INTRODUCTION TO THE SPECIAL PROVISIONS

(******)

The work on this project shall be accomplished in accordance with the *Standard Specifications for Road, Bridge and Municipal Construction*, 2021 edition, as issued by the Washington State Department of Transportation (WSDOT) and the American Public Works Association (APWA), Washington State Chapter (hereafter "Standard Specifications"). The Standard Specifications, as modified or supplemented by the Amendments to the Standard Specifications and these Special Provisions, all of which are made a part of the Contract Documents, shall govern all of the Work.

These Special Provisions are made up of both General Special Provisions (GSPs) from various sources, which may have project-specific fill-ins; and project-specific Special Provisions. Each Provision either supplements, modifies, or replaces the comparable Standard Specification, or is a new Provision. The deletion, amendment, alteration, or addition to any subsection or portion of the Standard Specifications is meant to pertain only to that particular portion of the section, and in no way should it be interpreted that the balance of the section does not apply.

The project-specific Special Provisions are not labeled as such. The GSPs are labeled under the headers of each GSP, with the effective date of the GSP and its source. For example:

(March 8, 2013 APWA GSP)	*APWA General Special Provision*
(April 1, 2013 WSDOT GSP)	*WSDOT General Special Provision*
(June 16, 2020 WSDOT SWR GSP)	*WSDOT Southwest Region General Special Provision*
(******)	*Project-Specific Special Provision*

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 La Center Public Works Engineering Standards for Construction*, current edition

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

Division 1
General Requirements

DESCRIPTION OF WORK

(March 13, 1995 WSDOT GSP)
This Contract provides for the improvement of *** E 4th Street from E Cedar Avenue to NE Highland Drive through construction of a new bridge and roadway widening. The Project includes clearing and grubbing, roadway excavation, storm sewer conveyance, detention, treatment, sanitary sewer, water, HMA paving, erosion control, traffic control, bridge construction, walls, illumination, pavement marking, traffic signal *** and other work, all in accordance with the attached Contract Plans, these Contract Provisions, and the Standard Specifications.

1-04 SCOPE OF THE WORK

1-04.4 Changes

1-04.4(1) Minor Changes

Delete the first paragraph and replace it with the following:

(May 30, 2019 APWA GSP)
Payments or credits for changes amounting to $5,000 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.

1-05 Control of Work

1-05.4 Conformity With And Deviations From Plans And Stakes

Section 1-05.4 is supplemented with the following:

(January 13, 2021 WSDOT GSP)
Contractor Surveying - Structure
The Contracting Agency has provided primary survey control in the Plans.

The Contractor shall be responsible for setting, maintaining, and resetting all alignment stakes, slope stakes, and grades necessary for the construction of bridges, noise walls, and retaining walls. Except for the survey control data to be furnished by the Contracting Agency, calculations, surveying, and measuring required for setting and maintaining the necessary lines and grades shall be the Contractor's responsibility.

The Contractor shall inform the Engineer when monuments are discovered that were not identified in the Plans and construction activity may disturb or damage the monuments. All monuments noted on the plans “DO NOT DISTURB” shall be protected throughout the length of the project or be replaced at the Contractors expense.

Detailed survey records shall be maintained, including a description of the work performed on each shift, the methods utilized, and the control points used. The record shall be adequate to allow the survey to be reproduced. A copy of each day's record shall be provided to the Engineer within three working days after the end of the shift.

The meaning of words and terms used in this provision shall be as listed in "Definitions of Surveying and Associated Terms" current edition, published by the American Congress on Surveying and Mapping and the American Society of Civil Engineers.

The survey work by the Contractor shall include but not be limited to the following:

1. Verify the primary horizontal and vertical control furnished by the Contracting Agency, and expand into secondary control by adding stakes and hubs as well as additional survey control needed for the project. Provide descriptions of secondary control to the Contracting Agency. The description shall include coordinates and elevations of all secondary control points.

2. Establish, by placing hubs and/or marked stakes, the location with offsets of foundation shafts and piles.

3. Establish offsets to footing centerline of bearing for structure excavation.

4. Establish offsets to footing centerline of bearing for footing forms.

5. Establish wing wall, retaining wall, and noise wall horizontal alignment.

6. Establish retaining wall top of wall profile grade.

7. Establish elevation benchmarks for all substructure formwork.

8. Check elevations at top of footing concrete line inside footing formwork immediately prior to concrete placement.

9. Check column location and pier centerline of bearing at top of footing immediately prior to concrete placement.

10. Establish location and plumbness of column forms, and monitor column plumbness during concrete placement.

11. Establish pier cap and crossbeam top and bottom elevations and centerline of bearing.

12. Check pier cap and crossbeam top and bottom elevations and centerline of bearing prior to and during concrete placement.

13. Establish grout pad locations and elevations.

14. Establish structure bearing locations and elevations, including locations of anchor bolt assemblies.

15. Establish box girder bottom slab grades and locations.

16. Establish girder and/or web wall profiles and locations.

17. Establish diaphragm locations and centerline of bearing.

18. Establish roadway slab alignment, grades and provide dimensions from top of girder to top of roadway slab. Set elevations for deck paving machine rails.

19. Establish traffic barrier and curb profile.

20. Profile all girders prior to the placement of any deadload or construction live load that may affect the girder's profile.

The Contractor shall provide the Contracting Agency copies of any calculations and staking data when requested by the Engineer.

The Contractor shall submit the computed elevations at the top of bridge decks as a Type 2 Working Drawing. The elevations shall be computed at tenth points along the centerline of each girder web.

The Contractor shall ensure a surveying accuracy within the following tolerances:

		Vertical	Horizontal
1.	Stationing on structures		±0.02 feet
2.	Alignment on structures		±0.02 feet
3.	Superstructure elevations	±0.01 feet variation from plan elevation	
4.	Substructure	±0.02 feet variation from Plan grades.	

The Contracting Agency may spot-check the Contractor's surveying. These spot-checks will not change the requirements for normal checking by the Contractor.

When staking the following items, the Contractor shall perform independent checks from different secondary control to ensure that the points staked for these items are within the specified survey accuracy tolerances:

Piles
Shafts
Footings
Columns

The Contractor shall calculate coordinates for the points associated with piles, shafts, footings and columns. The Contracting Agency will verify these coordinates prior to issuing approval to the Contractor for commencing with the survey work. The Contracting Agency will require up to seven calendar days from the date the data is received to issuing approval.

Contract work to be performed using contractor-provided stakes shall not begin until the stakes are approved by the Contracting Agency. Such approval shall not relieve the Contractor of responsibility for the accuracy of the stakes.

Payment

Payment will be made for the following bid item when included in the proposal:

"Structure Surveying", lump sum.

The lump sum contract price for "Structure Surveying" shall be full pay for all labor, equipment, materials, and supervision utilized to perform the Work specified, including any resurveying, checking, correction of errors, replacement of missing or damaged stakes, and coordination efforts.

(January 13, 2021 WSDOT GSP)

Contractor Surveying - Roadway

The Contracting Agency has provided primary survey control in the Plans.

The Contractor shall be responsible for setting, maintaining, and resetting all alignment stakes, slope stakes, and grades necessary for the construction of the roadbed, drainage, surfacing, paving, channelization and pavement marking, illumination and signals, guardrails and barriers, and signing. Except for the survey control data to be furnished by the Contracting Agency, calculations, surveying, and measuring required for setting and maintaining the necessary lines and grades shall be the Contractor's responsibility.

The Contractor shall inform the Engineer when monuments are discovered that were not identified in the Plans and construction activity may disturb or damage the monuments. All monuments noted on the plans “DO NOT DISTURB” shall be protected throughout the length of the project or be replaced at the Contractors expense.

Detailed survey records shall be maintained, including a description of the work performed on each shift, the methods utilized, and the control points used. The record shall be adequate to allow the survey to be reproduced. A copy of each day's record shall be provided to the Engineer within three working days after the end of the shift.

The meaning of words and terms used in this provision shall be as listed in "Definitions of Surveying and Associated Terms" current edition, published by the American Congress on Surveying and Mapping and the American Society of Civil Engineers.

The survey work shall include but not be limited to the following:

1. Verify the primary horizontal and vertical control furnished by the Contracting Agency, and expand into secondary control by adding stakes and hubs as well as additional survey control needed for the project. Provide descriptions of secondary control to the Contracting Agency. The description shall include coordinates and elevations of all secondary control points.

2. Establish, the centerlines of all alignments, by placing hubs, stakes, or marks on centerline or on offsets to centerline at all curve points (PCs, PTs, and PIs) and at points on the alignments spaced no further than 50 feet.

3. Establish clearing limits, placing stakes at all angle points and at intermediate points not more than 50 feet apart. The clearing and grubbing limits shall be 5 feet beyond the toe of a fill and 10 feet beyond the top of a cut unless otherwise shown in the Plans.

4. Establish grading limits, placing slope stakes at centerline increments not more than 50 feet apart. Establish offset reference to all slope stakes. If Global Positioning Satellite (GPS) Machine Controls are used to provide grade control, then slope stakes may be omitted at the discretion of the Contractor

5. Establish the horizontal and vertical location of all drainage features, placing offset stakes to all drainage structures and to pipes at a horizontal interval not greater than 25 feet.

6. Establish roadbed and surfacing elevations by placing stakes at the top of subgrade and at the top of each course of surfacing. Subgrade and surfacing stakes shall be set at horizontal intervals not greater than 50 feet in tangent sections, 25 feet in curve sections with a radius less than 300 feet, and at 10-foot intervals in intersection radii with a radius less than 10 feet. Transversely, stakes shall be placed at all locations where the roadway slope changes and at additional points such that the transverse spacing of stakes is not more than 12 feet. If GPS Machine Controls are used to provide grade control, then roadbed and surfacing stakes may be omitted at the discretion of the Contractor.

7. Establish intermediate elevation benchmarks as needed to check work throughout the project.

8. Provide references for paving pins at 25-foot intervals or provide simultaneous surveying to establish location and elevation of paving pins as they are being placed.

9. For all other types of construction included in this provision, (including but not limited to channelization and pavement marking, illumination and signals, guardrails and barriers, and signing) provide staking and layout as necessary to adequately locate, construct, and check the specific construction activity.

10. Contractor shall determine if changes are needed to the profiles or roadway sections shown in the Contract Plans in order to achieve proper smoothness and drainage where matching into existing features, such as a smooth transition from new pavement to existing pavement. The Contractor shall submit these changes to the Engineer for review and approval 10 days prior to the beginning of work.

The Contractor shall provide the Contracting Agency copies of any calculations and staking data when requested by the Engineer.

The Contractor shall ensure a surveying accuracy within the following tolerances:

	Vertical	Horizontal
Slope stakes	±0.10 feet	±0.10 feet
Subgrade grade stakes set 0.04 feet below grade	±0.01 feet	±0.5 feet (parallel to alignment) ±0.1 feet (normal to alignment)
Stationing on roadway	N/A	±0.1 feet
Alignment on roadway	N/A	±0.04 feet
Surfacing grade stakes	±0.01 feet	±0.5 feet (parallel to alignment) ±0.1 feet (normal to alignment)
Roadway paving pins for surfacing or paving	±0.01 feet	±0.2 feet (parallel to alignment) ±0.1 feet (normal to alignment)

The Contracting Agency may spot-check the Contractor's surveying. These spot-checks will not change the requirements for normal checking by the Contractor.

When staking roadway alignment and stationing, the Contractor shall perform independent checks from different secondary control to ensure that the points staked are within the specified survey accuracy tolerances.

The Contractor shall calculate coordinates for the alignment. The Contracting Agency will verify these coordinates prior to issuing approval to the Contractor for commencing with the work. The Contracting Agency will require up to seven calendar days from the date the data is received.

Contract work to be performed using contractor-provided stakes shall not begin until the stakes are approved by the Contracting Agency. Such approval shall not relieve the Contractor of responsibility for the accuracy of the stakes.

Stakes shall be marked in accordance with Standard Plan A10.10. When stakes are needed that are not described in the Plans, then those stakes shall be marked, at no additional cost to the Contracting Agency as ordered by the Engineer.

Payment

Payment will be made for the following bid item when included in the proposal:

"Roadway Surveying", lump sum.

The lump sum contract price for "Roadway Surveying" shall be full pay for all labor, equipment, materials, and supervision utilized to perform the Work specified, including any resurveying, checking, correction of errors, replacement of missing or damaged stakes, and coordination efforts.

1-07 Legal Relations and Responsibilities to the Public

1-07.5 Environmental Regulations

1-07.5(4) Air Quality

Section 1-07.5(4) is supplemented with the following:

(September 29, 2014 WSDOT SWR GSP)
For this project, the local air pollution agency is *** Southwest Clean Air Agency ***.

1-07.6 Permits and Licenses

Section 1-07.6 is supplemented with the following:

(January 2, 2018 WSDOT GSP)
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.
Department of the Army Section 404 Nationwide XXXXXX	Corps of Engineers Seattle District	XXXXXXXX

***

(******)
All costs to transfer the NPDES Construction Stormwater General Permit are incidental to the Contract and are the responsibility of the Contractor. The Contractor shall include all related costs in the associated bid prices of the Contract.

1-07.16 Protection and Restoration of Property

Section 1-07.16 is supplemented with the following:

(February 25, 2021 WSDOT GSP)

Protection of Wells

The Contractor shall save and protect existing wells throughout the life of the Contract at the locations as shown in the Plans. For the definition of wells types see WAC 173-160-111 and WAC 173-160-410.

The existing wells shall not be disturbed during any construction activity.

Discovery of Unidentified Wells

If unidentified wells are encountered by the Contractor, they shall not be further disturbed. The Contractor shall ensure any unidentified wells encountered are protected from all construction activities including spills. The Contractor shall follow the procedures set forth in Section 1-04.7. The Engineer will determine if the well will be protected in accordance with Section 1-07.1, 1-07.5(3), and 1-07.16 or the well will be decommissioned as part of the Work.

1-07.16(2) Vegetation Protection and Restoration

Section 1-07.16(2) is supplemented with the following:

(August 2, 2010 WSDOT GSP)

Vegetation and soil protection zones for trees shall extend out from the trunk to a distance of 1 foot radius for each inch of trunk diameter at breast height.

Vegetation and soil protection zones for shrubs shall extend out from the stems at ground level to twice the radius of the shrub.

Vegetation and soil protection zones for herbaceous vegetation shall extend to encompass the diameter of the plant as measured from the outer edge of the plant.

1-07.17 Utilities and Similar Facilities

Section 1-07.17 is supplemented with the following:

(April 2, 2007 WSDOT GSP)

Locations and dimensions shown in the Plans for existing facilities are in accordance with available information obtained without uncovering, measuring, or other verification.

The following addresses and telephone numbers of utility companies known or suspected of having facilities within the project limits are supplied for the Contractor's convenience:

*** Clark Public Utilities-Electric
8600 NE 117th Ave.
P.O. Box 8900
Vancouver, WA 98668
(360) 992-8814 (O)
(360) 600-1247 (C)
jpilling@clarkpud.com

*** Clark Public Utilities-Water
8600 NE 117th Ave.
P.O. Box 8900
Vancouver, WA 98668
(360) 992-8814 (O)
(360) 600-1247 (C)
nflagg@clarkpud.com

Comcast Cable
Ted Syfrett
6916 NE 40th Street
Vancouver, WA 98661
(360) 301-1633 (O)
Ted_Syfrett@comcast.com

NW Natural Gas
Ryan Winfree
11218 NE 66th Street
Vancouver, WA 98662
(503) 226-4211x.2045 (O)
(773) 612-9237 (C)
srw@nwnatural.com

In addition to the individual utility company contacts, the Contractor is required to call the 811-Call Before You Dig number, or www.callbeforeyoudig.org, two (2) days prior to beginning work. ***

1-10 Temporary Traffic Control

1-10.2 Traffic Control Management

1-10.2(1) General

Section 1-10.2(1) is supplemented with the following:

(January 3, 2017 WSDOT GSP)
Only training with WSDOT TCS card and WSDOT training curriculum is recognized in the State of Washington. The Traffic Control Supervisor shall be certified by one of the following:

The Northwest Laborers-Employers Training Trust
27055 Ohio Ave.
Kingston, WA 98346
(360) 297-3035

Evergreen Safety Council
12545 135th Ave. NE
Kirkland, WA 98034-8709

1-800-521-0778

The American Traffic Safety Services Association
15 Riverside Parkway, Suite 100
Fredericksburg, Virginia 22406-1022
Training Dept. Toll Free (877) 642-4637
Phone: (540) 368-1701

1-10.3 Traffic Control Labor, Procedures, and Devices

Section 1-10.3 is supplemented with the following:

(******)

Public Events

The Contractor shall have roadway clear and free of closures along E 4th Street on the following dates:

XXXX XX, 2023 (INSERT HOLIDAY OR EVENT)

No lane closures shall occur on these dates to allow public unrestricted access to La Center during these events. Project site shall be left in a condition appropriate to WSDOT standards and free of debris or obstacles that may pose dangers or risks to the public or driver safety. If areas under construction are left open and require barrier protection, barriers shall be in place prior to dates above and permitted as required through the City of La Center.

1-10.4 Measurement

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

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

(August 2, 2004 WSDOT GSP)

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.

*** $$1$$ ***

Add the following new section:

(******)

General Access

Description

This Work shall consist of creating and implementing a construction staging and access plan for the project site, and any potential impacts to adjacent businesses and residences due to selected traffic control and site access within the project limits.

Construction Requirements

Submittal

The Contractor shall create a construction staging and access plan. The Contractor shall provide a schedule for the implementation of the staging and access plan and incorporate it into the Contractor's progress schedule. The Contractor shall obtain the Engineer's acceptance of the staging and access plan along with the schedule before any work begins.

The Contractor shall allow 5 working days for the Engineer to review any original or revised staging and access plan. Failure to accept all or part of any such plan shall not make the Contracting Agency liable to the Contractor for any work delays.

Elements of the plan must include:

- Provision for public access to streets as shown in the plans.
- Construction access to and from site onto East 4th Street.
- Construction access to and from Mill Pond Dam.
- Vehicle access must be continuous from existing public streets.
- Vehicle access must be available 24 hours a day.
- Vehicle access must have a paved surface or temporary compacted gravel surface.
- Vehicle access must be a minimum of 10 feet wide.
- Maintain large truck and School Bus access into and out of La Center.
- Provisions for staging and access for main line utilities and joint utility trench.
- Provisions for staging and access for phases of construction staging.

Measurement

There will be no unit measurement for work listed above.

Payment

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

"Construction Staging and Access Plan", lump sum, shall be full pay for all costs to create and submit the staging and access plan, revise and resubmit the staging and access plan as necessary, and implementation of the access plan. Implementation shall include all labor, equipment and materials necessary for maintaining access to the residences within the project limits.

Add the following new section:

(******)

Temporary Pedestrian Access Plan and Management

Description

This Work shall consist of creating and implementing a temporary pedestrian access plan for bipedal users of the site, in addition to bicyclists through the project limits during construction, including implementation and management of plan through completion of construction.

Construction Requirements

Submittal

The Contractor shall create a Temporary Pedestrian Access and Management plan. The Contractor shall provide a schedule for the implementation of the Temporary Pedestrian Access and Management plan and incorporate it into the Contractor's progress schedule. The Contractor shall obtain the Engineer's acceptance of the Temporary Pedestrian Access and Management plan along with the schedule before any work begins.

The Contractor shall allow 5 working days for the Engineer to review any original or revised Temporary Pedestrian Access and Management plan. Failure to accept all or part of any such plan shall not make the Contracting Agency liable to the Contractor for any work delays.

Elements of the plan must include:

- A level of accessibility equal to or better than the existing pedestrian facility. (An "existing pedestrian facility" may not necessarily include a sidewalk. Pedestrians may be using the roadway shoulder or some other pathway.) The plan must provide a pathway that matches or exceeds the existing level of accessibility.
- Route and route features meeting applicable Federal, City of La Center and MUTCD Standards.
- Locations and provisions for temporary pedestrian crossings or pedestrian shuttles if proposed.
- Provisions for bicyclist access through the project site.

Measurement

There will be no unit measurement for work listed above.

Payment

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

"Temporary Pedestrian Access Plan and Management", lump sum.

The unit Contract price for "Temporary Pedestrian Access Plan and Management" shall be full pay for all costs to create and submit the temporary pedestrian access plan, revise and resubmit the temporary pedestrian access plan as necessary, and implementation of the access plan. Implementation shall include all labor, equipment, signage and materials

necessary for maintaining access to pedestrian and bicyclist users within the project limits throughout the life of the project.

Division 2
Earthwork

2-01 Clearing, Grubbing, and Roadside Cleanup

2-01.1 Description

Section 2-01.1 is supplemented with the following:

(March 13, 1995 WSDOT GSP)
Clearing and grubbing on this project shall be performed within the following limits:

*** Within limits of Cut and Fill shown with Temporary Construction Easements and City Right-of-Way.

All areas beyond the limits of the high visibility fencing (where shown in plans) shall be preserved in a natural state including all landform, natural drainages and vegetation, unless otherwise designated by the Engineer.

As staked in the field by the Engineer and limits of temporary silt fencing as shown in Plans. ***

2-02 Removal of Structures and Obstructions

2-02.3 Construction Requirements

Section 2-02.3 is supplemented with the following:

(******)
The Contractor shall employ the use of an industrial vacuum cleaner to collect sawcutting residue and debris immediately behind the sawcutting work to assure that concrete, asphalt, concrete by-products, or asphalt by-products from, or used in, the drilling, sawcutting, grinding, or planing of asphalt cement or cement concrete pavements, sidewalks, curbs, etc. do not enter any storm drain, surface water, and/or natural drainage system. Sawcutting by-products increase the pH of the wastewater, as such filtering prior to discharge will not be acceptable. The Contractor shall provide a means for collecting and for properly disposing of these by-products.

(******)
Salvage of Removed Structure Items
All existing traffic signs and school flasher poles, signs and equipment being removed shall remain the property of the City of La Center.

All above ground component of the existing sign board structure installed on the eastern side of the City of La Center Elementary School western driveway being removed shall remain the property of the Contracting Agency.

The Contractor shall transport the specified salvaged items to the following location:

Return salvaged traffic items and equipment to XXXXXX.
Coordinate with Tony Cooper at (360) 263-2889

The Contractor shall stack the material where directed by the Engineer. The Contractor shall contact the Engineer at least five working days prior to scheduled delivery of the items to confirm delivery arrangements.

(******)
Existing fences to be removed for construction shall be placed in a safe location until Contractor is ready to reinstall fencing. Contractor shall reset existing fence material with new concrete foundation and connect fence with existing fence to original condition to the limits of resetting.

2-02.4 Measurement

Section 2-02.4 is supplemented with the following:

(******)
Fencing that is called to be removed and reset will be measured along the face of the by the linear foot.

2-02.5 Payment

Section 2-02.5 is supplemented with the following:

(******)
"Remove and Reset Existing Fence", per linear foot.

2-03 Roadway Excavation and Embankment

2-03.3 Construction Requirements

2-03.3(14) Embankment Construction

2-03.3(14)C Compacting Earth Embankments

Section 2-03.3(14)C is supplemented with the following:

(******)
All embankments within the roadway will be subject to proof rolling with a fully loaded dump truck prior to placement of the next layer of surfacing (crushed surfacing or hot mix asphalt). Soft spots will be identified, over-excavated and replaced with 1 ¼"-0 CSBC compacted to 95% of AASHTO T-180 before proceeding with the next layer.

(******)
All embankments related to stormwater facility, shall be compacted using Method B.

2-03.4 Measurement

Section 2-03.4 is supplemented with the following:

(******)

Only one determination of the original ground elevation will be made on this project. Measurement for roadway excavation, and embankment will be based on the original ground elevations recorded previous to the award of this Contract.

If discrepancies are discovered in the ground elevations which will materially affect the quantities of earthwork, the original computations of earthwork quantities will be adjusted accordingly.

Earthwork quantities will be computed, either manually or by means of electronic data processing equipment, by use of the average end area method or by the finite element analysis method utilizing digital terrain modeling techniques.

Only upon award of the Contract, may copies of the original ground digital terrain model and survey data be furnished to the successful bidder, upon approval of the City Project Manager.

(******)
Pond and biofiltration swale excavation will be measured per cubic yard.

2-03.5 Payment

The paragraph beginning with the "The unit Contract price per cubic yard for "Common Borrow Incl. Haul"….." in Section 2-03.5 of the Standard Specification provisions is revised to read:

(******)
The unit Contract price per cubic yard for "Common Borrow Incl. Haul" shall be full compensation for all costs incurred for excavating, loading, hauling, placing, compacting, or otherwise disposing of the material. The unit Contract price includes removing, disposing of, wasting, or stockpiling any material in the borrow site that does not meet the Specifications for "Common Borrow".

The paragraph beginning with the "The unit Contract price per cubic yard for "Embankment Compaction"….." in Section 2-03.5 of the Standard Specification provisions is revised to read:

(******)
The unit Contract price per cubic yard for "Embankment Compaction" shall be full compensation for all costs incurred for all material, labor, tools, equipment, and incidentals required. The item "Embankment Compaction" includes onsite material reused for fill and does not include "Common Borrow Incl. Haul".

Section 2-03.5 is supplemented with the following:

(******)
"Pond and Biofiltration Facility Excavation Incl. Haul", per cubic yard.

Add the following new section:

Large Woody Debris

Description

This work shall include placement, adjustment, and anchoring of woody debris and root wads for creek installation.

Materials

Large Woody Debris

Large woody debris shall consist of logs with root wads attached via stacking as shown in the Plans. Trunk length and diameter shall be as shown in the Plans. Root wads shall consist of stout roots, minimum 2-inch diameter, that form a root wad at least 4 feet in diameter. Logs shall be Douglas Fir or Western Red Cedar species that are free from rot or decay.

Mobile Woody Debris

Mobile woody debris shall consist of logs with or without branches attached that are stacked within large woody debris as shown in the Plans. Log length and diameter shall be as shown in the Plans. Logs shall be sourced from onsite trees that have been removed. Douglas Fir or Western Red Cedar species shall be used if onsite. Other species may be used if Douglas Fir or Western Red Cedar are not onsite. Logs shall be free from rot or decay.

Construction Requirements

Large Woody Debris

This work consists of placing large woody debris in the stream channel where shown and as detailed in the Plans. Care should be taken when handling log materials to minimize damage such as abrasion, splitting, crushing, and shearing to the tree trunk and root wads where intact and required. The orientation shall be placed and anchored per the drawings or as directed by the Engineer to ensure that the wood debris will naturally anchor to the stream bed.

Mobile Woody Debris

This work consists of placing mobile woody debris in the stream channel where shown and as detailed in the Plans. Care should be taken when handling log materials to minimize damage such as abrasion, splitting, crushing and shearing to the logs where intact and required. The orientation shall be placed per the drawings or as directed by the Engineer to ensure that the mobile wood debris will naturally anchor to the large woody debris and stream bed.

Large Woody Debris Anchors

Logs shall be notched as necessary to provide a setting for the anchor rope. Logs shall be secured to two-man boulders with one 1/2” diameter stainless steel bolts, 8” in length, and shall be drilled a minimum of 3” into the two-man boulder per Section 6-02.3(24) of the Special Provisions. Once bolted, logs shall be epoxied to the two-man boulder using a Type IV epoxy per Section 9-26.1(1)A of the Standard Specifications.

Boulder surface shall be clean prior to epoxy application. Use an oil free solvent to wipe surfaces. Surface shall be roughened using a carbide grinding tool. Epoxy shall reach 90% shear strength prior to the placement of any streambed mixture.

Logs shall be anchored as shown on plans into the streambank by earth anchors. Logs shall be notched as necessary to provide a setting for the 1/2” wire anchor rope. The anchors shall be Manta Ray MR-2 or approved equivalent. The earth anchor shall be

under the log and in driven in a direction downward and into the bank 5-feet minimum from the channel.

Measurement

Large Woody Debris will be measured per each installed regardless of length, diameter, or attached root wad.
Mobile Woody Debris shall be measured per each installed regardless of length and diameter.

Payment

“Large Woody Debris” per each.
Payment for “Large Woody Debris” per each, shall be full pay for the Work described in this Section including excavation, backfilling, anchoring, epoxy to the two-man boulders, and compaction. The unit contract price shall be full pay for furnishing all labor, tools, materials, and equipment required to anchor logs as shown in the Contract Plans.

“Mobile Woody Debris” per each.
Payment for “Mobile Woody Debris” per each, shall be full pay for the Work described in this Section including placement, backfilling, and compaction.

The unit Contract price for these items shall be full pay for furnishing all labor, mixing, haul, tools, materials, and equipment required to place material as shown in the Contract Plans.

Division 4
Bases

Add the following new section:

(******)

Base Rock Preparation Prior to Paving

Description

This work shall consist of shaping and compacting the existing base rock prior to paving in accordance with the Plans, these Specifications, and the Standard Specifications, at the locations shown in the Plans.

Construction Requirements

Following pavement removal, the existing crushed surfacing base course shall be graded and shaped to conform to the lines and grades shown in the plans, and shall be compacted to at least 95 percent of maximum density determined by the requirements of Section 2-03.3(14)D. The determination of field in-place density shall be made by the Nuclear gauge. Vibratory compactors and rollers shall obtain the specified density. A mist spray of water shall be applied as needed to replace moisture lost by evaporation.

The completed layer shall have a smooth, tight, uniform surface true to the line, grade, and cross-section shown in the Plans, or as staked.

Measurement

Base rock preparation prior to paving will be measured by the square yard of completed and accepted base rock preparation prior to paving as determined by the specified lines, grades and cross sections shown in the Plans.

Payment

Payment will be made in accordance with Section 1-04.1 for each of the following Bid items that are included in the Proposal:

“Base Rock Preparation Prior to Paving”, per square yard.

Payment for “Base Rock Preparation Prior to Paving”, shall be made at the unit contract price per square yard and shall be full pay for all labor, equipment, and materials necessary to shape, and compact the base rock.

Division 5
Surface Treatments and Pavements

5-04 Hot Mix Asphalt

5-04.2 Materials

The sixth and seventh materials listed in Section 5-04.2 are revised to read:

(May 20, 2020 WSDOT GSP)

Reclaimed Asphalt Pavement (RAP)	9-03.8(3)B, 9-03.21
Reclaimed Asphalt Shingles (RAS)	9-03.8(3)B, 9-03.21

5-04.2(2) Mix Design – Obtaining Project Approval

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

(January 3, 2011 WSDOT GSP)

ESAL's

The number of ESAL's for the design and acceptance of the HMA shall be *** 0.85 *** million.

5-04.3 Construction Requirements

5-04.3(3) Equipment

5-04.3(3)D Material Transfer Device or Material Transfer Vehicle

(August 3, 2009 WSDOT GSP)

Section 5-04.3(3)D is deleted in its entirety.

5-04.3(10) HMA Compaction Acceptance

The column in Table 14 of Section 5-04.3(10), titled “Statistical Evaluation of HMA Compaction is Required for”, is supplemented with the following:

(April 3, 2017 WSDOT GSP)

- Any HMA for which the specified course thickness is greater than 0.10 feet and the HMA is placed in the shoulder.

5-04.5 Payment

Section 5-04.5 is supplemented with the following:

(January 13, 2021 WSDOT GSP)

Asphalt Cost Price Adjustment

The Contracting Agency will make an Asphalt Cost Price Adjustment, either a credit or a payment, for qualifying changes in the reference cost of asphalt binder. The adjustment will be applied to partial payments made according to Section 1-09.9 for the following bid items when they are included in the proposal:

"HMA Cl. ___ PG ___"
"HMA for Approach Cl. ___ PG ___"
"HMA for Preleveling Cl. ___ PG ___"
"HMA for Pavement Repair Cl. ___ PG ___"
"Commercial HMA"

The adjustment is not a guarantee of full compensation for changes in the cost of asphalt binder. The Contracting Agency does not guarantee that asphalt binder will be available at the reference cost.

The Contracting Agency will establish asphalt binder reference costs twice each month and post the information on the Agency website at: http://www.wsdot.wa.gov/Business/Construction/EscalationClauses.htm. The reference cost will be determined using posted prices furnished by Poten & Partners, Inc. If the selected price source ceases to be available for any reason, then the Contracting Agency will select a substitute price source to establish the reference cost.

Price adjustments will be calculated one time per month. No price adjustment will be made if the Current Reference Cost is within +/-5% of the Base Cost. Reference costs for projects located in Eastern versus Western Washington shall be selected from the column in the WSDOT website table labeled "Eastern", or "Western", accordingly. The adjustment will be calculated as follows:

If the reference cost is greater than or equal to 105% of the base cost, then
Asphalt Cost Price Adjustment = (Current Reference Cost – (1.05 x Base Cost)) x (Q x 0.056).

If the reference cost is less than or equal to 95% of the base cost, then
Asphalt Cost Price Adjustment = (Current Reference Cost – (0.95 x Base Cost)) x (Q x 0.056).

Where: **Current Reference Cost** is selected from the website table based on the "Date Effective" that immediately precedes the current month's progress estimate end date. For work completed after all authorized working days are used, the adjustment will be based on the posted reference cost during which contract time was exhausted.

Base Cost is selected from the website table based on the "Date Effective" that immediately precedes the contract bid opening date, and shall be a constant for all monthly adjustments.

Q = total tons of all classes of HMA paid in the current month's progress payment.

"Asphalt Cost Price Adjustment", by calculation.
"Asphalt Cost Price Adjustment" will be calculated and paid for as described in this section. For the purpose of providing a common proposal for all bidders, the Contracting Agency has entered an amount in the proposal to become a part of the total bid by the Contractor.

Division 6
Structures

Concrete Structures

Materials

Section 6-02.2 is supplemented with the following:

Resin Bonded Anchors

The resin bonded anchor system shall include the nut, washer, and threaded anchor rod which is installed into hardened concrete with a resin bonding material.

Resin bonding material used in overhead and horizontal application shall be specifically recommended by the resin manufacturer for those applications.

Resin bonding material used in submerged liquid environment shall be specifically recommended by the resin manufacturer for this application.

The resin bonded anchor system shall conform to the following requirements:

1. Threaded Anchor Rod and Nuts
   Threaded anchor rods shall conform to ASTM A 193 Grade B7 or ASTM A 449, except as otherwise noted, and be fully threaded. Threaded anchor rods for stainless steel resin bonded anchor systems shall conform to ASTM F 593 and shall be Type 304 unless otherwise specified.

   Nuts shall conform to ASTM A 563, Grade DH, except as otherwise noted. Nuts for stainless steel resin bonded anchor systems shall conform to ASTM F 594 and shall be Type 304 unless otherwise specified.

   Washers shall conform to ASTM F 436, and shall meet the same requirements as the supplied anchor rod, except as otherwise noted. Washers for stainless steel resin bonded anchor systems shall conform to ASTM A 240 and the geometric requirements of ASME B18.21.1 and shall be Type 304 Stainless Steel unless otherwise specified.

   Nuts and threaded anchor rods, except those manufactured of stainless steel, shall be galvanized in accordance with AASHTO M 232. Galvanized threaded anchor rods shall be tested for embrittlement after galvanizing, in accordance with Section 9-29.6(5).

   Threaded anchor rods used with resin capsules shall have the tip of the rod chiseled in accordance with the resin capsule manufacturer's recommendations. Galvanized threaded rods shall have the tip chiseled prior to galvanizing.

2. Resin Bonding Material
   Resin bonding material shall be a two component epoxy resin conforming to Type IV ASTM C 881 or be one of the following:

   a. Vinyl ester resin.

b. Polyester resin.

c. Methacrylate resin.

3. Ultimate Anchor Tensile Capacity
Resin bonded anchors shall be tested in accordance with ASTM E 488 to have the following minimum ultimate tensile load capacity when installed in concrete having a maximum compressive strength of 6000 pounds per square inch (psi) at the embedment specified below:

Anchor Diameter (inch)	Tensile Capacity (lbs.)	Embedment (inch)
3/8	7,800	3-3/8
1/2	12,400	4-1/2
5/8	19,000	5-5/8
3/4	27,200	6-3/4
7/8	32,000	7-7/8
1	41,000	9
1-1/4	70,000	11-1/4

The Contractor shall submit items 1 and 2 below to the Engineer for all resin bonded anchor systems. If the resin bonded anchor system and anchor diameter are not listed in the current WSDOT Qualified Products List, the Contractor shall also submit item 3 below to the Engineer.

For resin bonded anchor systems that are installed in a submerged liquid environment the Contractor shall submit items 1, 2, and 4 below. If the resin bonded anchor system and anchor diameter are not listed in the current WSDOT Qualified Products List, the Contractor shall also submit item 3 below to the Engineer.

1 The resin manufacturer's written installation procedure for the anchors.

2. The manufacturer's certificate of compliance for the threaded anchor rod certifying that the anchor rod meets these requirements.

3. Test results by an independent laboratory certifying that the threaded anchor rod system meets the ultimate anchor tensile load capacity specified in the above table. The tests shall be performed in accordance with ASTM E 488.

4. For threaded anchors intended to be installed in submerged liquid environments the Contractor shall submit tests performed by an independent laboratory within the past 24 months which certifies that anchors installed in a submerged environment meet the strength requirements specified in the above table.

Bridge Supported Utilities

Hanger rods, and associated nuts and washers, shall conform to Section 9-06.5(1), and shall be galvanized in accordance with ASTM F2329.

Steel bars and plates shall conform to ASTM A 36 and shall be galvanized in accordance with AASHTO M 111.

Construction Requirements

Reinforcement

Placing and Fastening

Section 6-02.3(24)C is supplemented with the following:

Drilling Holes for, and Setting, Steel Reinforcing Bar Dowels
Where called for in the Plans, holes shall be drilled into existing concrete to the size and dimension shown in the Plans. The Contractor may use any method for drilling the holes provided the method selected does not damage the concrete and the steel reinforcing bar that is to remain. Core drilling will be required when specifically noted in the Plans.

The Contractor shall exercise care in locating and drilling the holes to avoid damage to existing steel reinforcing bars and concrete. Location of the holes may be shifted slightly with the acceptance of the Engineer in order to avoid damaging the existing steel reinforcing bars. All damage caused by the Contractor's operations shall be repaired by the Contractor in accordance with Section 1-07.13.

Steel reinforcing bars shall be set into the holes noted in the Plans with epoxy resin. The holes shall be cleaned before placing the resin.

The Contractor shall demonstrate, to the satisfaction of the Engineer, that the method used for setting the steel reinforcing bars completely fills the void between the steel reinforcing bar and the concrete with epoxy resin. Dams shall be placed at the front of the holes to confine the epoxy and shall not be removed until the epoxy has cured in the hole.

Bridge Supported Utilities

Section 6-02.3 is supplemented with the following:

The Contractor shall furnish and install the bridge utility supports, and the utility pipe or conduit pipe, as shown in the Plans.

The Utility Company will furnish material for and install *** $$1$$ ***. The Contractor shall install *** $$2$$ *** furnished by the *** $$3$$ ***.

The Contractor shall notify the utility company a sufficient time in advance and shall cooperate with the utility company in order that the utility furnished items may be installed in the structure.

Bridge Approach Slab Orientation and Anchors

Section 6-02.3(10)F is supplemented with the following:

The pavement end of the bridge approach slab shall be constructed parallel to the pavement seat.

Placing Anchor Bolts

Section 6-02.3(18) is supplemented with the following:

Resin Bonded Anchors

The embedment depth of the anchors shall be as specified in the Plans. If the embedment depth of the anchor is not specified in the Plans then the embedment depth shall be as specified in the table of minimum and maximum torque below.

The anchors shall be installed in accordance with the resin manufacturer's written procedure.

Holes shall be drilled as specified in the Plans. Holes may be drilled with a rotary hammer drill when core drilling is not specified in the Plans. If holes are core drilled, the sides of the holes shall be roughened with a rotary hammer drill after core drilling.

Holes shall be prepared in accordance with the resin manufacturer's recommendations and shall meet the minimum requirements as specified herein. Holes drilled into concrete shall be thoroughly cleaned of debris, dust, and laitance prior to installing the threaded rod and resin bonding material. Holes shall not have any standing liquid at the time of installation of the threaded anchor rod.

The anchor nuts shall be tightened to the following torques when the embedment equals or exceeds the minimum embedment specified.

Anchor Diameter (inch)	Minimum Torque (ft-lbs)	Maximum Torque (ft-lbs)	Minimum Embedment (Inch)
3/8	12	18	3-3/8
1/2	22	35	4-1/2
5/8	55	80	5-5/8
3/4	106	140	6-3/4
7/8	165	190	7-7/8
1	195	225	9
1-1/4	370	525	11-1/4

When the anchor embedment depth is less than the minimum values specified, the anchor nuts shall be tightened to the torque values specified in the Plans, or as recommended by the resin bonded anchor system manufacturer and approved by the Engineer.

6-02.3(24) Reinforcement

6-02.3(24)C Placing and Fastening

Section 6-02.3(24)C is supplemented with the following:

Drilling Holes for, and Setting, Steel Reinforcing Bar Dowels
Where called for in the Plans, holes shall be drilled into existing concrete to the size and dimension shown in the Plans. The Contractor may use any method for drilling the holes provided the method selected does not damage the concrete and the steel reinforcing bar that is to remain. Core drilling will be required when specifically noted in the Plans.

The Contractor shall exercise care in locating and drilling the holes to avoid damage to existing steel reinforcing bars and concrete. Location of the holes may be shifted slightly with the acceptance of the Engineer in order to avoid damaging the existing steel reinforcing bars. All damage caused by the Contractor's operations shall be repaired by the Contractor in accordance with Section 1-07.13.

Steel reinforcing bars shall be set into the holes noted in the Plans with epoxy resin. The holes shall be cleaned before placing the resin.

The Contractor shall demonstrate, to the satisfaction of the Engineer, that the method used for setting the steel reinforcing bars completely fills the void between the steel reinforcing bar and the concrete with epoxy resin. Dams shall be placed at the front of the holes to confine the epoxy and shall not be removed until the epoxy has cured in the hole.

Measurement

Section 6-02.4 is supplemented with the following:

*** $$1$$ *** contains the following approximate quantities of materials and work:

*** $$2$$ ***

The quantities are listed only for the convenience of the Contractor in determining the volume of work involved and are not guaranteed to be accurate. The prospective bidders shall verify these quantities before submitting a bid. No adjustments other than for accepted changes will be made in the lump sum Contract price for *** $$3$$ *** even though the actual quantities required may deviate from those listed.

Payment

Section 6-02.5 is supplemented with the following:

Bridge Supported Utilities

All costs in connection with placing *** $$1$$ *** through the superstructure of *** $$2$$ *** as shown in the Plans, including all *** $$3$$ ***, shall be included in the *** $$4$$. ***

No additional compensation will be made by reason of any delay or other expense to the Contractor caused by coordination with the utility company or by installing utility company furnished items. However, any unavoidable delays to the Contractor caused by coordination with the utility company or resulting from installing utility company furnished items will be adjusted in accordance with Section 1-08.8.

Piling

Construction Requirements

Manufacture of Steel Piles

Section 6-05.3(5) is supplemented with the following:

Furnishing St. Piling

Welding for steel pipe piling shall conform to AWS D1.1/D1.1M, latest edition, Structural Welding Code, and Section 6-03.3(25), except that all weld filler metal shall be low hydrogen material selected from Table 4.1 in AASHTO/AWS D1.5M/D1.5:2020 Bridge Welding Code.

Welding and joint geometry for the seam, whether it be longitudinal or helical, shall be qualified in accordance with Clause 4, Qualification, of the AWS D1.1/D1.1M, latest edition, Structural Welding Code. In addition, charpy V-notch (CVN) testing in accordance with Clause 4, Part D, of the AWS D1.1/D1.1M, latest edition, Structural Welding Code, shall be performed. CVN testing shall include five tests at 0°F. The acceptance threshold for the five samples shall meet an average value of 20-foot-pounds CVN for the set of test coupons and a minimum value of 15-foot-pounds CVN for any individual test coupon. The Contractor may submit documentation of prior qualification to the Engineer to satisfy this requirement.

Dimensional tolerances shall conform to the material specification that the steel pipe piling is manufactured under, and, at a minimum, the following requirements:

1. Out-of-roundness shall be within 1-percent of the nominal outside diameter.

2. Deviation from a straight line, parallel to the centerline of the pile, shall not exceed 0.001 times the length of the pile.

3. The maximum radial offset of the strip/plate edges shall be 1/8-inch. The offset shall be transitioned with a taper weld and the slope shall not be less than a 1 in 2.5 taper.

4. The bead height of weld reinforcement shall not exceed 3/16-inch.

5. Misalignment of weld beads for double-sided welded pipe shall not exceed 1/8-inch.

6. The wall thickness shall not be less than 95-percent or greater than 110-percent of the specified nominal thickness.

All seams and skelp splices shall be complete penetration welds. Skelp splices in spiral welded (helical seam) pipe shall not be located within 12 inches of a girth shop or field weld.

All skelp splices shall be 100 percent radiographically or ultrasonically inspected in accordance with either API 5L Annex E Section E.4 or E.5, or Table 6.2 and Clause 6 Part E, F or G in AWS D1.1/D1.1M, latest edition, Structural Welding Code. Additionally, 10-percent of the total length of seam welds for both longitudinal and helical welded pipe, and one pipe diameter length of seam centered on any skelp splice intersection, shall be randomly inspected as specified above. If repairs are required in more than 10-percent of the welds examined, additional inspection shall be performed. The additional inspection shall be made on both sides of the repair for a length equal to 10-percent of the length of the pipe outside circumference. If repairs are required in more than 10-percent of welds examined in the second sample, 100-percent of the entire seam on the pile shall be inspected.

All seams and splices shall be 100 percent visually inspected in accordance with the acceptance criteria for statically loaded non-tubular connections in Table 6.1 of the AWS D1.1/D1.1M, latest edition, Structural Welding Code. Repairs shall conform to Section 5.26 of the AWS D1.1/D1.1M, latest edition, Structural Welding Code, using approved repair and weld procedures.

Each length of steel pipe pile shall be marked with paint stencil, no closer than six inches to the end of the pipe, with the name of the manufacturer, material specification and grade of pipe, steel heat number, nominal pipe diameter, and wall thickness.

Splicing Steel Casings and Steel Piles

Section 6-05.3(6) is supplemented with the following:

Furnishing St. Piling

Welding for steel pipe piling shall conform to AWS D1.1/D1.1M, latest edition, Structural Welding Code, and Section 6-03.3(25), except that all weld filler metal shall be low hydrogen material selected from Table 4.1 in AASHTO/AWS D1.5M/D1.5:2020 Bridge Welding Code.

Welding and joint geometry for splices shall be qualified in accordance with Clause 4, Qualification, of the AWS D1.1/D1.1M, latest edition, Structural Welding Code. In addition, charpy V-notch (CVN) testing in accordance with Clause 4, Part D, of the AWS D1.1/D1.1M, latest edition, Structural Welding Code, shall be performed. CVN testing shall include five tests at 0°F. The acceptance threshold for the five samples shall meet an average value of 20-foot-pounds CVN for the set of test coupons and a minimum value of 15-foot-pounds CVN for any individual test coupon. The

Contractor may submit documentation of prior qualification to the Engineer to satisfy this requirement.

Ends of steel pipe piling shall be prepared for splicing in accordance with AWS D1.1/D1.1M, latest edition, Structural Welding Code.

All splices shall be complete penetration groove welds using continuous backing rings of 1/4 inch minimum thickness. Tack welds shall be located in the root of the complete penetration groove weld.

Shop splices shall be 100 percent visually and ultrasonically inspected in accordance with the acceptance criteria for statically loaded non-tubular connections in Table 6.1 and the acceptance criteria in Table 6.2 in AWS D1.1/D1.1M, latest edition, Structural Welding Code. Repairs for shop and field splices shall conform to Section 5.26 of AWS D1.1/D1.1M, latest edition, Structural Welding Code, using approved repair and weld procedures.

Field splice welds and welders shall be further qualified, tested and inspected as follows:

1. Welder qualification shall be performed on sample full girth sections of steel pipe pile to be used, in the same position and using the same weld joint as for production pile splicing. At the Contractor's option, these tests may be performed on the test piles during test pile installation.

2. Weld qualification tests shall be conducted in the presence of the Contractor's CWI and a representative of the Contracting Agency.

3. Field welded test joints for welder qualification shall be inspected as specified above for shop splices.

4. Production pile field splices shall be inspected as specified above for shop splices, within the limits designated for UT inspection as shown in the Plans. All welds shall be 100 percent visually inspected. The Engineer and the Contractor's CWI reserve the right to request UT inspection of splices in any pile location.

Quality control for field welding shall be conducted by an AWS Certified Welding Inspector (CWI). The Contractor shall not begin pile splicing operations until receiving the CWI's approval of the joint fit-up. The CWI shall inspect 100 percent of all field welds in accordance with the criteria and requirements specified above. All field splices shall have received the CWI's approval prior to Engineer acceptance.

The CWI shall prepare a Type 1 Working Drawing documenting the results of the nondestructive quality control inspection of all field welds, and shall submit the report to the Engineer within five working days of the completion of the final pile splice in the project or as otherwise requested by the Engineer.

Driving Piles

Achieving Minimum Tip Elevation and Bearing

Section 6-05.3(11)D is supplemented with the following:

The areas where piles are to be driven are adjacent to highly developed areas. It is essential that vibration and noise resulting from pile driving be held to a minimum. Unless otherwise allowed by the Engineer, pile driving shall be done during regular daytime working hours. The Contractor shall select pile driving equipment which will minimize noise and vibration. When, in the opinion of the Engineer, noise or vibration are excessive, the Contractor will be required to use a hammer that does not exceed the minimum specifications by more than 10 percent for the type and capacity of piling being driven. If pre-boring, jetting, or other special methods are not specified elsewhere in the contract and are ordered by the Engineer to reduce noise or vibration, such change in method shall be considered a change, subject to the terms of Section 1-04.4.

6-10 Concrete Barrier

6-10.4 Measurement

The second paragraph of Section 6-10.4 is revised to read:

(******)
Temporary concrete barrier will be measured by the linear foot based on the largest amount required for any particular stage of construction as shown in the plans. No additional measurement will be made from moving, storing, or resetting temporary concrete barrier.

Division 7
Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits

7-04 Storm Sewers

7-04.1 Description

The paragraph is revised to read:

(******)
This Work consists of constructing storm sewer lines and connecting to existing storm sewer lines in accordance with the Plans, these Specifications, and the Standard Plans, as staked.

7-04.3 Construction Requirements

Section 7-04.3 is supplemented with the following:

(******)
The Contractor shall verify invert elevations prior to construction. At a minimum, new storm sewer pipe inverts at new structures shall match invert of existing culvert pipe, unless specified otherwise.

Once Work is started on a connection, it shall proceed continuously without interruption and as rapidly as possible until completed. No shutoff of storm sewer lines or systems will be permitted overnight, weekends, or holidays. The existing storm structure shall be kept in operation at all times and the necessary precautions shall be taken to prevent debris or other material from entering the sewer, including a tight pipeline bypass through the existing channel if required. Water used for flushing shall not be allowed to enter the sewer.

Contractor shall determine appropriate connection and appurtenances for required connections where called for in plans.

Prior to backfilling procedures, the Contractor shall acquire approval from the Engineer for the connection.

All damage to the existing storm structure resulting from the Contractor's operation shall be repaired at no expense to the Contracting Agency.

For connections by any other method, the Contractor shall furnish a detailed sketch for approval not less than 2 weeks prior to the expected construction.

(******)
Pipe connections to manholes shall be made with an approved expansion type rubber boot, Kor-N-Seal or approved equal for all pipes.

Where existing pipes connect to new structures, existing pipe shall be trimmed as necessary to make a good connection.

7-04.4 Measurement

The first sentence of Section 7-04.4 is revised to read:

(******)
The length of storm sewer pipe will be the number of linear feet of completed installation measured along the invert and will include the length through elbows, tees, and fittings. The number of linear feet will be measured from the center of manhole to center of manhole or to the inside face of catch basins and similar type Structures. Pipe placed in excess of the length designated by the Engineer will not be measured or paid for.

Section 7-04.4 is supplemented with the following:

(******)
Connections to existing storm pipe will be measured per each. At connections with new structures, each entrance or exit of the existing pipe to the structure will be counted as one connection. For example, a saddle manhole over an existing storm pipe will be counted as two connections if called on Plans.

7-04.5 Payment

The sentence beginning with " The unit Contract price..." in Section 7-04.5 is revised to read:

(******)
The unit Contract price per linear foot for storm sewer pipe of the kind and size specified shall be full pay for all work to complete the installation, including adjustment of inverts to manholes, saw-cutting, trench excavation, pipe bedding, pipe zone and trench backfill, testing, and trench patching as required.

Section 7-04.5 is supplement with the following:

(******)
“Ductile Iron Storm Sewer Pipe ___ In. Diam.”, per linear foot.
“Connection to Existing Storm Pipe”, per each.

The unit Contract price per each for “Connection to Existing Storm Pipe” shall be full pay for all work involved in connecting existing storm sewer pipes to new structures. The costs of connect to existing storm pipe shall not be considered as incidental to any other Contract item.

7-05 Manholes, Inlets, Catch Basins, And Drywells

7-05.1 Description

Section 7-05.1 is supplemented with the following:

(******)
This Work includes construction with materials for various frames and/or grates. These items shall be constructed in accordance with the Plans, the Standard Specifications, and these Special Provisions. Work shall include constructing structures of the type and size

designated in accordance with the Plans, this specification, and in conformity with the lines and grades staked.

7-05.2 Materials

Section 7-05.2 is supplemented with the following:

(******)
Materials for ditch inlets shall conform to the details in the Plans.

(******)
Materials for frames and/or grates shall conform to the details in the Plans.

(******)
PVC basins shall be manufactured from PVC pipe stock conforming to the requirements of ASTM D1784, cell classification 12454. Joints shall conform to ASTM D3212 utilizing flexible elastomeric seals conforming to ASTM F477

Ductile Iron Castings for PVC basins shall conform to the requirements of ASTM A 536, Grade 70-50-05 and shall be capable of supporting an H-20 load rating.

7-05.2(9-05.15(2)) Profile Wall PVC Culvert Pipe, Profile Wall PVC Storm Sewer Pipe, and Profile Wall PVC Sanitary Sewer Pipe

Section 9-05.15(2) is supplemented with the following:

(******)
Slip Resistant Lid shall meet ASTM A36 steel.

The slip-resistant lid shall be treated with Mebac #1 as manufactured by IKG Industries, or SlipNOT Grade 3-coarse as manufactured by W.S. Molnar Co. The slip-resistant lid shall be identified with the permanent marking on the underside indicating the type of surface treatment (“M1” for Mebac#1, or “S3” for SlipNOT Grade 3-coarse) and the year manufactured. The permanent marking shall be 1⁄8-inch line thickness formed with a mild steel weld bead. Slip-resistant lids shall be galvanized after fabrication in accordance with AASHTO M 111.

7-05.3 Construction Requirements

Section 7-05.3 is supplemented with the following:

(******)
Removal and Replacement of Unsuitable Materials
Whenever excavating trenches for storm sewers and the bottom of the trench exposes peat, soft clay, quicksand, or other unsuitable foundation material, such material shall be removed to the depth directed by the Engineer and backfilled with foundation material. When determined by the Engineer that silty soils or fine sandy soils are encountered, Class C foundation material shall be required. Silty soils or fine sandy soils usually flow in the presence of a stream of water. When determined by the Engineer that clay, peat, or other soft materials are encountered that become saturated with water, but do not break down into fine particles and flow, Class A or Class B foundation material shall be required.

Material removed from the trench that is unsuitable for trench backfill shall be removed and shall be loaded directly into trucks and hauled to a waste site obtained by the Contractor. If material is not available within the limits of the project for backfilling the trench, the Contractor shall furnish trench backfill meeting the requirements of Section 9-03.12(3) or 9-03.19 of the Standard Specifications as required. Unsuitable material Stockpiling of unsuitable material at the project site shall not be allowed.

(******)
Connections to the drain basin inlet/outlet connectors shall be made with manufacturer provided water-tight gasket as specified.

The drain basin body shall be cut at the time of the final grade so as to maintain a one piece, leak proof structure. When grade increase adjustments are required, adjustments shall be made with manufacturer supplied riser sections with socket bell solvent cemented to inlet structure and then cut to final grade.

(******)
Pipe connections to manholes shall be made with an approved expansion type rubber boot, Kor-N-Seal or approved equal for all pipes.

7-05.3(1) Adjusting Manholes and Catch Basins to Grade

Section 7-05.3(1) is supplemented with the following:

(******)
The top of existing manholes, drywells, and catch basins within the paved area, shall be adjusted by the following methods to the required elevation. The Contractor shall obtain the Engineer's approval as to the method of adjustment:

Method 1. Adding or removing grade rings and/or chipping up to 4 inches off the cone; or

Method 2. Replacing cones with a flat top and adjustment rings or replacing manhole sections with longer or shorter sections and final adjustment of the rim.

7-05.4 Measurement

Section 7-05.4 is supplemented with the following:

(******)
Combination Curb Inlet and Catch Basin Type 1 of any type called for in the Plans will be measured per each. Where dual combination curb inlets and dual catch basins are called for in Plans, each structure will be measured as two "Combination Curb Inlet" or "Catch Basin Type 1" structures respectively.

Ditch inlets will be measured per each.

There will be no additional measurement for manholes regardless of depth from rim to invert of lowest pipe.

Removal and replacement of unsuitable material will be measured by the cubic yard. The depth shall be the actual depth removed below the depth specified in Section 7-05.3 and Section 7-08.4 of the Special Provisions. The width shall be the actual width removed, but in no case shall the measured width exceed the allowable widths specified.

Grates and/or frames where called out in Plans will be included with the associated item called to be used with in Plans.

Pipe connections to proposed manholes shall be considered incidental and no measurement will be made.

Structure excavation and shoring for manholes and catch basins will be considered incidental and no measurement will be made.

Biofiltration sediment traps will be measured per each.

"Adjust Manhole/ Catch Basin/ Inlet - Method __" shall be measured per each and include all work and material to construct the completed adjustment, including any asphalt restoration work.

PVC basins will be measured per each, including frame and grate as determined in the Plans.

7-05.5 Payment

Section 7-05.5 is supplemented with the following:

(******)
"Adjust Manhole/ Catch Basin/ Inlet - Method __", per each.
"Biofiltration Sediment Trap", per each.
"Catch Basin Type 2 ___ In. Diam. With Flow Restrictor", per each.
"Ditch Inlet", per each.
"PVC Basin ____ In. Diam. With ____", per each.

All costs associated with furnishing and installing gravel backfill for bedding flow control manholes shall be included in the unit Contract Price for the item installed. All costs associated with structure excavation, dewatering, furnishing and installing gravel backfill for bedding, and compaction shall be included in the unit Contract price for the item installed.

All costs associated with exchanging frames and grates on manholes where noted in the Plans shall be included in the unit Contract price for the specified item.

7-06 Vacant

Section 7-06 is revised to read:

(******)

7-06 Temporary Stream Diversion

7-06.1 Description

This work shall consist of installation, maintenance, and removal of the temporary stream diversion system as required during construction to safely bypass stream flows around the in-water work areas. This work shall also include fish removal from the isolated area and installation and maintenance of temporary fish screens, sediment mat, and filter bags.

7-06.2 Materials

Materials shall meet the requirements of the following sections:

Plastic Covering	9-14.6(3)

Gravel Bags
Gravel bags shall be 17" x 27" Polypropylene bags filled with washed pea gravel or as directed by the Engineer.

Fish Screens
Material for fish screens shall be 6-14 or 6-16 (six squares per inch, 14 or 16 gauge) woven wire mesh.

7-06.3 Construction Requirements

7-06.3(1) Temporary Stream Diversion

The Contractor shall provide, install, and maintain the temporary stream bypass system as shown on the plans to ensure that all stream and stormwater flows bypass the construction site area safely without damage to surrounding property or downstream systems and to ensure that the work area is free from standing water or other saturated condition that impedes or interrupts the work.

Sediment must not be conveyed downstream during the construction period. The bypass system and any dewatering measures required must be in operation prior to any work done within the stream channel. The bypass pipe shall outlet to a sediment mat to avoid erosion of the streambed. The Contractor shall be responsible for removal of the temporary stream bypass system upon project completion.
The Contractor may submit an alternative bypass for approval by the Engineer.

Standard Operating Procedures
The stream bypass system is sized to pass base flows through the average annual flood. This size is provided for the Contractor's convenience. It is the Contractor's responsibility to verify all pipes and pumps, where applicable, are appropriately sized to ensure the stream flows will be sufficiently bypassed. The Contractor shall maintain base flows in the downstream reach at all times. If the Contractor finds that the bypass pipe or pump(s) is undersized, the Contractor shall notify the Engineer immediately. The Contractor shall monitor the weather reports and if precipitation in excess of the capacity of the bypass system is forecasted within 24 hours, the Contractor shall initiate the Emergency Operating Procedures described below.

Any pumps that are used as part of the standard operation shall be continuously monitored at night and during non-working hours.

Fish Removal

The Contractor shall provide for and coordinate with an experienced local fisheries Biologist for fish removal of the stream reach being isolated by the temporary stream bypass system. The fisheries Biologist, in accordance with any permits, shall perform the following tasks:

1. Fish shall be removed from the stream reach to be diverted by first installing fish screens upstream and downstream of the in-water work area. The fish screens shall remain in place for the duration of the construction activities. Once the fish screens are in place, a beach seine net should be dragged downstream while guiding all fish to the downstream net and collecting the fish at this end.

2. During dewatering of the reach, fish stranded in remaining pools shall be removed with dip nets and, if necessary, by conducting four-pass electrofishing. If Chinook are found during the fish removal activities, electrofishing should cease immediately. Electrofishing must be conducted according to the NMFS (2000) Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act.

3. Upon removal, fish should be transported in clean buckets half-filled with stream water and immediately reintroduced into the stream downstream of the project site. Fish transportation equipment should be ready and on the job site in advance.

The temporary stream bypass system shall be relocated as required to allow installation of the culvert, grading of the stream channel, to vegetate disturbed areas, and for landscape installation and restoration. See the construction drawings for recommended stream bypass alignment.

Temporary Stream Diversion Coffer Dam

The temporary stream bypass berm shall consist of gravel bags and plastic sheeting and be constructed so that the initial row of gravel bags are keyed into the ground and makes tight contact with the ground for the length of the berm. Sandbags shall be placed to ensure there are no gaps. Ecology blocks may be used with the approval of the Engineer. Clear plastic covering shall be placed under the keyed-in gravel bags and cover the entire upstream face of the gravel bag berm.

Emergency Procedures

The Contractor shall provide pumps, generators, hoses, and personnel as backup to the bypass piping in the event the piping becomes non-operational and cannot adequately bypass flows around the project site. Pumps shall be continuously monitored at night and during non-working hours in the event of a power failure.

Emergency bypass pump intake shall be screened in order to protect juvenile fish. The area of the screen shall be a minimum of seven (7) square feet and be fully submerged.

Screen types shall be of the following:

Perforated Plate
0.0938 inch maximum opening diameter or maximum slot width.

Profile Bar
0.069 inch maximum width opening.

Woven Wire
0.087 inch maximum in the narrowest direction.

The Contractor shall inspect and remove any debris accumulated on the face of the screen.

Modifications to Temporary Stream Bypass Plan
The Contractor may submit modifications to the temporary stream bypass plan to the Engineer for approval prior to starting construction. The plan must include all elements for isolating the stream banks during in-channel grading and excavation. The modified temporary stream bypass plan must be prepared and stamped by a licensed engineer.

7-06.5 Payment

"Temporary Stream Diversion", lump sum.
The lump sum bid item "Temporary Stream Diversion" shall include all materials, tools, labor and equipment necessary to install, maintain, and remove the temporary stream diversion within the designated fish window period as shown conceptually in the site preparation plans. Items included in "Temporary Stream Diversion" include approved pumping and piping systems, coffer dams, filter bags, fish screens, removal and implementation of any erosion control measures needed to safely bypass surface flows around the project site, monitoring, and other incidental work. The development of the stream diversion and removal of the stream diversion items are considered incidental.

"Fish Exclusion", lump sum.
The lump sum bid item "Fish Exclusion" shall include all materials, tools, labor and equipment necessary for fish isolation (including costs for Fisheries Biologist(s) needed for fish removal) during the designated fish window period. Items include coffer dams, fish screens, monitoring, and other incidental work.

7-08 General Pipe Installation Requirements

7-08.2 Materials

Section 7-08.2 is supplemented with the following:

(******)
Foundation material, if required to be installed by Engineer due to unsuitable native materials being encountered at the bottom of the trench, shall be Class C as defined in Section 9-03.18 of the Standard Specifications.

Pipe zone material shall be comprised of pipe zone bedding as defined by Section 9-03.12(3) of the Standard Specifications. Backfill shall be as indicated on the City of La Center Standard details for trench backfill.

7-08.3 Construction Requirements

7-08.3(1) Excavation and Preparation of Trench

7-08.3(1)A Trenches

The sixth paragraph of Section 7-08.3(1)A is revised to read:

(******)

When, after excavating to the foundation level, the material remaining in the trench bottom is determined to be unsuitable by the Engineer, excavation shall be continued to such additional depth and width as required by the Engineer. Unsuitable foundation materials shall be disposed of at an approved site. The trench foundation shall be backfilled to the bottom of the pipe zone with foundation material Class C meeting the requirements of Section 9-03.18 of the Standard Specifications, and compacted to form a uniformly dense, unyielding foundation.

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

(******)

Where water is encountered in the trench, it shall be removed during pipe-laying operations and the trench maintained until the ends of the pipe are sealed and provisions are made to prevent floating of the pipe. Trench water or other deleterious materials shall not be allowed to enter the pipe at any time.

The Contractor shall keep the groundwater elevation below all stormwater facility construction and grading activities by dewatering.

(******)

Control of Water in Excavations

Provide ample equipment and labor to promptly remove and dispose of all water entering the trench and control surface runoff to prevent entry of water into the excavation.

Dewatering

Dewatering may be required and is incidental to the unit cost per linear foot of pipe or excavation unless otherwise meeting requirements for “Trench Dewatering Over 250 GPM” in these Special Provisions. The amount and location of high ground water conditions varies and cannot be predicted for this Project.

Trench water may be screened using as a minimum a double layer of standard steel or aluminum window screening and allowed to drain into the sewer and meet NPDES requirements for storm discharges. Screening shall be secured during pipe laying operations to the pipe bell and also to the nearest manhole outlet, as approved by the Engineer.

The Contractor shall clean the screens and the downstream sewer system when necessary or when directed to do so by the Engineer. Costs associated with trench dewatering by means of disposal to the downstream sewer shall be considered incidental to the Work, and no extra payment shall be made except as allowed for below.

The volume of ground water allowed to enter the sewer shall not exceed a flow depth of two inches in the pipe. All ground water in excess of this amount shall be removed from the trench by pumping. The Contractor shall obtain permits and/or disposal plans necessary for the disposal of wastewater.

All costs for piping water to the sewer and pumping of up to 250 GPM shall be considered incidental to the work.

If conditions are such that additional pumps are required to remove water beyond 250 GPM, the Contractor shall use the number and size of additional pumps, as required, to maintain a water-free trench. Payment for "Trench Dewatering over 250 GPM" for water removal in excess of 250 GPM shall be made in accordance with Section 1-04.7 of the Standard Specifications.

The Contractor is responsible for the suitable discharge of trench water. The size and number of pumps, and the length of open trench, shall be arranged and employed to dewater the trench in an efficient manner.

If ground water seepage is so rapid that direct trench pumping erodes the stability of trench walls, then the Contractor shall implement an alternative method of dewatering. Such method may include, but not be limited to, well-point construction. Contractor shall seek the approval of the Engineer before implementing an alternate method.

7-08.3(1)B Shoring

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

(******)
"Trench Safety System" will include all work as necessary to provide a safe and stable trench for pipeline installations. The Contractor will be paid for those sections of trench that are actually mechanically shored, or over-excavated specifically for the sole purpose of providing a safe working environment for workers. Minimum Bid for this item is $1/linear foot. Provisions of Section 1-04.6 of the Standard Specifications shall not apply in the event of any under-run of that quantity.

7-08.3(1)C Bedding the Pipe

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

(******)
Pipe zone material shall be comprised of pipe zone bedding as defined by Section 9-03.12(3) of the Standard Specifications. Pipe zone bedding shall be placed to the depths shown in the Plans. Pipe zone bedding shall be rammed and tamped around the pipe to 95-percent of maximum density by approved hand-held tools, so as to provide firm and uniform support for the full length of the pipe. Care shall be taken to prevent any damage to the pipe.

7-08.4 Measurement

Delete the first paragraph of section 7-08.4 and replace with the following:

(******)
Each bid item for the various pipe items included in this project shall include saw-cutting, excavation, CSTC bedding, pipe, mechanical joint restraints, mega-lugs, flanged fittings, other pipe fittings, CSTC backfill, compaction, testing, and other items as required for a

completed installation and as indicated in the plans and these specifications. Excavation and backfill shall be included in the cost per linear foot of pipe. When excavation below grade is necessary, excavation and backfilling of unsuitable material will be measured under “Removal and Replacement of Unsuitable Material”.

Delete the fourth paragraph of section 7-08.4 and replace with the following:

(******)
Each bid item for the various pipe items included in this project shall include saw-cutting, excavation, CSTC bedding, pipe, CSTC backfill, compaction, testing, and other items as required for a completed installation and as indicated in the plans and these specifications. Measurement and payment for excavation and imported CSBC backfill shall be included in the cost per linear foot of pipe. When excavation below grade is necessary, excavation and backfilling of unsuitable material will be measured under “Removal and Replacement of Unsuitable Material”.

No specific unit of measurement will apply to the item of dewatering when the rate required is less than or equal to 250 GPM.

Trenches requiring dewatering at a rate greater than 250 GPM will be addressed through force account as described in Section 7-08.5.

7-08.5 Payment

Section 7-08.5 is supplemented with the following:

(******)
“Removal and Replacement of Unsuitable Material”, per cubic yard.
The unit Contract price per cubic yard for "Removal and Replacement of Unsuitable Material" shall be full pay for all labor, equipment and materials necessary to excavate unsuitable material from the bottom of the pipe trench, haul-off and disposal, and supply, place, and compact imported CSBC material, as directed by the Engineer.

“Trench Safety System", per linear foot.
The unit Contract price per linear foot for “Trench Safety System” shall be full pay for all work involved.

“Dewatering”
Dewatering will be paid for by Force Account, when meeting the conditions described below and as authorized by the Engineer.

Dewatering is incidental to the various pipeline items, manholes, catch basins, walls, vaults, and similar items, unless the dewatering effort requires a system to be installed that is capable of transporting and disposal of more than 250 GPM, as determined by the Engineer. Work for dewatering shall be included in unit Contract price of the items or work being affected by ground water unless meeting requirements of Section 7-08.3. Items may include but not limited to “Roadway Excavation Incl. Haul”, and all Project items called for in Division 7 of the Standard Specifications.

7-14 Hydrants

7-14.1 Description

The first sentence of Section 7-14.1 is supplemented with the following:

(******)

The use of the terms "Fire Hydrant" and "Hydrant Assembly" will be used interchangeably throughout the Standard Specifications.

7-14.4 Measurement

The first sentence of Section 7-14.4 is revised to read:

(******)

Measurement of adjusting existing hydrants will be made per each.

7-14.5 Payment

Section 7-14.5 is supplemented with the following:

(******)

“Adjusting Existing Hydrant”, per each.

The unit Contract price per each for “Adjusting Existing Hydrant” shall be full pay for all Work to remove reset the existing fire hydrant assembly to the revised finished grade height, including all costs for pipe, shackles, tie rods, concrete blocks, gravel, and concrete pads for the complete installation of the hydrant assembly as specified and shown in the plans. Work shall additionally include full compensation for all labor, materials, equipment and tools necessary testing, disinfecting the pipeline, flushing dechlorination of water used for flushing, and clean up.

7-15 Service Connections

7-15.1 Description

Section 7-15.1 is supplemented with the following:

(******)

This work shall consist of adjusting water meter and box.

7-15.3 Construction Requirements

Section 7-15.3 paragraph 4 is supplemented with the following:

(******)

Water service interruptions shall only take place between the hours 10:00 P.M. and 4:00 A.M. unless otherwise approved by the property owners. Water service interruptions shall not be longer than 4 hours.

Section 7-15.3 is supplemented with the following:

(******)

Water meters and associated boxes shall be adjusted to finished grade as noted in the Plans. Care shall be taken to not damage the water meter or box. Water meter and box damaged, due to the Contractor’s operations, shall be repaired or replaced by the

Contractor at no additional cost to the Contracting Agency and to the satisfaction of the Engineer.

7-15.4 Measurement

Section 7-12.4 is supplemented with the following:

(******)
Adjust Water Meter and Box will be measured per each.

7-15.5 Payment

Section 7-12.5 is supplemented with the following:

(******)
"Adjust Water Meter and Box", per each.
The unit Contract price per each shall be full pay for all labor, equipment and materials required to move and/or adjust the meter and meter box to finished grade.

Add the following new section:

(******)

Compost Amended Biofiltration Swale

7-20.1 Description

This work consists of furnishing, installing, and maintaining Compost Amended Biofiltration Swale following the Plans.

7-20.2 Materials

Topsoil shall meet the requirements of 9-14.1 and these Special Provisions.

Compost shall be Fine Compost and meet the requirements of 9-14.4(8).

The composition of the amended topsoil shall be as follows:

80 % Topsoil Type A
20 % Fine Compost

7-20.3 Construction Requirements

Prepare swale following the Plans and these Special Provisions. Care shall be taken to construct the swale so the bottom of the swale, perpendicular to the length, is flat and the longitudinal slope conforms to the Plans and is never less than 0.5%.

Install and construct biofiltration sediment trap, pedestrian curb for flow spreading, placement of amended topsoil as shown in the Plans. A three (3) inch depth of Fine Compost shall be applied over amended topsoil.

Seeding preparation shall follow Section 8-01.3(2)A.

7-20.4 Measurement

There will be no unit of measure for “Stormwater Facility A Construction”, also referred to as the Compost Amended Biofiltration Swale.

If excavation of unsuitable material below staked grades is required for foundation stabilization, it shall be measured by the cubic yard from the original staked grade to the actual depth of excavation and paid as "Unsuitable Foundation Excavation Incl. Haul” per Section 2-03.3(14)E. Material removed shall be replaced to match proposed grades and paid as “Select Borrow including Haul” per Section 2-03.3(14)K.

Biofiltration Sediment Trap shall be measured in accordance with Section 7-05.4 and payment in accordance with Section 7-05.5.

7-20.5 Payment

Payment will be made in accordance with Section 1-04.1(1) for the following bid item:

“Stormwater Facility A Construction“, per lump sum.

The lump sum Contract price for “Stormwater Facility A Construction” shall be full pay for all Work to complete as specified, including the following:

Dewatering, grading, embankment, compaction, disposal of excess material, mixing of amended topsoil and compost application and all work to remove accumulated sediment including haul and disposal of material.

Add the following new section:

Sanitary Sewer Bypass

Install temporary Sanitary Sewer Bypass following the contract plans and these special provisions. Sanitary Sewer Bypass to provide temporary routing of sanitary sewer utility attached to temporary retaining wall for continuity of utility service during construction.

Measurement
“Sanitary Sewer Bypass” will be measured by Lineal Feet of pipe from permanent or existing sanitary sewer connections.

Payment
“Sanitary Sewer Bypass” per lineal foot, shall be full pay for the work described in this section including pipe plumbing and installation, pipe material including fittings and attachments, and expansion joints.

Water Main Bypass

Install temporary Water Main Bypass following the contract plans and these special provisions. Water Main Bypass to provide temporary routing of sanitary sewer utility attached to temporary retaining wall for continuity of utility service during construction.

Measurement

"Water Main Bypass" will be measured by Lineal Feet of pipe from permanent or existing water main connections.

Payment

"Water Main Bypass" per lineal foot, shall be full pay for the work described in this section including pipe plumbing and installation, pipe material including fittings and attachments, and expansion joints.

Division 8
Miscellaneous Construction

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 be responsible for all Work required for compliance with the Construction Stormwater General Permit (CSWGP) including annual permit fees. Prior to breaking ground, coverage of the CSWGP (see Section 1-07.6 of the Special Provisions) shall be made from the City of La Center to the Contractor.

8-01.3(7) Stabilized Construction Entrance

The second paragraph of Section 8-01.3(7) is revised as follows:

(******)
When the stabilized entrance no longer prevents track out of sediment or debris, the Contractor shall either rehabilitate the existing entrance to original condition, or construct a new entrance, at no additional cost to the Contracting Agency.

8-01.3(8) Street Cleaning

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

(******)
The Contractor shall prevent the transport of soil, wood waste, or other debris onto the paved street surface. If during the course of construction, debris accumulates to the extent that street cleaning is required, the Contractor shall use a self-propelled street sweeper approved for use by the Engineer.

8-01.4 Measurement

Section 8-01.5 is supplemented with the following:

(******)
Street cleaning will be measured by the hour for the actual time spent cleaning pavement, as authorized by the Engineer. During the wet season (October 1 to April 30, a maximum of 1 hour per day will be allowed for street cleaning, and only upon prior authorization by the Engineer. During the dry season (June 1 to September 30) a maximum of 5 hours per week will be allowed for street cleaning. Time required to clean the street in excess of these time allotments will not be measured or paid for and shall be at the Contractor's expense.

No additional measurement will be made for maintaining each construction entrance, including additional rock required to maintain functionality, and removing the construction entrance once it is no longer required and restoring the ground to original condition.

8-01.5 Payment

Section 8-01.5 is supplemented with the following:

(******)
No separate payment will be made for maintenance and removal of erosion and water pollution control devices, including removal and disposal of sediment, removal of silt fence, high visibility fence, inlet protection, construction entrances, or the stabilization and rehabilitation of soil disturbed by these activities. Removal of erosion control devices shall be at the completion of the project, or as directed by the Engineer. The cost of these activities shall be included in other items of work.

8-02 Roadside Restoration

8-02.2 Measurement

Section 8-02.2 is supplemented with the following:

8-02.2(9-14.2) Topsoil

8-02.2(9-14.2(2)) Topsoil Type B

Section 9-14.2(2) is deleted and replaced with the following:

(******)
Topsoil Type B shall be native topsoil up to 2 foot in depth taken from within the existing vegetation areas within project limits. No roadway subgrade, or previous impervious areas subgrade shall become part of Topsoil Type B.

In the production of Topsoil Type B, all vegetative matter, less than 1 feet in height, shall become a part of the topsoil. Asphalt or other construction debris, aggregate, bark or wood chip mulch, vegetation matter greater than 1-foot, live weeds (blackberries, reed canary grass, other undesirable vegetation) as determined by the Engineer, or rocks greater than 2-inch in diameter will not be allowed as part of any Topsoil type B placed.

8-02.2(9-14.2(3)) Topsoil Type C

Section 9-14.2(3) is supplemented with the following:

(******)
Topsoil Type C source and material shall be approved by the Engineer. The Contractor shall provide the location of source to the Engineer for inspection prior to approval and haul.

Topsoil Type C shall not be produced from any mapped hydric soil unit listed in the National Hydric Soil List published by the National Resource Conservation Service as updated.

Asphalt or other construction debris, aggregates, bark or wood chip mulch, clearing and grubbing debris, live weeds, sod or other undesirable vegetation as determined by the Engineer, or rocks greater than 2-inch in diameter will not be allowed as part of any topsoil placed. Rocks shall not comprise more than 10% by volume of Topsoil Type C.

The Contractor shall provide certified test results from an independent, accredited laboratory approved by the Engineer, and dated within 6 months prior to proposed application showing the following physical criteria:

1. Topsoil Type C shall have a particle size distribution of less than 70% Sand, less than 20% Clay, and less than 40% Silt less as documented with a Particle Size Analysis by a laboratory accredited to perform AASHTO T 88 “Particle Size Analysis of Soils”.

2. Organic matter content greater than 5% but less than 15% as measured on a dry weight basis as documented by a laboratory accredited to perform AASHTO T 267 “Determination of Organic Content in Soils by Loss on Ignition”.

3. pH shall be between 6.0 and 7.5 as documented by a laboratory accredited to perform AASHTO T289 “Standard Method of Test for Determining pH of Soil.”

4. Cation Exchange Capacity shall be between 5 and 15 as documented by a laboratory accredited to perform ASTM D7503 “Standard Test Method for Measuring the Exchange Capacity of Inorganic Fine-Grained Soils”

5. Meets the Acute Toxicity, Solvents, and Heavy Metals standards documented in 9-14.5(2) Table 1 of the Standard Specifications.

8-02.2(9-14.3) Seed

Section 9-14.3 is supplemented with the following:

(******)
Seed of the type specified shall be certified in accordance with WAC 16-302. 30 days prior to application, the Contractor shall submit testing results in accordance with Section 8-02.3(9) of the Standard Specifications certifying that each lot of seed for each specified species has been tested for species verification, purity, germination, noxious weeds and other crop seeds.

The Contracting Agency shall adjust the Pure Live Seed (PLS) per acre to meet the specified Total Pounds PLS per acre in 8-02(3)9 of the Special Provisions following the certified testing results.

8-02.2(9-14.4) Fertilizer

Section 9-14.4 is supplemented with the following:

(******)
Commercially available, pre-packaged “tea bag” controlled release fertilizer packets used for all woody plant material shall be a 20-10-5 plus micronutrients formulation in 10-gram biodegradable planting packet.

The Nitrogen, Phosphorous, and Potassium sources shall be coated with a polymer coating to provide controlled release of nutrients for up to one year.

Tablet, pellet, or liquid form fertilizer shall not be allowed.

8-02.3 Construction Requirements

8-02.3(3) Weed and Pest Control

8-02.3(3)A Chemical Pesticides

Section 8-02.3(4)A is supplemented with the following:

(******)
Pre-emergent herbicide shall be applied between March 1 and March 15 within all planting areas. Application shall occur after removal of all weeds within the planting areas. This Work is included in the bid items for planting installation.

8-02.3(4) Topsoil

Section 8-02.3(4)B is supplemented with the following:

(******)
Prior to applying Topsoil Type B, the Contractor shall scarify any compacted areas to the depths as indicated in the Plans. 18” minimum decompaction for planting areas and 6” minimum decompaction for seeding areas. This shall include all access roads, haul roads, staging areas, and other areas of compacted soil and as identified by the Engineer.

Topsoil Type B shall be placed to the depth and locations as specified on the Plans.

Areas not receiving a uniform depth as specified in the Plans shall have additional Topsoil Type B placed at no additional cost to the Contracting Agency until the specified depth is achieved.

Areas adjacent to curbs, sidewalks and other structures shall be a depth to accommodate compost and bark mulch placement to maintain 1 inch below all adjacent structures.

Topsoil shall not be placed when the soil is saturated or as directed by the Engineer.

8-02.3(6) Mulch and Amendments

8-02.3(6)A Compost

Section 8-02.3(6)A is supplemented with the following:

(******)
Fine Compost shall be placed and allowed to settle for a minimum of 5 working days prior to measurement. Following compost placement, no motor vehicle shall be allowed on the compost areas unless authorized by the Engineer.

Areas not receiving a uniform settled depth as specified in the Plans shall have additional Fine Compost placed at no additional cost to the Contracting Agency until the specified depth is achieved.

8-02.3(6)B Fertilizers

Section 8-02.3(8) is supplemented with the following:

(******)
The Contractor shall apply pre-packaged “tea bag” fertilizer packets to all plant material as part of the backfill material at the time of planting. Quantity and placement of the “tea bag” packets shall be as per the manufacturer’s recommendations.

8-02.3(9) Seeding, Fertilizing, and Mulching

8-02.3(9)C Seeding with Fertilizing and Mulches

Section 8-02.3(9)C is supplemented with the following:

(******)
Permanent seeding shall not occur until areas have been approved following Section 8-02.3(5)A of the Standard Specifications, including removal of any temporary BMPS, necessary decompaction of staging and construction areas.

Permanent seeding, fertilizing, and mulching shall be applied in two directions as to provide a complete and uniform cover over the entire seeding areas. Hydroseed operations will require the use of hoses capable of applying material on slopes and on both sides of tracks to provide the specified cover and two-direction application requirement.

Seeding, Fertilizing, and Mulching – Site Roadside
Grass seed species, of the following composition, proportion, and quality shall be hydraulically applied at the rate of 375 pounds of pure live seed (PLS) per acre as shown below as designated in the Plans.

Kind and Variety of Seed in Mixture by Common Name and (Botanical name)	Pounds Pure Live Seed (PLS) Per Acre

Express II Perennial Ryegrass *(Lolium perenne var. Express II)*	150.00
Cutter II Perennial Ryegrass *(Lolium perenne var. Cutter II)*	150.00
Garnet Creeping Red Fescue *(Festuca rubra var Garnet)*	37.50
Windward Chewings Fescue *(Festuca rubra spp. fallax var Windward)*	37.50
Total Pounds PLS Per Acre	375.00

Seeds shall be certified "Weed Free," indicating there are no noxious or nuisance weeds in the seed.

Seeding, Fertilizing, and Mulching – Site Creek

Grass seed species, of the following composition, proportion, and quality shall be hydraulically applied at the rate of 60 pounds of pure live seed (PLS) per acre as shown below as designated in the Plans.

Kind and Variety of Seed in Mixture by Common Name and (Botanical name)	Pounds Pure Live Seed (PLS) Per Acre
Meadow Barley *(Hordeum branchyantherum)*	21.00
Northwestern Mannagrass *(Glyceria occidentalis)*	12.00
Native Red Fescue *(Festuca rubra rubra)*	12.00
Water Foxtail *(Alopecurus genicaultius)*	7.80
Common Spikerush *(Eleocharis palustris)*	3.00
American Sloughgrass *(Beckmannia syziganche)*	2.40
Tufted Hairgrass *(Dechampsia caespitosa)*	1.50

Spike Bentgrass *(Agrostis exarata)*	0.30
Total Pounds PLS Per Acre	60.00

Seeds shall be certified “Weed Free,” indicating there are no noxious or nuisance weeds in the seed.

Seeding, Fertilizing, and Mulching – Site Storm

Grass seed species, of the following composition, proportion, and quality shall be hydraulically applied at the rate of 60 pounds of pure live seed (PLS) per acre as shown below as designated in the Plans.

Kind and Variety of Seed in Mixture by Common Name and (Botanical name)	Pounds Pure Live Seed (PLS) Per Acre
Blue Wildrye *(Elymus glaucus)*	30.00
Native Red Fescue *(Festuca rubra rubra)*	9.00
Meadow Barley *(Hordeum brachyantherum)*	6.00
Northwestern Mannagrass *(Glyceria occidentalis)*	6.00
American Sloughgrass *(Beckmannia syziganche)*	6.00
Tufted Hairgrass *(Dechampsia caespitosa)*	3.00
Total Pounds PLS Per Acre	60.00

Seeds shall be certified “Weed Free,” indicating there are no noxious or nuisance weeds in the seed.

Fertilizing (seeding operation):

The Contractor shall apply sufficient quantities of fertilizer to supply the following amounts of nutrients at the time of initial seeding:

- Total Nitrogen as N - 60 pounds per acre.
- Available Phosphoric Acid as P2O5 - 60 pounds per acre.
- Soluble Potash as K2O - 30 pounds per acre.

30 pounds of nitrogen applied per acre shall be derived from isobutylidene diurea (IBDU), cyclo-di-urea (CDU), or a time release, polyurethane coated source with a minimum release time of 6 months. The remainder may be derived from any source.

8-02.3(11) Mulch

Section 8-02.3(11)B is supplemented with the following:

(******)
Bark or Wood Chip Mulch shall be placed and allowed to settle for a minimum of 5 working days prior to measurement. Areas not receiving a uniform 3-inch settled depth shall have additional bark mulch placed until the specified depth is achieved at no additional cost to the Contracting Agency.

8-02.5 Payment

Section 8-02.5 is supplemented with the following:

(******)
"Topsoil Type B", per acre.
The unit Contract price per acre for "Topsoil Type B" shall be full pay to perform the Work as specified including pre-installation weed control and removal, planting area preparation, loading, hauling, screening, stockpiling, weed control with removal leading up to plant installation, placing, spreading, processing, cultivating of Topsoil Type B.

"Fine Compost", per square yard.
The unit Contract price per square yard for "Fine Compost" shall be full pay to perform the Work as specified including furnishing, loading, hauling, weed control, and the placement and spreading of Fine Compost.

"PSIPE____", per each.
The unit Contract price for "PSIPE ____", per each, shall be full pay for all labor, materials, tools, equipment, and supplies necessary for planting area preparation, fine grading, plant material and installation, plant storage and protection, fertilizer, staking, cleanup, planting area weed control including pre-emergent application, watering as required, and water necessary to complete planting operations as defined by the Plans and these Special Provisions.

8-04 Curbs, Gutters, and Spillways

8-04.5 Payment

Section 8-04.5 is supplemented with the following:

(******)
"Mountable Cement Conc. Traffic Curb and Gutter", per linear foot.

8-06 Cement Concrete Driveway Entrances

8-06.1 Description

Section 8-06.1 is supplemented with the following:

(******)
This Work shall consist of constructing driveway approaches beyond the driveway entrance limits as shown in the Plans and in accordance with these Specifications.

8-06.2 Materials

Section 8-06.2 is supplemented with the following:

(******)
Driveways shall have a minimum compressive strength of 4,000 psi at 28 days. The concrete shall achieve a minimum compressive strength of 2,500 psi based on early break cylinders prior to allowing traffic to pass across the driveway.

Type III cement conforming to Section 9-01.2(1) may be used.

The nominal maximum size aggregate shall be 1-1/2 inch.

Section 6-02.3(3) notwithstanding, non-chloride accelerating admixtures conforming to the following specifications may be used:

Admixture	**Specifications**
Accelerating	Section 9-23.6(4)
Water Reducing/Accelerating	Section 9-23.6(6)

8-06.3 Construction Requirements

Section 8-06.3 is supplemented with the following:

(******)
Contractor shall coordinate with each property owner affected for timing of staging and construction of driveway entrances and driveway approaches.

8-06.4 Measurement

Section 8-06.4 is supplemented with the following:

(******)
Cement concrete driveway approaches will be measured by the square yard of finished surface.

Driveway entrances will be measured by the square yard of finished surface including wings. Measurement will exclude curb.

8-06.5 Payment

Section 8-06.5 is supplemented with the following:

(******)

“Cement Conc. Driveway Approach”, per square yard.
"Cement Conc. Driveway Entrance", per square yard.

The unit Contract price for "Cement Conc. Driveway Entrance" and “"Cement Conc. Driveway Approach” shall include the base rock section under the pavement and compaction of the base rock.

Chain Link Fence and Wire Fence

Materials

Section 8-12.2 is supplemented with the following:

Coated Chain Link Fence

Chain link fence fabric shall be hot-dip galvanized with a minimum of 0.8 ounce per square foot of surface area.

Fencing materials shall be coated with an ultraviolet-insensitive plastic or other inert material at least 2 mils in thickness. Any pretreatment or coating shall be applied in accordance with the manufacturer's written instructions. The Contractor shall provide the Engineer with the manufacturer's written specifications detailing the product and method of fabrication. The color shall match SAE AMS Standard 595 color number *** $$1$$ ***.

Samples of the coated fencing materials shall have received the Engineer’s acceptance prior to installation on the project.

The Contractor shall supply the Engineer with 10 aerosol spray cans containing a minimum of 14 ounces each of paint of the color specified above. The touch-up paint shall be compatible with the coating system used.

Payment

Section 8-12.5 is supplemented with the following:

“Coated Chain Link Fence Type ___”, per linear foot.
Payment for clearing of fence line for “Coated Chain Link Fence Type ___” shall be in accordance with Section 2-01.5.
“Coated End, Gate, Corner, Pull Post for Chain Link Fence”, per each.
“Double 14 Ft. Coated Chain Link Gate”, per each.
“Double 20 Ft. Coated Chain Link Gate”, per each.
“Single 6 Ft. Coated Chain Link Gate”, per each.

8-13 Monument Cases

8-13.1 Description

Section 8-13.1 is supplemented with the following:

(******)

This works consists of adjusting or replacing existing site monuments.

8-13.3 Construction Requirements

Section 8-13.3 is supplemented with the following:

(******)
When called out in the plans to adjust a monument, the Contractor shall maintain all control points on the site outside of the roadway prism noted in Survey Monumentation sheets of the plans. The control points shall be used to reset the adjusted monuments in their current location. After monuments have been reset, used control points, need not be saved.

8-13.4 Measurement

Section 8-13.4 is supplemented with the following:

(******)
Adjust Monument Case and Cover shall be measured per each monument adjusted. Control points on the plans that are called out as adjust shall not be included in this bid item, as they are called out to reference to the Contractor, the control points to be used for resetting the existing monuments.

8-13.5 Payment

Section 8-13.5 is supplemented with the following:

(******)
"Adjust Monument Case and Cover", per each.

8-14 Cement Concrete Sidewalks

8-14.1 Description

Section 8-14.1 is revised to read:

(April 3, 2017 WSDOT GSP)
This Work consists of constructing cement concrete sidewalks, curb ramps, bus stop shelter foundations, masonry sidewalks, and ramp grinding in accordance with details shown in the Plans, Standard Plans, these Specifications, and in conformity to the lines and grades shown in the Plans, Standard Plans, and as established by the Engineer.

8-14.3 Construction Requirements

Section 8-14.3 is supplemented with the following:

(January 7, 2019 WSDOT GSP)
Timing Restrictions
Curb ramps shall be constructed on one leg of the intersection at a time. The curb ramps shall be completed and open to traffic within five calendar days before construction can begin on another leg of the intersection unless otherwise allowed by the Engineer.

Unless otherwise allowed by the Engineer, the five calendar day time restriction begins when an existing curb ramp for the quadrant or traffic island/median is closed to pedestrian use and ends when the quadrant or traffic island/median is fully functional and open for pedestrian access.

(January 7, 2019 WSDOT GSP)

Layout and Conformance to Grades

Using the information provided in the Contract documents, the Contractor shall lay out, grade, and form each new curb ramp, sidewalk, and curb and gutter.

8-14.4 Measurement

Section 8-14.4 is supplemented with the following:

(******)

Cement concrete sidewalks of any type will be measured by the square yard of finished surface and will not include the surface area of the curb ramps.

8-14.5 Payment

Section 8-14.5 is supplemented with the following:

(******)

"Cement Conc. Sidewalk (Thickened)", per square yard.

"Cement Conc. Sidewalk with Thickened Edge", per square yard.

(******)

No separate or additional payment will be provided for crushed surfacing top course placed under the cement concrete sidewalks of all types within the Contract.

Payment for excavation of material not related to the construction of the cement concrete sidewalks of all types within the Contract but necessary before the cement concrete sidewalk can be placed, when and if shown in the Plans, will be made in accordance with the provisions of Section 2-03. Otherwise, the Contractor shall make all excavations including haul and disposal, regardless of the depth required for constructing the cement concrete sidewalk to the lines and grades shown, and shall include all costs thereof in the unit Contract price per square yard for the type of sidewalk.

The unit Contract price per square yard for "Cement Conc. Sidewalk with Thickened Edge" shall also include rebar, and any additional appurtenances required per the Plans.

8-15 Riprap

8-15.2 Materials

Section 8-15.2 is supplemented with the following:

(******)

Streambed Sediment	9-03.11

Streambed Cobbles, 8 In.	9-03.11
Streambed Boulder One-Man	9-03.11
Streambed Boulder Two-Man	9-03.11

Pre-vegetated coir mat shall be supplied with native grasses using a minimum of five grass species specifically suited for riparian and erosion control restoration in the PNW. The Contractor shall submit the product specification outlying the proposed species prior to installation.

8-15.3 Construction Requirements

Section 8-15.3 is supplemented with the following:

(******)
Naturalized Stormwater Channel Outfalls shall follow a naturalized design as detailed in the Plans. These outfalls shall be fitted with streambed cobbles, one to two man, smooth, rounded streambed boulders, biodegradable pre-vegetated coir mat with native grasses.

Plant establishment of the pre-vegetated coir mat shall fall under requirements of Section 8-02 of the Standard Specifications. The pre-vegetated coir mat shall be continuously wetted prior, during and after installation.

Streambed Boulder, One Man
Place streambed boulders as shown in the Plans or as directed by the Engineering during construction.

Streambed Boulder, Two Man
Set streambed boulders as shown in the Plans or as directed by the Engineering during construction.

Streambed Mix
The Contractor shall manufacture a Streambed Mix by combining Streambed Sediment and Streambed Cobbles 8 In on-site or prior to placing per mix gradations shown on plans. Place in stream channel as profiled and detailed in the Plans. Thoroughly wash down with a pressurized hose until fines settle and the mix is firm and stable. Place in 12-inch maximum lifts.

8-15.4 Measurement

Section 8-15.4 is supplemented with the following:

(******)
Naturalized Stormwater Channel Outfalls will be measured per each.

One Man Streambed Boulders will be measured per each installed.

Two Man Streambed Boulders will be measured per each installed.

Streambed Mix will be measured per ton.

8-15.5 Payment

Section 8-15.5 is supplemented with the following:

(******)
"Naturalized Stormwater Outfall Channel", per each.
The unit Contract price per each of "Naturalized Stormwater Outfall Channel" shall be full pay for furnishing all labor, tools, equipment, and materials required to construct the naturalized outfall channel and shall include required number of one and two man boulders, streambed cobbles, biodegradable coir mat pre-vegetated with native grasses, cedar stakes, and all other work and materials to complete outfall as shown in the Plans.

"Streambed Boulder One Man" per each.
"Streambed Boulder Two Man" per each.
Payment for "Streambed Boulder One Man" and "Streambed Boulder Two Man" shall be full pay for the Work described in this Section including anchoring, excavation, placement, and compaction.

"Streambed Sediment" per Ton.
"Streambed Cobbles 8 In" per Ton.
Payment for bid items "Streambed Sediment" and "Streambed Cobbles 8 In." shall include haul to the site, mixing the materials as specified in the specifications and plans, compacting the materials with pressurized water, and all other incidental work to the placement of a completed streambed mix.

The unit Contract price for these items shall be full pay for furnishing all labor, mixing, haul, tools, materials, and equipment required to place material as shown in the Contract Plans.

8-18 Mailbox Support

8-18.1 Description

Section 8-18.1 is supplemented with the following:

(******)
This Work will consist of moving existing mailboxes to new locations, where shown on the Plans.

8-18.2 Materials

Section 8-18.2 is supplemented with the following:

(******)
Only steel posts shall be used for mailbox supports.

8-18.3 Construction Requirements

Section 8-18.3 is supplemented with the following:

(******)
Mailboxes to be relocated shall be replaced with new mailboxes. Care shall be taken when removing existing cluster mailboxes so that damage doesn't occur. If the cluster mailbox is damaged in the removal and resetting process and the damage can't be repaired to the

satisfaction of the Engineer and Postmaster, then the mailbox shall be replaced with a new mailbox at the Contractor's expense. Contractor shall coordinate with Postmaster on relocations. Removed standard style mailboxes will become property of the Contractor upon installation on new mailbox and will be required to be removed from site.

8-18.4 Measurement

Section 8-18.4 is supplemented with the following:

(******)
Relocated mailboxes will be measured per each.

8-18.5 Payment

Section 8-18.5 is supplemented with the following:

(******)
"Remove and Reinstall Existing Mailbox", per each.
The unit Contract price for "Remove and Reinstall Existing Mailbox" shall be full pay for all work and not limited to removing and temporarily relocated mailbox, installation of metal posts and new mailboxes and appurtenances for connection to mailbox, placement in new location and concrete foundation.

8-20 Illumination, Traffic Signal Systems, Intelligent Transportation Systems, and Electrical

8-20.2 Materials

Section 8-20.2 is supplemented with the following:

(April 6, 2015 WSDOT GSP)
Traffic Signal Standard Foundation Shaft Casing
All permanent casing shall be a smooth wall non-corrugated structure of steel base metal. All permanent casing shall be of ample strength to resist damage and deformation from transportation and handling, installation stresses, and all pressures and forces acting on the casing. The casing shall be clean prior to placement in the excavation. The permanent casing may be telescoped, but the outside diameter of the casing shall not be less than the specified diameter of the shaft.

8-20.2(9-29.1) Conduit, Innerduct, and Outerduct

8-20.2(9-29.1(11)) Foam Conduit Sealant

Section 9-29.1(11) is supplemented with the following:

(January 7, 2019 WSDOT)
The following products are accepted for use as foam conduit sealant:

- CRC Minimal Expansion Foam (No. 14077)
- Polywater FST Foam Duct Sealant
- Superior Industries Foam Seal

- Todol Duo Fill 400

8-20.2(9-29.2) Junction Boxes, Cable Vaults, and Pull Boxes

Section 9-29.2 is supplemented with the following:

(September 3, 2019 WSDOT)

Slip-Resistant Surfacing for Junction Boxes, Cable Vaults, and Pull Boxes

Where slip-resistant junction boxes, cable vaults, or pull boxes are required, each box or vault shall have slip-resistant surfacing material applied to the steel lid and frame of the box or vault. Where the exposed portion of the frame is ½ inch wide or less, slip-resistant surfacing material may be omitted from that portion of the frame.

Slip-resistant surfacing material shall be identified with a permanent marking on the underside of each box or vault lid where it is applied. The permanent marking shall be formed with a mild steel weld bead, with a line thickness of at least 1/8 inch. The marking shall include a two-character identification code for the type of material used and the year of manufacture or application. The following materials are approved for application as slip-resistant material, and shall use the associated identification codes:

1. Harsco Industrial IKG, Mebac #1 - Steel: **M1**

2. W. S. Molnar Co., SlipNOT Grade 3 – Coarse: **S3**

3. Thermion, SafTrax TH604 Grade #1 – Coarse: **T1**

8-20.2(9-29.2(1)) Standard Duty and Heavy-Duty Junction Boxes

Section 9-29.2(1) is supplemented with the following:

(******)

Junction boxes and covers installed in locations that include deliberate vehicle traffic shall meet or exceed AASHTO H-20 standards for loading and design stress.

Type-2, Type-2 Modified and Type-8 junction boxes (and covers) that will not experience deliberate vehicle traffic may be constructed of polymer concrete (composites) and shall meet or exceed ANSI Tier 15 test provisions including 15,000 lbf design load and 22,500 lbf test load.

Minimum inside dimensions for junction boxes shall be as shown on WSDOT Standard Plan J-40.10-00 and J-40.30-00.

Cable vaults shall be in accordance with WSDOT Standard Plan J-90.20-00 with standard duty (rectangular) lid unless the cable vault is within the driven portion of the roadway, where it shall have a heavy duty (round) lid per the standard plan.

Pull Boxes shall be in accordance with WSDOT Standard Plan J-90.10-00 with standard duty (rectangular) lid unless the cable vault is within the driven portion of the roadway, where it shall have a heavy duty (round) lid per the standard plan.

9-29.2(1)A Standard Duty Junction Boxes

Section 9-29.2(1)A is supplemented with the following:

(August 1, 2016 WSDOT GSP)

Concrete Junction Boxes

Both the slip-resistant lid and slip-resistant frame shall be treated with Mebac#1 as manufactured by IKG industries, or SlipNOT Grade 3-coarse as manufactured by W.S. Molnar Co. Where the exposed portion of the frame is ½ inch wide or less the slip-resistant treatment may be omitted on that portion of the frame. The slip-resistant lid shall be identified with permanent marking on the underside indicating the type of surface treatment ("M1" for Mebac#1; or "S3" for SlipNOT Grade 3-coarse) and the year manufactured. The permanent marking shall be ⅛-inch line thickness formed with a mild steel weld bead.

8-20.2(9-29.2(2)A) Standard Duty Cable Vaults and Pull Boxes

Section 9-29.2(2)A is supplemented with the following:

(August 1, 2016 WSDOT GSP)

Both the slip-resistant lid and slip-resistant frame shall be treated with Mebac#1 as manufactured by IKG industries, or SlipNOT Grade 3-coarse as manufactured by W.S. Molnar Co. Where the exposed portion of the frame is ½ inch wide or less the slip-resistant treatment may be omitted on that portion of the frame. The slip-resistant lid shall be identified with permanent marking on the underside indicating the type of surface treatment ("M1" for Mebac#1; or "S3" for SlipNOT Grade 3-coarse) and the year manufactured. The permanent marking shall be ⅛-inch line thickness formed with a mild steel weld bead.

8-20.2(9-29.2(4)) Cover Markings

The second paragraph of Section 9-29.2(4) is revised to read:

(******)

Junction boxes shall be marked or embossed for use in accordance with the Plans and the following schedule:

System Type	Legend
Traffic Signal	TRAFFIC/SIGNALS or SIGNALS
Lighting	STREET/LIGHTING

The inscription on all boxes used for the same function shall be consistent throughout the project.

8-20.2(9-29.3(2)) Electrical Conductors and Cable

8-20.2(9-29.3(2)B) Multi-Conductor Cable

Section 9-29.3(2)B is replaced with:

(******)

Multi-conductor cable shall be used for signal control. The cable shall meet International Municipal Signal Association (IMSA) signal cable specification 20-1. Only five (5)- or seven (7)-conductor IMSA specification cables shall be permitted, as indicated on the Plans. IMSA specification cables shall use No. 14 AWG stranded copper conductors. Individual conductors shall be cabled together in accordance with the following:

Conductor Number	Color Code	Color/Trace	Display Use	
			Vehicle	Pedestrian
1.	R	Red	Red	Don't Walk #1
2.	O	Orange	Yellow	Don't Walk #2
3.	G	Green	Green	Walk #1
4.	B	Black	spare	Walk #2
5.	W	White	Neutral (AC-)	Neutral (AC-)

8-20.2(9-29.6) Light and Signal Standards

Section 9-29.6 is supplemented with the following:

(******)

Traffic Signal Standards

Traffic signal standards shall be furnished and installed in accordance with the methods and materials noted in the applicable Standard Plans, pre-approved plans, or special design plans.

The Type III signal standards will be supplied by the Contractor to the City.

All welds shall comply with the latest AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. Welding inspection shall comply with Section 6-03.3(25)A Welding Inspection.

Hardened washers shall be used with all signal arm connecting bolts instead of lockwashers. All signal arm ASTM F 3125 Grade A325 connecting bolts tightening shall comply with Section 6-03.3(33).

Traffic signal standard types, applicable characteristics, and foundation types are as follows:

Type PPB Pedestrian push button posts shall conform to Standard Plan J-20.10 or to one of the following pre-approved plans:

Fabricator	Drawing No.
Northwest Signal Supply Inc.	NWS 3565
Valmont Ind. Inc.	DB00655 Rev. L Sheet's 1, 2 & 3 of 3
Ameron Pole Prod. Div.	WA10TR-1 Rev. F and WAPPBPBA Rev. B

	Union Metal Corp.	TA-10035 Rev. R8 Sht. 1
	West Coast Engineering Group	WSDOT-PP-01 Rev. 1
	KW Industries	10-200-PED-1 Rev. 9, Sheets 1, 2 and 3

Type PS Pedestrian signal standards shall conform to Standard Plan J-20.16 or to one of the following pre-approved plans:

Fabricator	Drawing No.
Northwest Signal Supply Inc.	NWS 3540 Rev. 4 and NWS 3540B Rev. 4
Valmont Ind. Inc.	DB00655 Rev. L Sht. 1, 2 & 3 of 3
Ameron Pole Prod. Div.	WA10TR-1 Rev. F and WA10TR-2 Rev. C
Union Metal Corp.	TA-10025 Rev. R18 Sht. 1 & 2
West Coast Engineering Group	WSDOT-PP-02 Rev. 1
American Pole Structures, Inc.	WS-PP-03 Rev. 1D
KW Industries	10-200-PED-1 Rev. 9, Sheets 1, 2 and 3

Type III Characteristics:

Luminaire mounting height	30 ft., 35 ft., 40 ft., or 50 ft.
Luminaire arms	One Only
Luminaire arm type	Type 1
Luminaire arm length (max.)	16 ft.
Signal arms	One Only

Type III standards shall conform to one of the following pre-approved plans, provided all other requirements noted herein have been satisfied. Maximum (x) (y) (z) signal arm loadings in cubic feet are noted after fabricator.

Signal Arm Length (max)	Fabricator-(x) (y) (z)	Drawing No.
65 ft.	Valmont Ind. Inc.-(2947)	DB00625-Rev.U, Shts. 1, 2, 3 & 4 and "J" luminaire arm
65 ft.	Union Metal Corp. (2900)	71026-B87 Rev. R13 Shts. 1, 2 & 3
65 ft.	Ameron Pole-(2900) Prod. Div.	W3724-1 Rev. K & W3724-2 Rev. H and "J" luminaire arm
65 ft.	Northwest Signal-(2802) Supply Inc.	NWS 3500 Rev. 4 or NWS 3500B Rev. 4
45 ft.	American Pole (1875) Structures, Inc.	WS-T3J-L, Rev. 11 Sheets 1 & 2 of 2
65 ft.	American Pole (2913) Structures, Inc.	WS-T3J-H, Rev. 10 Sheets 1 & 2 of 2
65 ft.	West Coast Engineering Group	WSDOT-TS-01 Rev. 3 Sheets 1, 2, and 3
65 ft.	Maico Industries (2947)	WSDOTMA Rev. 3 Sheets 1, 2 and 3 and "J" luminaire arm
65 ft.	KW Industries	10-200-TSP-3 Rev. 5, Sheets 1, 2, and 3

Foundations for various types of standards shall be as follows:

Type PPB	As noted on Standard Plan J-20.10
Type PS	As noted on Standard Plan J-21.10
Type III	As noted on Standard Plan J-26.10 and in the Plans.

8-20.2(9-29.6(5)) Foundation hardware

Section 9-29.6(5) is supplemented with the following:

(******)

Foundation hardware for Street Illumination standards shall conform to pole manufacturer's mounting requirements.

8-20.2(9-29.10) Luminaires

Section 9-29.10 is supplemented with the following:

(******)

Street illumination luminaires shall be in accordance with the details shown in the contract drawings.

8-20.2(9-29.11) Control Equipment

Section 9-29.11 is supplemented with the following:

(******)

Street illumination shall be controlled by photoelectric control devices mounted on the service cabinets. Refer to subsection 9-29.11(2) and the contract drawings.

8-20.2(9-29.13) Traffic Signal Controllers

Section 9-29.13 is supplemented with the following:

(******)

The Contractor shall deliver 2070 controller meeting the general WSDOT specification in this section, with the components and software described in Section 8-20.3(11) of the Special provisions.

The traffic signal system shall operate in conformance with the Phase Sequence Diagram in the Plans.

The Contractor shall adjust the range and demonstrate the optical preemption system in the presence of the Engineer and the local fire marshal.

The detection panel shall conform to details in the Plans.

Field wiring input and output terminals shall conform to Section 9-29.13(7) B-8. In addition, the circuit numbers shown on the Plans shall be engraved on the marker strip.

8-20.2(9-29.13(10)) NEMA, Type 170E, 2070 Controllers and Cabinets

Section 9-29.13(10) is supplemented with the following:

(******)

2070 Controller Specifications

Model 2070L Controller Assemblies; Providing New and Modifying Existing:

New Model 2070L controller assembly or assemblies shall be furnished by the Contractor, as shown on plans, and shall conform to Section 9-29.13, “Control Cabinet Assemblies,” of the Standard Specifications and all addendum thereto current at the time of project advertising and these Special Provisions.

One printed copy of the operations manuals of the local controller software shall be provided for each controller. One printed copy of the maintenance manuals of the local controller shall be provided for each controller.

Each controller shall be the “lite” version Model 2070L (Caltrans Rack Mount type) ATC traffic controller per Washington State Dept. of Transportation (“WSDOT”),

California Department of Transportation's (Caltrans) specification. Supplied unit(s) shall conform to the Transportation Electrical Equipment Specifications (TEES) Errata 2 and shall be registered on the current Caltrans Qualified Products List (QPL).

Each Model 2070L controller shall be delivered as a complete, working assembly, equipped with the modules as shown on the Plans. Each 2070 controller shall have aluminum slot covers covering all open or unused ports on the back of the controller.

Each Model 2070L controller configured for TS2-1 shall be delivered with a power cable to connect the 2070-2N card to a wall socket for AC power. Each Model 2070L controller configured for TS2-2 operation shall be delivered with a power cable to connect the "A" plug on the front of the NEMA base to a wall socket for AC power.

2070-1C

The 2070-1C shall be equipped with a CPU with 8 MB RAM, 10MB Ethernet data port and data key. The controller software operating on the 2070-1C shall be capable of utilizing the Ethernet port for data transfers. The operating system shall allow the user FTP and Telnet access via the Ethernet port. The CPU shall come licensed from the factory with the following modules.

- Local
- Web Access Enabled

2070-7A

The 2070-7A shall conform to the latest TEES specification. The 2070-7A shall be optically isolated and capable of asynchronous serial communications for ports C21S and C22S. On-board jumpers shall be provided to allow either DCE or DTE operation for each port.

2070-3B

The 2070-3B shall include switch SW-1 which shall be a momentary contact switch designed to reset the display panel's display screen.

Operating System

Each 2070 controller shall operate on the 2070-1B using the latest OS 9 version for the 8meg processor.

Intersection Software

Each 2070 controller CPU shall be provided with the latest version of Trafficware SCOUT ATC intersection control software for the 2070 controller. The intersection software shall incorporate all the NTCIP minimum requirements and pass the State NTCIP exerciser.

The software shall be furnished such that County staff can load the software onto backup controllers with a standard laptop computer and standard

communications software. The Contractor's vendor shall provide all necessary cabling to allow for the upgrade of software from the PC to the controllers.

Testing

The controller shall be delivered with the documentation as described in Sections 8-20.3(11)E and 8-20.3(14)D.

A factory-certified representative for the controller and cabinet manufacturer shall set up the cabinet and its components and shall conduct the signal cabinet testing for at least seven (7) days of simulated operation. Testing must conclude with at least three (3) days of error-free operation.

The Contractor shall provide the space and pay the applicable expenses related to the signal testing.

Installation

A factory-certified representative for the cabinet manufacturer shall be on-site during signal turn-on for support. A factory certified representative for the controller manufacturer shall be available by phone consultation on the day of signal turn on.

Warranty

Each controller assembly shall be warranted by the manufacturer against mechanical and electrical defects for a period of one (1) year. The warranty period shall begin from the date of installation and acceptance by the Engineer.

The supplier shall correct any defects in design, workmanship, or material during the warranty period at no cost to the Contract or Clark County. All costs of labor, parts and transportation shall be borne by the supplier for the duration of the warranty period.

The vendor shall provide all revisions to any equipment furnished under these specifications at no cost to the Contract, or Clark County.

8-20.2(9-29.13(10)C) NEMA Controller Cabinets

Section 9-29.13(10)C is supplemented with the following:

(******)
Display panels shall be provided on all new NEMA TS2 traffic signal controller cabinets.

Each display panel shall have a single multi-conductor plug/receptacle which energizes the vehicle and pedestrian indications occurring in the intersection. No vehicle or pedestrian detection displays will be required in the display panel. A multi-conductor wafer switch shall be provided which will transfer the indications between the display "ON" and "OFF/TEST" positions.

All display panel lamps shall be LED type and energized directly from the field wiring terminals to which they apply. Intersection channelization for the traffic signal system. The signal head displays on the display panel shall be as shown on the Plans.

The display panel signal indications shall include LED modules, with the vehicle indications using a red, yellow, flashing yellow (where applicable), and green LED mounted on a circuit board that can be plugged into the wiring of the display module. The pedestrian indications shall have lunar white, and orange LED's mounted on a circuit board that can be plugged into the wiring of the display module.

The Contractor shall provide two spare red/yellow/green LED modules and one spare walk / don't walk LED module for each display panel provided.

North shall be oriented to be straight up on the display panel.

Controller Cabinets

All new County traffic signal cabinets shall be NEMA TS2 Type 1 cabinets, with all components meeting the NEMA TS2, version 02.06, with the equipment detailed on the Plans.

NEMA TS2 Type 1 'Stretch P' Traffic Signal Cabinet

Each NEMA Stretch P traffic signal cabinet shall be wired to provide for future alternate use of controllers, in the intersection.

Controller SDLC Cable Slack

To facilitate the alternate controllers, the SDLC cable shall have sufficient slack to connect to the 2070 controller supplied, plus cable slack to connect to the front of a future NEMA TS2 Type 1 controller.

Additional Controller Wiring

The cabinet shall be provided, wired, for the 2070 controller. The cabinet shall also include a wired "A" plug, and TS2 Type 1 10-pin power plug allowing for the County to install an alternate NEMA style TS2 type 1 controllers, using the "A" plug or the TS2 Type 1 plug to power the controller, and provide any necessary inputs to the alternate controller to operate in the cabinet, based on input from the MMU, and door switches. The alternate controller power plugs shall be wired to logic ground, power, and CVM at a minimum. The door switch for controller power shall also switch the power for the alternate controller power plugs.

The alternate controller power plugs shall be fitted to a mount on the side panel of the cabinet where it will hang without conflicting with other cabinet equipment. The alternate controller power plugs shall be labeled clearly with a tag describing the function of this cannon plug. The "A" plug label and the TS2 Type 1 10 pin power plug label shall each state at a minimum "**NEMA TS2 Type 2 Alternate Controller Power**".

The controller alternate controller power plugs shall rest in the mount, including a cap over the plug.

Cabinet Height

Each “stretch P” cabinet shall be provided with at least three shelves. Each “stretch P” cabinet shall include an 8-in metal riser, as shown on the Plans.

General Cabinet Layout

Each traffic signal cabinet shall be provided, configured as detailed in the Plans.

Any loose equipment on a shelf shall be provided a rubber friction pad, or Velcro, to keep the equipment from sliding or vibrating off the shelf. This shall include the conflict monitor, controller, and other equipment that is not secured to a shelf.

Each shelf shall be sufficiently tall enough that there is at least 1/2-inch of clear space above the equipment provided on that shelf.

The cabinet manufacturer may propose an alternate cabinet configuration that provides equal access to all components in the cabinet.

Cabinet Doors

Each traffic signal controller cabinet supplied on this project shall include two doors – one in front, one in back, each meeting the requirements of bullet 5 of this section of the specifications. The front door shall be tall enough to allow full access to the load bays, and the top shelf of the cabinet. Both front and back doors shall include bracing to keep the door from buckling when open.

The back door shall be the same dimensions, and at approximately the same elevation as the front door.

The cabinet shall be delivered with green Best door locks for each door. The green core shall be painted green on the face. The cabinet shall be delivered with:

- 1 ea. police panel skeleton key
- ea. green core keys – with clear markings on the key that it is for a green core
- 1 ea. green core removal key – with clear markings on the key that it is a core removal key.
- ea. T-handle plastic core alignment tool – designed to allow the dual prongs of the lock to be turned with the core removed.

Cabinet Construction

Each traffic signal cabinet shall be constructed be of 0.125-inch minimum thickness sheet aluminum (5052 alloy).

Cabinet Fan:

The cabinet shall have a thermostatically controlled fan for taking in fresh, filtered air.

Cabinet Heater:

The cabinet shall include a 350-Watt minimum thermostatically controlled heater with fan, mounted on a small shelf on the right-side wall, near the base of the cabinet.

Cabinet Light:
The cabinet light shall include two white light LED grid fixtures in the top of the cabinet, and one white light LED grid fixture under the bottom shelf that will energize only when one or more doors is open. A switch shall activate the light fixture when either the front door, or the rear door, or when both doors are open.

The cabinet lights shall be either Relume model 796-5000, Bivar 12-in LED strips, model BIVDL-C1358 with power supply model VIBPS-1026 or GE LED Power Grid LED lighting systems.

The cabinets shall be provided with power supplies to power the LED cabinet lights.

Cabinet Door Open Switches:
The cabinet shall be wired to include a cabinet door open switches on both doors, which shall be wired to the traffic signal controller, such that when the cabinet door is open, the traffic signal controller will log the door open in the internal memory of the controller.

The door switches shall be wired, such that opening either the front, or back door, or both doors registers as a door open call to the traffic signal controller. The traffic signal controller shall be able to be programmed to dial an alert over the cellular data modem to the existing County server that is operating the ATMS.now central software.

Convenience Outlet:
Convenience outlets shall be furnished in the cabinet(s). The outlets shall be mounted on each side of the cabinet, near the top shelf, not on the door.

One 2-plug in outlet mounted on the right side of the cabinet shall be ground fault interrupted protected.

A 4-plug outlet shall be mounted on the right side of the cabinet shall not be ground fault interrupted protected.

A second 4-plug outlet shall be mounted on the left side of the cabinet, and shall not be ground fault interrupted protected.

The two four-plug outlets shall be protected by a circuit breaker rated at 25 amps.

All convenience outlets shall be installed in such a fashion that the electrical circuitry inside the outlets are enclosed, and no wires can be directly touched from the outlet.

Service Panel Switches:

Power Switches:

There shall **not** be a main power switch inside the cabinet(s) that render all control equipment electrically dead when turned off.

There shall be a controller power switch that shall render the controller and load switch devices electrically dead while maintaining flashing operations for purposes of changing the controller or load switching devices. The switch shall be a general-purpose bat style toggle switch with an approximately 11/16-in. long bat.

There shall be a power switch shall render the detector amplifiers and detector power supplies electrically dead when turned off.

There shall be a power switch that shall render the radar, video and the GPS time source electrically dead when turned off.

Each switch shall have a protective cover, which must be lifted to operate the switch. Alternately, the bank of all switches on the inside of the door may be covered by a single clear Plexiglas hinged cover.

Stop Time Switch:

There shall be a 3-position switch located inside the cabinet door identified as a Stop Time switch. Its positions shall be labeled as "Normal" (up), "Off", (center), and "On" (down). With the switch in the "Normal" position, a stop timing command may be applied to the controller by the police flash switch or the conflict monitor unit. When the switch is in the "Off" position, stop timing commands shall be removed from the controller. The "On" position of the switch shall cause the controller to stop timing. The switch shall be a general-purpose bat style toggle switch with an approximately 11/16-in. long bat.

The switch shall have a protective cover, which must be lifted to operate the switch.

Detector Disconnect / Test Switches:

The cabinets on this project shall be delivered with vehicle detector switches on the detector racks, as specified in Section 9-29.18(1), and as shown on the plans.

The optical preemption system detection switches shall not be supplied on the door panel, instead, emergency vehicle detection test calls will be placed from the optical preemption system phase selector card.

Pedestrian Switches and Input Terminals

Pedestrian Switches:

The service panel on the door shall include switches for pedestrian inputs 1 through 8. The pedestrian detection input switches shall be labeled "Constant Call" (up) and place a call to the signal controller for that specific pedestrian input; "Normal" (center) which shall allow the normal pedestrian pushbuttons to pass calls through to the controller;

and “Test” (down) which shall provide a momentary logic ground to test the controller detection input.

The cabinet shall include eight pedestrian switches, wired to the first eight possible pedestrian movements (phases 1 through 8).

The pedestrian detection switches shall be covered with a clear Plexiglas cover. The Plexiglas cover shall cover the switches, and be fitted with a tether, to hold it up when tethered.

Pedestrian Field Wiring Tie Points

The back panel or side panel of the cabinet shall include input terminals for each of the 8 pedestrian phases. The input terminals shall be wired to allow a contact closure on any of the terminals to call the specific pedestrian phase on the controller. The terminals shall be wired such that all 8 pedestrian terminals are on the same terminal strip, with pedestrian phase 1 being on the left, pedestrian phase 8 on the right, and sequentially ordered between. Each pedestrian terminal input shall be labeled. The pedestrian field wiring tie points shall be mounted such that a screw driver can be applied to any terminal screw without being blocked by other items in the signal cabinet.

Display Panel:

The cabinet shall have a display panel meeting the requirements of Section 9-29.13(10)C.

Police Panel Switches

The Police panel assembly only include a switch to turn the signal from normal operation to flash operation. When the signal is turned from flash to normal operation from this police panel switch, the controller shall restart, and progress through the programmed startup procedures.

The police panel switch and wiring to the controller shall allow the controller to startup and hold in all-red prior to being turned from Flash to normal operation.

Mercury Contactors:

The cabinet shall be provided with solid state relays or similar switching devices, not mercury contactors to transition the cabinet from normal operation to all-red flash.

A 75-amp solid state relay shall be wired between the RFI filter output and the load switch power bus. The relay shall be controlled by the signal-shutdown switch and the flash switch. The relay shall be mounted to a heat sink designed to allow maximum current flow at 74 degrees C without damaging the relay. The solid-state relay shall be a Crydom A4875 or equivalent

Red Flash Program:

Flash operation must be programmable without removing field wiring (i.e., no red / yellow jumpers). The cabinet shall be delivered programmed for all-red flash.

The cabinet shall be configured to flash all-red all even phases, followed by all odd phases. Overlap A and B shall flash with the even phases. Overlap C and D shall flash with the odd phases.

Mechanical Lugs for Field Wiring Terminals:
Mechanical lugs shall be provided, as specified in Section 8-20.3(8).

Cabinet Relays:
All mechanical relays shall be commonly available from more than one manufacturer, and have 24-volt DC or 120Volt AC relay coils. Every socket, which has the capacity of accepting a relay or load switch shall have the appropriate relay or load switch installed. The relays shall be easily accessible, not covered by equipment or wiring.

Resistor Array:
The cabinet shall be delivered with a spare block of 8-grounded resistors that allow any unused phase outputs on the load bay to be bled to ground, in the event of transient voltages on the load bay.

This resistor array shall have all 8 resistors unused from the factory. If the cabinet includes a resistor array for normal cabinet operations, the cabinet shall include a fully unused 8-resistory array.

Field Wiring Terminals:
There shall be terminal strips for field wiring in the controller cabinet. The terminals shall be numbered in accordance to the field wiring chart included in these specifications, or the plans.

A common bus bar with a minimum of 15 spare terminals shall be available after the cabinet is fully wired.

In addition, a 15-terminal bar shall be provided for the pedestrian common and a terminal shall be provided for each signal head neutral.

The bus bars shall be located on the left side wall of the cabinet.

The cabinet shall include a minimum of 10 terminals (with metal bus bar connecting each pair of screws in the each terminal) that will allow for field communications wiring to be terminated. The field communications wiring terminals shall be connected to the FSK filter.

The cabinet shall include 40 spare wiring terminals, in blocks. The spare wiring terminals shall be provided such that the screws in the terminal block have a metal bar connecting each pair of screw for each terminal location. Each pair of screws connected by the metal bar shall count as a single spare terminal.

Interference Suppressors:
All power supplies of equipment used in the cabinet shall have electrical interference immunity from other devices within the cabinet.

Surge Protector (Lightning Arrestor):

The cabinet shall have an input voltage surge protector that shall protect the controller power supply input from any voltage surges that could damage it. Interconnect cable terminal strips shall be equipped with lightning surge protectors. The cabinet shall be wired to light LED indicators when the surge protection has been activated. The LED indicator shall be mounted facing the front to allow unobstructed view of the indicator. In addition, there shall be a metal oxide varactor (MOV) between the ground and hot and between the neutral and ground.

Power Panel Cover:

The power panel shall be covered by an easy removal, clear Plexiglas cover.

Power Strip / Surge Protector

The cabinet shall be supplied with a power strip / surge protector that has at least 7 plugs, and 1,200 joules of protection. The power strip / surge protector shall be plugged into one of the plugs on one of the convenience outlets. The power strip shall be used to provide power to the plugs of the cellular data modem, managed Ethernet edge switches, and the serial to Ethernet switches.

The power strip / surge protector shall be mounted on the side wall of the cabinet. The power strip / surge protector shall be mounted such that the plugs can be reached without moving other equipment in the cabinet. The power strip / surge protector shall be mounted such that the power cord connects directly to one of the convenience outlets.

DIN Rails

The cabinet shall be configured with DIN rails to hold the following equipment:

- GridSmart detection equipment
- Video server
- Managed Ethernet edge switches
- Serial to Ethernet switches
- TS2- Frame grabber

All equipment shall be mounted on the bottom DIN rail. The equipment shall be mounted to allow access to all connections and ports on the equipment, without requiring that the equipment be removed from the DIN rail to connect cables, patch cords, or buttons / displays on the equipment.

The equipment shall be mounted to allow access to the latch and to facilitate removal of the equipment from the DIN Rail.

If the DIN rail is mounted on the back of the cabinet, the DIN rail shall be mounted such that it is free from the rear door, and the rear door is able to close / open without binding or pinching any cords on the equipment.

Bus Interface Unit (BIU)

The cabinet shall be provided with the BIU's as specified previously.

The BIU's shall meet the requirements of NEMA TS2-2002, be fully hot-swappable, and shall include SDLC bus and input / output surge protection.

Terminals and Facilities (T&F) Bus Interface Unit Wiring Harness and Socket

The Terminals and Facilities BIU wiring harness and socket shall not be directly wired or soldered to the back panel contacts. All wires from the sockets for T&F BIU's shall be terminated with spade terminals through an intermediate series of terminal blocks. Each specific T&F BIU's wiring harness shall be on a unique set of terminal blocks.

No wires from T&F BIU's shall be terminated on any terminal block that has wires for any of the other T&F BIU's.

The terminal blocks shall be labeled and arranged in the cabinet to facilitate easy replacement of the socket and wiring for the T&F BIU's.

The terminal blocks for the T&F BIU's shall be of the same size and shape as the rest of the terminal blocks in the cabinet. The terminal blocks shall be provided with the metal jumper between two terminals, as required in the rest of the cabinet.

The cabinet manufacturer may propose an alternate configuration for this terminal block configuration. The final acceptance shall solely be with the Clark County Traffic Signal Engineer.

SDLC Wiring Tie Point Bus

The SDLC wiring harnesses shall be tied to a central bus, or array of buses. All of the wires on the SDLC wiring harnesses shall be spade terminated to the bus, not soldered.

Detector Racks:

The detector racks shall be configured to include 1 BIU, and 16 channels of detection. The detector racks shall be capable of having any combination of 2 and 4 channel detector cards installed to make up the 16 channels of detection.

The detector cards installed may include induction 4 or 4 channel loop amplifier cards, 2 or 4 channel radar detection cards, 2 or 4 channel video detection cards, or other detection cards.

Each detector rack shall be configured to include a 16-channel detector disconnect / test switch as specified in Section 9-29.18(1).

Detector Switch Panel

The cabinets are to be delivered without the normal detector switches mounted on the door, instead, the cabinet shall include specific detector switches on each detector rack.

Each detector rack shall include a detector switch panel that individually conditions the call outputs of the four, four-channel detectors in the detector

rack. Each switch shall be a three-position toggle switch to set the output of one of three states:

- Continuous call state (up)
- Normal operation (center)
- Momentary call (momentary down)

GridSmart Detection:
A factory-certified representative shall configure the GridSmart video detection system to provide the vehicle detection zones indicated in the Plans.

Optical Preemption System Equipment:
Each call channel of the optical preemption system phase selector shall NOT be wired through a disconnect / test switch located on the service panel (previously described).

No calls shall be placed on the non-preempt phases. Preempt call shall be inhibited during flashing operation.

The optical preemption system phase selector shall be connected to the Ethernet edge switch.

The traffic signal cabinet shall be provided without a “green sense harness,” typically used for connecting Opticom 754 cards to the load bay. The green and red outputs of the cabinet’s load bay shall be wired to the Opticom 768 card.

Malfunction Management Unit (MMU):
The MMU unit shall meet the requirements of Section 9-29.13(10)A6.

The MMU shall be connected to the Ethernet edge switch. The vendor for the MMU shall provide training for the Clark County traffic signal engineer, as to setting up the MMU PC software to view, upload and download to the MMU via the Ethernet connection.

The patch cable that connects the MMU to the Ethernet hub switch shall be color coded, as described in Section 8-20.3(8).

TS2 Frame Grabber.
The cabinet shall be supplied with a frame grabber that connects to the SDLC bus.

The signal shall include all cables to integrate the frame grabber into the cabinet. The Contractor shall also provide one data key for the frame grabber in the cabinet, one copy of PC software for each frame grabber provided plus one spare data key.

The frame grabbers, cables, software and other devices necessary to integrate the frame grabber into the cabinet, and to the PC, shall be incidental to the bid items for the traffic signal systems.

The TS2 Frame Grabber shall be fixed with a DIN rail mount, such that the DIN rail mount is on the back of the frame grabber with the frame grabber mounted sideways, and the SDLC IN and SDLC OUT connections are on the bottom. The front panel of the frame grabber shall be facing away from the DIN rail mount.

The TS2 frame grabbers shall include the standard SDLC cable, provided by the manufacturer and a second, longer SDLC cable, that will allow the frame grabber mounted on a DIN rail to be connected to the system. The second, longer SDLC cable shall be long enough to be zip tied to the cabinet shelf, to secure it, and not to kink the cable.

Spare SDLC Connection

Each component in the cabinet with SDLC communications shall be provided a separate SDLC connection. The cabinet shall include one additional (spare) SDLC connection prewired, and labeled as “SPARE SDLC”.

The spare SDLC cable in the cabinet shall be sufficiently long enough to reach any component on any shelf, routed via the back of the shelf, and long enough to connect to any point on the load bay.

The cabinet shall be shipped with the spare SDLC cable tied to the cabinet with the wiring not conflicting with other cabinet components, such that the plug of the cable is located on the left side in the back of the cabinet, below the bottom shelf, accessible from the back door.

Controller Direct Connect Wiring Harness

The cabinet shall be provided with a harness that allows for connection of a PC to the connector on the back of the controller, for upload / download of data from PC software on a laptop at the intersection directly into the controller inside the cabinet, without having to open the back door, or move the equipment within the cabinet. The same connection will allow for a PDA running streetwise partner software to upload / download from the PDA database and to monitor the signal’s operations.

The plug for the front of the cabinet may be located either on the print holder rollout drawer, or on a plug mounted on the side of the cabinet. If the plug is located on the print holder rollout drawer, the wiring shall be fixed such that the rollout drawer is able to slide in, and out without binding or catching the wiring, and without having the wiring hang down in front of other equipment.

The plug shall be wired to connect to one of the DB9 serial ports on the 7A card on the back of the controller. The plug wiring shall be wired as a NULL MODEM connection.

Cabinet Rollout Drawer

The cabinet shall be provided with a print holder rollout drawer. The drawer shall be shelf mounted under the bottom shelf of the cabinet.

The cabinet rollout drawer shall include the controller direct connect wiring harness, as previously described in this section.

Schematics & Manuals:
The cabinet shall have two waterproof envelopes with a side access attached to the inside of the door. At the time of delivery, the envelopes shall have two complete sets of schematics and manuals for all assemblies and sub-assemblies. In addition, the cabinet shall arrive with two sets of cabinet prints including circuit schematics for each model of the following:

1. Controller
2. Conflict Monitor
3. GridSmart Detection Equipment
4. Cellular Communications Equipment
5. Optical Preemption System Equipment

8-20.2(9-29.15) Flashing Beacon Control

Section 9-29.15 is supplemented with the following:

(January 7, 2019 WSDOT)

Rapid Flashing Beacons

Rectangular Rapid Flashing Beacon (RRFB) indications shall comply with the dimensional, operational, and flash pattern requirements of Federal Highway Administration (FHWA) Interim Approval 21 (IA-21), Conditions 4, 5, and 6, excluding Condition 5f; https://mutcd.fhwa.dot.gov/resources/interim_approval/ia21/index.htm). RRFB systems shall be capable of providing, at a minimum, the following two-channel flashing patterns:

1. NEMA Standard 50-50:

   - Channel one is ON and channel two is OFF for 0.5 seconds.
   - Channel one is OFF and channel two is ON for 0.5 seconds.

   (Cycle repeats; the total flashing pattern cycle length is 1.00 second.)

2. RRFB “WW+S” Pattern (IA-21 Condition 5b):

   - Channel one is ON and channel two is OFF for 0.05 seconds.
   - Both channels are OFF for 0.05 seconds.
   - Channel one is OFF and channel two is ON for 0.05 seconds.
   - Both channels are OFF for 0.05 seconds.
   - Channel one is ON and channel two is OFF for 0.05 seconds.
   - Both channels are OFF for 0.05 seconds.

- Channel one is OFF and channel two is ON for 0.05 seconds.
- Both channels are OFF for 0.05 seconds.
- Both channels are ON for 0.05 seconds.
- Both channels are OFF for 0.05 seconds.
- Both channels are ON for 0.05 seconds.
- Both channels are OFF for 0.25 seconds.

(Cycle repeats; the total flashing pattern cycle length is 0.80 seconds.)

The flashing pattern shall be user-selectable in the field.

RRFB system pushbuttons shall include a locator tone but shall not include tactile arrows. RRFB system pushbuttons may include speech messages or vibrotactile functionality, provided these features can be deactivated. RRFB system pushbuttons shall use a 9" x 12" R10-25 sign. The R10-25 sign may include integral yellow warning lights.

8-20.2(9-29.16) Vehicular Signal Heads

8-20.2(9-29.16(2)) Conventional Traffic Signal Heads

8-20.2(9-29.16(2)A) Optical Units

Section 9-29.16(2)A Optical Units is supplemented by the following:

(******)
Light Emitting Diode (LED) light sources are required for all displays.

- The red signal indications shall have a red lens cover.
- The yellow indication shall have a yellow lens cover.
- The green indication shall have a clear lens cover.

The use of more than one manufacturer of LED vehicle traffic signal modules for the same color of conventional traffic signal displays will not be allowed.

8-20.2(9-29.16(2)B) Signal Housing

The first sentence of the fifth paragraph of Section 9-29.16(2)B is supplemented with the following:

(******)
Each lens for a conventional traffic signal head section shall be protected with a removable corrosion resistant aluminum tunnel visor having a 0.050-inch minimum thickness, an inner surface of black anodizing, flat black enamel, or flat black powder coat paint and an outer surface of dark green

powder coat paint. Refer to Section 9-29.13(7)D, in these special provisions for requirements on powder coat painting. Attachment screws shall be made of stainless steel and shall be torqued to securely hold the visor in place.

8-20.2(9-29.16(2)D) Back Plates

Section 9-29.16(2)D is replaced with the following:

(******)
Back plates shall be furnished and installed to all signal heads installed. Back plates shall be constructed of corrosion resistant aluminum having a 0.050-inch minimum thickness.

All surfaces of the back plate shall be coated with black anodizing, flat black enamel, or flat black powder coat paint. Refer to Section 9-29.13(7)D, in these special provisions for requirements on powder coat painting. Back plates shall have attaching holes (slots are not permitted) for installation to the signal head housing. Attachment screws shall be made of stainless steel and shall be torqued to securely hold the back plate in place.

The back plates provided and installed shall be single-piece back plates.

All signal heads shall be supplied and installed with back plates on this project.

A 1-inch-wide strip of yellow retro-reflective, type IV prismatic sheeting, conforming to the requirements of Section 9-28.12, shall be applied around the perimeter of each back plate.

8-20.2(9-29.16(2)E) Painting Signal Heads

Section 9-29.16(2)E is supplemented by the following:

(******)
Traffic signal heads, including the outside of visors and the back of back plates shall be painted with traffic signal green powder coat paint. Refer to Section 9-29.13(10)D, in these special provisions for requirements on powder coat painting. The use of enamel paint for conventional traffic signal heads is not permitted.

Section 9-29.16 is supplemented with the following new subsection:

(******)

8-20.2(9-29.16(4)) Traffic Signal Cover

The covers shall be made from outdoor fabric, solution-dyed with a urethane finish. The fabric shall be weather resistant and treated to withstand mildew.

The cover facing for signal heads and pedestrian heads shall include a strip of see-through material only visible when the signal light is on for testing.

The same color and type of material shall be used for the facing and siding of the cover.

The cover shall completely cover the signal head excluding the back plate, with an elastic cord around the signal / pedestrian head assembly. The elastic cord shall secure the cover to the signal head sun visors. The cover shall also be strapped to the head, with one-inch wide strapped that fasten around the back of the signal head. The Contractor shall provide the number of straps recommended by the manufacturer of the cover.

The covers shall be tan or yellow with a vertical message "NOT IN SERVICE" in white on each cover. Plastic bags or cloth materials shall at no time be used to cover vehicle or pedestrian heads.

8-20.2(9-29.18) Vehicle Detector

Section 9-29.18 is supplemented with the following:

(******)

8-20.2(9-29.18(3)) GridSmart Detection System

Section 9-29.18 is supplemented with the following new subsection:

1. Description.

Install a GridSmart Vehicle Detection System (GSVDS) that monitors vehicles on a roadway via processing of video images and provides detector outputs to a traffic controller or similar device.

A GSVDS configuration for a single intersection will consist of either 1 or 2 fixed focal length omnidirectional view cameras and the GSVDS PROCESSOR.

The system is composed of these principal items: the camera(s), the field communications link consisting of a single CAT5e cable between each camera and the GSVDS Processor, and the GSVDS PROCESSOR along with a PC, video monitor or associated equipment required to setup the GSVDS PROCESSOR and software to communicate to the GSVDS PROCESSOR.

The GSVDS PROCESSOR must be either NEMA TS 2 TYPE 1 or TYPE 2. TYPE 2 must have RS 485 SDLC. The GSVDS PROCESSOR must have at least four (4) processing cores of 2.8GHz or greater, a minimum of 3GB random access memory (RAM), and at least 32GB of onboard storage.

2. Definitions.

A. GSVDS PROCESSOR. The electronic unit that converts the video image provided by the cameras, generates vehicle detections for defined zones and collects vehicular data as specified.

B. Central Control. A remotely located control center, which communicates with the GSVDS PROCESSOR. The GSVDS operator at the central control has the ability to monitor the operation and modify detector placement and configuration parameters. The equipment that constitutes central control is comprised of a workstation microcomputer along with the associated peripherals as described in this special specification.

C. Field Setup Computer. A portable microcomputer used to set up and monitor the operation of the GSVDS PROCESSOR. If required to interface with the GSVDS processor unit, the field setup computer with the associated peripherals described in this special specification and a video monitor, also described in this special specification, must be supplied as part of the GSVDS.

D. Field Communications Link. The communications connection between the camera(s) and the GSVDS PROCESSOR. This link will consist of one CAT5e cable for each omnidirectional camera.

E. Remote Communications Link. The communications connection between the GSVDS PROCESSOR and the central control.

F. Camera Assembly. The complete camera or optical device assembly used to collect the visual image. The camera assembly consists of a CMOS camera, environmental enclosure, temperature control mechanism, and all necessary mounting hardware.

G. Occlusion. The phenomenon when a vehicle passes through the detection zone but the view from the sensor is obstructed by another vehicle. This type of occlusion results in the vehicle not being detected by the sensor.

Or

When a vehicle in one lane passes through the detection zone of an adjacent lane. This type of occlusion can result in the same vehicle being counted in more than one lane.

H. Detection Zone. The detection zone is an area selected through the GSVDS PROCESSOR that when occupied by a vehicle, sends a vehicle detection to the traffic controller or freeway management system.

I. Detection Accuracy. The measure of the basic operation of a detection system (shows detection when a vehicle is in the detection zone and shows no detection when there is not a vehicle in the detection zone).

J. Live Video. Video being viewed or processed at 5 to 10 frames per second.

K. Lux. The measure of light intensity at which a camera may operate. A unit of illumination equal to one lumen per square meter or to the illumination of a surface uniformly one meter distant from a point source of one candle.

3. Functional Capabilities.

The system software must be able to detect either approaching or departing vehicles in multiple traffic lanes. A minimum of 24 detector outputs per GSVDS PROCESSOR. Each zone and output must be user definable through interactive graphics by drawing arbitrarily shaped polygons using the Field Setup Computer or Central Control. The user must be able to redefine previously defined detection zones.

The GSVDS PROCESSOR must provide real time vehicle detection (within 500 milliseconds (ms) of vehicle arrival).

The system must be able to detect the presence of vehicles in up to 64 detection zones per camera.

Detection zones must be provided that are sensitive to the direction of vehicle travel. The direction to be detected by each detection zone must be user programmable.

The GSVDS PROCESSOR unit must compensate for minor camera movement (up to 2% of the field of view at 400 ft.) without falsely detecting vehicles. The camera movement must be measured on the unprocessed video input to the GSVDS PROCESSOR.

The camera must operate while directly connected to GSVDS Processor Unit.

Once the detector configuration has been downloaded or saved into the GSVDS PROCESSOR, the video detection system must operate with the monitoring equipment (monitor and/or laptop) disconnected or on-line.

When the monitoring equipment is directly connected to the GSVDS PROCESSOR, it must be possible to view vehicle detections in real time as they occur on the field setup computer's color VGA display or the video monitor.

The GSVDS PROCESSOR must support 1 or 2 omnidirectional view cameras. If equipped with 1 omnidirectional view camera, the GSVDS processor must also be capable of simultaneously supporting up to four (4) more traditional view cameras for special needs such as advance detection or underpass detection.

4. Vehicle Detection.

A. Detection Zone Placement. The video detection system must provide flexible detection zone placement anywhere within the combined field of view of the image sensors. Preferred presence detector configurations shall be arbitrarily shaped polygons, including simple boxes drawn across lanes of traffic or placed in line with lanes of traffic. A single detector must be able to replace one or more conventional detector loops.

B. Detection Zone Programming. Placement of detection zones must be by means of a graphical interface using the video image of the roadway. The monitor must show images of the detection zones superimposed on the video image of traffic while the GSVDS PROCESSOR is running. The displayed zones, when operating, must be able to be displayed outlined or filled, with a visible change indicating detection.

The detection zones must be created by using the mouse or keypad to draw detection zones on the monitor. The detection zones must be capable of being sized and shaped to provide optimal road coverage and detection. It must be possible to upload detector configurations to the GSVDS PROCESSOR and to retrieve the detector configuration that is currently running in the GSVDS PROCESSOR.

The mouse or keypad may be used to edit previously defined detector configurations so as to fine tune the detection zone placement size and shape. Once a detection configuration has been created, the system must provide a graphic display of the new configuration on its monitor. While this fine-tuning is

being done, the detection must continue to operate from the detector configuration that is currently called.

When a vehicle occupies a detection zone, the detection zone on the live video must indicate the presence of a vehicle, thereby verifying proper operation of the detection system. With the absence of video, the GSVDS PROCESSOR must have a display that will indicate proper operation of the detection zones.

Detection zones must be provided that are sensitive to the direction of vehicle travel. The direction to be detected by each detection zone must be user programmable. The vehicle detection zone should not activate if a vehicle traveling any direction other than the one specified for detection occupies the detection zone. Cross-street and wrong way traffic should not cause a detection.

Detection zones must have the option for the user to define that calls can be made with a side entrance (90° or less angled entrance).

C. Design Field of View. The video detection system must reliably detect vehicle presence in the design field of view. The design field of view must be defined as the sensor view when the image sensor is mounted 30 ft. or higher above the roadway, when the camera is adjacent (within 15 ft.) to the edge of the nearest vehicle travel lane, and when the length of the detection area is not greater than 5 times the mounting height of the image sensor. Within this design field of view, the GSVDS PROCESSOR unit must be capable of setting up a single detection zone for point detection (equivalent to the operation of a 6 ft. by 6 ft. inductive loop). A single camera, placed at the proper mounting height, must be able to monitor up to and including 5 traffic lanes simultaneously. A single omnidirectional camera, placed at the proper mounting height, must be able to monitor detection zones in at least intersection approaches.

D. Detection Performance. Detection accuracy of the video detection system must be comparable to properly operating inductive loops. Detection accuracy must include the presence of any vehicle in the defined detection zone regardless of the lane, which the vehicle is occupying. Occlusion produced by vehicles in the same or adjacent lanes must not be considered a failure of the GSVDS PROCESSOR, but a limitation of the camera placement. Detection accuracy (a minimum of 95%) must be enforced for the entire design field of view on a lane by lane and on a time period basis. When specified in the plans, furnish up to 24 continuous hours of recorded video of all installed intersection cameras within the 30-day test period for verification of proper camera placement, field of view, focus, detection zone placement, processor setup and operation. The video from each camera must show vehicle detections for all zones.

E. Equipment failure, either camera or GSVDS PROCESSOR, must result in constant vehicle detection on affected detection zones.

5. GSVDS PROCESSOR.

A. Cabinet Mounting- The GSVDS PROCESSOR is shelf mountable.

B. Environmental Requirements - The GSVDS PROCESSOR must be designed to operate reliably in the adverse environment found in the typical roadside traffic cabinet. It must meet the environmental requirements set forth by the latest

NEMA (National Electrical Manufacturers Association) TS1 and TS2 standards as well as the environmental requirements for Type 170, Type 179 and 2070 controllers. Operating temperature must be from -30°F to +165°F at 0% to 95% relative humidity, non-condensing.

C. Electrical - The GSVDS PROCESSOR must have a modular electrical design.

The GSVDS PROCESSOR must operate within a range of 89 to 135 VAC, 60 Hz single phase. Power to the GSVDS PROCESSOR must be from the transient protected side of the AC power distribution system in the traffic control cabinet in which the GSVDS PROCESSOR is installed.

Communications to the field setup computer must be through an Ethernet port. This port must be able to download the real-time detection information needed to show detector actuations.

The GSVDS PROCESSOR must have an Ethernet connection on the front of the unit for the connection to the 1st camera. If a second camera is installed at the intersection, the camera will connect with the GSVDS PROCESSOR through a connector mounted on the side of the PROCESSOR.

The unit must be equipped with a single VGA video output. This output must be capable of displaying the operation and detections of the GSVDS PROCESSOR.

The change log for all Software upgrades and/or changes MUST be presented on a readily assessable internet site with unencumbered public access.

The unit software and the supervisor software must include diagnostic software to allow testing the GSVDS functions. This must include the capability to set and clear individual detector outputs and display the status of inputs to enable setup and troubleshooting in the field.

6. Camera Assembly.

A. Camera. The video detection system must use high resolution, color image sensors as the video source for real time vehicle detection. The cameras must be approved for use with the GSVDS PROCESSOR unit by the supplier of the GSVDS. As a minimum, each camera must provide the following capabilities:

1. Images must be produced with a CMOS sensing element with horizontal resolution of at least 2580 lines and vertical resolution of at least 1920 lines. Images must be output in digital format as MJPEG image.

2. Useable video and resolvable features in the video image must be produced when those features have luminance levels as low 1.0 lux for color, for night use.

3. Useable video and resolvable features in the video image must be produced when those features have luminance levels as high as 10,000 lux during the day.

4. The camera must include an electronic shutter control based upon average scene luminance and must be equipped with fixed field of view and fixed

focus lens which does not require opening the camera enclosure. The fixed focus lens must be always in focus without any required end-user adjustments.

B. Camera and Lens Assembly. The camera and lens assembly must be housed in an environmental enclosure that provides the following capabilities:

1. The enclosure must be waterproof and dust tight to the latest NEMA 4 specifications.

2. The enclosure must allow the camera to operate satisfactorily over an ambient temperature range from -30°F to +165°F while exposed to precipitation as well as direct sunlight.

3. The enclosure must include a provision for connection of the CAT5e cable. Input power to the environmental enclosure must be included in the Ethernet interface.

4. A thermostatically controlled heater must be at the front of the enclosure to prevent the formation of ice and condensation. The heater must not interfere with the operation of the camera electronics, and it must not cause interference with the video signal.

5. The enclosure must be light colored or unfinished and must be designed to minimize solar heating. Any plastics used in the enclosure must include ultra violet inhibitors.

6. The total weight of the image sensor in the environmental enclosure must be less than 10 lb.

Use waterproof, quick disconnect connectors to the camera for the CAT5e connection.

A camera interface panel capable of being mounted to sidewalls of a controller cabinet must be provided for protection of the GSVDS PROCESSOR, camera CAT5e connection. The panel must consist of, as a minimum, 2 CAT5e cable surge protection connections.

When the connection between the camera and the GSVDS PROCESSOR is CAT5e cable, the cable used must be suited for outdoor installation.

Camera mounting hardware must allow for vertical or horizontal mounting to the camera enclosure.

7. Field Communication Link.

The field communications link must be a two-way communications connection from the camera to the GSVDS PROCESSOR. The primary communications link media must be burial grade CAT5e cable.

The following requirements must govern for the various types of field communications link media described on the plans:

A. CAT5e Cable. In locations where the plans indicate CAT5e cable is required as the primary communications link, this cable must be burial grade as well as suitable for above ground applications.

All connection cables must be continuous from the equipment cabinet to the camera connector.

Install lightning and transient surge suppression devices on the processor side of the field communications link to protect the peripheral devices. The suppression devices must be all solid state. The devices must present high impedance to, and must not interfere with, the communications lines during normal operation. The suppression devices must not allow the peak voltage on any line to exceed 300% of the normal operating peak voltage at any time. The response time of the devices must not exceed 5 nanoseconds.

8. GSVDS Set-Up System.

The minimum GSVDS set-up system, as needed for detector setup and viewing of vehicle detections, must consist of a field setup computer and Windows based interface software (if required) or a video monitor with interface software built-in to the GSVDS PROCESSOR.

Live video (5 frames per second) must be available on the field setup computer to determine proper operation of detectors. The field set-up computer as a minimum, must have a network connection.

If a field setup computer is required for system set-up, it must be supplied by the supplier of the GSVDS PROCESSOR.

The field setup computer must include all necessary cabling and a Windows based program to interface with the GSVDS PROCESSOR. This software must provide an easy to use graphical user interface and support all models/versions of the supplied GSVDS.

Live video with the detection overlaid is required for field verification of the system.

9. Temporary Use and Retesting.

A. Temporary Use. When shown on the plans, the GSVDS equipment must be used to provide vehicle detection on a temporary basis. When the permanent vehicle detection system and related equipment are installed and made operational, the GSVDS equipment must be carefully removed and delivered to the location shown on the plans.

10. Operation from Central Control.

The central control must transmit and receive all information needed for detector setup, monitor the vehicle detection, view the vehicle traffic flow and interrogate all required stored data. The remote communications link between the GSVDS PROCESSOR and central control may be dial-up (telephone or ISDN lines) or dedicated twisted wire pair communications cable which may be accompanied with coaxial cable or fiber-optic cable, as shown on the plans. Communications with the central control must not interfere with the on-street detection of the GSVDS PROCESSOR.

11. Installation and Training.

The supplier of the video detection system must supervise the installation and testing of the video and computer equipment.

Instruction personnel are required to be certified by the equipment manufacturer. The User's Guide is not an adequate substitute for practical, classroom training and formal certification by an approved agency.

Formal levels of factory authorized training are required for installers, contractors and system operators. All training must be certified by the manufacturer.

12. Warranty, Maintenance and Support.

The video detection system must be warranted to be free of defects in material and workmanship for a period of 3 years from date of shipment from the supplier's facility. During the warranty period, the supplier must repair with new or refurbished materials, or replace at no charge, any product containing a warranty defect provided the product is returned FOB to the supplier's factory or authorized repair site. Return product repair or replaced under warranty by the supplier with transportation prepaid. This warranty does not apply to products damaged by accident, improperly operated, abused, serviced by unauthorized personnel or unauthorized modification.

Ongoing software support by the supplier must include updates of the GSVDS PROCESSOR and supervisor software (if a field setup computer is required for set up). Provide these updates free of charge during the warranty period.

The supplier must maintain a program for technical support and software updates following expiration of the warranty period.

Optical Preemption System Equipment:

Each call channel of the optical preemption system phase selector shall NOT be wired through a disconnect / test switch located on the service panel (previously described).

No calls shall be placed on the non-preempt phases. Preempt call shall be inhibited during flashing operation.

The optical preemption system phase selector shall be connected to the Ethernet edge switch.

The traffic signal cabinet shall be provided without a "green sense harness", typically used for connecting Opticom 754 cards to the load bay. The green and red outputs of the cabinet's load bay shall be wired to the Opticom 768 card.

8-20.2(9-29.19) Pedestrian Push Buttons

Section 9-29.19 is supplemented with the following:

(******)

The Contractor shall install the Accessible Pedestrian Signal (APS) pushbuttons where shown on the Plans. Each APS pushbutton assembly has a unique message unique to the pedestrian specific crossing of the intersection. The Contractor shall work with the Engineer to ensure that the APS pushbutton assemblies are installed at the correct location.

The APS pushbuttons include an arrow on the pushbutton that is to point in the direction of the intended crossing. This style of pushbutton is installed with different orientations than standard pushbuttons.

The Contractor shall confirm with the Engineer each specific pushbutton's location and orientation prior to installing the button assembly. Some pushbuttons will require extensions to ensure that the button is within reach of the sidewalk. The cost for the extensions shall be paid subsidiary to the lump sum item for the traffic signal system.

The Contractor shall review the specific installation requirements of the APS buttons with the County's vendor of the APS system prior to installing any APS system in any intersection.

(******)

Accessible Pedestrian Signal (APS) Pushbuttons

When required in the Contract, APS Pushbuttons shall be provided. Each accessible pedestrian signal (APS) shall be a complete APS pushbutton system at each pedestrian pushbutton location shown in the Plans. Equipment shall be current-generation Polara Enterprises iNS models or approved equal.

Only one brand of equipment shall be used for the entire Contract.

Each pushbutton station shall include the following:

1. Flat black colored housing.

2. High contrast pushbutton arrow (dark on a light background or light on a dark background). White on silver or silver on white are not acceptable as high contrast.

3. Integral 9" x 15" R10-3e Sign. Braille shall not be included. Adaptor plates shall be included if required to accommodate the sign.

4. Appropriate interface control unit for installation in associated pedestrian display.

5. Percussive tone / rapid tick walk indication.

6. Voice messages, as specified below, pre-installed. Voice shall be male.

7. Interconnect cable for installation between pushbutton station and pedestrian display interface unit. Unless otherwise specified in the Contract, cable shall be provided by the pushbutton manufacturer. Cable may be standard four-conductor cables meeting the requirements of Section 9-29.3(2)B if it meets the pushbutton manufacturer's requirements.

The following shall be provided at each intersection:

1. One USB flash drive with copies of all voice message audio files for that intersection, placed in the traffic signal cabinet drawer or drawing envelope. A separate flash drive is required for each intersection.

2. One USB cable of the appropriate type (A to A, A to B, male/female, etc.), placed in the traffic signal cabinet drawer or drawing envelope.

Any other equipment or software required by the manufacturer for setup, operation, and maintenance of the pushbutton stations shall be provided. For Polara systems only, *** do not *** provide one EConfigurator for the entire Contract.

Dual button adaptor brackets are required for all installations with two APS pushbuttons on the same Type PPB, Type PS, or Type I Signal Standard. Where dual button adaptor brackets or extension brackets are required, they shall be obtained from the same manufacturer as the pushbutton station. Brackets and extensions from other manufacturers shall not be used.

APS Speech Messages
Speech messages shall be provided in the following format:

- "Wait."
- "Wait to cross ___ _(A)_____ at _____(B)_____."
- "Walk sign is on to cross ___ _(A)_____."

The following table lists the entries for (A) and (B) above, as well as quantities for button and arrow orientations:

(A)	(B)	Buttons with Left-Pointing Arrow	Buttons with Right-Pointing Arrow
Ivy Avenue	4th Street	1	1
4th Street	-	2	2
Highland Road	4th Street	1	1

Order forms shall be completed by the Contractor using the information presented above.

8-20.2(9-29.20) Pedestrian Signal Heads

Section 9-29.20 is supplemented with the following:

(******)
Pedestrian signal heads used on this project shall be 19.5-inch wide by 16-inch high units having Light Emitting Diode (LED) orange hand ("DON'T WALK") and white walker ("WALK") messages located on the left half of the pedestrian signal head face. The light source for LED messages shall be portland orange or white LED's in a uniformly spaced grid (a dotted outline of either symbol is not permitted). The LED's shall be mounted to a printed circuit board where the center-to-center spacing of the LED's (along vertical and horizontal grid lines) is not to exceed 5/8".

The right half of the pedestrian signal head face shall have a two-digit numerical countdown display. This countdown display shall consist of two, staggered, dual row, seven segment digits. The digits shall be comprised of not less than 9 LED's per vertical segment, and not less than 6 LED's per horizontal segment. The LED's shall be wired so that the loss of a single LED within a string will not significantly degrade the legibility of the display. The countdown LED's may be either orange or white. The

countdown display module shall have internal logic that will measure and store the timings for the walk and flashing pedestrian clearance intervals. If the pedestrian interval timings are changed, the module shall re-learn and store the new timings within two successive cycles of the pedestrian phase. The countdown module shall have seven programmable modes, which are set by a DIP switch located on the rear of the module. The DIP switch shall be provided with a protective cover. The various modes will allow the countdown display to run with the walk display, flashing don't walk display, or both displays. The digits shall also be programmable to flash during the pedestrian clearance interval.

The front of the pedestrian signal face shall have a translucent diffusion lens. This message lens shall be UV stabilized polycarbonate plastic having a thickness of not less than 0.250". Spacing between the LED's and the message lens and diffusion refraction characteristics of the message lens shall be sufficient to provide a uniformity ratio of 4:1 or better between adjacent LED's.

The module assembly shall be designed to operate on a voltage of 120 VAC 60HZ ± 3HZ. The fluctuation of the line voltage over the range of 95 volts to 135 volts shall have no visible effect on the luminous intensity of the indications. The LED's and power supplies shall be designed to prevent perceptible flicker to the unaided eye when the module is operated over the voltage range specified above. The module shall also have onboard surge protection to withstand the high repetition noise transients as stated in Section 2.1.6 of the NEMA Standard TS-2, 1992. The maximum power consumption for the unit shall be as follows:

Portland Orange Hand display = 9 Watts
Lunar White Person display = 5.5 Watts
Portland Orange Digit display = 5 Watts

8-20.2(9-29.25) Amplifier, Transformer and Terminal Cabinets

The first paragraph of Section 9-29.25 is replaced with:

(******)
Amplifier, terminal and transformer cabinets shall conform to the Contract, NEMA 3R requirements and the following:

The following is added to Section 9-29.25:

All terminal cabinets supplied for this project shall be supplied with the same Best green core locks as the traffic signal cabinet. Each terminal cabinet shall include 1 green core key. The keys shall be marked as the traffic signal cabinets.

8-20.2(9-29.26) Optical Preemption System

Section 9-29.26 is added as follows:

(******)
The Opticom emergency vehicle detection system shall be provided, including all field wiring, detectors, phase selectors, cards, and all other equipment required to make the emergency vehicle preemption system function in the intersection.

8-20.2(1) Equipment List And Drawings

The first sentence of Section 8-20.2(1) is modified from "Within twenty days following the execution of the contract..." to read as follows:

(******)
"Within five working days following the execution of the contract..."

Revise the fourth paragraph to read:

(******)
The Contractor shall submit for approval shop drawings for each of the following types of illumination standards called for on this project:

1. Street illumination standards as identified and described in the contract drawings.

Section 8-20.2(1) is supplemented as follows:

(******)
Within five working days following approval of the sources, the Contractor shall submit to the Engineer the following information:

A letter from the traffic signal cabinet and control equipment manufacturers that states the estimated delivery date of the equipment to the Contracting Agency for testing, and a letter from the traffic signal pole manufacturer that states the estimated delivery date of the poles to the job site.

Quantities for specific equipment to construct and install the signal and all appurtenances are shown on the Plans. These quantities are minimum quantities required to perform the work shown on the Plans. The Contractor shall verify each item's quantity and supply the quantities required to perform the work detailed on the Plans.

(******)
Approval of Shop Drawings For Illumination And Signals
The review time for approval of shop drawings for illumination and signal work will require up to seven (7) calendar days from the date the Engineer receives the drawings until they are returned to the Contractor. The drawing submitted for approval shall be from the pre-approved list in Section 8-20.2 for Traffic Signal Standards in these Special Provisions. If the pole manufacturer determines that a standard plan is insufficient for the loading, they shall submit a shop drawing stamped by a professional engineer licensed in the state of Washington.

Deficiencies will require additional time for approval based on the degree of the deficiency and the additional review time required. If the shop drawings are returned to the Contractor to correct deficiencies, an additional seven (7) calendar days may be required for the approval process.

If more than seven (7) calendar days are required for routine approval of shop drawings that are complete and accurate, the effect which the additional review and approval time have on the completion time will be considered in evaluating a time

extension. The Contractor will be granted an extension of time, in accordance with Section 1-08.5 of these Special Provisions and Section 1-08.8 of the Standard Specifications.

(*****)

Specific Equipment Listings

The Contractor shall provide a listing of all equipment provided for the signal in table form, detailing the equipment provided. The signal will have the following information included on the signal equipment list:

- Traffic Signal Name
- Specific electronic equipment item (traffic signal, control cabinet, etc.)
- Serial number of item
- A space for the County staff to log the date that the piece of equipment was provided to the Contractor for installation

The listing will be used by the County staff to record the equipment that was initially provided by the Contractor for cabinet testing, payment for material on hand, and ultimately to show what equipment was provided back to the Contractor for installation in the field.

8-20.3 Construction Requirements

8-20.3(4) Foundations

Section 8-20.3(4) is supplemented with the following:

(******)

Foundations for various types of standards shall be as follows:

Type PPB	As noted on Standard Plan J-20.15.
Type PS	As noted on Standard Plan J-21.10.
Type III	As noted on Standard Plan J-26.10 and on the Plans.

Standard Pole Foundations:

Minimum Traffic Signal Standard Foundation Depths

Signal Standard Type	Foundation Size and Shape	Minimum Foundation Depth **
III	3' diameter round	15-ft
III	3' by 3' square	10-ft
III	4' by 4' square	10-ft

** Depths greater than these will be required only in those cases where unusually poor soil conditions and/or buried obstacles are encountered. Depths less than these will be allowed for a base design having a 4-foot square or 5-foot diameter circular cross-section, where every vertical foot below 1 foot is equivalent to 1.5 feet of foundation depth at a 3-foot square cross-section. For example, if a 13-foot deep

foundation is required for a 3-foot square cross-section, a full depth 4-foot square or 5-foot diameter circular cross-section foundation that is 9 feet deep would be allowed.

8-20.3(5) Conduit

Section 8-20.3(5) is supplemented with the following:

(******)
Mule Tape and Tracer Wire in all new conduits
A 12-gauge stranded tracer wire shall be installed in all conduits. A mule tape pull line shall be installed in each conduit. The pull line shall have a tensile strength of 1800 lbf. Any existing pull lines or tapes utilized by the Contractor shall be replaced with a new pull line.

(******)
Mule Tape and Tracer Wire in all existing conduits
The Contractor shall confirm the presence of a 12-gauge stranded tracer wire and of a mule tape pull line in each existing conduit. The Contractor shall confirm each pull line has a tensile strength of at least 1800 lbf. Any deficient tracer wires or pull lines shall be replaced with new materials meeting the above specifications for new conduits.

Section 8-20.3(5)B Conduit Type

Section 8-20.3(5)B, Paragraph 4 is revised to read:

(******)
Conduit runs, including outer-duct, that do not enter the traveled way or shoulders shall be Schedule 80 HDPE, Schedule 80 PVC or rigid metal.

Section 8-20.3(5)D Conduit Placement

Section 8-20.3(5)D, Paragraph 1 is revised to read:

(******)
Conduit shall be laid so that the top of the conduit is a minimum depth of:

- 36-inches below the finished grade of curb and sidewalk, or
- 36-inches below the top of the roadway base, or
- 48-inches below the bottom of railroad ties under railroad tracks unless otherwise specified by the railroad company, or
- 36-inches below the finish grade in all other areas.

All conduit installed within a rain garden storm water feature (crossing, or alongside, but not under new concrete) shall be placed such that the top of the conduit is 48-inches below the grade of the gutter in the adjacent finished curb elevation.

All new conduit crossing roads shall be installed to not disturb the existing pavement or sidewalk.

Section 8-20.3(5)D is supplemented with the following:

(******)

The conduit is schematically shown on the Plans as being located near the sidewalk. Conduit shall be placed under new sidewalk. Conduit may be placed next to existing sidewalk (a) if the existing sidewalk will not be removed as part of the Contract and (b) if the conduit can be placed within the public right of way.

A 12-gauge stranded tracer wire shall be installed in all new conduits. A tape pull line shall be installed in all new conduits. The pull line shall have a tensile strength of 1800 lbf. Any existing pull lines utilized by the Contractor shall be replaced with a new pull line.

8-20.3(6) Junction Boxes, Pull Boxes, and Cable Vaults

Section 8-20.3(6) is supplemented with the following:

(******)

All junction box locations shown on the plans are diagrammatic and may be adjusted in the field to provide compatibility and ease of installation within curb and street excavations. The Engineer, prior to installation, must approve alternate junction box locations.

All junction boxes shall be located outside of paved or areas with concrete pavement / concrete sidewalk, unless the Engineer requires the specific location. The Contractor shall verify each junction box location with the Engineer prior to installation.

When adjacent junction boxes are installed, they shall be butted together or be separated by more than three feet (3').

All junction boxes shall be flush with the grade of the adjacent land or sidewalk as directed by the Engineer.

Slip-Resistant Application for Junction Boxes and Cable Vaults Within Sidewalk

All junction box and cable vault lids within the sidewalk shall have special non-slip surfaces applied. There are two pre-approved surfaces for lids:

- Mebac1 as manufactured by IKG Industries
- SlipNOT Grade 3-coarse as manufactured by W.S. Molnar Company.

All lids with the special non-slip surface provided on the project shall have same manufacturer of non-slip surface.

Slack Cable in Type 1 Junction Boxes

Each loop lead in shall have 10-ft of spare lead in wire spooled in the Type 1 junction box, where the loop lead in wiring is spliced to the loop wire. Each loop wire shall have 10-ft of spare loop wire spooled In the type 1 junction box where the splice is made.

No spare loop lead in wire shall be spooled in Type 1 Junction boxes where the loop lead in wire is passing through.

Slack Cable In Type 2 Junction Box Near Poles

The Contractor shall spool 10-ft of wire for all conductors, illumination circuits, pedestrian detection, GridSmart detection, radar detection, spare wires to the terminal cabinets and emergency vehicle detection in each Type 2 junction box nearest each signal pole. Any wiring passing through the junction box nearest a signal pole destined to another signal pole shall not be spooled in the junction box.

Slack Cable In Type 8 Junction Box Near Poles and Signal Cabinet

The Contractor shall spool 20-ft of wire for all conductors, illumination circuits, pedestrian detection, radar detection, spare wires to the terminal cabinets and emergency vehicle detection in each Type 8 junction box nearest the traffic signal cabinet. Any wiring passing through the junction box nearest a signal pole destined to another signal pole shall not be spooled in the junction box.

On new signal installations, the Contractor shall provide double depth Type 8 junction boxes nearest the traffic signal cabinet to allow for the quantity of wire being spooled in the Type 8 junction box.

Slack Cable in Traffic Signal Cabinet

The slack wire at the traffic signal cabinet shall instead be spooled in the junction box. The well of the traffic signal cabinet shall hold no more than one circle of wire; all excess shall be pulled back to the nearest junction box. No excess wire shall be spooled in the well of the cabinet.

8-20.3(8) Wiring

Section 8-20.3(8) is supplemented with the following:

(March 13, 1995 WSDOT GSP)

Field Wiring Chart

501	AC+ Input	516-520 Railroad Pre-empt
502	AC- Input	5A1-5D5 Emergency Pre-empt
503-510	Control-Display	541-580 Coordination
511-515	Sign Lights	581-599 Spare

Movement Number	1	2	3	4	5	6	7	8	9
Vehicle Head									
Red	611	621	631	641	651	661	671	681	691
Yellow	612	622	632	642	652	662	672	682	692
Green	613	623	633	643	653	663	673	683	693
Spare	614	624	634	644	654	664	674	684	694
Spare	615	625	635	645	655	665	675	685	695
AC-	616	626	636	646	656	666	676	686	696
Red Auxiliary	617	627	637	647	657	667	677	687	697
Yellow Auxiliary	618	628	638	648	658	668	678	688	698
Green Auxiliary	619	629	639	649	659	669	679	689	699
Pedestrian Heads & Detectors.									

Hand	711	721	731	741	751	761	771	781	791
Man	712	722	732	742	752	762	772	782	792
AC-	713	723	733	743	753	763	773	783	793
Detection	714	724	734	744	754	764	774	784	794
Common-Detection	715	725	735	745	755	765	775	785	795
Spare	716	726	736	746	756	766	776	786	796
Spare	717	727	737	747	757	767	777	787	797
Spare	718	728	738	748	758	768	778	788	798
Spare	719	729	739	749	759	769	779	789	799
Detection									
AC+	811	821	831	841	851	861	871	881	891
AC-	812	822	832	842	852	862	872	882	892
Common-Detection	813	823	833	843	853	863	873	883	893
Detection A	814	824	834	844	854	864	874	884	894
Detection B	815	825	835	845	855	865	875	885	895
Loop 1 Out	816	826	836	846	856	866	876	886	896
Loop 1 In	817	827	837	847	857	867	877	887	897
Loop 2 Out	818	828	838	848	858	868	878	888	898
Loop 2 In	819	829	839	849	859	869	879	889	899
Supplemental Detection									
Loop 3 Out	911	921	931	941	951	961	971	981	991
Loop 3 In	912	922	932	942	952	962	972	982	992
Loop 4 Out	913	923	933	943	953	963	973	983	993
Loop 4 In	914	924	934	944	954	964	974	984	994
Loop 5 Out	915	925	935	945	955	965	975	985	995
Loop 5 In	916	926	936	946	956	966	976	986	996
Loop 6 Out	917	927	937	947	957	967	977	987	997
Loop 6 In	918	928	938	948	958	968	978	988	998
Spare	919	929	939	949	959	969	979	989	999

In addition to the requirements of Section 9-29.3 of the Standard Specifications and revisions to Section 9-29.3 within these Special Provisions, Section 8-20.3(8) is supplemented with the following:

(******)

The termination of all field wiring, except those used for the electrical service, shall be made by utilizing nylon insulated spade terminals of the proper size/color for the wire AWG and installed on the wire with a compound action non-piercing crimping tool (Thomas & Betts model No. WT1455, Xcelite model No. MAC-2210, Paladin model No. PA 1305, or approved equal). Any field wiring connection terminals that are not installed in accordance with the above tool(s) shall be immediately rejected and replaced by the Contractor prior to turn-on of the signal system.

The ends of every conductor at each wire termination, splice, connector or device shall have a PVC marking sleeve on the insulation that bears its circuit number, as indicated in the field wiring chart and the cabinet wiring requirements in these Special Provisions.

The PVC marking sleeve shall have the circuit number printed by machine, not hand written.

The traffic signal system have been designed for the use of multi-conductor cable and single conductors for traffic control. All single conductors shall be No. 12 AWG Class B stranded copper conductors having chemically cross-linked polyethylene Type USE insulation.

Single conductor wires shall be used for all signal system power, inductive loops, illumination, and spare wires.

Wiring Nomenclature

The wiring nomenclature for Clark County signals is detailed on the plans.

The Contractor shall mark the Clark County signal's wiring consistent with the Clark County nomenclature.

Mechanical Lugs

All field wiring which has two or more wires terminated on a terminal strip shall be connected to the terminal strip with an Ideal product dual rated panel board mechanical lug, or approved equivalent.

The RAM submittal shall include a catalog cut sheet for the mechanical lugs.

8-20.3(8)B Cabinet Wiring Requirements

Section 8-20.3(8)B is supplemented with the following:

(******)
All field terminals and wires in the controller cabinet shall be labeled consistent with the standards of the field wiring chart above and the following cabinet wiring requirements:

All field terminals and wires in the controller cabinet shall be labeled consistent with the standards of the cabinet termination drawings and wiring nomenclature.

<u>Copper Ethernet Patch Cables</u>

Each copper patch cable within the traffic signal cabinet, between the Ethernet switch and individual components shall have the exterior jacketing color coded and tagged, as described below. This is to visually separate out the function and connection between the equipment.

Each patch cable shall be tied to the cabinet, with a loop sufficient to allow plugging and unplugging each end of the patch cable from the components in the cabinet, allowing for a neat orderly appearance of the cables.

The location of the tie points of all wiring and patch cables in the cabinet shall be sufficient to hold the wiring, not kinking or over bending the wires, while also not restricting the maintenance, removal or modification of settings to the equipment in the cabinet.

Patch Cable Color	Device connected to Ethernet switch
Blue	Controller
Purple	MMU Ethernet port
Yellow with “XX Approach” tag, tag on both ends of cable	Radar Detector system. Each approach would have a unique tag, the eastbound approach would be tagged with "EB Approach", if multiple approaches existed, then each approach's patch cable shall be tagged with the appropriate approach label
Ivory with function tag	Patch cables between the Ethernet switch(s). Each patch cable shall be tagged on each end with a descriptor stating what it was for
Ivory with red color tape on each end	Patch cable from switch in ITS cabinet to switch in traffic signal cabinet, 40-ft typical length
*****	GridSmart detection
White	Radar stopbar detection
Pink	Pavement Temperature Alert System
*****	Cellular communication
Grey with red color tape around both ends "Opticom" tag	Optical preemption system with the Ethernet to serial communications on the emergency vehicle preemption phase selector
Grey with "XXX" tag	Other equipment not specifically listed in this table.
Blue with red color tape around both ends	Pedestrian detection system
Yellow with red color tape around both ends	Battery Backup System

8-20.3(11) Signal Testing

Section 8-20.3(11) is supplemented with the following:

(******)

Product Listing

The Contractor shall provide a single listing of all traffic signal equipment supplied under the contract, including make, model and serial number, and the date provided, to the engineer.

This listing will be used by the Engineer to ensure that all equipment was delivered to the Engineer for testing, and verification that all equipment is located in the field.

The complete listing of equipment shall be provided to the Engineer prior to the beginning of cabinet testing.

Shop Testing

All signal control equipment in the controller cabinet and battery backup systems being supplied under this contract shall be shop-tested to the satisfaction of the

Clark County Traffic Signal Engineer. The equipment will also be functionally tested after installation in the field. Shop testing will be at a location provided by the Contractor, and the related expenses shall be subsidiary to the Contract.

Shop testing will verify specific Plan requirements, in addition to testing requirements listed in the Standard Specifications. All costs for transporting signal control equipment shall be included in the Contractor's bid price for the respective items. The Contractor or his representative shall assemble the cabinet and related signal equipment ready for testing.

A complete demonstration by the Contractor or his representative of all integrated components satisfactorily functioning shall be required. All control elements shall function properly as a complete system. Any malfunction shall stop the test until all parts are satisfactorily operating.

Five (5) working days' notice to the Engineer is required prior to the start of the test period.

Ethernet Cabinet Communications Integration Testing

Each of the components connected to the Ethernet hub within the cabinet will be demonstrated as being able to communicate with the related software on a PC connected to the cabinet via the Ethernet hub.

The demonstration shall include, but not be limited to demonstrate that each of the following cabinet components communicate to the PC connected via Ethernet hub:

- Optical Preemption System Phase Selector
- Controller
- On-Street Master
- Malfunction Management Unit
- GridSmart Detection System
- Ethernet hub and switches

8-20.3(11)C Controller Delivery Dates for Testing

The Contractor shall deliver the 2070 controllers for all signal cabinets to the County signal shop at least 14 days prior to any cabinet testing.

8-20.3(11)D Cabinet Delivery Dates for Testing

The Contractor shall provide to the Engineer a detailed list of delivery dates for signal cabinet testing to Clark County Public Works Traffic Signal Shop, as described in Section 1-08.3.

The detailed list of delivery dates shall account for the time required for shipment of those cabinets to the County Traffic Signal Shop, and scheduling of testing at the County Traffic Signal Shop.

8-20.3(11)E Signal Cabinet Testing at County Shops

As part of the cabinet testing, the traffic signal cabinet vendor for the Contractor shall provide for testing the signal cabinets to specifically set up and test all communications and functionality of equipment in the signal cabinet.

Vendor Representation During Cabinet Testing

The Contractor shall arrange to have a qualified representative of the traffic signal controllers and signal controller intersection software available for phone consultation on the day of the signal cabinet testing. The Contractor shall arrange to have a representative for the vendor that supplies the traffic signal cabinets and other electronic equipment inside the traffic signal cabinets present during the days of cabinet testing.

8-20.3(11)F Release of Signal Equipment to the Contractor

After the signal equipment is shop tested, Clark County Public Works will run the cabinets under loading in the signal shop for a minimum of 7 calendar days. If a cabinet goes into flash, or fails in another manner, during this 7-day period, the Contractor shall arrange with the vendor to work with County staff to address why the cabinet failed. This arrangement may range from swapping out a defective component in the cabinet, to having the cabinet vendor come back to the County shops to modify the cabinet operation. After each failure of the cabinet, the cabinet will be tested for a minimum of 7 calendar days in the County's signal shop prior to release of the cabinet to the Contractor for installation.

The Contractor's vendor shall have all components within the cabinet fully functional prior to beginning the 7-day test period.

After the signal control equipment is successfully shop tested, the Engineer will provide notice to the Contractor to remove the traffic signal cabinet from the County shop. The pluggable components shall remain at the County's traffic signal shop until the signal turn-on procedure is ready to begin.

The Contractor shall take delivery of the shop inspected, approved cabinets within 7 calendar days of notification by the Engineer of acceptance of the equipment. If the Contractor does not take delivery of the approved cabinets within 7 calendar days of notification, the Engineer shall drop ship the cabinet to the Contractor's office, charging all shipping costs to the Contractor.

The County signal shop has the space and equipment to configure, and 7-day test a total of 4 traffic signal cabinets. The signals shown on the plan sets to be upgraded are a portion of the signals that will be under construction while this Contract is under construction. Traffic signal cabinets will be configured and tested on a first come, first served basis, based on the delivery date of the equipment to the signal shop. The Contractor's schedule for testing, and ultimately signal upgrades on this Contract may need to be adjusted, depending on the timeliness of the Contractor's delivery of equipment and other project's cabinets in the shop.

The Contractor shall store the cabinet to protect against vandalism, weather, and all other damage until the cabinets are ready to be moved to the intersection for turn-on.

8-20.3(14) Signal Systems

Section 8-20.3(14) is supplemented with the following:

(******)

Optical Preemption System Continuous Wiring

The signal shall have continuous runs of wiring between the traffic signal cabinet and each optical preemption system detector. Splices shall not be installed in the continuous emergency vehicle preemption wiring. The wiring for the optical preemption system shall not be terminated in the terminal cabinet on the poles.

GridSmart Stop Bar Detection Continuous Wiring

The GridSmart stop bar detection wiring shall be as required by the manufacturer of the GridSmart stop bar detection system. The GridSmart stop bar detection shall have continuous runs of wiring between the traffic signal cabinet and the vendor supplied terminal box mounted on the pole near the GridSmart stop bar detection system.

Signal Conductor Wiring

The wiring used for signal conductors shall have continuous runs of wiring between the traffic signal cabinet and the terminal cabinet mounted on the traffic signal cabinet. The wiring shall be terminated on wire terminals in the terminal cabinet. Each traffic signal head shall have a unique single, or pair of 5-conductor wires connecting the signal head to the terminals in the terminal cabinet. Field wiring for signal heads will not be daisy chained between signal heads. No splices will be allowed in the field wiring between the traffic signal cabinet and the terminal cabinet. No splices will be allowed in the field wiring between the terminal cabinet and the signal head.

Luminaire Conductor Wiring

For steel pole luminaires, the illumination system wiring shall be continuous from the lighting circuits in the electrical service to the base of the pole, where a fuse is installed, then run continuous from the fuse to the luminaire housing. In addition to the slack wire that is required in junction boxes.

For all other illumination wiring, the wiring shall be continuous from the lighting circuits in the electrical service to the luminaire head, with the slack wire required in junction boxes.

Equipment To Be Fully Functional At Signal On Day Of Turn On

Where construction signing is required (Signal Revision Ahead signs) are required in Section 1-10.3(3)A, these construction warning signs shall be installed prior to the day of the signal turn on, with covers over the signs. These signs shall be uncovered just prior to the traffic signal cabinet turn on.

On the day of signal turn-on, the W3-3 / W16-8P sign assemblies shall be in place. The signs to be removed on the approaches shall also be removed on the day of the signal turn on. This work is specified in Section 8-21.

The following equipment shall be fully functional prior to the end of the day that the signal is turned on:

- Vehicle and Pedestrian Signal Indications
- Pedestrian Pushbuttons
- GridSmart Advance and Stop Bar Detection System
- Bicycle Detection system
- Optical Preemption System
- Cellular modem communication
- Illumination System
- Regulatory and warning signing at the signal, and on the approaches.

8-20.3(14)B Signal Heads

Section 8-20.3(14)B is supplemented with the following:

(******)
The Contractor shall mount all traffic signal heads on the mast arms and poles, as shown on the Plans using type N mounts.

The Plans show the relative location of signal heads in relation to the vehicle lanes of travel. The Contractor shall verify all locations of each of the signal heads with the Engineer prior to installing the signal heads on any mast arm.

Where the Plans show new signal heads, the Contractor shall install new 5-conductor wiring from each head to the terminal cabinet. The Contractor shall install new 7-cc conductor wiring between the head and terminal cabinet where the signal head is a 5-section signal head, or a 4-section flashing yellow arrow signal head.

The Contractor shall not install the signal heads onto new poles and mast arms any more than fourteen (14) calendar days prior to turning on the signal into normal stop and go operation. The Contractor shall seal any holes to keep water and other objects from entering the pole or mast arm. After the signal heads are installed, they shall be fully covered with black plastic sheeting material until the signal is turned on to normal stop and go operation.

8-20.3(14)E Light and Signal Standards

Section 8-20.3(14)E is supplemented with the following:

(******)
Traffic Signal Pole Tags
Each component of each pole shall include a metal tag that is riveted to the component that states in 1-in minimum high capital letters the following information:

Intersection Name

Pole #
Manufacturer
Manufacture Date

Each luminaire arm, traffic signal pole, and traffic signal mast arm shall include the riveted metal tag with the above listed information. If the Contractor provides a pole configuration where multiple mast arm sections are connected to make a longer mast arm, then each unique section of each mast arm shall be tagged.

Mast Arms and Signal Mounting

The mast arms for signal poles shall be delivered without tenons for traffic signal heads or for the optical preemption system detectors. The Contractor shall install the traffic signal heads mounts as shown on the Plans. The mounts shall be delivered with steel cable mounts.

The mounts are intended to allow movement of the signal heads, in case the pole foundation is moved laterally due to utility conflicts. The Contractor shall verify the locations of the signal heads to be mounted with the engineer prior to installation on the mast arm.

The traffic signal poles are to be delivered with the mast arm as detailed in the plans. The mast arms are longer than required for the signal head locations. After the mast arm and signal heads are installed, the Contractor shall cut the end of the mast arm off, and cap the end – sealing the end of the mast arm. Not all signal mast arms are to be cut by the Contractor, as extra length is necessary to accommodate future intersection configurations. The Contractor shall verify with the Engineer the length of mast arm to be cut. The mast arm should extend beyond the center of the mount as shown on the plans. The intent of this specification is that if the pole foundation needs to be moved laterally, the mast arm will be long enough to allow for placing the signal heads laterally in the proper area for the driver's view.

New traffic signal heads shall be mounted using mounts, mounted including tether line, and wire rope (cable mount) not metal band style mounting. The cables shall be provided with sufficient length to install the mount. Mounts shall be provided to allow the signal head to move vertically, rotate and swivel.

Pedestrian indications shall be installed as shown on the Plans.

Signal Head Covers

Traffic and pedestrian signals that have been installed and have not yet been energized shall be covered with traffic signal head covers. The covers shall be tan or yellow with a vertical message "NOT IN SERVICE" in white on each cover. Plastic bags or cloth materials shall at no time be used to cover vehicle or pedestrian heads. At no time shall vehicle and/or pedestrian signals that have been installed and are not in operation remain uncovered.

The temporary coverings remain the property of the Contractor until the signal is energized and is accepted by the Maintaining Agency, upon which they become the property of Contractor. The Contractor shall maintain the coverings so that no tears or rips appear in the covers before the traffic signal is turned on and accepted.

Signal head covers shall meet the requirements of Section 9-29.16(4).

Sign covers shall meet the requirements of Section 8-21.3(3).

Emergency Vehicle Detector Mounting

All optical preemption system detectors shall be drilled and tapped into the neutral axis (center) of the pole, and fitted with schedule 80 threaded pipe fittings and 90-degree elbow to place detector either 6-inches over top of mast arm, or 6-inches over adjacent signal back plates, or sign blades.

8-20.3(14)F Traffic Signal System Description

Section 8-20.3(14)F is added to Section 8-20.3(14):

(******)

For the purposes of this section, the front door is the door that opens to reveal the front panels of the controller, detection, etc., in the cabinet.

After the equipment has arrived at the signal shops, tested and released to the Contractor as described in Sections 8-20.3(11), the Contractor shall submit a schedule showing the proposed cabinet upgrades and installations.

The Contractor shall not schedule signal work that involves the new traffic signal cabinets until all of the signal equipment has been released from the signal shops.

The Contractor may work on installing conduit, junction boxes, field wiring, signal poles, cabinet foundations new electrical services for the signal prior to the release of the traffic signal cabinets.

Add the following new subsection:

(******)

8-20.3(22) Video Monitoring System

8-20.3(22)A New CCTV Cameras

The video and data will be transmitted to the Clark County Public Works Building via a fiber optic network using digitized video and Ethernet switches. The digitized video may be provided using separate video encoders or IP cameras.

The Contractor shall provide, install, configure and test materials for the new CCTV pan-tilt-zoom cameras being installed by this project. The Contractor shall install CCTV cameras at the intersections as shown on the Plans and described in the Special Provisions. The Contractor shall mount the cameras on existing and new traffic signal mast arm poles, and luminaires. The final camera mounting locations shall provide the following camera viewing capabilities. The Contractor shall firmly attach the dome system to the existing signal pole via a pole mount adapter as shown in the Plans and specified in Section 9-29.35.

The installation of the wiring will include that a hole be drilled into the existing signal pole. The edges of the drilled hole shall be smoothed. The contractor shall install a

watertight gland nut (or grommet) in this hole that securely holds the wiring. All cables shall be:

- Installed without damaging the conductors or insulation
- Installed without kinks
- Run continuously between terminations without splices
- Installed with sufficient slack for equipment movement
- Rated for outdoor use and resisted to water and UV radiation

When cameras are initially installed, the camera shall be in a position where its view of the roadway will be not obstructed by the pole it is mounted on. The camera shall see all four legs without its view being blocked by the signal pole.

This contract includes Contractor provided and installed pan tilt zoom CCTV cameras, camera mounts, camera power supplies, video encoders, camera video/data/power cabling, and communications interfaces required to allow the video encoder system to make the camera pan / tilt / zoom and Cat5e cables. The CCTV camera assembly shall be installed such that the camera viewing coverage is optimized as directed by the Engineer. Video encoders are not required if IP cameras are supplied and conform to the CCTV camera specifications.

A manufacturer's representative shall be present at turn-on. Furnish, install, and fully adjust the camera with the associated lens, power supplies, housing, pan/tilt units, and all necessary cabling, etc., to make the assembly complete and operational. Options involved in setup, configuration and data entry shall be discussed with the Engineer prior to entry. Installation and configuration of video equipment and cameras shall be performed by personnel experienced in the installation and configuration of similar systems. Properly terminate all the electrical cables to the camera and firmly attach them.

The camera power supply shall be installed in a recessed rack mount panel as shown on plans. For each signal that has two cameras, two power supplies shall be installed in the traffic signal cabinet. One power supply shall be mounted so as to be accessible from front side of the cabinet. The second power supply shall be mounted on a hinged recessed rack mount panel accessible from the back side of the cabinet.

8-20.3(22)D System Testing

Video monitoring system testing shall include tests on the video system components at the following points (a) pre-installation testing, (b) Subsystem testing – after installation in the field, but prior to connection to any other portion of the system, (c) Final system – after connection of the complete system.

8-20.3(22)E Pre-Installation Testing

Pre-inspection testing shall include testing of all material, equipment, and cables in a laboratory environment prior to delivery to the site. Use of laboratory facilities, shall be arranged by the Contractor. The tests shall either be conducted at the equipment manufacturer's premises or at a laboratory arranged by the Contractor. Configure a proof-of-concept to demonstrate the operation of the system with the components intended for implementation prior to installation in the field. With the proof-of-concept, demonstrate the following:

- Verify operation of camera, video encoder, Ethernet switches and camera control software as an integrated system
- Demonstrate pan/tilt/zoom functionality and video quality performance using video viewing and control software and over a simulated Ethernet network.

8-20.3(22)F Subsystem Testing

Demonstrate the pan/tilt/zoom functionality and video quality performance for each camera site. Notify the Engineer of intent to proceed with subsystem testing 48 hours prior to commencement of each test. Pan/tilt/zoom control shall be performed using encoded video and camera control software.

Provide installation documentation and test results for all material, equipment and cable upon completion of the subsystem testing and prior to the final system testing. Installation documentation shall include the following as appropriate:

- Model, part number and serial number for all material and equipment
- Test equipment model number, serial number, settings, and date of last calibration
- All factory, laboratory and site test results.

8-20.3(22)G Final System Tests

Test the full integration of all camera subsystems and demonstrate pan/tilt/zoom functionality and video image quality at the Clark County Engineering building and the Clark County traffic shop on 78th Street.

Test each camera image and verify camera control using the encoded video and camera control software. Document all functional test results. If the Engineer determines any aspect of the functional tests have failed, cease testing, determine cause of failure and make repairs to satisfaction of Engineer. If the Engineer directs, repeat functional test from the beginning.

Final system testing is considered complete upon demonstration of video quality and control functions (pan/tilt/zoom) using camera control software from the County facilities.

8-20.3(22)H System Documentation

Provide a vendor manual with each product installed. The vendor manual shall be of good commercial quality and shall have sufficient information to support correct installation, set up, operation and maintenance of the product.

8-20.4 Measurement

Section 8-20.4 is supplemented with the following:

(******)

No specific unit of measurement will apply to the lump sum items for rectangular rapid flashing beacon system, but measurement will be for the sum total of all items for a complete system to be furnished and installed.

The lump sum contract price for “Rectangular Rapid Flashing Beacon” shall be full pay for the construction of the complete electrical systems, as described in the Plans, and herein specified, including excavation, backfilling, concrete foundations, conduit, wiring, restoring

facilities destroyed or damaged during construction, and for making all required tests. All additional materials and labor, not shown in the Plans or called for herein and which are required to complete the electrical system shall be included in the lump sum contract price.

8-20.5 Payment

Section 8-20.5 is supplemented with the following:

(******)
The lump sum Contract price for “Traffic Signal System” shall include traffic signal illumination as shown on the Plans.

(******)
The lump sum contract prices for the bid items listed below shall be full pay for all costs involved in furnishing all labor, materials, tools, and equipment necessary or incidental to the construction, and installation of the complete and operable rectangular rapid flashing beacon systems.

“Rectangular Rapid Flashing Beacon”, lump sum.

8-23 Temporary Pavement Markings

8-23.3 Construction Requirements

8-23.3(4)(9-34.5) Temporary Pavement Marking Tape

8-23.3(4)(9-34.5(2)) Temporary Pavement Marking Tape – Long Duration (Non-Removable)

Section 9-34.5(2), including title, is revised to read:

(February 25, 2021 WSDOT GSP)
Temporary Pavement Marking Tape – Long Duration
Temporary pavement marking tape for long duration (usage is for greater than two months and less than one year) shall conform to ASTM D4592 Type I. Temporary pavement marking tape for long duration, except for black tape, shall have a minimum initial coefficient of retroreflective luminance of 200 mcd*m-2*lx-1 when measured in accordance with ASTM E2832. Black tape, black mask tape and the black portion of the contrast tape, shall be non-reflective.

Add the following new section:

(******)
Joint Utility Trench

Description
This work shall consist of the excavation and backfill of a joint utility trench.

The purpose of this work is to facilitate the installation of conduit for communication, power, and gas within the road section as shown in the Joint Utility Plans and per the Joint Utility Trench Details.

Construction Requirements

The Contractor shall provide coordination with all utility providers included in the utility trench.

The Contractor shall excavate the trench, parallel to E 4th Street, and the trench road crossings, at the locations and dimensions shown on the Plans, and shall coordinate with individual utilities for the installation of electrical, and communication conduits to be completed by each individual utility (or their assigned contractor).

After the completion of power, gas, and communication conduit installation, the Contractor shall backfill the trench to subgrade and complete compaction. Backfill material shall be select borrow or screenings as indicated on the road sections.

Measurement

Joint utility trench for dry utilities will be measured by the linear foot measured along the center of the trench, parallel to East 4th Street, and at transverse crossings, at the locations shown in the Plans.

Separate measurement for Trench Safety System will only be allowed if the depth of the trench from the bottom of trench to finished grade (bottom of crushed surfacing under sidewalk, or bottom CSBC in the roadway) is greater than 48 inches.

Payment

"Joint Utility Trench, Incl. Backfill", per linear foot

The unit Contract price per linear foot for "Joint Utility Trench, Incl. Backfill" shall be full pay for all labor, equipment and materials associated with excavating the trench, coordinating with other utilities for installation of their facilities, backfilling the trench in stages, conduit bedding with screenings, and compaction of all lifts. Conduit bedding with screenings shall meet City of La Center standards for trench backfill or screenings per WSDOT Standard Specification 9-03.4(2) and be free of debris, trash, organics and rocks larger than 1"-0".

Appendices

(January 2, 2012 WSDOT GSP)

The following appendices are attached and made a part of this contract:

*** APPENDIX A:
Construction Stormwater General Permit

APPENDIX B:
XXXXXXXX ***

Standard Plans

(January 13, 2021 WSDOT GSP)

The State of Washington Standard Plans for Road, Bridge and Municipal Construction M21-01, effective September 30, 2020, is made a part of this contract.

The Standard Plans are revised as follows:

A-50.10
DELETED

A-50.20
DELETED

A-50.30
DELETED

A-50.40
DELETED

B-90.40
Valve Detail – DELETED

C-1a
DELETED

C-8
Add new Note 5, "5. Type 2 Barrier and Barrier Terminals are allowed in temporary installations only. New Type 2 Barrier and Barrier Terminals are not allowed to be fabricated after December 31, 2019. The plan is provided as a means to verify that any Type 2 barrier and Barrier Terminals fabricated prior to December 31, 2019 meets the plan requirements and cross-sectional dimensions as specified in Standard Specifications 6-10.3(5)."

C-8a
Add new Note 2, "2. Type 4 Barrier and Barrier Transition are allowed in temporary installations only. New Type 4 Barrier and Barrier Transition are not allowed to be fabricated after December 31, 2019. The plan is provided as a means to verify that any Type 4 barrier and Barrier Transition fabricated prior to December 31, 2019 meets the plan requirements and cross-sectional dimensions as specified in Standard Specifications 6-10.3(5)."

C-8b
DELETED

C-8e
DELETED

C-8f
DELETED

C-16a
DELETED

C-20.10

The following table is added:

SLOPE \ EMBANKMENT TABLE (FOR 8', 9', 11' LONG POSTS)		
POST LENGTH	**SLOPE**	**W (FT)**
8-FOOT	1H : 1V OR FLATTER	2.5 MIN.
8-FOOT	2H : 1V OR FLATTER	0 (FACE OF BARRIER AT SLOPE BREAK POINT)
9-FOOT	1.5H : 1V OR FLATTER	0 (FACE OF BARRIER AT SLOPE BREAK POINT)
11-FOOT	1H : 1V OR FLATTER	0 (FACE OF BARRIER AT SLOPE BREAK POINT)

C-20.11

DELETED

C-20.19

DELETED

C-40.16

DELETED

C-40.18

DELETED

C-80.50

DELETED

C-85.14

DELETED

C-85.15

SECTION B detail, the callout reading "ANCHOR BOLT (TYP.) ~ SEE DETAIL, STANDARD PLAN C-8b", is revised to read "ANCHOR BOLT (TYP.) ~ SEE DETAIL IN PLANS".

SECTION B detail, the callout reading "ANCHOR PLATE (TYP.) ~ SEE STANDARD PLAN J-8b", is revised to read "ANCHOR PLATE (TYP.) ~ SEE DETAIL IN PLANS".

D-2.14

DELETED

D-2.16

DELETED

D-2.18

DELETED

D-2.20
DELETED

D-2.42
DELETED

D-2.44
DELETED

D-2.46
DELETED

D-2.48
DELETED

D-2.82
DELETED

D-2.86
DELETED

D-10.10
Wall Type 1 may be used if no traffic barrier is attached on top of the wall. Walls with traffic barriers attached on top of the wall are considered non-standard and shall be designed in accordance with the current WSDOT Bridge Design Manual (BDM) and the revisions stated in the 11/3/15 Bridge Design memorandum.

D-10.15
Wall Type 2 may be used if no traffic barrier is attached on top of the wall. Walls with traffic barriers attached on top of the wall are considered non-standard and shall be designed in accordance with the current WSDOT BDM and the revisions stated in the 11/3/15 Bridge Design memorandum.

D-10.30
Wall Type 5 may be used in all cases.

D-10.35
Wall Type 6 may be used in all cases.

D-10.40
Wall Type 7 may be used if no traffic barrier is attached on top of the wall. Walls with traffic barriers attached on top of the wall are considered non-standard and shall be designed in accordance with the current WSDOT BDM and the revisions stated in the 11/3/15 Bridge Design memorandum.

D-10.45
Wall Type 8 may be used if no traffic barrier is attached on top of the wall. Walls with traffic barriers attached on top of the wall are considered non-standard and shall be designed in accordance with the current WSDOT BDM and the revisions stated in the revisions stated in the 11/3/15 Bridge Design memorandum.

D-15.10
STD Plans D-15 series “Traffic Barrier Details for Reinforced Concrete Retaining Walls” are withdrawn. Special designs in accordance with the current WSDOT BDM are required in place of these STD Plans.

D-15.20
STD Plans D-15 series “Traffic Barrier Details for Reinforced Concrete Retaining Walls” are withdrawn. Special designs in accordance with the current WSDOT BDM are required in place of these STD Plans.

D-15.30
STD Plans D-15 series “Traffic Barrier Details for Reinforced Concrete Retaining Walls” are withdrawn. Special designs in accordance with the current WSDOT BDM are required in place of these STD Plans.

G-20.10
SIGN INSTALLATION BEHIND TRAFFIC BARRIER detail, dimension callout “3’ MIN.”, is revised to read “5’ MIN.”.

H-70.20
Sheet 2, Spacing Detail, Mailbox Support Type 1, reference to Standard Plan I-70.10 is revised to H-70.10

H-70.30
DELETED

J-10.16
Key Note 14, reads:”Mounting Hole ~ See Standard Plan J-10.30 for mounting Details.” Is revised to read:”Mounting Hole ~ See Standard Plan J-10.14 for mounting Details.”
General Note 12, reads: “See Standard Plan J-10.30 for pole installation details.” Is revised to read: “See Standard Plan J-10.14 for pole installation details.”

J-10.17
Key Note 16, reads:”Mounting Hole ~ See Standard Plan J-10.?? for mounting Details.” Is revised to read:”Mounting Hole ~ See Standard Plan J-10.14 for mounting Details.”
General Note 12, reads: “See Standard Plan J-10.30 for pole installation details.” Is revised to read: “See Standard Plan J-10.14 for pole installation details.”

J-10.18
Key Note 12, reads:”Mounting Hole ~ See Standard Plan J-10.20 for mounting Details.” Is revised to read:”Mounting Hole ~ See Standard Plan J-10.14 for mounting Details.”
General Note 12, reads: “See Standard Plan J-10.30 for pole installation details.” Is revised to read: “See Standard Plan J-10.14 for pole installation details.”

J-20.26
Add Note 1, “1. One accessible pedestrian pushbutton station per pedestrian pushbutton post.”

J-20.16
View A, callout, was – LOCK NIPPLE, is revised to read; CHASE NIPPLE

J-21.10

Sheet 1, Elevation View, Round Concrete Foundation Detail, callout – "ANCHOR BOLTS ~ ¾" (IN) x 30" (IN) FULL THREAD ~ THREE REQ'D. PER ASSEMBLY" IS REVISED TO READ: "ANCHOR BOLTS ~ ¾" (IN) x 30" (IN) FULL THREAD ~ FOUR REQ'D. PER ASSEMBLY"

Sheet 1 of 2, Elevation view (Round), add dimension depicting the distance from the top of the foundation to find 2 #4 reinforcing bar shown, to read; 3" CLR.. Delete "(TYP.)" from the 2 ½" CLR. dimension, depicting the distance from the bottom of the foundation to find 2 # 4 reinf. Bar.

Sheet 1 of 2, Elevation view (Square), add dimension depicting the distance from the top of the foundation to find 1 #4 reinforcing bar shown, to read; 3" CLR. Delete "(TYP.)" from the 2 ½" CLR. dimension, depicting the distance from the bottom of the foundation to find 1 # 4 reinf. Bar.

Sheet 2 of 2, Elevation view (Round), add dimension depicting the distance from the top of the foundation to find 2 #4 reinforcing bar shown, to read; 3" CLR. Delete "(TYP.)" from the 2 ½" CLR. dimension, depicting the distance from the bottom of the foundation to find 2 # 4 reinf. Bar.

Sheet 2 of 2, Elevation view (Square), add dimension depicting the distance from the top of the foundation to find 1 #4 reinforcing bar shown, to read; 3" CLR. Delete "(TYP.)" from the 2 ½" CLR. dimension, depicting the distance from the bottom of the foundation to find 1 # 4 reinf. Bar.

Detail F, callout, "Heavy Hex Clamping Bolt (TYP.) ~ 3/4" (IN) Diam. Torque Clamping Bolts (see Note 3)" is revised to read; "Heavy Hex Clamping Bolt (TYP.) ~ 3/4" (IN) Diam. Torque Clamping Bolts (see Note 1)"

Detail F, callout, "3/4" (IN) x 2' – 6" Anchor Bolt (TYP.) ~ Four Required (See Note 4)" is revised to read; "3/4" (IN) x 2' – 6" Anchor Bolt (TYP.) ~ Three Required (See Note 2)"

J-21.15

Partial View, callout, was – LOCK NIPPLE ~ 1 ½" DIAM., is revised to read; CHASE NIPPLE ~ 1 ½" (IN) DIAM.

J-21.16

Detail A, callout, was – LOCKNIPPLE, is revised to read; CHASE NIPPLE

J-22.15

Ramp Meter Signal Standard, elevation, dimension 4' - 6" is revised to read; 6'-0"

(2x) Detail A, callout, was – LOCK NIPPLE ~ 1 ½" DIAM. is revised to read; CHASE NIPPLE ~ 1 ½" (IN) DIAM.

J-28.60

Note 1 "See Standard Plans C-8b and C-85.14 for foundation and anchor bolt details." is revised to read "See contract for anchor bolt details. See Standard Plan C-85.15 for foundation details."

J-40.10

Sheet 2 of 2, Detail F, callout, "12 – 13 x 1 ½" S.S. PENTA HEAD BOLT AND 12" S. S. FLAT WASHER" is revised to read; "12 – 13 x 1 ½" S.S. PENTA HEAD BOLT AND 1/2" (IN) S. S. FLAT WASHER"

J-40.36

Note 1, second sentence; "Finish shall be # 2B for backbox and # 4 for the cover." Is revised to read; "Finish shall be # 2B for barrier box and HRAP (Hot Rolled Annealed and Pickled) for the cover.

J-40.37

Note 1, second sentence; ”Finish shall be # 2B for backbox and # 4 for the cover.” Is revised to read; ”Finish shall be # 2B for barrier box and HRAP (Hot Rolled Annealed and Pickled) for the cover.

J-75.20

Key Notes, note 16, second bullet point, was: “1/2” (IN) x 0.45” (IN) Stainless Steel Bands”, add the following to the end of the note: “Alternate: Stainless steel cable with stainless steel ends, nuts, bolts, and washers may be used in place of stainless steel bands and associated hardware.”

J-81.10

All references to “Type 170 Controller” are replaced with “Controller”.

L-40.10

DELETED

The following are the Standard Plan numbers applicable at the time this project was advertised. The date shown with each plan number is the publication approval date shown in the lower right-hand corner of that plan. Standard Plans showing different dates shall not be used in this contract.

A-10.10-00.....8/7/07
A-10.20-00.....10/5/07
A-10.30-00.....10/5/07
A-20.10-00.....8/31/07
A-30.10-00.....11/8/07
A-30.30-01.....6/16/11
A-30.35-00.....10/12/07
A-40.00-00.....8/11/09
A-40.10-04.....7/31/19
A-40.15-00.....8/11/09
A-40.20-04.....1/18/17
A-40.50-02.....12/23/14
A-60.10-03.....12/23/14
A-60.20-03.....12/23/14
A-60.30-01.....6/28/18
A-60.40-00.....8/31/07

B-5.20-03.....9/9/20
B-5.40-02.....1/26/17
B-5.60-02.....1/26/17
B-10.20-02.....3/2/18
B-10.40-01.....1/26/17
B-10.70-01……9/9/20
B-15.20-01.....2/7/12
B-15.40-01.....2/7/12
B-15.60-02.....1/26/17
B-20.20-02.....3/16/12
B-20.40-04.....2/27/18
B-20.60-03.....3/15/12
B-25.20-02.....2/27/18
B-25.60-02.....2/27/18
B-30.05-00……..9/9/20
B-30.10-03.....2/27/18
B-30.15-00……..2/27/18
B-30.20-04.....2/27/18
B-30.30-03.....2/27/18
B-30.40-03.....2/27/18
B-30.50-03.....2/27/18
B-30.60-00……..9/9/20
B-30.70-04.....2/27/18
B-30.80-01.....2/27/18
B-30.90-02.....1/26/17
B-35.20-00.....6/8/06
B-35.40-00.....6/8/06
B-40.20-00.....6/1/06
B-40.40-02.....1/26/17
B-45.20-01.....7/11/17
B-45.40-01.....7/21/17
B-50.20-00.....6/1/06
B-55.20-02.....2/27/18
B-60.20-02.....9/9/20
B-60.40-01.....2/27/18
B-65.20-01.....4/26/12
B-65.40-00.....6/1/06
B-70.20-00.....6/1/06
B-70.60-01.....1/26/17
B-75.20-02.....2/27/18
B-75.50-01.....6/10/08
B-75.60-00.....6/8/06
B-80.20-00.....6/8/06
B-80.40-00.....6/1/06
B-85.10-01.....6/10/08
B-85.20-00.....6/1/06
B-85.30-00.....6/1/06
B-85.40-00.....6/8/06
B-85.50-01.....6/10/08
B-90.10-00…….6/8/06
B-90.20-00.....6/8/06
B-90.30-00.....6/8/06
B-90.40-01.....1/26/17
B-90.50-00.....6/8/06
B-95.20-01.....2/3/09
B-95.40-01.....6/28/18

C-1.....9/9/20
C-20.42-05.....7/14/15
C-70.10-02.....9/16/20

C-1b.....9/9/20
C-1d.....10/31/03
C-2c.....8/12/19
C-4f.....8/12/19
C-6a.....10/14/09
C-7.....6/16/11
C-7a.....6/16/11
C-8.....2/10/09
C-8a.....7/25/97
C-20.10-06.....9/16/20
C-20.14-04.....8/12/19
C-20.15-02.....6/11/14
C-20.18-03.....8/12/19
C-20.40-07.....8/12/19
C-20.41-02.....8/12/19
C-20.45.02.....8/12/19
C-22.16-07.....9/16/20
C-22.40-08.....9/16/20
C-22.45-05.....9/16/20
C-23.60-04.....7/21/17
C.24.10-02.....8/12/19
C-25.20-06.....7/14/15
C-25.22-05.....7/14/15
C-25.26-04.....8/12/19
C-25.30-00…….6/28/18
C-25.80-05.....8/12/19
C-60.10-01…….9/24/20
C-60.20-00……9/24/20
C-60.30-00……9/24/20
C-60.70-00……9/24/20
C-75.10-02.....9/16/20
C-75.20-02.....9/16/20
C-75.30-02.....9/16/20
C-80.10-02.....9/16/20
C-80.20-01.....6/11/14
C-80.30-01.....6/11/14
C-80.40-01.....6/11/14
C-85.10-00.....4/8/12
C-85.11-01.....9/16/20
C-85.15-01.....6/30/14
C-85.16-01.....6/17/14
C-85-18-01.....6/11/14
C-85.20-01.....6/11/14

1

D-2.04-00.....11/10/05
D-2.06-01.....1/6/09
D-2.08-00.....11/10/05
D-2.32-00.....11/10/05
D-2.34-01.....1/6/09
D-2.36-03.....6/11/14
D-2.60-00.....11/10/05
D-2.62-00.....11/10/05
D-2.64-01.....1/6/09
D-2.66-00.....11/10/05
D-2.68-00.....11/10/05
D-2.80-00.....11/10/05
D-2.84-00.....11/10/05
D-2.88-00.....11/10/05
D-2.92-00.....11/10/05
D-3.09-00.....5/17/12
D-3.10-01……5/29/13
D-3.11-03……6/11/14
D-3.15-02……6/10/13
D-3.16-02……5/29/13
D-3.17-02……5/9/16
D-4.....12/11/98
D-6.....6/19/98
D-10.10-01.....12/2/08
D-10.15-01.....12/2/08
D-10.20-01.....8/7/19
D-10.25-01.....8/7/19
D-10.30-00.....7/8/08
D-10.35-00.....7/8/08
D-10.40-01.....12/2/08
D-10.45-01.....12/2/08

2

E-1.....2/21/07
E-2.....5/29/98
E-4.....8/27/03
E-4a.....8/27/03

3

F-10.12-04.....9/24/20
F-10.16-00.....12/20/06
F-10.18-02.....9/24/20
F-10.40-04.....9/24/20
F-10.42-00.....1/23/07
F-10.62-02.....4/22/14
F-10.64-03.....4/22/14
F-30.10-04.....9/25/20
F-40.12-03.....6/29/16
F-40.14-03.....6/29/16
F-40.15-04.....9/25/20
F-40.16-03.....6/29/16
F-45.10-02.....7/15/16
F-80.10-04.....7/15/16

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G-10.10-00.....9/20/07
G-20.10-02.....6/23/15
G-22.10-04.....6/28/18
G-24.10-00.....11/8/07
G-24.20-01.....2/7/12
G-24.30-02.....6/28/18
G-24.40-07.....6/28/18
G-24.50-05.....8/7/19
G-24.60-05.....6/28/18
G-25.10-05.....9/16/20
G-26.10-00……7/31/19
G-30.10-04.....6/23/15
G-50.10-03.....6/28/18
G-90.10-03……7/11/17
G-90.11-00……4/28/16
G-90.20-05……7/11/17
G-90.30-04……7/11/17
G-90.40-02……4/28/16
G-95.10-02.....6/28/18
G-95.20-03.....6/28/18
G-95.30-03.....6/28/18

5

H-10.10-00.....7/3/08
H-10.15-00.....7/3/08
H-30.10-00.....10/12/07
H-32.10-00.....9/20/07
H-60.10-01.....7/3/08
H-60.20-01.....7/3/08
H-70.10-01.....2/7/12
H-70.20-01.....2/16/12

6

I-10.10-01.....8/11/09
I-30.10-02.....3/22/13
I-30.15-02.....3/22/13
I-30.16-01.....7/11/19
I-30.17-01.....6/12/19
I-30.20-00.....9/20/07
I-30.30-02.....6/12/19
I-30.40-02.....6/12/19
I-30.60-02.....6/12/19
I-40.10-00.....9/20/07
I-40.20-00.....9/20/07
I-50.20-01.....6/10/13
I-60.10-01.....6/10/13
I-60.20-01.....6/10/13
I-80.10-02.....7/15/16

1

J-10.....7/18/97
J-10.10-04……9/16/20
J-10.12-00……9/16/20
J-10.14-00……9/16/20
J-10.15-01.....6/11/14
J-10.16-01……9/16/20
J-10.17-01……9/16/20
J-10.18-01……9/16/20
J-10.20-03……9/16/20
J-10.21-01……9/16/20
J-10.22-01.....9/16/20
J-10.25-00……7/11/17
J-12.15-00……6/28/18
J-12.16-00……6/28/18
J-15.10-01.....6/11/14
J-15.15-02……7/10/15
J-20.10-04.....7/31/19
J-20.11-03.....7/31/19
J-20.15-03.....6/30/14
J-20.16-02.....6/30/14
J-20.20-02.....5/20/13
J-20.26-01.....7/12/12
J-21.10-04.....6/30/14
J-21.15-01.....6/10/13
J-21.16-01.....6/10/13
J-21.17-01.....6/10/13
J-21.20-01.....6/10/13
J-22.15-02.....7/10/15
J-22.16-03.....7/10/15
J-26.10-03…..7/21/16
J-26.15-01…..5/17/12
J-26.20-01…..6/28/18
J-27.10-01…..7/21/16
J-27.15-00…..3/15/12
J-28.10-02.....8/7/19
J-28.22-00.....8/07/07
J-28.24-02.....9/16/20
J-28.26-01.....12/02/08
J-28.30-03.....6/11/14
J-28.40-02.....6/11/14
J-28.42-01.....6/11/14
J-28.43-01.....6/28/18
J-28.45-03.....7/21/16
J-28.50-03.....7/21/16
J-28.60-02.....7/21/16
J-28.70-03.....7/21/17
J-29.10-01.....7/21/16
J-29.15-01.....7/21/16
J-29.16-02.....7/21/16
J-30.10-00…...6/18/15
J-40.05-00……7/21/16
J-40.10-04…...4/28/16
J-40.20-03…...4/28/16
J-40.30-04……4/28/16
J-40.35-01……5/29/13
J-40.36-02……7/21/17
J-40.37-02……7/21/17
J-40.38-01.....5/20/13
J-40.39-00……5/20/13
J-40.40-02……7/31/19
J-45.36-00……7/21/17
J-50.05-00……7/21/17
J-50.10-01…….7/31/19
J-50.11-02…….7/31/19
J-50.12-02…….8/7/19
J-50.13-00…….8/22/19
J-50.15-01…….7/21/17
J-50.16-01…….3/22/13
J-50.18-00…….8/7/19
J-50.19-00…….8/7/19
J-50.20-00…….6/3/11
J-50.25-00…….6/3/11
J-50.30-00…….6/3/11
J-60.05-01…….7/21/16
J-60.11-00…….5/20/13
J-60.12-00…….5/20/13
J-60.13-00……..6/16/10
J-60.14-01……7/31/19
J-75.10-02……7/10/15
J-75.20-01……7/10/15
J-75.30-02…….7/10/15
J-75.40-02……6/1/16
J-75.41-01……6/29/16
J-75.45-02……6/1/16
J-80.10-00……6/28/18
J-80.15-00……6/28/18
J-81.10-01……9/16/20
J-86.10-00……6/28/18
J-90.10-03…….6/28/18
J-90.20-03…….6/28/18
J-90.21-02……6/28/18
J-90.50-00……6/28/18

2

K-70.20-01.....6/1/16
K-80.10-02.....9/25/20
K-80.20-00.....12/20/06
K-80.35-01.....9/16/20
K-80.37-01.....9/16/20

3

L-10.10-02.....6/21/12
L-20.10-03.....7/14/15
L-30.10-02.....6/11/14
L-40.15-01.....6/16/11
L-40.20-02.....6/21/12
L-70.10-01.....5/21/08
L-70.20-01.....5/21/08

1

M-1.20-04.....9/25/20
M-1.40-03.....9/25/20
M-1.60-03.....9/25/20
M-1.80-03.....6/3/11
M-2.20-03.....7/10/15
M-2.21-00……7/10/15
M-3.10-04.....9/25/20
M-3.20-03.....9/25/20
M-3.30-04.....9/25/20
M-3.40-04.....9/25/20
M-3.50-03.....9/25/20
M-5.10-03.....9/25/20
M-7.50-01.....1/30/07
M-9.50-02.....6/24/14
M-9.60-00……..2/10/09
M-11.10-03.....8/7/19
M-12.10-02……9/25/20
M-15.10-01.....2/6/07
M-17.10-02.....7/3/08
M-20.10-03.....9/25/20
M-20.20-02.....4/20/15
M-20.30-04.....2/29/16
M-20.40-03.....6/24/14
M-20.50-02.....6/3/11
M-24.20-02.....4/20/15
M-24.40-02.....4/20/15
M-24.60-04.....6/24/14
M-24.65-00……7/11/17
M-24.66-00……7/11/17
M-40.10-03.....6/24/14
M-40.20-00...10/12/07
M-40.30-01.....7/11/17
M-40.40-00.....9/20/07
M-40.50-00.....9/20/07
M-40.60-00.....9/20/07
M-60.10-01.....6/3/11
M-60.20-02.....6/27/11
M-65.10-02.....5/11/11
M-80.10-01.....6/3/11
M-80.20-00.....6/10/08
M-80.30-00.....6/10/08

2
3