrance label nameplate on the main panelboard which includes the following:
   1. Architect
   2. Electrical Consultant
   3. Electrical Contractor
   4. Date of Installation
   5. Service Voltage & Bus Amperage Rating
   6. Symmetrical Short Circuit Current Rating
   7. Year of Manufacture

PART 3 - EXECUTION

3.01 MOUNTING

A. Secure in place with top of cabinet at 6'-0", unless otherwise noted. Top of cabinet and trim shall be level. Firmly anchor cabinets directly or with concealed bracing to Building Structure. When panels are not located in or directly on a wall, provide a support frame of formed steel channel which is anchored to the floor and Ceiling Structure. Interiors shall not be installed until Structure is totally enclosed. Where panels are mounted adjacent to each other, the top edges shall be at the same height.

3.02 CIRCUIT INDEX

A. For each branch circuit panelboard provide a typewritten index listing each circuit in the panelboard by number with its proper load designation. Mount with a transparent protective cover inside cabinet door. Listing shall match circuit breaker arrangements, typically with odd numbers on the left and even numbers on the right. Room numbers used shall be final room numbers used in the building as verified with the Owner, and not room number assigned on Plans.

3.03 CABINET PAINTING

A. Cabinets furnished as prime painting shall be field painted to match color of adjacent wall.

3.04 SPACE

A. Verify space available with equipment sizes and Code Required Working Clearances prior to Submittal of Shop Drawings.

3.05 GROUNDING

A. Provide separate ground busbar for all panels supplying isolated ground circuits.

3.06 FEED THROUGH AND DOUBLE LUGS

A. Provide feed through or double lugs with amperage equal to the incoming feeder amperage unless shown as larger.

END OF SECTION

SECTION 26 4300
SURGE PROTECTIVE DEVICE (SPD)

1.01 DESCRIPTION

A. This Section describes the materials and installation requirements for transient voltage surge suppressors alternatively called Surge Protective Devices (SPD). SPDs are used for the protection of all AC electrical circuits from the effects of lightning induced currents, substation switching transients and internally generated transients resulting from inductive and/or capacitive load switching.

B. This specification also describes the mechanical and the electrical requirements for the SPDs. The SPD shall be suitable for application in both category A, B and C environments as described in ANSI/IEEE C62.41- 2002.

C. The SPD shall be of parallel design and provide individual protection components connected Line to Ground and Line to Line for Delta and High Resistance Grounded systems and Line to Ground, Line to Neutral and Neutral to Ground for Wye and Single-Phase distribution systems.

D. Systems not providing discreet protection components in the above configuration will be rejected. A schematic diagram showing the configuration and technology of all internal connected components must be provided with submittals.

E. The SPDs will be used both near electrical service entrance locations and at locations distant from service entrance locations (Panels, MCC's, Equipment Disconnects, etc.). For the purposes of this specification, it should not be assumed that on Wye systems a neutral to ground bond will not be located electrically close to the suppressor location, thus discreet Neutral to Ground Suppression and Filter components are required.

F. The Manufacturer/Vendor shall furnish all of the necessary SPD products and related hardware (i.e., flush mounting kits, mounting brackets, etc.) as required for the installation of the Transient Voltage Surge Suppression (TVSS) / Surge Protective Devices (SPD) System suitable for the application.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 26 0000 – Electrical General Conditions

B. Section 26 0519 - Wire and Cable

C. Section 26 0526 - Grounding

D. Section 26 0532 – Outlet and Pull Boxes

E. Section 26 0533 – Raceways

F. Section 26 2413 - Switchboards

G. Section 26 2416 – Panelboards

1.03 SUBMITTALS

A. The vendor/manufacturer shall submit 3 copies of all related SPD Specifications, product data, electrical and mechanical shop drawings, installation requirements/instructions, maintenance manuals (if applicable) and performance/warranty information requested in this document for the actual proposed SPD(s) to Project Engineer. All information shall be submitted in a three-ring binder indexed by response and test. Project Engineer reserves the right to select or reject any vendor response or product.

B. In order for SPD to be considered for this project, all responses to information requested in this specification must be provided in writing and must reference each specification section and sub-section. Written submittal responses shall be signed by manufacturer's VP of Engineering. Attach information as necessary to provide compliance with specification response requirements. If a manufacturer cannot fully comply with a section of the specification, this must be stated in the response and the reason for non-compliance shall be provided.

1.04 QUALITY ASSURANCE AND PERFORMANCE

A. Each complete suppression unit shall be UL1449 3rd Edition Listed as a Transient Voltage Surge Suppressor. UL 1449 test data for SPDs proposed, including UL let through voltage classification shall be provided with submittal. Units shall bear suppressed voltage rating issued by UL.

B. Engineer reserves the right to have an employee or a representative designated by firm witness any testing required by this document. Vendor/manufacturer shall provide written notice of intent to test and shall coordinate testing with Engineer, should Engineer desire to witness tests.

C. Performance & Durability Testing: Units shall be tested by an independent test agency in accordance with test procedures outlined in ANSI/IEEE C62.45, NEMA LS1 & UL1449. The following test data shall be provided:

1. Provide Maximum Surge Current (Single Pulse Rated, 8/20µS, by mode, Amperes) as per NEMA LS1-1992 – 2.2.9 with submittals document. Maximum surge current rating shall not be less than 120kA (60kA per mode including N-G) for branch panel models in low exposure areas, high exposure areas and for IEEE C62.41.1-2002 - Category B Switchboard and Motor Control Center Locations. Maximum surge current rating (per phase in applicable modes other than Neutral to Ground) shall not be less than 240kA (120kA per mode including N-G) for IEEE C62.41.1-2002 - Category C Locations, including all Electrical Equipment located at Service Entrance location. Provide proof of completion of such tests and test data with submittal data. Provide surge current ratings for each applicable protection mode (L-L, L-N, L-G & N-G) with submittals.
2. Provide durability test data utilizing the ANSI/IEEE C62.41-1991, Category C3, 20kV/10kA, 1.2 x 50 S - 8x20S combination waveform. Provide test data with submittals. Let through voltages shall be provided for all applicable protection modes (L-N, L-G & N-G) from zero reference. All SPDs (including branch panel) shall withstand a minimum of 5,000 hits delivered at a rate of one pulse per minute. Unit shall not fail or suffer let through voltage degradation of more than 7%. Lead length for testing and let through measurements shall be 6”. Provide lead length used for testing with submittals.
3. Provide performance test data utilizing the ANSI/IEEEC62.41.2-2002, Exposure - High, 10kV/10kA, 1.2 x 50µS - 8x20µS combination waveform. Provide test data with submittals. Let through voltages shall be provided for all applicable protection modes (L-N, L-L & L-G) from zero reference. Lead length for testing and let through measurements shall be 6”. Provide lead length used for testing with submittals.
4. Provide let through voltage test data and test waveforms used for (N-G) with the submittals for units intended for grounded Wye systems.
5. Provide let through voltage test data for the ANSI/IEEE C62.41.2-2002, Category B, 0.5µS-100 kHz 6kV/.5kA ring wave (L-L, L-N & L-G) with the submittals. Let through voltages shall be provided for all applicable protection modes and shall be measured from the zero reference.
6. Provide let through voltage test data for the ANSI/IEEE C62.41.2-2002, Neutral grounded at service entrance – Far Category, 0.5µS-100 kHz 3kV ring wave (N-G) with the submittals for units intended for grounded systems.
7. If available, test data shall be provided for the ANSI/IEEEC62.41.2-2002 level three category of the 5/50 nS EFT Burst waveform as a part of this submittal package. Let through voltages shall be provided for all applicable protection modes (L-L, L-N, L-G & N-G).
8. All SPD tests must provide let through voltages using a positive polarity pulse at the 90-degree phase angle location on the sine wave for Category B and C waveforms and 180-degree for Category A waveforms. Let through voltages must be measured from the zero-voltage reference line for the tests.

9. All let through voltage test results must be provided with a minimum of six inches of lead length as measured from the point where the wire would normally exit the SPD enclosure (standard installation) to the point of termination. Wire used for test must be of the type of building wiring material recognized by the latest adopted version of the NEC and must be readily available for wiring commercial buildings, unless permanently attached to and supplied with suppressor. Conductors sizing used for test shall be based on manufacturer's installation instructions for the proposed product.
10. The above test results, including oscillographs, test conditions, identity of the testing lab and the test technicians and engineers shall be provided as part of the submittal package. The manufacturer shall provide the contact phone number for a readily available factory engineer responsible for answering questions about this product and the tests performed. Information shall be provided in a format that is easily to analyze and review.
11. Maximum Let Through Voltages based on above requirements:

Peak Voltage Let Through Table

Peak Let Through Voltages (measured from zero reference per NEMA LS-1) shall not exceed:

Voltage & Configuration	Test / Wave	L-L	L-N	L-G	N-G	Phase Angle
480/277 Wye - Grounded	C3 – 20 kV/10ka	2500	1600	1900	1700	90
480/277 Wye - Grounded	B3 – 6 kV/3kA	1700	1000	1100	1000	90
480/277 Wye - Grounded	A1 – 2kV – 67A	150	150	150	150	180
480/277 Wye - Grounded	UL1449 Rev2 Update	1500	800	800	800	----
480 Delta	C3 – 20 kV/10ka	2400	N/A	2400	N/A	90
480 Delta	B3 – 6 kV/3kA	2000	N/A	1900	N/A	90
480 Delta	A1 – 2kV – 67A	75	N/A	1200	N/A	180
120/208 Wye	C3 – 20 kV/10ka	1400	1100	1300	1150	90
120/208 Wye	B3 – 6 kV/3kA	950	550	600	550	90
120/208 Wye	A1 – 2kV – 67A	100	75	120	100	180
120/208 Wye	UL1449 Rev2 Update	800	400	400	400	-----
120/240 Split Phase	C3 – 20 kV/10ka	1400	1100	1250	1200	90
120/240 Split Phase	B3 – 6 kV/3kA	1000	600	600	600	90
120/240 Split Phase	A1 – 2kV – 67A	100	75	120	95	180

D. Manufacturers Qualifications: Only firms regularly engaged in the manufacture of SPD products for category C locations (ANSI/IEEE C62.41.1-2002), and whose products have been providing satisfactory service for not less than five years, shall be considered. A customer reference list, with a minimum of five contact names and current phone numbers shall be provided with the submittals. All manufacturer qualifications shall be provided as part of the submittal.

E. The successful manufacturer/vendor shall assign a technical contact person for SPD application, installation and warranty questions. This contact shall be available to provide a response to a technical question within a maximum of two business days.

F. The Engineer reserves the right to accept or reject any or all submittals, to request additional information as deemed necessary or to request submittals for a different unit that may be deemed more appropriate for this installation.

G. Engineer reserves the right to have an employee or a representative designated by firm witness any testing required by this document. Vendor/manufacturer shall provide written notice of intent to test and shall coordinate testing with Engineer, should Engineer desire to witness tests.

1.05 CODES AND STANDARDS

A. UL compliance and labeling: Listed per UL 1449, Third Edition.

B. SPD and Enclosures proposed and submitted shall be safety agency listed for all intended installations, meeting or exceeding all of the following: NEMA 1, 3R, 4, 12 & 13.

C. SPD shall be designed to allow installation in accordance with latest adopted version of the National Electrical Code (NEC), National Electrical Safety Codes (NESC) and applicable OSHA 1910 requirements.

D. NEMA LS1 (latest revision)

E. IEEE Standard C62.41.1, IEEE Standard C62.41.2 & IEEE Standard C62.45 (latest revisions)

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. The SPD shall be compatible with the electrical system voltage, current, system configuration and intended applications.

B. The SPD maximum continuous operation voltage (MCOV) shall be capable of sustaining 115% of the nominal RMS voltage (with the associated peak voltage of 1.414*RMS) continuously without degradation and heating.

C. The SPD shall only use clamping components connected in parallel with the supply to limit the surge voltages.

D. Arc Discharge components, such as Gas Tube Arresters shall not be used as the sole protection component in any protection mode. Gas Tube Arresters may be used in conjunction with other components, such as MOV's and SAD's to provide protection. Where Gas Tube Arresters are installed, the circuit shall be specifically designed to prevent power follow current.

E. Internal Fusing – If provided, shall be component level style:
   1. Component Level Fusing:
      a. Each Metal Oxide Varistor, or other primary suppression component, shall be individually fused for safety and performance to allow the SPD to withstand the full rated single pulse peak surge capacity per mode without the operation or failure of the fuses. Overcurrent fusing that limits the listed peak surge current of the SPD is not acceptable. Replaceable cartridge type per phase or per mode overcurrent fusing is not acceptable.
      b. For arc quenching capability, minimization of smoke and contaminates in the event of a failure, and to ensure the safest possible design, all surge components, current carrying paths and fusing shall be packed in fuse grade silica sand.
      c. Fusing shall be present in every mode, including Neutral-to-Ground.
      d. The fusing shall be capable of interrupting up to a 200kA symmetrical fault current with 600VAC applied, providing a listed 200kAIC Short Circuit Current Rating (SCCR) without additional over-current protection.

F. Status Indication & Monitoring: The suppressor shall include individual Phase Status LEDs, a red Service Required LED, an integrated Audible Alarm with silence button and Form C dry contacts (N.O. or N.C.) for remote monitoring capability. The form C contacts must be rated a minimum of 65VDC/150VAC with a load of 30WDC/60VA AC, and must be isolated and insulated from the ground plane and the power system to prevent Surges from reaching the monitoring system. The system shall provide insulation and isolation against any impressed voltages. Contacts shall be designed to change state upon device failure or loss of power.

G. The protection should be housed in the appropriate NEMA rated, heavy duty powder coated steel enclosure. This enclosure must provide complete protection against personnel hazards and damage to equipment should a failure of the SPD protection device occur. This enclosure shall also be designed to allow connection of the SPD without sharp bends in the conductors and lead lengths of less than 18" from the SPD Lugs (or enclosure opening for devices with leads attached) to the final point of attachment to the power system for the application (assuming connection point is 12" from the exterior of the enclosure).

H. Manufacturer shall provide a comprehensive warranty that provides for unlimited full replacement of a suppressor that is damaged or that fails to meet manufacturers published specifications and specifications provided within, without pro-rating value. Warranty shall provide coverage for a minimum period of 20 years for individual units (standard warranty) and. Series SPDs shall be covered for 10 years. These Unlimited Replacement Warranties cannot exclude system overvoltages or direct lightning strike events. Warranty shall not require any factory or third-party testing. Warranty shall apply to installed unit(s) for the duration of the warranty period no matter who owns the facility or equipment. All warranty information and copies of warranty documents must be provided with this response.
   1. All replacements shall be of same make, model and configuration as original unit unless otherwise requested or approved by customer.
   2. The manufacturer/vendor shall provide a warranty replacement unit at the facility within 5 days of receipt of written notification that the SPD unit has failed, at no cost to the customer.
   3. If the manufacturer/vendor requires inspection of the installed unit to validate warranty claim, the manufacturer/vendor must visit the site where the failed SPD(s) are located within 3 days of notification. This visit will be performed at no cost to customer. This section does not modify the requirement for the SPD replacement to be within 5 days of written notification as described in section G, above.
   4. The replacement unit shall be sent to the facility without shipping, handling, examination or other fees.

I. Complete, comprehensive installation instructions shall be provided for the SPD systems proposed. Installation instructions must provide for compliance with latest adopted NEC requirements and UL listing requirements, while not degrading performance of SPD as tested. Provide copies of installation instructions for the models proposed with the specification response. Successful vendors/manufacturer shall provide a complete, comprehensive installation checklist.

J. If manufacturer claims SPD to have filtering capabilities, provide complete information on filtering performance of SPD with specification response. This information must include attenuation across a stated frequency range. If the SPD is a UL 1283 listed device, the manufacturer shall provide all performance specifications for filter attenuation.

K. Provide complete enclosure dimensions (H*W*D) and cutsheets indicating dimensions including locations of terminations and wire entry locations with specification response.

L. Provide UL Short Circuit Current Ratings (SCCR). Minimum ratings shall be 200kAIC without additional/external over-current protection.

M. Manufacturer shall make available metal flush plates for distribution and branch panel SPDs. The flush plate shall provide for a clean architectural finish and be utilized where the attached panel is mounted flush.

N. Manufacturer must have knowledgeable local representation and distribution within 100 miles of the project location and must be willing to provide technical support, warranty claim support, and installation support for the project.

O. Successful manufacturer/vendor must be capable of supplying SPD for project within 20 days of receipt of order for orders of 25 units and less for models submitted in response to this specification.

2.02 SERVICE ENTRANCE

A. Transient Voltage Surge Suppressors shall be installed at all service entrances of each building and as shown on the riser / one-line diagram. Suppressors shall be listed in accordance with UL 1449 3rd Edition, Standard for Safety, Transient Voltage Surge Suppressors.

B. For 3-phase, 4-wire plus ground configurations, suppressors shall provide suppression and filter elements between each phase conductor and the system neutral, each phase conductor and the system ground and between the neutral conductor and ground.

C. Suppressors shall include a passive circuit that allows the suppressor to actively follow the voltage waveform and provide a clamping envelope that follows the sine wave to limit low level IEEE C62.41 A1 ring waves (of either polarity) at all locations on the sine wave. This circuit shall also perform in the Neutral to Ground Mode where a sine wave does not exist. Details of circuit used to provide this function and information detailing and quantifying the performance of this circuit (in all modes with Category A1 ring wave) shall be provided with specification response. All Let Through Voltage (LTV) values shall not exceed those stated in section 1.04.C.11.

D. Indication of proper suppressor connection and operation shall be provided, consisting of status LEDs for each phase, a Red Service Required LED and an internal Audible Alarm with silence/mute button. Dry contacts (NO/NC) are required for external monitoring.

E. SPD shall exhibit fully redundant protection for each phase.

F. The surge suppressor shall be of parallel design and shall be capable of being removed and replaced without disrupting electrical service to the facility.

G. Suppressors shall consist of solid-state components and shall operate bi-directionally.

H. All surge protective devices shall be of the same manufacturer.

I. The minimum single impulse current rating (as per NEMA LS-1) shall not be less than 240,000 amperes per phase (120KA per mode). Provide proof of compliance by supplying certified test results from independent test lab with submittals.

J. Maximum size of SPD units for Primary, Service Entrance applications is 15.5”x12.3”x8.25”.

2.03 SECONDARY SUPPRESSORS FOR MCC, DISTRIBUTION & BRANCH PANELS

A. Transient Voltage Surge Suppressors shall be installed at all service entrances of each building and as shown on the riser / one-line diagram. Suppressors shall be listed in accordance with UL 1449 3rd Edition, Standard for Safety, Transient Voltage Surge Suppressors.

B. For 3-phase, 4-wire plus ground configurations, suppressors shall provide suppression and filter elements between each phase conductor and the system neutral, each phase conductor and the system ground and between the neutral conductor and ground.

C. Suppressors shall include a passive circuit that allows the suppressor to actively follow the voltage waveform and provide a clamping envelope that follows the sine wave to limit low level IEEE C62.41 A1 ring waves (of either polarity) at all locations on the sine wave. This circuit shall also perform in the Neutral to Ground Mode where a sine wave does not exist. Details of circuit used to provide this function and information detailing and quantifying the performance of this circuit (in all modes with Category A1 ring wave) shall be provided with specification response. All Let Through Voltage (LTV) values shall not exceed those stated in section 1.04.C.11.

D. Indication of proper suppressor connection and operation shall be provided, consisting of status LEDs for each phase, a Red Service Required LED and an internal Audible Alarm with silence/mute button. Dry contacts (NO/NC) are required for external monitoring.

E. SPD shall exhibit fully redundant protection for each phase.

F. The surge suppressor shall be of parallel design and shall be capable of being removed and replaced without disrupting electrical service to the facility.

G. Suppressors shall consist of solid-state components and shall operate bi-directionally.

H. All surge protective devices shall be of the same manufacturer.

I. The minimum single impulse current rating (as per NEMA LS-1) shall not be less than 120,000 amperes per phase (60KA per mode). Provide proof of compliance by supplying certified test results from independent test lab with submittals.

J. Maximum size of SPD units for Secondary Suppressors for MCC, Distribution & Branch Panel applications is 15.5"x12.3"x8.25".

2.04 PRIOR APPROVALS

A. The following manufacturer(s) have submitted the required information and have been reviewed and approved for this project:

Total Protection Solutions SPD by Thomas & Betts Power Solutions

Voltage / Location	480Y277v 3 Phase Bonded Wye	480v 3 Phase Delta	208Y120v 3 Phase Bonded Wye	208v 3 Phase Delta	120/240v Single / Split Phase	120v Fire Alarm, Security, PLC, etc.
Main Services	**ST240-3Y480-FL**	ST240-480NN-FL	**ST240-3Y208-FL**	ST240-240NN-FL	ST240-1S240-FL	N/A
Distribution MCC & Branch Panels	**LP120-3Y480-FL**	ST120-480NN-FL	**LP120-3Y208-FL**	ST120-240NN-FL	LP120-1S240-FL	N/A
Dedicated Equipment	N/A	N/A	N/A	N/A	N/A	**LTE120-30A**

SPD Applications Notes:

1. Use 60 Amp Circuit Breakers for Service Entrances and 30 Amp Circuit Breakers for Distribution, MCC & Branch Panel applications.
2. Use Delta units for unbonded/ungrounded and high resistance ground Wye applications.

Innovative Technology Protector by Eaton/Cutler Hammer

Voltage / Location	480Y277v 3 Phase Bonded Wye	480v 3 Phase Delta	208Y120v 3 Phase Bonded Wye	208v 3 Phase Delta	120/240v Single / Split Phase	120v Fire alarm Security, PLC, etc.
Main Services	**PTE240-3Y201-L-SD**	PTE240-NN400-L-SD	**PTE240-3Y101-L-SD**	PTE240-NN201-L-SD	PTE240-1S101-L-SD	N/A
Distribution MCC & Branch Panels	**PTE120-3Y201-L-SD**	PTE120-NN400-L-SD	**PTE120-3Y101-L-SD**	PTE120-NN201-L-SD	PTE120-1S101-L-SD	N/A
Dedicated Equipment	N/A	N/A	N/A	N/A	N/A	**LTE120-30A**

PART 3 - EXECUTION

3.01 GENERAL

A. Suppressors shall be installed per the manufacturer's installation instructions and the requirements of: the NEC, the local authority having jurisdiction and the project engineer.

B. Size overcurrent protective device and conductors per manufacturer's recommendations and NEC requirements.

C. Project Engineer or their appointed representative may perform inspection of the installed suppressors and reserves the right to require corrections to the installation to comply with manufacturer’s installation requirements and project specifications.

D. The SPD supplier must provide on-site installation training for the electrical contractor.

3.02 SERVICE ENTRANCE

A. Install one primary suppressor at each utility service entrance to the facility as indicated on the drawings.

B. Suppressor shall be installed on the load side of the service entrance disconnecting means in accordance with NEC requirements.

C. Provide a 60 Amp circuit breaker (with a safety clip to ensure the circuit breaker cannot be inadvertently turned off) in the switchboard as over-current protection for the wire and as a disconnecting means for the SPD (or as specified by the manufacture).

D. Use minimum #6 AWG wire for connecting the SPD.

E. Conductors between suppressor and point of attachment shall be kept as short and straight as possible. Lead length of connecting conductor shall not exceed two (2) feet without written permission of the specifying Engineer. If length is exceeded, Contractor may be required to relocate SPD at no cost to the Owner.

F. Over-length SPD leads (greater than 24”) must be twisted together (1 twist/foot) and securely tie-wrapped once per foot to reduce impedance of the leads.

G. SPD leads may not be spliced.

H. Suppressor's ground shall be bonded to enclosure frame and the service entrance ground bus, and conduit between the SPD and the switchboard must provide secure electrical/mechanical connections.

3.03 SECONDARY SUPPRESSORS FOR MCC, DISTRIBUTION & BRANCH PANELS

A. Install one secondary suppressor at each MCC, Distribution Panel, Branch Panel & Sub-Panel location as indicated on the drawings.

B. Provide a 30 Amp circuit breaker (with a safety clip to ensure the circuit breaker cannot be inadvertently turned off) in the panel being protected as over-current protection for the wire and as a disconnecting means for the SPD (or as specified by the manufacture).

C. Conductors between suppressor and point of attachment to the panelboard shall be kept as short and straight as possible. Mount the SPD directly adjacent to the circuit breaker closest to the neutral bus, such that the maximum length of connecting wiring is kept as short as possible, not exceed 18 inches for all phase and neutral leads (24” for ground lead on IG panels). If length is exceeded, Contractor may be required to relocate SPD at no cost to the Owner.

D. Over-length SPD leads (greater than 18”) must be twisted together (2 twists/foot) and securely tie-wrapped once per foot to reduce impedance of the leads. Quality compression butt-splice connections are required when extending SPD leads (wire nuts are not acceptable).

E. Grounding for all non-IG installations: Suppressor's ground lead shall be bonded to the panel enclosure with a small ground lug as close as possible to the SPD mounting point. Conduit between the SPD and the switchboard must provide secure electrical/mechanical connections.

F. Multiple “Feed-Through” Panels with shared SPD units must be immediately adjacent to each other (side by side) with short tie cables not to exceed 36”. Sub-panels must be feed from a primary panel with a “lug-out’, lug-in” tie connection, and the tie connection lugs must be at the same end of the primary and sub-fed panel. i.e., bottom to bottom or top to top to ensure short tie “sub-feed” cables.
   1. Dual Panel Configurations: One SPD per two panels
   2. Three and Four Panel Configurations: One SPD installed on both outside panels of the multi-panel configuration, i.e., Install SPD on first (primary) and another one on the third or fourth sub-fed panel for a total of two SPDs.

END OF SECTION

SECTION 26 5000
LIGHTING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide the lighting system complete and operational.

B. Recessed fixtures installed in fire-resistive ceiling construction shall have the same fire rating as the ceiling or shall be provided with fireproofing boxes having materials of the same fire rating as the ceiling.

1.02 RELATED DOCUMENTS

A. Section 26 0000 – Electrical General Conditions

1.03 FIXTURE SCHEDULE MANUFACTURER'S SERIES NUMBERS

A. The design series reference does not necessarily represent the number, size, wattage, lumen output or special requirements as specified hereinafter.

1.04 SUBMITTALS

A. Shall be neatly and clearly marked to indicate the fixtures, performance, efficiency, mounting methods comply with contract documents.

B. When substitute fixtures are submitted (if permitted) the data shall clearly cross reference (written or highlighted) that the substitute fixture complies with every detail of the specified fixture. The substitute fixture must be supplied with an IES file for verification of the fixture performance and lumen output.

C. The manufacturer’s representative will be required to provide the photometric reports for various areas with the substituted fixture to prove the foot-candle level is adequate and meets the design intent.

D. The Engineer has the right to request a working sample of the substituted light fixture to verify quality and style meet the design intent.

E. Fixtures not fully complying with the intent of the contract documents and design criteria will be rejected.

PART 2 - PRODUCTS

2.01 DLC COMPLIANCE

A. Light fixtures are required to be DLC 4.0 Compliance and be on a DLC Compliance listing to accommodate energy rebate.

2.02 METAL PARTS

A. Exterior Fixtures: Corrosion resisting metal, a (non-ferrous, stainless steel or special finish) and in all cases suitable for outdoor service without tarnishing or other damage due to exposure; manufacturer's standard colors unless specified otherwise; cadmium plate all metal parts concealed by canopies, including screws, plates and brackets. All exposed fasteners shall be tamperproof.

2.03 LIGHT TRANSMITTING COMPONENTS

A. When not otherwise independently secured by other means the lens of any fixture shall be contained in a captive metal frame that remains attached to the fixture when door is in open position.

2.04 SPECIAL PARTS

A. Adapters, Plates, Brackets and Anchors: Provide where required by construction features of the building to suitably mount lighting fixture. All such appurtenances and mounting methods shall be approved by the Architect/Engineer prior to fabrication and installation.

B. Low Voltage Transformers: Provide and install where required to power individual or linear runs of low voltage light fixtures.

2.05 LAMPS

A. Solid-State Lighting: Fixtures shall have a lumen maintenance life expectancy (L_{70}) of > 50,000 hours, a CRI of > 80, and a CCT of 3500K or as shown on the panel schedule. Each solid-state fixture model shall be tested in accordance with IES LM-79 & LM-80 requirements.

2.06 LED DRIVERS/POWER SUPPLIES

A. The LED drivers/power supplies shall meet the following criteria:

1. Drive mode: Constant Current or Constant Voltage depending on the LED configuration for the light fixture.
2. Output currents: 250 mA – 1000 mA
3. Output voltages: 6VDC – 48VDC
4. Input voltages: 110 to 277 VAC; 50/60 Hz.
5. Power factor at >0.90 @ full load
6. Line regulation accuracy: +/- 2%
7. Load regulation accuracy: +/- 3%
8. Greater than 85% efficient
9. Output over-voltage, output over-current and output short circuit protection with auto recovery
10. Provide each driver with onboard transient voltage suppression (TVS)
11. Limited power source output to allow for class 2 wiring.
12. Flicker Free 0-10V Dimmable to 10% light output.
13. 5 Year Warranty.

2.07 OUTDOOR LIGHTING STANDARDS

A. Provide watertight insulating fuse in the base of lighting standards to individually protect each lighting fixture; buss Style "HEB" or approved, waterproof fuse holder with Buss fuse of appropriate capacity and voltage. Provide fuse for each hot circuit wire; do not fuse neutral.

B. Provide concrete preformed round poles with base plate for bolting to concrete foundation. Natural exposed aggregate finish. Height as noted on drawings.

C. Provide concrete foundations as shown on drawings. Field verify locations with Architect prior to installation of bases.

2.08 OUTDOOR GROUND MOUNTED LIGHTING FIXTURES

A. Provide concrete foundations for mounting of ground mounted lighting fixtures. Foundation shall be a minimum of 6” deeper than the light fixture and a minimum of 6” all around the base of the fixture. Provide #4 rebar with 3” minimum ring ties at 8” on center. The #4 rebar shall be vertically spaced approximately 6” apart. Field verify locations with Architect prior to installation of bases.

PART 3 - EXECUTION

3.01 LIGHTING FIXTURES - GENERAL

A. Size and mounting height as indicated on the drawings. Verify mounting provisions prior to the ordering of fixtures. Fixtures shall be UL listed for the location, and application in which they are installed.

3.02 ADJUSTMENT OF FIXTURES

A. Make all final spotlight and adjustable light settings under the direction of the Architect/Engineer during a scheduled period of time prior to the completion of the project. Include costs for all equipment and personnel expenses required for adjustment.

3.03 LOCATION

A. Mount to the dimensions shown on the drawings. Mount at quarter points where no dimensions appear. Architect shall specify mounting locations where no dimensions appear and quarter point mounting is impractical or not indicated on the drawings.

B. Refer to details, structural drawings, mechanical drawings, and coordinate with mechanical Contractor for equipment and ductwork mounted in ceilings to prevent conflict with light fixtures prior to installation. If conflicts cannot be resolved with the Mechanical Contractor, notify Architect/Engineer.

3.04 SPARE FIXTURES

A. Self-Luminous Exit Sign: Provide (2) two Self-Luminous Exit Signs Lithonia # DSW1X Green or Red to match EX1. Install at locations as directed by Architect.

3.05 CONCRETE FOUNDATIONS

A. Install at locations shown taking care to provide soil compaction same as required under paving to avoid settling and tilting of pole. Provide for all steel, concrete or aluminum poles shown. Concrete foundations shall have a minimum raceway sweeps of 90 degrees and anchor bolts shall be accurately set in foundations using a template supplied by the pole manufacturer. Concrete work and grouting; see Division 3 of the specifications. When concrete work has cured, base plates shall be leveled and grouted in place. Pole anchor bases shall then be set on base plates, leveled plumb on foundations, and secured with holding nuts.

END OF SECTION

SECTION 26 5619
ROADWAY LIGHTING

PART 1 - GENERAL

1.01 GENERAL NOTES

A. All workmanship, materials and testing will be in accordance with WSDOT/APWA, MUTCD, NEC or City of Lacey Development Standards or City of Lacey Streetlight Installation Guidelines unless otherwise specified below. In cases of conflict, the most stringent guideline will apply.

B. An R-O-W obstruction permit, electrical permits, and inspections are required for all street lighting installations within the City of Lacey. The Contractor is responsible for obtaining said permits prior to any type of actual construction. These permits are available from the Community Planning and Development Department.

C. Provide a clearly marked service disconnect for every lighting circuit. The location and installation of the disconnect will conform to National Electrical Code (NEC) and City of Lacey standards. The photocell window will face north unless otherwise directed by the City. The service disconnect will not be mounted on the luminaire pole. The service disconnect will be of a type equal to a Milbank CP3B11115ASP058 service, 120/240 VAC, single phase 3 wire, with contactors, photoelectric cell and test switch. All service disconnects will be used to their fullest capabilities; i.e., maximum number of luminaires per circuit.

D. All lighting wire will be copper with a minimum size of #8. All wire will be suitable for wet locations. All wire will be installed in Schedule 40 PVC conduit with a minimum diameter of 2 inches. A bushing or bell-end will be used at the end of a conduit that terminates at a junction box or luminaire pole. Conductor identification will be an integral part of the insulation of the conductors throughout the system; i.e., color coded wire. Equipment grounding conductor will be #8 copper. All splices or taps will be made by approved methods utilizing epoxy kits rated at 600 volts; i.e., 3-M 82-A2. All splices will be made with pressure type connectors (wire nuts will not be allowed). Direct burial wire will not be allowed. All other installation will conform to NEC, WSDOT/APWA and MUTCD standards.

E. Provide each luminaire pole with an in-line, fused, watertight electrical disconnect located at the base of the pole. Access to these fused disconnects will be through the hand-hole on the pole. The hand-hole will be facing away from on-coming traffic. Additional conductor length will be left inside the pole and pull or junction box equal to a loop having a diameter of one-foot. Load side of in-line fuse to luminaire head will be cable and pole bracket wire, 2-conductor, 19 strand copper #10 and will be supported at the end of the luminaire arm by an approved means. Fuse size, disconnect installation and grounding in pole will conform to NEC standards.

F. Approved pull boxes or junction boxes will be installed when conduit runs are more than 200 feet. Provide a pull box or junction box located within 10 feet of each luminaire pole and at every road crossing. Boxes will be clearly and indelibly marked as lighting boxes by the legend, “L.T.” or “LIGHTING”. See WSDOT STANDARD Plan J-11a.

G. Cement concrete bases will follow City of Lacey Streetlight Standard Plan. Extend conduit between 3 and 6 inches above the concrete base.

H. Any modification to approved plans will be reviewed and approved by the City prior to installation.

1.02 STAKING

A. All surveying and staking will be performed by an engineering or surveying firm capable of performing such work. The engineer or surveyor directing such work will be licensed by the State of Washington.

B. A pre-construction meeting will be held with the City prior to commencing staking. All construction staking will be inspected by the City prior to construction. Staking will be maintained throughout construction.

C. The minimum staking of luminaires will be as follows:
    1. Location and elevation to the center of every pole base.
    2. Location and elevation of each service disconnect.
    3. Location and elevation of each J-box.

PART 2 - PRODUCT

2.01 STREETLIGHT POLES

A. The standard pole specifications are supplemented with the following:
    1. Performance Criteria: The pole shall be capable of supporting 13.4 EPA at 90 mph with a 1.3 gust factor.
        a. The pole shall be capable of withstanding 1300 pounds of top load before failure (strength).
    2. Pole Top: The pole top shall be reinforced to accommodate (1) one 6- to 8-foot decorative mast arm and light fixture.

B. The base flange for the attachment of the shaft to the foundation shall be a one-piece cast socket of aluminum alloy 356 per ASTM B26 or B108. The flange shall be joined to the shaft by means of complete circumferential welds, externally at the top of the flange and internally at the bottom of the shaft tube.

C. Hardware: All nuts, bolts and washers used in the fabrication of the pole shall be Grade 18-8 stainless steel per ASTM A193 Class 1 Grade B8 except for anchorage hardware.

D. Anchorage bolts shall be hot-dipped galvanized steel per ASTM A576, Grade 1021-1046 and shall have minimum yield strength of 50,000 psi. The top 6 inches of each bolt shall have rolled or cut threads (before galvanizing) per ASTM A307. The bolts shall be hot-dipped galvanized per ASTM A153 at the threaded end. The bolts shall include a 4-inch right angle hook at the unthreaded end. The nut, washer and lock washer shall be fully galvanized per ASTM A153.

E. Each pole shaft shall contain an internal lug with a 3/8-inch diameter hole for the purpose of attaching a grounding connector.

F. Each pole shall be provided with a shaft cap of aluminum allow. The cap shall be fastened to the shaft by means of stainless-steel screws.

G. Adapter/Bracket at 15 feet for pedestrian standard: SFS Adapter. 30’ standard SF80 Adapter and CRF-F-0DEG bracket. Textured black powder coating.

PART 3 - EXECUTION

3.01 GENERAL

A. At each junction box, provide waterproof splices and a minimum of 18 inches of slack wire.

B. Provide equipment ground from the service to each light pole.

C. Install all street lighting, service disconnect, junction boxes, conduit and wiring per City of Lacey standards.

D. A pre-construction meeting shall be held with the City of Lacey prior to commencing any work.

3.02 SERVICE DISCONNECT - GENERAL

A. Provide a 3’x3’x6” deep concrete base for the service disconnect. Install the service disconnect per City of Lacey Standards. Provide #6 copper ground wire and ground rod to meet NEC and City of Lacey requirements.

3.03 TESTING

A. All luminaires will be subject to an electrical inspection. Lamp, photocell, and fixture will be warranted for a period of one year.

END OF SECTION

SECTION 27 0000

LOW VOLTAGE SYSTEMS GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Section D – Special Provisions, apply to work of this section.

B. Specification Section 26 0000 Electrical General Conditions.

C. Section D – Special Provision 8-20

1.02 SCOPE AND RELATED DOCUMENTS

A. The work performed under this specification shall be of good quality and performed in a workmanlike manner. In this context "good quality" means the work shall meet industry technical standards and quality of appearance. The Owner reserves the right to reject all or a portion of the work performed, either on technical or aesthetic grounds. The Installing Vendor/Contractor shall make all corrections as needed, to the satisfaction of the Architect.

B. Provide system documentation and Owner training as specified below.

C. An important item of the construction process for this project is the Pre-Construction Kick Off Meeting, which shall take place PRIOR to submittal of equipment data sheets.
   1. The General Contractor shall coordinate the scheduling of the meeting.
   2. The Owner's Representative and the Owner's IT Department Representative will be present for the meeting.
   3. The General Contractor, Electrical Contractor, and a representative from EACH Section shall attend this coordination meeting.
   4. As this meeting is essential for early coordination and shop drawings, billing for each low voltage discipline will not be approved until after the low voltage Pre-Construction Kick Off Meeting has taken place.
   5. The estimated time is approximate and shall be extended for each Installing Vendor/Contractor as necessary.
   6. EACH Installing Vendor/Contractor shall submit their list of coordination items through the construction channels a minimum of 14 days in advance of the meeting for Owner review.
      a. Review EACH specific Section for the sub-section titled "Coordination" for a minimum list of items to be discussed during the **Pre-Construction Kick Off Meeting**.

D. The requirements of the conditions of the Contract, Supplementary Conditions, General Requirements, or other work specified to provide a fully functional system for EACH specific low voltage Section listed below includes, but is not limited to the following sections:

			Pre-Construction Kick Off Meeting	
			Estimated time for EACH Section	Submit questions 14 days in advance
1.	Section 26 0000	Electrical General Conditions	30	
2.	Section 27 0000	Low Voltage System General Requirements	15	
3.	Section 27 0528	Pathways for Communications Systems	10	
4.	Section 27 2000	Data and Voice Infrastructure	30	
5.	Section 28 2300	Closed Circuit Television System (CCTV)	30	

E. Applicable Standards: All work shall be performed in accordance with the latest revisions of the following standards:
   1. International Building Code
   2. International Fire Code
   3. NEC (National Electrical Code)
   4. Telecommunications Architectural Standards - In Washington State Government
   5. ANSI-J-STD-607-A - Commercial Building Grounding and Bonding Requirements for Telecommunications

F. EACH Installing Vendor/Contractor for their Section shall possess a current and valid Washington State 06 Electrical Low Voltage License.

1.03 QUALITY ASSURANCE

A. Device or wiring arrangement shown on the drawings represents the intent of the system. If additional equipment (that may not be shown) is required to make a fully functional system, then provide such equipment as required.

B. Each specification Section that is governed by these specifications shall be provided, installed, commissioned, and warranted by a local Installing Vendor/Contractor that meets the following requirements for the equipment manufacturer that is being submitted for:
   1. All equipment for EACH specification Section shall be provided and installed by a single supplier.
   2. Have installed a minimum of three (3) systems within the past five (5) years.
   3. Maintain a 24-hour emergency service program using manufacturer trained technicians. Shall respond to service calls within 24 hours during and after the warranty period.
   4. The Installing Vendor/Contractor shall be manufacturer approved to purchase the equipment, have a local office staffed with manufacturer-certified installers that are capable of maintaining, servicing, and warranting the equipment being installed; who are full-time employees and are capable of programming, testing, inspecting, maintaining, warranting, and inventorying parts for the life of the system; and shall be located within a 100-mile radius of the project site.
   5. Offices that require staff from another “branch office and/or company office” outside of this radius are not acceptable.

C. Prior to completion of the installation, the Installing Vendor/Contractor shall provide:
   1. A preventative maintenance agreement which shall, at the Owner’s option, become effective at the end of the warranty period.
   2. A proposal for off-site monitoring services where applicable.

1.04 SUBSTANTIAL COMPLETION

A. In addition to the “Substantial Completion” requirements, when applied to EACH of the specification Sections identified in “Scope and Related Documents”, Substantial Completion shall be defined as follows:
   1. The stage in the progress of work where the work or designated portion is sufficiently complete in accordance with the Contract Documents, so that the Owner can utilize the work for its intended use.
   2. ALL of the requirements listed in “Testing & Complete System Functionality” shall be met. Once all conditions have been met, this shall be deemed Substantial Completion. These requirements shall be completed on or before the Substantial Completion date listed in the Contract Documents.
   3. The Owner reserves the right to withhold up to 10% of the funds for each low voltage system until that system has been shown, to the full satisfaction of the Owner, to function properly.

1.05 DOCUMENTATION

A. Document Format:
   1. All documents shall be generated on a PC. Provide these documents electronically, with the As-Built Documentation (where applicable).
      a. Data sheets, installation manuals, technical documents, brochures, and user manuals may be in PDF format.
      b. Power Point presentation(s) shall be in MS-Power Point.
      c. Test forms and other project-specific documents shall be in an editable format, either MS Word or MS Excel.
      d. Drawings and details shall be in AutoCAD 2013 or newer.

1.06 SUBMITTALS AND SHOP DRAWINGS

A. Submittals and Shop Drawings shall be provided for EACH low voltage system specification section number and shall contain, but not be limited to the items listed below:

B. Submittals – Prior to installation of any equipment, the Installing Vendor/Contractor shall provide the Architect with seven (7) copies of submittals for approval. With the approval of the Architect, electronic submittals in PDF format may be substituted for hard copy. Provide the following:
   1. A complete materials list of the quantity of each device, the manufacturer, model number, and description of the equipment for each individual system component or device that will be provided. This list shall precede the data sheets.
      a. Each system component or device data sheet shall have and indicating arrow next to each component or device that is being submitted.
      b. Each submittal shall be by EACH low voltage system specification section number and each submittal shall have its own list of data sheets. Combined submittal sections are not authorized.

C. Additional Shop Drawing Requirements:
   1. For additional shop drawing requirements, refer to EACH low voltage system specification section number, in addition to what is listed below.

D. Shop Drawings – Prior to installation of any equipment, the Installing Vendor/Contractor shall provide the Architect with seven (7) copies of submittals for approval.
   1. Shop Drawing Requirements: The Installing Vendor's/Contractor's complete and full-size set of Shop Drawings shall be issued in the following format:
      a. They shall be clear and legible.
      b. The same sheet size as the Contract Drawings (i.e. 30" x 42").
      c. A minimum of 1/8" text height shall be used for all text, symbol text, and subscript text.
      d. Scale of Drawings:
         1) Site plan drawings shall be the same scale as issued in the Contract Documents.
         2) Floor plan drawings shall be 1/8" =1'-0", unless directed to do otherwise.
      e. The Electrical Legend, Wire Legend, Load and Battery Calculations, Riser Diagram, Sequence of Operation Info, Wiring Details, and Mounting Details shall precede the Site Plans and Floor Plans.
      f. All sheets, including the cover, shall include a title block along the edge of each of the drawings that, when the drawings are rolled up, the following information shall be visible:
         1) The system-specific sheet number
         2) Project name, specification section number and section title name
         3) Floor name, area, and/or section of the building (Use the name of the area and/or floor description that is on the Contract Drawings.)
      g. Architectural information on the Contract Drawings shall be included on the Installing Vendor's/Contractor's Shop Drawings, including, but not limited to: match lines, grid lines, grid bubbles, key plan, and enlarged floor plans.

h. Electrical information on the Contract Drawings shall be included on the Installing Vendor's/Contractor's Shop Drawings, including, but not limited to: all applicable general notes and applicable construction notes for each of the floor plans. Where enlarged plans are shown on the Contract Drawings, include this in the Installing Vendor's/Contractor's Shop Drawings to show the room and ALL equipment within the room to help facilitate and coordinate the installation of the low voltage equipment for all systems.

2. Cover Sheet: The first page of the shop drawings shall be a cover sheet to include the following items:
   a. Owner's project information:
      1) Site Information:
         a) Name of site, address, city, and zip code of where the installation shall take place.
   b. Installing Vendor's/Contractor's project information:
      1) Business name
      2) Local office address of the Installing Vendor/Contractor
      3) Primary contact person's name, phone number, and email address who is responsible for the long-term management of the Owner's System.
   c. Provide a Sheet Index which assigns a sheet number and unique name for each sheet that is included in the shop drawing submittal package. As part of the sheet index, list every sheet that is part of the system shop drawing package. On the left side of the Sheet Index, provide two columns: "Included" and "Not Included". Include a check box, and provide a check in each box for all sheets that are included or not included in each submittal.
      1) Each sheet shall have a system-specific sheet number, and shall match the Contract Drawing sheet numbering system (i.e. E4.02 shall be FA-4.02 [for Fire Alarm], E4.02 shall be LAN-4.02 [for Local Area Network]).
3. Legend Information: From left to right, provide the following information for EACH device:
   a. Use the symbol on the legend of the contract drawings
   b. List the manufacturer's name
   c. List the manufacturer's model number
4. Provide a logical description of the device.
   a. Provide the back-box requirements and related information. At a minimum, this shall include:
      1) The height, width, and depth of each required back box for each symbol on the legend.
      2) If the device is a back box or comes with a back box (e.g., control panel, power supply, enclosure, etc.) then provide the height, width, and depth of the dimensions.
      3) Indicate if this device back box is going to be installed flush, semi-flush, or surface-mounted.
5. Wire Legend: Provide a listing of the cable manufacturer, model number, cable rating, size of conductors, quantity of conductors, and color of each conductor. Use the format in the sample "Wire Legend" as it applies to each system (see the sample at the end of this specification). Provide a cable identification naming scheme (as defined within these specifications).
   a. The Wire Legend shall include the cable manufacturer and model number for EACH of the following types of cables (as applicable to the project):
      1) Conduit/Raceway Cable.
      2) Open Cabling.
      3) Wet Rated Cable.
      4) Aerial Rated Cable.
      5) EACH cable and EACH cable type shall have a different letter designation.

6. Riser Diagram: Provide a system one-line Riser Diagram that shows the entire system. List the following:
    a. The head-end equipment and IP addressed devices. Show the connection to the WAN (where applicable).
        1) Show each location.
        2) Show each cable type, size, and quantity.
        3) Show EACH device in the MDF and each designated IDF location (control panel, CPU, DVR, server, power supply and terminal cabinet) for each applicable system, the room name that each major system component is located in, and the connection to the headend equipment.
        4) Show all field devices with their respective room names and/or numbers and connections to their associated equipment.
        5) Show all field devices with their respective address point (where applicable).
7. Provide all mounting details and mounting heights for all equipment
8. Detailed Wiring Information:
    a. Show each individual conductor color for all wiring on the point-to-point wiring diagrams for each device.
9. The matrix as defined in the “System Device Naming Matrix” of each system specification (where applicable).
10. On the shop drawings, include a letter signed by the System Designer that is responsible for the design depicted in the submittals and on the shop drawings. The letter shall state that the equipment and shop drawings design conform to national, state, local codes as adopted by the local Authority Having Jurisdiction, and meet or exceed all of the performance requirements as outlined in the specifications.
    a. Designers shall provide the following:
        1) A “signature” line and signature of the designer.
        2) A “printed name” line below (or to the right of) the signature line and the printed name of the designer.
        3) A “date” line below (or to the right of) the printed name line and date of the design.
    b. For fire alarm shop drawings, include the above information and the system shall be designed by one of the following (provide a copy of the supporting documentation):
        1) NICET Level III Certified Designer
        2) Registered Professional Engineer
11. Labels and Labeling:
    a. On the drawings, label each rack, control panel, CPU, DVR, power supply, and terminal cabinet in a logical numeric sequence (e.g., for fire alarm power supplies, list them as FAPS-1, FAPS-2, etc.).
    b. Cables: Generate an alpha-numeric label for each cable type and cable run.
    c. For projects with multiple sites, all labeling shall be consistent for all sites.
12. Show floor plan layout of devices and the anticipated routing of cable runs on Shop Drawings. Include conduit requirements where cables are routed underground or through locations that will be inaccessible after construction. Ensure runs are parallel with all structural framing and routed in a neat and orderly fashion.
13. EACH device at EACH location shall be shown on EACH floor plan. The cabling for EACH device shall be shown from EACH device to the device that it shall be connected to. EACH cable shown on the floor plan shall be identified as described in the “Wire Legend” portion listed within this specification.
    a. Floor Plans: show all system related devices and all equipment that the system specific shop drawings will interface to, on each of the floor plans. Provide cabling for each device and the related wire type (as shown on the “Wire Legend”) shown for each of the devices. Where multiple devices are on the same circuit or an addressable data cable is used, show all devices and their related cables.

14. All drawing submittals shall be a complete and full set of the system. If drawings are required to be re-submitted, a full and complete set must be re-submitted. Partial system drawing sets will be rejected and the Installing Vendor/Contractor shall reissue a full set of drawings. Any re-submittals shall be provided at the Installing Vendor's/Contractor's expense.
15. The Installing Vendor/Contractor is responsible for assuring that the raceway size, raceway routing, wire quantity, wire size, and wire type is suitable for the equipment supplied. The Installing Vendor/Contractor shall review the proper installation method(s) for each type of device/equipment with the manufacturer's representative, and the AHJ, prior to rough-in.
16. Provide shop drawings that are usable for trouble-shooting purposes showing equipment/device locations, conduit routing, junction boxes, and connection wiring of entire system.

E. Contract Drawings shall not be used as Shop Drawings.

F. The Shop Drawings shall be system specific. For example: only fire alarm equipment and connections to other equipment that will be interfaced to the fire alarm shall be shown on the fire alarm drawings.

G. Floor plans for the project have been developed by the Engineer using AutoCAD software. These drawing files will be made available to the Installing Vendor/Contractor for development of Shop Drawings and/or As-Builts for a fee of $20.00 per sheet.

1.07 GOVERNING CODES AND CONFLICTS

A. If the requirements of this section, related sections, or the Project Drawings exceed those of the governing codes and regulations, then the requirements of this section, related sections, and the drawings shall govern. However, nothing in this section, related sections or the drawings shall be construed to permit work not forming to all governing codes and regulations.

1.08 PROJECT CONDITIONS – CIVIL PLANS

A. The Installing Vendor/Contractor shall carefully coordinate the various symbols utilized on the drawings, and shall consult the civil plans to determine site conditions in the various areas.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide all equipment as defined in each specification and on the drawings.

B. All equipment, panels, power supplies, and devices shall be manufactured under the appropriate category by Underwriters Laboratories, Inc. (UL), and shall bear the UL label.

C. All equipment for each system shall bear the UL label. Partial or pending listings shall not be acceptable. It shall be the Installing Vendor's/Contractor's responsibility to ensure that these requirements are met, and replace any and all equipment up to and including the entire system, if these requirements are not met.

D. EACH of the specified Low Voltage Systems identified in PART 1 of these specifications including the design, devices and/or wiring arrangement shown on the drawings, represent that based on various equipment manufacturers. Any changes resulting from differences between the specified product and other manufacturers or substitute manufacturers, shall be the responsibility of the Installing Vendor/Contractor.
1. Substitutions of the specified equipment and/or supplier will be considered provided that sufficient documentation is provided to the Engineer which certifies that the equipment and/or supplier qualification meets the requirement of these specifications. Any request for substitution shall be submitted by the Installing Vendor/Contractor in writing so as to be received by the Architect not later than (10) ten days prior to the bid due date. Equipment that is approved by the Engineer will be issued by addendum prior to the bid date.

E. Refer to PART 1 for any equipment that is not specifically defined.

2.02 CONDITION OF MATERIAL

A. All equipment shall be new, in un-opened boxes, and be the most current model available for each component and/or device that is provided for this project. For products that use firmware, the most current version available shall be downloaded and installed at each component and/or device, prior to any programming being performed. Outdated or used equipment, as determined by the Architect, shall be removed and replaced by the Installing Vendor/Contractor at no cost to the Owner.

B. All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturers' installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation. All materials shall be in working order as intended by the manufacturer, at the completion of the project.

2.03 WIRE GUARDS

A. Provide at locations where designated on the drawings. Provide wire guards to protect the device from damage. At a minimum, all field devices located in the gymnasium(s) and multipurpose room(s) shall have wire guards installed.

B. Provide and install wire guards that are sized appropriately to protect each device at locations indicated on the drawings, but will not interfere with the operation of any device. The device shall operate as intended by the manufacturer after the wire guard has been installed.

C. Wire guards shall be made using seven (7) gauge welded steel and be chrome plated.
   1. Use Space Age Electronics, HSG Series or PSG Series, or approved equal. Size as required.

2.04 TERMINAL CABINETS, TERMINAL STRIPS, ENCLOSURES AND OUTLET BACKBOXES

A. On-Site System Information Binder and Enclosure: EACH specification section identified on the first page of this specification shall have an Information Binder that shall be housed in a System Information enclosure. The enclosure shall have a hinged door with the text "(Section Title here) Information", with each specific system name silk screened onto the enclosure door, and shall bear the Underwriters Laboratories "UL" label. A "T-Turn" cam lock shall be used to keep the enclosure door closed, and a key shall NOT be required to open the enclosure. Use the following Space Age Electronics model number, or approved equal:
   1. All systems (other than fire alarm): Model # YD9048DBXAA. Verify with the Architect the color of the enclosure(s) prior to ordering the enclosure. There shall be no additional charge to the Owner for changes to the color of the enclosure.
   2. For the fire alarm: Model # YD9049DBXAA shall be red in color, have a hinged door, and have "Fire Alarm System Documentation" silk screened on the enclosure door.

B. Terminal Cabinets (TC):
   1. See EACH Specification for terminal cabinet requirements (where applicable).

C. Terminal Strips:
   1. See EACH Specification for terminal strip requirements (where applicable).

D. Enclosures:
   1. Each systems control panel, power supply, TC, and other metal enclosures shall have the following:
      a. Use key operated locks to secure the enclosure (keyed so that a single key can lock and unlock all enclosure locks for the entire system), and provide ten (10) keys.
      b. Use some form of wire management that uses permanently secured fasteners (no double-back tape), and uses reusable and adjustable Velcro-style cable straps, which shall be installed approximately every four (4) inches within each enclosure.

E. Backboxes:
   1. Each system backbox, with the exception of specific backboxes, shall be metal and installed specific to the system it is being used on.
      a. Provide Red Randl Industries Inc., 5 Square boxes or equal for all fire alarm devices.

b. Provide Blue Randl Industries Inc., 5 Square boxes or equal for all A/V locations. Provide single gang mud ring for all A/V locations only requiring single gang faceplate and provide double gang mud ring for all A/V locations requiring double gang faceplate. See A/V schedule for more information.
c. Provide Blue Randl Industries Inc., 5 Square box or equal for all telecom workstation locations with single gang mud ring unless noted otherwise.

2.05 LABELS AND LABELING

A. The alpha-numeric labeling shall be developed by the Installing Vendor/Contractor.

B. Label all equipment and cables in an identical fashion of a sequential manner.

C. The Installing Vendor/Contractor-proposed alpha-numeric labeling that is intended to be used to identify all components of the system shall be submitted for approval by the Engineer, with the submittal of equipment data sheets.

D. All labeling information shall be recorded on the As-Built drawings and all test documents shall reflect the appropriate labeling scheme.

E. Phenolic name plates shall be used for identification of the racks, control panel, power supply, terminal cabinet, and other appurtenances of each system in a logical numeric sequence. Use an alpha-numeric name of each device for each location (created by the Installing Vendor/Contractor) to identify the equipment on the Shop Drawings.
1. The size of the plate shall be two (2) inches high by approximately eight (8) inches wide. Different colors of backgrounds may be used for each system (but Red shall only be used for fire alarm).
2. The text color shall be white letters that are 3/4inch high and are 1/2inch in width.

F. Labeling of cables must be provided in the following locations: EACH system control panel, power supply, terminal cabinet, terminal strip, rack, other system related appurtenances, and all junction boxes. Label all cables as shown on the Installing Vendor's/Contractor's Shop Drawings.

G. All label printing shall be machine generated using indelible ink ribbons or cartridges, self-laminating labels shall be used on cable jackets, appropriately sized to the outside diameter of the cable, and placed within view at the termination point on each end.
1. Temporary Labels: Shall consist of the following:
a. Using a fine point permanent style marker, Sharpie or equivalent, to write directly onto the outer jacket of the cable, or use temporary tags.
b. The Installing Vendor/Contractor shall take all precautions to use care when pulling the cable to ensure the integrity of the temporary label.
c. Remove all temporary labels and tags prior to installing the permanent label.
2. Permanent Labels: Labels shall be produced using an electronic labeler. Cabling shall be marked with a permanent, electronic printed label with a self-laminating clear wrapping to cover the printed label, and shall be secured to the outer jacket of the cable.
3. Provide Brady Model # XSL-116-427 or approved equal.

2.06 SYSTEM CABLES

A. All cables shall be new.

B. All cable types shall be UL listed and rated to meet all code requirements for site conditions, including, but not limited to; underground, wet, plenum, and aerial requirements as mandated per N.E.C. and local AHJ requirements. The Installing Vendor/Contractor shall be responsible for ensuring that all cables meet all national codes, state codes, local codes, AHJ requirements, and each equipment manufacturers' requirements for a reliable, fully functional, and warrantable system, as intended. Do not exceed the wiring distance limitation of the equipment, devices, cables and/or conductors as recommended by the manufacturer of either the equipment and/or the cables for each installation application.
1. Use the manufacturer recommended cables for EACH application and as required by code (e.g., raceway, open cabling, wet, and/or aerial).

2. All cables that run through wet locations shall be UL listed for wet locations and be run in EMT wherever re-entering the building to the device location and the headend location to include ground floor box locations in slab and under slab, aerial locations and any location that it may be exposed to moisture.
3. All cables shall be stranded unless otherwise noted and/or recommended in writing by the manufacturer.
    a. CAT5 through CAT7 cables are excluded.
4. See PART 3 of this section, and of each system specification for more information.

2.07 PROOF OF DELIVERY FORM

A. When providing equipment to the Owner, the Installing Vendor/Contractor shall provide the following transmittal document and obtain the necessary signatures.
    1. The Installing Vendor's/Contractor's Transmittal Document is defined as:
        a. Company logo
        b. Name
        c. Address
        d. Telephone number
        e. Delivery date
        f. Installing Vendor's/Contractor's representative name that is making the delivery
        g. Quantity of each item
        h. Manufacturers' name and model number
        i. The exact same description of the device (as used on the Shop Drawings)
        j. Provide a "signature" line for the Owner's Representative
        k. Provide a "printed name" line for the Owner's Representative
        l. Provide a "date" line for the Owner's Representative

PART 3 - EXECUTION

3.01 WORK ENVIRONMENT

A. General:
    1. The Installing Vendor/Contractor shall have implemented an OSHA approved safety plan at their place of business. All staff should adhere to it in their daily practice.
        a. Avoiding injury is the primary concern for this project. Use OSHA industry standards to avoid accidents.
    2. Coordination with Other Trades:
        a. It is the responsibility of the Installing Vendor/Contractor to coordinate with all trades for this project. Maintain all requirements for project schedule deadlines, rough-in, installation, programming, training, and ensuring that the Owner receives a fully functional system as defined in this specification.

3.02 APPROVED EQUIPMENT AND PERMITS

A. No equipment shall be delivered to the job site until Shop Drawings have been reviewed and approved by the Architect.

B. An approved set of Shop Drawings shall be continuously available at the job site during construction, for review by the Architect.

C. Obtain all permits as required, prior to installation of any equipment. They shall be continuously available at the job site during construction, for review by the Architect.

3.03 CABLE INSTALLATION – GENERAL

A. All cable types shall be rated to meet all code requirements for site conditions, including, but not limited to: underground, wet, and aerial requirements as mandated per N.E.C. and local AHJ requirements.

B. Do not exceed the wiring distance limitation of the equipment, devices, cables and/or conductors as recommended by the manufacturer of either equipment and/or cables for each installation application. The Installing Vendor/Contractor shall be responsible for ensuring that all cables meet all equipment manufacturers' requirements for a reliable, fully functional, and warrantable system, as intended.

C. Wiring insulation shall be one of the types required by NEC 725-16.

D. Allowable Cable Bend Radius and Pull Tension: In general, all cables cannot tolerate sharp bends or excessive pull tension during installation. The minimum radius bend shall be ten (10) times the cable outer diameter with no tensile load applied, and twenty times the cable outer diameter with a maximum tensile load of 25ft/lbs. applied during installation. The Installing Vendor/Contractor is responsible for maintaining the cable manufacturers' end Radius and Pull Tension at all times. Corrections to cable installation shall be made to the satisfaction of the Architect at no additional cost to the Owner.

E. Service Loops and Cable Management:
   1. Comb all wires for the duration of the cable run so they are neat, orderly, do not have excessive slack, and are not tangled, prior to any service loop, continuing through any service loop, or continuing into EACH enclosure and/or system rack.
   2. Cable Management shall be used to bundle all cables of like kind, separated by system type.

F. The Installing Vendor/Contractor shall ensure that communications cable is installed with care, using techniques which prevent kinking, sharp bends, scraping, cutting, deforming the jacket, or other damage. During inspection, evidence of such damage will result in the material being declared unacceptable. The Installing Vendor/Contractor shall replace all unacceptable cabling at no additional expense to the Owner.

G. The Installing Vendor/Contractor shall order and install the exact cables as specified on the Installing Vendor's/Contractor's Shop Drawings. If at any time during the installation and through the warranty period, it is discovered that any cable other than what is called for on the Installing Vendor's/Contractor's drawings has been installed, the Installing Vendor/Contractor shall remove all effected cables and shall provide and install the correct cable, as required. The Installing Vendor/Contractor shall also provide the staff to monitor the building during the cable replacement period until the system is fully operational to the satisfaction of the Architect, without any additional cost to the Owner.

H. Conduit type and areas where conduit will be required for this project are:
   1. Provide EMT metal raceway in the following areas:
      a. Direct buried underground pathways throughout the site.
      b. Within light poles as shown on the plans.
   2. Provide conduit, conduit sleeves, junction boxes, couplers, connectors, cabling and terminations as recommended by the manufacturer and as required by code.
   3. Provide conduit sleeves through all spaces to accommodate all low voltage cabling.
   4. Fill Requirements: Conduit, conduit sleeves, raceways, floor boxes, device boxes, mud rings, etc., shall be furnished and installed per the Division 26 requirements. Maintain all conduit code fill requirements, and provide no less than an additional 40% spare capacity for future growth.
   5. Conduit and Raceway Usage: All communications cable shall be dedicated for communications purposes, and not to be shared with other electrical wiring when required by code. Obtain written approval from EACH of the manufacturers if more than one system type is going to be installed in a single conduit.
      a. Fire alarm cabling shall be in a separate, dedicated raceway (where indicated on the drawings).
   6. Pull Cords: Provide nylon-type pull cords in EACH conduit raceway.

7. Provide surface-mounted raceway in the following areas (for retrofit/remodels or as directed by the drawings or Architect):
    a. Occupied areas exposed to view. Occupied rooms. Generally, occupied areas are defined as places that staff or the public will be in the room or area for more than a few minutes. This includes, but is not limited to:
        1) Administrative areas
        2) Office spaces
        3) Other occupied rooms
    b. Install conduits to an accessible ceiling space, as defined above.
    c. Size conduits as required.
    d. Consult with the Architect for further clarification.

I. Cable Lubricants: Lubrications specifically designed for installing cables may be used to reduce pulling tension as necessary when pulling cable into conduit. After installation, exposed cable and other surfaces must be cleaned of lubricant residue.
    1. Recommended Products:
        a. Dyna-Blue
        b. American Polywater

J. Horizontal Cabling:
    1. Horizontal cable terminations shall be made at the appropriate device ports and labeled as noted on the Outlet Schedule. At each outlet, a sufficient length of spare cable shall be provided for terminating outlet devices such that the outlet can be easily removed and inspected. In addition, each cable shall be terminated as indicated below:
        a. Cables shall be dressed and terminated in accordance with the recommendations made in the TIA/EIA-568-C document, manufacturers' recommendations and/or best industry practices.
        b. Bend radius of the cable in the termination area shall not be less than four (4) times the outside diameter of the cable.
        c. The cable jacket shall be maintained as close as possible to the termination point.

3.04 GROUNDING

A. Ground all equipment per the manufacturers' recommendations, per Division 26 and as required by code.

3.05 INSTALLATION

A. Provide all equipment, wiring, conduit, and outlet boxes required for the installation of a complete, fully functioning, operating system in accordance with applicable local, state, national codes, AHJ requirements, the manufacturers' recommendations, these plans and specifications. All circuits not in conduit must be wired with UL listed power limited cable under NEC 725, Class II wiring. Plenum cable shall be utilized in all return air plenum ceilings.
    1. Color-coded wires shall be used throughout.
    2. Wiring shall conform to the National Electrical Code Article 725.

B. Installation of equipment and devices that pertain to other work in the contract shall be closely coordinated with the appropriate subcontractors.

C. EACH manufacturers' authorized representative shall provide on-site supervision of the installation for EACH of the systems equipment for the duration of the project. This includes programming, training, and the Owner's ability to use the Complete System Functionality as it was designed.

3.06 MOUNTING HEIGHTS, LOCATIONS, AND SETTINGS

A. Install all equipment as recommended by the manufacturer.

B. The installation of EACH device and enclosure shall be installed so that the maintenance staff will be able to access, test and/or replace any component of the system. If this installation does not meet this requirement to the satisfaction of the Architect, it will not be accepted. The Installing Vendor/Contractor shall be required to remove the item, patch and paint the area to the satisfaction of the Architect, and reinstall the device, enclosure, or control panel as required to make the system easily maintainable and acceptable, at no additional cost to the Owner.

C. All equipment shall be attached to poles and shall be held firmly in place. Fasteners and supports shall be able to support the no less than four (4) times the weight of the equipment and/or device.

D. See each system specification for additional mounting information.

3.07 NUMBERING AND LABELING

A. Phenolic Plates:
   1. Install phenolic plates at each of the control panels, power supplies, terminal cabinets, and racks.
      a. All phenolic plates shall be secured to each enclosure with rivets.
      b. Install each plate 1” from the top of the enclosure, and be centered on the door. Relocate as required to avoid interfering with equipment or components within the enclosure or prevent the enclosure door from closing properly. The location of the phenolic plates shall be consistently installed in the same location on each system enclosure, at EACH location.

B. Terminal Cabinets:
   1. Label each termination point on the inside of EACH enclosure door. All information shall be legible, as defined by the Architect.

3.08 WIRING

A. For consistency of wiring throughout the entire system equipment, if specific conductor colors are not called out in EACH system specification, then the following colors shall apply:
   1. Red is (+) positive voltage or data bus (+) positive.
   2. Black is (-) negative voltage or data bus (-) negative.
   3. White is common.
   4. Green is normally open or normally closed.

B. Wiring within EACH enclosure shall have the outer jacket of the cable removed to within three (3) inches of the cable entering the enclosure. Individual conductors from each jacketed cable shall be spirally twisted to keep them together, until they are routed into each appropriate individual terminal. Route all conductors parallel with the walls of the enclosure, make 90° turns within the enclosure, and always keep a two (2) inch minimum spacing from any circuit board and/or terminals.
   1. Labeling of Cables:
      a. Prior to installing any label, clean each cable with the appropriate cleaner to remove any pulling compound residue, grease, oil, dirt, etc., in order for the label to properly adhere to the cable jacket.
      b. The label shall indicate the device or outlet and the area or wing of the building that the cable is being routed from. The label shall also indicate the MDF room or designated IDF location that the cable is being routed to.
      c. Each label shall be located on each cable that enters any enclosure or junction box, and shall be easily visible and readable.
      d. The cable numbering system shall be consistent with shop drawings.

C. All wiring routed under slab or underground shall be suitable for wet locations.

D. The Installing Vendor/Contractor shall clean all dirt and debris from the inside and the outside of EACH enclosure after completion of the installation, and prior to any testing being performed.

E. All circuits shall be identified in accordance with table below and all labels shall include wire type, quantity, and circuit number. Wire code shall match approved shop drawings' wire code.

Table

Example: C2HX3
C = Signal circuit wire
2 = Signal circuit number
H = LCD Keypad wire
X = Addressable initiating device circuit wire
3 = Addressable initiating device circuit number

3.09 ON-SITE SYSTEM INFORMATION BINDER ENCLOSURE

A. The Installing Vendor/Contractor shall install the wall mount enclosure that is labeled "(Section Title here) information". The enclosure shall be located in the administrative area or the MDF room. Verify the exact location with the Architect, prior to installation.

B. The enclosure shall have a site-specific manual, in a "D" style 3-ring binder with an 18-inch heavy-duty chain securely fastened to the inside of the enclosure.

C. See "As-Built Documentation" for more information.

3.10 TESTING & COMPLETE SYSTEM FUNCTIONALITY (FOR ALL SYSTEMS THAT IDENTIFY THIS TESTING REQUIREMENT)

A. The warranty shall NOT begin until the following conditions have been met:
   1. Obtain the AHJ signature, printed name, date, and telephone number on the permit(s) and other required documentation. Provide this documentation with the As-Built documents.
   2. The Installing Vendor/Contractor shall provide a copy of the (Section Number and Section Title here) - Operational Test Form that has been performed and submitted to the Architect for review. The purpose of this document is to show that the Installing Vendor/Contractor has in fact performed a complete test. In some cases, every device may not pass the test. This shall serve as the Installing Vendor's/Contractor's own punch list, to make corrections prior to the Acceptance Test. This must be completely filled out, and have an original signature of the representative of the Installing Vendor/Contractor. Allow for a minimum of ten (10) business days for the Architect to review this document.
   3. After the Architect's review of the System Operational Test Form, the Architect will discuss the results of the test with the Installing Vendor/Contractor.
   4. The Installing Vendor/Contractor shall coordinate with the Architect to witness the Performance Test. Allow for a minimum of ten (10) business days to schedule this testing.
   5. System Testing:
      a. The Installing Vendor/Contractor shall provide two-way communication devices for their own staff, each Owner's Representative, and the Architect, so that all parties can communicate as required to perform all tests.
      b. The Installing Vendor/Contractor shall demonstrate the testing of each device, to the Owner's Representative and the Architect, and document this information on the (Section Number and Section Title here) - Performance Test Form.
      c. Upon the completion and passing the Performance Test with 100% positive results, the Acceptance Test Form shall be signed by the Installing Vendor/Contractor, the Owner's Representative, and the Architect.
         1) If the Installing Vendor/Contractor fails this test by NOT passing the test with 100% positive results, the following shall occur:
            a) The Installing Vendor/Contractor shall make all of the necessary corrections to provide 100% positive results.
            b) The Installing Vendor/Contractor shall document the corrective action taken for each item that failed the Test, and submit to the Architect for review. Upon approval by the Architect, the Acceptance Test shall be rescheduled.
         2) The Installing Vendor is subject to the Close Out requirements as specified in Section 20 0000, Schedule of Values.

6. As-Builts:
    a. Refer to the “As-Built Documentation” of this specification for more information.
7. Training:
    a. Refer to EACH specific section for the training requirements as described in “Training Materials and Programming Survey”.
8. Complete System Functionality:
    a. After ALL of the above conditions have been met, deemed by a "Pass" on the Governing Acceptance Form - (Section Name and Section Title here), and the required signatures have been received, Complete System Functionality shall be deemed complete, as the Owner has the ability to use the system as it was designed.
9. Warranty:
    a. The warranty period shall now begin, and the initiating date of the warranty period shall commence on the date of the Owner’s ability to use the Complete System Functionality as it was intended. Refer to the “Warranty” section of this specification for more information.

3.11 WARRANTY

A. See “Testing & Complete System Functionality”, listed elsewhere in these specifications, to establish the requirements and confirm when the actual warranty period shall begin.

B. The Installing Vendor/Contractor shall include in the pricing of their bid that they will honor and provide EACH of the manufacturers’ full-term warranty period for the provision of replacement equipment for EACH individual device and/or component provided for this project. The completed and fully functional system, including wiring, installation, and all equipment shall be free from inherent mechanical and electrical defects. At a minimum, this shall be no less than one (1) year from the date of Complete System Functionality as defined in “Testing & Complete System Functionality” portion of this specification. Warranty service for the on-site replacement of equipment shall be provided by the system supplier's manufacturer trained representative during normal working hours, Monday through Friday, excluding holidays, and response for service shall be delivered no later than the following business day after the call was received.

C. When the manufacturers’ warranty exceeds one year, the Installing Vendor/Contractor shall be responsible for replacing the actual component or device for the full duration of the manufacturers’ warranty, if the Owner or their representative chooses to take the item to the Installing Vendor’s/Contractor’s place of business. If the Owner chooses to have the Installing Vendor/Contractor provide on-site service, then the Installing Vendor/Contractor is entitled to their standard published (or negotiated) labor rates and miscellaneous material items to replace the damaged warranty item.

D. The Installing Vendor/Contractor who is authorized to provide warranty service for this project is defined in “Quality Assurance” located in Part 1 of this specification.

3.12 AS-BUILT DOCUMENTATION

A. The following documentation must be completed to the satisfaction of the Architect, in order to fulfill the Close Out requirements as specified in Section 26 0000, Schedule of Values.

B. All electronic and hard copy information submitted to the Owner shall immediately become the Owner’s property to use as best determined by the Owner, without any compensation to any party.

C. All labeling shall match the final room number identification at completion of the project (not the room number that is indicated on the Bid Set of drawings).

D. Operation and Maintenance Manuals: The Installing Vendor/Contractor shall provide and electronic set of detailed Operation and Maintenance Manuals. The following information shall also be included on the cover sheet: Project Name and Project Number, Specification Section Number and Section Title, Owner's name, Site Name and Site Address, Installing Vendor's/Contractor's Name, Address, and Contact Name. These O&M Manuals shall include the following:
   1. Use color-coded numbered tabs to separate each item defined below and for each device that was installed.
      a. Provide these items in the following order.
         1) Provide a sheet in front of a table of contents page as the first page of the manual indicating each of the equipment or device documents contained in each tab section.
         2) The System Software User Guide
         3) The Web Server "Web-based" Software User Guide
         4) Warranty information. The Installing Vendor/Contractor shall provide warranty information in the form of a matrix from left to right, that lists the following information:
            a) Use the symbol on the legend of the contract drawings.
            b) List the actual manufacturer's name of each device shown on the Installing Vendor's/Contractor's shop drawings.
            c) List the actual manufacturer's model number of each device shown on the Installing Vendor's/Contractor's shop drawings.
            d) Provide the description of the device that is used for each symbol on the legend.
            e) On the matrix, indicate recommended testing frequency for each item.
            f) State the manufacturer's full term of the warranty for EACH control panel, EACH power supply, and EACH device provided.
            g) Indicate where the Owner may purchase each of these devices. Provide the Business Name, Address, City, State, Zip Code, Phone Number, and list two (2) contact names.
         5) A copy of record drawings.
         6) Provide a copy of the "Spare Parts Proof of Delivery" form that was signed by the Owner's Representative.
         7) A printed copy of the final completed version of the "(Section Number and Section Title here) Technical Configuration". This document shall be dated.
         8) A printed copy of the final completed version of the "(Section Number and Section Title here) Software 'Point Status Report'" (where applicable). This document shall be dated.
         9) Update the matrix as defined in the "System Device Naming Matrix" for each specification section, to correct any changes that may have occurred through the course of this project. This list shall follow the above equipment list.
         10) The technical data sheet for each power supply, terminal cabinet, field device and component installed. Use a separate tab for each of these that were supplied and/or installed.
            a) Include all testing documentation and the procedure to properly test each device. Put this document immediately behind the respective technical data sheet.
            b) Include the installation manual for each device that was installed. Put this information immediately behind the testing documentation.
         11) Provide a copy of the completed documents:
            a) The (Section Number, and Section Title here) - Operational Test Form.
            b) The (Section Number, and Section Title here) - Performance Test Form.
            c) The approved Governing Acceptance Form - (Section Number, and Section Title here).

d) If the Governing Acceptance Form has not been approved, accepted, and signed by the Architect, the manual will be rejected.

E. On-Site System Information Binder: The Installing Vendor/Contractor shall provide an Individual Site Manual, in a "D" style 3-ring binder with an 18inch heavy-duty chain securely fastened to the inside of the "(Section Title here) information" enclosure. See the "On-Site System Information Binder Enclosure" listed elsewhere in these specifications, for the enclosure information and location. The binder shall be sized to allow for 20% additional documentation. The spine of the binder shall have a clear cover with an insert clearly typed with the following label: "(Section Title here) information". The binder shall have a clear front cover with an insert clearly typed with the title of the spine on the front sheet, located at the top of the page, and centered. The following information shall also be included on the front sheet of the binder; the Project Name and Project Number, Specification Section Number and Section Title, Owner's name, Site Name and Site Address, Installing Vendor's/Contractor's Name, Address, and Contact Name. Each binder shall include the following:
   1. Use color-coded numbered tabs to separate each item defined below and for each device that was installed.
      a. Provide these items in the following order:
         1) Provide an 8½" x 11" clear heavy plastic sheet in front of a Table of Contents page as the first page of the binder indicating each of the equipment or device documents contained in each tab section.
      b. The Installing Vendor/Contractor shall coordinate with the Owner to obtain the information listed below. A single sheet shall list the following items:
         1) The Site Name and Site Address.
         2) State "In case of emergency during regular business hours: (list the appropriate name and telephone number)". List the Owner's Representative who should be contacted during regular business hours.
         3) State "In case of emergency after regular business hours: (list the appropriate name and telephone number)". List the Owner's Representative who should be contacted after regular business hours.
         4) List the following information (where applicable): State "The monitoring of the (Section Title here) is being monitored by (list the name of the central monitoring station here), Phone Number: (list the central station phone number here), Account # (enter the account number here)".
      c. Provide each of the items identified in the Operation and Maintenance Manuals, with the following exceptions. Do NOT provide:
         1) Spare Parts Proof of Delivery Form.

F. As-Built Drawings: The Installing Vendor/Contractor shall provide an electronic copy of As-Built Drawings.
   1. Update the Shop Drawings:
      a. To address any changes, including but not limited to the riser, point-to-point wiring diagrams, and mounting details.
      b. To accurately reflect the final installation of equipment and devices that were relocated, added or removed.
      c. Update the matrix as defined in the "System Device Naming Matrix" of the specification, to correct any changes that may have occurred through the course of this project.
      d. Actual routing of all raceways.
      e. Actual routing of all open cables.
      f. Actual cable type, color, and numbers.
      g. Actual system wiring diagrams, connection diagrams, and interface of all components in the system.
      h. Provide scale drawings of the internal components of the main panel, and each power supply. Show each circuit number coming from the terminals of each control panel and/or power supply.

i. Actual room number and programming addresses (where applicable) for all components in the system.
j. Show on the As-Built Drawings the location of each panel board that is being used to power any system equipment, and list each panel board circuit used.
k. Indicate on the As-Built Drawings where EACH of the End-Of-Line Resistors is located.
l. Provide all updated As-Built Drawings in AutoCAD 2013 format (or newer) and put these electronic files on the Operation and Maintenance Manuals CD, as described elsewhere in these specifications.

G. Provide all As-Built documentation to the Architect prior to any training and no less than ten (10) business days prior to project completion.

H. Any re-submittal(s) shall be provided at the Installing Vendor's/Contractor's expense.

END OF SECTION

SECTION 27 0528
PATHWAYS FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Section D – Special Provisions, apply to work of this Section.

B. Specification Section 26 0000 Electrical General Conditions.

1.02 SCOPE

A. The installation shall include innerduct, conduit, and wire management.

B. The bonding of metallic raceways.

C. The work performed under this specification shall be of good quality and performed in a workmanlike manner. In this context "good quality" means the work shall meet industry technical standards and quality of appearance. The Owner reserves the right to reject all or a portion of the work performed, either on technical or aesthetic grounds. The Installing Vendor/Contractor shall make all corrections as needed, to the satisfaction of the Architect.

D. The system shall meet ALL of the requirements listed in Section 27 0000 Low Voltage Systems General Requirements PART 3 “Testing & Complete System Functionality”, prior to “Substantial Completion”.

E. Contractual information, guidelines, requirements, or other work specified to provide a fully functional system for Section 27 0528 includes, but is not limited to the sections identified in Section 27 0000.

1.03 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Section D – Special Provisions, apply to work specified in this Section.

B. Applicable Standards: All work shall be performed in accordance with the latest revisions of the following standards:
   1. National Electrical Manufacturers Association:
      a. NEMA FG 1 - Fiberglass Cable Tray Systems
      b. NEMA VE 1 - Metal Cable Tray Systems
      c. NEMA VE 2 - Cable Tray Installation Guidelines
   2. NFPA 70 - National Electrical Code.
   3. ANSI/TIA-568-C.0 - Generic Telecommunications Cabling for Customer Premises.
   4. ANSI/TIA-569-B - Commercial Building Standard for Telecommunications Pathways and Spaces.
   5. ANSI-J-STD-607-A - Commercial Building Grounding and Bonding Requirements for Telecommunications.

1.04 QUALITY ASSURANCE

A. Installing Contractor Qualifications:
   1. Work in this section shall be performed by a licensed and bonded low voltage Installing Vendor/Contractor with a minimum of five (5) years’ experience in the installation and maintenance of high-speed data and voice networks. Only Installing Vendors/Contractors whose primary business is that of installing, maintaining, troubleshooting, and testing telecommunication infrastructures shall perform this work.
   2. License Classification: Installing Vendor/Contractor must possess a valid Washington State 06 Electrical Low Voltage License.

1.05 GOVERNING CODES AND CONFLICTS

A. If the requirements of this section or the Project Drawings exceed those of the governing codes and regulations, then the requirements of this section and the Drawings shall govern. However, nothing in this section or the Drawings shall be construed to permit work not conforming to all governing codes and regulations.

1.06 PROJECT CONDITIONS ARCHITECTURAL PLANS

A. The Installing Vendor/Contractor shall carefully coordinate the various symbols utilized on the drawings and shall consult the architectural plans to determine ceiling and floor types in the various areas.

1.07 SUBMITTALS

A. Refer to Section 27 0000 Low Voltage Systems General Requirements for additional data sheet submittal requirements and the shop drawing submittal requirements.

PART 2 - PRODUCTS

2.01 MATERIALS

A. See Section 27 0000 Low Voltage Systems General Requirements for additional requirements.

B. The Installing Vendor/Contractor shall review the Site Plans, Floor Plans, Riser Diagrams, and Detail Sheets for additional work that is required to be performed by the Installing Vendor/Contractor of this section.

2.02 COORDINATION

A. Refer to “Installation of Owner Furnished Equipment” for additional coordination and installation requirements.

B. Refer to “Submittals” listed elsewhere in this specification for additional coordination requirements.

2.03 ADDITIONAL REQUIREMENTS.

A. Refer to “As-Built Drawings” listed elsewhere in this specification for additional equipment required for this project.

2.04 SEISMIC BRACING

A. Provide Seismic Bracing as required by the Authority Having Jurisdiction (AHJ).

2.05 INNERDUCTS AND CONDUIT SEALS

A. Innerduct (Fabric Mesh):
   1. The Installing Vendor/Contractor shall provide the proper type of fabric mesh innerduct for the application in which it is being used.
   2. Provide flexible multi-cell fabric mesh innerduct consisting of white polyester and nylon resin polymer.
   3. EACH cell shall contain a factory-installed pull tape, which shall be a different color for EACH cell.
   4. Manufactured by MaxCell: Model # MXE64283BK (black), or approved equal. Provide quantities as required where shown on plans.
      a. This shall be the default color for one (1) 3-Cell innerduct.
   5. Manufactured by MaxCell: Model # MXE64283RD (red), or approved equal. Provide quantities as required where shown on plans.
      a. Where two (2) 3-Cell innerducts are shown in a single conduit on the plans, this shall be the second color.
   6. Manufactured by MaxCell: Model # MXE64283 (blue), or approved equal. Provide quantities as required where shown on plans.
      a. Where three (3) 3-Cell innerducts are shown in a single conduit on the plans, this shall be the third color.

2.06 ADDITIONAL SYSTEM EQUIPMENT

A. See Part 3 of this specification for additional provision of system equipment and/or labor.

PART 3 - EXECUTION

3.01 GENERAL

A. See Section 27 0000 Low Voltage Systems General Requirements for additional information.

B. Prior to rough-in, coordinate with the Architect for the exact installation location(s) and areas to avoid.

C. Install all equipment per the manufacturer's recommendation.

3.02 PRODUCT INSPECTIONS

A. The Installing Vendor/Contractor shall inspect all cable prior to installation to verify that it is identified properly on the reel identification label, that it is of proper gauge, containing correct number of pairs, and is the material ordered. Any physical damage to the cable and wire must be noted; un uniform jacket thickness and jacket tightness should also be identified. Note any buckling of the jacket, which would indicate possible problems.

3.03 GROUNDING AND BONDING

A. Provide grounding and bonding per ANSI-STD-J-607-A, which includes, but is not limited to: cable trays, racks, conduit sleeves, and other equipment connected to the TMGB/TGB.

B. The minimum conductor size shall be #6 green insulated copper grounding conductor. However, the size of each conductor shall be based on the actual cable length as defined in ANSI-STD-J-607-A.

3.04 HORIZONTAL PATHWAYS

A. It is the responsibility of the contractor to ensure that ALL PATHWAYS for the permanent link of each balanced twisted pair cable shall not exceed 295' in length from work area outlet to telecommunications patch panel.

B. To ensure this length, all pathways shall be coordinated and installed prior to pouring of any slabs or the installation of any permanent structure which would inhibit a conduit or cable tray run from being installed after the structure is complete.

C. See Section 27 2000 for horizontal cabling types and additional requirements.

3.05 WARRANTY

A. The warranty shall be direct to the end user, from the manufacturer, supported through the certified Installing Vendor/Contractor, and shall cover both materials and labor costs for any claims related to the warranty program. If the Installing Vendor/Contractor were to default, the manufacturer will assume responsibility of employing another certified installer to maintain the existing warranty. Bids from installers or Installing Vendors/Contractors who are not certified by the connecting hardware manufacturer and wire manufacturer at the time of project bid will be rejected.

3.06 OPERATION & MAINTENANCE MANUALS (O&M'S)

A. Provide all Operation & Maintenance Manual (O&Ms) documentation as defined in Section 27 0000 Low Voltage Systems General Requirements and listed elsewhere in this specification.

3.07 AS-BUILT DRAWINGS

A. Provide all As-Built documentation as defined in Section 27 0000 Low Voltage Systems General Requirements and listed elsewhere in this specification.

B. All labeling shall match the final room number identification at completion of the project (not the room number that is indicated on the Bid Set of drawings).

C. Update all documents provided in the Submittal and Shop Drawings to accurately reflect the actual equipment that was provided for this project, and the actual locations of the installed equipment.

D. The Installing Contractor shall provide As-Built Drawings to the Architect, which clearly indicate:
   1. The floor plan of the building showing the As-Built location of conduit runs, cable tray, and terminal cabinets.
   2. Provide three (3) sets of complete As-Built Drawings.

3.08 DEMONSTRATION AND TRAINING

A. Upon completion of the system installation, the installation representative shall conduct a system test for the Owner, Owner's Representative, Architect, and Engineer.

B. Upon completion of the installation, after test and demonstration, the Installing Vendor/Contractor shall provide to the Architect a signed written statement substantiating the:
   1. "System has been completely tested, demonstrated to the Owner's Representative, and accepted by the appropriate authority."

END OF SECTION

SECTION 27 2000
DATA AND VOICE INFRASTRUCTURE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Section D – Special Provisions, apply to work of this Section.

B. Contractual information, guidelines, requirements, or other work specified to provide a fully functional system for Section 27 2000 includes, but is not limited to the sections identified in Section 27 0000.

C. Specification Section 26 0000 Electrical General Conditions.

1.02 SCOPE

A. The Installing Contractor shall furnish and install all materials for a complete, fully functional data and voice Telecommunications Infrastructure system in accordance with this specification and the contract drawings. The system shall be in full compliance with a “Limited Lifetime Warranty”. The Installing Contractor shall be responsible for providing a complete, functional system including all necessary components, whether included in this specification or not.

B. The installation shall include Fiber Optic Cable and Copper Category Rated Cables, interconnect equipment, connectors, patch cables, telecommunication outlets, and wire management.

C. All copper Horizontal Cables shall be terminated at the pole mount enclosure and cameras.

D. Upon completion of installation, the Installing Contractor shall test all fiber and copper cables. All cables shall be tested as defined elsewhere within this specification.

E. The work performed under this specification shall be of good quality and performed in a workmanlike manner. In this context "good quality" means the work shall meet industry technical standards and quality of appearance. The owner reserves the right to reject all or a portion of the work performed, either on technical or aesthetic grounds.

F. The system shall meet ALL of the requirements listed in Section 27 0000 Low Voltage Systems General Requirements PART 3 “Testing & Complete System Functionality”, prior to “Substantial Completion”.

G. Contractual information, guidelines, requirements, or other work specified to provide a fully functional system for Section 27 2000 includes, but is not limited to the sections identified in Section 27 0000.

H. See “Horizontal Cable” located in this specification for additional work and equipment. This includes, but is not limited to; CAT6 Cabling for ALL Local Area Network (LAN) based Systems as shown on the plans, detail sheets, and riser diagrams.

1.03 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Section D – Special Provisions, apply to work specified in this Section.

B. Applicable Standards: All work shall be performed in accordance with the latest revisions of the following standards:
   1. BICSI Information Technology Systems Installation Methods Manual, 6th Edition
   2. BICSI Telecommunications Distribution Methods Manual, 13th Edition
   3. ANSI/TIA 606-A (2002) Administration Standard for Commercial Telecommunications Infrastructure.
   4. ANSI/TIA 607-B Commercial Building Grounding and Bonding Requirements for Telecommunications.
   5. EIA/TIA-455-61 (latest edition). "FOTP-61, Measurement of Fiber or Cable Attenuation Using An OTDR".

6. TIA-526-7. Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant OFSTP-7.
7. ANSI/TIA 568-C.0. "Generic Telecommunications Cabling for Customer Premises."
8. ANSI/TIA 568-C.1. "Commercial Building Telecommunications Cabling Standard - Part 1: General Requirements."
9. ANSI/TIA 568-C.2. “Commercial Building Telecommunications Cabling Standard - Part 2: Balanced Twisted Pair Cabling Components."
10. ANSI/TIA 568-C.3. “Optical Fiber Cabling Components Standard."
11. EIA/TIA 569-B. "Commercial Building Standard for Telecommunications Pathways and Spaces."
12. IEEE 802.3 (latest edition) "Carrier Sense Multiple Access With Collision Detection.”
13. International Building Code (latest edition).
14. International Fire Code (latest edition).
15. NEC (National Electrical Code) (latest edition).
16. Telecommunications Architectural Standards - In Washington State Government (latest edition).

1.04 QUALITY ASSURANCE

A. Installing Contractor Qualifications:
   1. The Installing Contractor project manager shall hold a valid and current Registered Communications Distribution Designer (RCDD) certification issued by Building Industry Consulting Service International (BICSI). The project manager shall have a minimum of five years’ experience with projects of similar size and scope.
   2. The Installing Contractor field staff installers shall hold valid and current Installation certifications issued by Building Industry Consulting Service International (BICSI) or hold documented certification of training from the manufacturer of the cabling and equipment that is being installed. The field staff shall have a minimum of five years’ experience with projects of similar size and scope.
   3. The Installing Contractor shall be an Authorized Premier Network Installer Certification Only Partner of the Manufacturer of the equipment being installed and shall furnish documentation showing that the Installing Contractor is trained and certified. The Installing Contractor shall be capable of providing the Owner with a documented Limited Lifetime Performance Warranty of the equipment being installed at the time of project bid, to be approved for bidding.
   4. Work in this section shall be performed by a licensed and bonded low voltage Installing Contractor with a minimum of five years’ experience in the installation and maintenance of high-speed data and voice networks. Only Installing Contractors whose primary business is that of installing, maintaining, troubleshooting, and testing Telecommunication Infrastructures shall perform this work.
   5. In order to qualify for installation of the Telecommunications Infrastructure Installing Contractor must possess the required license classification, a performance history, experience in the installation and termination of copper and optical fiber cable systems, and proof of time in business.
   6. License Classification: Installing Contractor must possess a valid Washington State 06 Electrical Low Voltage License.

1.05 GOVERNING CODES AND CONFLICTS

A. If the requirements of this section or the Project Drawings exceed those of the governing codes and regulations, then the requirements of this section and the Drawings shall govern. However, nothing in this section or the Drawings shall be construed to permit work not conforming to all governing codes and regulations.

1.06 PROJECT CONDITIONS - ARCHITECTURAL PLANS

A. The Installing Contractor shall carefully coordinate the various symbols utilized on the drawings and shall consult the architectural plans to determine ceiling and floor types in the various areas.

1.07 SUBMITTALS

A. Refer to Section 27 0000 Low Voltage Systems General Requirements, for additional data sheet submittal requirements and the shop drawing submittal requirements.

PART 2 - PRODUCTS

2.01 MATERIALS

A. See Section 27 0000 Low Voltage Systems General Requirements for additional requirements.

B. The Installing Contractor shall review the Site Plans, Floor Plans, Riser Diagrams, and Detail Sheets for additional work that is required to be performed by the Installing Contractor of this section.

C. **Leviton / Berk-Tek** manufactures the products that are used for the **basis of design** of this specification.
   1. Equivalent manufacture's solutions may be submitted for prior approval **no less than 2 weeks before bid date closing.** Products not submitted for prior approval shall be rejected.
      a. Include with substitution request, a 3rd party verified testing agency's report which shall include, but not be limited to, the following TIA-568-C.2 tests:
         1) Insertion Loss / Attenuation.
         2) NEXT (Near End Cross Talk).
         3) PSNEXT (Power Sum Near End Cross Talk).
         4) ACR (Attenuation Crosstalk Ratio).
         5) PSACR (Power Sum Attenuation Crosstalk Ratio).
         6) ACR-F (Attenuation Crosstalk Ratio – Far End)
         7) PSACR-F (Power Sum Attenuation Crosstalk Ratio – Far End)
         8) The following tests are only required for CAT6A cabling:
            a) PSANEXT (Power Sum Alien NEXT).
            b) PSAACRF (Power Sum Alien ACRF).

D. All products shall be new, and brought to the job site in original manufacturer's packaging. Electrical components shall bear the Underwriter's Laboratories label. All Telecommunications cable shall bear the manufacturer's label in accordance with NEC 800 based on flammability testing as follows:
   1. CMR General Purpose Communications Riser Cable.
   2. CMP Plenum-rated Communications Cable.
   3. And other cable ratings to comply with the National Electrical Code requirements for the installation.

E. All products shall meet the certification requirements of the warranty. All device products and all cabling products shall be of a single manufacturer.

F. Provide all equipment as defined in the specification(s) and shown on the drawings.

G. Refer to PART 1 for any equipment that is not specifically defined.

2.02 MATERIALS NOT INCLUDED (PROVIDED & INSTALLED BY OTHERS)

A. Telephone switching equipment and related appurtenances.

B. Telephones.

C. Switchers, routers, network hubs, data concentrators and other similar active electronic equipment for data communications.

D. Computers, printers, facsimile machines, modems and other similar utilization equipment.

2.03 COORDINATION

A. Refer to “Installation of Owner Furnished Equipment” for additional coordination and installation requirements.

B. Refer to “Submittals” for additional coordination requirements.

2.04 INSTALLATION OF OWNER FURNISHED EQUIPMENT

A. The Installing Contractor shall install the following Owner Furnished equipment:
   1. Wireless Access Points (WAP’s). Coordinate with the Owner as required.
      a. Install each WAP where indicated on the plans.

2.05 ADDITIONAL REQUIREMENTS

A. Refer to “As-Built Drawings” listed elsewhere in this specification for additional equipment required for this project.

2.06 TELECOMMUNICATIONS SYSTEM DESCRIPTION

A. Provide Horizontal Cabling from each CCTV camera to the pole mount enclosure location. Each Telecommunication Outlet type and style shall contain the quantity of Horizontal Cables identified on the Legend, unless noted otherwise.

B. Horizontal cables are to be terminated on rack-mounted patch panels of the same data speed transfer rating. Horizontal Cabling shall be to Patch Panels within each designated rack. Horizontal Cabling shall be cross-connected to backbone cables.

C. A fiber optic backbone shall be installed between the Main Distribution Frame (MDF) and each designated Intermediate Distribution Frame (IDF) for data connectivity. Within the MDF and the IDF’s, the backbone fiber strands shall be terminated and housed in rack-mounted fiber optic enclosures. Both ends of EACH fiber shall be terminated.

D. “High” pair count, 24 AWG, cables shall be installed between the MDF Analog (POTS) and each designated IDF Analog (POTS) for voice connectivity, unless noted otherwise. The MDF Room and EACH designated IDF location backbone copper pairs shall be terminated on punch blocks and cross connected to voice patch panels, unless otherwise noted.

E. Modems, fax machines, wall mount voice outlets for telephone handsets, etc. shall be connected to the data and voice infrastructure via Horizontal Cabling.

2.07 LABELING

A. See Section 27 0000 for additional label type and additional requirements.

B. The alpha-numeric labeling shall be developed by the Installing Contractor, under the direction of the Owners IT Department at the Pre-Installation project kick-off meeting.

C. The Installing Contractor shall label all equipment and cables in an identical fashion of a sequential manner to the satisfaction of the Owner.

D. All label printing shall be machine generated using indelible ink ribbons or cartridges, and self-laminating labels shall be used on cable jackets appropriately sized to the outside diameter of the cable.

E. All labeling shall match the final room number identification at completion of the project (not the room number that is indicated on the Bid Set of drawings). This includes, but is not limited to; the Outlets, Port Addresses, Patch Panels, As-Built Drawings, and Test Results.

F. Patch panels shall have each port labeled to identify each outlet port.

G. Racks shall have phenolic labels installed at the Top and Centered of EACH Rack installed on this project. Phenolic labels shall be size 36 font.

H. Cable Identification Labels shall be places in the following locations:
   1. Horizontal Cables. Each cable shall be identified and marked with the outlet port identification near the cable termination point at the rear of the patch panel and placed within view.

2. Backbone Cables. Each cable shall be identified and marked on all backbone cables (at both ends of the cable) with an identifier as to the location of the beginning and termination of each cable. Labels shall be attached to each cable at the point of entrance and exit to the MDF and each designated IDF location.

I. Where telecommunications outlets are located above accessible ceiling space, provide a label directly on the ceiling tile grid indicating “TELECOM OUTLET ABOVE”.

2.08 TELECOMMUNICATION OUTLETS

A. Review the Site Plan(s), Floor Plan(s), Riser Diagram(s), and Detail Sheet(s) for all cable types and quantities required for this project.

B. Each Telecommunication Outlet type and style shall contain the quantity of Horizontal Cables identified on the Electrical Legend, unless otherwise noted.

C. Provide Horizontal Cabling from EACH CCTV camera port to the PoE network switch located within the pole enclosure. Outlets shall be terminated on each end with male 8P8C connectors for connection to the associated device at each end.

2.09 FIBER OPTIC CABLE

A. See “Testing of Cables” listed elsewhere within this specification for Testing Requirements to be documented and submitted at the completion of this project.

B. All cables shall be UL listed and suitable for outdoor installation. Provide other cable types where required by Code and the AHJ.

C. EACH Cable installed shall be rated for wet rated application.

D. Multi-Mode Fiber Optic Cable:
1. 2-strands of fiber optic cabling shall be provided from each CCTV camera noted on the plans to the pole mount enclosure.
2. Fiber optic cables shall be utilized to provide connectivity between media converters for CCTV camera connections exceeding 295’.
3. Fiber optic cables shall be 50/125-micron, graded index, tight-buffered outdoor rated, unless otherwise noted. The core fiber shall have a diameter of 50 microns, and a cladding diameter of 125 microns.
4. Each end of fiber cables shall be terminated with duplex LC style connectors.

2.10 HORIZONTAL CABLE – OUTSIDE PLANT (OSP) & WET RATED LOCATIONS

A. See “Testing of Cables” listed elsewhere within this specification for Testing Requirements to be documented and submitted at the completion of this project.

B. Outside Plant (OSP) cables shall be used where conduits are routed below grade.

C. Provide Horizontal Cabling from each CCTV camera to the nearest pole mount enclosure.

D. The Telecommunication Horizontal Cable shall be Category 6 rated, 4-pair, 23 AWG UTP, unless noted otherwise.
1. Manufactured by Berk-Tek: Model # LANmark-6 OSP Series, or approved equal.
2. Each cable shall be terminated on a male 8P8C connector for connection to the associated device on each end.

2.11 RACKS AND ENCLOSURES

A. Pole mount enclosure shall be provided as specified in Section 28 2300.

2.12 CABLE MANAGEMENT TIES

A. Wire ties of any type shall NOT be used anywhere in this installation.

B. Bundle all Horizontal Cables together with Velcro-type tie wraps.
1. Adjustable Hook-and-Loop Straps shall be used for all cable bundles.
   a. Provide Hook-and-Loop Straps every two-feet (approximately) above accessible ceilings, in Cable Trays (where applicable) and throughout the cable run.
   b. Provide Hook-and-Loop Straps every twelve-inches (approximately) within the MDF and each designated IDF location.

2. Chatsworth Products Inc. (CPI): Model # 020XX-201, or approved equal. XX indicates actual length. “06” (6-inches long for two-inch diameter cable bundles), “09” (9-inches long for three-inch diameter cable bundles), and “12” (12-inches long for four-inch diameter cable bundles). Provide quantities as required.

2.13 ADDITIONAL SYSTEM EQUIPMENT

A. See Part 3 of this specification for additional provision of system Equipment and/or Labor.

B. See Section 27 0528 for pathway requirements (cable tray, inner duct, etc.).

PART 3 - EXECUTION

3.01 GENERAL

A. See Section 27 0000 Low Voltage Systems General Requirements for additional information.

B. Prior to rough-in, coordinate with the Architect for the exact location(s).

C. Install all cabling, devices, and/or equipment per the manufacturer’s recommendation.

3.02 PRODUCT INSPECTIONS

A. The Installing Contractor shall inspect all cable prior to installation to verify that it is identified properly on the reel identification label, that it is of proper gauge, containing correct number of pairs, and is the material ordered. Any physical damage to the cable and wire must be noted; un-uniform jacket thickness and jacket tightness should also be identified. Note any buckling of the jacket, which would indicate possible problems.

3.03 CABLE INSTALLATION - GENERAL

A. EACH CABLE RUN SHALL BE CONTINUOUS, WITHOUT ANY SPLICES. Any cable run that does not meet this requirement shall be replaced at no additional cost to the Owner.

B. The Installing Contractor shall insure that EACH Telecommunications cable is installed with care, using techniques which prevent kinking, sharp bends, scraping cutting, deforming the jacket, or other damage. During inspection evidence of such damage will result in the material being declared unacceptable. The Installing Contractor shall replace unacceptable cabling at no additional cost to the Owner.

C. Conduit and Raceway Usage: All Telecommunications cable shall be installed in grounded metal conduit or raceway dedicated for Telecommunications purposes, when called for on the Project Drawings, and not to be shared with electrical wiring.

D. Cable shall not be draped on, tied or otherwise secured to electrical conduit, plumbing, ventilation ductwork or any other equipment. Cable shall be secured to building supports or hangers or to additional blocks or anchors specifically installed for this purpose.

E. All wiring to be installed in a neat and inconspicuous manner and per local code requirements. Route wires parallel or perpendicular to the building structure using the specified cable supports. Wiring shall be installed near or on structural members as to minimize risk of physical damage by other trades or maintenance personnel servicing the equipment.

F. Cable Lubricants specifically designed for installing Telecommunications cable may be used to reduce pulling tension as necessary when pulling cable into conduit. After installation, exposed cable and other surfaces must be cleaned of lubricant residue.

3.04 HORIZONTAL CABLING

A. Horizontal Cables shall be dressed and terminated in accordance with TIA/EIA-568-B requirements and the cable manufacturer’s recommendations.
   1. Untwisting of pairs at the termination point shall not exceed one-half an inch for Category 6 connecting hardware.
   2. Bend radius of the cable in the termination area shall not be less than the manufacturer’s recommendation.
   3. The Horizontal Cable jacket shall be maintained as close as possible to the termination point.

B. Every attempt shall be made to avoid running Horizontal Cables close to (less than 24") and parallel to power raceway and wiring, or close to light fixtures.

C. When an approved cable support is used to support cable bundles, all horizontal cables shall be supported at a maximum of four-foot intervals with UL approved cable support. At no point shall cables rest on acoustic ceiling grids or panels. Cables shall not be attached to ceiling grid or lighting support wires. Where light support for drop cable legs is required, the Installing Contractor shall install clips to support the cabling.

D. The installation of Horizontal Cables around moveable devices, instruments, subpanels, etc. shall be provided with adequate support, length, protection, and flexibility so that the cable is not damaged in the event the equipment is moved.

E. Pathways:
   1. It is the responsibility of the contractor to ensure that ALL PATHWAYS for the permanent link of each balanced twisted pair cable shall not exceed 295' in length from work area outlet to telecommunications room patch panel.
   2. To ensure this length, all pathways shall be coordinated and installed prior to pouring of any slabs or the installation of any permanent structure which would inhibit a conduit or cable tray run from being installed after the structure is complete.
   3. See section 27 0528 for pathway types and additional requirements.

3.05 FIBER OPTIC CABLING

A. All fiber optic cabling shall be installed in fabric mesh innerduct. There shall be no splices allowed.

B. Fiber optic termination hardware shall be installed in the following manner:
   1. Fiber slack shall be neatly coiled within the pole enclosures. No slack loops shall be allowed external to the pole enclosures.
   2. Each cable shall be clearly labeled at the entrance to the pole enclosures. Cables labeled within the bundle shall not be acceptable.
   3. Dust caps shall be installed on the connectors and couplings at all times unless physically connected.

3.06 CABLE LABELING

A. Alpha-numeric numbering shall be developed by Installing Contractor, under the direction of the Owners IT Department. Label all equipment and cables in an identical fashion.

B. Outlet Port Labeling: Outlet labels for each port shall be identified and marked on the Outlet with the outlet port identification.

C. Horizontal Cables: Each cable shall be identified and marked with the outlet port identification near the cable termination point at the rear of the patch panel.

3.07 TESTING OF CABLES

A. Notification shall be given a minimum of 14 days prior to any testing so that the testing may be witnessed by the Owner.

B. An ETL certified, TIA-1152 Level IIIe (ISO/IEC 11801 Level IV) Test Meter shall be used to test all balanced twisted-pair coper cabling.

C. All labeling shall match the final room number identification at completion of the project (not the room number that is indicated on the Bid Set of drawings). This includes, but is not limited to; the Outlets, Port Addresses, Patch Panels, As-Built Drawings, and Test Results.

D. Provide documentation of the following items of EACH Test Meter used:
   1. Calibration certification from a third party shall be within two-years of testing (at the time that the test is performed).
   2. Manufacturer of Test Meter.
   3. Model Number of Test Meter.
   4. Serial Number of Test Meter.

E. Copper Cables – Category 6 Cables: Each of the pairs shall be tested from the Patch Panel or Punch Block to the Outlet. The Installing Contractor shall test:
   1. Wire Map.
   2. Length.
   3. Insertion Loss / Attenuation.
   4. NEXT (Near End Cross Talk).
   5. PS-NEXT (Power Sum Near End Cross Talk).
   6. ACR-F Loss (Attenuation Crosstalk Ratio Far-end).
   7. PS ACR-F Loss (Power Sum Attenuation Crosstalk Ratio Far-end).
   8. Return Loss.
   9. Propagation Delay.
   10. Delay Skew.
   11. The following tests are only required for CAT6A cabling:
      a. PSANEXT (Power Sum Alien NEXT).
      b. PSAACRF (Power Sum Alien ACRF).

F. Fiber Optic Cables – Multi-Mode Outside Plant (OSP): Each of the fibers shall be tested from End-to-End. The Tests performed shall comply with ANSI/TIA-568-C.3 standards. The Installing Contractor shall test:
   1. Polarity Testing
   2. Length Measurement.
   3. OLTS / Link Attenuation.
   4. OTDR.
   5. Two 2-meter patch cords shall be used for the actual test. The two-jumper test shall be used to estimate the actual link loss of the installed cables plus the loss of the connectors. This measurement is consistent with the loss which network equipment will see under normal installation and use.

G. The source of each error shall be determined, corrected, and the cable re-tested. All defective cables, connectors, connections, and related appurtenances shall be replaced and re-tested at no additional cost to the Owner.

H. Submit the Test Reports in PDF format.

I. See the O & M Manual / As built Drawings requirements in this specification and also in Section 27 0000 for additional requirements.

J. Acceptance of these test procedures is predicated on the Installing Contractor's use of the recommended products including, but not limited to; the specified cable type, patch panels, outlets, punch blocks, specified equipment identified in Part 2 and the installation standards of this specification. Adherence to these requirements shall be determined upon the completed installation and will be evaluated in the context of each of these factors.

3.08 WARRANTY

A. Upon final installation, a certificate providing a "Performance and Application Warranty" shall be provided to the owner. This warranty shall be valid for a period of no less than 25 Years. The warranty shall be direct to the end user, from the manufacturer, supported through the installing and certified Installing Contractor, and shall cover both materials and labor costs for any claims related to the warranty program. If the Installing Contractor were to default, the manufacturer will assume responsibility of employing another certified installer to maintain the existing warranty. Bids from installers or Installing Contractors who are not certified by the connecting hardware manufacturer and wire manufacturer at the time of project bid, will be rejected.

3.09 OPERATION & MAINTENANCE MANUALS (O&M'S)

A. Provide all Operation & Maintenance Manuals (O&M's) documentation as defined in Section 27 0000 Low Voltage Systems General Requirements and listed elsewhere in this specification.

B. Provide hard copies of the Test Results of EACH Cable tested.

C. Provide the Test Results on CD in PDF format.

3.10 AS-BUILT DRAWINGS

A. Provide all As-Built documentation as defined in Section 27 0000 Low Voltage Systems General Requirements and listed elsewhere in this specification.

B. All labeling shall match the final room number identification at completion of the project (not the room number that is indicated on the Bid Set of drawings). This includes, but is not limited to; the Outlets, Port Addresses, Patch Panels, As-Built Drawings, and Test Results.

C. Update all documents provided in the Submittal and Shop Drawings to accurately reflect the actual equipment that was provided for this project, and the actual locations of the installed equipment.

D. The Installing Contractor shall provide As-Built drawings to the Architect, which clearly indicates:
   1. The floor plan of the building showing the As-Built location of Telecommunication Outlets and their associated Port Address(es), conduit runs, and terminal cabinets.
   2. A list of EACH Telecommunication Outlet and the associated Port Address(es) shall clearly be identified according to system labeling scheme. Show all ports and punchdowns.
   3. Provide (3) sets of complete As-Builts.

END OF SECTION

SECTION 28 2300
CLOSED CIRCUIT TELEVISION SYSTEM (CCTV)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary Conditions and Section D – Special Provisions, apply to work of this Section.

1.02 SCOPE AND RELATED DOCUMENTS

A. The project CCTV System shall be an extension of the site's existing CCTV System. The Installing Vendor shall install equipment at the project site and include the necessary programming for viewing, and playback control functions of the new CCTV System to and from the following locations:
   1. Remote Viewing Monitor/PC.

B. Install a complete and fully operational ALL IP Camera CCTV system meeting the functional and operational requirements of this section and all related sections. The System includes but is not limited to:
   1. Cameras, lenses, camera housings, IP converters, network switches, power supplies, mounting hardware, brackets.
   2. Contractor-provided environmental enclosures and accessories, remote viewing software, video monitors, fasteners, cable and all other connectors, hardware and components for a complete and coordinated system.
   3. CCTV system servers and licensing required for full system operation will be provided by the owner. Contractor will be responsible for all programming and configuration required to integrate CFCI equipment into the owner provided platform.

C. All cameras shall be Wide Dynamic Range Day/Night cameras.

D. The CCTV System shall utilize the new data infrastructure cabling, as described in Section 27 2000 – Data Infrastructure. Review these specifications and see the CCTV System Riser Diagram for more information.

E. The Installing Vendor shall configure the system as described and shown. All Closed-Circuit Television equipment shall conform to IEEE 802.3af and IEEE 802.3at specifications.

F. The system shall meet ALL of the requirements listed in Section 27 0000 Low Voltage Systems General Requirements PART 3 "Testing & Complete System Functionality", prior to "Substantial Completion".

G. Contractual information, guidelines, requirements, or other work specified to provide a fully functional system for Section 28 2300 includes but is not limited to the sections identified in Section 27 0000 and Section 27 2000.

1.03 SYSTEM OPERATION

A. The CCTV System shall record EACH camera when motion is present in EACH Cameras Field-of-View.

B. The Owner's existing PC's that are connected to the LAN and/or WAN shall accommodate the following features:
   1. View Live Video from any site.
   2. View Recorded Video from any site.
   3. Provide the ability to export video clips from the Video Server(s) to email and CD.
   4. Configure each PC with remote viewing software.

1.04 QUALITY ASSURANCE

A. The Installing Contractor shall provide a Staff Commitment Letter in the Submittal and Shop Drawings submittal package, that states the following:
   1. The Installing Contractor shall identify and designate Manufacturer Trained and Certified Installing Vendor Technicians for the duration of this project.
      a. To be deemed a qualified Installing Contractor for this project, technicians shall hold the following Manufacturers Certifications PRIOR to issuing submittals for this project:
         1) The Installing Contractor shall submit copies of the above designated technicians Manufacturer Certification(s). The Installing Contractor must be certified in Avigilon Control Center – Enterprise Edition and Avigilon Access Control Manager as the primary installing Contractor. Sub-tier Contractors will not be allowed on this project.
   2. The Installing Contractor shall identify and designate a Project Manager whose responsibilities will include, but are not limited to:
      a. The Primary Point of Contact between the Owner and the Installing Contractor. It is acceptable for this person to be the Lead Technician.
      b. Scheduling of technicians to perform the work on the Owners premises.
      c. Scheduling of any meetings.
         1) All meetings shall be on the Owners premises.
      d. Scheduling and coordination of any deliveries to the Owners premises.

B. The system, devices, and equipment, shall be manufactured under the appropriate category by Underwriters' Laboratories, Inc. (UL), and shall bear the UL label. Partial or pending listings are not acceptable. The installation of EACH device and/or component shall be in compliance with the UL listing. The system, devices, and equipment shall fully comply with the latest issue of these standards, where applicable, which includes, but is not limited to:
   1. National Fire Protection Association (NFPA) - USA:
      a. NFPA 70 National Electrical Code
      b. NFPA 72 National Fire Alarm Code
   2. Underwriters Laboratories Inc. (UL) - USA:
      a. UL 50 NEMA 4X Enclosures for Electrical Equipment
      b. UL 1950 Electrical Safety
   3. Meet or exceed Building Codes and Standards:
      a. Local Authority Having Jurisdiction (AHJ) Requirements
      b. State:
         1) WAC 51-20 Washington Barrier Free Regulations
      c. National:
         1) National Electrical Code (see NFPA 70)
      d. International:
         1) International Building Code
         2) International Electrical Code (see NFPA 70)

C. Approvals:
   1. The system shall have proper listing and/or approval from the following nationally recognized agencies:
      a. ULUnderwriters Laboratories Inc.
      b. ULC Underwriters Laboratories Canada.
      c. IP66 Water/Dust Protection.
      d. IEC 60068-2-75 Impact Protection.

D. Service and Software Modifications:
   1. Provide the services of a Manufacturer Certified/Authorized Technician to perform all system software modifications, upgrades or changes.

2. Provide all hardware, software, programming tools and documentation necessary to modify the system on-site. Modification includes addition and/or deletion of system devices, changes to system operation, and custom label changes for devices. The system structure and software shall place no limit on the type or extent of software modifications on-site.

1.05 SUBMITTALS AND SHOP DRAWINGS:

A. See Section 27 0000 Low Voltage Systems General Requirements for additional requirements.

B. Refer to “As-Built Drawings” for additional requirements.

C. Data Sheets and other documentation.
   1. Installing Contractor Staff qualifications. Provide the following information:
      a. Provide a copy of technicians (from the Installing Contractor local office) Factory Certifications for the following items:
         1) Axis Certified Professional.
      b. Provide the Installing Contractor Staff Commitment Letter as described in “Quality Assurance” listed elsewhere in this specification.
   2. The Materials List shall identify the specification section, quantity of each item, the manufacturer, model number, and brief description of each item.
      a. Provide data sheets for each item listed on the materials list.
      b. Provide indicating arrows on data sheets that have multiple items on the data sheet.
      c. Provide complete PDF export from Avigilon System Design Tool (sdt.avigilon.com) for each camera installed.

D. Shop Drawings shall include the following items:
   1. The CCTV System Riser Diagram shall show the MDF.
      a. Show each system component and device connected to and installed in the MDF.
   2. EACH camera shall be identified by a Camera ID #.
      a. The number sequence shall begin at the buildings main entrance (at the exterior of the building).
      b. Go clockwise through the entire site.
      c. Where interior cameras are shown, the number sequence shall continue (starting at the main entrance and going clockwise), only after all of the exterior cameras have been identified.
      d. EACH Fixed exterior camera shall show the cameras Field-of-View (two lines in a “V” shaped pattern, projecting outwards from the camera).
      e. Each Interior camera shall show direction-of-view with an arrow projecting outward from the camera.
      f. The Shop Drawings shall show the intended Field-of-View for all Fixed Cameras. Use light “hatching” to show this area. This shall be shown on the Site Plan(s).
         1) Site Plans: Show all exterior devices on the poles and on the structure.

E. See Section 27 0000 Low Voltage Systems General Requirements for additional requirements.

PART 2 - PRODUCTS

2.01 MATERIALS

A. See Section 26 0000 Electrical General Conditions for additional information.

B. See Section 27 0000 Low Voltage Systems General Requirements for additional information.

C. See Section 27 2000 Data and Voice Infrastructure for additional equipment requirements.

D. Axis manufactures the CCTV cameras that are used for the basis of design for this specification.
   1. Substitutions will not be approved on this project.

E. Other than the CCTV System cameras, the design, devices and/or wiring arrangement shown on the drawings represent that based on various equipment manufacturers outlined in this specification. Any changes resulting from differences between the specified product and other manufacturers or substitute manufacturers, shall be the responsibility of the Installing Vendor.
   1. Substitutions of the specified equipment and/or supplier will be considered provided that sufficient documentation is provided to the Engineer which certifies that the equipment and or supplier qualification meets the requirement of these specifications. Any request for substitution shall be submitted by the Installing Vendor in writing so as to be received by the Engineer not later than (10) days prior to the bid due date. Approval by the Engineer will be issued by addendum prior to the bid date.

F. Provide all equipment as defined in the specification(s) and shown on the drawings.

G. Refer to PART 1 for any equipment that is not specifically defined.

2.02 SYSTEM WORKSTATION(S)

A. Existing Owner Provided Workstation(s):
   1. Existing Owner Provided Workstation(s) shall be used for this project. These workstations are intended to be used for other tasks in addition to for this system.
      a. Remote Monitoring Software: The system software shall be loaded on the Owner provided PC's. The Installing Vendor shall provide, load, configure, and test the new software on EACH PC, as required.
         1) Coordinate with the Owner to confirm which PC's will receive the new software.
         2) Coordinate with the Owner's IT Department, as required.

2.03 VIDEO SERVER(S) AND SYSTEM SOFTWARE

A. Video Server(s): The Video Server shall be provided by the Owner.

B. Operating Software: Existing Operating Software is OnSSI Ocularis Enterprise v5.8. The Owner shall provide any and all legally required additional software license(s) by Microsoft™ and other related software.

C. CCTV System Software/Licensing shall be provided by the Owner for integration of all new cameras into the existing VMS platform.

D. Coordinate with the Owner's IT Department, as required.

2.04 NETWORK RELATED EQUIPMENT

A. Data Infrastructure:
   1. See Section 27 2000 Data Infrastructure shall provide EACH of the following items at EACH location required:
      a. Cat6 Cable Infrastructure.
      b. Fiber Optic Infrastructure.

B. PoE network switches:
   1. Provide network switches for connection to existing fiber at the existing pole mount enclosure.
      a. PoE network switch – Axis Model #D8208-R
      b. Provide (2) two for connection to new pole cameras and fiber media converters.

2.05 FIELD DEVICES

A. Cameras: Axis cameras are the basis of design.
   1. Exterior Fixed Dome Cameras:
      a. 15 MP 360° Camera – Axis Model # P3719-PLE
         1) Provide the following accessories for each location:
            a) Axis Model # T91B67 Pole Mount
            b) Axis Model # T94N01D Pendant Kit

b. 13MP 180° Camera – Axis Model # P3818-PVE
    1) Provide the following accessories for each location:
        a) Axis Model # T91B47 Pole Mount
        b) Axis Model # T91E61 Wall Mount
        c) Axis Model # T94A01D Pendant Kit
c. 8 MP Dome Camera – Axis Model # Q3538-LVE
    1) Provide the following accessories for each location:
        a) Axis Model # T91B47 Pole Mount
d. Install camera quantities as shown on the plans.
e. Provide and install any additional mounting hardware or equipment required for installation at each location.

2.06 CCTV FIBER MEDIA CONVERTER

A. Provide media converters for locations exceeding 295' CAT6 run lengths.
    1. 8-Port Media Converter/Repeater – Altronix Model # NetWaySP8A.
        a. Provide (1) at the Existing Pole Enclosure location. The 8-port media converter shall provide a fiber connection to additional media converters located at the new pole cameras.
        b. SFP Module – Altronix Model # P1MM. Provide duplex LC SFP transceiver for each fiber connection required at the 8-port media converter.
    2. Media Converter/Injector with Integral Power and Outdoor Enclosure – Altronix Model # NetWaySP1BTWPX.
        a. Provide (1) at each camera location exceeding 295' from the Existing Pole Enclosure location. See plans for additional information.
        b. SFP Module – Altronix Model # P1MM. Provide duplex LC SFP transceiver for each location.
        c. Pole Mount Kit – Altronix Model # MPK2. Provide pole mount kit for each location.
        d. The Electrical Contractor must provide 277VAC to 115VAC transformer for each location. Transformer shall provide power connection to the Integral Power Supply. Transformer shall be installed within the provided Outdoor Enclosure.

2.07 SYSTEM CABLES, CONNECTORS, AND PATCH CORDS

A. Include the "Spare Capacity" requirements listed elsewhere within this specification, for the calculations and sizing requirements of the cables and/or conductors.

B. Cables/Conductors: The minimum allowable size conductors are specified below. Use larger conductors and/or additional conductors, as required. Use the Manufacturers equivalent cable requirements, to meet all code requirements [such as "Wet Rated" or "Aerial Rated" cable] for the appropriate devices.
    1. CAT6 cable(s):
        a. Refer to Section 27 2000.
            1) The color of the outer jacket of the cable is identified in Section 27 2000.
    2. Media Converter Fiber Optic cable for locations exceeding CAT6 run lengths of 295'.
        a. Refer to Section 27 2000.

C. Connectors/Terminations: Use the manufacturer approved terminations as required.
    1. CAT6 cable(s):
        a. Refer to Section 27 2000.
    2. Fiber Optic cable(s):
        a. Refer to Section 27 2000.
        b. Terminate both ends with LC style connectors.

D. See PART 3 of this specification and Section 27 0000 for additional information.

2.08 TRAINING MATERIALS AND PROGRAMMING SURVEY

A. Interview the Owner for no less than a minimum of one (1) 1-Hour session. Allow for additional time if required, at no additional cost to the Owner. The Installing Contractor LEAD TECHNICIAN shall be present for this meeting. The purpose of this Interview is to verbally discuss all of the feature sets of the system. The dialog shall describe the benefits for implementing each of the systems features, thus allowing the Owner to make an informed decision on the how they can maximize the functional operation of their system.
   1. Prior to starting the Interview process with the Owner, have EACH attendee fill out a "Sign in Sheet" listing EACH attendee's name, department they work in, and their phone number.
   2. Provide a detailed list of features with a document titled "Section 28 2300 CCTV System – PRE-INTERVIEW of Owner Requested Systems Programming Sheet". This shall be provided in the "Submittal and Shop Drawings" with the Section 27 0000 submittal. This shall be used as the basis of discussion for the Interview process.
   3. For Bidding Purposes, the Installing Contractor shall be expected to program the system to Industry Standards, based on a project of this size, scope, typical functionality for this market segment, and as described throughout this specification.
      a. Review the testing requirements specified elsewhere within this specification for additional information.

B. Training Manuals for the Site Staff:
   1. At the 1st training session, prior to starting, provide a quantity of up to ten (10) training manuals to the site staff.
   2. The training manual shall be specific to the site (i.e., Binder spine, binder cover insert, and the binder's internal documents).
   3. Each of the training manuals shall be in a 3-ring "D" style binder. The binder shall be sized to allow for 20% additional documentation. The spine of the binder shall have a clear cover with an insert clearly typed with the following label "Section 28 2300 CCTV System – (site name here) training manual". The binder shall have a clear front cover with an insert clearly typed with the title of the spine on the front sheet, located at the top of the page, and centered. Under the title of the spine, the following information shall also be included on the front sheet of the binder; the site name and site address, the project name and project address, the current date, the installing vendors name, address, contact name and phone. Each binder shall include the following;
      a. Use color coded numbered tabs to separate each item defined below and for each device that was installed. Provide these items in the following order.
         1) Provide an 8½" x 11" clear heavy plastic sheet in front of a table of contents page as the first page of the binder indicating each of the equipment or device documents contained in each tab section.
         2) "Section 28 2300 CCTV System – (Site Name Here) Training Syllabus".
   4. Include the Manufacturers Software User's Manual(s).

2.09 ADDITIONAL SYSTEM EQUIPMENT

A. See Part 3 of this specification for additional provision of system Equipment and/or Labor.

PART 3 - EXECUTION

3.01 GENERAL

A. See Section 27 0000 Low Voltage Systems General Requirements for additional information.

B. See Section 27 2000 Data and Voice Infrastructure for additional cable and installation requirements.

C. See Section 27 0528 Pathways for Communications additional installation requirements.

D. Prior to rough-in, coordinate with the Engineer for the exact location(s).

E. Install all cabling, devices, and/or equipment per the manufacturer's recommendation.

3.02 INSTALLATION

A. EACH CABLE RUN SHALL CONTINUOUS, WITHOUT ANY SPLICES, from the device to the terminal strip on the system patch panel(s). Any cable run that does not meet this requirement shall be replaced at no additional cost to the Owner.

B. Setup, connect, and configure the Servers/Workstations/Monitors per the manufacturer's recommendations to operate as intended. Load, configure, and test the software for a fully functional system.

3.03 MOUNTING HEIGHTS, LOCATIONS, AND SETTINGS

A. General Camera Information:
   1. Prior to rough-in, examine the surrounding area and the cameras intended Field-of-View (FoV) (from the perspective of where the camera is to be installed). Cameras shall be installed with an unobstructed FoV. This includes but is not limited to; existing objects, such as lights or other physical impediments.
   2. Any camera that has the final and approved FoV that is obstructed will require the Installing to relocate the camera, at no additional cost to the Owner.
   3. Coordinate with the Engineer and all trades to ensure that the cameras FoV will not be obstructed. Prior to relocating any camera, obtain written direction from the Engineer.
      a. Coordinate with the Owner to relocate banners, art, or anything else that may block the cameras FoV and/or mounting requirements.
      b. Wall Mount Cameras shall be installed at the following locations:
         1) At all areas as shown on the drawings.

B. Camera Mounting:
   1. All cameras shall be surface mounted to pole structure.

C. Camera Focusing:
   1. After the CCTV System has been powered up, cameras have been back focused (where applicable) and configured, then the camera shall then be positioned as discussed during the Interview with the Owner, which is described in "Training Materials and Programming Survey" listed elsewhere within this specification.
      a. Fixed Cameras shall be adjusted and focused for the intended Field of View (FoV). Readjust the cameras to the Owner's needs, as required.

D. Remote Viewing of VIDEO SERVER(S)(s):
   1. Load and configure the software on the Owners Existing PC's and remote viewing monitor/PC(s) as required.
   2. Train the Owners IT department how to load and configure the software on additional PC's, as required.

3.04 TRAINING

A. Training for Site Staff:
   1. The training sessions shall be held at the project Site.
      a. Provide Training for up to 10 Site Staff.
      b. Provide a total of two (2) separate training sessions for the Owners personnel. Schedule both training sessions with the Owner, providing a minimum of 14 days advance notice, and offer a minimum of three dates to choose from.
   2. The 1st Training Session shall consist of:
      a. Providing the printed Training Manuals to EACH attendee, as described elsewhere in this specification in "Training Materials and Programming Survey".
      b. The training shall be a minimum of one (1) 4-Hour session and provide a thorough and in-depth full feature training session. Provide additional training time as required, to answer EACH of the staff's questions, at no additional cost to the Owner. This training shall address EACH of the software features that meet the

Owners requirements identified on the documents that were filled out during the "Interview with the Owner". This includes, but is not limited to:

1) The "Section 28 2300 CCTV System – Owner Requested Systems Programming Sheet".
    a) Using an Installing Contractor laptop and projector, connect to the Owners WAN and demonstrate each of these features and functions.
2) At the Owners option, the Installing Contractor may be allowed to provide the Training Session on the Owners Workstation.

3. The 2nd Training Session shall consist of:
    a. A refresher training session shall be held approximately 30 days after the first training session. The training session shall be a minimum of two (2) hours that may be conducted by one of the Installing Contractors designated technicians that attended the first training session. Provide additional training time as required, to answer EACH of the staff's questions, at no additional cost to the Owner.
    b. Using an Installing Contractors laptop and projector, connect to the Owners WAN and demonstrate each of the features and functions that the Owner's staff would like clarification on.
        1) No less than five (5) business days in advance of this meeting, the Installing Vendor shall request from the Owner, EACH of the items that the Owner would like clarification on.
            a) The documents that were filled out during the "Interview with the Owner" shall be used as the reference document.
            b) At the Owners option, the Installing Contractor may be allowed to provide the Training Session on the Owners Workstation.
        2) Following the 2nd training session, the Installing Contractor shall include additional programming to accommodate system functionality changes, based on the requirements of the Owner.
            a) Provide up to two (2) hours of system programming changes.
4. Upon completion of training, provide a letter from the customer on the customer's letterhead acknowledging that the training requirements have been met.

3.05 AS-BUILTS

A. Provide all As-Built documentation as defined in Section 27 0000 Low Voltage Systems General Requirements and listed elsewhere in this specification.

B. Update all documents provided in the Submittal and Shop Drawings to accurately reflect the actual equipment that was provided for this project, and the actual locations of the installed equipment.

C. The Installing Vendor shall include in the pricing of their bid, the time and materials to generate and create the documentation, as described below.
    1. Provide an "Equipment Information Sheet", in the O & M manuals. At a minimum, from left to right, provide the following information;
        a. Each row shall have an "Item #".
        b. Manufacturers Name.
        c. Equipment Device Type (such as Workstation, Control Panel, etc).
        d. Location (such as MDF room 240, or area of building).
        e. IP Address.
        f. Software Name.
        g. Software Version that is installed on the device.
        h. List the "Highest Level" configurable password for EACH device.
        i. List "EACH System Operator" password.
        j. List all other password settings for EACH device.

D. Provide ALL CD(s)/DVD(s) of installation software, legally required software licenses, and the associated documentation to reinstall all portions of the software that is running on the new and/or existing Server/Workstations.

E. Upon final acceptance of the CCTV system by the customer, provide a letter of acceptance from the customer on the customer's letter head accepting the CCTV system as installed and that the CCTV system is fully operational and all training requirements have been met.

END OF SECTION

F
PREVAILING WAGES

PREVAILING WAGE RATES

The following wage rates are in effect for this project.

State of Washington
Department of Labor and Industries
Washington State Prevailing Wage Rates For Public Works Contracts

Thurston County Rates For All Trades

Effective: October 5th, 2023 including any correction notices issued by Labor and Industries prior to bid.

Wage Rates and the Benefit Code Key may be found at:
https://secure.lni.wa.gov/wagelookup/

Supplemental to State Wage Rates may be found at:
http://www.wsdot.wa.gov/Design/ProjectDev/WageRates/default.htm

A copy is also available for viewing at the City of Lacey Public Works Engineering office located at 420 College St SE, Lacey, WA 98503. If requested, a hard copy will be mailed to you.